Charnwood Borough Local Plan Mitigation

Draft Final Report

Charnwood Borough Council

27th May 2021

Quality information

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1.1 Context and Objective

1.1.1.1 Charnwood Borough Council (CBC) commissioned AECOM to identify transport interventions to mitigate the impact of growth options being considered in CBC's emerging Local Plan. The report provides information to support CBC in identifying a preferred spatial growth option, and the development of settlement-based policies to support growth.

1.1.1.2 This report sets out the approach undertaken to determine what transport interventions are needed and the outcomes from this work, including the preferred package of mitigation and indicative capital cost.

1.1.1.3 Complementing this report is Technical Note 3, an Excel file '210203 Charnwood BC LP Mitigation EAST Assessment Final' (Final Draft, 3rd February 2021), which provides a long list of potential transport interventions to mitigate Local Plan growth, and the preferred package of interventions with indicative capital cost.

1.2 Charnwood's Local Plan Growth Options

1.2.1.1 The emerging Local Plan for Charnwood covers the period 2021 to 2037. Seven options for housing development for the Local Plan in Charnwood were put forward in 'Towards a Local Plan for Charnwood' (Charnwood Borough Council, June 2018). The impacts of these seven options on the highways network were assessed using LLITM-Lite (Leicester and Leicestershire Integrated Transport Model)[1], which informed the shortlisting of two growth options ('Option 1' and 'Option 2'). Since then, CBC has identified a 'Hybrid Option', which has emerged as the preferred option to be tested.

1.2.1.2 This commission reports on the transport intervention needs to mitigate the impact of the Hybrid Option.

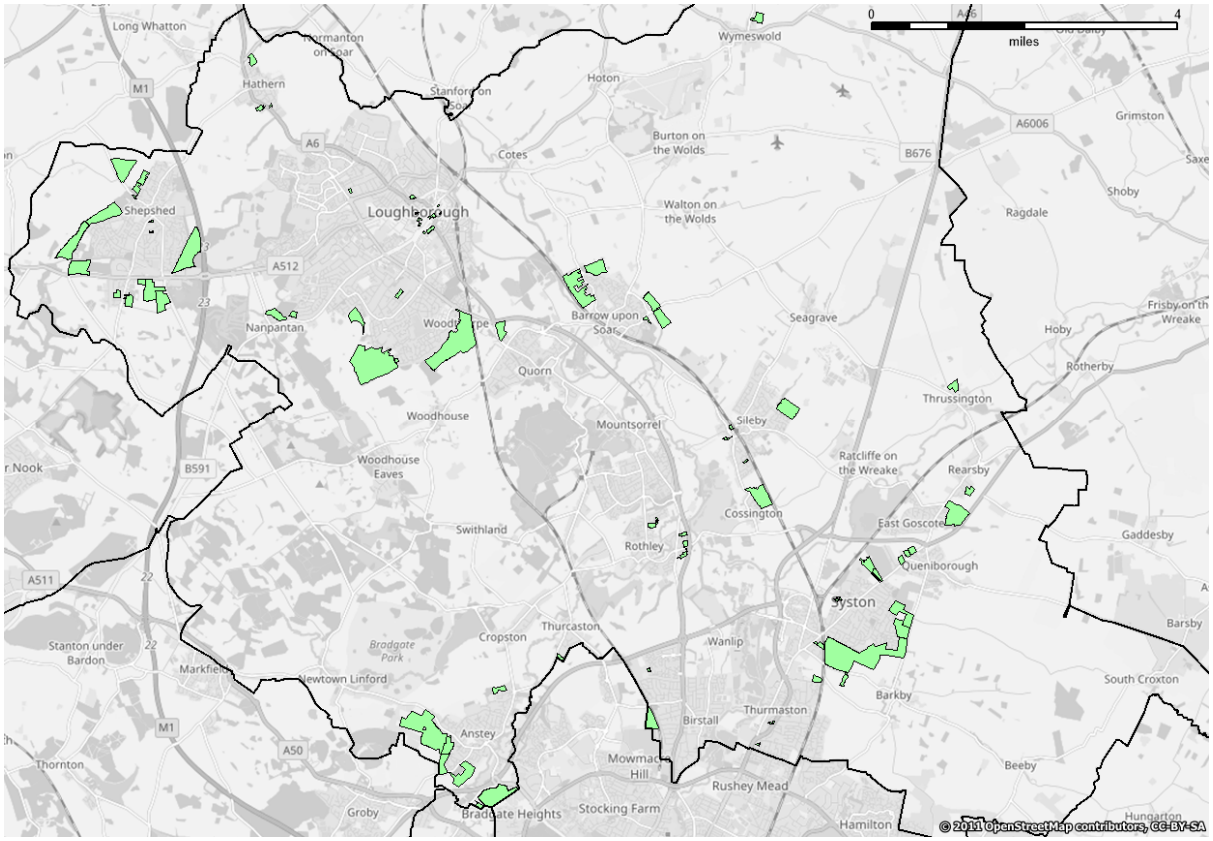
1.2.1.3 The Hybrid Option consists of:

- 9,105 additional homes;
- 5 ha hectares of employment land; and
- Up to 2,205 additional school places.

1.2.1.4 Figure 1-1 presents the distribution of sites that make up the Hybrid Option. Sites are located throughout the borough with key sites being proposed to expand existing urban areas, such as Loughborough (c.2,100 homes), Shepshed (c.2,050) and Syston (c.1,450), as well as some Service Centres and smaller other settlements such as Barrow upon Soar (c.700), Anstey (c.650), Sileby (c.250), and East Goscote (c200).[2]

[1] Charnwood Borough Council Local Plan: Mitigation Testing Final Report (Leicestershire County Council; June 2019)
[2] The distribution and scale of growth proposed under the Hybrid Option is broadly similar to that of Option 1, and comparatively more similar than Option 2. The main differences between the Hybrid Option and Option 1 is that the Hybrid Option has less growth in Sileby; and new development sites have been added at Fairhaven Farm in Anstey, and Land at Lovrin Equine Stables in Wymeswold.

Figure 1-1: Development Sites of the Hybrid Option



1.3 Overview of Method

1.3.1.1 The approach to this work involved three tasks:

- Task 1: Identifying broad locations and corridors where transport impacts were assessed to be most significant and where mitigation would need to focus. This produced TN1;
- Task 2: Creating a long list of transport interventions, which could potentially mitigate the impact of growth options within the broad locations and corridors identified in TN1. This produced TN2; and
- Task 3: Assessing the long list of transport interventions to identify a set of package options to address borough wide impacts, and identify a preferred package of interventions. This task included a high-level estimate of the capital cost of each intervention and package options (TN3).

1.3.1.2 For Task 1, Technical Note 1 (TN1) was produced on 25th November 2020 by AECOM to identify broad locations for mitigation based on growth under Option 1 and Option 2. TN1 set out the approach and how information from modelling outputs and other sources were used to identify where mitigation may need to be focused. An updated version of TN1 (TN1 Hybrid Option) was written to focus on identifying broad locations for the Hybrid Option of growth.

1.3.1.3 For Task 1 a workshop was hosted by AECOM attended by CBC, Leicestershire County Council (LCC), Leicester City Council, and Highways England (HE), and comments from that meeting were addressed and incorporated into a revised view of the potential broad locations where mitigation would need to focus, and also the approach to dealing with existing issues on the network and issues on the Strategic Road Network (SRN).

1.3.1.4 Technical Note 2 (TN2), to document the outcomes of Task 2, consisted of a long list of potential mitigation measures which could support mitigation of the impact of Local Plan growth in Charnwood and was completed on 8th January 2021. TN2 was reviewed by CBC, LCC and HE during week 11th Jan 2021 and amendments to TN2 proposed, including new ideas for interventions. The long list of interventions

presented here takes on board those comments and proposed ideas or mitigation Leicester City Council were also consulted but was unable to provide a response in the timescales available.

1.3.1.5 Technical Note 3 (TN3) was submitted on 20th January 2021 to CBC and assessed the suitability of interventions identified through the work of this commission to mitigate the impact of Local Plan growth (Hybrid Option) on the transport network to address Task 3. TN3 was produced in an Excel spreadsheet and therefore the contents from it cannot be placed in this report, however it will be provided separately to this report and should be read alongside it.

1.3.1.6 For each task a draft Technical Note (TN) was produced and circulated to CBC, Leicester City Council. LCC and HE for comment.

1.3.1.7 In response to comments received at the workshop, a separate note addressing issues on the SRN was provided to CBC on 8th January 2021. The note addressed how the SRN is considered when developing Local Plans, the SRN in Charnwood and how it interacts with the local road network, current and forecasted issues on the SRN in Charnwood, previously identified and potential mitigation to support growth, and recommendations for how network issues should be addressed. This note can be viewed in Appendix B.

1.4 Policy Context

1.4.1.1 An initial task was to undertake a review of relevant policy.

1.4.1.2 Key local policy documents include CBC's Charnwood Local Plan Core Strategy (2011 to 2028), CBC's Draft Local Plan (2019 to 2036), Charnwood Sustainable Transport Study (September 2020), LCC's Network Management Plan (2014) and LCC's Highway Asset Management Policy were reviewed to identify the key policies that would guide the approach to mitigation ideas in the borough. From this, it was recognised that there was an emphasis on encouraging sustainable travel, particularly walking and cycling, and a desire to reduce car trips in the borough. Reducing the need to travel, supporting housing growth, and creating a resilient and reliable road network were also themes across the policy documents.

1.4.1.3 In addition to the local documents, regional and national documents such as DfT Gear Change: a bold vision for cycling and walking (2020), DfT Circular 02/2013, and Highways England: North and East to Midlands Route Strategy (2017). These established a need to create seamless walking and cycle networks, a need to provide transport that supports economic growth, and a need to create a safe and free-flowing road network.

1.4.1.4 An important framework applied in the development of interventions was the user hierarchy as described in Department for Transport's (DfT) Manual for Streets. The user hierarchy, which is shown in Table 1-1. It recommends that the design of a scheme (or schemes) follow this user hierarchy. It states that, *'The hierarchy is not meant to be rigidly applied and does not necessarily mean that it is always more important to provide for pedestrians than it is for other modes. However, they should at least be considered first followed by consideration for the others in the order given'.*

Table 1-1: DfT User hierarchy[3]

Consideration	User
First	Pedestrians
↓	Cyclists
↓	Public transport users
↓	Specialist service vehicles (e.g. emergency services, waste, etc.)
Last	Other motor traffic

1.4.1.8 The full list of policy documents reviewed are listed in **Appendix A**.

1.5 Report Structure

1.5.1.1 The report includes the following chapters:

- Identifying Broad Locations for Mitigation: This chapter outlines the methodology for establishing the broad locations in Charnwood requiring mitigation and identifies issues on the network in Charnwood, and consequently identifies the broad locations requiring mitigation (Section 2).
- Growth and the Strategic Road Network: This chapter addresses the SRN in Charnwood, the issues that the SRN faces, and any proposed or potential mitigation measures to assist with growth (Section 3).
- Developing a Long List of Interventions: This chapter describes the methodology used to establish the long list of transport interventions to address the issues in each broad location (Section 4).
- Assessment of Long List of Interventions: This chapter documents the various options for packages of interventions identified to address the transport issues in each broad location and the methodology behind this process (Section 5).
- Preferred Package for Mitigation: Identifying the preferred package of interventions for mitigating against the proposed Local Plan growth (Section 6).
- Next Steps (Section 7).
- Appendix A – Policy Documents;
- Appendix B – Strategic Road Network Note;
- Appendix C – Long List of Interventions;
- Appendix D – Details of Preferred and Not Preferred Packages ; and
- Appendix E – Assessment Criteria Definitions.

[3] DfT Manual for Streets (2007)

2. Identifying Broad Locations for Mitigation

2.1 Introduction

2.1.1.1 Task 1 involved identifying the *broad locations* of the transport network that may require mitigation to support the emerging Local Plan growth options.

2.1.1.2 Mitigation is considered by broad location because:

- A high-level geographical assessment is deemed suitable to inform the development of settlement-based transport policy; and
- The timescale for testing the impact of emerging growth options and developing mitigation options is short.

2.2 PRTM Forecasting

2.2.1.1 The initial stage of evidence involved utilising outputs from the Pan-Regional Transport Model (PRTM) forecasting outputs of the potential impact of one Local Plan option to identify the broad locations of the transport network which may require mitigation.

2.2.1.2 The PRTM was used to test the impact of the two shortlisted Local Plan growth options. This work was undertaken by AECOM on behalf of CBC.

2.2.1.3 The PRTM outputs are set out in the following reports:

- PRTMv2 Charnwood Local Plan: Interim Forecasting Report (AECOM; Version 2; 16th November 2020); and
- Charnwood Additional Forecasting Analysis (AECOM; Version 2; 16th November 2020).

2.2.1.4 The forecast assessment represents the year 2037 and is compared against a Baseline scenario. Forecasting outputs which illustrate how the network performs in the two growth options include the following metrics: Volume over Capacity (VoC), traffic flow, and delay by link / junction.

2.2.1.5 Key points of note are:

- The focus of the development assumptions, in terms of trip rates and distributions, was on highway demand. Public transport usage and other mode trip rates were based on generic National Trip End Model (NTEM) assumptions. The forecasting report contains outputs on mode share; however, these remain stable between Baseline and Local Plan option scenarios as mode choice is relatively insensitive to changes in highway congestion brought about by the additional development.
- PRTM modelling is strategic and therefore makes broad assumptions on the capacity of the network by type of road.
- No mitigation measures were included in the modelling.
- The forecast does not take into account the impacts of the Covid-19 pandemic on travel patterns.

2.2.1.6 In addition, to inform the identification of broad locations in need of mitigation, further analysis of PRTM outputs was undertaken to develop a better understanding of potential issues affecting the highway network at specific locations.

2.3 Informing the Identification of Broad Locations

2.3.1.1 The following PRTM forecasting outputs has been used to inform the identification of broad locations for mitigation:

2.3.2 Volume over Capacity (VoC)

2.3.2.1 Junctions where there has been a significant deterioration in performance have been identified. A significant deterioration has been defined by:

- a change in VoC of at least 5% and a VoC level of at least 80% in the Local Plan growth options, or
- a change in VoC from below 100% in the Baseline to above 100% in the Local Plan growth option.

2.3.2.2 A VoC of 80% or more means that the level of traffic using the junction is approaching the capacity for which it was designed, and it may not operate at optimal efficiency. Increases in the volume of traffic beyond a VoC of 80% are likely to lead to additional congestion and delay. A VoC of 100% or above indicates a junction at or exceeding theoretical capacity, meaning that the highway is saturated and will result in more significant levels of congestion and delay.

2.3.2.3 Each of these junctions have been reviewed to sense-check the VoC change and identify the junction approach arms which are of concern.

2.3.2.4 As part of the process for deriving the package of mitigations, junctions which met the agreed threshold for reporting were looked at in detail to understand the nature of the issues and whether they could be attributed directly to the proposed Local Plan development. This, along with other information such as the broad location and cost of potential interventions, helped inform the development of mitigations for that area. In some cases these were specific junction improvements, and in others broader measures aimed at encouraging more sustainable modes of transport.

2.3.3 Change in Delay

2.3.3.1 The locations of significant delay change were identified from the PRTM delay plots, and the specific junctions of concern were listed. Note that the change in delay is based on the difference between the growth option and Baseline scenario, and does not represent the delay experienced at junctions (unless the Baseline delay is zero).

2.3.3.2 The PRTM outputs mapped junctions which experience a delay increase of at least 20 seconds on at least one approach arm. Review of data found that delay increases were typically much higher than 20 seconds, with some delays increases of over 100 seconds being identified.

2.3.3.3 Delays can affect the routeing of traffic. Analysis of selected zone and selected links was undertaken to identify ‘undesirable’ routeing in both the Baseline and Local Plan growth options, and the location of delays on the ‘desirable’ routes (for example traffic travelling longer distances re-routeing to use minor roads instead of the strategic road network).

2.3.4 Change in Flow

2.3.4.1 The change in flow is represented by the change in the number of vehicles along a section of road. This measure does not include information on the capacity of the road network or the level of utilisation. A large change in flow does not necessarily mean there is a need for mitigation.

2.3.4.2 Significant increases in flows were identified and mapped. This assessment was guided by the PRTM flow plots and data on the change in vehicle numbers.

2.3.5 Existing Issues

2.3.5.1 Though the assessment focuses on the potential impacts of growth options and how they need to be mitigated, we have considered - at a high level - how existing issues in the Baseline may be affecting the PRTM outputs such as where there may be congestion or delays at key junctions and how these re-route traffic. Whilst not the primary focus for attention, existing Baseline issues may need to be addressed as part of a package of mitigation measures where there is a strong geographical relationship to new issues developing on the surrounding network and where it would help support Local Plan growth. This applies to both the LRN and SRN, and further work could be undertaken to understand these affects in more detail.

2.3.6 Existing Public Transport and Active Mode Provision

2.3.6.1 In order to identify appropriate and sustainable mitigation, it is important for the analysis not to focus solely on private vehicle trips. An initial view of the provision of public transport and active travel routes has been considered for larger sites. Larger sites were identified as those with more than 100 dwellings proposed. It was recognised that these sites are areas where there could be a significant demand of alternative modes to the car and potentially the critical mass to support improvements to alternative modes. Therefore, a high-level review of the existing transport provisions was undertaken, including a review of the existing bus network[4], the existing rail network[5], and any cycle provision[6]. From this, it was established that some of the larger proposed sites located on the outskirts of settlements would also be included in the broad areas of mitigation identified in the next section of this TN.

2.4 Broad Locations Identified

2.4.1.1 Figure 2-1 presents the locations where there is deemed to be a relatively significant change in Volume over Capacity (VoC), delay, and flow taken from the PRTM output, and the location of any known existing issues which may impact on the highway network.

2.4.1.2 The broad locations for mitigation have been identified based on the location and grouping of highway issues which point to the potential need for mitigation, as presented in Figure 2-1. The boundary of the broad locations, shown as a dashed red line, provides an indication for an area within which mitigation may be required. The boundary is illustrative of the area and is not definitive, i.e. mitigation could be considered along corridors and across boundaries.

2.4.1.3 There are a number of key corridors crossing the borough which link settlements and the locations where growth is proposed. These are shown by the indicative shaded purple areas on the map in Figure 2-1. The key corridors are the A512 corridor (Shepshed to Loughborough), the A6 corridor (Loughborough to north Leicester via Barrow upon Soar, Rothley, Birstall, and Syston), and the A46 corridor (East Goscote to north Leicester via Syston, Birstall and Anstey).

2.4.1.4 The intention of the key corridors is to recognise the key, direct routes between locations of growth where direct impact on the network could be greatest and which could support integrated forms of mitigation. Recognising these corridors helps to address any concerns of a location-specific approach to mitigation, for example those raised at the workshop regarding north Leicester, Anstey, Birstall, and Syston.

2.4.1.5 There will be other important routes which link Charnwood locations with Leicester City such as the A563, A607, and A50 which may need to be considered as part of the wider picture when thinking through an integrated mitigation response. We recognise the transport network relationship between south of Charnwood and north of Leicester City, and this was highlighted at the workshop. The locations of growth and traffic movements between and across these areas will be considered when developing a mitigation long list.

2.4.1.6 The PRTM outputs also identified some delays in Leicester (primarily to the north). They lie south of the map boundary shown in Figure 2-1. These are not included when considering mitigation for the following reasons: the junctions showing delay lie relatively distant from the Charnwood boundary; these junction could already be close to capacity (although further analysis to identify this is required); the location and nature of growth in Leicester and other adjacent local authority areas may be different to that expressed in the PRTM and the requirement for mitigation will be an outcome of growth arising from other locations not only within Charnwood. Problem areas within the boundary of the City Council need to be considered further alongside the impacts identified from Leicester City Council's Local Plan preferred spatial option modelling.

2.4.1.7 Based on the information available, our view on the issues identified are explained in Table 2-1. A corresponding list of the junctions which show significant changes in VoC, delay or flow is available.

[4] Leicestershire County Council (2018) https://www.leicestershire.gov.uk/sites/default/files/field/pdf/2018/3/22/Commercial%20over%20Contracted%20v2.pdf
[5] Open Street Map https://www.openstreetmap.org
[6] Open Street Map and Propensity to Cycle Tool https://www.openstreetmap.org and https://www.pct.bike/m/?r=leicestershire

Figure 2-1: Hybrid Option PRTM outputs and broad locations requiring mitigation

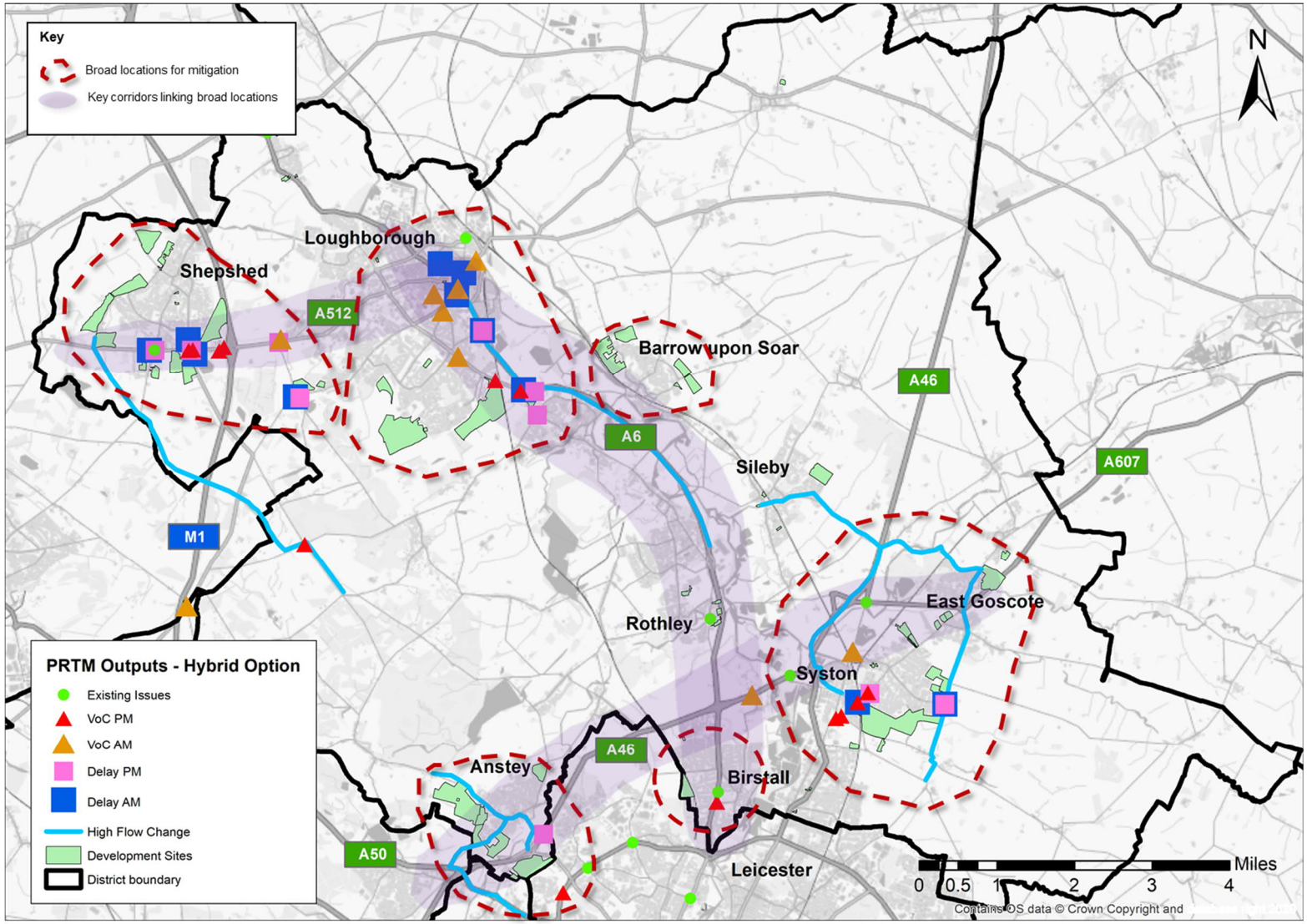


Table 2-1: Initial Explanations for Issues Identified

Broad location	Issue	Initial Explanation
Anstey	PM Peak delay at the A46 / A5630 junction on A46 east of junction. PM Peak VoC issues at A563 / A5630 junction on A563. High flow change along a number of local roads including Groby Road/Anstey Lane, Newton Linford Lane, Bradgate Road, and Leicester Road. None of the above network problems appear as existing issues so therefore it can be assumed that they are caused by the growth presented in the Hybrid Option.	Commuter trips into Leicester from new developments, exacerbated by existing issues on the A563. Potentially also caused by trips generated by developments to the north in Shepshed using local roads to commute to Leicester avoiding the M1 and A6.
Barrow upon Soar	High flow change along A6 to the south of Barrow upon Soar. This is not an existing issue therefore it can be assumed that they are caused by the growth presented in the Hybrid Option	Trips from sites in Barrow, Loughborough and Shepshed travelling into Leicester, potentially trips from the latter two avoiding the M1.
Birstall	VoC issues on Loughborough Road in the PM Peak. This is not an existing issue therefore it can be assumed that they are caused by the growth presented in the Hybrid Option.	Development to the west of Birstall causing delays on local roads around Belgrave - potentially commuter trips from Leicester in the PM Peak.
Loughborough	Delays and VoC issues in AM Peak throughout the town centre, particularly along A6 and A6004. Delays along the southern section of the A6 in both peaks and PM Peak VoC issues. AM and PM VoC issues along A6004 parallel to A6. High flow change along A6 through the town centre and to the south of Loughborough, as well as to the south west along local roads (Valley Road, Belvoir Drive, Park Road). All of these issues do not appear as existing issues so therefore it can be assumed that they are caused by the growth presented in the Hybrid Option.	Issues along the A6 perhaps due to developments to the south of the town commuting into Loughborough, or trips generated by the town centre developments commuting out to Leicester. Rerouting of strategic trips along A6004 to avoid Loughborough town centre could be causing delays and VoC issues along this road. These could be commuter trips into Leicester. New developments to the south of Loughborough causing high flow levels to the south as well as delays and VoC issues in Loughborough.
Shepshed (A512 corridor as well as southern cross-country route near Nanpantan)	VoC issues at M1 J23 on west arm eastbound approach on A512 Ashby Road East in the PM Peak and VoC issues at A512 Ashby Road East / B591 Ingleberry Road junction in the PM Peak. There is existing delay at A512 Ashby Road East / Iveshead Road / Charnwood Road junction, which also occurs in the AM and PM Peaks in the Hybrid Growth scenario. New delays at A512 Ashby Road / Snell's Nook Lane junction in the PM Peak, at Snell's Nook Lane / Nanpantan Road / Woodhouse Lane junction in both Peaks which were not existing issues. AM VoC issues and PM delays at A512 Ashby Road East / B591 Ingleberry Road junction which were not identified as existing issues.	New housing at sites in and around Shepshed leading to increase in trips along A512 to and from Loughborough.
Syston	Multiple PM Peak VoC issues along Melton Road junctions in PM Peak. AM Peak VoC issues at Fosse Way / High Street junction. PM Peak delay at Melton Road / Goodes Lane junction. Delays on Queniborough Road near new developments in both peaks, although this junction was highlighted as an existing issue.	Trips generated by new developments to the south east of Syston could be causing congestion issues along Melton Road, possibly through commuter trips into or out of Leicester. This could also be the cause for the delays on the A607 and Queniborough Road. Queniborough Road could be used as a potential bypass of Syston to access Leicester.

Broad location	Issue	Initial Explanation
	High flow change along Broome Lane to the north and Queniborough Road to the south. All issues identified in Syston were not established as existing, so therefore it can be assumed that they are caused by the growth presented in the Hybrid Option.	

3. Growth and the Strategic Road Network

3.1 Introduction

3.1.1.1 The full note can be viewed in Appendix B.

3.1.1.2 Analysis of the PRTM outputs and consultation with key stakeholders suggest there are existing constraints on strategic routes in Charnwood or in the vicinity, which could impact on the routeing of new traffic arising from the Local Plan growth, and which could impact on how the mitigation needed are identified and developed. It is important therefore to recognise how the Strategic Road Network (SRN), in conjunction with the Local Road Network (LRN), operates currently; how it could be impacted by planned growth in Charnwood Borough as well as surrounding areas; and the implications this has for developing a local transport mitigation strategy for Charnwood.

3.1.1.3 The SRN compromises all motorways and major A-roads across England. It provides long distance connectivity between regions of the UK and, indirectly, the efficient movement of traffic on other roads, including the LRN. The SRN therefore plays an important role in enabling and sustaining economic prosperity and productivity, helps support environmental and social aims. The SRN is managed by Highways England. Highways England's remit is to operate, maintain, renew and enhance the SRN to the benefit of all road users, as well as people who live next to or depend upon the network, and the natural, built and historic environment.

3.1.1.4 When developing Local Plans, the engagement of Highways England is critical as it provides an opportunity to consult on how to minimise trip generation and encourage the use of sustainable modes of transport.

3.2 The SRN in Charnwood

3.2.1.1 The SRN in Charnwood comprises the M1 and A46, with the former running across the western side of the borough in a broadly north-south orientation and the latter running across the southern edge and the eastern side of the borough in a broadly south-west to north-east orientation.

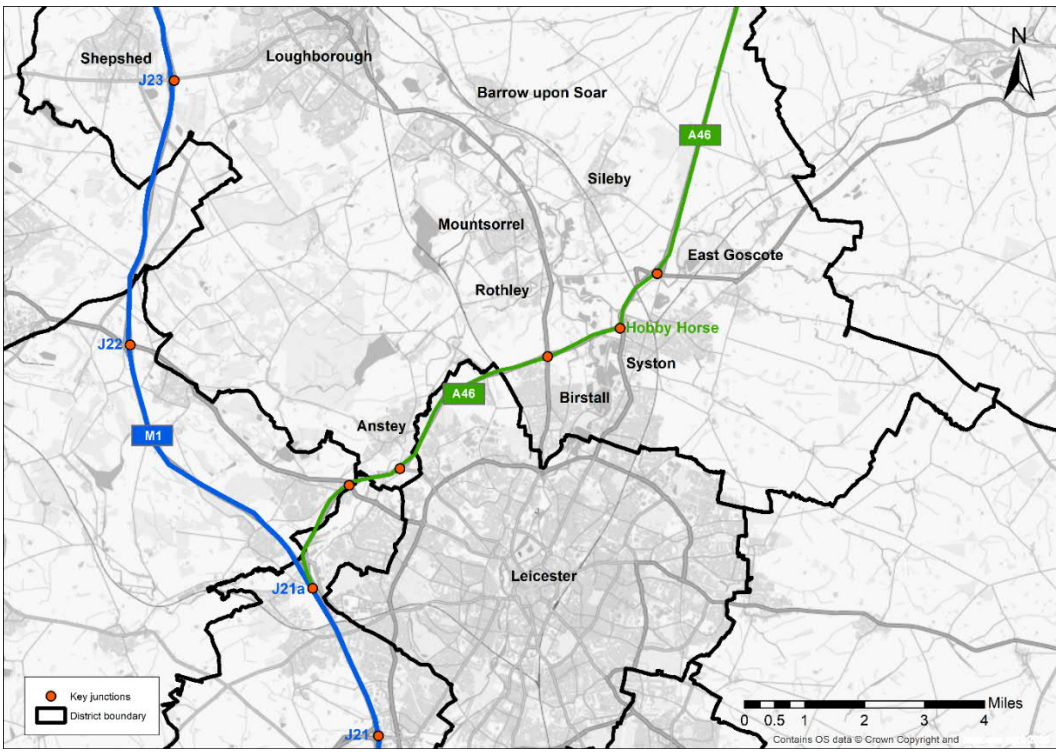


Figure 3-1: Charnwood Borough and the SRN

3.2.1.2 The M1 is a nationally important arterial route linking the South and North of England and mainly caters for a high proportion of long-distance commercial journeys, due to its strategic nature and the number of distribution centres along its length. There are however sections where short distance trips use sections of the SRN, which can lead to congestion.

3.2.1.3 The A46 is not as nationally important as the M1 and would therefore be expected to carry a combination of shorter distance, local trips as well as longer distance, regional trips. The A46 serves as a bypass around Leicester, linking suburbs and satellite settlements around the city.

3.2.1.4 As well as a strategic role, the SRN has an important local role to play. Key interactions between the SRN and LRN occur at several key junctions between the M1, A46, A6, A50 and A607.

3.2.1.5 Whilst the SRN should generally facilitate quicker and uninterrupted journeys, it can be susceptible to incidents and delays. This could lead to displacement of traffic from the SRN onto the LRN which can provide more flexibility with a greater variety of routeing permutations. Such routes, some of which may go through small settlements including Anstey, Thurcaston, Newton Linford and Cropston, are not designed to deal with high volumes of traffic.

3.3 Identified Problems

3.3.1.1 The M1 already experiences congestion and delays which is understood to be a consequence of insufficient capacity to accommodate traffic volumes during peak periods along the mainline between junctions, and congestion at junctions which in turn causes tailbacks onto the M1 mainline carriageway.

3.3.1.2 M1 Junctions 21 and 21a are a significant source of delay. These junctions serve both the north-south M1 and east-west A46/M69 corridors. Also, heavy reliance is placed on Junction 21 as it is the only main M1 gateway to Leicester.

3.3.1.3 Congestion and delays occurring on the M1 between Junction 21 and 21a will inevitably have a knock-on impact on the A46 which feeds into the M1. Depending on the level of severity of M1 congestion, junctions along the A46 including the A46-A50 Brantings Roundabout could also be impacted.

3.3.1.4 The PRTM has forecast localised congestion on the A512 close to M1 Junction 23. The Local Plan modelling has incorporated the improvement works currently being delivered as part of the M1 Junction 23 and A512 improvement scheme. The model outputs show increases in traffic on minor LRN rural routes which appear to occur as a consequence of SRN congestion and delays, therefore indicating that motorists may avoid using the M1 for certain journeys where the LRN could provide a viable alternative in terms of journey time.

3.3.1.5 It is difficult to quantify the level of rerouteing of traffic onto the LRN which may be associated with Local Plan development, because increases in traffic on LRN routes may also comprise ‘background’ trips which are also impacted by congestion and delays on the SRN.

3.3.1.6 The A46-A607 Hobby Horse roundabout is a major pressure point on the network. The Midlands Connect A46 Corridor Study Phase 2 report has identified this junction as the number one bottleneck on the entire A46 corridor with reported queues at this location lasting for 25 minutes on average. Congestion at the Hobby Horse roundabout may compel motorists to find alternative, less suitable routes, including Fosse Way and Melton Road through Syston town centre.

3.3.1.7 Localised congestion is evident at several junctions along the A46, including the Kirby Muxloe Interchange (adjacent to M1 Junction 21a), A46-A50 and A46-A6 junctions. Congestion at these locations is not considered to be severe and, in some cases, it may be as a knock-on effect of congestion occurring elsewhere, including on the M1 or the Hobby Horse roundabout. However, it is clear from the modelling that the A46 is forecast to be at capacity by 2037, demonstrated by there being little change in flow along this section when additional Local Plan development is introduced.

3.3.1.8 Congestion along the A46 could lead to continuing rat-running issues through villages to the north of Leicester, and this is evident in the PRTM outputs particularly through Anstey and between Sileby and East Goscote.

3.4 Addressing Problems on the SRN

3.4.1.1 In contrast to much of the LRN, the SRN mainly comprises larger, more complex infrastructure including grade-separated junctions and segregated carriageways. There are potentially therefore fewer opportunities to deliver smaller improvements to the SRN which are proportionate to the level of impact arising from Charnwood's Local Plan growth due to the complex nature of the infrastructure without substantial works and expense.

3.4.1.2 Many of the SRN junctions in/around Charnwood have been subject to incremental improvements over the years and these will have enhanced capacity, increased traffic throughput and reduced delays to an extent. Whilst there may remain in some cases further opportunities for additional incremental enhancements to the SRN, in many locations these opportunities will now have been largely exhausted. Furthermore, relatively small-scale improvements can still be complex and expensive to deliver, particularly where these impact utilities or require new structures.

3.4.1.3 The level of severity of the key issues of many of the SRN's issues in/around Charnwood is such that larger, more complex and expensive options would most likely be the next key step to be taken in order to deliver the level of improvement needed, not only to address Charnwood Local Plan growth but wider area growth as well.

4. Developing a Long List of Interventions

4.1 Introduction

4.1.1.1 This chapter provides an overview of the process used to develop a long list of interventions, which could address the transport issues identified in each of the broad locations. In some instances interventions are also identified to address cross border movements. Interventions are also identified for the Strategic Road Network where there are existing capacity constraints. The long list of interventions are set out in Appendix C.

4.2 Approach to Identifying Potential Interventions

4.2.1.1 The long list has been determined by undertaking the following steps:

- Review of policy documents and strategy.
- Review of previously identified interventions to address highway issues. Of particular relevance were CBC's Charnwood Sustainable Transport Study, 2050 Vision for Growth; and Connected Leicester Hub and Spoke Plan. The schemes identified through this process are set out in Appendix F.
- Identification of the potential improvements required on the SRN to address existing issues and support cumulative growth arising beyond Charnwood. These cover both smaller-scale improvements which could be delivered in the short-term and potential larger-scale improvements which would address both local and regional growth, which are more likely to be delivered in the longer term.
- Identify specific locations with the need for mitigation, informed by:
  - Junction, link or location identified from the PRTM outputs summarised in TN1;
  - Stakeholder comments at the workshop held 3rd December 2020;
  - Key corridors supporting movements and cross border movements; and
  - Existing issues in particular how current limitations on the SRN may impact the Local Road Network.
- Consider intervention based on the nature and scale of impact forecast; information on the existing transport network (for example existing provision and Google Maps / Google Streetview); and professional judgement.
- Consider intervention based on the corridor in which issues occur to understand the relationship between issues across the network, particularly on strategic roads. This includes considering routing and whether issues within corridors are to do with rerouting away from strategic roads onto local roads. Consider interventions within corridors which could help with rerouting strategic trips back onto strategic roads.

4.2.1.2 Interventions were grouped into 'intervention types' based on mode. These consisted of the following:

- Pedestrian network improvement (including improvement to existing pedestrian routes including; the creation of new routes; new crossing facilities);
- Cycle network improvement (including improvement to existing cycle routes on/off road; the creation of new routes; new crossing facilities; additional cycle parking at key locations);
- Traffic calming and urban realm (i.e. reducing traffic speeds or discouraging traffic from certain routes through changes to street design and enhancing streetscape to make it more attractive to non-motorised users);
- Integrated transport (i.e. improving connectivity between modes of transport to better utilise time, facilities, costs etc.);

- Bus network improvement (including increasing service frequencies or changing the routeing of services; the creation of new services; and improved supporting infrastructure including better bus stops, step-free access and real time information panels);
- Highway improvement (along sections of carriageway between junctions, including widening to accommodate additional lanes; speed limit changes); and
- Junction improvement (including changes junction configurations; adding lanes; changing designated turning movements from lanes).

4.3 Considerations when Developing the Long List

4.3.1.1 To identify interventions, the following factors were taken into consideration:

- Project objectives:
  - To identify mitigation which supports the proposed growth of the Local Plan (Hybrid Option).
- Supporting policy:
  - To align with policy (borough, county and national) in particular the 'hierarchy' for intervention - demand management, smarter choices (including public transport and active travel forms), and road set out in key policy / guidance.
- Appropriate scale:
  - Intervention proposed to be suitable in scale in relation to the impact forecast / anticipated need.
  - Intervention proposed is suitable for the Local Plan.

4.3.1.2 Other key considerations, such as whether the intervention is feasible and the cost of intervention, were considered in the next stage of the assessment using the Early Assessment and Sifting Tool (EAST).

4.3.1.3 It should be noted that Charnwood Sustainable Transport Study includes a series of proposed interventions. This was reviewed to incorporate well-defined interventions in the mitigation long list.

4.3.1.4 The list of interventions does not include measures within the boundaries of development sites, i.e. those which developers will be expected to deliver, including access arrangements, potential bus routes and cycle network facilities. Furthermore, for most developments, there is likely to be a requirement for a Travel Plan to accompany a planning application. Travel Plans typically include measures to encourage more sustainable travel behaviour including potentially incentives for using the bus or riding a bike (free bus passes, vouchers for cycle equipment etc). The design/layout of developments may also help to influence travel behaviour, for example giving priority to pedestrians and cyclists, and limiting car parking.

4.3.1.5 The full long list of interventions is displayed in Appendix C.

5. Assessment of Long List of Interventions

5.1 Introduction

5.1.1.1 Once the long list of interventions was generated, these then needed to be sifted. Task 3 assessed the suitability of interventions identified through the work of this commission to mitigate the impact of Local Plan growth (Hybrid Option) on the transport network. A list of interventions to mitigate impacts on the transport network arising from Local Plan growth was identified in Task 2, which is discussed above and displayed in TN3. The objective of Task 3 was to assess the suitability of the long list of interventions to inform the selection of interventions to address the potential impact arising from the Local Plan. The full option assessment process is documented in TN3, which should be read alongside this document.

5.2 Application of EAST

5.2.1.1 The DfT Early Assessment and Sifting Tool (EAST) has been used as a basis for the assessment of options. EAST is a decision support tool to summarise and present evidence on transport scheme options in a clear and consistent format. It provides decision makers with relevant, high level information to help form an early view of how various scheme options perform and compare. The benefits of EAST are that it can be used to help:

- Refine options by highlighting adverse impacts or unanticipated consequences;
- Consistently compare options, for example, within or across modes, geographical areas and networks;
- Identify trade-offs between objectives aiding package development; and
- Identify key uncertainties in the analysis and areas where further appraisal effort should focus.

5.2.1.2 The assessment criteria and sub-criteria for the assessment are displayed below in Table 5-1. The definitions for each criteria, and whether they have been included in the assessment (and justification if not), are displayed in Appendix E. The selection of criteria is based on what was necessary to understand in order to be able to make sufficient judgements on the interventions but also on availability of suitable information at this point.

Table 5-1: Assessment Criteria Broad Definitions

Case	Assessment Criteria
Strategic Case	Identified problems and objectives of the option
	Scale of impact
	Fit with wider transport and government objectives
	Fit with other objectives
	Degree of consensus over outcomes
Economic Case	Economic Growth (including connectivity, reliability, and deliverability of housing)
	Carbon emissions
	Local environment (including air quality, noise, and streetscape and urban environments)
Managerial Case	Practical feasibility
Financial Case	Indicative capital cost (£m)

5.3 Approach to Calculating Capital Costs

5.3.1.1 The assessment was first carried out by intervention type. This involved the following:

- Identification of the component parts of the intervention to be costed;
- Development of high-level cost benchmarks relevant to the intervention types. The capital costs have been derived from a combination of previous experience and professional opinion;

- Determination of the scale of intervention using professional judgement and various relevant sources such as Google Maps Measuring Tool (GMMT); and
- Calculation of high-level capital cost using per unit benchmark capital cost and scale.

5.3.1.2 There are many factors which are unknown and are therefore not included in the cost estimates including the relocation of statutory undertakers (utilities), third party land etc. Given that high-level unit capital costs are used, the range has been calculated based on a - / + 25% variation around the benchmark unit cost calculation. Benchmark capital costs have been identified through previous research and AECOM's approach to calculating these figures.

5.4 Factors Limiting Development of Long List

5.4.1.1 There are a number of key caveats relating to the development of mitigation packages, including the preferred package:

- The analysis is based on a strategic traffic highway model (PRTM) and information available at the time of research.
- Mitigation is designed to address the impact of growth arising over the total Local Plan period. It does not consider the timing of development coming forward.
- It assumes SRN mitigation (as identified) is undertaken which will help address traffic impacts elsewhere on the network.

5.4.1.2 There are limitations relating to the estimation of capital costs of interventions:

- Base costs have been derived from a combination of previous experience and professional expertise. They are high-level and indicative and should be independently checked if they are to be relied upon for use beyond the scope of this study.
- No engineering or environmental analysis has been undertaken.
- Quantitative inputs such as distances and measurements have been based on professional judgement and estimated using on-line tools such as Google Maps Measuring Tool (GMMT). This meant that the approach was limited because it was an indicative measurement.

5.4.1.3 The preferred package is AECOM's best view on what is needed based on the scope of this commission, the available information and within the programme of works. The decision of which preferred package to take forward is for Charnwood Borough Council.

5.4.1.4 For some interventions proposed there will need to be further work to assess technical deliverability, economic benefits, and financial feasibility. The proposed bus improvements in AN6/B12 is one such example, which will need further investigation and consider in relation to extending Leicester City Council's TCF proposal for a bus network linking settlement.

5.4.1.5 In making this decision the Council will need to consider the suitability of packages and the preferred package in light of the emerging Local Plan's aspirations and against a range of key factors, many of which may have trade-offs such as costs, funding, stakeholder acceptability, and technical deliverability. The Council will need to make this decision balanced against other priorities.

5.4.1.6 It will be important to work with partners also, including those Local Planning Authorities it borders with, such as Leicester City Council, as well as County and other strategic stakeholders in helping develop a wider integrated strategy for mitigation arising from cumulative growth.

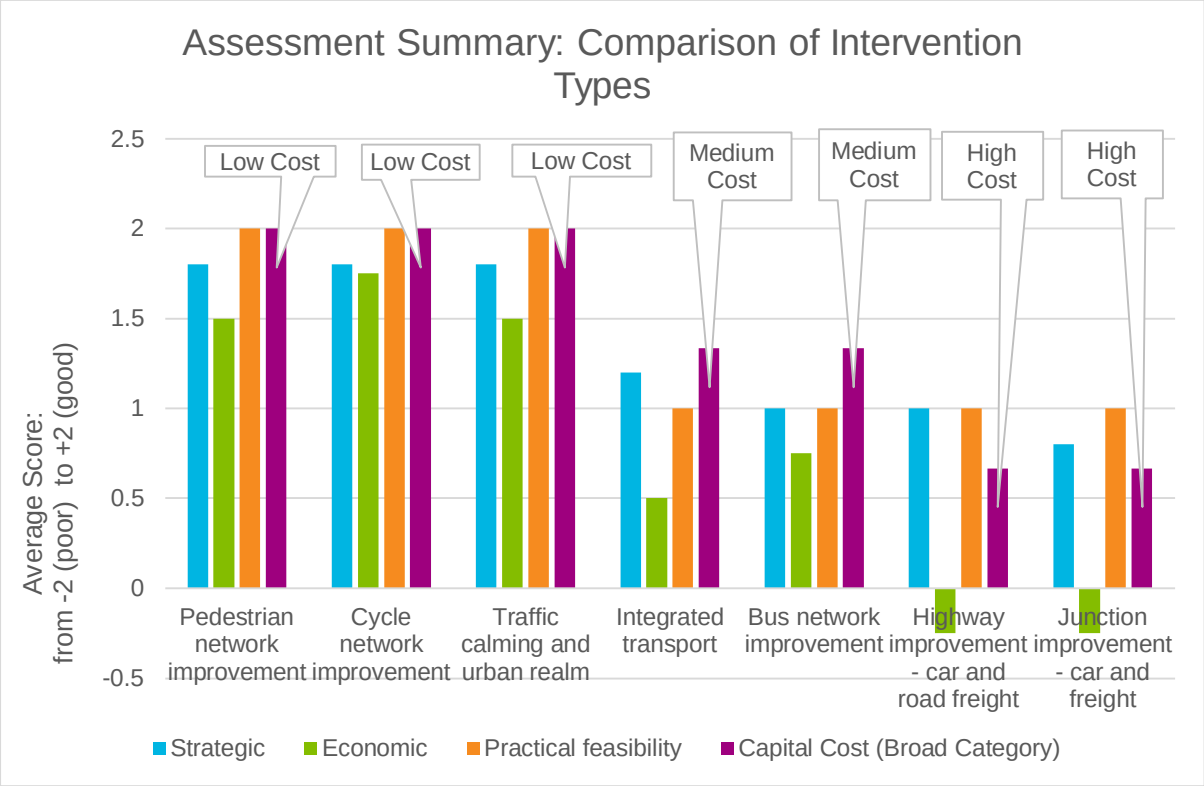
5.5 Assessment Summary

5.5.1.1 A summary of the results from the assessment is shown in Figure 5-1. The assessment does not aim to conclusively identify a preferred set of interventions for the borough. Rather, the aim is to illustrate key differences between interventions categories, by the different key criteria, which need to be considered further when identifying the right balance for a package of interventions.

5.5.1.2 The scores presented in the chart are averaged, with the components parts of each criteria equally weighted. Where detail is needed, it is important to review Technical Note 3 which provides a breakdown of scores by intervention type and by broad location.

5.5.1.3Note that the assessment summary does not take into account any interventions proposed in the long list.

Figure 5-1: Assessment Summary – Comparison of Intervention Types



5.6 Developing Package Options and Preferred Package

5.6.1.1The long list of interventions present a range of ideas including: improvements to roads and junctions to reduce traffic congestion; improvements to bus services; new/improved footway and cycle routes; and broader smarter choice initiatives. Interventions vary in scale, ranging from smaller-scale interventions, which could be delivered at lower cost and in a shorter timeframe, to larger scale, more complex interventions which are likely to be more expensive and take longer to deliver.

5.6.1.2With these interventions identified the next step was to develop packages of interventions, and identify a preferred package.

5.6.1.3The package options developed represent key choices available between different combinations of interventions within each broad location. Transport mode, as defined through the intervention categories, has been the key mechanism used for formulating package options.

5.6.1.4For simplicity, interventions have been grouped according to whether they are focused towards facilitating sustainable travel or providing additional highway capacity. Blended approaches have also been considered, in some cases being a simple combination of sustainable travel focused and highways capacity focused interventions. In a few instances, through consideration of the evidence, EAST and professional judgement, a bespoke, selective combination of some sustainable travel and/or highways capacity focused interventions has been made.

5.6.1.5The intention has been to formulate at least two packages in all broad locations, in order to present contrasting approaches to facilitating growth through transport improvements. For Shepshed and Birstall, single packages representing a blended approach of sustainable travel and highways capacity focused improvements are proposed as there is considered to be only one feasible approach to combining interventions.

5.6.1.6The formation of package options has not been informed by any transport modelling or additional evidence gathering to quantify the impacts of each package option. As part of the process for deriving the package of mitigations, further reflection on PRTM outputs was made, and junctions which met the agreed threshold for reporting were looked at in detail to understand the nature of the issues and whether they could be attributed directly to the proposed Local Plan development.

5.6.1.7 The selection of the preferred package has been informed by EAST in terms of the expected impacts of different categories of interventions, and professional judgement on the effectiveness of combinations of packages. A range of factors have been considered as part of the selection of a preferred package option by broad location, particularly with regard to how much reliance can be placed on sustainable travel interventions in providing an effective means of facilitating local plan growth. It is recognised that the effectiveness of sustainable travel measures could vary by broad location and therefore highway capacity improvements may be needed in combination to support growth. Factors include for example existing provision of sustainable travel measures (whether there is already an established network of walking, cycling and passenger transport routes and services), land-use density (with a higher density enhancing the ability to make shorter journeys which could be made by sustainable travel modes) and the availability of local jobs, retail, key services.

5.6.1.8 To address some issues identified through evidence, a large-scale and potentially expensive intervention has been identified because it is considered that there are no smaller-scale, cheaper alternative interventions which could be as effective. The issue(s) being addressed will vary in severity, however in some cases the scale of change in terms of impact on the transport network resulting from planned growth could be relatively small. The formation of package options and the selection of a preferred package of interventions has taken into consideration the severity of issues and the scale of growth proposed to take a view on whether the potential intervention would be proportionate and viable. In some cases, a decision has been made to exclude a large-scale intervention from the preferred package because it is considered that it would not provide sufficient benefit (compared with not implementing it) to offset the expected high cost associated with delivering the intervention.

5.6.1.9 Consideration has been made to the potential knock-on impacts of incorporating interventions into PRTM. However, it is not possible prior to undertaking a model run to accurately predict the impacts of interventions. There is potential the PRTM model runs may indicate that further interventions or revisions to interventions may be required to optimise the network.

5.6.1.10 The long list of interventions is displayed in Appendix C. Appendix D shows a simplified version of the table of the preferred packages but does not include details such as the capital costs. Note that the formation of package options has not been informed by any transport modelling or additional evidence gathering to quantify the impacts of each package option.

6. Preferred Package for Mitigation

6.1 Introduction

6.1.1.1 This section presents the preferred package of interventions.

6.2 Preferred Package

6.2.1.1 Table 6-1 presents the preferred packages with the capital costs. The full details for both the preferred and not preferred packages are presented in Tab 4.1 (‘Packages’) of TN3. The indicative capital costs for both the higher and lower brackets for each Broad Location are shown in Table 6-3 and for each intervention type are shown in Table 6-3.

Table 6-1: Preferred Package

Broad Location	Package Option ID	Package Option Name	Description	Justification	Package Interventions and capital costs (£) (Reference links back to Sheet '2.2 Long List and Capital Costs')						Total Costs
Anstey	AN-PK2	Highways capacity + cycle route improvements - blended approach	Package option AN-PK2 comprises interventions which will deliver increased highway capacity on key roads and junctions surrounding Anstey, in addition to complementary cycle route improvements which will improve connectivity between Anstey and north-west Leicester.	Based on a review of evidence, the EAST assessment and professional judgement, package option AN-PK2 is preferred because it recognises the opportunities for facilitating sustainable travel in particular for trips between Anstey and the north-western part of Leicester, in combination with improvements to the highway which could address local capacity and routeing issues	Intervention ID (see Sheet '2.2 Long list and Capital Costs')	AN1	AN2	AN3	AN5	AN7	
					Intervention Type	7. Junction improvement - car and freight	7. Junction improvement - car and freight	7. Junction improvement - car and freight	2. Cycle network improvement	2. Cycle network improvement	
					Indicative Capital Cost (low)	£487,500	£1,556,250	£750,000	£452,250	£562,500	£3,800,000
					Indicative Capital Cost (high)	£812,500	£2,593,750	£1,250,000	£753,750	£937,500	£6,300,000
Barrow	BA-PK2	Sustainable Travel focus + selective Highways capacity - blended approach	Package option BA-PK2 comprises sustainable travel interventions including footway and cycle route improvements, in addition to one highway capacity improvements at key pinch points - the High Street-South Street-Bridge Street roundabout	Based on a review of evidence, the EAST assessment and professional judgement, package option BA-PK2 is preferred because it is considered that a combination of sustainable travel interventions and two highway capacity improvements which address the key pinch points in Barrow could be sufficient to address planned growth.	Intervention ID (see Sheet '2.2 Long list and Capital Costs')	BA1	BA2	BA4	BA5		
					Intervention Type	1. Pedestrian network improvement	2. Cycle network improvement	2. Cycle network improvement	7. Junction improvement - car and freight		
					Indicative Capital Cost (low)	£52,500	£1,563,000	£9,750	£37,500		£1,700,000
					Indicative Capital Cost (high)	£87,500	£1,172,250	£16,250	£62,500		£1,300,000

Broad Location	Package Option ID	Package Option Name	Description	Justification		Package Interventions and capital costs (£) (Reference links back to Sheet '2.2 Long List and Capital Costs')									Total Costs
Birstall	BI-PK1	Highways capacity + Sustainable travel - blended approach	Package option BI-PK1 comprises a combination of all highways capacity and sustainable travel focused interventions across Birstall	Based on a review of evidence, the EAST assessment and professional judgement, package option BI-PK1 is preferred because it is considered that a combination of sustainable travel interventions and highway capacity improvements which address two gateway routes into Birstall could be sufficient to address planned growth.	Intervention ID (see Sheet '2.2 Long list and Capital Costs')	AN6/BI2	BI3	BI4							
					Intervention Type	5. Bus network improvement	5. Bus network improvement	3. Traffic calming and urban realm							
					Indicative Capital Cost (low)	£1,125,000	£225,000	£135,000							£1,500,000
					Indicative Capital Cost (high)	£1,875,000	£375,000	£225,000							£2,500,000
Loughborough	LO-PK3	Sustainable travel + Highway capacity focus - blended approach	Package option LO-PK3 comprises a combination of highway capacity interventions at key junctions and sustainable travel interventions across Loughborough	Based on a review of evidence, the EAST assessment and professional judgement, package option LO-PK3 is preferred because it is considered that the opportunities with delivering sustainable travel in a large town such as Loughborough are very significant and would comply fully with policy. However, these need to be in combination with highway capacity improvements in recognition that Loughborough attracts trips from areas outside of the town which	Intervention ID (see Sheet '2.2 Long list and Capital Costs')	LO1	LO2	LO3	LO4	LO5/SH1	LO6	LO7	LO8	LO9	
					Intervention Type	7. Junction improvement - car and freight	4. Integrated transport	5. Bus network improvement	2. Cycle network improvement	5. Bus network improvement	7. Junction improvement - car and freight	7. Junction improvement - car and freight	7. Junction improvement - car and freight	7. Junction improvement - car and freight	
					Indicative Capital Cost (low)	£1,200,000	£187,500	£300,000	£9,750	£210,750	£225,000	£562,500	£225,000	£562,500	£3,500,000
					Indicative Capital Cost (high)	£2,000,000	£312,500	£500,000	£16,250	£351,250	£375,000	£937,500	£375,000	£937,500	£5,800,000

Broad Location	Package Option ID	Package Option Name	Description	Justification	Package Interventions and capital costs (£) (Reference links back to Sheet '2.2 Long List and Capital Costs')											Total Costs
				may not be as influenced by sustainable travel.												
Shepshed	SH-PK1	Sustainable travel + Highway capacity - blended approach	Package option SH-PK1 is the only option put forward for Shepshed and comprises a combination of sustainable travel (including bus service and cycle route improvements) and highways capacity focused intervention (in discouraging cross-country trips between Shepshed and Charley Road)	Package option SH-PK1 is the only package put forward for Shepshed. Based on a review of evidence, the EAST assessment and professional judgement, package option SH-PK1 is preferred because it is considered that a combination of sustainable travel interventions and a smaller-scale highway capacity improvement will help facilitate growth planned growth in the Shepshed broad location.	Intervention ID (see Sheet '2.2 Long list and Capital Costs')	LO5/SH1	SH2	SH3	SH4	SH5						
					Intervention Type	5. Bus network improvement	7. Junction improvement - car and freight	2. Cycle network improvement	2. Cycle network improvement	5. Bus network improvement						
					Indicative Capital Cost (low)	£210,750	£90,000	£1,035,000	£562,500	£187,500						£2,100,000
					Indicative Capital Cost (high)	£351,250	£150,000	£1,725,000	£937,500	£312,500						£3,500,000
Syston	SY-PK2	Sustainable Travel + smaller-scale Highways capacity - blended approach	Package option SY-PK2 comprises a combination of sustainable travel interventions and a smaller-scale highway capacity interventions at key junctions and on road links across the Syston broad location	Based on a review of evidence, the EAST assessment and professional judgement, package option SY-PK2 is preferred because it is considered that a combination of sustainable travel interventions and smaller-scale highway capacity improvements will help facilitate growth planned growth in the	Intervention ID (see Sheet '2.2 Long list and Capital Costs')	SY3	SY4	SY5	SY6	SY7	SY9	SY10	SY11	SY12	SY13	SY14	
					Intervention Type	7. Junction improvement - car and freight	6. Highway improvement - car and road freight	3. Traffic calming and urban realm	1. Pedestrian network improvement	2. Cycle network improvement	2. Cycle network improvement	7. Junction improvement - car and freight	3. Traffic calming and urban realm	7. Junction improvement - car and freight	3. Traffic calming and urban realm	3. Traffic calming and urban realm	
					Indicative Capital Cost (low)	£375,000	£52,500	£67,500	£225,000	£9,750	£9,750	£264,000	£81,000	£11,250	£135,000	£108,000	£1,300,000
					Indicative Capital Cost (high)	£625,000	£87,500	£112,500	£375,000	£16,250	£16,250	£440,000	£135,000	£18,750	£225,000	£180,000	£2,200,000

Broad Location	Package Option ID	Package Option Name	Description	Justification	Package Interventions and capital costs (£) (Reference links back to Sheet '2.2 Long List and Capital Costs')					Total Costs
				Syston broad location.						
Strategic	STRAT-PK2	Short, Medium and Longer term (End Goal) Improvements to the Strategic Road Network	A46 Corridor including key junctions	Based on a review of evidence, the EAST assessment and professional judgement, it is recognised that a longer term package of improvements across the SRN would be required to address existing severe issues on the SRN; to facilitate Charnwood Local Plan growth; and to facilitate wider area growth including from neighbouring planning authority areas	Intervention ID (see Sheet '2.2 Long list and Capital Costs')	STRAT6	STRAT11	*STRAT1 or STRAT2*	STRAT13	
					Intervention Type	6. Highway improvement - car and road freight	7. Junction improvement - car and freight	7. Junction improvement - car and freight	7. Junction improvement - car and freight	
					Indicative Capital Cost (low)	£7,500,000	£1,125,000	£11,250,000	£3,000,000	£22,900,000
					Indicative Capital Cost (high)	£12,500,000	£1,875,000	£18,750,000	£5,000,000	£38,100,000
			M1 Corridor		Intervention ID (see Sheet '2.2 Long list and Capital Costs')	STRAT4	STRAT5			
					Intervention Type	6. Highway improvement - car and road freight	6. Highway improvement - car and road freight			
					Indicative Capital Cost (low)	£15,000,000	£56,250,000			£71,300,000
					Indicative Capital Cost (high)	£25,000,000	£93,750,000			£118,800,000
			M1 Junction 21		Intervention ID (see Sheet '2.2 Long list and Capital Costs')	STRAT10	STRAT3			
					Intervention Type	6. Highway improvement - car and road freight	7. Junction improvement - car and freight			
					Indicative Capital Cost (low)	£2,043,750	£90,000,000			£92,000,000
					Indicative Capital Cost (high)	£3,406,250	£150,000,000			£153,400,000

Broad Location	Package Option ID	Package Option Name	Description	Justification	Package Interventions and capital costs (£) (Reference links back to Sheet '2.2 Long List and Capital Costs')											Total Costs
			M1 Junction 23		Intervention ID (see Sheet '2.2 Long list and Capital Costs')	STRAT9	*STRAT 7 or STRAT8*									
					Intervention Type	7. Junction improvement - car and freight	7. Junction improvement - car and freight									
					Indicative Capital Cost (low)	£15,881,250	£9,075,000									£25,000,000
					Indicative Capital Cost (high)	£26,468,750	£15,125,000									£41,600,000
					Total Indicative Capital Cost (low)	£40,425,000	£156,450,000	£11,250,000	£3,000,000	£0	£0	£0	£0	£0	£0	£211,100,000
					Total Indicative Capital Cost (high)	£67,375,000	£260,750,000	£18,750,000	£5,000,000	£0	£0	£0	£0	£0	£0	£351,900,000

Table 6-2: Preferred Package Cost by Broad Location

Cost Range

	Anstey	Barrow	Birstall	Loughborough	Shepshed	Syston	Total	Strategic				
								A46 Corridor including key junctions	M1 Corridor	M1 Junction 23	M1 Junction 25	M1 Junction 27
Total Indicative Capital Cost – low	£3,800,000	£1,700,000	£1,500,000	£3,500,000	£2,100,000	£1,300,000	£13,900,000	£22,900,000	£71,300,000	£92,000,000	£25,000,000	£211,100,000
Total Indicative Capital Cost – high	£6,300,000	£1,300,000	£2,500,000	£5,800,000	£3,500,000	£2,200,000	£21,600,000	£38,100,000	£118,800,000	£153,400,000	£41,600,000	£351,900,000

Table 6-3: Preferred Package Cost by Intervention Type

Cost Range	1. Pedestrian network improvement	2. Cycle network improvement	3. Traffic calming and urban realm	4. Integrated transport	5. Bus network improvement	6. Highway improvement - car and road freight	7. Junction improvement - car and freight
Total Indicative Capital Cost – low	£277,500	£4,214,250	£526,500	£187,500	£2,259,000	£52,500	£6,346,500
Total Indicative Capital Cost – high	£462,500	£5,591,000	£877,500	£312,500	£3,765,000	£87,500	£10,577,500

7. Next Steps

7.1 Conclusion and suggested next steps

7.1.1.1 The preferred package is AECOM's best view on what is needed based on the scope of this commission, the available information and within the programme of works.

7.1.1.2 This will be informed by further modelling work (PRTM) being undertaken, which will test the preferred package. The modelling of the preferred package will illustrate to what degree the impacts of Local Plan growth will be mitigated.

7.1.1.3 Assessing the impact of interventions is not necessarily straightforward. We anticipate that the modelling will identify the need to undertake further analysis to explain how interventions address the impacts of growth on the network, in both positive and negative ways, and refine the preferred package. For example, mitigation which enhances the capacity of the road network, whether SRN or LRN, can lead to an increase in vehicle traffic. Location or local area specific mitigation, though designed with the wider borough picture in mind, applied to a relatively constrained or affected network, may also generate some undesirable knock-on effects such as rerouteing. Mitigation may address the impact of growth on certain locations but it may also redistribute traffic elsewhere, though redistribution may be accommodated sufficiently within existing capacity levels and not necessarily lead to significant effects.

7.1.1.4 An iterative process of modelling and refinement of the preferred package is therefore required to work towards an improved solution.

7.1.1.5 We are also aware of the limitations of PRTM in testing the impact of interventions. PRTM is a strategic model and at key junctions of interest other models such as SATURN / microsimulation would be more appropriate, especially when schemes are complex and costly e.g. Hobby Horse.

7.1.1.6 For some interventions, and in particular major interventions, more detailed work is required to understand, amongst other things, technical deliverability, financial feasibility and potential economic and socio-economic benefits that could be unlocked.

7.1.1.7 The decision of which package / combination of interventions to take forward is for Charnwood Borough Council to determine. In making that decision the Council will need to consider the suitability of packages and the preferred package in light of the emerging Local Plan's aspirations and against a range of key factors, many of which may have trade-offs such as costs, funding, stakeholder acceptability, and technical deliverability. The Council will need to make this decision balanced against other priorities and commitments. It would be advantageous to keep in mind a clear long term vision for place. Growth drives movement and traffic levels, but a key question is what forms or mode of travel should be supported or encouraged. The user hierarchy is a helpful concept to bear in mind when developing that vision for place.

7.1.1.8 There will also need to be other complementary measures put in place to support mitigation measures. For example, in order for the interventions to effectively encourage modal shift there needs to be behavioural change, promoted through communications and marketing to the public, to highlight importance of moving to more sustainable modes and the benefits of doing so.

7.1.1.9 Critical for success will be the need to continue to work with partners including those Local Planning Authorities who share a boundary with Charnwood, such as Leicester City Council, as well as the County Council and other strategic stakeholders (in particular Highways England) and to formulate a wider integrated transport strategy to support cumulative growth. For example, it is very likely that the same SRN issues will be reflected in the City's Local Plan and therefore collaboration between authorities to identify solutions that benefit the wider road network is essential. A collaborative approach is therefore critical to forward planning strategic commitments to create long term benefits across a wider geography. A starting point for this way forward could be the County's Strategic Growth Plan.

Appendix A – Policy Documents

A list of policy documents reviewed is set out below.

Document	Date Published
MLCHG, National Planning Framework (Section 9. Promoting Sustainable Transport)	February 2019
DfT, Transport Investment Strategy, Moving Britain Ahead	July 2017
DfT, Gear change: a bold vision for cycling and walking	July 2020
DfT, Road Investment Strategy 2: 2020-2025	-
DfT, The Inclusive Transport Strategy, achieving equal access for disabled people	2018
DfT Manual for Streets	2007
Highways England, North and East to Midlands Route Strategy	March 2017
LEPs, The Midlands Engine for Growth Prospectus	-
Leicester and Leicestershire 2050: Our Vision for Growth	December 2018
Leicester County Council, Leicestershire Local Transport Plan 3, 2011- 2026	-
Leicester County Council, Highway Asset Management Policy	June 2017
Leicester County Council, Highway Infrastructure Asset Management Plan	June 2017
Leicester County Council, Network Management Plan 2014-2026	-
Leicester and Leicestershire Rail Strategy February 2017	February 2017
Charnwood Borough Council, Charnwood Local Plan Core Strategy, 2011 to 2028	November 2015
Charnwood Borough Council, Charnwood Draft Local Plan, 2019-36	October 2019
Charnwood Borough Council, Charnwood Sustainable Transport Study	September 2020
Charnwood Borough Council, Loughborough Town Centre Masterplan	March 2018
AECOM, Charnwood Local Plan, PRTMv2, Interim Forecasting Report	October 2020

Appendix B – Strategic Road Network Note

1. Introduction

1.1 Charnwood Borough Council (CBC) commissioned AECOM to identify transport mitigation needed to support growth options being considered in CBC's emerging Local Plan. The work will provide information to support CBC in identifying a preferred growth option.

1.2 Growth options have been through the Pan-Regional Transport Model (PRTM) to forecast the potential changes that could come about on the road network. The PRTM outputs have informed the identification of 'broad locations' where interventions would need to focus to mitigate impacts. This work is set out 'Charnwood Borough Local Plan Mitigation: Technical Note 1' (TN1) January 2021, for the Hybrid Option.

1.3 Analysis of the PRTM outputs and consultation with key stakeholders[7] suggest there are existing constraints on strategic routes in Charnwood or in the vicinity, which could impact on the routeing of new traffic arising from the Local Plan growth, and which could impact on how the mitigation needed are identified and developed.

1.4 The objective of this note is to describe how the Strategic Road Network (SRN), in conjunction with the Local Road Network (LRN), operates currently; how it could be impacted by planned growth in Charnwood Borough as well as surrounding areas; and the implications this has for developing a local transport mitigation strategy for Charnwood.

1.5 The existing conditions of other key routes through Charnwood, such as the A6, which is not part of the SRN, are also important to understand when formulating a mitigation response to growth; however, analysis of PRTM forecasting and stakeholder engagement has not suggested that the condition of other non-SRN routes is such a significant issue or would be significantly affected by growth. As such the focus of this note is primarily on the SRN.

1.6 As will be explained in this note, existing issues occurring on the SRN are significant in scale and are likely to be complex to resolve. Direct impact on the SRN arising from Charnwood's growth is relatively small, although it is important to recognise the potential displacement of traffic from SRN routes onto local roads. This note has a core focus on the SRN, and its relationship to the LRN, because it is viewed as being critical to help unlock growth not only in Charnwood but also in the wider area. Furthermore, Highways England ultimately determines what improvements are needed on the SRN, and so this note is a pointer to what are considered to be the bigger issues (affecting Charnwood but also beyond) and as such the note is providing a basis to begin developing a wider area strategy for mitigation.

1.7 The note explains:

- The role that the SRN and Highways England plays, and how the SRN is considered when developing Local Plans (Section 2);
- What the SRN comprises in the Charnwood area, including how it interacts with the LRN (Section 3);
- Current and forecasted issues, which affect the SRN (Section 4);
- Previously identified mitigation and potential (Section 5); and
- Concludes by setting out the recommended approach for how network issues should be addressed (Section 6).

[7] Workshop held on 3rd December 2020 by AECOM with CBC, Leicestershire County Council, Leicester City Council, and Highways England.

2. The role of the SRN and Highways England

2.1 The SRN compromises all motorways and major A-roads across England. It provides long distance connectivity between regions of the UK and, indirectly, the efficient movement of traffic on other roads, including the LRN. The SRN therefore plays an important role in enabling and sustaining economic prosperity and productivity, helps support environmental and social aims.

2.2 The SRN is managed by Highways England. Highways England's remit is to operate, maintain, renew and enhance the SRN to the benefit of all road users, as well as people who live next to or depend upon the network, and the natural, built and historic environment.

2.3 When developing Local Plans, the engagement of Highways England is critical as it provides an opportunity to consult on how to minimise trip generation and encourage the use of sustainable modes of transport. The role of the SRN and Highways England's approach to engaging in Local Plans is set out in the Department for Transport's (DfT's) Circular 02/2013, 'The Strategic Road Network and the delivery of sustainable development' and 'Planning for the future – A guide to working with Highways England on planning matters' (2015). Highways England's guidance is that the planning of growth, and its impact mitigation, should be to make the most efficient use of available capacity on the SRN in recognition that additional physical capacity is often difficult, costly and takes time to provide.

2.4 Although not explicitly a mechanism for unlocking and delivering Local Plan growth, the DfT's Road Investment Strategy (RIS) process allows Highways England to plan future works. RIS sets a long-term strategic vision for the network and with that it lists planned enhancement schemes, which are expected to be built and the funding available. During the preparation of each RIS, stakeholders including local authorities have opportunity to submit evidence to the DfT indicating the need for local investment in infrastructure.

2.5 Other funding routes are also available to support the delivery of improvements on the SRN, with recent examples including Highways England's Growth and Housing Fund and the Ministry of Housing, Communities and Local Government's Housing Infrastructure Fund. Many of these mechanisms for supporting the delivery of new infrastructure require close collaboration and cooperation between multiple agencies, including local authorities and Highways England, and sometimes private developers. Smaller-scale improvements to the SRN can also be secured through planning permissions.

3. What the SRN comprises in and around Charnwood

3.1 The SRN in Charnwood comprises the M1 and A46, with the former running across the western side of the borough in a broadly north-south orientation and the latter running across the southern edge and the eastern side of the borough in a broadly south-west to north-east orientation.

3.2 The sections and junctions of the SRN which are located within the Charnwood administrative boundary (Figure 3-1) comprise the following:

- 5.2km section of the M1 motorway in the north-west of the borough with Junction 23, broadly equidistant along this section, linking to the A512 at Shepshed;
- 1.5km of the A46 to the south of the village of Anstey which incorporates a grade separated junction with Leicester Road/ Anstey Lane/Gynsill Lane; and
- 17km section of the A46 between Birstall and the north-east corner of the borough near to Willoughby-on-the-Wolds, incorporating numerous at-grade and grade-separated junctions including (from south to north) the A46/A6 Loughborough Road grade-separated junction at Birstall, A46/A607 Hobby Horse at-grade roundabout west of Syston, A46/A607 grade separated interchange junction north of Syston; A46/Ratcliffe Road/Broome Lane grade separated junction; and the A46 Six Hills grade separated junction.

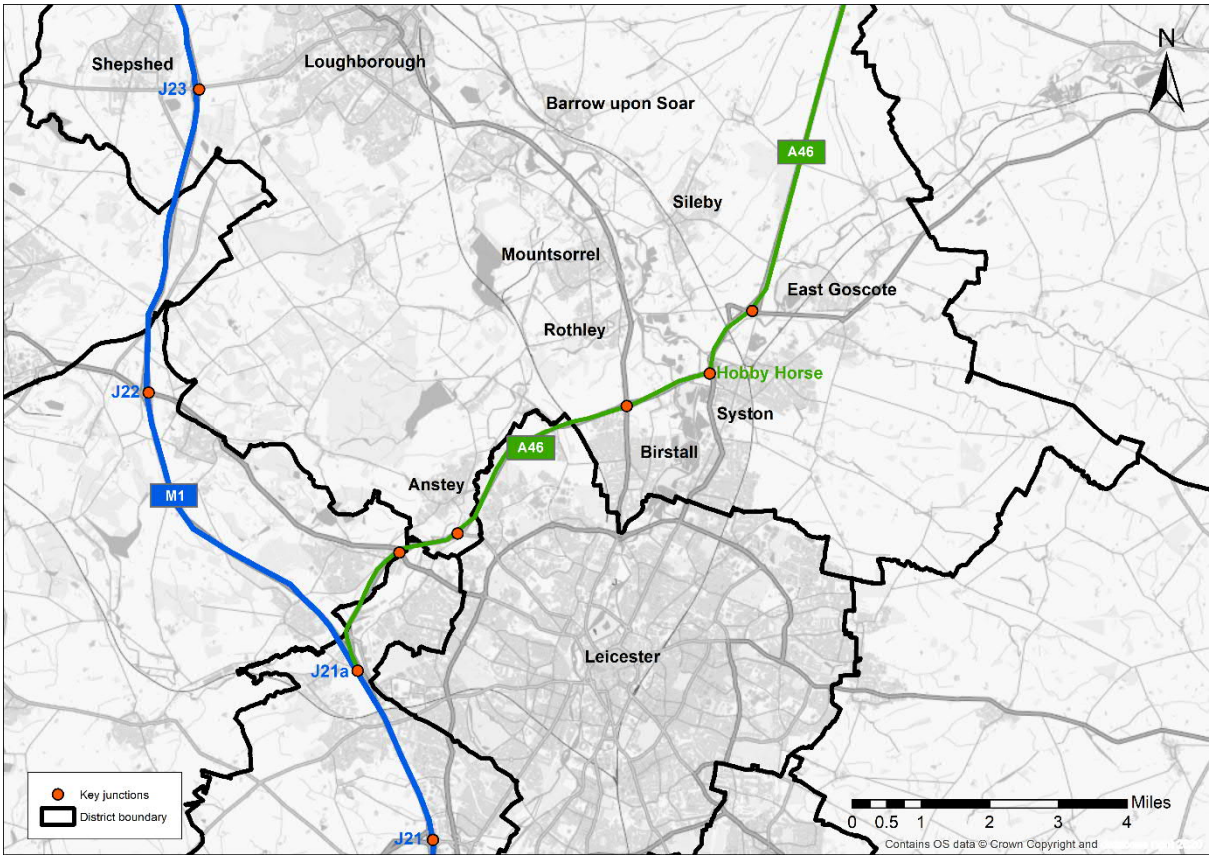


Figure 3-1: Charnwood Borough and the SRN

3.3 Beyond Charnwood's border the M1 extends southwards through the neighbouring Leicestershire planning authorities of Hinckley and Bosworth Borough, Blaby District and Harborough District. The A46 and M1 join at Junction 21a with a connection into north-west Leicester via the Kirby Muxloe Interchange (although traffic from the M1 north cannot access Leicester at this location, and instead needs to exit at Junction 22 upstream and use the A50). Further south is M1 Junction 21, which is the only main access to Leicester from the M1 and also connects with the M69 which links across to the A5 and M6 corridors.

The M1

3.4 The M1 is a nationally important arterial route linking the South and North of England. To the south of Charnwood, it provides access to Leicester, Northampton, Milton Keynes, Luton, Greater London and the M25. To the north of Charnwood, the M1 provides access to Derby, Nottingham, Chesterfield, Sheffield, Barnsley, Wakefield and Leeds. The M1 route serves a number of key national and international gateways and freight terminals, including Luton Airport and East Midlands Airport.

3.5 The M1 corridor caters for a high proportion of long-distance commercial journeys, due to its strategic nature and the number of distribution centres along its length (London to Scotland East Route Strategy, Highways England, March 2017). There are however sections where short distance trips use sections of the SRN, which can lead to congestion. So-called 'junction hopping' can occur where relatively short trips take place between consecutive junctions on the SRN, particularly where there are closely-spaced junctions and where there is no viable alternative route on the LRN.

3.6 Within the local area, the M1 comprises three lanes and hard shoulder in either direction. A motorway service area is located between Junctions 21 and 21a at Leicester Forest East on the western edge of Leicester, outside of Charnwood. All junctions are grade-separated, with the M1 mainline carriageway running uninterrupted through the junction. Junction 23, the only junction within Charnwood, and Junction 22 located in neighbouring Hinckley and Bosworth district, consist of large, traffic signal-controlled roundabouts or gyratories.

The A46

3.7 The A46 is not as nationally important as the M1 and would therefore be expected to carry a combination of shorter distance, local trips as well as longer distance, regional trips. It feeds into the M1 to the south-west of Charnwood and resumes after the M69 to the east of Coventry providing onward connections to Royal Leamington Spa, Stratford-upon-Avon and Tewkesbury. To the north-east of Charnwood, the A46 links to Newark-on-Trent, Lincoln and Grimsby.

3.8 Within the local area, the A46 comprises a dual carriageway, mostly two lanes in both directions although there are some sections with three lanes which incorporate an extra weaving lane between closely-spaced junctions. Most junctions are grade-separated with the A46 mainline carriageway running uninterrupted through each junction, although the notable exception is the A46-A607 Hobby Horse roundabout, which is discussed later in this note.

3.9 A section of the A46 between the Anstey and Birstall junctions falls within Leicester City, and the south-western section of the A46 which is outside Charnwood falls within the districts of Blaby and Hinckley and Bosworth. The section of the A46 running across the north-west/west of Leicester functions as a bypass to the city, in effect substituting inner-urban distributor routes such as the A563.

3.10 The A46 serves as a bypass around Leicester, linking suburbs and satellite settlements around the city including Groby (in Hinckley and Bosworth district), Glenfield (Leicester City), Anstey, Birstall, Syston and East Goscote. Several important employment and key service hubs are located close to the A46 corridor around the north/west of Leicester including Glenfield Hospital, Leicestershire County Council (County Hall), Beaumont Shopping Centre and Beaumont Leys industrial area (including Walkers Snacks factory).

3.11 The remainder of the network comprises the LRN which is managed by Leicestershire County Council and (within the city's boundary) Leicester City Council and local highway authorities. The LRN includes other vital A-road routes including the A6, A50, A512 and A607.[8]

The relationship between the SRN and LRN in and around Charnwood

3.12 As well as a strategic role, the SRN has an important local role to play. The key interactions between the SRN and LRN occur at several key junctions.

- The A512 runs east-west across the north of Charnwood and is the main route linking Shepshed and Loughborough to the M1 at Junction 23 as well as routeing onwards towards Ashby-de-la-Zouch and the A42.
- A section of the A50 links the M1 at Junction 22 with the A46 at Groby and facilitates not only access to Leicester City but for trips routeing between the M1 north and the A46 east.
- The A563 New Parks Way/Krefeld Way/Red Hill Way/Watermead Way runs broadly parallel across the northern and western suburbs of Leicester. Whilst the A46 formally acts as the western bypass to Leicester, the A563 provides an alternative distributor route to the A46 for local, urban trips.
- The A607 links Grantham and Melton Mowbray to Leicester and forms a northern and western bypass to Syston. A section of the A46 needs to be used to route between both sections of the A607 around Syston. The A46-A607 Hobby Horse roundabout is a notable point on the network being the only at-grade roundabout on the A46 in Leicestershire where the A46 mainline carriageway is interrupted, i.e. traffic has to give-way to opposing traffic.
- The A6 forms a key gateway into northern Leicester, connecting into Charnwood and interacts with the A46 at Birstall where there is a Park and Ride facility.
- There are several less obvious cross-borough routes which may be influenced by the SRN. These include the B591 which links Shepshed (Ingleberry Road) and the A511 near to M1 Junction 22 (Copt Oak Road) with Whitwick Road acting as a spur to the A50 east of the M1. There is also a

[8] It should be noted that the Government has set out proposals for the creation of a new Major Road Network (MRN) which will form the middle tier of the country's busiest and most economically important local authority 'A' roads, sitting between the SRN and rest of the LRN. It is expected that the MRN will receive a dedicated funding stream. MRN priorities include supporting economic growth and housing delivery and complementing and supporting the existing SRN by creating a more resilient road network. In the local area, the MRN is expected to comprise the A6, A50 and A607.

network of cross-country routes in the west of the borough, which the B591 forms part of, bounded by the M1, A512, A6 and A46, some of which could provide a more convenient and less congested way into Leicester, and these include Charley Road, Roecliffe Road and Snell's Nook Lane.

3.13 Whilst the SRN should generally facilitate quicker and uninterrupted journeys, it can be susceptible to incidents and delays. Unforeseen incidents or regular congestion and delays, especially during weekday peak periods, will compel some motorists to find alternative routes. Segregated, limited access routes such as the M1 and to some extent the A46, where junctions are spaced apart and there are fewer opportunities to make route changes to avoid congestion, motorists may feel discouraged from entering these routes especially where there is no certainty of when incidents may be cleared and delays reduced.

3.14 Conversely, the LRN can provide more flexibility with a greater variety of routeing permutations although not all routeings would be considered appropriate and desirable particularly where they may impact rural communities. Such routes, some of which may go through small settlements including Anstey, Thurmaston, Newton Linford and Cropston, are not designed to deal with high volumes of traffic.

3.15 In summary, there is a strong functional relationship between the SRN and LRN, and issues occurring on either network will influence the other. For this reason, it is important to understand how current and forecast issues on the SRN could affect Local Plan mitigation.

4. Identified problems (current and forecast)

4.1 The Leicestershire Pan-Regional Transport Model (PRTM) has been used to assess how the highway network will operate with and without the Local Plan growth in Charnwood in a forecast year of 2037. The PRTM incorporates all the SRN and a sizeable proportion of the LRN (excluding very minor routes for example quiet residential cul-de-sacs).

4.2 Analysis of model outputs has focused on volume over capacity ratios at junctions, changes in delay and changes in traffic volumes. The analysis has also sought to distinguish existing issues from those generated by planned growth.

4.3 Other evidence sources have been used to clarify the key issues occurring on the SRN and LRN.

4.4 Charnwood's Local Plan Growth is anticipated to intensify existing issues on the highway network with traffic routeing decisions influenced by areas of congestion on the SRN and LRN.

M1 Congestion, J20 and 21a

4.5 The M1 already experiences congestion and delays which is understood to be a consequence of insufficient capacity to accommodate traffic volumes during peak periods along the mainline between junctions, and congestion at junctions which in turn causes tailbacks onto the M1 mainline carriageway.

4.6 The Midlands Connect A46 Corridor Study (Phase 2 Final Report, November 2020) identifies M1 Junctions 21 and 21a as significant source of delay. Junctions 21 and 21a serves both the north-south M1 and east-west A46/M69 corridors. Also, heavy reliance is placed on Junction 21 as it is the only main M1 gateway to Leicester.

4.7 The London to Scotland East Route Strategy (Highways England, March 2017) highlights congestion at M1 Junctions 21 and 21a, where growth is restricted, and safety is compromised which is reported to be of concern to emergency services. The M1 between junctions 21 and 21a is noted to be one of the worst on the network for journey delays and congestion at Junction 21 and on the adjoining M1 mainline creates safety problems.

4.8 Leicestershire County Council's Local Transport Plan 3 also cites peak congestion at Junction 21 which affects inter-urban travel and connectivity to Leicester and its southern suburbs.

4.9 Congestion and delays occurring on the M1 between Junction 21 and 21a will inevitably have a knock-on impact on the A46 which feeds into the M1 south. Depending on the level of severity of M1 congestion, junctions along the A46 including the A46-A50 Brantings Roundabout could also be impacted.

4.10 It is also important to note that a section of the M1 between Junction 21 and 21a is a designated Air Quality Management Area.

4.11 Charnwood's Local Plan growth is forecast to marginally increase these existing issues which will also be impacted by background growth including that which is allocated in neighbouring Leicestershire planning authority areas including Hinckley and Bosworth, Blaby and Leicester City.

4.12 The increase in delay as a result of Local Plan growth in the AM Peak on the M69 approach to M1 J21 is around 60 seconds, however this is somewhat indicative of existing congestion amounting to over 6 minutes delay in the Baseline scenario (without Charnwood growth included).

4.13 A number of routes joining/leaving the M1 have volume/capacity (VoC) ratios greater than 100% in the Baseline scenario, and VoC on some sections of the M1 itself are as high as 85% - 90% in the Baseline.

4.14 The change in flow on the M1 as a result of Charnwood Local Plan growth is negligible at around 20-30 PCUs.

LRN issues adjacent to the SRN

4.15 The PRTM has forecast localised congestion on the A512 close to M1 Junction 23. The Local Plan modelling has incorporated the improvement works currently being delivered as part of the M1 Junction 23 and A512 improvement scheme. The model outputs show increases in traffic on minor LRN rural routes which appear to occur as a consequence of SRN congestion and delays, therefore indicating that motorists may avoid using the M1 for certain journeys where the LRN could provide a viable alternative in terms of journey time.

4.16 One example is Charley Road which connects the A512 at Shepshed to the B591, B5330 and other minor rural routes which provide access to the M1 at Junction 22, and Leicester. This is demonstrated in the Google on-line journey planning tool plot (Figure 4-1) which shows an AM peak journey starting in Shepshed and ending in central Leicester, with various routing options using the LRN, SRN and a combination of both, all with similar estimated journey time ranges.

4.17 It is difficult to quantify the level of displaced traffic which may be associated with Local Plan development, because increases in traffic on LRN routes may also comprise 'background' trips which are also impacted by congestion and delays on the SRN.

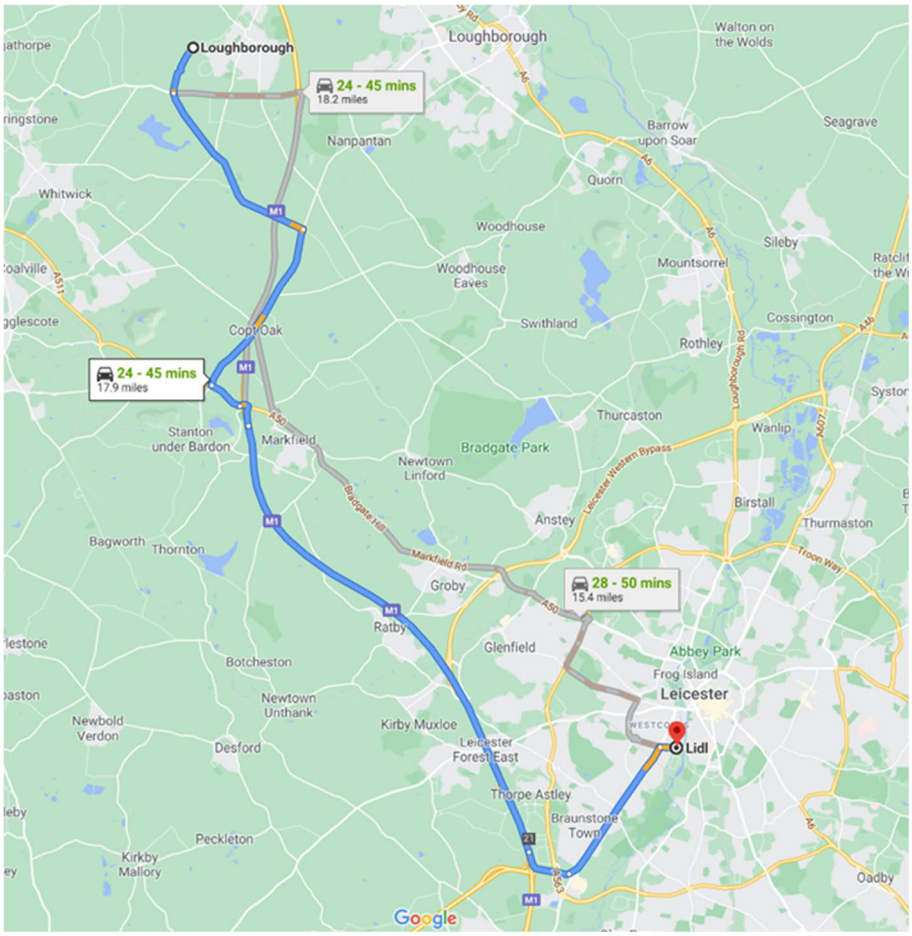


Figure 4-1: Google journey planner output for an AM peak trip from Shepshed to central Leicester

A46 Hobby Horse roundabout

4.18 The Hobby Horse roundabout is a major pressure point on the network. The Midlands Connect A46 Corridor Study Phase 2 report has identified this junction as the number one bottleneck on the entire A46 corridor with reported queues at this location lasting for 25 minutes on average.

4.19 Highway's England's North and East Midlands Route Strategy (March 2017) highlights that congestion at the A46 Hobby Horse roundabout may have a negative impact on the economic opportunity areas identified around Leicester. It also highlights that congestion on the A46 around Leicester has the potential to constrain economic growth in the region and further east on the A46 corridor in Lincolnshire.

4.20 The Hobby Horse junction facilitates a mixture of local traffic entering/exiting Leicester from areas to the north, as well as longer distance traffic along the A46 and A607 (which forms a bypass around Syston). The junction has been improved in the past in response to congestion, with additional lanes and traffic signals introduced.

4.21 Congestion at the Hobby Horse roundabout may compel motorists to find alternative, less suitable routes, including Fosse Way and Melton Road through Syston town centre.

4.22 The maximum estimated increase in traffic flow occurring as a result of Charnwood Local Plan growth is around 70 PCUs (AM Peak) and 130 PCUs (PM Peak). The A46 Wanlip Road westbound onslip, to the west of the Hobby Horse roundabout, is estimated to experience an increase in flow of around 50 PCUs in AM Peak.

4.23 Whilst these flows are not insignificant, there is estimated to be virtually no change in delays. It is also important to highlight the magnitude of issues estimated to occur at the junction in the Baseline scenario (without Charnwood's Local Plan growth). The western arm (A46 and left turn filter from A46 west to north) are estimated to experience VoC ratios of 90% - 100% in both peak periods, indicating high levels of congestion.

A46-A6 junction, A46-A50 Brantings Roundabout, A46-Anstey Lane junction, A46 Kirby Muxloe Interchange – localised congestion at key junctions

4.24 Highways England's North and East Midlands Route Strategy (March 2017) highlights that continued safety issues due to congestion and non-standard road layouts along the A46 could be exacerbated by future traffic growth.

4.25 Localised congestion is evident at several junctions, including the Kirby Muxloe Interchange (adjacent to M1 Junction 21a), A46-A50 and A46-A6 junctions. Congestion at these locations is not considered to be severe and, in some cases, it may be as a knock-on effect of congestion occurring elsewhere, including on the M1 or the Hobby Horse roundabout. However, it is clear from the modelling that the A46 is forecast to be at capacity by 2037, demonstrated by there being little change in flow along this section when additional Local Plan development is introduced.

4.26 Congestion along the A46 could lead to continuing rat-running issues through villages to the north of Leicester, and this is evident in the PRTM outputs particularly through Anstey and between Sileby and East Goscote.

5. Previously Identified Mitigation

M1 Junctions 21-21a and Junction 21a-23

5.1 The Road Investment Strategy 2 (RIS2) 2020-2025 identifies Smart Motorway schemes on the M1, identified as 'C13' M1 North Leicestershire extra capacity and 'C14' M1 Leicester Western Access and as RIS3 Pipeline schemes. This means that they are proposals which Highways England will develop during RIS period 2 so that they could enter construction in RIS period 3 (2025-2030).

5.2 Funding for construction of these schemes has not been committed. Acknowledgement of these vital schemes in the RIS signifies their importance to facilitating local and regional growth on a major national transport corridor.

A46 Hobby Horse roundabout

5.3 Highways England has undertaken a PCF Stage 0 high level assessment of options to improve the junction through grade separation. Such improvements will require significant land acquisition and will therefore be an expensive and complex scheme to deliver. It is understood that Highways England has not undertaken further investigations into possible junction improvements and therefore there is no certainty of when such a scheme could come forward. It is highly likely that substantial improvements at this junction will unlock significant growth opportunities both locally and regionally.

5.4 The junction improvements are not however included in RIS2 and more detailed feasibility work would be required to determine the scale and form of any improvements.

6. How to address problems on the SRN

6.1 DfT Circular 02/2013 sets out Highways England's approach to mitigating impacts from development on the SRN. A key aim is to promote sustainable transport solutions through Local Plans with development promoted at locations that are or can be made sustainable, that allow for uptake of sustainable transport modes and support wider social and health objectives, and which support existing business sectors as well as enabling new growth.

Travel Plans

6.2 The Circular states that capacity enhancements and infrastructure required to deliver strategic growth should be identified at the Local Plan stage, only after travel plan and demand management measures have been fully explored and applied should capacity enhancement be considered. Highways England therefore should endorse opportunities to introduce travel plan and demand management measures through the Local Plan process.

6.3 A sustainable travel led mitigation strategy approach is therefore required for Charnwood, but additional highway infrastructure improvements will also be needed.

SRN Intervention

6.4 In contrast to much of the LRN, the SRN mainly comprises larger, more complex infrastructure including grade-separated junctions and segregated carriageways. There are potentially therefore fewer opportunities to deliver smaller improvements to the SRN which are proportionate to the level of impact arising from Charnwood's Local Plan growth due to the complex nature of the infrastructure without substantial works and expense.

6.5 As is evident on the M1 and A46 in and around Charnwood, many of the junctions have been subject to incremental improvements over the years including for example providing additional lanes on slip road approaches to roundabouts, introducing traffic signals and changing designated lane movements.

6.6 These incremental improvements will have enhanced capacity, increased traffic throughput and reduced delays to an extent. Whilst there may remain in some cases further opportunities for additional incremental enhancements to the SRN, in many locations these opportunities will now have been largely exhausted. Furthermore, relatively small-scale improvements can still be complex and expensive to deliver, particularly where these impact utilities or require new structures.

6.7 The level of severity of the key issues for many of the SRN's issues in/around Charnwood is such that larger, more complex and expensive options would most likely be the next key step to be taken in order to deliver the level of improvement needed. Improvement schemes identified on the M1 Junctions 21-21a and at the A46 Hobby Horse roundabout are larger scale and more complex to deliver. They also address local and regional growth needs, as well as tackling existing severe congestion issues.

A Mitigation Strategy for the SRN

6.8 Taking a proportionate approach in the context of local growth in Charnwood, it is proposed that a multi-faceted mitigation strategy is needed which recognises the intrinsic relationship between the SRN and LRN and the need to unlock growth in the short term whilst not placing undue reliance upon the delivery of complex infrastructure which is unlikely to come forward until the medium to long term.

6.9 Figure 6-1 describes the proposed mitigation strategy for dealing with issues on the SRN.

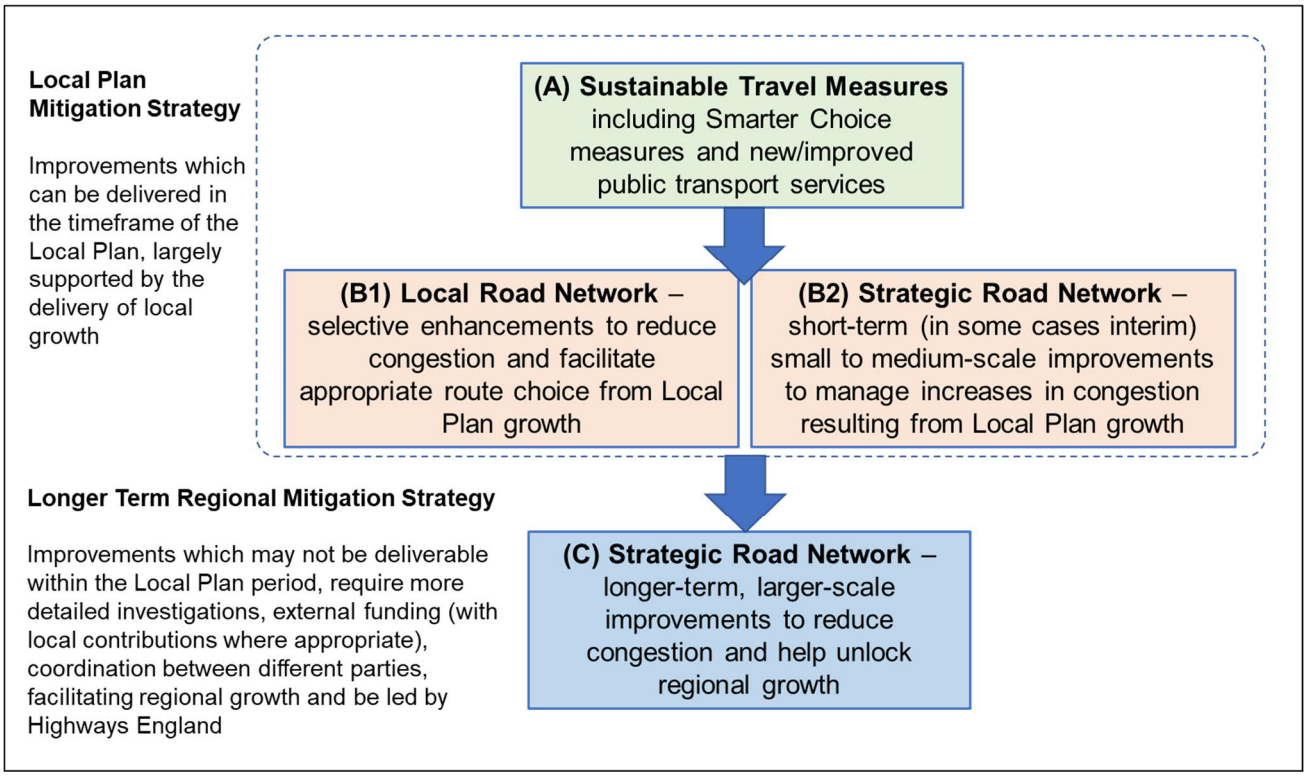


Figure 6-1: SRN mitigation strategy

6.10 First and foremost, the mitigation strategy should be led by sustainable travel measures where these are deliverable and could help relieve some pressure on the LRN and SRN (item A in the Figure above). In the context of Charnwood's growth and the SRN, this approach could yield benefits along the A512 corridor between Shepshed and Loughborough via M1 Junction 23; between Loughborough and Leicester along the A6 corridor via the A46 junction at Birstall; across the north-west of Leicester on the various routes leading into the city from surrounding villages including Anstey; and in Syston.

6.11 Sustainable travel measures should be complemented by selective, proportionate improvements to the LRN and SRN where these could help to manage increases in delays and congestion especially in the short term, leading to more appropriate route choice (for example, reducing rat-running on minor rural routes for inter-urban journeys) thus enabling Local Plan growth to get underway (items B1 and B2 in the figure above). It will be vital however that these improvements do not undermine opportunities to deliver sustainable travel measures, extinguishing congestion and therefore making private car travel too attractive again.

6.12 These interim improvements would need to be deliverable and affordable in a shorter timeframe; should not inhibit opportunities for bringing forward larger, more complex improvements in the longer term; and assist in achieving a tangible improvement in the short term.

6.13 In locations where evidence indicates that issues on the LRN are impacting route choices including the use of minor roads in preference to the SRN, consideration should be given to introducing 'stick' measures which could make them less attractive (for example, reducing speed limits, banning turning movements) however it must be recognised that access to rural communities along these minor routes should be maintained and the rural nature may prohibit certain types of highway improvements. The junction between Charley Road and the A512 is one such example where this approach could be appropriate.

6.14 Items A and B1/B2 in Figure 3 comprise the main Local Plan-led mitigation strategy. In the longer term, strategic-led improvements to the M1 and A46 will help to unlock both local and regional growth as well as tackle already severe congestion issues. Subject to further investigations led by Highways England in discussion with local and regional bodies, these larger-scale improvements could be delivered within the timescales of the Charnwood Local Plan, certainly in the latter stages. Monetary contributions from Charnwood Local Plan development towards these larger improvements may be appropriate, if it can be demonstrated that contributions are proportionate to the level of impact or traffic growth. It should be recognised however that Local Plan development may have already contributed to shorter term improvements on the SRN by the time larger scale improvements are being developed and implemented.

6.15 Should these larger interventions come forward sooner than expected, they may supersede the need for smaller scale, interim improvements which could become abortive works.

6.16 Pivotal to the mitigation strategy is cooperation and collaboration between the local authorities and Highways England. This is particularly important in light of many of the SRN issues (current and future) being impacted not only by growth in Charnwood but also in neighbouring local authorities and regionally.

6.17 Looking ahead to a future examination in public, to provide confidence to an Inspector, the following could be undertaken:

- Develop a Statement of Common Ground with strategic partners, especially those charged with the SRN/major road remit, i.e. other districts, Leicester County Council (LCC) and Highways England, which illustrates that there is a coordinated response to addressing the SRN.
- Provide a clear way forward (a road map) setting out how thinking and commitments will be progressed.
- This could point to the development of a strategic infrastructure plan, which could provide a strategic long-term vision for the SRN and LRN.

Appendix C – Long List of Interventions

ID	Corridor	Link/Junction/Location	Broad Location	Source	Description	Intervention Types	Initial points for consideration
AN1	A46	A46/Leicester Road/A5630 Anstey Lane junction	Anstey	AECOM Optioneering	Extend 2-lane flare on Leicester Road (Anstey) approach by 30m / / Amend east-facing merge and diverge to incorporate an auxiliary lane layout to aid the efficient merging and diverging of traffic.	7. Junction improvement - car and freight	-
AN2	A46	A46/A50	Anstey	AECOM Optioneering	Introduce signal-control on eastbound offslip and opposing circulatory. Introduce a segregated left turn (bypass) lane from the A50 onto the A46 eastbound onslip. Introduce third lane flare on eastbound offslip (nearside for left-turn only, middle and offside lanes for right turn towards Leicester).	7. Junction improvement - car and freight	-
AN3	A50	A50/Anstey Lane	Anstey	Developer proposal	Introduce signal-controlled right turn from A50 into Anstey Lane including auxiliary diverge lane on the offside of existing north-westbound carriageway.	7. Junction improvement - car and freight	This new turn could be restricted to buses only if there is sufficient demand for a service, or general traffic which could have wider benefits.
AN4	Anstey	Anstey	Anstey	AECOM Optioneering	Anstey-Beaumont Leys/Boston Rd Ind Estate-Hospital-County Council Circular Bus via Beaumont Leys P&R interchange hub (proposed by Leicester City). Improve key stops on route to form mini hubs (high quality bus stops with shelters, seating and real time information).	5. Bus network improvement	May impact on existing bus services, diluting patronage unless a significant uptake in passengers can be achieved through new service

ID	Corridor	Link/Junction/Location	Broad Location	Source	Description	Intervention Types	Initial points for consideration
AN5	Anstey	Anstey southern cycle route (and link to Beaumont Leys)	Anstey	AECOM Optioneering	Creation of a high quality cycle bypass route linking the proposed developments around Anstey, avoiding the centre of Anstey, linking across to Leicester Road (including a new signal-controlled crossing), improvements to the existing route under the A46 and improved links into Beaumont Leys.	2. Cycle network improvement	Land to the south east of Anstey may not be available. Alternatively an on-road route would be required through Anstey however this is considered less desirable because the roads are narrow and heavily trafficked.
AN6/BI2	Leicester	Leicester Park and Ride Sites	Anstey	AECOM Optioneering	Extend Park and Ride bus services out to nearby small satellite settlements. Enhance facilities (if required) to facilitate bus-to-bus interchange and potential for additional buses to stop at Park and Rides.	5. Bus network improvement	More consideration would be needed of potential impact on existing services, whether the necessary amendments to timetables are feasible.
AN7	Anstey/Leicester	Anstey to Glenfield cycle route	Anstey	AECOM Optioneering	Upgrade of existing rights of way between Groby Road (Anstey), beneath the A46 (existing subway) and onto Gynsill Lane via Ginshill Gate development.	2. Cycle network improvement	Subject to confirmation of rights of way and suitability of existing subway to accommodate cyclists.
AN8	Leicester	Leicester northern 'A563' Orbital Transit	Anstey	AECOM Optioneering	Creation of a new bus service or DRT to link the three existing P&Rs plus to additional two P&Rs proposed, as well as surrounding major employment areas including Beaumont Leys, County Hall, Glenfield Hospital, Meridian Business Park	5. Bus network improvement	More detailed feasibility required. It would need to be of a reasonably high frequency to be attractive. Bus priority measures may be required in addition but uncertain which route sections would need this treatment. The intervention would be well into Leicester City and may mitigate their own growth impacts. Would need to check if Leicester City have similar or clashing proposals.
BA1	Barrow	Barrow upon Soar	Barrow upon Soar	AECOM Optioneering	Footway improvements to the station from key development site(s). These may comprise of additional or improved wayfinding signage. Beveridge Street, Warner St, Grove Lane, Church Street,	1. Pedestrian network improvement	Any reductions in road capacity to accommodate footway improvements may increase delays or cause local traffic re-routing.

ID	Corridor	Link/Junction/Location	Broad Location	Source	Description	Intervention Types	Initial points for consideration
					Melton Road and Cotes Road a priority.		
BA2	Barrow	Barrow upon Soar	Barrow upon Soar	AECOM Optioneering	Cycle route improvements to the station from key development site(s). These may comprise a combination of additional or improved wayfinding signage, newly designated sections of cycle routes on or off road (with road markings) and reduced speed limits to 20mph to facilitate safer on-road cycling where off-road shared use cycle lanes or on-road cycle lanes are not feasible. If feasible, designate urban quiet ways which avoid the more heavily trafficked routes. Beveridge Street, Warner St, Grove Lane, Church Street, Melton Road and Cotes Road a priority.	2. Cycle network improvement	Any reductions in road capacity to accommodate cycle improvements may increase delays or cause local traffic re-routing.
BA3	Barrow	Barrow upon Soar	Barrow upon Soar	AECOM Optioneering	Improved station with step free access. Aligns with scheme PT.16 of the Charnwood Sustainable Transport Study.	4. Integrated transport	-
BA4	Barrow	Barrow upon Soar	Barrow upon Soar	AECOM Optioneering	Cycle parking facilities at station	2. Cycle network improvement	-
BA5	Barrow	High Street-South Street-Bridge Street	Barrow upon Soar	AECOM	Introduce give-ways on roundabout circulatory so that Bridge St-High Street movements have priority through the junction. Retain roundabout island.	7. Junction improvement - car and freight	-
BA6	B676	Coates Road-Loughborough Road-Barrow Road	Barrow upon Soar	AECOM	Convert to roundabout layout	7. Junction improvement - car and freight	-

ID	Corridor	Link/Junction/Location	Broad Location	Source	Description	Intervention Types	Initial points for consideration
BA7	A60	A60 Nottingham Road/Loughborough Road-B676 Barrow Road	Barrow upon Soar	AECOM	A) Convert to a roundabout	7. Junction improvement - car and freight	-
BA8	A60	A60 Nottingham Road/Loughborough Road-B676 Barrow Road	Barrow upon Soar	AECOM	B) Convert to a signal-controlled T-junction	7. Junction improvement - car and freight	Junction is close to River Soar which may restrict the ability to introduce a larger junction layout. Will not be possible to accommodate traffic signal heads on river overbridge.
BA9		Barrow Road	Barrow upon Soar	AECOM	Replace bridge over River Soar	6. Highway improvement - car and road freight	-
AN6/BI2	Leicester	Leicester Park and Ride Sites	Birstall	AECOM Optioneering	Extend Park and Ride bus services out to nearby small satellite settlements. Enhance facilities (if required) to facilitate bus-to-bus interchange and potential for additional buses to stop at Park and Rides	5. Bus network improvement	More consideration would be needed of potential impact on existing services, whether the necessary amendments to timetables are feasible
BI3	Birstall	New Bus Lane on A6	Birstall	AECOM Optioneering	A new bus lane on the A6 heading southbound towards the Red Hill Circle junction.	5. Bus network improvement	Reducing to a single lane for general traffic will inevitably increase queues and delays. A bus lane with no additional bus services may not be sufficient to offset this impact (i.e. reduced traffic demand). Traffic may divert onto alternative and less suitable routes, e.g. School Lane or Hermitage Road to then approach the Red Hill Circle junction on the Birstall Road approach instead.
BI4	Birstall	Wanlip Road	Birstall	AECOM	Introduce additional traffic calming features and a revised 20mph speed limit to discourage through-traffic (between Myrtle Ave and Subson Road)	3. Traffic calming and urban realm	Would need to be developed in accordance with LCC's speed management guidelines

ID	Corridor	Link/Junction/Location	Broad Location	Source	Description	Intervention Types	Initial points for consideration
LO1	A6/A6004	A6/A6004 One Ash Roundabout	Loughborough	AECOM Optioneering	Introduce partial signalisation on the junction, including A6 South and A6004 arms // introduce bus gating signals on Loughborough Road (Quorn) approach // Extend 2-lane taper exit onto A6004.	7. Junction improvement - car and freight	Bus gating may cause additional delays to traffic. Buses may not be frequent enough to warrant bus priority
LO2	Loughborough	Loughborough Town Wide	Loughborough	AECOM Optioneering	Loughborough Smarter Choices - personalised travel planning - developing app	4. Integrated transport	Additional evidence will be required to demonstrate the effectiveness of smarter choice measures. Would need substantial investment over the course of the Local Plan. Smarter Choices may be undermined if there is insufficient supporting infrastructure such as attractive cycle routes and bus priority.
LO3	Loughborough	Loughborough Town Wide	Loughborough	AECOM Optioneering	Loughborough Smarter Choices - increased bus frequencies, incentives to use the bus, real time information, bus stop upgrades. Aligns with schemes PT.01 and PT.09 of the Charnwood Sustainable Transport Study	5. Bus network improvement	Additional evidence will be required to demonstrate the effectiveness of smarter choice measures. Would need substantial investment over the course of the Local Plan. Smarter Choices may be undermined if there is insufficient supporting infrastructure such as attractive cycle routes and bus priority.

ID	Corridor	Link/Junction/Location	Broad Location	Source	Description	Intervention Types	Initial points for consideration
LO4	Loughborough	Loughborough Town Wide	Loughborough	AECOM Optioneering	Loughborough Smarter Choices - cycle hire schemes. Aligns with scheme WC.20 of the Charnwood Sustainable Transport Study	2. Cycle network improvement	Additional evidence will be required to demonstrate the effectiveness of smarter choice measures. Would need substantial investment over the course of the Local Plan. Smarter Choices may be undermined if there is insufficient supporting infrastructure such as attractive cycle routes and bus priority.
LO5/SH1	A512	Loughborough-Shepshed	Loughborough	AECOM Optioneering	Divert existing bus service from Shepshed to Loughborough via the hospital, Belton Road (industrial estates), railway station and town centre	5. Bus network improvement	Existing users who travel from Shepshed to Loughborough Town Centre or destinations beyond on the current route will be disadvantaged by the increased journey time. Bus may be susceptible to more delays as it routes around Loughborough.
LO6	A6004	A6004 Epinal Way-Beacon Road	Loughborough	AECOM	A) Extend 2 lane flares by 30m on both A6004 arms	7. Junction improvement - car and freight	-
LO7	A6004	A6004 Epinal Way-Beacon Road	Loughborough	AECOM	B) + Introduce traffic signals on roundabout	7. Junction improvement - car and freight	-
LO8	A6004	Epinal Way-Warwick Way-Sandringham Drive-Maxwell Drive	Loughborough	AECOM	Extend 2 lane flares on Epinal Way and Warwick Way arms by 30m each	7. Junction improvement - car and freight	-
LO9	A6004	Epinal Way-Alan Moss Rd	Loughborough	AECOM	Introduce traffic signals and extend 2-lane flare on Epinal Way northern arm by 30m	7. Junction improvement - car and freight	-
SH1/LO5	A512	Shepshed-Loughborough	Shepshed	AECOM Optioneering	Divert existing bus service from Shepshed to Loughborough via the hospital, Belton Road (industrial estates), railway station and town centre	5. Bus network improvement	Existing users who travel from Shepshed to Loughborough Town Centre or destinations beyond on the current route will be disadvantaged by the increased journey time. Bus may be susceptible to more delays as it routes around Loughborough.

ID	Corridor	Link/Junction/Location	Broad Location	Source	Description	Intervention Types	Initial points for consideration
SH2	A512	A512 Charley Road/Tickow Lane	Shepshed	AECOM Optioneering	Junction improvement to help facilitate development. Upgrade to a roundabout, signal-controlled crossroads or potentially an upgraded non-signalised crossroads which bans the straight ahead movements. Consider some form of gating/traffic calming on Charley Road to discourage through movements (although this is a rural route and may not be appropriate)	7. Junction improvement - car and freight	Prohibiting the straight ahead movement between Charley Road and Tickow Lane may cause traffic to find alternative and even less suitable routes or cause U-turning on the A512.
SH3	A512	Shepshed-Loughborough	Shepshed	AECOM Optioneering	Upgrade existing cycle route between the A512 west of Loughborough and Loughborough Hospital, including improved surfacing, lighting, wayfinding, improved crossings where the route intercepts key roads.	2. Cycle network improvement	Improved surfacing alone may not attract significant additional users. Priority to cyclists where the cycle route crosses roads may increase attractiveness, as would additional signage and lighting. Lighting may not be feasible for environmental sensitivity reasons.
SH4	Nanpanton Road	Nanpanton	Shepshed	AECOM Optioneering	New off-road cycle route (shared use) along Nanpanton Road between Nanpanton and Loughborough	2. Cycle network improvement	No scope to directly improve capacity at the junction.
SH5	Nanpanton Road	Nanpanton	Shepshed	AECOM Optioneering	Increase bus frequencies through Nanpanton, especially during peak times	5. Bus network improvement	No scope to directly improve capacity at the junction.
SY1	A607	A607/Fosse Way	Syston	AECOM Optioneering	Provide two lane exit from roundabout onto Fosse Way. Amend lane markings on A46 offslip approach to permit straight ahead movement from nearside and offside lanes // Extend flared approaches on southern, western and eastern arms by approximately 20m.	7. Junction improvement - car and freight	May not be required if Hobby Horse improvements were to unlock wider area benefits.

ID	Corridor	Link/Junction/Location	Broad Location	Source	Description	Intervention Types	Initial points for consideration
SY2	Syston	Syston Eastern developments	Syston	AECOM Optioneering	Bypass to Barkby village, potentially integrated within the proposed development.	6. Highway improvement - car and road freight	Will need to check the emerging Masterplan/pre-app (if available) or liaise with CBC to determine if the development is of sufficient scale to support such a scheme (i.e. scheme may be considered too large/expensive that it would make development less viable).
SY3	Syston	Syston Eastern developments	Syston	AECOM Optioneering	Queniborough Road-Barkby Road traffic signal junction improvement, incorporating additional lane on Barkby Road approach (nearside lane for left/ahead and offside lane for right turning traffic) and widen the southbound approach to incorporate a right turn filter.	7. Junction improvement - car and freight	Possible land take outside highway boundary.
SY4	Sileby-East Goscote	Broome Lane (Sileby-East Goscote)	Syston	AECOM Optioneering	Localised restrictions to make the route less attractive, e.g. signal-control single lane sections (shuttle working) over River Wreake.	6. Highway improvement - car and road freight	Introducing signals over the river may not be enough to discourage traffic rat-running. Being a rural route, it is not feasible to introduce traffic calming as a means of slowing traffic down.
SY5	Syston	Syston - Melton Road	Syston	AECOM Optioneering	Streetscape, semi-pedestrianised, enhance high street, 20mph max speed limit, raised speed tables, shared space.	3. Traffic calming and urban realm	Traffic rerouting back onto the A46 through Hobby Horse. Potentially less desirable re-routing onto quieter roads or potentially routes to the east of Syston
SY6	Sileby	Sileby	Syston	AECOM Optioneering	Footway route improvements to the station from key development site(s). These may comprise of additional or improved wayfinding and signage.	1. Pedestrian network improvement	Any reductions in road capacity to accommodate footway improvements may increase delays or cause local traffic re-routeing.

ID	Corridor	Link/Junction/Location	Broad Location	Source	Description	Intervention Types	Initial points for consideration
SY7	Sileby	Sileby	Syston	AECOM Optioneering	Cycle route improvements to the station from key development site(s). These may comprise a combination of additional or improved wayfinding, signage, newly designated sections of cycle routes on or off road (with road markings) and reduced speed limits to 20mph to facilitate safer on-road cycling where off-road shared use cycle lanes or on-road cycle lanes are not feasible. If feasible, designate urban quiet ways which avoid the more heavily trafficked routes. Additional cycle parking at stations may also be required.	2. Cycle network improvement	Any reductions in road capacity to accommodate cycle improvements may increase delays or cause local traffic re-routeing.
SY8	Sileby	Sileby	Syston	AECOM Optioneering	Improved station with step free access. Aligns with scheme PT.16 of the Charnwood Sustainable Transport Study	4. Integrated transport	-
SY9	Sileby	Sileby	Syston	AECOM Optioneering	Cycle parking facilities at station.	2. Cycle network improvement	-
SY10	Sileby	Swan Street-Highgate Road-Ratcliffe Road-The Banks	Syston	AECOM	Junction improvement including raised speed table and pedestrian crossing improvements.	7. Junction improvement - car and freight	-
SY11	Sileby	Ratcliffe Road	Syston	AECOM	Introduce additional traffic calming features between Cemetery Rd and Peashill Close. Incorporate formalised parking bays to reduce occurrence of parking on footways (creating chicanes to manage traffic flow and speeds).	3. Traffic calming and urban realm	Would need to be developed in accordance with LCC's speed management guidelines

ID	Corridor	Link/Junction/Location	Broad Location	Source	Description	Intervention Types	Initial points for consideration
SY12	Sileby	Brook Street-High Street-Cossington Road	Syston	AECOM	Convert to mini roundabout	7. Junction improvement - car and freight	Potential for queuing traffic on bridge over Sileby brook (weight considerations). Also, northbound queues may impede left-turning traffic out of Brook St (sharp bend may require vehicles to encroach onto opposing lane)
SY13	Syston	Barkley Road, Queniborough	Syston	AECOM	Introduce additional traffic calming features and a revised 20mph speed limit to discourage through-traffic (south of Syston Road/Queniborough Road junction).	3. Traffic calming and urban realm	Would need to be developed in accordance with LCC's speed management guidelines
SY14	East Goscote	Broome Lane, north of East Goscote	Syston	AECOM	Introduce additional traffic calming features and a revised 30mph speed limit to discourage through-traffic on section on northern edge of East Goscote.	3. Traffic calming and urban realm	Would need to be developed in accordance with LCC's speed management guidelines
STRAT1	A46	A46/A607 Hobby Horse Roundabout	STRATEGIC LONG TERM	AECOM Optioneering / HE PCF Stage 0	Large Scale Improvements (A): Grade separation of the junction	7. Junction improvement - car and freight	Complex and expensive. May be considered out of proportion to growth plans in Charnwood. A46 carries more strategic traffic therefore this shouldn't be a CBC issue to resolve solely.
STRAT2	A46	A46/A607 Hobby Horse Roundabout	STRATEGIC LONG TERM	AECOM Optioneering / HE PCF Stage 1	Large Scale Improvements (B): A46 throughabout with segregated A46 west to east link	7. Junction improvement - car and freight	Complex and expensive. May be considered out of proportion to growth plans in Charnwood. A46 carries more strategic traffic therefore this shouldn't be a CBC issue to resolve solely.
STRAT3	M1/M69	M1 Junction 21 - M1/M69/A5460	STRATEGIC LONG TERM	Other	Free flow interchange links between M1 and M69	7. Junction improvement - car and freight	Outside of Charnwood area. Likely to be linked to wider area growth
STRAT4	M1	M1 Leicester Western Access	STRATEGIC LONG TERM	RIS2 (RIS3 Pipeline)	Smart Motorway scheme J21-J21a	6. Highway improvement - car and road freight	Not exclusively linked to growth in Charnwood

ID	Corridor	Link/Junction/Location	Broad Location	Source	Description	Intervention Types	Initial points for consideration
STRAT5	M1	M1 North Leicestershire Extra Capacity	STRATEGIC LONG TERM	RIS2 (RIS3 Pipeline)	Smart Motorway Scheme J21a-J23	6. Highway improvement - car and road freight	Outside of Charnwood area. Likely to be linked to wider area growth
STRAT6	A46	A46	STRATEGIC LONG TERM	AECOM	Smart technology including variable speed limits to manage build-up of traffic flows on A46 between M1 J21a and north of the Hobby Horse roundabout	6. Highway improvement - car and road freight	Not exclusively linked to growth in Charnwood
STRAT7	M1 / A512	M1 Junction 23	STRATEGIC LONG TERM	AECOM	Lower Cost: Additional improvements (over and above committed scheme) comprising: permitting the left turn movement from lanes 1 and 2 of the northbound offslip (once widened) (whilst maintaining the straight ahead movement); extending the lane 1 flare by 60m; extending the A512 westbound lane 1 nearside flare by 60m; widen the southbound circulatory to 3 lanes at the stop line, with lanes 1 and 2 permitting the straight ahead movement (towards the M1 S) and lanes 2 and 3 permitting the right turn movement (towards Shepshed).	7. Junction improvement - car and freight	Not exclusively linked to growth in Charnwood although some contribution to the problem being addressed from developments in Shepshed and west Loughborough
STRAT8	M1 / A512	M1 Junction 23	STRATEGIC LONG TERM	AECOM	Higher Cost (Additional to Lower Cost): Widen eastbound and westbound circulatory overbridges to 3 lanes each, with lanes 1 and 2 permitting the straight ahead movement onto the A512 and lanes 2 and 3 permitting the right turn movement around the circulatory towards the M1; provide a segregated left turn bypass lane from the A512 west to the M1 S.	7. Junction improvement - car and freight	Not exclusively linked to growth in Charnwood although some contribution to the problem being addressed from developments in Shepshed and west Loughborough

ID	Corridor	Link/Junction/Location	Broad Location	Source	Description	Intervention Types	Initial points for consideration
STRAT9	M1 / A512	M1 Junction 23	STRATEGIC LONG TERM	AECOM	Higher Cost (Additional to Lower Cost) - Alternative: Widen eastbound and westbound circulatory overbridges to 3 lanes each, with lanes 1 in both directions forming bus lanes and lanes 2 and 3 maintaining the existing lane movements; widening of the A512 eastbound exit to 3 lanes to continue bus lane for approximately 100m; widening A512 westbound exit to 3 lanes to continue bus lane for approximately 100m; provide bus lane section on nearside of A512 eastbound approach to junction (no bus gating required) between weighbridge/development access (committed junction improvement) and M1 J23	7. Junction improvement - car and freight	Not exclusively linked to growth in Charnwood although some contribution to the problem being addressed from developments in Shepshed and west Loughborough
STRAT10	M1/M69	M1 Junction 21 - M1/M69/A5460	STRATEGIC LONG TERM	AECOM Optioneering	Interim Intervention: Extend the offside flare on the southbound offslip by approximately 20-30 m. Introduce a fourth lane on the eastbound circulatory. Introduce signal control with increased flare on M69 approach.	6. Highway improvement - car and road freight	Outside of Charnwood area. Likely to be linked to wider area growth
STRAT11	A46	A46/Wanlip Road slip road	STRATEGIC LONG TERM	AECOM Optioneering	Amend the merge layout to provide an auxiliary lane merge. Would need to tie in downstream prior to where cycle lane converges with A46 and River Soar bridge.	7. Junction improvement - car and freight	Improved layout is unlikely to significantly increase the attractiveness of the junction. HE view needed on whether the junction needs to be improved
STRAT12	A46	A46/A607 Hobby Horse Roundabout	STRATEGIC LONG TERM	AECOM Optioneering	Interim Intervention: Amend lane markings on A46 north approach to enable the A46 right turning traffic to approach the junction from either the nearside and offside lanes. The straight ahead movement onto A607 will therefore be approached from the nearside lane only. //	7. Junction improvement - car and freight	Potentially ineffective. A46 carries more strategic traffic therefore this should not be a CBC issue to resolve solely.

ID	Corridor	Link/Junction/Location	Broad Location	Source	Description	Intervention Types	Initial points for consideration
					Extend third lane merge taper on A46 westbound exit.		
STRAT13	A46	A46/A6 Loughborough Road Interchange	STRATEGIC LONG TERM	AECOM Optioneering	Extend flares and marked lanes on westbound offslip approach. Provide two lanes left turn onto A6 (Leicester). Widen A6 southbound on exit from the junction to provide third lane for access into Park and Ride.	7. Junction improvement - car and freight	It is understood there is a developer scheme which has been identified and secured through planning permission, which may supplement this scheme.

Appendix D – Details of Preferred and Not Preferred Packages

Broad Location	Package Option ID	Package Option Name	Description	Preferred (GREEN) or Not Preferred (PINK)	Justification
Anstey	AN-PK1	Highways capacity focus	Package option AN-PK1 comprises interventions which will deliver increased highway capacity on key roads and junctions surrounding Anstey.	Not Preferred	Based on a review of evidence, the EAST assessment and professional judgement, package option AN-PK1 is not preferred because it is considered that highway capacity improvements alone will not be sufficient to address issues and facilitate growth in Anstey.
	AN-PK2	Highways capacity + cycle route improvements - blended approach	Package option AN-PK2 comprises interventions which will deliver increased highway capacity on key roads and junctions surrounding Anstey, in addition to complementary cycle route improvements which will improve connectivity between Anstey and north-west Leicester.	Preferred	Based on a review of evidence, the EAST assessment and professional judgement, package option AN-PK2 is preferred because it recognises the opportunities for facilitating sustainable travel in particular for trips between Anstey and the north-western part of Leicester, in combination with improvements to the highway which could address local capacity and routeing issues
	AN-PK3	Sustainable Travel focus	Package option AN-PK3 comprises interventions which will improve sustainable travel links around Anstey, including cycle route improvements, bus service improvements and Park and Ride.	Not Preferred	Based on a review of evidence, the EAST assessment and professional judgement, package option AN-PK3 is not preferred because it is considered that the sustainable travel-focused interventions alone will not be sufficient to address issues and facilitate growth in Anstey.
	BA-PK1	Larger-scale Highways capacity focus	Package option BA-PK1 comprises a series of larger-scale, more expensive, highway capacity improvements within Barrow and on the cross-country route leading towards A60 corridor and eastern Loughborough	Not Preferred	Based on a review of evidence, the EAST assessment and professional judgement, package option BA-PK1 is not preferred because a solely highway capacity led approach is not in line with local and national policy; it overlooks the opportunity to influence travel behaviour within Barrow (including the potential to encourage sustainable travel); and it may encourage less sustainable car-based trips because of the additional highway capacity that would be delivered.
	BA-PK2	Sustainable Travel focus + selective Highways capacity - blended approach	Package option BA-PK2 comprises sustainable travel interventions including footway and cycle route improvements, in addition to one highway capacity improvements at key pinch points - the High Street-South Street-Bridge Street roundabout	Preferred	Based on a review of evidence, the EAST assessment and professional judgement, package option BA-PK2 is preferred because it is considered that a combination of sustainable travel interventions and two highway capacity improvements which address the key pinch points in Barrow could be sufficient to address planned growth.
Birstall	BI-PK1	Highways capacity + Sustainable travel - blended approach	Package option BI-PK1 comprises a combination of all highways capacity and sustainable travel focused interventions across Birstall	Preferred	Based on a review of evidence, the EAST assessment and professional judgement, package option BI-PK1 is preferred because it is considered that a combination of sustainable travel interventions and highway capacity improvements which address two gateway routes into Birstall could be sufficient to address planned growth.
Loughborough	LO-PK1	Sustainable Travel focus	Package option LO-PK1 comprises interventions which will improve sustainable travel across the town of Loughborough, including personalised travel planning; improved bus and cycle routes; and improved cycle facilities including cycle parking and a cycle hire scheme. The package also includes a single junction improvement at the A6/A6004 One Ash roundabout because this incorporates bus priority features.	Not Preferred	Based on a review of evidence, the EAST assessment and professional judgement, package option LO-PK1 is not preferred because sustainable travel focused interventions may not alone be sufficient to fully mitigate the impacts of local plan growth and that some highway capacity enhancements within the town may be necessary to unlock opportunities for improving sustainable travel.
	LO-PK2	Highways capacity focus	Package option LO-PK2 comprises increases to highway capacity at a series of junctions along the A6004 corridor, including increasing lanes and the length of flares on approaches to junctions and introducing traffic signals for better management of traffic flows	Not Preferred	Based on a review of evidence, the EAST assessment and professional judgement, package option LO-PK2 is not preferred because it is considered that highway capacity improvements alone are not aligned with policy, could lead to increases in traffic in Loughborough, could lead to increased severance; could discourage the take-up of sustainable travel options from planned growth areas; and may make existing trips made by sustainable modes less convenient

Broad Location	Package Option ID	Package Option Name	Description	Preferred (GREEN) or Not Preferred (PINK)	Justification
	LO-PK3	Sustainable travel + Highway capacity focus - blended approach	Package option LO-PK3 comprises a combination of highway capacity interventions at key junctions and sustainable travel interventions across Loughborough	Preferred	Based on a review of evidence, the EAST assessment and professional judgement, package option LO-PK3 is preferred because it is considered that the opportunities with delivering sustainable travel in a large town such as Loughborough are very significant and would comply fully with policy. However, these need to be in combination with highway capacity improvements in recognition that Loughborough attracts trips from areas outside of the town which may not be as influenced by sustainable travel.
Shepshed	SH-PK1	Sustainable travel + Highway capacity - blended approach	Package option SH-PK1 is the only option put forward for Shepshed and comprises a combination of sustainable travel (including bus service and cycle route improvements) and highways capacity focused intervention (in discouraging cross-country trips between Shepshed and Charley Road)	Preferred	Package option SH-PK1 is the only package put forward for Shepshed. Based on a review of evidence, the EAST assessment and professional judgement, package option SH-PK1 is preferred because it is considered that a combination of sustainable travel interventions and a smaller-scale highway capacity improvement will help facilitate growth planned growth in the Shepshed broad location.
Syston	SY-PK1	Highways capacity focus	Package option SY-PK1 comprises highway capacity improvements to road links and junctions in and around Syston, Barkby, Sileby and between Sileby and the A46 corridor. Interventions range for enlarging junctions to increasing lanes on junction approaches, and measures to discourage traffic rat-running between Sileby and East Goscote including signal-controlled shuttle working.	Not Preferred	Based on a review of evidence, the EAST assessment and professional judgement, package option SY-PK1 is not preferred because it is considered that highway capacity improvements alone are not aligned with policy, could lead to increases in traffic in the Syston broad location whilst not providing an attractive alternative in the form of sustainable travel improvements.
	SY-PK2	Sustainable Travel + smaller-scale Highways capacity - blended approach	Package option SY-PK2 comprises a combination of sustainable travel interventions and a smaller-scale highway capacity interventions at key junctions and on road links across the Syston broad location	Preferred	Based on a review of evidence, the EAST assessment and professional judgement, package option SY-PK2 is preferred because it is considered that a combination of sustainable travel interventions and smaller-scale highway capacity improvements will help facilitate growth planned growth in the Syston broad location.
	SY-PK3	Sustainable Travel focus	Package option SY-PK3 comprises interventions which will improve sustainable travel across the Syston broad location, but mainly focused in Syston and also Sileby. These interventions include measures to improve facilities for pedestrians and cyclists.	Not Preferred	Based on a review of evidence, the EAST assessment and professional judgement, package option SY-PK3 is not preferred because it is considered that the sustainable travel-focused interventions alone will not be sufficient to address issues and facilitate growth in the Syston broad location in terms of achieving modal shift, reducing congestion and countering the effects of increased traffic.
STRATEGIC	STRAT-PK1	Short-Medium Term (Interim) Improvements to the Strategic Road Network	A46 Corridor including key junctions M1 Junction 21 M1 Junction 23	Not Preferred	Based on a review of evidence, the EAST assessment and professional judgement, it is considered that a short-medium term package of improvements across the SRN would be required to address (in part) existing severe issues on the SRN; to help facilitate some local plan growth in Charnwood; and to help facilitate some local plan growth across the wider area. It is however not preferred as further, more significant interventions are likely to be required to address all issues on the SRN.
	STRAT-PK2	Short, Medium and Longer term (End Goal) Improvements to the Strategic Road Network	A46 Corridor including key junctions M1 Corridor M1 Junction 21 M1 Junction 23	Preferred	Based on a review of evidence, the EAST assessment and professional judgement, it is recognised that a longer term package of improvements across the SRN would be required to address existing severe issues on the SRN; to facilitate Charnwood Local Plan growth; and to facilitate wider area growth including from neighbouring planning authority areas

Appendix E – Assessment Criteria Definitions

Case	Assessment Criteria	Sub-Criteria	Definition	AECOM Interpretation / Reasons for Amendments
Strategic Case	Identified problems and objectives of the option	-	Short description of what the identified problem is (e.g. scale of problem, timescale over which the problem will emerge, key drivers); what the option is trying to achieve; and whether the option aims to meet any specific transport, network or cross-cutting objectives (possibly non-transport related).	Primarily the transport issues have been identified from the PRTM outputs. Interventions that aim to achieve mode shift away from the car to reduce congestion, rather than improving the highway to reduce congestion, have been scored higher for this due to modal shift aligning better with objectives of the Local Plan. Road-based interventions have largely been scored the second highest score for this due to SRN congestion relief, which is a priority for stakeholders.
	Scale of impact	-	To what extent does the option alleviate the identified problem?	-
	Fit with wider transport and government objectives	-	How does the option fit within the EU legislative framework governing transport proposals? Does it complement EU proposals? Could it qualify for EU funding? Has it been considered whether Government funding for the option would contravene state aid rules or give rise to any other legal difficulties within an EU context? are there any other policies/proposals affecting the same study area as the option/package or addressing the same issues? Does the option complement/enhance pre-existing proposals or is there potential for conflict? might the option impact negatively on other modes or types of transport? In particular, has the assessment considered the impact passenger proposals might have on freight transport and vice versa? To what extent does the option make better use of existing infrastructure or demonstrate innovation in terms of 'doing more with less'? how have other government priorities, beyond transport, been impacted by the option?	-
	Fit with other objectives	-	This is an opportunity to draw out and highlight any relevant network or regional objectives specific to an option and to outline how it performs against any local or modal objectives	-
	~~Key uncertainties~~	~~-~~	~~What are the main uncertainties, especially those related to the government and strategic objectives? What are the most uncertain assumptions that have been made?~~	Insufficient information at this stage
	Degree of consensus over outcomes?	-	What consultation has taken place with relevant stakeholders?	-
Economic Case	Economic Growth	Connectivity	Will journeys get shorter, quicker and/or cheaper? In some cases, options will have opposite impacts on time and cost and respondents will need to weigh up the individual impacts to form an overall judgement.	-
		Reliability	Will the option impact on the day to day variability in journey times or the average minutes of lateness? Will there be any impact on the number of incidents?	-
		~~Wider Economic Impacts~~	~~At this stage, respondents are not expected to assess wider economic impacts, instead the questions are intended to screen whether there may be an impact that would need to be considered in more detail later on in the appraisal process, should the option progress.~~	Insufficient information at this stage
		~~Resilience~~	~~Does the option have an impact on the vulnerability of the network to terrorism, severe weather events or the effects of climate change?~~	Insufficient information at this stage
		Delivery of Housing	In some cases, the need for new development in a specific location will mean that the development will require some form of transport development to support it. Respondents are asked to assess how their option will facilitate new housing.	-
	Carbon emissions	-	What impact the option could have on carbon emissions either through changes in activity, an increase in embedded carbon, changes in the carbon content of fuel or changes in efficiency; and, whether the change in carbon emitted is associated with the traded or non-traded sectors.	-
	Socio-distributional impacts and the regions	~~Social and distributional~~	~~Social and distributional impacts need to be considered when assessing the impact of options on noise, air quality, severance, accessibility, security, accidents, user benefits and personal affordability.~~	Insufficient information at this stage
		~~Regeneration~~	~~Does the option have an impact on a targeted regeneration area where poor transport been identified as a constraint and, if so, what is the impact likely to be?~~	Insufficient information at this stage
		~~Regional imbalance~~	~~Identify the extent to which the proposal impacts on a region or sub-region which is underperforming when compared to other areas or to the country as a whole. This underperformance or 'weakness' will need to be defined in terms of economic and/or social indicators.~~	Insufficient information at this stage

Case	Assessment Criteria	Sub-Criteria	Definition	AECOM Interpretation / Reasons for Amendments
	Local environment	Air quality	High level assessment on the impact the option has on air quality is based on mode encouraged by the option.	Amended definition: base assessment of sub-criteria on transport mode
		Noise	Respondents are asked to refer to the DEFRA noise action plan (http://www.defra.gov.uk/environment/quality/noise/environment/actionplan/index.htm) to assess whether their option is likely to impact on a noise problem area	-
		~~Natural environment, heritage and landscape~~	~~Landscape refers to both the physical and cultural (i.e. use and management) characteristics of the land. Physical characteristics include fields, hedges, trees and streams. Cultural characteristics include stone walls, water meadows and field barns. The man-made historic environment (heritage) comprises: buildings (individually or in association) of architectural or historic significance; areas, such as parks, gardens, other designed landscapes or public spaces, remnant historic landscapes and archaeological complexes; and sites (e.g. ancient monuments, places with historical associations such as battlefields, preserved evidence of human effects on the landscape, etc.). Heritage also includes the sense of identity and place which the combination of these features provides. Natural environment includes impacts on biodiversity and water.~~	Insufficient information at this stage
		Streetscape and urban environment	Streetscape is the physical and social characteristics of the built and unbuilt urban environment and the way in which we perceive those characteristics. It is this mix of characteristics and perceptions that make up and contribute to townscape character and give a 'sense of place' or identity.	-
	Well-being	Physical activity	The impact the option has on physical activity.	Amended definition: Base on transport mode (active travel scoring better than public transport, which scores better than highway based improvements.
		Injury or death	The impact on the number of people killed or injured in transport accidents should be assessed as well as the impact on the risk of travelling. This should include all transport-related accidents, including those accessing transport modes (for example injuries caused by stairs or escalators) or those sustained while working. The assessment is done based on the information available - no road safety assessment has been undertaken.	No road safety assessments have been undertaken
		~~Crime~~	~~Options that address perceptions of crime are relevant in addition to those that demonstrably reduce crime.~~	Insufficient information at this stage
		~~Terrorism~~	~~Respondents are asked to consider if the option might affect our vulnerability to terrorism and note in the comments box provided.~~	Insufficient information at this stage
		Enabling people to enjoy access to a range of goods, services, people and places	Does the option make it easier for people to access key locations? Does it make leisure trips quicker or cheaper? Does it make leisure trips more reliable? Will it have an impact on the number of incidents? At this level of assessment, key locations are considered to be town centres and secondary centres - no other specific locations are considered at this stage.	Town centres and secondary centres (not specific locations within these)
		Severance	Severance issues relate primarily to pedestrians though they can affect all non-motorised modes including cyclists and equestrians. Respondents should consider the impact on pedestrian movement, for example, whether there will be hindrance to pedestrian movement, whether some people (particularly children and old people) are likely to be dissuaded from making journeys on foot, or they will be less attractive to others or whether people will be deterred to the extent that they reorganise their activities?	-
	~~Expected VfM Category~~	~~-~~	~~Value for money measures the benefits for each £1 of costs. It includes both the benefits and costs that can be counted in monetary terms (which can be described as a benefit/cost ratio) and other nonmonetised impacts such as regeneration and environmental effects. Have you calculated the BCR (benefit cost ratio) and, if so, what is it? Further information on calculating the BCR can be found at (http://www.dft.gov.uk/webtag/documents/expert/pdf/unit3.5.4.pdf). It should be noted that there is a new BCR metric in draft webTAG guidance. It is advised that calculations produce estimates using both metrics for comparison.~~ ~~Are there significant impacts which you have not been able to include in the BCR? What are these impacts and what evidence do you have on their scale? If you have not yet calculated the BCR, is there evidence of the BCR and/or value for money of similar options that may be relevant, explaining why similar results might be expected? At a later stage, if your option belongs to a package of proposals, can you explain how low/medium value for money schemes are justified within the context of the package level business case?~~	Insufficient information at this stage
Management Case	~~Implementation timetable~~	~~-~~	~~Respondents will need to give an estimate of the timescales for implementing the option, from inception to delivery (this might include construction timescales or time for bringing legislation into force). How long is the option expected to be in operation/force if it is a fixed term project? What timescales would be involved if it is a recurrent project?~~	-

Case	Assessment Criteria	Sub-Criteria	Definition	AECOM Interpretation / Reasons for Amendments
	~~Public acceptability~~	~~-~~	~~An assessment of whether there are likely to be any issues around public acceptability of the option. For example, will the option require a long period for public consultation? Does the option require behavioural changes (like mode shift or seatbelt campaigns)? What stakeholder engagement has already taken place?~~	Insufficient information at this stage
	Practical feasibility	-	High level assessment of the technical deliverability	Technical deliverability
	~~What is the quality of the supporting evidence?~~	~~-~~	~~If it is based on evidence from where similar options have been implemented elsewhere, how transferable are the impacts likely to be? How well-developed is the supporting evidence at this stage? Is it based on initial modelling?~~	Insufficient information at this stage
	~~Key risks~~	~~-~~	What risks have been identified with regard to implementing such an option/project? where appropriate, include an assessment of how probable they are, interdependencies with other sources of risk and their expected impact. This might include examples of problems and risks experienced in similar schemes in the past, or extrapolations drawn from pilot schemes. How will the identified risks be actively managed? What countermeasures could be introduced?	-
Financial Case	~~Affordability~~	~~-~~	~~The issue of affordability needs to be put in the context of the available budget and relevant budget period. This will vary depending on what the tool is being used for and should be clarified in relation to each study or project using the tool. Some options that are unaffordable in the immediate budget period may be affordable in later years. Also, when assessing how affordable an option may be, it may be relevant to consider what sort of package of options is being put forward alongside the option under consideration~~	Insufficient information at this stage
	Capital Cost (£m)?	-	~~The user should select the appropriate cost category from the drop down menu. Capital costs should include all the costs involved in setting up the option and getting it up and running. In some cases cost information may be very uncertain. Respondents need to provide their best estimate, stating in the justification box if the estimate is particularly uncertain (and why).~~ High level capital cost estimated using benchmark costs and professional judgements. Categorised as Low, Medium and High.	Categorised as Low, Medium and High.
	~~Revenue Costs (£m)?~~	~~-~~	~~Includes subsidy costs. Revenue costs include all running costs to keep the scheme in operation~~	- Insufficient information at this stage
	~~Cost Profile~~	~~-~~	~~Do previous estimates include all implementation, operation, maintenance and enforcement costs including administration? What are the costs (and savings) to business? In particular, you should consider whether there is the potential for disproportionate burden on small business and how this might be minimised. If the option being considered is a regulation, what are the full/wider costs imposed?~~	Insufficient information at this stage
	~~Overall cost risk~~	~~-~~	~~Respondents are asked to provide a risk rating of 1 (low risk) to 5 (high risk). Supporting evidence should be provided where possible and this might include examples of what similar schemes have cost in the past, how these costs have differed from original estimates or extrapolations drawn from pilot schemes~~	Insufficient information at this stage
	~~Other costs~~	~~-~~	~~-~~	Insufficient information at this stage
Commercial Case	~~Flexibility of option~~	~~-~~	~~To what extent can the option be scaled up or down depending on the level of funding available? How easy would it be to stop the option/scheme once it has been put into operation? Or before it starts operating? How easily could the scheme be amended to fit with changing circumstances?~~	Insufficient information at this stage
	~~Where is funding coming from?~~	~~-~~	~~Brief qualitative statement on how capital and running costs will be financed and the certainty of funding~~	Insufficient information at this stage
	~~Any income generated? (Y/N)~~	~~-~~	~~Yes/no. Best estimate of incomes generated from the scheme have options for making beneficiaries pay for improvements been considered (e.g. fare increases)?~~	Insufficient information at this stage
	~~If yes, how much income generated (£m)?~~	~~-~~	~~-~~	Insufficient information at this stage

Appendix F – Predefined Interventions

Document	Scheme	Location	Stage of scheme	Included in PRTM?
2050 Vision for Growth	Smart Motorway M1 Junction 19-23a	West of Leicester. Junctions with A14, M69, A46, A50, A512, A42	Planning/committed	No (although it was in earlier stages of modelling)
2050 Vision for Growth	M1 Junction 23/A512 improvements	Between Shepshed and Loughborough	Construction	Yes
2050 Vision for Growth	A46 expressway	Connecting J20a with A46 north of Leicester	Planning - completion by 2030	No
2050 Vision for Growth	Midland Main Line upgrade and electrification	Between London and Nottingham	Committed/construction	No
Charnwood Sustainable Transport Study	Improvements to Birstall P&R between the hub and St Margaret's bus station, including new vehicles, new bus lanes and cycle infrastructure	Birstall	Concept	No
Charnwood Sustainable Transport Study	The existing P&R at Birstall has recently been granted funding for new electric buses, bus lanes and bus gates into Leicester and improvements to cycle infrastructure to increase	Birstall	Committed	No
	patronage.			
LTP 3	Smaller proposals associated with committed developments (e.g. bus stops)			N/A
Connected Leicester Hub and Spoke Plan	Flagship project to transform Leicester Rail Station into a fully integrated and sustainable rail, bus, cycling and walking transport hub and high-quality gateway into the city. This is a once in a generation opportunity linked to the new EMR franchise commitments.	Leicester	Concept	No
Connected Leicester Hub and Spoke Plan	Transformation of St Margaret's Bus Station to a fully integrated sustainable transport hub and high-quality gateway into the city.	Leicester	Concept	No
Connected Leicester Hub and Spoke Plan	Bike Share scheme and secure cycle storage to provide easy access to cycling	Leicester	Concept	No
The case for Toton/HS2 link	HS2 spear via Toton.	Nottingham	Concept	No