

## 10. INTERVENTIONS: NEED

### 10.1. Introduction

The schemes identified in this section are those considered necessary to cater for growth. They should be taken as a complete package rather than a 'picklist' if the results presented in Sections 10.5 and 10.6 are to be achievable.

In this study, we assumed that the overall level of transport investment is likely to be based on the total package of integrated transport measures defined by published documents such as the Local Transport Plan. We subsequently required a reasonable estimate of total transport demand in the county and the proportion of transport demand created by new development due to the RSS Growth Agenda.

Some allowance was necessary to reflect the likely intensity of development and its location relative to existing services and network capacities.

Historic deficit was not ignored as it affects timing and prioritisation. At this stage however it was and is difficult to predict how new transport infrastructure might be used by residents of new houses, or might instead simply absorb trend growth. As a result this was not analysed. Once identified, schemes that catered solely for historic deficit were not considered in detail. They are, however, addressed in Section 8.

The objective was therefore to understand the implications of growth in housing and jobs and how this affects future infrastructure requirements. While our general approach was to concentrate on the transport implications associated with growth only, historic deficits were included as they can have a significant bearing on scheme deliverability, timing and prioritisation. Even if it were desirable to isolate trend growth, it is extremely difficult at this stage in the planning process to do so to any level of accuracy. In many instances, it is impossible to attribute a particular item of transport infrastructure to a particular housing growth area. This infrastructure investment may however be necessary to create sufficient capacity to enable a number of developments to be delivered. Better evidence will be required to separate historic deficit from development and thereby attribute cost and programme to the various agencies responsible for delivery and funding in more detail.

This evidence will tend to emerge from transport assessments accompanying masterplans and the like when moving forward to Development Plan Documents (DPDs), which have a bearing on the transport aspects of this report. The specific transport infrastructure requirement for any given development will be influenced by its trip generation potential, which is linked to both land-use mix and location relative to the existing network and services.

It should be noted that the scope of this report does not allow for detailed assessment of every transport requirement across the county. This is partly because such an approach would draw the report into a more detailed assessment of deficit than is required or indeed possible at the modelling level available, and partly because there are other processes that go into the details – for example S106 analyses, which will still be required for site-specific transport items irrespective of this strategic work.

## 10.2. Distinguishing Between Primary and Secondary Infrastructure

This strategic study concentrated on primary rather than secondary infrastructure. Primary infrastructure comprises public transport and the road network outside the development sites. Secondary infrastructure is everything that developers need or can be expected to provide within development sites to achieve serviced development, except the primary strategic infrastructure. It includes local access to development sites and all on-site roads.

At times, it can be difficult to distinguish between the two precisely. It is useful to provide some additional information to assist in the categorisation.

**Primary infrastructure** is defined as:

- The provision or funding for off-site measures that are essential to ensure that on-site facilities will be effective;
- Contributions to off-site public transport, cycling and walking measures, in the general area or corridor within which the development lies, including road-based improvements such as bus lanes.

Infrastructure that can be classed as either primary or secondary (depending on individual circumstance) is as follows:

- The provision or funding for necessary local highway infrastructure improvements designed to cater for additional private road-based traffic, where this is based on a target for reduced traffic levels.

While **Secondary Infrastructure** is defined as:

- The provision of on-site highway, walking, cycling and public transport measures such as the internal road network, footways and bus shelters.

## 10.3. Compilation of the Scheme List

In simple terms, this is a list of schemes required to ensure that each growth site is adequately connected to the multi-modal transport network. Looked at on a district-by-district basis, it may be the case that some districts need relatively little additional infrastructure investment, since enough spare capacity exists in the system. Others may need significant investment, as they require substantial new connections, or generate an impact where there is insufficient capacity available to cater for predicted demand, or both.

The list of schemes is based in the first instance on the County's Infrastructure Plans, and those of other providers such as the HA and DfT, and was supplemented and confirmed by consultation with the various planning authorities following a series of workshops. The final list was subsequently developed to also take account of strategic masterplanning, sustainable transport policy and practice and due considerations related to delivery of an appropriate and functional network.

## 10.4. Interventions Required for Growth

The full list of schemes that was identified as necessary for growth is presented in Table 10-1. A full version of this can be found as Table F 2. It lists interventions by corridor, as presented in previous sections, and for those that cannot be clearly placed in a corridor, into the district that they fall. The corridors that have no interventions listed beneath them are shown for completeness.

**Table 10-1: Interventions Required for Growth**

ID	District	Location	Type	Description	Year
<b>M1</b>					
R2	Other	Brighton-Bedford	Rail	Thameslink Programme	2021
N15	Other	M1	Road	J6-10 ATM	2021
<b>M25</b>					
H9	Other	M25 J16-J31	Road	Widening	2021
N16	Other	M25 J20	Road	M25/ A41 Jct improvements	2021
N21	Other	M25 J17-19	Road	J17-19 ATM	2031
<b>A1(M)/ A1</b>					
R1	Other	East Coast Mainline	Rail	ECML improvements	2021
N13	Other	A1(M) J6-8	Road	ATM J6-8	2021
N25	Other	A1(M) J8	Road	Capacity enhancement	2021
<b>A5</b>					
<b>A10</b>					
R4	Other	WAGN Line	Rail	WAGN improvements	2021
H22	North Herts	Royston	Road	Southeast bypass A10-A505	2021
N22	Other	A10/ A1170	Road	Capacity enhancements	2021
<b>A41</b>					
S8	Hertsmere	A41/B462 Hartspring Lane	Road	Hartspring Rbt improvements	2021
<b>A120</b>					
H2	East Herts	A120 (A1-M11)	Road	A120 improvements	2021
H23	East Herts	Little hadham	Road	Bypass	2021
S296	East Herts	A120 Jct	Road	Jct capacity increase	2021
S349	East Herts	A120 Bishop's Stortford	Road	Bypass Dualling	2021
<b>A405</b>					
<b>A411</b>					
N8	Watford	Watford	Bus	East Watford bus corridor	2021
H10	Watford	Watford town centre	Road	Ring road 2-way operation	2021
S411	Watford	Bushey Arches	Road	Bushey Arches Jct improv.	2021
<b>A414</b>					
N28	Other	Central Herts	Bus	East-West PT corridor	2021
N14	East Herts	Hertford	Road	A414 mitigation	2021
N17	Dacorum	Hemel Hempstead	Road	A4146/ A414 jct (+ N2)	2021
S360	Dacorum	London Road/ Stn Road	Road	Rbt improvements	2021
S393	St Albans	St Albans	Road	SCOOT	2021
<b>A505</b>					

ID	District	Location	Type	Description	Year
N3	North Herts	Hitchin-Letchworth	Bus	A505 corridor bus priority	2021
N4	North Herts	Hitchin	Bus	A505/ A602 bus priority	2021
H3	North Herts	A505 Hitchin-Letchworth	Road	Improvements	2021
<b>A507</b>					
<b>A602</b>					
S123	Stevenage	Superstore access on Hitchin Rd	Bus	Bus Priority	2021
S124	Stevenage	Monkswood Way, Stevenage	Bus	Bus Priority	2021
S125	Stevenage	Six Hills Way/ Lytton Way Rbt	Bus	Bus Priority	2021
S126	Stevenage	Six Hills Way/St George's Way Rbt	Bus	Bus Priority	2021
S127	Stevenage	Fairlands Way westbound	Bus	Bus Priority	2021
S128	Stevenage	Gunnels Wood Road/ A602	Bus	Bus Priority	2021
H4	East Herts	A602 Ware-Stevenage	Road	Improvements	2021
N29	Stevenage	A602/ A1072	Road	Improvements	2021
S336	Stevenage	A602 Gunnels Wood Road Rdbt	Road	Improvement	2021
S364	Stevenage	Stevenage	Road	A602/Coreys Mill Lane	2021
<b>A1184</b>					
N10	East Herts	Sawbridgeworth	Bus	Town centre bus priority	2021
N23	East Herts	Sawbridgeworth	Road	A1184 Jcts capacity (+ N11)	2021
<b>A1189</b>					
<b>Broxbourne</b>					
Bl11	Broxbourne	Cheshunt Town Centre	Bus	Interchange improvement	2021
S340	Broxbourne	Broxbourne Essex Road	Road	Improvement	2021
S359	Broxbourne	Waltham Cross	Road	Waltham Cross Stn Links	2021
<b>Dacorum</b>					
B11	Dacorum	Hemel Hempstead Bus Stn	Bus	Interchange improvement	2021
N2	Dacorum	Hemel Hempstead	Bus	Central corridor bus priority	2021
S12	Dacorum	Tring Rail Stn	Rail	Stn Improv. (new building)	2021
S14	Dacorum	Hemel Hempstead Stn	Rail	Stn improvements	2021
H20	Dacorum	Hemel Hempstead	Road	Swallowdale Ln widening & jct	2021
H24	Dacorum	Water End	Road	Bypass	2021
N12	Dacorum	Hemel Hempstead	Road	Hemel Hempstead N. Bypass	2031
S16	Dacorum	Durrents Hill / London Road Jct	Road	Signalisation	2021
S17	Dacorum	Featherbed Lane/ London Road	Road	Jct improvements	2021
S31	Dacorum	Breakspear Way	Road	Jct improvements	2021
<b>East Herts</b>					
Bl12	East Herts	Bishops Stortford Bus Stn	Bus	Interchange improvement	2021
N9	East Herts	Hertford-Ware	Bus	Corridor bus priority	2021
S292	East herts	Dunmow Road Crridor	Bus	P&R	2021
N24	East Herts	Bishops Stortford	Road	Town centre Jcts (+ N12)	2021
S228	East herts	Sacombe Pound	Road	Jct improvements	2021
<b>Hertsmere</b>					
Bl4	Hertsmere	Borehamwood Town Centre	Bus	Interchange improvement	2021
N11	East Herts	Bishops Stortford	Bus	Town centre bus priority	2021
<b>North Herts</b>					
Bl14	North Herts	Letchworth Stn	Bus	Interchange improvement	2021

ID	District	Location	Type	Description	Year
Bl6	North Herts	Hitchin	Bus	Interchange improvement	2021
S353	North Herts	Hitchin Stn	Rail	Hitchin Stn Forecourt improvements	2021
S243	North Herts	Cadwell Lane, Hitchin	Road	Signalisation	2021
<b>St Albans</b>					
Bl2	St Albans	St Albans Town Centre	Bus	Interchange improvements	2021
S235	St Albans	Harpenden	Bus	Interchange improvements	2021
S383	St Albans	St Albans	Bus	P&R serving St Albans	2021
S384	St Albans	St Albans	Bus	Hatfield Rd bus corridor improv.	2021
S48	St Albans	Hemel Hempstead M1 Jct	Bus	Maylands Masterplan P+R	2021
N18	St Albans	Hemel-St Albans	Road	A4147 corridor Jct improv.	2021
N19	St Albans	St Albans	Road	Relief road improvements	2021
N20	St Albans	Harpenden	Road	Harpenden south Jct improv.	2021
S391	St Albans	St Albans	Road	Hat'f'd/ Clarence/ Camp Rds Jct	2021
S392	St Albans	St Albans	Road	SCOOT on w. orbital route	2021
<b>Stevenage</b>					
Bl5	Stevenage	Stevenage Bus Stn	Bus	Interchange improvement	2021
S122	Stevenage	Bessemer Drive, Stevenage	Bus	Widening of road	2021
S129	Stevenage	Gresley Way, Stevenage	Bus	Signalisation of the Juctions	2021
S130	Stevenage	The White Way, Stevenage	Bus	Signalisation of the Juctions	2021
S131	Stevenage	Fairlands Way, Stevenage	Bus	Signalisation of the Juctions	2021
S132	Stevenage	Mobbsbury Way, Stevenage	Bus	Signalisation of the Juctions	2021
S134	Stevenage	A1 (M) Stevenage	Road	Passage under or over A1(M)	2021
<b>Three Rivers</b>					
<b>Watford</b>					
N7	Watford	Watford	Bus	North Watford bus corridor	2021
S107	Watford	St Albans Road	Other	Watford Jct redevelopment	2021
S252	Watford	Watford Jct	Rail	Creation of Rail Interchange	2021
<b>Welwyn Hatfield</b>					
Bl7	WelHat	WGC Bus Stn	Bus	Interchange improvement	2021
Bl8	WelHat	Hatfield Rail Stn	Bus	Interchange improvement	2021
N5	WelHat	WGC spine	Bus	A1000 bus priority	2021
N6	WelHat	Hatfield	Bus	A1000/ B6426 bus priority	2021
S87	WelHat	College Lane onto A1001	Bus	Introduce bus priority measures	2021
S91	WelHat	Hatfield Rail Stn	Rail	Hatfield Stn interchange	2021
S99	WelHat	Hatfield Rail Stn	Road	Additional Parking	2021
<b>Other</b>					
N1	Other	Countywide	Cycle	HCC cycling strategy	2021
N27	Other	Countywide	DM	Smarter Choices	All
N26	Other	Countywide	Rail	General improvements to Stns	2021
R11	Other	Abbey Line	Rail	Abbey Line passing loop	2021
R12	Other	Croxley Rail	Rail	Croxley Rail Link	2021
S321	Other	M11 J7 & J8	Road	Jct Improvements	2021
S36	Other	M1 Luton	Road	Improve East - West Routes	2021
S47	Other	M11 Stansted	Road	Improve East - West Routes	2021

## 10.5. Transport Network Impact 2021

### 10.5.1. Introduction

This section considers the effects in 2021 of implementing the interventions described in Section 10.4. It uses the same criteria as previous sections (in broad terms, where there have been improvements or otherwise on the highway network) and offers qualitative comments on the other modes.

### 10.5.2. Walking and Cycling

To ensure that sustainable travel behaviour becomes habitual implementation of the HCC cycling strategy, and notably its related infrastructure, will need to be complete by 2021. The routes that are constructed will serve both cyclists and pedestrians. Detailed schemes that would perform this function will be identified by HCC and the districts through the Urban Transport Plan process as this rolls forward from 2011 to 2021.

Cycling infrastructure will also support Smarter Choices, which will reduce the impact of travel on the road network. In addition to cycle routes, good quality cycle parking and related facilities, as well as information on cycling provision in Hertfordshire, will help to make use of this mode attractive to both existing and potential users.

### 10.5.3. Bus and Coach Network

There are a number of large infrastructure items identified for bus and coach up to 2021, mainly improved or new bus stations. The aim of these is to facilitate the efficient movement of the increased number of buses required for Smarter Choices and also to improve conditions for bus passengers, attracting a greater number of potential users. Bus priority will also be a significant feature of the bus network from 2011 to 2021, enhancing its efficiency and, as a consequence, its attractiveness to passengers.

The number of bus services and the frequency of buses on them is a matter for short term route planning. There is likely to be a challenge for bus operators and HCC to improve the service offered to attract passengers from the existing population and the new population generated by RSS growth. It is not expected that the bus network would become over-subscribed as the services themselves should be able to respond to increasing demand in a relatively short space of time.

### 10.5.4. Rail

Table 5-5 indicated that by 2021 all rail corridors through the county will be approaching or over capacity. This highlights the need for investment above that identified in this study if rail is to play a part in ensuring efficient travel throughout the county.

### 10.5.5. Highway Network Comparison 2021<sup>MP</sup> and 2021<sup>MPI</sup>

Continuing the incremental approach to the assessment of transport infrastructure, this section considers the effects of full RSS growth with masterplanning in 2021, and

interventions that might be needed to help address the problems. It therefore considers two scenarios, represented by EERM runs:

- **2021<sup>MP</sup>**: This EERM run included full RSS growth up to 2021, in conjunction with the 2021 Reference Case network that included only the programmed schemes as set out in Chapter 4;
- **2021<sup>MPI</sup>**: This EERM run included full RSS growth up to 2021, as did the above run, but the network incorporated additional interventions to help mitigate adverse effects of the growth on transport.

It should be borne in mind too that the 2021<sup>MPI</sup> scenario incorporated fewer trips than that of the 2021<sup>MP</sup> scenario as it allowed for the assumed effects of Smarter Choices.

#### 10.5.5.1. Motorway Network

The motorway network shows that, in conjunction with the trip reductions through the Smarter Choices assumptions, the ATM schemes are effective at achieving considerable reductions in V/C ratios on links, in most cases to levels below the 80% threshold value. However there are very few corresponding junction improvements. This is not unexpected, since in general ATM has no effect on, for example, non-motorway approaches to motorway junctions (which have been considered in the criteria governing the junction V/C rating). In particular, the preliminary improvements to A1(M) J8 do not appear to have been effective according to the modelling and larger-scale measures may be needed to accommodate the traffic here, with more detailed operational modelling. This may be due to the additional traffic throughput between Junctions 6 and 8 more than offsetting the effect of the junction improvements; in other words transferring the problem to another point in the network, which is always a danger in congested networks.

#### 10.5.5.2. Other Road Corridors

According to the model, there are small reductions in the degree of network loading, particularly where a specific scheme has been implemented to solve a specific problem, such as the Little Hadham bypass. There are also minor improvements to some of the primary road corridors, such as the A41, A411, and A602 but the overall picture is one of largely maintaining the status quo without dramatic improvements. The A602 corridor shows, for example, that congestion is moved around rather than removed or dissipated by the interventions and a more 'holistic' approach to corridor improvement may be required if the intention is to aim to remove congestion or at least to allow buses freer movement within them.



**Table 10-2: Comparative Summary of Strategic and Intra-urban Road Deficit 2021MP (RSS Masterplanning) with 2021MPI (RSS Masterplanning plus new infrastructure)**

ROAD CORRIDOR				2021 <sup>MP</sup>	2021 <sup>MPI</sup>
<b>M1 (Junction 4 – 9)</b>					
Mainline – Northbound			Mainline – Southbound		
	2021 <sup>MP</sup>	2021 <sup>MPI</sup>		2021 <sup>MP</sup>	2021 <sup>MPI</sup>
J6A – J7			J10 – J9		
J8 – J10			J9 – J8		
			J8 – J6A		
			J6 – J4		
<b>Junctions</b>				2021 <sup>MP</sup>	2021 <sup>MPI</sup>
J5 (M1 NB & SB Off Slips)					
J6 (M1 SB On Slip), J6A (M1 NB On Slip and SB Off Slip)					
J8 (M1 NB Off Slip), J9 (A5 NW Approach)					
<b>M25 (Junction 17 – 26)</b>					
Mainline – Clockwise			Mainline – Anti-Clockwise		
	2021 <sup>MP</sup>	2021 <sup>MPI</sup>		2021 <sup>MP</sup>	2021 <sup>MPI</sup>
J17 – J19			J26 – J25		
J20 – J21A			J25 – J23		
J22 – J23			J23 – J21A		
J23 – J24			J19 – J18		
			J18 – J17		
<b>Junctions</b>				2021 <sup>MP</sup>	2021 <sup>MPI</sup>
J20 (A41 Approach), J22 (Circulating)					
J21 (M25 EB Off Slip to M1), J23 and J25 (WB Off Slips)					
<b>A1 (M) (Junction 1 – 10)</b>					
Mainline – Northbound			Mainline – Southbound		
	2021 <sup>MP</sup>	2021 <sup>MPI</sup>		2021 <sup>MP</sup>	2021 <sup>MPI</sup>
J1 – J3			J8 – J7		
J6 – J7			J7 – J6		
			J4 – J1		
<b>Junctions</b>				2021 <sup>MP</sup>	2021 <sup>MPI</sup>
J1 (M25 J23 – A1(M) SB Off Slip), J7 (Circulating), and J9 (SB On Slip)					
J3 (NB On Slip, SB and NB Off Slips, Circulating), and J8 (SB Off Slip)					
J7 (Circulating)					
<b>A1</b>					
BOREHAMWOOD: A1/A5135 Junction (SB Off Slip and SE Rowley Lane App.)					
BOREHAMWOOD: A1/A411 Stirling Corner Junc (A1 N and A411 E & W Apps.)					
<b>A5</b>					
MARKYATE: A5/B4540 Junction (A5 N and B4540 NE Luton Road Approaches)					
FLAMSTEAD: A5/M1 J9 (A5 NW Approach)					
<b>A10</b>					
WALTHAM CROSS: A10/M25 J25 (A10 N & S Approaches)					
CHESHUNT: A10/Church Lane Junction (Church Lane E Approach)					
ROYSTON: A10/Melbourn St Junction (Melbourn St W Approach)					



ROAD CORRIDOR	2021 <sup>MP</sup>	2021 <sup>MPI</sup>
<b>A41</b>		
<b>BERKHAMSTED:</b> A41/A416 Junction (A416 N Approach)		
<b>BERKHAMSTED:</b> A41/A4251 Junction (A41 W Approach to A4251 On Slip)		
<b>KINGS LANGLEY:</b> A41/M25 J20 (A41 NW Approach)		
<b>WATFORD:</b> A41/A412 Junction (All Approaches)		
<b>WATFORD:</b> A41/A4008/M1 J5 (A4008 SW Approach)		
<b>BUSHEY:</b> A41/A5183/A5 Junction (A41 NW Approach)		
<b>A120</b>		
<b>LITTLE HADHAM:</b> A120 Standon Rd/ Stortford Rd/ Albury Rd Junc (N App.)		
<b>LITTLE HADHAM:</b> A120 Standon Rd/ Stortford Rd/ Albury Rd Junc (E App.)		
<b>LITTLE HADHAM:</b> A120 Standon Rd/ Stortford Rd/ Albury Rd Junc (W App.)		
<b>A405</b>		
<b>BRICKET WOOD:</b> A405/M1 J6 (A405 NE Approach)		
<b>ST ALBANS:</b> A405/A5183/A1081/M1 J10 (A5183 N Approach)		
<b>A411</b>		
<b>WATFORD:</b> A411/A412 Junction (A411 E Approach)		
<b>WATFORD:</b> A411/A4178/Beechen Grove I/C (Note: limited modelling detail)		
<b>BUSHEY:</b> A411/A409 Junction (A411 E and A409 S Approaches)		
<b>ELSTREE:</b> A411/A5183 Junction (A5183 N Approach)		
<b>ELSTREE:</b> A411/Furzehill Road Junction (Furzehill Road NW Approach)		
<b>BOREHAMWOOD:</b> A411/A1 Stirling Corner (A411 E & W and A1 N Approach)		
<b>A414</b>		
<b>HEMEL HEMPSTEAD:</b> A414/A4251 Junction (A414 N Approach)		
<b>HEMEL HEMPSTEAD:</b> A414/A4146 Junction		
<b>HEMEL HEMPSTEAD:</b> A414/A4147 Junction (All Approaches)		
<b>HEMEL HEMPSTEAD:</b> A414/Green Lane Junction (A414 E Approach)		
<b>ST ALBANS:</b> A414/A1081 Junction (A1081 NW Approach)		
<b>HATFIELD:</b> A414/A1(M) J4 (A414 E Approach)		
<b>WELWYN GARDEN CITY:</b> A414/B1455 Junction (B1455 SE Approach)		
<b>HERTFORD:</b> A414/A119(W) Junction (A414 E & W and A119 N Approaches)		
<b>HERTFORD:</b> A414/B158 Junction (A414 E Approach)		
<b>HERTFORD:</b> A414/B158 Junction (A414 W Approach)		
<b>HERTFORD:</b> A414/A119(E) Junction (A414 SE Approach)		
<b>A505</b>		
<b>LETCHWORTH:</b> A505/A6141(W) Junction (A505 W Approach)		
<b>LETCHWORTH:</b> A505/Norton Way S/William Way Junction (A505 E & W Apps.)		
<b>HITCHIN:</b> A505/St Michael's Road Junction (A505 W Approach)		
<b>HITCHIN:</b> A505/B656 Junction (A505 E & W Approaches)		
<b>HITCHIN:</b> A505/A602 Junction (A505 E & W Approaches)		
<b>HITCHIN:</b> A505/B655 Junction (A505 W and B655 W Approaches)		
<b>A507</b>		
No major problems highlighted for this road within Hertfordshire.		
<b>A602</b>		
<b>HITCHIN:</b> A602/B656 Junction (A602 NW Approach)		
<b>HITCHIN:</b> A602/B656 Junction (B656 N Approach)		
<b>STEVENAGE:</b> A602/A1(M) J8 (A602 W & SE Approaches)		
<b>STEVENAGE:</b> A602/A1072 Junction (A602 N and A1072 E Approaches)		
<b>WATTON:</b> A602/A119 Junction (A602 E Approach)		

ROAD CORRIDOR	2021 <sup>MP</sup>	2021 <sup>MPI</sup>
<b>WARE:</b> A602/B158 Junction (A602 N Approach)		
<b>A1184</b>		
<b>SAWBRIDGEWORTH:</b> A1184/Station Road/West Road Junc. (A1184 S App.)		
<b>SAWBRIDGEWORTH:</b> A1184/High Wych Road Junction (A1184 N Approach)		
<b>A1198</b>		
No major problems highlighted for this road within Hertfordshire.		

## 10.6. Transport Network Impact 2031

### 10.6.1. Introduction

This section considers the effects in 2031 of implementing the interventions described in Section 10.4. It uses the same criteria as previous sections (in broad terms, where there have been improvements or otherwise on the highway network) and offers qualitative comments on the other modes.

### 10.6.2. Walking and Cycling

Because the planning of cycling and walking schemes is relatively short term it is not feasible to speculate as to the exact nature of even the larger schemes. However, it is certain that these modes will play an important part in continuing to ensure that Hertfordshire remains a sustainable community and that, by retaining short trips off the road network, highways can operate effectively for longer distance journeys (where other modes are unsuitable) and the movement of goods.

### 10.6.3. Bus and Coach Network

It is probable that smaller-scale bus infrastructure will continue to be required after 2021 to ensure effective operation of the network. However, it is judged that most schemes already identified, including all larger ones, should be in place by 2021. This means that from 2021 to 2031 the bus network should build on successes achieved in the previous ten years. It is not expected that the bus network would become over capacity as the services themselves should be able to respond to increasing demand relatively quickly.

### 10.6.4. Rail

Post-2021 it is unlikely that the rail network will have capacity to absorb additional trips unless there is substantial investment in the network. If Smarter Choices are to remain attractive throughout the study period and the road network alleviated of a proportion of its car trips then serious consideration of these implications is required at a national level.

### 10.6.5. Highway Network Comparison 2031<sup>MP</sup> and 2031<sup>MPI</sup>

As for the 2021 case, this section compares the corresponding 2031 model runs, that is, the effects of full RSS growth with masterplanning in 2031, and interventions that might be needed to help address the problems. It therefore considers two scenarios, represented by EERM runs:

- **2031<sup>MP</sup>**: This EERM run included full RSS growth up to 2031, in conjunction with the 2031 Reference Case network that included only the programmed schemes as set out in Chapter 4;
- **2031<sup>MPI</sup>**: This EERM run included full RSS growth up to 2031, as does the above run, but the network incorporated additional interventions to help mitigate adverse effects of the growth on transport.

#### 10.6.5.1. Motorway Network

Growth to 2031 has increased traffic levels on the network but the M1, M25 and A1(M) ATM schemes are still reasonably effective at providing relief to the most overloaded sections by 2031. However, the junctions fare less well and these comparisons show further deterioration, as was the case in 2021, particularly M25 J22 and J24. Much of the additional M25 capacity through programmed widening is invoked by 2031, again maintaining a level of service that is similar to current conditions.

#### 10.6.5.2. Other Road Corridors

The overall reaction of the model to the 2031 interventions is similar to that of the 2021<sup>MP</sup> and 2021<sup>MPI</sup> comparison, as the majority of the new interventions are the same in each case. Accordingly, it is useful to look at the areas where there are new interventions in 2031 such as the Hemel northern bypass. The northern section is relatively free flowing, but the eastern link down to Breakspear Way is congested. It appears that it attracts some of the north-south through traffic that otherwise uses the A5183 via St Albans, as this latter location, including the A4147 Hemel-St Albans link, is considerably less congested. In general however, the picture is one of increasing growth that tends to outpace the improvements gained from this initial set of interventions.

Elsewhere on the network, there are corridor improvements, such as the A602 Stevenage to Hertford, and these tend to be through the more rural areas of the county. Within the urban areas, traffic problems tend to be moved around as travellers switch routes to attempt to avoid congestion.

**Table 10-3: Comparative Summary of Strategic and Intra-urban Road Deficit 2031MP (RSS masterplanning) with 2031MPI (RSS masterplanning plus new infrastructure)**

ROAD CORRIDOR	2031 <sup>MP</sup>		2031 <sup>MPI</sup>		
<b>M1 (Junction 4 – 9)</b>					
Mainline – Northbound			Mainline – Southbound		
	2031 <sup>MP</sup>	2031 <sup>MPI</sup>		2031 <sup>MP</sup>	2031 <sup>MPI</sup>
J6A – J7			J10 – J9		
J8 – J10			J9 – J8		
			J8 – J7		
			J7 – J6A		
			J6 – J5		
			J5 – J4		
<b>Junctions</b>			2031 <sup>MP</sup>		2031 <sup>MPI</sup>
J5 (M1 NB & SB Off Slips)					
J6 (M1 SB On Slip), J6A (M1 NB On Slip and SB Off Slip)					
J8 (M1 NB Off Slip), J9 (A5 NW Approach)					
<b>M25 (Junction 17 – 26)</b>					
Mainline – Clockwise			Mainline – Anti-Clockwise		
	2031 <sup>MP</sup>	2031 <sup>MPI</sup>		2031 <sup>MP</sup>	2031 <sup>MPI</sup>
J17 – J19			J26 – J22		
J20 – J21A			J22 – J21A		
J22 – J23			J21A – J20		
J23 – J24			J19 – J18		
			J18 – J17		
<b>Junctions</b>			2031 <sup>MP</sup>		2031 <sup>MPI</sup>
J20 (A41 Approach)					
J22 (Circulating)					
J24 (Circulating)					
J21 (M25 EB Off Slip to M1), J23 and J25 (WB Off Slips)					
<b>A1 (M) (Junction 1 – 10)</b>					
Mainline – Northbound			Mainline – Southbound		
	2031 <sup>MP</sup>	2031 <sup>MPI</sup>		2031 <sup>MP</sup>	2031 <sup>MPI</sup>
J1 – J3			J8 – J7		
J6 – J7			J7 – J6		
			J4 – J1		
<b>Junctions</b>			2031 <sup>MP</sup>		2031 <sup>MPI</sup>
J1 (M25 J23 – A1(M) SB Off Slip)					
J7 (Circulating), and J9 (SB On Slip)					
J3 (NB On Slip, SB and NB Off Slips, Circulating), and J8 (SB Off Slip)					
<b>A1</b>					
BOREHAMWOOD: A1/A5135 Junction (SB Off Slip and SE Rowley Lane App.)					
BOREHAMWOOD: A1/A411 Stirling Corner Junc (A1 N and A411 E & W Apps.)					
<b>A5</b>					
MARKYATE: A5/B4540 Junction (A5 N and B4540 NE Luton Road Approaches)					
FLAMSTEAD: A5/M1 J9 (A5 NW Approach)					
<b>A10</b>					
WALTHAM CROSS: A10/M25 J25 (A10 N & S Approaches, Circulating)					

ROAD CORRIDOR	2031 <sup>MP</sup>	2031 <sup>MPI</sup>
<b>CHESHUNT:</b> A10/Church Lane Junction (Church Lane E Approach)		
<b>ROYSTON:</b> A10/Melbourn St Junction (Melbourn St W Approach)		
<b>A41</b>		
<b>BERKHAMSTED:</b> A41/A416 Junction (A416 N Approach)		
<b>BERKHAMSTED:</b> A41/A4251 Junction (A41 W Approach to A4251 On Slip)		
<b>KINGS LANGLEY:</b> A41/M25 J20 (A41 NW Approach)		
<b>WATFORD:</b> A41/A412 Junction (All Approaches)		
<b>WATFORD:</b> A41/A4008/M1 J5 (A4008 SW Approach)		
<b>A120</b>		
<b>LITTLE HADHAM:</b> A120 Standon Rd/ Stortford Rd/ Albury Rd Junc (N App.)		
<b>LITTLE HADHAM:</b> A120 Standon Rd/ Stortford Rd/ Albury Rd Junc (E App.)		
<b>LITTLE HADHAM:</b> A120 Standon Rd/ Stortford Rd/ Albury Rd Junc (W App.)		
<b>A405</b>		
<b>BRICKET WOOD:</b> A405/M1 J6 (A405 NE Approach)		
<b>ST ALBANS:</b> A405/A5183/A1081/M1 J10 (A5183 N Approach)		
<b>A411</b>		
<b>WATFORD:</b> A411/A412 Junction (A411 E Approach)		
<b>WATFORD:</b> A411/A4178/Beechen Grove I/C (Note: limited modelling detail)		
<b>BUSHEY:</b> A411/A409 Junction (A411 E and A409 S Approaches)		
<b>ELSTREE:</b> A411/A5183 Junction (A5183 N Approach)		
<b>ELSTREE:</b> A411/Furzehill Road Junction (Furzehill Road NW Approach)		
<b>BOREHAMWOOD:</b> A411/A1 Stirling Corner (A411 E & W and A1 N Approach)		
<b>A414</b>		
<b>HEMEL HEMPSTEAD:</b> A414/A4251 Junction (A414 N Approach)		
<b>HEMEL HEMPSTEAD:</b> A414/A4146 Junction		
<b>HEMEL HEMPSTEAD:</b> A414/A4147 Junction (All Approaches)		
<b>HEMEL HEMPSTEAD:</b> A414/Green Lane Junction (A414 E Approach)		
<b>ST ALBANS:</b> A414/A1081 Junction (A1081 NW Approach)		
<b>HATFIELD:</b> A414/A1(M) J4 (A414 E Approach)		
<b>WELWYN GARDEN CITY:</b> A414/B1455 Junction (B1455 SE Approach)		
<b>HERTFORD:</b> A414/A119(W) Junction (A414 E & W and A119 N Approaches)		
<b>HERTFORD:</b> A414/B158 Junction (A414 E & W Approaches)		
<b>HERTFORD:</b> A414/A119(E) Junction (A414 SE Approach)		
<b>A505</b>		
<b>LETCHWORTH:</b> A505/A6141(W) Junction (A505 W Approach)		
<b>LETCHWORTH:</b> A505/Norton Way S/Willian Way Junction (A505 E & W Apps.)		
<b>HITCHIN:</b> A505/St Michael's Road Junction (A505 W Approach)		
<b>HITCHIN:</b> A505/B656 Junction (A505 E & W Approaches)		
<b>HITCHIN:</b> A505/A602 Junction (A505 E & W Approaches)		
<b>HITCHIN:</b> A505/B655 Junction (A505 W and B655 W Approaches)		
<b>A507</b>		
No major problems highlighted for this road within Hertfordshire.		
<b>A602</b>		
<b>HITCHIN:</b> A602/B656 Junction (A602 NW and B656 N Approaches)		
<b>STEVENAGE:</b> A602/A1(M) J8 (A602 W & SE Approaches)		
<b>STEVENAGE:</b> A602/A1072 Junction (A602 N and A1072 E Approaches)		
<b>WATTON:</b> A602/A119 Junction (A602 N Approach)		

ROAD CORRIDOR	2031 <sup>MP</sup>	2031 <sup>MPI</sup>
<b>WARE:</b> A602/B158 Junction (A602 N Approach)		
<b>A1184</b>		
<b>SAWBRIDGEWORTH:</b> A1184/Station Road/West Road Junc. (A1184 S App.)		
<b>SAWBRIDGEWORTH:</b> A1184/High Wych Road Junction (A1184 N Approach)		
<b>A1198</b>		
No major problems highlighted for this road within Hertfordshire.		

## 10.7. Prioritising Interventions

The assessment presented in Section 9.1.3 predicted areas expecting substantial RSS growth and where existing deficit and future corridor limitations could restrict this growth. These were therefore considered as priority areas for new sustainable transport interventions. The areas identified included (in alphabetical order):

- Hemel Hempstead;
- St Albans;
- Stevenage;
- Watford; and
- Welwyn Hatfield.

Table 10-4 presents examples of the interventions that should be considered for prioritisation. They are not given in order of priority and should not be considered as the only schemes suitable for prioritisation. Priorities have not been given yet as the actual process will require finalising once plans for growth have been completed as part of the LDF process, and phasing of growth across the county is identified and confirmed in greater detail. Further detail on these schemes can be found in Table 10-1 and in Appendix F. Schemes that will be funded at the national level, such as the Thameslink Programme, have not been included in Table 10-1 as the HIIS partners can have little control over their implementation; however such schemes should be considered essential for growth and lobbying to ensure that they progress is a priority.

**Table 10-4: Potential Priority Interventions**

ID	Scheme	Reason for Prioritisation
N1	Implementation of HCC cycling strategy	Facilitate reduction in car trips and therefore congestion, particularly for shorter journeys
N6	A1000/ B6426 bus priority	Enhancing bus services around Hatfield rail station and between Hatfield and Welwyn Garden City
N13	ATM J6-8	Improving north-south movement through the centre of the county and between Stevenage and Welwyn Hatfield
N18	A4147 corridor Jct improvements	Improved access between Hemel Hempstead and St Albans
N19	St Albans relief road improvements	Improved access around northern St Albans, facilitating east-west movement for existing and growth traffic
N25	A1(M) J8 Capacity enhancement	Improve access to the A1(M) for growth around Stevenage and A1(M) and reduce existing congestion
N27	Smarter Choices	Promotion of sustainable travel across the county will have county and local benefits
R11	Abbey Line passing loop	Improving rail connections between St Albans and Watford
S252	Watford Junction Rail Interchange	Improvement in intermodal connectivity and improvement in road network efficiency within Watford including benefits for the bus network
S31	Breakspear Way jcy improvements	Improved access to the M1 from Hemel Hempstead and between Hemel Hempstead and St Albans

While delivery of projected housing and employment growth is subject to the normal planning processes and constraints, there are in some locations additional or key constraints that impinge directly on whether particular schemes can be delivered. Therefore, in addition to the prioritisation discussed above, all schemes considered necessary for growth were prioritised using the qualitative scale from the funding model, described in 9.1.6.3. As an indication of the way this scale was applied a number of examples are shown in Table 10-5. The prioritisation of all schemes is shown in Table F 4 and Table F 5. It should be noted that there are considerably more higher priority items than there are at the lower end of the scale; in particular there are only three interventions classed as 'Desirable'. Table 10-5 highlights that cost is no indicator of priority. The most expensive item shown is classed as 'Essential', whilst all of the 'Desirable' interventions are more expensive than the widening of Bessemer Drive, which has a priority rating of 3 (Essential) highlighting that cost is not necessarily an indication of a higher priority.



**Table 10-5: Examples of Scheme Prioritisation Using the Funding Model Scale**

ID	Description	Cost (£m)
<b>4: Statutory</b>		
H23	Little Hadham Bypass	32.0
N25	Capacity Enhancement at A1(M) J8	7.0
N27	Smarter Choices	114.7
<b>3: Essential</b>		
N13	A1(M) J6-8 ATM	164.0
S122	Widening of Bessemer Drive to facilitate bus movement	0.3
S252	Watford Junction Interchange Improvements	32.5
<b>2: Required</b>		
BI1	Hemel Hempstead Bus Interchange Improvement	4.0
N14	Hertford A414 mitigation	10.0
S336	A602 Gunnells Wood Road Rdbt improvement	5.0
<b>1: Desirable</b>		
BI14	Letchworth station potential interchange improvement	1.5
N16	M25/ A41 junction improvements	5
N26	General improvements to rail stations	5.1

Note: Inclusion in this table does not imply that a scheme is considered more important than others of the same priority scale

The interventions included in Table 10-4 and Table 10-5 are illustrative with respect to their importance compared to other schemes identified in the study (i.e. inclusion in these tables should not be taken to mean that the interventions shown are necessarily more important than others identified in this study). Whilst they reflect the outcome of the broad priorities identified as part of this study final decisions regarding scheme prioritisation are likely to be influenced by political priorities and stakeholder (including public) consultation. This is particularly the case for large and controversial schemes. To assist the partners with this process a Prioritisation Framework is proposed in Appendix G.

The framework was designed to be used for all scheme types of all sizes. It includes consideration of criteria such as policy, need, and wider benefits. To some extent it seeks to simplify the WebTAG scheme assessment process and make it more relevant to all sizes of scheme, whilst at the same time retaining a robust and consistent appraisal to aid prioritisation.

## 11. INTERVENTIONS: COST

The cost of infrastructure required to support anticipated future growth and demand is just that – the capital costs of the transport infrastructure necessary to allow additional growth to take place.

The cost quoted throughout the report is the “total cost” of, say, a new bus interchange or road improvement, which is considered likely to be necessary to sustain future network functions at an appropriate level of service.

### 11.1. Infrastructure Capital Cost

Where possible costs already identified for schemes from published sources were used, such as those available from the inventory of deficit schemes in Appendix B. Other cost estimates were based on similar types of schemes; for example the cost of a generic Park and Ride installation. For a number of the schemes it was necessary to make reasonable estimates.

### 11.2. Smarter Choices Capital Cost

The HIIS project has always recognised the need to include 'soft infrastructure' as part of the transport programme to facilitate new development. This includes what is generally known as Smarter Choices schemes that have been costed for inclusion in the funding model. The method of modelling Smarter Choices is outlined in Section 9.1.3, and is essentially a destination-based set of factors applied to the EERM.

The costing of Smarter Choices was based on the premise that the measures remove car trips from the road network. This represents a measurable saving, but is offset by the cost of Smarter Choice initiatives. An average cost per trip (or per vehicle-kilometre) can therefore be derived empirically, and has been achieved through independent research and case studies in which the impact of Smarter Choices has been proven. These values can then be applied elsewhere to estimate overall costs. The process lends itself to modelling, since it is relatively easy to obtain changes in trips and vehicle kilometres from the modelling process once the Smarter Choice matrix assumptions have been applied. This leads to car and other trip reductions, which are costed, and hence places less pressure on the transport network.

The overall outputs from the model needed to be interpreted carefully with regard to representing and costing Smarter Choices for two reasons.

First it was important to distinguish the impact of Hertfordshire schemes on the County within the context of a model covering the whole region. Clearly the impact on regional flows will be far lower than effects within the County boundary as it was assumed for the purposes of this study that there are no Smarter Choices interventions outside the county. This should not however be the case as other authorities are likely to apply similar measures to promote sustainable travel behaviour. Furthermore, some short journeys within the county will be excluded from the analysis due to the size of the EERM zones (a function of its geographic scale) and the impact of Smarter Choices within may therefore be slightly underestimated.

Secondly it was important to distinguish Smarter Choices impacts, which are "bottom up" in terms of changing patterns of travel, from "top down" plans such as new roads or public transport services. This is for two reasons:

- To estimate the effectiveness of travel planning in terms of improving transport efficiency and reducing carbon emissions; and
- To identify areas where additional hard infrastructure might be needed to provide extra capacity, for example bus or cycle priority, or used to "lock in" benefits, for example creating additional priority to avoid generating extra car traffic.

To give an indication of where demand would be reduced and the possible changes in demand, comparisons of trips to individual and groups of zones representing settlements in the traffic model were made, with and without the Smarter Choice (and other) measures.

As well as indicating the scale of reductions in key locations, it also allowed estimates of the extent of support for public transport. This often takes the form of enhancing existing services, for example through new vehicles, higher frequencies, and priority measures. Increased service frequencies will in turn improve the justification for priority. Such improvements also tend to attract a second round of passenger increases. Major changes in flow in urban settlements indicate the need for enhanced public transport.

Thus the combination of demand which is supplied through travel plans, and that which is generated in urban and suburban areas from service improvement, can make services self-sufficient in the longer-term. At the least it reduces the level of financial support required. Without a more detailed study the precise service designs cannot be tested, so the figures given in the next section should be considered as initial estimates.

Costs were calculated by allowing for hard infrastructure and service improvements associated with the settlements with the highest levels of car trip reduction. For example, additional bus services can be provided, plus some additional on street priority. These are supplied at an average cost. The destination-based planning is then costed on the basis of how many trips are affected and the average annual cost of doing so. This is assumed over the period to 2021 only, as travel behaviour is expected to become habitual by this time.

The estimates include an additional £6.6m for bus priority and other hard measures over and above that already planned in relation to settlements with over 500 car trips switching (see Table 11-1) up to 2021.

**Table 11-1: Settlements with Over 500 Car Trips Switching to Other Modes**

Settlement	Reduction in car trips (AM peak)
Watford	1563
Hemel Hempstead	1447
Stevenage	1251
St Albans	968
Welwyn Garden City	771
Hatfield	606

Source: EERM HIIS run 2021

Given that the additional Smarter Choices programme is estimated at the strategic level, it is difficult to estimate precise costs of specific elements such as bus service levels or priority that might be required. There is, however, evidence for the cost of destination-based schemes which can be applied. To allow for additional expenditure, it was assumed that around 30% of the reduction in car driver trips in all settlements with a change of 100 trips or more would transfer to bus (based on previous experience and published evidence). The cost of extra services can be calculated using industry average figures from Transport Statistics Great Britain. In addition, some allowance can be made for infrastructure related to areas where the impact was greatest. These also serve to act as a “locking in” device, by reallocating road space. The fares income was also taken to be 40% of costs, towards the low end of the range for additional subsidised services. The additional settlements are shown in Table 11-2 (see page 90).

With allowance for capital expenditure and bus service improvements, the implementation and maintenance costs of the travel planning package can be added. An average cost of £47 per trip saved has been calculated in the DfT study, which used a range of real case studies, particularly for travel to work. This figure was used in the estimation process and applied to all car trips removed in all areas. It should be noted that this revenue cost is assumed for each year between 2011 and 2031.

The total cost using the approach outlined above (i.e. trips saved plus infrastructure allowance) was £114.7m over the 20 year period.

**Table 11-2: Settlements with Between 100 and 500 Car Trips Switching to Other Modes**

Settlement	Reduction in car trips (AM peak)
Bishops Stortford	446
Hitchin	389
Cheshunt	378
Letchworth	360
Hertford	319
Borehamwood	267
Ware	253
Rickmansworth	235
Hoddesdon	204
Berkhampstead	204
Harpenden	192
Radlett	184
Royston	136
Harlow	125
South Oxney	113

Source: EERM HIIS run 2021

### 11.3. Potential Underestimation of Total Costs

There are three schemes for which costs could not be estimated. This is solely because the level of detail for each scheme could not be sufficiently identified based on information available at the time. The schemes are listed below; note from Table F 3 that they have not been modelled as changes to the EERM.

- S36 – Improvements to east-west routes as part of strategic connections on the Stevenage and Stansted corridor;
- S47 - Improvements to east-west routes as part of strategic connections on the Luton and Stansted corridor; and
- S321 – M11 J7 and J8 improvements.

In addition the scheme costs do not include any potential land costs as it was not possible to make a robust estimate of these. This is likely to lead to a relatively small underestimation of the total cost of schemes that may need to be funded from alternative sources, such as applications to regional and central government sources.

Identifying the extent of the underestimation will require schemes to be 'worked up' in greater detail. At present details of some schemes (in particular smaller schemes) are somewhat vague and as a result it is impossible to identify costs accurately. Not only would this exercise help to identify the quantum of additional cost, it would also provide useful inputs for the Prioritisation Framework presented in Appendix G.

#### **11.4. The Predicted Transport Costs Associated with Growth**

The costs of the schemes presented in Table F 4 (deficit schemes) and Table F 5 (new schemes) in Appendix F are summarised in Table 11-3 by district, type and period (2011-2021 and 2021-2031).

The district with the highest costs in the period to 2021 is East Herts, principally as a result of road schemes such as the Little Hadham bypass and A602 improvements. No costs are identified for Three Rivers as this study has shown that, at the level of detail at which it has been possible to assess locations across the county, there are no infrastructure requirements. However, the 'Other' NMU cost refers to the implementation of the HCC cycling strategy and would involve some spending within Three Rivers. It is also known that there are local issues that would require addressing within the LDF and LTP funding framework.

There is a significant difference in costs between some districts, ranging from £1.6m in Hertsmere to £262.7m in Watford. This is predominantly due the presence or otherwise of large-scale development in each district, and in particular the presence of a KCDC. It is important to note that Table 11-3 reflects the cost of growth, and that there will be additional costs associated with existing deficit. The cost of deficit is discussed in Section 8.

The costs associated with growth are particularly high for Watford because of the attribution of the full or partial cost of the Abbey Passing Loop and Croxley Rail link. Rail schemes are notoriously expensive and so will have a disproportionately high impact on the total cost for a district compared.

Costs in the period 2021-2031 are lower than those of 2011-2021, since the analysis has indicated that the majority of existing and new schemes identified for inclusion in the funding model will be required by 2021. The lower costs are not necessarily an indication that costs in the period 2021 to 2031 are harder to define, although it is likely that new schemes will come forward for this period in particular at a local level. Such schemes are outside the remit of this study.

**Table 11-3: Estimated Cost of Primary Infrastructure by Period (£m)**

District	NMU		Bus & Coach		Rail inc. Freight		Road		Other		Total	
	No.	£m	No.	£m	No.	£m	No.	£m	No.	£m	No.	£m
<b>2021</b>												
Broxbourne	0	0.00	1	1.50	0	0.00	2	6.47	0	0.00	3	7.97
Dacorum	0	0.00	2	42.50	2	4.00	7	47.99	0	0.00	11	94.49
East Herts	0	0.00	5	47.10	0	0.00	9	131.91	0	0.00	14	179.01
Hertsmere	0	0.00	1	1.50	0	0.00	1	0.10	0	0.00	2	1.60
North Herts	0	0.00	4	6.50	1	1.00	3	91.90	0	0.00	8	99.40
St Albans	0	0.00	5	45.40	0	3.00	6	69.13	0	0.00	11	117.53
Stevenage	0	0.00	12	5.55	0	0.00	4	32.17	0	0.00	16	37.72
Three Riv.	0	0.00	0	0.00	0	0.00	0	1.67	0	0.00	0	1.67
Watford	0	0.00	2	39.50	1	179.95	2	26.57	1	1.00	6	247.02
Wel/Hat	0	0.00	5	6.90	1	1.20	1	41.50	0	0.00	7	49.60
Other	1	36.00	1	0.00	3	5.10	8	0.00	1	59.12	14	100.22
<b>2021 Total</b>	<b>1</b>	<b>36.00</b>	<b>38</b>	<b>196.45</b>	<b>8</b>	<b>194.25</b>	<b>44</b>	<b>449.41</b>	<b>2</b>	<b>60.12</b>	<b>92</b>	<b>936.23</b>
<b>2031</b>												
Broxbourne	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Dacorum	0	0.00	0	0.00	0	0.00	1	60.34	0	0.00	1	60.34
East Herts	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Hertsmere	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
North Herts	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
St Albans	0	0.00	0	0.00	0	0.00	0	22.50	0	0.00	0	22.50
Stevenage	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Three Riv.	0	0.00	0	0.00	0	0.00	0	15.68	0	0.00	0	15.68
Watford	0	0.00	0	0.00	0	0.00	0	15.68	0	0.00	0	15.68
Wel/Hat	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Other	0	0.00	0	0.00	0	0.00	1	0.00	1	55.58	2	55.58
<b>2031 Total</b>	<b>0</b>	<b>0.00</b>	<b>0</b>	<b>0.00</b>	<b>0</b>	<b>0.00</b>	<b>2</b>	<b>114.20</b>	<b>1</b>	<b>55.58</b>	<b>3</b>	<b>169.78</b>
<b>Total 2011-2031</b>	<b>1</b>	<b>36.00</b>	<b>38</b>	<b>196.45</b>	<b>8</b>	<b>194.25</b>	<b>45</b>	<b>563.61</b>	<b>3</b>	<b>115.70</b>	<b>95</b>	<b>1,106.01</b>

Note: Other refers to countywide and multidistrict schemes. Costs are attributed to districts by % of schemes that fall into them but scheme numbers are either by district or countywide/ other. Where there is a cost but no scheme this indicates that a proportion of the scheme numbered in other falls into this district.

From a total of 95 schemes (including Smarter Choices in the periods to both 2021 and 2031) the largest numbers of schemes shown in Table 11-3 are associated with Dacorum, East Herts, St Albans, and Stevenage. Three of these are KCDC areas and so it is to be expected that they attract higher infrastructure requirements. The fact that other districts that also include KCDCs have fewer interventions does not reflect a less rigorous analysis, rather that the need for infrastructure has not been considered so great based upon the evidence gathered and evaluation criteria used. Indeed, the number of interventions associated with each district is only a crude measure of the requirements compared to say cost, as the nature of the interventions may be very different. Furthermore, schemes such as the A1(M) ATM would benefit a number of districts (including East Herts, Stevenage, St Albans and Welwyn Hatfield in this example).



As an additional guide to the distribution of costs throughout the county Table 11-4 shows costs for the whole period (2011-2031) by KCDC. It is important to note that these figures are indicative and should be treated as orders of magnitude. The KCDC total does not match the total cost of transport infrastructure presented in Table 11-3, as it excludes interventions in non-KCDC areas.

**Table 11-4: Estimated Cost of Primary Infrastructure by KCDC, 2011-2031 (£m)**

District	NMU	Bus & Coach	Rail inc. Freight	Road	Other	Total
Dacorum/ St Albans/ Welwyn Hatfield	0.00	132.20	6.20	95.75	0.00	<b>234.15</b>
East Luton	0.00	0.00	0.00	1.79	0.00	<b>1.79</b>
Harlow	0.00	0.00	0.00	0.00	0.00	<b>0.00</b>
Stevenage	0.00	5.55	0.00	41.37	0.00	<b>46.92</b>
Watford	0.00	39.50	179.95	20.22	1.00	<b>240.67</b>
<b>KCDC Total</b>	<b>0.00</b>	<b>177.25</b>	<b>186.15</b>	<b>159.14</b>	<b>1.00</b>	<b>523.54</b>

A number of schemes included in the list in Table 10-1 are however excluded from the costs relating to growth (and are not reflected in Table 11-3 and Table 11-4, nor the funding model developed by the Lot 1 consultants) since whilst they are considered essential for growth in Hertfordshire, their strategic nature means that they are beyond the remit of the funding model and CIL. They are flagged separately here as an indication of their importance to growth. At a total cost of £8.5billion the schemes are:

- East Cost Mainline Improvements (£1.6b);
- The Thameslink Programme (£5.5b);
- WAGN Improvements (£50m); and
- Widening and Demand Management on the M25 (£1.3b).

It is also the case that all these schemes have existing full funding from central government sources.



## 12. INTERVENTIONS: FUNDING

### 12.1. Funding Opportunities

The costs and likely deliverability of new infrastructure provision need to be matched with the likely availability of suitable funding. This section examines the mainstream funding available for the transport infrastructure in question, with a summary of potential funds provided in Table 12-1.

Four sources of existing funding have been identified:

- a) DfT and HA schemes, some of which are considered to be fully funded;
- b) Regional Funding Allocation
- c) Projection of existing funding such as LTP or equivalent; and
- d) Developer funding.

Growth Area Funding and Supplementary Business Rates were also identified but were not suitable for inclusion.

- **Department for Transport and HA**

A number of schemes are known to be fully funded, such as large rail projects and M25 widening. Although the schemes feature in the list of interventions, due to their significance to the county, they were not included in the funding model or costs because of their national status.

- **Regional Funding Allocation (RFA)**

RFA funding was only assumed for current RFA bids, which are:

- Croxley Rail Link;
- Watford Junction Rail Interchange; and
- Little Hadham Bypass.

This gives total funding of £195.5m to 2021 (in approximately 2008 prices). Assuming this is accurate it is feasible that the same amount would be available for similar schemes between 2021 and 2031. However this has not been allocated over the second ten year period as it is not clear which schemes would be most appropriate.

RFA represents a funding 'last resort', and is usually highly oversubscribed with individual schemes competing not only with others in the same authority, but with other regional schemes as well. The proportion of schemes awarded RFA funding in Hertfordshire in recent years is of the order of a few per cent, and there is therefore a major shortfall in the funding of the larger LTP schemes.

- **Local Transport Plan (LTP) funding**

LTP funding for the current LTP period was averaged to provide an annual figure that was assumed to remain constant from 2011 to 2031. It is considered that one third of this will be available over this timescale, the remainder going towards deficit only schemes, smaller schemes, those not appropriate for CIL funding, and those coming forward over the next 20 or so years that will exclusively require LTP funding. This gives a total LTP budget of £79.5m from 2011 to 2031. However, the schemes that will need LTP funding are all anticipated to be required by 2021, meaning that only half of the total funding from this source will be available (i.e. LTP funding between 2011 and 2021) resulting in only £39.8m being available for the schemes to which LTP funding will contribute. This is spread according to scheme cost across eligible schemes on a pro rata basis (excluding for example HA schemes). This funding should be considered to be in approximately 2006/7 prices, as this is when the planning guidelines were available.

A potential £39.8m of LTP funding has been identified for the period 2021 to 2031 but there are no appropriate schemes to which it can be allocated. For this reason it is not shown in subsequent tables.

- **Developer Funding**

A small number of schemes have been identified that would be wholly funded by developers (as distinct from developer contributions, discussed below).

- **Growth Area Fund (GAF)**

Although a number of areas in Hertfordshire currently benefit from GAF funding it has been indicated that transport schemes would be unlikely to have the first call on this source, and it was therefore assumed that GAF would not contribute towards the cost of transport growth impacts.

- **Supplementary Business Rates**

Supplementary Business Rates (SBR) were made possible under the Business Rates Supplement Bill 2009. It allows local authorities to charge a supplement on business rates to contribute towards funding transport and other investments supporting economic growth. This study has not considered contributions from SBR as it is not a tested source of funding and there has been no indication that it might be adopted by the partners.

**Table 12-1: Summary of Potential Funding Sources (£m)**

Potential Source	Existing Schemes		New Schemes		Period Totals		Total
	2011-21	2021-31	2011-21	2021-31	2011-21	2021-31	
RFA	209.0	0.0	0.0	0.0	209.0	0.0	209.0
LTP	27.4	0.0	21.5	0.0	48.9	0.0	48.9
Other	23.7	0.0	3.0	0.0	26.7	75.0	101.7
<b>Total</b>	<b>260.0</b>	<b>0.0</b>	<b>24.5</b>	<b>0.0</b>	<b>284.5</b>	<b>75.0</b>	<b>359.5</b>

'Other' principally includes developer funding

Importantly, Table 12-1 excludes possible developer contributions. In addition to schemes appropriate for CIL funding it is anticipated that monies will be secured through negotiation for off-site public transport, cycling and walking measures. It will be essential to ensure that developers will be able to relate the results of their individual contributions to proposed schemes. Anticipated Section 106 funding will therefore need to be related to the specific package of measures for which contributions will be sought. Packages will become more definitive as plans progress and as it becomes clear what level of new development will be accommodated in each strategic sector or sub-area.

It is not the role of this assessment to decide how to allocate individual developer contributions between service providers (say, between health, transport, and education) and as a consequence there are no recommendations regarding how much developer contributions should be allocated to transport infrastructure investment.

## 12.2. Costs Versus Funding

A comparison of the cost of interventions and the available funding shows that there is a funding shortfall. The funding model shows a total shortfall of £652m from 2011-2021 and £95m from 2021 to 2031, a total shortfall of £747m. Table 12-2 illustrates the funding shortfall, showing costs against available funding.

**Table 12-2: Hertfordshire Funding Shortfall 2021-2031**

	2021	2031	Total
Costs (£m)	936	170	1,106
Funding (£m)	284	75	359
<b>Shortfall (£m)</b>	<b>-652</b>	<b>-95</b>	<b>-747</b>

The outputs from the URS work on costs and funding are inputs to the Lot 1 funding model, an excerpt of which is shown as Table 12-3. It shows the cost and funding profile of investment in Hertfordshire (i.e. excluding the strategic schemes listed in Section 11.4) over the period 2011 to 2031. From 2011 to 2015 the annual shortfall is £20m, in the period 2016 to 2020 it is approximately £94m, from 2021 to 2025 it is £20m and between 2026 and 2031 it

is £13m. This highlights that in each year there will be a funding shortfall, and that there are cashflow issues. These are addressed in more detail in the Lot 1 report.

**Table 12-3: Profile of Hertfordshire Only Investment (£m)**

	2011	2012	2013	2014	2015	2016-2020	2021-2025	2026-2031	TOTAL
<b>Total Costs</b>	£31.774	£30.189	£130.654	£97.239	£29.089	£542.264	£179.500	£65.300	£1,106.008
<b>Total Funding</b>	£11.115	£9.530	£109.995	£76.580	£8.430	£68.826	£75.000	£0	£359.474
<b>TOTAL</b>	-£20.659	-£20.659	-£20.659	-£20.659	-£20.659	-£473.438	-£104.500	-£65.300	-£746.534

Source: Excerpt from RTP Funding Model

## 13. OVERARCHING ISSUES

### 13.1. Introduction

In the course of this study, various issues came to light and are briefly set out in this chapter. They relate to considerations of acceptable levels of service, to modelling limitations, and hence to further work that would be appropriate to address some of them.

### 13.2. Level of Service

As outlined in Section 5, the considerations involved in determining the preliminary highway infrastructure improvements cannot and should not be based on a 'predict and provide' basis, for the following reasons:

- Policy – this does not dictate such an approach, not least as there is no guarantee that a radically improved network would not simply promote a further mode shift to car. Maintaining a certain level of impedance in the highway network is likely to be the necessary deterrent to effect a shift to improved sustainable modes (the 'carrot and stick' approach). This has been reinforced by the recent DaSTS initiative from DfT;
- Cost – extensive highway improvements would simply not be affordable and would quickly render any CIL contribution unviable; and
- Practicalities – space, environmental factors, public opinion etc would make such an approach very difficult to implement.

A decision that may need to be taken by HCC is: what is an acceptable level of service on the various modes? This type of target-driven approach is being considered by the HA as part of their Integrated Demand Management (IDM) strategy for the M25, whereby packages of bespoke interventions (Smarter Choices, ramp metering etc) are looking to provide a more 'holistic' solution to travel management.

The interventions proposed here, based on a preliminary assessment, represent a level of expenditure that is partly attributable to CIL but above which its viability may be compromised; however they do not collectively demonstrate wholesale improvements in travel conditions across the network. Subject to limitations of the modelling discussed below, the overall picture is one of maintaining similar conditions through time as are experienced now – of maintaining the status quo. Thus the study has avoided simply suggesting large-scale capacity improvements, in particular to the road network. A further consideration is that of the proportion of time during the day when the network is congested – this is normally the peaks only (with the possible exception of the M25) and may dilute the justification to provide such improvements. More could be done, but it would need much more money to fund it.

### 13.3. Modelling issues and limitations

The EERM is a strategic model into which it has not always been possible to code the new highway interventions identified to address particular issues, due for example to the coarseness of the network. This is no criticism: it is simply a characteristic of strategic models.



Some highway interventions that were costed were not included in the model for this reason, so their effectiveness or otherwise is not reflected in the model outputs. The requirement for these measures has necessarily been based on judgement.

Where specific highway interventions are represented, the effect in some cases was to re-distribute traffic locally, causing demand and in some cases congestion to shift from one location to another. Thus to obtain a more informed picture and maximise the effectiveness of the interventions, some iterative testing, and more detailed analysis of the EERM results, will be needed. Issues such as the optimisation of new signals certainly require iterative testing, similar to the way in which they might be set 'on the ground'.

Related to this is the consideration of how accurately the existing zones and zone connectors represent the new development density and location from the masterplanning. Within the scope of this study and within the way that the EERM process calculates travel demand, it was not appropriate to sub-divide zones and modify connectors for the masterplanning runs; however it is likely that a more detailed review of this would lead to more accurate modelling of the effects, given time to adjust the model accordingly.

There are a number of local, more detailed models being developed in the districts, and further testing of local interventions will inevitably be more informative using such models – particularly those interventions that are intended to 'lock in' the benefits of Smarter Choices, such as bus priority measures. This will be needed for the LDF process irrespective of this work.

The 2021<sup>MP</sup> results were obtained from a full run of the EERM model incorporating the masterplanning results of this study. Therefore the full set of EERM stages was invoked: demand, distribution, mode split and assignment, allowing for trip suppression and induction. However, testing of the interventions in 2021<sup>MPI</sup> was carried out using only an assignment of the highway trip matrix obtained from 2021<sup>MP</sup>, but factored down to represent the effects of Smarter Choices. This was a deliberate decision, since Smarter Choices include responses that are not explicitly modelled (for example car sharing and working at home). In this respect the process for 2021<sup>MPI</sup> assumes a specified degree of success of Smarter Choices from the outset, and it is the re-assignment effects of this, taking into account further highway schemes, that are modelled. This assumed degree of success has the merit of being empirically-based, but clearly it is still an assumption. In the time available, this was considered a more robust approach than attempting to model Smarter Choices by proxy, invoking the full EERM processes, which would have introduced greater uncertainty. The same approach was used for 2031<sup>MP</sup> and 2031<sup>MPI</sup>. A key omission from the MPI work done to date is therefore explicit consideration of, for example, rail initiatives such as ECML improvements and Croxley Rail Link, other than partially through the effect of the Smarter Choice factors. In this respect specific rail interventions are relatively unknown post 2021, and are difficult to predict now.

However, further work would benefit from invoking the full EERM stages, with more consideration given to how Smarter Choices and the public transport interventions could be incorporated realistically within the full process (see Section 9.1.3, which describes how this has been approached in the HIIS study). It would also be informative to test the effects of

Smarter Choices independently from the highway interventions so as to attribute effects to causes more easily, and to appreciate better the likely impact of each.

This is a unique and ground-breaking study – as such, the initial programme for the study evolved and this restricted the number and nature of model runs that it was possible to undertake, compared to those envisaged in the original brief. Therefore, the opportunity has not existed to look carefully at the underlying reasons for the 2021<sup>MPI</sup> and 2031<sup>MPI</sup> modelling results, nor to determine whether successes or failures in terms of the effectiveness of interventions are due to realistic and explainable traffic responses, or to limitations of the model coding to represent exactly what is intended. Ideally, there would be some iteration in this process.

The V/C bands used here to indicate impending congestion or over-capacity sections of the network (80%-100% and over 100% respectively) are based on generally accepted criteria rather than on any thresholds or targets set by HCC that are deemed to represent 'unacceptable' levels of traffic. Two consequences of this fairly coarse banding that should be borne in mind are:

- It can mask degrees of worsening or improvement (for example an increase from 85% to 95% in different scenarios would be coded as 'amber' in both cases);
- Similarly, a change from amber to red or vice versa may be triggered by a very small change, if the section of network in question is bordering on capacity.

Therefore the results presented are indicative, and give a feel for future network conditions. The alternative, that of providing numerical V/C ratios, has not been adopted here because it would imbue the figures with a level of accuracy that cannot exist in the EERM, or any other, traffic model – they are a useful guide only. In both cases above it is difficult to determine what will be acceptable in the absence of prescribed targets. We are conscious of the need to maintain an effective network, however this must be viewed on balance with policy demands for sustainable transport; some congestion is likely to be inevitable.

The AM peak period was used throughout to provide a representation of the most congested period of the weekday, since the PM peak is usually less severe with fewer school-related trips and a greater spread of home-commuting traffic over a longer period than that of the AM. However, it is recognised that the PM peak would identify some different congested areas, and that there is an element of tidality in the traffic patterns.

Modelling intermediate years may help to shed more light on the issue of priority infrastructure and the way it is tied in to the phasing of new development. This interaction highlights the need to monitor and measure the effectiveness of interventions against targets. A longer-term strategy based on clear targets may be derailed should these not be met, so it would be essential to have an adaptable process to correct or re-plan based on monitoring. This is linked to enabling development, where certain schemes are reliant on development to trigger them, or vice versa, and the need to prioritise.

### 13.4. Further Work – Addressing the Issues

Distilled from the above considerations is a list of recommendations for further work that would build on what has been done, and improve the modelling representation of it. These steps would go some way to providing a more robust analysis of the wider issues.

- Modelling intermediate years to enable the priorities and dependencies of developments and infrastructure to be understood better;
- Investigating the extent to which Smarter Choices might be reasonably and realistically be integrated into the modelling process;
- Reviewing and refining the way in which masterplanned developments are represented in the network and zone system;
- Using the local models that are being developed to look in more detail at measures that could improve bus corridors;
- Undertaking similar work including the PM peak to inform measures with higher priorities;
- Further iteration is needed in the testing process to establish the effectiveness of potential measures. Those provided here represent a preliminary view, but the results indicate that they could be refined, improved and if necessary extended in scope.

Other additional work might focus on assessing the impact of decisions that could change investment decisions. The most significant variable may be the location of growth. Whilst it is anticipated that the masterplanning produced by Atkins with input from the partners represents the 'best guess' as to where development will eventually proceed it is a snapshot and circumstances may change.

Further 'optioneering' may centre on local policy decisions to pursue sustainable transport policies more aggressively. This could most easily be reflected through the assessment of schemes using the Prioritisation Framework in Appendix G. It may also be possible to assess simple changes in trip making using a spreadsheet model, although it is likely that further use of the EERM would ultimately be required for the assessment of schemes. The result of such a strategy would be greater investment emphasis on public transport and other sustainable modes. In addition land-use policies might need to reflect the desire to reduce the need to travel by private transport with a higher level of mixed use development and increasingly higher densities.

## 14. CONCLUSIONS

### 14.1. Introduction

URS was appointed in April 2008 by the Partners to provide consultancy services for the preparation of the Lot 2 transport elements of the Hertfordshire Infrastructure and Investment Strategy (HIIS). Atkins and Roger Tym and Partners (RTP) were appointed as the Lot 1 consultants to lead the overall strategy, to deal with the non-transport infrastructure elements and to establish the investment-funding model.

In the absence of a formal Implementation Strategy the study was commissioned to examine the implications for Hertfordshire associated with the published Regional Spatial Strategy (RSS – also called the East of England Plan), which has established district housing growth targets for the county to 2021 and 2031.

This report represents Stages One and Two of the HIIS assessment process and its focus is on taking forward the elements of historic or legacy transport deficit (Stage One) that are likely to remain post-2011, to be considered in the mix with an assessment of the transport implications associated with further RSS growth for the period 2011-2021 and subsequently 2021-2031 (Stage Two). One of the difficulties associated with transport is that of attempting to associate the demand for travel with particular geographic areas and points in time and this is why it was considered helpful to combine the historic and future deficit results into a single report.

A two-stage approach was taken to this study. The first stage identified baseline conditions, including historic deficit. Stage two studied the required transport interventions to cater for the RSS growth anticipated within Hertfordshire, based on masterplanning completed by the Lot 1 consultants.

Deficit is defined as the amount by which something falls short. For the purposes of this study a part of the transport network can therefore be considered to be deficient where it falls short of providing the necessary capacity for the prevailing travel demand.

This study represents an independent assessment of infrastructure requirements and costs. It was based on the available evidence base but has highlighted where further information is required. As such the schemes presented in it should not be considered definitive but instead as a list for more detailed consideration. Addressing the issues and progressing the outcomes of this study is discussed in Sections 13 and 14.3 respectively.

### 14.2. Study Outcomes

The study identified the impact of RSS growth and interventions required to cater for this between 2011 and 2031. The outcomes for the base case and future years with RSS growth and interventions are presented below.

### 14.2.1. 2011 Base Case

There is an existing requirement to improve the general facilities for pedestrians and cyclists in the county, including the wider introduction of safer routes to schools. Safety is also an issue. Accessibility to key services and facilities is currently a key consideration, in line with the Department for Transport's policies and targets.

Hertfordshire has an extensive bus network, providing for all but the smaller villages. Many of the routes serving East Hertfordshire are however limited in terms of the days of the week that they operate. Despite this most Hertfordshire residents are reasonably well catered for, with hours of operation similar to many non-metropolitan areas. However, the county lacks a centralised bus interchange to facilitate longer distance bus and coach travel.

Rail in Hertfordshire is currently constrained by a lack of capacity, with a shortage of trains to satisfy the passenger demand, especially for commuter trips into and out of London, inadequate platform capacity including at London Stations, limited train paths and a suggested shortfall in car parking capacity at some stations. Passengers boarding trains within the County generally experience overcrowding during peak commuter periods, which is severe on services into London at times. The deficit in terms of train paths and carriage capacity is accompanied by the need to improve rail facilities. Forecast growth in rail travel, which includes substantial background growth, indicates that conditions will be unacceptable without extra capacity.

By 2011 the majority of motorway corridor links within Hertfordshire are operating between 80% and 100% of their capacity in the AM peak, with some sections above 100%. This will lead to instability and the likelihood of poor journey time reliability that will impact on the M1, M25 and A1(M) in both directions. Problems on many grade-separated motorway junctions are also anticipated and at access points with the non-motorway network, or both.

The main non-motorway routes are also congested by 2011, principally due to insufficient capacity at junctions. Key locations coincide with town centres, in particular Watford, St Albans, Heme Hempstead and Stevenage. At a broader scale the picture is one of congestion along a series of corridors between the main centres, especially at junctions. Those running broadly east to west tend to be most problematic and include:

- Berkhamsted / Hemel Hempstead / St Albans / Hatfield;
- Watford / Bushey / Borehamwood;
- Welwyn / Hertford;
- Hitchin / Letchworth / Baldock;
- Hadham / Bishop's Stortford.

North to South corridors tend to be less challenging, although there are sections such as the A1(M) J6-J7 that are under pressure.

## 14.2.2. 2021 & 2031 RSS Growth with Interventions

### 14.2.2.1. Transport Network in 2021

To ensure that sustainable travel behaviour becomes habitual implementation of the HCC cycling strategy, and notably its related infrastructure, will need to be complete by 2021. Detailed schemes will be identified through the Urban Transport Plan process. Cycling infrastructure will also support Smarter Choices, which will reduce the impact of travel on the road network.

There are a number of big infrastructure items identified for bus and coach up to 2021, namely improved or new bus stations. If designed correctly these will facilitate the efficient movement of the increased number of buses required for Smarter Choices. Bus priority will also be a significant feature of the bus network from 2011 to 2021. The number of bus services and the frequency of buses on them is a matter for short term route planning. There is likely to be a challenge for bus operators and HCC to improve the service offer but it is not expected that the bus network should become over capacity.

Post-2011 there is a strong need for future rail capacity. While the East of England Plan is based on the assumption that out-commuting is reduced through sustainable policy objectives, the scale of development, even if it fully materialises, is unlikely to prevent continued commuting between Hertfordshire and London. The DfT suggests that much of the predicted demand up to 2021 can be accommodated on the existing railway with relatively small scale improvements. Delivery of infrastructure associated with both the Thameslink Programme and Crossrail is essential to cope with predicted increases in peak capacity on the Midland and East Coast Main Lines.

It has been necessary to comply with cascading national, regional and local transport policies when dealing with the network stress that has been identified. These clearly dictate that simply providing new or significantly improved roads is not a sustainable option for the future. Such considerations have rightly motivated and channelled the selection process for road improvements and helped to define key objectives and selection parameters.

Masterplanning and associated modelling of potential highway demand has shown that there is a need for some key road improvements otherwise Hertfordshire will face an unmanageable and undesirable future in terms of road transport. It was necessary however to balance this potential demand with the need to promote sustainable travel choices. As a consequence, while a number of road schemes were included in the list of proposed infrastructure requirements for 2021, they do not lead to a 'step-change' improvement to conditions. They help to free local bottlenecks but represent a balanced approach that aims to tackle the severest problems first in conjunction with the other initiatives. The overall result, not forgetting the larger scale programmed improvements, is very much one of maintaining the status quo.

### 14.2.2.2. Transport Network in 2031

Because the planning of cycling and walking schemes is relatively short-term it is not feasible to speculate as to the exact nature of even larger schemes beyond 2021. However, it is

certain that these modes will play an important part in continuing to ensure that Hertfordshire remains a sustainable community.

It is probable that smaller-scale bus infrastructure will continue to be required after 2021 to ensure effective operation of the network but that most schemes should be in place by this time. Between 2021 and 2031 the bus network should build on successes achieved in the previous ten years.

Beyond 2021 the predictions for rail capacity suggest that there would be a limit to the attractiveness of rail as a travel mode for Hertfordshire residents unless further substantial network improvements are delivered. This could impact on sustainable travel aspirations supporting growth and impose a 'cap' on rail use. Options for longer-term solutions up to 2031 need further consideration, but unfortunately rail planning does not appear to be that far advanced at present. The current thinking by the DfT suggests a further need to investigate improved signalling technology to allow more trains to run on existing lines, the potential for double-deck trains or alternatively, construction of new strategic railway lines, such as a north to south high speed line to serve growth by putting fast inter-city services onto a new line and freeing capacity on existing lines to accommodate both freight expansion and regional passenger services.

In 2031 the pattern of highway congestion, and the effectiveness of the measures, is similar to that of 2021. There are fewer new schemes and the Smarter Choices are assumed to reduce a larger number of trips. It would however be unwise to attach too much weight to these results simply because they look so far ahead, given the scope for policy, planning and other related circumstances to change in the interim.

#### **14.2.3. Interventions Need, Cost & Funding**

The interventions identified in this report come from a sound evidence base, either evidenced the EERM or from proven need backed by research. There are 95 in total, a mixture of those that already existed due to historic deficit (and which will be required to cater for growth as well) and new interventions identified by URS.

A summary of schemes is set out in Table 14-1 by scheme type and district, also showing cost. It indicates that, in general, the districts with the highest costs are those which contain KCDCs. Table 14-1 excludes those schemes not included in the funding model (and costing £8.5bn) such as M25 widening as they will not be funded through a CIL but it is important that such schemes are not forgotten as they will play an essential role in providing for the increased travel demand generated by RSS growth.



**Table 14-1: Summary of Schemes by District**

District	NMU		Bus & Coach		Rail inc. Freight		Road		Other		Total	
	No.	£m	No.	£m	No.	£m	No.	£m	No.	£m	No.	£m
Broxbourne	0	0.0	1	1.5	0	0.0	2	6.5	0	0.0	3	8.0
Dacorum	0	0.0	2	42.5	2	4.0	8	108.3	0	0.0	12	154.8
East Herts	0	0.0	5	47.1	0	0.0	9	131.9	0	0.0	14	179.0
Hertsmere	0	0.0	1	1.5	0	0.0	1	0.1	0	0.0	2	1.6
North Herts	0	0.0	4	6.5	1	1.0	3	91.9	0	0.0	8	99.4
St Albans	0	0.0	5	45.4	0	3.0	6	91.6	0	0.0	11	140.0
Stevenage	0	0.0	12	5.6	0	0.0	4	32.2	0	0.0	16	37.7
Three Rivers	0	0.0	0	0.0	0	0.0	0	17.3	0	0.0	0	17.3
Watford	0	0.0	2	39.5	1	180.0	2	42.2	1	1.0	6	262.7
Welwyn/Hat	0	0.0	5	6.9	1	1.2	1	41.5	0	0.0	7	49.6
Other	1	36.0	1	0.0	3	5.1	9	0.0	2	114.7	16	155.8
<b>Herts total</b>	<b>1</b>	<b>36.0</b>	<b>38</b>	<b>196.5</b>	<b>8</b>	<b>194.3</b>	<b>45</b>	<b>563.6</b>	<b>3</b>	<b>115.7</b>	<b>95</b>	<b>1106.0</b>

Note: 'Other' refers to countywide and multidistrict schemes. Costs are attributed to districts by % of schemes that fall into them but scheme numbers are either by district or countywide/ other. Where there is a cost but no scheme this indicates that a proportion of the scheme numbered in 'Other' falls into this district.

Table 14-2 presents the balance of the costs of interventions, set alongside the funding that has been identified from LTP and RFA sources. It also shows the profile of spending over the period 2011 to 2031, highlighting that the majority of costs are incurred during the first 10 years. This has been assessed based on evidence provided by the EERM and because it is important that infrastructure is in place in time for the opening of new development sites, rather than after they have been completed.

**Table 14-2: Summary of Scheme Costs and Funding by Period**

	2021	2031	Total
Costs (£m)	936	170	1,106
Potential Funding (£m)	284	75	359
<b>Shortfall (£m)</b>	<b>-652</b>	<b>-95</b>	<b>-747</b>

#### 14.2.4. Scheme Prioritisation

At this stage in the strategic planning process exact priorities cannot be determined. Increased detail through the LDF process and masterplanning will reveal the precise location and phasing of developments that play such an important role in transport prioritisation.

Nevertheless, potential schemes for prioritisation were identified based on the evidence presented in this report. It shows the key areas and corridors of stress, and from these locations schemes can be drawn that will make a significant contribution to catering for increased travel demand. Alongside the need for targeted road improvements, such as the

A1(M) between junctions 6 and 8, are sustainable measures such as Smarter Choices and improvements to the cycling network through the HCC cycling strategy. Furthermore, the prioritisation of each intervention from essential to desirable identifies those that must be implemented to facilitate growth (for example improvements to A1(M) junction 8) through to those that, whilst still considered appropriate to enable growth, should not be considered 'show stoppers' (such as Letchworth Station Interchange improvements).

#### 14.2.5. Overarching Issues

During the study a number of overarching issues arose, which should be taken into consideration as the HIIS is progressed and implemented over the next 20 or so years. These principally relate to providing a more detailed evidence base as the HIIS progresses. Ways to address these issues are presented in Section **Error! Reference source not found.**

### 14.3. Progressing The Study Outcomes

The recommendations that are made throughout this report are reiterated here. They focus on taking forward the outcomes of the study with particular reference to ensuring that there is sufficient funding and implementation to meet the intervention requirements of RSS growth outlined in Sections 10. In addition the need to address historic deficit is highlighted

- As more detailed plans come forward through the LDF and masterplanning process the interventions presented in Section 10 of this report (including their timing, and their prioritisation) will need to be refined, building on the foundations provided by this study. A review of the transport infrastructure as the growth agenda develops through more detailed proposals and the LDF process, taking note of the schemes identified for growth in this study. This may require the use of more detailed modelling, taking into consideration the issues raised in Section 13;
- To implement schemes relating to those items that are solely historic deficit and so cannot be addressed through CIL funding. This will help to ensure that the transport network operates effectively across the county, without those areas with negligible impact becoming 'poor relations' in transport terms and subsequently impacting the efficiency of the transport network in areas of growth. These schemes are likely to be underfunded, based on the evidence presented in Section 8, and it is further recommended that representations are made to regional and central government for funding to remedy previous under-investment in the county transport network;
- Lobbying of central government and its agencies (the Highways Agency and DfT Rail/ Network Rail) to ensure that the schemes they are responsible for are implemented in a timely manner to facilitate growth in the county. In particular that there be substantial rail investment to cater for the lack of capacity post-2021;
- Application to regional and central government funding sources to fund any additional costs above those included here, including those resulting from more detailed scheme development;

- Further work between transport service providers and highway authorities to define and refine infrastructure need;
- A further programme of work on scheme prioritisation; and
- A programme of action to potentially shift investment priorities towards and potentially beyond Smarter Choices and other sustainable transport measures identified in this report.

