

# Transport Evidence: Lubenham

Ver	Date	Author	Review	Approve	Comments
0.4	20 Apr 2013	Duncan Forbes	Neal Edwards		Internal review
1.0	22 Apr 2013	Duncan Forbes		Duncan Forbes	Incorporating NE comments
1.1	22 Apr 2013	Duncan Forbes		Duncan Forbes	Correction of minor typos

## 1 Executive Summary

- 1.1.1 The Strategic Development Areas (SDA) and Core Strategy rely on transport evidence primarily taken from the LLITM<sup>1</sup> model runs and to a lesser extent the Airfield Farm Transport Assessment (TA).
- 1.1.2 In the very limited time available to review the various documents I have primarily focussed on looking at the LLITM report as this provides the majority of the evidence against which transport options are considered. However I have also consulted the Addendum LLITM report, The SDA masterplan and the Harborough Core Strategy.
- 1.1.3 In the future a larger population in conjunction with increases in car ownership, reduced motoring costs, increased bus fares, as well as a general increase in wealth mean that if people make choices about travel in the same way as today then traffic levels could be considerably higher. Conventional measures for reducing congestion (including road and junction improvements, improved bus services and travel planning) are very unlikely to be able to reduce traffic levels and congestion to a level that is experienced today.
- 1.1.4 In 2026 in Lubenham the traffic levels reported in the LLITM report could be between 20% and 60% higher in the morning peak hour compared to that experienced in 2008. However the report does not highlight what **impact** this will have on **local** congestion, delay, speed or journey time, nor what contribution to this increase the development of the SDA site will make.
- 1.1.5 The LLITM report assesses the impact of the SDA against a 2026 'core' scenario. In this scenario the development at the SDA is assumed not to occur. The core and SDA option scenarios are:
- **Core scenario:** This scenario does not contain the housing related to the development at the SDA. However the scenario does assume that there will be an increase in the number of households and population within Harborough. Within the model the population who could have lived on the SDA are dispersed into Harborough and the neighbouring districts.
  - **Option 1:** Consists of 1,000 houses on the SDA site with assumptions roughly based upon the Airfield farm planning application (11\_00112\_OUT). In addition to the 1000 houses it also includes 5ha of employment land, access at two points onto the B6047 and no link road through the site. In addition 200 further houses are provided in Market Harborough
  - **Option 3:** The SDA consists of 1,500 houses. Two separate access points are provided. One onto the B6047, the other onto the A4304 Lubenham Road. There is no possibility for traffic to travel through the site between the B6047 and the A4304. In addition 200 further houses are provided in Market Harborough
  - **Option 3a:** The SDA consists of 1,500 houses. As option 3, but it also provides a through route between the B6047 and A4304 through the site

<sup>1</sup> Leicester and Leicestershire Integrated Transport Model

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- **Option 4:** as option 3a, but with 1,800 houses. This is reported in the Addendum LLITM report

1.1.6 Because there are increases in the numbers of households and population in the 'core' scenario, the methodology of comparing the SDA option scenarios against the 'core' scenario greatly underestimates the **reported** traffic impact of the development, and fails to **attribute** any impacts to the SDA. This is not because the model is necessarily wrong, but just by the way that it is analysed.

1.1.7 Instead of focussing on the differences between the options and the 'core' scenario a more productive approach would be to reanalyse the model runs to look at traffic and congestion in the various SDA development option scenarios and compare them to a known level of congestion (either today, or at some date in the future immediately before the first building is occupied). It is suggested that the following steps are required to be undertaken:

- **Demonstrate Model Robustness.** Demonstrate that the growth in travel and the travel patterns within the district are robust.
- **Improved Reporting:** The modellers should create a new 'zone' for which travel characteristics can be reported (eg villages to West of Market Harborough). This could be used to report the traffic levels, congestion, delay and average speed as in section 3, 4 and 5 of the LLITM report.
- **Identify congestion today:** Identify the location and level of congestion on the most congested links, junctions or routes in the reference year
- **Identify congestion in the future:** Identify the location and level of congestion on the most congested links, junctions or routes in 2026 without any mitigation measures
- **Determine the contribution of congestion from the SDA:** Identify the proportion of traffic at these congested locations that start or finish at the SDA site. This will determine the direct contribution of congestion that arises from the SDA site.
- **Propose mitigation measures** to address the concerns identified after identifying the problem links, junctions or routes in 2008 and 2026.
- **Test the proposed mitigation measures** in order to quantify the benefits that the mitigation has on reducing specific problems that have been identified.

1.1.8 This note consists of the following sections:

- **The robustness of the LLITM model.** The LLITM report does not demonstrate that the model is producing sensible results.
- **Transport Impacts within Lubenham.** The LLITM report highlights traffic growth, but does not quantify the impact, nor provide any means of attributing the impact to the SDA.
- **The 'core' scenario: the wrong reference.** Why the 'core' scenario is the wrong reference, how the impact of growth should be reported, and how the impact of the SDA should be quantified.
- **The Smarter choices campaign.** The modelling does not address specific situations in Market Harborough or the SDA. There is a possibility that the Mitigation measures 'double' count the benefits.
- **Addressing concerns raised in this note.** How the modelling could be re-analysed (or rerun) to address concerns raised.
- **Core Strategy policy CS13: A4304 to B6047 link road.** The LLITM report does not demonstrate the need nor the benefits or detriments of such a road.
- **Lubenham Bypass.** A bypass could cost between £55M and £75M to build. Traffic through the village in the morning peak hour could increase by between 20% and 60%, however the LLITM model report does not quantify the harm that this could cause, nor attribute impacts to the SDA.

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## 2 The robustness of the LLITM model

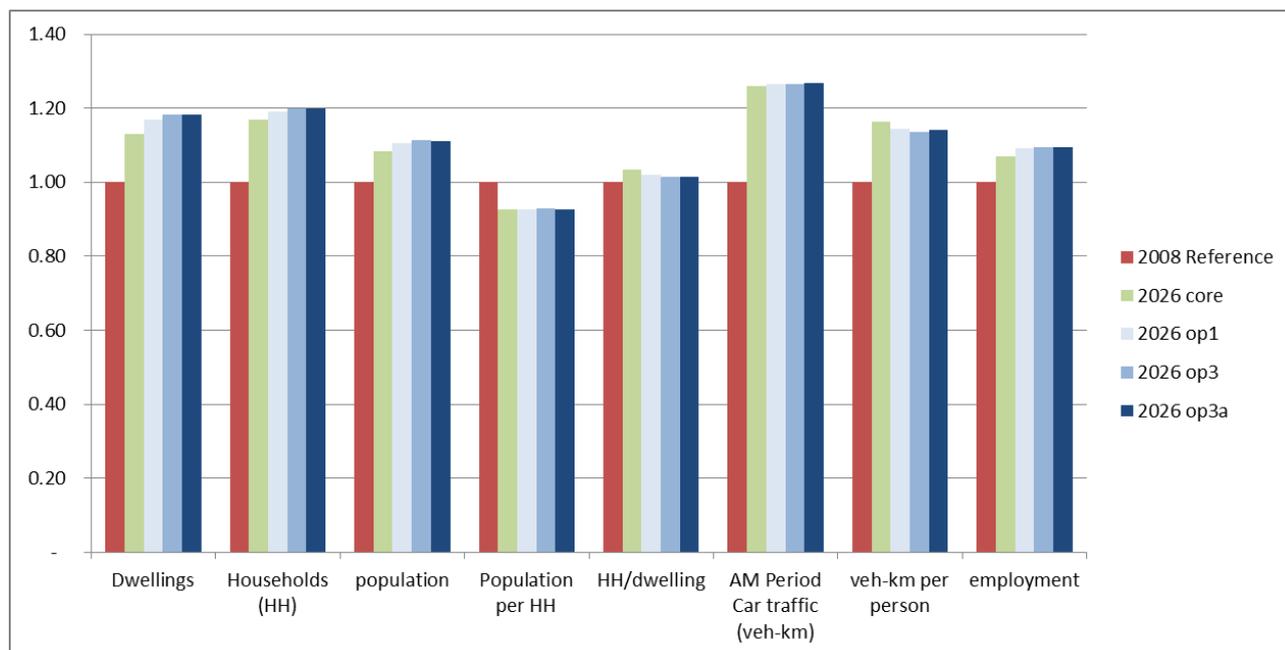
- 2.1.1 As no information is provided or surrounding districts, or travel patterns of residents from Harborough it is not possible to say how realistic or robust the overall assumptions and response of the model are. However the scenarios produce a significant increase in traffic between 2008 and 2026 which is feasible, although high. More locally to the SDA this lack of supporting information is a problem as without detail on local levels of growth and travel patterns it is not possible to determine whether the modelled behaviour to/from the proposed SDA site is realistic or robust.
- 2.1.2 I have analysed data from various parts of the model to determine whether at a district level it is reasonably consistent. In the short time available I have looked at the demographics, employment and the travel in the morning peak hour. A summary of the analysis is shown in Table 1, Table 2 and graphically in Figure 1. **Generally it is not possible to demonstrate that the response of the model is appropriate. Observations and questions relating to the model output are provided below.**
- The core scenario is packing more households into the available dwellings (dwellings increase by 13% whilst household increase by 17%). How does this compare to neighbouring districts. Is the response of the model consistent across the neighbouring districts?
  - There is a close match in scenario 1, 3 and 3a between the increase in the number of households and the increase in dwellings. However the model is tending to attract more households to the district than the number of available dwellings. What is being reporting for the neighbouring districts?
  - Traffic levels in all the future year scenarios are around 26% greater than in 2008. How does this compare to adjacent districts, and the county as a whole. Can it be explained with respect to the growth and change in distribution of the households?
  - Employment levels in Harborough are forecast to be around 9% in the option scenarios. This is higher than the 7% projected within TEMPRO 6.2 (Trip End Model Presentation Program - supplied by Department for Transport). This is a significant increase and is not justified in the modelling report. I would question the ability of the LLITM model to reliably predict the preferred location of employment representing 'basic' industry. Whilst accessibility does provide a factor in location the impact of political and business factors are likely to have a significant impact.
  - The average distance travelled per person increases by 16% in the core scenario compared to 14% in the option scenarios perhaps suggesting the potential benefits of locating the housing near to Market Harborough rather than distributing it around the district. However this cannot be verified, as no useful information is provided on where the residents locate in the core scenario. **THIS IS A MAJOR FAILING IN THE REPORTING OF THE CORE SCENARIO.**

**Table 1: Table of key parameters across the various scenarios. The dwellings information was not reliability reported within the LLITM report. I have estimated the dwelling numbers**

Harborough District	2008	2026				information source
	Reference	core	1	3	3a	
Dwellings	34,430	38,930	40,230	40,730	40,730	DCLG and core strategy.
Households (HH)	33,606	39,256	40,045	40,346	40,306	table 3.8
population	81,898	88,697	90,542	91,276	91,081	table 3.5
<i>Population per HH</i>	<i>2.44</i>	<i>2.26</i>	<i>2.26</i>	<i>2.26</i>	<i>2.26</i>	
<i>HH/dwelling</i>	<i>0.98</i>	<i>1.01</i>	<i>1.00</i>	<i>0.99</i>	<i>0.99</i>	
AM Car traffic (veh-km)	369,680	465,604	467,714	467,839	469,107	table 4.3
<i>veh-km per person</i>	<i>4.5</i>	<i>5.2</i>	<i>5.2</i>	<i>5.1</i>	<i>5.2</i>	
employment	37,407	40,026	40,817	40,926	40,924	TABLE 3.9

**Table 2: Table of key parameters across the various scenarios. Change compared to 2008**

Harborough District	2008	2026				information source
	Reference	core	1	3	3a	
Dwellings	34,430	13%	17%	18%	18%	DCLG and core strategy.
Households (HH)	33,606	17%	19%	20%	20%	table 3.8
population	81,898	8%	11%	11%	11%	table 3.5
<i>Population per HH</i>	<i>2.44</i>	<i>-0.07</i>	<i>-0.07</i>	<i>-0.07</i>	<i>-0.07</i>	
<i>HH/dwelling</i>	<i>0.98</i>	<i>0.03</i>	<i>0.02</i>	<i>0.01</i>	<i>0.01</i>	
AM Car traffic (veh-km)	369,680	26%	27%	27%	27%	table 4.3
<i>veh-km per person</i>	<i>5</i>	<i>16%</i>	<i>14%</i>	<i>14%</i>	<i>14%</i>	
employment	37,407	7%	9%	9%	9%	TABLE 3.9



**Figure 1: The information in table 1 represented graphically with the value of the 2026 options plotted relative to the value in 2008**

### 3 Transport impacts within Lubenham

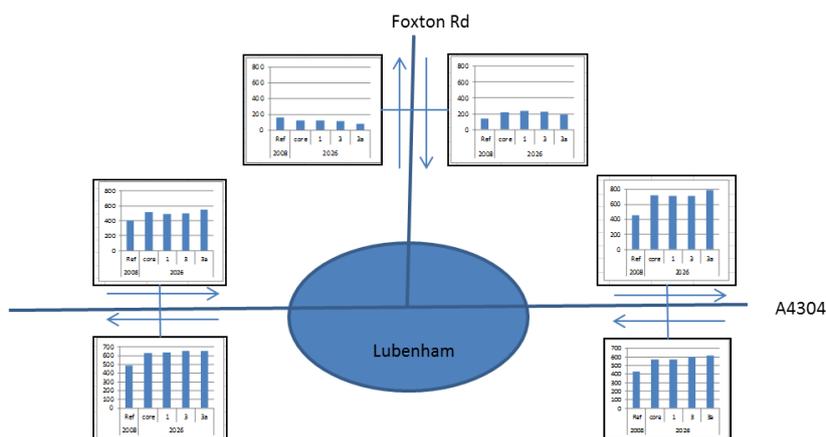
- 3.1.1 Locally to Lubenham the model reports that traffic levels will be higher in the future than they are today, and that this 'background growth' with or without the SDA development will cause between 20% and 60% more cars to travel through Lubenham village in the morning peak hour (see Table 3, Table 4 and Figure 2) compared to 2008.
- 3.1.2 Unfortunately the report does not address the **impact** of this increased traffic in terms of capacity of links or junctions, delay, reduced speed or increased journey time in a way that is meaningful to the residents. Where reported the impacts are compared to a hypothetical 2026 'core' scenario.

**Table 3: Count of the number of vehicles between 8am and 9am in 2008, and in 4 scenarios in 2026 (Appendix I of LLITM report) (W is Westbound, E is Eastbound etc)**

	Dir	2008	2026			
		Ref	core	1	3	3a
A4304 E of Lubenham	W	425	567	574	602	613
	E	451	717	709	714	792
A4304 W of Lubenham	W	491	629	641	653	651
	E	408	514	492	496	545
Foxton Rd N of Lubenham	N	156	123	120	118	80
	S	142	219	238	224	196

**Table 4: The count of vehicles between 8am and 9am in 2008, together with the forecast change in four scenarios in 2026**

	Dir	2008	2026			
		core	1	3	3a	
A4304 E of Lub	W	425	33%	35%	42%	44%
	E	451	59%	57%	58%	76%
A4304 W of Lub	W	491	28%	31%	33%	33%
	E	408	26%	21%	22%	34%
Foxton Rd N of Lub	N	156	-21%	-23%	-24%	-49%
	S	142	54%	68%	58%	38%



**Figure 2: A graphical representation of the traffic counts in Table 3 and Table 4**

- 3.1.3 In addition for areas outside the boundary of Market Harborough (eg Lubenham) the traffic, delay and speed characteristics are reported in section 3, 4 and 5 of the report in combination with the rest of the district. This means that it is totally impossible to understand the impact to villages such as Lubenham, Foxton, Gartree and Theddingworth that lie outside the town of Market Harborough. **The existing runs should be re-analysed and include the reporting of an additional area defined from a combination of the area covered by the villages to the West of Market Harborough**

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## 4 The 'Core' scenario: the wrong reference.

- 4.1.1 Generally the LLITM report is painting a picture of a future in which Harborough is a very attractive place to live and to work but in which traffic levels are much higher than they are today. This high level of traffic growth is acknowledged in the report, however it is then downplayed in the subsequent analysis. All future comparisons are made between the 3 options and the 'core' scenario. This is problematic as the model forecasts around 25% extra traffic in 2026 compared to today, but only 1% or 2% difference between the options and the 'core'.
- 4.1.2 **The report thus mis-directs the reader as he/she attempts to understand what congestion will be like in the future, how the SDA contributes to it, and what can be done to reduce the effects.**
- 4.1.3 A conventional Transport Assessments uses a relatively 'simple' technique whereby the population of a new development is assumed to have relocated from a place 'a long way away'. It is thus possible to create a 'with development' scenario by assuming that the new people who reside in the development generate 'new' traffic that is superimposed upon traffic that is already present from the 'no development' scenario. This simple superposition of the two scenarios allows the impact of the development on the surrounding road network to be readily quantified. However by undertaking this simple analysis the impact of changes in travel patterns, the changes over wider areas and the impact of 'knock-on' effects to other areas are not considered. This simple technique does though allow the local impact of the development on the transport network to be identified and quantified and allows for a comparison of 'today's' situation with that after the development is complete.
- 4.1.4 With LLITM a 'scenario' system is used whereby the population, household numbers and employment numbers for the whole of Leicestershire are roughly fixed. Changes to the availability and accessibility of factors such as housing, employment land, or retail space alter how people decide where to live, and how to travel. For instance if housing is scarce then it would impact the formation of new households, cause households to share dwellings or cause households to live further away from their preferred location at a place where housing is available.
- 4.1.5 In the LLITM 'core' scenario (the scenario in which housing on the SDA site does not occur) the model will 'find' houses for the population elsewhere within the modelled area. Where people find houses will depend on the assumptions built into the model. The scenarios in which no SDA development occurs will thus **not** be a 'no development' scenario in the sense of a conventional transport assessment, but will include within the area the people who might have lived on the new development.
- 4.1.6 There are three issues with the way that LLITM has been used:
- Firstly the 'core' scenario is not a true 'no development' scenario as it includes people who could have lived in the SDA. **The result is that compared to a conventional transport assessment the LLITM approach reports a much smaller impact.** The size of the difference, between the techniques, will be highly dependent on how the model responds to the pressure on housing, and will differ depending on the model that is used. The
  - Secondly the report fails to attribute any of the congestion to the SDA development site
  - Thirdly, because the 'core' scenario is so poorly described, it is not possible to ascertain exactly what the SDA scenarios are being compared against. If a reference 'core' scenario is going to be used to compare options then it is **essential** that it is precisely and accurately described and the **exact** differences from the option scenarios presented. **The LLITM report does not do this. The dwelling difference is noted, but not the difference in number and distribution of households, population, or changes in travel patterns. The comparisons of option 1, 3 and 3a are thus made against a reference which has not been adequately described and validated, and which produces levels of congestion very close to those in the option tests. Unfortunately the way that the 'core' scenario is described means that it can be considered to be almost arbitrary.**
- 4.1.7 The fallacy regarding the small impact of the development has been repeated in the Airfield Farm Transport Assessment where Waterman Boreham state in in Paragraph 3.2 of their addendum Transport Assessment:

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Results from the LLITM modelling conclude traffic conditions in Market Harborough are likely to be worse in 2026 than in the base year of 2008 without any housing growth. The results of the model also show that in 2026, with 1000 houses to the north west of the town, that the impact of development is considered to be relatively small when compared to conditions in 2026 without any development growth. **Consequently, it is concluded that the traffic impact of the Airfield Farm development would be relatively small.**

**Figure 3: Para 3.2 from Airfield Farm, Addendum Transport Assessment, June 2012  
11\_00112\_OUT-TR.1\_TRANSPORT\_ASSESSMENT\_REPORT\_\_AMENDMENT\_A\_-90163.pdf**

- 4.1.8 A development of between 1,000 and 1,800 houses **will cause additional local congestion**. One purpose of the modelling is to **quantify and then attribute this congestion** to the appropriate source. The LLITM model could do this if it looked at the impact of this congestion after the development was implemented **relative to the situation immediately before the work on building development started**. In addition to identifying those links, junction and routes that are shown to be congested once the development is complete, the proportional impact of travellers to/from the development on these junctions can be determined using features within SATURN (the highway model used by LLITM) such as select link analysis.
- 4.1.9 Instead of focussing on the differences between the options and the 'core' scenario a more productive approach would be to reanalyse the model runs to look at traffic and congestion in the various SDA development option scenarios and compare them to a known level of congestion (either today, or at some date in the future immediately before the first building is occupied) to highlight and address:
- **Identify congestion today:** Identify the location and level of congestion on the most congested links, junctions or routes in the reference year
  - **Identify congestion in the future:** Identify the location and level of congestion on the most congested links, junctions or routes in 2026 without any mitigation measures
  - **Determine the contribution of congestion from the SDA:** Identify the proportion of traffic at these congested locations that start or finish at the SDA site. This will determine the direct contribution of congestion that arises from the SDA site.
  - **Propose mitigation measures** to address the concerns identified after identifying the problem links, junctions or routes in 2008 and 2026.
  - **Test the proposed mitigation measures** in order to quantify the benefits that the mitigation has on reducing specific problems that have been identified.

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## 5 Smarter choices campaign

- 5.1.1 The impact of a Smarter choices campaign is included in the LLITM modelling. This represents the 'soft' measures that can affect how people make choices of when and why they travel, and the mode that they take. It can include travel planning at home, school or work. Alternatively it can include measures that improve the perception of the value of not travelling by car.
- 5.1.2 The LLITM model includes the assumptions that SMART measures are included within the reference scenarios and the options. These are based upon a £200,000 per year investments from Leicestershire County Council and £200,000 from Leicester City Council (LLITM report Table 2.1) and are targeted to produce between 3% and 5% reduction in car trips for commuting and education trips. **These are very challenging targets which within the model have been imposed for the city and the market towns.**
- 5.1.3 At a strategic level (ie county wide) the assumptions can be justified in the model, and can be used to test the possible impact of 'with' and 'without' the smart choices programmes. However when looking at a specific area (eg a town or development site) then this generic modelling is not appropriate, and it is not good practice to model smart measures in a reference scenario without including a scenario which does not include the soft measures.
- 5.1.4 The reason that it is not appropriate to include 'generic' smart measures benefits when looking at a local impact is that the soft measures have to be appropriately aligned and consistent with the hard measures that are proposed (There is little point in pointing out the benefits of bus travel in a travel plan if there is only 1 bus per week!). It is not clear that this has been done in the reference scenario in appendix A with regards Market Harborough. **It has also not been specifically confirmed that the county and city council will each be committing £200,000 per year on smarter measures from 2016.**
- 5.1.5 Further the mitigation measures for the development site include an **additional** smarter measures component (section 5.1 of the LLITM report). It is not clear whether the smarter measures incorporated into the mitigation measures are in addition to those in the reference scenario. **If they are then this is totally inappropriate as the model will have dramatically and unrealistically reduced the level of car traffic to and from the SDA development site.**
- 5.1.6 Good modelling practice (WebTAG 3.10.6) would suggest that hard measures should be presented separately from the combined 'hard and soft' measures in order that the impact of the travel planning and other techniques can be quantified. **The LLITM model does not do this, and therefore it is not possible to realistically quantify the impact of the smart measures.**

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## 6 Addressing concerns raised in this note

- 6.1.1 There are several deficiencies within the LLITM running and reporting that need to be addressed in order to demonstrate the robustness of the modelling, and also in order that the congestion impact of the SDA development is properly addressed and appropriate<sup>2</sup> mitigation measures proposed and assessed.
- 6.1.2 It may not necessarily be the case that re-running of the model is needed (provided that that the results show that the runs are robust). Most of the points raised relate to a re-analysis of the existing model runs.
- **Demonstrate Model Robustness.** Demonstrate that the growth in travel and the travel patterns within the district are robust.
  - **Improved Reporting:** The modellers should create a new 'zone' for which travel characteristics can be reported (eg villages to W of Market Harborough). This could be used to report the traffic levels, congestion, delay and average speed as in section 3, 4 and 5 of the LLITM report
  - **Remove the 'core' scenario from the analysis,** and compare the Option scenarios against an earlier year. Either 2008, or an alternative year that occurs before the first house is occupied.
  - **Identify congestion today:** Identify the location and level of congestion on the most congested links, junctions or routes in the reference year
  - **Identify congestion in the future:** Identify the location and level of congestion on the most congested links, junctions or routes in 2026 without any mitigation measures
  - **Determine the contribution of congestion from the SDA:** Identify the proportion of traffic at these congested locations that start or finish at the SDA site. This will determine the direct contribution of congestion that arises from the SDA site.
  - **Propose mitigation measures** to address the concerns identified after identifying the problem links, junctions or routes in 2008 and 2026.
  - **Test the proposed mitigation measures** in order to quantify the benefits that the mitigation has on reducing specific problems that have been identified.

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<sup>2</sup> I would not expect any conventional mitigation measures to be able to recover the situation back to what it was in 2008. However the levels of congestion forecast in the 2026 'Core' scenario are not appropriate, nor is the method of attributing the blame.

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## 7 Core Strategy CS13: A4304 to B6047 link road

- 7.1.1 The Core Strategy policy CS13 states that the SDA will ***Not prejudice the provision of a future link road to enable transport movements between the A4304 (Lubenham Hill ) and B6047 (Leicester Road) as part of a wider package of measures that seek to deal with transport issues predicted to arise in and around the town during the Core Strategy period.*** None of the evidence presented in the LLITM report, or the Addendum report provide evidence to support nor reject the need for this road, nor does it highlight the impact or benefits that it would produce.
- 7.1.2 An analysis of Option 3a compared to Option 3 is required. This does not appear to have been reported in the LLITM report. Assuming that the modelling is to be used to assess the impact on congestion, rather than perform a full economic appraisal then it will be necessary to:
- Demonstrate the robustness of the LLITM model in replicating a plausible pattern of movements around the Western part of Market Harborough.
  - Undertake a with and without link road analysis
  - Report on the changes in congestion, areas that benefit, and those that get worse.