

Leicester and Leicestershire  
Integrated Transport Model (LLITM)



Responses to Melton Mowbray Core Strategy LLITM Modelling Comments

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Rev No	Comments	Date
1	Initial draft for issue	2011-12-05
2		

## Burton and Dalby Parish Council

### Observations:

We note with interest how this modelling broadly agrees with previous studies that showed little benefit to town centre traffic by extending Option C North to a  $\frac{3}{4}$  hybrid composite but increases significantly traffic on arterial roads (31.3%).

It is this factor that seriously concerns councillors due to the serious impact on the Parish routes B6047 and A606 as the table below shows. The prospect of an extra 2 – 300 vehicles in the am peak hour through Great Dalby for 'political' benefits alone will clearly be greeted with dismay. We look forward to receiving answers to the following questions and early discussion with David Pendle on this issue.

1. Please advise baseline year used for assumptions and forecasts.

The base year of the model is 2008. The forecast year in which the development options and bypass scenarios have been tested in is 2026. The term 'baseline' has only been used twice in the report, both times in reference to the 2026 scenario without either development option, and with no bypass sections included.

2. P12 – 1.1 – final line - 'assumptions should be taken into account when considering the forecasts in this report'. – Are the classifications of assumption PR01 to PR08 and can we access these online please?

Further detail on the forecasting assumptions can be found in the 'PR06: Forecasting Report'. The report details the aforementioned modelling assumptions, and the source from where these assumptions have been derived.

3. Section 4 quotes "non-freight highway demand" when developing the core and growth scenarios.
  - a. Which sections of this report have freight or other traffic excluded from the analysis?

In general, the report considers total traffic including freight movements. Network statistics and link flows, for example, include freight and non-freight traffic. An exception to this is in Section 4.1.1 which considers the non-freight demand growth. Non-freight demand is driven by planning forecasts, and the choice of only considering non-freight demand in this section is to provide a linkage with the planning forecasts detailed in Section 3.

- b. Do tables E1 to E6 on pages 133 – 138 represent all vehicular movements including freight?

These tables do represent all vehicle movements. Note that these tables contain flows in passenger car units (PCUs) and not in vehicles. In considering PCUs, OGVs and buses are considered as 2 PCUs, with a car / LGV considered as a single PCU.

4. Page 48 – 4.1.2 –

- a. We assume that references to AM PM IP as described applies to whole report?

Some sections of the report refer to peak hours, and others refer to peak periods. For the peak hours, the definitions are as follows:

- AM Peak = 08:00 to 09:00;

- Interpeak = average hour between 10:00 and 16:00; and
- PM Peak = 17:00 to 18:00.

Peak periods cover a longer timeframe, and are defined as follows:

- AM Peak = 07:00 to 10:00;
- Interpeak = 10:00 to 16:00;
- PM Peak = 16:00 to 19:00; and
- Off-peak = 19:00 to 07:00.

A general rule of thumb is that network based statistics use peak hour definitions of time periods, whereas demand based statistics use the peak period definitions. However, with each set of statistics it is stated as to whether they refer to peak hours or peak periods.

- b. *Please advise OP interpretation e.g. average off peak over (?) hrs.*

See above.

5. *Page 64 – 4.2.7 – Generally, what government guidance is given on emissions and how does this impact on the figures?*

The Department for Transport's WebTAG guidance (Section 3.3: The Environmental Objective) contains a number of assumptions that should be used when calculating emissions. These include emission rates, and how they are forecast to change over time. LLITM implements this guidance through bespoke processes and also the use of Defra's spreadsheet-based emission factor toolkit (EFT).

6. *Page 69 3rd paragraph states "the majority of the increase in highway demand, with the introduction of bypass options is countered by a forecast decrease active mode demand". Does this mean adding the bypass converts pedestrians and cyclists to vehicle use? If so, does this increase/decrease in line with bypass length?*

Table 5.1 and Table 5.9 show the change in 24-hour person demand resulting from the introduction of the bypass scenarios with the Option 1 and Option 2 development scenarios respectively.

In line with WebTAG guidance, the total demand over all transport modes (including active modes) over 24 hours is fixed when introducing a change to the network, such as introducing one of the bypass scenarios. Therefore, as introducing the bypass options increases forecast amount of highway demand, this must be countered by a reduction in other modes. These forecasts suggest that the increase in highway demand when introducing the bypass options is primarily counteracted by a reduction in active mode (walking and cycling) demand.

These tables show that there is forecast to be little change in public transport demand as a result of the bypass scenarios.

In general, as the length of the bypass included in a given scenario increases, so does the increase in highway demand. As the change in public transport demand is relatively small, and fairly consistent, this means that the forecast decrease in active mode demand is larger in magnitude as the bypass length increases.

7. *Inconsistent use of undefined terminology throughout this report makes it difficult to follow and difficult or even impossible to make comparisons both within this report and with previous Ptolemy or MVA reports.*

AECOM has not had access to the previous PTOLEMY or MVA reports. This work is independent of those studies, and therefore it is likely that the reporting from LLITM is not consistent with previous reports.

- a. Page 72, 7<sup>th</sup> paragraph quotes "a forecast increase in traffic in the corridor of 4.7% and 6.3%" from introducing sections 1-9 of the bypass, whereas the next paragraph quotes the corresponding in flow reduction on the main routes through the town centre of 100 and 200 PCUs. Can we have PCU figures for these %'s please?

The corridor statistic considers a broad north-south screenline covering the movements along the A607. The forecast flow data behind these percentage changes, in PCUs, is given in the table below:

	Westbound			Eastbound		
	Core	Sc1 to 9	%Diff	Core	Sc1 to 9	%Diff
AM Peak	2,301	2,410	4.7%	2,282	2,426	6.3%
Interpeak	1,755	1,825	4.0%	1,781	1,897	6.5%
PM Peak	2,352	2,487	5.8%	2,917	3,206	9.9%

- b. Figures 5.2, to 5.5 show changes in traffic "volumes" during the AM peak hour, but Tables 5.1 and 5.2 use "PCU totals" over unspecified periods of OP, AM, IP, PM. Please define.

Table 5.1 gives 24-hour person demand totals for productions from Melton Borough and from within Melton Mowbray. Table 5.2 gives PCU totals for origins within Melton Borough and from Melton Mowbray for the four peak periods within the demand model. These peak periods are as defined in response to Q4.

Figures 5.2 to 5.5 show the assigned volume changes in the AM Peak hour (08:00 – 09:00) assignment.

8.

- a. The report states an increase in AM peak hour Vehicle Distances (veh-km) within Melton Mowbray, with increasing length of bypass, Sc 3-9 and Sc 1 to 9 by some 24% - 31%. This information is also quoted but not expanded upon in section 6.3.1 and 6.3.3; why? Where is the increased volume from, where is it going to and along which routes?

Section 6 contains a summary of the results contained in previous sections. More detailed discussion on the increases in vehicle-kms with the introduction of the bypass scenarios can be found in Section 5.1.2 and 5.2.2 for the bypass scenarios with Option 1 and Option 2 development scenarios respectively.

The network flow change plots with the introduction of the bypass scenarios give an indication of where this increase in volume is coming from / going to. Generally this increase in traffic is along the A607 corridor, with the majority not travelling beyond Grantham in the east and Leicester in the west.

- b. This significant increase appears directly at odds with the forecast reduction in vehicle emissions. Although engine emissions are reducing through technology (above point 5),

*this will happen irrespective of the bypass being introduced, so when comparing the core scenario with the bypass options, can we see direct increases in emission comparison with bypass increase please?*

Table 5.6 and Table 5.16 show the incremental change in emissions as a result of introducing the bypass scenarios compared to the 'with development' scenario for Option 1 and Option 2 development respectively. The text relating to these tables describes the forecast change in emissions due to the introduction of the bypass scenarios.

In general there is a forecast decrease in emissions as a result of introducing the bypass scenarios. There are several factors behind this, but the primary driver is that cars are forecast to travel at a more 'efficient' speed in terms of emission, and are less likely to be affected by queuing when using the bypass route compared to travelling through Melton Mowbray town centre.

- c. *Page 11. states: All bypass options (with one exception) increase carbon emissions across Leicestershire, the largest being section 1-9. Please inform detail by tonne for baseline plus 3-9 and 1-9 and advise same (by volume?) for other noxious emissions please.*

Section 5.1.3 and 5.2.3 contain forecasts for both noxious emissions and carbon for the bypass scenarios with Option 1 and Option 2 development respectively. This contains both absolute forecasts and percentage changes from the 'no bypass' scenario. The 'no development' or 'core' scenario is also given in these sections, allowing a comparison with this forecast to be undertaken.

9. *Page 11 – 'MM through traffic on A606 will not use the bypass due to longer times travelled': would this vary between freight and private vehicles and by how much?*

There are six different assignment user classes in the highway model, each of which has different routing parameters that may result in different choices made by these six user classes. These six user classes are: OGV; LGV; car business; car consumer low value of time (VoT); car consumer medium VoT; and car consumer high (VoT).

Despite this distinction, the plots in Figure 5.13 suggest that no, or very little, traffic is using the bypass as a complete alternative to the A606 through Melton Mowbray. It may be that with this bypass scenario, traffic calming measures would be introduced in the town centre to influence driver's behaviour. These have not been considered as part of this study.

10. *Page 81 – 5.2.1 – final paragraph refers to 'Tours'; please confirm this means two journeys i.e. One tour = (commuting) two trips.*

A tour consists of two trips: an outbound trip from the production (home for example) to the attraction (work for example); and then a return trip from the attraction to the production.

11. *Please confirm whether or not the LLITM model includes the effect of the Oakham bypass on traffic volume projections.*

Oakham is outside the fully simulated area and is included in the buffer area of the model. The Oakham bypass had already opened when the surveys, which underpin the assumptions and interactions of the model, were undertaken. As such, whilst the Oakham bypass does not appear as a specific link in the model, its effect on traffic movement is taken into account in the model's base year (2008) and its forecasting and predictions.

12. *What data is available to enable direct comparison with previous reports from Ptolemy (eg. Peak 7-10am) and MVA. Is there 24 hr data available?*

As commented in response to Q7, AECOM has not had access to the previous reports, and so cannot comment on whether data is available for a direct comparison with these reports.

That said, the report contains a number of tables containing summaries of demand data, including:

- 24-hour person productions by mode; and
- Peak period (see Q4 for definition) highway PCU origins.

13. *Town Centre analysis has always included Leicester St. which when combined with Norman Way, Wilton Rd and Sherrard St. gave the true representation of roads most affected in the actual town centre. Are any figures available for Leicester St. and if not, please explain why it was excluded?*

This analysis was not specified as part of the study, and so therefore has not been undertaken by AECOM. The data is available should this analysis be required to be performed.

14. *Why have costs of bypass per dwelling not been included? Will you be using the MVA information?*

Work on the precise cost of the bypass is ongoing and is currently being informed by the consultants, Halcrow, who are working on the masterplan for the sustainable urban extension.

G.E.Digby

Burton & Dalby PC

### **Broughton and Dalby Parish Council**

- 1) *Whilst we welcome the opportunity to see and comment on future strategy, this document is very large and of a technical nature. If MBC are going to send out such documents, then it would help councillors who do not have a technical background in this area if the consultants produced at least an executive summary with less jargon or made it plainer. For example, what are "vehicle-kms" and "highway tours" and what is the impact of the quoted level of change in the forecast?*

The report contains an executive summary, but the inherently technical nature of this work requires the use of some transport planning terminology. A glossary of terms has been supplied to LCC, this is being obtained for circulation.

- 2) *We may have missed this in the document, but it seemed as if all traffic was lumped together and no independent forecasts made of the individual impact on cars vs light vans vs medium vans vs HGVs. One purpose of a bypass is to take heavy goods through traffic away from the town centre, but on pg 21 it states that growth in freight was not taken into account in the land use model. Is this a limitation of the model and if it is taken into account, will it significantly alter the forecasts?*

The model forecasts demand for a number of purposes and income groups. The demand model considers commuting, education, shopping, home-based and non-home based other demand, home-based and non-home-based employers' business, as well as OGV and LGV demand.

Within the highway assignment model, these demand segments are aggregated to six assignment user classes. These are OGV; LGV; car business; car consumer low value of time (VoT); car consumer medium VoT; and car consumer high (VoT). The model can therefore distinguish between these various highway user classifications.

In terms of the forecast growth in freight demand over time, the DfT's trip-end forecasting tool (CTripEnd) takes planning forecasts (population, households, employment and car ownership) to predict future year non-freight demand. Freight demand is forecast to grow using the DfT's forecasts for LGV and OGV growth from the National Transport Model (NTM) over time.

- 3) *To a layperson, the outcome of this modelling is similar to what most motorists experience every day in small towns across the UK, i.e. the time taken to go round a bypass is roughly the same as that taken to go through the town. This is not rocket science rather simple maths - the increased speed on the bypass is offset by the greater distance travelled. Other factors therefore must be brought in such as the numbers of times a vehicle is likely to stop/start in town traffic vs constant speed on the bypass. We could not easily find these sorts of considerations in the models. If they were not incorporated, could they be and if so, would they change the conclusions?*

Tables 5.3 – 5.5 & 5.13 – 5.15 compare average speeds and delays for vehicles travelling through Melton Mowbray and through Melton Borough (for the purposes of the modelling exercise, the link roads are generally outside of Melton Mowbray). As the development and the various road links are added to the model, the capacity and traffic conditions on the modelled network change. These outputs indicate which link road options provide the optimum traffic conditions in terms of journey speed, journey delay and queuing. The report also describes the impact that the development, and new road links, will have on air quality and carbon emissions, which is a reflection of the extent to which traffic is able to travel through the modelled network at a consistent and expedient manner.

- 4) *Lower and upper limits of predictions are quoted, but at what percentile are these? Without knowing this, it is difficult to know the full error and hence value in the predictions. In fact throughout the document, no errors or other statistical considerations are quoted and without knowing this it is difficult to conclude what weight to give to findings.*

No upper and lower predictions are given in the report. There are statements such as "...traffic is forecast to increase by between 2.3% and 4.6%..." but these are summarising a number of forecasts

into a single statement. For example, traffic may be forecast to increase by different amounts in the three modelled time periods, and these statements describe the range of increases across these three time periods; they do not represent the result of statistical analysis.

As stated in the introduction section of the report, LLITM model is a robust, WebTAG compliant integrated model, which is based on assumptions including economic forecasts and predictions regarding travel behaviour. These assumptions are based on observed base year data, recent trends and DfT WebTAG forecasting assumptions. These assumptions should be taken into account when considering the forecasts contained in this report.

- 5) *On page 13, it claims that validation reports are available for 2 of the 4 components of the LLITM but only development reports for the other 2 components. Are we a guinea pig for validation of the LLITM as a whole? If so, what confidence level is there in the predictions?*

This is the terminology applied to the reports required in documenting a model such as LLITM.

Validation reports are only available where a component of the model can be compared against observed data such as traffic volumes and bus patronage. There is therefore a validation report for the highway and public transport assignment models.

The land-use and demand model are models with which to forecast to future year scenarios. These cannot be validated as there is no observed data of suitable dimensions against which to compare the model forecasts. Therefore, the reports detail their development assumptions are defined as 'development' reports. That said, there is WebTAG guidance on how these forecasting elements of LLITM should perform, and the calibrated performance of LLITM against this guidance is contained in these development reports.

LLITM has been used for a number of applications since its launch, of which this application was not the first. A thorough set of demonstration tests were undertaken prior to the model being made available for use, and the report on the model's performance can be found in '*PR07: Demonstration Testing Report*'.

- 6) *In view of the "predictable" outcome of the modelling and the incomplete nature of its validation, has this exercise been value for money?*

The Leicester and Leicestershire Integrated Transport Model has been developed by Leicestershire County Council, and its partners, for the purpose of predicting the potential impact of changes on the operation of the transport network, such as future growth and development. The development of LLITM received considerable government investment, through National Growth Point funding, in recognition of the contribution that the model would make in assisting with the development of land use/transport plans and strategies. As set out above, the model has been appropriately validated and has been calibrated so as to comply with the Department for Transport's WebTAG guidance. At a strategic level the model has proved to be robust and has been successfully used in order to undertake a range of tests and studies. Last week, for instance, the Secretary of State has announced that the Loughborough Inner Relief Road has gained Programme Entry status. LLITM played a major part in ensuring that the DfT allocated £14.760m for the scheme.

The borough council has been able to utilise this model, without having to meet the upfront costs of producing the various networks and calibrating/writing the associated software. Bearing this in mind, the exercise can be considered to have provided good value for money.



**Asfordby Parish Council**

*Further to your letter dated 9 November 2011 regarding the above, I confirm that the Parish Council's Planning Working Party considered the report at its meeting held on Monday 21 November 2011.*

*Notwithstanding that the report was quite difficult to read particularly the plans and the technical difficulties highlighted in Section 3 of the report, the Parish Council discussed the two growth options and considered that the most deliverable route would be the Northern route from Melton Spinney Road through to Nottingham Road with a northern SUE.*

*However, the most beneficial option for Asfordby Parish would be the Southern SUE with a bypass option from Burton Lazars to Leicester Road as this option limits the impact of traffic on the residents of Asfordby Hill and Asfordby Valley.*

*Any option that would necessitate the use of Welby Road would require substantial upgrading of Welby Road to accommodate the additional traffic. The Parish Council would also expect measures to be put into place to mitigate the impact of additional traffic on the residents of Asfordby Hill and Asfordby Valley.*

### **Kirby Bellars Parish Council**

*Kirby Parish Council considered the above document at their meeting yesterday evening.*

*It was generally felt that the document was not easy to follow, seemed somewhat 'muddled' in places and appeared to contain contradictions.*

*However, our comments are as follows;*

- *you suggest that some 2,600 additional homes need to be built, we would question where the jobs for these home owners will come from.*

The land use model forecasts changes in population and employment levels in the borough, based on assumptions of economic growth and changes in GDP set out by the Department for Transport, at a national level. In addition, the model takes account of planning commitments for economic growth in the borough to further inform economic growth and, consequentially, employment levels.

- *there does not appear to be any plan to generate jobs in and around Melton, it would therefore seem likely that those buying the houses will be employed elsewhere, with the attendant travel that this will entail.*

Section 4.2 of the report discusses the two growth scenarios modelled for Melton Mowbray and discusses the distribution of development demand in 4.2.1 indicating that for option 2 75% of the AM peak hour demand for journeys have a destination within Melton and 3% have a destination within Leicester City.

- *the 'link' road appears to be an urban road, and hence inadequate for the level of new development which is being proposed. Will the proposed road actually improve traffic flow? The road needs to be more substantial such as a ring road or by-pass so that future expansion is allowed for.*

Different lengths of additional infrastructure have been tested as part of this study, some of which provide a complete bypass of Melton Mowbray for certain movements. The assumptions included in this study with regards to the standard of this additional infrastructure can be found in Section 2.3 of the LLITM report.

Table 5.3 to Table 5.5 and Table 5.13 to Table 5.15 show the forecast network performance without and with the sections of bypass tested as part of this study. In general these show that including additional infrastructure increases average speeds and reduces delays and queuing on the highway network. In addition to this, the magnitude of these changes generally increases as more of the bypass sections are included.

- *In developing the 'link' road, provision should be made for the building of a dual carriageway road, even if that is not initially built due to lack of funds, again to allow for the future*

The development link roads will not be designed as a ring road, but should not prejudice any future potential ring road being provided. The road links will be designed so as to accommodate HGVs and distribute traffic away from the town centre.

- *the report suggests there will be a reduction in vehicle numbers, it is difficult to see how this stacks up with the provision of 2,600 new homes, which will surely lead to more vehicles*

We are unclear as to the source in the report of the 2,600 new homes, and the reduction in vehicle number to which this comment refers.

In the forecasts detailed in the LLITM report, there is a forecast increase in households of 6,100 within Melton Borough from 2008 to 2026, with around 3,350 of those within Melton Mowbray, excluding either of the development options tested (see Table 3.2).

This increase in households results in an increase in highway demand produced within Melton Borough and Melton Mowbray. Non-freight person highway demand is forecast to increase by 23% across the Borough, and by 30% within Melton Mowbray (see Table 4.2). This results in an increase of vehicle-kms (an indicator of traffic) of between 20% and 30% depending on the time of day (see Tables 4.3 to 4.5).

With the inclusion of one of the two development options tested, there is a forecast increase in households across the borough of around 450 in 2026. At the development sites themselves, the increase in households is around 1,000 households suggesting that some of these households would be located elsewhere in the borough if the development does not go ahead (see Section 3.2.2 and 3.3.2).

In each development option, the level of highway demand is forecast to increase across Melton Borough as a whole, by between 1.2% and 1.3% (see Table 4.6). There is a forecast reduction in highway productions within Melton Mowbray with the introduction of the development options, but this excludes the development sites themselves and reflects the moving of households to the developments.

In both development options, this increase in households results in around a 0.3% increase in vehicle-kms across the borough. In terms of vehicle-kms within Melton Mowbray, the development to the south of Melton Mowbray, Option 1, results in an increase in vehicle-kms within Melton Mowbray of around 0.5%, with Option 2 development to the north resulting in an increase of around 1.5%.

- *nothing in the document suggests any relief from the current plight experienced by Kirby Bellars residents with regard to traffic on the A607, and which we believe will increase with the proposed development, particularly as rural bus services appear to be in decline.*

The purpose of the transport modelling exercise was to understand what the impact of development options on the transport network within the borough and to identify what infrastructure may be necessary to reduce the impact of the development strategies modelled. Section 4.1.1 of the report forecasts growth in demand for transport in the future year of 2026 without any strategic development. The model forecasts a growth of 23% in demand for transport in the borough in the future year of 2026. Tables 5.1 and 5.9 identify the impact that the development options would have on top of this background growth in demand, which would appear to be 1.3% in the Borough with either of the development options and without any link roads. These may increase by approximately a further 0.4% with the introduction of all links 1 – 9.