

Discussion Note

Date	20 May 2015	Job No	W612001
Present		Subject	Carlisle Local Plan and Modelling Review

Introduction

JMP Consultants Ltd [JMP] has been commissioned by Highways England to review the Carlisle District Local Plan 2015 – 2030 Proposed Submission Draft document [The Draft Local Plan]. In addition two supporting modelling reports which make up part of the Draft Local Plan evidence base are to be reviewed. The modelling reports consist of the Carlisle Local Plan Modelling Report [CLPMR] and the Carlisle Transport Improvements Study [CTIS]. The reviews have been commissioned to ensure that the Local Plan and its evidence base is fit for purpose and that the potential impact of proposed land allocations on the Strategic Road Network [SRN] are accounted for and mitigated, as appropriate.

JMP has previously provided advice to Highways England as the former Highways Agency on the Carlisle Local Plan Preferred Options report and the Draft Infrastructure Delivery Plan in July 2014. JMP noted that Local Plan proposals have the potential to impact on M6 Junctions 42-44 as well as the A69. It should be noted that throughout the various iterations the Draft Local Plan has gone through to this point, the former Highways Agency consistently requested information on the transport modelling undertaken and offered its assistance. Despite these numerous requests over a period of months, the modelling work is now completed. This is the first time Carlisle City Council has issued modelling information for review.

This note firstly provides a review of the Draft Local Plan. Following this a review of the modelling reports is provided. Finally in the third section conclusions and recommendations are provided.

Discussion Note

Date 20 May 2015

Job No W612001

Present

Subject Carlisle Local Plan and Modelling
Review

1 Draft Local Plan Review

BACKGROUND

JMP Consultants Ltd [JMP], in their capacity as call-off Consultants to Highways England, has been commissioned to undertake a review of the Carlisle District Local Plan 2015 – 2030 Proposed Submission Draft document February 2015 [the Local Plan]. The review is required to identify any implications of the proposals on the safe and efficient operation of the strategic road network [SRN]; and in particular any impact on the M6, Junctions 42-44 and the A69.

Preparation of the Local Plan has been ongoing since 2010. Most recently in June 2014, JMP commented on the Preferred Options Stage Two document and Infrastructure Delivery Plan.

In this note firstly a review of the Local Plan is provided, followed by commentary on outstanding matters from the review of the Preferred Options Stage Two document of July 2014.

CARLISLE DISTRICT LOCAL PLAN (2015-2030) REVIEW

JMP has reviewed the Carlisle District Local Plan (2015- 2030) and identified the key issues arising from Highways England's perspective including some amendments to the Local Plan since the last consultation document draft.

Policy SP2 Strategic Growth and Distribution

The Local Plan states an aspiration to deliver an annualised average of at least 565 net new homes between 2015 and 2030, 70% located in the urban area of Carlisle, and 30% in the rural area. This is a total of 8,475 dwellings over 15 years. This is a reduction from the previous draft of the plan of 665 dwellings per annum between 2015 and 2030 (9,975 dwellings).

Specific sites have been identified within the Local Plan alongside windfall developments to accommodate growth until 2025. Following 2025 all growth will be concentrated in the general area designated as 'Carlisle South' (more detail in the next section).

The Local Plan states that the focus for development will be within the urban area of Carlisle and locations which can maximise the benefits of Carlisle's highly accessible position in relation to the M6 Corridor.

Policy SP3 Broad Location for Growth: Carlisle South

Policy SP3 includes proposals for a major mixed-use urban extension, focusing on housing for Carlisle South, phased from 2025 onwards. As detailed in the Preferred Options Stage Two document, no detailed masterplanning has been undertaken to this point. Masterplanning will be undertaken in future to provide a framework for planning applications. 1,450 dwellings are proposed along with other unspecified mixed use development. It is noted however that for modelling purposes a development of 2,825 dwellings has been allowed for with 40,000m² of B1/B2/B8.

The Local Plan states that a southern relief road linking Junction 42 of the M6 with the southern end of A689 will be an integral part of the Masterplan. This was not proposed in the previous iteration of the Local Plan. No further detail is provided on the highway works required to provide this. JMP consider that Highways England would

Discussion Note

Date 20 May 2015

Job No W612001

Present

Subject Carlisle Local Plan and Modelling Review

welcome further discussions, particularly in relation to the proposed relief road and the potential impacts on Junction 42 of the M6.

Policy SP5 Strategic Connectivity

The key elements of this policy which will potentially impact on the SRN include;

- Promote economic growth and seek to attract new growing investment along the M6 corridor.
- A southern relief road linking Junction 42 of the M6 with the southern end of the A689 to serve the Carlisle South Strategic Location.

JMP considers that the strategic nature of the M6 could potentially be compromised by development near to the junction. Highways England would welcome further dialogue with Carlisle City Council on the potential impact of development on this corridor, Junction 42, and information detailing appropriate mitigation measures.

Policy EC1 Employment Land Allocations

The sites allocated for employment use have remained largely the same as the previous version of the Local Plan with a focus on releasing residual capacity at existing employment sites. The main operation of the employment sites will be B1 (Business), B2 (General Industrial) and B8 (Storage and Distribution) businesses.

The allocation of 45 Ha employment land at Kingmoor Park/Brunthill (37 Ha) for the development of B1/B2/B8 and land to the south west of Morton (8 Ha) for the development of a business park (B1 use) remains as per the previous consultation. It is noted that both these sites already largely have planning permission in some form for employment uses.

It is noted that land at Kingmoor Park Harker Estate, previously allocated for employment in the Preferred Options Stage Two document is no longer included in the Local Plan. This site was located immediately north of M6 Junction 44 and would possibly have had an impact there.

As raised previously with the Council, the Local Plan demonstrates an imbalance between strategic employment sites being concentrated in the north of Carlisle, close to Junction 44, and the urban population (and proposed urban extension) being located in the south, close to Junction 42. In previous responses, Highways England had suggested more mixed-use sites might be introduced in order to minimise the impact on the SRN.

Aspirations for Land at the Ministry of Defence [MOD] Longtown site are included in the Local Plan, this is likely to have impacts on M6 Junction 45. However, due to the model coverage, these have not been included as part of the transport modelling for the Carlisle Local Plan. However Highways England is already actively engaged with stakeholders (including Carlisle City Council planners) on issues in this location, and has commissioned a study of the potential impact of this development on the junction.

Policy HO1 Housing Strategy and Delivery

A total of 2,756 dwellings are proposed in Carlisle Urban areas, the proposed developments which are located close to the SRN are:

- U1 – Land to the south east of Junction 44 (217 units)
- U2 – Land north of California Road east of U 1 (200 units) (Junction 44)
- U10 – Land off Windsor Way (300 units) (Junction 44)
- R11- Kingmoor Park Harker Estate Junction 44 (300 units)
- U5 – Land between Carleton Road and Cumwhinton Road (204 units) (Junction 42)

Discussion Note

Date	20 May 2015	Job No	W612001
Present		Subject	Carlisle Local Plan and Modelling Review

- U18 – Land Opposite Rosehill Industrial Estate (Junction 43 and A69)
- U 20 – Durranhill Road (Junction 43 and A69)

It is noted that the following sites are no longer included in the local plan:

- CARL 13 Former Printworks, Newtown Industrial Estate
- CARL 15 Land off Tree Road south of Chertsey Mount,
- CARL 18 Land to rear of Hilltop Hotel, London Road/ Tree Road
- CARL 22 Land bounded by Hammonds Pond, Oaklands Drive and Durdar Road

These sites are comparatively remote from the SRN and are concentrated in Central and Southern Carlisle.

In rural Carlisle a total of 1,379 dwellings are proposed, the largest developments being located in Brampton (443 units) and the aforementioned R11 Harker site (300 units).

Policy IP SW8 Planning Obligations

The Local Plan states that the Infrastructure Delivery Plan will be used to identify the infrastructure, services and facilities that new development may be required to contribute to within the life of the Plan.

The March 2015 Infrastructure delivery plan identifies that improvements to M6 Junction 45 are a priority to improve links to the north of the District, facilitating the development of key sites such as MOD Longtown. Improvements between M6 Junction 42 and Wigton Road are also identified to facilitate 'Carlisle South'. No cost or detail of what the improvements will consist of is provided for either improvement.

Policy IP 7 - Carlisle Airport

The Plan states that, within the boundary of Carlisle Airport, development that is related to airport activities will be acceptable. In addition, enabling development that would facilitate ongoing or further operational development of the airport will be allowed. It is noted that in the modelling reports 38,000m² of B8 development is allowed for, although this is treated as committed development rather than development triggered by the Local Plan.

PREVIOUS COMMENTS ON THE EMERGING LOCAL PLAN

JMP reviewed the Preferred Options Stage Two document and Infrastructure Delivery Plan on behalf of Highways England in June 2014. Carlisle City Council (Carlisle CC) provided a response to Highways England's concerns raised as part of the review in September 2014.

The key concerns from Highway England's point of view following the review of the Preferred Options Stage Two document are summarised below with JMP's additional comments following the recent review of the Carlisle District Local Plan (2015-2030).

Infrastructure Delivery Plan

In September 2014 it was agreed between Highways England and Carlisle City Council that further work was required on the Infrastructure Delivery Plan with regards to determining the impact of the proposed district wide development allocations on the local highways network and on the SRN.

Discussion Note

Date	20 May 2015	Job No	W612001
Present		Subject	Carlisle Local Plan and Modelling Review

Following this, Highways England has not been involved or consulted on the modelling work undertaken to assess the transport impact of the Local Plan. Only at the end of the modelling process has Highways England been consulted.

Operational Assessments of the SRN

It was confirmed by Carlisle City Council that transport modelling of the network was underway using the Carlisle SATURN model, which covered the Carlisle area. In July, Highways England received the first model report (April 2014) for review. The report primarily constituted of a methodology for undertaking the assessment. The Council stated that a 'second run' of the model would be conducted showing more detailed modelling at known pressure points within the network. It was agreed that Highways England would be engaged at an early stage to look at any large scale housing and employment developments close to the SRN as part of the modelling process.

Highways England requested the opportunity to provide comments on the modelling parameters used and to review the modelling approach, as well as the details of traffic generation and distribution. However, until this point, with the issue of the Modelling Report in April 2015 when the modelling exercise had been completed, no new information was provided by Carlisle City Council. Highways England's last input into the modelling process was to approve 'in principle' the methodology proposed to develop the SATURN model.

Carlisle South Masterplan

It was acknowledged by the Council that Highways England should be involved in the development of the Masterplan from an early stage. Highways England requested to be informed of the extent of assessment of the Masterplan and development scenarios.

It is clear from the latest version of the Local Plan that detailed masterplanning of Carlisle South has not yet been undertaken. Highways England would welcome consultation on this as it develops so that impact on the SRN is mitigated.

Airport proposals

It was confirmed by the Council that the Local Plan is not proposing a specific Strategic Location at the airport, but instead seeks to put in place a framework should proposals emerge over the lifetime of the plan. Highways England requested to be kept abreast of the proposals in this area as and when they develop.

Highways England would welcome continued consultation on any future proposals on the airport.

Ministry Of Defence Land – M6 Junction 45

The Council confirmed that the release of 120Ha of land at MoD Longtown had started and that given the proximity to Junction 45 of the M6 further discussions with Highways England may need to take place.

It is noted that Junction 45 has not been included in the Carlisle District Local Plan model assessments. JMP acknowledge however, that Highways England are aware of the relationship of Land at MoD Longtown and the proposals for Junction 45 of the M6, and is actively engaged with the cross-border group assessing traffic issues and options in the Gretna area, on which Cumbria CC and Carlisle City Council are also represented.

Discussion Note

Date	20 May 2015	Job No	W612001
Present		Subject	Carlisle Local Plan and Modelling Review

2 Modelling Report Reviews

In this section firstly a review of the Carlisle District Local Plan Modelling Report is provided. JMP has requested additional SATURN outputs information from Cumbria County Council, a review of this information follows this. Finally a review of the Transport Improvement Study undertaken by Parsons Brinckerhoff is provided.

CARLISLE DISTRICT LOCAL PLAN MODELLING REPORT REVIEW

The document provides a broad overview of Carlisle's SATURN modelling methodology. Following this the results of the future year assessments are provided. It should be noted that the focus of this analysis is the local road network, and only very brief details are provided of the impact on the SRN. For this reason JMP has requested additional information from Carlisle on traffic increases on the SRN and changes in RFC (ratio of flow to capacity) at the SRN junctions assessed (M6 Junctions 42, 43 and 44).

Model Overview

The base model was updated from a 2008 base to create a new 2013 base model which includes the Carlisle Northern Development Route. Both highway network and travel demand were updated with traffic counts used to validate the model. There is no detail to explain how the travel demand was updated, whether fresh survey data was collected or the matrix was updated through matrix estimation. No information is provided on how well the model validates. A reference is made to the Local Model Validation Report which would provide this information, however we have not been provided with a copy.

The study considers two future years, 2025 and 2030 in line with plan period which is consistent with other studies. Three scenarios are considered:

- 2025 Base (Scenario 1)
- 2025 Local Plan without Carlisle South (Scenario 2)
- 2030 Local Plan with Carlisle South (Scenario 3)

Scenario 1 includes background growth, committed and more than likely developments which are consistent with typical core case assumptions. Scenarios 2 and 3 add in the Local Plan demand data as per the approach discussed above.

The South Carlisle development is included in Scenario 3 only, due to the intention that it be developed only beyond 2025. As masterplanning of this area has not been undertaken, development assumptions are simplistic.

Traffic Generation Review

Traffic generation and distribution is estimated and included in the model. Trip generation values were generated using TRICS, with a synthetic gravity model to determine the distribution of the trips. Trips were disaggregated by trip purpose using data from the National Trip End Model, however no details are provided so it is not possible to comment on the split by trip purpose. Consideration has been given to the proportion of trips classed as 'pass-by', 'linked' and 'reassigned'.

JMP has undertaken a sensitivity test to ensure that the trip rates used are robust.

Discussion Note

Date 20 May 2015

Job No W612001

Present

Subject Carlisle Local Plan and Modelling Review

Table 1 below highlights the trip rates used in the Modelling Report for land uses with the greatest likelihood to impact on the operation of the SRN, and the comparative trip rates generated by JMP as part of a sensitivity test.

Table 1 Comparison between CLPMR trip rates and JMP sensitivity test trip rates

		AM (08:00-09:00)	PM (17:00-18:00)
Business Park	CLPMR	1.714	1.262
	JMP	1.550	1.169
Food Superstore (Edge of Town)	CLPMR	5.022	10.677
	JMP	4.740	10.006
Hotel	CLPMR	0.412	0.340
	JMP	0.441	0.349
Houses Privately Owned (City)	CLPMR	0.567	0.628
	JMP	0.518	0.554
Houses Privately Owned (Rural)	CLPMR	0.575	0.604
	JMP	0.577	0.576
Industrial Estate (B2)	CLPMR	0.959	0.814
	JMP	0.820	0.783
Industrial Estate (B2/B8)	CLPMR	0.609	0.411
	JMP	0.547	0.395
Retail Park (Excluding Food)	CLPMR	0.791	3.537
	JMP	0.185	0.265
Warehousing (Commercial)	CLPMR	0.130	0.110
	JMP	0.147	0.102

The primary land use with a higher trip rate identified through the JMP sensitivity test than that used in the CCC modelling is 'Hotel'. The trip rate in the CLPMR did not differentiate between city centre and edge of town sites, and therefore the JMP sensitivity test has undertaken this approach to achieve more robust trip rates.

Trip generation for one edge of town site is affected by this (Kingmoor Hub). After applying trip rates obtained from the JMP sensitivity test to this site, it is calculated that in total, across both peak periods, there are 5 extra trips associated with Kingmoor Hub in comparison to the CLPMR trip generation. It can be concluded that this will not adversely impact on the operation of the SRN.

The other land use with a higher trip rate identified in the JMP sensitivity test is 'Warehousing (Commercial)'. The AM trip rate is 13% higher than the rate used in the CLPMR, although it should be noted that the PM trip rate is 8% lower than the CLPMR equivalent.

Trip generation for two sites (Carlisle Airport and Former Baxter Site, Kingmoor) was recalculated using 'Warehousing (Commercial)' trip rates. After applying trip rates obtained from the JMP sensitivity test to these sites, it is identified that in total across both peak periods, there are 4 extra trips associated with Carlisle Airport and 1 less trip associated with Former Baxter Site, Kingmoor in comparison to the CLPMR trip generation. It can be concluded that this will not adversely impact on the operation of the SRN.

Discussion Note

Date	20 May 2015	Job No	W612001
Present		Subject	Carlisle Local Plan and Modelling Review

It should be noted that the 'Retail Park (Excluding Food)' trip rates are substantially higher in the CLPMR as weekend surveys were included in the trip rate calculations. Although this is not best practice, the trip rates can be considered extremely robust for calculating trips during weekday peak periods.

The CLPMR trip rates for both 'Houses Privately Owned (City)' and 'Houses Privately Owned (Rural)' included edge of town sites. Despite this, in comparison to the JMP sensitivity test trip rates the CLPMR trip rates are on the whole, robust.

It is noted that two non-food retail sites with associated multi-storey parking are assessed using a pre-calculated car park trip rate rather than a 'Retail Park (Excluding Food)' trip rate. However, considering that the CLPMR 'Retail Park (Excluding Food)' trip rates include Saturday surveys and are therefore very robust, the trip generation provided in the CLPMR for these sites is considered to be acceptable.

Traffic Generation Review Conclusion

In general, the trip rates used in the CLPMR are considered to be robust, and in instances where the trip rates from the JMP sensitivity test are higher, the additional trips generated will not adversely impact on the operation of the SRN.

However, the CLPMR indicates that the Kingmoor Brunthill site is not expected to generate any additional trips, with assumptions based on the original outline applications. Although the CLPMR trip rates for 'Business Park' and 'Industrial Estate (B2/B8)' were considered to be robust, the site is a significant size (112,600sqm) and the location of the site is in close proximity to M6 Junction 44. JMP therefore requires further information to determine whether the approach taken for this site is acceptable.

Detailed Comments

Matrix furnishing was applied to the forecast matrices to constrain trip totals for each of the Local Plan developments. This is an accepted practice typical of this process.

Fixed demand principles have been applied to determine the impacts of the proposed development in the Local Plan. This is appropriate at this stage of assessment. However should further work follow leading to funding bids this will need to be reviewed and re-submitted allowing for variable demand.

For this assessment only the core scenario has been considered. As the purpose of this report is to determine the impact of the Local Plan should it all be built out, this is appropriate at this stage.

TEMPRO forecasts were adjusted using the alternative planning assumptions, constraining the growth to TEMPRO in line with WebTAG guidance. Growth factors for LGVs and HGVs were generated using NTM (National Transport Model). Fuel and income adjustment factors were calculated in line with WebTAG guidance.

Model outputs were analysed including traffic flows, queues, delays and RFCs.

Cumulative highway improvements have been tested in the model and are tested in Scenarios 2 and 3. As variable demand has not been modelled an alternative fixed demand matrix has been created assuming a 5% reduction in car trips as a result of sustainable transport improvements.

Some assessment has been undertaken on the impact of the junctions on the SRN. Ratio of flow to capacity (RFC) values indicate that by 2030, with Carlisle South, both junction 42 and 44 will have RFC values exceeding 0.95 (close to capacity), with Junction 42 exceeding 1 (over capacity) on the southern A6 approach arm. With the mitigation measures proposed on the local road network also in place, both highway and sustainable options RFC values are forecast to improve on some arms and increase on others.

Discussion Note

Date	20 May 2015	Job No	W612001
Present		Subject	Carlisle Local Plan and Modelling Review

Only limited information is provided for impact at Junctions 42 and 44, no information is provided at all for Junction 43.

Increased journey times along London Road (the A6 towards Junction 42), and increasing RFC values on surrounding junctions potentially being used as diversion routes indicate that the Local Plan developments have the potential to have quite significant impacts on the traffic flow in the vicinity of Junction 42. However, as model outputs have not been presented it is not possible to analyse the impact on the M6 mainline itself.

RFC values and journey times are forecast to increase at the junctions along Warwick Road (A69 towards Junction 43). Junctions close to the M6 are forecast to be over capacity, although no consideration has been given to the impact of blocking back onto the M6. No analysis of the impact on the A69 east of Junction 43 has been undertaken.

The sustainable transport mitigation measures are stated to reduce the overall number of junctions operating over capacity. However, no justification is presented in this report to support that the statement that a 5% reduction in fixed demand across the board is a realistic value; nor is any account taken of **which** trips might transfer to public transport, whether it is more likely to be those wholly within the urban area, or those on arterial routes (such as A6, A7 and A69) which pass through the SRN junctions, since no pattern of improved sustainable transport is stated..

Average journey speeds are forecast to decrease for all scenarios when compared to the 2013 base situation. This corresponds with increased journey times along those routes.

SATURN flow difference plots have not been presented, neither has tabulated flow differences.

Model Review Conclusions

In summary the process undertaken to assess the impact of the Local Plan allocations on the highway network follows WebTAG guidance. The growth is based on an updated 2013 SATURN model which is stated to be validated. However, no evidence is presented in this report to support this statement. This information would be expected to be contained in an LMVR and this has not been provided to JMP for review.

Some consideration of the impact on the M6 J42 and J44 and A69 has been analysed, however this information is limited and from the results presented, indicates that there may be a significant impact on the junctions which require further investigation. The impacts of the Local Plan on the A69 and Junction 43 have not been considered.

SATURN outputs have not been presented so no comments can be made on the area of impact of the Local Plan trips and the impact that they have on the M6 and A69. Hence, further detailed information was requested.

CARLISLE SATURN MODEL OUTPUT REVIEW

Cumbria County Council (on Carlisle's behalf) has provided traffic flow and RFC (Ratio of Flow to Capacity) information for Scenarios, 1, 2 and 3 model runs. This information is summarised in Table 2 below. RFC values for the worst performing junction arm stated. For reference each scenario contains the following:

- 2025 Base (Scenario 1)
- 2025 Local Plan without Carlisle South (Scenario 2)
- 2030 Local Plan with Carlisle South (Scenario 3)

Discussion Note

Date 20 May 2015

Job No W612001

Present

Subject Carlisle Local Plan and Modelling Review

Table 2 Traffic Flow and RFC SATURN Data

			Scenario 1		Scenario 2		Scenario 3	
	2013 Base		2025 Base		2025 LP		2030 LP + CS	
	AM	PM	AM	PM	AM	PM	AM	PM
M6 J42 flow	1849	1843	2447	2614	2677	2912	3629	3800
RFC	0.54	0.44	0.71	0.66	0.77	0.73	1.09	1.10
M6 J43 flow	2542	2632	3151	3222	3372	3358	3738	3628
RFC	0.51	0.60	0.71	0.76	0.76	0.79	0.85	0.85
M6 J44 flow	3748	3827	4789	4946	5331	5400	6007	5951
RFC	0.73	0.87	0.63	0.78	0.72	0.94	0.8	0.95

It should be noted that an RFC value of 0.9 or above typically indicates that a junction is operating unsatisfactorily. At M62 Junction 42 in the 2025 base situation (Scenario 1) the junction operates below this RFC threshold. Local Plan traffic in 2025 adds 200 vehicles to the junction in the morning peak and 300 vehicles in the evening peak (Scenario 2) however RFC values remain below 0.9. For Scenario 3 however with Carlisle South traffic added the junction operates over capacity. Carlisle South and traffic growth between 2025 and 2030 adds a further 1000 vehicles in the morning peak and 900 in the evening peak. JMP considers that the information provided indicates that with the Carlisle South development in place M6 Junction 42 will suffer from congestion and delay. Junction 42 is the closest SRN junction to Carlisle South.

For M6 Junction 43 the Saturn output indicates that RFC thresholds will not exceed 0.9 in all scenarios. The Local Plan developments in 2025 (Scenario 2) will increase traffic flow by 200 vehicles in the morning peak and 100 in the evening peak beyond the 2025 base (Scenario 1). In 2030 with growth and Carlisle South traffic, vehicles at the junction will increase by 350 vehicles in the morning peak and 300 in the evening peak.

For M6 Junction 44, the junction is predicted to operate within capacity for Scenarios 1 and 2. Development traffic from the Local Plan is predicted to lead to an increase of 550 vehicles in the morning peak and 450 in the evening peak in 2025. In 2030 with Carlisle South added in 2030, 650 additional vehicles will travel through the junction in the morning peak and 550 additional vehicles beyond 2025 (Scenario 2). JMP would query these results, as with such significant increases in traffic at this junction we would expect more severe worsening of junction performance in this scenario. Furthermore the data provided indicated that the junction will operate better in 2013 than in 2025 when over 1000 more vehicles will travel through the junction.

Model Output Conclusions

JMP considers that the results indicate the Carlisle South development could potentially have a severe impact on Junction 42. No mitigation has been identified for this junction, and this will need to be developed during the Masterplanning process for the Carlisle South development..

For Junction 43 although the assessment indicates that the junction will operate satisfactorily, the 0.85 RFC value obtained is close to the 0.9 RFC threshold. Moreover results from the modelling report indicate that queuing issues may materialise on the A69 in future years which could impact on the operation of this junction. This will therefore need to be kept under review, especially in the light of the conclusion of the Transport Improvement Study below.

Discussion Note

Date	20 May 2015	Job No	W612001
Present		Subject	Carlisle Local Plan and Modelling Review

JMP queries the results of the modelling of Junction 44. Significant increases in traffic seem to result in disproportionate increases in RFC, though no mitigation is proposed nor taken into account. Moreover the 2013 base is predicted to operate worse than the 2025 forecast, which suggests an anomaly in the SATURN model.

TRANSPORT IMPROVEMENTS STUDY REVIEW

Parsons Brinckerhoff was commissioned by Cumbria County Council to undertake a transport improvements study for Carlisle to mitigate the impact of the proposed Carlisle District Local Plan land allocations for the period 2015–2030. The study focuses on the local road network. Impact on the SRN and potential mitigation at the Junctions of the M6 and on the A69 was not considered in the study.

The performance of junctions on key corridors into Carlisle is analysed. These corridors have been identified as in need of mitigation from the results of SATURN modelling. These include A7 Scotland Road (part of route to M6 Junction 44 to the north), A69 Warwick Road (part of route to Junction 43 to the east) and A6 London Road to the south (part of route to junction 42 to the south).

The study areas for the Scotland Road and London Road corridors are relatively remote from the SRN. The northern limit of the Scotland Road study is 2km from the M6 Junction 44. The southern limit of the London Road study is 3.5km from Junction 42. The Warwick Road corridor study area however is located in proximity to Junction 43. The Warwick Road / Montgomery Way junction is 0.5km from Junction 43, the Eastern Way junction is some 800m away.

The study reveals that with the Local Plan in place in 2025, the Montgomery Way junction will operate over capacity at 150% saturation for the 2025 and 2030 assessment years with queues of over 100 vehicles. Queues of this length would potentially impact on the operation of Junction 43. Junction improvements have been identified in the form of widening in the westbound direction. The model results with the improvements in place still show the junction operating over capacity although to a lesser extent with a maximum 'Degree of Saturation' [explain in footnote] of 115% and a queue of 57 vehicles.

For the Eastern Road junction, this is predicted to operate at 99% RFC in 2030 with the Local Plan in place with queuing of 50 vehicles. Improvements are proposed at this junction in the form of an additional lane for westbound traffic. The changes result in an improvement to the modelling results however the junction continues to operate close to 100% at 97% in 2030.

Given the potential impact of the Local Plan on this corridor and the interaction that this will have on M6 Junction 43 we consider that Highways England should be consulted on any improvements to this corridor. JMP recommends that the corridor should be modelled in VISSIM so that the impact on the corridor and interaction with Junction 43 can be understood.

Discussion Note

Date 20 May 2015

Job No W612001

Present

Subject Carlisle Local Plan and Modelling
Review

3 Conclusions and Recommendations

JMP has reviewed the latest Carlisle District Local Plan 2015 – 2030 Proposed Submission Draft document [The Draft Local Plan]. In addition two supporting modelling reports which make up part of the Draft Local Plan evidence base have been reviewed. The modelling reports consist of the Carlisle Local Plan Modelling Report [CLPMR] and the Carlisle Transport Improvements Study [CTIS]. Our conclusions and recommendations following the review are set out in this section.

The Local Plan states an aspiration to deliver an annualised average of at least 565 net new homes between 2015 and 2030, 70% located in the urban area of Carlisle, and 30% in the rural area. This is a total of 8,475 dwellings over 15 years. This is a reduction from the previous 665 dwellings per annum between 2015 and 2030 (9, 975 dwellings).

The sites allocated for employment use remain largely the same as the previous version of the Local Plan with a focus on releasing residual capacity at existing employment sites. The main operation of the employment sites will be B1 (Business), B2 (General Industrial) and B8 (Storage and Distribution) businesses. It is noted that the land at Kingmoor Park Harker Estate, previously allocated for employment in the Preferred Options Stage Two document is no longer included in the Local Plan. This site was located immediately north of M6 Junction 44 and would possibly have had an impact here.

It is acknowledged that aspirations for Land at the Ministry of Defence Longtown site are included in the Local Plan, the impacts on M6 Junction 45 have not been included as part of the transport modelling for the Carlisle Local Plan. However JMP is aware that Highways England is actively engaged and has commissioned a study of the potential impact of this development on the junction.

The 'Carlisle South' major mixed use urban extension and the proposed southern relief road which will link M6 Junction 42 and the A689 will have a significant impact on the SRN. Masterplanning of the site and design of the highway works required to accommodate the development has not yet been undertaken. JMP considers that Highways England should be consulted throughout this process. The modelling prepared by Carlisle indicates that the impact at Junction 43 will be severe.

JMP is not able to comment on the suitability or validation of the Carlisle SATURN Model as no validation report has been provided for review. At the request of JMP additional SATURN information detailing impact at SRN junctions has been provided. The information indicates that, with Carlisle South development, impact of the Local Plan at M6 Junction 22 will be severe. JMP has concerns on the impact assessment provided for Junction 44. The junction operates better in the future assessment years than the base years. Furthermore, despite changes in traffic brought about by the Local Plan of over 2000 vehicles between the 2013 base year the and future years, junction performance does not deteriorate proportionally. We will comment further once clarification is received.

The SATURN modelling reveals congestion and delay issues for the A69 Warwick Road corridor. Improvements are identified for this however with these improvements in place the corridor still experiences delay and queuing. Queuing and delay here could impact on the operation of M6 Junction 43. JMP considers that Highways England should continue to be consulted on proposed improvements here. JMP considers that the corridor should be modelled in VISSIM to better understand Local Plan impact and the interaction of the corridor junctions.

Name/ Signed Kevin Blakey

**Discussion
Note**

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Present		Subject	Carlisle Local Plan and Modelling Review