

A66 Northern Trans-Pennine DCO - Principal Areas of Disagreement Summary Statement of Westmorland and Furness Council at Deadline 7, 9th May 2023

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Junction Capacity at M6 J40, Penrith	<p>There is a key concern that the Project will worsen current congestion issues in Penrith, especially because Junction 40 of the M6 does not see any significant capacity improvements from the Project, yet will need to handle significantly more traffic. The Council therefore expects the Applicant to undertake further reviews of the Project designs and look to increase the capacity of this junction. The Council is not satisfied that Junction 40 of the M6 has adequate capacity to manage traffic flows at peak times and on Fridays resulting in congestion and delays to local journeys. Following completion of the Project, the Applicant's traffic model shows that traffic levels at this junction will grow with the potential for adverse impacts upon local residents, visitors, businesses alongside long distance travellers.</p>	<p>The Council needs to be provided with the opportunity to review the traffic modelling and traffic forecasts. The Council and the Applicant need to discuss further the modelling and reach agreement on the approach, which informs the suitability of the junction design and road capacity (see also Traffic Flows and Modelling below)</p>	<p>The Applicant has yet to provide the Council with the completed operational models, validated to relevant accepted standards, which cover Junction 40 of the M6 and Kemplay Bank. Given the interactions between the junctions for traffic and queuing, it has been difficult for the Applicant's consultants to replicate current conditions, particularly on a Friday.</p> <p>The Council awaits further information that shows the base year models to be valid representations of current conditions and the forecast year models that show how the junction is expected to cope with the additional background and Project related traffic growth. This information needs to cover both the infrastructure changes, assumed lane designations and operation of signals, which are shown to be critical from early demonstrations of the operational model.</p> <p>Overall, the Council is still concerned that the designs of the roundabouts at Junction 40 and Kemplay Bank do not provide sufficient capacity for the additional traffic predicted for the A66 and for the existing congestion and queuing to be improved, especially on Fridays throughout the year. Of most concern is the operation of Junction 40 for westbound traffic if Kemplay Bank is grade-separated and as such more traffic can arrive at the M6 junction unimpeded, but the roundabout itself is relatively unchanged.</p>	<p>Operation of Junction 40</p> <p>The Council welcomes the additional modelling undertaken, both in microsimulation software VISSIM, and junction signal software LinSig, to help inform the understanding of the potential impacts. This additional evidence was provided to the Council in April and has been reviewed in detail.</p> <p>Following the review to date, the Council is more confident that the proposed design will cope with the forecasted traffic growth to an acceptable level. The Vissim modelling results show reductions in traffic queuing compared to the without scheme option, and the LinSig shows that the junction can operate with the expected flows in 2044.</p> <p>There are some outstanding issues identified that require resolution both to 1) provide further confidence that the proposed Scheme operates efficiently and safely for all modes, and 2) to improve the design evolution process of the Proposed Scheme itself so that the signal control at M6 J40 and Kemplay Bank is optimised. The Council has set out a detailed breakdown of these issues in a Technical Note Issued to the Applicant on 18th April 2023 in Appendix A to C.</p> <p>The main issues from this Technical Note were discussed with the Applicant and Arup on 17th April 2023, and it was agreed that the issues in this Technical Note would be reviewed, with commentary to be provided in response to the issues set out in Appendix A-C before the end of the Examination so that the Council can record their expectation for further refinements to the design during the Detailed Design process post Examination.</p> <p>The Applicant has responded to these issues and the Council now has a record of the design elements that require development post Examination which are contained in two Technical Notes submitted alongside the Council's Covering Letter at Deadline 7:</p> <ol style="list-style-type: none"> 1. A66 Traffic Modelling Review Technical Note - Response from the Applicant 27.04.23; and 2. A66 Traffic Modelling Council's Review of Applicant Responses Technical Note 04.05.23 <p>The Council recommends that the speed limit on the M6 J40 is 30mph.</p>	<p>The parties agree that this concern is resolvable subject to the Council's agreement with the detailed design development post DCO Examination.</p> <p>The further areas requiring development are contained in two Technical Notes submitted alongside the Council's Covering Letter at Deadline 7:</p> <ol style="list-style-type: none"> 1. A66 Traffic Modelling Review Technical Note - Response from the Applicant 27.04.23; and 2. A66 Traffic Modelling Council's Review of Applicant Responses Technical Note 04.05.23

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Wetheriggs Country Park, Penrith	<p>Wetheriggs Country Park & Ullswater Playing fields - proposals include land take within the park and playing fields, as well as significant loss of mature trees that currently provide visual screening to the park and the residential properties on Clifford Road, including The Crescent retirement home (sheltered housing). The proposals will result in an increase in noise, effects on biodiversity, drainage and the overall country park environment. The Project does not meet the requirements of para.5.166 of the NPS NN and playing fields are an important community asset.</p>	<p>The land take in this section of the A66 seems to be largely for the cyclepath although it is understood a service corridor will be required along a section at the western and eastern ends. The Council considers there is an opportunity to redirect the cyclepath through the park to minimise the loss of the trees. Engagement with the Council and key stakeholders including Sport England and the Ullswater Community College (whose land is also affected by the proposed land take at Kemplay Bank roundabout) to agree a more holistic solution.</p>	<p>Funding is being provided by the Applicant to allow the Council to prepare a masterplan for Wetheriggs Country Park to include options for redirecting part of the cycleway. The Council and the Applicant are working collaboratively with initial options having been developed. Consultation with key stakeholders including Sport England, Ullswater Community College and the North Lakes Hotel will be undertaken to agree an alternative route for the cyclepath and other enhancement measures. Resolution of this issue will be dependent on the Applicant agreeing to implement the recommended masterplan option for changes to the cycleway route within the order limits. It is understood that the Applicant has secured money from their Environmental designated fund for works required outside the order limits.</p>	<p>In order that the current order limits and proposed design, as it relates to the country park, is acceptable the Council needs to be reassured that the Country Park /public open space can continue to function and provide an equivalent facility for local residents.</p> <p>To do this the Applicant needs to ensure that:</p> <ul style="list-style-type: none"> - the tree belt between the road and the park to be retained or as far as possible and replacement tree planting provided/ replaced as early as possible. Without this the attractiveness of the location to users is severely damaged; - replacement and retention of the tree belt should take into account the impact on residential properties including the sensitive receptor of the adjoining sheltered housing; - the existing sports facilities need to be able to continue at similar quality including space around the sports pitches; - the noise impact on the park minimised so that its current role as a peaceful oasis between the residential area and the well screened road is not destroyed; - the drainage on the lower part of the park is resolved as part of the works as it would be difficult to do at any other time; - that sufficient replacement open space land is provided of at least equivalent quality; and - that both the capital and ongoing maintenance costs of achieving the alterations to this area will be met by the Applicant. <p>The Council believes that the existing proposal to provide the cycleway along the side of the A66 is not a good solution for its users or for the impact of land take from Wetheriggs Country park. The potential to bring the Cycleway within the Country park away from the road should be explored.</p> <p>To achieve this the Council is collaborating with the Applicant to produce the best possible arrangement for the Country Park. The Council and the Applicant are working on a master plan that sets this out and upon which agreement can be reached. This work is well advanced and a preferred option is now being discussed with the relevant parties.</p> <p>The Country Park itself is outside the Order limits and many of the changes and the work required to make the land take and design of the A66 acceptable are outside the Order limits. However, unless they are</p>	<p>The Country Park itself is outside of the order limits. Many of the changes and the work required to make the land take and design of the A66 acceptable are outside the order limits. However, unless they are carried out the current A66 design proposals in relation to the park are unacceptable to the Council.</p> <p>This matter can be resolved provided the Applicant commits to funding the delivery of the masterplan in a Legal Side Agreement</p>

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				<p>carried out the current A66 design proposals in relation to the park are unacceptable to the Council.</p> <p>The actions required to create an acceptable situation go beyond the DCO design itself. During the Examination process the Council would expect to receive a firm assurance through a legal side agreement that the additional proposals related to the park will be delivered where part of the Project Design and, where they are not they will be fully funded by the Applicant. This would make the DCO proposals in this locality acceptable.</p>	
Impact upon Skirsgill Depot, Penrith	<p>The congestion at the Skirsgill Depot entrance as a consequence of capacity issues at M6 Junction 40 and Kemplay Bank. Also concern that traffic leaving the Skirsgill Depot will struggle to manoeuvre to the outside lane of the westbound carriageway in order to turn right at the M6 J40 roundabout towards Penrith or Kemplay Bank. Adequacy of junction to provide access to allocated local plan employment site.</p>	<p>The vehicular access to the depot from the M6 slip road needs to be retained to enable operational access from the west – this has now been agreed by the Applicant. Further consideration of movements in and out of the depot onto the A66 is still required in conjunction with modelling work. The Applicant needs to demonstrate that the junction is suitable to serve the future employment site as well as the depot itself. The final design solution needs to be agreed to the satisfaction of the Council.</p>	<p>The results of the September 2022 traffic survey were shared with the Council at meetings with the Applicant on 16/01/23, 16/02/23 and 09/03/23. Modelling work is still being refined by the Applicant and a further technical meeting will take place on 17/03/23. However, early indications suggest that existing congestion may not be addressed at Junction 40, particularly on the Friday pm peak. There is likely to be a 50% reduction in traffic using the Kemplay Bank Roundabout which may reduce queuing on the A66 back to Junction 40. The remaining 50% of the traffic will go under the Kemplay Bank Roundabout on the new dual carriageway. It may be that alterations to the traffic signal phasing may improve the performance of Junction 40. Vissim modelling information is not yet available, so no further comments can be made at this stage.</p>	<p>Modelling of weaving impacts and the importance of the Road Safety Audit</p> <p>The most recent modelling provided by the Applicant (April 2023) of Junction 40 shows no blocking back to the proposed access for Skirsgill Depot. Therefore, the safety implications of the proposed design will be related mainly to the horizontal and vertical visibility for drivers on the mainline and accessing/egressing Skirsgill Depot. Therefore, we will rely on the outcome of the Road Safety Audit which will identify key concerns, and representatives from the Council request to be present on site when this is undertaken.</p> <p>Skirsgill Depot access</p> <p>There is a concern that the private means of access to be constructed by the Applicant to access the compound (currently employment land) will impact the Council's ability to access Skirsgill as an operational highways depot which needs to be available 24 hours per day, 7 days per week, 365 days per year. The Council is awaiting wording from the Applicant to be inserted into the side agreement to address this issue.</p>	<p>The parties agree that this will be reviewed during the Road Safety Audit of the Design</p> <p>Likely to be resolved subject to acceptable assurances being provided by the Applicant in the Side Agreement</p>
Junction capacity at Kemplay Bank, Penrith	<p>It would appear that, with limited detail on the consultation General Arrangement drawings there is only a single lane exit from A66 eastbound onto the A6 Kemplay roundabout. This is on the diversion route for traffic from the M6 when the M6 is closed either north or south of Junction 40.</p>	<p>Consideration should be given to providing 2 lanes rather than a single lane on the approach to this signal-controlled roundabout to help provide capacity and ensure resilience at this junction. The additional construction required (two 3.65m lanes plus 1m hard strip versus one 3.7m lane plus 3.3m hard shoulder) would be minimal and appears to present better value. This extra 0.4m of carriageway width appears to be deliverable within the red line boundary (RLB) and requires no additional land acquisition. Provision of a two-lane approach to the traffic signal-controlled roundabout, should also be considered for westbound A66 off slip on the opposite side of the roundabout. This too appears to be achievable within the order limits.</p>	<p>Initial sight of the Vissim modelling (shared on screen at the meeting of 16/02/23 held between the Applicant and the Council) showed the eastbound single lane exit as struggling to cope with the future year traffic and queues extending back onto the A66 mainline. (Please note that this is not an Examination document).</p> <p>Details of the future year traffic flows for different movements at the grade-separated roundabout need to be shared in order to satisfy the Council that the layout is appropriate to cope with every day traffic and that sufficient spare capacity is allowed for when diversions are in place for the M6 and A6 (Eamont Bridge during floods and other incidents).</p>	<p>Further Modelling</p> <p>See response to "Junction Capacity at M6 J40, Penrith"</p> <p>Changes proposed at Kemplay Bank</p> <p>Details of the impacts upon the walking and cycling routes through this junction with the proposed change are required. The Council still maintains that provision of a more direct route to travel across the junction is required for non-motorised users, and the MOVA design needs to accommodate this. Signalised crossings for pedestrians and cyclists must be provided.</p> <p>The Council has made previous representations that the 'on' slip roads to the roundabout should be two lanes to increase capacity.</p>	<p>Further Modelling</p> <p>See response to "Junction Capacity at M6 J40, Penrith"</p> <p>Changes proposed at Kemplay Bank</p> <p>Issues identified will need to be developed during detailed design, including the active travel route across the junction, the slip road lane allocations and the associated MOVA Signal Control improvements. Signal control of the pedestrian and cycle crossings at this is required.</p>

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Impact on local road network, Penrith	The Council is not satisfied that impacts on the local road network at Ullswater Road, Clifford Road and Eamont Bridge have been adequately assessed.	The Council believes that there is a need for review of more detailed outputs for local modelling to be undertaken, particularly on Ullswater Road, Eamont Bridge and Clifford Road. There is also a need for further sensitivity testing to evidence that the proposals will not have unacceptable impacts on the local road network.	Results of the September 2022 traffic surveys, being used to update the operational models, were shared with the Council on 16/01/23. Vissim modelling information is not yet available, so no further comments can be made at this stage.	<p>Further Modelling</p> <p>See response to "Junction Capacity at M6 J40, Penrith"</p> <p>Potential rat-running through Penrith Town Centre</p> <p>Following further assessment of future traffic routing in Penrith Town Centre and residential streets, it is unclear why there are increases in AADT along Wetheriggs Lane/Clifford Road which is a residential street. There does not appear to be equivalent reductions on Kilgour Street or Castle Hill Road.</p> <p>It is not currently known whether this is a misrepresentation of traffic flow caused by the limitations of the Strategic Transport Model and needs further explanation. As a consequence, additional traffic may more appropriately route via the main roads in Penrith, such as Ullswater Road, Victoria Road, and Castlegate, for which the latter is potentially a future AQMA site. Further explanation is sought on this issue, and any potential impacts this may have on the Air Quality assessment made to date.</p> <p>This issue is also more likely to be prominent during construction of the proposed Scheme and will need to be appropriately mitigated through the Construction Traffic Management Plan.</p> <p>It is therefore requested that future monitoring (both during construction and operation) of traffic flows through Penrith is undertaken, by ANPR or equivalent means, and appropriate mitigation is provided to reduce the potential impacts of this issue</p> <p>Eamont Bridge</p> <p>The design of MOVA Signals at Kemplay Bank will need to include Eamont Bridge Signals to ensure optimal performance on A6</p>	<p>Further Modelling</p> <p>See response to "Junction Capacity at M6 J40, Penrith"</p> <p>Potential rat-running through Penrith Town Centre</p> <p>The issue is unlikely to be resolved before the end of the Examination and needs to be addressed through future monitoring of traffic flows in Penrith, both during construction and operation.</p> <p>Eamont Bridge</p> <p>The design of MOVA Signals during detailed design (post Examination) at Kemplay Bank will need to include Eamont Bridge Signals to ensure optimal performance on A6</p>

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Detrunking (road and structures)	<p>Lack of detail in the draft DCO provisions as to what assets will transfer to the Council as a result of detrunking. The Council needs to be assured that the detrunking proposals are acceptable in respect of:</p> <ol style="list-style-type: none"> 1. Maintenance liabilities & maintenance boundaries per asset type; 2. The condition of the detrunked assets backed up with appropriate records and assessments; 3. The design suitability of the asset (appropriate to the proposed use); 4. The provision of funds to maintain the asset. <p>The Council's specialist has discussed the detailed records for all asset types and welcome the Applicant's proposal which is in line with the Council's principles document, Appendix A to the LIR [REP1-019].</p> <p>Principal outstanding items include Crackenthorpe Retaining Wall, a potential major maintenance liability that will not be accepted by the Council without a full understanding of the structure and assessment of risks and liabilities. Walk Mill High Bridge includes liability due to high alumina cement used in construction.</p> <p>The Council must not inherit a maintenance liability and must be funded appropriately to maintain the full suite of detrunked assets.</p>	<p>The Applicant and the Council must continue to work together to reach an agreed position on matters of principle and detail.</p> <p>The structures present a major risk to the Council and it will require specialist technical advice and potentially investigation to quantify the risks and liabilities which it will be required to take on. The process for addressing the concerns and (if agreed) providing a commuted sum to offset the risks through the DCO process needs to be signed up to by all parties through a side agreement.</p> <p>Any remedial works determined to be undertaken by the Council immediately after project completion, should be undertaken by the Applicant as part of the Project before hand over.</p> <p>Side agreements to be reached covering the de-trunking process and to include for the consequence of the Project to significantly increase the assets to be maintained by the Council should have a direct compensation and not be reliant on unsecured future funding strategies.</p>	<p>The Council's specialist has discussed the detailed records for Crackenthorpe and welcome the Applicant's proposal.</p> <p>The Council notes the Crackenthorpe bored pile wall and aged retaining wall must be resolved together.</p> <p>The Council has concerns about the high alumina cement content in the Walk Mill High structure. Certainty through additional testing and assessment to prove adequate condition of all assets is required before handover, otherwise the Applicant must retain asset ownership, as stated in their draft document included in the side agreement.</p> <p>The side agreement calculation for commuted sums payable to the Council should not include the requirement for the Council to undertake works immediately after the Project is complete.</p>	<p>The principle of the detrunking documents for each asset type (pavements, VRS, structures, drainage and other assets) need to be finalised, for inclusion in the Legal Side Agreement.</p>	<p>Signing of the Side Agreement by both parties.</p>
New Structures	<p>There is no design information relating to new structures, including bridges, culverts and retaining walls. The Applicant's Project Design Principles [REP3-040 & 041] does not contain the required level of detail. In the absence of such details the Council is not satisfied that designs will be acceptable or achieve satisfactory integration with the local road network. The Council has not had the opportunity to comment on or agree the design of new structures that will carry the local road network, WCH routes or ProW and which it may be asked to maintain.</p> <p>There is a need to ensure visual integration of structures to minimise impact.</p>	<p>Design detail needs to be provided by the Applicant to confirm acceptability in terms of accommodating the proposed usage, tie-in with existing structures, meeting non-trunk road functions, integrating with existing and proposed ProW, meeting the needs of users and ensuring safety.</p> <p>The impact upon remote structures needs to be assessed and any mitigation delivered through the DCO. The mechanism for jointly agreeing the design detail needs to be clarified and set out and the next iteration of the EMP/ PDP secured through the proposed draft DCO amends to Article 54 suggested by the ExA. New A66 structures designed in accordance with DMRB and the associated design, checking and approval processes will be acceptable to the Council if built and maintained by the Applicant. The Council needs to be consulted upon and agree the design of all structures that will carry its network in order to ensure that they are fit for purpose and acceptable. The designs must be suitable to accommodate the proposed usage and should seek to address existing problems and constraints.</p>		<p>It is acknowledged that new structures will be designed in accordance with DMRB. Design details are also expected to be in line with the Applicant's Project Design Principles document. The Council will rely upon the recent changes to Article 54 of the draft DCO to ensure that the quality of structures will follow good design principles and their form and choice of materials will take into account the sensitive landscape in which they are located.</p>	<p>Further engagement is required between the Council and the Applicant's principal designer and the Council must have the opportunity to review the outline Approval in Principle (AiP) documents when they are in development.</p>
New Structures and impact of those upon drainage	<p>At Warcop, the alteration to the viaduct across Moor Beck and Cringle Beck may provide improvements from a watercourse geomorphology perspective but they do not take account of local flood risk.</p>	<p>The watercourse crossing proposals need to be better linked with the Cumbria County Council (Environment Agency funded) Cumbria Innovative Flood Resilience Programme, which is proposing to install a range of natural flood management interventions in the Warcop area to reduce flood risk.</p>	<p>This is expected to be resolved through the detailed design discussions and the approval of the second iteration EMP. Still subject to approval of the flood model by the Environment Agency.</p>	<p>The position hasn't changed from Deadline 5.</p>	<p>Unlikely to be resolved by the end of the Examination.</p>

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Diversions and construction impacts	<p>Diversion routes are not suitable without mitigation and fall outside the Order limits. The Applicant proposes these will be addressed in the next iteration of the EMP.</p> <p>The Council's assessment of diversion routes [REP1-019 appendix] indicates that all will require mitigation and six are unsuitable without significant mitigation outside the Order limits. Particular concerns remain in respect of the A685 at Kirkby Stephen, as well as other local roads, such as Ullswater Road and Clifford Road in Penrith, where various physical constraints will give rise to congestion and delay during construction, as well as impacts on local residents in terms of congestion, noise and air quality.</p> <p>HGVs - lack of clarity on diversions and impacts during construction.</p> <p>M6 diversion routes do not appear to have been considered adequately as part of the impact assessment. There are also concerns about the diversion routes around and through Penrith where there is already a significant traffic issue i.e. serious congestion occurs at Kemplay Bank during closures of the M6.</p>	<p>The Council needs to understand what future diversion use the Applicant may have for the detrunked routes, eg. Tactical diversions and future use of the network. The Applicant must develop a clear strategy for traffic management and the establishment of viable alternative/diversion routes to support the construction of the upgraded A66, taking into account the condition and suitability of local roads, susceptibility to rat-running and the particular constraints that may apply to HGV use. There are clear challenges with the suitability of the rural road network to accommodate the types and volumes of vehicles to be diverted.</p> <p>The Applicant should improve the existing strategic diversion routes, specifically the A6 and the A685 and undertake further feasibility work to determine how these routes can be enhanced to cope with the increased volume of traffic. This issue requires consideration by the Applicant in discussion with the Council and mitigation measures need to be agreed in the second and third iterations of the EMP. The Council believes there is a need for further sensitivity testing to provide comfort that the proposals will not have unacceptable impacts on the local road network.</p>	<p>The Council still has concerns that the detailed proposals for diversions, both temporary and operationally, have not been set out and assessed as part of the DCO and that there are no detailed commitments from the Applicant to address the concerns raised in the Council's Diversions Assessment Report, Appendix C to the LIR [REP1-019].</p> <p>The Council awaits the Applicant's Deadline 5 submission of post-hearing note setting out how strategic diversions will be undertaken and secured by the third iteration of the EMP.</p>	<p>The Council will engage in the Traffic Management Forums as they take place to aid development of the diversion strategy and the second iteration of the CTMP.</p>	<p>The Council is confident this can be resolved with meaningful engagement, captured in the second iteration of the CTMP, to be developed post-Examination.</p>
Soil Storage	<p>There are multiple soil storage compounds located between Kirkby Thore and the proposed alignment of the A66. The Council is concerned about the location of the soil storage compound south of the proposed junction at Kirkby Thore which results in compounds being proposed in close proximity to Kirkby Thore Primary School on Priest Lane. The Council is concerned about negative noise and air quality impacts that this might have on Kirkby Thore Primary School and potential impacts on children's learning and health.</p> <p>There is currently no guidance on the volume or height the soil storage may comprise, the Council would seek to minimise the height of the storage, particularly in this location to the sensitive residential properties.</p>	<p>The Applicant should locate soil storage areas and general compounds further away from the school to avoid these potential impacts.</p> <p>The Applicant to confirm the volumes and area of topsoil storage at each of the sites. The Applicant to also confirm that in accordance with BS3882:2015 topsoil spoil heaps will not exceed 3m in height, including topsoil existing on site, and will be used within 12 months (reference BS 4428:1989 Code of practice for general landscape operations).</p>	<p>The Council will continue to engage with the Applicant and DIPs to agree an appropriate solution in these locations.</p> <p>The Construction Management Plan needs to be explicit with regards to the location of compounds and storage areas and mitigation to avoid and/or minimise impacts.</p>	<p>The Council has appended to their covering letter a request for further clarification from the Applicant on matters relating to acoustic mitigation. This note raises comments on information that the Applicant has shared with the Council since Deadline 6 and hence at the submission stage of the PADSS is not available before the Examining Authority.</p> <p>The Council is concerned that the EMP that is to be submitted to the ExA at Deadline 7 does not fully address what the Council has requested and that as a consequence there is a risk that noise mitigation will not be implemented as they would expect during the construction phase of the Project.</p>	<p>The Council will continue discussion with the Applicant, but it is unlikely that the two parties will reach complete agreement.</p>

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HGVs	HGV (Parking and Services) - lack of provision and an absence of analysis of the impacts and requirements arising from a forecast increase in HGV traffic. Potential nuisance and safety risks arising from HGV parking.	Consideration of the adverse impacts arising from substantial increase in HGV traffic is required. The Applicant needs to provide clarity on provision of parking and services to accommodate increased usage by HGVs and parking and services demands. A Freight Study is being undertaken in conjunction with the Council and stakeholders to establish the need for parking and services provision	A meeting was held on 08.03.2023 in which the issue of HGV facilities was discussed in the context of the A66. The Applicant and its consultants provided an update on the Nationwide Freight Study, with particular focus on the A66. It was recognised that there was a specific need to meet the future demand of freight along the A66 corridor, and consultation feedback from hauliers was presented which supported this issue. The Council supports the study and will continue discussions with the Applicant to identify appropriate solutions on the A66 corridor. The impact of increased demand of HGV parking expected as a result of the Project is currently unmitigated by the Applicant, and this will result in a worsening of issues caused by indiscriminate HGV parking in Penrith, other settlements, and laybys along the A66. The Council understands that this issue will not be resolved by the determination of the Examination but support the parallel workstream to deliver an optimal solution. The Applicant will need to make a written binding commitment to implementing the recommendations of the freight study.	The Council retains this point until they have seen the final freight study and have received assurances from the Applicant that the recommendations will be implemented in conjunction with the construction of the dualled sections of the A66.	Dependent upon the Applicant sharing the outcomes of the freight study, the Council being satisfied and the Applicant making a commitment to implement the study recommendations.
Drainage and the Water Environment	Concern about flood risk, such as the location of treatment ponds within Flood Zones 2 & 3 (eg. Carleton Hall), flood compensation being proposed in existing flood zones, lack of detail for flood compensation, proposed discharges in flooding locations. Opportunities should be taken to provide benefits in terms of flood risk reduction and natural flood management.	The Council requires details of all proposals which impact upon flood risk and needs to have discussions with the Applicant to resolve any concerns. The Applicant needs to ensure the inclusion of Natural Flood Management and other mitigation measures to align with Environment Agency/ Lead Local Flood Authority works. It is essential that natural flood management is considered and engagement with the Cumbria Innovation and Flood Resilience Project team takes place, particularly in relation to the Warcop area, Lowgill Beck and Broom Rigg. Discussion is required on the flood modelling to ensure that the Applicant and the Council can reach agreement on the approach, which should then inform the drainage designs.	No further information has been provided.	No change since comments made at Deadline 5.	Unlikely to be resolved by the close of the Examination
WCH routes	It is not clear if the proposed WCH routes extend the full length of the Project. At Coupland Beck the route appears to stop abruptly with no indication of whether this will join an existing pathway.	A full set of design proposals needs to be provided showing the proposed new WCH routes and how they will connect with existing pathways or suitable local roads to provide a full east-west route for NMUs. This is an issue of great importance to the Council.	The Council recognises that detailed design will not be available during the DCO examination. The Council will need an assurance that a connection to the proposed new WCH route within this gap will be delivered and a plan indicating how it will be delivered should be provided. To be resolved during detailed design discussions and a commitment to a continuous east-west route made within the EMP or the DPD [TB checked by Tom]. The Council is still awaiting a plan of the complete WCH route that has been promised by the Applicant.	From further submission of PRoW plans by the Applicant, it is clear that the current intention is for the majority of the route to exclude horseriding as the route is designated as a cycle track or cycleway. The Council's preference is for as much of the route as possible to allow equestrian use and a commitment be made to this end for the detailed design stage. A complete east-west route is the Council's requirement and this is not clearly apparent as yet.	Unlikely to be resolved by the close of the Examination. The Applicant must commit to the provision of the east-west route. Further discussion required with the Applicant and user groups as part of detailed design
WCH/Safety at Penrith	There is no apparent physical separation between the shared use path and the dual carriageway between Kemplay Bank and M6 Junction 40. Given the proposed 50mph speed limit it is considered unsafe for users to be in such close proximity. This is also contrary to the guidance in LTN 1/20 for provision next to a road of this speed.	The Applicant to share details of the safety audit/risk assessment undertaken for the design. Consideration to be given to the inclusion of some form of safety barrier or buffer between the road and shared use path.	The Council awaits details from the Applicant	No change in the Council's position. Wetheriggs Masterplan is being developed which provides for a safer alternative. The Applicant should commit to funding and implementing the masterplan (see above)	Dependent upon the Applicant's ability to commit to implementing the masterplan

Principal Issue	The brief concern held by Westmorland and Furness Council	DEADLINE 5 What needs to change, or be included, or amended so as to overcome the disagreement	DEADLINE 5 Likelihood of the concern being addressed during Examination	DEADLINE 7 What needs to change, or be included, or amended so as to overcome the disagreement	DEADLINE 7 Likelihood of the concern being addressed during Examination
Appleby Horse Fair	It is unclear how access and Traffic Management for the Appleby Horse Fair traffic will be facilitated. The Project should not negatively impact on Appleby Horse Fair and should encourage further improvements on the local network by the provision of safe stopping places and ensure the safe use of the A66 by the travelling community.	The Council's Appleby Horse Fair Traffic Management Plan will require updating in consultation with the Applicant as a consequence of Project. The Applicant's CTMP [APP-033] will need to develop proposals to address provision for the Appleby Horse Fair traffic. Connections to existing routes used by travellers and designated stopping places will need to be maintained across the proposed dual carriageway to enable their continued use. The Council expects the Applicant to confirm how non-motorised traffic will be discouraged from using the A66, in particular how horse drawn traffic can effectively access Appleby Horse Fair via alternative routes. Route risk assessment to ensure the local network can accommodate safe passage of horse drawn vehicles there is continuity of alternative provision on the local network. There is a need to discuss the provision of stopping places for Appleby Horse Fair traffic on local and detrunked roads that will be used in preference to the A66. The Council expects the Applicant to provide either direct funding to provide stopping places on the detrunked sections or ensure the work is undertaken by its contractors prior to being detrunked.	The Applicant's CTMP, secured through the EMP, and an Operational Management Plan similarly secured, should be in place to ensure the safe operation of the Appleby Horse Fair, to the satisfaction of the Council. Awaiting response from the Applicant regarding the preparation of risk assessment/ other relevant assessment of safety and any proposed mitigation. Secured by a side agreement.	No change from the position at Deadline 5. Any changes to the AHFTMP due to the Project should be funded by the Applicant. The Applicant should fund the implementation of any additional mitigation to address the temporary construction impacts of the Project upon the operation of the Horse Fair.	Dependent upon the Applicant accepting the need to fund the amendments to the AHFTMP and any mitigation identified in the plan that arises as a result of the Project and secured through the side agreement.
Environmental	There are matters within the Environmental Statement and the EMP that are still of concern. These are submitted as "Environmental Issues Note for Deadline 5"	The detail of the amendments or further information that the Applicant needs to provide is specifically stated in the appended note.	Dependent upon the Applicant agreeing to change the EMP as suggested by the Council in its Environmental Issues Note for Deadline 5.	The Council has made suggestions for alternative wording of the EMP in relation to noise mitigation and control. Following consideration of information provided by the Applicant at Deadline 6 and a presentation by the Applicant, the Council has prepared a technical note in relation to noise monitoring at Kirkby Thore and proposed amendments to the EMP. The technical note, entitled, "Technical Note 1, Subject: A66 NTP Noise and Vibration Queries – Deadline 7" is submitted with the Council's covering letter at deadline 7. The Council has also suggested that alternative red squirrel mitigation to that proposed by the Applicant would be more beneficial than the Animex bridges that are proposed.	The Applicant and the Council have made substantial progress in agreeing a number of matters, although the Council remain concerned that matters relating to construction noise, operational noise and the impacts upon red squirrels are unlikely to be resolved during the Examination.



TECHNICAL NOTE

DATE:	12 April 2023	CONFIDENTIALITY:	Confidential
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PROJECT:	A66 DCO Support (70092031)	AUTHOR:	Samuel Clague
CHECKED:		APPROVED:	Vinny Holden

INTRODUCTION

Summary of the Review

The purpose of this technical note is to present the findings from a review of the traffic modelling prepared by Arup on behalf of National Highways in support of the A66 Northern Trans-Pennine Project DCO. This review aims to inform outstanding matters in relation to the future traffic and pedestrian operation of the Proposed Scheme in and around Penrith.

The council welcomes the additional modelling undertaken, both in microsimulation software VISSIM, and junction signal software LinSig, to help inform the understanding of the potential impacts.

Following the review to date, the Council is more confident that the proposed design will cope with the forecasted traffic growth to an acceptable level. The Vissim modelling results show reductions in traffic queuing compared to the without scheme option, and the LinSig shows that the junction can operate with the expected flows in 2044.

There are some outstanding issues identified that require resolution both to 1) **provide further confidence that the Proposed Scheme operates efficiently and safely for all modes**, and 2) **to improve the design evolution process of the Proposed Scheme itself so that the signal control at M6 J40 and Kempley Bank is optimised**. We have set out a detailed breakdown of these issues in Appendix A to C. Some of these issues can be addressed during the examination period, for example, providing further information about assumptions used, and other issues are likely to need progressing after the examination closes, where further design input is needed to optimise the future operation of the Proposed Scheme.

The main issues from this Technical Note were discussed with National Highways and Arup on 17th April 2023, and it was agreed that the issues in this Technical Note would be reviewed, with commentary to be provided in response to the issues set out in Appendix A-C.

The conclusions in this review to date are on the basis that the further information / alterations requested in this technical note do not lead to an undermining of the results to date, causing a worsening of journey times, queue lengths or reserve capacity than currently reported in the Transport Forecast Report.

Priority Issues

During the detailed review of the models, the following priorities are identified for further discussion:

- **Signal control strategy** – there is a need to review the MOVA configuration in the Vissim models and forecast year LinSig modelling to ensure that the existing and proposed operation is more realistically reflected in the models. These corrections are also essential to help improve the design process of the scheme and ensure that the traffic signal configuration is optimised for scheme opening. It will also be important that any predicted MOVA operation determined by the modelling is referred back to upon

TECHNICAL NOTE

DATE:	12 April 2023	CONFIDENTIALITY:	Confidential
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scheme opening and validated on site through the monitoring of the MOVA datasets, and where required, updated to reflect real life conditions.

- **Traffic flow assumptions in the base Vissim model** – further clarification is needed to ensure the existing and future operation is appropriately represented.
- **Sensitivity testing of August traffic flows in LinSig** – to understand the potential impacts in the peak summer months, test forecast scenarios at both roundabouts in LinSig.

INFORMATION RECEIVED

The extent of the modelling covers base and forecast operational models at the M6 Junction 40 and Kempley Bank. The areas of modelling and reporting where a response from Arup has been requested are given in Appendix A, B and C whilst the main body of this technical note summaries the key findings.

The latest versions of the files provided by Arup that have been reviewed in this study are given in Table 1 below.

Table 1: Summary of information received

Date received	Summary of file(s)
03/04/2023	2022 Base AM, PM & IP Vissim models with associated results files, MOVA datasets, PCMOVA-Vissim connections and VAP files
03/04/2023	Local Model Validation Report (LMVR)
03/04/2023	Drawing showing the lane diagram for the proposed design of the M6 J40 roundabout
06/04/2023	LinSig models of the proposed design of the M6 J40 roundabout for the 2029 & 2044 Friday IP forecast peak hour
12/04/2023	2029 & 2044 forecast AM, PM & IP Vissim models with associated results files, MOVA datasets, PCMOVA-Vissim connections and VAP files
12/04/2023	Transport Forecast Report (TFR)

The traffic modelling has been reviewed according to the three main model type subdivisions given in Table 2 which are examined in the following sections. Table 2 also identifies the location of the corresponding Appendix containing full documentation of the responses required from Arup.

Table 2: Subsections of the modelling review

Traffic modelling undertaken by Arup	Documentation reviewed alongside	Location of the detailed response requests
Base Vissim Models	LMVR	Appendix A



TECHNICAL NOTE

DATE:	12 April 2023	CONFIDENTIALITY:	Confidential
SUBJECT:	M6 J40 & Kempeley Bank Traffic Modelling Review		
PROJECT:	A66 DCO Support (70092031)	AUTHOR:	Samuel Clague
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Forecast Vissim Models	TFR	Appendix B
Forecast LinSig Models	TFR	Appendix C

BASE VISSIM MODELS

The process undertaken in building the base Vissim models is generally appropriate although the LMVR does not contain sufficient detail to fully verify the acceptability of all the input and validation steps. The driving behaviour and operation of the base models operate realistically in the most part, with exceptions mostly observed due to the setup of the PCMOVA-controlled junctions and associated MOVA dataset inputs. A summary of the key requests for information or alterations is given as follows with the full detail provided in Appendix A.

- Additional details on the process taken to prepare the MOVA datasets for use in the PCMOVA linker file and coding of the traffic signals within Vissim [please see Appendix A for further details]
- The controller specifications used to configure the signals in Vissim and PCMOVA are requested to check all of the signals have been configured correctly.
- Turning count validation statistics should be presented, preferably classified by vehicle type.
- A more detailed description or some spreadsheet data of the traffic assignment calculations are requested to confirm the input flows and turning proportions are representative of existing conditions in the modelled time periods.
- Modelling of busier time periods, such as in August or during bank holiday weekends, is requested. This can be in LinSig initially due to the short timescale for resolution.
- Full details of how a Center Parcs traffic proportion was determined from the survey data and justification for applying it more cautious driving behaviour are requested.
- A more detailed commentary explaining some of the more significant differences in the journey time validation statistics is requested.
- Justification for applying the static vehicle routing decisions indiscriminately across vehicle types is requested.
- Justification for the reduced speed areas being much lower than would be typically expected is requested.

Inaccurate signal configuration and vehicle detection that is applied to some junctions in the model is likely to impact the model outputs and operation, which could then affect how the base operation compares to the future scheme. It is therefore necessary that these issues are addressed to ensure realistic junction operation in the base scenario; it is also advised that the base models are revalidated as part of this process. Further calibration may be required if the turning count comparison falls short of meeting the required TAG M3.1 standards as well as additional alterations that may be required following the additional analysis / information provision on the model build process.

FORECAST VISSIM MODELS

The process undertaken in building the forecast Vissim models is generally appropriate although it is essential that all changes made upon reviewing the base model comments (Appendix A) are carried

TECHNICAL NOTE

DATE:	12 April 2023	CONFIDENTIALITY:	Confidential
SUBJECT:	M6 J40 & Kempeley Bank Traffic Modelling Review		
PROJECT:	A66 DCO Support (70092031)	AUTHOR:	Samuel Clague
CHECKED:		APPROVED:	Vinny Holden

forward to the forecast models where applicable. Additional requests for information or alterations are given as follows with the full detail provided in Appendix B.

- Further analysis of the journey time comparison in the TFR is requested in relation to the position of the route start points – it is possible that the selection of journey routes chosen do not consider all potential operational issues in the study area.
- Further detail relating to the forecasted traffic assignment calculations and applied growth factors is requested.

FORECAST LINSIG MODELS

The forecast LinSig models provided have been reviewed and whilst much of the modelling reflects the proposed design well, there are some issues that need to be addressed before accepting the conclusions drawn in the TFR. These specifically relate to the signal coordination and optimisation through the roundabout, and some of the lane lengths and associated connector cruise speed/times. A summary of the key requests is given as follows with the full detail provided in Appendix C.

- Some of the lane lengths on the circulatory and exit arms with pedestrian crossings appear to be too short as they should be measured stop-line to stop-line if a custom lane length is not assigned to the upstream connector. The lane lengths should be checked and updated where necessary.
- The cruise speeds are all given as 50km/h and should be checked alongside the updated lane lengths to ensure that the coordination between the signals is correct. It is requested that some evidence is provided that the calculated cruise time between stop-lines is realistic.
- The existing controller specification, or documentation of the process undertaken, is requested to ensure that the stage sequences, intergreen matrix, signal timings and any phase delays are reasonable and realistic.
- Evidence of the strategy applied to coordinate the signal timings through the roundabout's separate stage streams is requested.
- Evidence of the strategy applied to optimise the signal timings and cycle times is requested.
- Evidence that there is no internal blocking, or a commentary on its significance, is requested to ensure that LinSig is not overestimating the junction's PRC.
- Any updates made to the forecasted Vissim traffic demand and assignment upon review of Appendix B should be similarly applied to the LinSig models.

These requests for alterations and further information are necessary to ensure that the model is representing the proposed design and signal coordination realistically. LinSig does not make it possible to determine the significance of each comment in Appendix C on the modelling outputs and therefore it is requested that all changes are made to ensure the model is as representative as possible. Without this confidence, it cannot be confirmed that each of the modelled arms have sufficient capacity and storage area for the forecasted traffic flows – LinSig may not fully take into account operational issues at specific nodes when calculating the overall PRC.



TECHNICAL NOTE

DATE:	12 April 2023	CONFIDENTIALITY:	Confidential
SUBJECT:	M6 J40 & Kempley Bank Traffic Modelling Review		
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SUMMARY

This technical note has provided a review of the traffic forecasting and modelling undertaken by Arup at the M6 Junction 40 and Kempley Bank. Comments to be actioned within the agreed timescales are provided in the appendices where a red-amber-green scale of significance has been applied. Red comments are the most fundamental resolutions required to accept the modelling conclusions although all red and amber comments could significantly affect the modelling results and should be resolved. Green comments contain advice and recommendations that are unlikely to have an impact on model operation.

The modelling undertaken to date is showing that the proposed design of M6 Junction 40 and Kempley Bank will be able to cope with the 2044 forecasted traffic demand during the busiest period of a typical week. This conclusion is supported on the basis that the further information / alterations requested in this technical note do not lead to an undermining of the results currently presented.

In addition to providing more confidence to this conclusion, it is essential that these modelling issues are resolved satisfactorily so the models can be used in the design process of the scheme, especially for configuring the optimal traffic signal operation. It is also recommended that National Highways commit to a specific monitoring of signal operation post-opening, comparing actual timings, queues and delays with model forecasts to ensure the junction is operating as well as it can.



APPENDIX A – VISSIM BASE MODELS COMMENTS

Review of A66 M6 J40 Kempley Bank Base Vissim models & LMVR

We have reviewed the Vissim model specification and have used the below key, to allow for the prioritisation of amendments to be made.

Table Key	
Green	Information/general comment. Recommendations are unlikely to have a significant effect on model operation & outputs.
Amber	Recommendations/clarification regarded as medium risk on the results presented, but not considered to be detrimental to the overall outcomes.
Red	Recommendations/clarification regarded as a high risk to the reliability, and therefore validity of the results and conclusions presented to date

Recommendations

Note	WSP Comment (05/04/23)	Potential Impacts	Suggested Action	Response / Subsequent action for detailed design post examination
Signal Configuration	<ul style="list-style-type: none"> • Some of the configuration of the PCMOVA signalisation appears to have been modelled incorrectly. • The signal specification sheets and further clarification on the following points are needed to confirm whether the signalisation in the model is representative of current conditions: <ul style="list-style-type: none"> ➢ Checks to ensure the phase information has correctly been defined in imported MOVA datasets for the A66 / A6 Kemplay Bank Roundabout ➢ Clarity on how many of the EP links are being used and for what purpose in all MOVA datasets ➢ Checks on whether any special conditioning between individual signal controllers (as included in the controller specifications) needs to be included in the MOVA datasets and PCMOVA linker file ➢ Checks that all SINKS and stop line loops are correctly coded in the Vissim model and PCMOVA linker file 	<p>Risk: impacts of scheme could be misrepresented at the junctions with a negative impact on queuing.</p>	<p>Internal review of MOVA junction operation (including input files) with signal engineers.</p>	<p>Due to unavailability of MOVA data resulting from upgrades to the MOVA setup at the existing junctions, the latest MOVA files could not be used to develop the VISSIM model. Therefore, the model has been calibrated to observed conditions using the MOVA setup used to develop the original 2017 model, calibrated and validated to observed conditions in 2017 by a previous consultant.</p> <p>The Base model will be revised post examination following review of latest MOVA datasets to ensure the VISSIM model accurately reflects observed local conditions, and to enable finessing of the MOVA set up to ensure efficient operation of the proposed design.</p> <p>Given that: the base model currently validates well to observed journey times; both the VISSIM model and LINSIG models agree that there is capacity for the junction to accommodate forecast Friday flows in 2044; and that changes to the MOVA setup would generally improve the future year performance then we consider the risk that the current model currently significantly misrepresents junction capacity to be small.</p>

Note	WSP Comment (05/04/23)	Potential Impacts	Suggested Action	Response / Subsequent action for detailed design post examination
Turning count calibration/validation	<ul style="list-style-type: none"> No turning count validation analysis has been presented. 	<p>Risk: could impact lane allocations and storage utilisation on approaches to the junctions, impacting on land take.</p>	<p>Please provide analysis to show that the base models meet the required TAG M3.1 guidelines for turning count validation, even if the data isn't fully independent of that used in the model build process. This should be classified by vehicle type to ensure each lane's storage utilisation is accurately represented.</p>	<p>Turn count analysis is now included within Appendix F (LMVR) and discussed/referenced within the updated LMVR.</p>
Sensitivity testing	<ul style="list-style-type: none"> September flows are identified to be average whilst August is the busiest month (LMVR paragraph 3.1.2). Models are based on September traffic flows. 	<p>Risk: significant operational issues with higher traffic flows are not identified.</p>	<p>Test August traffic flows in LinSig before examination and in Vissim after examination.</p>	<p>It is noted that August traffic is heavier than September traffic on from Monday to Thursday.</p> <p>When considering Junction 40 exclusively, August Friday traffic is marginally lower than September Friday during the peak hour (13:00-14:00) based on available permanent ATC data. However, ATC data shows that August system wide traffic peaks between 10:00 and 11:00 on Friday. Based on this analysis, an August test has been undertaken using an uplift factor of 1.02 between these two selected hours. This is considered very precautionary. This is discussed in the updated TFR and Appendix E (TFR) provides further analysis on this.</p>

Note	WSP Comment (05/04/23)	Potential Impacts	Suggested Action	Response / Subsequent action for detailed design post examination
Traffic Assignment Calculations	<ul style="list-style-type: none"> The general approach and analysis undertaken (as described in the LMVR) is appropriate. However, the calculations cannot be fully verified without the raw data and some of the data processing being provided. No analysis on the ANPR capture rate is provided. It is also unclear how <i>“the ANPR has been adjusted to match the average ATC flow”</i> (LMVR Appendix A (page 51 of pdf provided)). It is possible that some of the ATC surveys are not identifying the true demand on some input arms due to being placed close to the junctions (LMVR Appendix A, Fig.1). The link flow and journey time validation presented is also compared against data collected near to the junctions so would not pick up on this. Therefore, traffic demand leading to oversaturated conditions/increasing queue lengths may not be fully considered in the vehicle inputs. For example, this could be a reason for some of the WB queues known to occur on the A66 E arm of Kempley Bank roundabout not appearing in the Base IP model. 	<p>Risk: the vehicle volumes entering the model might not be fully representative, potentially underestimating queuing and delay impacts.</p>	<p>Please provide some spreadsheet data and accompanying narrative to explain how the traffic flow input data was calculated.</p> <p>Please provide some additional evidence that the vehicle input flows in Vissim accurately represent the demand for each of the 8 input arms.</p>	<p>Evidence is provided in Appendix G (LMVR) that shows:</p> <ul style="list-style-type: none"> the ANPR data capture rate that the ATCs used within the model development are representative of the flows measured by permanent ATC counters installed at this location <p>It is acknowledged that no adjustments to input demands have been made to account for queueing traffic, however as the models have been developed with extensive warm up and cool down periods, and that there is no significant observed queueing at the start or end of these periods then the input demand to the model should be representative of that observed.</p>

Note	WSP Comment (05/04/23)	Potential Impacts	Suggested Action	Response / Subsequent action for detailed design post examination
Center Parcs traffic flow separation	<ul style="list-style-type: none"> Friday IP – The LMVR states 25% of surveyed flows have been assigned to a separate vehicle type ‘Car2’ (paragraph 2.2.9). Initial analysis of vehicle inputs on Base IP model shows a range of values from 13.4% to 21.9% of Car2’s proportion of total vehicle input, across all input links and time periods. Total vehicle input does however closely align with the total columns from Table 2 and Table 3 of Appendix A of LMVR. Center Parcs traffic (“Car2”) (described & queried above) has frequently been assigned lower speed distributions at desired speed decisions and reduced speed areas. 	<p>Risk: the proportion of cars driving more cautiously than general traffic might not be fully representative, potentially over or underestimating queuing and delay impacts.</p>	<p>Please provide further information in the LMVR to why this separation was undertaken and why “25% of the existing car flows was assumed to be headed to/from Centre Parcs” (LMVR paragraph 2.2.9).</p> <p>Please provide further information or calculations to how this 25% was applied to the vehicle inputs and routing decisions inputted into the Vissim model.</p> <p>Please provide further information to why vehicles heading to/from Center Parcs would be expected to drive more cautiously than general traffic and how the lower speed distributions were identified.</p>	<p>Appendix C (LMVR) contains a comparison of total cars on Thursday and Friday throughout the model period. The uplift in cars between Thursday and Friday as a proportion of total car traffic on a Friday varies considerably. This proportion is considered to provide an indication of the traffic that is associated with Center Parcs on a Friday. Outside of the peak hour, the proportion is as high as 39% when comparing car matrix totals for each 15-minute interval but is close to 0% in other intervals. During the peak hour, the proportion of additional car traffic reaches 22% (13:30 to 13:45). Therefore, using an overall factor of 25% for ‘Car2’ was considered a fair and precautionary estimate to use for total car traffic associated with Center Parcs.</p>
Static vehicle routing decisions – vehicle classification	<ul style="list-style-type: none"> The static vehicle routing decisions, derived from the ANPR turning counts, are applied indiscriminately across all vehicle types/classes. 	<p>Risk: could impact lane allocations and storage utilisation on approaches to the junctions, impacting on land take.</p>	<p>Either the static routing decisions should be assigned by vehicle type and the base models revalidated or some analysis should be provided to ensure that the indiscriminate application of turning movements does not have a significant impact of the model operation. This analysis could include the classified turning movement validation mentioned above.</p>	<p>Appendix C (LMVR) shows observed turning count proportions by vehicle type.</p>

Note	WSP Comment (05/04/23)	Potential Impacts	Suggested Action	Response / Subsequent action for detailed design post examination
Reduced speed areas	<ul style="list-style-type: none"> Paragraph 2.3.16 of the LMVR states that: <i>“Reduced speed area of 5m length with 17km/hr speed was introduced in front of every signal head for both M6(J40) and Kemplay bank Roundabout within the calibration process, to represent the saturation flows at the signals. In addition to this, the desired speed decisions for Centre Parcs traffic have been reduced to 10km/hr”</i>. Reduced speed areas of 40mph have also been included by the lay-bys on the A66 between the two roundabouts. Whilst the need for reduced speed areas is recognised, the speed distributions used seem excessively low. 	<p>Risk: journey time comparisons between the modelled scenarios may be inaccurate, affecting the conclusions drawn regarding the impact of the Proposed Scheme.</p>	<p>Please provide further justification to why the reduced speed areas are assigned such low speed distributions or make amendments in the models to reflect more typical driving behaviour.</p>	<p>The reduced speed areas were implemented such that base model reflected the observed journey times.</p> <p>The additional desired speed decisions for Centre Parcs traffic was required as delays on a Friday on the A66 West approach to Kemplay Bank approach exceeded those observed on a Thursday despite similar traffic flow levels. Such desired speed decisions were therefore placed on the other Kemplay Bank and Junction 40 approaches to illustrate an even-handed approach, given that the reduced speed areas are being used to define non-local drivers general unfamiliarity with the area.</p>

Note	WSP Comment (05/04/23)	Potential Impacts	Suggested Action	Response / Subsequent action for detailed design post examination
Journey time calibration/validation	<ul style="list-style-type: none"> Many of the routes across the 3 time periods have an observed-modelled difference of greater than 15%, up to a maximum of 47%. Whilst it is noted that none of these differences are greater than an absolute difference of 1 minute, additional narrative on some of the larger relative differences would be welcomed. Some of the start vehicle travel time measurements are positioned only a short distance upstream or slightly downstream of the corresponding stop-line and therefore will not capture some of the journey time spent queuing. Further details of how cycle time and saturation flows have been considered to match journey times (LMVR paragraph 5.5.5) would be useful, especially in relation to PCMOVA and existing signal data and configuration sheets. All changes made to calibrate the base models should be justified by observed conditions. Any journey time data used to calibrate the model shouldn't be presented as a validation statistic. 	<p>Risk: the LMVR journey time validation analysis is overestimating how accurately the base models are representing observed traffic conditions. This could then lead to unrealistic modelling of the forecast scenarios.</p>	<p>Please provide further explanation of some of the major differences between observed and modelled journey times. This should consider the precise locations of the observed and modelled routes in relation to the junctions and possible queuing.</p> <p>Please provide some documentation of the calibration process, eg what supporting data has been used to change cycle times (if paragraph 5.5.5 has been interpreted correctly).</p>	<p>The LMVR has been updated to discuss some of the larger variations.</p> <p>Such narrative will be updated once the base model is revised post examination following review of latest MOVA datasets.</p> <p>Video footage has been analysed to gain an indication of cycle times and green times on key approaches at Junction 40 and Kemplay Bank. A table containing this data is provided in Appendix E (LMVR).</p>

Note	WSP Comment (05/04/23)	Potential Impacts	Suggested Action	Response / Subsequent action for detailed design post examination
Link flow calibration	<ul style="list-style-type: none"> It slightly unclear to the extent of comparison against “independent observed flows” (LMVR paragraph 5.3.5) given that the ATC and ANPR data was used in the model build process. An explanation of why some of differences between modelled and observed link flows give a GEH>5 would be useful to be confident that any errors or issues are not carried forward to the forecast models. Specifically considering OGV2 flows in all time periods and car flows on M6 slip roads in IP. 	Low risk impact on junction operation	Provide some additional narrative on the given comments would be helpful.	<p>The word ‘Independent’ has been removed from the LMVR.</p> <p>The LMVR will be further updated once the MOVA file issue has been rectified.</p>
Static vehicle routing decisions – U-turns omitted	<ul style="list-style-type: none"> U-turns are not coded into the static vehicle routing decisions. The number of vehicles making a U-turn at roundabouts is very small but non-zero on the A66 West arm of J40. These movements are necessary to access some destinations so any quantification of their impact on base/forecast model operation would be helpful. 	Likely to be negligible	Consider modelling or assessing the impact of vehicles making U-turns at the roundabouts.	Noted. U turns will be included in the updated base model with the latest MOVA datasets
Public Transport Lines	<ul style="list-style-type: none"> The ‘5km/h’ initial speed distribution (uniform distribution between 2.49pmh & 3.73mph) is selected for all public transport lines which is unrealistically slow without justification. However, desired speed distributions are placed close to the start of the entry links so the only impact on the models is away from the junctions. 	Likely to be negligible	Consider updating the initial speed distribution of public transport lines in subsequent modelling.	Noted. This will be updated when updating the base model when it is updated with the latest MOVA datasets



APPENDIX B – VISSIM FORECAST MODELS COMMENTS

Review of A66 M6 J40 Kempley Bank Forecast Vissim Models & TFR

We have reviewed the Vissim model specification and have used the below key, to allow for the prioritisation of amendments to be made.

Table Key	
Green	Information/general comment. Recommendations are unlikely to have a significant effect on model operation & outputs.
Amber	Recommendations/clarification regarded as medium risk on the results presented, but not considered to be detrimental to the overall outcomes.
Red	Recommendations/clarification regarded as a high risk to the reliability, and therefore validity of the results and conclusions presented to date

Recommendations

Note	WSP Comment (13/04/23)	Potential Impacts	Suggested Action	Response / Subsequent action for detailed design post examination
Base Model Comments	<ul style="list-style-type: none"> Any changes made to the base model in response to the comments given in Appendix A should be carried forward to the forecast models where applicable. Network coding likely to require attention include (but are not limited to) the PCMOVA configuration, linking & location of detectors and the desired speed distributions of some reduced speed areas unless justification can be provided that these alterations are not required. Any changes should necessitate rerunning all base and forecast models so a fair comparison of output results can be made. 	<p>Risk: the forecast models are not representative of the future network operation – affecting the conclusions drawn regarding the impact of the Proposed Scheme and required land take.</p>	<p>Make the required network changes upon review of Appendix A and rerun all base and forecast models so a fair comparison of output results can be made.</p>	<p>Agreed. Any changes made to the base models will be carried forward to improve the forecast models. This will be undertaken as part of detail design.</p>

Note	WSP Comment (13/04/23)	Potential Impacts	Suggested Action	Response / Subsequent action for detailed design post examination
Vehicle Travel Time Measurements	<ul style="list-style-type: none"> Some of the start vehicle travel time measurements are positioned only a short distance upstream of the corresponding stop-line. Therefore most of the additional journey time caused by queuing to reach the stop-line is not captured which gives the potential for some of the journey time comparison analysis presented in the TFR to be misleading. It is recognised that some vehicle travel time measurements have been placed to match the positioning of the ANPR cameras for journey time validation – however, there is no reason that the comparison between modelled scenarios cannot utilise more strategically placed routes. 	<p>Risk: increases to journey time as a result of the Proposed Scheme and associated traffic growth are not fully considered in the TFR analysis and conclusions.</p>	<p>Either exclude/comment on journey time route comparisons in the TFR where the routes are not able to show the full extent of operational issues/delays; or move the vehicle travel time measurements to upstream of the back of any anticipated queues and present the updated journey time analysis in the TFR.</p>	<p>The TFR will be updated when the design model is updated to include longer journey time routes that include sections on the approach to stoplines where vehicles queue. Such information will be used to optimise the future performance of the scheme</p>

Note	WSP Comment (13/04/23)	Potential Impacts	Suggested Action	Response / Subsequent action for detailed design post examination
<p>Traffic Assignment Forecasting</p>	<ul style="list-style-type: none"> The general approach and analysis undertaken (as described in the TFR) is appropriate. However, the calculations cannot be fully verified without the raw data and some of the data processing being provided. It would also be helpful for the TFR to include how well calibrated the A66TM is near the study area, the growth factors applied to each input arm and any changes to the turning movement proportions from the base models. 	<p>Risk: the vehicle volumes entering the model might not be fully representative, potentially over or underestimating queuing and delay impacts.</p>	<p>Please provide some spreadsheet data and accompanying narrative to fully explain how the forecast traffic input and assignment was determined.</p>	<p>Growth Factors and resulting turn flows are provided in Appendix A (TFR). These have been calculated by applying the A66TM growth factors to the uplifted base turn flows (where ANPR to ATC factors are below 1.0, a factor of 1.0 has been used – this is also explained in the updated LMVR).</p> <p>Where there is a larger flow on Friday compared to Thursday on the A66 East Arm, the difference in trip end totals at this location is frozen i.e. not growthed. This is on the basis that Center Parcs is currently operating at capacity and therefore no additional traffic growth should be anticipated. Appendix C (TFR) contains Thursday IP flows used to calculate this difference. This was considered a fair and proportionate approach to the calculation of future Friday traffic.</p> <p>Appendix B (TFR) provides a summary of the Validation of A66TM in the area around Junction 40 and Kemplay Bank.</p>
<p>Journey Time Increases</p>	<ul style="list-style-type: none"> Tables 13-15 of the TFR show a significant increase in journey times along some routes without being commented upon. 	<p>Risk: scheme disbenefits are not fully reported.</p>	<p>Please provide some narrative in the TFR to highlight the fact that some routes are predicted to have a longer journey time in 2044 than observed in 2022.</p>	<p>Text included in updated TFR to highlight routes that have a longer journey time in 2044 compared to 2022.</p> <p>The locations highlighted will be considered further at detailed design stage when the signals are finessed.</p>

Note	WSP Comment (13/04/23)	Potential Impacts	Suggested Action	Response / Subsequent action for detailed design post examination
Model stability	<ul style="list-style-type: none"> A measure of the deviation from the mean, such as standard deviation, in each model run should be presented to show the stability between model runs (TFR Tables 10-12). 	Low risk of variation between runs leading to unreliable results.	Include standard deviation calculations in TFR Tables 10-12 to show there is sufficient stability between model runs.	Noted. This will be included when the TFR is updated following the design model update as part of detailed design.
Incorrect pedestrian input	<ul style="list-style-type: none"> The vehicle composition for the vehicle input on Link 92 (Skirsgill Lane) is incorrectly assigned a pedestrian composition in the IP scenarios. This leads to pedestrians on the vehicle links of the southern part of the A6 contributing to the low average speeds displayed in the TFR Figure 4-3 & 4-6. 	Low risk as all pedestrians are routed south on the A6 away from the Proposed Scheme.	Assign a motor vehicle composition to the vehicle input on Link 92 in all subsequent modelling.	Noted. This will be updated when updating the base model for detailed design.
Low lane change distance	<ul style="list-style-type: none"> The lane change distance on Link 10015 (M6 NB entry slip) is set as 25.0m. This is unrealistically small and leading to merging difficulties and vehicle being removed from the network at the end of Link 180. 	Low risk as merging problems do not impact on any output measurements collected.	Increase the lane change distance on Link 10015 in all subsequent modelling.	Noted. This will be updated when updating the base model for detailed design.



APPENDIX C – LINSIG FORECAST MODELS COMMENTS

Review of A66 M6 J40 Kempeley Bank Forecast LinSig Models & TFR

We have reviewed the LinSig model specification and have used the below key, to allow for the prioritisation of amendments to be made.

Table Key	
Green	Information/general comment. Recommendations are unlikely to have a significant effect on model operation & outputs.
Amber	Recommendations/clarification regarded as medium risk on the results presented, but not considered to be detrimental to the overall outcomes.
Red	Recommendations/clarification regarded as a high risk to the reliability, and therefore validity of the results and conclusions presented to date

Recommendations

Note	WSP Comment (13/04/23)	Potential Impacts	Suggested Action	Response / Subsequent action for detailed design post examination
Lane Lengths	<ul style="list-style-type: none"> Some of the lane lengths on the circulatory and exit arms with pedestrian crossings appear to be too short as they should be measured stop-line to stop-line if a custom lane length is not assigned to the upstream connector. Specific arms that appear to have too short lane lengths include Arm 8, 9, 12, 14 & 15. Whilst the lane lengths being too short won't positively affect (reduce) the queue profile on any individual lanes, it may affect the traffic profiles and signal coordination between the nodes of the roundabout. This impact cannot be quantified easily and therefore the correct lane lengths should be entered. 	<p>Risk: the profile of traffic arriving at some stop-lines may be incorrect leading to operational issues not currently detected.</p>	<p>Please amend incorrect lane lengths or apply accurate custom lane lengths to the connectors.</p>	<p>The LinSig model has been updated with revised lane lengths and a 75 second cycle time in the 2029 scenario. The revised model is provided in Appendix F1 (TFR) with accompanying summary report in Appendix F2 (TFR).</p>

Note	WSP Comment (13/04/23)	Potential Impacts	Suggested Action	Response / Subsequent action for detailed design post examination
Signal Timings Coordination	<ul style="list-style-type: none"> No explanation is given regarding the strategy applied to coordinate the signal timings across the stage streams/through the roundabout. This should represent the expected operation under MOVA as closely as possible where routes with the highest traffic flows are prioritised. Whilst incorrect coordination would reduce the overall junction performance on ground, there is a chance it could provide benefits on some arms in isolation and therefore LinSig would display smaller-than-realistic queue profiles and not pick up on related operational issues. 	<p>Risk: the queue and traffic profiles on some arms might not display the blocking-back operational issues that could occur.</p>	<p>Please provide some documentation of how the signal coordination between stage streams was developed to ensure the LinSig model is realistic of the proposed operation on site.</p>	<p>In the absence of detailed MOVA datasets the signal timings have been adjusted using the optimisation tools within LinSig to minimise the internal queues. This will be considered further during detail design</p>
Signal Optimisation	<ul style="list-style-type: none"> The signal timings seem to have been optimised for PRC within LinSig although full details of the process undertaken would be helpful. The cycle time is 60s for the 2029 DS scenario and 75s for the 2044 DS scenario. 75s cycle time is unusually long for two-stage roundabout junctions between an entry arm and a circulatory arm. 	<p>Risk: the roundabout would operate less efficiently than modelled and therefore the PRC values reported in the TRF is an overestimate.</p>	<p>Please provide details of any steps taken to optimise the signal timings.</p> <p>Please provide some reasoning that a 75s cycle time would likely occur on site in the 2044 forecast peak periods or other justification for using this cycle time.</p>	<p>Video footage from the day of the survey has been analysed to gain an indication of cycle times and green times on key approaches at Junction 40 and Kemplay Bank. A table containing this data is provided in Appendix E (LMVR).</p>

Note	WSP Comment (13/04/23)	Potential Impacts	Suggested Action	Response / Subsequent action for detailed design post examination
Traffic Assignment Forecasting	<ul style="list-style-type: none"> See corresponding comments made in Appendix B as the same traffic demand has been applied in LinSig as in Vissim for the forecast models. 	<p>Risk: the vehicle volumes entering the model might not be fully representative, potentially over or underestimating queuing and delay impacts.</p>	<p>Ensure any updated traffic demand forecast matrices made upon review of Appendix B are applied to the LinSig models.</p>	<p>Further information on traffic demand is provided. Growth factors and resulting turn flows are provided in Appendix A (TFR). Appendix B (TFR) provides a summary of the validation of A66TM in the area around Junction 40 and Kemplay Bank.</p>
Cruise Times/Speeds	<ul style="list-style-type: none"> The cruise speeds are entered as 50km/h on all connectors. Whilst this uniform approach might be accurate, no justification for this has been provided. 	<p>Risk: the profile of traffic arriving at some stop-lines may be incorrect leading to operational issues not currently detected.</p>	<p>Please provide some evidence that the mean cruise speeds entered are giving realistic cruise times between stop-lines.</p>	<p>No further information is available to base this on. A cruise speed of 50km/h (31mph) was considered reasonable for the assessment.</p>
Signal Configuration	<ul style="list-style-type: none"> The general signal configuration of the stage sequences, intergreen matrix, signal timings and any phase delays appear to have been set up correctly; however, no documentation of the process is supplied to confirm this. 	<p>Risk: the LinSig model does not reflect the likely future operation.</p>	<p>Please provide the existing controller specification, or documentation of the process undertaken, to ensure the modelled signal configuration is reasonable and realistic.</p>	<p>Noted. To be provided/checked at detailed design stage.</p>
Internal Blocking	<ul style="list-style-type: none"> One of the limitations of LinSig is that it does not model the impacts of blocking-back to any upstream arms. No analysis of the queue profiles has been provided in the TFR. 	<p>Risk: blocking-back between arms could significantly increase queues on multiple entry and circulatory arms leading to other operational issues not currently detected.</p>	<p>Once any changes to the model based on other comments have been made, please provide some analysis of the significance of any queues observed to block-back to any other arms or connectors.</p>	<p>Updated TFR (section 4.7.6) includes a commentary on blocking back in the LinSig model and how this impacts upstream arms.</p>

Note	WSP Comment (13/04/23)	Potential Impacts	Suggested Action	Response / Subsequent action for detailed design post examination
Saturation Flows	<ul style="list-style-type: none"> The saturation flow has been entered as 1900 PCU/hr on all lanes. 	<p>Risk: the saturation flow is overestimated on some arms which could lead to longer queues and an overestimate of the roundabout's overall capacity.</p>	<p>Please provide some justification that a saturation flow of 1900 PCU/hr is realistic, or apply a more conservative estimate as a sensitivity test.</p>	<p>When treated as a nearside lane, RR67 formulae used in LinSig shows that a saturation flow of 1900 PCU/hr is equivalent to a lane width of 2.85m (2040 PCU/hr for a non-nearside lane for width of 2.85m). Given that all existing and proposed lane widths will be significantly in excess of 2.85m, 1900 PCU/hr is considered a reasonable and precautionary approach.</p>
Phase ordering	<ul style="list-style-type: none"> It is normal convention for the circulatory arm phase to be lettered before the entry arm phase at a signal-controlled roundabout with the circulatory arm stage reverting to green when no traffic is detected. Whilst entering the entry arm phases first, as applied in this model, has no impact on the model operation, it would be useful to know if this ordering matches an existing signal configuration. It should also be ensured that any deviation from existing configuration or convention doesn't cause any confusion if the model is used for any future signal design work. 	<p>Negligible risk to modelling.</p>	<p>Consult with signal engineers if model is used to inform more detailed design work.</p>	<p>Noted. This will be updated for detail design. This model was inherited from the previous consultants.</p>



TECHNICAL NOTE

DATE:	04 May 2023	CONFIDENTIALITY:	Confidential
SUBJECT:	M6 J40 & Kempley Bank Traffic Modelling – Review of Responses		
PROJECT:	A66 DCO Support (70092031)	AUTHOR:	Samuel Clague
CHECKED:	Vinny Holden	APPROVED:	Vinny Holden

This technical note presents a review of the responses made by the Applicant in relation to the Councils' recent modelling audit of their operational traffic models. This traffic modelling has been prepared by the Applicant on behalf of National Highways in support of the A66 Northern Trans-Pennine Project DCO. The modelling audit was provided to the Applicant on the 18th of April 2023 with the requests for responses given in the appendices of the corresponding technical note. The Council received these responses on the 27th of April 2023 – this technical note acknowledges each of these responses in Appendix A-C below and provides a commentary on any remaining risk and action required where identified.

The changes and information received has provided additional confidence that the proposed design will cope with the forecasted traffic growth to an acceptable level. The Council is satisfied with the responses provided by the Applicant that have been assigned a green revised review colour in Appendix A-C below, subject to full implementation of the agreed actions. These actions can be found in the right-hand columns of the response tables provided by the Applicant, and reinforced in the right-hand columns of the appendices below.

Requests for additional action, not currently acknowledged, are given an orange revised review colour below. These should also be carried out during detailed design with the priorities summarised as follows:

- Turning count validation statistics classified by vehicle type should be presented for the base Vissim models.
- The August sensitivity tests are showing that the junction is approaching capacity in the peak 2044 forecast periods. Appropriate mitigation measures and signal coordination should be considered in detailed design to prevent queuing back onto the M6 main carriageway when traffic demand is exceptionally high.
- Assigning the static vehicle routing decisions by vehicle type in Vissim should be strongly considered.
- All the reduced speed areas in the base and forecast Vissim models should be revisited to ensure that they are appropriate and allow for realistic modelling of the proposed signal coordination.
- The lane length and/or the connector cruise times/speeds should be checked and refined where necessary to ensure the traffic flow profiles and optimised signal coordination is realistic.
- The impacts of blocking back in the LinSig model should continue to be analysed in detailed design, in conjunction with consulting with the Vissim models and signal engineers.
- LinSig (or TRANSYT) models for the Kempley Bank roundabout should be developed to aid the detailed design process.
- Clarification of the survey locations and consistency between all documentation would be welcomed to ensure the correct information is provided to the detailed design teams.



APPENDIX A – VISSIM BASE MODELS COMMENTS

Review of A66 M6 J40 Kempeley Bank Base Vissim models & LMVR

We have reviewed the responses from the Applicant and have used the below key to allow for the prioritisation of amendments to be made.

Table Key	
Green	Satisfied with response, subject to the implementation of agreed action.
Amber	Recommendations/clarification regarded as medium risk on the results presented, but not considered to be detrimental to the overall outcomes.
Red	Recommendations/clarification regarded as a high risk to the reliability, and therefore validity of the results and conclusions presented to date

Recommendations

Note (original review colour)	Council Comments (revised review colour)	Remaining Risk	Subsequent action required
Signal Configuration	Agreed that the MOVA configuration and datasets need revisiting during detailed design. Base model should be revalidated with the corrected MOVA setup to ensure modelled journey times still reflect observed journey times.	Low risk as changes will likely improve operation of forecast models.	Consult with signal engineers and modellers with PCMOVA experience during detailed design. Ensure that the base model journey time validation still meets the required TAG M3.1 standards once the MOVA setup has been corrected. Assess current and future linkage with Eamont Bridge Signals
Turning count calibration/validation	Turning count validation meets required standards for total validation. However, no turning count validation classified by vehicle type has been presented.	Could impact lane allocations and storage utilisation on approaches to the junctions if, for example, a higher proportion of longer vehicles use a particular lane/turning movement.	Present classified turning count validation statistics using the ANPR data or other available turning counts.

Note (original review colour)	Council Comments (revised review colour)	Remaining Risk	Subsequent action required
Sensitivity testing	Approach and uplift applied in LinSig models is acceptable. However, this does lead to an increase in the junction degree of saturation and a reduction in the reserve capacity – PRC is 1.7% in 2044 August Friday scenario.	There is a risk that the junction could be operating over capacity during the busiest peak periods by 2044. This could lead to queuing on some approaches, possibly back onto the M6 carriageway in a worst-case scenario.	Ensure that appropriate mitigation measures are implemented to prevent queuing back onto the M6 in periods of exceptionally high traffic demand. This should be considered when designing the signal configuration in detailed design. Ensure pedestrian signal crossings on slip roads are coordinated in the MOVA dataset
Traffic Assignment Calculations	The factors and method applied to uplift the ANPR traffic counts in Appendix G is appropriate. There appears to be some inconsistencies between the maps at the start of LMVR Appendix A & F to the location of the ATC/radar surveys.	A slight risk remains that the peak hour input demand is underrepresented due to queuing traffic even the demand is accurate over the longer modelled periods.	Clarification of the survey locations and consistency between all documentation would be welcomed to ensure the correct information is provided to the detailed design teams. None other action suggested unless problems arise with journey time validation following the corrected MOVA setup. On-site queue length measurements could help determine if the queues extend beyond survey location during the base peak periods and therefore the peak hour demand is actually higher than currently considered.
Center Parcs traffic flow separation	The approach taken to separate Center Parcs traffic is understood and acceptable.	Low risk (does not affect total demand in base models).	None required.
Static vehicle routing decisions – vehicle classification	The data provided in Appendix C is welcomed although there is no comparison between observed and modelled turning movements by vehicle type.	Could impact lane allocations and storage utilisation on approaches to the junctions if, for example, a higher proportion of longer vehicles use a particular lane/turning movement.	Strongly consider assigning the static vehicle routing decisions by vehicle type in Vissim during detailed design. This information is already available in Appendix C and should also help ensure that the classified turning count validation is satisfactory.



Note (original review colour)	Council Comments (revised review colour)	Remaining Risk	Subsequent action required
Reduced speed areas	It is understood that the reduced areas were used to help calibrate the journey times, including for the Center Parcs traffic on Fridays. However, it is a slight concern that the corresponding speed distributions have been reduced by so much.	<p>There is a risk that the reduced speed areas could impact designing and testing the MOVA signal configuration in detailed design if vehicles would likely travel faster than currently coded into Vissim.</p> <p>There also a slight risk that this over-cautious calibration has masked other network issues (such as underrepresented traffic demand).</p>	During detailed design, revisit all the reduced speed area speed distributions applied in the base and forecast models. Ensure that they are all appropriate and allow for realistic modelling of the proposed signal coordination.
Journey time calibration/validation	The additional narrative on some journey times and the calibration process is welcomed.	A slight risk remains that some of the journey time differences could impact the effectiveness of the model when used in detailed design.	Ensure that the base model journey time validation still meets the required TAG M3.1 standards following any network changes made during detailed design.
Link flow calibration	Response accepted.	Low risk.	Apply agreed changes during detailed design.
Static vehicle routing decisions – U-turns omitted	Response accepted.	Low risk.	Apply agreed changes during detailed design.
Public Transport Lines	Response accepted.	Low risk.	Apply agreed changes during detailed design.



APPENDIX B – VISSIM FORECAST MODELS COMMENTS

Review of A66 M6 J40 Kempley Bank Forecast Vissim Models & TFR

We have reviewed the responses from the Applicant and have used the below key, to allow for the prioritisation of amendments to be made.

Table Key	
Green	Satisfied with response, subject to the implementation of agreed action.
Amber	Recommendations/clarification regarded as medium risk on the results presented, but not considered to be detrimental to the overall outcomes.
Red	Recommendations/clarification regarded as a high risk to the reliability, and therefore validity of the results and conclusions presented to date

Recommendations

Note (original review colour)	Council Comments (revised review colour)	Remaining Risk	Subsequent action required
Base Model Comments	Response accepted.	Low risk for detailed design providing the recommendations suggested by the Council are fully implemented.	Ensure that all changes made to the base model are documented and applied to the forecast models.
Vehicle Travel Time Measurements	Response accepted.	Low risk.	Apply agreed changes during detailed design.
Traffic Assignment Forecasting	The information provided in TFR Appendix A & B is welcomed.	Low risk although the differences between the A66TM modelled and observed flows on the A6 S approach to Kempley Bank roundabout should be noted.	None suggested unless the A6 S approach (including Eamont Signals) to the Kempley Bank roundabout proves particularly sensitive to the proposed design.

Note (original review colour)	Council Comments (revised review colour)	Remaining Risk	Subsequent action required
Journey Time Increases	Agreed that the journey times should be analysed in more detail during detailed design. This should include the analysis of longer routes as agreed in the 'vehicle travel time measurements' note.	Low risk as no significant operational issues have been observed or reported in the modelling carried out to date.	Analyse journey times closely during detailed design and work with relevant stakeholders to ensure any increases are acceptable.
Model stability	Response accepted.	Low risk.	Apply agreed changes during detailed design.
Incorrect pedestrian input	Response accepted.	Low risk.	Apply agreed changes during detailed design.
Low lane change distance	Response accepted.	Low risk.	Apply agreed changes during detailed design.



APPENDIX C – LINSIG FORECAST MODELS COMMENTS

Review of A66 M6 J40 Kempeley Bank Forecast LinSig Models & TFR

We have reviewed the responses from the Applicant and have used the below key, to allow for the prioritisation of amendments to be made.

Table Key	
Green	Satisfied with response, subject to the implementation of agreed action.
Amber	Recommendations/clarification regarded as medium risk on the results presented, but not considered to be detrimental to the overall outcomes.
Red	Recommendations/clarification regarded as a high risk to the reliability, and therefore validity of the results and conclusions presented to date

Recommendations

Note (original review colour)	Council Comments (revised review colour)	Remaining Risk	Subsequent action required
Lane Lengths	Lane lengths seem to have been correctly measured.	Low risk.	None required (although further checks/refinements alongside cruise times/speeds could be carried out during detailed design to ensure the correct traffic profiles are arriving at each stop line).
Signal Timings Coordination	The current limitations of accurately representing the signal coordination are acknowledged.	There is a risk that the impacts of blocking back could be worse than currently reported. Conversely, updates to the signal coordination could improve the junction operation.	The coordination of the traffic signals should be carefully considered in detailed design, consulting with signal engineers. The full risk should be quantified once the optimal signal configuration has been agreed.
Signal Optimisation	The analysis of observed cycle times in Appendix E is welcomed, confirming that the cycle times are higher than would typically be expected.	Low risk if 75s cycle times are to be used in the proposed design on site.	Consult with signal engineers and relevant stakeholders during detailed design to ensure the LinSig model signalisation (including cycle time) is reflecting the proposed junction operation.

Note (original review colour)	Council Comments (revised review colour)	Remaining Risk	Subsequent action required
Traffic Assignment Forecasting	See corresponding comment in Appendix B.	See corresponding comment in Appendix B.	See corresponding comment in Appendix B.
Cruise Times/Speeds	It is acknowledged that 50 km/h is a realistic cruise speed although it may vary, especially in congested conditions.	The risk remains that the profile of traffic arriving at some stop-lines may be incorrect leading to operational issues not currently detected.	Fully consider the cruise time or speed on each connector in detailed design to ensure the traffic profiles are correct throughout the roundabout. Consult with the Vissim model or signal engineers if necessary.
Signal Configuration	Agreed that the controller specification should be obtained and checked during detail design.	The risk remains that the LinSig model does not reflect the likely future operation.	Apply any changes in detailed design and the risks of any changes to model operation.
Internal Blocking	The updated analysis on blocking back in the TFR is welcomed although it is difficult to quantify the full impacts from the LinSig model alone.	There remains a risk that the blocking back could lead to the junction operating over capacity by 2044 in some peak periods.	Continue to analyse the impacts of blocking back during detailed design. Consultation with the Vissim model and signal engineers will help to quantify the impacts.
Saturation Flows	The explanation given for the saturation flows is appropriate.	Low risk.	Consider deriving more accurate saturation flows in detailed design from available data or traffic modelling.
Phase ordering	Response accepted.	Low risk.	Apply agreed changes during detailed design.