HIGHWAY OBSERVATIONS FOR: 20/01656/CONS

DATE: **9th April 2021**

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Outline planning application with all matters reserved except for access for a mixed use sustainable urban extension on land to the South West of Milton Keynes to provide up to 1855 mixed tenure dwellings; an employment area (B1); a neighbourhood centre including retail (A1/A2/A3/A4/A5), community (D1/D2) and residential (C3) uses; a primary school and a secondary school; a grid road reserve; multifunctional greenspace; a sustainable drainage system; and associated access, drainage and public transport infrastructure. (Buckinghamshire Council's application 15/00314/AOP).

Summary of advice from Transport Development Management

No objection	☐
No objection subject to condition(s)	☐
Object to the Planning Application	☒
Application needs amending and/or further information required	☒

Milton Keynes' concerns are outlined in the following response from our Highway department.

Summary

Milton Keynes Council (MKC) has now been able to review the current suite of submissions by the applicant in respect of highways matters.

MKC objects to the proposed development, the supporting assessment for which predicts severe queuing and delay on the A421 corridor which is a key artery linking MK and Buckinghamshire, and on local roads around the site. MKC recommends that Buckinghamshire Council (BC) refuses to grant planning permission due to the practical and policy issues arising, including the predicted severe transport impact.

The Transport Assessment (TA) and TRNs do not meet the requirements of national policy as the severe traffic impact of the scheme would remain even with the proposed mitigation in place. Taking the applicant's alternative view that traffic would re-route, the TA / TRNs remain unacceptable as they provide no evidence of the scale, location and impact of that re-routing.

Chapters 10-12 of the Environmental Statement (ES) are based on the traffic flows used in TRN3. The Proof of Evidence of Martin Paddle (WSP)[1] on behalf of the applicant / appellant for the related MKC appeal[2] states:

> 6.10 The use of a manual spreadsheet-based approach to distribute and assign traffic is unable to account for the benefits of any dynamic reassignment that would arise in a congested urban network. It assumes that traffic volumes would increase at a junction indefinitely and ignores the fact that motorists will only accept a certain level of queueing and delay before either re-routing (i.e. to balance traffic flows across the network), re-timing (to outside of peak hours), or re-moding (i.e. to sustainable transport options) their journey. When used on a congested urban network, a manual-spreadsheet based approach would therefore present a robust assessment of the development impacts in that the extent of the impacts it identifies are unlikely to occur to the same extent.

Similarly, in the draft Highways Statement of Common Ground (SoCG) between WSP and MKC in relation to the Appeal for the planning application in the MKC area, WSP states:

'this 'static' junction modelling approach would make no allowance for the dynamic reassignment of traffic across the wider highway network'

Whilst WSP uses this as justification for arguing that its assessments present a worst-case in traffic terms, the argument undermines the validity of the traffic assumptions used in ES Chapters 10-12 which should be revisited based on evidence which accounts for rerouting of traffic across the network.
This is particularly pertinent given the strategic regional/national role of the A421, identified by Government as part of the Major Road Network, the operation of which is protected in Plan:MK policy.
MKC also raises serious questions as to the deliverability of much of the proposed mitigation on the Council's highway network for reasons including geometry/design standards, safety, impacts on street furniture (which it may not be feasible to re-site), utilities and arboricultural effects.

In the case of Bottledump roundabout (on the BC boundary) and the Tattenhoe roundabout, the WSP traffic models must be revised to more accurately reflect the likely operation of those junctions before the nature and extent of mitigation can be accepted.

In summary:

- The TA/TRNs need to be updated to fully illustrate the likely impacts of the proposed development, along with the identification of NPPF-compliant mitigation.
- Dependent upon the approach taken by the applicant, this will either require network traffic modelling, alongside updates to the ES, and/or the identification of deliverable mitigation schemes in line with the requirements of policy.

[1] 15th September 2020.
[2] Application 15/00619FUL and Appeal Ref APP/Y0435/W/20/3252528.

With regard to network traffic modelling, MKC would be happy to discuss options put forward by the appellant, which may include the preparation of new models covering a suitable area. Given that the approach taken in the TA/TRNs/ES diverges from the methodology used in existing models (e.g. in respect of trip generation), no direct comparisons can currently be drawn between WSP's latest analyses and the earlier strategic models held by the Council.

Introduction

MKC objected to the previous application. A parallel application for the previous proposal to Milton Keynes Council (reference 15/00169/FUL) for physical improvement to Bottledump Corner and a new access on to the A421 to accommodate the development of land in Aylesbury Vale District was refused by Milton Keynes Council and is currently the subject of a planning appeal. The reason for refusal was:

> "That in the opinion of the Local Planning Authority there is insufficient evidence to mitigate the harm of this development in terms of increased traffic flow and impact on the highway and grid road network with specific reference to Standing Way and Buckingham Road, thus this will be in contravention of Policies CT1 and CT2 (A1) of Plan:MK."

A new (2020) Transport Assessment (TA) was prepared as part of the appeal mentioned above and an identical TA accompanied this application, titled as "Updated Transport Assessment" (albeit it represents a completely new analysis and can be considered a new TA). That new TA is now understood to have been largely superseded by the submission of Transport Response Notes (TRNs), including TRN3 which was issued on 29th January 2021.

BC has recently consulted MKC on TRN3 (and also on TRN2 which relates to its own highway network). MKC is now able to provide the following initial comments.

Extent of Assessment Work

Having agreed with BC and MKC that it would progress a TA (and then TRNs) using a traditional approach which does not refer to wider network traffic modelling, the applicant has the options to either:

- Take the conclusions of its TA at face-value and seek to mitigate them in the usual way – e.g. by reducing travel demand and physically mitigating the residual traffic impacts; or,
- If it is to argue the case that traffic would redistribute across the highway network, reducing specific predicted junction/link impacts, it must provide a comprehensive assessment of how much traffic would divert, to where, and with what effects.

At present, TRN3 indicates widespread congestion between junctions along the A421 between Bottledump roundabout and central Milton Keynes. The extent of queuing predicted by WSP is sufficient that queues from one junction would often extend back and block the exit of the upstream junction. Based on WSP's assessment within TRN3,

the residual impact is shown to be severe, as there is a significant reduction in performance even with the mitigation measures in place.

This is defended in the TA on the basis that, in practice, there will be some redistribution of traffic on the grid road network. However, the applicant provides no analysis to show whether the spare capacity exists on alternative routes so, although this may be a possibility, it cannot be accepted at this stage as a 'solution' to the predicted issues.

None of the submitted assessment work shows where/to what extent redistribution might occur and, given the extent of predicted queuing/delay as a result of the development, it is possible that the residual impact could still be unacceptable.

In coming to this view, MKC is mindful of matters including the potential social, economic and environmental impact of excessive queuing and delay which would undermine accessibility between Buckinghamshire and Milton Keynes, and would have a significant adverse impact on public transport reliability and emergency vehicle access. It is noted that the A421 is identified as part of the national Major Road Network, protected in policy.

The National Planning Policy Framework (NPPF) requires the provision of a TA for developments which will generate significant amounts of movement 'so that the likely impacts of the development can be assessed' (para 111). The NPPF defines a TA as a 'comprehensive and systematic process that sets out transport issues relating to a proposed development. It identifies measures required to improve accessibility and safety for all modes of travel…and measures that will be needed to deal with the anticipated transport impacts of the development'.

The present evidence base relating to the MKC highway network comprises of part of the 2020 TA and TRN3. The applicant argues that these documents over-predict impacts on the highway network, but provides no further assessment to quantify the extent and effect of any wider re-distribution of trips upon which it relies to mitigate the predicted severe operational impacts.

The applicant also refers to the initial agreement by BC and MKC of the scope of the 2020 TA. MKC Officers accepted the assessment methodology proposed by WSP, but did not and could not have accepted at that stage that the conclusions of the TA would be acceptable to the LHA, or that further work would not be required. The requirement for additional assessment is further evidenced by the subsequent submissions by WSP which include TRNs 1-3, reflecting the comments of BC Highways.

The current evidence base submitted by the applicant does not meet NPPF requirements for a TA, nor those set out in the National Planning Practice Guidance (NPPG) because:

- WSP states that actual effects would be different from those indicated in its reports, meaning that WSP's current evidence does not indicate the 'likely impacts of the development' as required;
- It does not assess the potentially-significant levels of re-routing, meaning that it is not 'comprehensive';

- Given that TRN3 predicts severe queuing and delay, the assessment does not identify the 'measures that will be needed to deal with the anticipated transport impacts of the development';
- No further studies have been presented – e.g. an assessment of the likely environmental and operational impact of roads and junctions affected by queuing and/or re-routing traffic[3].

Consequently, MKC does not accept the transport evidence base submitted by the applicant. As noted, this must logically be updated either to address the predicted severe queuing and delay indicated in TRN3, or to provide an extended assessment including a network model capable of illustrating the location, extent and effect of rerouting (along with any required mitigation measures).

Policy

In addition to the Plan:MK and NPPF policies quoted previously, the development would be contrary to NPPF:

Paragraph 7, which states that the purpose of the planning system is to 'contribute to the achievement of sustainable development', which is defined as 'meeting the needs of the present without compromising the ability of future generations to meet their own needs'.

Paragraph 8, which identifies three linked strands to sustainable development – economic, social and environmental objectives. The level of queuing and delay on the A421 and Buckingham Road, as predicted by WSP in TRN3, would have significant impacts across these strands, including:

- The economic impact on Milton Keynes and Buckinghamshire arising from severe congestion on the A421.
- Social impacts arising from mobility constraints on local residents, delays to public transport services and constraints to emergency vehicle access.
- Environmental impacts including new queues outside of local schools, stationary traffic on the A421, and unknown effects due to re-routing of vehicles across the wider network (not assessed in the TA/TRN or in the ES).

In the same vein, NPPF paragraph 102 requires that 'the potential impacts of development can be addressed' and that 'the environmental impacts of traffic and transport infrastructure can be identified, addressed and taken into account – including appropriate opportunities for avoiding and mitigating any adverse effects, and for net environmental gains'.

Paragraph 104 states that policies should 'identify and protect…routes which could be critical in developing infrastructure to widen transport choice and realise opportunities for large scale development'.

At paragraph 108, the NPPF requires that 'any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree'. The

[3] NPPG Paragraph: 015 Reference ID: 42-015-20140306.

mitigation, as currently proposed, fails to achieve this and, as indicated subsequently, may not be deliverable.

Reflecting the above, paragraph 110, the NPPF requires that developments 'allow for the efficient delivery of goods, and access by service and emergency vehicles'.

The development as proposed does not accord with the NPPF in the above regard. The Council recommends that the application is refused planning permission given the predicted severe operational impact (contrary to NPPF paragraph 109), and in light of its likely economic, social and environmental impacts which extend across Local Authority boundaries and fail to meet the NPPF definition of sustainable development.

Junction Model Updates

Junction 1: Buckingham Road/Sherwood Drive/Water Eaton Roundabout

TRN3 proposes that the existing roundabout is retained and a scheme is implemented which involves footway narrowing around the roundabout in order to provide additional carriageway area.

On Sherwood Drive, it is proposed to remove much of the verge between the carriageway and footway. Street lighting columns are currently present within this area and it is unlikely that they can be retained/re-provided within the limited area of verge that would remain. The footway would therefore need to be moved to the west in order for street lighting to be retained, the achievability of which must be confirmed in relation to land availability and conflicts with utilities infrastructure.

On Buckingham Road, east and west of the roundabout, the footway and foot/cycleway would be narrowed in order to create additional exit lanes on the carriageway. It is again unclear whether street lighting could be retained as required.

The bus stop on the north side of Buckingham Road (eastern arm) is to be moved from a layby to on-carriageway, 86 metres upstream of the roundabout exit. This could cause a conflict if enough cars back up behind a stopped bus to cause a queue onto the roundabout. The bus stop is also to be moved further from the pedestrian refuge that currently allows pedestrians to cross the road. This move could encourage pedestrians alighting the bus to cross the carriageway away from the crossing point.

The proposals significantly affect the entry path curvature of the eastern (Buckingham Road) arm. The proposals effectively remove any entry path curvature at all. The applicant should review accident data and consider whether the slackening of the entry path could exacerbate any safety problems.
Visibility to the right from Water Eaton Road (southern arm) looking right along Buckingham Road (eastern arm) is limited when approaching the roundabout, which is slightly exacerbated by the proposals. If accident records show that visibility is an issue, it could be considered that the proposals are detrimental to highway safety – this should be reviewed by the applicant.

Issues relating to the position of street furniture post-widening are raised in the Road Safety Audit (RSA) undertaken by WSP. Whilst it is accepted that the junctions would

be subject to detailed design / Stage 2 RSA at s278 stage, the potential impact of accommodating street lighting in particular needs to be confirmed, given that it relates to the overall nature and deliverability of the proposed scheme.

Junction 2: Buckingham Road / Shenley Road Mini-Roundabout

The proposed scheme largely comprises carriageway widening into existing grass verge. It is proposed to remove around half the width of the footway on the northern side of Buckingham Road, to the west of the roundabouts, which is unacceptable in terms of pedestrian provision.

Furthermore, it is proposed to remove the layby on Shenley Road, to the north of the roundabouts, which currently provides a degree of protection for a vehicular property access 12m north of the junction. As noted in the RSA, this has potential safety implications for pedestrians and motor vehicles. The RSA and Designer's Response (DR) note this issue, and also a further problem in that it is unclear from the current drawings whether the pedestrian crossing islands around the junction are to be retained. Whilst it is reassuring that the DR states that drop-kerbs would be provided in relation to the Shenley Road property access, and that the pedestrian crossing islands are to be retained, this should be shown on the planning-stage drawings, rather than at s278 stage.

Under the proposals, the approach from Newton Road (southern arm) aims drivers in the right hand lane directly at the central island. This could make manoeuvring around the island difficult.
The forward visibility to pedestrians waiting to cross on the eastern side of Newton Road is worsened by the proposals. Taking an MfS SSD (given the speeds and environment), there is currently space to accommodate an approximately 41.9m SSD to the centre of the footway at the crossing. Under the proposals this is reduced to approximately 31.9m (both distances measured along the driver’s path), as shown below:

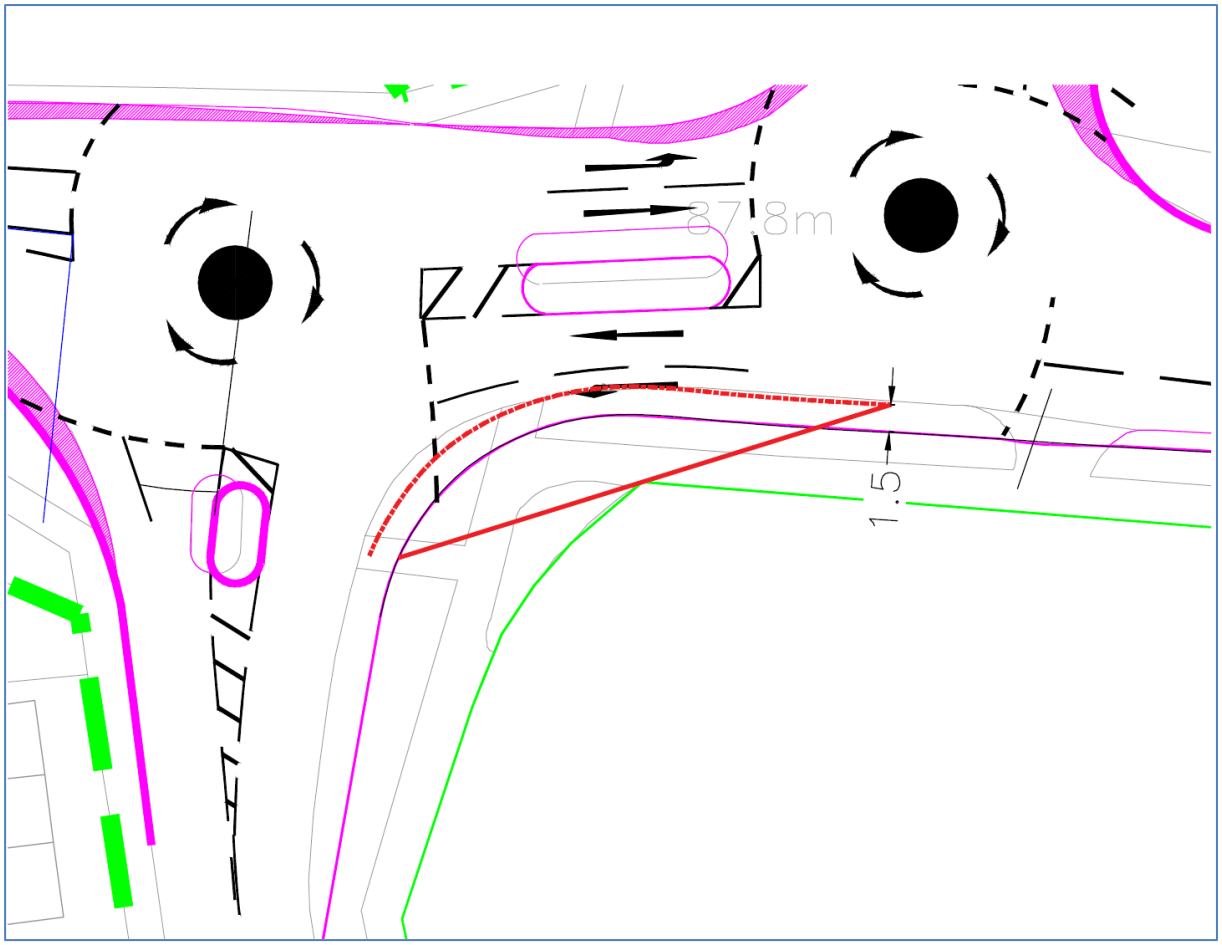

Figure 1: Forward visibility onto pedestrian crossing

Modelling indicates that development traffic would lead to a significant increase in queuing and delay on the westbound approach to the eastern roundabout from Buckingham Road. Queuing is predicted to increase from 47 to 133.5 vehicles, an increase of around 519m, with delay increasing from 129.22 seconds to 448.74 seconds per vehicle on that arm (an increase of 5.3 minutes).

The conclusion reached in TRN3 seems to erroneously compare the Do Something 1 Pre-Mitigation and Do Something 1 Post-Mitigation scenarios. The correct comparison is between the operation of the highway with and without development traffic - i.e. a comparison of 2033 Do Nothing (Pre-Mitigation) and the mitigated Do Something scenarios.

The increase in queuing on Buckingham Road would block back as far as Cottingham Grove to the east. By comparison with the without-development scenario, this queue would block an additional six side roads, two bus stops, multiple property accesses, a signalised crossing outside of a school, and would create congestion adjacent to that school (Holne Chase Primary) where none presently exists.

In summary, the scheme drawings are incomplete and unacceptable for planning determination purposes, and the proposed mitigation would not address the severe / unacceptable impact of development traffic.

Junction 5: Tattenhoe Roundabout

Mitigation includes the signalisation of the junction.

The design drawings do not indicate an intention to reduce the speeds on approach to the roundabout as part of the signalisation. DMRB CD 116 states:

4.1 Where the 85th percentile speed on the approach roads are greater than or equal to 104kph (65mph), a signal-controlled roundabout shall not be provided.

Given that the proposed signalisation is on the A421, a national speed limit dual carriageway, the 85%ile speeds should be confirmed, if the 85%ile speeds are above 65mph then the viability of the signalisation is questionable.

There is a fundamental flaw with the model construction concerning the lane lengths that have been used for the gyratory and the resulting stacking capacity of these links.

This has previously been discussed, and WSP has therefore provided an explanation at TRN3 paragraphs 5.2.11 and 5.2.12. WSP implies that blocking back is of no concern as the longest queue on the gyratory is 3.1 PCU before the lights turning green, when considering the back of a Uniform Queue (UQ) (Table 5.5 within TRN3). 3 PCU equates to approximately 17m of queuing from the stop line, and a corresponding stacking capacity of 16-20m has been provided. However, a fluctuation of one vehicle on the gyratory could cause blocking back and impact on the junction's operation, as a single PCU (5.75m) would exceed the provided stacking capacity.

The UQ does not allow for such variations, and is not the appropriate queue measure. LinSig models queue lengths in three components, of which UQ is one. The Mean Max Queue (MMQ) is an average of those three components, and provides a more realistic indication incorporating the random and oversaturated queues. Lanes 1 and 2 on the west gyratory have a MMQ of 6.3 and 6.7 respectively, which is in excess of 34m of queuing space.

In any case, an articulated HGV stopped at the lights would completely or partially block the exits of the roundabout as shown in Figure 2:

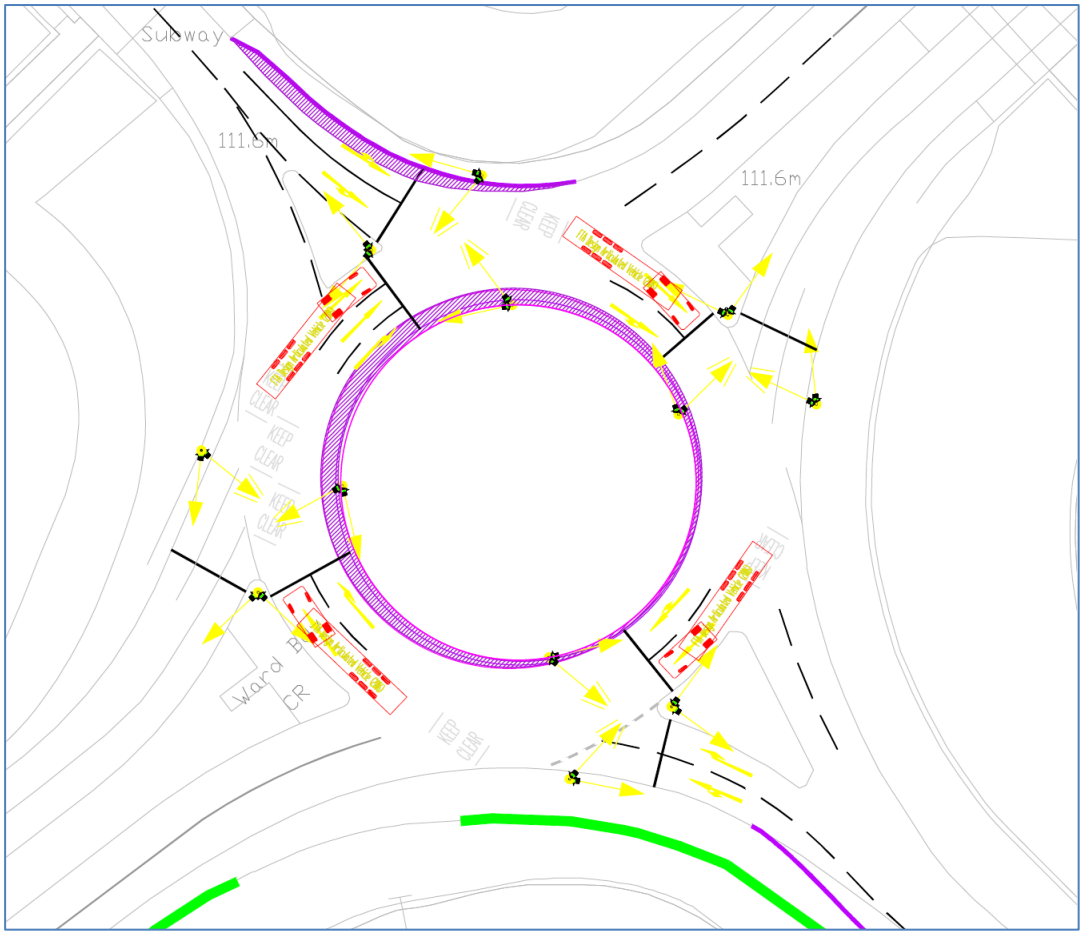

Figure 2: Roundabout exits blocked by HGVs

Keep Clear markings have been proposed to mitigate against this potential blocking back. Given that the junction is signalised and would be congested at busy periods, it is unlikely that these markings would be observed by drivers and they are not enforceable.

Keep Clear markings are not commonly used at roundabouts and the Traffic Signs Manual (6.9.2)4 states:

> '*Although the Directions do not prohibit the use of the "KEEP CLEAR" marking (diagram 1026, S11-4-16) on roundabouts, there are still the potential problems of obscuration of sight lines and re-establishing priorities. These risks should be assessed carefully when considering whether the marking might help resolve problems caused by exit blocking.*'

By contrast, yellow box markings are enforceable, increasing compliance. However, there must be full time signal control on the roundabout entry where they are to be used. The Traffic Signs Manual explains that (6.9.1):

> *'This is because a circulating vehicle has priority over those entering. If it stops to avoid obstructing the box when its exit is blocked, thereby releasing the flow*

4 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/773421/traffic-signs-manual-chapter-05.pdf

of entering vehicles, there is likely to be uncertainty over re-establishing right of way when the exit is clear again. Moreover, a vehicle stopped in an outer lane might obscure vehicles lawfully continuing to circulate on the inner lanes (whose exit might not be blocked) from the view of drivers entering the roundabout. Yellow box markings must not be used where part time signals are in operation.'

In this case, the appellant proposes part-time (peak-hour) signalisation of the junction, which is incompatible with yellow box markings.

The gyratory lane lengths in the model would still need to be updated so that vehicles could not extend back onto these markings - this would reduce the stacking capacity of 16-20m to c.10m, sufficient for 1-2 PCUs, below both the UQ and MMQ measurements.

In relation to visibility, CD116 states:

On an external approach to a signal-controlled roundabout, each traffic lane shall have clear visibility of at least one primary traffic signal associated with its particular movement, from a distance equivalent to the desirable minimum SSD of the approach road.

It would appear that a desirable minimum stopping sight distance of 295m to any signal head on Standing Way (SW approach arm) can not be achieved within the highway boundary indicated on the drawings. It would also appear that a desirable minimum stopping sight distance of 215m to any signal head on Buckingham Road (SE approach arm) can not be achieved within the highway boundary indicated on the drawings.

The mitigation scheme drawing is lacking details such as road markings for the A421 approaches and guide markings on the circulatory carriageway. Vehicle tracking has been provided which indicates that Heavy Goods Vehicles (HGVs) would slightly over-run adjacent lanes and, in one location, would collide with a car running parallel. It would be normal for this to be examined in more detail and the matter resolved, including the assessment of two large vehicles travelling in parallel through the junction. This point is raised in the RSA and should be resolved in advance of determination of the application.

The NW approach arm currently has an entry path radius in the region of approximately 140m and the proposed geometry will worsen the situation.

The V1 Snelshall Street approach indicates a relatively sharp taper to two lanes immediately south of the overbridge north of the junction. This needs to be checked against design standards, as any requirement for a more gradual taper would require works to the bridge structure.

The RSA notes the potential requirement to relocate street furniture around the junction in order to accommodate carriageway widening. This should be confirmed at planning stage, particularly given the level differences and potential requirement for earthworks to accommodate any significant re-siting.

Additional detail is also required on the Buckingham Road approach, as the proposed widening does not illustrate how the carriageway centreline would be accommodated, how the exit lanes would operate, and over what length the approach lanes would develop. Neither does the drawing show the proposed extent of carriageway construction. An Advance Direction Sign for the roundabout is presently sited within the area indicated for carriageway widening and, given the importance of its location relative to the nearby junctions, the location for its re-provision needs to be confirmed.

In summary, the modelled operation of the junction is not accepted, as queuing around the roundabout would likely lead to exit blocking. Furthermore, the design needs to be worked-up in additional detail as there are matters which need to be confirmed in advance of determination, as they affect the deliverability of the design concept (and are therefore not detailed design matters as proposed by WSP).

Junction 6: Bottledump Roundabout

At Junction 6: Bottledump Roundabout, lane simulation has been used to effectively model the entry to the junction with a flare of 0 which, given that the approach to the roundabout has a clear flare, is inconsistent with the mitigation drawings that have been provided. TRN3 does not explain why lane simulation has been used in this way and it is noted that the percentage of vehicles using each lane has not been altered from the 50/50 default.

This removal of the flare effectively undermines the entry capacity formula by approximately 300 vehicles per hour (vph), and a revised model with the correct flare lengths must be prepared. This is likely to demonstrate that the mitigation proposed is unacceptable.

In relation to the proposed mitigation measures, the nearside kerb on the A421 westbound approach is already over-run by large vehicles turning left into Whaddon Road, but remains unaltered in the WSP design.

Whilst some limited widening is proposed on the A421 eastbound and Whaddon Road approaches, these already have two-lane entries to the junction, meaning that the actual benefit of such widening may not be as great as the model suggests.

Swept path analysis plans in TRN3 show that a HGV would collide with a car running in parallel around the junction for the westbound A421 movement, due to the significant encroachment of that HGV into the adjacent lane. No such tracking plans have been provided by WSP for movements including the left-turn into Whaddon Road, and the right-turn from the A421 into Whaddon Road. These should be provided in advance of determination.

Owing to the widening of the circulatory carriageway through reducing the size of the central island, the entry path curvature on all arms is reduced, which could lead to higher entry speeds.

A standalone Pegasus crossing is proposed on Whaddon Road, within the BC area, with links to/from the MKC area. It is recommended that BC requires the applicant to provide evidence that vehicle speeds in this area are, or could be, reduced to a level commensurate with the introduction of this crossing.

The RSA notes (problem 9) that the tie-in for WCHR to Buckingham Road is at the recycling centre access, which could cause conflicts. The auditors recommended that:

It is recommended that good visibility splays, removal of vegetation, signing and enhanced visual features are proposed at this tie-in, warning vehicle users to expect WCHR activity.

The Designer's Response is:

2.9.1. Noted. Vegetation will be trimmed to ensure good visibility for WCHRs in this location and advance signage and markings will be used to ensure drivers using the recycling centre access are warned of the equestrian route. The specification and location of the features will be provided at the detailed design stage, which will be subject to a Stage 2 RSA.

Although visibility within the highway boundary can likely be improved, there is also a fence around the recycling centre (within the BC boundary). This fence could obstruct horse riders emerging into the carriageway from the view of drivers leaving the recycling centre.

RSA (problem 11) highlights the lack of visibility of the new Pegasus crossing for vehicles traveling from the roundabout down Whaddon Road. The Designers state that the vegetation will be cut back and maintenance of this visibility will be the responsibility of Buckinghamshire Council. However, it seems from the design drawing that the visibility splay (as well as some of the widening) is outside of the highway boundary. There is no mention in the Designer's Response of any plans for this area to become Adopted. This should be clarified as it relates to the deliverability of the scheme.

In summary, the junction modelling is not accepted, as there would actually be significantly less capacity - and, hence, more queuing and delay, than predicted in TRN3. The proposed mitigation drawings should take account of the existing operation of the junction, including verge overrunning, and should be updated to address the above matters and avoid conflicts between vehicles that are currently shown on the tracking plans.

Junction 12: Kingsmead Roundabout

The proposed nearside widening on the Chaffron Way approach should be checked against design standards, as the taper to the immediate west of the overbridge appears sharper than would be expected. The position of the Vehicle Restraint System (VRS) barrier to the west of the overbridge should be checked, as its position on the plan appears to be further from the carriageway edge than is the case in reality.

The RSA notes the potential for side-swipe collisions on the junction, and WSP should provide tracking plots to demonstrate that it would operate safely.

These are matters which affect the potential deliverability of the proposed junction works and need to be confirmed at planning stage.

Junction 14: Furzton Roundabout

The junction design should be checked in terms of the need to relocate street lighting and ADS signage. Likewise, the sharp flare to the east of the bus stop on Chaffron Way should be checked against design standards, and consideration should be given to whether the nearside lane would better extend from the bus stop itself (with appropriate markings to control inappropriate use of the bus stop).

The area of widened carriageway on Chaffron Way is obscured from view on approach if a bus is using the bus stop immediately upstream. This could be an issue if vehicles are queuing in this lane.

These are matters which affect the potential deliverability of the proposed junction works and need to be confirmed at planning stage.

Junction 15: Bleak Hall Roundabout

The proposed mitigation scheme increases all approaches to three lanes. However, the drawing provides no indication of lane allocations, and no guide markings are indicated on the roundabout circulatory. These points are raised in the RSA. No vehicle tracking plots have been provided.

DMRB states that Circulatory Carriageway Width shall be between 1.0 and 1.2 times the maximum entry width, excluding any overrun area. The circulatory carriageway width (9.4m) is 0.86 times the maximum entry width (10.8m), below the standard set by DMRB. It is not clear whether, under the proposals, the three lane entries will allow three vehicles to circulate at once or if all three lane entries include a left turn only lane.

It appears that the widening on Standing Way leads to the right hand lane on approach having an entry angle of greater than the DMRB-recommended 60 degrees.

On all four approaches, the entry path curvature is worsened by the proposals and vehicles may enter the roundabout at a higher speed. The associated risks should be qualified by reference to the accident record.
The widening on the north side of Grafton Street (NW approach arm) appears to be partially on the subway structure. The distance from the carriageway edge to the railings on the bridge would need to be reduced, as well as the distance to the lighting column in this location. The drawings are not detailed enough to determine what the existing or proposed remaining distance from kerb to railing would be; however, it could be below the minimum 1200mm prescribed by CD127 (Cross Sections and Headrooms).

The addition of development traffic to the proposed mitigation scheme results in a further 58.5 vehicles queued on the A421 eastbound approach in the AM peak hour. This approach has queues which block back to the upstream junction, Elfield Park

Roundabout, in the base (without development) scenario. Consequently, this additional queuing would create further congestion at that location.

In the PM peak, there would be significant increases in queuing on Grafton Street (N) and A421 (E). With development traffic, the queue on Leadenhall Street would extend to the exit of the upstream junction (Leadenhall Roundabout). Similarly, the queue on the A421 (E) approach would block back through the upstream Coffee Hall Roundabout whereas, in the without-development scenario, the queue would be close to that junction but would not reach the roundabout itself.

The junction model takes no account of predicted exit-blocking from the downstream Elfield Park Roundabout (Junction 16) and consequently over-predicts capacity.

In summary, the proposed mitigation drawing is inadequate for planning determination purposes and does not address points raised in the RSA. Even with mitigation, development traffic would lead to either increased queuing at upstream junctions, or queues which would now block the exits from those junctions. the stand-alone model does not address exit blocking from the downstream Elfield Park Roundabout.

Junction 16: Elfield Park Roundabout

The proposed mitigation scheme comprises of localised entry, exit and circulatory carriageway widening.

TRN3 uses a stand-alone model which does not recognise the exit-blocking on the A421 (N) arm in the AM peak hour. However, the with-mitigation development scenario indicates significant increases in queuing on the A421 (S) entry arm in the AM peak, and on the A421 (N) arm in the PM peak.

The additional queuing on the A421(S) entry arm due to development traffic is predicted by WSP to cause queuing back to, and through, the upstream Emerson Roundabout. That queueing would not exist in the 2033 baseline.

Likewise, development traffic would add to pre-existing queuing on the A421(N) approach which blocks back through the upstream Bleak Hall Roundabout.

As indicated in the subsequent section, the A421(S) exit would be blocked by queued traffic from Emerson Roundabout.

As with other junction mitigation proposals, no lane or guide markings are shown within the drawing. Neither is vehicle tracking included within TRN3.

The proposed circulatory carriageway is marginally narrower than the maximum entry widths (not the 1.0-1.2 times recommended by DMRB).

The Watling Street (SE arm) exit has some road markings which are not tangential to the traffic island and should be corrected.

On all arms the entry path is made flatter and therefore vehicle speeds made faster by the proposals.

In summary, the scheme results in a worsening of conditions for pedestrians and queuing which interacts with other junctions in the vicinity. The scheme drawings lack the required level of detail and assessment for planning stage.

Junction 17: Emerson Roundabout

The proposed widening of the Shenley Road approach into the existing splitter island would result in an approach geometry which reduces deflection and may not accord with standards.

On the Standing Way (S) approach, the proposed widening includes a sharp flare which may not accord with design standards. This widening would require the removal of hedgerow and re-siting of street furniture / statutory undertakers' equipment, the acceptability of which must be established at determination stage.

On the Fulmer Street arm, the proposed approach widening would impact on street furniture and signage which could only be re-provided in that location with the significant loss of highway trees. Due to the level of the verge, above the carriageway, it is likely that the proposed widening would impact on the root systems of all trees along that carriageway frontage. An arboricultural impact assessment should be provided to determine the likely scope of impact.

On Standing Way (N), the proposals indicate widening through the provision of a sharp flare to the immediate south of the overbridge, which may not accord with highway design standards. This widening also impacts on services and street furniture including lighting columns and the VRS for the nearby subway.

The traffic islands on Shenley Road (SE Arm) and Fulmer Street (NW Arm) are directly in front of traffic emerging from the left hand lane of Standing Way on both arms. If these are to remain as a left turn only lanes, then this should be acceptable, but if drivers can now go straight on from this lane, it should be redesigned to point them at the circulatory carriageway.

The proposals include 10.5m wide, three-lane entries going into an 8.9-9.4m wide circulatory carriageway, i.e. 0.85 times the max entry width. This is below standard, and an 8.9m width is narrow for three lanes of traffic to negotiate, particularly if one of those lanes of traffic includes an HGV.

All entry path curvatures will be made flatter by the proposals to reduce the size of the central island, and could therefore lead to increased vehicle speeds.

As noted above, WSP predicts that the A421(N) exit would be blocked by traffic from Junction 16 Elfield Park Roundabout. Given that TRN3 utilises stand-alone junction models, this has not been accounted for by WSP, meaning that the junction model over-predicts capacity.

Likewise, TRN3 modelling indicates that the A421(S) exit would be blocked by traffic queuing from Junction 18 Windmill Hill roundabout.

However, taking the modelling at face-value, WSP predicts increased queuing on both Standing Way approaches in the AM peak hour. In the PM peak, TRN3 predicts worsening queues on Shenley Way and both Standing Way approaches - queuing on

the Standing Way (N) arm would increase significantly to the extent that it would block the exit from the upstream Elfield Park roundabout.

The proposed mitigation would appear to be outside of design standards, requires re-siting of street furniture / VRS, and has a potentially significant adverse impact on trees. The operation of the junction is predicted to create, and be impacted by, queuing at other junctions on the surrounding network. These are matters which affect the potential deliverability of the proposed junction works and need to be confirmed at planning stage.

Junction 18: Windmill Hill Roundabout

The proposed widening on the Tattenhoe Street approach would require re-siting of street furniture, an ADS, and electronic traffic count equipment. The proposed works to the Standing Way (N) arm would similarly impact on existing street furniture and statutory undertakers' equipment.

The scheme drawing omits to show a Give Way marking on the Tattenhoe Street arm, and has no directional / guidance markings, despite the proposed increase in entry lanes. No vehicle tracking plots have been provided to confirm the operation of the roundabout for large vehicles.

The entry widths have been enlarged to 10.5m. The carriageway width is 9.1m. This means that the carriageway width is 0.86 times the max entry width.

On all arms the entry path curvature is made worse by the proposed widening. The proposals may cause the Tattenhoe Lane arms to become sub-standard; however, more precise locations of existing road markings would need to be provided to confirm this.

With the addition of development traffic, the proposed mitigation works result in increased AM peak hour queuing on both Standing Way approaches. In the PM peak hour, the predicted queue on Standing Way (N) would increase almost sevenfold, reaching the exit of the upstream Emerson Roundabout.

The physical effects of the proposed mitigation should be confirmed at planning stage, and a complete scheme drawing / tracking plots should be provided. However, the proposed scheme still results in interaction with other nearby junctions, the impact of which has not been assessed in the current modelling.

Conclusion

On the basis of the information set out above, Milton Keynes Highways would recommend that Buckinghamshire Council objects to the proposed development on traffic impact grounds, given the severe transport impacts predicted by the applicant in its TA/TRNs at locations which provide immediate and more strategic access between the BC and MKC highway networks.

MKC would be please to liaise with the applicant on these matters and to discuss the scope of the additional work required which is likely to include additional mitigation design, network modelling and revisions to assessment documents including the ES.

Stirling Maynard Transportation

for
Milton Keynes Council – Transport Development Management