



Ref: LT090462-01/RJW/220816

For the attention of:

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18th August 2016

Greater Fernwood Transport Modelling

Dear Matt,

I am writing in regards to the above project and our conversation on 15th August 2016. The details below set out the transport modelling carried out by WYG on behalf of Newark and Sherwood District Council to date and based on these model outputs, comment on the suitability of the package of transport measures proposed by the developers for the Greater Fernwood area.

Please note that the details below include the main steps in modelling and descriptions of some sub phases of the modelling process have been omitted for clarity where their description would not significantly aid understanding of the overall process.

Background

WYG was appointed by Newark & Sherwood District Council (NSDC) to maintain and operate the Newark-on-Trent VISUM transport model on behalf of the Council. The VISUM transport model was used to advise the District-Wide Transport Study that was produced in May 2010 in support of the Council's Core Strategy. The model was originally built by consultants acting on behalf of the developers promoting the Land South of Newark strategic development site. N&SDC purchased the right to use the VISUM model "to fulfil their statutory obligations".

The models cover peak hour periods for the morning and evening weekday peaks. The model is a highways model incorporating the vehicle types of Light and Heavy vehicles.

Since the base model was originally created it has been updated in the course of assessment work commissioned by NSDC to produce a validated model in accordance with recommended best practice that was 'fit for purpose' for use as a forecasting tool.





Reference Case Modelling

The validated base year model was updated to a reference case model by adding details of committed infrastructure schemes and committed land-use developments. This included the land use trip generation and infrastructure associated with the Land South of Newark development which includes the Southern Link Road (SLR).

No other committed infrastructure schemes were identified within the District that would result in material changes to existing transport conditions within Newark-on-Trent that had sufficient certainty in the form of design and timetable of their completion to be included.

Information was obtained from Newark and Sherwood District Council regarding committed land-use developments within the District and in adjacent Districts/Boroughs (proposed developments with planning permissions yet to be implemented, or developments already under construction but yet to be completed or occupied). Further developments that do not yet have planning permission but could be assigned a 'likelihood' of development were also assessed to produce an uncertainty log which was used to define a 'core' scenario of developments that could be considered likely to proceed within the time frame to be assessed.

Trip distribution for the committed developments is based on a compound distribution pattern created from existing modelled zones by existing development type e.g. the sum of the distribution pattern for a number of existing residential zones is used to provide the distribution for the residential element of a new development. A bespoke additional module then assesses the relative sizes of new developments compared to the existing residential/employment areas and allows assignment of trips between different new development areas e.g. a new residential trip to a new employment area.

Please note that the full quantum of development proposed for the Newark area is in excess of that predicted by TEMPRO for the local area by the end of the plan period as TEMPRO predicts the growth spread over a larger geographical area. Therefore, TEMPRO growth predictions do not take into account the aggregated affect of the developments that are proposed in the local area. Constraining the matrices to specific TEMPRO forecast year growth predictions would hence lead to a reduction in background traffic that could be considered unreasonable. As such, no attempt was made to incorporate TEMPRO predictions of growth. This is considered a robust approach.

The reference case forecasts assumed no new residential or employment development in the Greater Fernwood area over and above the employment area development proposals consented prior to this study.

This reference case scenario provided predicted background traffic conditions in the future forecast year modelled (2031) for the AM and PM peak hour periods.





Greater Fernwood Development No Mitigation Modelling

Initial modelling of the Greater Fernwood Development site was added to the reference case modelling to produce a no mitigation development case scenario. This included any links/junctions required for the development trips to access the road network but did not include any proposed mitigation measures to address the impact of the additional trips on the highway network.

Traffic flows from the initial and reference case models were provided to the developers to assist in the design of the mitigation measure package.

Greater Fernwood Development With Mitigation Modelling

Details of the mitigation were provided by the developer's consultants and included in the model. This was an iterative process with flows fed back to the developer and designs updated in order to produce the full mitigation package.

The final mitigation package tested consisted of the following:

Highway Work	Proposed Mitigation
A1 South/B6326 Fernwood South	Various works including <ul style="list-style-type: none"> • Creation of left-slip from A1 (south) • Banning right turn from B6326 to A1 north • Roundabout to serve Phase 3 of the Persimmon development
B6326 Great North Road (GNR)/ Sylvan Way	Works proposed include improving existing footway and pedestrian crossing facilities around the bell-mouth of the junction. (Works do not require inclusion in the model.)
B6326 Great North Road/C421 Shire Lane junction	Change existing give way controlled junction to a new roundabout
C421 Shire Lane Corridor improvements	Reconstruction of carriageway between the roundabout junction with the GNR and the County boundary at the bridge at the Shire dyke giving; <ul style="list-style-type: none"> • continuous carriageway of 6.75m wide • including the provision of a continuous shared 3m footway/cycleway on the northern side of the carriageway • including a 2m footway on the southern side of the carriageway (Includes access points to Persimmon Phases 2 and 3)
B6326 Great North Road Corridor Improvements (Shire Lane to Dale Way)	Narrowing of carriageway to facilitate construction of a 3m shared footway/cycleway
B6326 Great North Road/ Dale Way Junction	Improvements to existing roundabout including widening on northbound approach and northbound exit to 2 lanes





Goldstraw Lane/B6326 Roundabout	Works involve: <ul style="list-style-type: none"> • Increased flare length on Goldstraw Lane to extend the 2 lane entry; • Increased flare length on the B6326 southern arm to extend 2 lane exit; • Widening of the B6326 on the northern arm to provide a 2 lane exit; • Increase flare length on the A1 slip road with 40m taper to provide a 2 lane entry
A1 Over-bridge	Widening to provide to 2 lanes north bound towards Newark
B6326/London Road Balderton Roundabout	Widening of the B6326 southern arm to create two lanes to accommodate continuous 2 x 3.3m lane approach
B6326 between Dale Way and Goldstraw Lane junctions	Continuous 2 lanes northbound between the two roundabout junctions.
Hollowdyke Lane/B6326 Great North Road Junction	Junction improvements including widening on the Hollowdyke Lane approach and provision of northbound ghost island right turn. Carriageway widening and standard improvements to Hollowdyke Lane.

The models were reassigned to provide with mitigation traffic flows on the network.

In addition to the above, the traffic flows generated indicated that in order for the new B6326/SLR junction to operate within capacity, the turning movements at the junction would require a two lane right turn from the B6326 south to B6326 north. In agreement with NSDC and Nottinghamshire County Council (the Highways Authority for the area), this double right turn has been included in all further scenarios.

The traffic flows from the model were provided to the developers to allow capacity assessments of the proposed junctions to be carried out.

Modelled Flows Points of Interest

Traffic flows in the model are allowed to assign to the perceived least cost path using an iterative equilibrium assignment. This means that where there is an alternative route that is close to the most direct route in travel time terms, some vehicles will use the alternative route with the volume of traffic on each route reaching a balance so that no vehicle could reduce their travel time by switching to another route. In this model, the above assignment leads to two significant routing patterns discussed at length between NSDC, NCC and the developers. These were:

1. Use of the A1/B6326 south junction to turn right onto the A1 to travel into Newark/further north on the A1; and
2. Use of the Greater Fernwood employment area internal links to avoid using the B6326.

For the first point, the revision of the A1/B6236 south junction to ban the right turn out of the B6326 was included as part of the iterative process of mitigation design. However, this movement was desirable due to the travel times experienced travelling north on the B6326 through the Goldstraw and SLR roundabout





junctions. Once the right turn ban was included in the model, the numbers of vehicles using the A1/B6326 south junction to travel north decreased significantly although some vehicles were seen to travel south onto the A1 and u-turn at the next available junction.

The second point also relates to the travel time northbound on the B6326 through Fernwood. Due to the travel times experienced in the model, vehicles 'saved' time by diverting off the B6326 at the Dale Way roundabout or junctions south of Dale Way and using the internal links through the employment site to access the Goldstraw roundabout to continue northbound. This is likely due to the delay caused at the B6326 southern entry onto the Goldstraw Roundabout. Part of this delay was caused by traffic accessing the employment site from the A1 southbound off slip at Goldstraw roundabout. As such, the employment site was modelled in more detail as part of the iterative process to allow the inbound flows to balance more realistically between the access points of Goldstraw roundabout and Dale Way roundabouts. Although this reduced the volume of diverting trips, it did not eradicate it and it was recommended that sensitivity tests be carried out on the capacity assessments which manually rerouted this diverting traffic onto the B6326 in order to test the impact were measures put in place to deter rat running through the employment site.

Capacity Assessments

Capacity assessments of the existing and proposed junctions were carried out by the developer using the Arcady and Picady software in line with current guidance. These assessments were submitted to WYG for review.

No issues were found with the assessments of the full mitigation/full development capacity assessments carried out. Please note that some queries were raised with the intermediate level of development scenarios tested but these are not discussed/assessed as part of this letter as they do not affect the overall mitigation package proposed.

Reduced Package of Works

Based on the capacity assessments mentioned above, the developers have proposed a reduced package of works. This is due to the capacity assessment of the existing layout for the B6326 Dale Way roundabout showing that no improvements are needed in order to handle the additional development traffic. This also means that the B6326 northbound carriageway between Dale Way and Goldstraw Lane is no longer proposed as two lanes for the whole length but widened on the approach to Goldstraw Lane only.

Similarly, the Hollowdyke Lane junction and link proposals and the London Road junction improvements were not seen as required until the full development at Greater Fernwood goes ahead. The current planning applications do not cover the full development area but consist of the Barratts/David Wilson and Persimmon areas. Therefore, although the mitigation package proposed by these two developers includes these schemes, they are proposed as delivered by third parties once any additional applications come forward.





The transport modelling has not been tested without the inclusion of the developments over and above the Barratts/David Wilson and Persimmon areas or with the reduced package of works and as such no conclusions can be made regarding this scenario in the event that no other developers come forward although the capacity assessments do not indicate any issues with this 'intermediate' stage.

Provision of Mitigation

It is understood that there is a schedule of works proposed for the mitigation package that relates to the phasing of the development proposed by the developers. This has been discussed with NSDC at a meeting held on 15th August 2016 and the following suggested trigger points and completion points proposed:

Highway Work	Trigger for Delivery
A1 South/B6326 Fernwood South	1a) banning right turn out and extension of the right turn in filter will be completed prior to first occupation of the 100 th dwelling (Persimmon development); 1b) Creation of left slip road from A1 will be completed prior to occupation of the 900 th dwelling (Persimmon development)
B6326 Great North Road/ Sylvan Way	Works to be completed prior to occupation of Phase 2 of Persimmon scheme.
B6326 Great North Road/C421 Shire Lane junction	Works to be commenced on commencement of Phase 1 of Persimmon scheme and completion prior to first occupation of the 50 th dwelling.
C421 Shire Lane Corridor improvements	Works to be started on commencement of Phase 1 of Persimmon scheme and finished prior to completion of Phase 1 of Persimmon scheme.
B6326 Great North Road Corridor Improvements (Shire Lane to Dale Way)	Works to be completed prior to first occupation of the 50 th dwelling of the Persimmon development.
B6326 Great North Road/ Dale Way Junction	Please refer to agreement with Nottinghamshire County Council (NCC). Although it is understood that no works will be required by either party.
Goldstraw Lane/B6326 Roundabout	Triggered on commencement of development with completion required prior to first occupation of the 100 th dwelling. In the event that the Barratt/DWH scheme does not come forward then Persimmon to undertake suitable works prior to first occupation of the 630 th dwelling subject to NCC approval.
A1 Over-bridge	For NSDC to take forward through CIL.
B6326/London Road Balderton Roundabout	This improvement is not triggered until the much later in the Great Fernwood Allocation delivery.
B6326 between Dale Lane and Goldstraw Lane junctions	Triggered on commencement of Barratt/DWH development with completion required prior to first occupation of the 100 th dwelling (to tie in with B6326/Goldstraw Lane Roundabout). No trigger for Persimmon.
Hollowdyke Lane/B6326 Great North Road Junction	Final works to Hollowdyke Lane and it's junction with the B6326 is triggered later in the Great Fernwood Allocation delivery. Interim improvements still under discussion.





No testing of the phased proposed mitigation works has been carried out within the model and, as such, WYG cannot confirm the suitability of the trigger points and completion points of the phases in modelling terms. However, based on our experience with the model and with reference to the discussions with NSDC, it is our professional opinion that this phasing represents a reasonable and suitable approach for phasing of the works.

Conclusions

Based on the transport modelling carried out to date, review of the capacity assessments and experience; it is our professional opinion that the full mitigation package proposed for the Greater Fernwood area is appropriate and sensible with the caveat that the reduced package of works or the phasing of mitigation works has not been tested in the model. However, the capacity assessments results support the reduced package based on the current applications by Barratts/David Wilson and Persimmon and the trigger and completion points for the phased works are considered reasonable.

Yours Sincerely

A handwritten signature in black ink, appearing to read 'Rachael Walker'.

Rachael Walker Bsc MSc(Eng) FIMA MIHT
Associate
For and on behalf of WYG

