

Memorandum



To: Kate McKessar
From: Leo Hills
Date: 17 September 2014
Job N^o: 12273/2
Subject: **SH16 St Lukes Interchange Phase 2– Transportation Review**

As requested, Traffic Design Group Ltd (“TDG”) has undertaken a review of the additional left turn lane Notice of Requirement (“NoR”) documentation prepared by Aurecon on behalf of both New Zealand Transport Authority (NZTA) and Auckland Transport (AT). We report as follows.

1. Project

NZTA and AT have given Notice of Requirement (“NoR”) for a designation for public works in the vicinity of the St Luke Interchange in Western Springs. The works required are described in Aurecon report dated 15 May 2014 entitled “Additional left turn lane for west bound traffic from Great North Road onto St Lukes Road at the St Lukes Interchange- Notice of Requirement and resource Consent to change conditions”. In summary, the key aspects of the project in relation to traffic / transportation are:

- Construction of an additional left turn lane for westbound Great North Road traffic turning into St Lukes Road
- Extension of the westbound bus lane of Great North Road

These works follow on from those approved in 21 February 2014 (consented works) which enabled the substantial upgrade of the St Lukes interchange including additional traffic lanes, widening of east and west off ramps, and overall widening and raising of St Lukes bridge / interchange

While the additional left turn lane is part of the overall WRR and already consented SH16 St Lukes interchange upgrade, given the NoR is only for the additional left turn lane only, we have assessed only its effects.

2. General Traffic and Road Effects

The St Lukes interchange projects purpose is to “ensure the efficient and seamless operation of the local and state highway networks”¹. The traffic modelling assessment for 2026 of the consented scheme shows the left turn from Great North Road to St Lukes is predicted to have the highest degree of saturation (DoS) of all movements in the interchange (following upgrade).

The aim of the additional left turn lane project is to provide increased capacity for the left turn movement from Great North Road (westbound) into St Lukes Road.

¹ Aurecon 15 May report Section 1.3.4
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The Aurecon report notes that without the additional lanes (i.e. the previously consented scheme) *“queuing would extend from the St Lukes / Great North Road intersection, east on Great North Road, past the eastbound SH16 off-ramps in excess of 1km”*². Further the report notes that without the additional lane *“an estimated additional seven minute average delay would be experienced by vehicles through the interchange to access the west bound Sh16 on-ramp”*³.

We have reviewed the reporting re the chosen option vs the current consent (i.e. one left turn lane vs two). Appendix E of the Assessment of Options report (Further Option Testing dated 11 March 2013) provides the analysis. A review of this document has found the benefit of the two lanes is only in the PM commuter peak period (the report states there is only marginal change in performance in the AM or inter-peak). Further the benefit is really confined to westbound movements on Great North Road (travelling to St Lukes Rd, onto the motorway westbound and staying on Great North Road). All other movements at all other intersection are basically unchanged.

The benefit the two lanes provides is between 3.8 and 5.7 minutes in travel time savings per vehicle undertaking these movements (around 2500 vehicles in the two hour PM peak). As such the statement in the overall Aurecon 15 May report regarding the additional seven minutes delay experienced by vehicles through the interchange to access SH16 is not considered entirely correct in that the additional delay is only experienced in the PM peak and according to the Beca modelling the average delay in the PM peak for this movement is between 4 and 6 minutes. The 7 minute delay according to the Beca report is only *“during the most intense part of the PM peak”*⁴.

The queue lengths in the area stay around the same except on Great North Road westbound (from the east). Of note the Aurecon and Beca reports says this extends up to 1km which is correct however the diagrams provided show that even with the two lane preferred option the queue will be 450m (so the reduction / benefit is only 550m). Again the benefit is only in the PM peak and no change will be experienced at other times.

Of note there appears to be no benefits to the State Highway system and the benefits are only limited to the PM peak and for those vehicles travelling westbound on Great north Road (effectively from Grey Lynn / City area). It is however noted in Section 1.3.4 of the Aurecon report that the project *“will also address the potential for queuing vehicles on Great North Road to block vehicles existing SH16 at the eastbound off-ramp”*⁵. Figure 3.6 of the Beca report does appear to show a slight improvement in the eastbound off-ramp queue length in the PM peak in the 1-lane (consented) vs 2-lane option. The order of magnitude appears to be a reduction from 230m to 150m. In both cases the queue length is confined to the off-ramp itself and significantly does not queue back to the motorway through lanes as the off-ramp has over 500m of queue length available.

Buses are also expected to benefit in the order of 24 seconds per bus for all buses travelling westbound in the PM peak. No other noticeable benefits will occur for buses for any other movements or time periods. Of note in 2011 TDG measured bus numbers to be around 37 buses per hour doing this movement in the PM peak.

Note all the above are based on 2026 predicted traffic volume.

We note that any intersection near the motorway (and subsequent traffic modelling) will be greatly affected by the motorway performance itself. Changes to the motorway performance will be transferred to ramp signal timings which will then affect the interchange performance.

² Aurecon 15 May Report Section 1.3.3

³ Aurecon 15 May Report Section 1.3.3

⁴ Beca St Lukes Interchange – further option testing 11 March 2013 pg. 1 Executive Summary

⁵ Aurecon 15 May Report Section 1.3.4



Further the modelling is based on the year 2026 and includes a very significant change in infrastructure (Waterview Connection) in the immediate area. Given this extended timeframe and major change in the network there is always going to be some uncertainty regarding the assumptions about travel patterns and demand used to generate the traffic model. However it is considered Beca have undertaken best practice methods in their modelling assumptions.

There are no noticeable changes to both pedestrian and cyclist provision of the consented one-lane scheme verse the proposed two-lane scheme apart from a longer westbound bus lane on Great north Road which will slightly aid cyclists through the intersection.

3. Effects during Construction

We support the proposed Conditions 246 to 254 (Appendix K of the Aurecon May report) relating to Construction Management Traffic Plan (CTMP) and monitoring of the construction effects. These conditions are generally based on those carried over from the Board of Inquiry decision of the NZTA Waterview Connection Proposal and are considered appropriate.

4. Requiring Authorities Assessment

4.1 General

Overall, we generally agree with the requiring authority's assessment (including additional information) including the benefits the project will create relating to travel time benefits. It is noted that these benefits are however limited to one approach (Great North Road westbound) and are completely confined to the evening commuter peak. Further the approved single left turn lane option also met the project objectives (all be it with lesser performance in the evening peak).

4.2 Assessment of alternatives

Appendix B of the Aurecon 15 May report contains another Aurecon Report "*St Lukes Interchange Options Assessment Report*" (Options report) dated 2 May 2014. This report details a total of 7 options including the preferred option (Option 1) and the consented option Do minimum (Option 2).

Section 171(1) b of the RMA discusses Consideration of Alternatives in relation to Notices of Requirements. In particular S171 (1) b states: "*whether adequate consideration has been given to alternative sites, routes, or methods of undertaking the work if—*

(i) the requiring authority does not have an interest in the land sufficient for undertaking the work; or

(ii) it is likely that the work will have a significant adverse effect on the environment;"

It is understood that the requiring authority (NZTA / AT) does not have an interest in all the land and further, from discussion with other Council experts (landscape / visual / arboricultural in particular), it is considered that the work will have significant adverse effect (in relation to tree removal). As such adequate consideration needs to be given to alternative sites, routes or methods of undertaking the work. It is fully recognised that it is up to the requiring authority (NZTA / AT) to choose their preferred option. However the RMA require a judgement on whether an adequate process has been followed, including an assessment of what consideration has been adopted and has the requiring authority established an appropriate range of alternatives and properly considered them.

We note a recent Board of Inquiry decision relating to the Basin Bridge proposal in Wellington.



In paragraph 1534 the BoI draft report and decision states in relation to consideration of alternatives *“Clearly, the purpose of the statutory direction in Section 171(1)(b) of the RMA is to ensure that the decision to proceed with the preferred option is soundly based and other options (particularly those with reduced adverse environmental effect) have been dismissed for good reason. Adequate consideration becomes even more relevant when the Project, as here, involves significantly adverse environmental effects”*⁶.

We initially had some concerns regarding the consideration of alternatives. In the request for further information the traffic / transportation requests centred not on the chosen Option 1 but a number of alternatives. This request was to better understand the process of option evaluation and to ensure other options have been dismissed for a “good reason”.

The main concerns centre on both Option 4 (relocation of left turn lane through car park) and Option 6 (closure of Great North Road lane). The reasons for the concerns are as follows:

Option 4 (relocation of left turn lane)

The detail provided for Option 4 is shown in Figure 2 of the Options report. From a review of this figure it is clear that this option has had very little design work and appears to simply be a thick line drawn on an aerial. In the request for further information we requested if a more detailed design for this option was available and in the response back (15 August response Q3 Traffic) it was noted that no design of this option has been undertaken due to significant geometric and operation limitations. It was thus difficult to ascertain if indeed the Option does have these significant geometric limitations if no design has been drawn up showing these limitations. In terms of operation limitations a request was made in the s92 in regards to the modelling of this option as in the Aurecon Option report, it was noted the *“traffic impacts of this scenario have not been specifically assessed”*⁷. This was further reinforced in the s92 response (Q4 Traffic) that no traffic modelling has been undertaken for this option.

It is recognised that this option would reduce queuing capacity on St Lukes bridge, however it is not clear (as no detailed design has been undertaken) as to the extent of this reduction or exactly how much this reduction effects the performance of the option (as no modelling has been undertaken for this option).

As such we have a concern that this option in particular has not been assessed to the same level of detail as others.

Option 6 (closure of a Great North Road lanes)

This alternative option effectively gains the additional left turn lane at the expense of a through (eastbound) lane of Great North Road. This option has been extensively modelled by Beca (Appendix K of the Aurecon Option report) and stated *“in conclusion, the modelling has shown that there is only a small difference noted in the travel times between the 2 and 3 lanes scenario”*⁸ and as such this Option 6 performs and has similar benefits to Option 1 (the preferred option) however Option 6 does not have the adverse effects of removing the trees (which we understand from Council landscape consultant is considered to be significant).

⁶ BoE Basin Bridge proposal: Draft report and decision dated July 2014 para 1534

⁷ Aurecon Option report 2 May 2014, 4.5(b)

⁸ Beca St Lukes Interchange: Traffic Modelling input of the closure of a lane at Great North Road, dated 4 March 2014, Section 4, page 11

We asked several s92 questions regarding this option and its design (shown as Appendix J of the Option Report). It appears in the options report that one of the reasons for discounting this option was due to a reduced footpath width however in the s92 response it appear this is not the case but rather the reason was concerns with *“lack of flexibility to manage the local network as described in the Options Assessment Report at section 4.7(b)”* and *“flexibility to manage future for public transport on the existing local network”*⁹.

In section 4.7(b) of the options report the author notes that the modelling of this option shows *“longer than modelled queues resulting from the east bound SH16 on-ramp, block the entire east bound carriageway”*. What the modelling is essentially saying is that if the queues / volumes are larger than the model predicts then there maybe queue back effects on the eastbound carriageway. It is considered that this is merely speculation as no data / analysis was provided in response to a s92 question regarding how much addition traffic over that modelled would result in the queue blocking the through lane (Q7 response to traffic).

It is noted that additional pruning (above that already approved) would be required to the trees for Option 6 (short bus lane) however the extent has not been fully quantified by an arborist. For the alternative Option 6 (extended bus lane) the options report notes that all six trees would be required to be removed anyway and as such this sub-option of Option 6 can be discarded.

The issues raised in the s92 response in relation to the reasons why this option was rejected relate to *“flexibility to manage the local network”* which is included in the Option report analysis and the *“flexibility to manage public transport”* which is not mentioned at all in the options assessment. As such it appears the reason for rejecting the Option 6 in the Options report centres solely on the flexibility to manage the network. On closer inspection of the Options report this appears to relate to manage non-typical incidents and maintain efficient operation of the interchange. As such the rejection of this option in the Options report appears to be on the basis that a non-typical incident may occur and thus Auckland Transport requires an additional eastbound through lane (three in total) encase a non-typical incident occurs. We would note that this additional provision for maintaining flexibility for non-typical incidents is typically not done in other areas of Auckland (especially in the congested PM peak) but rather is based on sound transportation modelling of a typical peak period which Beca have undertaken (and shown that Option 6 performs to a very similar level to the preferred Option).

Subsequent to the original S92 response, additional information has been provided by Auckland Transport including a memo entitled *“SH16 St Lukes WRR Project - alternative option Summary”* dated 15 September 2014. In particular this document provides the benefits and dis-benefits of all alternative options considered together with more detailed diagram of Option 4. This document does provide a comparison between different options assessed in one simple document with similar levels of detail.

While we have some reservations as to the exact reason why some options were discarded, this is largely irrelevant as the requiring authority (NZTA / AT) have the overall responsibility for selecting the chosen option. The actual process in selecting the chosen option (from a transportation review) is well described in the 15 September memo and appears now to be well documented and transparent.

⁹ S92 response dated 15 August 2014 Traffic Response 1, page 5

5. Submissions

The submissions regarding the NoR have been reviewed in order to identify the specific traffic and transportation issues held by submitters. The following table details the specific matters and mitigation measures raised / proposed by submitters relating to traffic / transportation.

| Submission Number | Name | Matters Raise / Relief Sought |
|--|--|---|
| 12 Oppose | Conan Gorbey 1 Rose Road Grey Lynn | <ul style="list-style-type: none"> ■ Concern regarding the effect of pedestrian amenity in the area. ■ Seeks the two crossings of Great North Road are retained and the un-signalised crossing should remain. |
| 14 Oppose | Patricia M Reade 802/9 Hopetown Street Freemans Bay | <ul style="list-style-type: none"> ■ Considers AT should not be worried regarding additional 5-7 minutes delay and should purposely persuade people to use public transport. ■ Considers the main problem is the plans to raise Great North Road by 1.5m, and this could be achieved by simply removing the lower branches. |
| 17 Oppose | Ben Lenihan 14 Cassino Street Bayswater | <ul style="list-style-type: none"> ■ Considers the design should be redesigned to include separated cycle lanes and bus lanes to encourage people not to drive. |
| 21 Oppose | Catherine Hill 57 Western Springs Rd Western Springs | <ul style="list-style-type: none"> ■ Considers the design should include pedestrians / cyclists as well as traffic. ■ Should be more creative solutions to safely move everyone through the space. Design currently prioritises car movements at all costs. ■ Requests a full pedestrian crossing on weekends and festival days, bike safe intersections every other day. ■ Considers that simply increasing road capacity just encourage more private transport, necessitating more roads. |
| 65 Support – subject to changes | MOTAT | <ul style="list-style-type: none"> ■ Supports the improvements in principle. ■ Wants to ensure construction and ongoing operational effects do not adversely affect MOTAT. ■ The submitter would like to ensure that the operation of the tramway will not be disrupted during construction. ■ The submitter seeks that the maximum possible number of parking spaces are provided at 820 Great north Road. ■ The submitter seeks that all east-bound traffic on Great North Road is controlled by traffic signals in order to avoid the existing conflict that can currently occur with traffic turning right onto Great north road from St Lukes road. ■ Considers that the designation should allow for the provision of signalised pedestrian crossings at the intersections of St Lukes Road and great North road. |

Table 1: Summary of traffic related matters from submissions

Each one of the submitters noted above are considered / discussed as follows:

5.1 Conan Gorbey (Submissions 12)

The issues contained in this submission appear to relate not to the additional left turn lane which is subject of this proposed NoR, but rather the design of the signalised intersection which is already consented.



In regards to the pedestrian amenity in the area, we consider the revised signals (already consented) will improve pedestrian amenity particularly due to the removal of the un-signalised zebra crossing across Great North Road which current exists in the eastbound lane. This zebra intersection is widely considered as a potential safety issue and will be replaced by a fully signalised intersection.

5.2 Patricia M Reade. (Submission 14)

This submission basically considers that the positive benefits (5-7 minutes reduction in delay) should not off-set the removal of the trees and AT should be more concerned with getting people in public transport. The submitter also considers the removal of the trees could be avoided with pruning. In regards to the pruning the chosen option adds an additional left turn lane as well as raising the bridge (already consented) and the trees would definitely need to be removed with the chosen option.

5.3 Ben Lenihan. (Submission 17)

This submission considers the layout should be redesigned to include separated cycle lanes and bus lanes to encourage people not to drive. In this regard it is again noted that the application is not for the signalised intersection as this has already been consented but rather the addition of the additional left turn lane. As such the submitters concerns regarding traffic / transportation are generally not relevant to the proposal. It is however worth noting that the consented scheme for the intersection does include substantial upgrade of cycle and bus facilities including separate cycle lanes on St Lukes Road / bridge and dedicated bus lanes on Great North Road.

5.4 Catherine Hill (Submission 21)

Again this submission concentrates on the general design of the intersection which already has consent (rather than the addition of the left turn lane). However the design as consented does substantially improve other modes of transport (other than car) with new / wider footpaths, new cycle lanes, new bus lanes and the removal of a dangerous zebra crossing. While we agree with some of the sentiment in the submission (regarding other modes of transport) it should also be noted that this intersection / interchange is a very important link to Auckland's motorway network and as such car / vehicle movement at this intersection is an important consideration in the design.

5.5 MOTAT. (Submission 65)

MOTAT generally support the improvements proposed however they are concerned with the detail design and construction issues surrounding their site. In regards to their last two bullet points listed above, the already consented design both removes the current uncontrolled eastbound through lane and includes signalised pedestrian crossing across the full length of Great North Road, therefore we consider this satisfies these concerns.

In terms of construction effects the proposed conditions of consent provided in the NoR documentation (specifically conditions 246-254 should adequately address those concerns. We consider it would be beneficially if MOTAT is specific listed in the condition as someone who needs to be regularly informed of works during construction.

In terms of the car park at 820 Great North Road, our understanding is the car park will be designed to maximise the number of car parks while at the same time ensuring appropriate mitigation regarding removal of trees is provided.



6. Conclusions

Following a review of the Notice of Requirement (“NoR”) documentation prepared by Aurecon / Beca together with a review of submissions (and subject to any additional information provided at the Council hearing) we consider that the project will overall provide positive benefits to the traffic / transportation environment. These benefits are limited to one approach (Great North Road westbound) and are completely confined to the evening commuter peak period however the benefits are significant during these times.

Further (subject to additional information provided at the Council Hearing), we support the proposed Conditions 246 to 254 (Appendix K) relating to Construction Management Traffic Plan (CTMP) and monitoring of the construction effects to be appropriate.

We do have some concerns relating to assessment of alternatives (the appropriateness of the reasons for dismissing these options) however it remains the responsibility of the requiring authority (NZTA and AT) for selecting the chosen option and the process in selecting this option has been well described and transparent.

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