flow
TRANSPORTATION SPECIALISTS

technical note

PROJECT	**THE PARADE CROSS SECTION**
SUBJECT	**INDEPENDENT REVIEW**
TO	**KARL HANCOCK**
FROM	JOE HEWITT
REVIEWED BY	SANDY MILLS
DATE	23 JULY 2014

1 INTRODUCTION

Thank you for sending us through the information for the independent review of the proposed changes to The Parade cross section. We have reviewed the information provided and make the following comments with respect to the minimum standard cross section/s as proposed.

2 USE OF MINIMUMS

2.1 Vehicle Lanes

In general I support the application of minimum standards provided the circumstances are right and a robust review has been undertaken. In this instance, I think the circumstances and location are appropriate.

The Parade is relatively flat and straight, moderately trafficked and through largely residential suburbs. Narrow traffic lanes help to reinforce slower vehicle speeds; 3 m is typically the "narrowest" acceptable in the NZ context (recognising that there are examples of narrower lane widths in places), and would support appropriate vehicle speeds expected in an environment like The Parade. From work Flow has previously undertaken, I quote the following with respect to the suitability of minimum lane widths

AUSTROADS recommends a lane width between 3.0 – 3.3 m for Urban Arterials with low truck volumes.

International research suggests that there is no increase in risk related to lane width. Research by Potts, Harwood, and Richard, presented at the 2007 TRB Conference comes to the following conclusion:

> *"Analysis of geometric design, traffic volume, and accident data collected in NCHRP Project 17-26 has found that, with limited exceptions, there is no consistent, statistically significant relationship between lane width and safety for approaches to intersections on urban and suburban arterials. There is no indication that the use of 3.0- or 3.3-m (10- or 11-ft lanes), rather than 3.6-m (12-ft) lanes, for arterial intersection approaches leads to increases in accident frequency. There are situations in which use of narrower lanes may provide benefits in traffic operations, pedestrian safety, and/or reduced interference with surrounding development, and may provide space for geometric features that enhance safety such as*

medians or turn lanes. The analysis results indicate narrow lanes can generally be used to obtain these benefits without compromising safety."

"It is concluded from this research that there is no indication that crash frequencies increase as lane width decreases for arterial roadway segments or arterial intersection approaches."[1]

The Institute of Transportation Engineers (ITE) published a guideline for the design of major urban thoroughfares. The guideline, called "Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities"[2] *recommends lanes to be 10 – 11 ft. (3.05 – 3.35 m) wide on urban arterials with a design speed of 35 mph (56 km/h). .*

A study undertaken in 2002 by the Centre for Transport Studies of the London Imperial College of Science, Technology and Medicine, focused on road safety across all fifty states in the U.S. and uses data from fourteen years[3]*. This research analyses how different road infrastructure improvements affect the number of serious injury or fatal crashes. The conclusion of this research is that arterial roads with lane widths of 9 or 10 ft (2.75 or 3.05 m) show a lower than average number of injuries or fatalities. Roads with a lane width of 12 ft or more (3.6 m) have a higher rate of injuries or fatalities. This shows that while wider lanes are commonly considered safer, in reality wider lanes cause more injuries and fatalities*

2.2 Parking

With respect to the parking lane, 2 m is typically recognised as the minimum width in the New Zealand context, and would seem to be no different than is currently being provided along The Parade. I understand that safe-hit posts are proposed for installation within the buffer and I suggest that other separators are considered as possibly more appropriate alternatives, for example an "armadillo" type hump may be better. The issues I see with the buffer area are:

- How can the cycle lane be made useable for cyclists who are looking to overtake another cyclist? This could become more of an issue should cyclist volumes significantly increase and could be site specific depending on the range of cyclists on the corridor (novice, children, commuter, training etc)
- How to ensure that vehicles do not park within the buffer area
- The ability for the passenger door to be safely opened and whether the use of safe-hit posts would be an issue for motorists' (hitting posts with their vehicle door).

It must also be recognised that there will be increased pedestrians crossing the cycle lane travelling to and from their parked vehicles, and the increased likelihood of pedestrians dwelling within the buffer zone as they load/unload goods, children etc from their vehicles.

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[1] Potts, Harwood, and Richard (2007), *Relationship of Lane Width to Safety for Urban and Suburban Arterials* Transportation Research Board 2007 Annual Meeting

[2] Institute of Transportation Engineers (2006), *Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities"*

[3] Noland, R.B., (2002), *Traffic Fatalities and Injuries: The Effect of Changes in Infrastructure and Other Trends,* Imperial College of Science, Technology and Medicine, London

2.3 Cycling

In terms of the cycle lanes, specifically where the carriageway becomes narrow, the cycle lanes have been reduced to 1.4 m with a 0.6 m buffer. This is considered very tight, indeed possibly too narrow, to enable a faster moving cyclist to pass a slower moving cyclist. If there are no posts in the buffer space and/or a gap in the use of the on-street parking, there may be the ability for the faster moving cyclist to swing out and around the slower moving cyclist. In addition, well-constructed channels and flush mounted stormwater grates will help the slower cyclist to shift as far left as practicable.

In terms of the issues around the narrow buffer zone and the conflict with an opening vehicle door it is noted that not every vehicle has a passenger, but every vehicle does have a driver. So there is a much lower incidence of passengers exiting the vehicle than via the driver door which must be opened at the start and end of every journey. So the perceived risk is much lower for a cyclist striking a passenger door. Again this reinforces the absolute need to ensure the edge of seal and stormwater grates are of a high quality to enable a cyclist to pass as close to the kerb as is practicable.

2.4 Pedestrians

Mention is made to the fact that removing the flush median will make pedestrians crossing The Parade more difficult. Consideration may need to be given to more "formalised" locations where pedestrians can cross, situated at identifiable desire lines. This could see parking removed about these locations and the kerb extended out to reduce the overall crossing distance, whilst maintaining the cycle lanes.

3 DESIGN DETAILS TO CONSIDER

I recognise that what you have provided are typical mid block cross sections, and that as these are applied to the actual corridor there will be a need to vary the cross sections to match the land use activities. However, I thought it worth outlining some of the matters that came to mind as I reviewed the information:

- Given that cyclists would be travelling closer to the kerb, in some situations within a constrained lane width, it is imperative that there is very little, if any, lip between the edge of seal and the channel and that all stormwater grates are flush mounted and cycle friendly
- Careful consideration of pedestrian crossing and refuges and the ability to accommodate these. I would expect some on-street parking could be impacted to accommodate this
- Enforcement, particularly in the early stages of implementation, to ensure vehicles do not park in the buffer area
- Consideration of alternative separators if poles could impact on vehicle doors
- Recommendation of associated advertising campaign to inform and educate the public as to how to behave and treat the new cross section (including the reasons for the cross section change and the expected outcomes). Cycle lanes inside parking is a relatively new concept in NZ, and it would be beneficial to try and lay the "ground rules" for how you want these to operate.

4 USING MINIMUM STANDARDS ELSEWHERE

I am of the opinion that there are always compromises that need to be made; and the space allowed for the various modes within each cross section is always site specific. What might be suitable for The Parade may not be suitable for other areas. Whilst I consider minimum standards should be considered on a site by site basis rather than a precedent established in a specific location, if some of the widths adopted for The Parade are to be used elsewhere I consider that there are a number of actions that would need to happen:

- Undertake a similar option assessment as that done for The Parade to weigh up the pros and cons of each
- Consider the removal of parking as a higher priority on arterials
- Monitor The Parade to see how well the new cross section works, undertake user surveys (cyclists, pedestrians, motorists and residents), assess crash records and update traffic speed data to see if everything is working as expected. It would be useful to report these findings for industry wide interest.

Reference: S:\wccx\TN1A140723.docx - Karl Hancock