Separated cycle lanes in the New Zealand context

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ABSTRACT

Nelson City's St Vincent Street Separated Cycleway was one of the first bi-directional cycle facility of its type installed in New Zealand. It has now been operational for over two full Calendar years and provides a great opportunity to study how effective it has been with crash records and user numbers data available both pre and post construction.

This paper summarises a post construction review of the project, looking in detail at user numbers, crash performance, public perception and actual user satisfaction. It the aim of this report to inform designers and asset owners of the lessons learnt and provide some guidance as to the actual user benefits, in particular safety crash reductions and attracted new users for a New Zealand example. It is hoped that this data can be used to improve future benefit forecasting. There are additional design suggestions as to how to improve the level of service this facility provides.

This report has been written for the IPENZ transportation conference March 2017 and will form the topic of a shared roundtable workshop session. This report is a summary of more detailed report prepared for the New Zealand Transport Agency and Nelson City Council, dated February 2017.

INTRODUCTION

The provision of cycle facilities for the *'interested but concerned'* user,(a potential cyclist who would like to cycle but does not due to the lack of safe facilities) are the key focus of recent government agency initiatives to stimulate a growth in urban cycling. Throughout New Zealand new separated cycle lanes (SCL) are seen as an ideal facility to cater for this user group. These SCLs are defined as an on road cycle lanes with physical separation in the form of islands or vertical bollards from parking or moving traffic.

This study reviews the St Vincent Street bi-directional SCL installed in Nelson New Zealand. This facilities was installed in early 2014 and has been operation for two years. This facility was one of the first bi-directional SCLs installed in New Zealand.

This review analyses the safety crash performance, public perception of the facility through a user survey, pre and post user numbers and considers wider network traffic effects.

This study also reviews how the facility has performed compared to pre-construction forecast of new users in the projects economic evaluation.

This facility has also been audited by two experienced cycle safety auditors and provides suggestions of how the facility would be upgraded to meet current best practise design.

This practise paper goal is to provide evidence of the benefits of bi-directional SCL and to assist engineers who are considering installing a similar facility in New Zealand. This paper is summary of the full report and is provided as background for a desk top discussion group at the upcoming IPENZ conference.

Photograph 1: St Vincent Street SCL Facility near North Esk Street Intersection looking south.

St VINCENT STREET SEPARATED CYCLEWAY LOCATION AND DESIGN

The St Vincent Street SCL is located in a commercial industrial provides a strategic network cycle linkage between residential areas, a primary and intermediate school and the central business district. The SCL crosses 6 side roads. International guidelines would suggest that a bi-directional facility is not ideal where you have busy commercial access ways. This was highlighted in a NZTA/Viastrada Peer Review Pre-construction Safety Audit. The Facility is 3m wide with a 1m painted buffers with a mix of solid traffic islands at major intersection and commercial access ways along with vertical bollards. It has 2m parallel parking along the outside of the SCL as shown below in photograph 2. Access ways have warnings signs and pavement markings, refer photograph 3. At each side road the SCL has a giveway for cyclists. The remainder of the road cross-section has two 3m traffic lanes and parallel parking on the opposite side of road. A 1.5m footpath is provided on both sides of the road for pedestrians.

This facility cost $306,000 and extends over 1.1km in length. This cost includes a lighting upgrade of the road. This equates to a unit rate of $280,000 per Km. This facility was able to be installed at a low cost due to the existing wide road width and required no adjustments to kerbs or drainage. Similar facilities installed in Christchurch with a full length separator Island, colour surfacing, SCL priority at side roads and signalised crossing points at major road junctions have a construction costs closer to $2M/ km or 10 times higher.

Photograph 2: St Vincent Street Separated Bi-directional cycle lane

Photograph 3 Commercial access pavement markings and signage

St Vincent Street is a local Collector Road and carries 7,000 vehicles /day.

Running parallel to St Vincent Street is Vanguard Street, which also is a local collector but carries 10,000 vehicles/day. This parallel road had on-road cycleways. As part of the installation of this SCL for cyclists the on-road facilities on Vanguard Street were removed and a flush median installed.

SIDE ROAD TREATMENT

All the side road junction along the St Vincent Street SCL have been controlled with a giveway for cyclists on the SCL, refer photograph 4 following.

Photograph 4 SCL approach to Parere Street, showing giveway control

USER NUMBERS St VINCENT STREET

Pre-Construction (February 2014):

Cyclist 475 cyclist/day
Vehicles 7,000 vehicles /day.

Post Construction (March 2016)

Cyclist 930 cyclist/day
Vehicles/day 7,000 vehicles /day.

CRASH PERFORMANCE

Table 1: St Vincent Street Crash History

	Base Data Summary		Crashes per year	
Period	Total (all)	Cycle+Ped.	All	Cycle+Ped.
Pre-Construction (2008-13)	18	6	3.6	1.2
Construction (2014)	3	0	3	0
Post-Construction (2015-Current)	4	2 (both cycle crashes)	2.67	1.33

A more detailed look at these crashes shows that the two post construction cycle crashes are unusual crashes with one being serious and the other minor injury. One cycle crash involved a cyclist cycling illegally on the footpath on the opposite side of the road being struck by a vehicle existing a driveway. This is completely unrelated to the new SCL. The second post construction

cycle crash was a serious crash involving a cyclists on a new bicycle applying her brakes heavily at a giveway junction with a side road and losing control. The cyclists in the crash statement they were unfamiliar with their bicycle disc brakes. This crash cannot be completely discounted and does highlight the need to consider priority of give-way for SCL and side road junctions.

Table 2: Vanguard Street Crash History

	Base Data Summary		Crashes per year	
Period	All	Cycle+Ped.	All	Cycle+Ped.
Pre-Construction (2008-13)	37	7	7.4	1.4
Construction (2014)	1	0	1	0
Post-Construction (2015-Current)	7	3	4.67	2

The crash performance of Vanguard Street post construction shows a significant crash reduction especially right turn crashes. This provides clear evidence of the benefits of the flush median treatment without a significant increase in cycle crashes. Since installation no right turn turning crashes have occurred.

ECONOMIC ANALYSIS OUTCOME

This project was part of a Nelson Urban Cycleway package programme of $30 Million, which had an overall benefit Cost ration of 3.7, with a cycle growth forecast of 4.65%.

This particular facility had a forecast of:

- Capital cost of $241,000 (less lighting upgrade)
- Cycle Forecast of 340 cyclist/day (140 daily increase)
- Pedestrian forecast of 400 pedestrian /day (90 daily increase)

The net achieved increase of cyclists was 455 cyclists/day in summer with is close to doubling of cycle numbers or a 94% increase. A more detailed breakdown of these user's age groups and gender is provided in the full report.

The forecast increase was 70% from a much lower yearly base volume.

This post analysis shows that this facility has exceeded its economic predicted return.

PUBLIC PERCEPTION

A public user survey was undertaken of users 35 users along St Vincent Street. The users surveyed were a mix:

- 23% walkers
- 23% cyclists
- 32% drivers
- 10% mobility scooters
- 13% business owners

The results showed that those 35% felt the facility was a safety improvement and 58% felt it had made St Vincent less safe.

The majority of cyclists felt the facility was a safety improvement.

The users who were the most supportive of the facility were the mobility scooter users who enjoyed the even surface.

Photograph 5: User survey being undertaken

CONCLUSIONS

The results of the post construction analysis of the St Vincent Street bi directional SCL shows that the facility has seen a 94% increase in cycle user numbers and has seen a particular increase in the interested but concerned user.

The crash rate along St Vincent Street has shown little change post construction. No cycle crashes have occurred at access ways and the two crashes that have occurred post construction have unique contributing factors.

The introduction of a flush median along the parallel Vanguard Street has created a significant crash reduction.

The public perception survey shows that the broad cross section of users have a negative view of the safety performance of the SCL facility. This may indicate a need for more public education on the operation of these facilities.