

TENNYSON STREET REVIEW




Report prepared for
Christchurch City Council



ViaStrada Ltd
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Summary

Tennyson Street's new cycle facilities were introduced in 2001 as part of a kerb renewal project. They consist of an off-road cycle path on each side of the road at midblock locations, with a transition from the off-road path to on-road cycle lanes at each intersection. The street carries about 10,000 motor vehicles per day and about 370 cyclists per day. Cycle traffic has grown significantly over recent years, with an increase of 18% per annum recorded between 2003 and 2008. Motor vehicle traffic has remained relatively constant over this time.

A crash analysis of five year periods before and after installation of the cycle paths indicates that motor vehicle and cycle crash numbers have remained relatively constant.

An on-line survey of 129 cyclists revealed that 51% of survey respondents think that the new design of Tennyson St is better for cycling than before, but 32% feel it is worse than before. In addition, opinions are polarised towards the extremes, with 61% of respondents claiming that the street is either "much better" or "much worse" than before.

A number of design and operational issues of the new street design were raised by survey respondents. These include: lack of intervisibility between drivers and cyclists at driveways; the fear of colliding with opening car doors; concerns with motor vehicle drivers failing to give way to cyclists; discomfort when cycling across driveways and intersections; and rubbish bags and recycling boxes obstructing the cycle paths. Because of these issues, some cyclists choose to cycle on the road carriageway (even though it has narrower traffic lanes than before) rather than on the cycle paths. Others probably avoid cycling on Tennyson St altogether for some trips.

The cycle path design does not satisfy the design criteria for one-way off-road cycle paths in Austroads Guide to Traffic Engineering Practice Part 14 Bicycles, because of the frequency of driveways and the lack of separation between the paths and the road carriageway. Many faster cyclists (especially training cyclists using road bikes) do not use the cycle paths. The cycle path design is safest at quite low speeds (under 10 km/h) and so best serves slower cyclists. Nevertheless, many path users are very happy with the design.

The popularity of the facility (as evidenced by the increase in cyclists counted) demonstrates that there is a demand for off-road cycling facilities. It is concluded that Tennyson St has proved a very useful design concept but ideally should not be repeated unless some of the inherent design flaws can be resolved. This would require considerably more road width than is available on Tennyson St (or is likely to be available on most streets in Christchurch) or the removal of on-street car parking. Other concepts for providing off-road cycling opportunities (such as the new design for Matai St) should be explored where off-road facilities are desired.





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1 Introduction

Tennyson Street's new cycle facilities were introduced in 2001. They consist of an off-road cycle path on each side of the road at midblock locations, with a transition from the off-road path to on-road cycle lanes at each intersection. Cycle lanes are provided on both sides of the road between Colombo St and a point approximately 110 m east of Colombo St and between Eastern Tce and a point approximately 50 m west of Eastern Tce. Tennyson St is approximately 800 m long and operates with a 50 km/h speed limit. It carries about 10,000 motor vehicles per day (vpd) and about 370 cyclists per day.

The Christchurch City Council (CCC) commissioned ViaStrada Ltd to undertake a review of the cycle facilities on Tennyson St in the latter half of 2008. The study comprised four parts:

1. **Crash analysis and background research.** The study analysed and reported on crashes five years before and after the construction of the new cycle treatment. Various background reports were also reviewed.
2. **On-line survey of cyclists.** Cyclists were surveyed about their perceptions of the changes to the design of Tennyson St.
3. **Motor vehicle and cycle traffic volumes.** Motor vehicle volumes before and after the installation of the new cycle facilities were compared. Bicycle counts on Tennyson St's cycle paths were collected for two weeks during October.
4. **Commentary on design guidelines and principles.** The merits of the Tennyson St design approach and its applicability for use elsewhere in Christchurch are discussed in the context of current best practice design guidelines.



2 Crash Analysis and Background Research

2.1 CAS Analysis

Analysis of the crash histories before and after the installation of cycle paths for Tennyson St was undertaken to review the effectiveness of the new cycle facilities. Installation of the cycle paths occurred from April 2001 to April 2002.

Analysis of the CAS database reveals that in the five years prior to the installation of the facilities (March 1996 – February 2001 inclusive) there were 16 officially recorded crashes. An additional four crashes occurred at the Colombo St intersection on Colombo St itself and are not considered relevant to this review.

The 16 “before” crashes represent an average of 3.2 crashes per year. Most of these (12) occurred at various intersections along Tennyson St, with four occurring mid-block. The intersection crashes mainly occurred at the Tennyson St and Colombo St intersection (on Tennyson St or right in the intersection), when car drivers appeared to have failed to notice the car in front of them slowing or stopping for the signals. Another common type of intersection crash was motor vehicles exiting from or turning into a side street being hit by an oncoming vehicle on Tennyson St. The mid-block crashes usually involved motor vehicles entering driveways, hit by on-coming vehicles or were “rear ended”.

There were two recorded crashes that involved cyclists during the five year “before” period. One of these involved a cyclist being sideswiped by a motor vehicle, failing to give way, turning left into an intersection, while the other involved a motor vehicle failing to give way, turning right from a side street into the path of an oncoming cyclist on Tennyson St.

There were 18 recorded crashes for the five year period following construction of the cycle paths on Tennyson St (January 2003 – December 2007 inclusive). An additional six occurred at the Colombo St intersection and are not considered relevant to this review.

The 18 “after” crashes represent an average of 3.6 crashes per year, slightly more than the “before” period, although the difference is not considered to be statistically significant. Most (14) occurred at various intersections along Tennyson St, with only four occurring mid-block. The mid-block crashes were often due to car drivers turning into driveways and failing to give way to oncoming vehicles and car drivers reversing out of driveways into oncoming traffic. The most common type of intersection crash was motor vehicles exiting from or turning into side streets being hit by oncoming vehicles on Tennyson St.

A review of the crash histories before and after the installation of cycle paths on Tennyson St has revealed a reduction in cycle crashes (from 2 to 1) although this is statistically insignificant with such small numbers. In addition, the new layout has a slightly higher crash rate for motor vehicles, possibly reflecting a slight growth in motor vehicle traffic volumes over the period being monitored. Again, this is probably statistically insignificant. The “after” cycle crash was caused by a car driver failing to give way while turning left from a side street into Tennyson St, into the path of a cyclist on the cycle lane across the intersection. Crashes before and after installation of the cycle paths are shown in Table 1:

Table 1 Comparison of crashes before and after installation of the new cycle facilities

Crash type	Before	After
Midblock	4	4
Intersection	12	14
Total (motor vehicle)	16	18
Cycle	2	1



2.2 Background Reports

The following reports, which evaluated the effectiveness of the new Tennyson St cycling facility, were reviewed:

1. March 2004 Field Connection report on Tennyson St;
2. September 2004 CCC staff report on Tennyson St and Lyttelton St to the Sustainable Transport and Utilities Committee; and
3. 2004 MWH report on Tennyson St.

The MWH report showed that there had been an increase in the use of the cycle path facility. The CCC staff report and the Field Connection report showed that survey respondents (residents, cyclists and motorists) were generally satisfied with the new cycle layout, as shown in Table 2.

Table 2: Overall satisfaction result from 2003-04 research

	Residents n = 92	Cyclists n = 200	Motorists n = 100
Very satisfied	26.1%	60.0%	30.0%
Quite satisfied	41.3%	32.5%	50.0%
Neither satisfied nor dissatisfied	16.3%	2.0%	12.0%
Quite dissatisfied	14.1%	3.0%	2.0%
Very dissatisfied	2.2%	2.5%	6.0%

The Cycle Network and Route Planning Guide identifies five types of cyclists:

- neighbourhood cycling
- commuter cycling
- sports adults
- recreation cycling
- touring cycling.

All types of cyclist (except perhaps touring cyclists) are likely to be present in significant numbers on Tennyson St. As noted in *Table 3.1: The relative importance of network or route criteria to different cyclist groups* (page 23), they all have different requirements and value different attributes of a cycling route or facility differently.



3 User Survey

3.1 Survey Respondents' Demographic Information

A survey of cyclists was undertaken in the first half of October 2008 to ascertain their experiences of and opinions of the Tennyson St cycle treatment. The research aimed to inform the debate about whether or not the concept has merit for implementation in other areas of Christchurch in the future.

The survey was hosted on the ViaStrada website. There were 129 respondents to the online survey. Many respondents (53) found out about the survey via the Vorb website, a popular NZ-wide cyclists' website, 22 respondents accessed the survey via other sources, 20 were from Spokes and 35 did not identify where they had accessed the survey. There is some error associated with this question as it was added a few days after the survey was launched, at the time when the Vorb website was given a link to the survey on 6 October.

About three quarters (74%) of respondents were male, with most (86%) aged between 25 and 54. The age distribution of respondents was as follows:

Age group	No. of respondents	Percentage
15 – 24	7	5.4%
25 – 34	38	29.5%
35 – 44	45	34.9%
45 – 54	28	21.7%
55 – 64	10	7.8%
65 and over	1	0.8%
Total	129	100.0%

Some 42% of respondents lived on or within one kilometre of Tennyson St and 56% lived elsewhere in Christchurch, with the remaining 2% living outside Christchurch.

Residential location	No. of respondents	Percentage
On Tennyson Street	3	2.3%
Near Tennyson St (say within 1 km)	51	39.8%
Elsewhere in Christchurch	71	55.5%
Outside Christchurch	3	2.3%
Total	128	100.0%
Note – not all respondents answered all questions, so totals are sometimes less than 129		

Of all survey respondents, 84% were employed full-time. The occupational status of respondents was as follows:

Employment status	No. of respondents	Percentage
Secondary school student	1	0.8%
Full-time tertiary student	5	3.9%
Full-time employment	107	83.6%
Part-time employment	12	9.4%
Unemployed	1	0.8%
Retired	1	0.8%
Other	1	0.8%
Total	128	100.0%



Survey respondents were asked to describe their main purpose for cycling on Tennyson St. Almost half (48%) use Tennyson St for recreation or training, with another large group (34%) using the street for commuting to or from work. Responses were as follows:

Main purpose for cycling on Tennyson St	No. of respondents	Percentage
Travel to or from work	43	34.1%
Travel to or from school	1	0.8%
Recreation	43	34.1%
Training	18	14.3%
Shopping	10	7.9%
Other	11	8.7%
Total	126	100.0%

Survey respondents were asked about their bicycle type when riding on Tennyson St. The largest group (39%) ride racing or road bikes, with nearly as many (35%) riding mountainbikes. Some 15% ride commuter bikes. Their responses are shown below:

Cycle type	No. of respondents	Percentage
Single speed bike	3	2.4%
Ten speed bike	3	2.4%
Racing or "road" bike	49	38.6%
Mountain bike	45	35.4%
Commuter bike	19	15.0%
Other	8	6.3%
Total	127	100.0%

Respondents were asked to identify where they cycle on Tennyson St, and responded as follows:

Cycling location on Tennyson St	No. of respondents	Percentage
On the off-road path	80	63.5%
On the road	46	36.5%
Total	126	100.0%

These two options for cycling are shown in Figure 1.



Figure 1: Some cyclists use the off-road paths (left); others use the road carriageway (right)

The MWH report (based on surveys in November 2003) found that 9% of cyclists on Tennyson St used the road, another 9% used the footpaths and 84% used the cycle paths. Survey respondents in 2008 were thus perhaps over-represented by road cyclists.



Most respondents (95%) cycle regularly in Christchurch, as illustrated in the following table:

Cycling frequency in Christchurch	No. of respondents	Percentage
Several days per week or more	121	94.5%
About one day per week	3	2.3%
Occasionally	4	3.1%
Total	128	100.0%

Most respondents cycle regularly on Tennyson St, with 39% cycling “about one day per week” and a further 37% cycling “several days per week or more”.

Cycling frequency on Tennyson St	No. of respondents	Percentage
Several days per week or more	47	36.7%
About one day per week	50	39.1%
Occasionally	27	21.1%
Never	4	3.1%
Total	128	100.0%

Respondents’ views on key questions are reported in the following sub-sections. The complete questionnaire is attached as Appendix 1.

3.2 Tennyson St now Compared to Before

Respondents were asked:

How would you rate Tennyson St now for cycling compared with the same street before the new facilities existed (with a wider roadway but without the cycle paths)? Compared with Tennyson St prior to the new facilities, cycling on the street now is:

Tennyson St cf. before	No. of respondents	Percentage
Much better	50	39.1%
A little better	15	11.7%
About the same	4	3.1%
A little worse	13	10.2%
Much worse	28	21.9%
Don't know	18	14.1%
Total	128	100.0%

Most respondents (51%) think the new cycle path design is better than the previous design. Some respondents stated that it is now safer to cycle on Tennyson St because they are separated from motorised traffic.

However, 32% of respondents think that the new cycle path design is worse than before. These respondents generally think that there is a lack of intervisibility between cyclists and drivers, with the new design. Respondents commented that car drivers reversing out of driveways sometimes do not see and consequently do not give way to on path cyclists.

In addition, the views of respondents are quite polarised, with 39% of all respondents saying that the facility is “much better”, while the second largest group (at 22%) feels that the facility is “much worse”. The third largest group (at 14%) does not know whether the facility is better or worse, while only 3% feel it is “about the same”. Some 61% of respondents feel that the facility is either “much better” or “much worse” than it was



before. Generally speaking, people either love it or hate it! This polarity is illustrated in Figure 2.

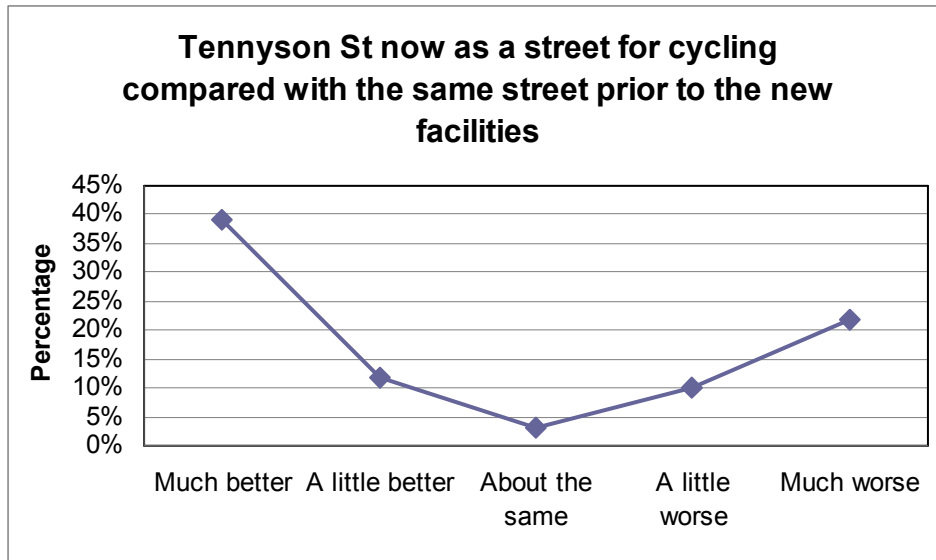


Figure 2: Polarised views about whether the street is better or worse than before

There appears to be a significant difference in approval ratings by cyclists between the 2008 survey and the 2003 survey (although the questions are not directly comparable as they asked different questions). The earlier survey involved face-to-face surveys on Tennyson St, finding that 93% of cyclists felt that they were “very satisfied” or “quite satisfied” with the street redevelopment. The later survey was done over the internet and found that only 51% of cyclists felt the street was “much better” or “a little better” than before.

Figure 3 illustrates one example of the occasionally poor level of service provided by the cycle paths. In this case, the path is blocked by a parked motor vehicle and trailer, but other reports of rubbish bags, wheelie bins, recycling boxes and broken glass were also reported by survey respondents.

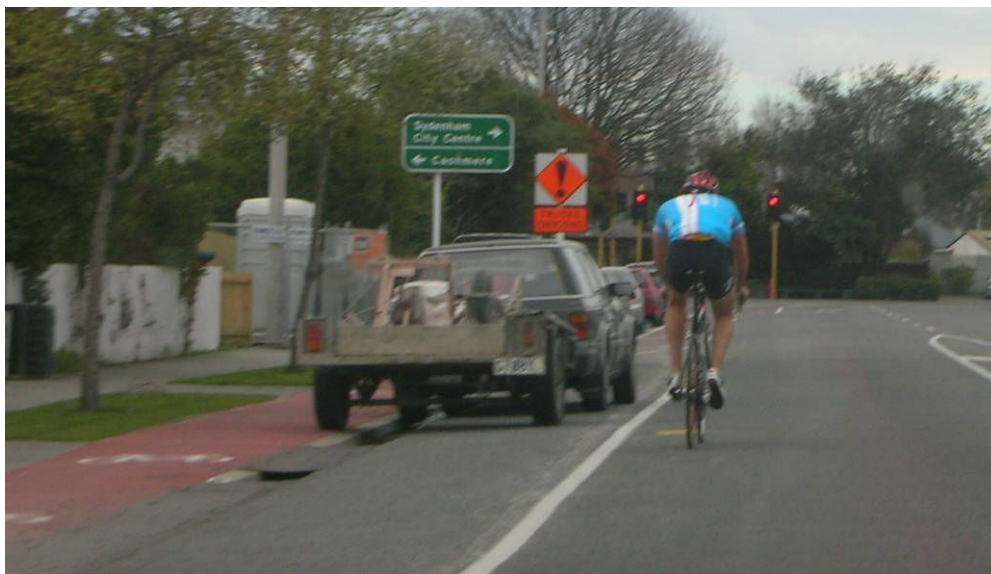


Figure 3: Path blockages from rubbish bags, recycling boxes, wheelie bins or parked vehicles encourage some cyclists to use the carriageway, rather than the cycle paths.



3.3 Tennyson St now Compared to Tennyson St with Cycle Lanes

Respondents were asked:

How would you rate Tennyson St now for cycling compared with the same street with conventional cycle lanes marked on the road surface? Compared with Tennyson St if it had conventional cycle lanes, the street now is:

Tennyson St cf. cycle lanes	No. of respondents	Percentage
Much better	42	32.8%
A little better	20	15.6%
About the same	12	9.4%
A little worse	12	9.4%
Much worse	39	30.5%
Don't know	3	2.3%
Total	128	100.0%

Respondents have a slight preference for Tennyson St now (48%) over the same street with conventional cycle lanes (40%), but again, views are quite polarised, with 63% of respondents having strong views on this (“much better” or “much worse”). This polarity is illustrated in Figure 4

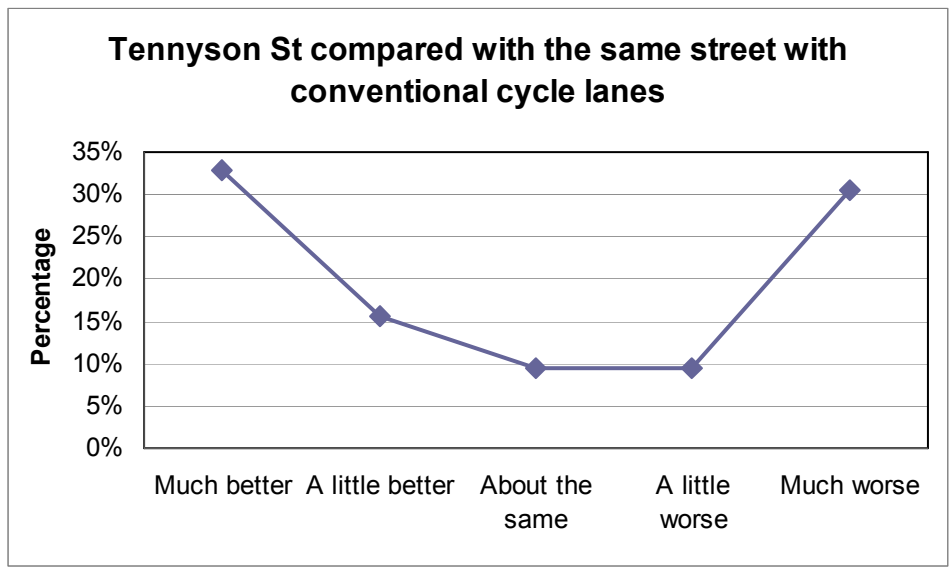


Figure 4: Polarised views on Tennyson St treatment compared with conventional cycle lanes

This graph shows that while there is a preference for the new facility over cycle lanes, the difference is not as marked when compared with perceptions about the street relative to its previous configuration (Figure 2).



3.4 Least Favourite Street for Cycling in Christchurch

The least favourite streets for cycling in Christchurch were identified by more than one survey respondent as follows:

Least favourite cycling street	No. of respondents
Colombo Street	16
Centaurus Road	10
Riccarton Road	6
Bealey Avenue	5
Brougham Street	5
Tennyson Street	5
Barrington Street	4
Blenheim Road	4
Ferry Road	4
Gasson Street	4
Moorhouse Avenue	4
Armagh Street	3
Papanui Road	3
Streets without cycle lanes	3
Deans Avenue	2
Johns Road	2
Memorial Avenue	2
Sparks Road	2
CBD streets	2
One-way streets	2
Cycle lanes merging into traffic lanes	2
Total	90

Given the predominance of respondents who live on or close to Tennyson St, it is not surprising that a significant number of people chose nearby Colombo St as their least favourite street.

Five people chose Tennyson St as their least favourite street, ranking it the same as Bealey Av and Brougham St, both often identified by cyclists as difficult or dangerous for cycling. Centaurus Rd was identified as least favourite by 10 respondents. This is a well-used route by racing and training cyclists and there are few alternatives. Riccarton Rd, identified by six respondents, is also often criticised by cyclists.

In addition, another 16 streets were identified as the least favourite street for cycling by one respondent.



3.5 Cross-tabulations

When the survey is analysed in more detail, those who prefer Tennyson St now relative to its former configuration are mostly those riding mountainbikes or commuter bikes, with more accommodating suspension systems than racing or “road” bikes. Amongst those with mountainbikes or commuter bikes, 41 prefer the new arrangement compared with 9 who don’t, a ratio of nearly 5 to 1. Conversely, amongst those riding racing or “road” bikes, the number who prefer the prior arrangement (27) outweigh those who prefer the current configuration (16) by a ratio of nearly 2 to 1.

	Single speed bike	Ten speed bike	Racing or “road” bike	Mountain bike	Commuter bike	Other	Total
Much better	1	2	12	22	9	4	50
A little better	1	0	4	7	3	0	15
About the same	0	0	1	2	1	0	4
A little worse	0	0	9	2	1	1	13
Much worse	1	0	18	5	1	2	27
Don’t know	0	1	5	7	5	0	18
Total	3	3	49	45	20	7	127

Those riding road or racing bikes have less comfort over the relatively bumpy cycle paths and their transitions off and on road. In addition, they are probably travelling faster and will consequently be more affected by the uneven surface. If they ride on the road, they will be sharing the traffic lanes with cars and trucks but the lanes are narrower than previously, so they are likely to prefer the previous wider road layout.

Those cyclists who choose to ride on the road may also make this choice because they feel safer intrinsically at their typically higher speeds in the carriageway, rather than on the cycle paths, with the potential for driveway hazards.

Similarly, of those who use the off-road paths, 58 (47 + 11) prefer the new arrangement while 10 (5 + 5) do not (a ratio of nearly 6:1). Conversely, of those who cycle on the road carriageway, 31 prefer the prior wider road layout of Tennyson St compared with 5 who prefer the current layout, also with a ratio of about 6:1.

	On road	Off road	Total
Much better	2	47	49
A little better	3	11	14
About the same	1	3	4
A little worse	8	5	13
Much worse	23	5	28
Don’t know	9	9	18
Total	46	80	126



4 Motor Vehicle and Cycle Traffic Volumes

A bicycle traffic survey was carried out from 13 October 2008 (Monday) to 26 October 2008 (Sunday). Rubber tube counters were installed on the cycle path at two locations (outside #31 and #36 near the western end of Tennyson St and outside #121 and #128 near the eastern end).

Table 3 shows the number of cyclists (between 7.30 am and 4.15 pm) in 2003 compared to the number in 2008.

Table 3: Comparison between bicycle counts in 2003 and 2008

Direction	Average no. of cyclists on paths (7.30 am – 4.30 pm)		
	Nov-03	Oct-08	Oct-08
Eastbound	49	94	128
Westbound	64	128	157
Total	113	222	285

Surveys in 2003 showed that about 83% of all cycle traffic on Tennyson St was on the cycle paths (with similar numbers of cyclists using the footpaths and the roadway). The AADT calculation here assumes the same distribution. Using the Cycle Network and Route Planning Guide method for calculating AADT (CNRPG Appendix 2), it is estimated that 327 cyclists per day use Tennyson St (on both paths and roadway) towards its western end and 419 per day at the eastern end, resulting in an estimate of about 370 cyclists per day near Norwood St.

Motor vehicle traffic volumes have varied between 8,900 and 10,200 vehicles per day since 2001, as shown in Table 4.

Table 4: ADT of motor vehicles on Tennyson St

Year	ADT (7 days)
Mar-07	9729
Feb-04	8861
Feb-01	10210

The traffic volume is thus approximately 10,000 motor vehicles per day.



5 Commentary on Design Guidelines and Principles

The New Zealand Supplement to Austroads Guide to Traffic Engineering Practice Part 14 Bicycles has the following to say about off-road paths:

“GTEP Part 14 highlights the issues that need to be considered when locating a path alongside a road. However, the potential safety issues associated with locating a cycle path near a property boundary are not explicitly detailed. Where there are a number of concealed side roads and/or driveways where visibility between drivers and cyclists is restricted (for example, by hedges or fences) then it is necessary to provide sufficient clear space between the property boundary and the path in order that cyclists are not in danger of colliding with motor vehicles emerging from concealed driveways.”

“In situations where visibility is restricted the desirable minimum distance of 1.5 m suggested in GTEP Part 14 will be insufficient. In this circumstance at least 3 m is suggested to allow a vehicle to pull clear of the driveway before crossing the cycle path.”

The path design of Tennyson St just satisfies this requirement for clear space (3 m to the property boundary). Stopping sight distance calculations¹, however, reveal that a cyclist will be able to brake in time to avoid a car emerging at 5 km/h from a property and intending to stop at the kerb (thus blocking the cycle path). However, this calculation assumes that cyclists are travelling at 10 km/h or slower and that the path is separated from the property boundary by 3 m (as is the case on Tennyson St).

Accordingly, this facility will be satisfactory for slower cyclists (travelling at 10 km/h or less). Most utilitarian cyclists, however, travel at between 15 km/h and 25 km/h, with many racing or training cyclists travelling at 30 km/h or more. The Tennyson St paths are quite unsuitable for use at these speeds.

The MWH survey (Nov 2003) found that the average cycling speed on the off-road paths was 17.4 km/h. Accordingly, there will be some risk of driveway collisions for cyclists on these paths.

Feedback from survey respondents supports this view, with those preferring the new configuration being predominantly those riding mountain bikes at relatively slow speeds. Those who choose to ride in the roadway are predominantly riding racing or “road” bikes and are likely to feel that the new facilities are too close to the boundary (and introduce uncertainty and risk from emerging motor vehicles) while offering a lower (rougher and slower) level of service.

Separated one-way paths are “most appropriate” (according to Austroads Part 14, page 88) when “there is a limited number of driveway crossings (preferably less than one per 100 m)”. In practice, Tennyson St has driveways approximately every 20 m, so this street (in fact most streets in any urban area) would not satisfy this criterion.

An additional criterion is that a “suitable separation/barrier exists between the path and the road carriageway”. The presence of a vertical kerb (with occasional steel plate kerb crossings) is not ideal, as it reduces the effective width of the path so that cyclists will shy away from the edge. Cyclists will also shy away from adjacent parked cars, with the opportunity for car passengers (who do not need driving licences and may have poor road traffic safety skills) to open car doors into the paths of cyclists.

¹ The Case against Cycle Paths, Macbeth A. G., NZ Cycling Conference North Shore City, October 2003.
<http://viastrada.co.nz/pub/case-against-cycle-paths>



Ideally, there should be a 0.5 m or 1.0 m grass or paved strip between the kerb and the cycle path, but the road is not wide enough to accommodate this.

The hill crossing kerb and steel plate gutter crossing is not ideal, providing the potential for cyclists to run off the path or road and into the plate, although it helps reduce gradient change on the paths.

Austrroads Part 14 recommends path widths for separated one-way paths of 1.5 m but this should be widened next to the kerb or provided with a buffer area. There is insufficient space to accommodate this.

The intersections have been designed with cycle lanes, but this is a rather clumsy (but necessary) solution to address the legal right of way problem. The transitions from path to carriageway appear to be adequate but some of the transitions from carriageway to path are not smooth (although a review of the construction and maintenance quality of the facility is beyond the scope of this project).

A technique for consideration on Tennyson St would be the introduction of pavement marking symbols to indicate an advisory (but not enforceable) speed limit of 15 km/h. These should not be erected as pole-mounted signs because they would potentially confuse motorists, but could be painted on the path, possibly in conjunction with a cycle logo. The PW-25 Curve Advisory Speed sign or the RG-1 Speed Limit sign from MOTSAM may be able to be modified as pavement marking for this purpose.

Many of the inherent design flaws of Tennyson St (the inadequate space between the path and boundaries and between the path and the carriageway, the transitions from cycle path to cycle lane necessary at each intersection and the issue of path obstruction by rubbish bags and recycling bins) appear to have been avoided with the Matai St design. This treatment is illustrated in Figure 5.



Figure 5: Matai Street West off-road cycle path

A comprehensive review of that facility may confirm that this would be a better design concept for more widespread adoption if it is desired to provide more off-road cycling facilities for Christchurch.



6 Conclusions

A review of the crash histories on Tennyson St confirms that crash numbers (either for motor vehicles or cyclists) have not changed significantly with the installation of the Tennyson St cycle facilities.

The online survey of cyclists, however, has revealed that there are two diverse groups of respondents, with 51% thinking that the new configuration of Tennyson St is better than the previous design and 32% thinking it is worse. Reasons given by survey respondents include the lack of intervisibility at driveways, motor vehicles not giving way to cyclists, the uneven surface across the driveways and the risk of riding into opening car doors on the passenger side of the car. Broken glass was recorded as being a common occurrence on the paths too, reducing the popularity amongst cyclists of the paths on Tennyson St.

The Tennyson St cycle path concept was supported mostly by those riding mountain bikes or commuter bikes. Conversely, it was criticised mostly by those riding “road” bikes. Similarly, those who rode on the paths tended to support the design concept, but considerable numbers of cyclists continue to ride in the carriageway (despite the traffic lanes being narrower); these on road users tend to prefer the prior design of Tennyson St.

An analysis of safe stopping sight distance for this design has shown that it operates safely for cyclists travelling at about 10 km/h or less. This is not a suitable design speed for cycling and accordingly this layout should not be repeated elsewhere in Christchurch, unless there are fewer than 10 driveways per kilometre, or between 5 m and 7 m of clear space can be provided between the path and the property boundary. In addition, the paths should have adequate space between them and the adjacent roadway. In practice, few roads will have this much available space.

To mitigate the risk of driveway crashes (in particular) on the cycle paths, consideration should be given to the installation of pavement marking symbols to support slower travel speeds by cyclists and other path users.

Generally the bicycle count results indicate that there was an increase of about 130% in the number of cyclists using the cycle path on Tennyson St between 2003 and 2008, or about 18% per annum. This illustrates the demand for off-road facilities – even when significant numbers of users do not like the design, there has still been a significant increase in the numbers of users. There appears to be a considerable suppressed demand for cycling in Christchurch.

Based on unpublished cycle traffic counts, cycle traffic appears to have grown slightly in Christchurch over the same period, but certainly not to the same extent as on Tennyson St. Census data reveal that about 9,100 people cycled to work in Christchurch (and Banks Peninsula) on Census day in 2006, up about 4% since the previous Census in 2001. This is less than 1% growth per annum.

Motor vehicle traffic volumes have remained constant at around 10,000 motor vehicles per day between 2001 and 2007.



7 Recommendations

It is recommended:

1. That regular information drops (perhaps now and subsequently every two years) be made to Tennyson St residents to advise them of:
 - The preferred location for placing the new solid waste, organics and recycling wheelie bins in relation to the cycle paths;
 - The need for caution entering and exiting their properties as motor vehicle drivers; and
 - The safe operating speed of the cycle paths and the consequential need for caution when cycling on the paths;
2. That consideration be given to installing pavement marking symbols on the paths recommending that users travel below 15 km/h;
3. That consideration be given to ways of finding more space on Tennyson St for on-road cycling, including eliminating parking on one side and eliminating the flush median;
4. That consideration be given to reducing the speed limit on Tennyson St to 40 km/h until such changes as identified in Recommendation 2 are implemented;
5. That a comprehensive review of Matai St be undertaken to evaluate the crash history, cycle and motor vehicle traffic volumes, opinions of cyclists, motorists and residents and commentary on engineering guidelines and principles; and
6. That other design options, including the Matai St design, be considered before repeating the Tennyson St cycle path design concept on other streets in Christchurch.





Appendix 1: Survey Form

