

ACTIVE MODES INFRASTRUCTURE GROUP

- 1 Walking and cycling (the Active Modes) have become an increasingly important component of the mode mix across the network. The Active Modes are considered a priority in the Safer Journeys strategy, which looks to “achieve a reduction in the crash risk for pedestrians and particularly cyclists, while at the same time encouraging an increase in use of these modes through safer roading infrastructure”.
- 2 The Active Mode Infrastructure Group (AMIG) follows the established model for the Road Controlling Authorities Forum in responding to changing needs within the sector by working together collaboratively to put best practice into the hands of practitioners, and ensure interventions are delivered consistently across the network.
- 3 Although several panels, working parties or committees have been active around cycling, AMIG is the group representing the infrastructure asset managers and providing guidance for the design of infrastructure for cycling and walking. It provides a national forum for the asset managers and practitioners to explore solutions to technical challenges in providing infrastructure for the active modes.
- 4 AMIG has overseen a review of the markings used to designate cycle lanes and trials of potential markings for situations where cyclists are encouraged to be fully within the traffic lane, and is now the technical reference group for addressing the gaps in current guidelines and the regulatory framework in providing for the active modes.

Background

- 5 The Road User Rule (2004) and the supporting Traffic Control Devices (TCD) Rule (2004) gave cycle lanes a legal status through the application of a defined cycle lane symbol. By the end of that decade road controlling authorities (RCAs) and transport practitioners were using or proposing to use the cycle symbol for purposes other than defining legal cycle lanes, such as cycle advisory awareness.
- 6 In addition, many towns and cities throughout New Zealand had adopted a variety of signs and markings to identify the presence of cyclists using the roading network that were not approved in MOTSAM or the TCD manual. Responding to this increasing need was leading to each RCA making individual judgements about the appropriate solution to use, resulting in inconsistency across the network and potential confusion for users.
- 7 It was becoming apparent that, in practical design terms, the available cycle marking and its legal connotations restricted designers in their ability to provide facilities for cyclists. There was a perceived need to be able to advise motorists where cyclists were likely to be on the road where potential conflict might occur.
- 8 The TCD Steering Group in September 2010 decided to investigate and confirm what the issues and limitations were with the current signs and markings, and establish what would be most desirable from a road user perspective. Rather than introducing an additional pavement marking, it was decided to have the existing practice reviewed in its entirety first.
- 9 Christchurch consultancy ViaStrada was commissioned to undertake this review with the objective *“to review the current signs and markings of cycle facilities in NZ and make recommendations to the TCD Steering Group on options for control devices, and/or the*

legal framework and rules that that will enable a clearer understanding to all road users on the meaning and application of cycle facility signs and markings (TCDs)".

- 10 The ViaStrada report provided a very good synopsis of the range of issues, the diversity of views and the gaps and opportunities to provide a clearer understanding to all road users about signs and markings for cyclists. The report highlighted that where RCAs had developed their own signs and markings, as these signs and markings were not "officially" approved, there was a potential difficulty in enforcement of non-approved signs and markings. Continued absence of nationally approved signs and markings to meet the needs of RCAs would only ensure that RCAs continued to trial new solutions, leading to more inconsistency across the network and more potential problems.
- 11 The ViaStrada report did not, however, provide a definitive recommended solution on Shared ("Advisory") Lane Markings and suggested further investigation was required to inform the decision as to whether shared lane markings should be adopted. The review of shared advisory markings used overseas indicated a preferred option of the addition of chevrons to the cycle symbol for advisory purposes. A consideration in this was that chevrons could easily be added to the existing symbol with minimal additional cost. The very possibility of trials of chevron markings had already drawn expressions of Interest from New Plymouth, Hastings, Whangarei, Wellington, Christchurch and Auckland.

National Cycling Markings Working Group

- 12 After considering the recommendations of the ViaStrada report, the TCD Steering Group formally proposed that a working group should be established by the RCA Forum to consider the recommendations and the wider issue. The Research and Guidelines Steering Group agreed to establish a working group at its meeting on 9 August 2012.
- 13 Representatives from New Plymouth, Hastings, Tauranga, Dunedin, Auckland, Nelson, Christchurch, Palmerston North, Taupo and the Transport Agency convened for the first time on 23 November 2012.
- 14 An Investment Logic Mapping exercise to define the problems at stake as precisely as possible and to establish the benefits in addressing these, and the outcomes being sought, identified a wide range of issues. These included:
 - Neither cyclists nor motorists regarded cyclists as legitimately belonging on roads;
 - The legal meaning of the current cycle symbol was not understood by most road users;
 - Therefore, the marking used for exclusive cycle lanes was ineffective, requiring added signage at 50-70m intervals and extra marking in yellow or green to convey the original message;
 - Use of signs, rather than markings, tended to aggravate conflict between cyclists and parking, and between cyclists and pedestrians;
 - Planning for cycling infrastructure has been piecemeal, uncoordinated and often done without regard to meeting cycling needs or any genuine demand for routes;
 - Provision of a fully segregated and continuous alternative network for cyclists is put forward as an ideal solution, but it is regarded as merely replicating what

exists already and alternative infrastructure almost invariably provides a lower level of service than exists on roads;

- A perception of safety is central to encouraging the uptake of cycling, but the policy approach to cycling over several decades has been to emphasise that it is not safe.

15 The ILM exercise concluded that there were three related problems:

- Cycling is not seen as part of an integrated network solution, which affects the quality and quantity of the cycling network.
- Disconnected networks geared towards motor vehicles potentially make cyclists feel they don't belong on the network.
- A limited toolbox of cycle signs and markings leads to a lack of understanding of those signs, markings and infrastructure.

16 In considering that limited toolbox, the group identified six situations within the network where a means of providing information for cyclists was needed:

- Where a facility is for the exclusive use of cyclists;
- Where a facility is to be shared by motorists and cyclists;
- Where a facility is to be shared by pedestrians and cyclists;
- To identify a route for cyclists;
- To offer advice on alternative routes for cyclists;
- To indicate preferred or safe alignment on the road.

17 The nature of these situations would be often specific to certain types of location within networks: rural roads were seen as differing from urban; alignment for safer passage beside parked cars was seen as differing from alignment to activate cycle detection traffic signals. It was recognised that before changes could be made to the legislative toolbox to amend the RUR and adopt changes to the TCD Manual, it would be necessary to assess the existing symbol and alternatives in controlled trials.

18 The group reconvened in March 2013 and considered markings to address three different situations:

- Defining a cycle lane
- Defining a lane to be shared by motorists and cyclists
- Defining a safe line for cyclists

These equate to the three purposes of markings specified by 5.1 of the Traffic Control Devices Rule 2004 requiring a marking to have a regulatory, warning or advisory function.

19 The options considered for trials included the existing symbol, used alone or with an arrow or a single or double chevron (generally known as the "sharrow"), or inside an arrow ("bike in house"), or in association with a word:



20 The principal alternative to the existing symbol involved adopting the cyclist symbol, used extensively overseas and by many authorities for advisory signage, but adding a rider immediately raises numerous distracting decisions regarding the depiction of the cyclist: posture - racing or relaxed; helmet - with or without; bicycle frame - with or without; basket - with or without. Examples of this type of symbol include:



21 A complex new painting template would be needed by roading authorities and, if a cyclist symbol were to be introduced, it would ideally need to be adopted for all cycling markings to avoid confusion and then be distinguished by additional symbols to indicate the function it was serving in different situations. This would deliver no benefit over the existing symbol, but involve considerable expense for authorities in re-marking existing facilities.

22 Additionally, while the cyclist symbol is used in Europe and North America in addition to the existing cycle symbol, the cycle symbol is consistent with Australian usage and, more to the point, with Austroads guidance. For these reasons the group agreed that trials would be undertaken using the existing symbol augmented with chevrons.

23 Legal advice suggested that introducing an advisory symbol for sharing a lane based on the existing symbol would require unlocking the regulatory connotations of the existing symbol by introducing a new system of marking a cycle lane, by edge lines, pavement colour or adding words or no stopping lines to the existing symbol to give it a regulatory meaning. For consistency with other special-vehicle lane-marking and ease of retrofitting existing cycle lanes to comply with any amended rule, adding "LANE" or "ONLY" to the existing symbol was chosen for trials.

24 A sub-group was convened to progress the preparation of the trial proposal and worked on identifying sites and methodology through 2013. A proposal was presented to the TCD

Steering Group on 21 November 2013 for trials at five sites in Auckland and proposals for further trials in Palmerston North, Wellington, Nelson and Dunedin were approved by the TCD Steering Group on 12 March 2014.

Markings Trials

- 25 Care was needed in selecting sites with both appropriate speed environments and traffic volumes for trials. Aspects of the initial proposals from Palmerston North, Nelson and Dunedin had needed to resolve details around these issues and initial feedback from cyclists on the Auckland trial sites suggested that sharrow-placement must be considered very carefully. More frequent marking than 100m spacing was requested and some markings had been too close to the kerb or parked cars. The chevrons gazetted for the trials were also revised and increased 25% to fit into a square 1m x 1m to be more legible to road users.
- 26 Trials of sharrow markings in Auckland occurred at five sites: Seacliffe Ave, Belmont; Riddell Road, Glendowie; Point Chevalier Road, Point Chevalier; and Riverside Ave, Dunkirk Road and Elstree Ave, Point England. Cycle-lane marking trials occurred on Mt Albert Road, Point England Road, Carrington Road, Lake Road and St Lukes Road. An initial survey of 715 residents (including 288 cyclists) suggested that adding LANE to cycle lanes would increase understanding. The current M2-3 symbol had the poorest understanding, while symbols on a green background had the highest recognition. Only 25% of the survey properly understood the intent of sharrows, however, with 50% misunderstanding their message completely.
- 27 In Palmerston North, Broadway Ave, College St and Freyburg St were selected as trial sites. Although Broadway Ave is a CBD street with angled parking, it has a low speed environment that is not posted at 30kph or as a shared zone. College St is relatively narrow, with 1.9m parking on either side of a 6.5m carriageway. Freyburg St has two different parking environments. LANE was added to markings on the cycle lane along Fitzherbert Ave.
- 28 In Nelson sharrow markings were placed on Tasman St from Bridge St to Weka St northwards, and Tasman St - Brook St - Westbrook Tce from Nile St to Robinson Rd southwards, and on Hardy St across the CBD. Hardy St between Domett St and Rutherford Rd ranges from 7,800 vpd in the CBD to about 1,400 vpd at the eastern end, and carries about 250 cyclists per diem. LANE was added in cycle lanes along Rutherford Rd as part of the trial.
- 29 In Dunedin only sharrow markings were trialled, on George St from Moray Place to Albany St and on King Edward St from Hillside Rd to Macandrew Rd. George St has 11,300 vpd and King Edward St has 11,000 vpd.
- 30 In Wellington sharrows were marked along Featherston St and Victoria St in both lanes on every block. This is a southbound arterial through the CBD carrying 20,000 vpd and 2,000 cyclists, but it is a relatively low-speed environment. The LANE marking was added to the cycle lane on Evans Bay Rd.

Lessons From Trials

- 31 The trials demonstrated the complexities surrounding the best placement of advisory markings for cyclists. More frequent spacing was needed. Position in relation to other

markings needed to be considered: centrelines and directional arrows near the sharrows confused the message to share the lane. Careful assessment of the traffic volume and speed environment was needed, but also of the parking environment.

- 32 The most problematic consideration was the lateral position of the marking in the lane. The sharrow must be placed so that motorists drive over it to reinforce the message that cyclists belong in the lane, rather than on the edge, and so that cyclists tracking along the markings are travelling beyond the door-zone of parked cars. In an environment of occasional parking without a line marking the edge of the parking lane, a sharrow marked midway between the kerb and centreline places the cyclist in the traffic lane unnecessarily if no cars are parked along the kerb, but in the door-zone as soon as a car is parked there. A slightly counter-intuitive outcome was that streets with high turnover and angle parking are potentially better suited to sharrow markings than those with discontinuous occasional parking.
- 33 Overall, the trials saw a slight shift in cyclist's lateral position. Some trial sites appeared to test the upper limits of traffic speed and vehicle numbers for encouraging cyclists into the lane, while other sites raised a question of whether the traffic environment required any extra marking to achieve this. Almost every trial observed reduced vehicle speeds in response to the sharrow markings, however. This indicated that the marking was effective in communicating with its principal target audience, but it was also an unintended consequence that delivers significant potential safety gains. A reduction in vehicle speed of 1kph is considered roughly equivalent to a reduction in risk of 4%. The trial on Featherston St observed an average speed reduction from 42kph to 36kph, while the trial on King Edward St produced a 7.5kph speed reduction in the 85th percentile.
- 34 The trial results have not been as clear-cut on the most suitable means of clearly differentiating the present M2-3 symbol from the proposed sharrow marking. Perception surveys found 77% of the public saw the markings as different, although only 44% intuitively understood the sharrow marking. Some doubt remains over whether the addition of the chevrons and placement of the marking within standard traffic lanes is sufficient to distinguish sharrows from the present marking for cycle lanes.
- 35 The trials revealed practical difficulties in accurately remarking relatively unwieldy markings in very constrained margins within narrow cycle lanes. Although the primary reason for trials of adding LANE to cycle lanes was because the alternative that was most favoured in every public perception survey, the M2-3 symbol on a green background, is already recognised as significantly increasing the cost of marking a cycle lane, at the moment it appears that the green background has wider public acceptance and practical advantages in the longer term.

Next steps

- 36 The results of the trials are expected to inform changes to the RUR being proposed later this year. The working group completed its original task, but identified a wider range of issues surrounding the design and provision of infrastructure for cycling and walking, and has agreed to broaden its scope. The context in which this is taking place, however, has changed completely and AMIG is now a technical reference group for providing national cycling design guidelines. In this it is important that AMIG is the group representing the

infrastructure asset managers and providing a forum for solutions to technical challenges in providing cycling and walking infrastructure.

- 37 The first stage of the national cycling design guidelines project – the gap analysis – has identified about 40 tasks able to be addressed within available budgets. The intent is to provide the best practice as quickly as possible and this will require a pragmatic approach that is likely to involve trials of innovative solutions and reporting on what works. AMIG expects to be closely involved in this process.