Attachment E

Transport Planning and Design
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Walking and Cycling Network Audit

Stage 1: Network Attributes

Report prepared for

Queenstown Lakes District Council

13 January 2016

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1 Background

ViaStrada has been engaged to provide a document and method to identify what makes a great town network for walking and cycling. The results can be applied to the Wanaka and Queenstown townships.

Action 2.2 of the Draft Queenstown Town Centre Transport Strategy (7 January 2015) includes an action to conduct a *Walking & cycling audit of roads & pathways:*

- *This project will assess safety risks to pedestrians and cyclists presented by current roading infrastructure*
- *The project will recommend operational improvements*
- *The project will be undertaken in the short term*

This action is part of a holistic approach to improving transportation as indicated in the actions schedule (Figure 1). The results of the audit could be used to inform many of the other actions, including arterial route improvements, operational parking changes, an on-street wayfinding system for pedestrians and other road users, and the transport communications plan.

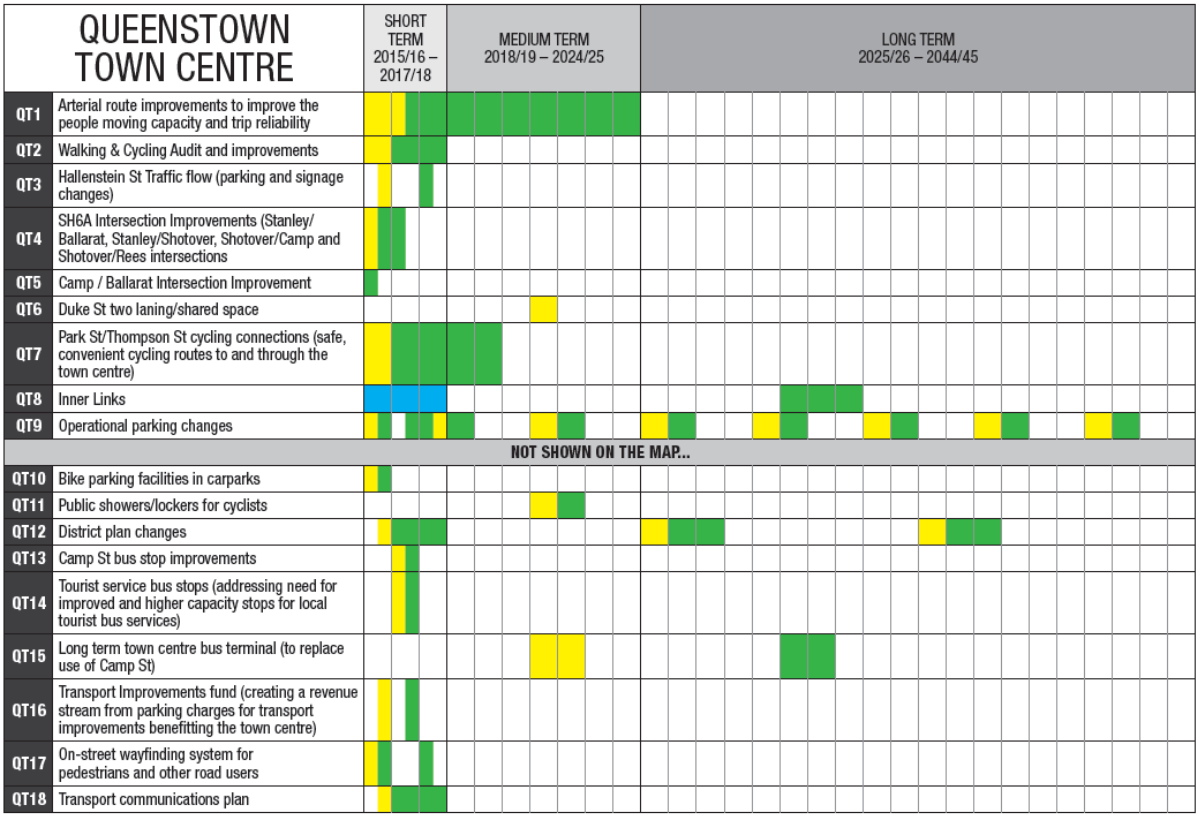

Figure 1: Queenstown Town Centre Transport Actions Schedule (the focus of this report is item QT2)

2 Scope

While data on the number and distribution of motor traffic trips and network quality have been collected for years, authorities across New Zealand are increasingly gathering data on bicycle and pedestrian networks, collisions, and usage annually. For example:

- Auckland Transport performs cross tabulations of walking and cycling crash and usage data to gauge the effectiveness of red light cameras and reduced speed limits
- Palmerston North conducts periodic footpath condition assessments to prioritise maintenance
- The NZ Transport Agency commissioned ViaStrada to collect geotagged video for a cycleway safety audit in Wellington

Collecting active transportation (and perhaps recreational) network data will help QLDC cost-effectively manage the network, prioritise investment, and communicate to citizens, the media, and stakeholders how Queenstown is becoming a world-class place to walk and bike.

To help create a robust, cost effective and repeatable method for conducting walking and cycling network audits, this report aims to:

- Describe the network qualities that help communities such as Queenstown and Wanaka become safer and more comfortable places to walk and cycle
- Link those qualities with network features that can be measured
- Explain how non-motorised network data collection informs best practise asset management, including prioritisation of resources for operational and capital programmes
- Suggest the next steps that would be required to perform the audits

3 What makes a great place to walk and cycle?

One of the objectives of the QLDC walking and cycling strategy is "to provide an **attractive** and **safe** environment for cyclists and pedestrians that support a stronger **sense of community**" (bold emphasis added). The attractive and safe qualities of this objective are two of the eight attributes identified in the the Cycle Network and Route Planning Guide (Land Transport Safety Authority, 2004) and the Pedestrian Planning and Design Guide (NZTA, 2009), as described in Table 1.

Table 1: Eight Characteristics of a Great Place to Walk and Cycle

Characteristic	Examples
1. Coherent and Legible. Routes: • Are continuous and recognisable • Link all potential origins and destinations • Offer consistent standard of protection throughout • Are clearly signposted and published in local maps	 *Figure 2: Artist impression of wayfinding signage proposal for Christchurch along a physically separated cycle lane (source: Christchurch City Council)*
2. Direct and Connected. Routes: • Should be based on desire lines, which are generally the quickest way to get from point A to point B. • Provide direct access for pedestrians to the places they wish to reach • Connect well to public transport and to the surrounding networks	 *Figure 3: worn track shows pedestrian desire line in Hagley Park, Christchurch (source: Axel Wilke)*

Characteristic	Examples

3. Attractive and Pleasant. Routes:
• Are integrated with and complement their surroundings
  • Contribute to good urban design
  • Enhance public security
  • Are attractive, interesting, quiet and clean
  • Contribute to a enjoyable walking/cycling experience
  • Encourage lingering and social interaction
	
	Figure 4: Trees installed within a low-speed street in Auckland provides safety and attractiveness benefits for walking and cycling (source: Glen Koorey)

4. Comfort. Routes: • Are unpolluted by excessive noise and fumes • Paths are wide enough with even surfaces and gentle gradients • Have shelter from the elements and places to rest	 *Figure 5: A footpath on Fernhill Road is not wide enough to comfortably pass persons walking in the same or other direction (source: Google)*
5. Convenient. Routes are: • Continuous • Efficient • Unimpeded by obstacles • Undelayed by other path users and road traffic Building on coherence and directness, prioritising people walking and cycling over motor traffic via raised platform crossings reduces non-motorised user travel time and improves road safety. Conversely, pedestrian barriers can impede desire lines and accelerate traffic speeds.	 *Figure 6: A convenient 'active' connection along Church Lane in Queenstown (source: Ministry for the Environment)*

Characteristic	Examples
6. Safe and Secure. There are three aspects to safety. Routes should offer protection from: • Traffic danger • Trip hazards • Personal security risks, mitigated through environmental design factors such as sufficient visibility and natural surveillance (eyes on the street)	 *Figure 7: A raised platform highlights a level, smooth route through a car park (source: Tim Hughes)*
7. Universal. Facilities must be inclusive (suitable for all users): • Barriers at path intersections with roadways should not prevent the passage of prams, larger bicycles (trikes, tandems, cargo bikes and trailers). • Gradients and surfaces such as kerb ramps should be suitable for wheelchair users and mobility impaired pedestrians	 *Figure 8: A kerb in Arrowtown is an impediment to wheeled or mobility impaired pedestrians (source: Warren Lloyd)*
8. Accessible. Popular destinations should be within easy walking distances. This characteristic is most influenced by land use planning considerations.	 *Figure 9: An art gallery is a popular destination within easy walking distance in Arrowtown (source: Warren Lloyd)*

4 Why collect data on the walking and cycling network and usage?

4.1 To help achieve the strategic vision and objectives

QLDC has made a significant commitment to improve walking and cycling in planning documents such as the aforementioned Town Centre Transport Strategy and the On Foot, By Cycle Strategy (2008).

Figure 10: QLDC Walking and Cycling Strategy Vision and Objectives

To achieve these objectives, QLDC has plans and policies to guide capital infrastructure development and operational maintenance and management.

4.2 To give effect to national and local policies

4.2.1 National Policy

The Government Policy Statement on Land Transport Funding (2011) includes the following (bold emphasis added):

> "*Investment in walking and cycling is also expected to make a contribution to economic growth and productivity. To achieve this, funding should be directed to reducing congestion and/or* ***improving pedestrian and cyclist safety****.*

NZTA's strategic network principles include:

- Promote walking in, to and from areas of high pedestrian activity
- Improve level of service on key cycle links to activity areas

Pedestrians are the most diverse group of travellers – with varying attention span, visual ability, balance, stamina, walking speed, height, road experience, and cognitive ability. The NZTA Pedestrian Planning and Design Guide suggests that facilities are designed for the most challenged persons.

4.2.2 Local Policy

A selection of QLDC policies relevant to walking and cycling are provided in Table 2.

Table 2: Policies and data requirements relevant to walking and cycling

Policy	Key Data Requirements
Bus Stop Policy and Standards "QLDC will upgrade and maintain bus stops…so that they: …provide sheltered and safe waiting areas…situated within easy walking distances .are supported by safe and convenient access routes to and from the stop".	• at least 1.5m clear width is provided past any street furniture such as signs, seats, or shelters • bus stop furniture is graffiti-free • disembarkation pad is firm (paved) and level • bus stop length meets policy • Crossing facilities are upstream of the stop if between intersections
Code of Practice for Working in the Road To comply with the Council adopted standard SNZ HB 2002:2003. Examples of data that would show non-compliance are suggested at right.	• Utility covers in the path of cyclist travel have been reinstated at a level above or below the surrounding road surface • Temporary traffic management signage does not fully block a cycle lane or leave less than 1.2m of clear width on a footpath
On-Road Directional Signage Policy This policy does not provide for cycleway or trail wayfinding. Consideration should be given to development of a wayfinding policy and plan. The plan could be informed by the recent Austroads research report AP-R492-15 Bicycle Wayfinding.	• Desktop study of networks to identify locations for fingerboards or direction indication signs, location plates, advanced direction signs, reassurance direction signs, and map signs.
Prioritisation of Minor Safety Projects Proposed projects are ranked using a data-driven method.	• Crash reports include vulnerable road users • Existing road environment is consistent with good practice / national standards, which include pedestrian and cycling aspects of the Austroads guides and MOTSAM
Street Signage Policy The signage policy does not provide for supplemental "Except Pedestrians and Cyclists" (symbols) on No Exit street signs,	• Inventory of existing access-ways along or at the end of no-exit streets

Policy	Key Data Requirements
which limits the ability to promote access-ways and "permeable" street networks.	

4.3 To help prioritise projects and better manage network assets

QLDC does support walking and cycling by maintaining over 150km of walkways, tracks, and mountain bike trails.

As measured by the annual survey, the community's satisfaction with footpaths has been steadily climbing from 56% (2012/2013) to 64.5% (2013/2014) and most recently 66.1% (2014/2015).

Despite these gains, a reactive approach is taken when projects are identified based solely on public pressure associated with high profile crashes, demands for traffic calming, crosswalks, or parking changes. Proactive project identification and prioritisation can be done using flow charts and multi-criteria decision support tools, but robust data is required.

The Community Transport Asset Management Plan 2015-2030[1] identifies a number of databases for the gathering of information about transportation assets, including GIS (Geographic Information System), RAMM (Road Asset Maintenance and Management), Data Warehouse (links all asset management data into one place for ease of reporting), and dTIMs (modelling of asset renewals requirements).

At present, while there are places to store the data (especially GIS and/or RAMM) there is no tool currently in place for QLDC to measure the quality and safety of the walking and cycling network, prioritise investment, improve operations, and ultimately communicate how walking and cycling improvements are impacting travel choices, safety and return on investment.

5 How do we collect data

5.1 Collection tools

Data can be collected with the following tools:

1. Usage data – manual and/or automatic cycle and pedestrian counts. Automatic counts provide larger datasets that can be statistically analysed and comparisons year-to-year at specific locations can be made. For one-off counts, at least three (3) two-hour counts are recommended. New smartphone and tablet data collection apps are available that can aid in screen-line manual counts, but for intersection counts a paper form remains the best option.
2. Origin/destination, satisfaction data: intercept surveys

[1] http://www.qldc.govt.nz/assets/Uploads/Council-Documents/Asset-Management-Plans/Community-Transport.pdf

3. Safety data: Crash Analysis System (CAS) interrogation and analysis
4. Infrastructure presence, condition assessment and quality data (the focus of this document):
    a) Manual survey forms are the easiest means to collect data but it is difficult and time consuming to achieve consistency and depth of information. Extra work is required to transfer the paper forms into spreadsheets.
    b) Geo-tagged video capture using a camera optimised for active sports and integrated with GPS capability can provide data for subsequent processing and analysis. This should not be the principal means of conducting the infrastructure audits because specialized equipment is required and the method would not meet QLDC's budget and timing constraints.
    c) Pocket RAMM can be used to collect data in the field. A netbook or laptop running Pocket RAMM must have GPS enabled, or an external GPS unit is required. Tablets, required. Devices running Android, Apple iOS or Windows Mobile operating systems are not compatible[2].
    d) ArcGIS Data Collector App can also be used to collect data in the field, and is recommended because the iOS and Android platform is easily accessible to a wider range of staff and potential volunteers. Unlike Pocket RAMM, a GPS feature is not required as cell phone technology enables geo-location capture. Data can be easily collated in ArcGIS and/or exported to platforms such as RAMM.

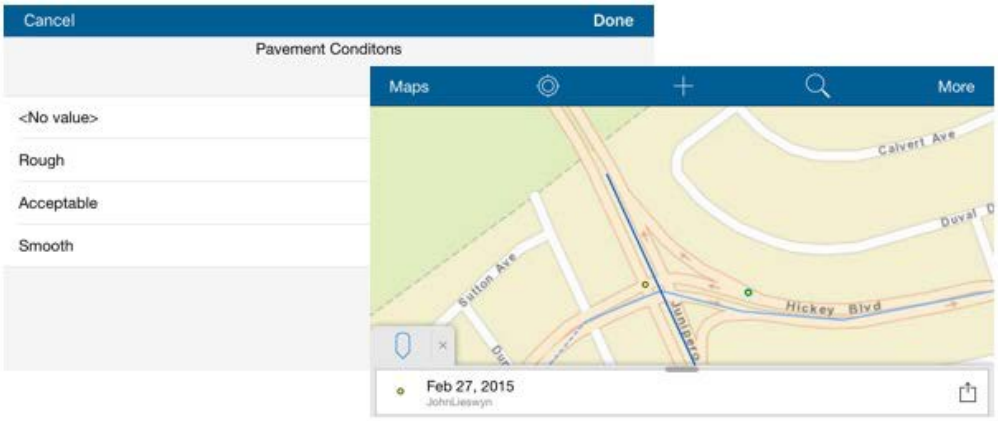

Figure 11: ArcGIS based Data Collector app screenshots (source: John Lieswyn)

5.2 Recommended data attributes for collection

Based on the network characteristics identified in this report and experience with the types of data associated with each characteristic, a list of the data grouped by data source is given in Table 3. A "1" in any cell indicates that the data attribute is associated

[2] http://www.ramm.com/?page_id=1973

with the network characteristic listed in the heading at that top of the column. There are 41 unique data attributes, some of which fulfil more than one network characteristic. This table is intended to inform the development of a data collection tool; it is not an audit form.

Table 3: Recommended Data Attributes for Collection

Data Attribute	Network Characteristic								
	1. Coherent / Legible	2. Direct / Connected	3. Attractive / Pleasant	4. Comfort	5. Convenient	6a. Safety – Traffic, Surface	6b. Safety – Pers. Security	7. Universal	8. Accessible
Audit	**2**	**2**	**3**	**5**	**3**	**10**	**5**	**11**	**1**
Accessway quality									1
Barriers / Obstacles					1				
Benches presence								1	
Bus stop crossing facility					1	1		1	
Bus stop embarkation pads								1	
Bus stop length meets policy								1	
Crossing facility presence and type					1				
Eyes on street - fence / wall (typical)							1		
Facility type	1			1		1			
Facility width (minimum)						1		1	
Facility width (typical)				1		2			
Gradient (maximum)				1				1	
Graffiti presence			1				1		
Hiding places							1		
Intervisibility / sight distance						1			
Kerb ramp present								1	
Kerb ramp standard met								1	
Landscaping/trees presence			1						
Lighting presence							1		
Lighting quality							1		
Obstacles		1						1	
Pavement defects				1		1			
Pavement quality (typical)				1					
Public art			1						
Signs and Markings - compliance						1			

Data Attribute	Network Characteristic								
	1. Coherent / Legible	2. Direct / Connected	3. Attractive / Pleasant	4. Comfort	5. Convenient	6a. Safety – Traffic, Surface	6b. Safety – Pers. Security	7. Universal	8. Accessible
Signs and Markings - condition						1			
TGSI present								1	
TGSI standard met								1	
Traffic calming device presence						1			
Wayfinding signs	1								
Worn tracks indicating desire line		1							
CAS						**1**			
Crash data						1			
GIS	**1**	**1**		**2**	**2**			**2**	**2**
Accessway locations									1
Bus stop locations					1				
Bus stop shelter presence				1					
Gradient (typical)				1				1	
Major destinations		1			1				1
Mobility car parking presence								1	
Network - identified route	1								
RAMM				**2**		**2**			
Traffic speed				1		1			
Traffic volume				1		1			

6 Next steps

It is recommended that:

1. City staff confirm the list of data attributes and priority for collection
2. For each attribute, field type (numeric, text) and drop down lists be established
3. The method of data collection should be confirmed:
    a. Determine method (e.g. separate or integrated walk and cycle audits)
    b. Determine hardware/software tools to be used
4. Develop data collection method
5. Conduct audits
6. Data post processing and analysis
7. Reporting and project prioritisation

7 Other things we can do

This project focuses on the data needed to capture data needed to manage and develop a walking and cycling friendly network. However, non-infrastructure educational encouragement and enforcement programmes can also help achieve the desired outcomes by building social impetus for change. Programmes include (but are not limited to) school student road safety initiatives (e.g. the School Travel Programme), workplace travel plans, and police-led crosswalk enforcement campaigns to educate and remind drivers about interacting with pedestrians.

Appendix A Recommended Audit Geographic Scope

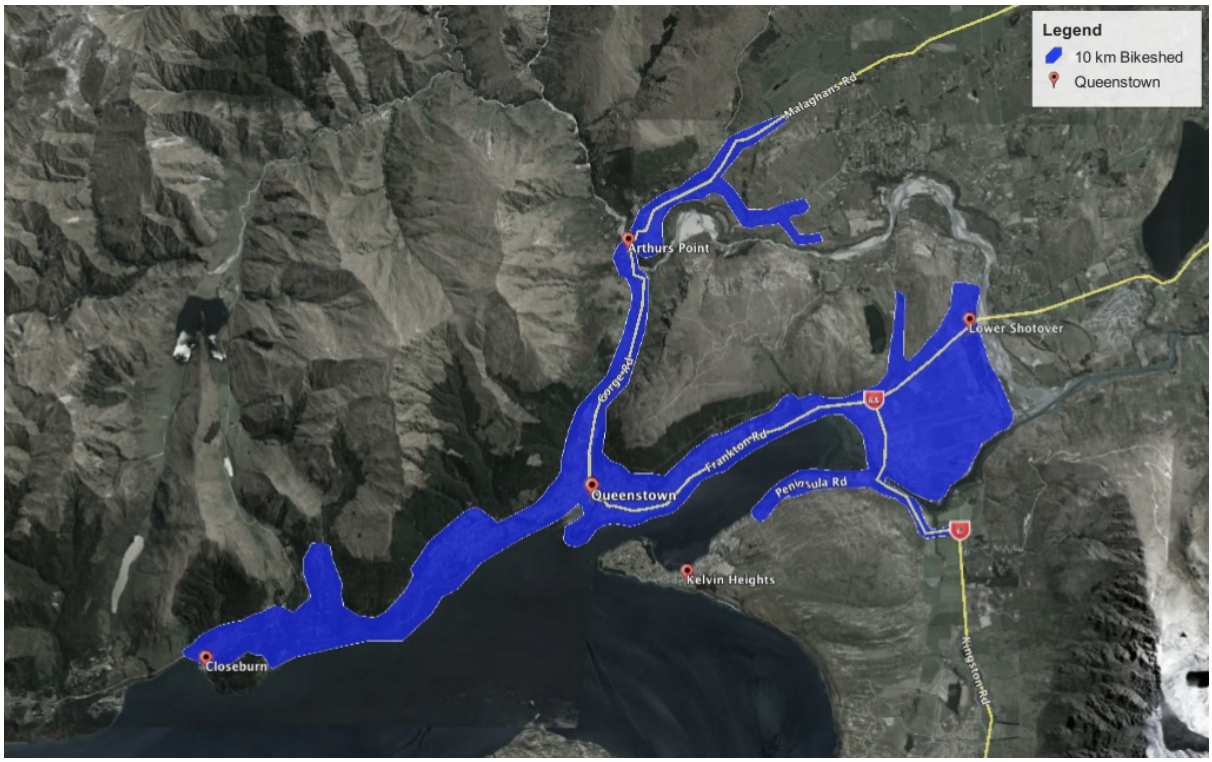

Figure 12: 10km (30min) bikeshed

Figure 13: 2.5km (30min) walkshed (orange) and 3km expanded walkshed (light orange)