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Research into key performance indicators

Prepared for: Taupo District Council

Job Number: TPDC-J002

Revision: 2.0

Issue Date: 16 April 2019

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1. Background

The purpose of this technical note is to identify the key performance indicators (KPIs) that will inform both the Taupo Parking Supply and Demand Analysis and Bus Hub Options, and the Taupo Traffic Modelling and Future Road Network Options projects undertaken by Ableys.

Ultimately, the KPIs will feed into Taupo's Transport Strategy, and will be part of an ongoing performance and assessment framework that will measure how the transport system is performing and progressing toward the aspirations of the Taupo District Council.

1.1 Purpose of KPIs

A key performance indicator is generally understood to be a tool to measure how effectively a business or organisation is achieving its goals.

Beyond this, KPIs can have a range of other uses, including:

- Identifying best practice.
- Identifying areas for improvement, and support decision making.
- Ensuring value-for-money is being achieved from investment.
- Providing a basis for continuous improvement.
- Assessing against a level of service.

1.2 How and where they will be used

The Taupo District Council is working towards developing a 30-year Transport Strategy (the strategy). It is expected that the KPIs developed through this work will be carried through into the strategy. Ideally, the strategy would be in place first to identify what the Council is aiming to achieve with its transport system. In the absence of the strategy, it has been assumed that the strategy will align with national and regional strategic documents that aim to promote safe and sustainable travel by providing for and encouraging walking, cycling and public transport over vehicular travel.

It is critical that the KPIs are measured regularly and consistently to ensure that the results are comparable over time against a good baseline. The KPIs should therefore be part of an assessment framework that is actively managed. The cost of data gathering will be taken into consideration when setting the KPIs, to ensure that is not placing a burden on Council budgets.

1.3 What elements we will cover

The KPIs will be incorporated into the Taupo Transport Strategy. It is therefore important that all aspects of the transport system are included. This will ensure that all modes are adequately provided and managed, and that adverse effects are not created by focusing on single parts of the transport system. We recommend that the KPI framework includes the following elements:

- Walking
- Cycling
- Public transport
- General traffic
- Parking
- Freight

When setting the KPIs the following factors will also be taken into consideration across each of the above elements.

- Safety
- Accessibility
- Resilience
- Customer experience
- Transport mode share

There are two perspectives to consider this from:

1. Council's point-of-view in terms of the provision and management of an asset; and,
2. The customers point-of-view and the service that they are provided (customer level of service).

1.4 Existing KPIs

To set the scene for developing KPIs, existing KPIs have been identified in the Taupo District Council Annual Report and the Waikato Regional Transport Plan.

Taupo District Council Annual Report

Through the Annual Report, the Taupo District Council measures the following levels of service for transport (each have performance measures and targets):

- The number of serious and fatal crashes on District roads is falling.
- That our roading network is maintained and in good condition.
- Footpaths are maintained and in good condition.
- Fix problems on the network promptly or explain why there are delays.

Satisfaction surveys

Satisfaction surveys are undertaken every three years, the most recently was undertaken in 2014 (reported in 2015). The questions in this survey are comparable to other Councils around New Zealand. The survey asks a sample of approximately 400 residents their satisfaction with the following Council services facilities:

- Roads in the District (excluding State Highways)
- Footpaths
- Cycleways and other cycle facilities

It is unclear whether this survey will be ongoing, and whether it can be used for future monitoring of transport system performance.

Waikato Regional Transport Plan 2018

The regional plan informs investment in transport across the region. It also includes monitoring report cards with two levels of KPIs attached to each problem statement as in **Table 1.1**. The KPIs do not directly mention Taupo, and in some cases, especially under the access grouping, only mention Hamilton.

Table 1.1 Waikato Regional Transport Plan monitoring report card

Problem	High level ILM benefits	Monitoring measurements
Economic development and strategic corridors	KPI 1: Decrease in travel time. KPI 2: Transfer freight to strategic corridors. KPI 3: Maintain travel time reliability on key corridors.	KPI 1: Reduce travel time on the Waikato Expressway from 2015 levels. KPI 2: Maintain travel time reliability on identified inter-regionally significant corridors and arterial corridors in Hamilton from 2015 levels. KPI 3: Increased volume of freight moved on North Island Main Trunk (NIMT) and East Coast Main Trunk (ECMT) rail corridors compared to 2015 levels. KPI 4: Increased visitor spend in the Waikato region contributable to regional cycle trails, compared to 2015 levels. KPI 5: Decreased road closure time delay or detour travel time on inter-regionally significant strategic corridors from 2015 levels. KPI 6: Increased provision of transport infrastructure and public transport services in planned growth areas compared to 2018 levels.
Road Safety	KPI 1: Decrease in deaths and serious injuries. KPI 2: Decrease in network closure due to incident. KPI 3: Decrease in social cost of road crashes.	KPI 1: Reduced number of deaths and serious injury crashes for each mode and crash factor, compared to the 204-2008 five-year baseline. KPI 2: Reduced annual social cost of Waikato regional road crashes. KPI 3: All districts within the Waikato region have a Speed Management in place by 2021.

Access and mobility	KPI 1: Increase use of active transport modes. KPI 2: Increase public transport patronage. KPI 3: Increase investment in accessibility projects.	KPI 1: Increased annual passenger boardings per capita above 2015 levels. KPI 2: Increase public transport, walking and cycling travel to work mode share in Hamilton from 2013 levels. KPI 3: Improve perception ratings across the region for public transport, walking and cycling from 2015 levels. KPI 4: Increase walking and cycling counts in Hamilton and outer urban centres from 2018 levels. KPI 5: Increased level of investment targeting inclusive infrastructure in Hamilton and rural towns compared to 2015 levels. KPI 6: Increased investment in urban cycle facilities in urban areas from 2018 levels. KPI 7: Reduced distance per capita travelled in single occupancy vehicles in Hamilton on weekdays below 2017 levels.

2. Review of KPIs

2.1 New Zealand

Local authority documents from around New Zealand were reviewed to identify examples of KPIs for each transport mode or element. Examples have been extracted from strategy/policy documents or reporting documents such as annual plans.

The appendices also include performance metric examples from the Auckland Council and NZ Transport Agency in sections 5.1 and 5.2 of this technical note respectively.

Parking

A key issue for parking management is parking occupancy. This measures the duration of time that a car park contains a parked vehicle. Other factors that may be considered is parking duration (how long someone parks for), and turnover (how many vehicles park in a car park during the day). Each of the measures are associated with aiming to support that local business by ensuring that customers are able to find a car park, and that there is a continual flow of new customers. It is also an issue for traffic congestion by managing the amount of circulating traffic looking for a car park, and associated safety issues of frustrated drivers. We have reviewed documentation from Wellington City Council, Auckland Transport, Dunedin City Council and Timaru District Council.

The Auckland Transport Annual Report measures parking occupancy (peak four hours, on-street). Performance is measure against the target of 70 – 90% occupancy. However, the Auckland Transport Parking Strategy 2015 uses an 85% occupancy rate as a target for on-street parking, with an acceptable range between 70 – 90%. Auckland Transport has a set of intervention triggers that are aimed to manage occupancy to 85%. Noting that Auckland Transport uses pricing as one of the management strategies, the strategy discusses this occupancy target:

Demand responsive pricing means that the prices charged for on-street parking will be adjusted based on parking demand. Price rates will be adjusted up or down with the goal of maintaining an average 85% occupancy at peak times. An occupancy range of 70-90% is considered an acceptable range. The target parking occupancy rate is not set at 100% because some parking spaces should be available at all times. An occupancy rate of approximately 85% ensures that parking resources *are well-used and people can find a park in reasonable proximity to their destination. Maintaining some availability reduces the need for people to drive around searching for a parking space, thereby reducing congestion.*

Auckland Transport applies a similar approach for off-street parking in the facilities that it owns noting that *most off-street parking under the control of AT acts as an extension to on-street parking and forms part of the overall parking supply in a town centre.* It uses the same 85% target for its short-term parking, and has a set of intervention triggers to manage this. Where there is high demand for unrestricted parking, the policy is to introduce time restrictions or paid all day parking.

Dunedin City Council parking performance measure[1] is *Percentage of residents satisfied with availability of metered on-street parking in the central city.* The performance is measured against a target of greater than 40%.

Timaru District[2] has a level of service statement that *carparks are available, fit for purpose and easy to access* with the following measures:

- 75% or residents are satisfied that access to Council provided carparking is adequate
- 80% of residents are satisfied with the location, design and maintenance of carparking
- Parking fees are reviewed annually, and the activity is self-funding

Wellington City Council has a policy for Central City on-street parking which states:

A 15% vacancy rate will be used as an indicator to measure the effectiveness of the Council's management of the parking system. A 15% vacancy rate conforms to international best practice for managing parking, ensuring that

[1] Dunedin City Council Annual Report
[2] Source Timaru District Council Annual Report 2017/18

turnover and the ability to find a space are balanced. Spaces will need to be managed through a combination of pricing, time limits and enforcement.[3]

This 15% vacancy rate also applies to suburban centres in retail and commercial areas for on-street parking.

Through its Annual Report, Wellington City Council has specific performance measures for on-street parking occupancy, turnover compliance with restrictions and perceptions of enforcement as shown in **Figure 2.1**.

PERFORMANCE MEASURES		2015/16	2016/17	2017/18 ACTUAL	2017/18 TARGET	% VARIANCE	
7.2 Parking							
To measure the quality of our parking provision							
On-street car park turnover rates	Weekdays	6.1	6.1	7.3	6.8	7%	↑
	Weekends	4.7	4.9	6.2	5.3	18%	↑
Parking turnover is the rate of use of a parking space. It is calculated as the number of vehicles parked in a space over the course of the day. For the last 3 years the turnover rate has not met the target of 5.3. In 2017/18 it has now exceeded target, which is consistent with our aim of increasing turnover.							
On-street car park average occupancy		78%*	83%*	68% weekends 58% weekday	75%	NA	—
With the introduction of parking sensors, data sampling has allowed a more accurate measurement of occupancy. Previous years' values are non-comparable and targets will be reset at Annual Plan.							
On-street car park compliance – time restrictions and payment	Time			96%	95%	1%	↑
	Payment			NA	90%	NA	—
With the introduction of parking sensors, parking officers have access to live data on vehicle arrival and departure times. This allows for more efficient enforcement. Work is under way to integrate payment methods with the Council's pay by space system. This will enable accurate reporting on payment compliance in future.							
Residents (%) who perceive parking enforcement to be fair - Increase from previous year		48%	50%	53%	Increase	6%	↑

Figure 2.1 Wellington City Council parking performance measures (source: Annual report 2017/18)

Walking and cycling

Walking and cycling has been grouped together as they are often reported and monitored together by local authorities. Key issues for cycling are the numbers of people cycling (or the distance they cycle), safety and the quantity and quality of cycle infrastructure. Pedestrian monitoring is generally focussed on the number of people walking, although the quality of footpaths is monitored under infrastructure reporting.

Wellington City Council have had a long-term monitoring regime in place that counts pedestrians, cyclists and other modes coming into the city 'cordon' on an annual basis. This provides a great data basis for setting and monitoring KPIs, as illustrated in **Figure 2.2**. Their annual Residents Monitoring Survey also provides a good basis for KPIs.

[3] Wellington Parking Policy 2007

COUNCIL OUTCOME INDICATOR	SOURCE		2015/16	2016/17	2017/18	
Number of cyclists and pedestrians entering the Central Business District (average weekday*)	WCC Transport – Cycle Cordon Survey	Cyclists	1,924	1,846	1,914	↑
	WCC Transport – Pedestrian Cordon Survey	Pedestrians	11,024	10,226	10,952	↑
** these measures were reported in previous Annual Reports as "weekdays" being the total for one week" rather than "average per weekday".*						
Residents (%) who agree the transport system allows easy movement around the city – vehicle users and pedestrians	WCC RMS 2018	Vehicle users	45%	45%	43%	✓
		Bike users	new	37%	31%	↓
		Pedestrians	91%	93%	93%	✓

Figure 2.2 Wellington City Council walking/cycling performance measures (source: Annual report 2017/18)

Dunedin City Council has a reasonably simple indicator of *Increase in length of cycle lanes (on and off road*[4]*),* with a target to *increase the length on the previous year*. Their performance measures also include:

- Percentage of footpaths within the level of service standard adopted by the Council in its Asset Management Plan (target <15% rated poor or very poor)
- Percentage of residents satisfied with the suitability of the road network for cyclists throughout the city (target >28%)
- Percentage of residents satisfied with condition of footpaths throughout the city (target >57%)
- Percentage of residents satisfied with the ease of pedestrian access throughout the city (target >65%)

These results come from the Residents Opinion Survey.

From a safety perspective Dunedin City Council measures:

- Number of pedestrian vs vehicle causalities
- Number of cyclist vs vehicle casualties

Dunedin City Council's Integrated Transport Strategy has a goal: *The percentage of Dunedin census respondents who cycle, walk or take a bus to work increases from 16% at the 2006 census to 40% by 2024.*

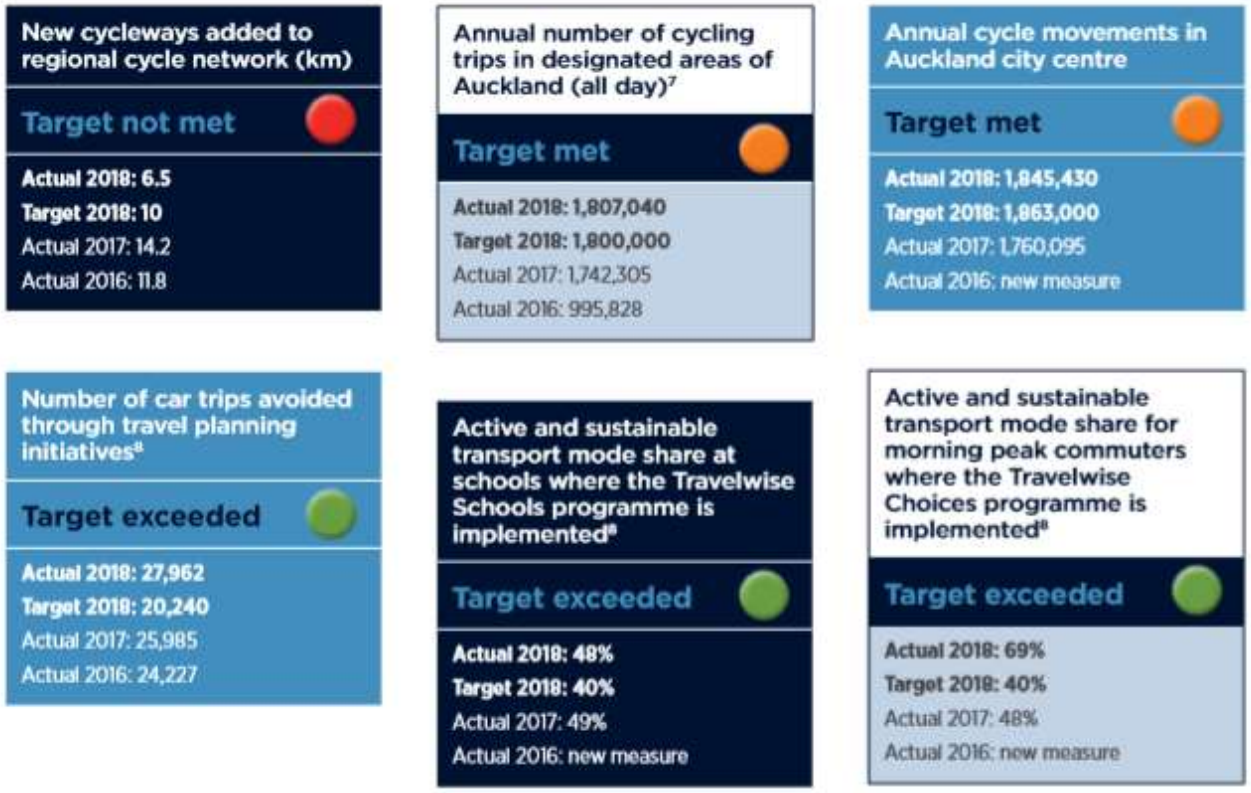
Timaru District[5] has a level of service statement that *sustainable transport options are facilitated and provided* that are measured by:

- 1 school travel plan completed or reviewed annually
- Use of Active/Public Transport modes: 80% residents regularly walk, 30% residents regularly cycle, 15% residents use public transport

[4] Source: Dunedin City Council Annual Report 2017/18
[5] Source Timaru District Council Annual Report 2017/18

Auckland Transport also has a comprehensive cycle monitoring regime with monthly and annual cycle monitoring (26 count sites – was 85 sites up until 2015 when the number of sites reduced) identifies trends in cycling, guiding policy and investment, reporting on use of the cycling network. They also carry out annual quantitative survey for active modes to understand behaviours, attitudes and perceptions of travel.

Figure 2.3 illustrates the key results for Auckland Transport for walking, cycling and travel demand. Notably, cycling comes through in these measures much more strongly than walking.



[6]

Figure 2.3 Auckland Transport key performance measure: walking cycling and travel demand

Public transport

We understand that public transport may be considered a relatively low focus for Council given the limited service provision of three service routes. We understand that boarding numbers are recorded and monitored on a monthly basis.

The Nelson City Council[7] has a regional objective that *Communities have access to a range of travel choices to meet their social, economic, health and cultural needs.* The indicator for public transport is *Total annual Bus Patronage for Nbus service in Nelson and Richmond and the Bayleys Bus in Blenheim* with a target of an increasing number of trips.

The Timaru District Council[8] has a level of statement that *sustainable transport options are facilitated and provided* with a target that *90% of users are satisfied with the quality of transport services.*

Dunedin City Council's Integrated Transport Strategy has a goal: *The percentage of Dunedin census respondents who cycle, walk or take a bus to work increases from 16% at the 2006 census to 40% by 2024.*

[6] Source: Auckland Transport Annual Report 2018
[7] Source: Nelson RLTP 2018 Mid Term Review
[8] Source: Timaru District Council Annual Report 2017/18

Figure 2.4 Auckland Transport key performance measure: public transport**Figure 2.4** illustrates the performance measures for Auckland Transport, however, it is noted that the public transport system is of a much larger scale than Taupo and is therefore not a direct comparison.

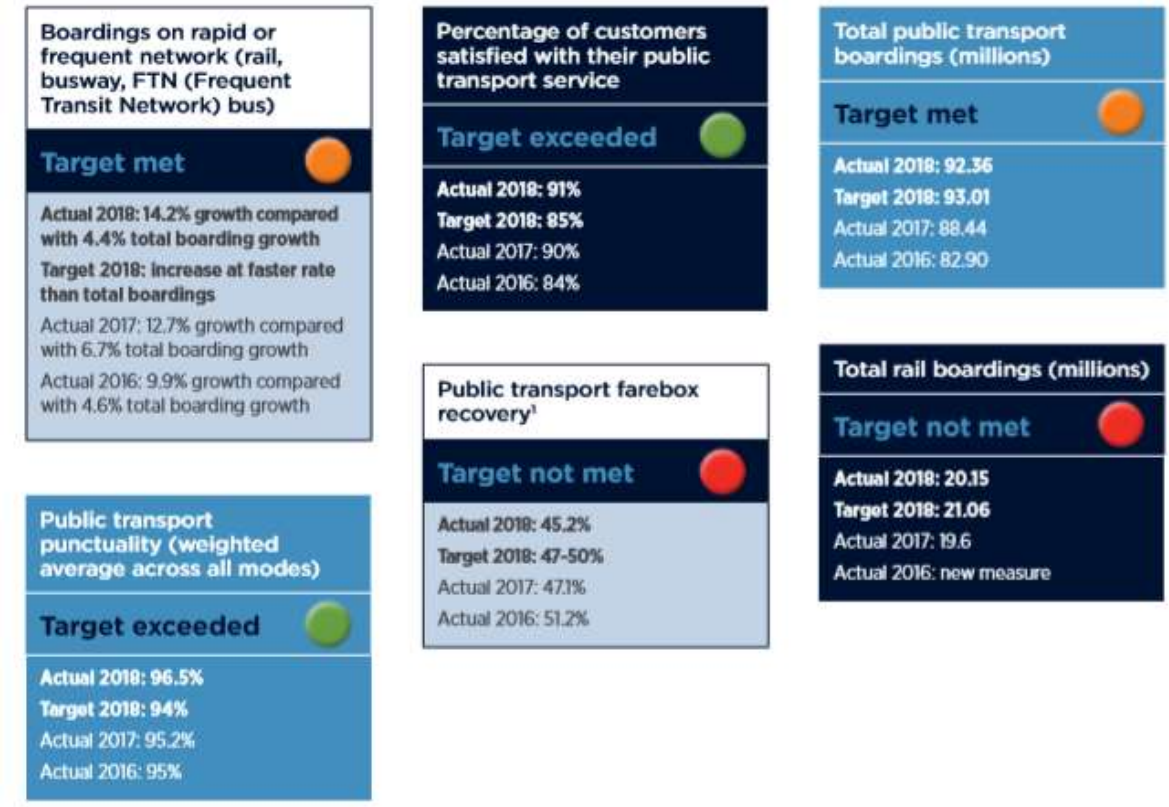


Figure 2.4 Auckland Transport key performance measure: public transport

General traffic

General traffic performance indicators focus on travel time or travel delays, along key routes or at key locations. Data may be collected via traffic surveys, or floating car surveys where a car is driven along the same route multiple times during the day or week. Recently of course, technology enables this to be done more efficiently through the likes of Google API or data from GPS providers such as TomTom.

Dunedin City Council for example has five urban routes with a target travel time that is measured annually and reported in the Annual Report.

Timaru District[9] has a level of service statement that *Roads are fit for purpose and provide for comfortable and efficient travel* with the following measure *Timaru journey times on key transport routes are maintained at 2005 +10% levels.*

Wellington City Council has an indicator that asks through the resident's surveys whether residents agree that peak traffic volumes are acceptable. This is reported annually and is looking for an improving trend rather than a specific target.

Auckland Transport has a performance metric for the arterial road network productivity. This is an overall metric to evaluate the efficiency of a road during peaks hours, and includes the number of vehicles, average journey time and vehicular occupancy. Auckland Transport also includes road safety performance in this area with actual numbers and survey responses:

[9] Source Timaru District Council Annual Report 2017/18

- Percentage of Aucklanders satisfied with road safety in the Auckland region (target 65%)
- Change from previous financial year in number of fatalities and serious injuries on the local road network, expressed as a number (target 537)
- Local road deaths and serious injuries per 100 million vehicle kilometres travelled (target 4.9)

NZTA guidance[10] suggests the following measures for travel time reliability:

- Coefficient of variation; standard deviation of travel time divided by average minutes travel time (as per Austroads)
- Average travel time in minutes
- Difference between average travel time A and average travel time B in minutes per kilometre to measure travel time delay

Another measure used is vehicle occupancy which is used in part to inform travel demand management efforts, by seeking to increase the number of people per vehicle and thereby decreasing the number of vehicle trips and associated congestion.

Freight

The monitoring of freight is understood to be of relatively low priority for Taupo, as industrial areas are located to the east of the town centre, are adjacent to the State Highway and do not have a big impact on the operation of the Taupo centre. The SH1 Taupo Bypass also directs through traffic away from the central city. If freight was to be considered further, the mode of freight travel may be considered, for example encouraging rail over trucks. Another measure may be travel time along key freight routes, such as the Auckland Transport Annual Report which measures travel times on 10 key freight routes during the inter-peak (9am – 4pm) for 85th percentile travel times.

2.2 International

There is a wealth of international literature and it is acknowledged that this is not a comprehensive review of all resources which are available but focuses on a select few resources which provide good high-level guidance or learnings.

Best practice guidance for setting KPIs

The Victorian Transport Policy Institute[11] has identified a set of best practice principles for developing transport performance indicators, these guidelines include:

- **Comprehensive** – Indicators should reflect various economic, social and environmental impacts, and various transport activities (such as both personal and freight transport).
- **Data quality** – Data collection practices should reflect high standards to ensure that information is accurate and consistent.
- **Comparable** – Data collection should be standardised so the results are suitable for comparison between various jurisdictions, times and groups. Indicators should be clearly defined. For example, "Number of people with good access to food shopping" should specify 'good access' and 'food shopping.'
- **Easy to understand** – Indicators must be useful to decision-makers and understandable to the general public. The more information condensed into a single index the less meaning it has for specific policy targets (for example, Ecological Footprint analysis incorporates many factors) and the greater the likelihood of double counting.
- **Accessible and transparent** – Indicators (and the raw data they are based on) and analysis details should be available to all stakeholders.
- **Cost effective** – The suite of indicators should be cost effective to collect. The decision-making worth of the indicators must outweigh the cost of collecting them.

[10] https://www.nzta.govt.nz/planning-and-investment/planning-and-investment-knowledge-base/monitoring-and-reporting-on-investments/investment-performance-measurement/list-of-investment-performance-measures/

[11] https://www.vtpi.org/

- **Net effects** – Indicators should differentiate between net (total) impacts and shifts of impacts to different locations and times.
- **Performance targets** – select indicators that are suitable for establishing usable performance targets.

The VTPI guidance also identifies that KPIs can be aimed at four levels:

1. Process – planning and policies,
2. Inputs – funding levels spent on activities,
3. Outputs – direct results such as km's of footpath, and
4. Outcomes – ultimate results such as mode split.

We recommend that Taupo District Council focuses on output and outcome measures for the Taupo transport system.

Walking and cycling indicators

Creating Walkable and Bikeable Communities: A User Guide to Developing Pedestrian and Bicycle Master Plans (Roughton, et al 2012)[12], identifies the following performance indicators relevant to walking and cycling broken into four groups:

1. Infrastructure – including measures such as total miles of bikeways, percentage of households within fixed distance of infrastructure, buses equipped with bicycle racks, number of cycle parking spaces etc.
2. Programs – including measures such as percent of schools served by Safe Routes to Schools program, safety trainings offered per year, participation in and mode shift resulting from cycling programs etc.
3. Use and Safety – including measures such as mode share for work and all trips, number of walking and bicycling trips per day along key corridors, bicycle and pedestrian crash rates etc.
4. Public Opinion – including measures such as percent of residents satisfied with the safety and comfort of existing bicycle and/or pedestrian facilities, and percent of residents interested in walking and bicycling more frequently

Transport for London

Transport for London develops an annual Travel in London report[13] that tracks a vast array of transport performance indicators, with over 250 pages in the report. The report relates to performance against the Transport Strategy. Section 5.3 of this technical note contains a diagram that illustrates the outcomes of the strategy and how performance is measured.

It is noted that the Transport Strategy is focused on mode shift away from general traffic. Consequently, there is no reporting on parking in the 250 pages or in the performance metrics. The focus is more on mode share for walking, cycling and public transport. It goes further, with a metric *Londoners can live well without a car.* Similarly, there are no metrics on travel time or delay for general traffic.

2.3 Network Operating Plans

In New Zealand, Network Operating Plans (NOPs) are used by roading authorities to determine, on a one-network approach, both where and how to manage and invest in the network. The process is based on establishing the Operating Gaps that identify where there are performance deficiencies on the network. The Operating Gaps are developed based on the following inputs:

- Place value,

[12] Found from www.vtpi.org
[13] http://content.tfl.gov.uk/travel-in-london-report-10.pdf

- Mode priorities,
- Throughput for each mode,
- Current Level of Service; and,
- Time periods for evaluation.

Towards the end of 2018, Ableyundertake consultation with a broad range of local and state roading authorities across Australasia on the subject of Network Operating Plans and Network Performance Indicators. This research provided helpful insights to how road controlling authorities seek to measure performance and which of these might be beneficial for comparison purposes. The research indicated that efficiency, reliability, accessibility and safety were most important indicators. However, resilience and amenity were also noted but to a lesser extent.

The most common performance metrics incorporated into NOPs included:

- serious injuries,
- road fatalities,
- social cost of crashes,
- road maintenance effectiveness,
- predicted BCR (Pre-construction),
- actual travel time,
- Congestion indicators,
- journey reliability; and
- car occupancy.

We recommend that Taupo District Council consider KPIs that not only will inform the development of a Transport Strategy but could also be incorporated into any future development of a Network Operating Plan for Taupo township.

3. Long list of KPI options

The long list of KPI options were developed on the basis of the review of KPIs, while taking into account local factors such as the population size in Taupo and a reasonable expectation of the level of data required to monitor the KPIs. The long list of KPIs were presented to Taupo District Council officers as part of the process to develop the short list of options. The long list has been developed for each transport mode as shown in the following tables. The bold KPIs have been taken through into the short list. Some of the tables have a '*to consider' row at the end of the table. These were ideas that were given some consideration but not included in the long list.

Each KPI has been developed with an outcome (a behaviour or change sought) or an output (an infrastructural change). A metric and target have been recommended, however, the timing of the KPI will be refined as part of the transport strategy.

Table 3.1 Long list of cycling KPIs

Outcome / output	KPI
Cycling	
A greater proportion of people making their trips by cycle	5% of trips made by cycle
Cycle facilities provided along key recreational cycle routes	100% of key recreational cycle routes have dedicate cycle facilities (cycle lanes, shared path, separate path)

Cycle facilities provided along key commuter cycle routes	**100% of key commuter cycle routes have dedicate cycle facilities (cycle lanes, shared path or separate path)**
Cycle facilities provided along key cycle routes	An increase in length of dedicated cycle facilities on the previous year
Provide an accessible cycle network	All residents are within a 5-minute cycle catchment of a dedicated cycle facility
Provide an accessible cycle network	Increasing number of people living with 500m of a high-quality cycle facility
Provision of cycle parking	Cycle parking provided at key attractions and destinations
Zero cycle fatalities on the road network	**Zero cycle fatalities on the road network**
A quality cycle network is provided	No customer complaints are received regarding the lack of cycle provision
A quality cycle network is provided	100% of the cycle network complying with level of service expectation
A greater number of cycle trips are made at key locations	**5% increase in cycle counts on the previous year at key locations**
*To consider – cycled to school routes	

Table 3.2 Long list of walking KPIs

Outcome / output	KPI
Walking	
A greater proportion of people making their trips by walking	10% of trips (to work) made by walking
A greater number of walking trips are made	**5% increase in pedestrian counts on the previous year at key locations**
Walking facilities are provided across the city	**100% of streets have a footpath on one side, and 80% on both sides on key routes**

Quality walking facilities are provided	Percentage of footpaths within the level of service standard adopted by the Council in its Asset Management Plan
Zero pedestrian fatalities on the road network	**Zero pedestrian fatalities on the road network**
*The condition of footpaths is already monitored through the annual report	
*To consider - facilities in new subdivisions, on bridges, intersections to standard, walking distances, walk to school, presence of mobility scooters and electric scooters, overgrown trees on footpaths, connections between cul-de-sacs	

Table 3.3 Long list of parking KPIs

Outcome / output	KPI
Parking	
People are able to find a short-term available car park in the central business district within a reasonable time	**85% average on-street parking occupancy**
People are able to find a short-term available car park in the central business district within a reasonable time	80% of residents satisfied that access to on-street parking is adequate
On-street parking supports business and commercial activities	**On-street daily parking turnover is x (tbc) in the central business district**
On-street parking supports business and commercial activities	95% of parking durations comply with time restrictions
Parking restrictions are fairly enforced	**80% of residents perceive parking enforcement to be fair**
Parking restrictions are fairly enforced	The number of parking infringement notices decrease on the previous year
*To consider - long term parking, on-street v off-street, TDM implications – especially around schools, widths of parks, and number of accessible parks	

Table 3.4 Long list of public transport KPIs

Outcome / output	KPI

Public transport	
A greater proportion of people making their trips by public transport	5% of mode share of trips made by public transport
Bus shelter facilities (with weather protection) provided at key locations	All residents within a 5-minute walking catchment of bus stop
Increasing number of passenger boardings per month	**5% increase in boardings year on year**
A quality public transport service is provided	All services arrive within 5 minutes of the scheduled time
*To consider - coverage of PT routes or frequency, public perception of PT, safety	

Table 3.5 Long list of general traffic KPIs

Outcome / output	KPI
General traffic	
Provide consistent travel speeds	Maintain travel speeds within 10% below posted speed limit
Provide consistent travel times	Travel time variability is no greater than 10% throughout the day on selected routes
Provide consistent travel times	Peak travel time is not greater than 25% above free flow travel time
Provide consistent travel times	Average travel time is x minutes on x route (routes to be selected)
Travel times are reasonable during seasonal peaks and events in Taupo	**Travel times increase by no greater than 25% above average peak demand during peak seasons and events (no more than 14 days a year)**
Zero fatalities on the road network	**Zero fatalities on the road network**
Efficient use of vehicle capacity	Average vehicle occupancy is 1.2 people per car during peak periods
A good level of service is provided across the network	No intersections modelled to perform worse than level of service D.

Positive public perception of the road network	80% of residents are satisfied with the performance of the transport system
Maintain reasonable traffic volumes	**Traffic volumes increase by no more than 2% annually on key routes coming into the centre of town**

3.1 Workshop feedback

Council offers provided the following feedback on the long list of KPIs.

General

- The Transport strategy intent is being drafted and may address safety, accessibility, prosperity and vibrancy of urban centre. It is too early to formally report on this intent, but this provides focus for development of KPIs.
- Less of a focus on efficiency and mode shift and more on mode choice is the likely direction.
- KPIs around total persons (vehicles drivers, vehicle occupants, pedestrians, cyclists, PT) could be monitored by surveys ay key locations providing a collar around town centre, such as Control Gate Bridge, Spa Road/Tauhara, Rifle Range Road, Lake Terrace.
- Need to think about extent of monitoring required for KPIs.

Cycling

- Mode share split will offer little value.
- Cycle parking could be measured as part of cycle facilities, alongside cycle lanes.
- Some interest in monitoring cycling around schools, but no specifics identified at this stage.

Walking

- Mode share split will offer little value.
- Primarily interested in providing footpaths on key routes (in the central area). Already Council policy to provide footpaths on one side of the road on100% of the network.
- Some interest in monitoring walking to schools, but no specifics identified at this stage.
- Side issues identified such as maintaining vegetation over footpaths, providing standard width footpaths and how to manage scooters on the footpath. These however more relate to the management of the asset rather than KPIs.

Parking

- Some interest in managing parking around schools, but no specifics identified.
- Some interest in monitoring the number of mobility parks, and the standard width of car parks.

Public transport

- Noted that the extent of service did not justify comprehensive monitoring.
- Mode share split will offer little value.

General traffic

- Interest in a KPI relating to network performance during peak holiday periods potentially addressing the number of days where volumes or travel times reach certain targets. Use of Bluetooth monitoring and VMS could be used to manage this
- Monitoring freight is relatively low priority at this stage.

4. Short list of KPIs

Following the workshop with Council officers, the long list was reduced to a short list. To identify the short list, we recommend that around 10 KPIs are selected in total, with 1-3 KPIs per mode. The following table contains the recommended short list of KPIs along with commentary about the justification for the KPI and the data requirements.

Table 4.1 Recommended short-list of KPIs

Outcome / output	KPI	Commentary
Cycling		
Cycle facilities are provided along key commuter cycle routes	100% of key commuter cycle routes have dedicated cycle facilities (cycle lanes, shared path or separate path)	TDC has a nominated cycle network, however, the network has not yet been completed. This KPI would monitor progress towards implementing the full network. Providing good cycle facilities are a key aspect to encourage more cycling. This can be measured annually and does not have a burdensome data requirement. Once commuter routes are completed the KPI could change to recreational routes.
A greater number of cycle trips are made at key locations	5% increase in cycle counts on the previous year at key locations	In combination with the above KPI, it is important to monitor the number of people cycling. An annual cordon survey is recommended that counts all modes on key routes to monitor the change in volumes and mode share. There will be cost and effort associated with this, however, this data will provide comprehensive information that will inform a variety of future growth and investment decisions.
Walking		
Walking facilities are provided across the city	100% of streets have a footpath on one side, and 80% on both sides on key routes	Council has adopted a walking and cycling strategy. This KPI seeks a good provision of walking facilities to encourage more walking. This is particularly relevant to new subdivisions as they open, as additional facilitates provided retrospectively is less

		likely. This KPI can be monitored easily and cheaply relying on good asset management processes.
A greater number of walking trips are made at key locations	5% increase in pedestrian counts on the previous year at key locations	In combination with the above KPI, it is important to monitor the number of people walking. An annual cordon survey is recommended that counts all modes on key routes to monitor the change in volumes and mode share. There will be cost and effort associated with this, however, this data will provide comprehensive information that will inform a variety of future growth and investment decisions.
Parking		
People are able to find a short-term available car park in the central business district within a reasonable time	85% average on-street parking occupancy	85% occupancy is an international best practice figure for on-street parking. It reflects that a higher occupancy results in more circulating traffic with safety and efficiency impacts. It also recognises that parking can support local businesses, and don't therefore want to encourage a low occupancy of parking. Parking technology can easily measure this KPI. It is understood that a new parking management system is expected in Taupo in the near future.
On-street parking supports business and commercial activities	On-street daily parking turnover is x (to be determined following the review of parking restrictions) in the central business district	This KPI seeks to encourage the turnover of vehicles at a parking space. It recognises that the same vehicle should not be parking outside a shop for the entire day, and that spending may be encouraged by having a turnover of vehicles/customers. Data gathered for this KPI can also help inform appropriate time restrictions for locations. Similar to the above, this KPI can be

		measured through a parking management system.
Parking restrictions are fairly enforced	80% of residents perceive parking enforcement to be fair	Parking enforcement is important to ensure a turnover of vehicles throughout the day, and thereby encourage economic activity. There is however a balance in allowing people enough time to go about their business without 'space hopping''. This KPI seeks to understand how people feel about enforcement. This information can also be used to inform the setting of parking time restrictions. This KPI would most likely require intercept surveys on the street, or through a residents survey (which is not currently in place). There will be additional cost in measuring this KPI.
Public transport		
Increase the number of public transport passenger boardings per month	5% increase in boardings year on year	It is important to provide a public transport option to the community. Part of understanding how good the service is can be determined by how well the service is used. Monthly passenger boarding data is already captured and provides a good basis for a KPI. Given the limited public transport service a comprehensive data collection for public transport is not consider necessary. Measuring this KPI can be done at no extra cost.
General traffic		
Travel times are reasonable during seasonal peaks and events in Taupo	Travel times on key routes increase by no greater than 25% above average peak demand during peak seasons and events (no more than 14 days a year)	Travel times can be accurately measured with Bluetooth technology. This provides real time information that can be recorded year-round. This year-round information provides great insights into daily, monthly

		and seasonal peaks as well as for events. It shows how traffic volumes build up, and the point at which the network fails and results in serious congestion. There will be reasonable costs in setting up and running this system, however, the data it provides is very powerful.
Maintain reasonable traffic volumes	Traffic volumes increase by no more than 2% annually on key routes coming into the centre of town	Traffic volumes are often used as a proxy for economic activity, however, they also have a negative impact on the feel of a town centre, as well as negative environmental impacts. Therefore, aiming to maintain current traffic volumes (where traffic congestion is not too severe but can act as a travel demand management technique to encourage people to walk or cycle) is recommended. This data would be captured as part of the cordon survey that captures the total number of people driving, walking, cycling and taking public transport coming into the town centre.
Safety		
Zero fatalities on the transport system	Zero vehicle, cycle or walking fatalities on the transport system	The government, and international best practice, direction is to not accept any death or serious injuries resulting from the transport system. Accordingly, this can be measured for Taupo through data from the NZTA's Crash Analysis System. This can be measured annually, or even more regularly, at no cost other than a small amount of staff time.

4.1 Monitoring process

In order to deliver the short list of KPI's the following systems and processes would need to be put in place:

- **Town centre cordon survey:** This would be an annual survey to capture the total number of people coming into the town centre. The survey would count each mode independently, so that volumes and mode share information can be counted and monitored overtime. We recommend four count sites, one at each of the following locations: Control Gate Bridge, Spa Road/Tauhara Road, Rifle Range Road and Lake Terrace. This can cover car occupants, cyclists, pedestrians and (depending on the view) public transport and coach patrons.
- **Travel time survey:** Travel times can be collected on key routes all year round to identify seasonal peaks. The most likely technology to deliver this would be Bluetooth detection however there may be options to harvest GPS data for this purpose also. The travel time data has other benefits beyond monitoring for KPIs, as it can be used to actively manage the transport network. For example, if it is combined with variable message signs (VMS) then traffic can be diverted to alternative routes when traffic volumes or travel times hit a certain point. This will be a particularly effective way to manage traffic during events.
- **Parking enforcement survey:** An intercept survey would be initiated to understand the public's perception of parking enforcement (and time restrictions). This can be done annually, utilising existing staff or survey staff at relatively low cost. Alternately this could be incorporated into customer satisfaction surveys with ratepayers.

The following KPIs can be measured utilising existing data/processes:

- **Asset management data collection:** ensure that asset management processes capture all new walking and cycling facilities.
- **Crash data analysis:** Crash data can be extracted and analysed from the NZTA's Crash Analysis System.
- **Parking management system:** We understand the Taupo District Council already plan to install a new parking management system. It is expected that this system will be able to capture parking duration and turnover data on a daily basis. The current system would have been appropriate however it is understood that this has reached the end of its life.
- **Public transport:** public transport patronage is already monitored.

5. Additional resources

5.1 Auckland Transport Regional Land Transport Programme

Measuring outcomes

This chapter sets out the performance measures and targets to track progress in addressing Auckland's challenges and achieving outcomes over the 10 years of this RLTP.

AREA	MEASURE	INFORMATION SOURCE	2027/28 TARGET
Access			
Cycling	Number of cycle movements past selected count sites	Collected monthly by AT	5.653 million
Public transport	Total public transport boardings	Collected monthly by AT	149.7 million
	Total annual boardings on rapid or frequent public transport networks	Collected monthly by AT	Increase at faster rate than total boardings
Arterial and motorway productivity	Average morning peak period lane productivity across 30 monitored arterial routes	Collected monthly by AT	24,000
	Average morning peak period lane productivity across the Auckland motorway network	Collected monthly by the Transport Agency	Measure to create baseline and future targets
Freight network congestion	Proportion of the freight network operating at Level of Service C or better during the inter-peak	Collected monthly by AT	85 per cent
Commuting active and sustainable mode share	Active and sustainable mode share for morning peak commuters where a Travelwise Choices programme is implemented	Calculated annually by AT	45 per cent
School active and sustainable mode share	Active and sustainable mode share at schools where Travelwise programme is implemented	Calculated annually by AT	45 per cent
Safety			
Deaths and serious injuries (DSI)	DSI on Auckland's transport network	Collected monthly by AT and the Transport Agency	No more than 325 per year
	DSI on the Auckland local road network	Collected monthly by AT from the Transport Agency's Crash Database	No more than 277 per year
	DSI on the Auckland State Highway network	Collected monthly by the Transport Agency	No more than 49 per year

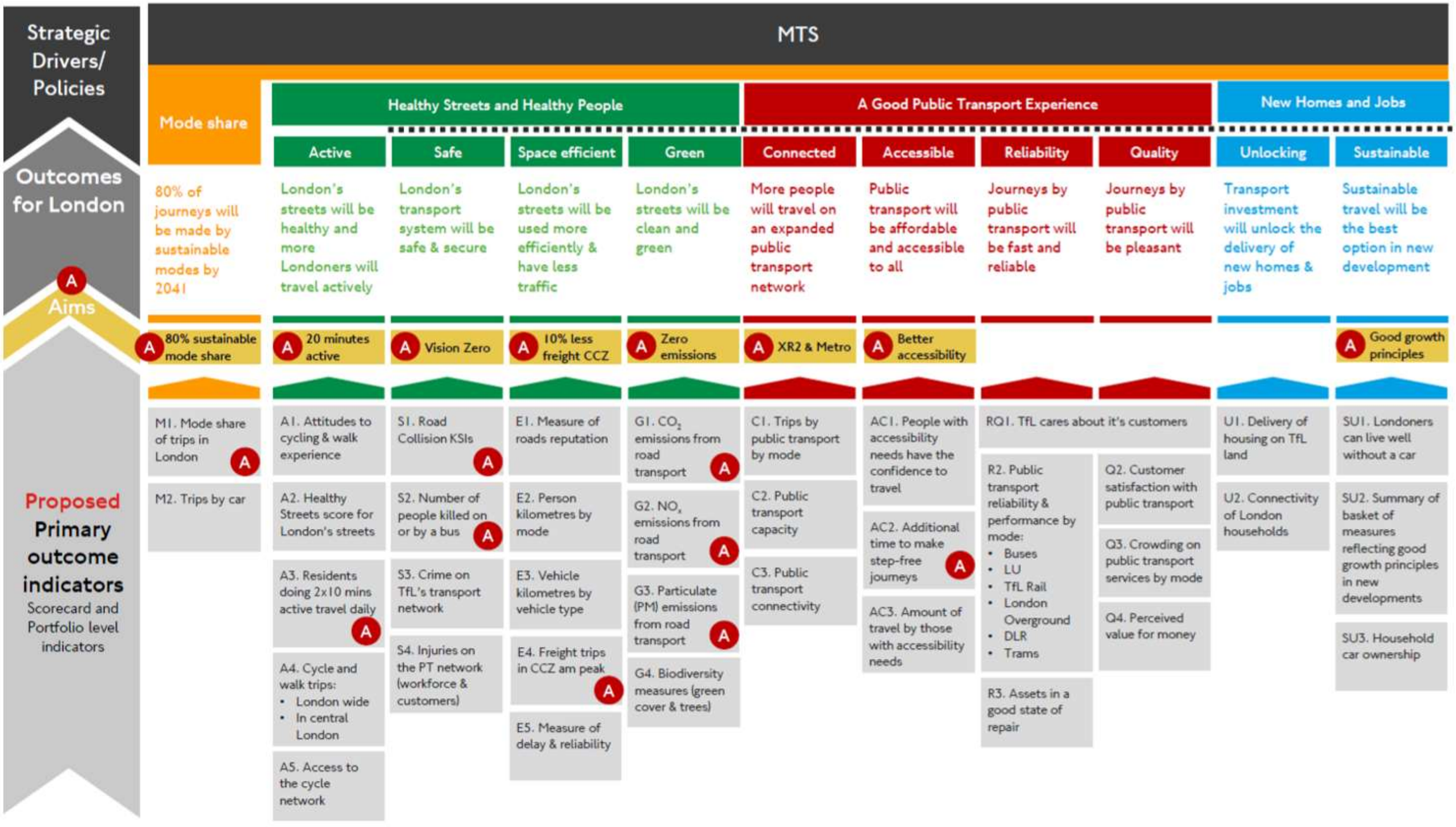
5.2 NZTA network performance and capability performance metrics

Investment benefit	Measure	Description
Throughput – increase/maintain	Traffic – throughput	Number of pedestrians, cyclists and motor vehicles by vehicle class
	Traffic – mode share	Number of pedestrians, cyclists and motor vehicles by vehicle class, expressed as percentages
	People – throughput	Number of pedestrians, cyclists, public transport boardings and motor vehicles (excl. public transport) TIMES average number of people per vehicle
	People – mode share	Number of pedestrians, cyclists, public transport boardings and motor vehicles (excl. public transport) TIMES average number of people per vehicle, expressed as percentages
	People – throughput (UCP)	Number of pedestrians and cyclists
	Freight – throughput value	Number of vehicles TIMES average load per vehicle in NZD
	Freight – mode share value	Number of vehicles TIMES average load per vehicle in NZD, expressed as percentages
	Freight – throughput weight	Number of vehicles TIMES average load per vehicle in tonnes
	Freight – mode share weight	Number of vehicles TIMES average load per vehicle in tonnes, expressed as percentages
Reliability – increase/ maintain	Travel time reliability – motor vehicles	Coefficient of variation; standard deviation of travel time DIVIDED BY average minutes travel time (as per Austroads)
	Punctuality – public transport	Percentage of scheduled service trips between 59 seconds before and 4 minutes 59 seconds after the scheduled departure time of selected points
Travel time – decrease/maintain	Travel time	Average travel time in minutes
	Travel time delay	Difference between average travel time A and average travel time B in minutes per kilometre

Access – increase/ maintain	Spatial coverage – cycle lanes & paths	Percentage completion of the strategic cycle network
	Spatial coverage – cycling facilities	Number of people living within 500m of a high quality cycling facility
	Spatial coverage – public transport – resident population	Number of people living within 500m of a bus stop or 1km from a rail or bus rapid transit station
	Spatial coverage – public transport – employees	Number of employees within 500m of a bus stop or 1km from a rail or bus rapid transit station
	Spatial coverage – freight	Percentage completion of the strategic high productivity motor vehicle freight network
	Temporal availability – public transport	Public transport frequency per hour weighted by percentage of the population living within 500m of a bus stop or 1km from a rail or bus rapid transit station
	Access to key destinations (all modes)	Proportion of population living within travel threshold (15 minutes, 30 minutes or 45 minutes) of key social and economic opportunities (including work, education, health care, supermarkets) by different modes (walking, cycling, public transport, private motor vehicle) in the AM peak
	Pedestrian delay	Pedestrian time lost due to intersection delay
	Accessibility – public transport facilities	Number of bus or train stops that are fully accessible
	Access – perception	Perception of safety and ease of walking and cycling
Comfort & customer experience – improve/maintain	Network condition – road	Percentage travel on road network classified as smooth as per defined level of service
	Network condition – cycling	Percentage travel on cycle network classified as complying with defined level of service (facility type)
	Ease of getting on/off public transport services	Percentage of low floor and wheelchair accessible services
Resilience – improve/maintain	Availability of a viable alternative to high-risk and high-impact route	Percentage of high-risk, high-impact routes with a viable alternative

	Temporal availability – road	Number and duration of resolved road closures: urban >=2 hours; rural >=12 hours
	Network redundancy	Appropriate capacity in event of system disruption (including alternative routes, alternative modes, alternative destinations)
	Level of service and risk	*User to describe*

5.3 Transport for London



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