

# Auckland Network Operating Plan

## Applying Strategy Today

VERSION 3 | NOVEMBER 2020



## What you need to know about the Network Operating Plan?

In order to operate Auckland's transport network safely and efficiently, different transport modes must be integrated and appropriately prioritised to move people, goods and services. The Network Operating Plan (NOP) provides a reference for this optimal operation.

The NOP builds on Future Connect Strategic Networks and the Roads and Streets Framework (RASf) to ensure consistent application of strategy. Future Connect is AT's long-term vision for Auckland's future integrated transport system. It maps the most critical links of our current and future transport systems, our Strategic Networks, and will ultimately set a 30-year long-term plan for all transport modes: public transport, general traffic, freight, cycle and walking.

Future Connect uses data driven analysis to identify the most significant problems and opportunities along the Strategic Networks over the next 10 years and beyond. Where multiple deficiencies occur, focus areas are identified as critical locations for potential future projects and programmes which inform the next Regional Land Transport Plan. The RASf is a first-step strategic planning tool which sets the role of individual roads and streets within the context of the network and the land use pattern of the region.

The RASf acknowledges the important role that roads and streets play as part of the public

realm, as well as the impacts that transport and land use have on each other. It recognises both the Place value and the Movement value of a street, and therefore sets the individual modal priorities for each road and street, to guide both design and network operation. These principles and associated goals are embedded in the NOP.

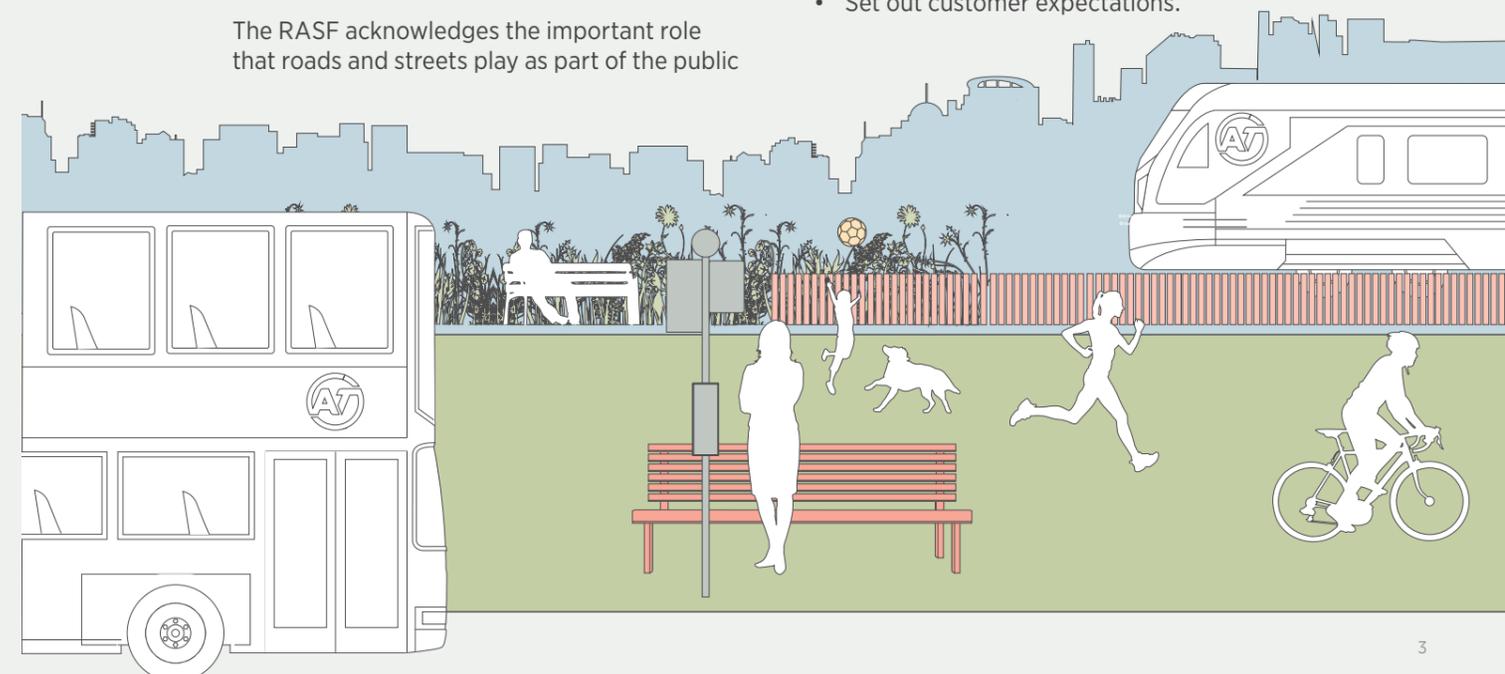
By comparing the current experience of various users to the goals set out in the NOP, deficiencies in the network can be highlighted. This information then empowers decision makers to make changes that reduce and remove these deficiencies through adjustments to dynamic components of the network, undertaking physical improvements and encouraging behaviour change.

### THE NOP CAN BE USED TO:

- Inform Auckland Transport Operations Centre how the network should be operating for different modes at various times of the day.
- Inform Traffic Management Plans to ensure the correct priorities for different sections of road are maintained.
- Highlight infrastructure improvement opportunities.
- Set out customer expectations.

## Contents

01	What is the Network Operating Plan?	4
02	Where does the Network Operating Plan fit?	6
03	Components of the Network Operating Plan	8
04	Applying the Network Operating Plan	12
	SmartRoads tool for gap identification	16
	Access to the NOP	17
	User experience tables	18



# 1

## What is the Network Operating Plan?

The Network Operating Plan (NOP) is an agreed plan of how the transport network should be operated at different times of day for the different transport modes. The NOP is primarily based on the strategic aspirations identified in the Roads and Streets Framework (RASf) and Future Connect.

The NOP prioritises different modes in different locations to inform decision makers where to focus investments and which trade-offs are appropriate. Operational deficiencies in the network can be identified by comparing the existing network operation against the optimal state. The NOP is a live document continually being updated with network changes.



The NOP directs the way the network should operate to ensure Auckland's transport vision, strategic goals and aspirations are met.

Auckland is growing fast, with a population increase of **720,000 PROJECTED IN THE NEXT 30 YEARS.**

This population growth brings increasing demand on Auckland's transport system and its ability to move people, goods and services about effectively. To meet this challenge changes are needed today that will enable optimal outcomes for the future.



# 2

## Where does the Network Operating Plan fit?

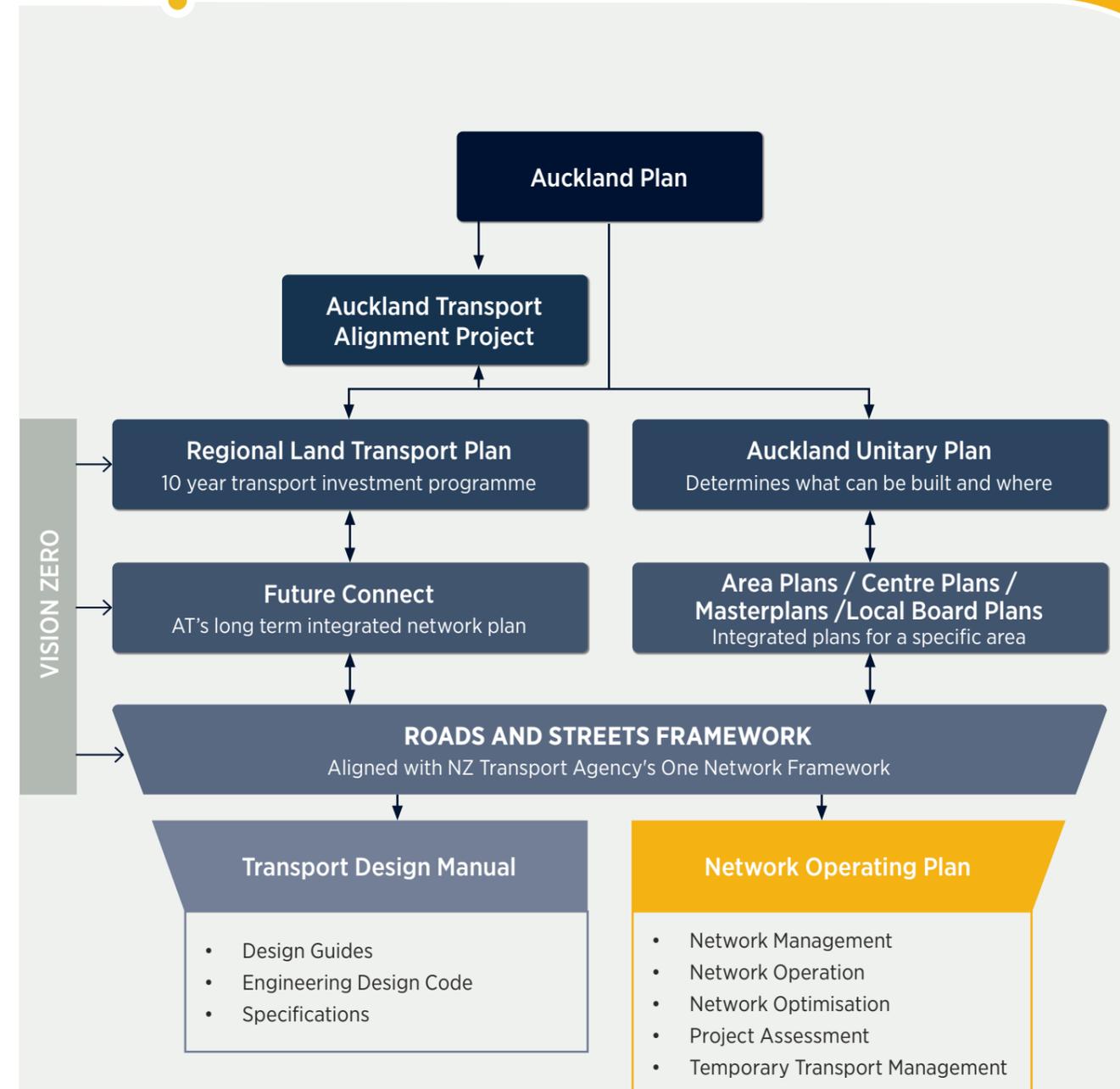


The strategic framework and direction for Auckland has been set within the Auckland Plan and the Auckland Transport Alignment Project. The NOP is guided by Future Connect Strategic Networks and the RASF which determines the ideal modal aspirations across Auckland's network. The RASF categorizes each section of road into typologies by movement and place significance and highlights the aspirational intent for each mode of transport. The NOP provides the link between this aspirational intent and network operation by translating the individual street and segment RASF mandates into a connected continuous network with quantifiable measures.

The existing operation for different modes can then be compared to the NOP to identify deficiencies. These deficiencies

can be addressed through changes to the network, through various low to medium cost interventions. Larger scale interventions would more typically be included in potential future projects and programmes forming part of the Regional Land Transport Plan (RLTP). This process ensures that the optimal modal outcomes to support the movement of goods, services and people identified in the RASF are achieved.

The NOP reflects and reinforces the Vision Zero strategy for Auckland. The operation of the network outlined by the NOP will continue to be aligned with the goal of 'zero deaths and serious injuries by 2050'. Safety for all modes is the foremost priority and ensures that safe mobility can be balanced with efficiency on today's network.



The NOP translates the RASF mandates into a connected quantified plan for operational use.

# 3

## Components of the Network Operating Plan



### Movement of people, goods and services



To meet the long-term challenge of population growth and road user demands, a shift towards more sustainable and efficient transport modes is necessary. It is therefore important to consider the movement of people rather than the movement of vehicles. The NOP takes into consideration the relative people-movement efficiency of each mode at each location. In a similar way, it is also important to consider the movement of goods and services rather than the movement of vehicles.

The movement of people, goods and services is fundamental to the NOP and forms a basis for comparison.

### Multi-modal



Future Connect is a plan that represents the Strategic Networks. These represent key links for the movement of people, goods and services as part of an integrated multi-modal system. Based on these networks, the RASF details the significance of each mode by location and therefore what should be prioritised.

While maximum access is important for all road users, the RASF aims to ensure that appropriate modes have priority in the appropriate places.

The RASF outlines 7 transport modes including parking and loading while the NOP streamlines these to focus on key contributors to the movement of people, goods and services, and represents these modes as a single multi-modal network plan.

The NOP considers loading, servicing and parking as interrelated components to these movement-related modes.



## Principles

The NOP incorporates principles outlined by the RASF and Future Connect Strategic Network to ensure a strong link between strategic aspirations and day to day operation. These principles ensure a multi-modal integrated network by promoting modes where and when they are of high strategic importance on the network.

Consideration of modal requirements by time of day is an important feature of the NOP so that appropriate priorities are assigned during peaks and off-peak times. In locations where there are competing modes and limited space, assigning priority at specific times of day maximises performance to achieve a win - win result.

Town centres present an example of competing modal priorities throughout different times of the day. They often experience high pedestrian demand during shopping hours both on weekdays and weekends, a need for servicing in the early morning, public transport demand throughout the day both to the area and through the area and high general traffic demand during weekday peaks.



-  Promote walking in high pedestrian areas
-  Promote cycle links to activity centres and on designated routes
-  Promote high priority on key bus routes
-  Promote on designated freight network
-  Promote on preferred traffic routes
-  Specify requirements by time of day
-  Promotes safe outcomes
-  Promote 'places' and activity centres

MULTI-MODAL NETWORK PLAN



PRINCIPLES

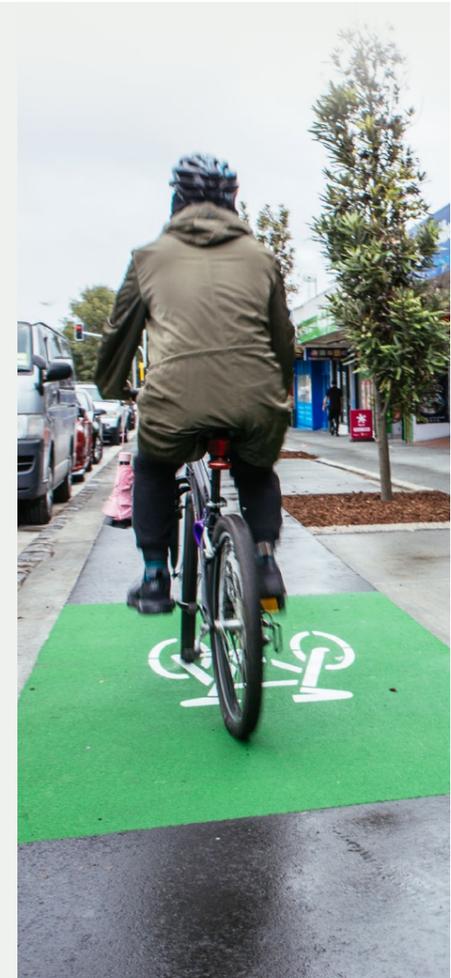


NETWORK OPERATING PLAN

## User Experience

User experience definitions are used to describe aspirational outcomes and the operation of the current network performance. The factors include both quantitative and qualitative measures, and incorporates guidance from the Transport Design Manual. Qualitative measures are applied when considering active modes where factors such as perceived safety and street lighting can contribute to poor user experience. While there are a number of factors which can be considered, the NOP uses the measures outlined below. These measures are detailed further in Appendix 1.

ACTIVE MODE	MOVEMENT/ THROUGHPUT FOCUSED MODE
 Walking	 Bus / PT
 Cycling	 General traffic
	 Freight
<b>MEASURES</b>	<b>MEASURES</b>
Physical facility Imposed delays	Journey time Journey time reliability



In order to provide a common 'measuring stick' for user experience, ratings have been defined for each mode which describe what good and poor user experience or level of service looks like. The NOP uses six levels of service (LOS) ratings ranging from A, which defines very good user experience, through to F, depicting a very poor user experience.

Typically, a user experience or LOS rating of A, B or C is considered as a positive outcome for that particular mode, whereas D, E or F increasingly highlights a deficiency for that mode at that time and location.

The NOP provides benchmarks for user experience or LOS across the network that can be generally summarised as follows. .

USER / MODE	ASPIRATIONAL USER EXPERIENCE OR LOS (as stated or higher)	
 Pedestrians	B/C C/D	At high pedestrian demand locations and times At all other locations
 Cycling	B B/C	Within activity areas with cycle network connections On the strategic cycle network
 Public Transport	B B/C C/D	On the Rapid Transit Network On the Frequent Transit Network On remaining bus network
 General traffic	C/D	On the strategic general traffic network during the commuting peaks Lower on local streets
 Freight	C/D B	On key Level 1A/1B Strategic Freight Network routes at all times On the Level 1A/1B Strategic Freight Network during the interpeak

# 4

## Applying the Network Operating Plan



Comparing existing network performance to the NOP guides decision makers towards network management that will address deficiencies and move the network toward ideal strategic outcomes.

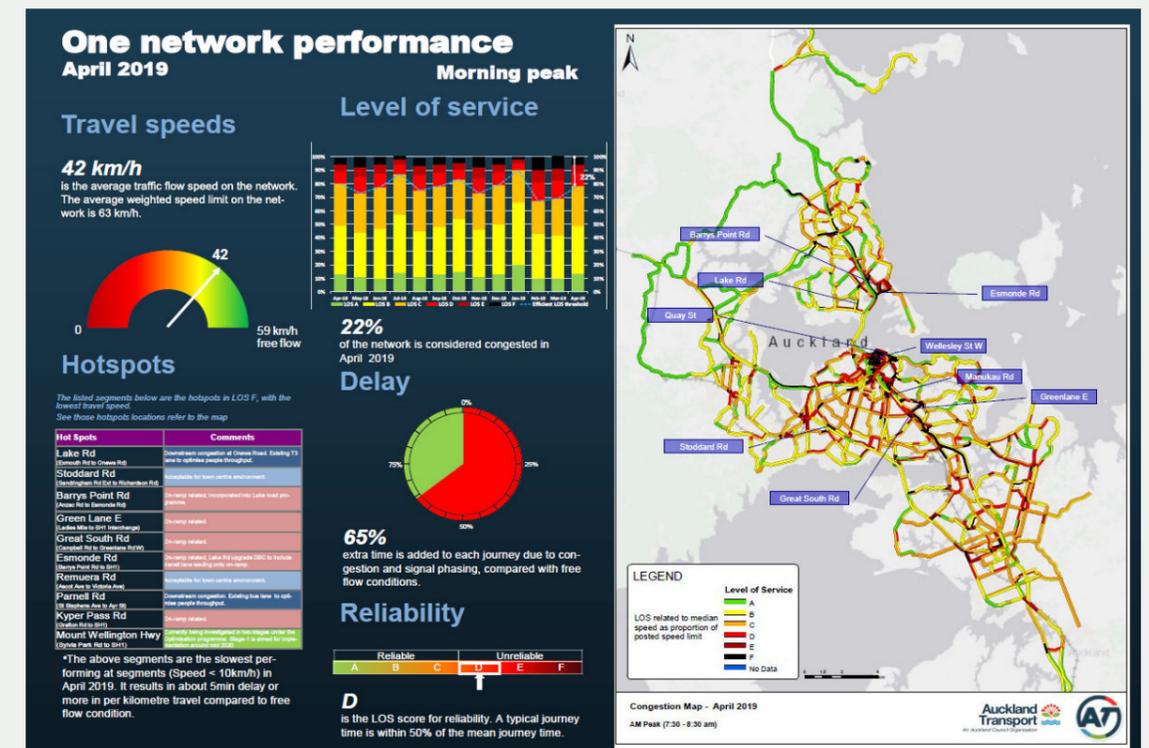
The NOP provides direction for:

- 1 Network performance monitoring
- 2 Network operation
- 3 Network Optimisation Programme of Works
- 4 Temporary transport management plans
- 5 Customer understanding and expectations
- 6 Project effectiveness assessment



### 1 Assessing current network performance

AT Network Management and Safety produce monthly network performance 'dashboards' for each of the different modes. These dashboards provide insights as to how well the network is performing for each mode and highlights where deficiencies currently exist.



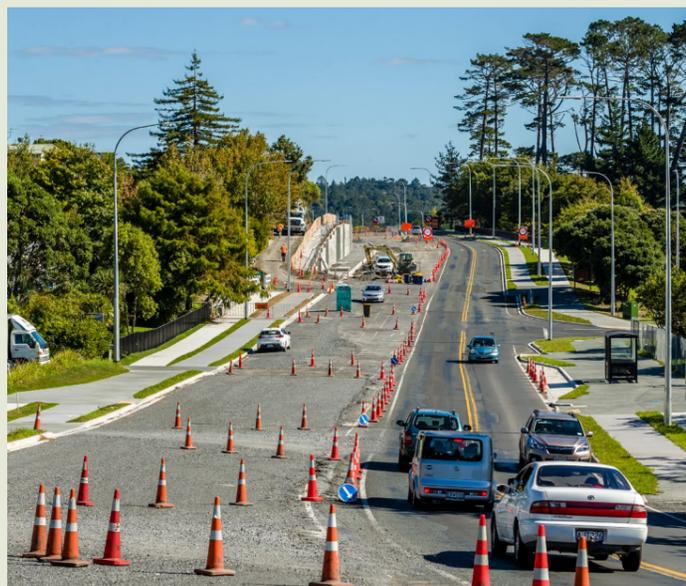
## 2 Network Operation

The NOP provides the base reference for how the Auckland Transport Operations Centre (ATOC) operate the traffic signals network and directs decisions in routine and real-time operation.



## 4 Temporary Traffic Management Assessment

Assessing the impacts of proposed temporary traffic management plans relative to the NOP, highlights potential modal impacts. This therefore indicates necessary remedial measures for each mode to ensure that the network operates at appropriate levels during roadworks.



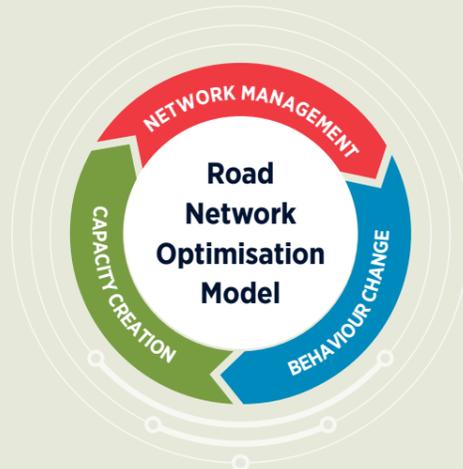
## 3 Network Optimisation

Network Optimisation is the programme of work seeking to make best use of the existing network. Network Optimisation is based on the following three principles:

**NETWORK MANAGEMENT:**  
managing and operating the network in alignment with strategic intent and the NOP.

**CAPACITY CREATION:**  
increasing people movement capacity (not necessarily vehicle movement capacity).

**BEHAVIOURAL CHANGE:**  
increasing people movement efficiencies and user experience using the existing road space.



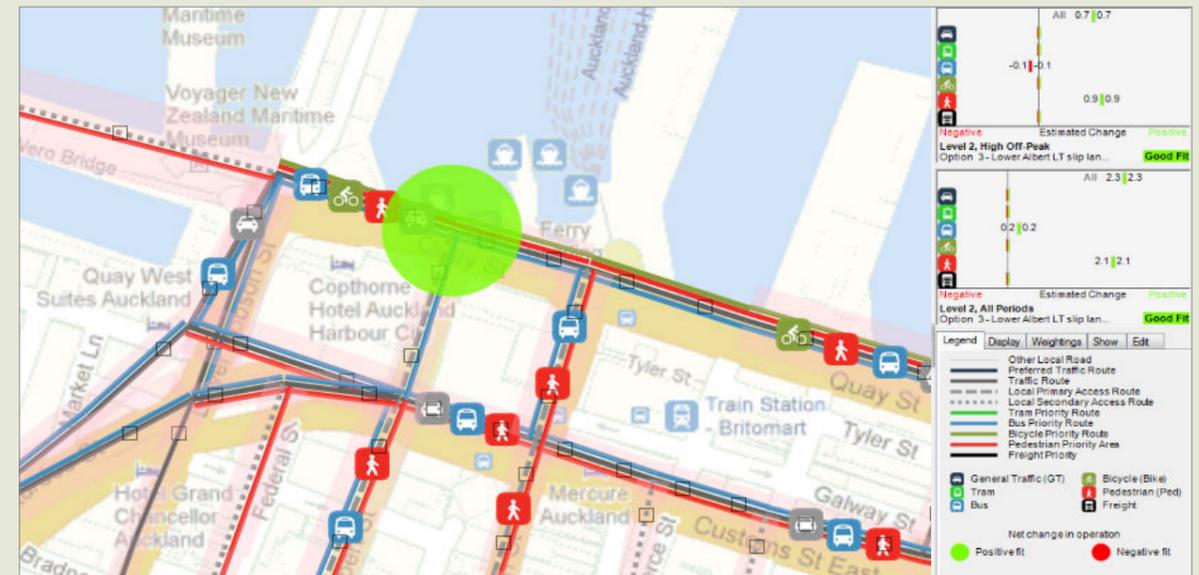
## 5 Customer understanding and expectations

Publication of the NOP, together with the RASF and Future Connect, provides full transparency regarding AT's strategic intent. When customers ask questions, provide feedback or ask for changes, the NOP can provide a reference for communicating AT's decision making and intended operation.

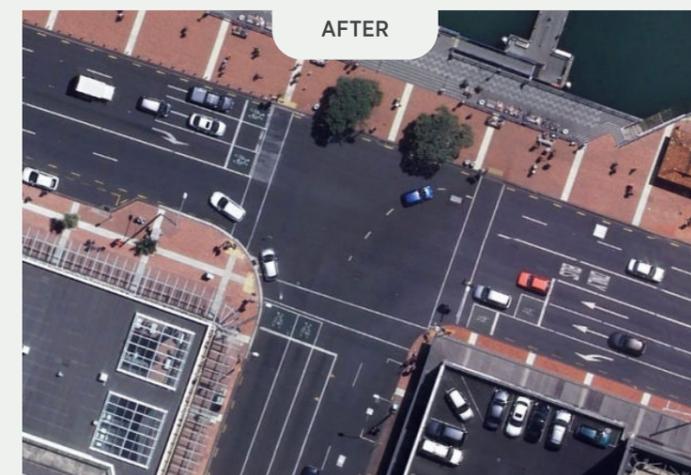
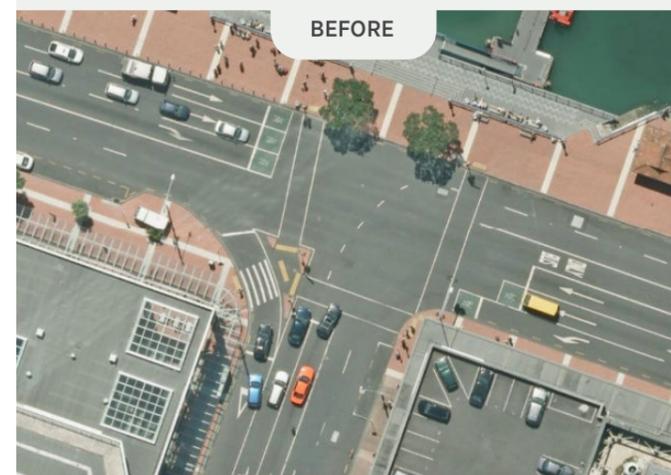
## 6 Network Fit Assessments for new projects

Network Fit Assessments can be applied to determine how effectively a proposed project contributes to reducing identified operational deficiencies introduced by the project.

Where there are multiple interventions available for different modes, a tool such as SmartRoads can assess the impact of each alternative on the current operating gap and therefore help in the selection of the most appropriate solution.



In the above example on Quay Street a Network Fit Assessment was used to show that widening of the footpath and removal of a left turn slip lane provides pedestrian benefits with little or no impact for buses.





## Future Connect Viewer and SmartRoads tool for gap identification

The Future Connect Viewer provides an overview of network deficiencies across the network for both the Current and Future situation. The outputs thereof form important information to direct Optimisation focus and larger scale interventions appropriate for RLTP funding.

SmartRoads is a useful multi-criteria assessment tool developed by VicRoads in Melbourne that represents both the aspirational intent of the network alongside the current operational deficiencies.

The pie charts presented by SmartRoads represent how each transport mode is operating compared to the aspirational goals set by the RASF. The size of the pie chart shows the combined multi-modal deficiency at each location. This comparison allows decisions to focus on interventions that would be most beneficial and which modes need the most attention.

The tool is useful to represent network deficiencies by mode, as well as illustrate the expected benefits or affects of projects, interventions or roadworks through network fit assessments.



## Access to the NOP

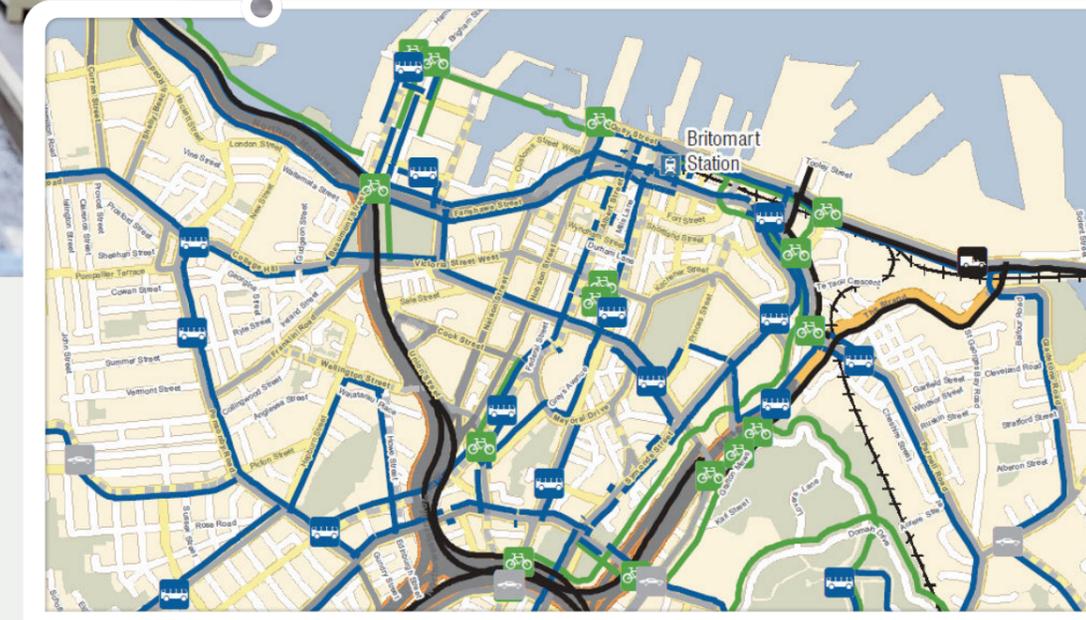
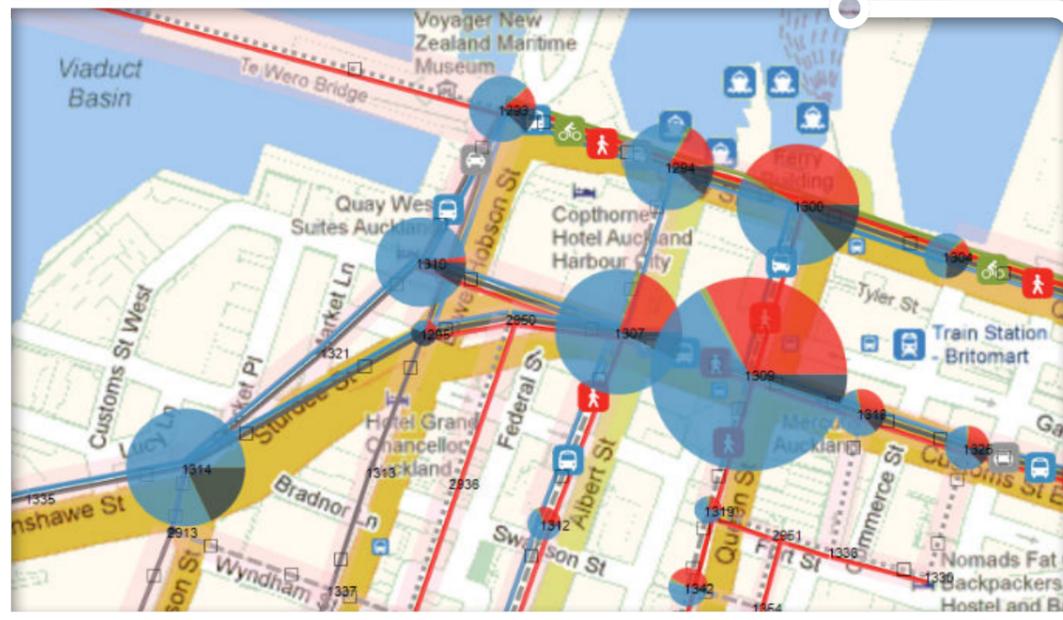
The NOP is represented as the 'Current' networks within the Future Connect Viewer. The Current user experience or LOS by mode are also represented within the Viewer.

The NOP is managed by AT Network Management and Safety, who also measure multi-modal operational performance on a monthly basis. This provides current and continual insight into the operational performance and therefore customer experience of the network.

The NOP is updated to reflect changes to the current Future Connect Strategic Networks and RASF, as well as changes to the physical network.

As the NOP is an operational plan used to put strategy into effect, it is imperative that the NOP remains well connected and aligned with Future Connect and the RASF, and that the NOP is applied both consistently and across all network operation activities in Auckland.

The NOP is publicly available through the [AT website www.at.govt.nz](http://www.at.govt.nz).



The larger blue and red representations illustrate the need to promote bus and walking experience within the Auckland downtown area based on the strategic intent and current user experience or LOS.

**USER EXPERIENCE**



LOS	PEDESTRIANS	
	Facility	Crossing delay
A	Crossing opportunity is within 50m* or shared space High quality pedestrian facilities with appropriate separation Friendly speed environment Free flowing for pedestrians No street obstacles	Average crossing delay less than 10s
B	Crossing opportunity is within 100m* Pedestrian facilities provided with appropriate separation Some street obstacles with minor conflicts for pedestrians	Average crossing delay less than 20s
C	Crossing opportunity is within 200m* Pedestrian facilities provided with appropriate separation Pedestrian speeds restricted	Average crossing delay less than 30s
D	Crossing opportunity is within 400m* Narrow sealed footpath Restricted movement for most pedestrians	Average crossing delay less than 45s
E	Crossing opportunity is within 800m* Formed footpath Footpath significantly restricted by street obstacles Restricted movement for pedestrians	Average crossing delay less than 60s
F	Crossing opportunity is more than 800m* No discernible footpaths OR Shuffling movement for pedestrians	Average crossing delay greater than 60s



LOS	CYCLE	
	Facility	Crossing delay
A	Unobstructed off-road facility OR protected cycle path for use by cycles only AND Cyclist operating speeds are largely unhindered AND Minimal conflict with other modes at intersections	Average crossing delay less than 10s
B	Protected cycle path OR separated shared path OR shared path AND Cyclist operating speeds are largely unhindered AND Some conflict with other modes at intersections	Average crossing delay less than 20s
C	Protected cycle path OR separated shared path OR shared path OR shared spaces with low volume & low speed AND Cyclist operating speeds are somewhat impeded AND Some conflict with other modes at intersections	Average crossing delay less than 30s
D	Shared path OR traffic environment with low volume & low speed AND / OR Cyclist operating speeds are impeded AND Some conflicts with other modes en-route and at intersections	Average crossing delay less than 45s
E	On-road cycle lane OR shared traffic environment with medium volume & low speed OR low volume & medium speed (e.g bus or transit lane) AND Cyclist operating speeds significantly impeded due to obstructions that require dismounting OR Conflict with other modes at intersections	Average crossing delay less than 60s
F	Shared traffic environment with high volumes AND high speeds	Average crossing delay greater than 60s

**A lower LOS should be considered for the following aspects:**

- Poor actual safety record or perceived safety risks
- Poor quality of the surface (if uneven or in disrepair)
- Poor environment in relation to CPTED factors
- Poor quality crossing facilities (is it visible and legible to approaching drivers?)
- Widths and design not as per the Transport Design Manual

\* Distance to crossing opportunities should be halved in activity centres and outside schools

Footpaths should be >1.8m wide or >3.0m within activity areas and on shared path

**A lower LOS rating is applicable where the following aspects might apply:**

- Poor actual safety record or perceived safety risks
- Poor route continuity, obvious indirectness of route or inclusion of steep grades
- Poor quality of the surface (if uneven or in disrepair)
- Poor environment in relation to CPTED factors
- High numbers of pedestrians on shared paths
- High volumes of traffic on any roundabouts along the route
- Widths and design not as per the Transport Design Manual



LOS	PUBLIC TRANSPORT		FREIGHT		GENERAL TRAFFIC	
	Travel Speed OR Delay	Travel Time Reliability	Travel Speed OR Delay	Travel Time Reliability	Travel Speed OR Delay	Travel Time Reliability
A	Average Travel Speed greater than 90% of Posted Speed Limit OR No delay	85 <sup>th</sup> percentile journey time/ median journey time ≤ 1.1	Average Travel Speed greater than 90% of Posted Speed Limit OR No delay	85 <sup>th</sup> percentile journey time/ median journey time ≤ 1.1	Average Travel Speed greater than 90% of Posted Speed Limit OR No delay	85 <sup>th</sup> percentile journey time/ median journey time ≤ 1.1
B	Average Travel Speed greater than 70% of Posted Speed Limit OR Minimal delay	85 <sup>th</sup> percentile journey time/ median journey time ≤ 1.3	Average Travel Speed greater than 70% of Posted Speed Limit OR Minimal delay	85 <sup>th</sup> percentile journey time/ median journey time ≤ 1.3	Average Travel Speed greater than 70% of Posted Speed Limit OR Minimal delay	85 <sup>th</sup> percentile journey time/ median journey time ≤ 1.3
C	Average Travel Speed greater than 50% of Posted Speed Limit OR Some midblock delay Stop at most intersections and clear next cycle No side friction	85 <sup>th</sup> percentile journey time/ median journey time ≤ 1.5	Average Travel Speed greater than 50% of Posted Speed Limit OR Some midblock delay Stop at most intersections and clear next cycle No side friction	85 <sup>th</sup> percentile journey time/ median journey time ≤ 1.5	Average Travel Speed greater than 50% of Posted Speed Limit OR Some midblock delay Stop at most intersections and clear next cycle No side friction	85 <sup>th</sup> percentile journey time/ median journey time ≤ 1.5
D	Average Travel Speed greater than 40% of Posted Speed Limit OR Some midblock delay Stop at most intersections and mostly clear next cycle Noticeable side friction	85 <sup>th</sup> percentile journey time/ median journey time ≤ 1.7	Average Travel Speed greater than 40% of Posted Speed Limit OR Some midblock delay Stop at most intersections and mostly clear next cycle Noticeable side friction	85 <sup>th</sup> percentile journey time/ median journey time ≤ 1.7	Average Travel Speed greater than 40% of Posted Speed Limit OR Some midblock delay Stop at most intersections and mostly clear next cycle Noticeable side friction	85 <sup>th</sup> percentile journey time/ median journey time ≤ 1.7
E	Average Travel Speed greater than 30% of Posted Speed Limit OR Large midblock delay Stop at each intersection and take ≥2 cycles to go through Significant side friction	85 <sup>th</sup> percentile journey time/ median journey time ≤ 2.0	Average Travel Speed greater than 30% of Posted Speed Limit OR Large midblock delay Stop at each intersection and take ≥2 cycles to go through Significant side friction	85 <sup>th</sup> percentile journey time/ median journey time ≤ 2.0	Average Travel Speed greater than 30% of Posted Speed Limit OR Large midblock delay Stop at each intersection and take ≥ 2 cycles to go through Significant side friction	85 <sup>th</sup> percentile journey time/ median journey time ≤ 2.0
F	Average Travel Speed less than 30% of Posted Speed Limit OR Significant midblock delay Significant delay at intersection	85 <sup>th</sup> percentile journey time/ median journey time >2.0	Average Travel Speed less than 30% of Posted Speed Limit OR Significant midblock delay Significant delay at intersection	85 <sup>th</sup> percentile journey time/ median journey time >2.0	Average Travel Speed less than 30% of Posted Speed Limit OR Significant midblock delay Significant delay at intersection	85 <sup>th</sup> percentile journey time/ median journey time >2.0
	<ul style="list-style-type: none"> <li>Delay can be used when no travel speed information is available OR to supplement assessment of travel speed</li> <li>Side friction: parking, bus stops, side roads, lack of enforcement</li> <li>Midblock delay: pedestrian crossings</li> <li>LOS can also be influenced by Quality of Service and should be considered.</li> </ul>		<ul style="list-style-type: none"> <li>Delay can be used when no travel speed information is available OR to supplement assessment of travel speed</li> <li>Side friction: parking, bus stops, side roads, lack of enforcement</li> <li>Midblock delay: pedestrian crossings</li> </ul>		<ul style="list-style-type: none"> <li>Delay can be used when no travel speed information is available OR to supplement assessment of travel speed</li> <li>Side friction: parking, bus stops, side roads, lack of enforcement</li> <li>Midblock delay: pedestrian crossings</li> </ul>	



