

# Network Operating Plans – Changing *Traffic Engineering* in Auckland

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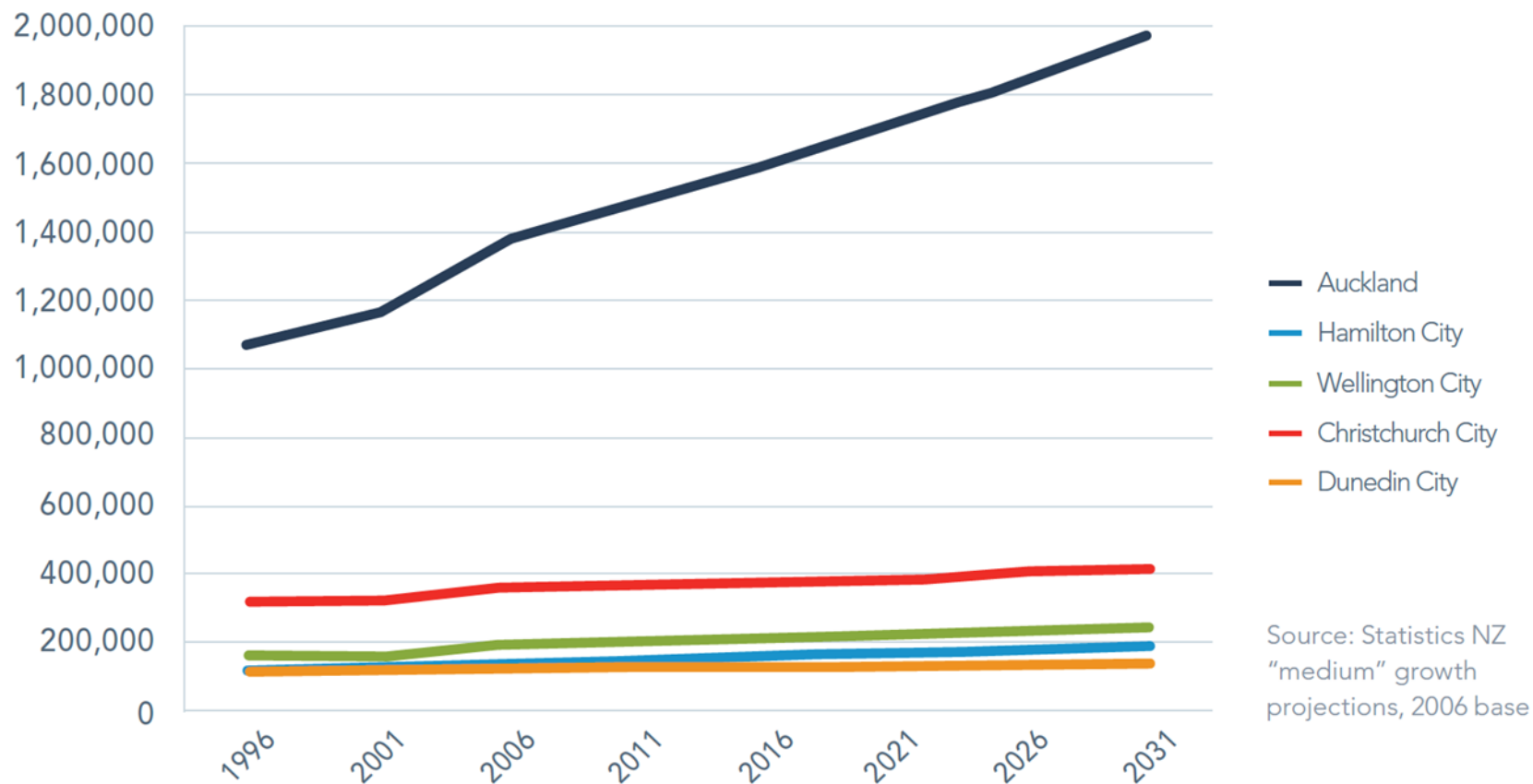
Operational Planning and  
Performance  
Travel Demand Unit

1. Why – Beyond Traffic Engineering 101
2. What – Network Operating Plans & SmartRoads
3. How – Application
4. Some Examples

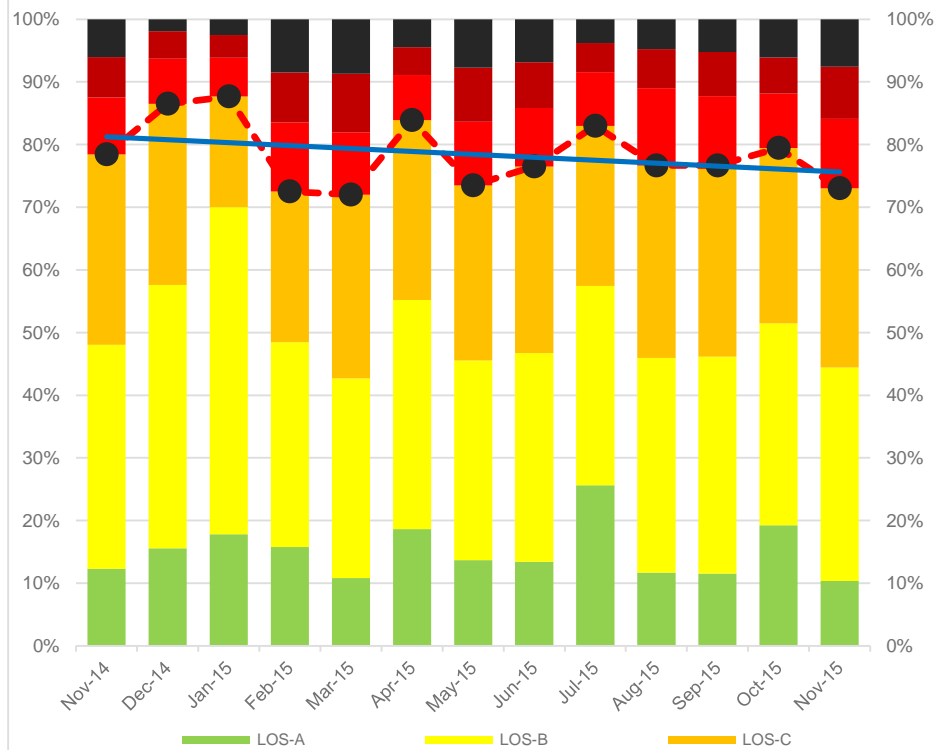
1. **Why – Beyond Traffic Engineering 101**
2. What – Network Operating Plans & SmartRoads
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Figure 7: **Population growth 1996-2031, Auckland and Territorial Local Authorities**



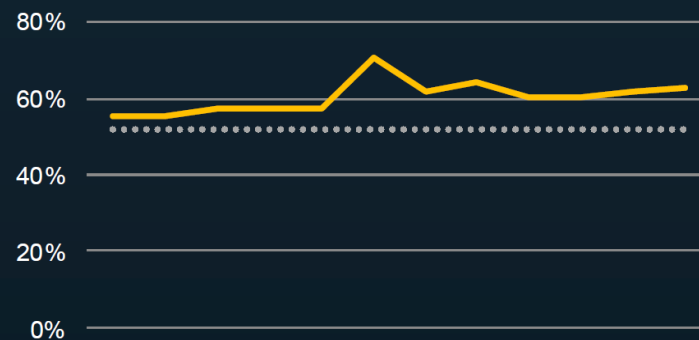
Auckland arterial network LOS - November 2014 to November 2015



## Productivity

**63%**

of the benchmark productivity level is the average our SOI routes operate at in the morning peak. The target is shown by the dotted line.



Build network optimisation and	Arterial road productivity <sup>8</sup>	68%	53% of the ideal achieved	54% of the ideal achieved	55% of the ideal achieved	55% of the ideal achieved	55% of the ideal achieved
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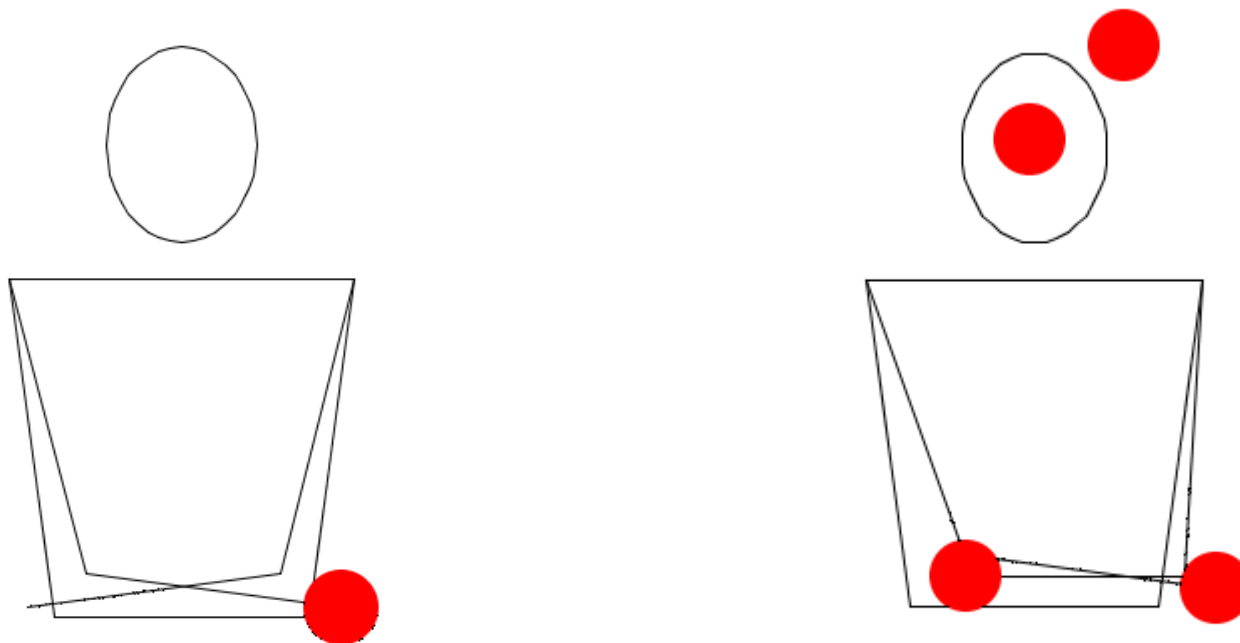


Making the most of urban network capacity

Move People and goods







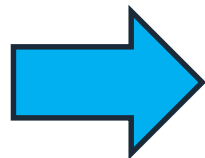
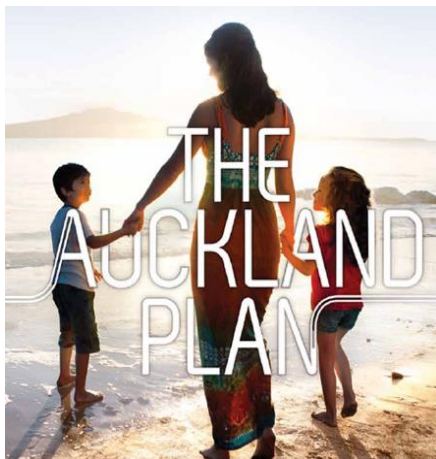
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# Network Operating Plans

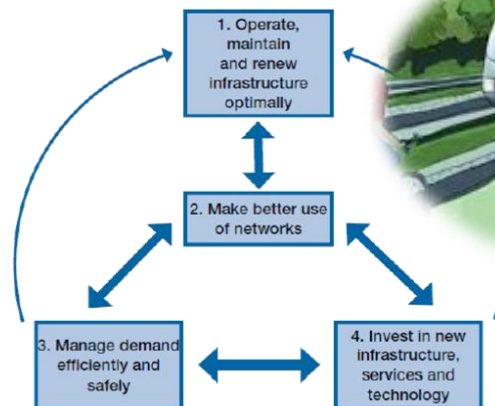
Operate *to* Plan



## Vision



## AT Strategy



## Strategic Plans

Future  
Solutions- based



## ANOP



Today  
Outcomes- based



## Road User Hierarchy

Strategic networks and direction

## Network Operating Plan

Modal aspiration  
Time of day priorities

## Operating Gap

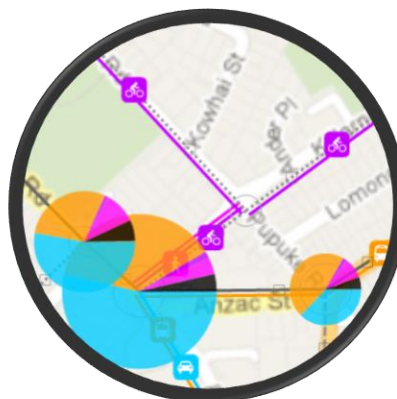
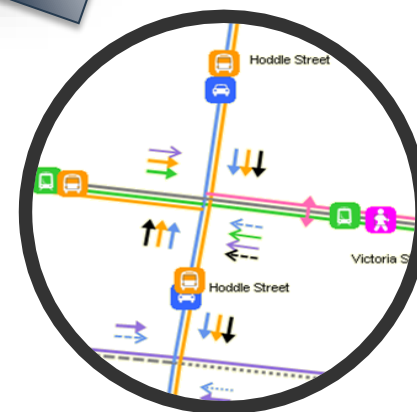
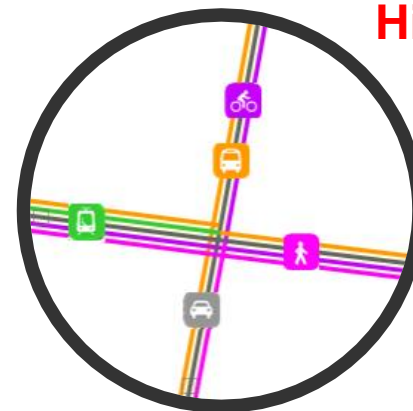
Actual versus Aspirational  
Modal deficiencies

## ANOP

## Network Fit Assessment

ATOC

Project assessment  
Network optimisation



# RUH Emphasis Principles



- Support “places” and activity centres



- Promote walking in high pedestrian areas



- Promote links to activity centres and designated routes, *reduce conflict*



- High priority on designated routes



- Promote on freight network



- Promote preferred traffic routes



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# 1. Establishing User experience



## AT User Experience Table



LOS	Public Transport 	Freight and General Traffic 
	Travel Speed OR Delay	Travel Speed OR Delay
<b>A</b>	Average Travel Speed greater than 70% of Posted Speed Limit OR No delay	Average Travel Speed greater than 90% of Posted Speed Limit OR No delay
<b>B</b>	Average Travel Speed greater than 70% of Posted Speed Limit OR Minimal delay	Average Travel Speed greater than 70% of Posted Speed Limit OR Minimal delay
<b>C</b>	Average Travel Speed greater than 50% of Posted Speed Limit OR Some midblock delay Stop at most intersection and clear next cycle No side friction	Average Travel Speed greater than 50% of Posted Speed Limit OR Some midblock delay Stop at most intersection and clear next cycle No side friction
<b>D</b>	Average Travel Speed greater than 35% of Posted Speed Limit OR Some midblock delay Stop at most intersection and clear next cycle Noticeable side friction	Average Travel Speed greater than 35% of Posted Speed Limit OR Some midblock delay Stop at most intersection and clear next cycle Noticeable side friction
<b>E</b>	Average Travel Speed greater than 20% of Posted Speed Limit OR Large midblock delay Stop at each intersection and take ≥ 2 cycles to go through Significant side friction	Average Travel Speed greater than 20% of Posted Speed Limit OR Large midblock delay Stop at each intersection and take ≥ 2 cycles to go through Significant side friction
<b>F</b>	Average Travel Speed less than 20% of Posted Speed Limit OR Significant midblock delay Significant delay at intersection	Average Travel Speed less than 20% of Posted Speed Limit OR Significant midblock delay Significant delay at intersection
* Delay can be used when no Travel Speed information OR to supplement assessment of Travel Speed  * Side friction: parking, bus stops, side road, lack of enforcement * Midblock delay: pedestrian crossings  * A lower LOS should be considered if the reliability is poor		* Delay can be used: - When no Travel Speed information; OR - To supplement assessment of Travel Speed  * Side friction: parking, bus stops, side road, lack of enforcement * Midblock delay: pedestrian crossings  * A lower LOS should be considered if the reliability is poor



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19/06/2013





# AT User Experience Table



LOS	Pedestrians 			Cycle 
	Crossing Opportunities	Crossing Delay	Longitudinal Amenity	Facility and Separation
A	Crossing opportunity is within 25m or shared space	Average crossing delay less than 15s	High quality pedestrian facilities with appropriate separation Friendly speed environment Free flowing for pedestrians No street obstacles	Separate cycle path or well separated from all modes Provision for the full range of abilities Minimal conflict with other traffic at intersections
B	Crossing Opportunity is within 50m	Average crossing delay within 30s	Pedestrian facilities provided with appropriate separation Some street obstacles with minor conflicts for pedestrians	Copenhagen cycle lane, some conflict with other traffic at intersections, but no multi-lane roundabouts OR Cycle lane on arterial road Operating speed less than 40km/h OR Cycle facility on a local road with minimal traffic OR Shared off-road path with low pedestrian volumes
C	Crossing Opportunity is within 100m	Average crossing delay within 45s	Pedestrian facilities provided with appropriate separation Pedestrian speeds restricted	On road cycle lane. Some conflict with turning traffic at intersections Vehicle operating speeds less than 60 km/h OR Cycles share space on a local road with light traffic
D	Crossing Opportunity is within 200m	Average crossing delay within 60s	Narrow sealed footpath Restricted movement for most pedestrians	On road cycle lane, may include bus / transit lanes Conflict with turning traffic at intersections Vehicle operating speeds greater than 60 km/h
E	Crossing Opportunity is within 400m	Average crossing delay within 80s	Formed footpath Significantly restricted footpath by street obstacles Restricted movement for pedestrians	Cycles share with other vehicles Lane width greater than 4.2m
F	Crossing opportunity is more than 400m	Average crossing delay greater than 80s	No discernible footpaths OR Shuffling movement for pedestrians	Cycles share with other vehicles Lane width less than 4.2m OR Cycles share with other vehicles Lane width less than 4.2m
<p>* Use spacing of crossings as criterion only where there are shops both sides or other pedestrian desire lines</p> <p>* Spacing refers to the closest walking distance required for pedestrians to safely cross the road. Safe crossing areas can be signalised intersections or crossings, formalised unsignalised crossings (e.g. pedestrian refuges), zebra crossings, and school crossing areas when a school crossing supervisor is present</p> <p>* Consideration must also be given to the quality of the crossing, i.e. is it visible and legible to approaching drivers. A lower LOS should be considered for poor quality facilities</p> <p>* Obstacles include street furniture (bus stop, street light / rubbish bin etc.) and other obstacles from the shops</p> <p>* Footpath should be &gt;1.8m wide to be considered adequate quality. Within activity areas and on shared paths, the width should be &gt;3.0m</p> <p>* A lower LOS should be considered for the following aspects: - Poor quality of the surface (i.e. if the surface uneven or in disrepair?) - Poor environment in relation to CPTED factors - Poor actual safety record or perceived safety risks</p> <p>* A lower LOS should be considered, if the following are not considered appropriate: - Route continuity (pinch points, driveway crossings) - High traffic volumes - Conflict with pedestrians - Surface quality - CPTED factors - Safety</p>				

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19/06/2013



## 2. Common *currency*



### 3. Understanding deficiencies



Size and slice matter

## 4. Keeping aspirational in tact



Travel choice matters







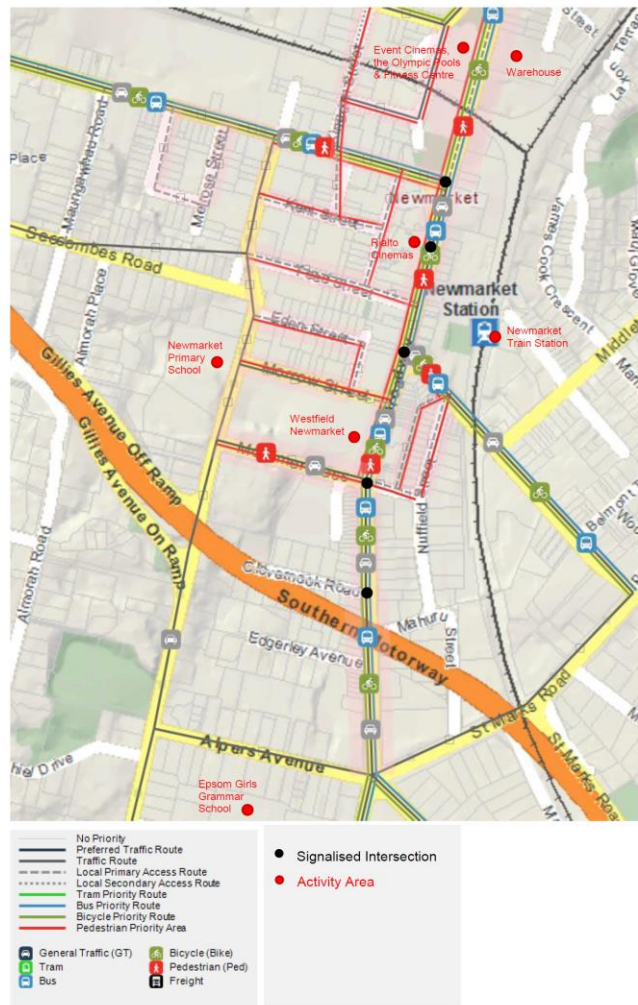
# Network Optimisation

- Routine Traffic Signal Optimisation
- *(Network-wide)* NOP Optimisation



## Network Operating Plan – Broadway

### Road User Hierarchy



### Broadway

Broadway is a Primary arterial route and thus a key route in Central Auckland. This route is a key link connecting Epsom, Remuera, Parnell, Grafton and CBD.

This route is currently a major bus route and will run frequent services in the new bus network (FSN) in the future and is the major connection to the Auckland CBD.

It is part of the Auckland Cycle Network (ACN) and therefore forms a key cycle connector.

Newmarket is one of the main metropolitan centres and due to the various shopping centres and activity centres, high volumes of pedestrian movements are expected along Broadway during AM and PM peak as well as inter peaks. During school peaks, high volumes of pedestrian movements are expected around schools near Broadway especially from Epsom Girls Grammar School and Newmarket Primary School. Also, high volumes of activities for all modes are expected during weekend interpeak.

### AM Peak

Enable appropriate levels of service (ideally LoS C/D) for commuting traffic  
Enable appropriate levels of service for pedestrian movements at activity locations. Look to provide good levels of service for buses and cycling.

### Weekday Interpeak and Weekends

Accommodate the movement of general traffic, bus and cycle along the route  
Enable appropriate levels of service at activity centres and around school areas during school

### PM Peak

Enable appropriate levels of service (ideally LoS C/D) for commuting traffic  
Enable appropriate levels of service for pedestrian movements at activity locations. Look to provide good levels of service for buses and cycling.

### Network Deficiencies

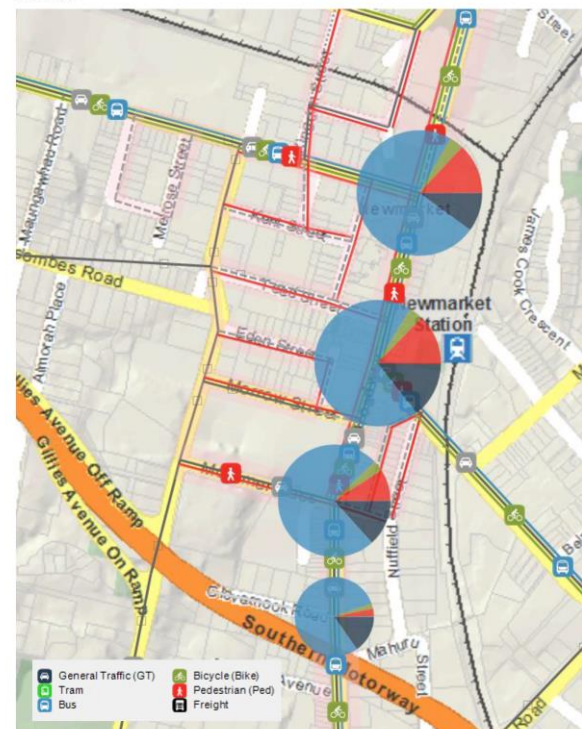
Current operating gaps on Broadway are shown below. These have been identified and include cursory volumes for pedestrians and cyclists.

The major operating gaps on Broadway are found at intersections with Belmont Road, Mortimer and Balm Street.

Most deficiencies on Broadway are with the Buses and some deficiencies with pedestrians. However, balance with cycles should also be considered in all

### Network Fit Assessments

#### AM Peak

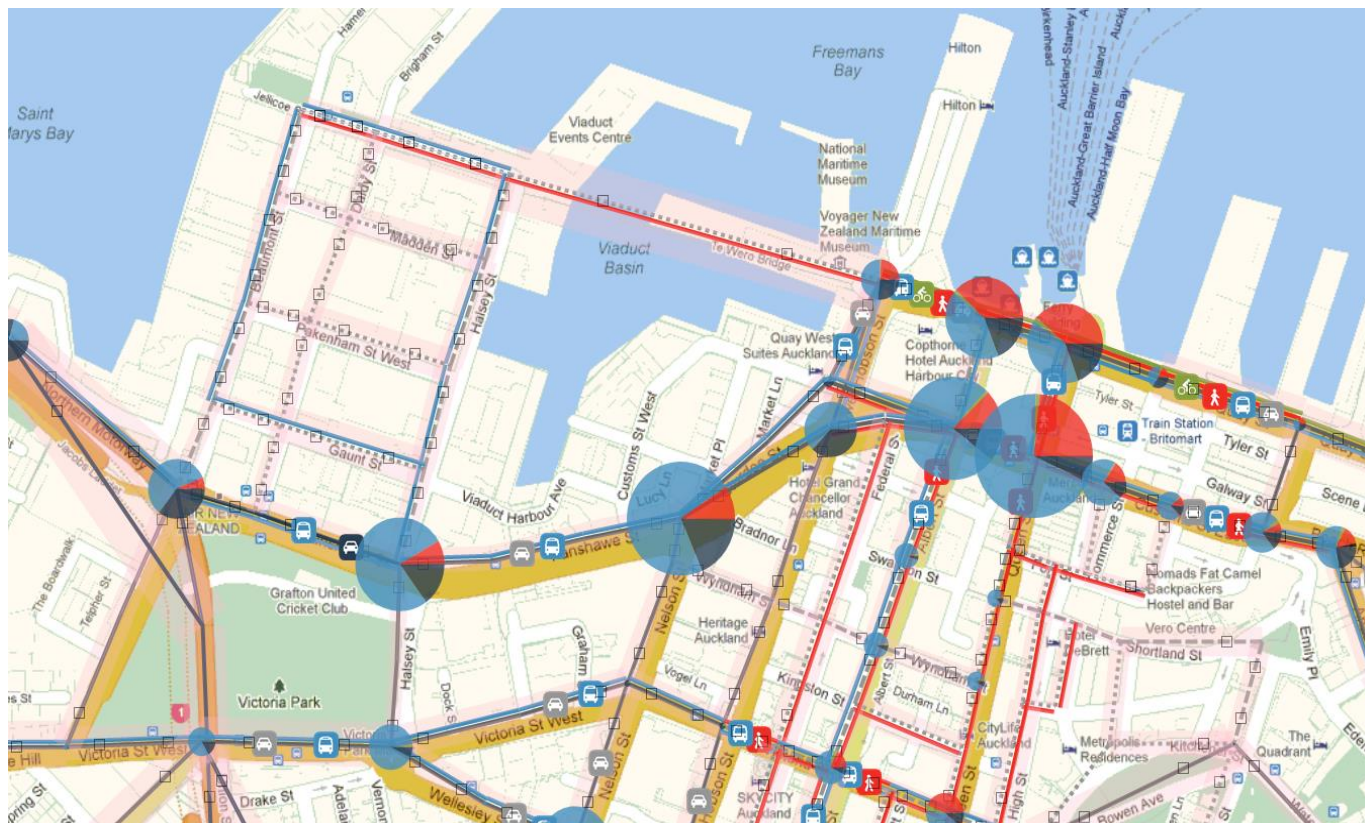




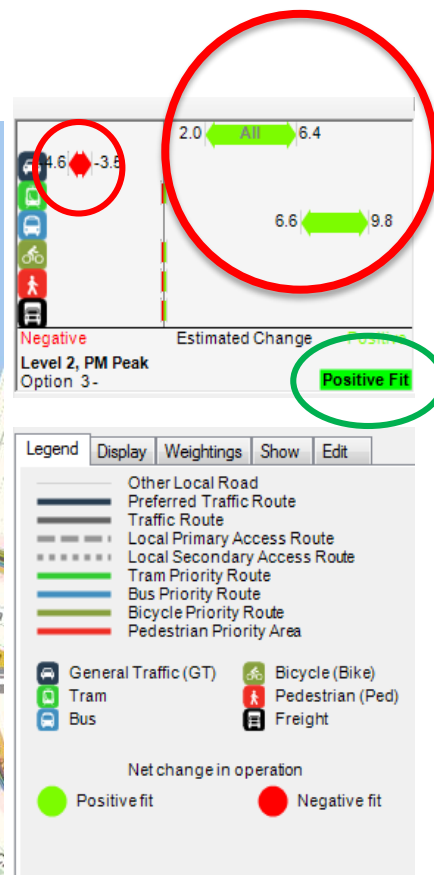
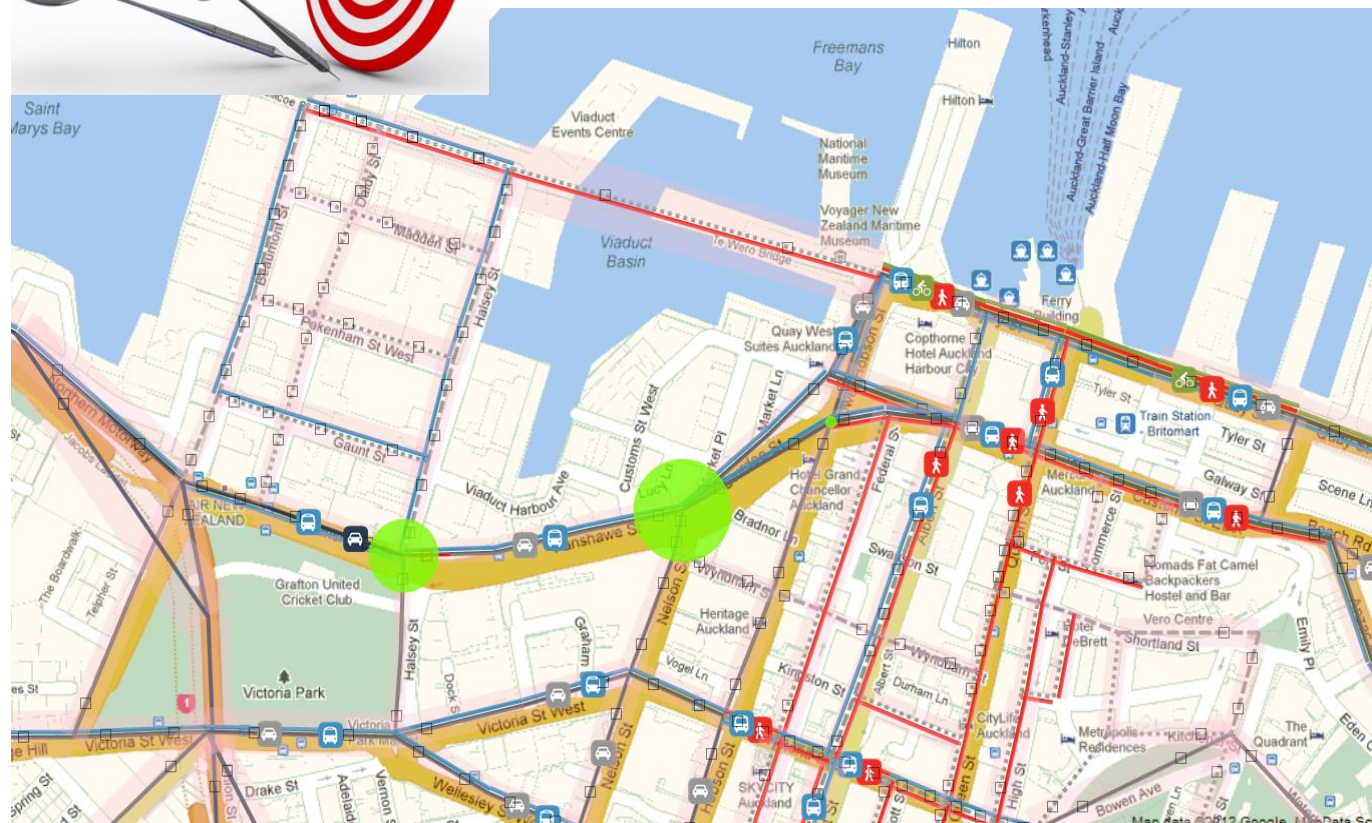


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# 1. Fanshawe Street bus lane









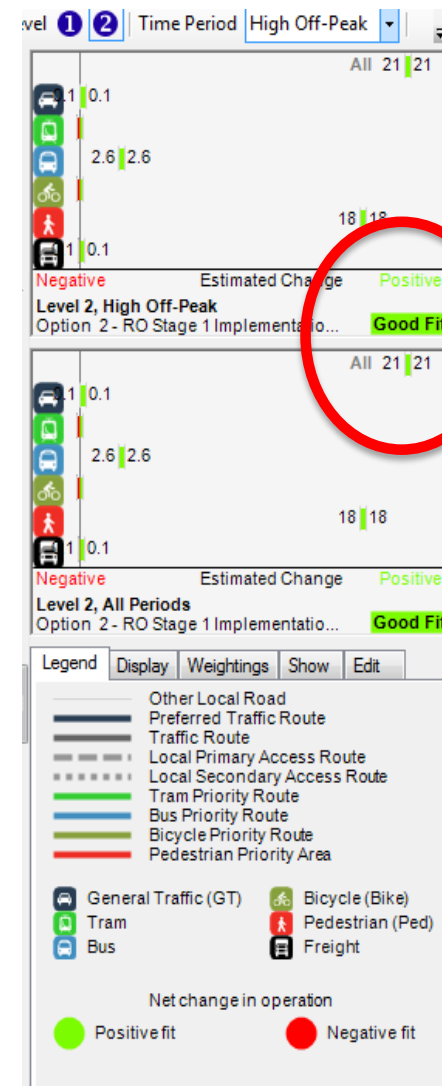
Before



After



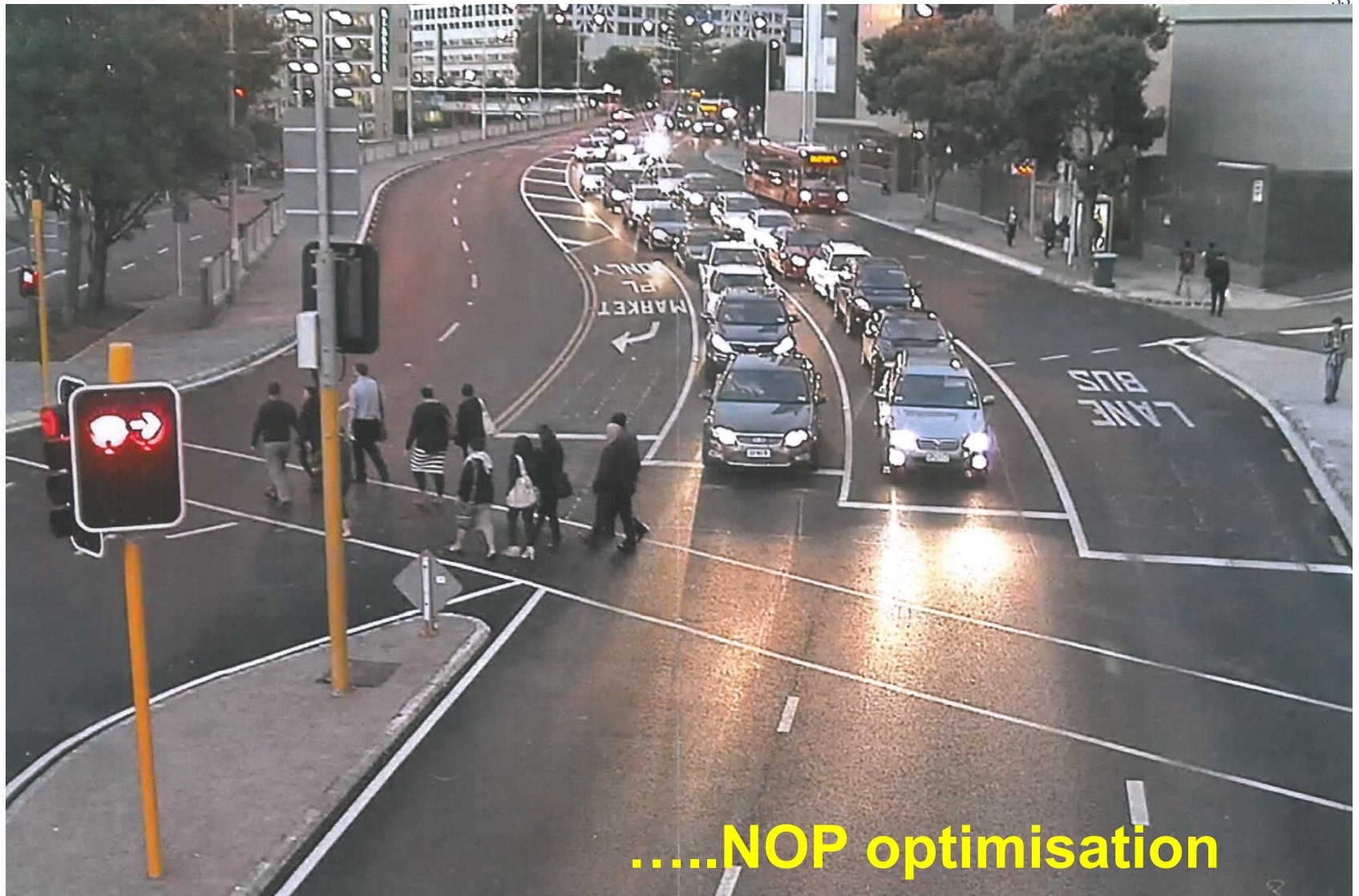
## 2. Route Optimisation (interpeak)





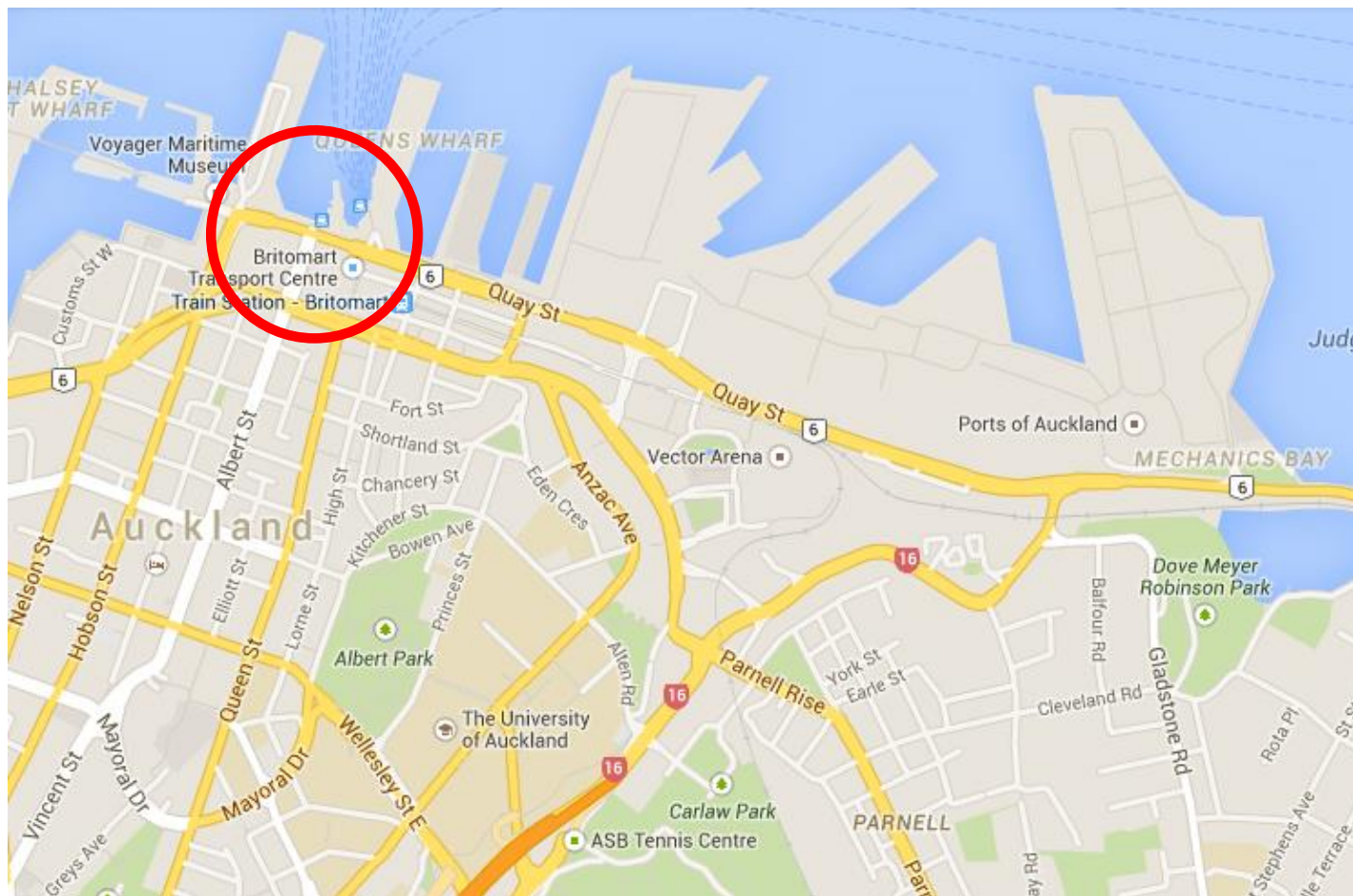




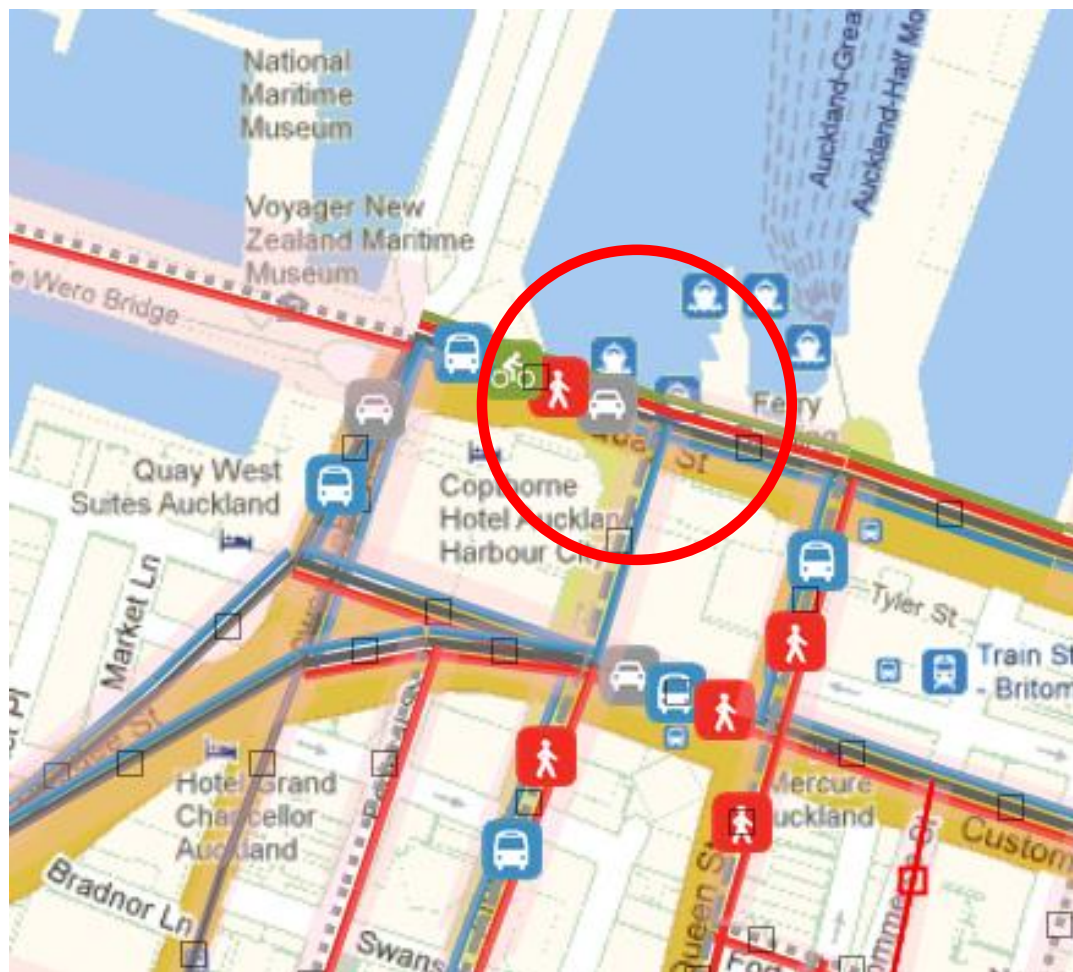


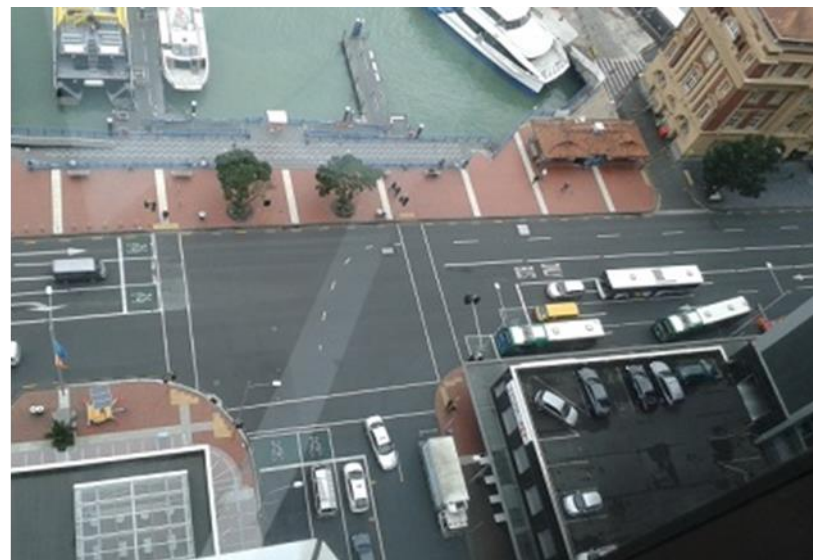


### 3. Lower Albert / Quay



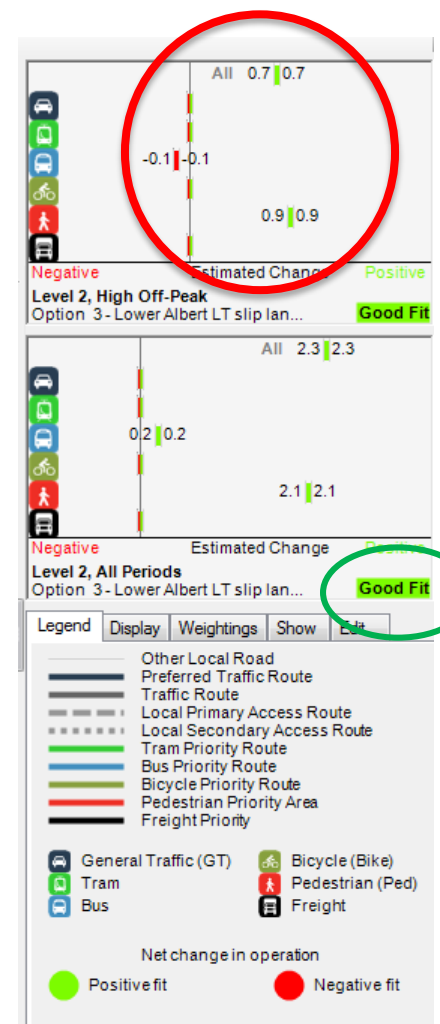
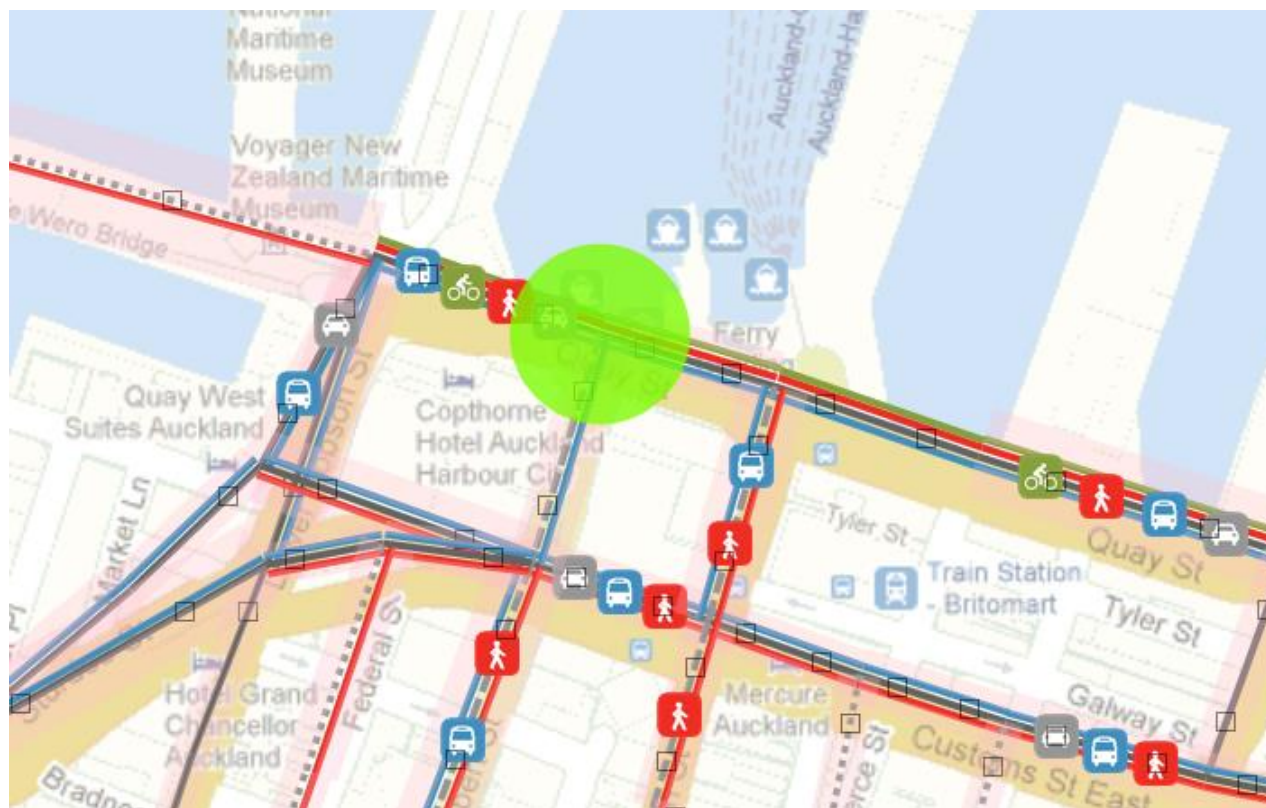
### 3. Lower Albert / Quay







### 3. Lower Albert / Quay



# Pedestrian Perception & Slip Lane Survey

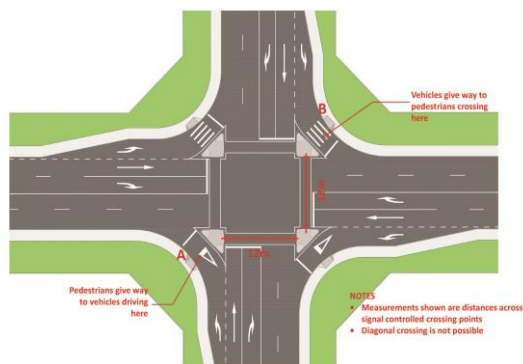
October 2015



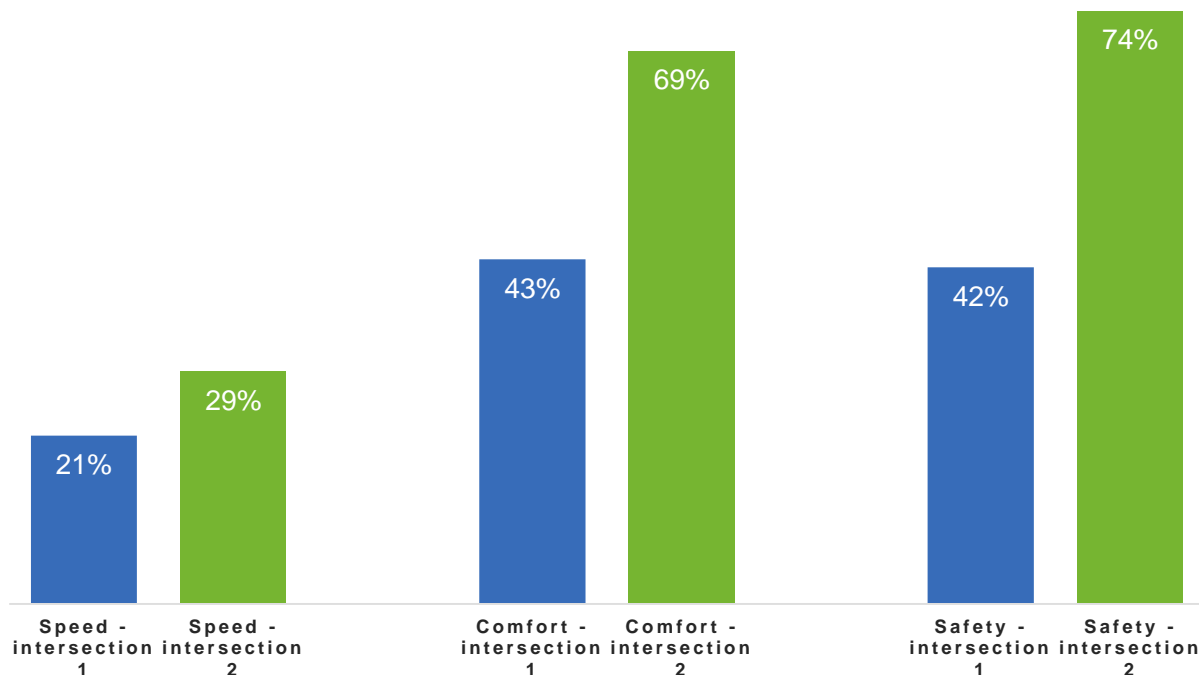
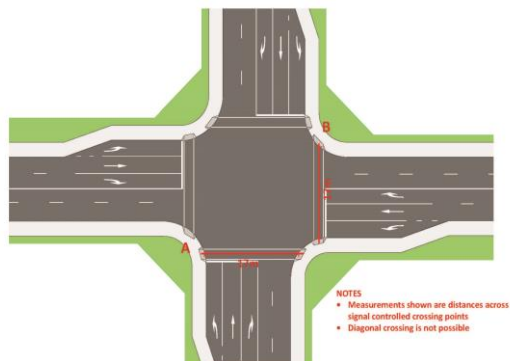


# Overall, Intersection 2 rates more positively for all key measures

## Intersection 1 – including slip lanes

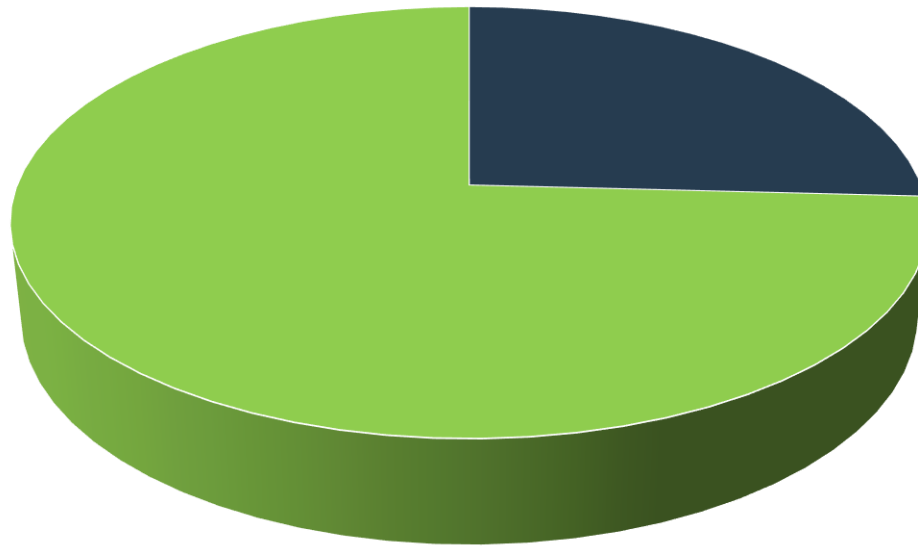


## Intersection 2 – excluding slip lanes

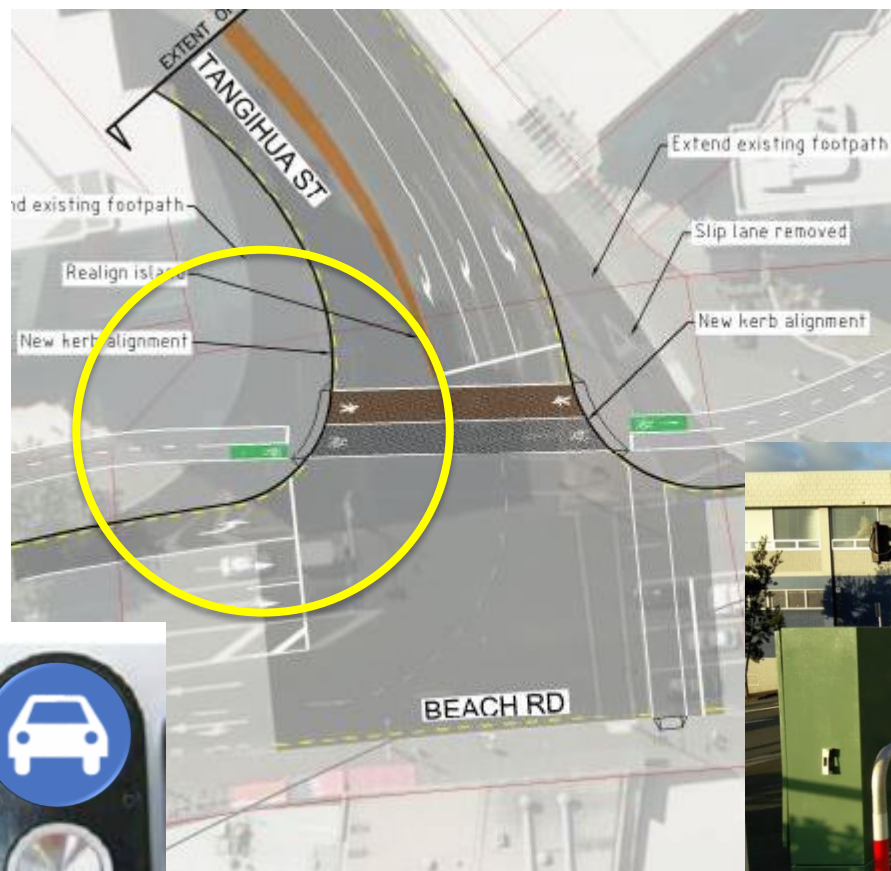


Q1 & 2. Imagine you are a pedestrian wanting to get from point A to B with a moderate, consistent level of traffic on the roads. For each of these, how would you feel getting from point A to B using the crossing facilities provided? Ratings 5-7 (Total Positive)  
All respondents n=678

From a pedestrian perspective, the intersection without a slip lane is most preferred as it is considered safer, there are no dangerous slip lanes to contend with and there are signalised traffic controls



## 4. Cycle ways...



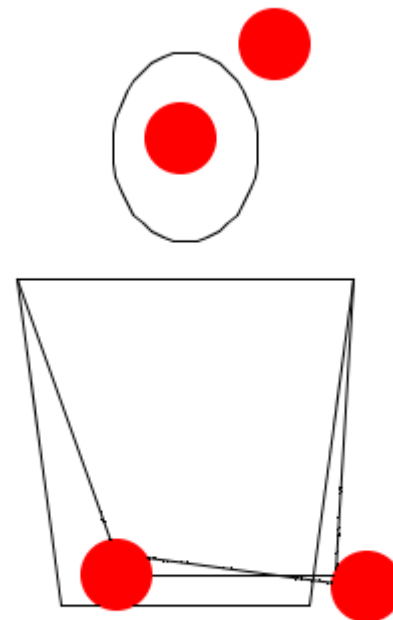


## 5. Central Rail Link works









# Thank you