

Auckland Motorways

Network Performance Monitoring

IPENZ Conference 2011

Anita Lin (Traffic Optimisation Leader)
Hanford Cheung (Network Performance Manager)

New Zealand Government

Agenda


- Background
- What's Congestion?
- What do we measure
- What do we monitor
- Impacts from the capital projects
- How do we work with the capital projects
- Initiatives
- Conclusions

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Background

Our Network



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Background

Auckland Motorway Alliance and its Network

- 900,000 vehicles access the network per day
- 208 ramps in the system
- 124 km of Motorway
- 6 km of Expressway
- 47 km of Rural/ Urban Highways


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Network Operations Cultural Change

Past: Reactive and Maintenance focus


Now: Proactive and Customer Oriented




Customer Expectations

Telephone Survey (March & April 2010)


- Nearly 60% of the respondents considered the way congestion is managed needs to be improved
- en-route traveller information, including messages on variable message signs, was ranked as the 3rd most important by the customers
- reliable travel time was ranked as the 4th most important by the customers



Arterial VMS Signs

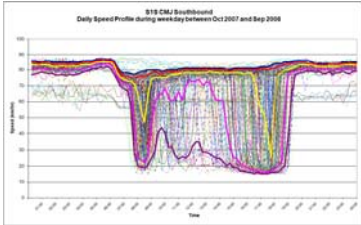


The left sign displays: ESTIMATED MINUTES VIA MOTORWAY. The right sign displays: GILLIES 1, GREENLANE 3, MT WGTN 7.




What's Congestion?

- Engineers, Road Users and Politicians all have different opinions



The graph shows speed in km/h on the y-axis (0 to 100) and time on the x-axis. Multiple colored lines represent different days, showing a significant drop in speed during the middle of the day, indicating congestion.



What's Congestion?

Our Answer

- Congestion occurs when the measured operating speed is below half of free flow speed

Free Flow Speed

Congested Speed

Congestion

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Performance Baseline Establishment

Which Data Source do we use?

- Several Data Sources on the network

Our Answer

- Speed and Volume
- ATMS I Count Sites

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Performance Baseline Establishment

The baseline performance at Each Count Site

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Performance Baseline Establishment

The baseline performance at Network Level

- Information needs to be aggregated to the network level
- Vehicle Kilometre travelled (VKT)
- The number of vehicles (motorists) affected by congestion

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Presentation Layers

VKT is too complex for the average customer!

- Courier Run - Congested Travel
- Bread Run - Delay due to Roadworks
- On Time - Travel Time Reliability

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Network Performance

Network Performance - Network-wide

Year	Courier Run (%)	Bread Run (%)	On Time (%)
Baseline 2007/8	~9.0	~0.5	~5.0
Year 2008	~8.0	~0.5	~4.5
Year 2009	~8.0	~0.5	~5.0
Year 2010	~9.0	~0.5	~10.5

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Network Performance

Network Performance - Northern Motorway

Year/Quarter	Courier Run (%)	Bread Run (%)	On Time (%)
Baseline 2007/8	~7.0	~0.5	~5.0
Q4 2008	~6.0	~0.5	~4.5
Q1 2009	~8.0	~0.5	~9.0
Q2 2009	~7.0	~0.5	~6.0
Q3 2009	~7.0	~0.5	~4.0
Q4 2009	~8.0	~0.5	~5.0
Q1 2010	~10.0	~0.5	~9.0
Q2 2010	~10.0	~0.5	~14.0
Q3 2010	~9.5	~0.5	~15.0
Q4 2010	~10.0	~0.5	~13.0

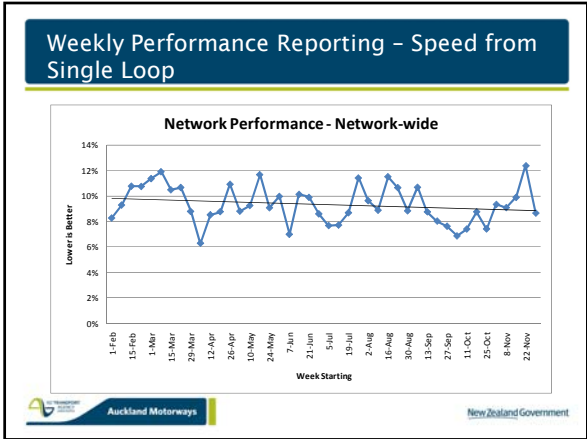
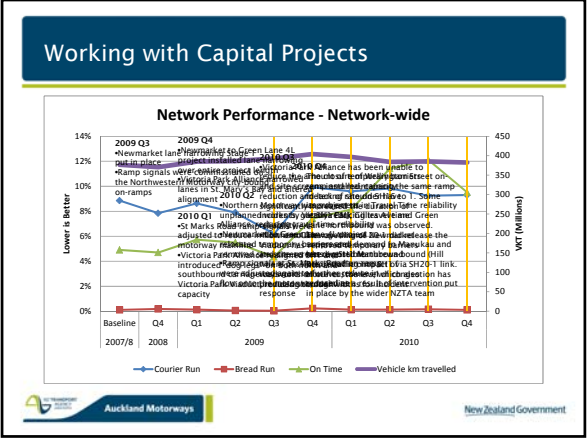
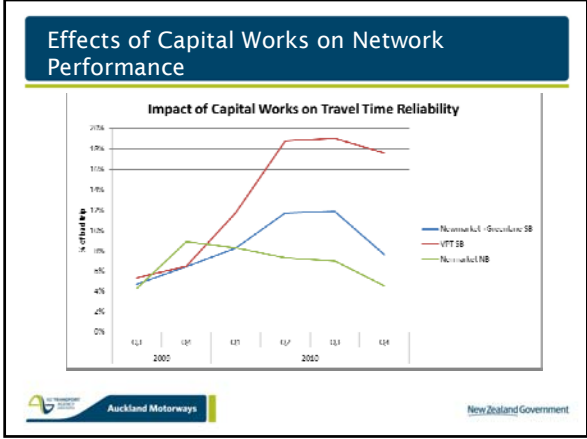
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Effects of Capital Works on Reliability

2009 Speed Percentile

2010 Speed Percentiles

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- ### Current Development
- These are some of the initiatives that are being developed:
 - Weekly Performance monitoring
 - Real time performance monitoring
 - Bottleneck Management
 - Road works impact assessment system
 - These activities are only made possible by the additional data collected by the ramp signalling system

Other Initiatives

- Operational Plans for the network
- Incident Response Strategy
- Moveable Lane Barrier Operational Strategy
- Bottleneck Removal Action Plans
- Incident Detection Improvement
- Traffic Data Collection Improvement Plan
- Traveller Information Strategy
- Off-ramp Traffic Signals Operational Review
- High Value Vehicles Performance Baseline Establishment.

Conclusions

The AMA has successfully:

- established the first ever baseline for the network
- established the network based KPI's - Courier Run, Bread Run and On Time
- established the KPI targets
- monitoring the network performance
- proved that the methodology is robust and consistent
- liaising with different capital projects to minimise the impact on the road users
- increasing the granularity in performance reporting