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Reducing Congestion and Improving our Environment through Route Optimisation

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Background


- Transportation utilises **43% of all energy consumption**.
- Transport contributes **45% of CO₂ emissions**
- Vehicle emissions have a detrimental effect on air quality, urban amenity and human health.
- Traffic congestion in Auckland costs the local and national economy **\$700 million per year**.
- Therefore, there are significant benefits that can be achieved by addressing urban traffic emissions.



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What is Route Optimisation ?


Route optimisation is the **review and modification** of the inputs into a traffic signal coordination program to ensure the **most coordinated, efficient and safe** operation of a **group or corridor of traffic signals**.



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Route Optimisation Benefits


- Time Savings
- Vehicle Operating Cost Savings
- Accident Savings
- Emissions and Carbon Footprint
- Noise and other Environmental Benefits



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Route Optimisation Costs


- Data Collection and Analysis
- Traffic Signal optimisation and Coordination
- Traffic Signal Software
- Traffic Signal Controller Upgrades
- Minor Physical Works
- Before and After Studies
- Reporting



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Who Benefits from Route Optimisation?

- Private vehicles
- Cycles
- Pedestrians
- Commercial vehicles
- Local residents
- The environment
- The local economy

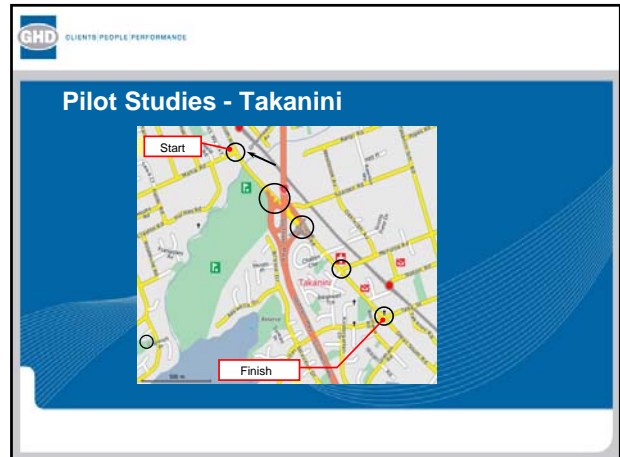


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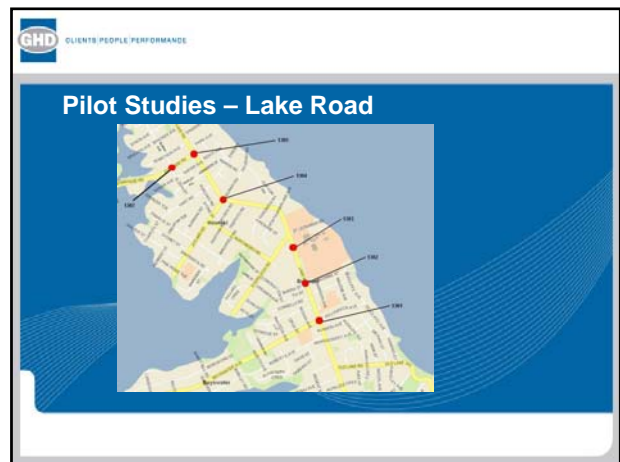
City Comparison

City	No of traffic signal controlled intersections	SCATS Traffic Management		Route Optimisation		
		Budget	No of staff	Budget	Frequency of Optimisation	No of staff
Melbourne (VicRoads)	2000	A\$2.1 million p.a.	12	A\$1.2 million p.a.	30% of the network per year	12
Sydney NSW RTA)	2000	A\$2.4 million p.a.	13	A\$1.0 million p.a.	30 to 50 % of the network per year	12
Adelaide (SA ACTS)	700	A\$2.7 million p.a.	12	A\$1.0 million p.a.	50% of the network per year	14
Auckland (TMU)	650 + 30 ramp signals	NZ\$400K p.a	3	< NZ\$200K	Ad hoc: 5% approx	3

*2007 numbers



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- ### Pilot Studies – Takanini Results
- Calculated first year benefits:
- Fuel savings of **214,680 litres** (10%)
 - CO₂ reduction of **527 tonnes** (10%)
 - Average time savings of **17 seconds per vehicle**
 - Total time savings of **63,453 hours** (13.3 %)
 - Financial benefits of **\$1,181,598**
 - A benefit cost ratio of **17 for first year**
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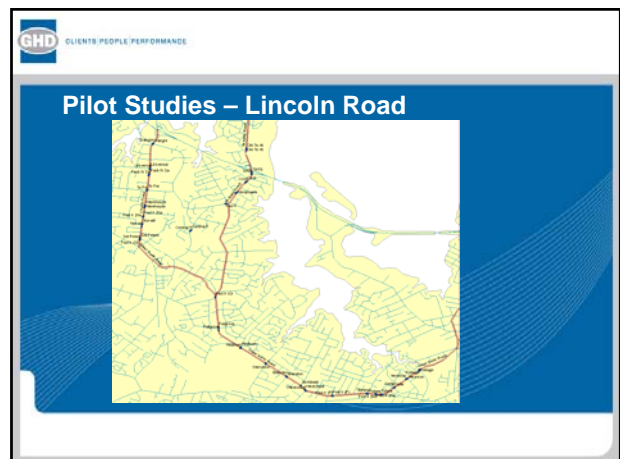
Pilot Studies – Lake Road Results

Northbound Delay:

- **54% reduction** during the morning peak
- **7% reduction** during the evening peak.

Southbound Delay:

- **27% reduction** during the morning peak
- **1% increase** during the evening peak.



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Pilot Studies – Lincoln Road Results

- AM Peak journey time reduction of between **8% and 27%**
- IP Peak journey time reduction of between **4% and 18%**
- PM Peak journey time reduction of between **0% and -4%**

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Potential for Annual Congestion and Energy Savings in Auckland Region

- Fuel savings of **10.3 million litres**
- CO₂ reduction of **26,000 tonnes**
- Total time savings of **3,045,725 hrs**
- Financial benefits of **\$55.7 million**



These results are equivalent to removing **9,300 private cars** from Auckland's road system.

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Suggested Implementation Time Table

Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
System Setup Hire/Train Resources Priorities Sites	Training Review 20% of Sites	30% of Network Reviewed Implement 25% of sites	30% of Network reviewed and Implement 30% improvements	Ongoing 30% of sites reviewed and implemented
Review 10% of sites Implement 8% of sites	Implement 15% of sites			

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Recommendations

- On-going funding
- Funding to be at a level similar to Australian cities
- This would enable optimisation of **30% to 50%** of identified routes per year.

