

Economically Justified Traffic Control Systems

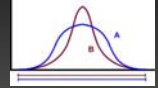


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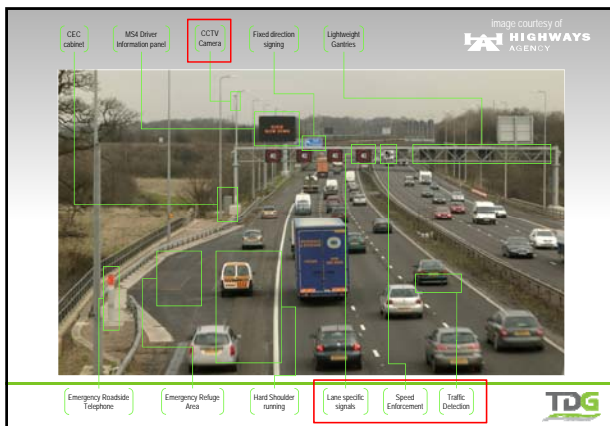


NZ's Motorway Network

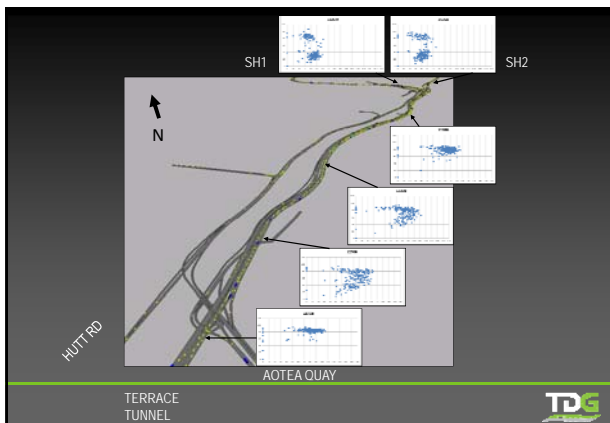
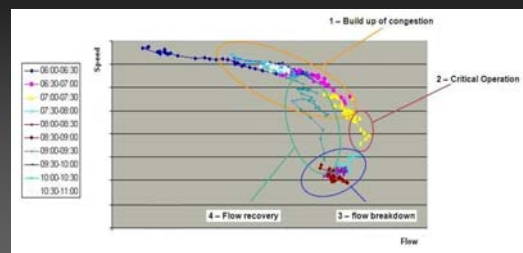
- 200km access controlled, high speed
- <2% of State Highway Network
- Carries 10% of NZ's traffic



- Towards capacity, few dominant bottlenecks



Speed – Flow Curve



How do Managed Motorways Work?



- Technology
 - Monitor
 - Detect
 - Control / Inform
 - Enforce
- Traffic Officers
 - Manage
 - Respond
 - Control
 - Coordinate



Efficiency / Safety / Environmental

- ↑ Capacity +7 to 9%
- ↑ Journey time reliability + 22%
- ↑ Users experience no congestion +7%
- ↓ Journey times - 24% (NB) & 9% (SB)
- ↑ Speed compliance ≥ 94%
- ↓ Personal Injury Accidents – 42%
- ↓ Vehicle emissions – 4 to 10%
- ↓ Fuel use – 4%
- ↓ Noise – 1.8 to 2.4 dB



Cost Estimate¹

Managed Motorway Component	Cost / km
Shoulder Pavement Strengthening	\$0.7m
VMS signage, say 4/km @ \$50K each, commissioned	\$0.2M
Gantries, signals, shoulder and median, \$450K each @ 2/km	\$0.9M
Combined VSL/LCS roundels, \$8K each * 4 lanes (each direction) @ 2/km	\$0.7M
Civil works	\$1.0M
Traffic Management Plans	\$0.5M
Design and supervision	\$0.4M
Operations and maintenance assumed to be 2.5% of capital cost	\$0.1M

- Approximately \$4.5M / km / direction of travel
- 25% the cost of widening?

1 - TDG (2011). Auckland Managed Motorway Project, Business case and outline BCR



Benefit : Cost Ratio (BCR)

- UK's M42 Pilot Scheme
 - BCR: 5.6
- UK's M4/M5 Managed Motorway
 - BCR (estimate): 7.1
- Auckland Managed Motorway Project, Business case and outline BCR
 - BCR (high level estimate): 4.7



Managed Motorways in NZ?

- Congestion
- Design Guidance
- Relevant NZ <> UK Difference:
 - Speed limits
 - Driver behaviour
 - Constructed motorway environment
 - Enforcement
- How can the potential be assessed and quantified?



Traffic Modelling

- Real time simulation of individual vehicles
- Influence model operation
- Interrogate model performance
- Speed – flow relationship



Microsimulation Modelling

- Traffic Characteristics
- Design Input
- Establish Economic Benefits
- Assess VMSL and HSR
- Value of Enforcement
- Response to Incidents
- Subtle Complexities



Conclusion



- Design Guidance
 - Excellent BCRs
 - Assessment Tools



THE END
Questions?

