

M1,
Melbourne, VIC



MANAGED FREEWAYS

A Holistic Approach for Fully Controlling Freeway Operations

Managed Freeways provides a comprehensive approach to fully control freeway operations

- Managed Freeways rethinks the way we manage freeways
 - Builds upon ITS, ATM, ICM and dynamic demand management tools of managed lanes.
 - Provides a comprehensive package of strategies to fully control freeway access to manage demand and optimize traffic flows.



Source: VicRoads

Integrated Corridor Management shares some common elements with Managed Freeways

- ICM provides a framework for coordinating various ITS elements
- Incident management, adaptive ramp metering, arterial system integration and traveler information are integral elements of ICM



INCIDENT MANAGEMENT

Benefit: Electronic signage provides advance warning of accidents, improving safety, and guides detouring drivers back to I-80.

The image shows an electronic sign with a red 'X' on the left, a speed limit of 55 in the center, and a green arrow pointing down on the right. Below the sign, the text 'INCIDENT MANAGEMENT' is displayed in white on a black background.



ADAPTIVE RAMP METERING

Benefit: By adjusting green times, adaptive ramp metering improves traffic flow onto I-80 and reduces merging collisions.


The image shows a highway ramp with traffic lights. The text 'ADAPTIVE RAMP METERING' is displayed in white on a black background.



SYSTEM INTEGRATION

Benefit: The communications network proactively manages traffic along I-80 and local roads and shares information among transportation and local agencies.

The image shows a control room with multiple monitors displaying traffic data. The text 'SYSTEM INTEGRATION' is displayed in white on a black background.



TRAFFIC INFORMATION

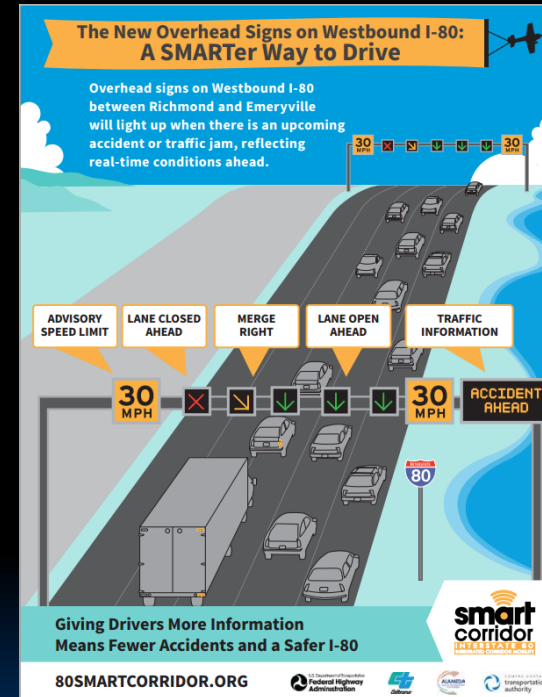
Benefit: Traffic message signs provide drivers with information to plan or adjust travel routes.

The image shows a traffic message sign with a green arrow pointing down and the text 'Reduced Speed Zone Ahead'. The text 'TRAFFIC INFORMATION' is displayed in white on a black background.

Source: Alameda County Transportation Commission

Integrated Corridor Management provides coordinated corridor management

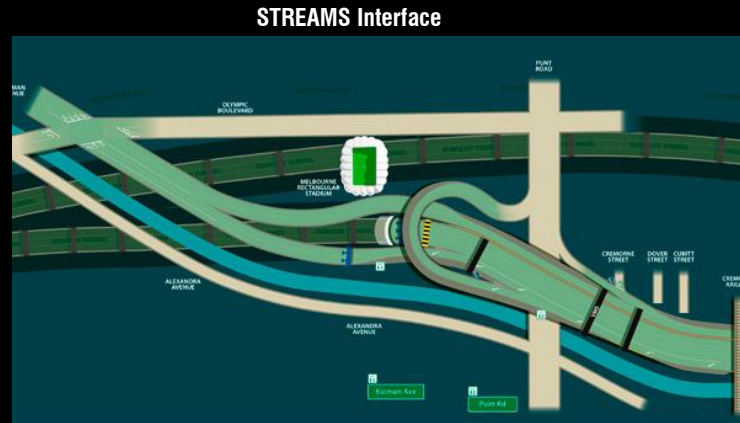
- ICM can provide enhanced traveler information and facilitates coordinated response to congestion and incidents
- ICM does not typically synchronize freeway traffic flows to accomplish full control of corridor traffic operations



Source: Caltrans

Highly precise data and advanced system management tools are key to Managed Freeways

- Managed freeways synchronizes the flow of vehicles entering and exiting the freeway to those already on the freeway.
- Provides real time demand management to control traffic and optimize overall freeway efficiency

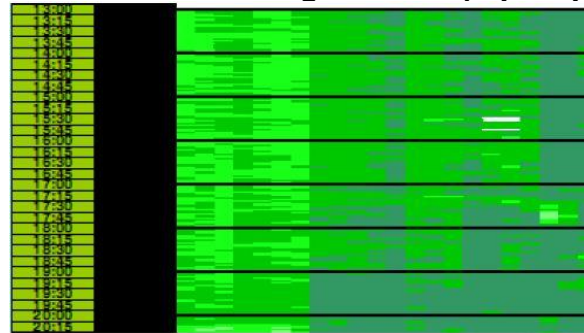
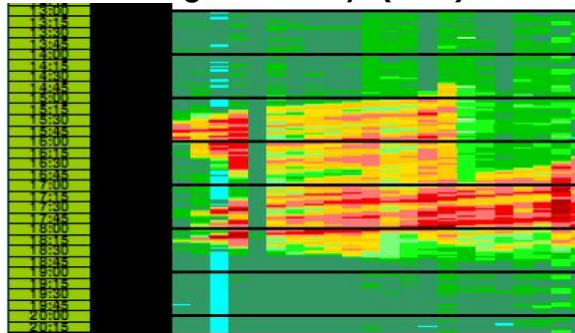


Source: Transmax

VicRoads Managed Motorways is the only proven strategy to reliably control freeway operations

- Managed freeways have minimized instability in traffic flows on M1:
 - Integrated system ensures components work together to sustain traffic flows.
 - Bottlenecks have been substantially eliminated.

M1 Managed Motorway Speed Contour Plot (PM Peak Period Monash Motorway Outbound)
 Before Managed Freeways (2007) After Managed Freeways (2010)



Legend
Speed Ranges (km/h)

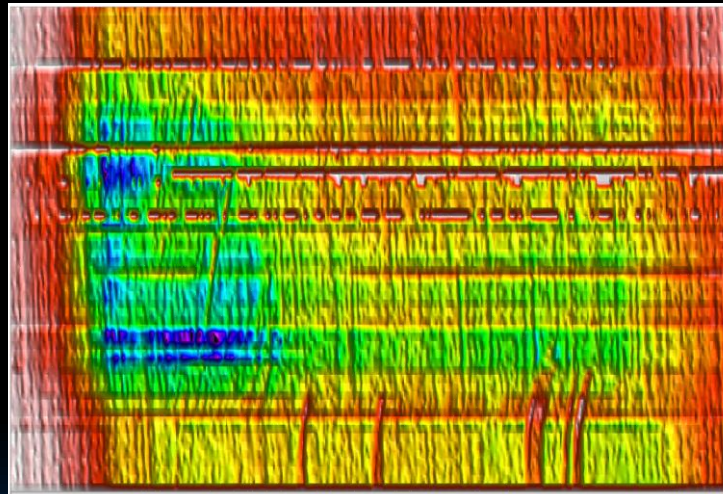
BIN	Low	High	LEGEND	INDEX
1	1	10	000 - 000	17
2	11	20	011 - 020	18
3	21	30	021 - 030	19
4	31	40	031 - 040	20
5	41	50	041 - 050	21
6	51	60	051 - 060	22
7	61	70	061 - 070	23
8	71	80	071 - 080	24
9	81	90	081 - 090	25
10	91	100	091 - 100	26
11	101	110	101 - 110	27
12	111	999	111 - 999	28

Source: VicRoads

VicRoads Managed Motorways is the only proven strategy to reliably control freeway operations

- VicRoads M1 Managed Motorway has proven results
 - up to 25% additional throughput during peak periods
 - shorter overall travel times with delays reduced by up to 50%
 - Improved travel reliability
 - Improved safety with crashes reduced by 20 to 50%

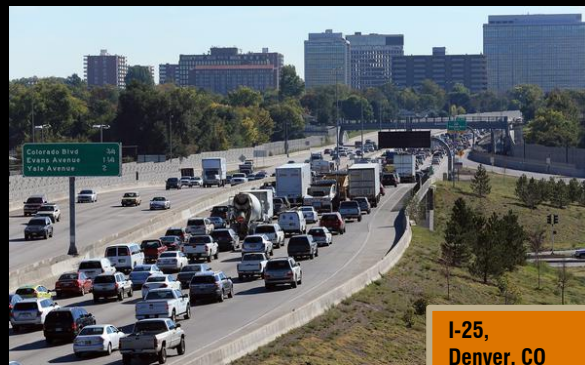
M1 West Gate Freeway Traffic Flows (October 24, 2014)



Source: VicRoads

Managed Freeways is getting growing interest in the United States

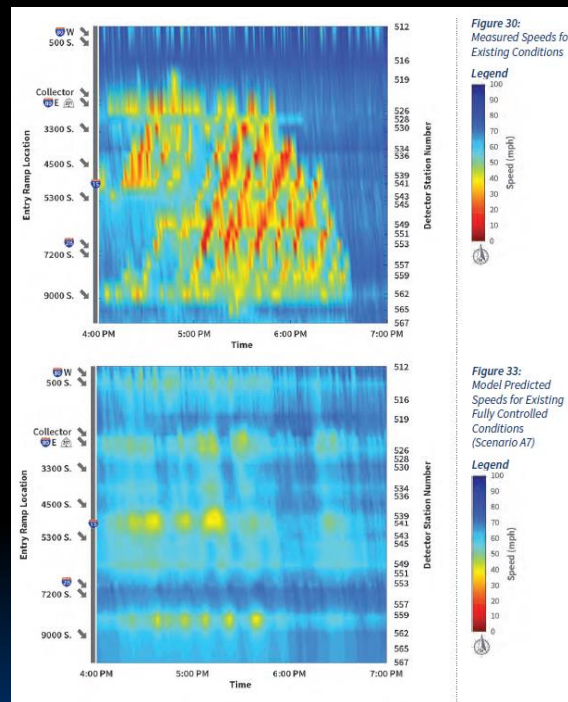
- Colorado and Utah DOT's have undertaken initial feasibility assessments
 - Managed freeways has been identified as a viable strategy for both candidate corridors
 - Both agencies are seeking funding for initial deployments



Initial evaluation shows great potential for Managed Freeways in the United States

- Preliminary results show the potential for managed freeways to effectively eliminate recurring congestion on I-15
 - Total trip times estimated to improve 11%
 - Total delay estimated to be reduced 37%

I-15 Managed Motorways Study



Managed Freeways requires a paradigm shift in how we plan and manage freeways

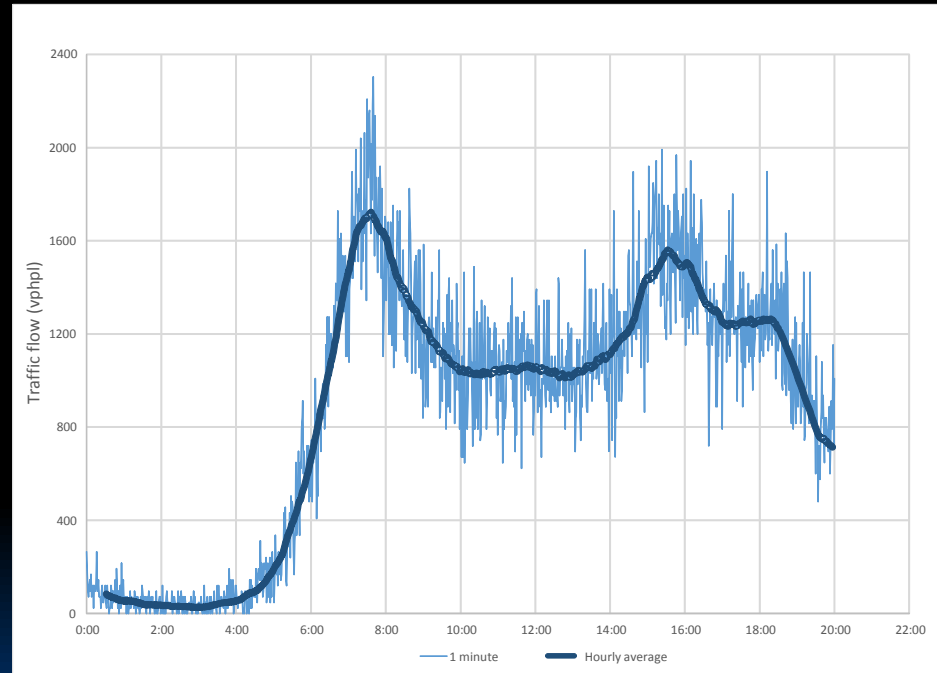
- Managed freeways requires prioritization of the roadway hierarchy to maximize performance
 - Freeways are our highest value and most productive roadway assets and should be prioritized as such
- A congested freeway is not a productive freeway



Source: VicRoads

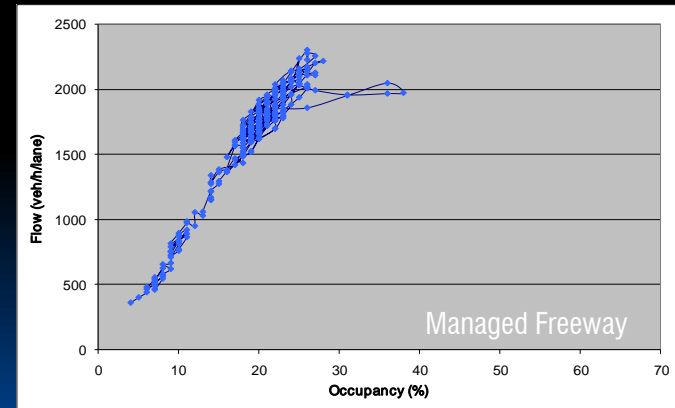
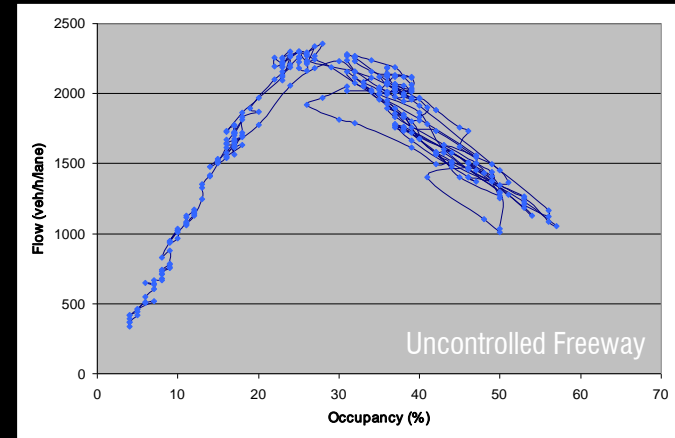
Managed Freeways requires a paradigm shift in how we plan and manage freeways

- Freeway planning has typically been based on hourly corridor volumes
- Traffic flows are very volatile and can fluctuate greatly in very short periods of time
 - Managed freeways optimizes traffic flows to match these fluctuations and avoid traffic flow breakdown



Managed Freeways requires a paradigm shift in how we plan and manage freeways

- Uncontrolled freeways may achieve optimal flow rates for very short periods of time before breaking down
- Managed freeways maintain flow rates at near optimal levels continuously
 - Coordinated ramp metering controls the amount of traffic entering the freeway to prevent breakdown
 - ATM elements help further fine tune traffic flows, especially during incidents



“Managed Motorways is not a trivial matter”

Markos Papageorgiou 2007

- Managed freeways is not a small stepwise change to existing ramp metering systems
 - It will require a commitment to a new paradigm
- Managed freeways is a multi-faceted solution that involves new skill sets, communication systems, control systems, control engineering & optimization
 - These skills are not typically associated with DOT’s traditional functions
- Unless you commit to all the critical elements of managed freeways you cannot achieve the full benefits

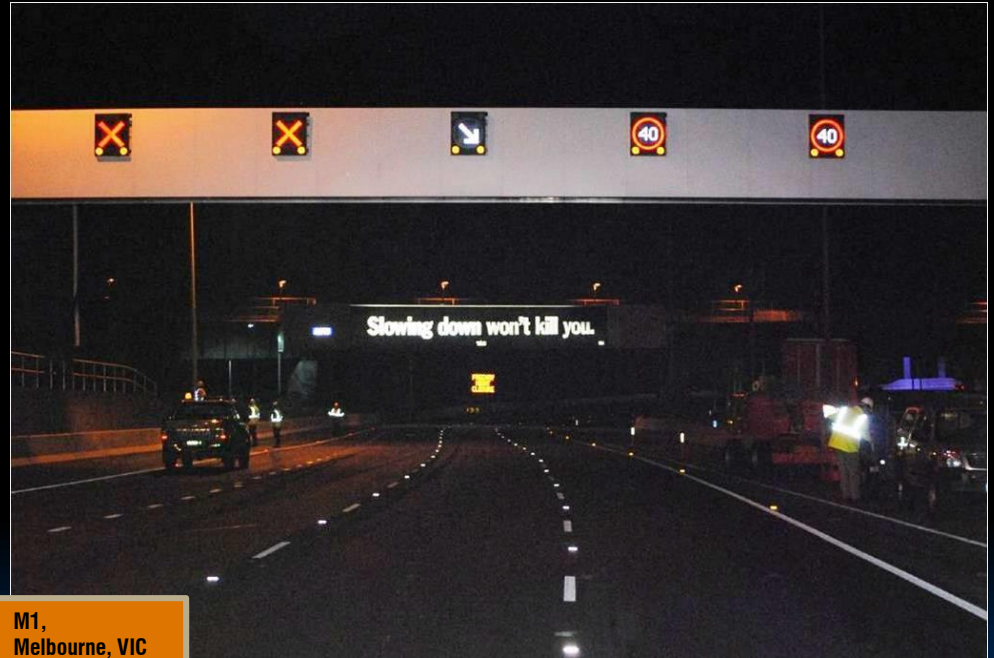
Questions

Darren Henderson

WSP | Parsons Brinckerhoff

(951) 833-7763

hendersond@pbworld.com



M1,
Melbourne, VIC

Source: VicRoads