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 M1, Melbourne, VIC
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

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 STREAMS Interface
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](image-url)

**Legend**
- Speed Ranges (km/h)
- Before Managed Freeways (2007)
- After Managed Freeways (2010)

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%
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

I-25, Denver, CO
I-15, Salt Lake City, UT
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%
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
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

Source: VicRoads
“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

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