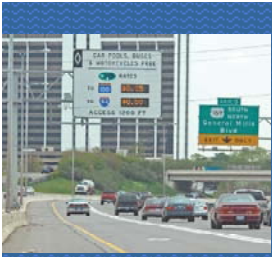


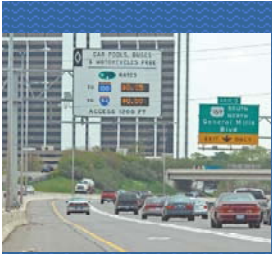
# Managed Lanes: A National Perspective

By: Greg Jones: FHWA  
Resource Center



# Managed Lanes

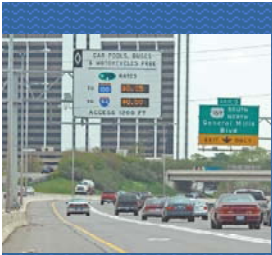
- A Lane Management technique that uses a variety of control strategies to manage the lane in the most efficient manner
  - Manage traffic flow efficiency
  - Effective person throughput
  - Balance demand and capacity
  - Provide reliable travel speeds



# Managed Lane Strategies

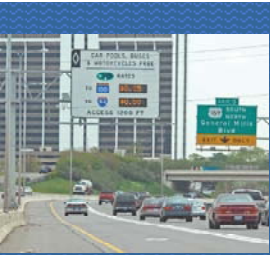
Use the following control strategies to manage a lane(s) to provide a reliable transportation option:

- Eligibility/occupancy
- Access control
- Congestion pricing

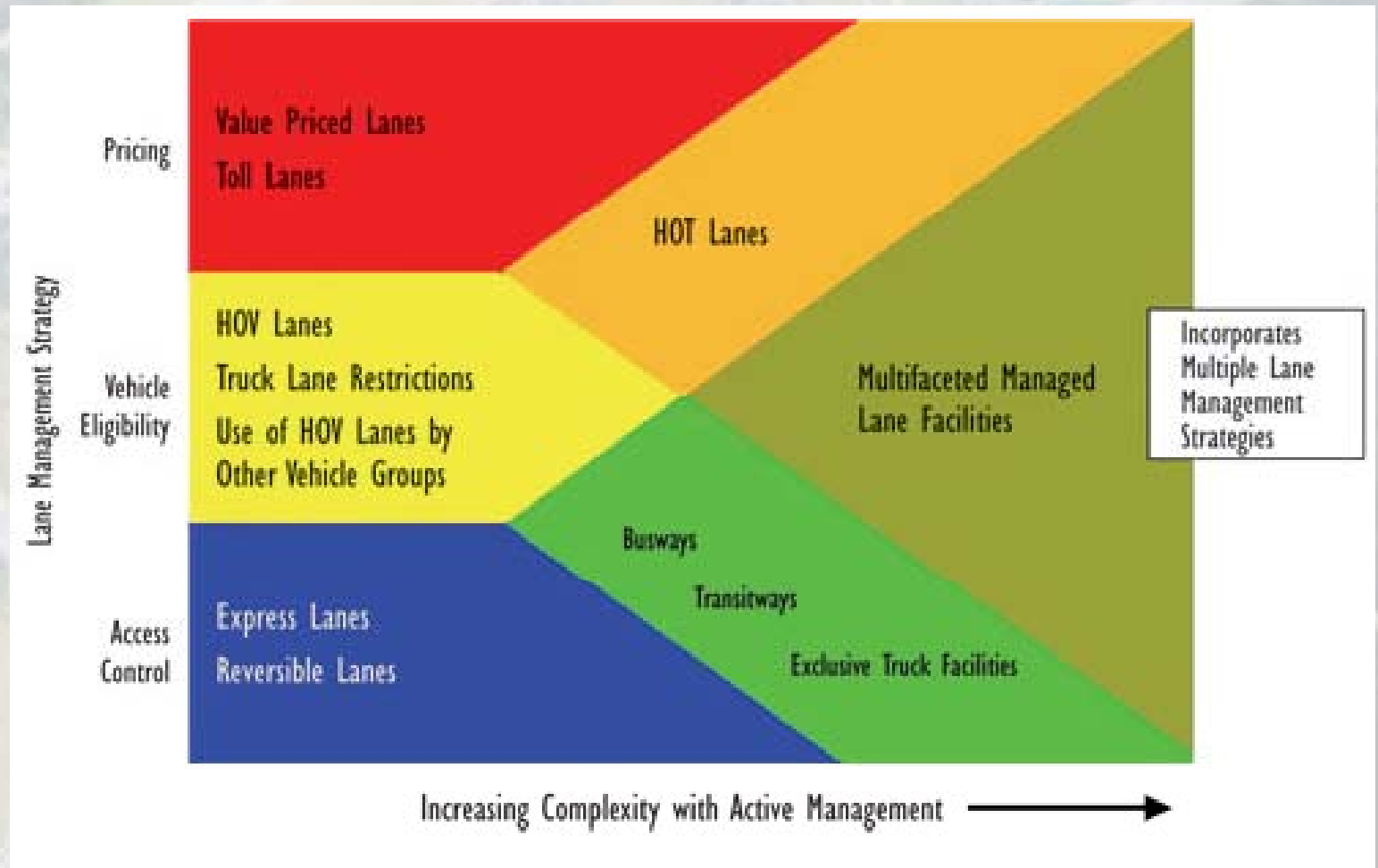


# Types of Managed Lanes

- Busways
- HOV
- **HOT**
- **Express Toll Lanes**

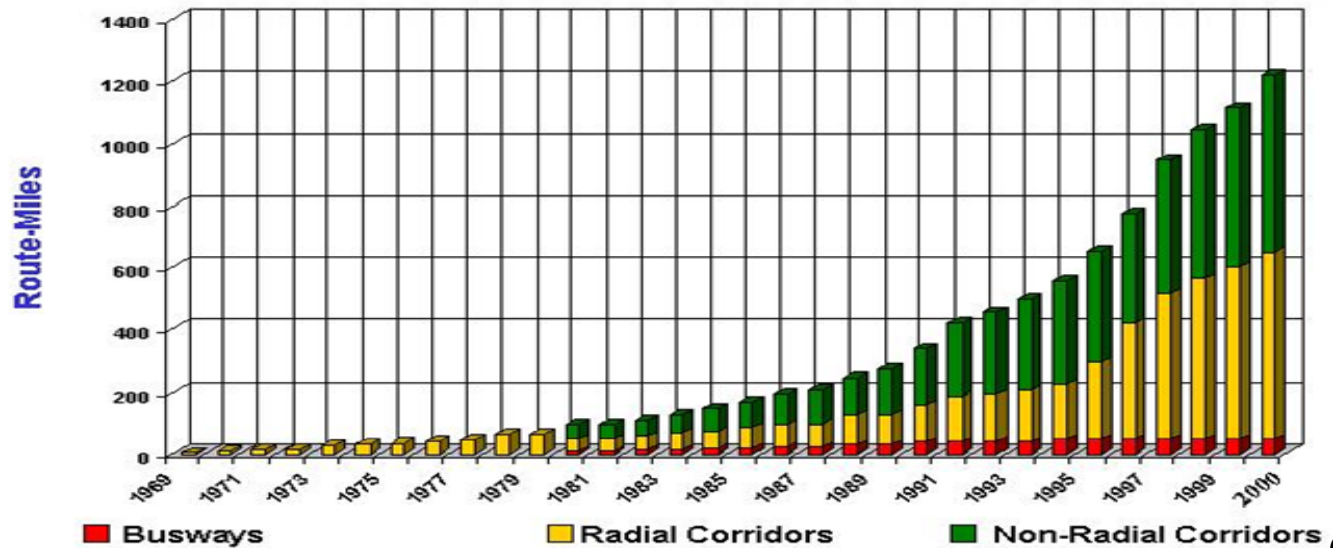


# Types of Managed Lanes



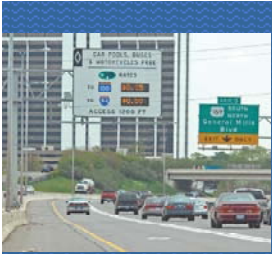
# Managed Lane History

- Bus lanes to HOV lanes to HOT lanes to Express Toll Lanes = Managed Lanes
- 2.5 miles to over 4000 lane-miles
- 3 bus demonstrations to accepted practice
- Serving millions of trips and
- Saving over 600,000 hours daily



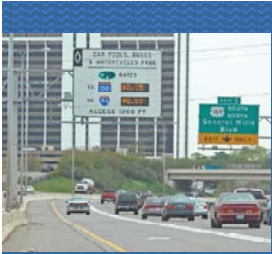
# HOT Lanes

- The most common *priced* managed lanes – HOV lanes plus the added exception to allow those that don't meet the occupancy to pay a toll to use the lane
  - Maintain increased person-throughput
  - Dynamic pricing to control flow
  - Conversion of HOV
  - New capacity HOT
  - Revenue neutral

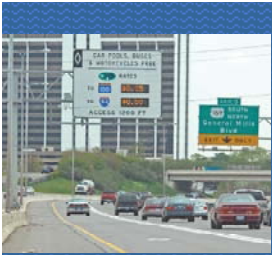


# Express Toll Lanes

- All vehicles are charged a toll
- Dynamic pricing to control flow
- Provides greater opportunities for producing a steady revenue stream – thus expedites new capacity
- Some allow a discount for HOV vehicles

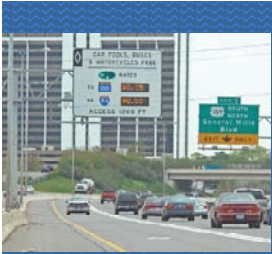


# Managed Lanes Projects, 2011



# What have we learned

- Managed Lanes have worked
- Managed Lanes are flexible by their nature, and can evolve based on changing demand, technology and commute patterns
- Public outreach is very important
- They fit a wide range of needs
- Part of a comprehensive congestion management program
- However, the concepts are still misunderstood by some



# How has the public reacted to HOT lanes?

Public acceptance has been high on early projects

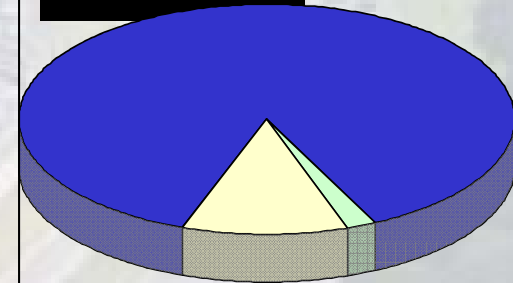
## I-394 MnPass

- 95% satisfaction with all electronic tolling
- 85% satisfaction with traffic speed in lane
- 76% satisfaction with dynamic pricing

Source: [www.mnpass.org](http://www.mnpass.org)

## San Diego I-15

Approve  
88%



Disapprove 11%    Don't Know 1%

Source: [fastrak.sandag.org](http://fastrak.sandag.org)



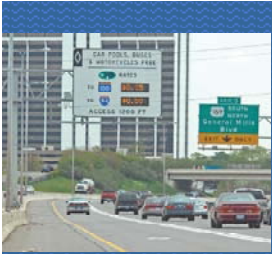
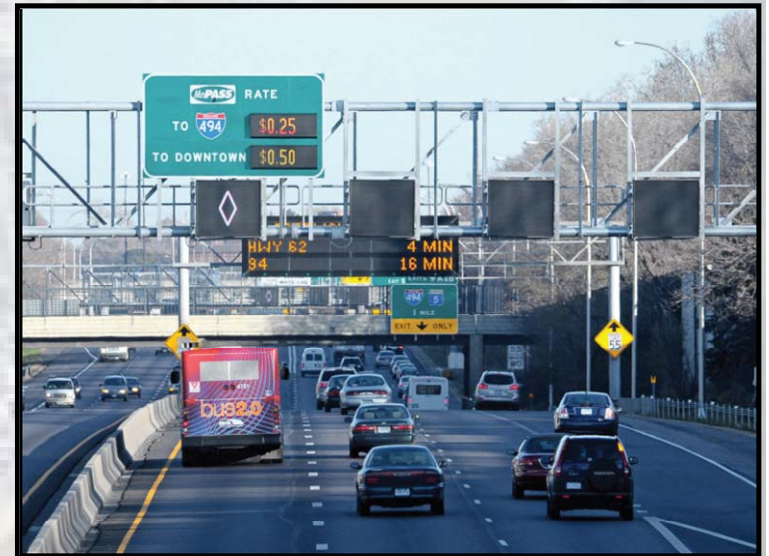
# Benefits from Managed Lanes

## User Benefits

- Reliable travel time
- Reduced delay
- More choices

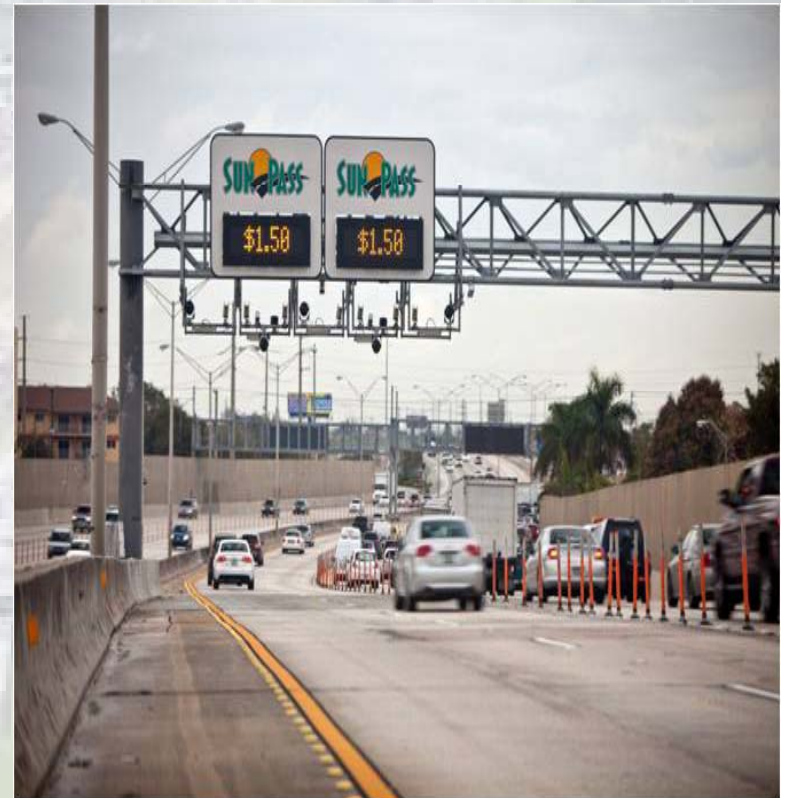
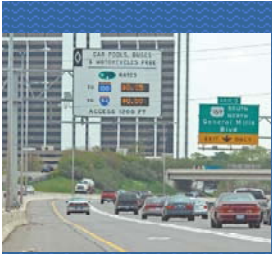
## System Benefits

- Greater throughput
- Increased transit & carpool use
- More modal options
- Improved air quality
- Revenue generation



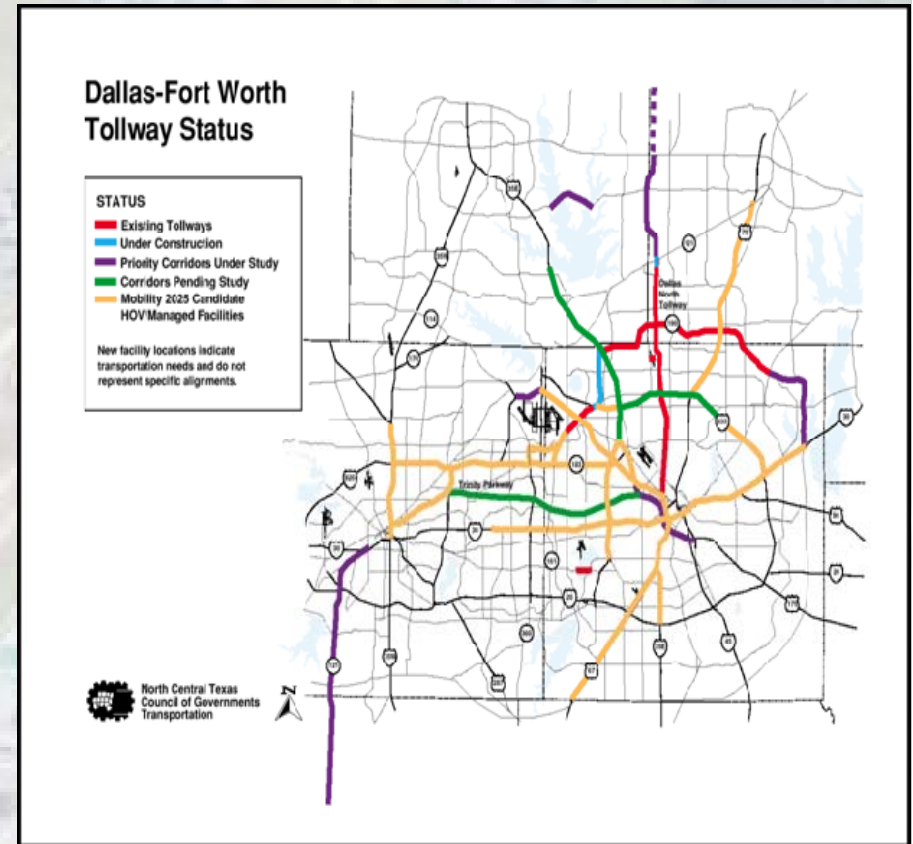
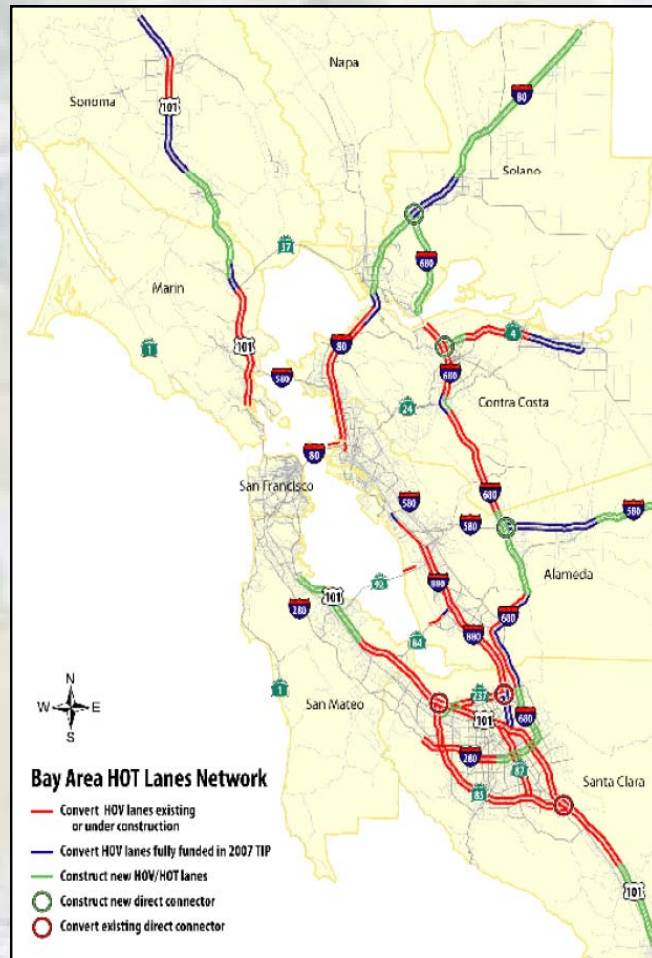
# Benefits – I-95 Miami

- Speeds in the HOT lane have gone from 20 MPH in the peak to over 55 MPH.
- Expanded Express Bus use, ridership up 22%
- GP lanes speeds up from 15 MPH to 40 MPH in the peak



# Future Trends

## Managed Lane Regional Networks



# Future Trends (cont.)

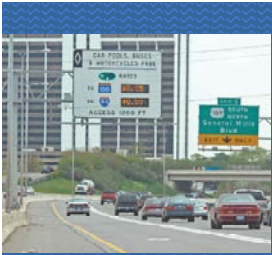
- **Design:** Most projects will continue to be single lanes, but more new capacity projects with multi-lane systems
- **Growth:** Managed lane mileage incorporating congestion pricing will double in 5 years, double again in a decade
- **Implementation:** At least half will be implemented by agencies other than State DOT's—MPO's, regional toll authorities, transit agencies, and private partners
- **Operation:** Hours of operation expanding, free use decreasing to 3+, many projects will require all to carry a transponder

# Future Trends (cont.)






- **Funding:** Financing and delivery utilizing new partnerships
- **Lane Management:** Maintaining effective enforcement and lane reliability will continue to be challenging
- **Technology:** Lower costs, greater convergence in personal devices that replace the transponder and improve interoperability.
  - Automated occupancy verification is the key to a new level of dynamic applications

# Future Trends (cont.)

- **Transit:** Most areas will see improved transit integration and reliability
- **Public acceptance:** Increasing satisfaction if benefits are assured, but institutional barriers public/political understanding will remain a challenge

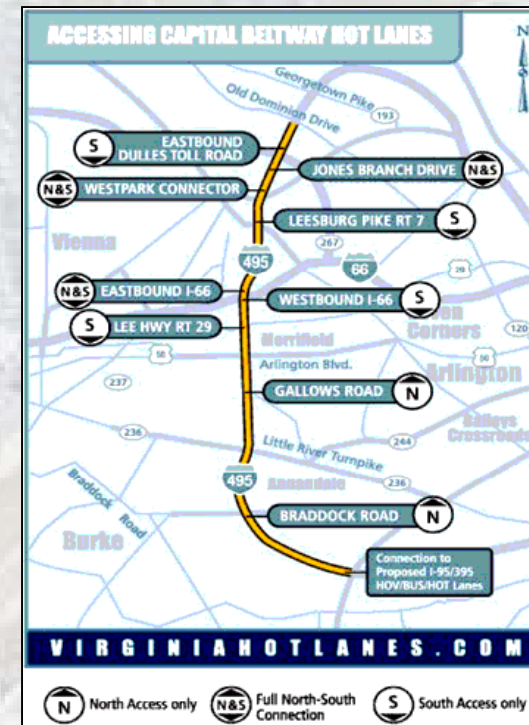


**Express Toll Lanes**  
*An Alternative to Gridlock*  
What are Express Toll Lanes and How Can They Help Deliver on the Promise of a More Mobile Maryland?



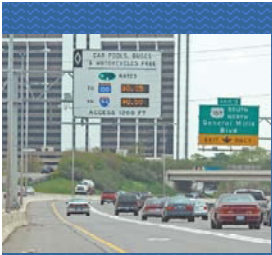
# Public Private Partnerships in Managed Lanes: Virginia I-495 Capital Beltway:

- VDOT project
  - 2 HOT lanes each way for 14 miles
  - No ROW needed
  - Direct connect ramps at interchanges
- Financing through concessionaire agreement



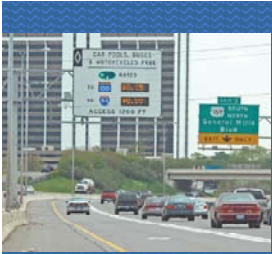
# Capital Beltway HOT Lanes Project (continued)

- The concessionaire is using toll revenues to be collected on the HOT lanes to finance approximately \$1.5 billion of the project's expected cost of approximately \$1.9 billion
- The financing package includes:
  - \$588 million loan from the USDOT's TIFIA program
  - \$589 million in private activity bonds authorized by USDOT
  - \$350 million in private equity from the members of the concessionaire
  - \$409 million funded from Federal-aid and State sources



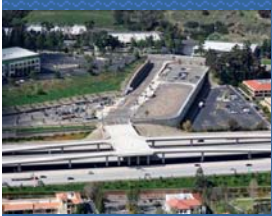
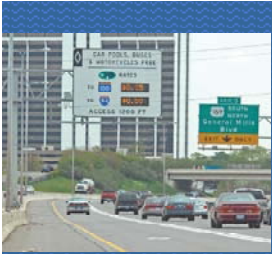
# Enforcement is a vital partner

- HOT Lane enforcement requires visual inspection in vehicle to count occupants and/or to determine if a toll has been paid
- Technology has been used effectively to assist law enforcement activities
- Revenue from project can support enhanced enforcement activities



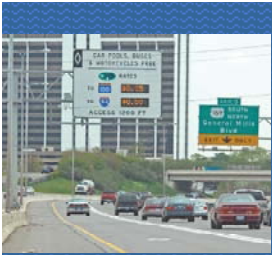
# Where we are going

- Growth: 6000 lane-miles by 2020
- Toward real-time management: 24/7 operations and higher minimum occupancies (largest cities)
- More reliance on automation
- Different goal-based outcomes: conversions vs. new capacity
- Diverse sponsors, new management and delivery approaches



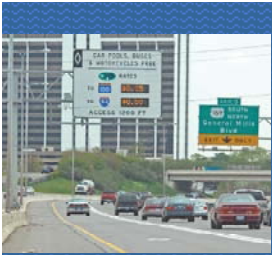
# Where are we going

- More mega-projects: dual roadways, regional systems, better connectivity
- More transit coordination/redundancy
- More customer focused



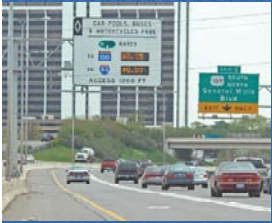
# New ideas

- Priced Dynamic Shoulder Lane
- Tolloed Busways
- Arterial Managed Lanes
- Tolloed Ramp Bypass



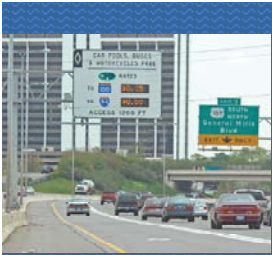
# Priced Dynamic Shoulder Lane

## I-35 W Minneapolis, MN

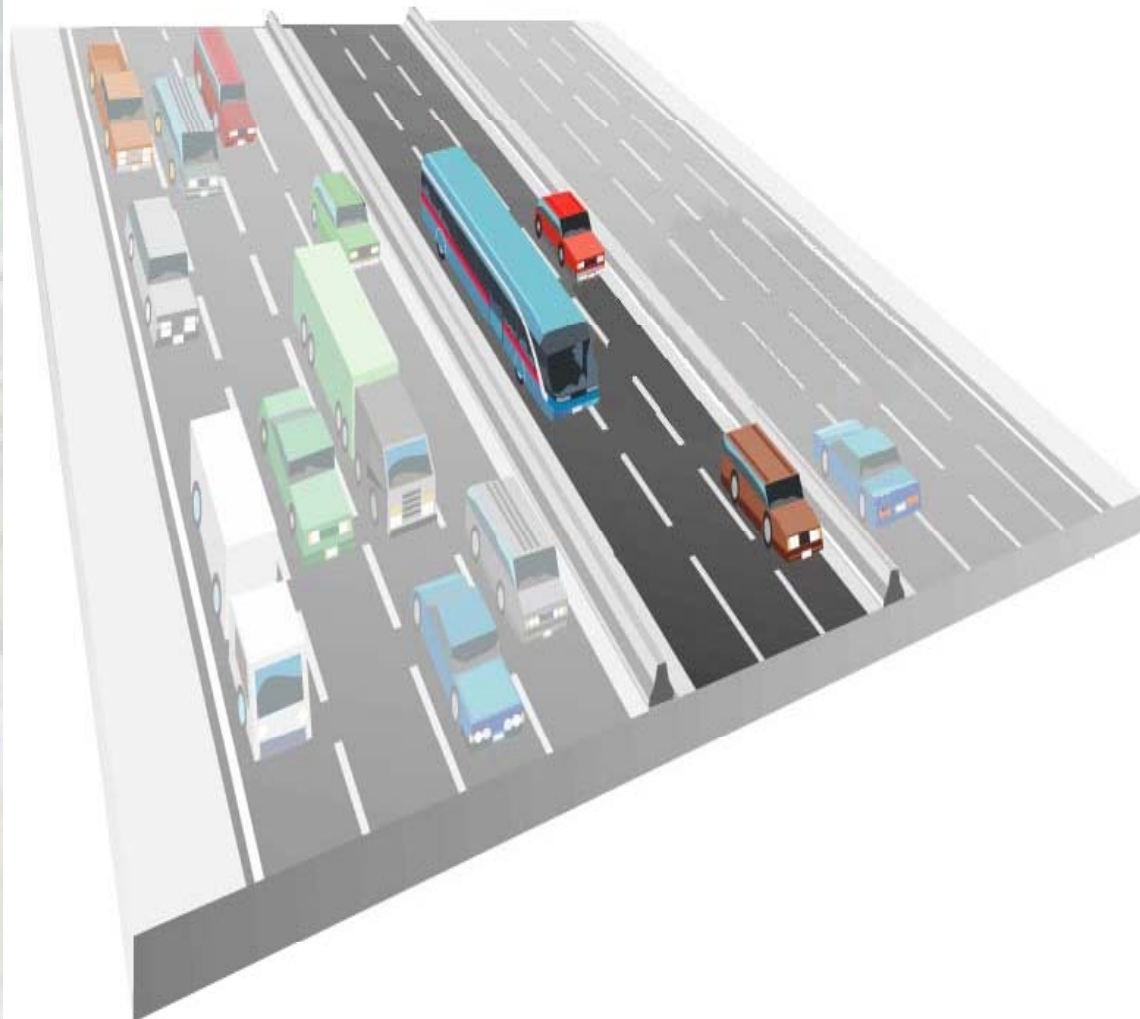


# Priced Dynamic Shoulder Lane

## I-35 W Minneapolis, MN

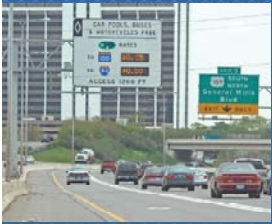


# Bus Toll Lane

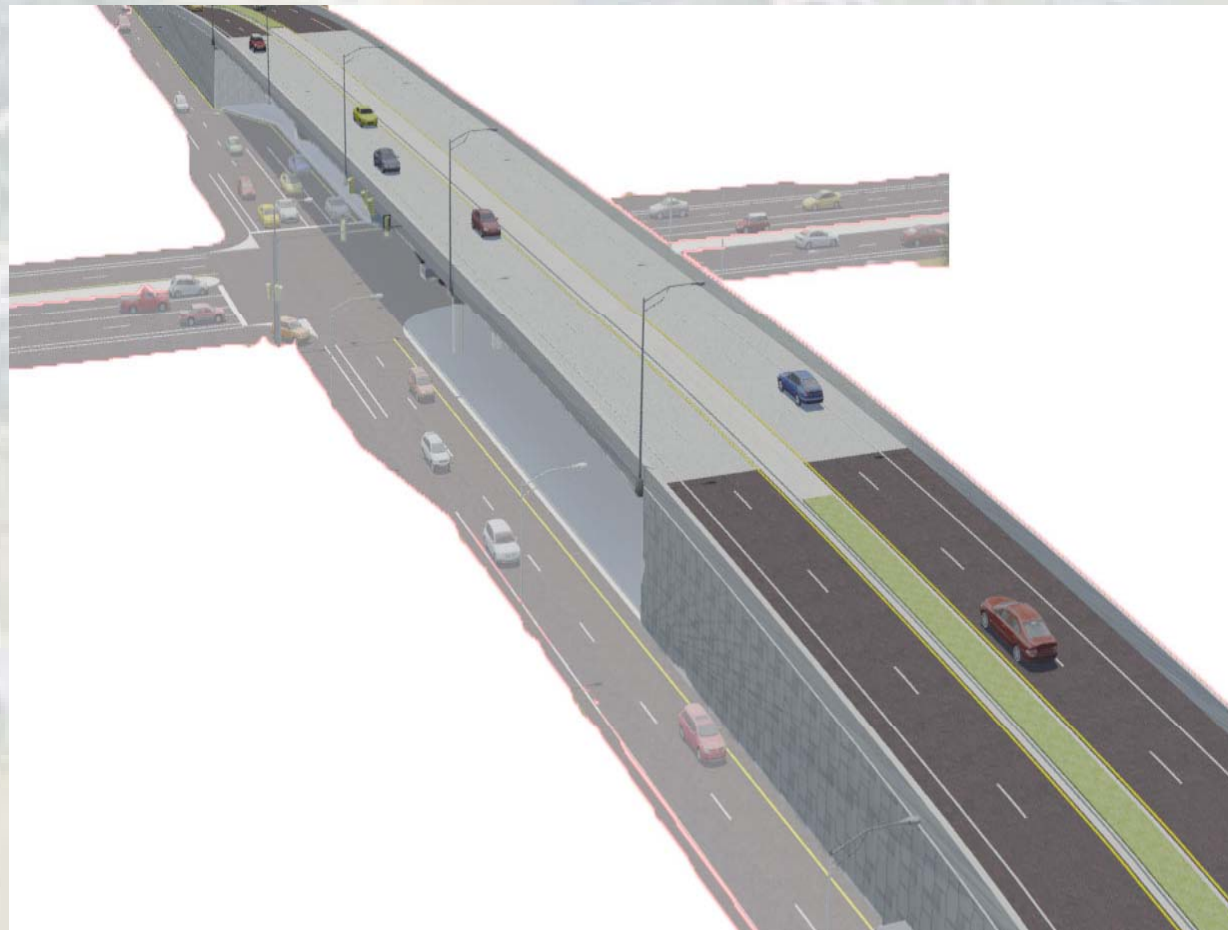
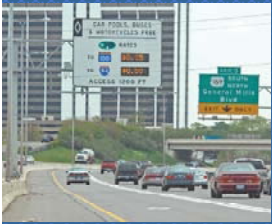


# Bus Toll Lane

- ❑ New capacity (not HOV conversion)
- ❑ Barrier separated lanes using existing public ROW (where feasible)
- ❑ Dedicated 1<sup>st</sup> to public transit
- ❑ Sell ALL remaining capacity
- ❑ Use price management to guarantee free flow conditions

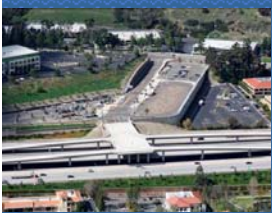
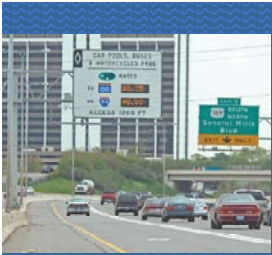


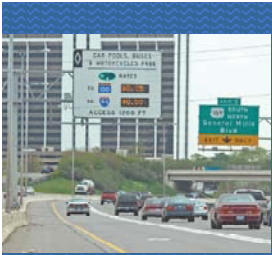
# Managed Arterials



# Managed Arterials

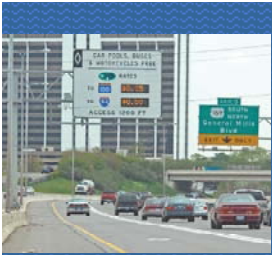
- ❑ Recognize intersections are the “controlling element” for arterial capacity
- ❑ Use priced grade separation to bypass traffic signals **(and as toll collection point)**
- ❑ May be over or underpass
- ❑ Excellent tie in with BRT or Local Transit Service





# Issues to face

- Adopting the latest technology
- Operational and design flexibility
- Enforcement
- Balancing modal needs
- Agency resources and policy consensus
- Consistency of practice
- Public and political support (and level of engagement)
- Using performance monitoring/reliability
- Funding and financing
- Embracing different approaches for different goals



# Questions?

Greg Jones  
Transportation Operations Specialist  
FHWA Resource Center – Atlanta  
E-mail: [GregM.Jones@dot.gov](mailto:GregM.Jones@dot.gov)  
Phone: (404) 562-3906