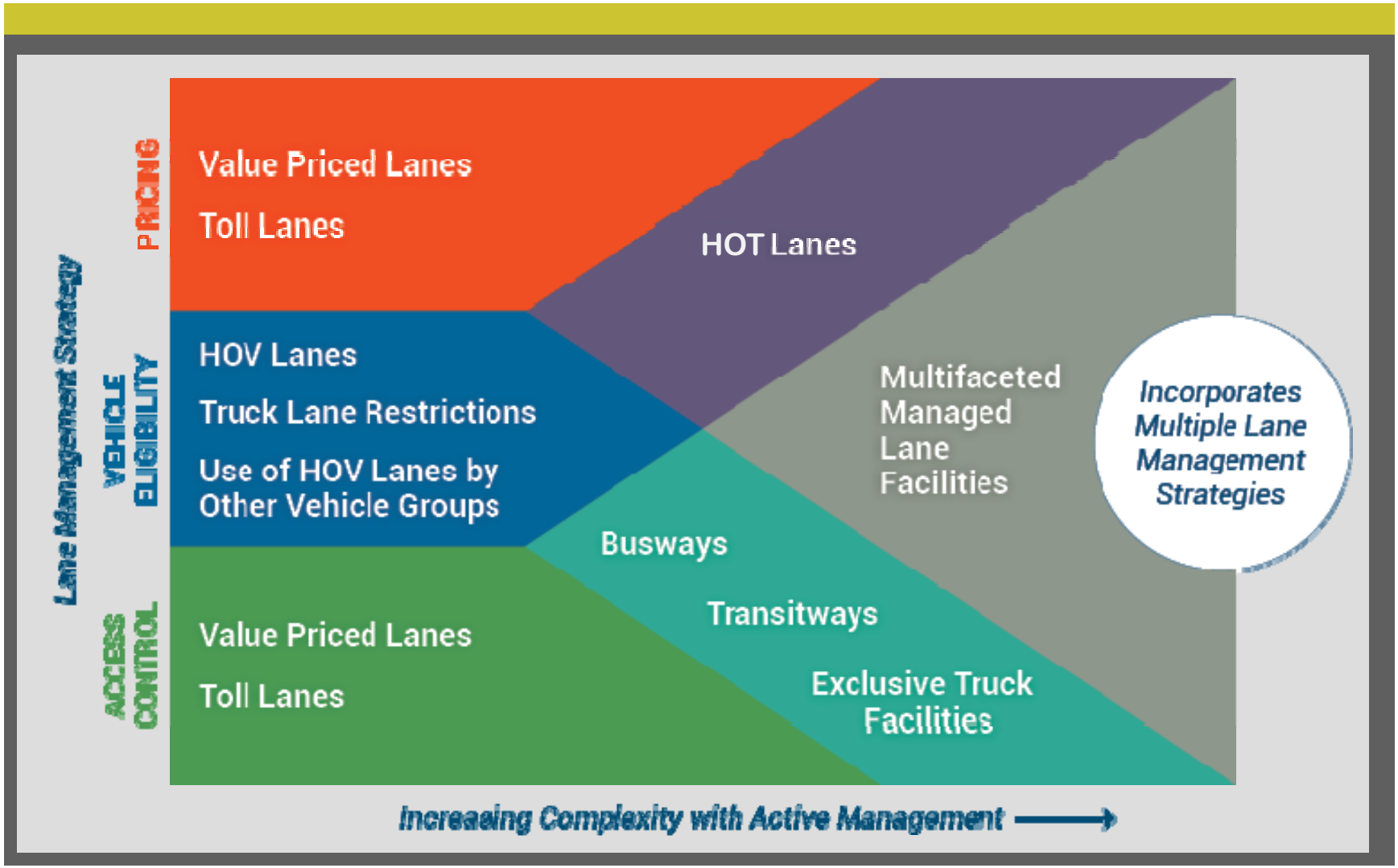
2015 FHWA Webinar
Managed Lanes

DEVELOPMENT OF PRICED MANAGED LANES

MATTHEW CLICK, AICP

HNTB 100 YEARS OF INFRASTRUCTURE SOLUTIONS

WHAT ARE MANAGED LANES?



HNTB

WHAT ARE MANAGED LANES?

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WHAT ARE PRICED MANAGED LANES?

- A tolled corridor inside of an existing road
- Congestion is managed with pricing

HNTB

WHO CAN USE PMLS AND WHO PAYS?

- Single Occupant Vehicles (SOV)
  - Cars
  - Motorcycles
  - Hybrids / Alternative Fuel Vehicles

- High Occupant Vehicles (HOV2, HOV3+)
- Transit Vehicles
  - Buses
  - Vanpools

- Trucks (3+ axles)

WHO CAN USE PRICED MANAGED LANES?

Priced Managed Lane Types	Vehicle Types				
	SOV	HOV2+	HOV3+	Transit	Trucks (3+ Axels)
HOT2+	●	○	○	○	X
HOT3+	●	●	○	○	X
ETL	●	●	●	○	X
TOT	X	X	X	X	●
Mixed ETL	●	●	●	○	●

○ - Free ● - Priced X – Not Allowed

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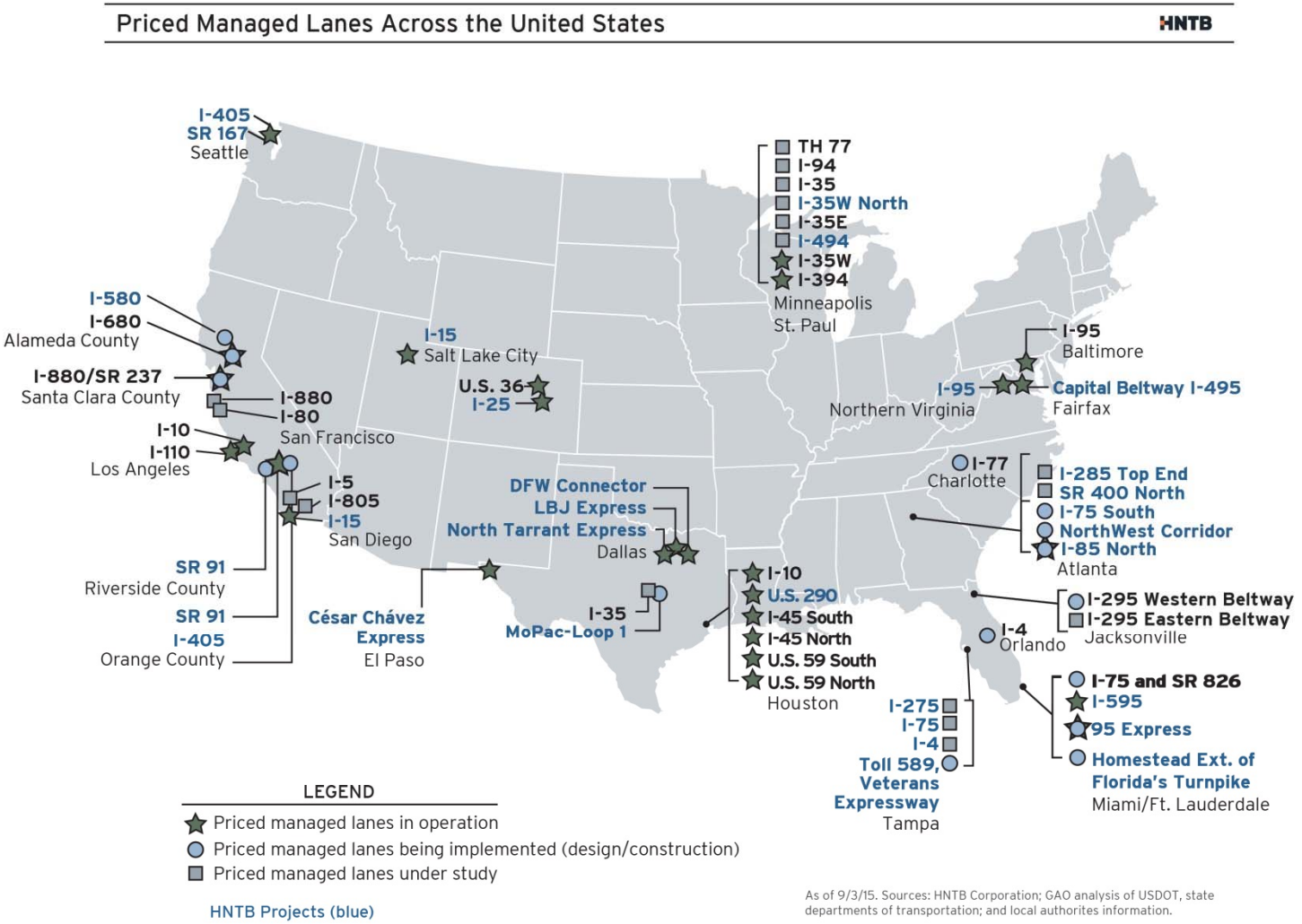
PRICED MANAGED LANES IN OPERATION



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WHAT ARE THE BENEFITS OF PMLS?

- Trip reliability
- Time savings
- Improved mobility
- Congestion management
- Revenue generation
- Reduction in capital costs

NATIONAL LESSONS LEARNED?

- Must have a “political champion”
- Engage the media and public early and often
- Address equity issues early in the planning process
- Multi-modal approach helps with public acceptance
- A system plan approach can help

FUTURE TRENDS IN PRICING?

- Dynamic pricing
- Less exceptions for “free” usgae
- More multi-faceted pricing schemes
  - Parking
  - Cordon
  - Area
- Mileage based pricing
  - VMT

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SR 167 HOT Lanes

Express Toll Lanes (version 1.0)







Tyler Patterson
Toll Lane Systems Operations Manager

Transportation Research Board
Managed Lanes and Congestion Pricing Committees
September 2015

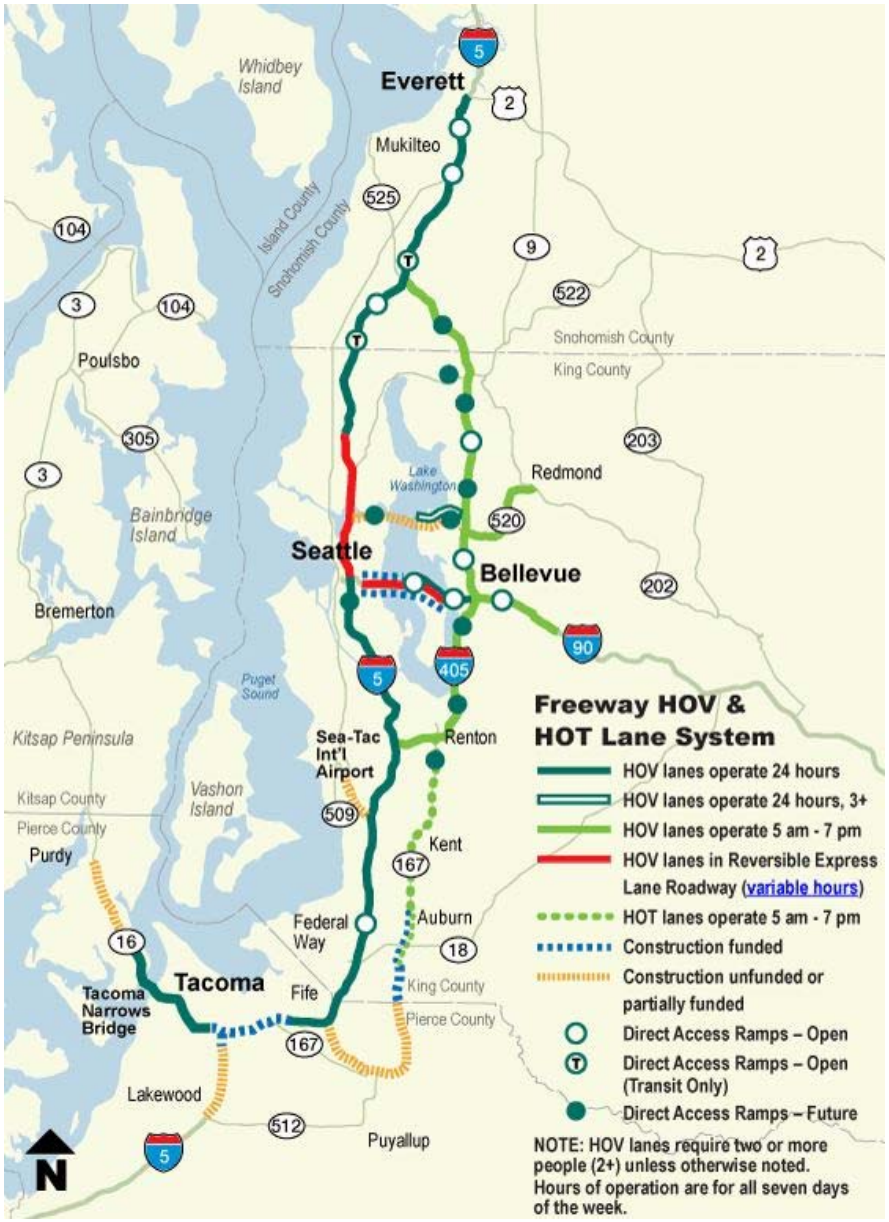
Washington State Department of Transportation

Overview

- WSDOT's HOV System
- Why High Occupancy Toll Lanes / Express Toll Lanes?
- Why did WSDOT choose SR 167?
- HOT Conversion and Early Operations
- Continuous Access on SR 167
- Current Operations
- What did we learn?
- Future of Express Toll Lanes at WSDOT

Washington's HOV system

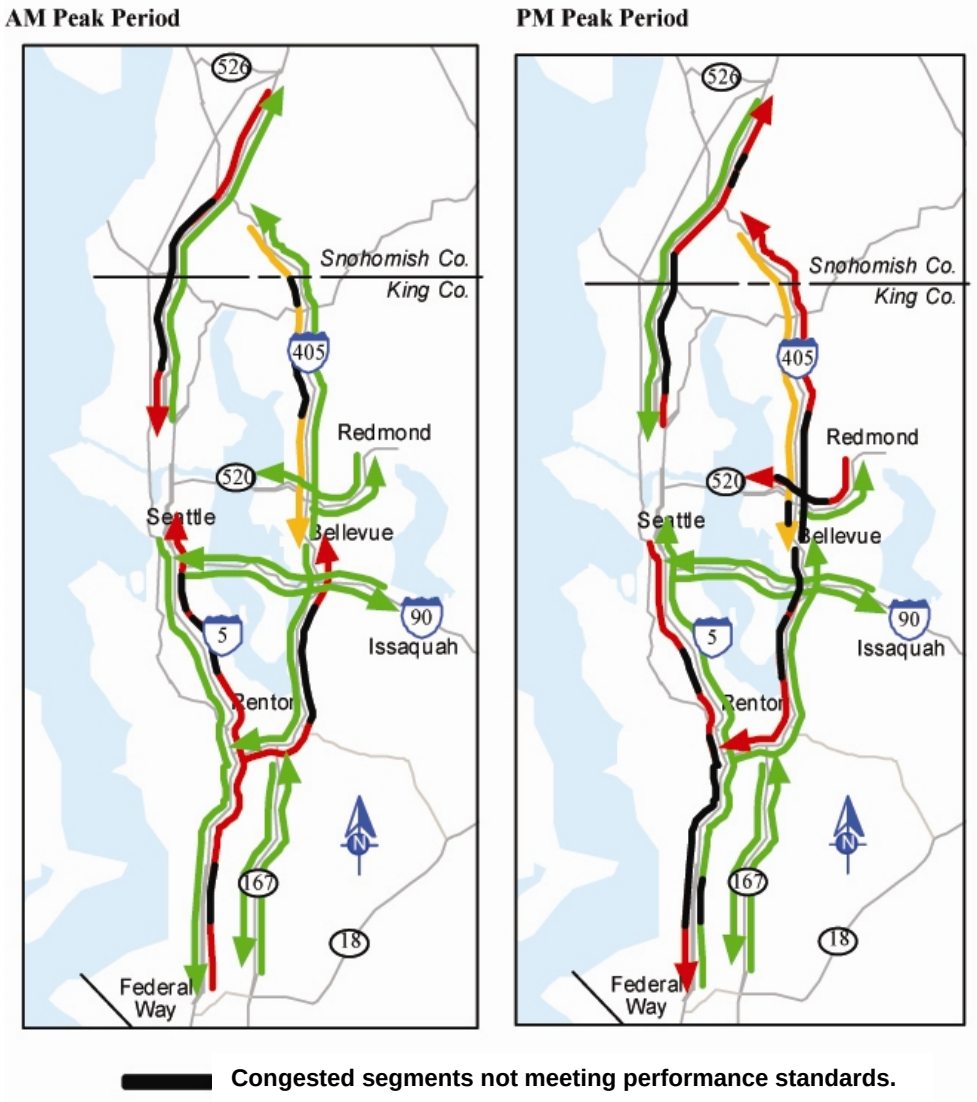
- 310 lane-mile HOV system
- Right-of-way for regional bus service while providing incentive to vanpool and carpool and avoid congestion
- Fully open (non-designated) access between the HOV lane and the adjacent general purpose lane.
- HOV lanes in the Seattle area are well-used and many fail to meet state and federal performance goals, particularly during peak periods.



HOV lanes designed to manage demand

Currently experiencing breakdowns

- **HOV asset:** Over $2 billion has been invested since the 1970s to build out a 300-mile HOV system in Central Puget Sound.
- **HOV congestion:** Lanes should operate at 45 mph 90 percent of the time during peak periods. Many HOV lanes currently don't meet this performance standard, as the 2+ HOV lanes are over-utilized.
- **HOV management:** Some HOV lanes are congested, some are underused.
- **Congested lanes mean inability to guarantee transit trips:** Bus service costs increase and require more coaches when trips are slow or unreliable.

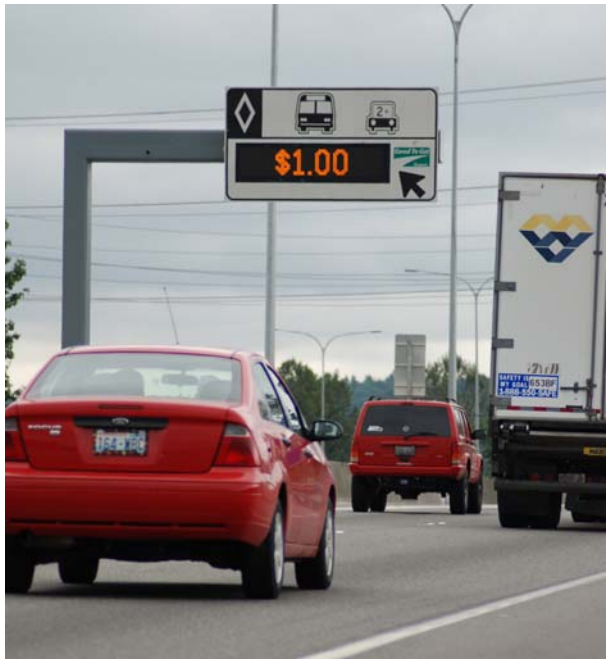


Why Express Toll Lanes?

- Express toll lanes were originally proposed as a means to achieve HOV speed and reliability standards needed to serve as an effective transit right-of-way and carpooling incentive

- Provides an opportunity to meet HOV objectives, while improving utilization and adding value for other users

- Express toll lanes provide tools to manage both vehicle and person throughput
  - Dynamic pricing manages vehicle flow and throughput
  - But HOV objectives focus on person-throughput, not just vehicles
  - Transit and carpool exemptions provide incentive to fill empty seats to maximize person throughput overall



Why did WSDOT choose SR 167?

- In 2002/2003 - WSDOT was looking for a corridor to act as "**proof of concept**" for HOT or Express Toll Lanes, so that we could add this valuable congestion management tool to our toolbox.

- *From the 2003 HOT Lanes Pilot Project Analysis:* Out of 310 HOV lane miles in the Puget Sound Region, WSDOT considered several HOV corridors as possible candidates for the HOT Lane Pilot project including:
  - I-405: SR 520 to I-5 (N)
  - I-5: I-405 (South end I-405 to I-90 junction)
  - I-90: I-405 to Issaquah
  - SR 167: between Renton and Auburn

- WSDOT chose SR 167 because of its characteristics, including:
  - Peak hour congestion
  - Available space in the 2+ HOV lanes (one of the only locations in the region where this was true)
  - Only minor improvements needed to implement HOT lanes (i.e. SR 167 there was roadway width to add a buffer within the current footprint)

HOV to HOT Conversion

Pre-conversion

(Prior to May 2008)

Post-conversion

(May 2008 – August 2014)

SR 167 HOT lane features

- Opened May 3, 2008
- Dynamic Toll Rates
- Free to buses and 2+ carpools
- Solo drivers pay a single toll to travel any distance on 10-mile route
- Electronic signs indicate toll rate at each entry point
- 10 access points
  - 6 Northbound
  - 4 Southbound

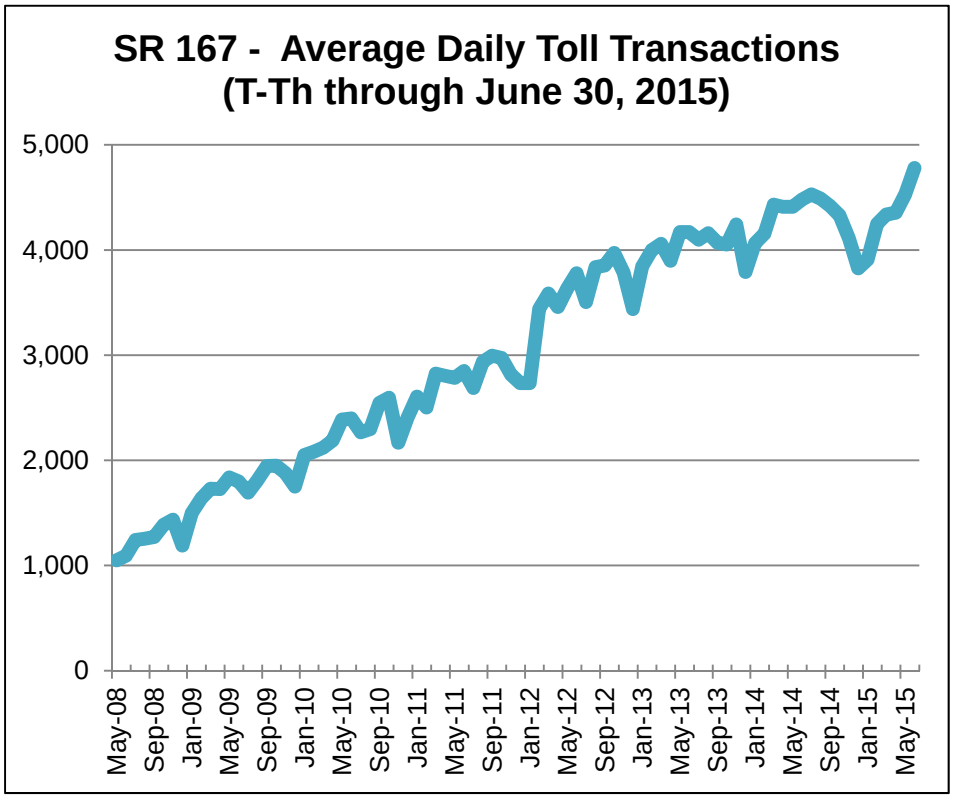
SR 167 HOT Lanes are meeting objectives

Objectives	Accomplishments
Free flow traffic	• HOT lanes speeds > 45 mph • Travel times more reliable
Reduced congestion	• Daily tolled volumes up • Corridor transit volumes up
Improved safety	• Average collision rate remains stable • Incident response time down
Demonstrated ability to finance improvements	• HOT lanes generating revenue to cover operating costs since April 2011
Equitable use of facility	• Annual surveys show both low and high income drivers use HOT lanes

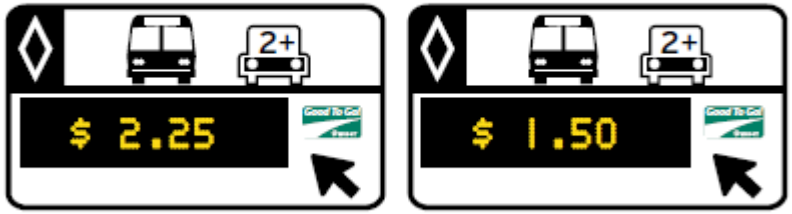
SR 167 HOT Lanes Performance Statistics

Fiscal year 2014

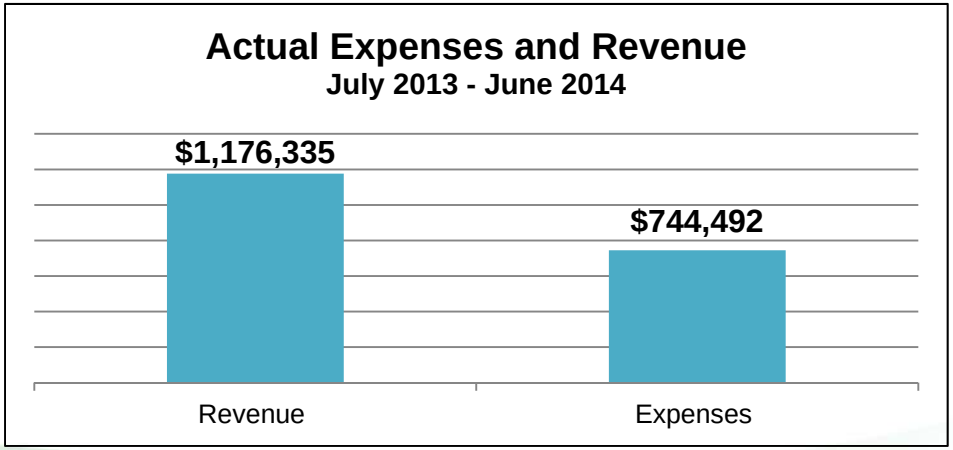
- 1.2 million gross toll revenue
- 4,400 tolled trips per weekday
    - Average daily tolled trips have more than quadrupled since opening
- Average 7 minutes savings for $2 toll
- Annual HOT lane revenue increased 3% over the previous year.



SR 167 Average Peak Hour Toll Rates for FY 2014



Northbound AM (7-8 a.m.) Southbound PM (4-5 p.m.)



SR 167 HOT Lanes Performance Statistics

HOT Lanes are saving people time

The northbound HOT lanes provided weekday drivers with an average time savings of eight minutes during the morning peak hour for an average toll of $2.25. In the afternoon peak hour, the southbound HOT lane provided weekday drivers an average savings of six minutes for an average toll of $1.50.

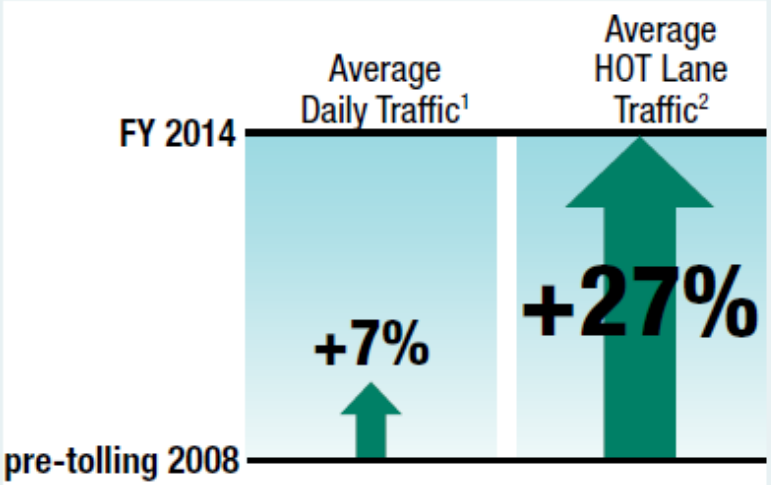
More drivers are using the HOT lanes and saving time.

	Tolled Trips[1]	Average Toll Paid[2]	Travel Time Savings[3] Northbound	Travel Time Savings[3] Southbound
June 2008	1,000	$1.00	8 Minutes Saved	4 Minutes Saved
June 2013	4,200	$1.25	9 Minutes Saved	6 Minutes Saved
June 2014	4,500	$1.25	8 Minutes Saved	6 Minutes Saved

[1]Tolled trips per weekday (Tuesday - Thursday)
[2] Average toll rate (Tuesday - Thursday)
[3] AM Peak (7-8am) PM Peak (4-5pm); Savings = HOT lane vs. general purpose lane

Source: WSDOT Toll Operations

More people are choosing HOT lanes



[1] Weekday traffic (Tuesday - Thursday); All lanes
[2] Weekday traffic (Tuesday - Thursday); HOT Lane only

Source: WSDOT Toll Operations

SR 167 HOT Lane Access Changes

- **Per 2012 survey, 40 percent wanted easier access**

"Sometimes it is hard to exit the HOT lanes to make your exit off 167 due to the double line restriction. There should be access points prior to each exit." – survey respondent

"Too many drivers violating the double white line crossing restrictions without any apparent penalties. Creates a real safety hazard." – survey respondent

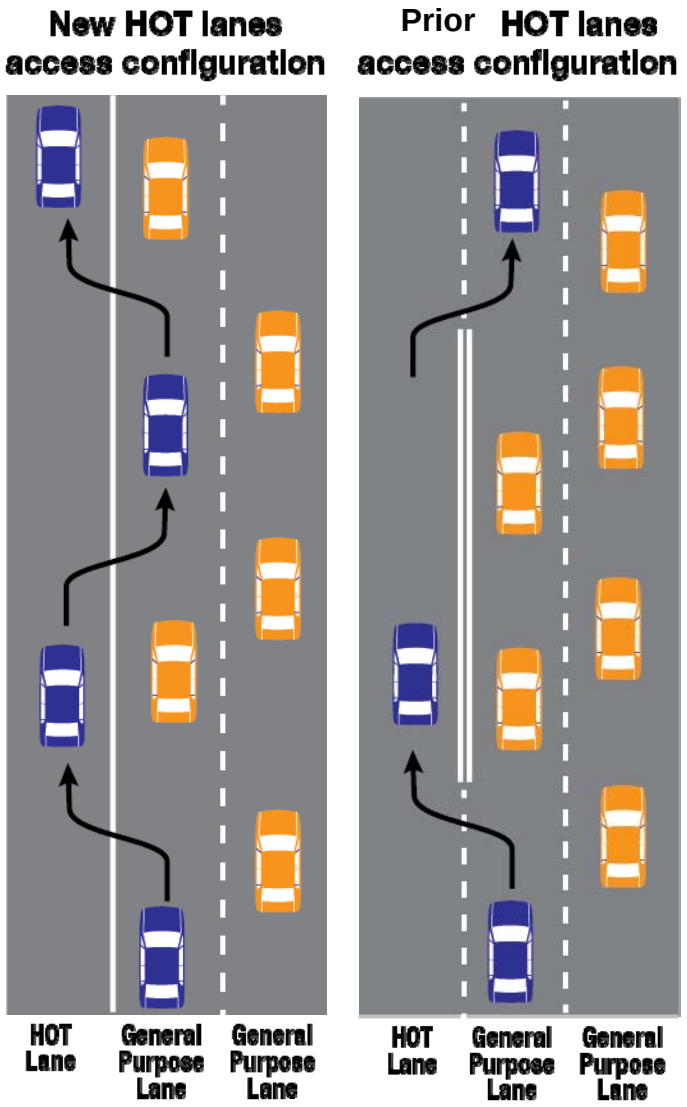
"We have seen already that dedicated access points can make it difficult for transit to use if not located appropriately…a continuous access treatment would remove this uncertainty for transit." – Sound Transit

"Our members have indicated that the number one complaint they have received for the SR 167 HOT Lane Pilot Program is the access control restrictions." - PSRC

SR 167 HOT Lane Access Changes

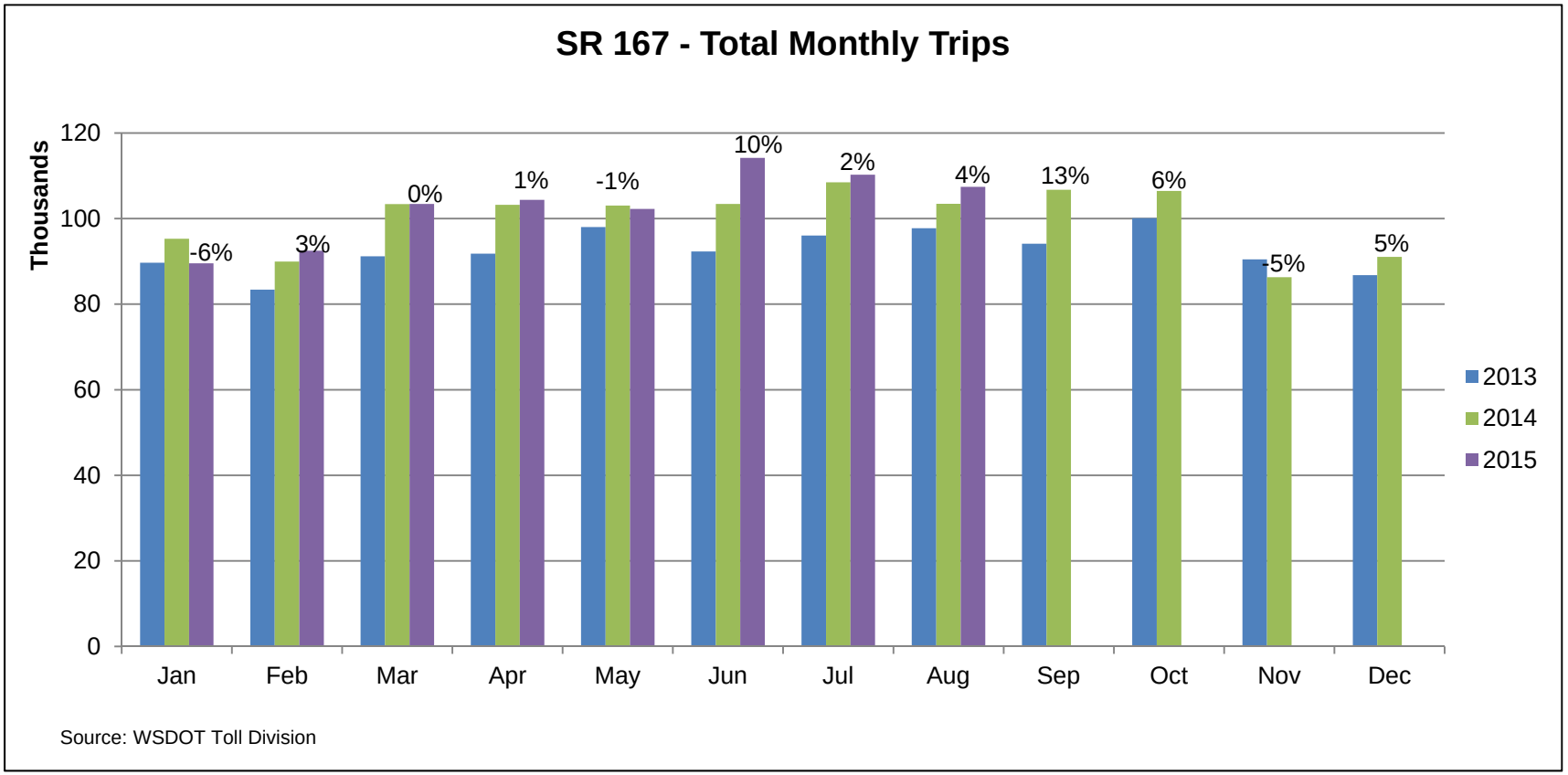
WSDOT removed the double white lines during August 2014

- Speeds are maintained, even during peak hours
- Drivers have an easier time accessing the HOT Lanes
- Increase in HOV usage in the HOT Lanes
- Initial results showed that the algorithm was not reducing the rate quickly enough once volumes and speeds recovered after the peak hour.
  - The algorithm was adjusted on December 4, 2014 allowing toll rates to step down at a faster rate



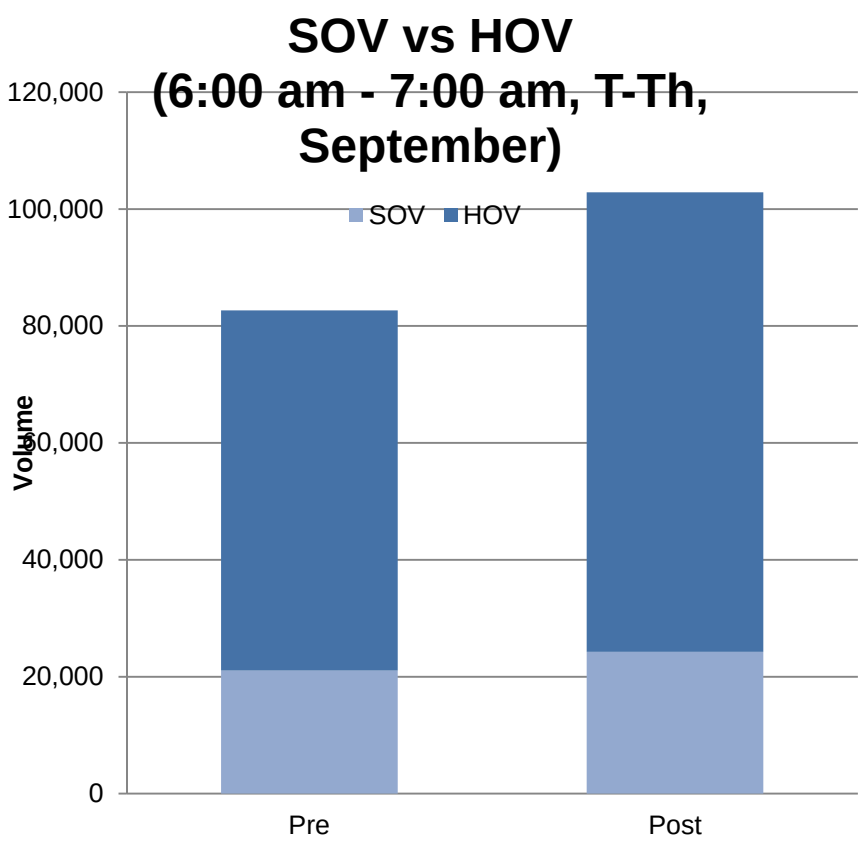
SR 167 HOT Lane Access Changes

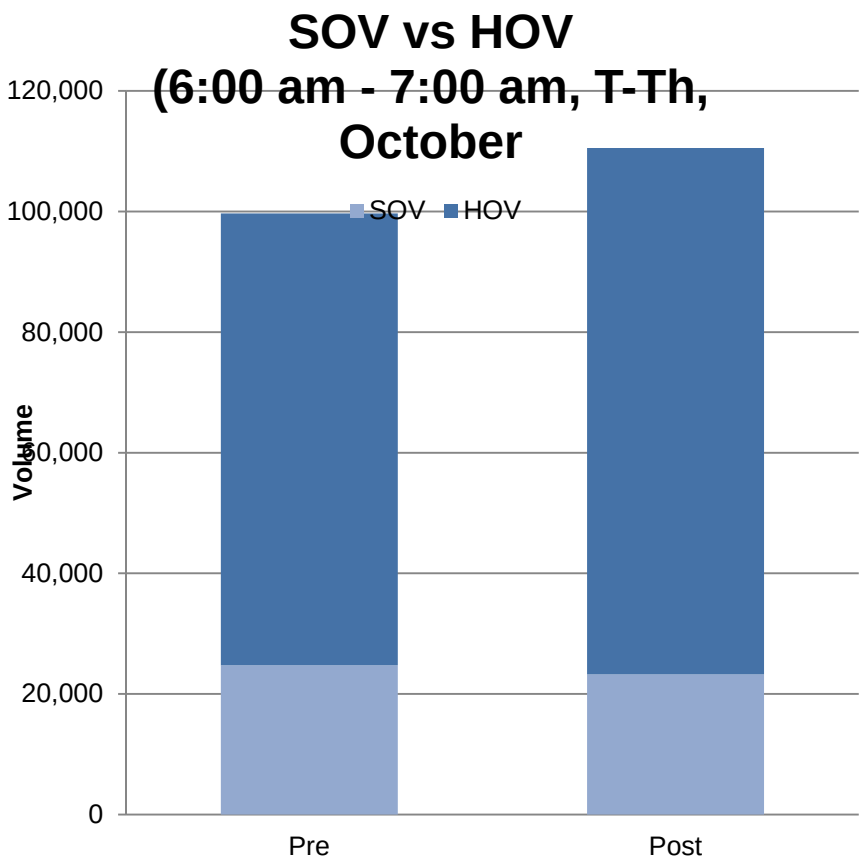
- Continues to show monthly growth in toll transactions



SR 167 HOT Lane Access Changes

- HOV users have increased where SOV users remain relatively constant





Project assessment

WSDOT reports to the Legislature and the Transportation Commission annually, on such items as:

a. Freeway efficiency and safety;
b. Effectiveness for transit;
c. Person and vehicle movements by mode;
d. Ability to finance improvements and transportation services through tolls;
e. The impacts on all highway users. The department will analyze aggregate use data and conduct, as needed, surveys to assess usage of the facility with geographic, socioeconomic, and demographic information.

What did we learn from the SR 167 Pilot Project?

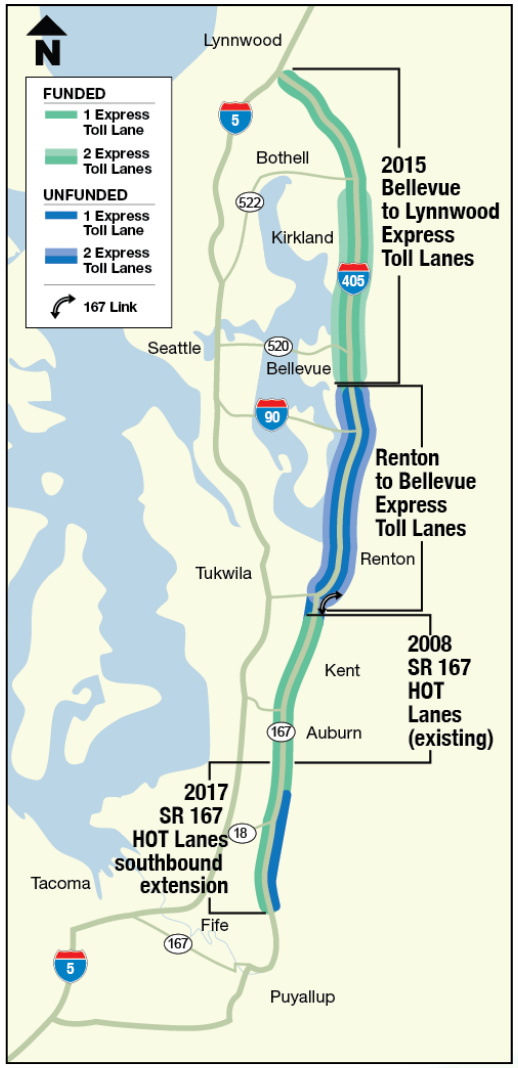
- Version 1.0 – proven the concept for drivers in Washington State
  - We can point to a successful project in our own region.
  - We've proven the technology works.
  - We've proven there is a real operational benefit to our drivers.
  - Earned public support for other projects

- Pilot status is an advantage
  - We've gone over 7 years on a 4 year pilot.
  - We've been able to take advantage of the pilot status to study continuous access, learn and grow our program.

- Tolling is a program, not just a project
  - Operate the lane everyday.
  - The DOT is shifting from builders to operators.

Express Toll Lane Program (Version 2.0)

- **WSDOT has plans for a 40-mile system Express Toll lane system on our Eastside corridor.**
  - 17 miles of express toll lanes on I-405 from NE 6th Street in Bellevue to I-5 in Lynnwood will open to traffic on September 27th!
  - An extension of the SR 167 system in the southbound direction will open in 2017.
  - The connection between the two systems was just funded by Washington State Legislature.



For more information

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San Diego's I-15 Corridor Managed Lanes

TRB Webinar on HOV Pricing
September 17, 2015

SANDAG San Diego Association of Governments

Managed Lanes:
In the Beginning

- I-15 HOV Express Lanes - 8-mile, two-lane, reversible facility
- Opened in 1987 to HOV only

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I-15 Express Lanes: Issues

- By early 1990's, 2-lane HOV facility was still underutilized; pressure to open to SOVs
- Suburban city mayor wanted funding to increase transit service in corridor
- Interest locally in implementing pricing, but also opposition to "double taxation"

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I-15 Express Lanes:
The Opportunity

- New federal authorization bill had Congestion Pricing Pilot Program (1995)
  - Was able to secure $9 million grant
- Suburban city mayor championed project
  - Lead effort to secure approval from state legislature when he became State representative

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I-15 Express Lanes:
Congestion Pricing Demo Program

Goals:

- Increase operating efficiency of both Express lanes and main lanes
- Gauge consumer acceptance of concept of paying to bypass congestion
- Test subscription pricing elasticity initially, with idea of moving to dynamic pricing
- Provide funding for increased transit in the I-15 corridor

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I-15 Express Lanes:
Congestion Pricing Demo Program

Framework for Planning:

- First agency to test pricing (1996)
- Focus was on pilot project
- Had political champion
- Evaluation was kept simple

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I-15 Express Lanes:
Congestion Pricing Demo Program

Planning Evaluation:

- Measure impacts on traffic in Express Lanes and main lanes
  - LOS/HOV Lane integrity
  - Time savings
  - Operational safety
- Measure consumer acceptance
  - Market research
  - Subscription pricing/variable pricing elasticity
  - Toll revenue potential
- Assess enforcement methods

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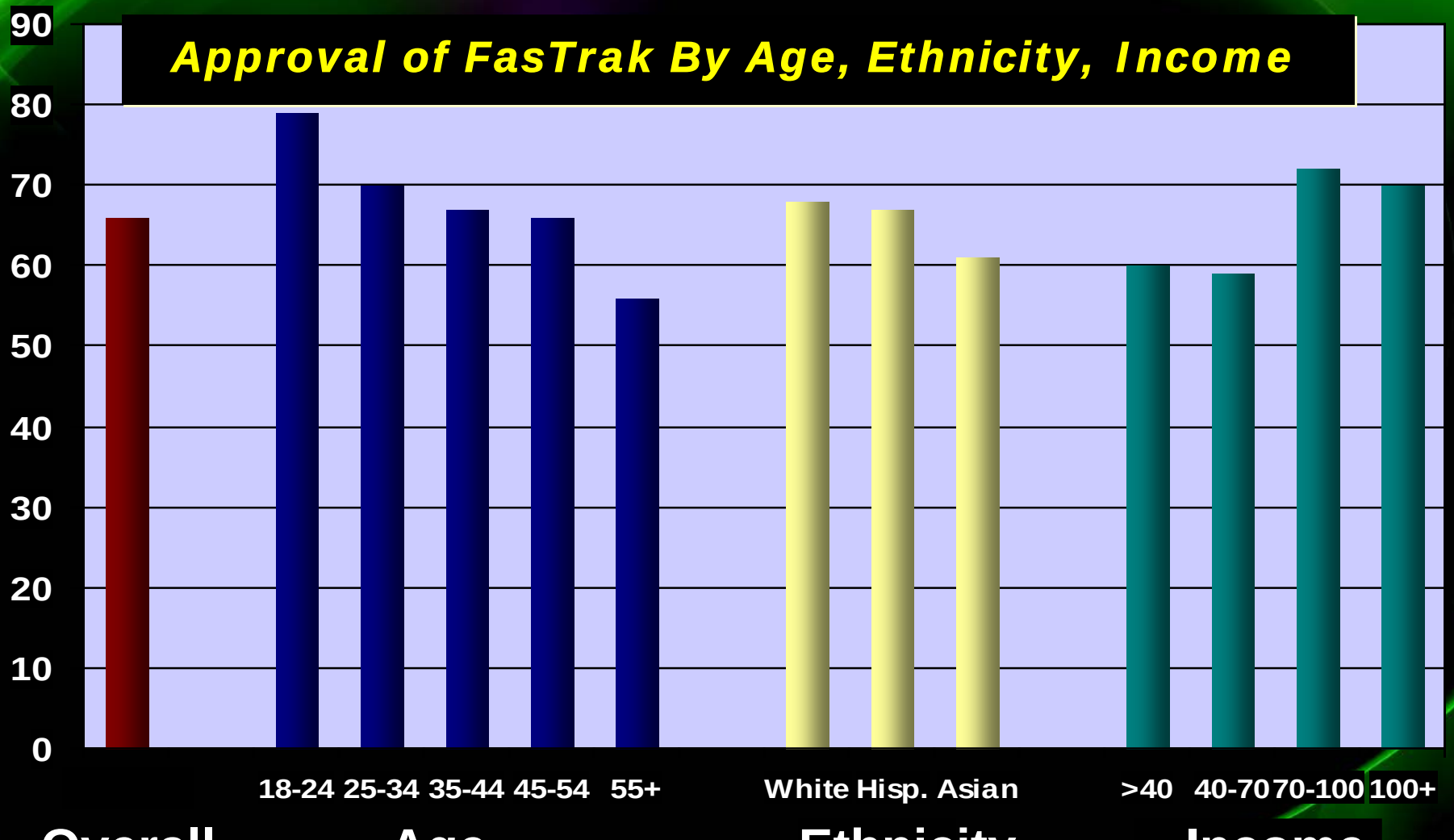
I-15 Pricing Results: Strong Community Support



I-15 Pricing Results: Community Support

- Focus was not on raising revenues, but rather:
  - Increasing transit
  - Maximizing person throughput
- Reinvestment of toll revenues into transit countered "Lexus Lane" issue
- Pricing provided "advertisement" for value of carpooling/vanpooling

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I-15 Pricing "Ah-Ha" Moments

- Pricing led to increase, not decrease, in carpooling/vanpooling
- Lexus Lane issue dissipated quickly
- Most SOVs utilize HOV lanes occasionally
- Residents in corridor embraced pricing and new transit as creating "new travel choices"

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Pricing - Where Are We Now?

- Expansion of I-15 Managed Lanes into 20-mile Managed Lanes/Bus Rapid Transit facility

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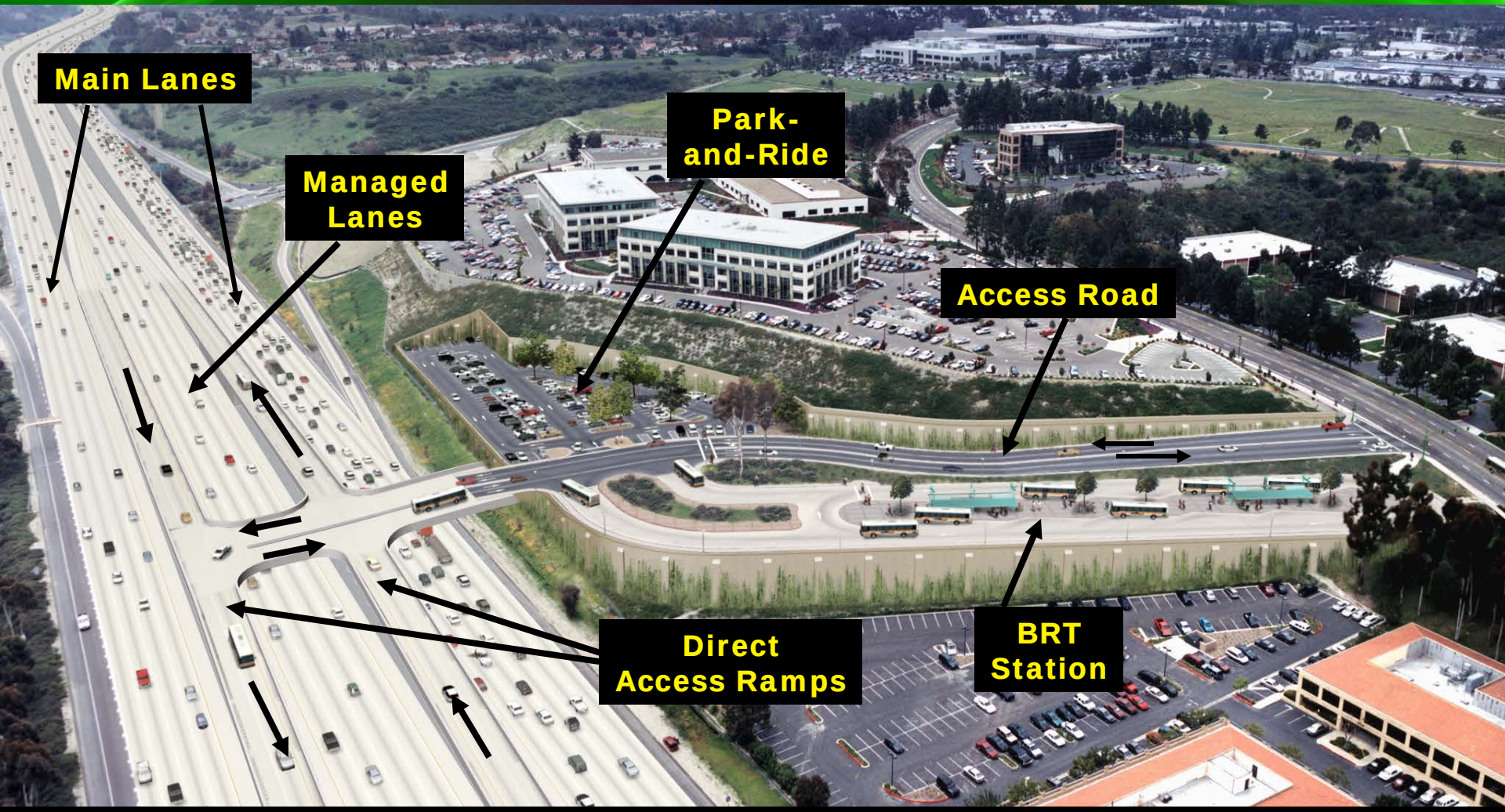
I-15 Managed Lanes/ Bus Rapid Transit Concept



Direct access ramps open to BRT, carpools, and SOV buy-in users.

Pricing - Where Are We Now?

- Expansion of I-15 Managed Lanes into 20-mile Managed Lanes/Bus Rapid Transit facility

- Long Range Regional Transportation Plan calls for regional network of Managed Lanes
  - Transit and carpooling/vanpooling equally important in focus on increasing use of alternative modes

- Managed Lanes projects under development in two additional corridors

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I-15 Managed Lanes:
Lessons Learned

- Had elected official as project champion
- Were in the right place at the right time
- Reinvested toll revenues in transit in corridor
- Started out slowly with pilot project = low risk

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San Diego's I-15 Managed Lanes

Dave Schumacher, Principal Planner
dsc@sandag.org

SANDAG San Diego Association of Governments

DEVELOPMENT OF PRICE-MANAGED LANES:

Florida's Approach to Relieving Congestion and Increasing Choice

95 EXPRESS

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FDOT

Florida Department of Transportation

- Decentralized Agency – Seven Districts + Turnpike
- $8.5 Billion Average Annual Funding (FY 2016-20)
  - ✓ Nearly 10,000 projects
  - ✓ Nearly 20,000 project phases
- Highly Privatized Project Delivery
  - ✓ Construction 100%, CEI 90%
  - ✓ Maintenance 85 – 90%
  - ✓ Planning and Design 75 – 85%

PROBLEM and CONTEXT

- The Problem
  - ✓ AADT of nearly 300,000
    - Projected to increase to 360,000 by 2030
  - ✓ Severe congestion, unreliable travel times
    - General purpose lane speeds ~ 15 – 18 MPH
  - ✓ HOV lane performance & degraded transit service
    - HOV lane speeds ~ 18 – 20 MPH
  - ✓ Physical & political constraints to widening
  - ✓ Costly traditional solutions
  - ✓ Limited Choice

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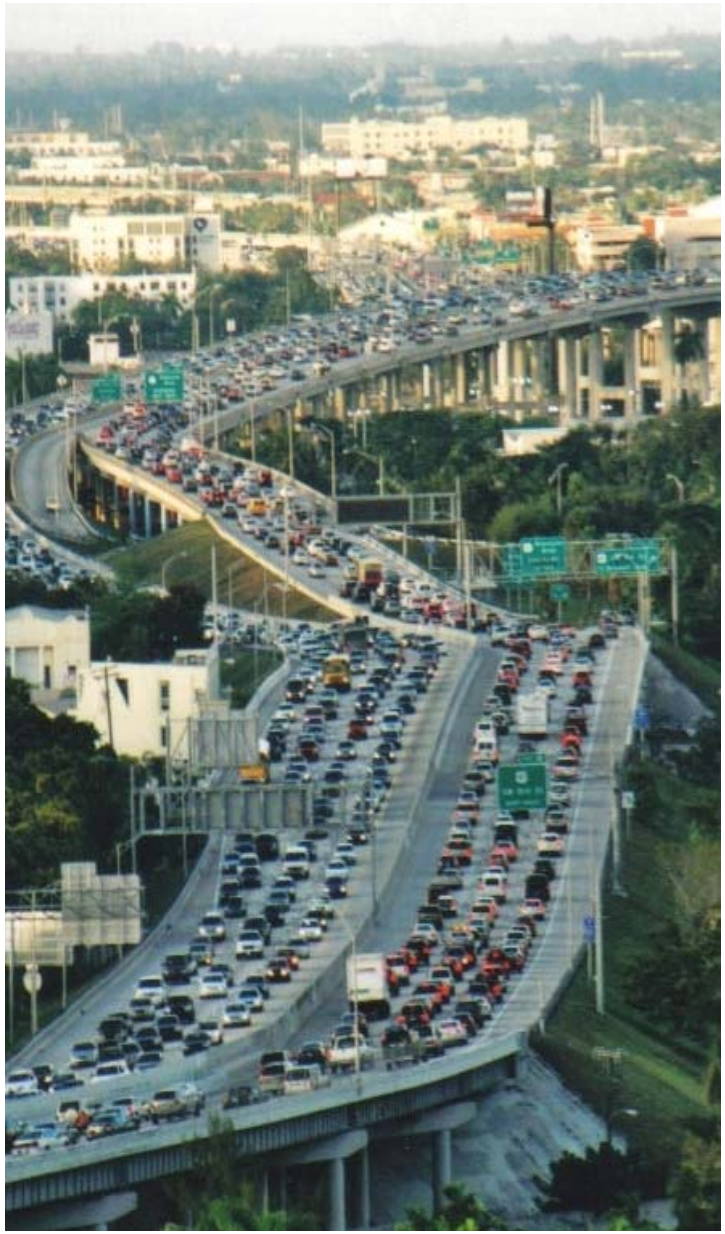
PROBLEM and CONTEXT

- The Context
  - ✓ Commuter corridor
  - ✓ Established transit use with heavy demand
  - ✓ Well-established Commuter Assistance & Ride-sharing programs
  - ✓ Acceptance of tolls
  - ✓ Strong political advocacy for transit



THE SOLUTION

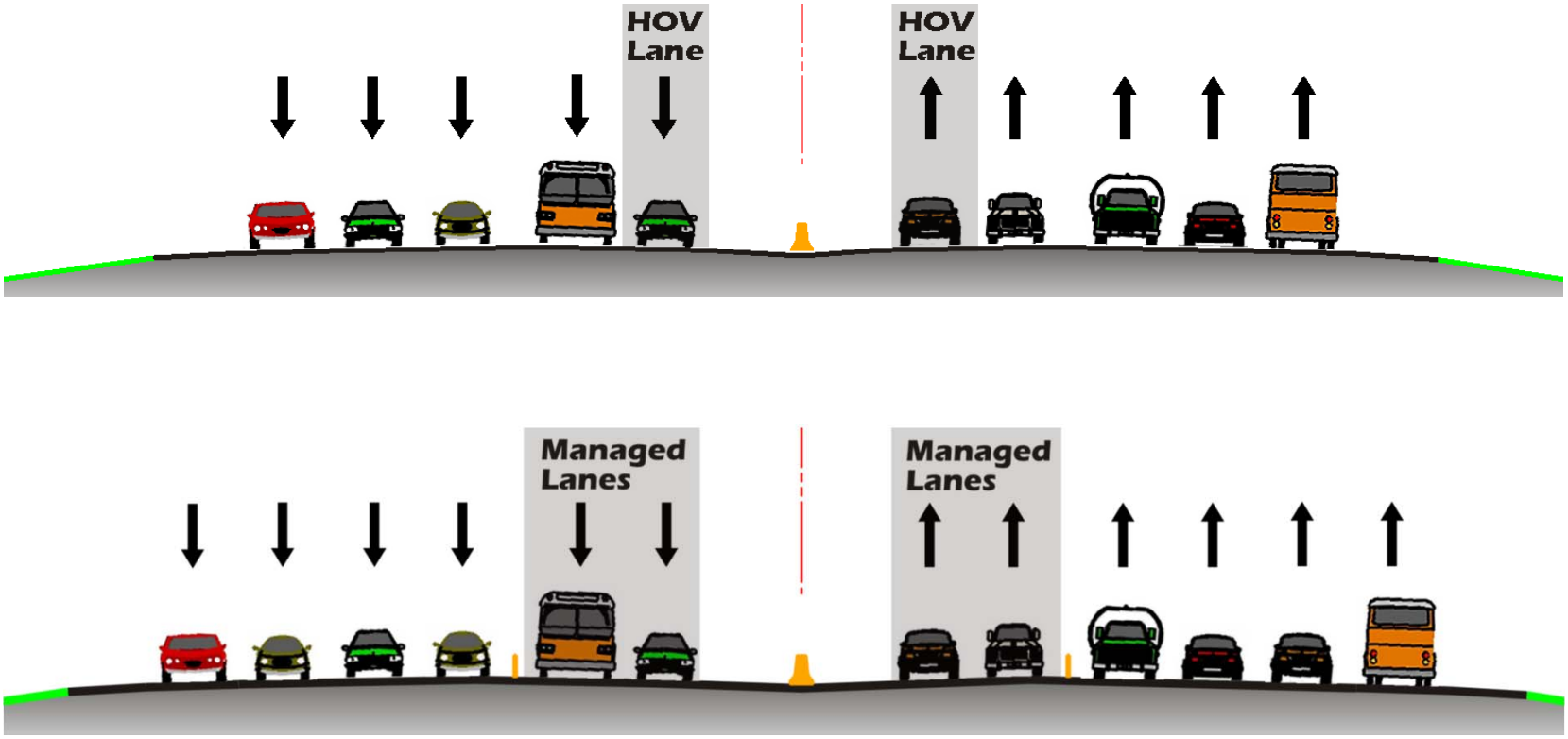
- USDOT Urban Partnership Agreement
  - ✓ Tolling, technology, transit and travel demand
    - Provided funding & encouraged innovation
  - ✓ Rapid delivery
    - Built upon previous efforts
    - Accelerated schedule
  - ✓ Pilot project
    - Relatively low cost
    - Existing infrastructure

PROJECT OVERVIEW

- Manage capacity & relieve congestion
- Increase choice
- Improve trip reliability & travel times
- Minimize impact

PROJECT OVERVIEW

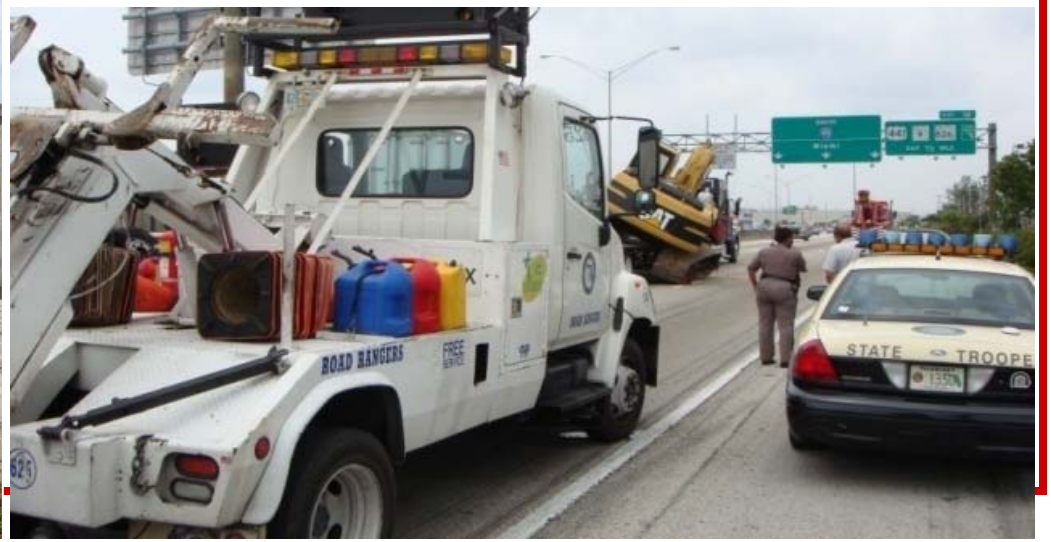
- New capacity, same footprint
  - ✓ Lane & shoulder width reductions



PROJECT OVERVIEW

- Transit Improvements
  - ✓ Regional agreements
    - Eliminated transfers
  - ✓ Signal priority
- Electronic Toll Collection (SunPass®)

- Complementary Strategies
  - ✓ Carpool registration
    - Verified and renewed regularly
  - ✓ Enhanced enforcement
  - ✓ Rapid incident response
  - ✓ Ramp metering



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PERFORMANCE

- Project Success Defined
  - ✓ The attainment of a particular goal or set of goals within the context of specific parameters
    - Did 95 Express work as expected and what are the performance metrics?
  - ✓ The ability to influence, through demonstrated achievement (proof of concept), the adoption of new and bigger goals including metrics for the measurement of their achievement
    - How did 95 Express influence Florida's policy and pursuit of Express Lanes elsewhere ?

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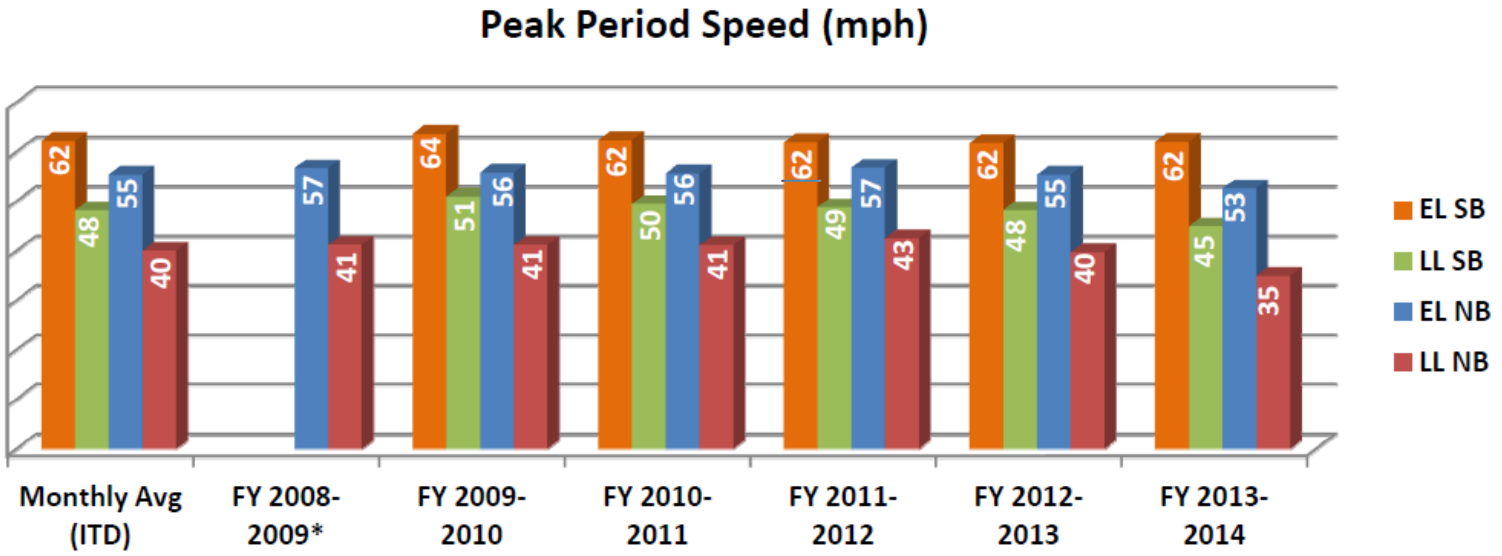
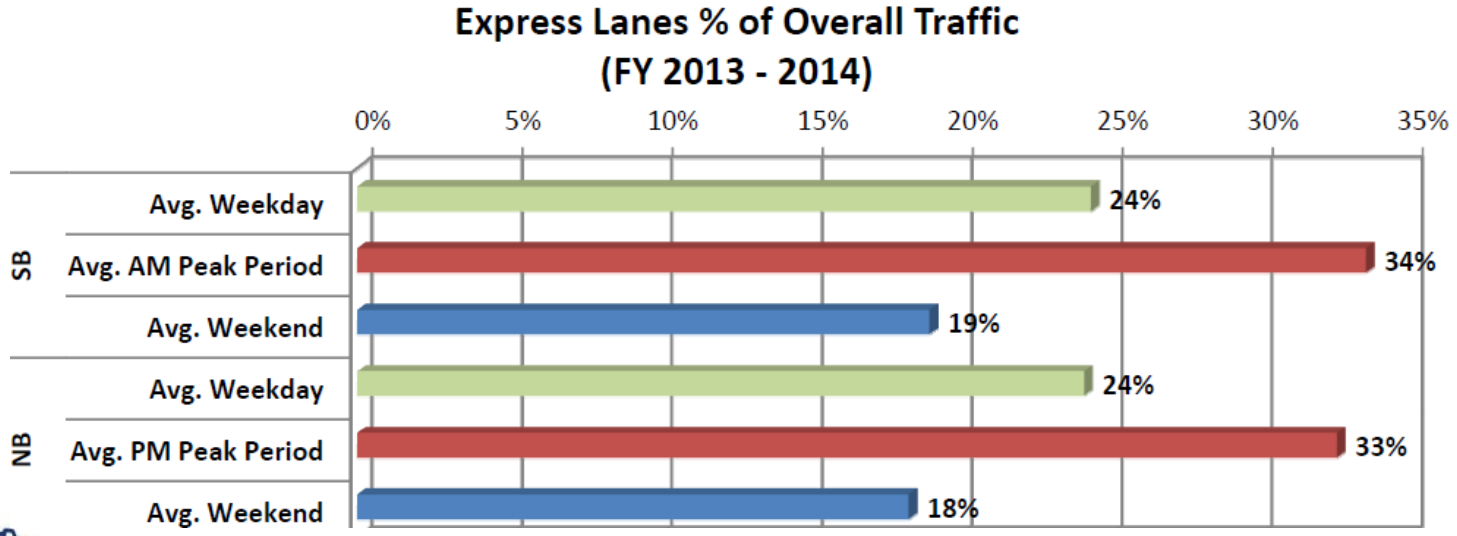
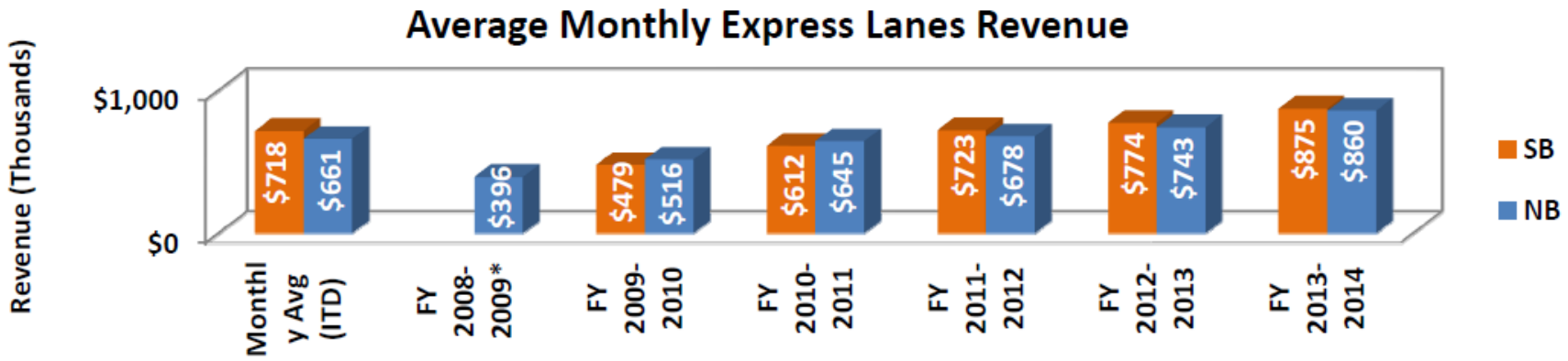
PERFORMANCE





PERFORMANCE



- Transit
  - ✓ More than double the number of passengers
    - Added routes
    - Average weekday boarding nearly 6,000
  - ✓ Funding
    - O&M support
    - Replacement buses

PERFORMANCE

- There will be set-backs
  - ✓ Plan for them ahead of time
  - ✓ Identify resources to respond
  - ✓ Prepare your partners

Sun-Sentinel.com

August 1, 2008

Search Go

Classifieds
- Place an ad
- Find a job
- Find a car
- Autos A-Z
- Find real estate
- Find rental properties
- Shopping
- Dating
- Pets

Text size:

Crash course: New I-95 express lanes make rush hour crawl

Confusion reigns on I-95 after new express lanes with plastic poles are installed. The result: Accidents and slowdowns at rush hour.

By Michael Turnbell | South Florida Sun-Sentinel

Posted on Monday, Jul. 14, 2008

For now, I-95 experiment an express lane to chaos

By LARRY LEBOWITZ

M*ayhem. Bedlam. Chaos.*

My good friend, Mr. Thesaurus, provides plenty of options to describe the early days of Interstate 95.

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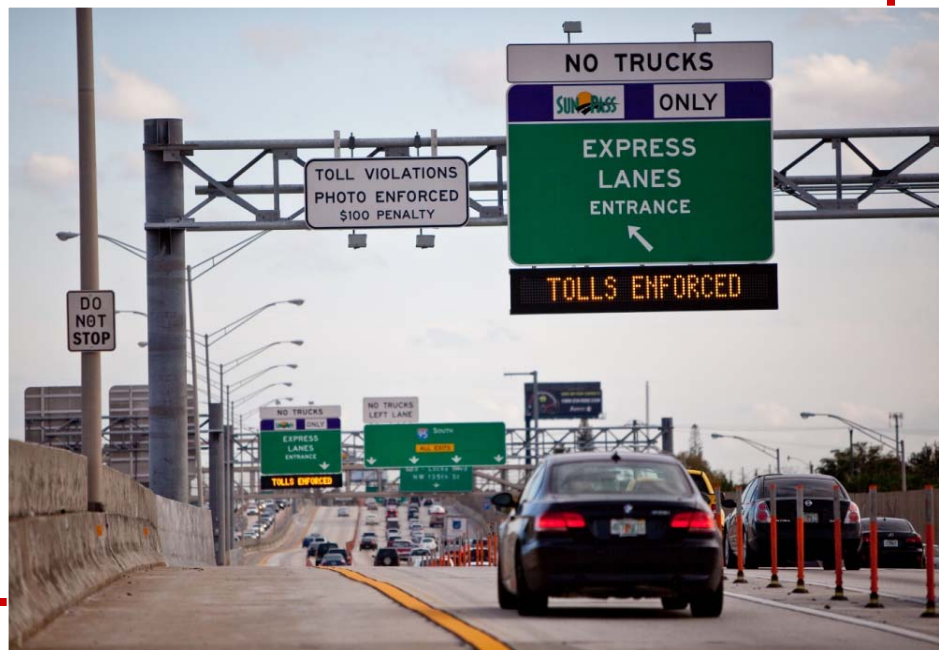
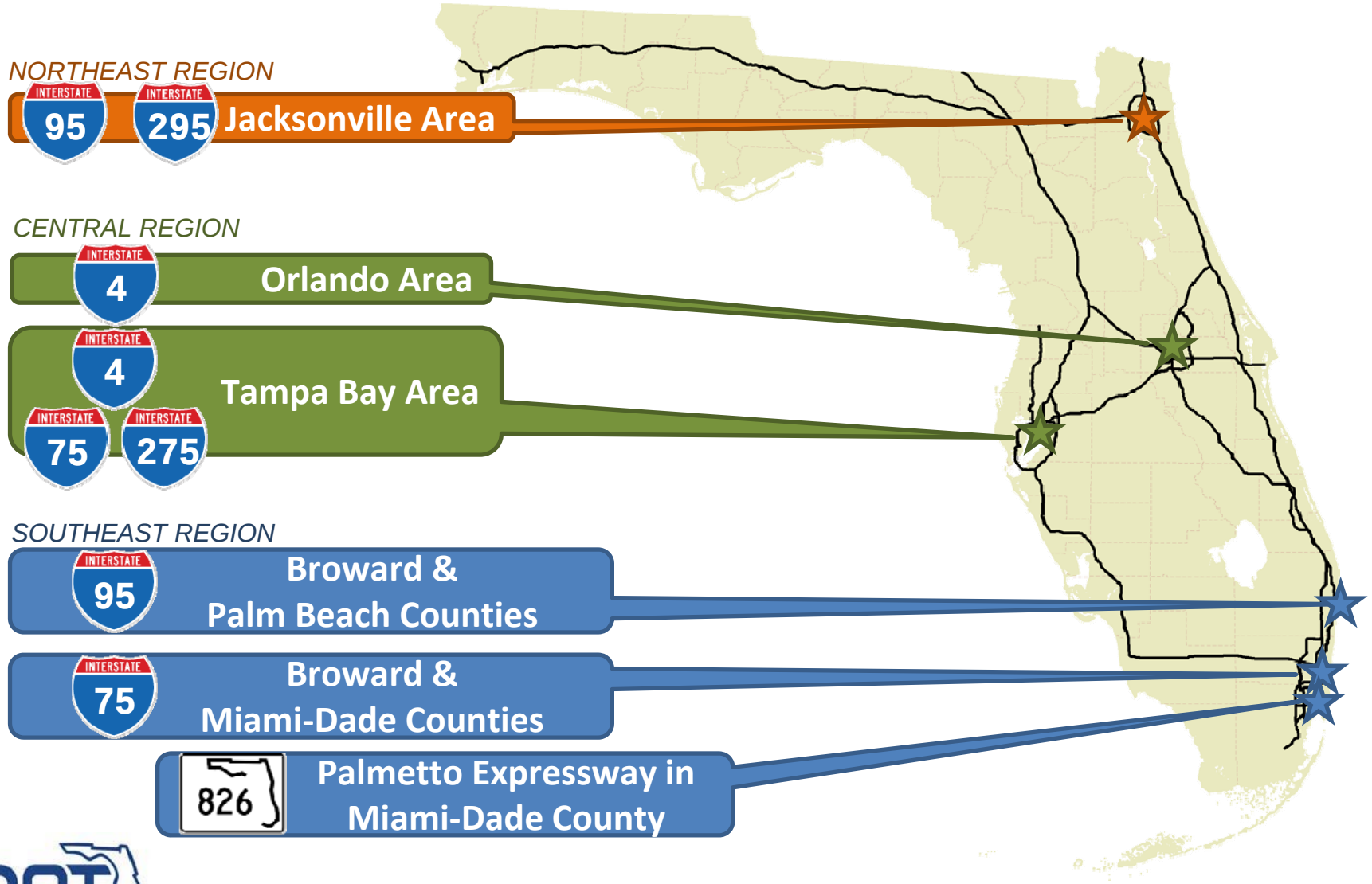
INFLUENCE

- Proof of Concept
- Regional Managed Lanes Network
  - ✓ Framework for on-going decision-making
- Statewide Express Lane Policy and Action Plan
  - ✓ Policy Framework



INFLUENCE



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WHAT WE LEARNED

- Understand your community, project history, context and purpose
- More is More: You can *never* over-communicate
  - ✓ Outreach before, during & after
  - ✓ Plan for it, fund it and do it!
- Focus on Operations & consider the entire corridor
  - ✓ Do your operational analysis early
  - ✓ Use a systems engineering approach
- Willingness to pay may surprise you

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WHAT WE LEARNED

- You are developing a program not just a project
  - ✓ Define success broadly
- Consider a change from HOV 2+ to 3+
- Be ready for something to go wrong
  - ✓ How you respond can either build or destroy credibility
- Don’t let construction outpace your ability to message
  - ✓ This is not your typical project – folks may not know what to expect
- Don’t under or overestimate the project benefits

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Common Misconceptions

- Express lanes make money
  - ✓ Objective must be improved mobility & choice
- Express lanes will work everywhere
  - ✓ Requires severity and duration of congestion
- Express lanes benefit only those who can afford to pay the tolls
  - ✓ Significant improvements to general lanes are possible
- Express lanes alone can solve congestion problems
  - ✓ Should be a part of a large mobility plan

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IF YOU REMEMBER NOTHING ELSE

- Understand your community, project history, context and purpose
- You cannot over-communicate
- Focus on Operations & use a corridor-based approach
- Be ready for the unexpected and have a plan

Congestion Relief and Choice

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