

The Impacts of Congestion Pricing on Carpooling and Transit

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Managed Lanes and Alternative Modes – How Can They Peacefully Coexist?

Allen Greenberg

FHWA, Congestion Management and Pricing Team

Overview

- Why managed lanes are important
 - Case study: Miami
- Unique issues for casual carpooling with managed lanes
- Appropriate program goals
- What not to worry about
- Other commuter-related pricing
 - Employer programs
 - Parking and access pricing “gems”

Why managed lanes are important: the problem

- Because HOV lanes had excess vehicle carrying capacity (despite higher person throughput than GP lanes), drivers in GP lanes demanded less restrictive or open access to these lanes
- Where HOV lanes remained, occupancy requirements were reduced, especially through the early 1990s prior to the popularization of HOT lanes
- New capacity built on the promise that it would be for HOV became GP lanes

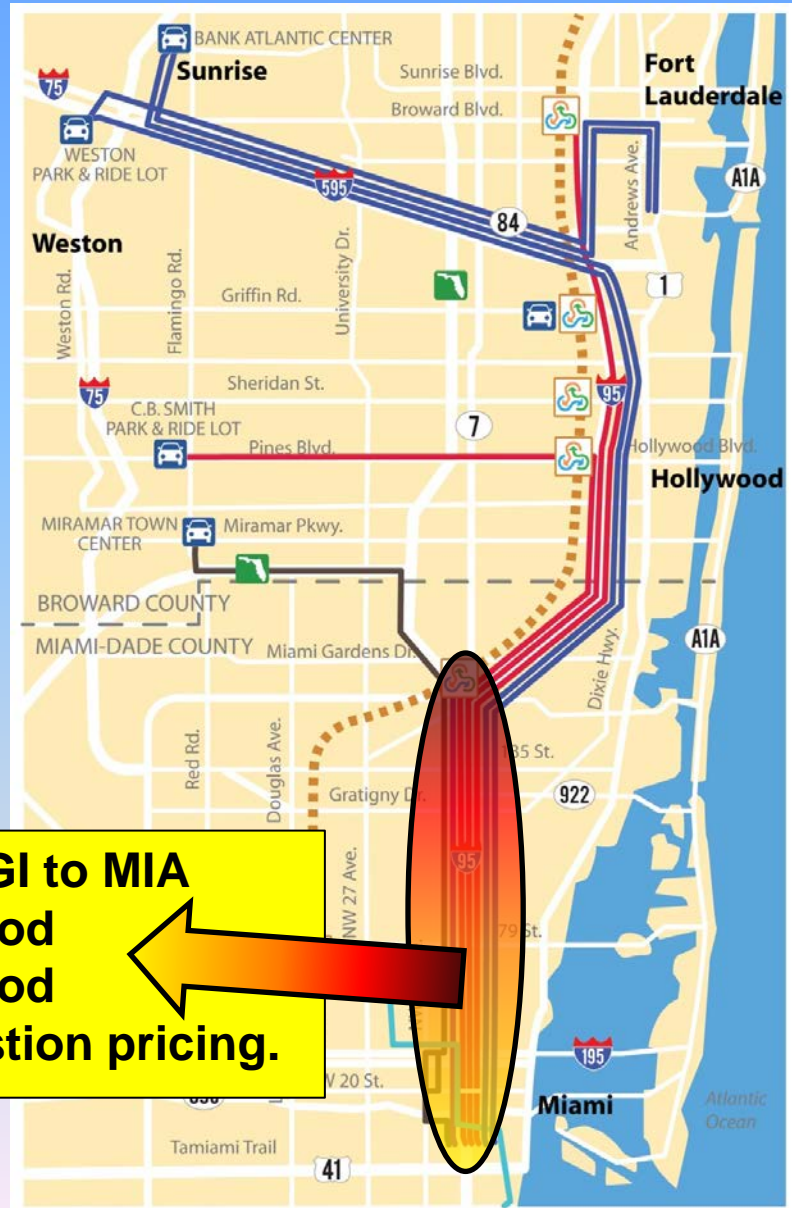
Why managed lanes are important: the solution

- HOT lanes have for the first time led to increasing occupancy requirements for free HOV travel (albeit often with projects adding capacity)
- HOT lane projects, especially through the Urban Partnership Program, have been the backbone of enormously successful new and expanded express bus services (case study: Miami)

Miami I-95 Express Lanes



Miami I-95 Express Lanes

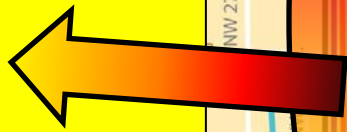


TOTAL RIDERSHIP MULs GGI to MIA

2009: 1,800 / peak period

2012: 5,498 / peak period

Transit can play a role in congestion pricing.



Unique issues for casual carpooling with managed lanes

- Describe casual carpooling
- Casual carpooling requires 3+ occupancy for enhanced safety (Houston HOT-2 exception)
- HOT-3 is likely to work with casual carpooling if tolls are high and not work if tolls are low
- Where HOT lanes are introduced, driver/rider numerical balance could be maintained by, with political support from casual carpoolers, moving from HOT-3 to HOT-4

Appropriate program goals

- Preserving a managed lane network that offers users fast and efficient travel
- Serve and foster express bus and casual carpooling systems
- Offer solo-drivers a premium travel option (used occasionally by drivers of all incomes) as a substitute for adding new GP lanes (can reward transit riders with credits toward free access)

What not to worry about

- Slight changes in vehicle occupancy or slower commutes for HOV-2 “fam-pools” that choose not to pay a HOT-3 toll (perhaps to enjoy more “in-vehicle quality family time”)
 - Focus should instead be on having a system that allows fast and efficient “high-value” trips (e.g., bus, commuter van, and perhaps other multi-occupant vehicle trips, plus SOV users paying a real premium)

Other commuter-related pricing

- Fairly pricing employee parking
- Parking pricing and access gems

Fairly pricing employee parking

- 95% of private-sector employees receive free parking v. 6% receiving transit benefits
- Equalizing parking and non-parking benefits through cash-out and transportation allowances works:
 - Eight-site Los Angeles study showed cash-out to cut drive-alone commutes from 76% to 63% of total
 - CH2M Hill in Bellevue, WA converted free parking to a travel allowance, cutting SOV commuting from 89% to 64%
- Cities without cash-out ordinances uniquely disadvantage their own citizens (e.g., 31% SOV mode share for DC residents v. 50+% for suburban residents traveling to DC worksites)

Parking and access pricing gems

- Minneapolis PayGo Flex-Pass led to 56.5% driving days v. 78.5% for traditional paid monthly parking
- After off-peak port-access discounts were introduced, 45% of trucks at the Los Angeles and Long Beach piers arrived during off-peak hours, versus only 17-21% prior to such discounts
- Parking pricing can include congestion pricing elements (e.g., *SFpark* \$2 peak-shoulder garage entrance/exit discount)

Contact Information

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Impact of HOV to HOT Conversions on Carpooling



White Paper prepared for
FHWA Office of Operations,
Transportation Management

Eric N. Schreffler

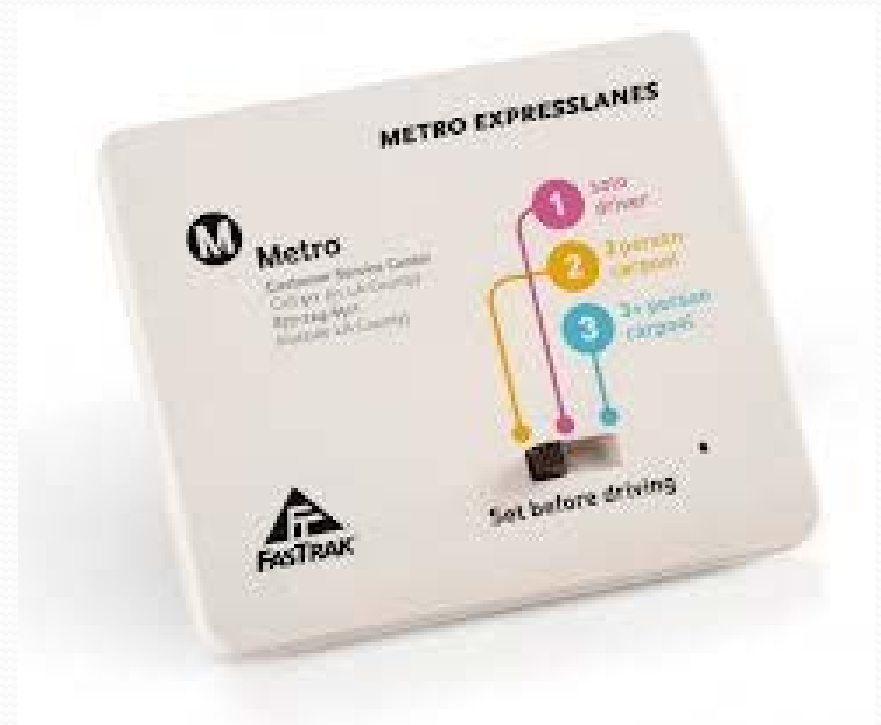
ESTC

Purpose of White Paper

- Preliminary assessment of impacts of HOT conversion on carpooling
- Does not focus on transit impacts; acknowledges primary objectives such as increased efficiency
- Cross-cutting investigation of UPA/CRD projects (Atlanta and Miami) and other projects, e.g., I-15 (San Diego) and I-394 (Minneapolis)
- Intended to assess findings from early projects and provide input to USDOT and others
- Builds upon recent work by Caltrans and TTI
- Desire to elicit discussion at this conference

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Projects Investigated

- *UPA/CRD (completed)*
 - Miami
 - Minnesota
 - Atlanta
- *Newer UPA/CRD & Studies*
 - Seattle
 - Los Angeles
 - Dallas
- *Other Operational Projects*
 - San Diego
 - Houston
 - Minneapolis
 - Denver
 - Seattle
 - San Francisco/Oakland

Range of Interventions

- HOV to HOT lane conversion
- Requirement to obtain transponder
- Increase free usage to 3+ carpools
- Slugging possible
- Additional commuter transit service

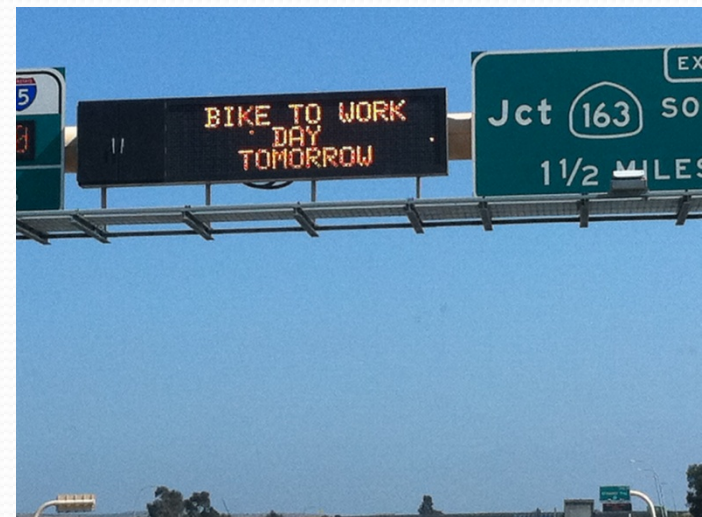


Time Series Data Utilized

- Occupancy Counts
- Traffic counts (to assess vehicle and person throughput)
- License plate surveys (SEA and ATL)
- Carpool registrant surveys (ATL)

- Transponder applicant data (LA)*
- Vanpool data (SEA and LA)*

* being collected



Range of Impacts

1. Positive impacts (carpooling increased in managed lanes) – Minnesota I-35W
2. Neutral impacts (no change in carpooling) - Denver
3. Negative impacts (carpooling decreased in managed lanes) – Atlanta and Miami (and SF)
4. Variable impacts (carpooling increases and decreases) – San Diego and Minneapolis I-394
5. Other impacts (carpools shifted to free GP lanes) – Atlanta and Miami

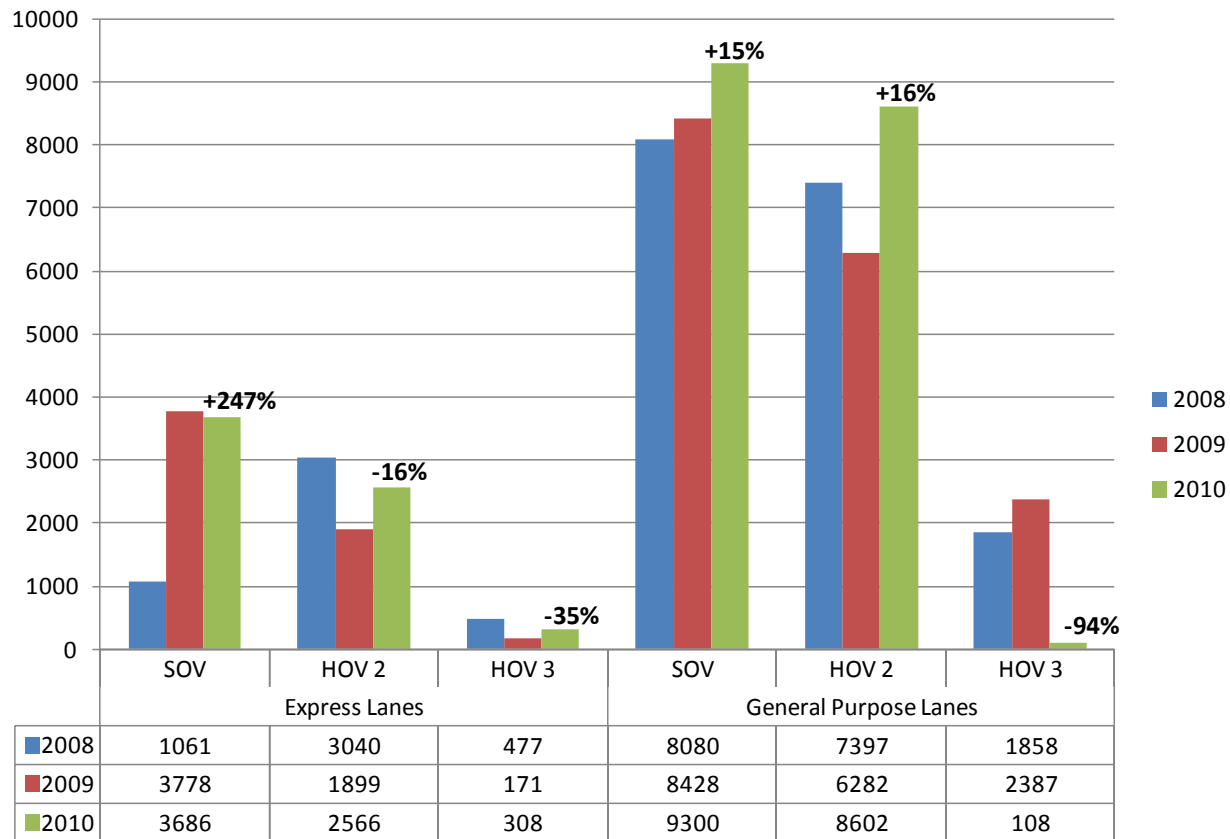
Atlanta I-85

- 2-person CP tolled
- Transponder required
- Person throughput down 7% in a.m. and up 1% in p.m.
- Many 2-person CPs (38%) switched to GP lanes
- Few 3-person CPs formed
- 29% of existing CPs switched to drive alone



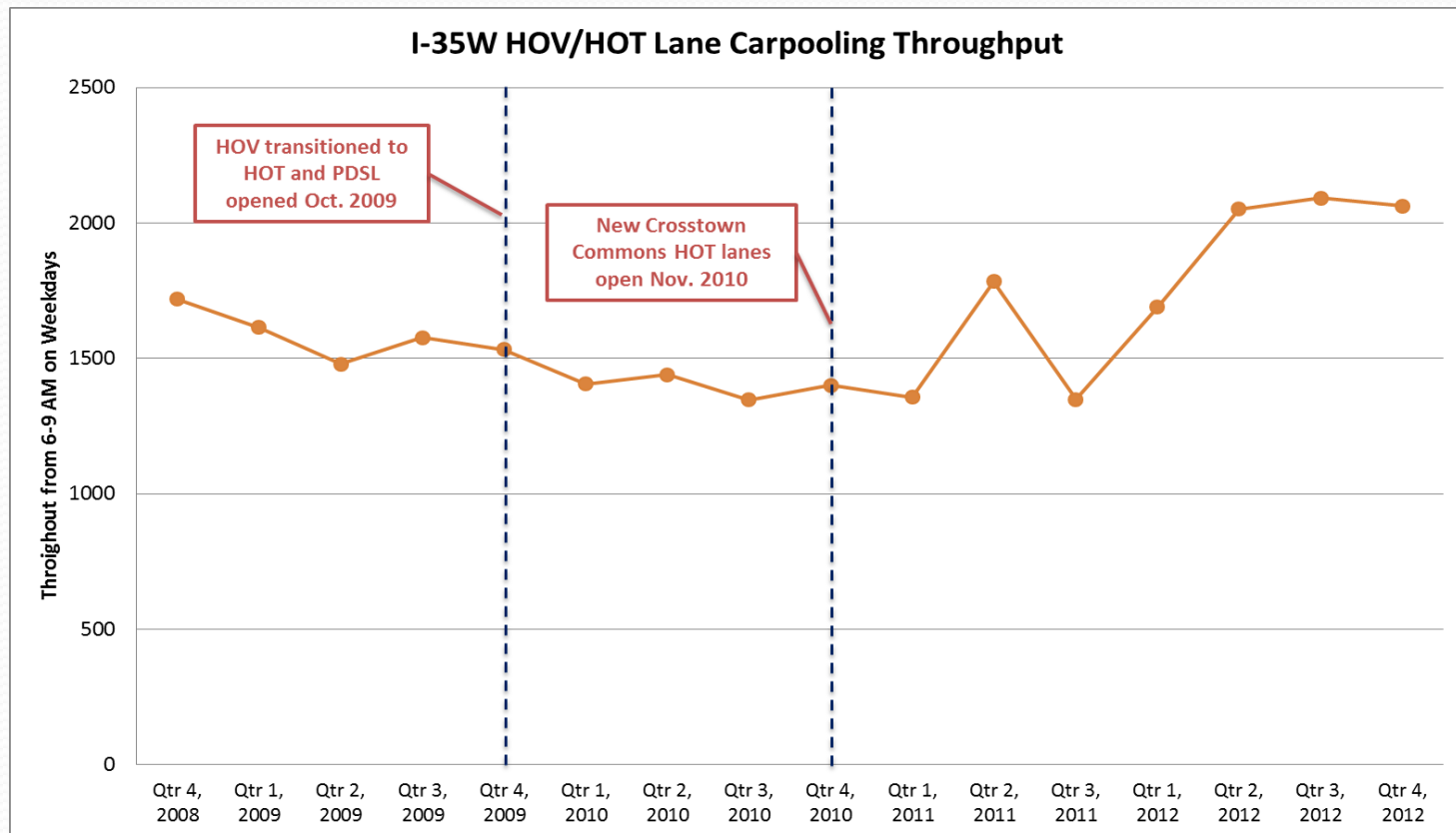
Miami I-95

Northbound Person Throughput by Vehicle Type and Percent Change from 2008 to 2010



Northbound PM Peak Period (4-7pm)

Minneapolis I-35W



San Diego I-15

- 2+ carpools free
- Carpool volumes increased 7% first phase (monthly permit)
- Carpool volumes decreased during second phase (dynamic pricing) in both HOT and GP lanes (overall 15-32%)
- Longer term trends show stabilization



Probable Influence Factors

- Increase in occupancy requirement for free usage and challenges in forming 3-person carpools
- Requirement for carpools to register and obtain transponder
- Toll structure and changes therein
- Parallel transit service
- Conflicting regional HOV and HOT policies
- Exogenous factors (gas prices and employment)

Issues for Further Investigation

- Policy – e.g., are there conflicting policy objectives for HOV and HOT projects?
- Analytic and Behavioral – e.g., can existing analytic tools accurately predict impact on carpooling?
- Operational – e.g., can the negative impacts be mitigated?
- Institutional – e.g., what level of public understanding is needed for HOT conversion projects?

Implications

- Carpool support needed after HOT implementation
- Policy objectives need to be carefully considered
- Quantification of actual impacts necessary for better future predictive exercise
- Lessons can be learned from HOT pioneers
- Continuing investigation and assessment needed

More Information

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Impacts of Congestion Pricing on Transit

Brian Pessaro, AICP

FHWA Webinar
September 17, 2013 •



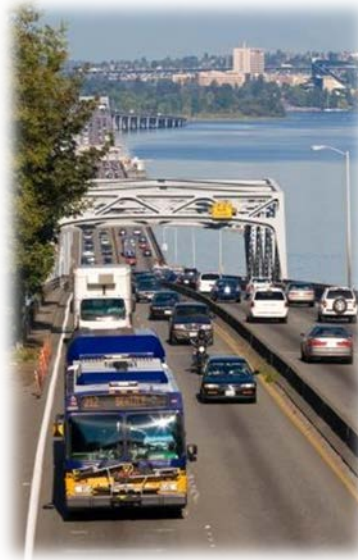
I-85 Express Lanes
Atlanta



I-35W MnPass Lanes
Minneapolis



I-95 Express Lanes
Miami



SR 520 Bridge
Seattle

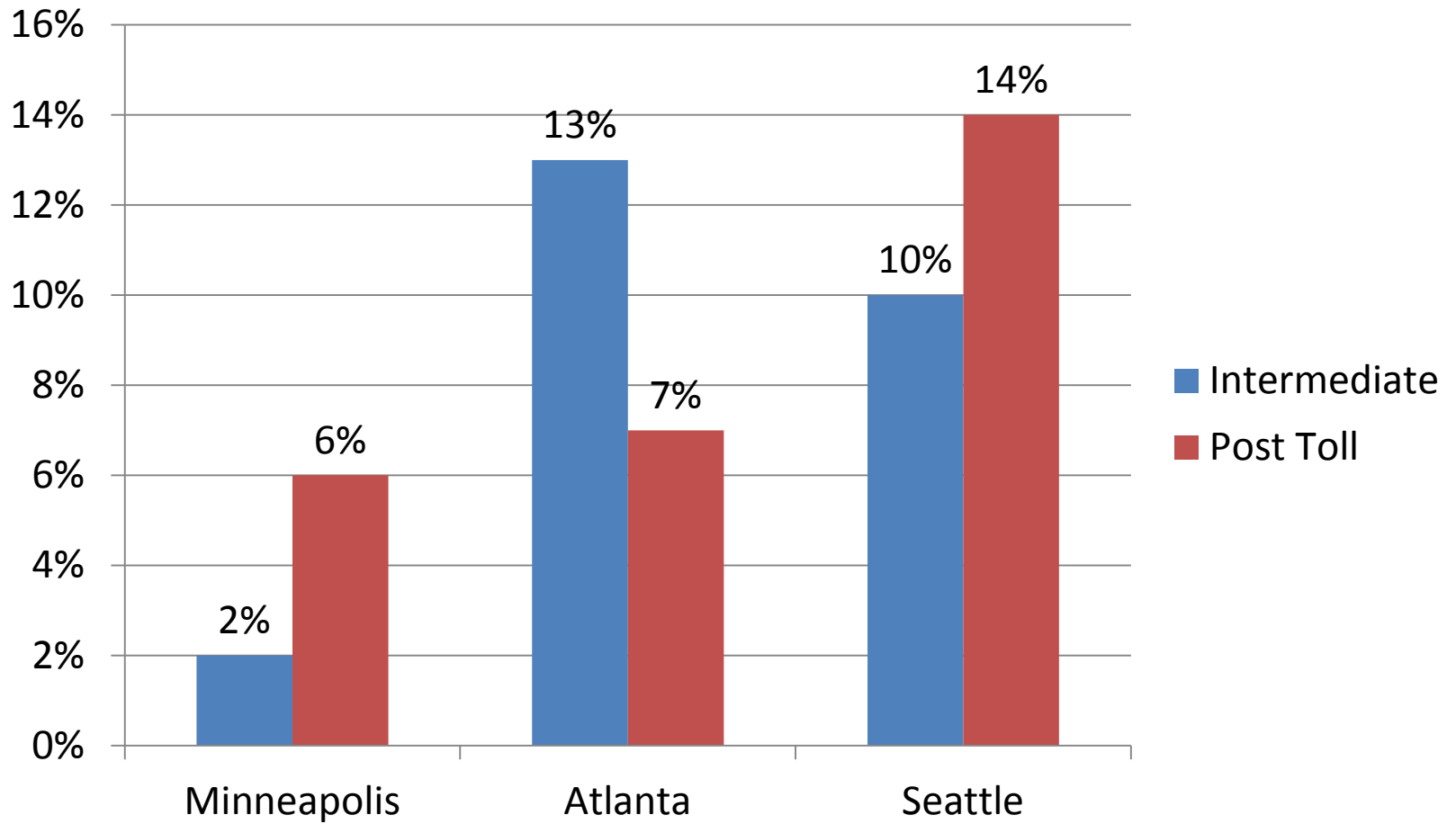
More Average Daily Riders

UPA Site	Before HOT	After HOT	% Change
Miami	1,827	2,877	57%
Minneapolis	4,572	4,649	8%
Atlanta	1,210	1,459	21%
Seattle	4,441	4,889	24%

Figures reflect a.m. peak period

Seattle figures are for eastbound and westbound combined

Ridership



Shorter Travel Times

UPA Site	Before HOT	After HOT	% Change
Miami	25.0 min	8.2 min	-67%
Minneapolis	20.0 min	15.6 min	-22%
Atlanta	47.2 min	42.4 min	-10%*
Seattle (west)	5.3 min	5.1 min	-4%
Seattle (east)	6.1 min	5.2 min	-15%

Figures reflect a.m. peak period

Variation in travel time due to variation in HOT segment length

Rider Perceptions of Travel Time

UPA Site	Before HOT	After HOT	Statistical Sig.
Miami	4.05	4.51	Yes
Minneapolis	4.18	4.26	Yes
Seattle	4.22	4.23	No

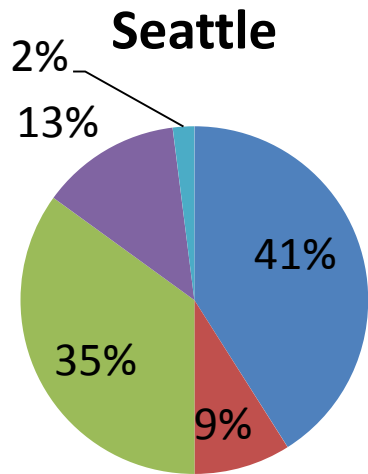
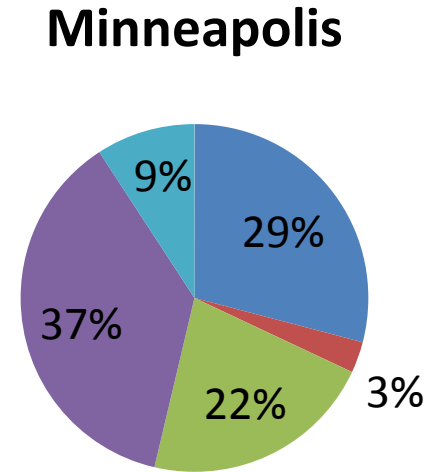
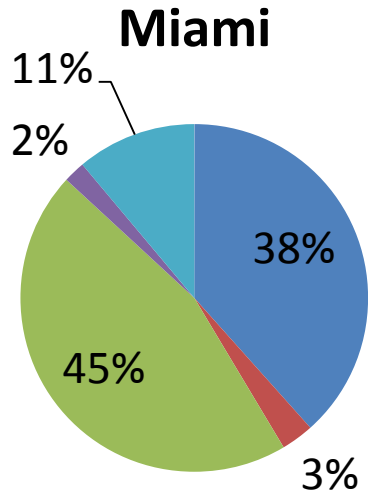
1 Very Poor	2 Poor	3 Fair	4 Good	5 Very Good
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Rider Perceptions of Reliability

UPA Site	Before HOT	After HOT	Statistical Sig.
Miami	4.06	4.37	Yes
Minneapolis	4.33	4.37	No
Seattle	4.24	4.14	Yes

1 Very Poor	2 Poor	3 Fair	4 Good	5 Very Good
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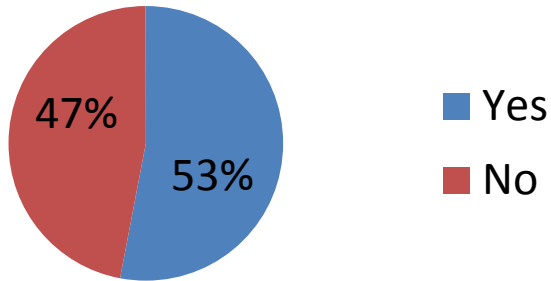
Previous mode of new transit riders



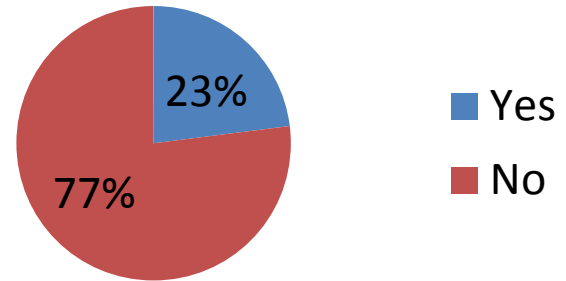
- Drove Alone
- Carpooled
- Used Other Transit
- Didn't Make Trip
- Other

Did the tolls influence new riders to take transit?

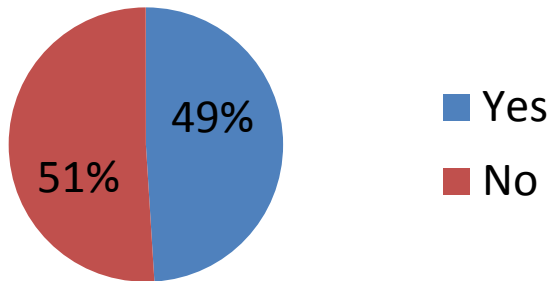
Miami



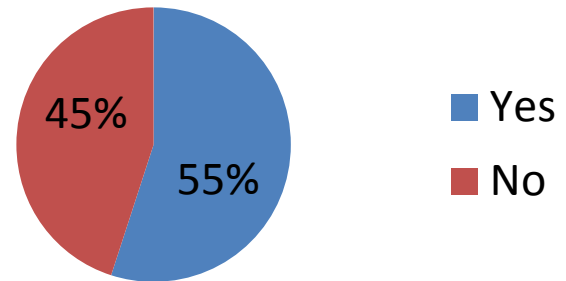
Minneapolis



Atlanta

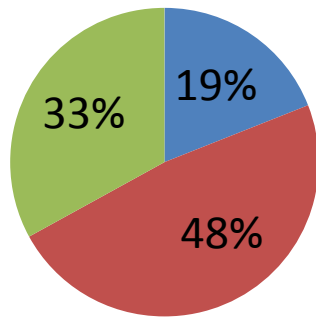


Seattle



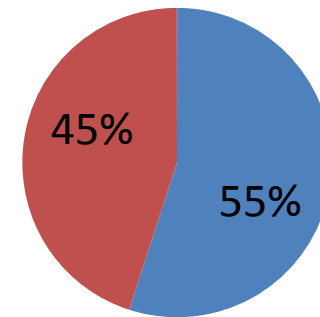
What had more influence on Seattle transit riders?

UPA transit service



■ Yes ■ No ■ Unaware

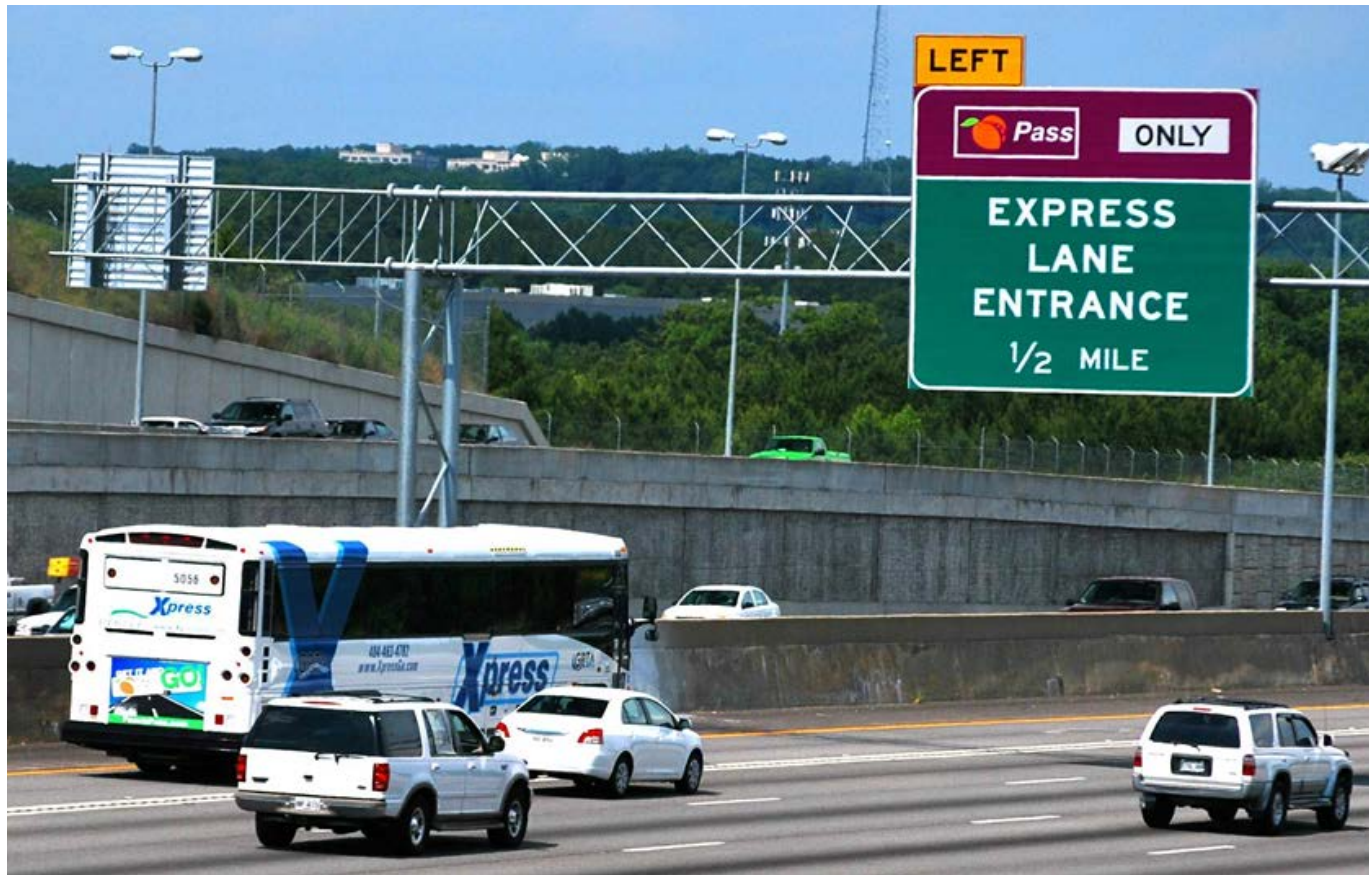
SR 520 Tolls



■ Yes ■ No

- Most new riders in Seattle were unaware or uninfluenced by the UPA-funded transit service that began prior to SR 520 tolls.
- The SR 520 tolls had a greater influence.

Other Observations



Atlanta riders loved the transit service but not the priced lane

- In pre-toll survey **60% disapproved** converting I-85 HOV lane to HOT
 - Only **9%** approved
- In the post-toll survey
 - Only **18%** said I-85 Express Lanes improved travel
 - Only **13%** said they have been good for Atlanta

Transit riders from other UPA sites were more positive about the tolls

- In **Seattle**, **57%** said the SR 520 tolls have improved their travel and **42%** said the tolls have been good for the region.
- In **Minneapolis**, **61%** said the MnPass lanes have improved bus travel speeds and **55%** said the MnPass lanes improved bus reliability.
- In **Miami**, over **80%** of transit riders said their bus travel time was faster after the I-95 Express Lanes opened.

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San Diego

I-15 Managed Lanes and FasTrak: Lessons Learned for Transit



**FHWA Webinar:
Impacts of Congestion Pricing
on Carpooling and Transit
September 17, 2013**

Role of Managed Lanes

- Focus of 2050 Regional Transportation Plan is a multi-modal strategy
 - Provide “travel choices”
 - Offer time competitive travel time for alternative modes
 - Increase freeway operating efficiency
- Managed Lanes are “dynamic”
 - Users, access, pricing all can adjust time depending on changing conditions

I-15 Managed Lanes Design

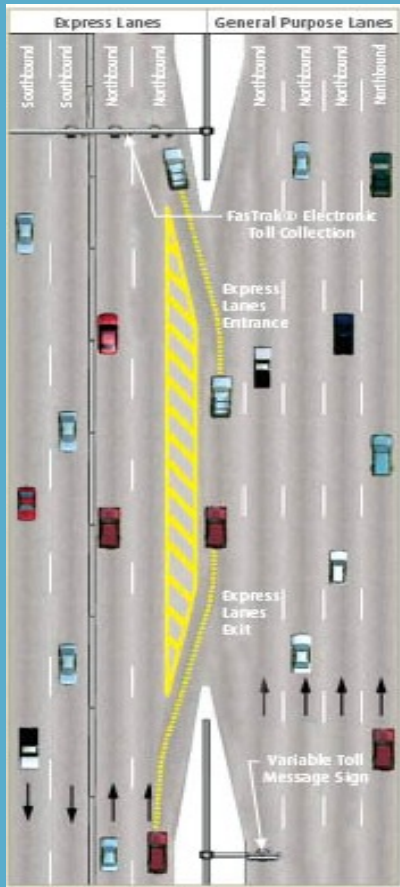
- Barrier-separated, 4-lanes, movable barrier
- Direct Access Ramps every 4-5 miles
- Off-line BRT transit stations and park-n-rides
- FasTrak for SOV buy-in – dynamic pricing

I-15 Managed Lanes Design



Direct access ramps open to BRT, carpools, and FasTrak customers.

I-15 FasTrak Design



Variable Toll Message Signs



Electronic Tolling Equipment

Multiple access points, dynamic pricing strategy

Managed Lanes: I-15 Results



Increased use of HOV Lanes
- Up to 20,000 avg daily users
(75% HOV, 25% FasTrak)

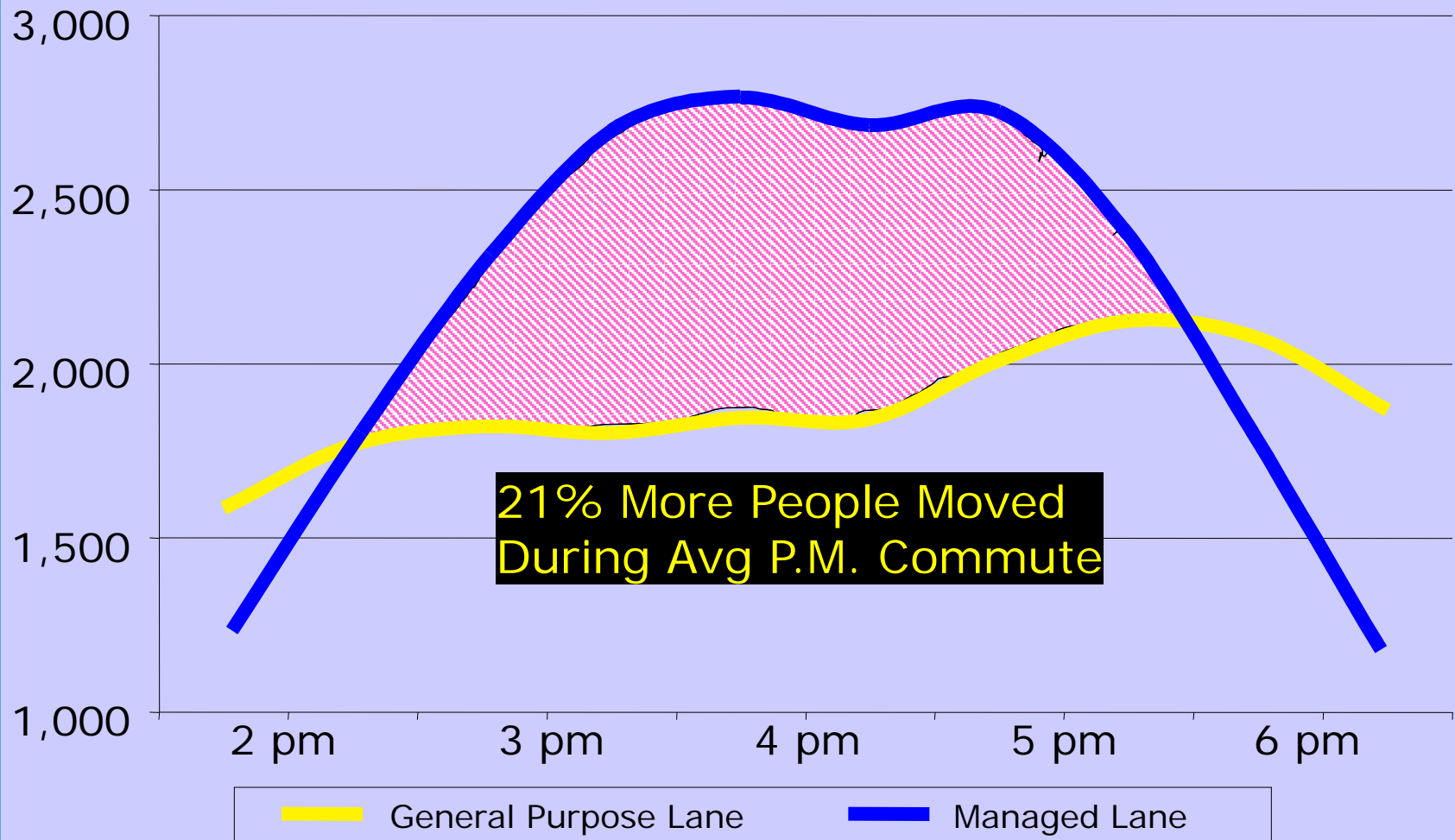
Provides travel choices
- Transit, carpool, FasTrak



FasTrak revenues to transit
- Generated over \$7 million for
I-15 transit in first decade

Moving People, Not Just Cars

Number of People per Hour per Lane on I-15

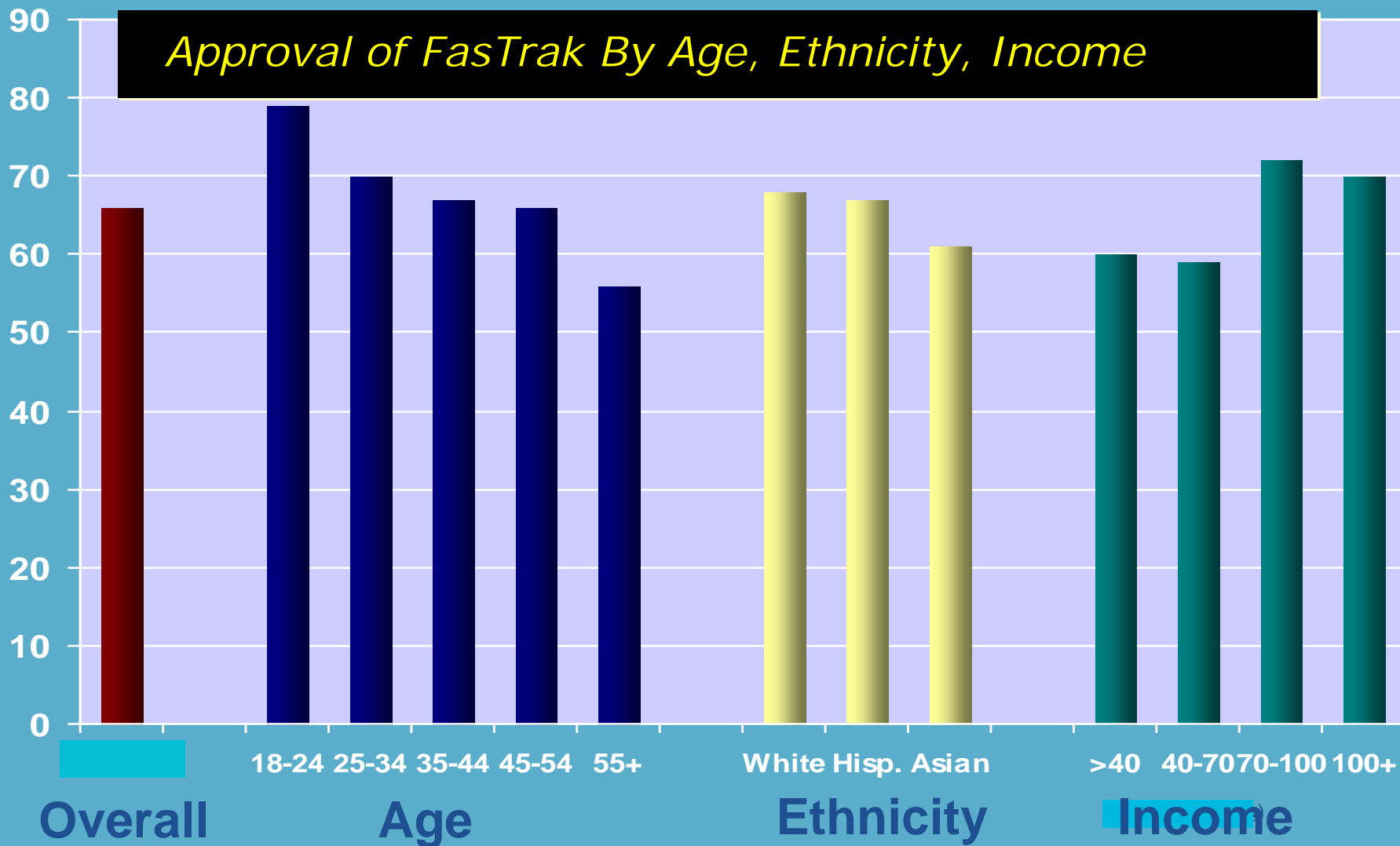


I-15 BRT Operations

- Serves long distance trips
 - “Trolley-on-tires”
- High speed
 - Stations spaced 4-5 miles avg
 - Managed Lanes = transitway
- Service includes:
 - All-stop, all day trunk
 - Peak period limited stop commuter expresses
- Opens in 2015



FasTrak Value Pricing Support



I-15 Managed Lanes/BRT – Lessons Learned

- Managed Lanes = collaboration between SANDAG, Caltrans, and transit operators
 - SANDAG lead, but joint vision/decisionmaking
- Local TransNet program:
 - Provides local match to federal/state funding
 - Provides both BRT capital & operating funding

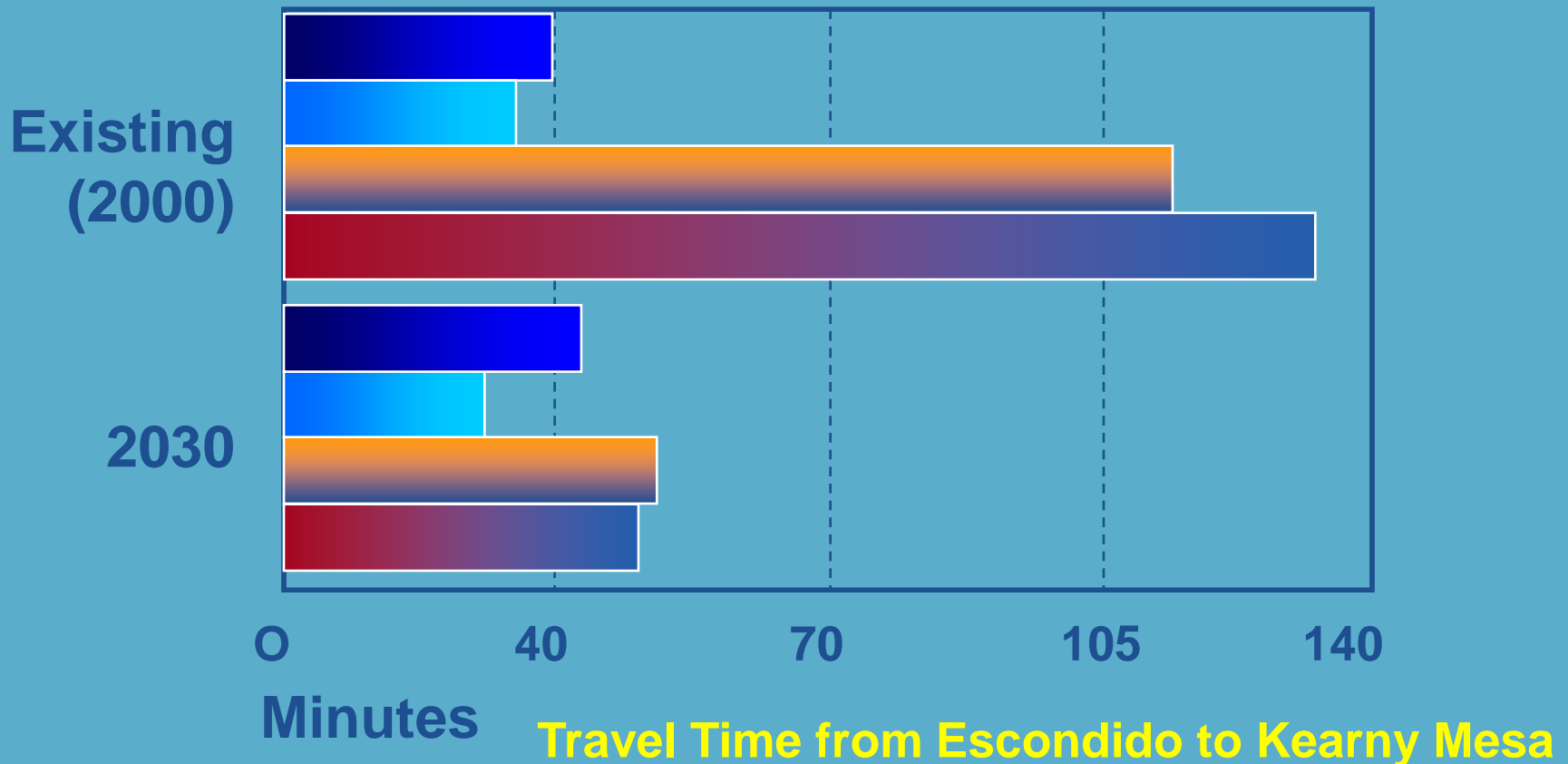


I-15 Managed Lanes/BRT – Lessons Learned

- Moving people, not cars
 - Managed lanes improves efficiency of highway system
- HOV/BRT travel time benefits
 - Provides incentive for ridesharing and taking transit

I-15 Managed Lanes/BRT – Travel Times

Auto Carpool Transit (Walk) Transit (Park & Ride)



I-15 Managed Lanes/BRT – Lessons Learned

- HOV Users:
 - Represent 80% of demand
 - HOV use increased with FasTrak program
 - 4-lane facility enables 2+ person occupancy plus BRT and FasTrak
 - Future demand shows need for 3+ person occupancy by 2035 – will need to look at possible peak/off-peak occupancies



I-15 Managed Lanes/BRT – Lessons Learned

- FasTrak Program
 - Expands travel choices
 - Ensures free-flow conditions for BRT
 - Resolves equity issue by helping fund BRT operations
- Future Managed Lanes
 - Likely to be buffer-separated, fewer DARs due to high costs and ROW impacts



Managed Lanes: Why Tolling and Transit Work

- Success of BRT premised on fast travel times and schedule reliability
- Managed Lanes provide a multi-modal guideway for BRT and carpooling
- Problem: how to guarantee that Managed Lanes don't become congested?
- Solution: Tolling
 - Tolling works only if Managed Lanes operate in free-flow conditions
 - Win-win for BRT, carpooling, and tolling

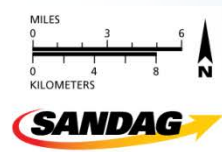


Future Opportunities and Challenges

- 2050 Plan - expand Managed Lanes/BRT/
tolling to other corridors

2050 Regional Transportation Plan - Highway Network

- █ Managed Lanes
 - █ Transit Lanes
 - █ General Purpose Lanes
 - █ Toll Lanes
 - █ Operational Improvements
 - Freeway Connectors
 - HOV Connectors
 - Freeway & HOV Connectors
- C** = Conventional Highway
F = Freeway
HOV = High Occupancy Vehicle
MB = Movable Barrier
ML = Managed Lanes
OPS = Operational Improvements
T = Toll Road



Future Opportunities and Challenges

- 2050 Plan - expand Managed Lanes/BRT/tolling to other corridors
- Priority remains to BRT and ridesharing; FasTrak fills excess capacity
- With growth, maintaining free flow conditions is key challenge
 - Carpool occupancy increase to 3+ persons?
 - FasTrak toll costs?
 - Need for dedicated BRT/LRT lanes?

Future Opportunities and Challenges







- Future Managed Lanes
 - Likely to be buffer-separated, fewer DARs due to high costs and ROW impacts
 - Some initially will be one lane facilities
- FasTrak Program
 - Can it work with one lane HOT lane? Winners and losers – carpools or FasTrak users?

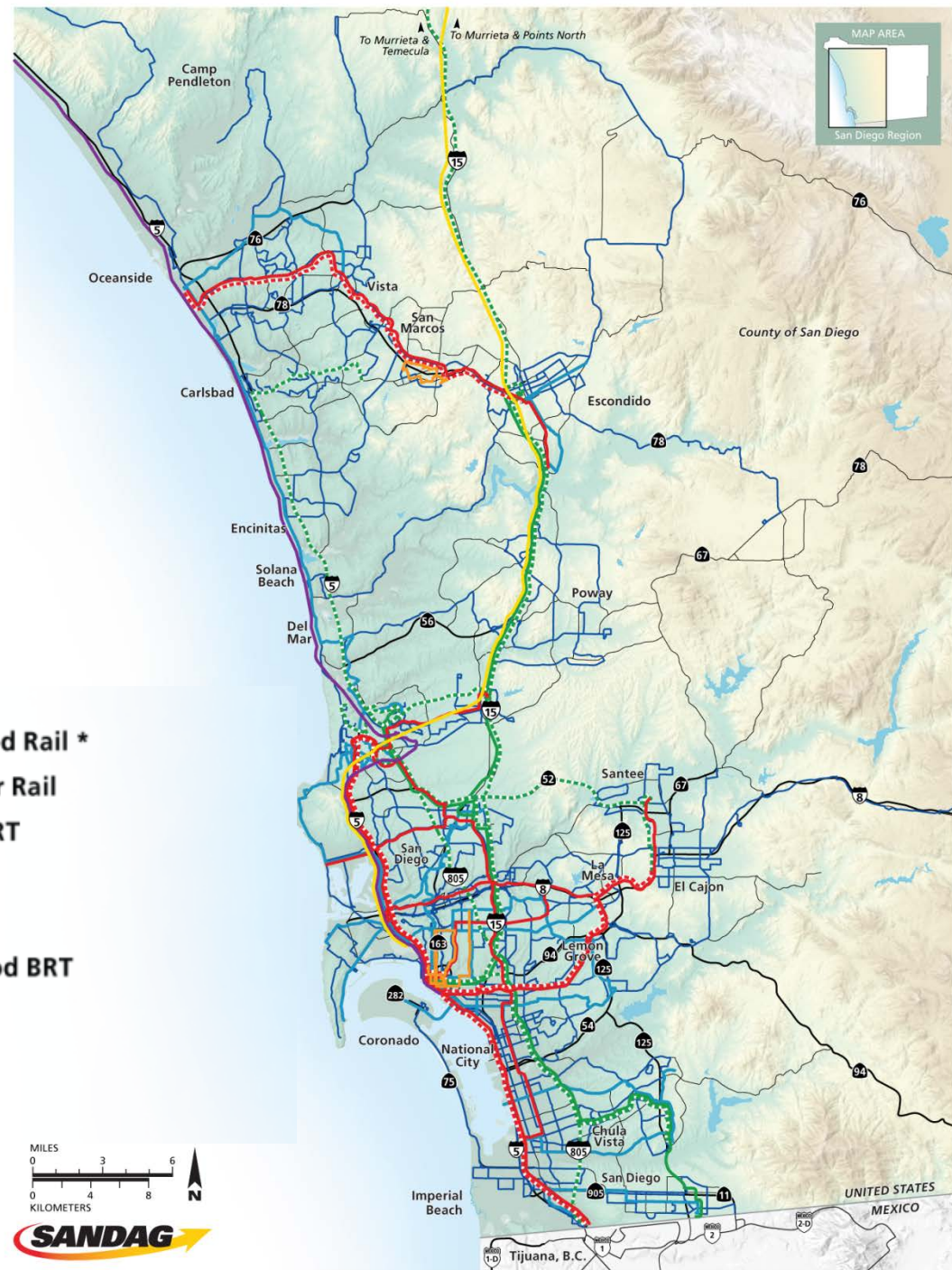
Future Opportunities and Challenges



Automated Highways

2050 Regional Transportation Plan - Transit Network

-  High Speed Rail *
-  Commuter Rail
-  Express LRT
-  LRT
-  BRT
-  Peak Period BRT
-  Streetcar
-  Rapid Bus
-  Local Bus



San Diego

I-15 Managed Lanes and FasTrak: Lessons Learned for Transit



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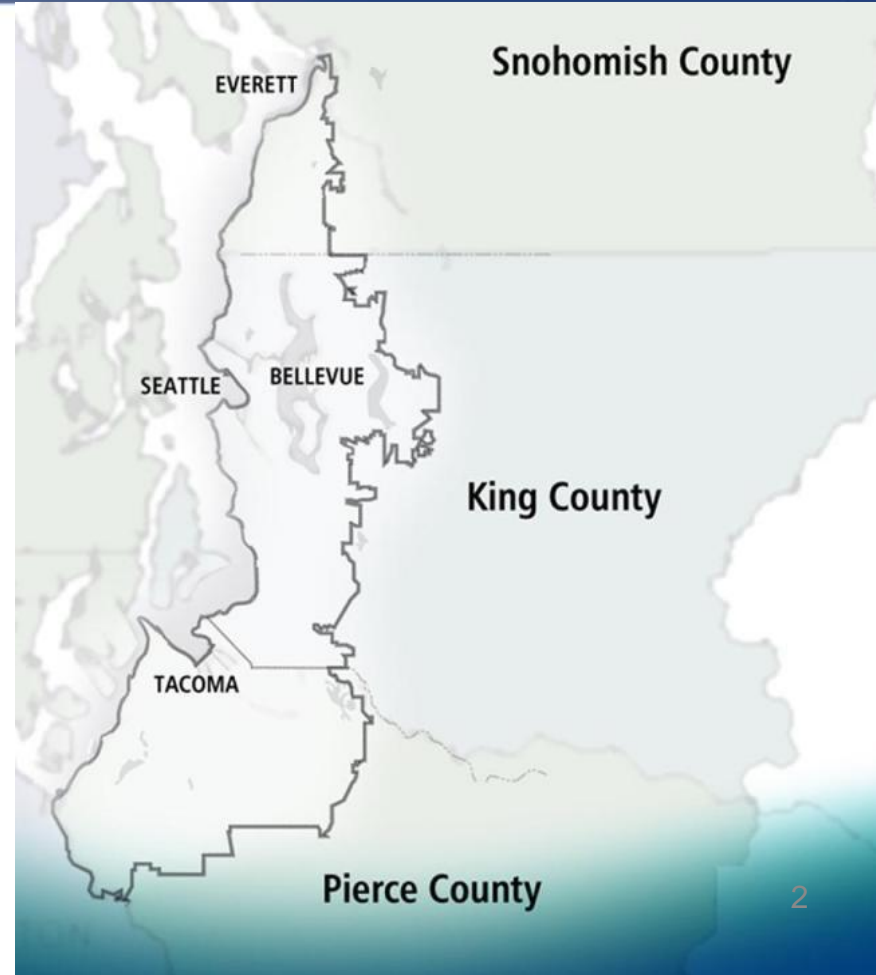
Congestion Pricing Impacts on Carpools & Transit

September 17, 2013



Transit Perspective

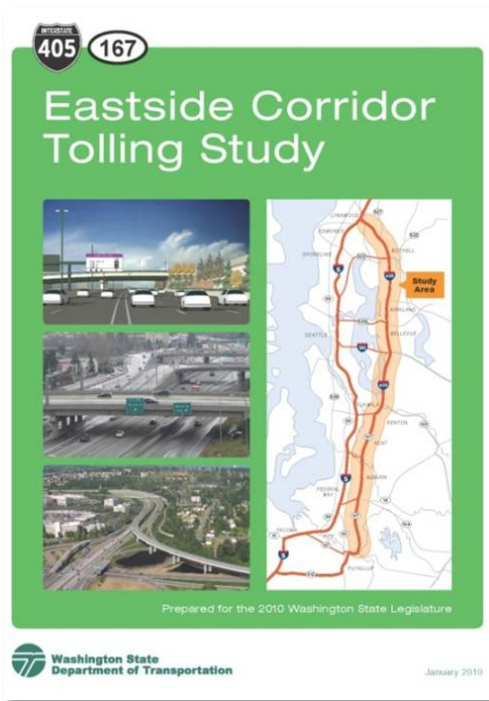
Sound Transit District



ST Express Regional Bus and transit projects



Gaining and Maintaining Acceptance



- Transit agencies are key stakeholders in dealing with congestion;
- Should be a partner in early planning, design and dealing with operational issues of congestion pricing;
- Transit can help address equity issues.

Congestion Pricing beneficial and supported by transit agencies due to these potentials depending on pricing method



- Reduce Peak Hours SOV demand;
- Raise revenue for system and transit improvements;
- Maximize system through-put;
- Maintain HOV system at higher performance levels.

Congestion Pricing does impact transit services and facilities



- Increases ridership demand on already congested facilities, like park and ride facilities and transit centers;
- Increases peak hour ridership demands on transit. Difficult and expensive to add peak hour bus service;
- HOV/HOT lanes need to be well managed; performance measures need to be established up front;
- Transit speed & reliability critical to ridership.

Congestion Pricing programs and revenues need to consider public transportation impacts

- Legislation can restrict use of revenues only to corridor and only to highway purposes;
- Public transit should not be tolled;
- Toll objectives should be clear;
- Peak hour tolls should be higher than transit fares.



Any questions?



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