Integrating Transit with Congestion Pricing:
A Review of the Miami and Minneapolis UPAs

FHWA Webinar Series
October 27, 2011

URBAN PARTNERSHIP AGREEMENT PROGRAM

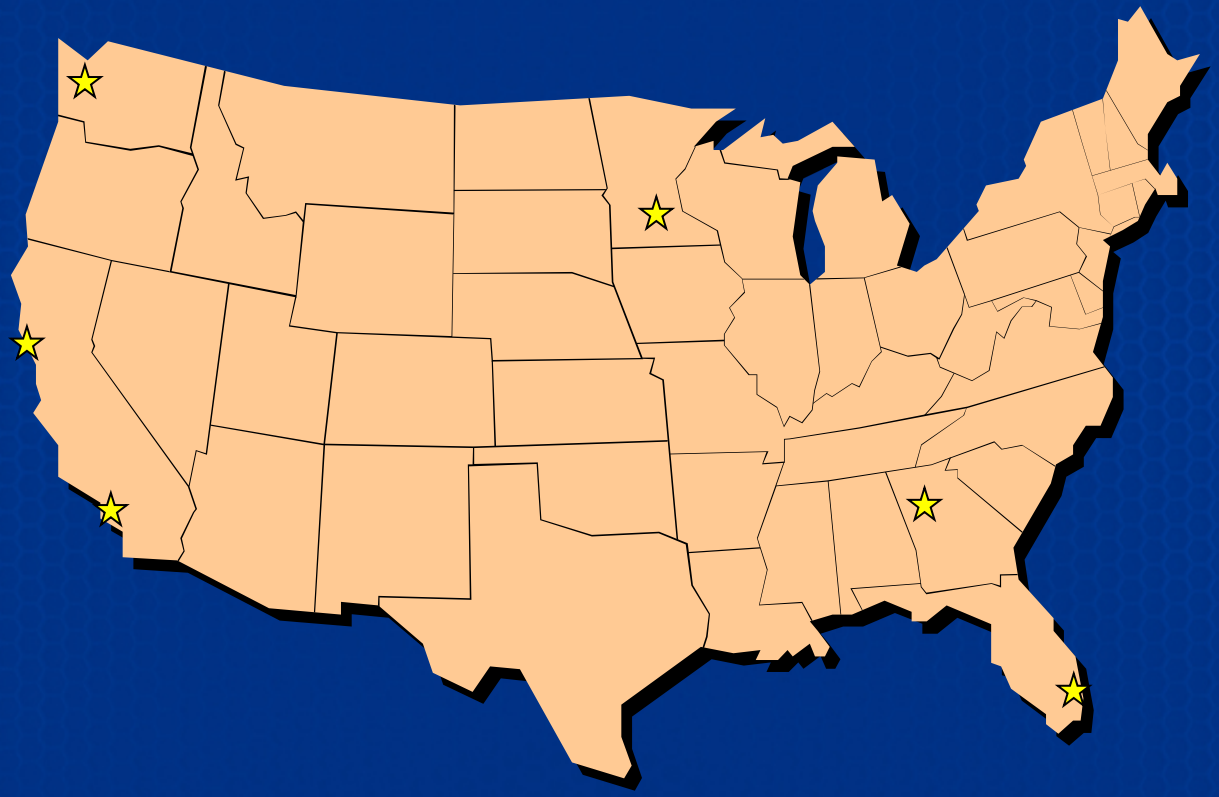
- $1 Billion congestion relief program
- Additional $300 Million for the Congestion Reduction Demonstration Program
- USDOT sought applications that used the **4T's**:
  - **T**olling
  - **T**ransit
  - **T**elecommuting
  - **T**echnology
- Awards made to…

URBAN PARTNERSHIP AGREEMENT PROGRAM

Seattle
(UPA)

San Francisco
(UPA)

Los Angeles
(CRD)



Minneapolis
(UPA)

Atlanta
(CRD)

Miami
(UPA)

Miami UPA (I-95)

HOV to HOT conversion

3 Phases

- Phase 1A - Dec. 2008
- Phase 1B - Jan. 2010
- Phase 2 - mid 2014

2 HOT lanes per direction

Separated by plastic poles

Dynamic pricing

Registered 3+ carpools free

Phase 1 Transit Improvements

2 new routes

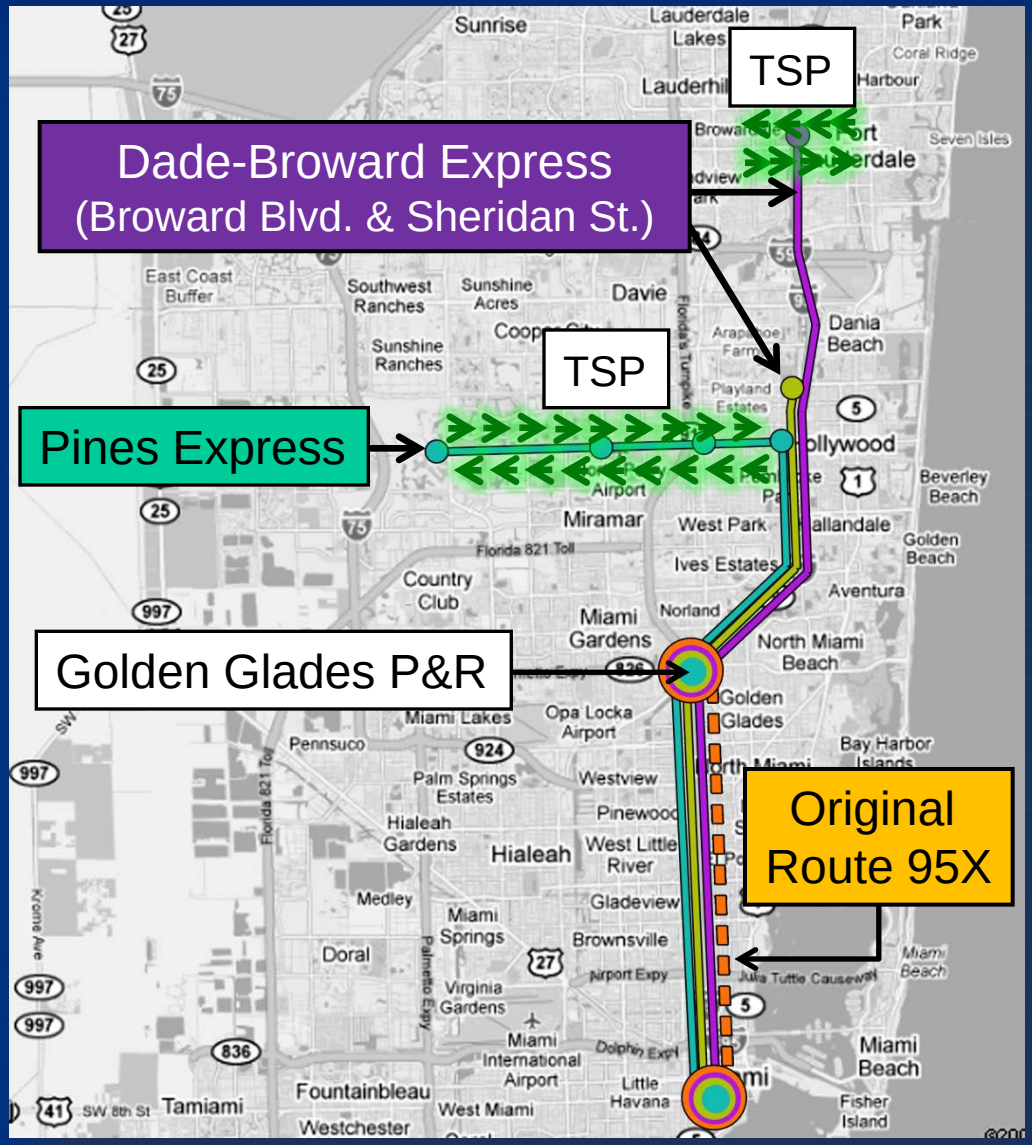
- Pines Blvd. Express
- Dade-Broward Express

Golden Glades P&R

- 500 new spaces

Transit Signal Priority

- Pines Blvd.
- Broward Blvd.



Minnesota UPA (I-35W)

HOV to HOT + new HOT lanes

Fully opened Nov. 2010

1 HOT lane per direction (except PDSL segment)

Stripe separation

Dynamic pricing

Multiple entry/exit points

2+ carpools free

Open to all traffic in off-peak (except PDSL segment)

Minnesota UPA (I-35W)

Transit Improvements

- Added bus service
- 6 new or expanded park-n-rides
- 1 transit bypass lane
- Contra-flow bus only lanes
- ITS technology

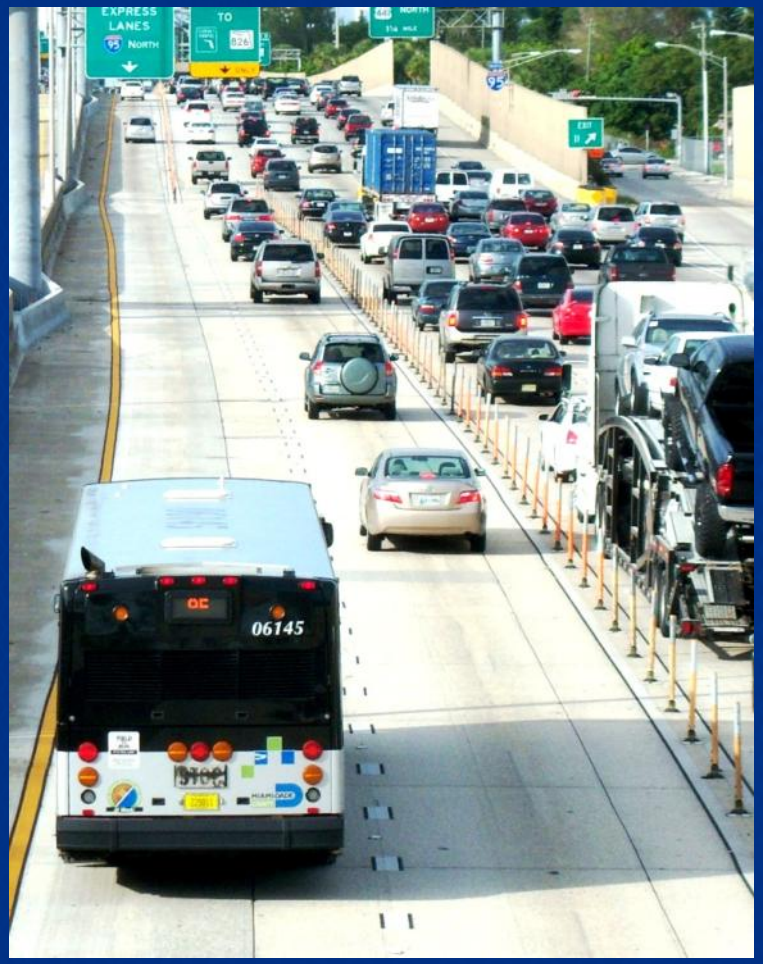
Apple Valley BRT Station

MARQ2 Bus Lanes
Downtown Minneapolis

Transit Hypotheses & Question

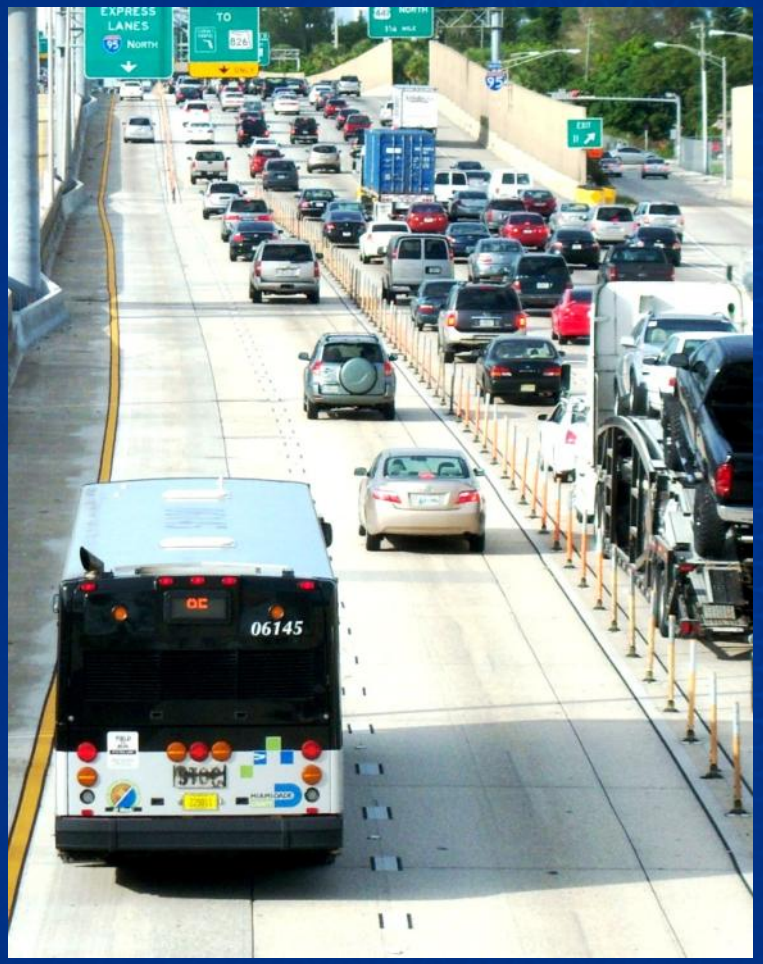
1. The UPA project will enhance transit performance on the UPA corridors
2. The UPA project will increase ridership and facilitate a mode shift to transit
3. Transit mode shift/increased ridership will contribute to congestion mitigation
4. What was the contribution of each UPA project element to increased ridership and/or mode shift to transit?

Miami UPA Transit Results (2008 – 2010 Data)



Miami UPA Hypothesis 1 Results

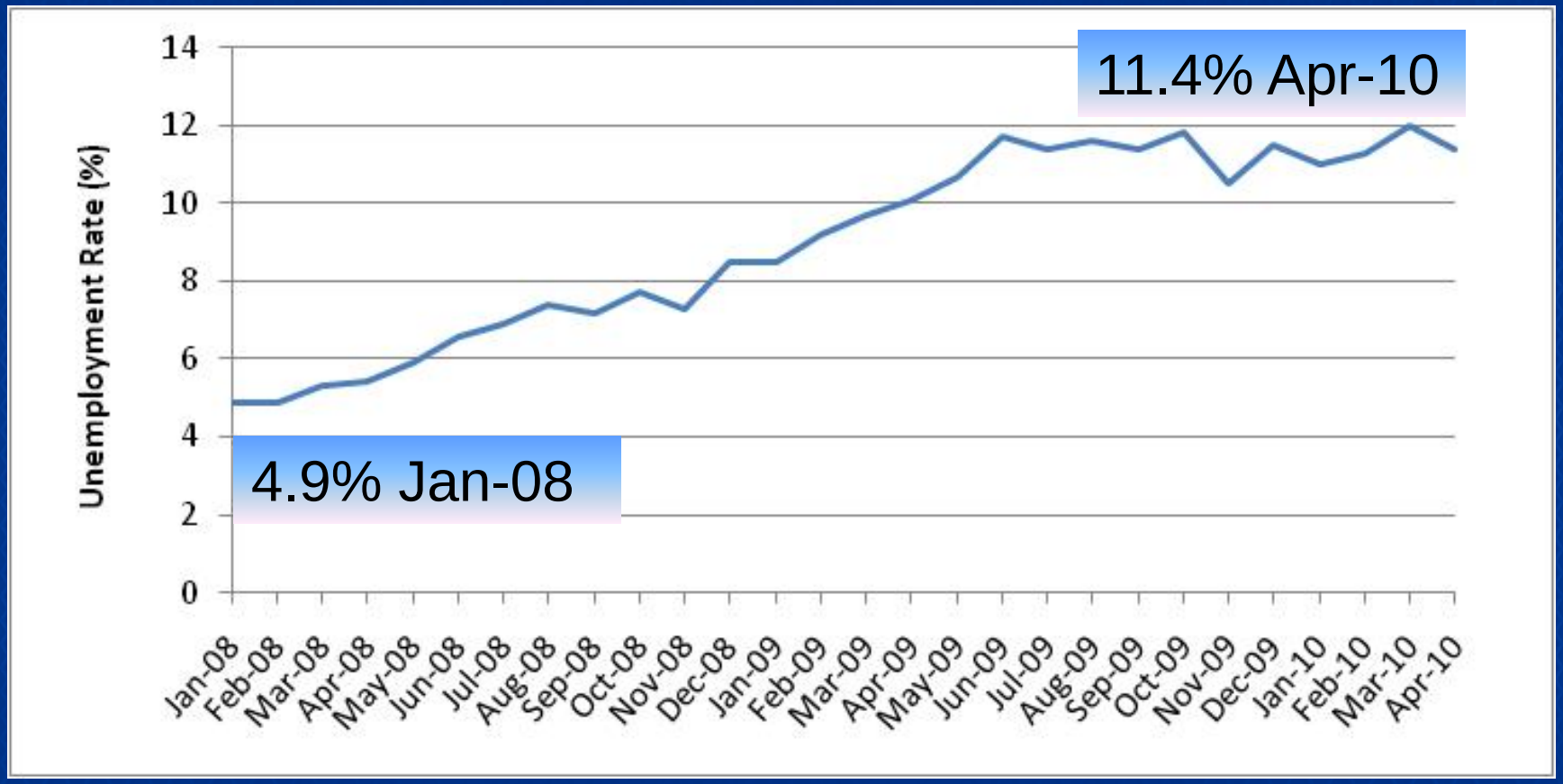
- ✓ Average travel times in Express Lanes improved from 25 to 8 minutes.
- ✓ Average travel speeds went from 18 to 57 mph.
- ✓ Scheduled travel times reduced by 10 minutes (northbound) and 7 minutes (southbound).
- ✓ On-time performance improved from 76% to 81%.
- ✓ A.M. bus travel times on Pines Blvd. reduced by 12% because of TSP.



Miami UPA Hypothesis 2 Results

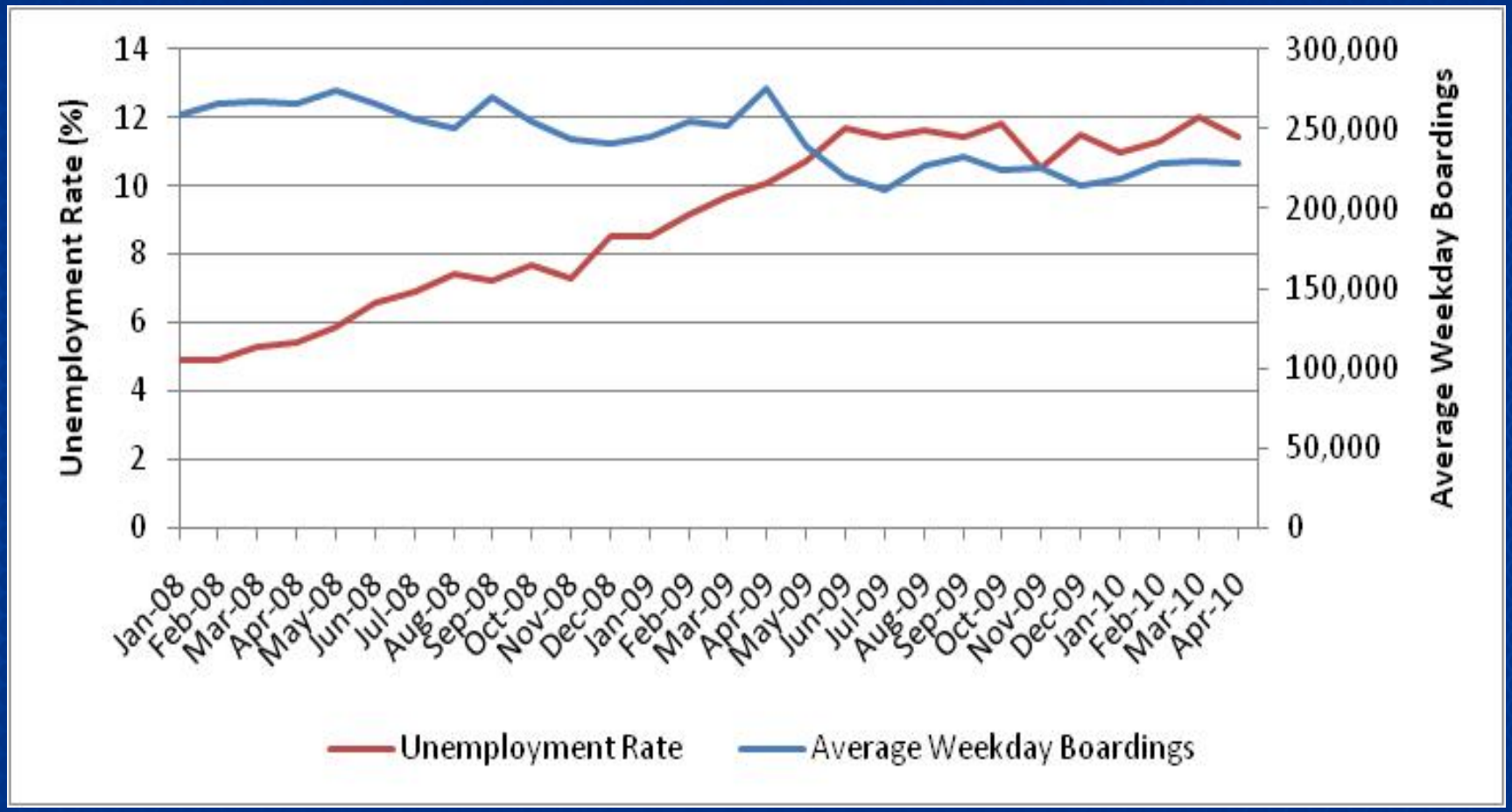
- ✓ Average weekday ridership increased 57%.
- x Boardings per revenue mile dropped 14%.
- x Average vehicle occupancy dropped from 2.20 to 1.36 (a.m.) dropped from 1.95 to 1.46. (p.m.)
- x Transit mode share dropped from 19% to 16% (a.m.) dropped from 15% to 14% (p.m.)

Unemployment Rate in Miami-Dade



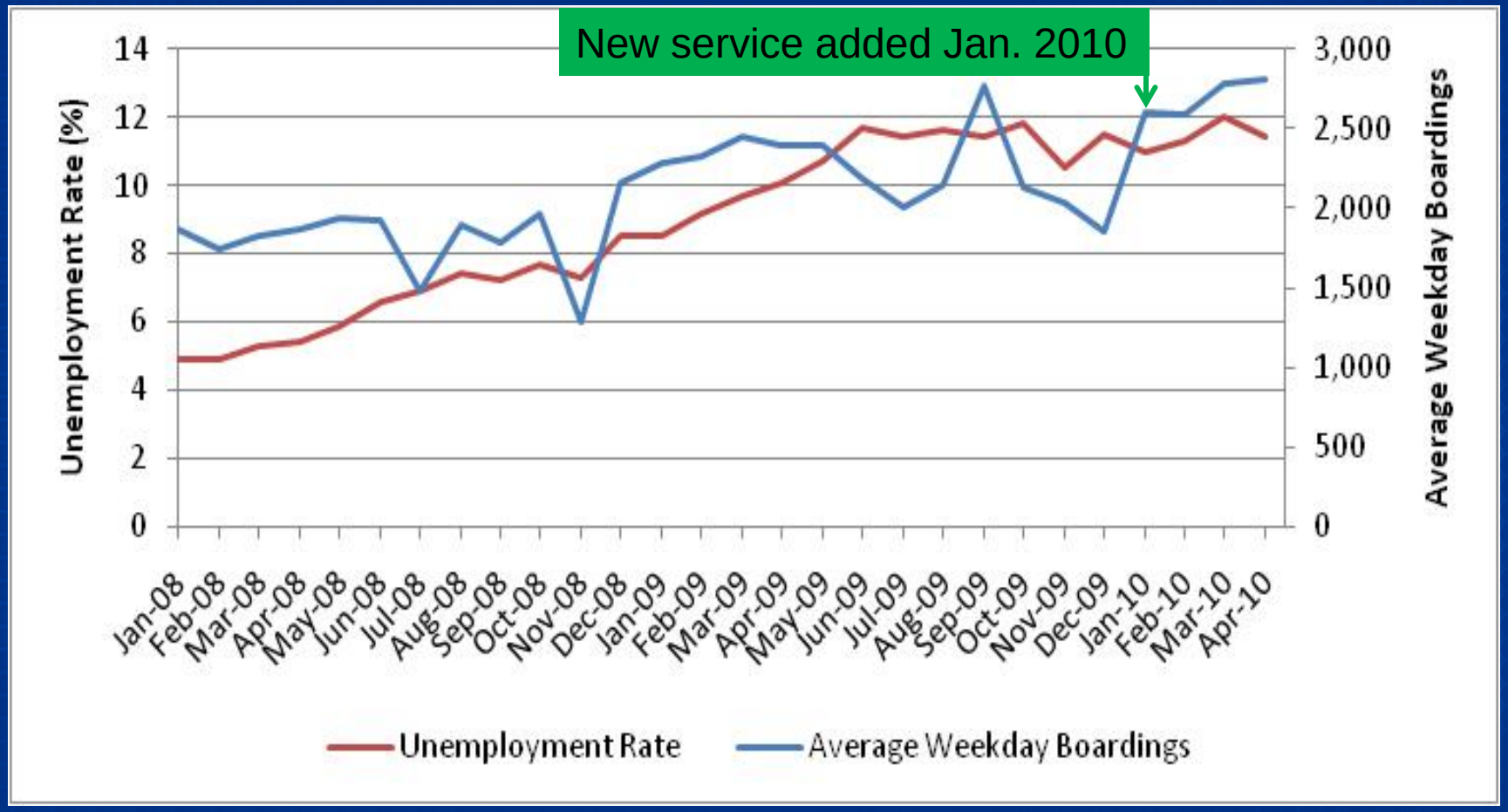
Unemployment Rate in Miami-Dade County
Source: U.S. Department of Labor

Unemployment v. MDT Ridership



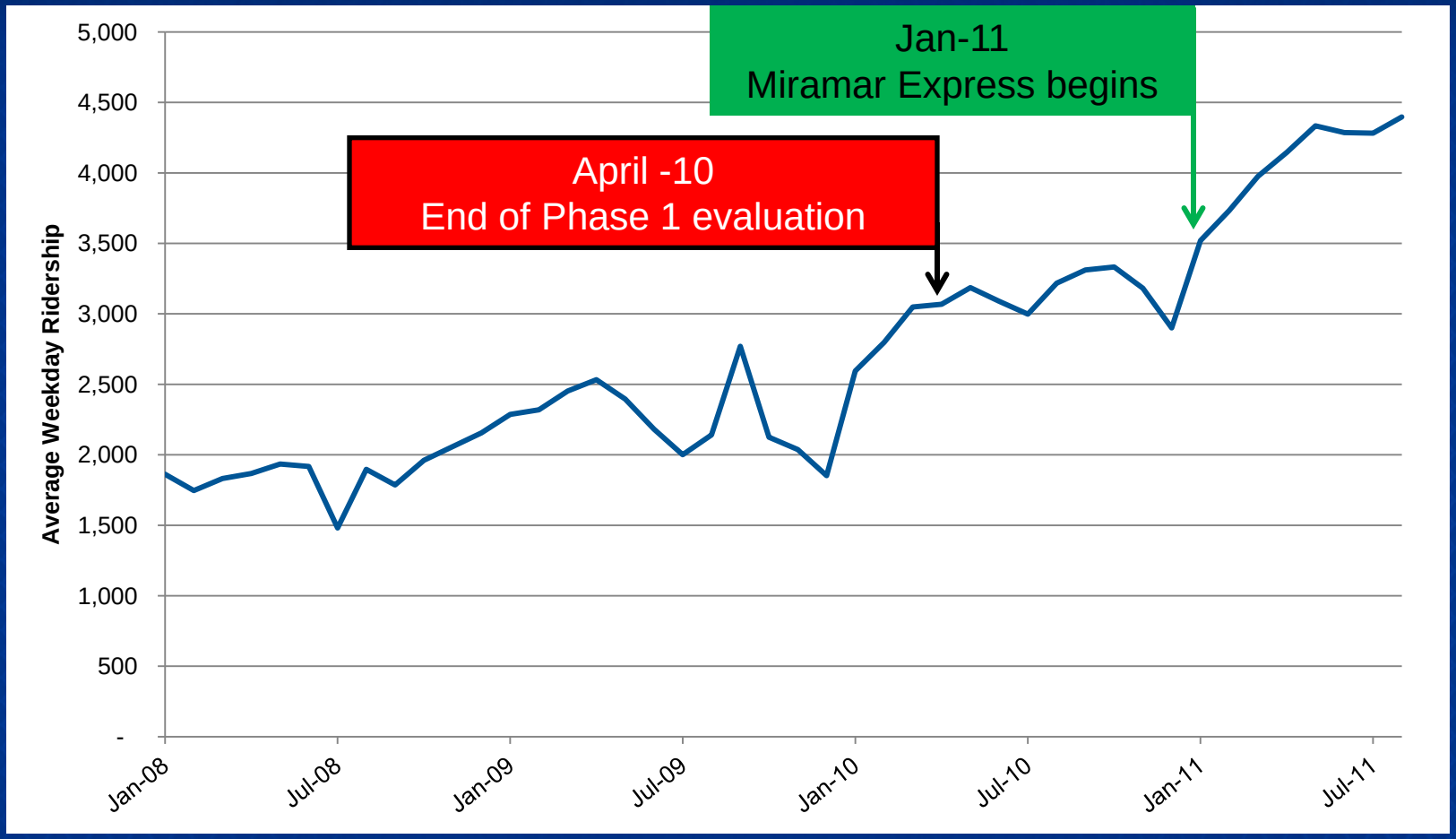
Ridership is for all MDT MetroBus

Unemployment v. 95 Express Bus



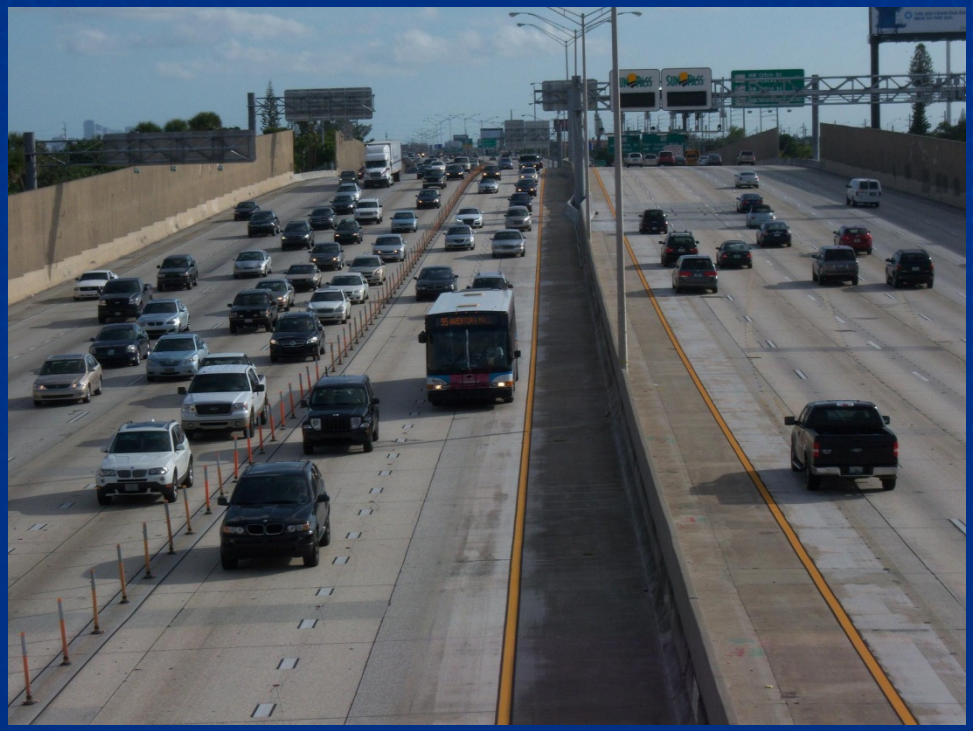
Ridership is for all 95 Express Bus routes

Ridership Continues Upward



Miami UPA Hypothesis 3 Results

- ✓ Total person throughput for the Express Lanes increased 42%.
- ✓ Person throughput from transit increased while person throughput from HOVs decreased.



Miami UPA Hypothesis 4 Results

- ✓ 53% of new 95 Express Bus riders said the Express Lanes influenced their decision to use transit.
- ✓ 38% of new 95 Express Bus riders used to drive alone.
- ✓ 34% switched from Tri-Rail and/or MetroRail.
- ✓ 86% have access to vehicle always or most of the time.

Minnesota UPA Transit Results (2009 – 2011 Data)

Minnesota UPA Hypothesis 1 Results

MARQ2 Bus Lanes
(opened Dec. 2009)

Marquette Ave.

2nd Ave.

Minnesota UPA Hypothesis 1 Results

MARQ2 Bus Lanes
(opened Dec. 2009)

Target Speed: 8 mph

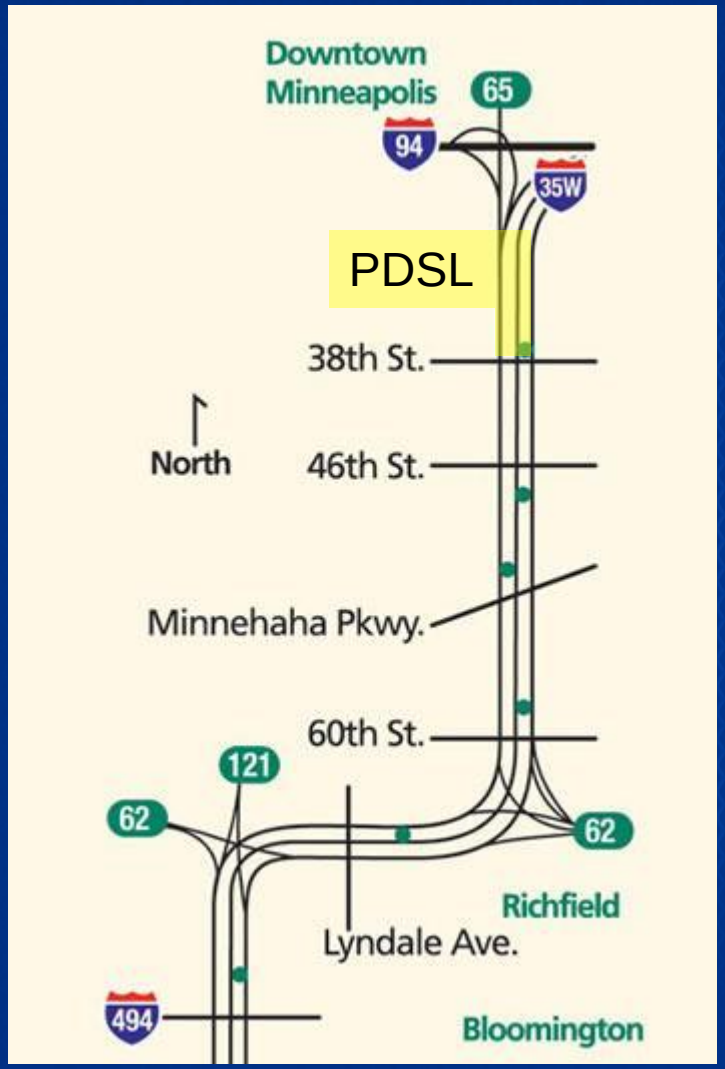
Average Speeds (mph)			
	2008	**2011**	**Percent Change 08-11**
Marquette Ave. AM	5.1	6.7	31%
Marquette Ave. PM	3.9	5.7	48%
2nd Ave. AM	4.3	7.4	74%
2nd Ave. PM	4.0	6.4	57%

Minnesota UPA Hypothesis 1 Results

Priced Dynamic Shoulder Lanes opened in Sept. 2009

Travel Speeds (mph)	
Apr. 2009	**Apr. 2011**
41 mph	35 mph

Note: PDSL is northbound only



Minnesota UPA Hypothesis 1 Results

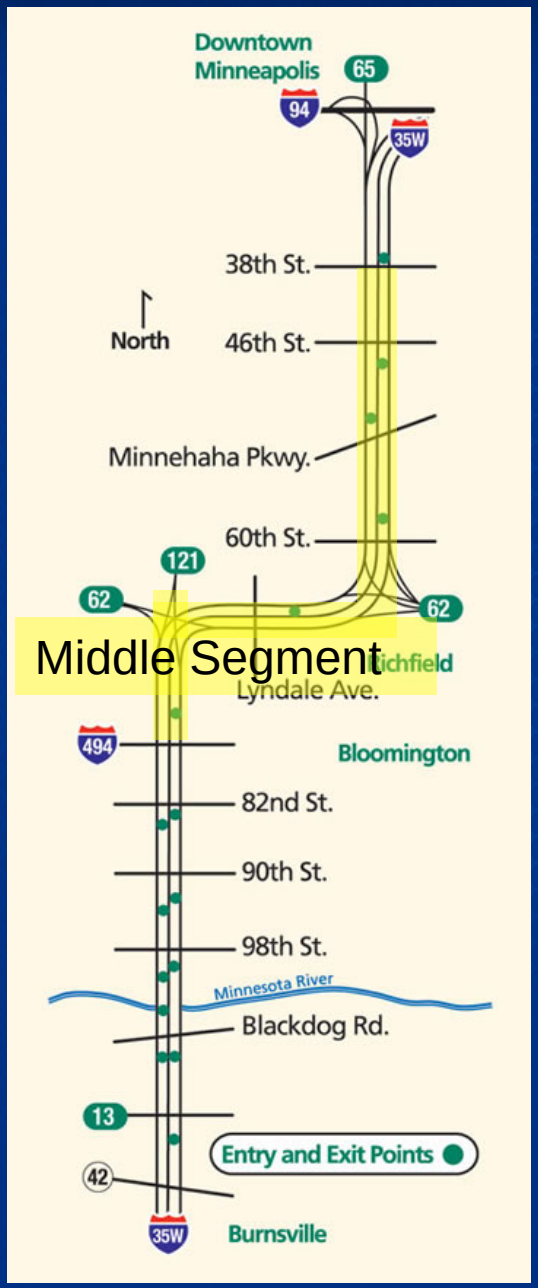
HOT Lanes Southern Segment opened in Sept. 2009

Travel Speeds (mph)		
	Apr. 2009	**Apr. 2011**
Northbound	61 mph	52 mph
Southbound	52 mph	52 mph

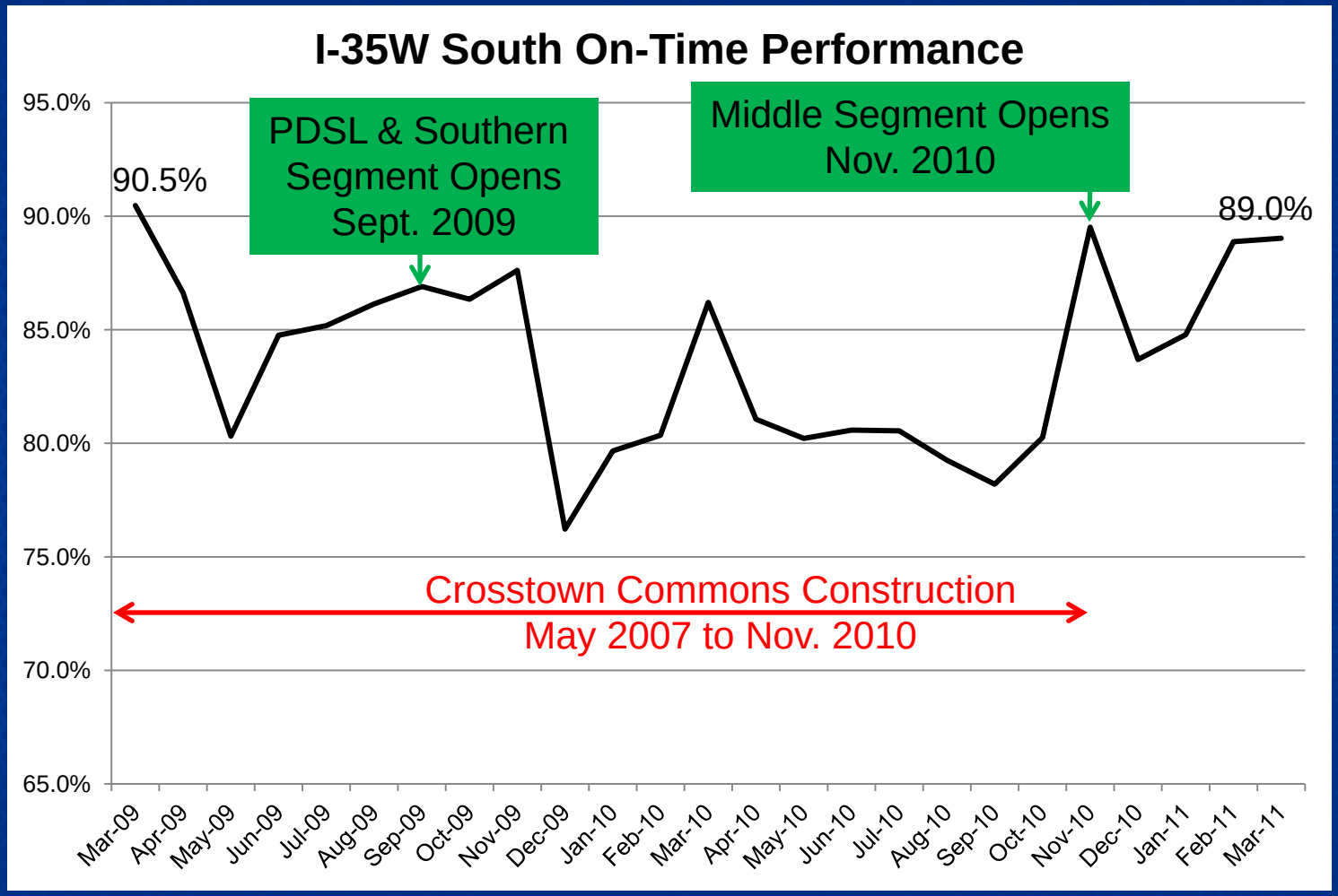
Minnesota UPA Hypothesis 1 Results

HOT Lanes Middle Segment
opened in Nov. 2010

Travel Speeds (mph)		
	Apr. 2009	**Apr. 2011**
Northbound	28 mph	57 mph
Southbound	47 mph	57 mph



Minnesota UPA Hypothesis 1 Results

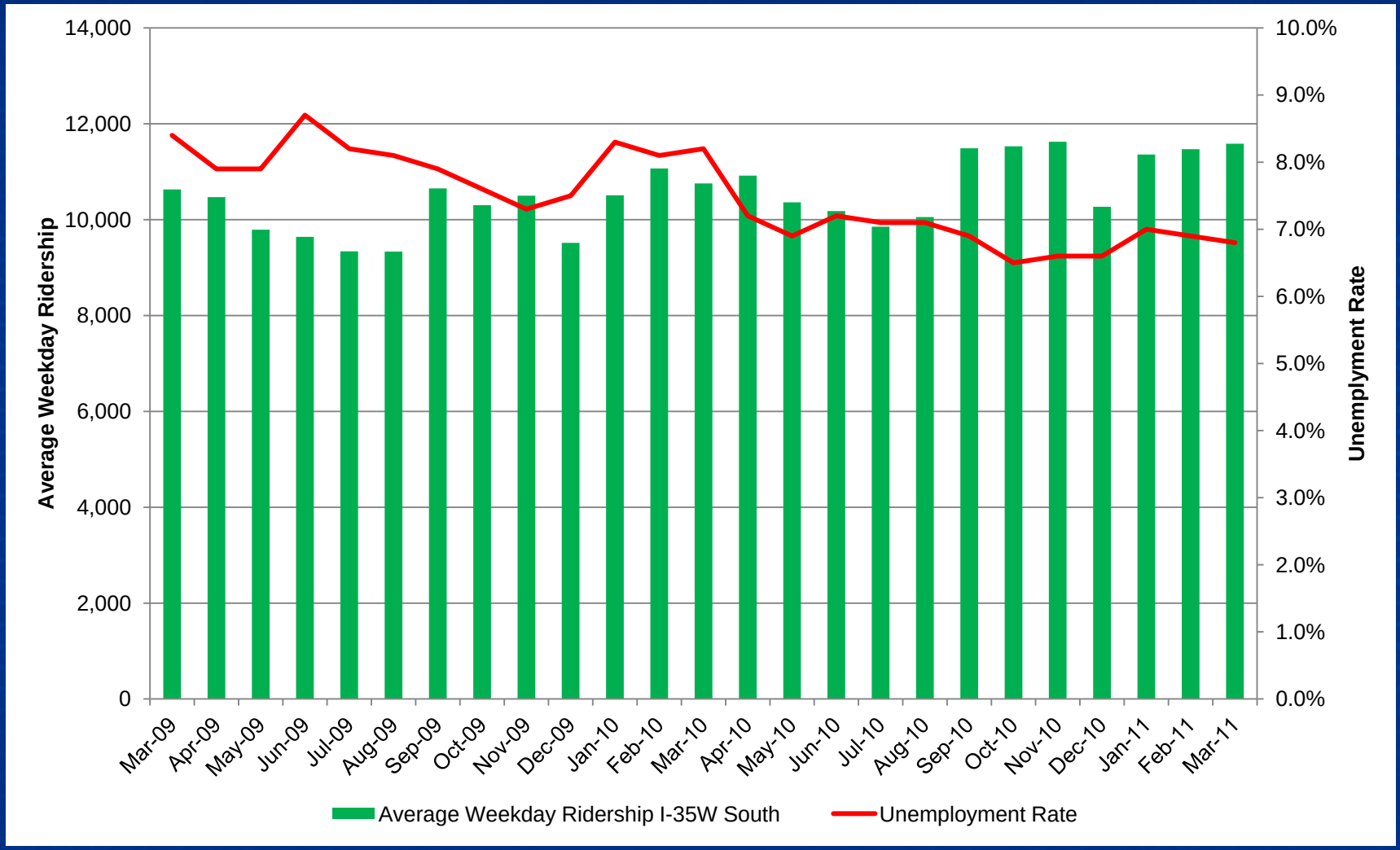


Minnesota UPA Hypothesis 2 Results

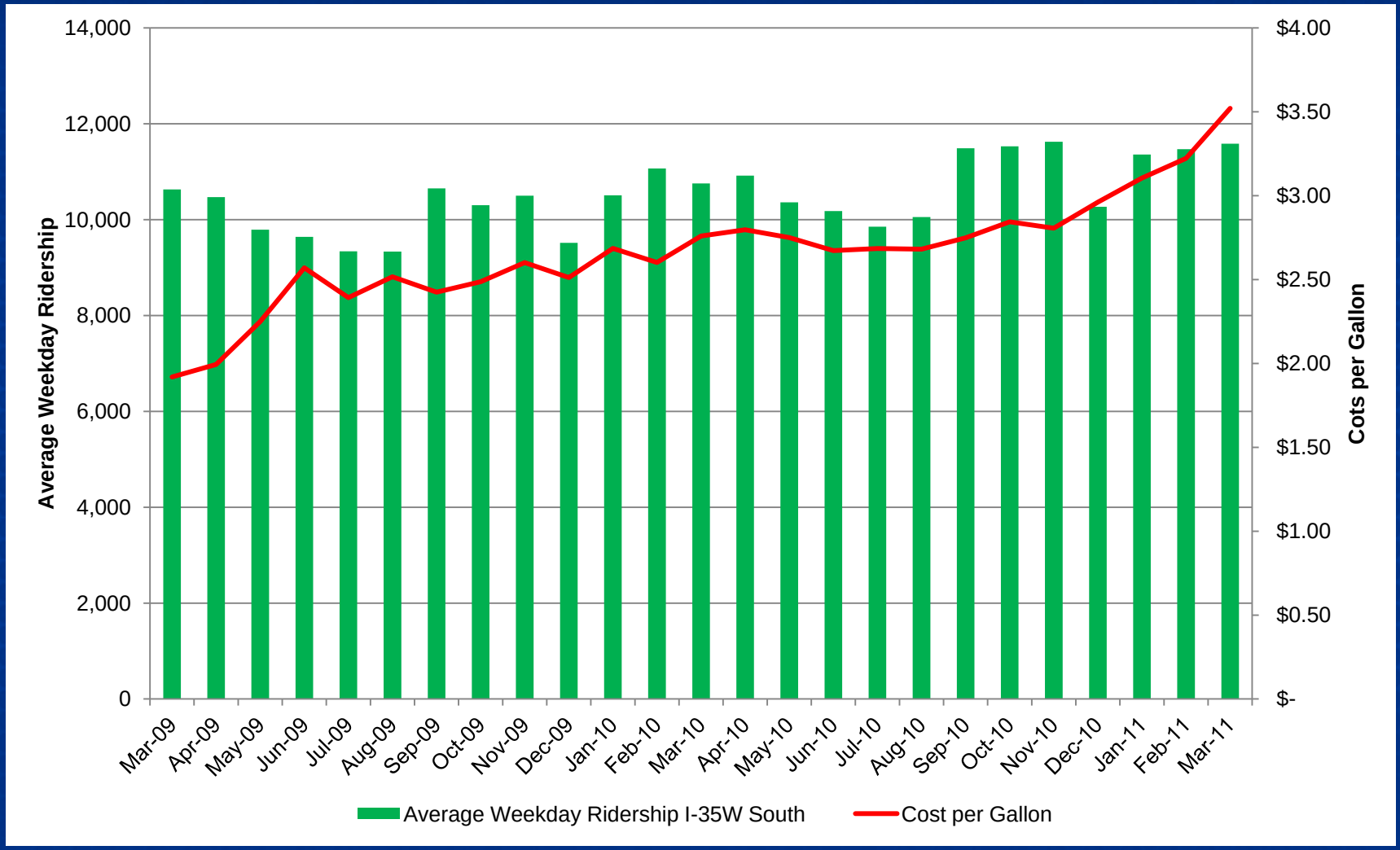
Average Weekday Ridership by Corridor	
I-35W North	7.0%
I-35W South	9.0%
I-394	2.4%
I-94N	4.5%

Percentages are between March 2009 and March 2011

I-35W South Ridership vs. Unemployment



I-35W South Ridership vs. Cost per Gallon



Minnesota UPA Transit Rider Survey

June 2010 survey of all I-35W routes.

- Post deployment for PDSL, Southern Segment, and MARQ2 lanes.

Transit has attracted new choice commuters.

- 95% of all riders were riding to work
- 32% are new riders (1 year or less)
- 26% of new riders used to drive alone

Riders happy with bus reliability and travel times.

- 91% rated bus reliability very good or good
- 85% rated bus travel time very good or good

Overall HOT lanes haven’t changed these perceptions.

- 57% rated reliability the same; 22% said it was now better
- 48% rated travel times the same; 26% said they were now better

Minnesota UPA Transit Rider Survey

Bus Arrival Time Signs

- 86% have seen them
- 8% were influenced by them

Bus arrival time sign on MARQ2

Impact of MARQ2 lanes

- 55% said service speed better
- 46% said service reliability better

MARQ2 Bus Lanes Downtown Minneapolis

I-35W Express Bus Rider Demographics

Category	I-35W Riders		All Metro Riders	
Aged 35 to 64	66%		48%	
Caucasian	86%		62%	
African-American	4%		23%	
Gender	Male	Female	Male	Female
	38%	62%	59%	41%
Household income > $60K	69%		27%	
Household income < $20K	3%		32%	
Access to at least 1 car	94%		56%	

Comments / Questions?

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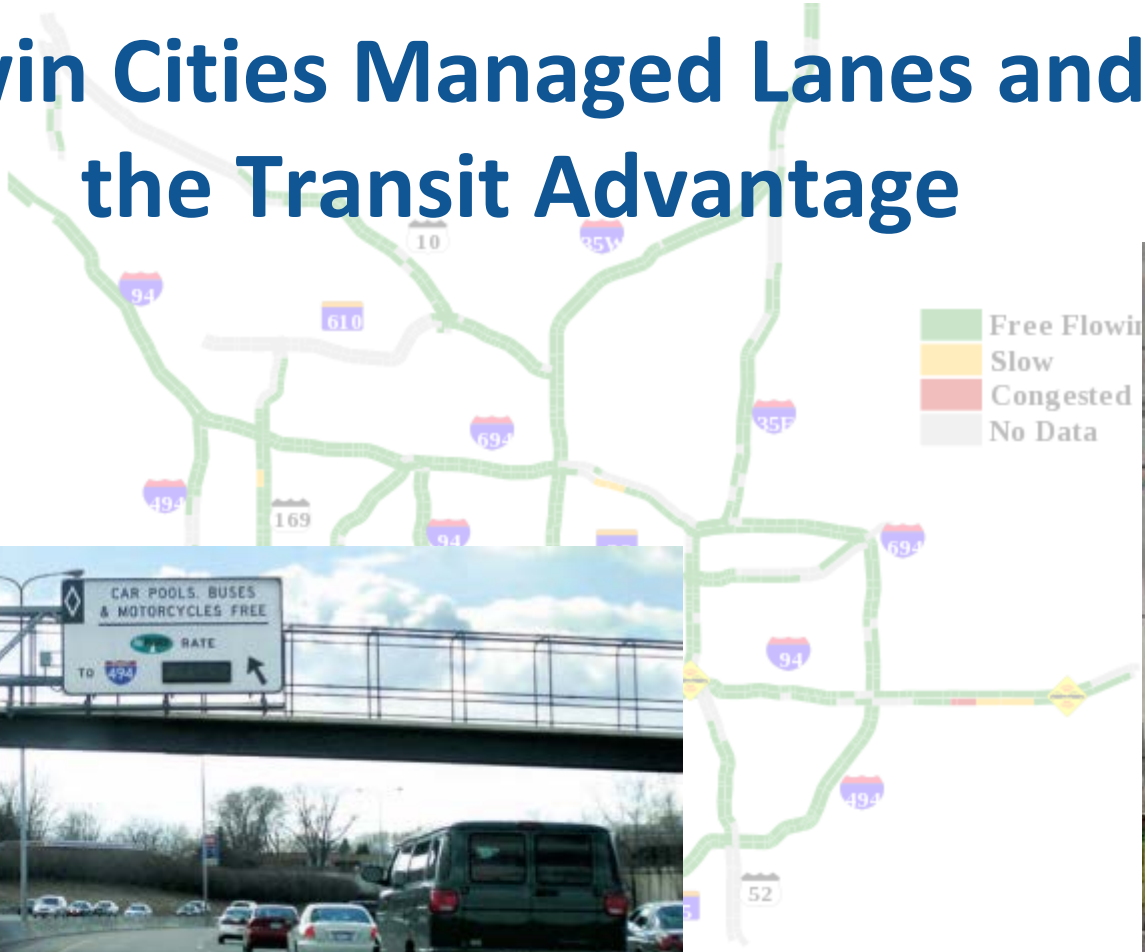
Twin Cities Managed Lanes and the Transit Advantage



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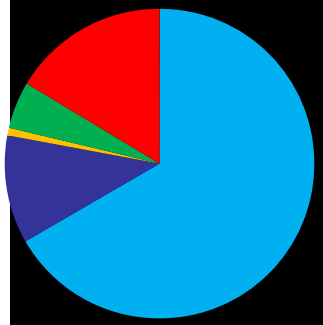


Urban Local

- 70 routes
- 5,500 weekday bus trips
- 185,151 average daily rides

Hiawatha Line Light Rail

- 245 weekday train trips
- 31,000 average daily rides

Northstar Commuter Rail

- 12 weekday train trips
- 2,200 average daily rides

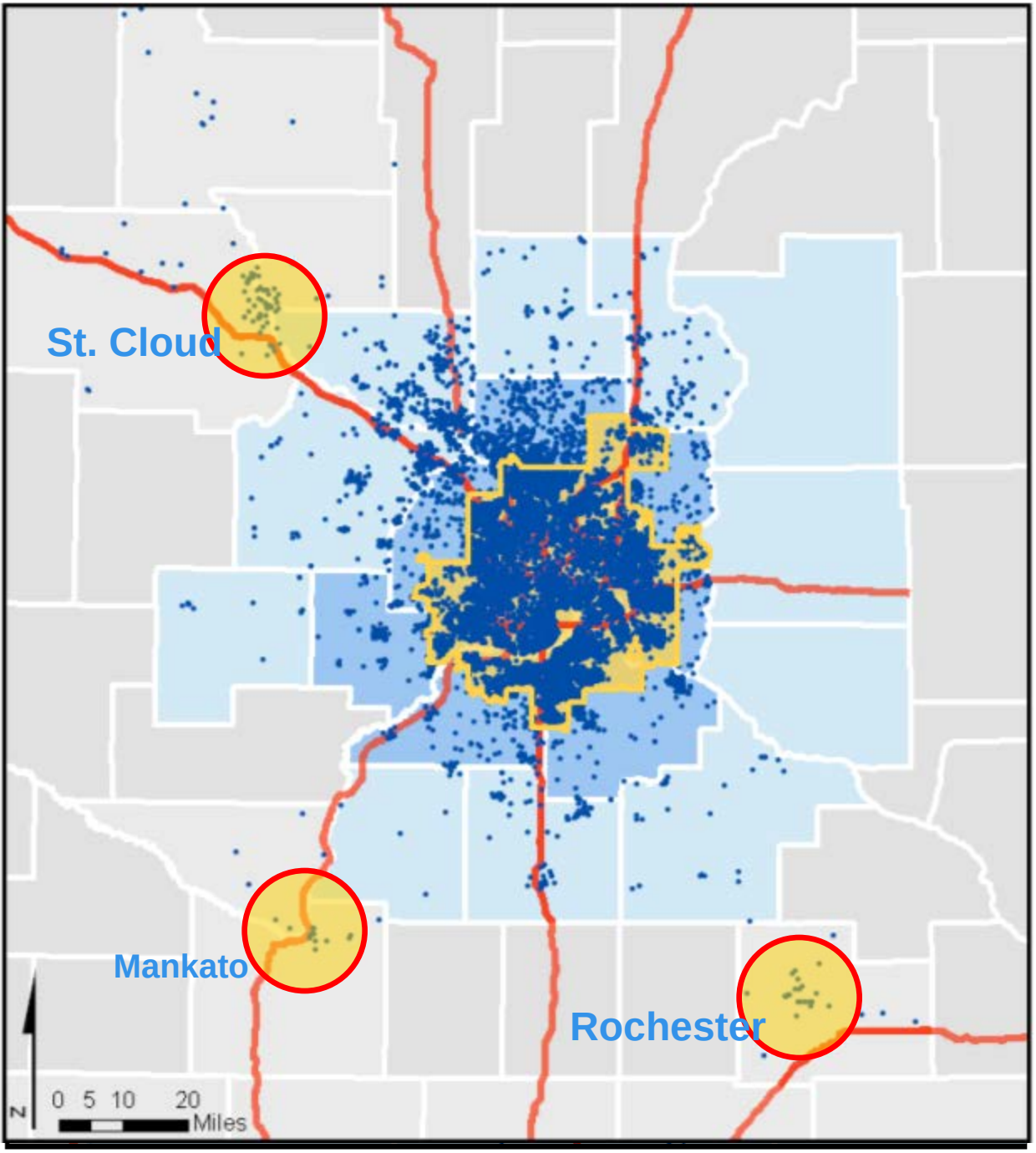
Suburban Local

- 48 routes
- 1,350 weekday bus trips
- 13,600 average daily rides

Express Service & Park & Rides

- 100 routes
- 2,200 weekday bus trips
- 45,500 average daily rides
- 111 park & rides
- 28,860 park & ride spaces

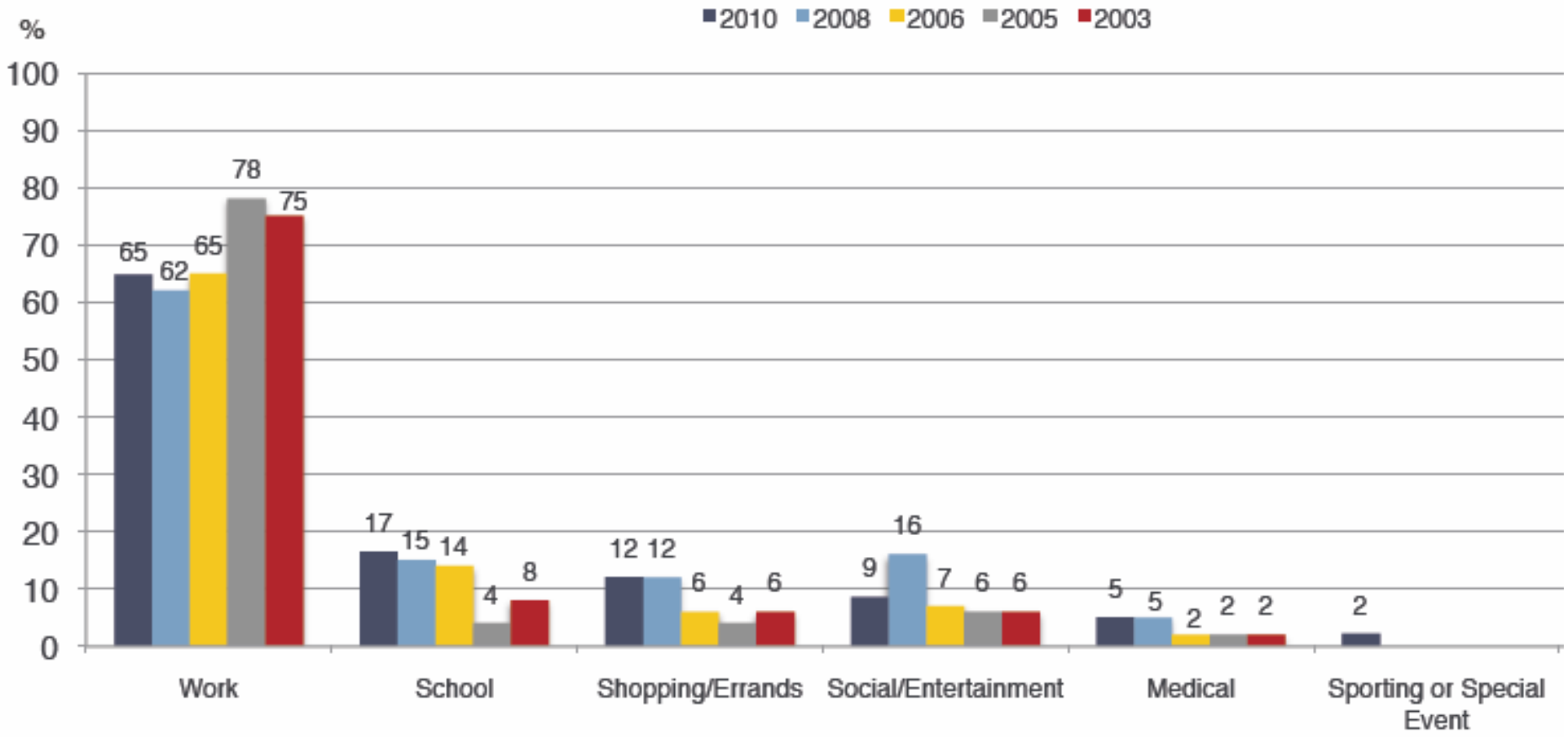
Park & Ride User **Distribution**



- 74% in *Transit Capital Levy Communities*
- 85% in 7-County Metro Area
- Greater Minnesota Population centers

Park-and-Ride User (17,888)
Interstate Highway
Transit Capital Levy Communities
7-County Metro Area
19-County Metro Area
Greater Minnesota/Wisconsin

Trip purpose



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Transit Market Factors

- Auto ownership
- Employment Density
- Fuel cost
- Parking availability and cost
- Compete with auto travel time and reliability
  - Congestion on streets and highways
  - Transit advantages

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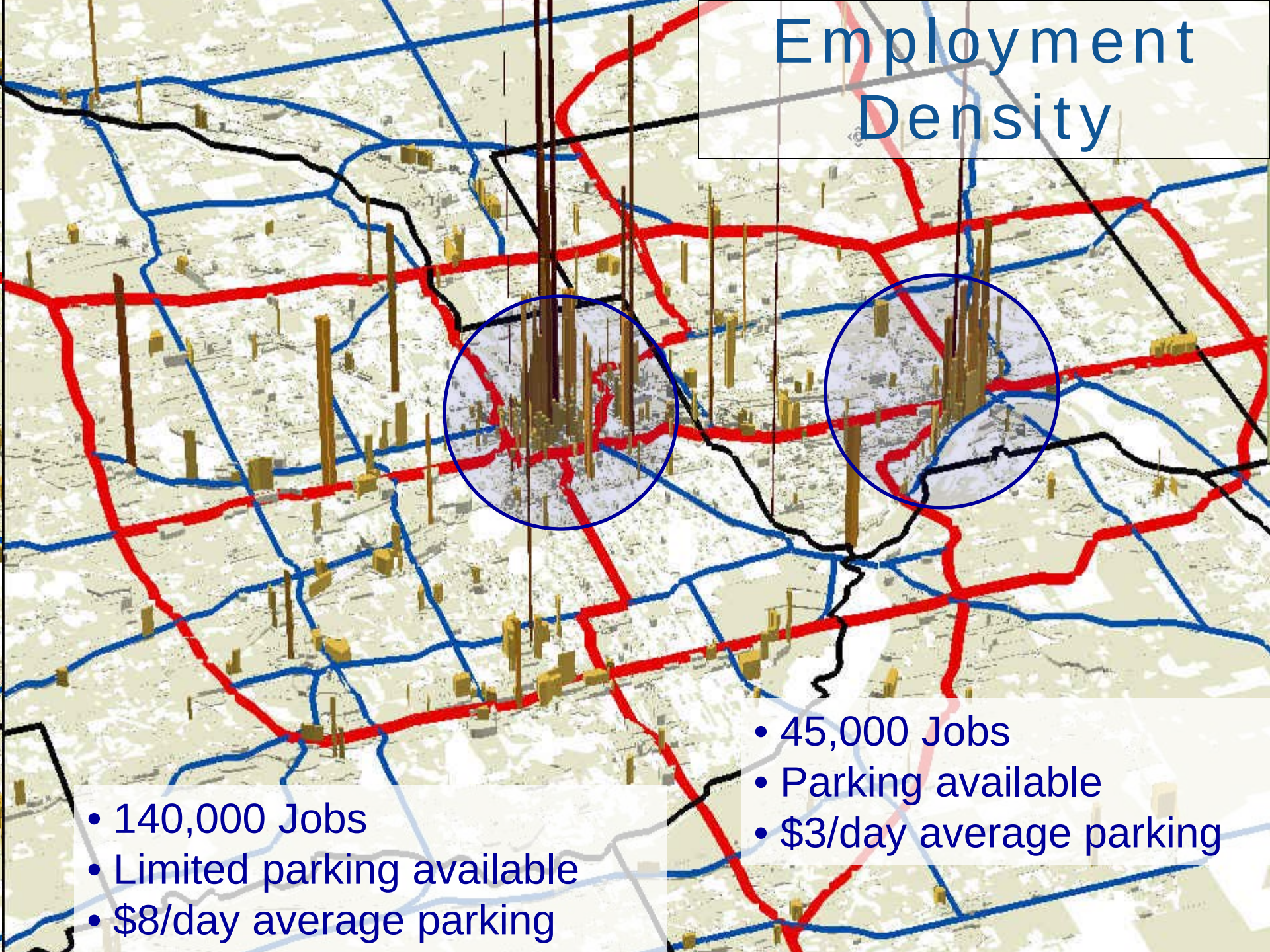
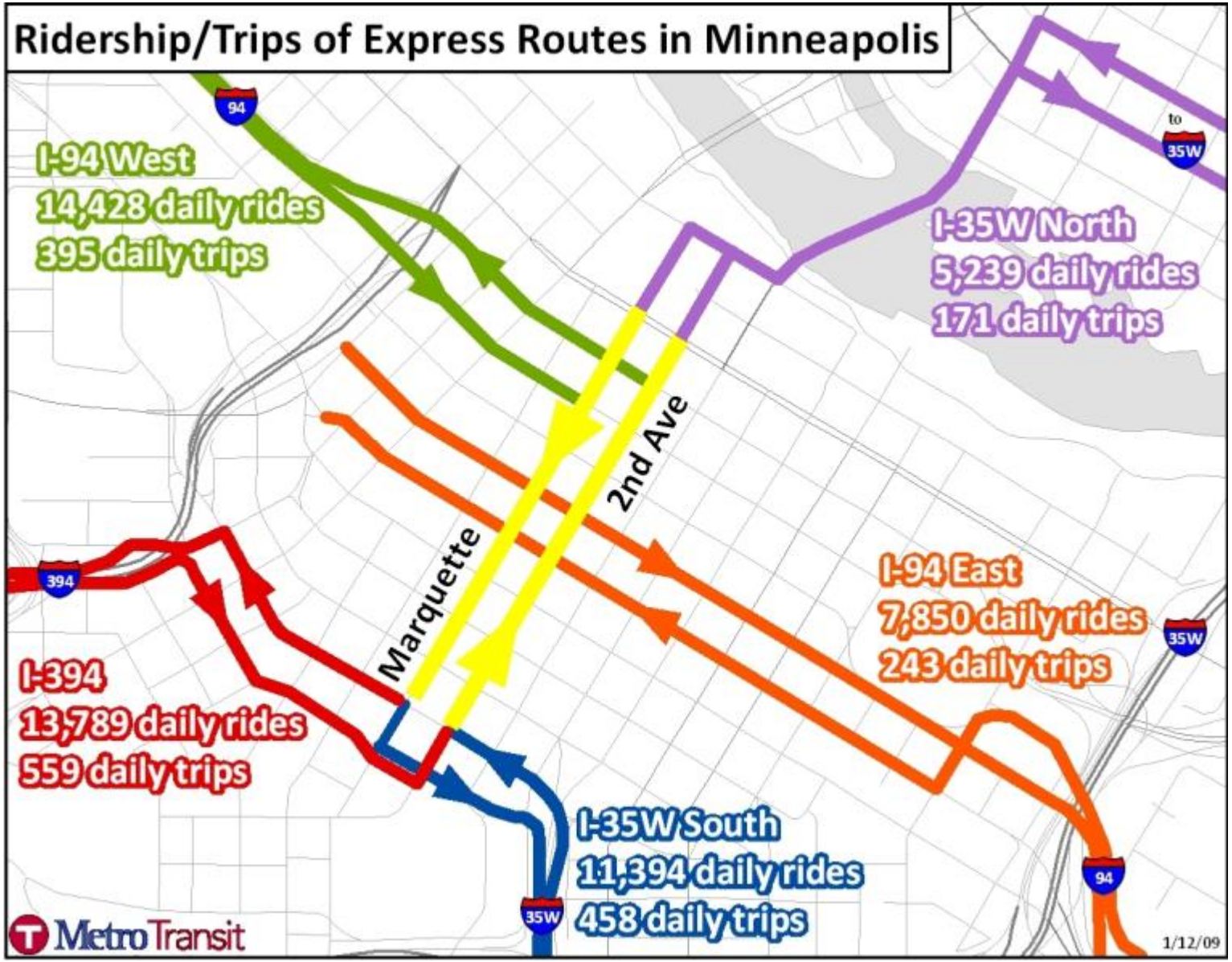
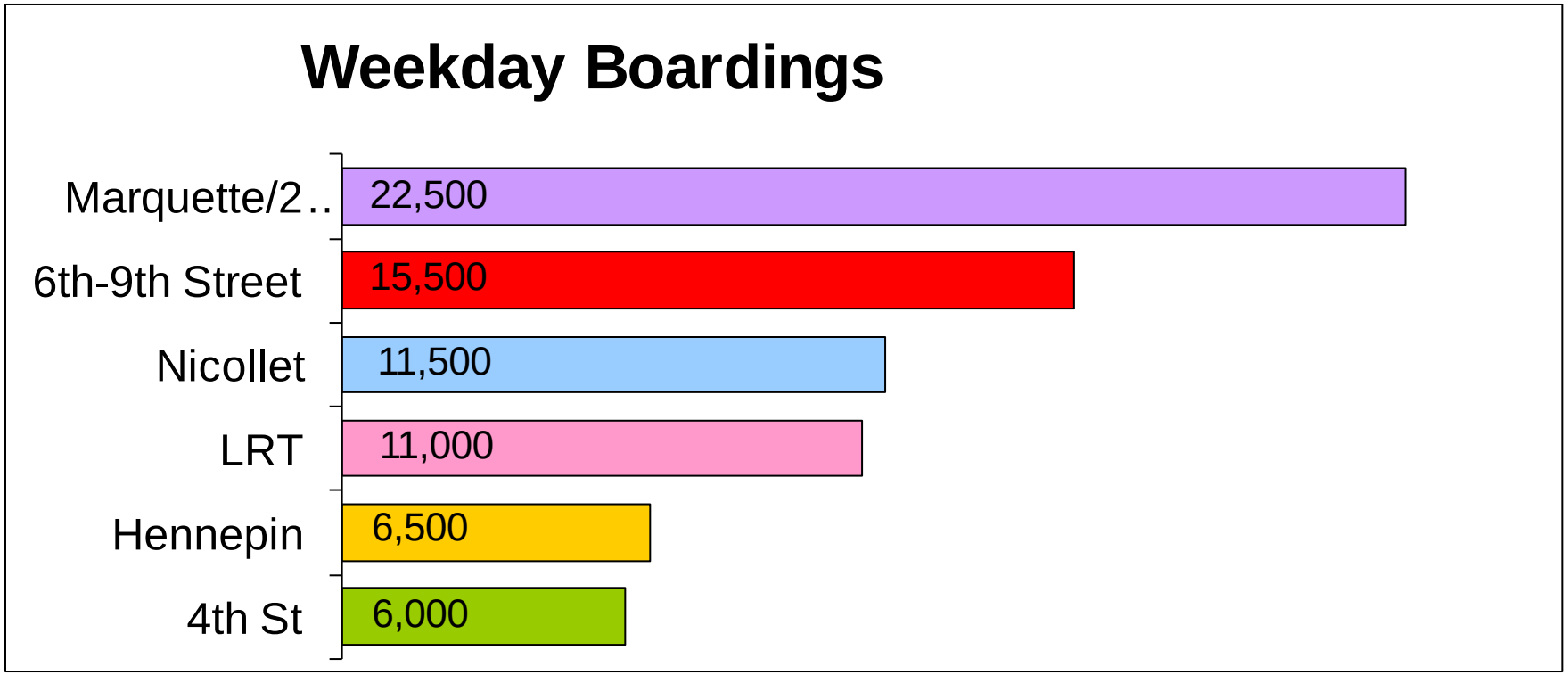

Employment Density
• 140,000 Jobs
• Limited parking available
• $8/day average parking
• 45,000 Jobs
• Parking available
• $3/day average parking

Express Service to Downtown Minneapolis



Downtown Minneapolis Transit



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Transit vs. SOV

- Time and Speed
- Reliability
- Convenience

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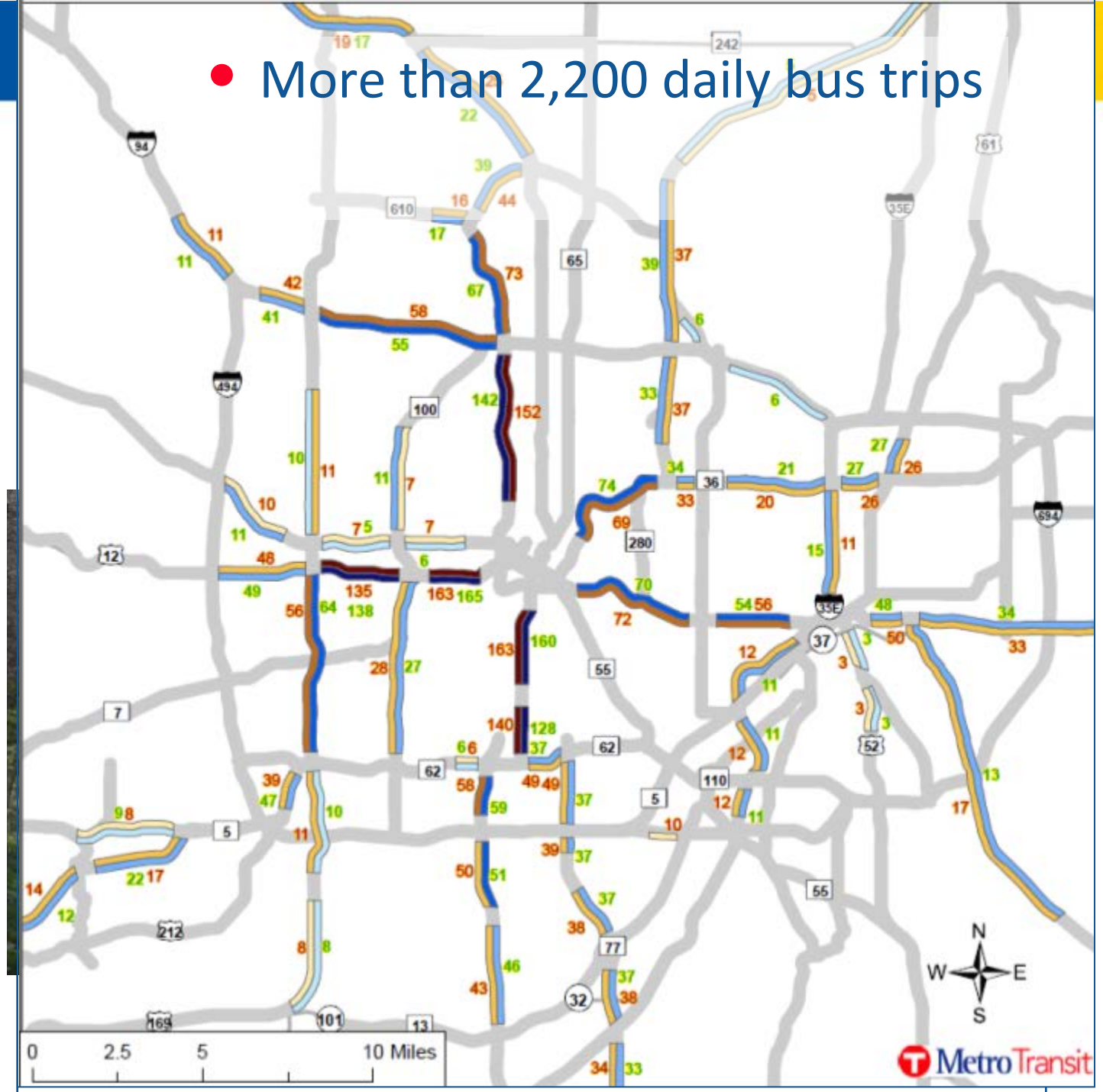
- More than 2,200 daily bus trips



Managed Lanes: The Next Generation – Can We Improve Performance

Urban Partnership Agreement

Tolling, Transit, Telecommuting & Technology

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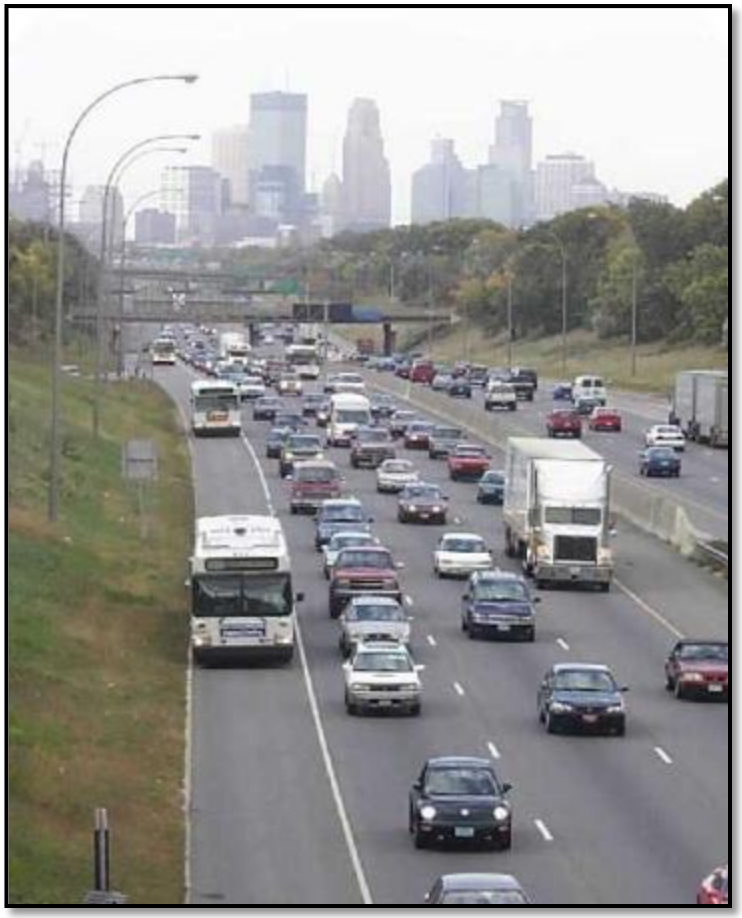

Transit Benefits of Managed Lanes

- Speed
- Reliability
- Revenue sharing

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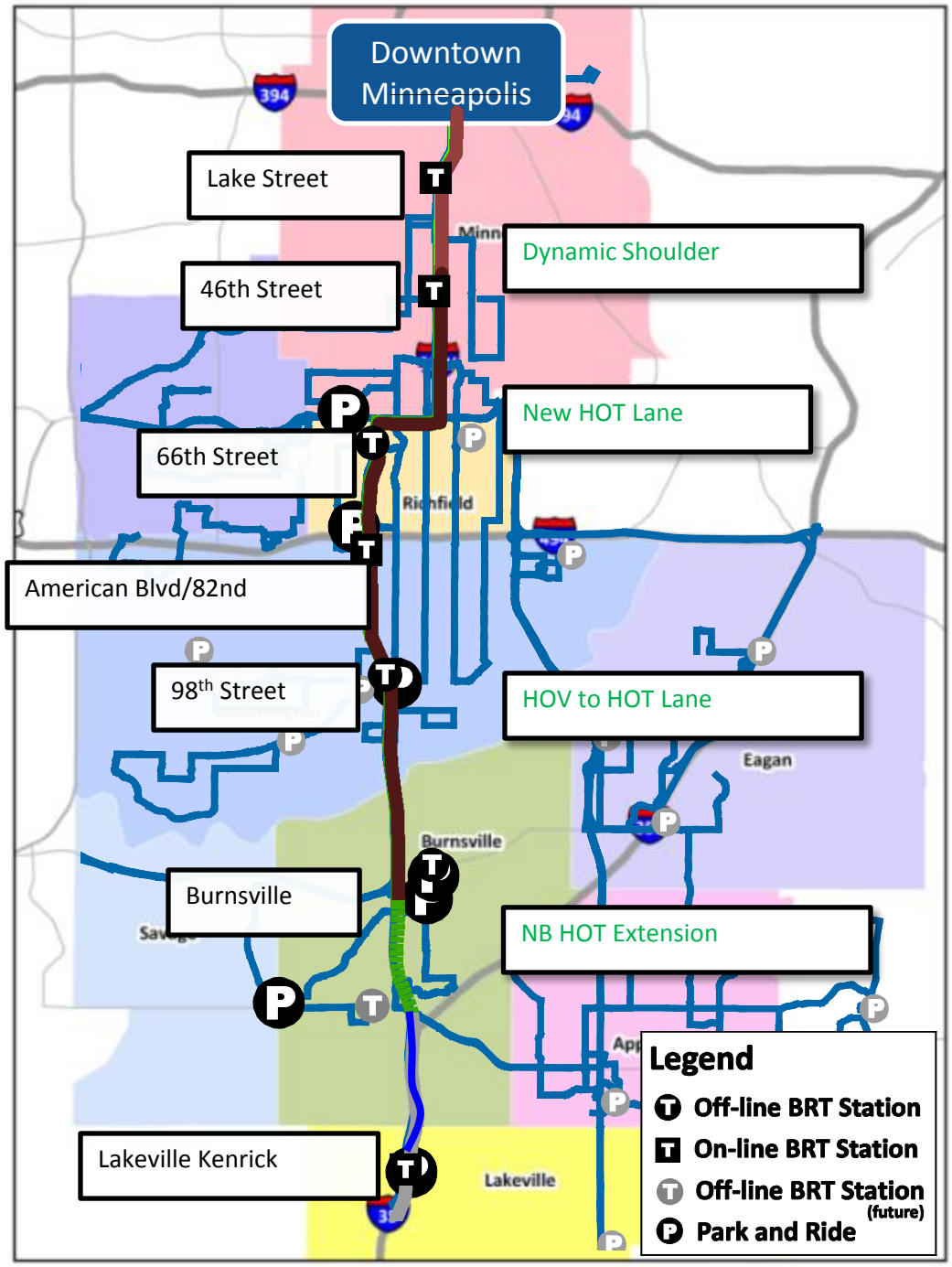

I-35W BRT Overview

- Express service
  - Fast, direct to downtown
  - Park & ride facilities
- MnPass express lanes
- High quality stations
- "Station-to-Station" service
  - Fast, frequent, all stops, both directions, all day
  - Unique vehicles
- Integrated Network

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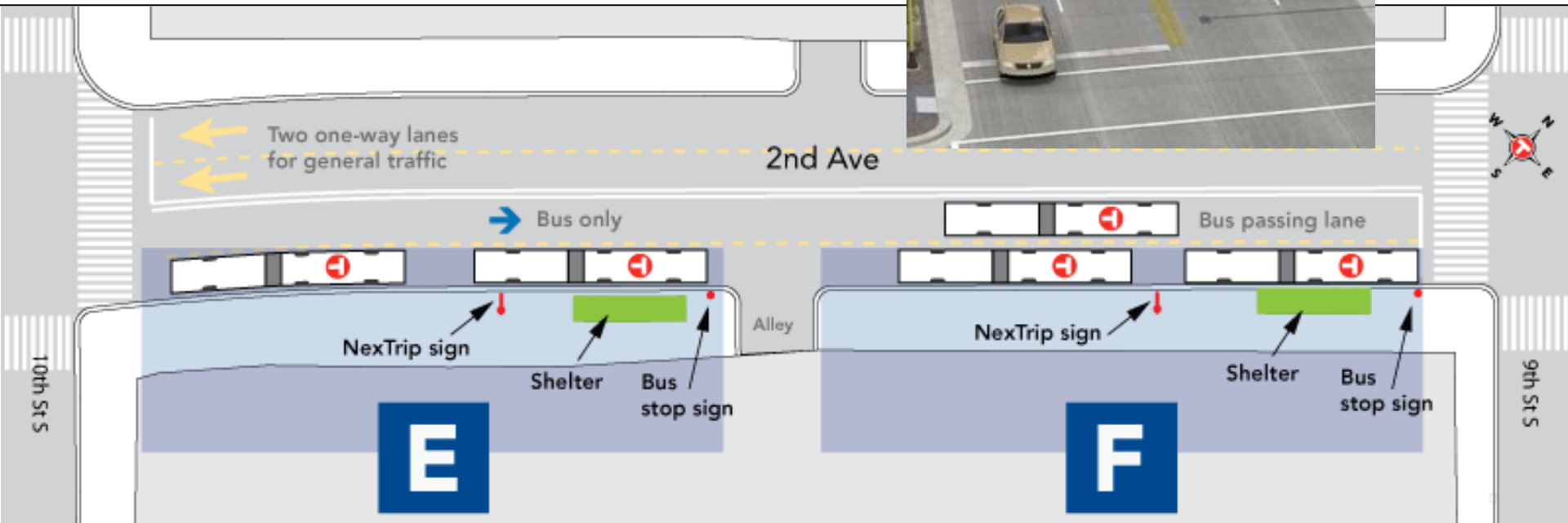
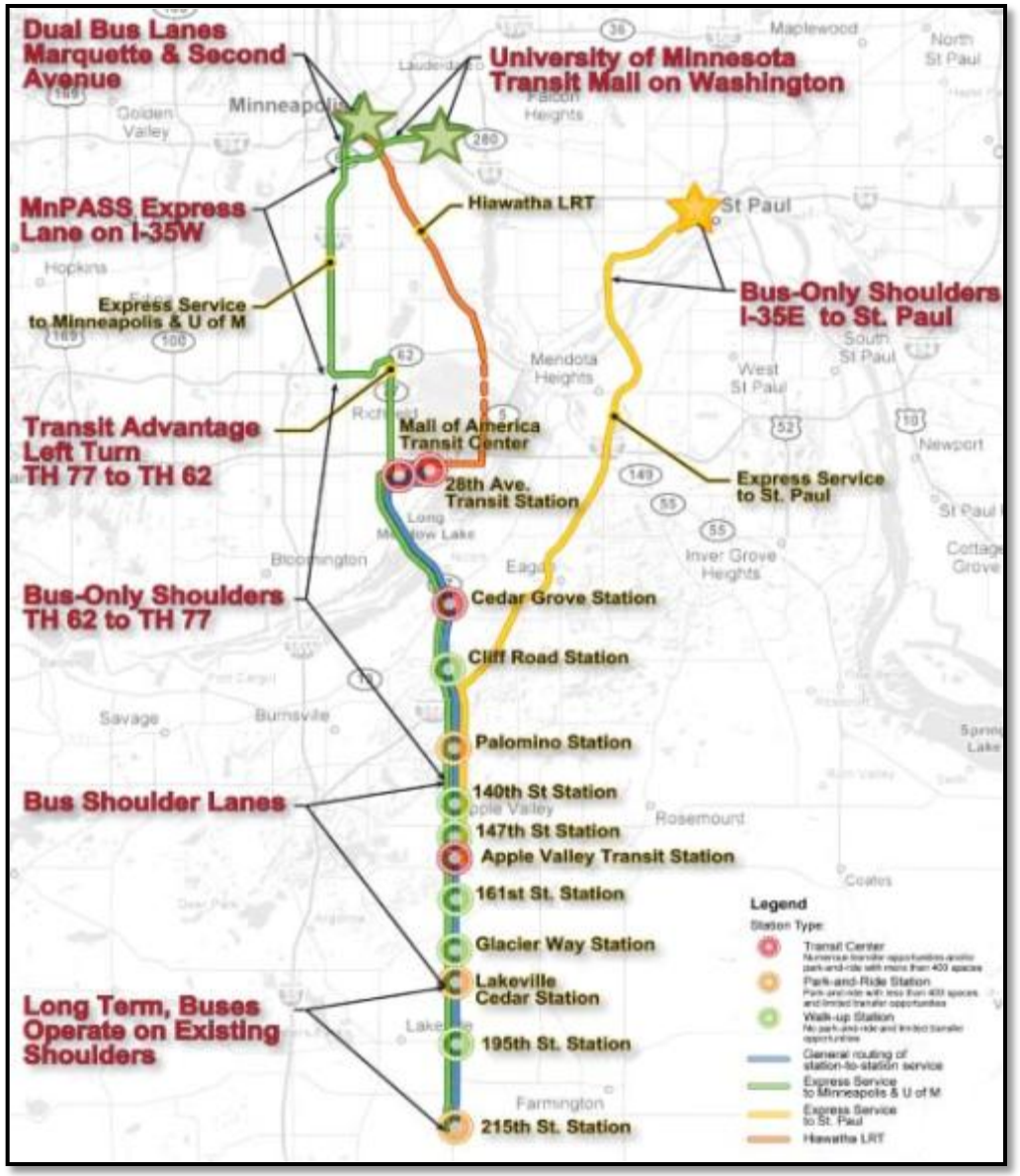
Downtown Minneapolis MARQ2 Bus operations

- Standard Operating Procedure
- 2 Stop Groups per Block
- 180 buses/hour (3x a single lane)



I-35W and 46th Street Online Station

- Opened December 6, 2010
- New service plan offers increased frequency to additional destinations; early ridership growth observed



UPA investment for Cedar Avenue BRT 2012

- Minneapolis MARQ2
- Transit bypass lane Hwy 62
- Apple Valley Transit Station
- Cedar Grove Park & Ride
- Lakeville Cedar Park & Ride

Minnesota Valley Transit Authority

Two MnPASS Corridors
The Same and Very Different

I-394 & 35W MnPASS Corridors

Similarities

- Brand
- Pricing Algorithms
- Toll Infrastructure
- Hours of Tolling
- Carpools and Buses Free
- Customer Geography
- Customer Utilization
- Performance

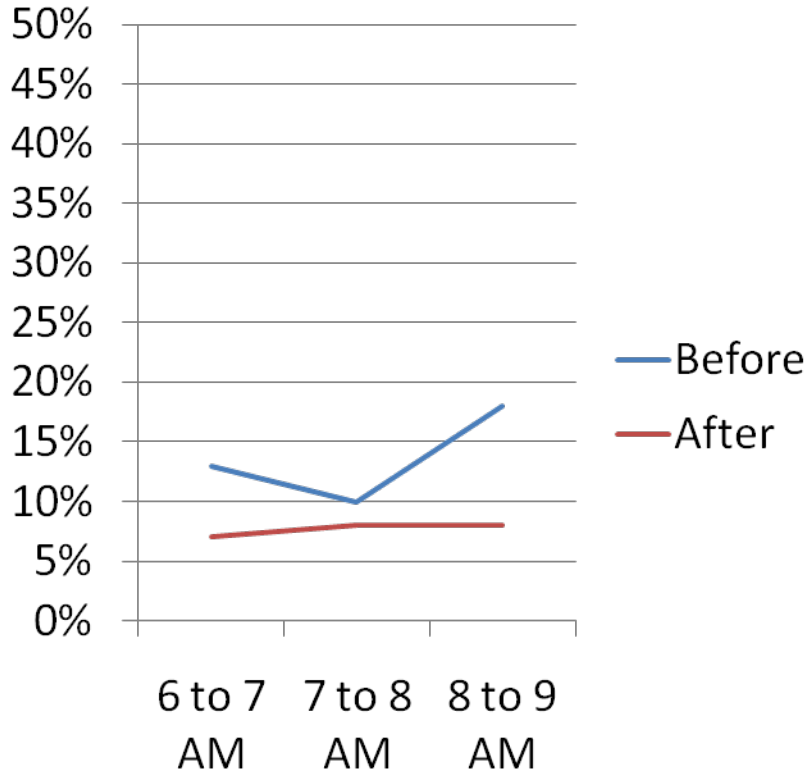
Differences

- Road Design
- Access Design
  - I-394: 75% Closed Access
  - I-35W: 75% Open Access
- Active Traffic Management
- Signing
- Start-up Staging
- Performance

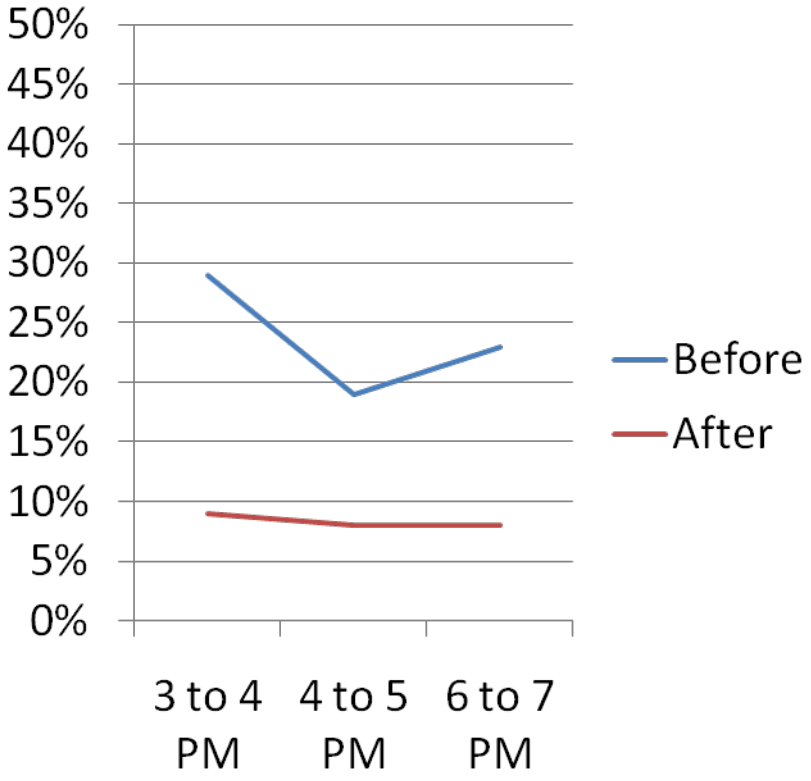
Changes in Violation Rates

Before and After MnPASS Implementation

AM Peak



PM Peak

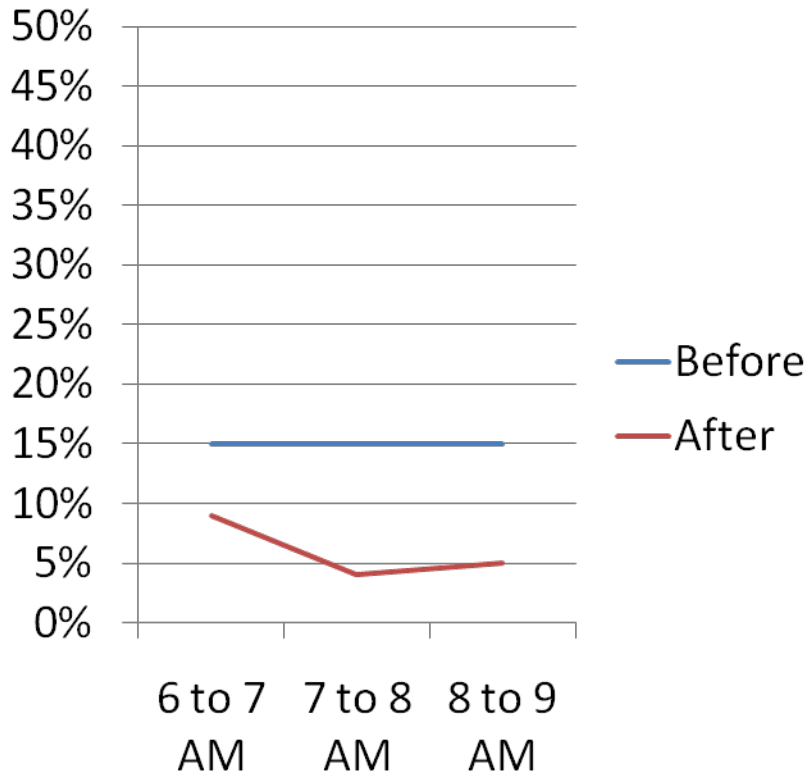


Before Data: 1st Quarter 2005

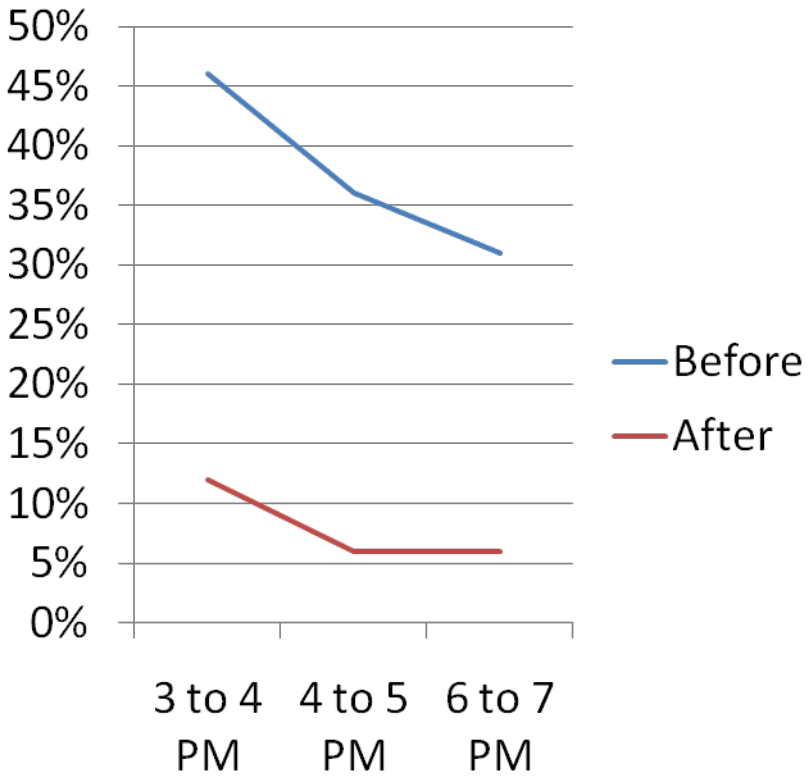
After Data: 1st Quarter 2006

Changes in Violation Rates:
Before and After MnPASS Implementation

AM Peak



PM Peak



Before Data: 1st Quarter 2009

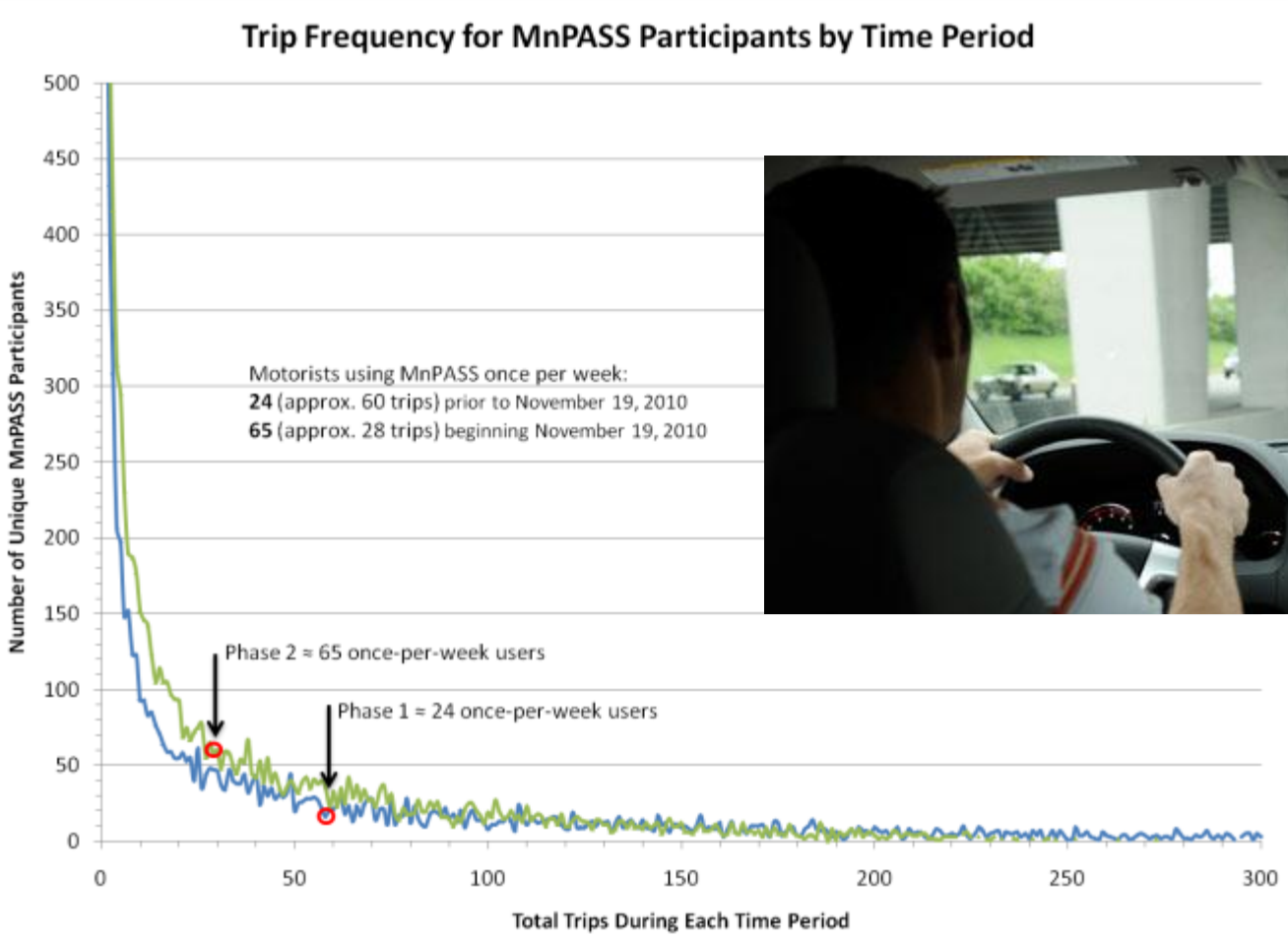
After Data: 1st Quarter 2010

MnPASS Users Satisfied with Congestion Pricing

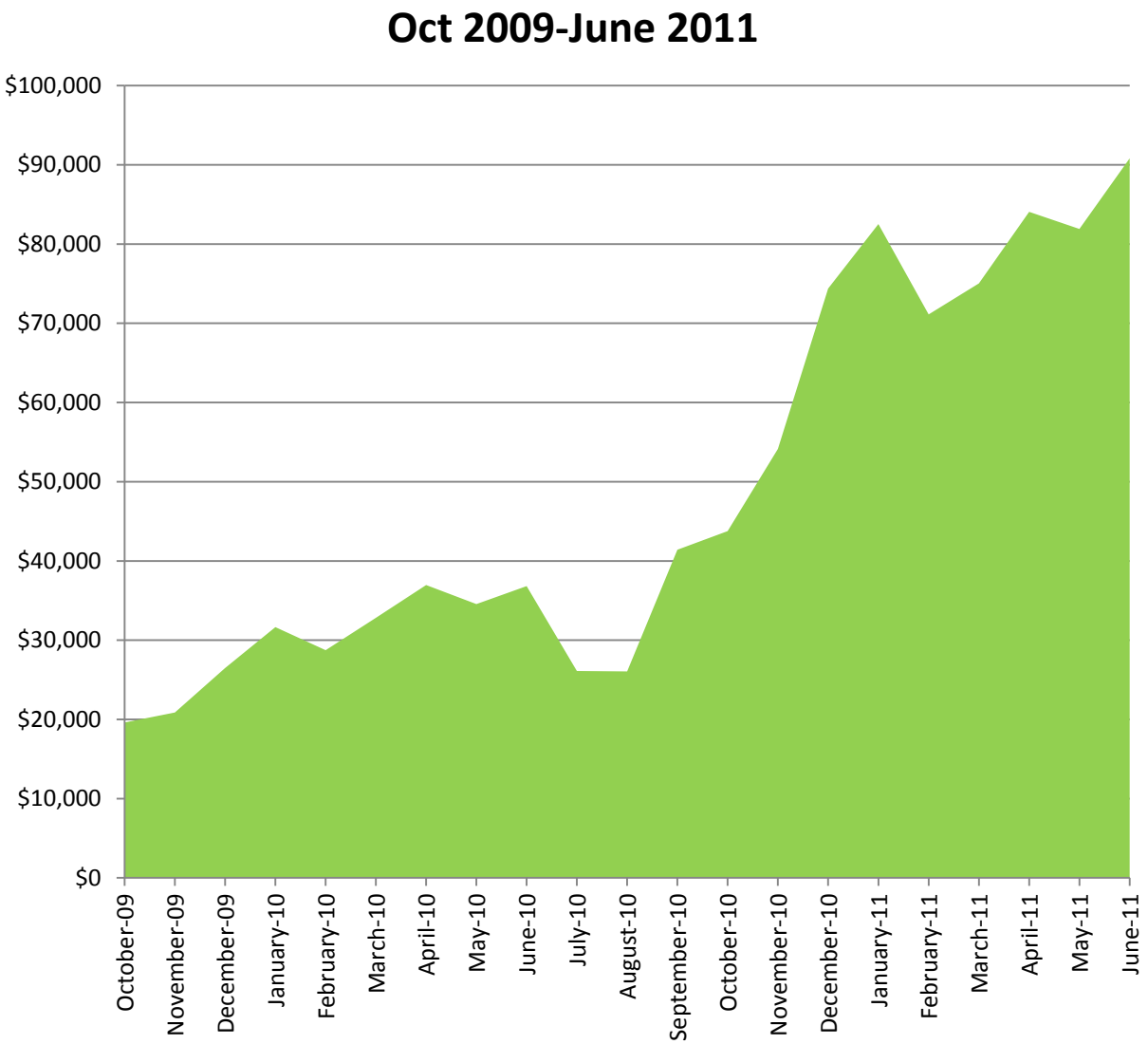
- 91% overall satisfaction
- 95% satisfaction with all electronic tolling
- 85% satisfaction with traffic speed in lane
- 76% satisfaction with dynamic pricing
- 66% satisfaction with safety of merging

Data from Survey of 500 MnPASS account holders in 2009

MnPASS Customers
Distribution Trips per Account



MNPASS Revenue from I-35W



Comparison of Two Managed Facilities

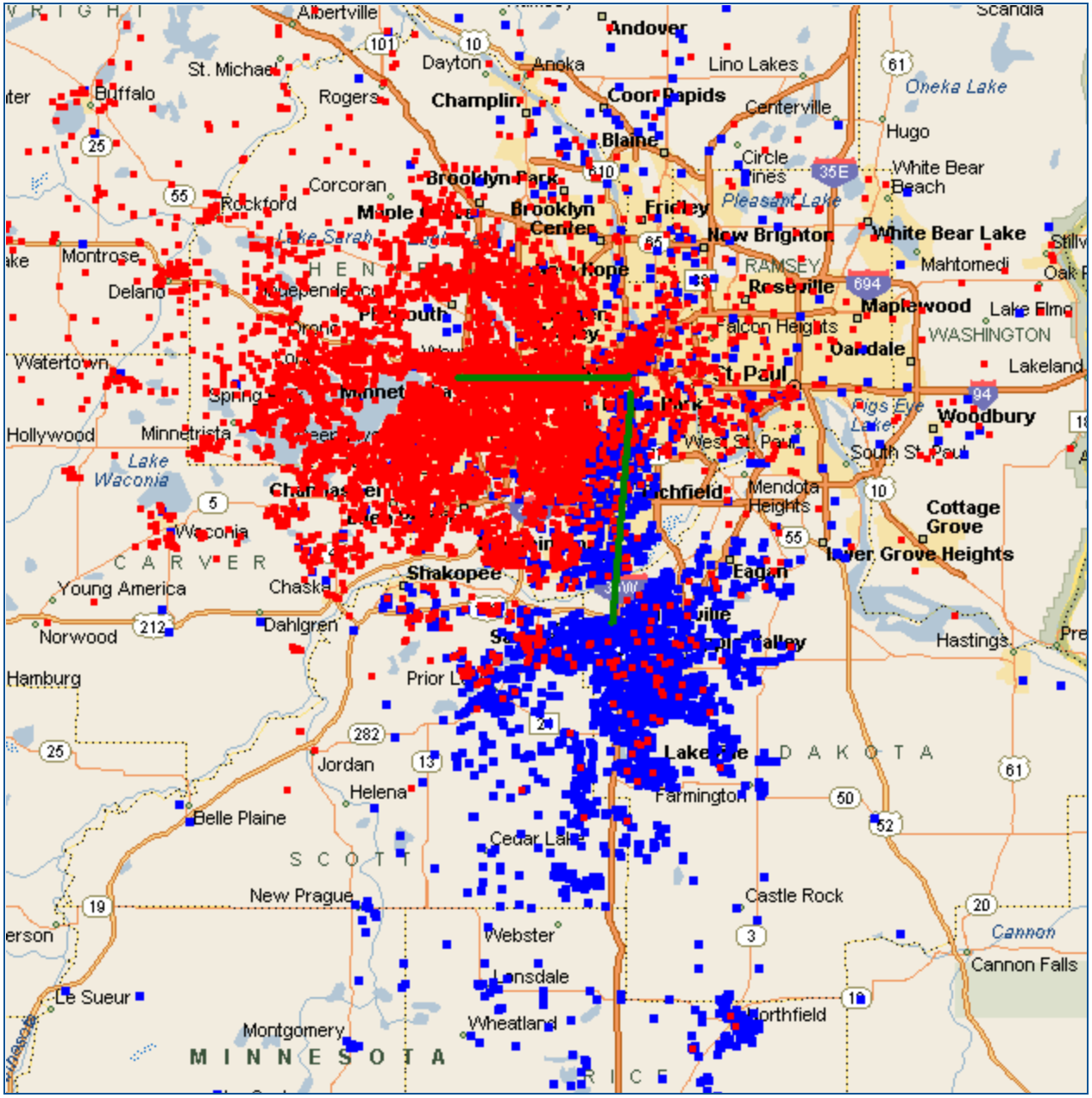
- **4,800** Active Transponders
- **190,000** Trips
- **$161,000** in Gross Toll Revenue
- Average of **40** Trips per Transponder
- Average Toll of **$0.85**

- **9,000** Active Transponders
- **400,000** Trips
- **$291,000** in Gross Revenue
- Average of **44** Trips per Transponder
- Average Toll of **$0.73**

Bottom line: similar patterns for users on frequency of use, revenue per user, trip lengths, and market areas in the two start-up periods …*but* slower growth in customer base/revenue on 35W due to phased implementation

First Six Full Months for each MnPASS Facility

MNPASS Customer Origins



- I- 394
- I-35W

35W South Transit Results

- 750 new parking spaces
- Operating speeds improved
  - I-35W at posted speeds in congested conditions
  - Downtown Minneapolis from 4 mph to 6mph
- On-time performance improved
  - Lake Street Impact: operational change Sept 2011
- I-35W South bus ridership up 15% over past year

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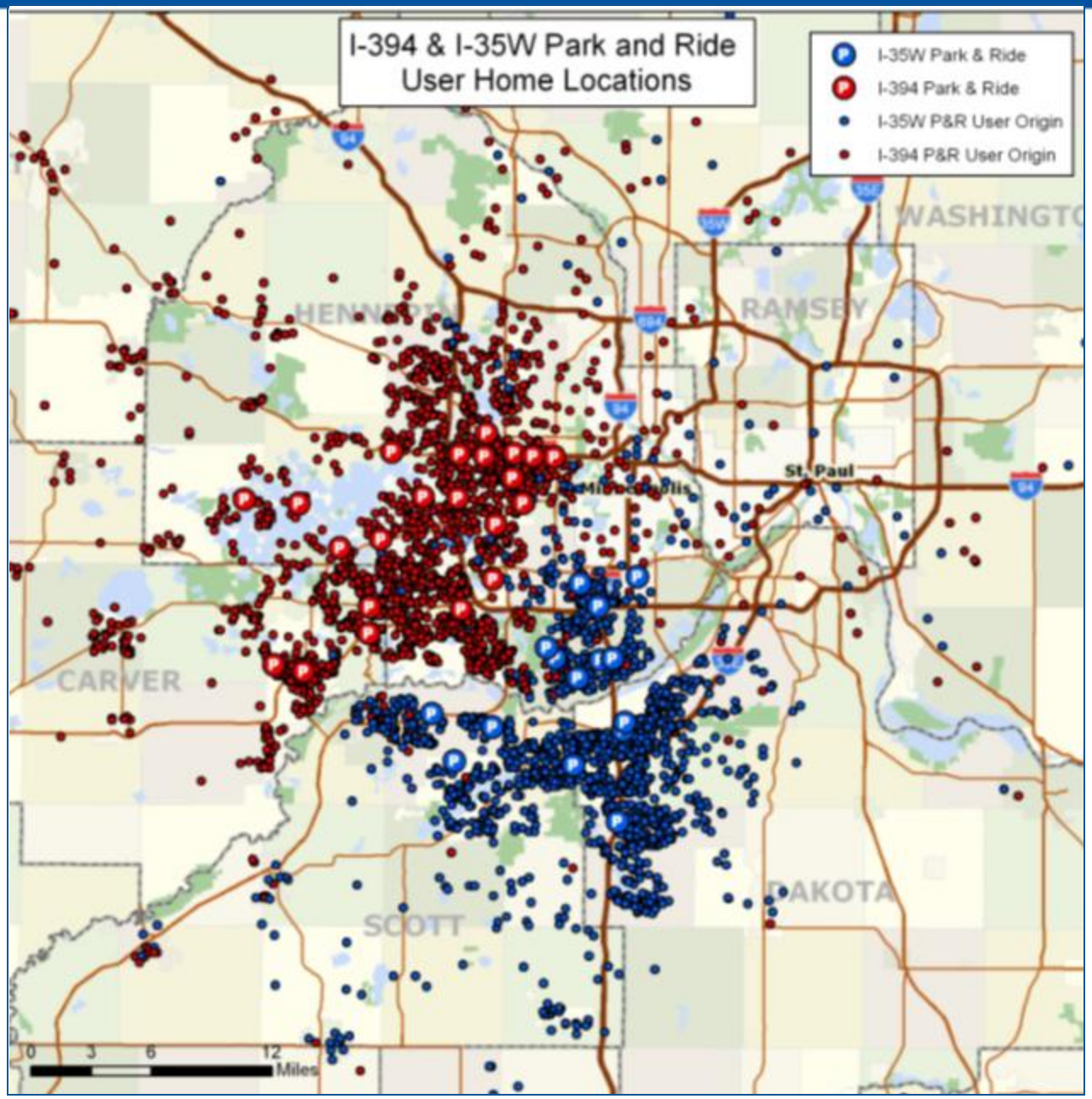
Transit Customer Origins



5 Years of MnPASS

- Congestion Pricing Works…in providing congestion free choices to users
- Customers like MnPASS
- MnPASS enables transit service improvements, transit ridership increases
- Technology can be used to substantially reduce roadway capital costs

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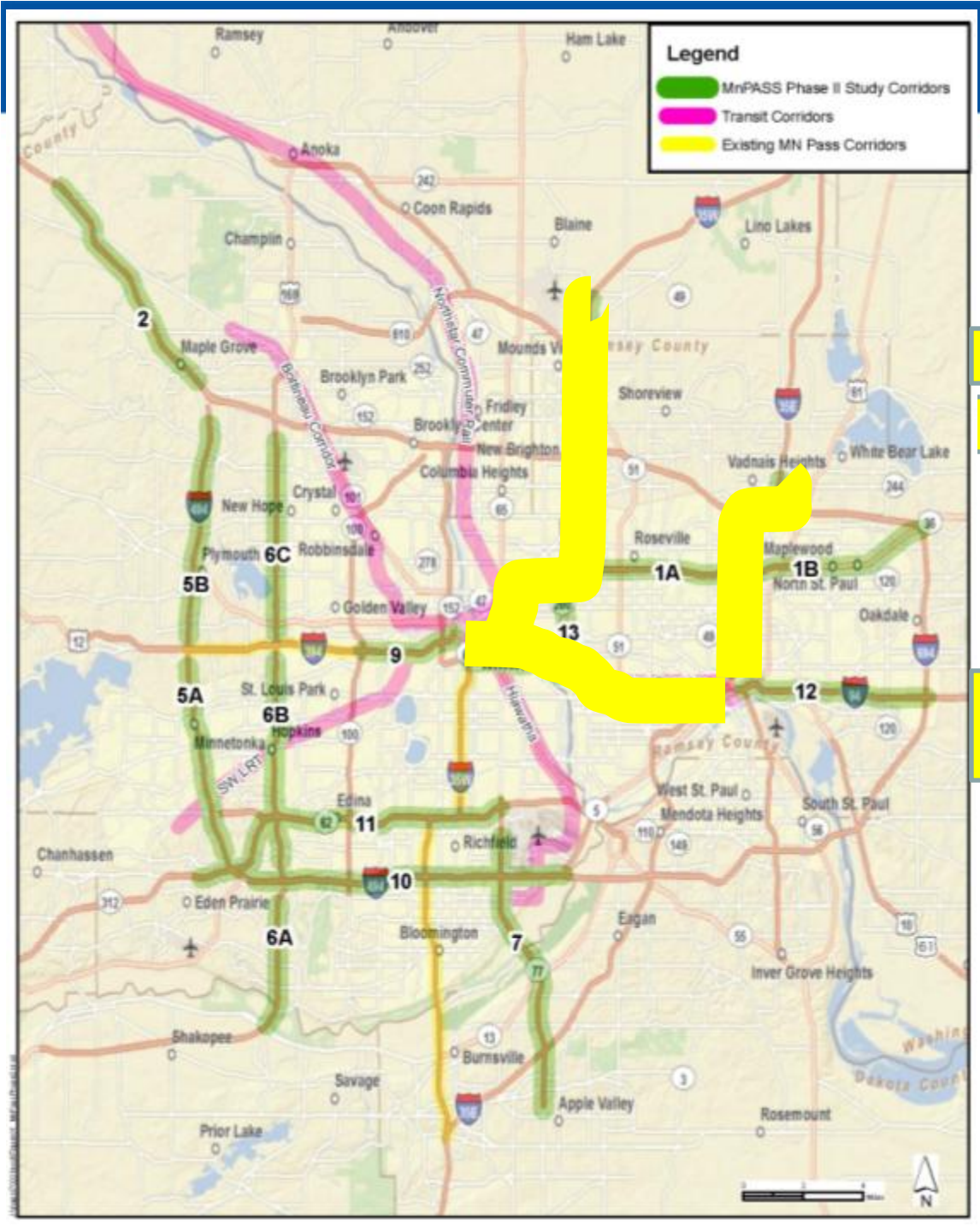
5 Years of MnPASS

- Revenue (in the Minnesota design):
  1. Policies on who pays and who is free (carpools free?)
  2. Pricing objective: congestion vs. revenue (different revenue outcomes for each)
  3. Congestion levels – the more congestion a user can avoid the more they will pay to avoid it
  4. Minimum prices – pricing for congestion may result in the price being set below what users are willing to pay
  5. Marketing /Customers Service levels – the system must be treated like a product. On-going investment in customer service and marketing are required to recruit /retain customers and grow revenue
  6. Network effects: revenue increases faster than operating costs as the system expands



NEXT!

1. TH 36: I-35W to I-694
2. I-94: TH 101 to I-494
3. I-35E: I-94 to CR E
4. I-35W: Minneapolis to Blaine
5. I-494: TH 212 to I-94
6. TH 169: TH 101 to I-94
7. TH 77: 141st Street to TH 62
8. I-94: Downtown Minneapolis to Downtown Saint Paul
9. I-394: TH 100 to I-94
10. I-494: TH 212 to MSP Airport
11. TH 212/TH 62: TH 5 to TH 77
12. I-94: Downtown Saint Paul to I-694
13. TH 280: I-94 to I-35W

More Information:

Visit

www.mnpass.org

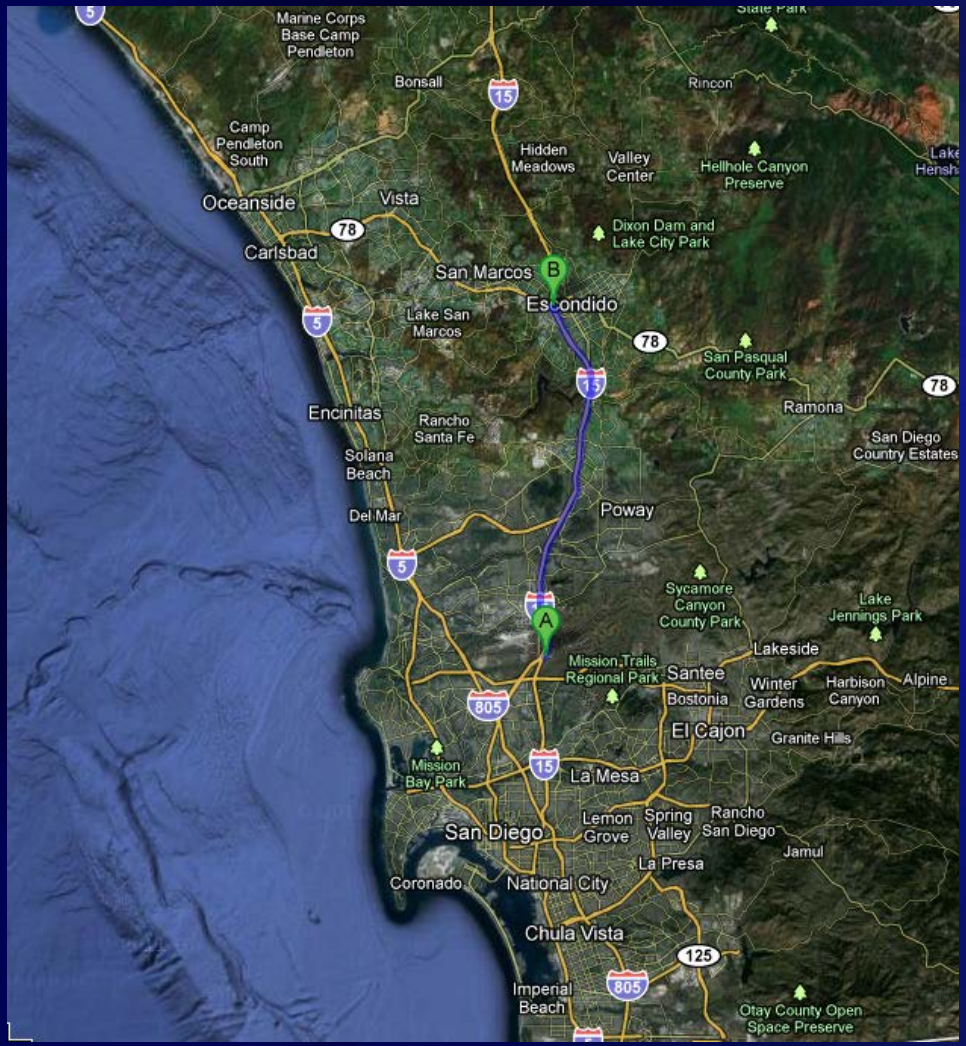
www.metrotransit.org

Metro Transit
a service of the Metropolitan Council

San Diego's Managed Lanes and Bus Rapid Transit

Integrating Transit with Congestion Pricing and Increasing Congestion Pricing Acceptance

Overview I-15 Express Lanes Project



In the Beginning - I-15 Express Lanes

Enabling Legislation states:

"... remaining revenue shall be used in the I-15 corridor exclusively for (A) the improvement of transit service, including, but not limited to, support for transit operations ... "

I-15 Express Lanes Successes

Increased use of HOV Lanes

Up to 20,000 Avg. Daily Vehicles
(~75% HOV, 25% FasTrak users)

Provides travel choices

Transit, carpooling, FasTrak

FasTrak revenue used to fund I-15 transit service

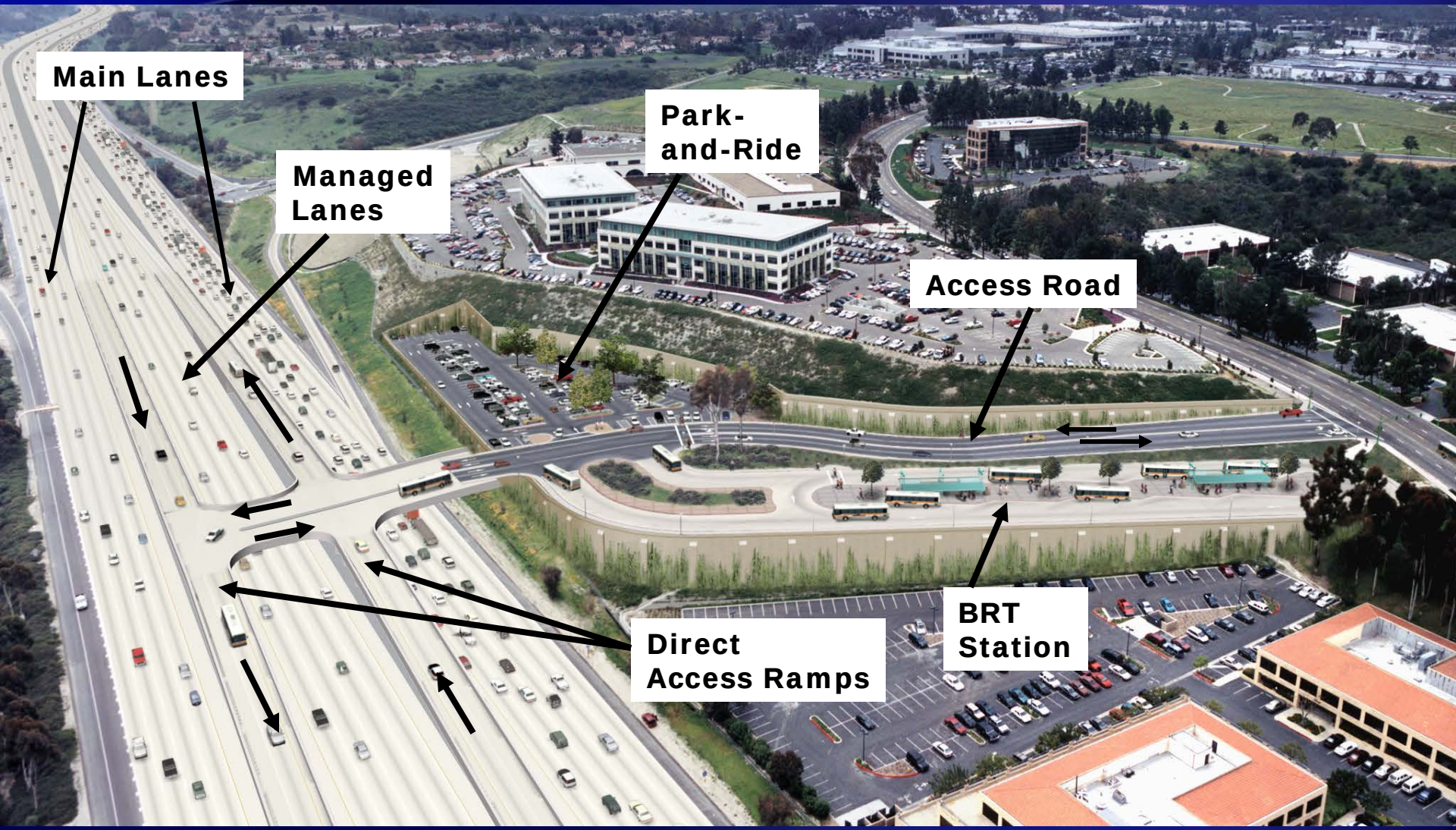
Generated over $7 million for transit in first decade

Managed Lanes: A Regional Framework

Goals:

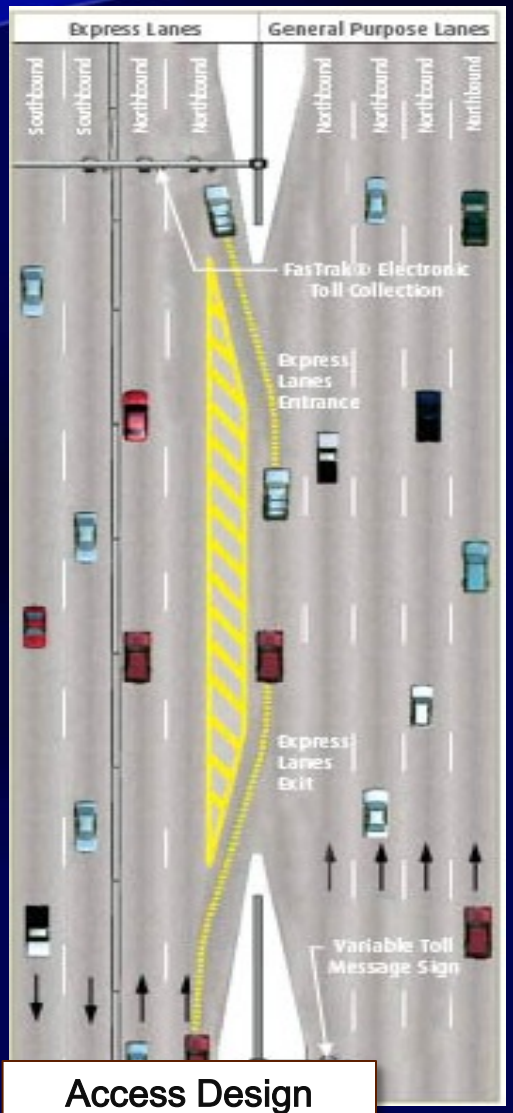
- Increase operating efficiency of freeway system versus new freeways
- Increase travel choices – ridesharing, transit, value pricing
- Provide time competitive travel times for car/vanpools and transit
- Extend FasTrak, including funding for BRT services

I-15 Express Lanes Design

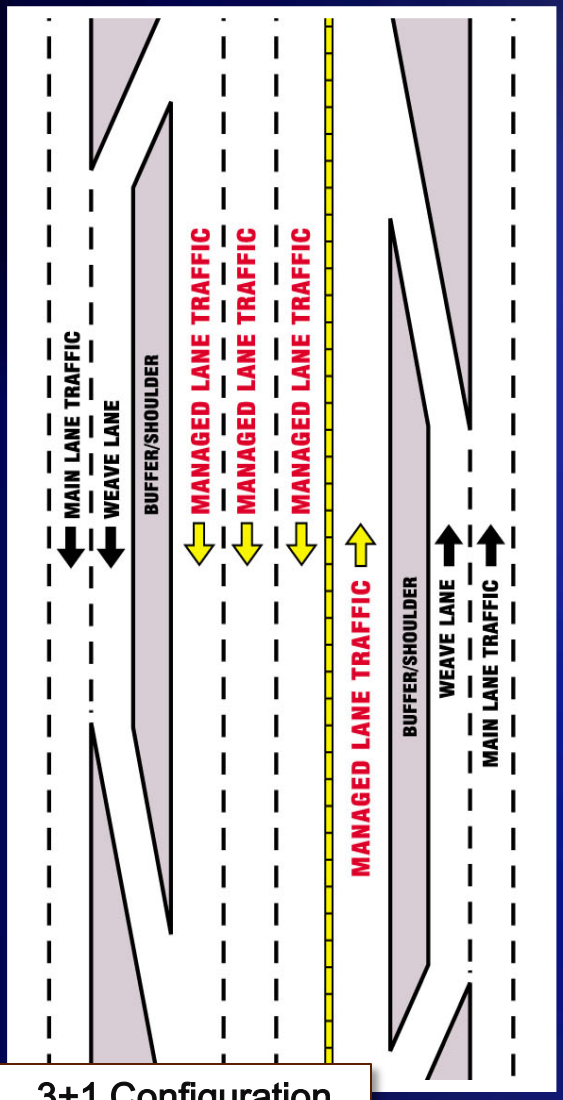


SANDAG

I-15 Express Lanes Design



Access Design



3+1 Configuration

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I-15 Express Bus Ridership (Peak Period)

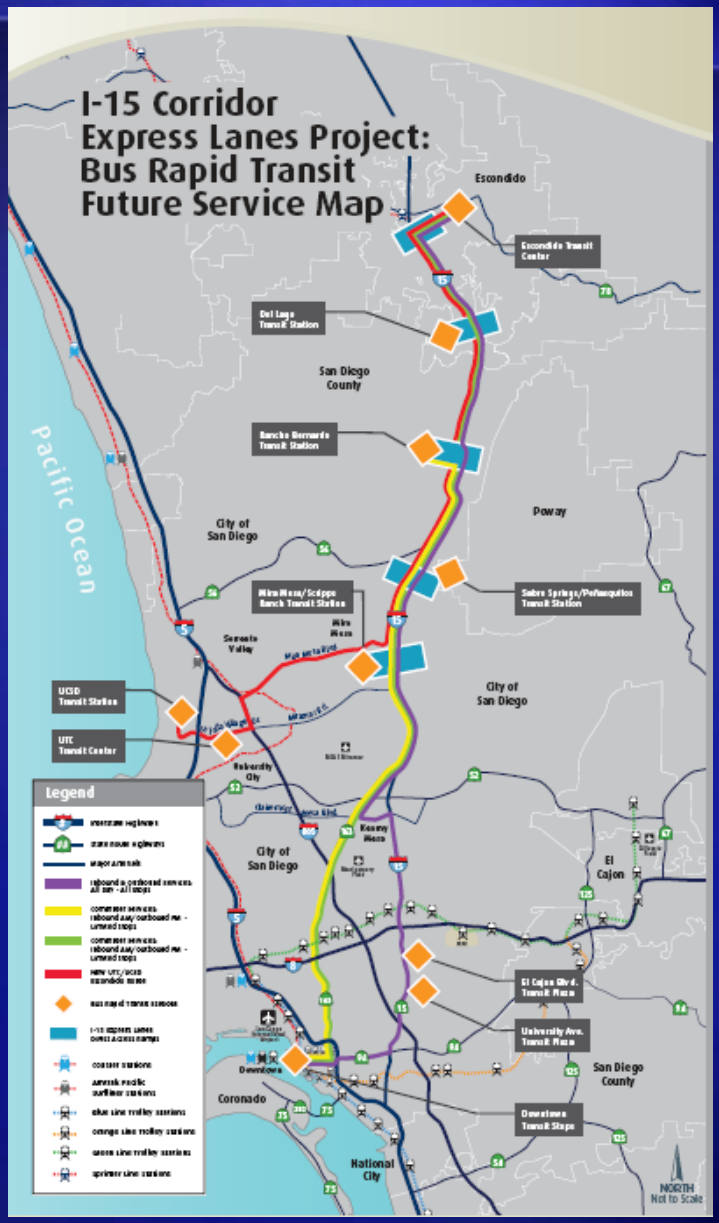
Route #	FY11	FY10	FY09	FY08
Route 810	146,763	128,714	114,387	97,869
Route 820	46,892	50,864	51,200	45,274
Route 850	46,224	47,025	62,866	65,362
Route 860	38,699	43,164	61,844	59,643
Route 880 (March-June, FY09)	17,504	29,936	2,209	N/A
PREMIUM EXPRESS TOTAL	**296,082**	**299,703**	**292,506**	**268,148**
Route 210	74,866	85,834	88,121	75,947
CORRIDOR TOTAL	**370,948**	**385,537**	**380,627**	**344,095**

What is BRT?

- Premium service
- Trolley/Coaster like experience
- Serves:
  - Commuters
  - Visitors/Tourists
  - Residents
  - Shoppers
- High frequency
- All day service
- Premium Fares

BRT Route and Station Plan

- Expected to start 2013
- 35 mile long corridor
- 5 freeway BRT stations with DARs
- Service includes:
  - All-stop, all day trunk
  - Peak period limited stop commuter expresses



Link to I-15 Corridor Express Lanes Project: Bus Rapid Transit Future Service Map: http://www.keepsandiegomoving.com/Libraries/I15-Corridor-doc/I-15_BRT.sflb.ashx

Region's Future

Expanding the Express Lanes concept:

- **Improve mobility, move more people**
- **Relieve congestion**
- **Enhance transit service**

Annual Funding for Transit

Current = $ 2 million
2020 = $ 80 million
2050 = $530 million
(Year of Expenditure $$)

Questions

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