21st Century Traffic Management Tools

Brian Kary
Minnesota Department of Transportation
Regional Transportation Management Center

• Shared Operations Center
  – MnDOT Traffic Operations
  – MnDOT Maintenance Dispatch
  – State Patrol Dispatch

• 400 miles of freeway management system
  – Cameras
  – Changeable Message Signs
  – Freeway Service Patrol

• 10-year Anniversary
Ramp Meters

- Ramp Metering Benefits
  - Increased Freeway Capacity
  - Improve Freeway Travel Times
  - Increased Freeway Speeds
  - Reduced Crashes

- New Algorithm Being Tested
MnPASS System

• High Occupancy Toll Lanes

• Provide for faster, safer and more reliable travel options

• Travel benefits for transit, carpoolers, motorcycles and MnPASS customers
MnPASS System

- Opened 11 miles HOT lane on I-394 in 2005
- Opened 16 mile HOT lane on I-35W in 2009/2010
- Proposed 4 mile HOT lane on I-35E in 2015
MnPASS Use & Performance

**Steady annual growth** (27,000 transponder holders)
- I-35W MnPASS Express Lanes – 2012 trips up 24% over 2011 – active accounts up 22% - avg. lane speed 65mph
- I-394 MnPASS Express Lanes – 2012 trips up 12% over 2011 – active accounts up 7% - avg. lane speed 59mph

- **Greater than 80% satisfaction rate among customers**
  - Time saved, congestion avoidance, choice and reliability valued most
  - Customers stay customers
MnPASS Use & Performance

• Transit users and operators strongly support system
  – Greater than 80% of the people using MnPASS are carpooling or riding transit
  – I-35W Express Bus Service – increased operating speeds (5-10 minute time savings); near perfect on-time performance; ridership up 27%; park and ride use up 20%; Lakeville Express fare box covers app. 70% of cost

• MnPASS lane can carry 50% more people than a general purpose lane during peak hour traffic

• Violation rates range from 5-15% depending on segment
I-35W: The 21st Century Highway

- Expanded MnPASS System
- Smart Lanes
- Priced Dynamic Shoulder Lane
- Bus Rapid Transit and Stations
- Integrated Park and Rides
- Low cost/high benefit capacity
I-35W: The 21ST Century Highway
Smart Lanes

• Intelligent Lane Control Signals (ILCS) located every ½ mile over every lane.
  – 187 ILCS on I-35W
  – 110 ILCS on I-94

• ILCS are a 4ft x 5ft full color matrix signs.

• Use of the ILCS is for incident management, variable speeds and priced dynamic shoulder lane.
ILCS Sign Options

- Blank – default
- Green – Lane Open
- Flashing Yellow – Caution
- Red X – Closed
- Yellow X – Closed Ahead
- Merge
- Speed Limit
- White Diamond
Variable Speed Limits

- Advisory Only
- Detection measures traffic speeds downstream
- Speeds are posted up to 1 ½ miles upstream
Smart Lanes - Early Results

• **Lane Control Messages**
  - Human factors study and surveys has shown understanding of ILCS messages
  - Message compliance still an issue

• **Variable Speed Limits**
  - Minimal improvements to mobility
  - Improvements in speed differential approaching congestion
  - Reduced shockwaves
  - Too early for crash data results
Priced Dynamic Shoulder Lane (PDSL)

- 3 Mile Segment on NB 35W
- Maintains existing 4 lanes with an added PDSL Lane
- Effectively extends the MnPASS lane to downtown Minneapolis using existing road space
- Total Cost = $17 M
I-35W PDSL Operations

- Monday – Friday
  - 6:00 AM to 7:00 PM
  - Expanded Mid-day hours due to high violation rates

- Can be open on weekends or evenings for special events, weather or incidents.
  - Regular Saturday hours from 11:00 AM to 7:00 PM
I-94 Managed Auxiliary Lane

Normal Operations
I-94 Managed Auxiliary Lane
PM Peak Period Operations
Dynamic MnPASS Sign on I-35E

EXPRESS LANE

Rates

To

694

Little Canada Rd

1/4

To Cty Rd 14

$1.50

Roselawn Ave

1 3/4

Larpenter Ave

2 1/4

4'

12'

2'

12'

12'

12'

10'
Dynamic MnPASS Sign on I-35E

EXPRESS LANE
OPEN TO ALL TRAFFIC

Little Canada Rd 1/4
Roselawn Ave 1 3/4
Larpenter Ave 2 1/4
Dynamic MnPASS Sign on I-35E
I-494 Dynamic Shoulder

- Right hand dynamic shoulder
- Open during peak hours to general purpose traffic
- Project limits from Hwy 55 to I-94
- 2014-2015 construction season
- Lane control signals over shoulder
- Supplemental CMS
Questions?

Brian Kary
Freeway Operations Engineer
brian.kary@state.mn.us