“Managed Lanes”

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Major Projects Unit Head
District 1

Illinois Traffic Engineering and Safety Conference
October 2016
Agenda

✓ Managed Lanes Projects
✓ I-55 (Stevenson Expressway)
  ✓ Express Toll Lane
  ✓ Operations
  ✓ Current Status
✓ I-90 (Jane Addams)
  ✓ Active Traffic Management Systems
✓ I-290 (Eisenhower Expressway)
  ✓ High Occupancy Toll Lane
Upcoming Congestion Management Projects
I-55 Managed Lanes
EXPRESS TOLL LANE
I-55 Study Area

Communities: 16
System Interchanges: 3
Service Interchanges: 14

Study Limits:
I-355 to I-90/I-94
25 miles
Existing Traffic Characteristics

Average Daily Traffic (ADT)

- Year 2040 (No-Build) 200,000 to 250,000 vehicles per day
- Current 140,000 to 180,000 vehicles per day

Passenger Vehicle Occupancy

- 1 passenger 83.5%
- 2 passengers 13.7%
- 3 or more passengers 2.8%

Trucks

- 13 – 15% of total volume
I-55 Bus-on-Shoulder Program

✓ Since inception in 2011, on-time performance improved to nearly 90%
✓ Ridership increased up to 150%

Limitations:
- Buses can only use the shoulder for 18 miles of the 25 mile corridor
- 35 mph maximum speed limit
- May only use shoulder when mainline traffic speed is less than 35 mph
Project Purpose and Need

- **Mobility** and **operational efficiency** to adapt to changing travel demands
- **Congestion management strategies** to improve system performance & travel time reliability
- **New travel choices** supporting transit opportunities
- **Sustainable transportation solutions** that meets future environmental & economic needs
- **Maximize use of existing facility** to recognize funding constraints
Concept Alternative Screening

Alternatives that Fail to Address Purpose and Need

General Purpose Lane:

✓ Fails to provide sustainable/reliable transportation
✓ Does not provide alternative to stop and go traffic concerns
✓ Eliminates Median Bus-on-Shoulder Benefit

Truck Only Lane:

✓ Does not address congestion management
✓ Does not maximize use of existing facility, requires complete reconstruction of facility bridges, interchanges and I-55
✓ Does not provide sustainable transportation solutions
✓ Not financially feasible requires additional right-of-way to accommodate increased foot print

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Managed Lane Alternatives

**HOV-2+**
Only carpools with 2+ passengers are allowed

**HOV-3+**
Only carpools with 3+ passengers are allowed

**HOT-2+**
SOVs can use if they pay a toll; carpools with 2+ passengers travel free.

**HOT-3+**
Carpools with 3+ passengers travel free. SOVs and HOV-2s toll

**ETL**
All Vehicles Pay
Sketch Level Summary
Travel Performance

Total Travel Volume Served
- No-Build (0%)
- HOV 3+ (4%)
- HOT 3+ (11%)
- HOT 2+ (14%)
- HOV 2+ (17%)

Person Throughput Increase
- No-Build (0%)
- HOV 3+ (6%)
- HOT 3+ (11%)
- ETL (11%)
- HOT 2+ (14%)
- HOT 3+ (13%)
- ETL (13%)

system compared to the No-Build condition

The addition of capacity to I-55 will result in additional traffic use along I-55 and reduce travel on the local roadway system compared to the No-Build condition.
Sketch Level Summary
Consumer Benefits

Roadway Vehicle Hours Traveled (VHT) Savings

- No-Build (0%)
- HOV 3+ (-1%)
- HOV 2+ (3%)
- HOT 2+ (3%)
- HOT 3+ (3%)
- ETL (4%)

Roadway Vehicle Miles Traveled (VMT) Increase

- No-Build (0%)
- HOV 3+ (3%)
- HOV 2+ (11%)
- HOT 2+ (11%)
- HOT 3+ (11%)
- ETL (11%)
Preferred Alternative

Express Toll Lane (ETL): Best Addresses Corridor Needs

- **Time savings**
  - *ETL* - **10 to 15 minutes time savings** in AM and PM Peak
  - *Existing Free Lanes* - **5 to 10 minutes time savings**

- **Person throughput** – 11-14% Increase
- Greatest Ability to **control congestion**
- Best accommodates Pace bus service
- Ease of **Enforcement**
- Compatible with regional **tolling technology**
Environmental Study

- Environmental Assessment (EA) dated April 2016 is publicly available for review
- Public comment period on the EA concluded on June 1, 2016
- Errata for the EA was published on June 24, 2016
- On July 20, 2016, FHWA issued a FONSI for the Project based on its independent evaluation of the EA.
Express Toll Lane
Before and After

40 feet
Approx. 15 miles

60 feet
Approx. 10 miles

40 feet
Approx. 15 miles

60 feet
Approx. 10 miles
Preferred Alternative Improvements

- Improvement activities to include:
  - New median construction
  - Grading and drainage piping
  - Replacement of overhead signs and associated structures
  - 3 bridge replacements at Lemont Rd, Cicero Ave, and BRC Railroad corridor crossings
  - 16 bridge widenings between Kedzie Ave and I-90/94
  - Addition of over 11 miles of noise walls
  - Addition of toll collection and active traffic management systems
I-55 Managed Lanes
OPERATIONS
ETL OPERATIONS

✓ Simplified signage/driver information
✓ Compatible with current tolling technology
✓ Compatible with dynamic tolling/congestion pricing strategies
✓ Manageable enforcement criteria
Managed Lane Access Alternatives
Managed Lane Controlled Access

- Vehicles can enter/exit managed lanes only in designated areas
- Buffer areas are approximately ¼ mile long and require an additional 12 feet of width for lane changing maneuvers
- Access location serve multiple interchanges
- Specific new managed lane interchange signing required

Traffic Flow

Managed Lane Vehicle
General Purpose Lane Vehicle
Managed Lane Access Alternatives
Managed Lane Continuous Access

- Vehicles can freely enter/exit managed lanes directly from general purpose lanes
- Interchange signing same general purpose lane
- No or relatively few access restrictions along the 25 mile corridor
- Driver allowed to operate at their comfort level
- Managed lane separated from general purpose lanes pavement marking
- Allows larger median shoulder
- Current facilities with Continuous Access
  - SR167 - Seattle
  - I-580 - California
  - I-35W – Minneapolis
  - I-394 Minnesota
Project Delivery

• IDOT is investigating the potential to deliver the Project as a Public-Private Partnership (P3) to achieve Project goals by leveraging private sector expertise

• The anticipated P3 structure may include:
  • Design-Build-Finance-Operate Maintain (DBFOM) structure
  • Private sector innovation

• Industry Forum held on September 20 & 21, 2016
I-90 Corridor
ACTIVE TRAFFIC MANAGEMENT (ATM)
I-90 Corridor

- **62 miles**
- **130,000 – 160,000 VPD**
- **Reconstruction/Widening I-90**
- **17 miles Active Traffic Management**
  - Barrington Road to I-294
  - Bus on Shoulder (left)
- **Completion late 2016**
Common Corridor Concept

✓ Actively Manage All Lanes With ATM
✓ Lane-use control signals (LCS) over all lanes and shoulders
✓ Gantries spaced approx. every ½ mile
✓ Smaller DMS on every gantry
### Typical Lane-Use Control Signal Displays

<table>
<thead>
<tr>
<th>Icon</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>![Green Arrow Down]</td>
<td>Lane Open to Traffic</td>
</tr>
<tr>
<td>![Yellow Merge]</td>
<td>Traffic Merge Right</td>
</tr>
<tr>
<td>![Yellow Merge]</td>
<td>Traffic Merge Left</td>
</tr>
<tr>
<td>![Yellow Merge]</td>
<td>Traffic Merge Right or Left</td>
</tr>
<tr>
<td>![Red X with 1 Mile]</td>
<td>Lane/Shoulder Closed 1 Mile Ahead</td>
</tr>
<tr>
<td>![Red X]</td>
<td>Lane/Shoulder Closed to Traffic</td>
</tr>
<tr>
<td>![45 MPH]</td>
<td>Advissory Speed of 45 MPH</td>
</tr>
</tbody>
</table>
Dynamic Lane Use Control

- Warning drivers of upcoming lane closures and directing them to open lanes.
- Increase safety for drivers and incident responders.
- Traffic Enforcement
Speed Harmonization

- Dynamically changing advisory speeds based on road, traffic, and weather conditions.
- Maintain traffic flow and reduce risks of rear-end collision that is caused by stop-and-go conditions.
Queue Warning

✓ Dynamic display of warning signs to alert drivers of downstream congestion and queues.
✓ Effectively use available roadway capacity and reduce likelihood of incidents associated with queuing.
I-290 Eisenhower Expressway
HIGH OCCUPANCY TOLL LANE
I-290 MAINLINE GEOMETRICS

- **Reconstruction Section** – From I-88/290 merge to near Kostner
  - Full bridge, interchange, and pavement reconstruction

- **Re-striping Section** – Kostner Avenue to Racine Avenue
  - Restriping – for managed lane concepts
  - Overhead bridges east of Cicero will be studied separately

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Reconstruction Section (9 miles)

Re-striping Section (4 miles)
Interstate Route 290

- The Interstate 290 corridor was originally constructed and opened to traffic in the 1950’s and was the first new multi-modal transportation corridor in the US.
- Interstate 290 has exceeded its life expectancy and is in need of reconstruction. Bridges and roadway over 50-years old
  Capacity issues resulting in substantial congestion and delays
- Interstate 290 is a major transportation link between Chicago and the western suburbs and also serves other transportation markets.

**Peak Traffic Hours**

<table>
<thead>
<tr>
<th>Time</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morning (AM)</td>
<td>6 am to 10 am</td>
</tr>
<tr>
<td>Evening (PM)</td>
<td>4 pm to 7 pm</td>
</tr>
</tbody>
</table>

**Resurfacing 2010**

**I-290 Existing Conditions (2009)**

Original construction (still in place) 1954-1960
Improve Facility Condition

Improve Access to Jobs

Improve Mobility

Improve Safety

Improve Connections Between Travel Modes
Transportation Needs, Alternatives Summary

Environmental considerations

• The communities are the environment
• Priority – stay within existing right of way
• Environmental effects not a distinguishing factor

Stakeholder concerns

• Access
• Economic benefits
Transit Providers:
- CTA Rail
- CTA Bus
- Pace Bus
- Metra Rail

- 21% Work Trips vs. 12% Regionally
Transportation Needs, Alternatives Summary

Alternatives development evaluation
- Three evaluation rounds, CTA Blue Line Vision Study

Engineering considerations
- Evaluation rounds 1 and 2 – conceptual alternatives, travel model
- Evaluation round 3 – geometry

Environmental Considerations
- Communities are the environment
ROUND 3 EVALUATION: PERSON THROUGHPUT

2040 Daily Person East-West Throughput: I-290, Arterials, Transit

<table>
<thead>
<tr>
<th>GP Lane</th>
<th>HOV 2+</th>
<th>HOT 3+</th>
<th>HOT 3+ &amp; TOLL</th>
</tr>
</thead>
<tbody>
<tr>
<td>+25,200</td>
<td>+31,900</td>
<td>+34,800</td>
<td>+29,500</td>
</tr>
</tbody>
</table>

HOT 3+ provides the greatest person throughput improvement, followed by HOV2+

- HOT 3+ best “manages” added capacity by encouraging HOV3+ vehicles and allowing SOVs who pay tolls when capacity is available
- HOV 2+ encourages carpools, but does not allow SOVs, which may result in underutilization of added capacity
- HOT 3+ & TOLL encourages HOV 3+, but results in diversions for those not wanting to pay tolls
**ROUND 3 EVALUATION: ACCESSIBILITY**

2040 # of additional Jobs Accessible within 60 minutes from Study Area (compared to 2040 No Build)

<table>
<thead>
<tr>
<th>Additional # of Jobs Accessible</th>
<th>GP Lane</th>
<th>HOV 2+</th>
<th>HOT 3+</th>
<th>HOT 3+ &amp; TOLL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto</td>
<td>+82,000</td>
<td>+341,000</td>
<td>+373,000</td>
<td>+310,000</td>
</tr>
<tr>
<td>Transit</td>
<td>+24,000</td>
<td>+24,000</td>
<td>+24,000</td>
<td>+24,000</td>
</tr>
</tbody>
</table>

HOT 3+ provides the greatest accessibility improvement, followed by HOV 2+

- Improvement related to overall travel time improvements on I-290 and arterials
- HOT 3+ provides best balance of I-290 and arterial travel time improvements.
Recommended Preferred Alternative

Existing Condition

Preferred Alternative

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I-290 Mainline Preferred Alternative

High Occupancy Toll 3+ and Supporting Transit

Supporting Transit:
- Bus Feeder Service
- Blue Line Extension to Mannheim
  - Initial service option - bus in managed lane
  - I-290 corridor improvements will enable/leverage transit improvement

*The Preferred Alternative is the same for all Maywood access options*
Next Steps

- Visit website for updates: EisenhowerExpressway.com

Overall I-290 Study

- DEIS Preparation – Fall 2016
- Public Hearing – Winter 2017

Study Completion – Summer 2017

- Final design, ROW and construction not funded
QUESTIONS?