The purpose of this presentation is to provide a review of various types of dynamic pricing strategies used in managed lanes network deployments.

- Dynamic Pricing Overview
- Dynamic Pricing Algorithms
- Challenges
- Next Steps
Priced Managed Lanes Trends

New Agencies

Pricing

Transit

Hours of Operation

Financing

Public Acceptance

Growth
Managed Lanes Networks

SF / Bay Area, CA
Southeast Florida
Atlanta, Georgia
Dynamic Pricing Trends

1st Generation Dynamic Pricing Algorithms

Predictive Models

Network Based Dynamic Pricing Systems

Mileage-Based User Fees

Active Transportation and Demand Management

Performance Management (System Network)
Dynamic Pricing Overview

The I-15 Express Lanes in San Diego was the first managed lane facility in the U.S. to use dynamic pricing.

- Miami, FL
- Los Angeles, CA
- Atlanta, GA

The I-15 Express Lanes in San Diego was the first managed lane facility in the U.S. to use dynamic pricing.
The 95 Express has been in operations for nearly 5 yrs and is growing into a Priced Managed Lanes network.

- Toll Rate Change – 15 min
- $0.25 minimum
- $1.00/mile maximum
- Travel Time Reliability
95 Express, Miami, FL

ATMS Software

Lane Status DMS

Toll Rate DMS

Toll Rate DMS at Gantry

Full DMS

Tag Readers

Dynamic Pricing Software

Turnpike’s Middleware

Turnpike’s Tolling Software

Toll Viewer

TMC Operator

Tolls Operator

Customer Disputes
95 Express – Rate Cap Impacts

95 Express Phase 1
Northbound Peak Period Reliability (6-month Intervals)

Instances of Max Toll:
- Dec 2009 to Aug 2012: 36 times over 55 months
- Aug 2012 to May 2013: 100 times over 10 months
## I-10/I-110 ExpressLanes, Los Angeles, CA

### Low Congestion Level

**Metro ExpressLanes**

- I-105: $0.75 per mile
- Adams Blvd: $2.70 per mile

### Moderate Congestion Level

**Metro ExpressLanes**

- I-105: $2.20 per mile
- Adams Blvd: $9.95 per mile

### High Congestion Level

**Metro ExpressLanes**

- I-105: $3.05 per mile
- Adams Blvd: $12.40 per mile

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<table>
<thead>
<tr>
<th>Traffic</th>
<th>Segment 1</th>
<th>Segment 2</th>
<th>Segment 3</th>
<th>Segment 4</th>
<th>Segment 5</th>
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<tbody>
<tr>
<td>Free Flow</td>
<td>$0.25</td>
<td>$0.25</td>
<td>$0.25</td>
<td>$0.25</td>
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<tr>
<td>Moderate Congestion</td>
<td>$0.55</td>
<td>$0.85</td>
<td>$1.20</td>
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<tr>
<td>Heavy Congestion</td>
<td>$0.95</td>
<td>$1.05</td>
<td>$1.25</td>
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### Mile Post Identification

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<td>7</td>
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### Trip Cost

- **Free Flow:** $0.35, $0.75, $1.30
- **Moderate Congestion:** $0.40, $1.45, $1.75
- **Heavy Congestion:** $1.05, $3.50, $4.30

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*Business Rules: Dated April 22, 2010*

- Artesia Transit Center/91 Fwy to Rosencrans/El Segundo
- Rosencrans/El Segundo to I-105
- I-105 to Gage/Slauson/Vernon
- Gage/Slauson/Vernon to Adams Blvd
- I-105 to Adams Blvd
- End to End Trip Artesia Transit Ctr/91Fwy to Adams Blvd

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*For Business Rules: Dated April 22, 2010*
The I-85 Express has been in operations for two years and is growing into a Priced Managed Lanes network.

Optimize:

- Travel Time Reliability
- Traffic Throughput
- Revenue
### Dynamic Pricing Algorithms

<table>
<thead>
<tr>
<th>Tolling Strategy</th>
<th>Trip Based</th>
<th>Segment Based</th>
<th>Zone Based</th>
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<tr>
<td>Public Acceptance</td>
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<tr>
<td>Operational Impacts</td>
<td>Locks in toll rate for longer trips</td>
<td>Displays tolls for each segment</td>
<td>Same tolls within the zone</td>
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<td>Signing Impacts</td>
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<td>Human Factor Issues</td>
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<td>Cost Impacts</td>
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<td>Throughput Impacts</td>
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<td>Policy Changes</td>
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</table>
Dynamic Pricing Algorithm

- Loosely Coupled Design
- Common Tools and Components
- **Single User Interface**
- Changes & Calibration
- Model vs Actual Data
Challenges

- Regional Network Consistency
- Business Rules
- Flexibility to Change
- Public Acceptance
- Enforcement
- Bottleneck Management
Next Steps

- Best Practices, Lessons Learned
- Statewide, Regional, Corridor Policies & Business Rules
- User Studies
- Payment Options
- Behavioral Studies
Behavioral Studies

with price used by customers as a proxy for service in avoiding congestion the demand curve itself moves rightward with higher posted toll rates

Source: MnDOT
Summary

Concept of Operations

Dynamic Pricing

Business Rules

Traffic & Revenue Study
Thank You

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