Auto Occupancy Detection Technology Rewards Program and Tolled Managed Lane Policy

Regional Transportation Council Workshop
September 13, 2018
Project History

2012 - NCTCOG
Regional Transportation Council instructed staff to replace manual enforcement with more advanced technology verification equipment.

2012 – NCTCOG
Technology Approaches to HOV Occupancy Declaration and Verification, Texas A&M Transportation Institute (TTI) Request for Information (RFI) for IH 30 Managed Lane Technology Occupancy detection and verification
- Dynamic tracking of vehicles

2013 – NCTCOG
Reissue RFI with demonstration component

2014 – NCTCOG
TTI Update to White Paper and Proof of Concept Testing of In-Vehicle Technology

2014 – TxDOT/ P3
Drive on TEXPRESS application

2015 – TxDOT Lead/NCTCOG Partner
Request for Offer - Automated Vehicle Occupancy Detection Solution

2016 – NCTCOG Lead/TxDOT Partner
TxDOT Requested NCTCOG to Take the Lead
Request for Proposals - Auto Occupancy Detection and Verification Technology
Activities Implementing New Technology

July 2017
Issued Notice to Proceed with Carma Technology Corporation

August – December 2017
Pilot Test on DFW Connector Corridor
  • 98.4% exact match in reported occupancy
  • 1.6% indicate an “over count”

January – March 2018
Shared pilot results and worked with partners on back office integration

March – June 2018
Developed draft violation process and continued to work with partners on back office integration

July 2018
Met with TxDOT management on statewide interest

August 2018
Discussed rewards approach with partners
Register

Pre-Declare Every Trip

Occupancy Declaration Sent to Field

Officers Watch for Red Light

Toll Collected

Violation: Legal Process

NTTA Back Office System for Billing

Current HOV Enforcement
Register

Pre-Declare Every Trip

Occupancy Declaration Sent to Field

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HOV Rewards Program

HOV Clearinghouse
Receive Transaction File(s)
Carma Active Tags/Plates API
Select Carma User Transactions
Carma Occupancy API
Send Differential File(s)
User Story

Sample flow...

1. Get the Carma Points app
   - Name change

2. User registration
   - With / without toll tag

3. Car registration
   - Table of target road segments
   - Determine when a car likely passed a segment
   - At least 2 GPS points required
   - Directionality important
   - Calculate reward based on HOV rules per segment

4. Beacon Setup
   - Email (per transaction / day?)

5. Take a trip

6. Transaction Identification

7. Reward Notification
   - New menu item
   - New statement screen
   - Display points balance
   - Display all transactions
     - timestamp
     - road segment
     - occupancy
     - occupants
   - User can query occupancy
   - Redeem process (TBD)

8. View Rewards
New Approach – Rewarding HOV

Phase 1 – Managed Lane Rewards
• HOV Points = 50% of actual toll transaction
• Support for all 8 managed lanes in DFW (Cintra & TransCore operated roads)

Phase 2 – US 75 Technology Lane

Phase 3 and Beyond – Corridor & Event Rewards
• HOV Points for HOV travel on specific road segments for any event purpose
• Support for any road segment (including toll roads), any day of week and 24/7/365, any area
• Support for other modes (transit, bicycles, pedestrians)
• Cash-out options and gamified tiers (e.g. Amazon e-credit, Visa cards, check, cash)
• Integrate with other rewards applications (e.g. Try Parking It)
<table>
<thead>
<tr>
<th>Phase</th>
<th>Year</th>
<th>Technology*</th>
<th>Marketing</th>
<th>Integration</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development/</td>
<td>2016-2018</td>
<td>$ 3,150,000</td>
<td></td>
<td>$850,000</td>
<td>$4,000,000</td>
</tr>
<tr>
<td>Pilot Testing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Implementation</td>
<td>2019-2028</td>
<td>$16,000,000</td>
<td>$3,000,000</td>
<td>$1,000,000</td>
<td>$20,000,000</td>
</tr>
<tr>
<td>(10 Years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>$19,150,000</td>
<td>$3,000,000</td>
<td>$1,850,000</td>
<td>$24,000,000</td>
</tr>
</tbody>
</table>

*Technology includes system hardware, user beacons, app maintenance, and system operation. The cost might change.
## Direct Cost Comparison

<table>
<thead>
<tr>
<th>Estimated Direct Costs with Existing System (10 Years)*</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual Enforcement</td>
<td>$15,245,452</td>
</tr>
<tr>
<td>Enhancement to TEXPRESS Application</td>
<td>$5,927,285</td>
</tr>
<tr>
<td>Marketing and Education</td>
<td>$2,000,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$23,172,737</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Expected Total Cost for New System (10 years)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>New Technology Operating and Marketing Cost</td>
<td>$20,000,000</td>
</tr>
</tbody>
</table>

*Does not include indirect benefits such as safety, traffic flow, and legal savings.*
Indirect Benefits

Automated Vehicle Occupancy Verification

- Safety
- Reliability / Compliance
- Easy to Use
- Air Quality/Congestion Benefits
- Privacy Protection
- Expandability
- Return on Investment
- Legal/Court
## HOV Subsidy Reimbursement by Corridor

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Current Program</th>
<th>Proposed Program</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P3 Operated</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LBJ</td>
<td>RTC Funded</td>
<td>RTC Funded</td>
</tr>
<tr>
<td>NTE</td>
<td>RTC Funded</td>
<td>RTC Funded</td>
</tr>
<tr>
<td><strong>TxDOT Operated</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IH 635 East</td>
<td>N/A</td>
<td>TxDOT Passthru*</td>
</tr>
<tr>
<td>DFW Connector</td>
<td>N/A</td>
<td>TxDOT Passthru*</td>
</tr>
<tr>
<td>IH 30</td>
<td>N/A</td>
<td>TxDOT Passthru*</td>
</tr>
<tr>
<td>IH 35E</td>
<td>N/A</td>
<td>TxDOT Passthru*</td>
</tr>
<tr>
<td>Midtown Express</td>
<td>N/A</td>
<td>TxDOT Passthru*</td>
</tr>
<tr>
<td>Future Facilities</td>
<td>N/A</td>
<td>TxDOT Passthru*</td>
</tr>
</tbody>
</table>

*Rewards paid through toll revenue.*
## HOV Subsidy Reimbursement and HOV Declarations by Corridor

<table>
<thead>
<tr>
<th>Corridor</th>
<th>Total Annual Program Cost</th>
<th>Total Annual HOV Declarations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>P3 Operated</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LBJ</td>
<td>$770,814</td>
<td>482,773</td>
</tr>
<tr>
<td>NTE</td>
<td>$300,857</td>
<td>190,583</td>
</tr>
<tr>
<td><strong>TxDOT Operated</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IH 635 East (24 hours)</td>
<td></td>
<td>928,177</td>
</tr>
<tr>
<td>DFW Connector</td>
<td></td>
<td>12,971</td>
</tr>
<tr>
<td>IH 30</td>
<td></td>
<td>41,592</td>
</tr>
<tr>
<td>IH 35E</td>
<td></td>
<td>200,466</td>
</tr>
<tr>
<td>Midtown Express</td>
<td></td>
<td>36,387</td>
</tr>
<tr>
<td>Future Facilities</td>
<td></td>
<td>TBD</td>
</tr>
</tbody>
</table>
Violation Process Policy (Different from Toll Road)
# Possible Violation Scenarios

<table>
<thead>
<tr>
<th>#</th>
<th>Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2nd Account</td>
<td>A user creates a second account using a different email address/phone number/name.</td>
</tr>
<tr>
<td>2</td>
<td>2nd Smartphone Left in Car</td>
<td>A user leaves a 2nd smartphone in the car at all times to ensure HOV status is achieved even on SOV trips.</td>
</tr>
<tr>
<td>3</td>
<td>Occupant Beacon Left in Car</td>
<td>A user leaves an Occupant Beacon in the car at all times to ensure HOV2 status is achieved even on SOV trips.</td>
</tr>
<tr>
<td>4</td>
<td>2nd Smartphone Carried</td>
<td>A user carries a second smartphone at all times to ensure HOV2 status is achieved even on SOV trips.</td>
</tr>
<tr>
<td>5</td>
<td>2nd Occupant Beacon Carried</td>
<td>A user carries an Occupant Beacon at all times, in addition to another occupant device, to ensure that HOV2 status is achieved even on SOV trips.</td>
</tr>
<tr>
<td>6</td>
<td>2 Cars Together</td>
<td>2 single occupancy cars are next to each other in traffic so that each car momentarily achieves a HOV 2 status.</td>
</tr>
</tbody>
</table>
Auto Occupancy Detection Technology and Rewards Program Communications

Proposed Key Messaging

Download App to get your HOV rewards

Easy to use

Mobile phone based

Messaging to existing Drive on TExpress customers

Refine messages from what we learn from Focus Groups/Partner Agency Input
Auto Occupancy Detection Technology and Rewards Program Communications

Potential Communication Approaches

Branding (e.g., logo, device, packaging, partner logos, distribution)

Website, Social Media, Newsletters

Launch Event, Media Relations, Community Events

Work with Partner Agencies and Elected Officials to Distribute Messages

Targeted Emails, In-App Messaging to Existing Drive On TEXpress Customers

Customer Service Training for Partner Agencies

Educational Brochures, Videos
Auto Occupancy Detection Technology and Rewards Program Communications

*Potential Communication Approaches – Continued*

- Paid Advertising
- Digital Billboards
- Search Engine Optimization
- Publications/Print Advertising
- Radio Spots/Streaming Audio
- Online Ads
- Direct Mail
- Paid Social Media Ads
- Paid Event Sponsorship
Possible Adjustments to Tolled Managed Lane and Express Lane/HOV Policies

Replacing Subsidy with Rewards

Transition from Manual Enforcement to Automated Verification
  - Eliminating the Court System
Draft Schedule

August/September 2018 - Surface Transportation Technical Committee

September - Regional Transportation Council Workshop

September/October 2018 - Regional Transportation Council

Fall 2018 - TxDOT Endorsement for Application for DFW and Statewide

Soft Launch; December 2018, 10-15 regular users for each managed lane

Full Launch; February 2019, all managed lanes in DFW