Auto Occupancy Detection and Verification Technology Update

PUBLIC MEETINGS

OCTOBER
Introduction

Project Overview

Project Goals
• To demonstrate the success of technology for automatically detecting and verifying vehicle occupancy on tolled managed lane facilities in the Dallas-Fort Worth region
• To eliminate the need for drivers to activate HOV status every time they qualify for a carpool discount
• To verify that the technology can be implemented not only in the Dallas-Fort Worth region, but in a seamless fashion on TxDOT managed lane and express facilities

Project Timeline
• 1 year project, from July 2017 to July 2018
• 14 key project milestones
• 4 key test phases

Technology Vendor
Carma Technology Corporation is a world leader in technology that encourages and enables high occupancy commuting.
Drive on TEXPRESS Application
Current HOV Enforcement

- NTE Toll Site & Enforcement Zone
- LBJ Toll Site & Enforcement Zone
- Police Enforcement Portable Device Application (PDA)
- Mobile App
- SMS
- Secure Network Firewall
- HOV List Network
- Wireless Communication System (Cellphone Network)
- Customer Support
- NTE/LBJ Back Office System (BOS)
- TxDOT HOV Enforcement Zone
- Beacon Light
- TxDOT Toll Site
- NTTA Back Office System (BOS)
- TxDOT/NTTA TOLL SERVICE PROVIDERS (Customer Service center)
Why Mobile Occupancy Verification?

No Additional Roadside Infrastructure
- No right-of-way for HOV declaration-ramps of law enforcement
- No special lights or law enforcement technologies
- Work with existing toll infrastructure

Reliability
- Works 24 hours per day x 365 days per year
- Covers 100% of your road network
- Invulnerable to variance in weather, traffic, vehicles

Privacy
- Opt-in by users, no peering inside vehicles
- No PII data: toll tag plus verified occupancy

Network Benefits
- Leakage reductions, optional occupancy perks
- Performance measures, planning data

Big Data Analytics
- Big Data analysis identifies non-compliant behaviors
- Agency policies define automated warnings
- Data aggregation of traffic patterns, travel times and origin / destination maps

No Messy Legal Issues
- Manual enforcement is often sporadic and ineffective
- No law enforcement officers needed to issue tickets
- Does not tie-up court system
- Flexible “fraud detection” program
- Charge the right toll
- Willing to live with small level of “violators” in lieu of costly manual enforcement
Technology Overview
How Carma’s solution works

2. Number of occupants recorded within app.
3. Tolltag is read at gantry.
4. Occupancy info time-stamped within app.
Customer Process

Place car beacon in glove box
• Or other out of the way location in vehicle

Download app
• Runs in background once installed
• Bluetooth turned on
• Low energy/battery usage
• Pickup a friend and want to carpool? Just use the app to send an invite before you drive.

Register Tolltag to car beacon
• Occupants do not need to register to tolltag

Place optional occupant beacon in diaper bag or backpack
• In lieu of app for occupants without phone

Detection/Verification Process

Occupancy automatically detected
• When occupant with app enters vehicle
• Optional occupant beacons also counted
• Occupant count transmitted to Carma server via cellular network
• Carma server transmits timestamped occupancy data to toll back office

Occupant data timestamped at toll gantry
• Carma occupant data matched with toll transaction

Customer gets charged correct toll!

Fraud detection
• System monitors proximity of phones/beacons periodically
• Region to develop potential fraud messaging and response

www.gocarma.com/carma-faq
## Overall Schedule

<table>
<thead>
<tr>
<th>Task</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kick-off Meeting with Partners</td>
<td>August 2017</td>
</tr>
<tr>
<td>Surface Transportation Technical Committee/Regional Transportation Council/Public Meetings</td>
<td>September/October 2017</td>
</tr>
<tr>
<td>Pilot on DFW Connector Corridor</td>
<td>October/November 2017</td>
</tr>
<tr>
<td>Share Pilot Results to Partner Agencies</td>
<td>December 2017</td>
</tr>
<tr>
<td>Surface Transportation Technical Committee/Regional Transportation Council/Public Meetings</td>
<td>January/February 2018</td>
</tr>
<tr>
<td>Partner Integration</td>
<td>March 2018</td>
</tr>
<tr>
<td>System-Wide Deployment</td>
<td>May 2018</td>
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<tr>
<td>Transition to Incentive Program</td>
<td>??</td>
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