Improving Houston METRO HOV/HOT Lane Safety

2012 Fall TexITE: Fort Worth
August 31st, 2012
Dustin Qualls, PE, PTOE
Nader Mirjamali, PE
Agenda for Today’s Presentation

I. Introduction to ARGO (Automated Reversible Gate Operation) and HOT (High Occupancy Tolling) Lanes in Houston, TX

II. Existing HOV Lane Safety Deficiencies

III. The ARGO Safety Solution

IV. HOT Lanes – An Added HOV Lane Utilization Benefit

V. Conclusion / Questions
I. Introduction

- The Metropolitan Transit Authority of Harris County (METRO) has operated and maintained reversible, barrier separated, HOV lanes for over 20 years.

- There are five HOV lane corridors in Houston:
  - IH 45 South (Gulf Freeway)
  - IH 45 North (North Freeway)
  - US 59 South (Southwest Freeway)
  - US 59 North (Eastex Freeway)
  - US 290 (Northwest Freeway)
I. Introduction – System Overview
I. Introduction – Access Types
II. Existing Safety Deficiencies
II. Existing Safety Deficiencies
II. Existing Safety Deficiencies
II. Existing Safety Deficiencies
II. Existing Safety Deficiencies
II. Existing Safety Deficiencies
II. Existing Safety Deficiencies

- Other safety deficiencies include the inability to monitor the five corridor system in real time; thus wrong-way drivers or motorists using the HOV lane during times in which the lane is closed were not able to be instantly identified.

- Safety at Park & Ride lots was compromised at times due to lack of video monitoring when on-site police were not present.
III. The ARGO Safety Solution
III. The ARGO Safety Solution

- Purpose is to automate HOV/HOT lane reversing procedure and provide full video coverage of all Park & Ride lots, HOV/HOT lanes and access points

- Utilizes vertical gates, swinging gates, fiber-optic changeable message small signs and full PTZ video camera coverage of system

- Funded by American Recovery and Reinvestment Act of 2009

- Design-Build method of delivery
III. The ARGO Safety Solution

- METRO employees previously assigned to manual reversing of HOV/HOT lane now stationed at Houston TranStar watching system remotely from video cameras

- Manual reversing time before automation was approximately one hour per corridor (twice per day)

- With ARGO, reversing time now a matter of minutes based on visual confirmations of all gates prior to opening and closing; all gates opened and closed from TranStar
III. The ARGO Safety Solution

- Manually reversed small signs either removed or replaced with fiber-optic, changeable message signs (CMS) tied into same 2070 controller as adjacent ARGO system

- All new fiber optic CMS signs are also observed and confirmed from TranStar using video feed

- Five year operations and maintenance contract with contractor utilized to replace any inoperable or malfunctioning fiber optic sign or ARGO gate; turnaround time within one day
III. The ARGO Safety Solution
III. The ARGO Safety Solution

- Total number of new ARGO gates by HOV/HOT lane corridor:
  - IH 45 South: 26
  - US 59 South: 28
  - IH 45 North: 32
  - US 59 North: 40
  - US 290: 22

- A total of 148 new ARGO gates and approximately 100 new fiber-optic changeable message small signs
III. The ARGO Safety Solution
III. The ARGO Safety Solution

- Full PTZ video camera at all HOV/HOT lane access points, Park & Ride lots, etc

- All viewable from TranStar as well as METRO headquarters building in downtown Houston
IV. HOT Lanes – The Added Benefit
IV. HOT Lanes - Benefits

- Provides new options for commuters
- Increases safety and promotes quick response to accidents and issues in the lanes due to additional camera monitoring
- Improves air quality by reducing traffic congestion
- Better utilizes existing HOV Lanes
- Offers increased enforcement of the HOV Lane system
IV. HOT Lanes - Benefits

- Carpools, vanpools and motorcycles are still able to use the HOV Lanes for free
- Travel times will not increase – traffic monitoring systems monitor real-time speeds on the lane and will close access to HOT lane patrons if speeds drop below 55 mph
- METRO HOT Lanes users have a choice of using a METRO HOT Lanes Toll Tag, Harris County EZ TAG, TxDOT’s TxTAG or the Dallas NTTA Toll Tag
- System is transparent to customers already having one of the aforementioned ETC tags; ie, there is not an additional set-up procedure or new tag required
### IV. HOT Lanes – AM Schedule

<table>
<thead>
<tr>
<th>Time</th>
<th>Sun</th>
<th>Mon</th>
<th>Tue</th>
<th>Wed</th>
<th>Thurs</th>
<th>Fri</th>
<th>Sat</th>
</tr>
</thead>
<tbody>
<tr>
<td>5:00 a.m.</td>
<td>CLOSED</td>
<td>$2.25</td>
<td>$2.25</td>
<td>$2.25</td>
<td>$2.25</td>
<td>$2.25</td>
<td>CLOSED</td>
</tr>
<tr>
<td>6:00 a.m.</td>
<td>CLOSED</td>
<td>$4.50</td>
<td>$4.50</td>
<td>$4.50</td>
<td>$4.50</td>
<td>$4.50</td>
<td>CLOSED</td>
</tr>
<tr>
<td>7:00 a.m.</td>
<td>CLOSED</td>
<td>HOV only</td>
<td>HOV only</td>
<td>HOV only</td>
<td>HOV only</td>
<td>HOV only</td>
<td>CLOSED</td>
</tr>
<tr>
<td>8:00 a.m.</td>
<td>CLOSED</td>
<td>$4.50</td>
<td>$4.50</td>
<td>$4.50</td>
<td>$4.50</td>
<td>$4.50</td>
<td>CLOSED</td>
</tr>
<tr>
<td>9:00 a.m.</td>
<td>CLOSED</td>
<td>$2.25</td>
<td>$2.25</td>
<td>$2.25</td>
<td>$2.25</td>
<td>$2.25</td>
<td>CLOSED</td>
</tr>
<tr>
<td>10:00 a.m.</td>
<td>CLOSED</td>
<td>$1.00</td>
<td>$1.00</td>
<td>$1.00</td>
<td>$1.00</td>
<td>$1.00</td>
<td>CLOSED</td>
</tr>
<tr>
<td>11:00 a.m.</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
</tr>
<tr>
<td>Noon</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
</tr>
<tr>
<td>1:00 p.m.</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
</tr>
<tr>
<td>2:00 p.m.</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
</tr>
<tr>
<td>3:00 p.m.</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
</tr>
<tr>
<td>4:00 p.m.</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
</tr>
<tr>
<td>5:00 p.m.</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
</tr>
<tr>
<td>6:00 p.m.</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
</tr>
<tr>
<td>7:00 p.m.</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
</tr>
</tbody>
</table>
## IV. HOT Lanes – PM Schedule

<table>
<thead>
<tr>
<th>Time</th>
<th>Sun</th>
<th>Mon</th>
<th>Tue</th>
<th>Wed</th>
<th>Thurs</th>
<th>Fri</th>
<th>Sat</th>
</tr>
</thead>
<tbody>
<tr>
<td>5:00 a.m.</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
</tr>
<tr>
<td>6:00 a.m.</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
</tr>
<tr>
<td>7:00 a.m.</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
</tr>
<tr>
<td>8:00 a.m.</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
</tr>
<tr>
<td>9:00 a.m.</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
</tr>
<tr>
<td>10:00 a.m.</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
</tr>
<tr>
<td>11:00 a.m.</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
</tr>
<tr>
<td>Noon</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
<td>CLOSED</td>
</tr>
<tr>
<td>1:00 p.m.</td>
<td>CLOSED</td>
<td>$1.00</td>
<td>$1.00</td>
<td>$1.00</td>
<td>$1.00</td>
<td>$1.00</td>
<td>CLOSED</td>
</tr>
<tr>
<td>2:00 p.m.</td>
<td>CLOSED</td>
<td>$2.25</td>
<td>$2.25</td>
<td>$2.25</td>
<td>$2.25</td>
<td>$2.25</td>
<td>CLOSED</td>
</tr>
<tr>
<td>3:00 p.m.</td>
<td>CLOSED</td>
<td>$4.50</td>
<td>$4.50</td>
<td>$4.50</td>
<td>$4.50</td>
<td>$4.50</td>
<td>CLOSED</td>
</tr>
<tr>
<td>4:00 p.m.</td>
<td>CLOSED</td>
<td>HOV only</td>
<td>HOV only</td>
<td>HOV only</td>
<td>HOV only</td>
<td>HOV only</td>
<td>CLOSED</td>
</tr>
<tr>
<td>5:00 p.m.</td>
<td>CLOSED</td>
<td>HOV only</td>
<td>HOV only</td>
<td>HOV only</td>
<td>HOV only</td>
<td>HOV only</td>
<td>CLOSED</td>
</tr>
<tr>
<td>6:00 p.m.</td>
<td>CLOSED</td>
<td>$4.50</td>
<td>$4.50</td>
<td>$4.50</td>
<td>$4.50</td>
<td>$4.50</td>
<td>CLOSED</td>
</tr>
<tr>
<td>7:00 p.m.</td>
<td>CLOSED</td>
<td>$2.25</td>
<td>$2.25</td>
<td>$2.25</td>
<td>$2.25</td>
<td>$2.25</td>
<td>CLOSED</td>
</tr>
</tbody>
</table>
IV. HOT Lanes
IV. HOT Lanes
IV. HOT Lanes
IV. HOT Lanes – Schedule of Openings

- IH 45 South: Opened early 2012
- US 59 South: Opened July 2012
- IH 45 North: Opening later this year
- US 59 North: Opening mid-2013
- US 290: Opening late 2013
IV. HOT Lanes – Dynamic Message Sign
IV. HOT Lanes – US 59 S Grand Opening
V. Questions / Discussion?