Vehicle Detection

OTEA Fall Meeting – October 20, 2015
Agenda

• Introductions
• 30k Foot Summary
  • Previous Technology
  • Current Technology
  • Potential Technology
• Questions & Answers
Introduction

Frank Robinson
TransCore - Operations Manager for Oklahoma

We are responsible for:
• All installation and maintenance of toll equipment statewide
  • Including, but not limited to: Antenna(s), Reader(s), Loop(s), Treadle(s), Blade(s), UPS(s), ACM(s), APM(s), Toll indication Light(s), Bell(s) printer(s) and various MLT booth equipment.
  • 35 IT/Technician/TrAc personnel located in offices in OKC and Tulsa
  • 24/7/365 operations
Previous Technology – Vehicle Detection

Light Curtains
• A series of IR light bars matched vertically across the lane
• The break in light indicates a vehicle and vehicle separation.

Treadles
• Steel frame placed into the driving surface with evenly spaced pressure sensitive strips that indicate vehicle and axle count.
Current Technology – Vehicle Detection

Loops/Gradients
- Cast or cut-in leads below the surface.
- Trigger/Control Video Enforcement System (VES)

Treadles
- Steel frame placed into the driving surface with evenly spaced pressure sensitive strips that indicate vehicle and axle count.
- Limited to manned lanes
- Post-class identification
Loops/Gradient Cut-ins
Potential Technology – Vehicle Detection

Infinity/IVIS Suite

- Intelligent Vehicle Identification System (IVIS)
- Open Road Tolling (ORT)
- Vehicle Capture and Recognition System (VCARS)
- Interoperability (IOP) Readers
- Pre-class and Post-class Identification
- Automatic Payment Machine (APM)
- Optical Profile Unifying System (OPUS)
- All Electronic Tolling (AET)

Advanced Treadles

- Fiber optic strips
- Polymer frame with S.S. anchors
General Data Flow
IVIS ORT

- IVIS
  - Static In-pavement sensors
  - Electromagnetic fields
  - Computerized Signal Processing
- ORT
  - Shoulder to shoulder coverage

https://www.transcore.com/videos
https://www.youtube.com/watch?v=B-gzNi6MRwI
<table>
<thead>
<tr>
<th><strong>Features</strong></th>
<th><strong>Benefits</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Axle-based classification system with no moving parts to wear out or maintain.</td>
<td>High reliability. Low maintenance cost.</td>
</tr>
<tr>
<td>No minimum requirement for vehicle separation.</td>
<td>Accurately classifies vehicles even with no physical separation.</td>
</tr>
<tr>
<td>MS sensors are almost invisibly imbedded in the road surface.</td>
<td>Safe and transparent to toll patrons. No above-ground components to keep aligned.</td>
</tr>
<tr>
<td>Easy to install in new or existing roadways.</td>
<td>Low installation time and costs.</td>
</tr>
<tr>
<td>Unaffected by weather.</td>
<td>Tested in the snow and ice of Colorado, the tropical conditions of Florida, and in the extreme heat of Texas with unprecedented accuracy and reliability.</td>
</tr>
<tr>
<td>Provides accurate pre- and post-classification.</td>
<td>Redundancy increases data confidence. Indicates the toll amount to the patron in Attended, Automatic Coin Machine or Automatic Toll Payment Machine lanes.</td>
</tr>
<tr>
<td>Triggers for vehicle license plate images.</td>
<td>Highly accurate camera triggering improves the &quot;region-of-interest&quot; (ROI) capture of license plate images for optical character recognition as well as images to support transaction-level auditing.</td>
</tr>
<tr>
<td>No minimum or maximum speed requirements.</td>
<td>Effective in high-speed and stop and go traffic.</td>
</tr>
<tr>
<td>High quality pre-manufactured sensors.</td>
<td>Precision made sensors are designed for the life of the roadway. Install quickly, efficiently, and consistently.</td>
</tr>
<tr>
<td>Common technology for both single lane and open road applications.</td>
<td>Single technology for all lane configurations.</td>
</tr>
<tr>
<td>Foolproof deployment.</td>
<td>Curb-to-curb coverage.</td>
</tr>
<tr>
<td>Proven tolling technology.</td>
<td>Tested over tens of millions of transactions with a high degree of accuracy and availability.</td>
</tr>
</tbody>
</table>
Mounted VCARS and Antenna
VCARS

• Infinity/IVIS Integrated System
  • IVIS triggered
  • Front and Rear Images
• Redundant design
  • Dual cameras
  • Dual lights
  • Dual controls
  • Dual power supplies
• Advanced Imaging
  • Stereoscopic imaging
  • Remote adjustable
  • Self-learning capabilities

*The VCARS stereoscopic cameras cover the entire Open Road Tolling zone.*
VCARS

- Ice/drip edge
- Remote angle/view adjustable cameras
- Weather/Heat shield
- IR Strobe lights
Infinity Controls

• Serviceable design
  • Tip-out units
  • Thumb screwed blades
  • Removable connectors
• IOP Reader
  • Multiprotocol capable
  • Authority tuned
General Data Flow
Contact Information

Frank Robinson - Operations Manager

TransCore
13408 Railway Drive
Oklahoma City, Oklahoma 73114
Office: 405.755.2955 x 309
Cell: 405.923.2335
Email: Frank.Robinson@transcore.com
Web: www.transcore.com