

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.

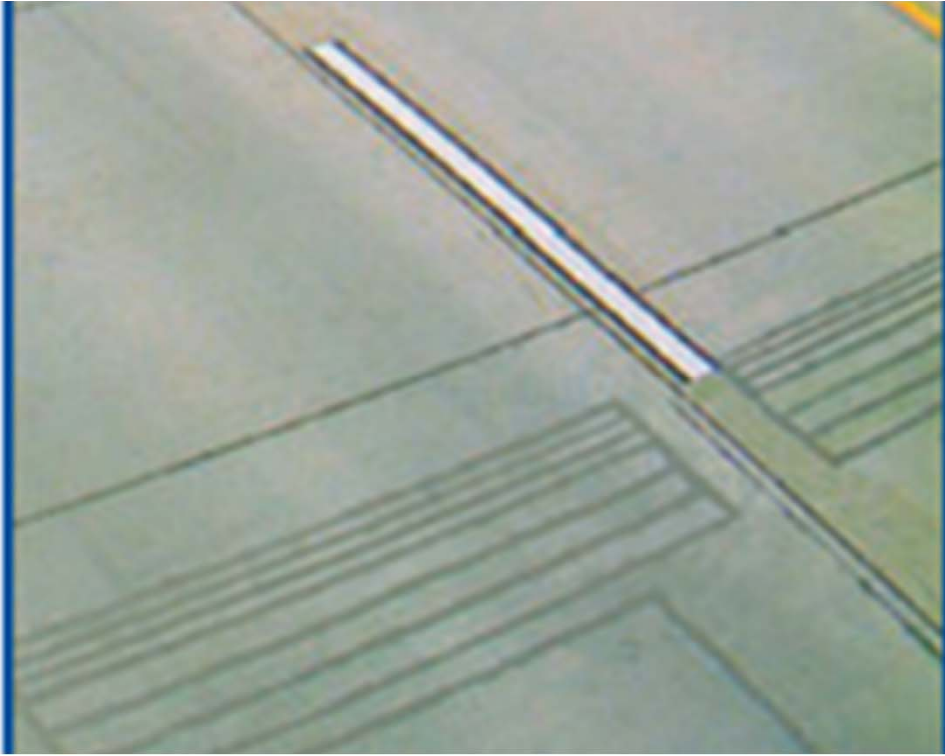
Current Technology – Vehicle Detection

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

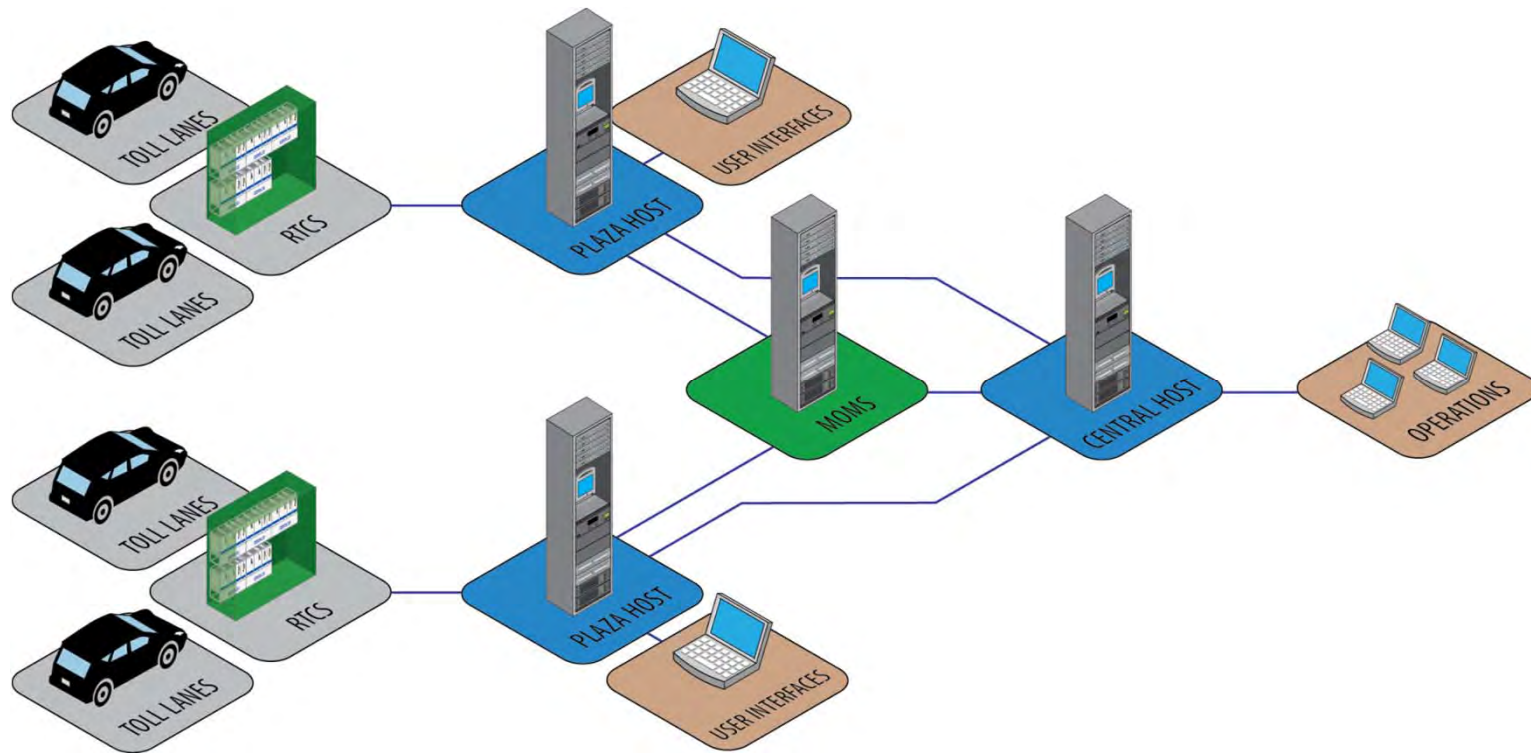
Infinity/IVIS Suite

- 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

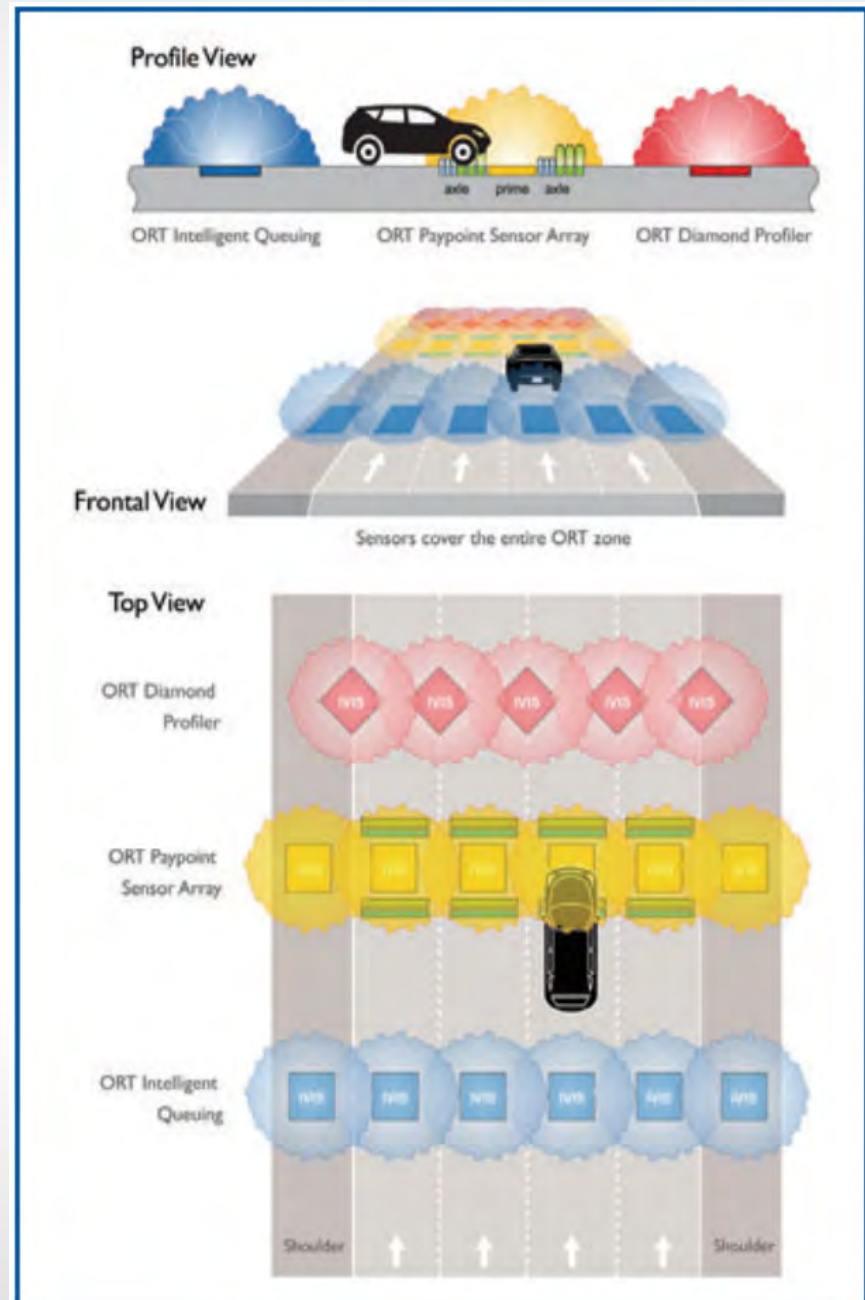


IVIS ORT

- 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-gzNi6MRwl>



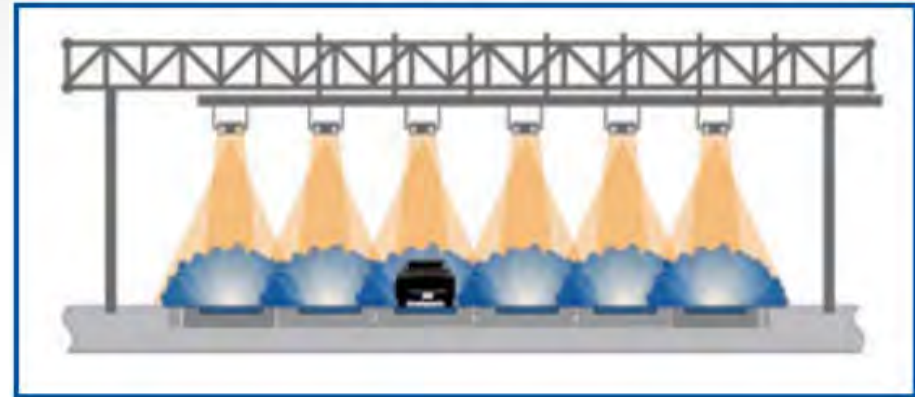
Features	Benefits
Axle-based classification system with no moving parts to wear out or maintain.	High reliability. Low maintenance cost.
No minimum requirement for vehicle separation.	Accurately classifies vehicles even with no physical separation.
IVIS sensors are almost invisibly imbedded in the road surface.	Safe and transparent to toll patrons. No above-ground components to keep aligned.
Easy to install in new or existing roadways.	Low installation time and costs.
Unaffected by weather.	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!
Provides accurate pre- and post-classification.	Redundancy increases data confidence. Indicates the toll amount to the patron in Attended, Automatic Coin Machine or Automatic Toll Payment Machine lanes.
Triggers for vehicle license plate images.	Highly accurate camera triggering improves the "region-of-interest" (ROI) capture of license plate images for optical character recognition as well as images to support transaction-level auditing.
No minimum or maximum speed requirements.	Effective in high-speed and stop and go traffic.
High quality pre-manufactured sensors.	Precision made sensors are designed for the life of the roadway. Install quickly, efficiently, and consistently.
Common technology for both single lane and open road applications.	Single technology for all lane configurations.
Foolproof deployment.	Curb-to-curb coverage.
Proven tolling technology.	Tested over tens of millions of transactions with a high degree of accuracy and availability.



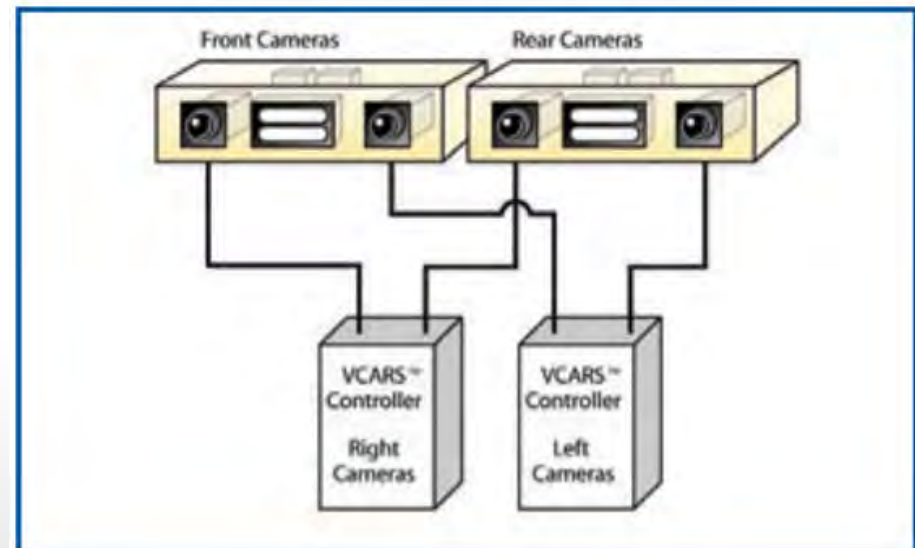
Mounted VCARS and Antenna

VCARS

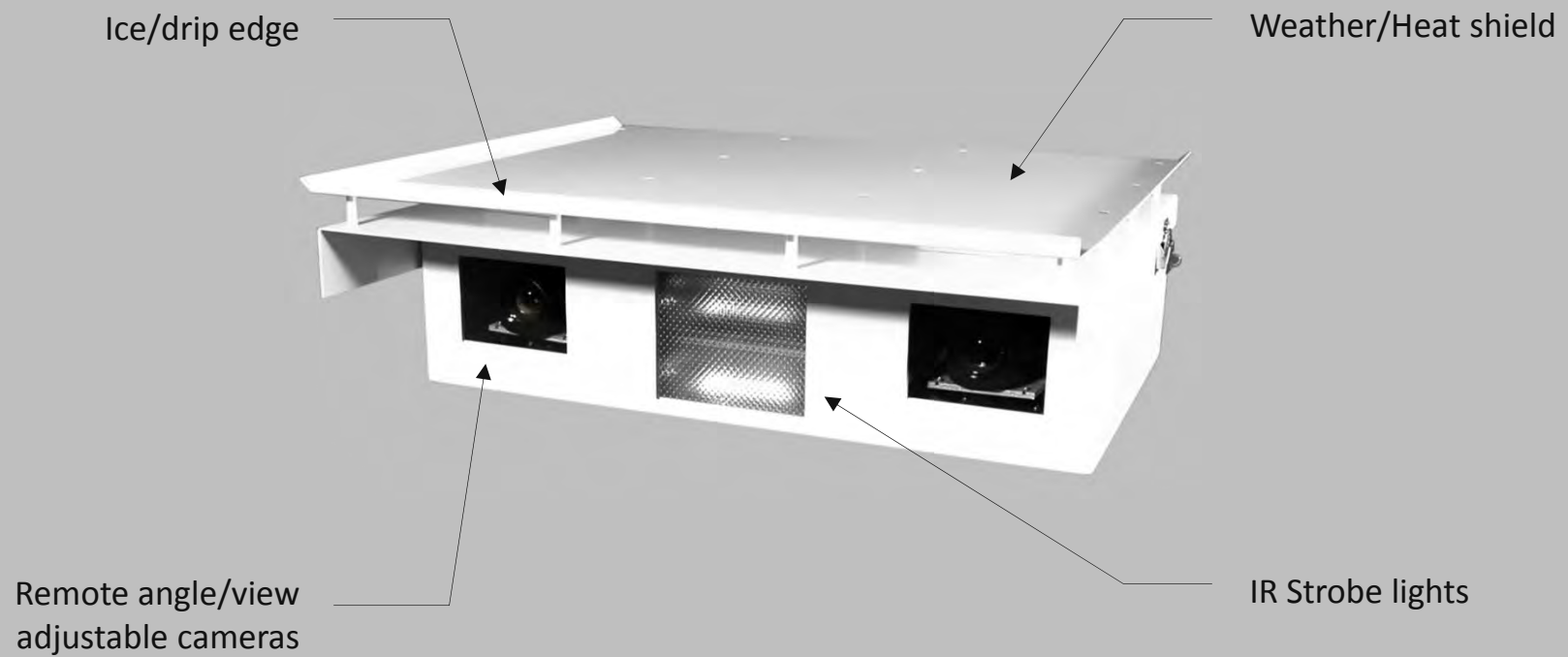
- Infinity/IVIS Integrated System
 - IVIS triggered
 - Front and Rear Images
- Redundant design
 - Dual cameras
 - Dual lights
 - Dual controls
 - Dual power supplies
- Advanced Imaging
 - Stereoscopic imaging
 - Remote adjustable
 - Self-learning capabilities



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



VCARS

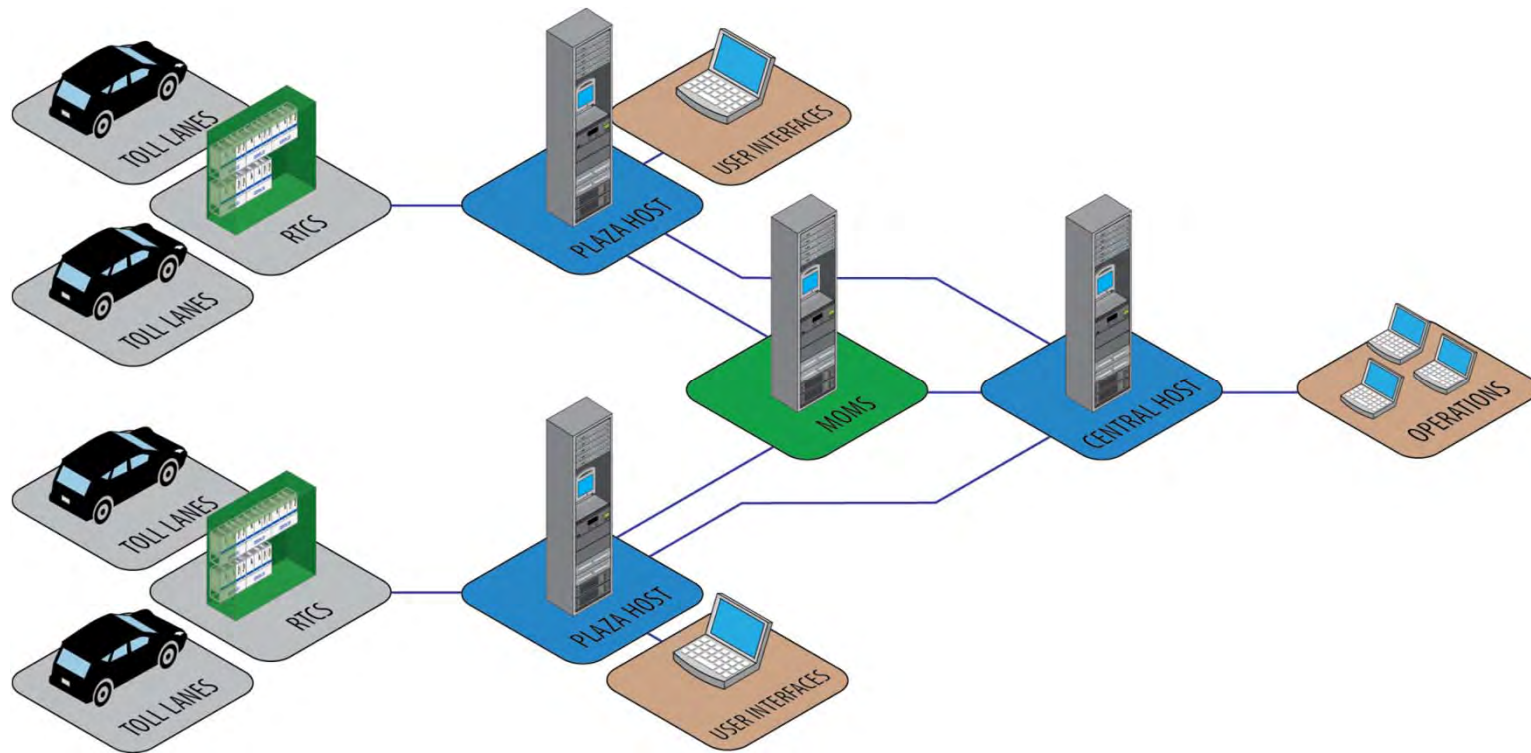


Infinity Controls

- Serviceable design
 - Tip-out units
 - Thumb screwed blades
 - Removable connectors
- IOP Reader
 - Multiprotocol capable
 - Authority tuned



General Data Flow



Contact Information

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