Fort Worth Railroad Program

- Fort Worth has 194 grade crossings today.
- We have a lot of “situations” to deal with, and a lot of needs to use the cameras we deploy.

- Fort Worth RR Program:
  - Quiet Zone Program
  - RR signal upgrades
  - Traffic signal preemption
  - Crossing surface upgrades
  - Channelization program
  - Planning & major project coordination: Tower 55, commuter rail, etc.
  - RR ITS applications: AIRMS

Railroad Crossing Camera Systems

Advanced ITS Railroad Management System - AIRMS
Fort Worth
Intelligent Transportation System

Traffic Management Center

AIRMS to eventually integrate into our ITS system

RR Crossing Problems

- Blocked Crossings:
  Affects emergency response time, traffic access, and school walking routes for children

- Crossing Violations:
  Gate drive arounds, children crossing under stopped rail cars

- Quiet Zone violations
  Unnecessary horn soundings

- Gate malfunctions
  Improper operation of RR signals
Today’s Presentation

Three Camera Solutions to Present:
1. IP cameras with cell modems
2. RR Camera Web Site
3. Special PTMS camera

1. IP Cameras with Cell Modems

Components:
- Camera
- Cabinet
- Video Server (codec)
- Cell Modem
  - Antenna
Camera at N Main & Northside Dr.

1st camera, PTZ, cell service

Camera Viewing & Control

- Web Cam (IP Cam) web browser used for Pan-Tilt-Zoom functions
- Easy to access from any PC*

* Unless your PC is on the CFW LAN, then complex firewall rules breakdown and prevent staff from seeing our own cameras.
Use of Existing Traffic Signal Video Detection Camera

15 Minute Installation

Camera at FM 156 & Avondale Haslett Rd

Peach Street Camera

Problem captured… alerted UP… problem fixed

RR cameras down because train is stopped too close to the crossing
2. User Interface: RR Camera Website

**RR Camera Map**

Allows staff and public to view up-to-date images

Based on the Houston TranStar Rail Camera System

**RR Camera Map**

- TTI hosts web site
- Open to public
- We use daily
Yellow or Red dot: blocked crossing

Future feature:
• automatically obtain crossing status from the RR circuit...
• then, automatically drive a yellow/red dot on the map.

Envisioned to be used by:
• Police
• Fire
• MedStar
• Trucking dispatch centers
• Public
• RR dispatch

SmartPhone accessible
Archived Data Feature

- TTI saves each one-minute snapshots from each camera
- Periodically sends them to city

One Minute Snap Shots—For measuring blockage time

Data collected.
- Tabulate duration of blockage.
- Access magnitude of problem.
3. PTMS

**Portable** (move around site to site)

**Train** (or any traffic event)

**Monitoring System**

- View live RR crossings and archive video events
- Capture and Document:
  - Train horn violations in Quiet Zones.
  - Length of time crossing is blocked.
  - Gate “drive arounds”.

**PTMS**

- Tabulate Event:
  - Date & TOD
  - Engine Number
  - Audio!!!

- Motion based detection - Wireless transmission - Power from local street lights
Camera streams available

Camera 1 Recorded earlier

Camera 2 Live scene

Detection zones

Play back controls

Play next flag

Video detection flags

Video Detection:

• First tried to initiate recording session based on motion.
  • Too many flags
  • Missed trains
  • Scene issues (weather, wind, resolution…)

• Numerous configuration options

• Now use 24x7 recording, and use flags to denote motion detected.
Live video is “good”. But expect improvements with:
- Codec – MPEG4 to H.264
- Cell modem – 3G to 4G

Costs:
- IP Camera: $2,900
- If VIVDS existing: $1,300
- PTMS field unit: $6,700
- PTMS NVR, firewall, switches: $25,000
- Monthly cell fee: $42

Learning Curve...

8 camera systems

Railroad Camera Website
http://165.95.118.46/fortworth/rail_intersection/