

AIRMS

## Railroad Crossing Camera Systems

### Advanced ITS Railroad Management System - AIRMS



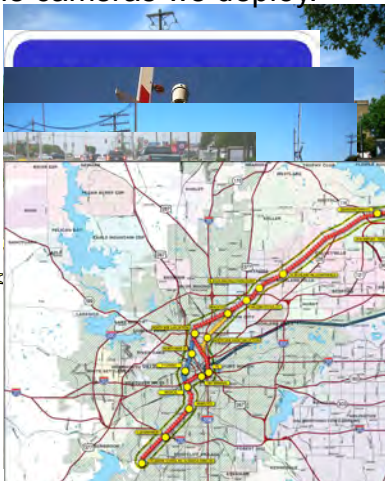


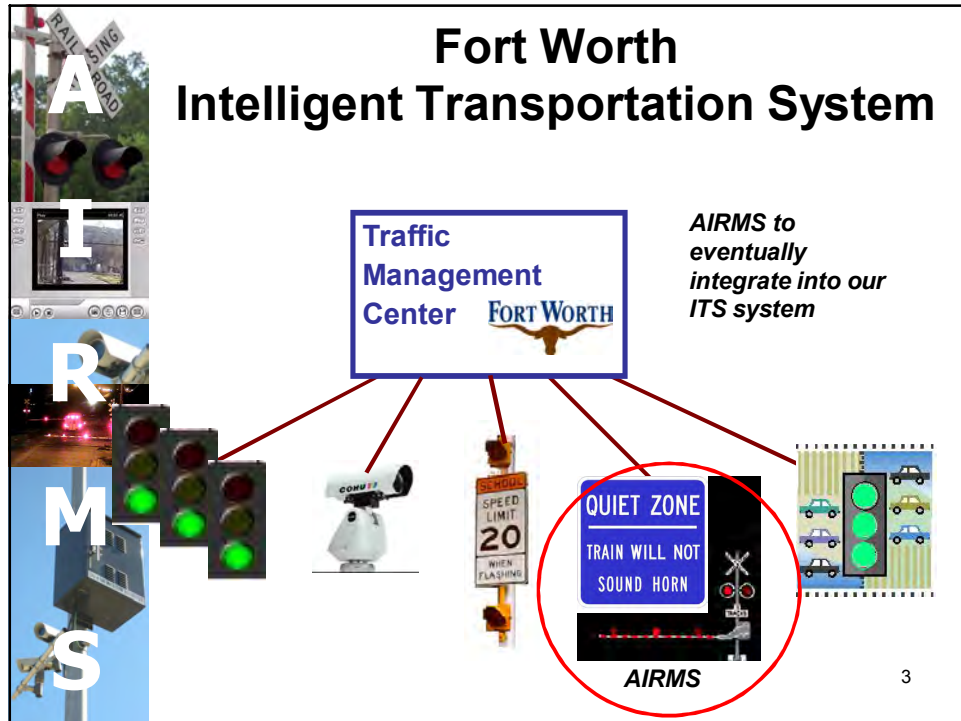

**Russell P. Wiles P.E.**  
 Transportation and Public Works Dept  
 Traffic Services Division

AIRMS

## 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 New!
  - Planning & major project coordination: Tower 55, commuter rail, etc.
  - RR ITS applications: AIRMS







## 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


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## Today's Presentation


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Three Camera Solutions to Present:


1. IP cameras with cell modems
2. RR Camera Web Site
3. Special PTMS camera



Hemphill & Morningside Dr 2009-08-31 07:58:50




## 1. IP Cameras with Cell Modems



Components:

- Camera
- Cabinet
- Video Server (codec)
- Cell Modem
  - Antenna



Fabrication team

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## Camera at N Main & Northside Dr.

1<sup>st</sup> camera, PTZ,  
cell service

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## 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.

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## Use of Existing Traffic Signal Video Detection Camera

BNSF at Avondale-Haslett Rd 2009-08-26 17:54:25

**15 Minute Installation**

Antenna

Video Server (codec)

Verizon Air Card (cellular modem)

Install "T"

Camera at FM 156 & Avondale Haslett Rd

## Peach Street Camera

Peach Street

RR gates down because train is stopped too close to the crossing

Problem captured... alerted UP... problem fixed

BNSF & Peach

UP & 4th St

Tower 55


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## 2. User Interface: RR Camera Website

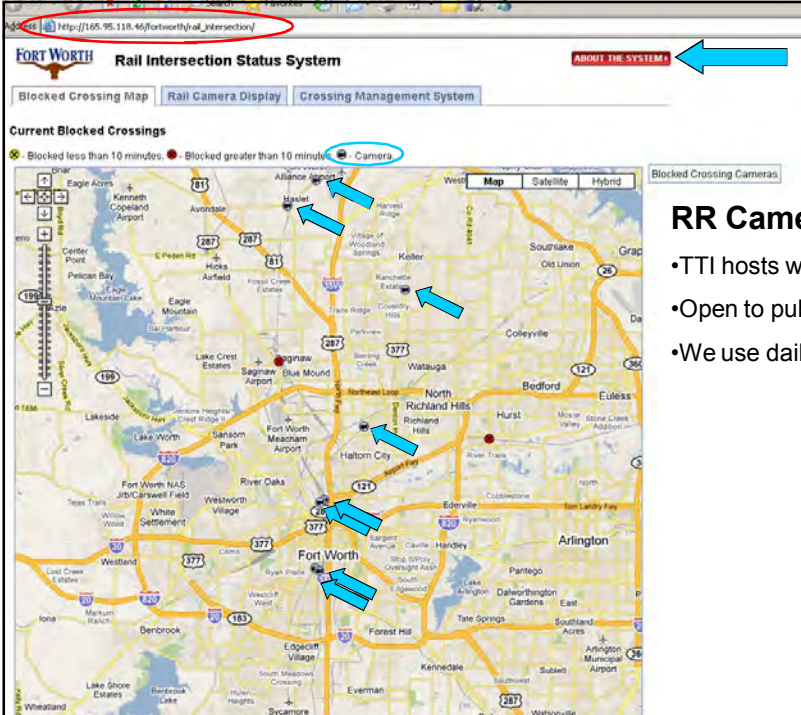
### RR Camera Map

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

Based on the Houston TranStar Rail Camera System



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### RR Camera Map

- TTI hosts web site
- Open to public
- We use daily

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**Rail Intersection Status System**

[Blocked Crossing Map](#)
[Rail Camera Display](#)
[Crossing Management System](#)

**Current Blocked Crossings**

- Blocked less than 10 minutes.
 - Blocked greater than 10 minutes.
 - Camera.

Hemphill & Morningside Dr 2009-08-31 15:28:51

**Blocked Crossing Cameras**

**Future feature:**

- automatically obtain crossing status from the RR circuit...
- then, automatically drive a yellow/red dot on the map.

**Rail Intersection Status System**

[Blocked Crossing Map](#)
[Rail Camera Display](#)
[Crossing Management System](#)

**Rail Camera Display**

**Envisioned to be used by:**


- Police
- Fire
- MedStar
- Trucking dispatch centers
- Public
- RR dispatch

SmartPhone accessible


Blocked Crossing Map
Rail Camera Display
Crossing Management System

**Rail Camera Display**


BNSF at Peach 2010-01-25 14:16:38




UP at Peach 2010-01-25 14:16:38




Hemphill & Morningside Dr 2010-01-25 14:16:09




Hemphill & Morningside Dr 2010-01-25 14:16:29



BNSF at Avondale-Hastlet Rd. 2010-01-25 14:14:18



BNSF @ Intermodal Parkway 2010-01-25 14:16:36



**Archived Data Feature**

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

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## One Minute Snap Shots-for measuring blockage time

**Picture Tasks**

- View as a slide show
- Order print table
- Print pictures
- Copy all items to CD

**File and Folder Tasks**

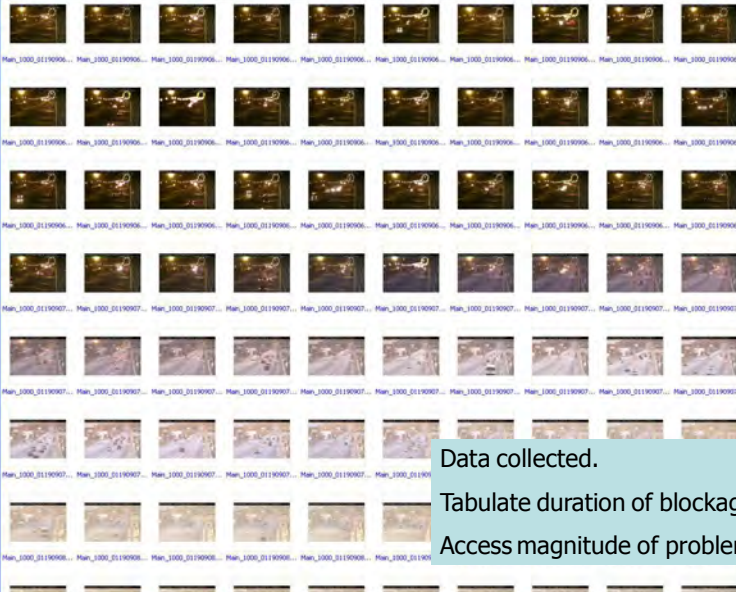
- Make a new folder
- Publish this folder to the web

**Other Places**

- My Recent
- My Computer
- My Network Places

**Details**

19 File Folder



Data collected.  
Tabulate duration of blockage.  
Access magnitude of problem.

PTMS


## 3. PTMS

**P**ortable (move around site to site)

**T**rain (or any traffic event)

**M**onitoring

**S**ystem




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## PTMS

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

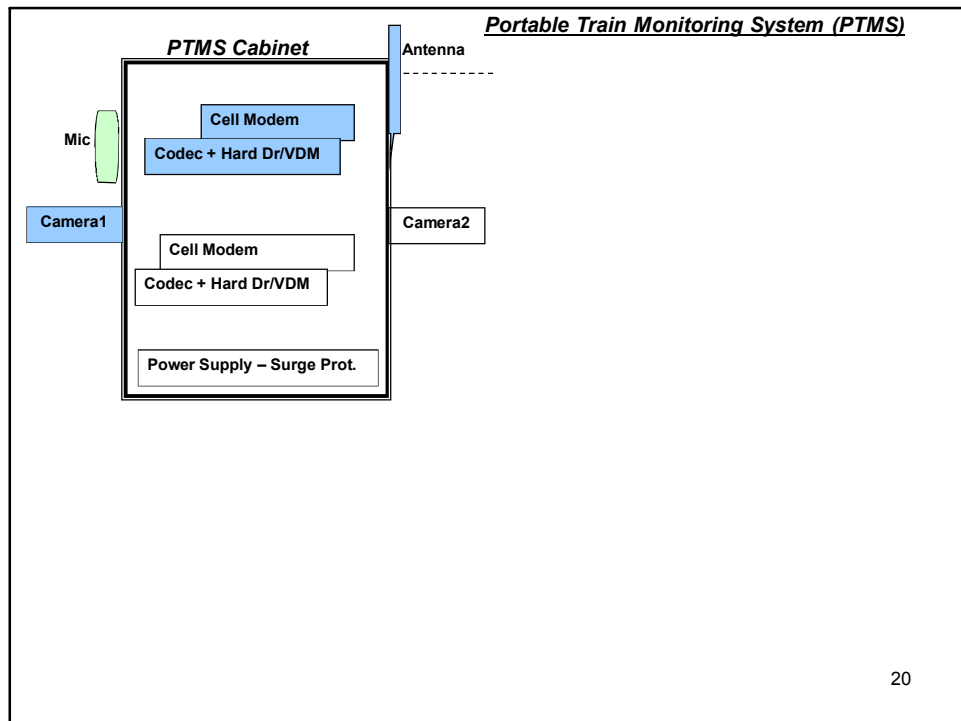
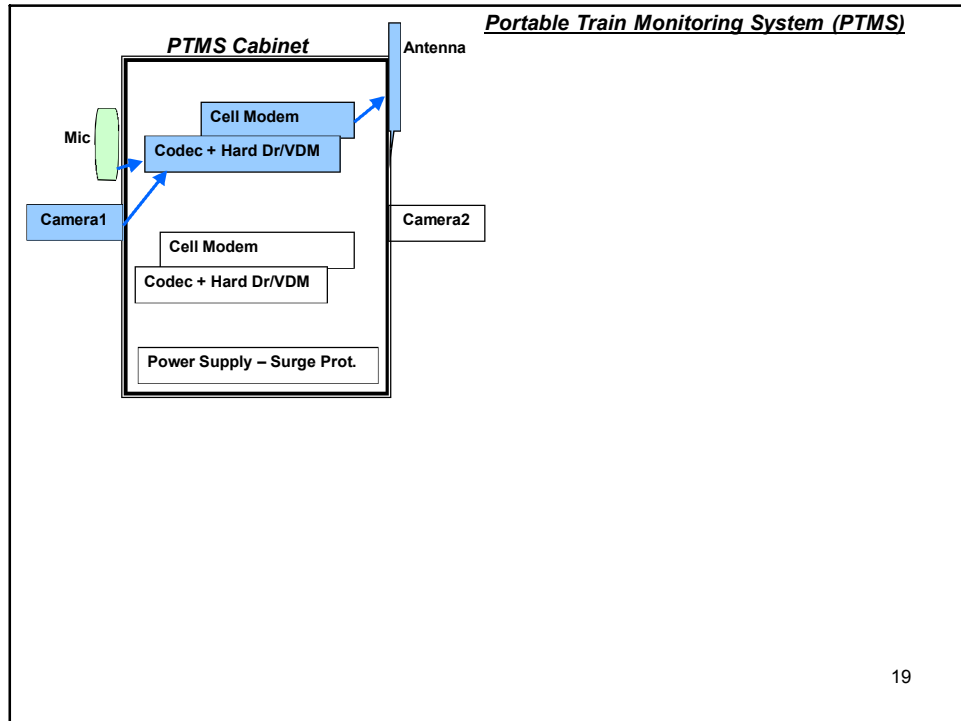
BNSF & 1<sup>st</sup> Street  
Quiet Zone

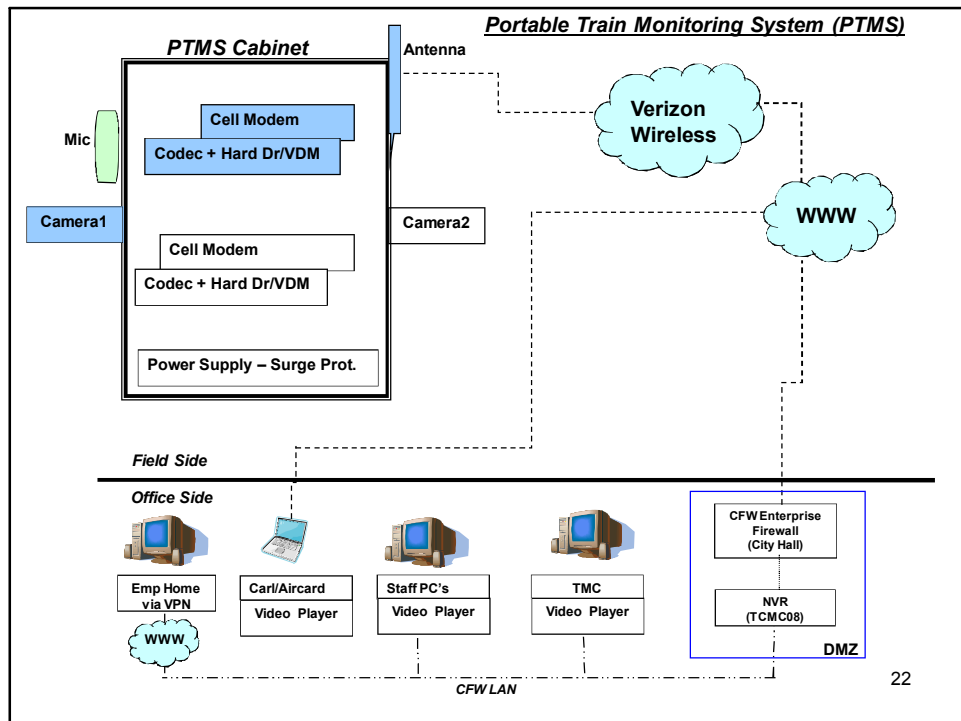
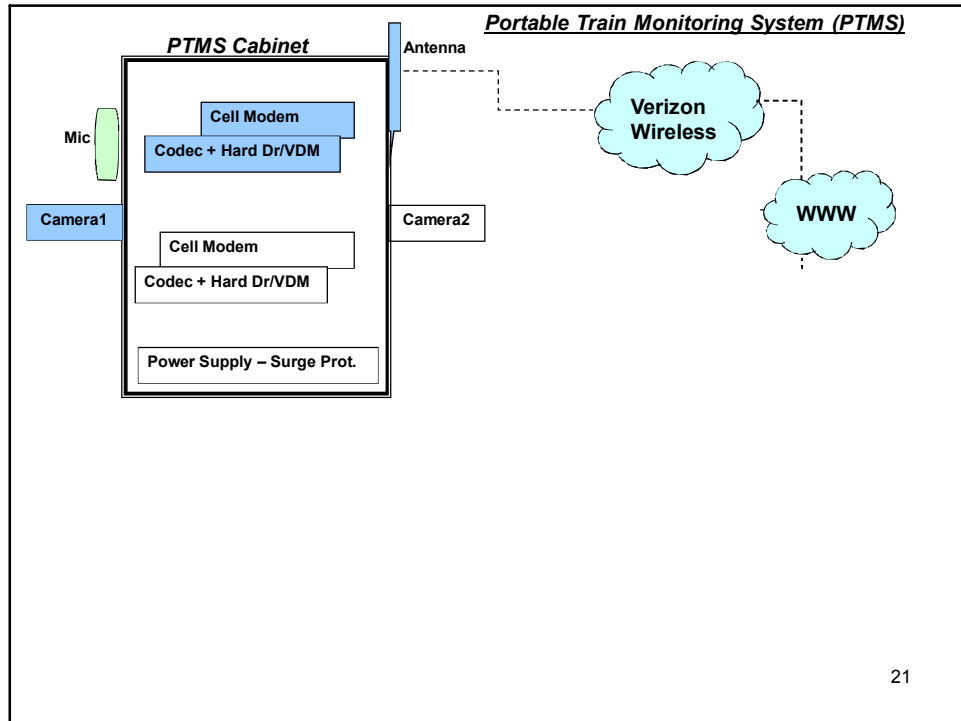


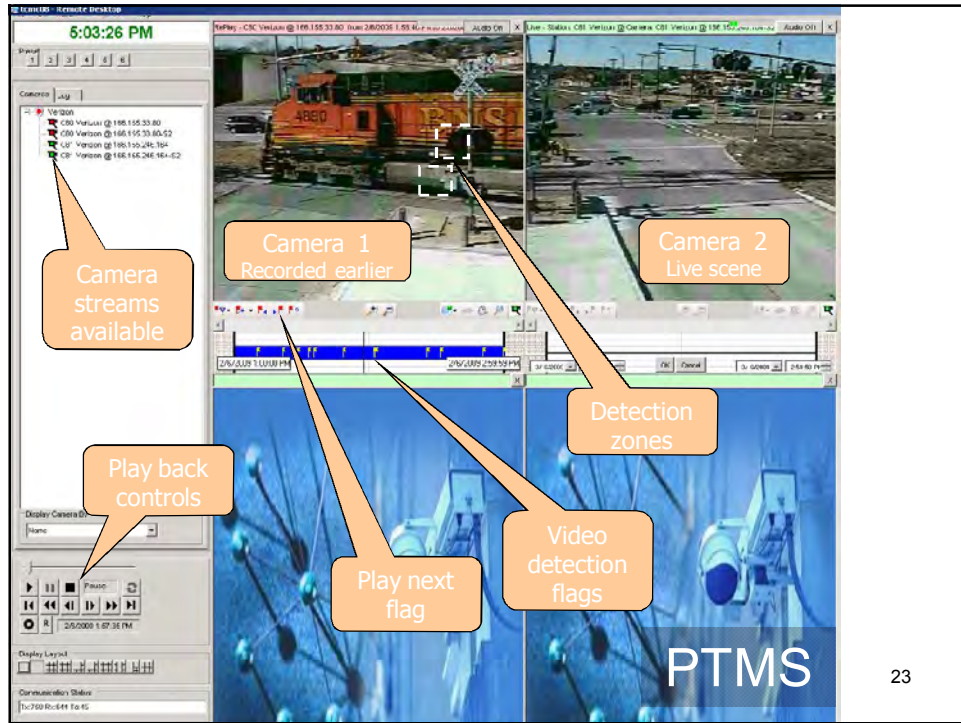
- View live RR crossings and archive video events
- Capture and Document:
  - Train horn violations in Quiet Zones.
  - Length of time crossing is blocked.
  - Gate “drive arounds”.

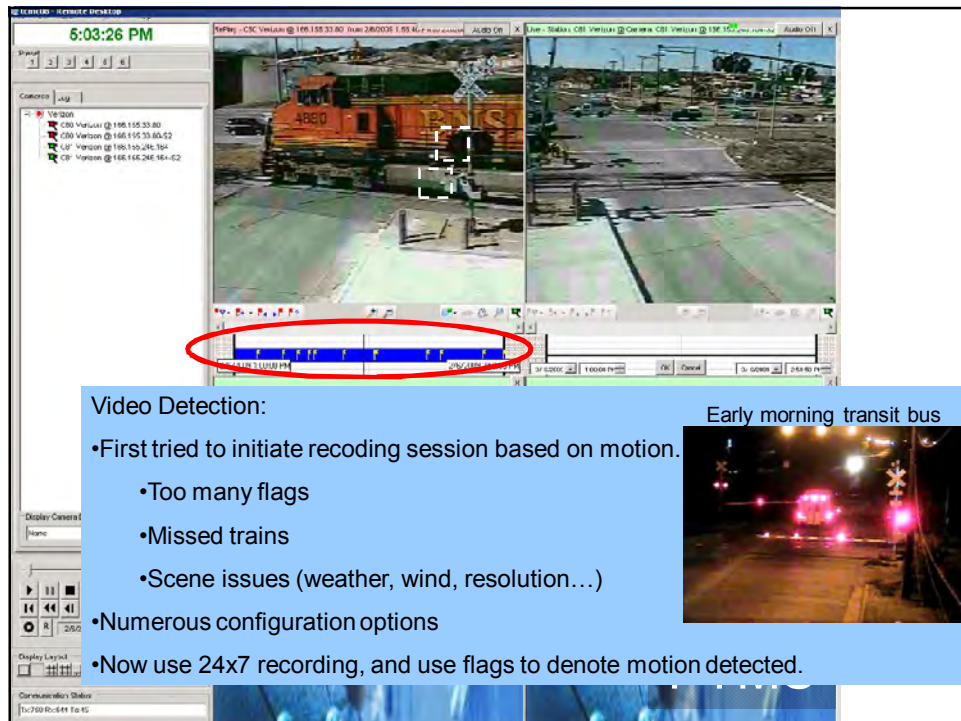
Motion based detection - Wireless transmission - Power from local street lights

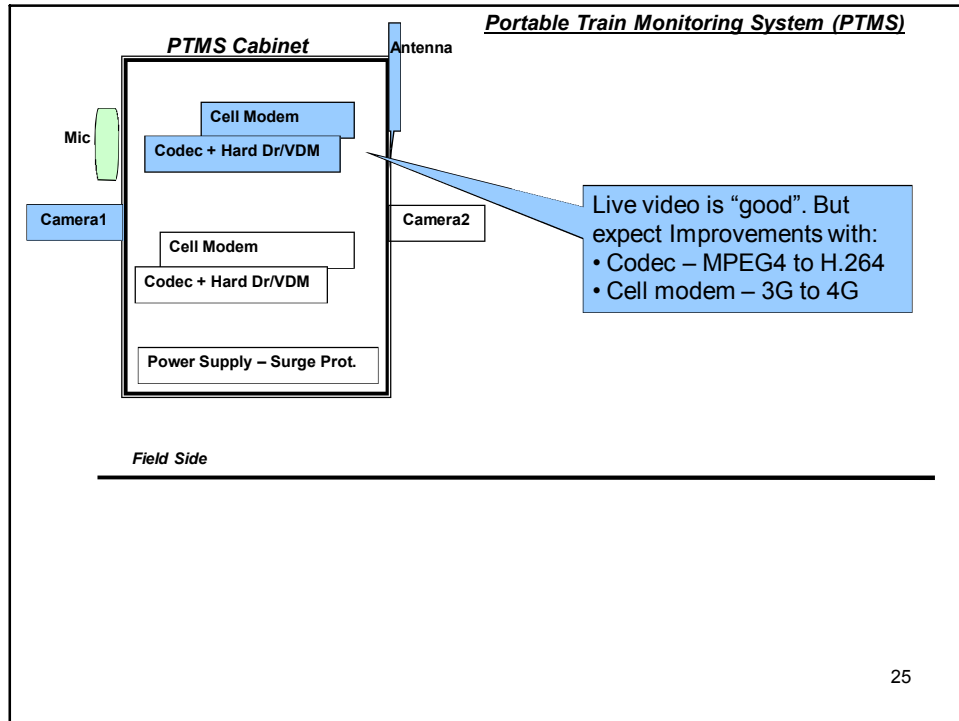






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**Costs:** IP Camera: \$2,900  
 If VIVDS existing: \$1,300  
 PTMS field unit: \$6,700  
 PTMS NVR, firewall, switches: \$25,000  
 Monthly cell fee: \$42

Learning Curve...

8 camera systems

Railroad Camera Website  
[http://165.95.118.46/fortworth/rail\\_intersection/](http://165.95.118.46/fortworth/rail_intersection/)