# Smart Railroad Crossings

## Pilot Status Update

**May 12, 2022**

# Program Overview

## Opportunities:

- Houston motorists and first responders frequently encounter trains at railroad crossings leading to unexpected delays for emergency response, traffic flow and other city services
- More data is needed to understand, manage and control impacts of blocked railroad crossings
- Existing technology solutions such as RFID, radar and acoustic sensors do not support visual verification and would be difficult to scale

## Objectives:

- Gather data to understand, manage and control impacts of blocked railroad crossings
- Provide alerts to motorists and first responders to reduce traffic impacts
- Use data to encourage better data-driven collaboration between the community, regulators and railroad companies

# Smart Railroad Crossing Monitor Pilot

## Solutions at a glance:

- Smart Devices: "Off the shelf" readily available technology, optimized to detect activities and anomalies at identified railroad crossings
  - **CCTV**: React to visual cues to create alerts and generate data
  - **LIDAR**: Scans an environment using laser-based technology to detect when a train is present
  - **Acoustic/Decibel**: Uses sound signatures of trains to determine the speed, distance and duration of train activity

### Requirements:

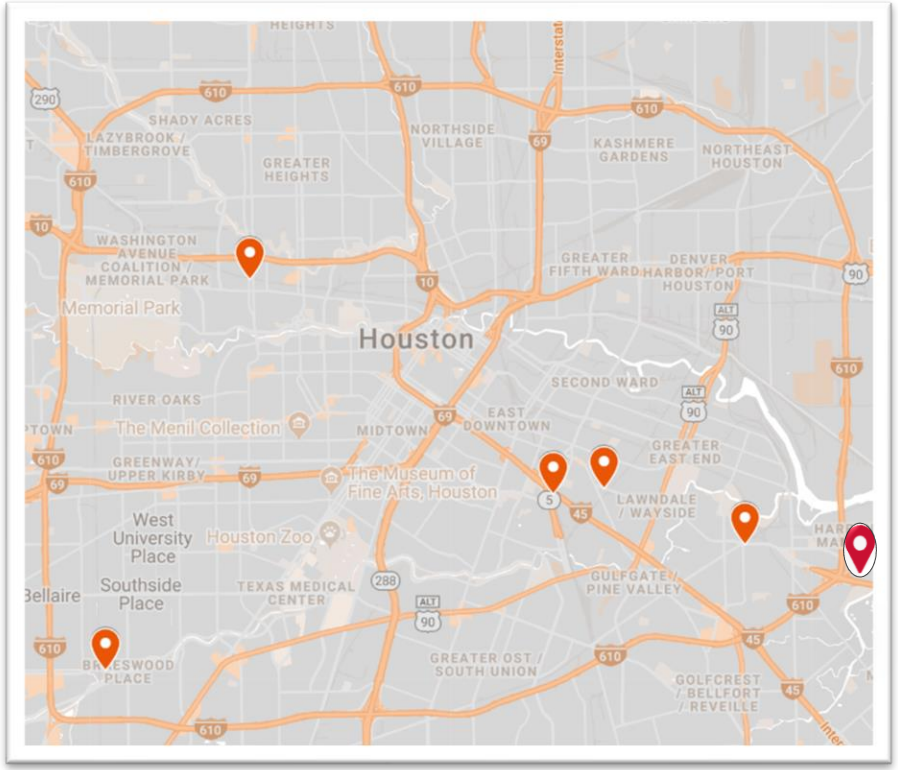
- Live and recorded video streams with the capability to track:
  - Stopped Train
  - Gate Activation without Train
  - Gate Activation with Train Overhang
  - Train Horn Use in Quiet Zone

# Pilot Details

**Background:**

- Initiative received $50K grant from Intel to fund first-of-its-kind camera-based solution using AI
- Six locations were chosen based on historical blocked crossing data and location complexity:
  - 4230 N. Braeswood
  - 1300 S. Durham
  - 5200 Lawndale
  - 7200 Lawndale
  - 700 S. Lockwood
  - 1506 Central Street (SWD Facility)
- Manufacturer "In-Kind Services" and equipment to support this endeavor

**Map of Pilot Camera Locations**




**Pilot Partners:**

cradlepoint

HOUSTON TRANSTAR

OPTEX

intel

verizon

BOSCH

Genetec

# Pilot Status and Initial Findings

## Status and Next Steps:

1. **Pilot Refining**
   - Validating events, configuring alerts and optimizing machine-learning model
   - Reporting improvements

2. **Pilot Evaluation**
   - Analysis of costs & resources
   - Develop program management strategy
   - Pass/fail decision

3. **Funding & Procurement**
   - Prioritization of crossings
   - Identify and apply for grants

4. **Implementation**

**Number of Crossing Events Over 1 Hour in Duration**
**5200 Lawndale**
3/10/2022-4/5/2022


| Day Name | Afternoon | Early Evening | Early Morning | Late Evening | Morning | Total |
|---|---|---|---|---|---|---|
| Friday | 1.87% | 3.74% | 2.80% | 1.87% | 4.67% | **14.95%** |
| Monday | 0.93% | 1.87% | 2.80% | 1.87% | 3.74% | **11.21%** |
| Saturday | 4.67% | 0.93% | 2.80% | 3.74% | 5.61% | **17.76%** |
| Sunday | 2.80% | 1.87% | 2.80% | | 6.54% | **14.02%** |
| Thursday | 3.74% | 1.87% | 4.67% | 2.80% | 4.67% | **17.76%** |
| Tuesday | 1.87% | 0.93% | 1.87% | | 4.67% | **9.35%** |
| Wednesday | 1.87% | 1.87% | 4.67% | 2.80% | 3.74% | **14.95%** |
| **Total** | **17.76%** | **13.08%** | **22.43%** | **13.08%** | **33.64%** | **100.00%** |

**107**
Total events lasting more than 1hr during period

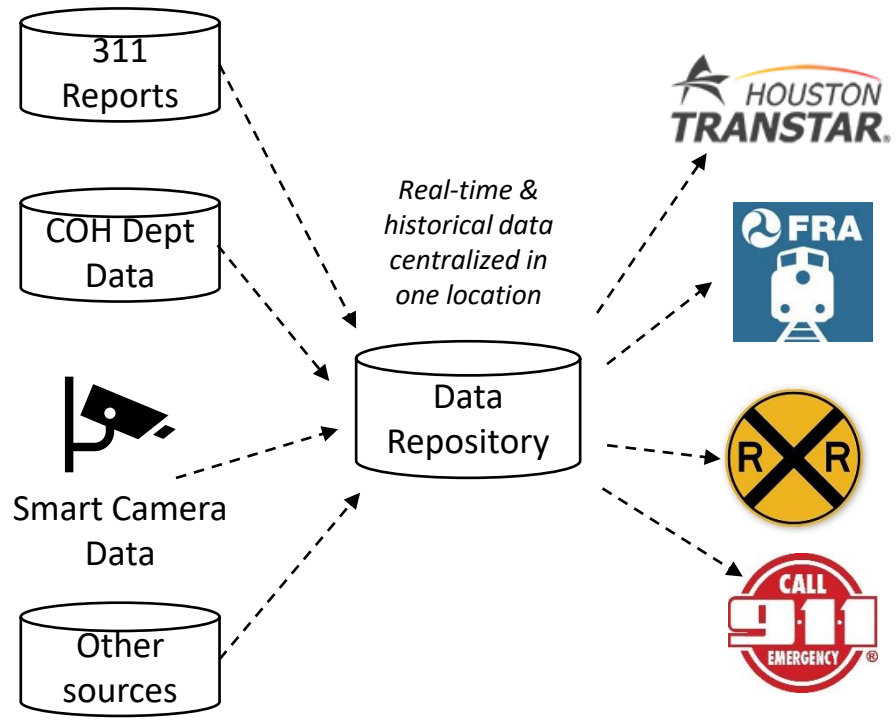
**14:54**
The time in hours of the longest event during period

**32**
Total events lasting more than 3hr during period

# Centralizing Blocked Crossing Data

*Improved data collection enables better outcomes*

**Data Flow (Future-State):**




## We need you!

If you encounter a blocked train crossing:

1. **Call 311** – the City will document the crossing violation and provide a link to FRA's web portal
2. Go online and report the issue via the **FRA Blocked Crossing Portal** www.fra.dot.gov/blockedcrossings

# Thank You