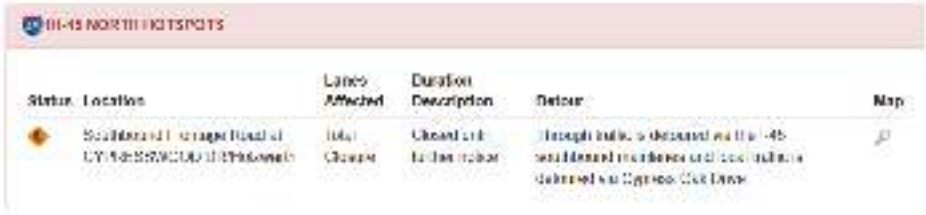
Merging Connected Work Zone Data With Planned Closures

FHWA Work Zone Peer Exchange

November 14-15, 2022

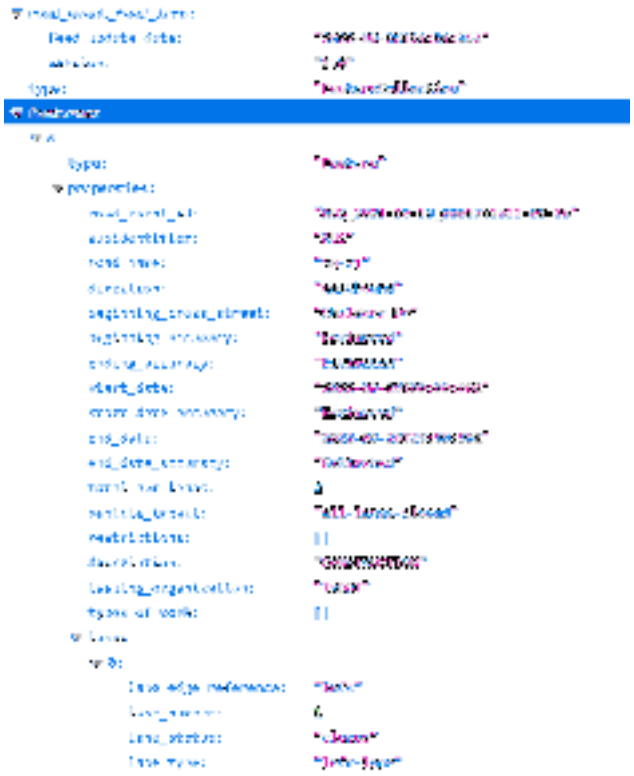
Current TxDOT Lane Closure Reporting



TxDOT Planned Lane Closure Data Feeds

Planned Lane Closure Database

Work Zone Data Exchange (WZDx) JSON Feed

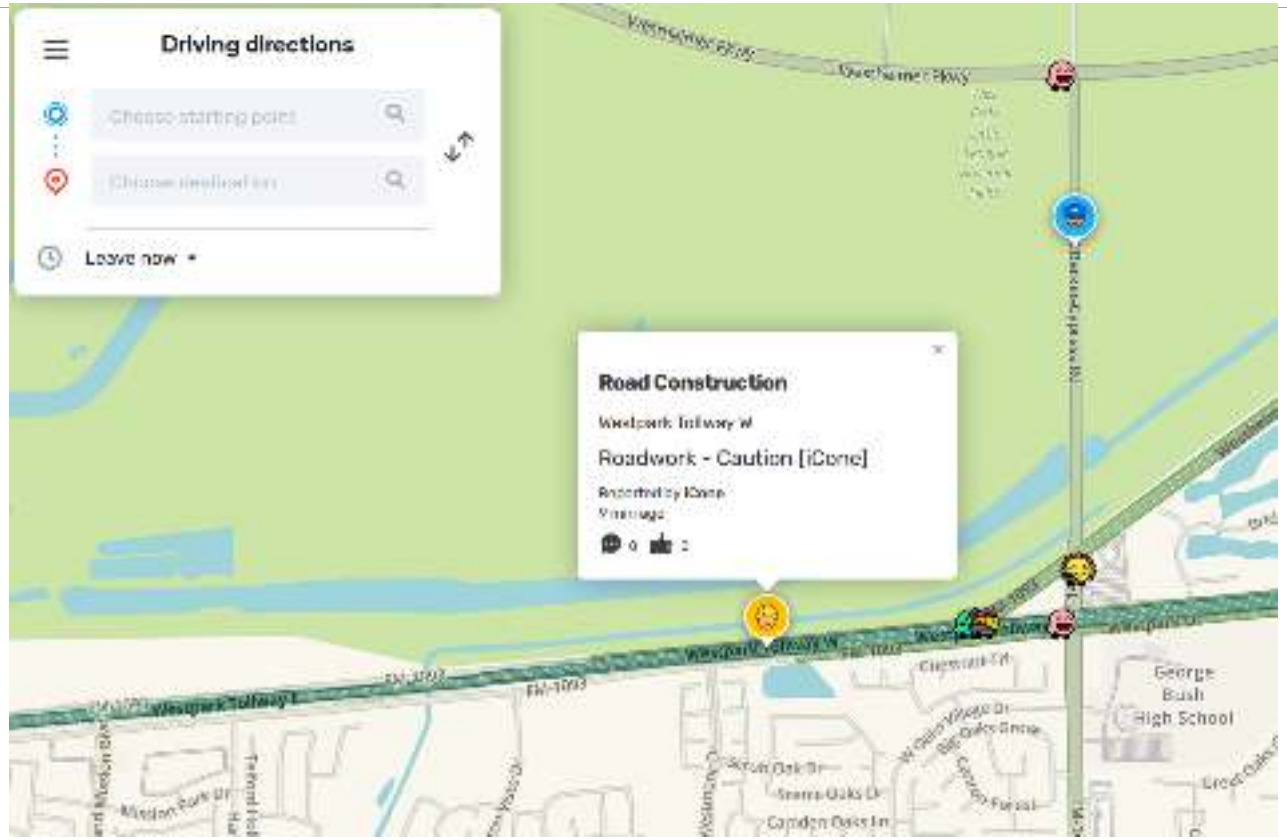


Connected Work Zone Live Data Feed

XML Data


```
▼<incident id="U13632478_20220920112600">
   <creationtime>2022-09-20T11:26:00Z</creationtime>
   <updatetime>2022-09-22T13:36:45Z</updatetime>
   <type>CONSTRUCTION</type>
   <subtype>HAZARD_ON_ROAD_LANE_CLOSED</subtype>
   <description>Roadwork - Lane Closed, MERGE RIGHT [State Barricades, iCone]
   </description>
  ▼<location>
     <direction>ONE_DIRECTION</direction>
     <polyline>42.5656397,-83.0332625,42.5656397,-83.0332625</polyline>
   </location>
   <starttime>2022-09-20T11:26:00Z</starttime>
  ▼<display type="AB" id="13632478" latitude="42.5656397" longitude="-83.0332625">
     <message verified="2022-09-22T13:36:45Z" indicator="Merge Right"
     latitude="42.5656508" longitude="-83.0332615"/>
     <status type="Arrow Panel" starttime="2022 06 14T19:23:07Z" verified="2022
     09-22T13:36:45Z" state="Right Arrow"/>
   </display>
 </incident>
```

Connected Work Zones on Waze

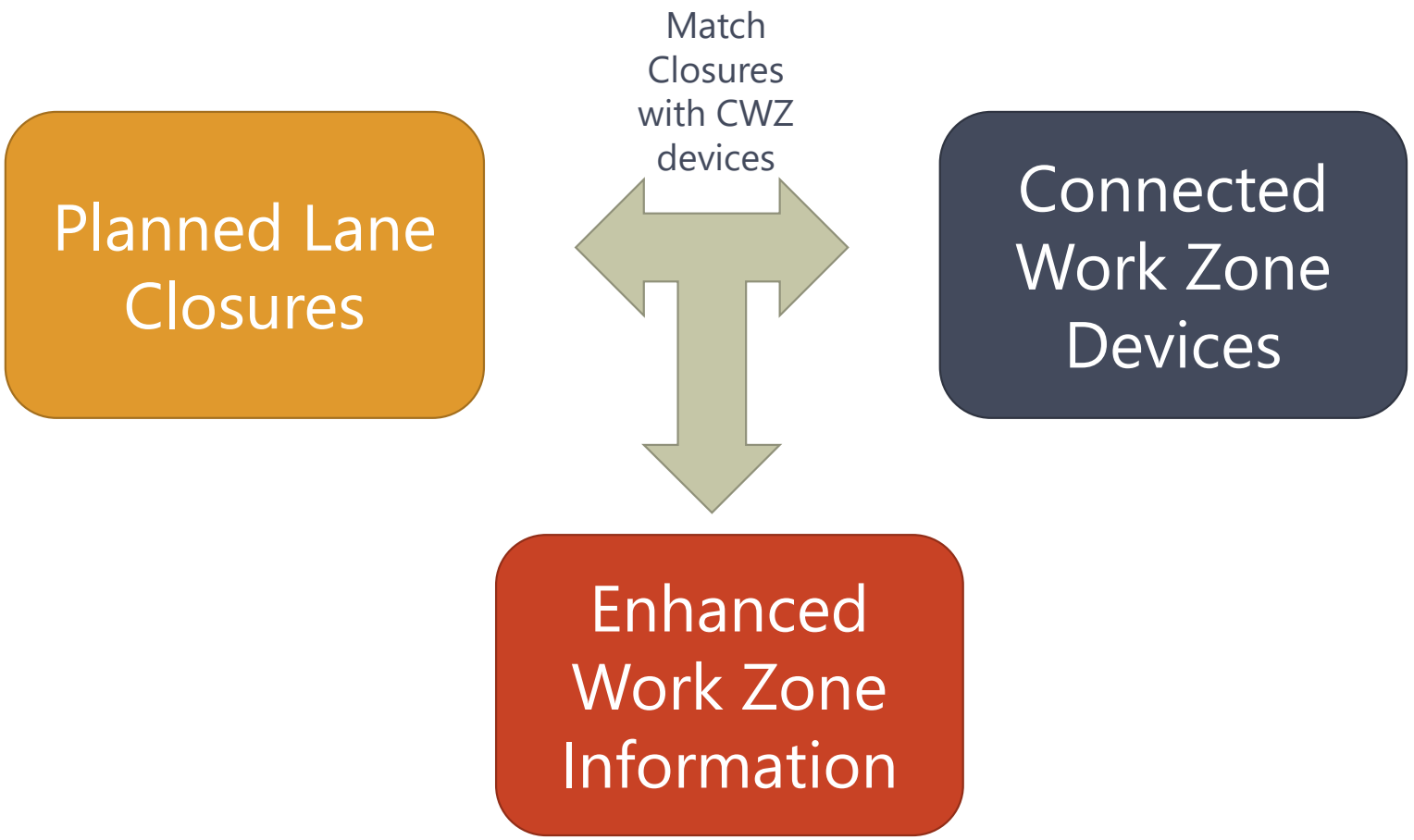


Planned vs Actual

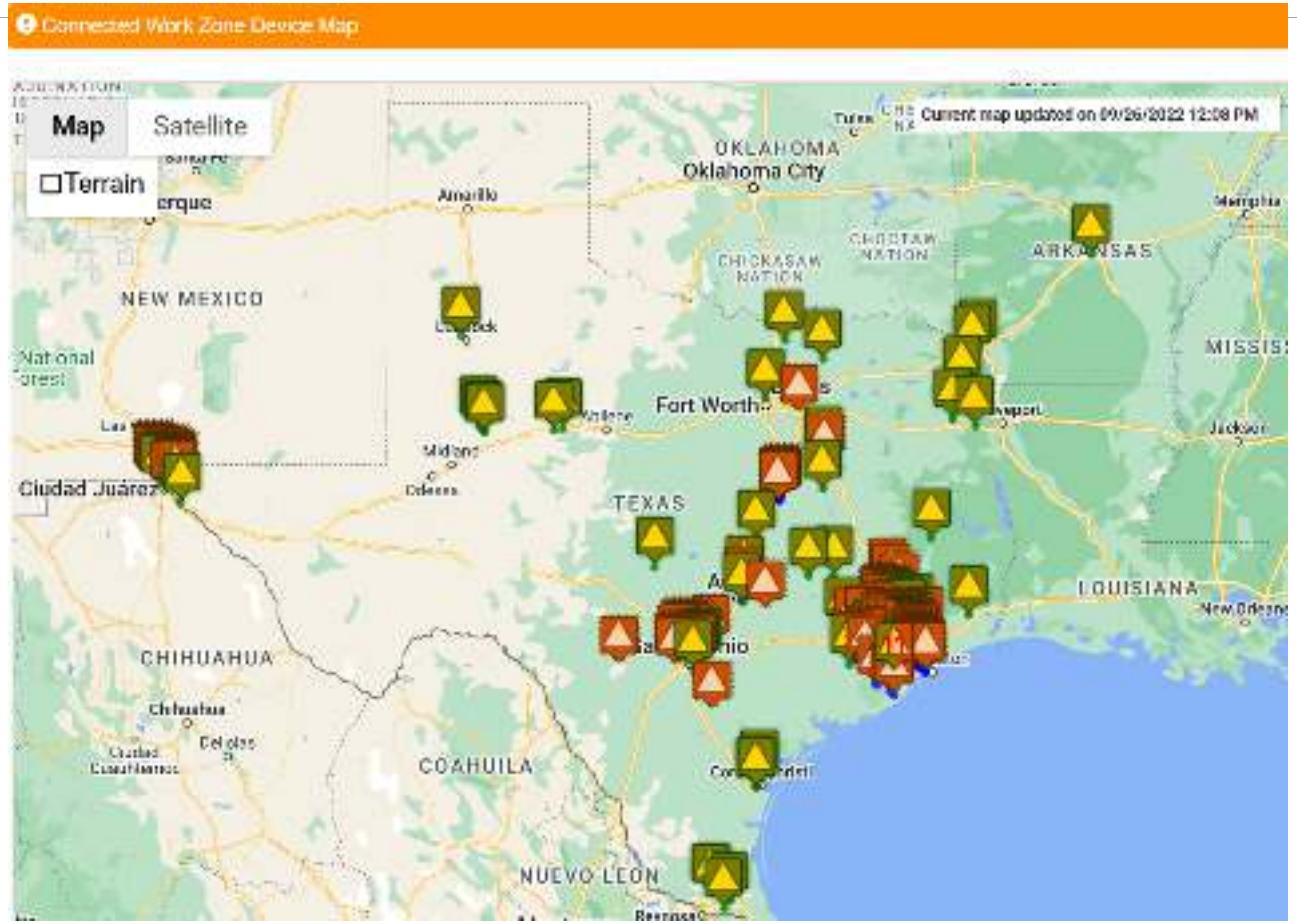
- Planned Lane Closure data is limited by what is planned and not necessarily reflect what is actually occuring.
- Exact location and times of active closures aren't always accurate.

Can Connected Work Zone data supplement Planned Lane Closure data by reporting on what is actually occuring?

Concept


Match Closures with CWZ devices
Planned Lane Closures
Connected Work Zone Devices
Enhanced Work Zone Information

Map Framework



Connected Work Zone

TxDOT planned closures

Record Matching Challenges

Planned Closures

- Locations and times are approximate.
- Data could be incomplete.

Connected Work Zone Devices

- No roadway names or directions in data.
- Many records are off TxDOT network.
- Possible inaccurate locations

Matching ability is only as good as the 2 datasets.

Methodology

Is CWZ Device within a certain distance of planned closure (example .5 miles)?

Yes

Use geocoordinates to estimate if CWZ device and planned closure are on the same roadway segment.

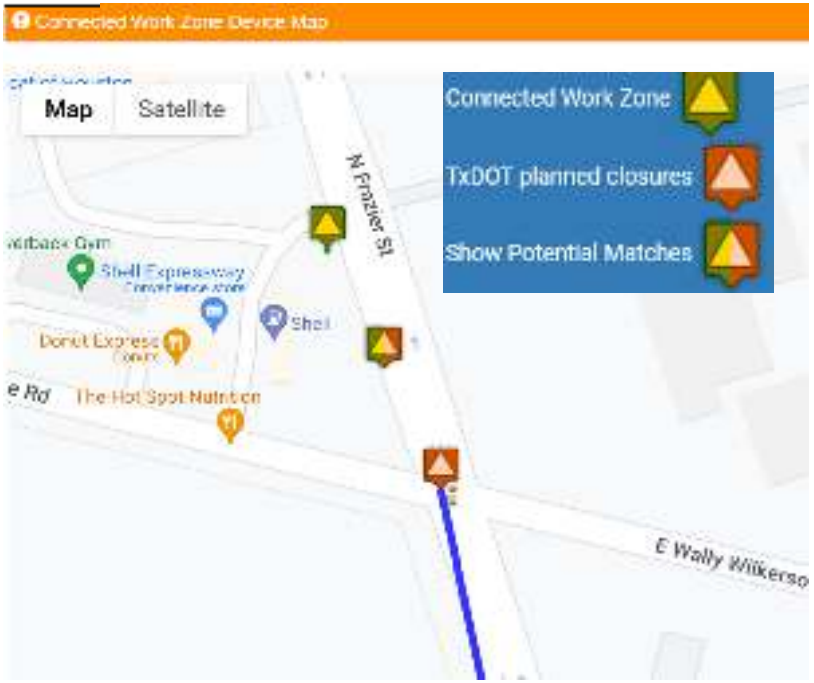
Latitude, Longitude values

Roadway Segment of CWZ Device

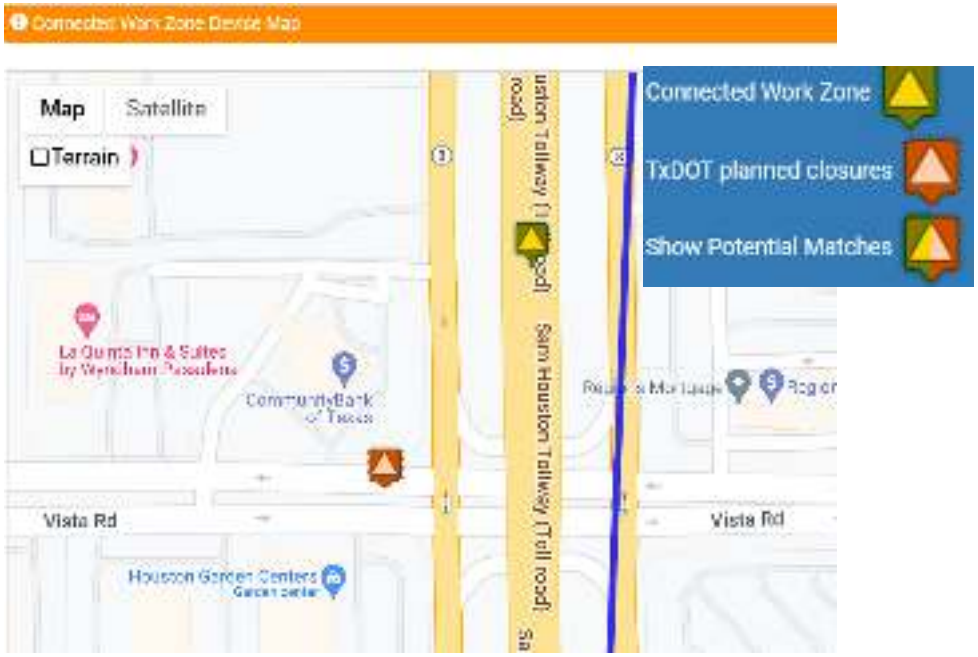
Roadway Segment of Planned Closure

Results

Match



Close—But Not a Match



Statistics

Events in Texas over a 2 month period

1300+ Planned Closure Events

141 Connected Work Zone Devices
- 140 Arrow Boards
- 1 Truck Beacon

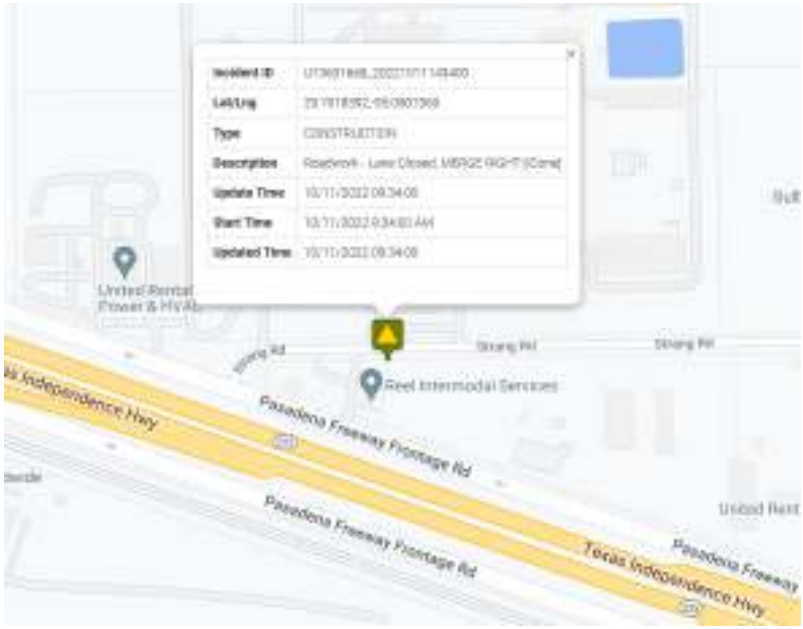
41 Matched Events (29% of CWZ Devices)
- Average 1/4 mile difference in location of matched events
- Some CWZ devices match with multiple planned closures

25% CWZ Devices are not on TxDOT's roadway system.

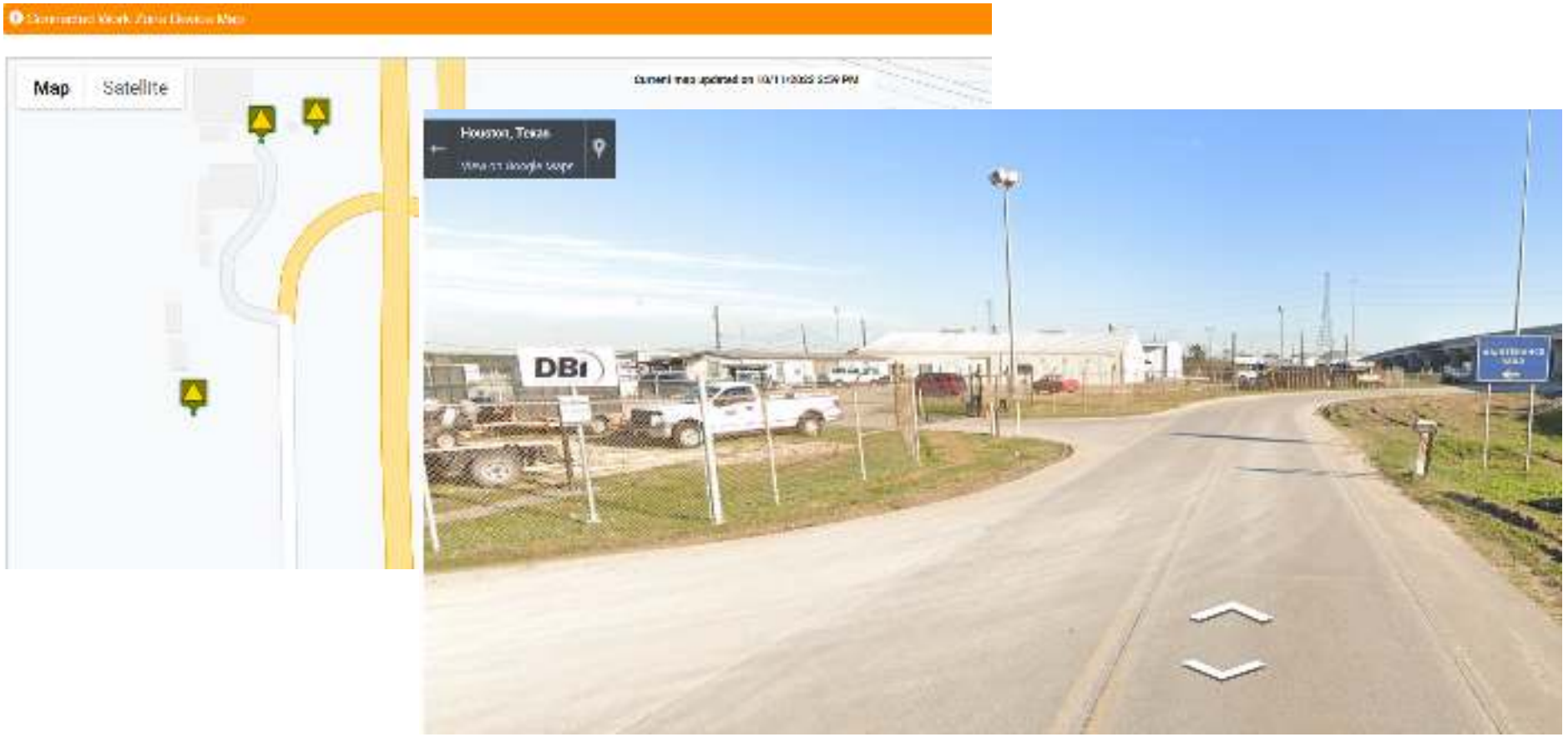
Location Challenges

Device in Backyard?

Device Not on TxDOT System



Devices in Maintenance Yard



Ongoing Work

- Using APIs and datasets to enhance matching abilities.
- Working on integrating matched CWZ device data with associated planned closure.
  - Can enhance actual closure status and location.
- Look at planned closure feeds beyond TxDOT's.