



SMTX/Go

*A Virtual Traffic
Management Center (TMC)
& Traveler Information
System
on a Shoe-String Budget*

**ITS Texas
2025 Annual Meeting**

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City of San Marcos, TX

About the Community: San Marcos, TX

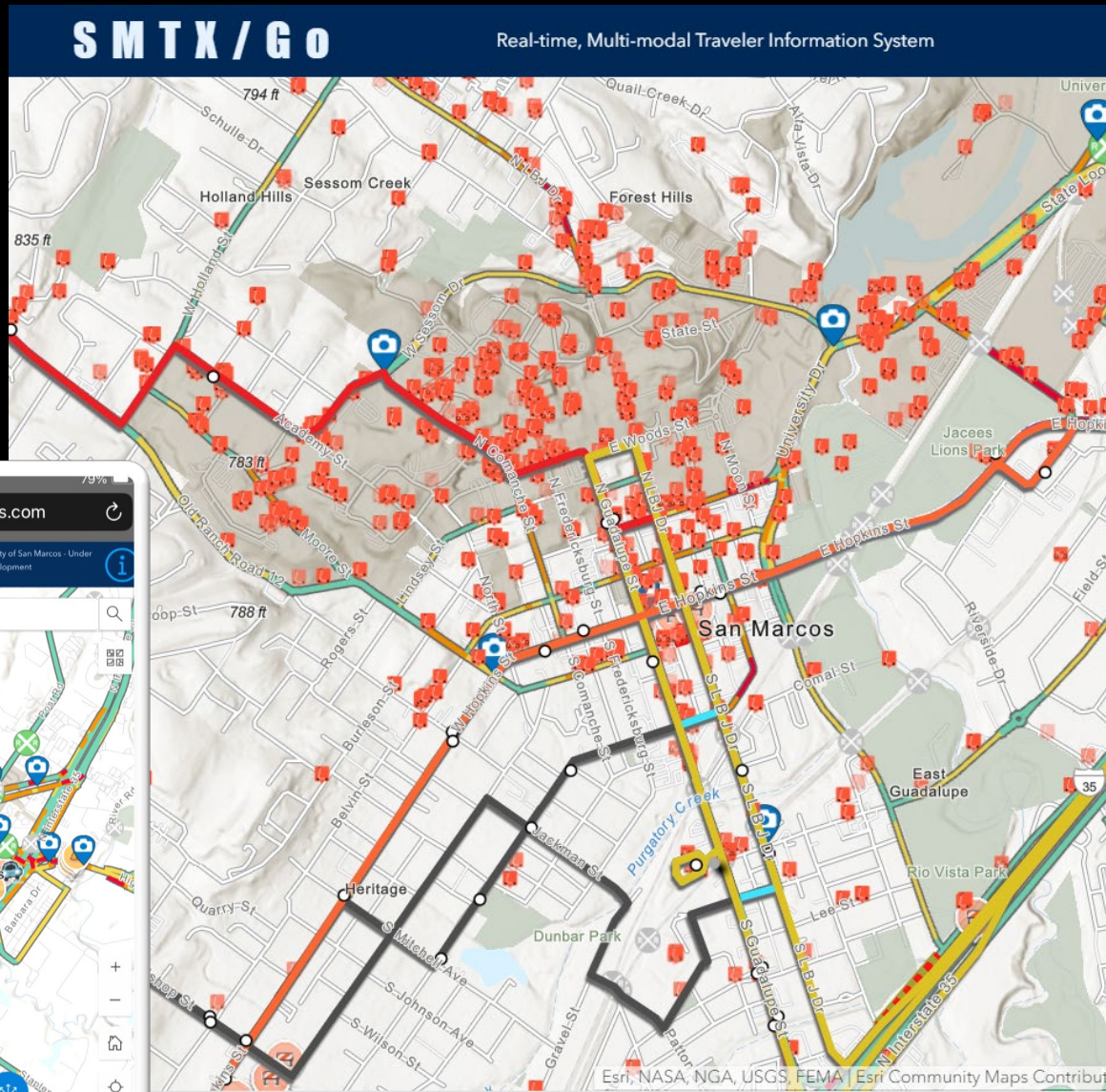


About the Community. San Marcos, TX is a community of 90,000 located on the I- 35 corridor between Austin and San Antonio. San Marcos is home to the 7th largest university in the state, TxState University; the San Marcos Outlet Malls; and the San Marcos River.

Transportation Facts:

- **Commuter College:** Approx. 68% of TxState students are commuters
- **Visitors:** Approx. 14 million visitors/shoppers a year
- **Railroads:** San Marcos is bisected by two Union Pacific Railroads
- **Coordinated Transit system** between the City and TxState.

What is SMTX/Go



A Real-Time, Multimodal Virtual TMC & Traveler Information System

Combines near, real-time traffic information/events from multimodal sources into one easy-to-use map viewer including:

- ✓ Construction/Event Closures (Shared with Waze)
- ✓ Traffic incidents (Waze)
- ✓ Traffic Speeds (Waze)
- ✓ Railroad Crossing Closures
- ✓ Traffic Signal Status
- ✓ Low-water Crossing Closures
- ✓ Traffic Cameras (Livestream 24/7)
- ✓ Public Transit
- ✓ Microtransit
- ✓ DriveTexas

Why Virtual TMC?



Small Urban City Challenges

- Limited Funds
 - No funding for brick-and-mortar TMC
 - No funding for specialized or customized software
- Limited Man-power
 - No dedicated personnel for traffic monitoring
- No Integrated traffic systems for
 - Traffic Signals
 - Cameras
 - Opticom
 - Transit
 - Road Closures
 - Traffic Incidents
- Need to share information between departments
 - Public Works
 - Emergency (Fire / Police / EOC)
 - Transportation Partners

The Evolution to a Traveler Information System

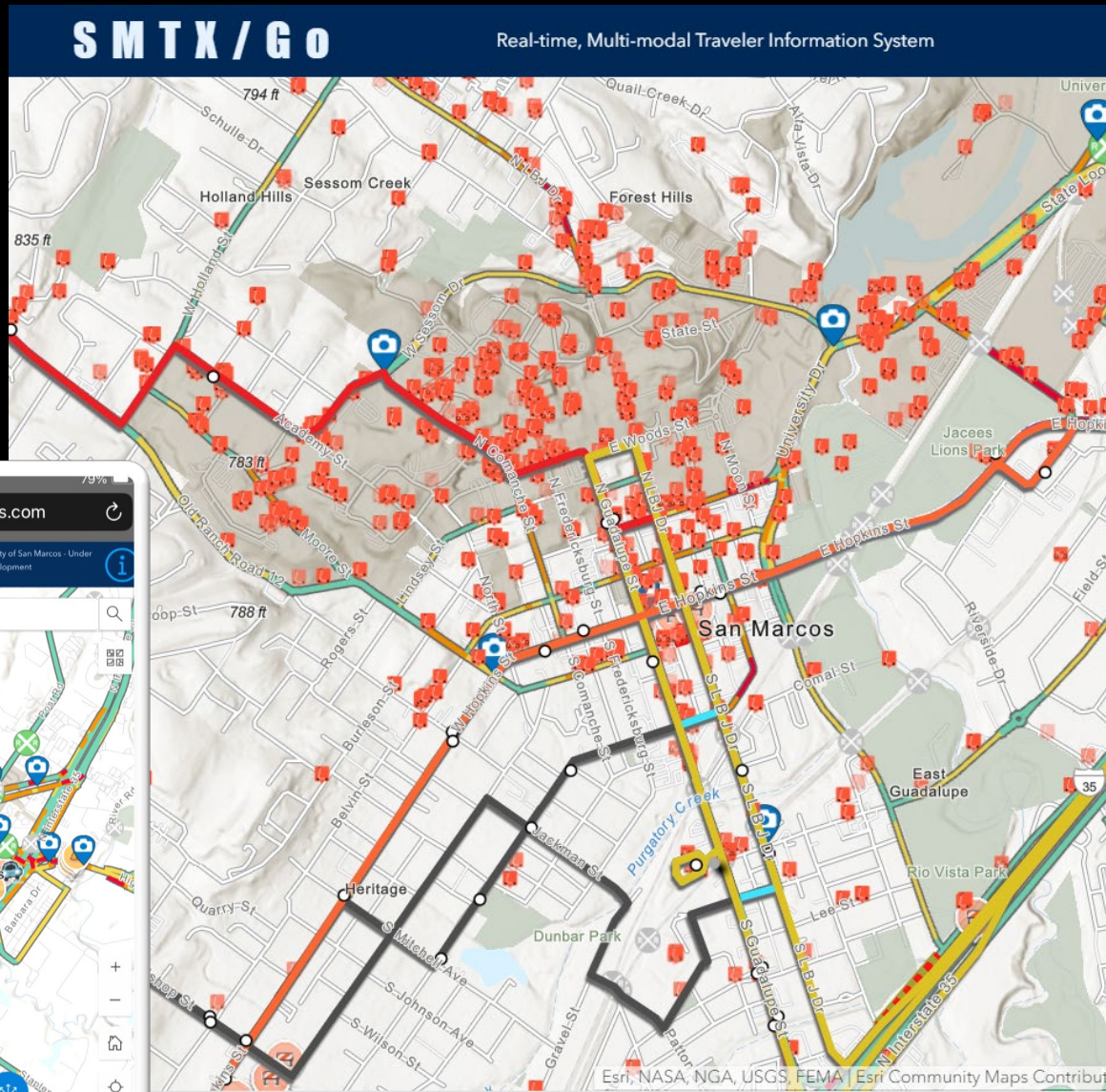
Connectivity & Integration Needs

- Need to Share Information Between Multimodal Transportation Providers
- Need to Share information with the public quickly
- Need for Multimodal Integration
 - Vehicle
 - Bike
 - Ped
 - Transit
 - Micromobility
- Need for interim V2X Capabilities (until more cars are equipped for V2X)

Where is my bus?



The SMTX/Go Solution



- ✓ Developed In-House (with partner/vendor assistance)
- ✓ Does not require specialized software, training, or administrative access
- ✓ Integrate multiple systems into one viewer
- ✓ Share information between departments (Public Works, Police, Fire, EOC, etc.)
- ✓ Share information from all multi-modal transportation providers
- ✓ Share information with the public
- ✓ Improves coordination and efficiency
- ✓ Provides Interim V2X


How Does SMTX/Go Work?



How does the system work?

The system utilizes:


- Internet of Thing (IoT) model
 - ✓ APIs
 - ✓ Traffic Signal
Radio Comm. Network
 - ✓ GIS (ESRI GeoEvent Server)



```

1 {
2   "version": "2.3",
3   "data": {
4     "bikes": [
5       {
6         "bike_id": "9534545a-a7d8-4aa0-b60c-0b33c10d1086",
7         "lat": 29.891568333333332,
8         "lon": -97.926465000000001,
9         "is_disabled": false,
10        "is_reserved": false,
11        "vehicle_type_id": "bae2102b-56ba-42ba-9097-720e5990b3ba",
12        "last_reported": 1724861843,
13        "current_range_meters": 15921,
14        "current_fuel_percent": 0.65591395,
15        "pricing_plan_id": "5c469505-2249-4383-9f13-8e4fd1...",
16      },
17      {
18        "bike_id": "73c095b4-e307-42d3-9c9e-61f760f78cd1",
19        "lat": 29.887793333333335,
20        "lon": -97.944445,
21        "is_disabled": false,
22        "is_reserved": false,
23        "vehicle_type_id": "bae2102b-56ba-42ba-9097-720e5990b3ba",
24        "last_reported": 1724861894,
25        "current_range_meters": 8874,
26        "current_fuel_percent": 0.65591395,
27        "pricing_plan_id": "5c469505-2249-4383-9f13-8e4fd1...",
28      }
29    ]
30  }
31 }

```

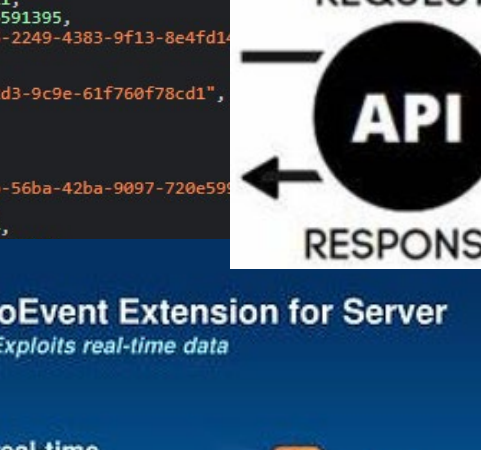


A diagram showing a central black circle with the text "API" in white. Two horizontal arrows point away from the circle, one to the left and one to the right. Above the left arrow is the word "REQUEST" and below the right arrow is the word "RESPONSE".

ArcGIS GeoEvent Extension for Server

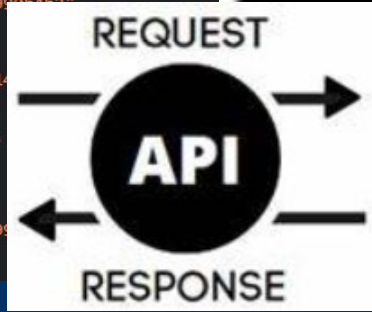
Integrates and Exploits real-time data

- Integrates real-time streaming data into ArcGIS

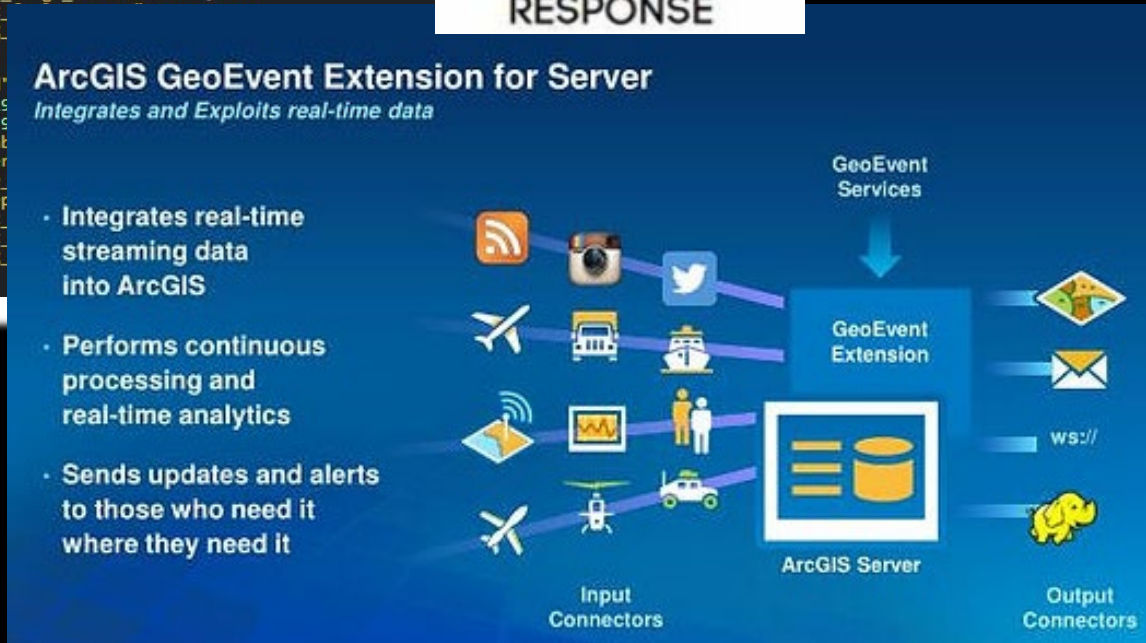


A row of three social media icons: an orange RSS feed icon, an Instagram camera icon, and a blue Twitter bird icon.

An API allows different software applications to communicate and exchange data. It acts as an intermediary, defining how these applications should interact. Security Control of what is shared



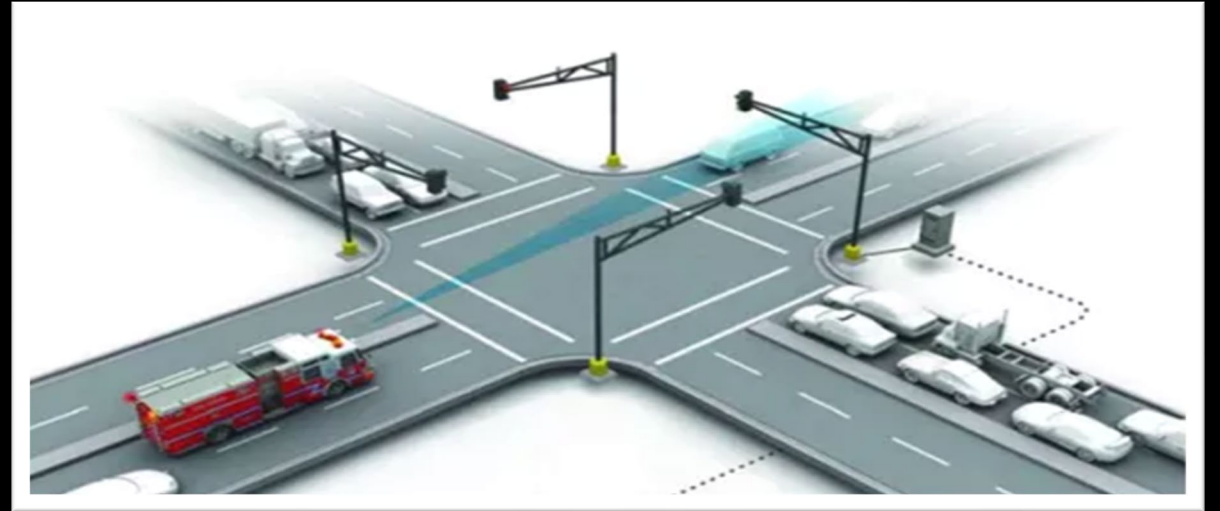
- A tool that allows organizations to integrate real-time event-based data streams into their enterprise geographic information system (GIS)
- Cost: \$6,100/year



SMTX/Go Highlights:

Traffic Signal Flash & Emergency Preemption

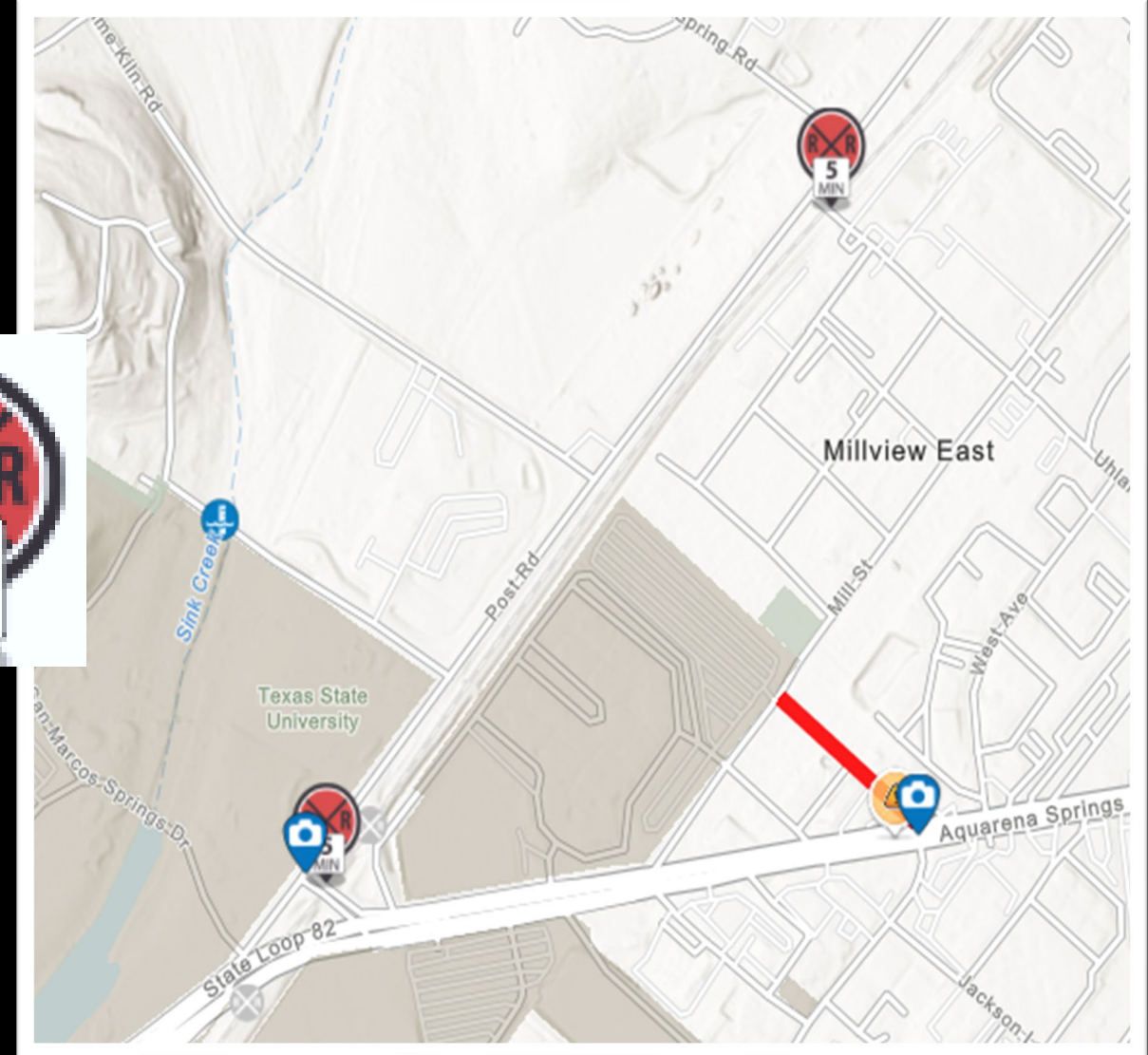
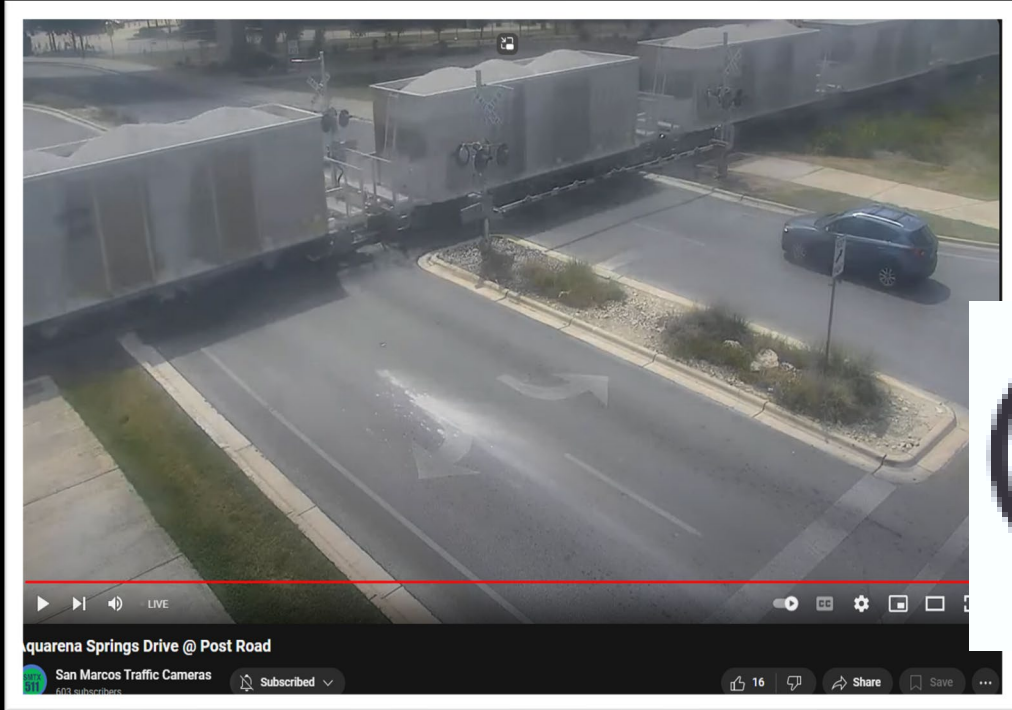
- The City's traffic signal system provides the foundation of the SMTX/Go system
- Iteris, Inc. provided the API for TACTICS (Traffic Signal management system)
- Traffic Signal Flash Status
- Preemption for:
 - Emergency Vehicles
 - Railroad Crossing Closure
- GeoEvent Server watches the API file and updates GIS with changes



```
<Controller_Status>
  <Signal_Status>
    <Last_Update>09-13-2024 14:55:01</Last_Update>
    <Signal_ID>SIG41</Signal_ID>
    <Name>Hopkins E. @ Charles Austin Dr</Name>
    <Sepac_Version>5.2.2 (MAR 2020)</Sepac_Version>
    <Up_Time>26d 2h 3m 53s 500ms</Up_Time>
    <Flash_Status>OFF</Flash_Status>
    <Preempt_1_Status>OFF</Preempt_1_Status>
    <Preempt_2_Status>OFF</Preempt_2_Status>
    <Preempt_3_Status>OFF</Preempt_3_Status>
    <Preempt_4_Status>OFF</Preempt_4_Status>
    <Preempt_5_Status>OFF</Preempt_5_Status>
    <Preempt_6_Status>OFF</Preempt_6_Status>
  </Signal_Status>
</Controller_Status>
```

SMTX/Go Highlights:

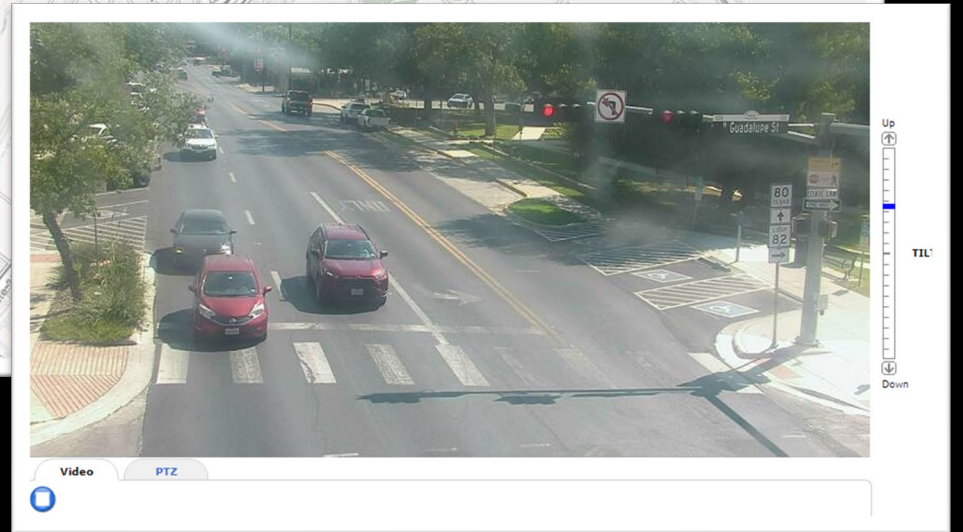
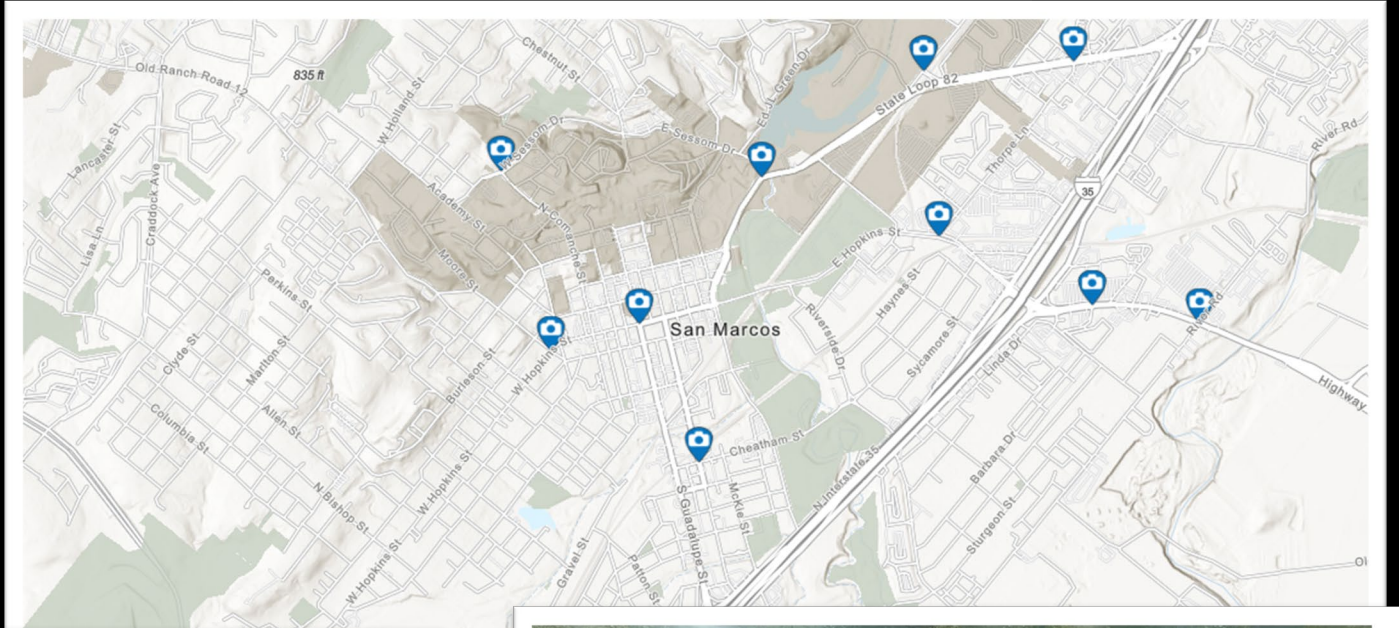
Real-Time Railroad Crossings Alerts



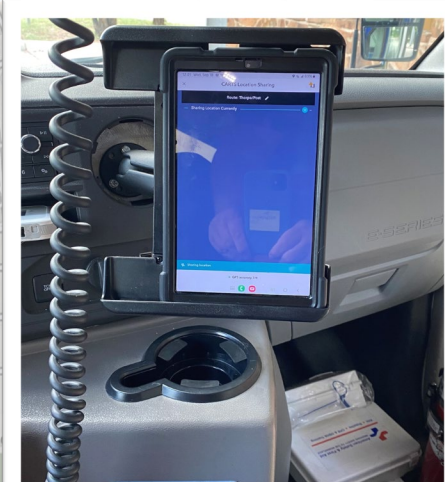
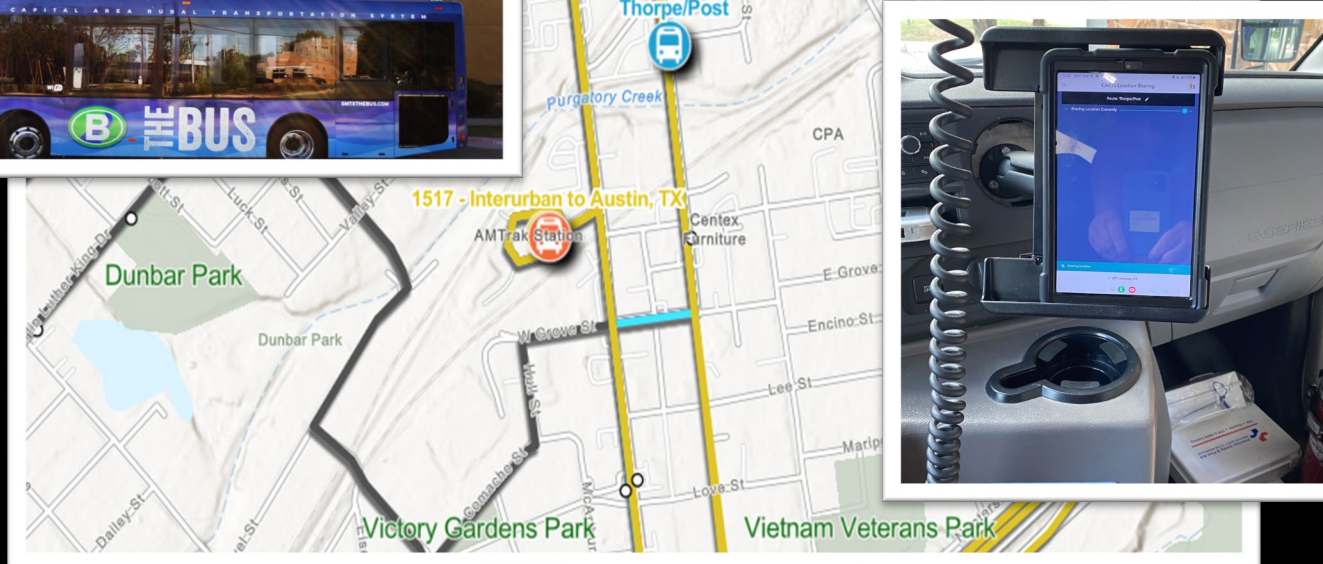
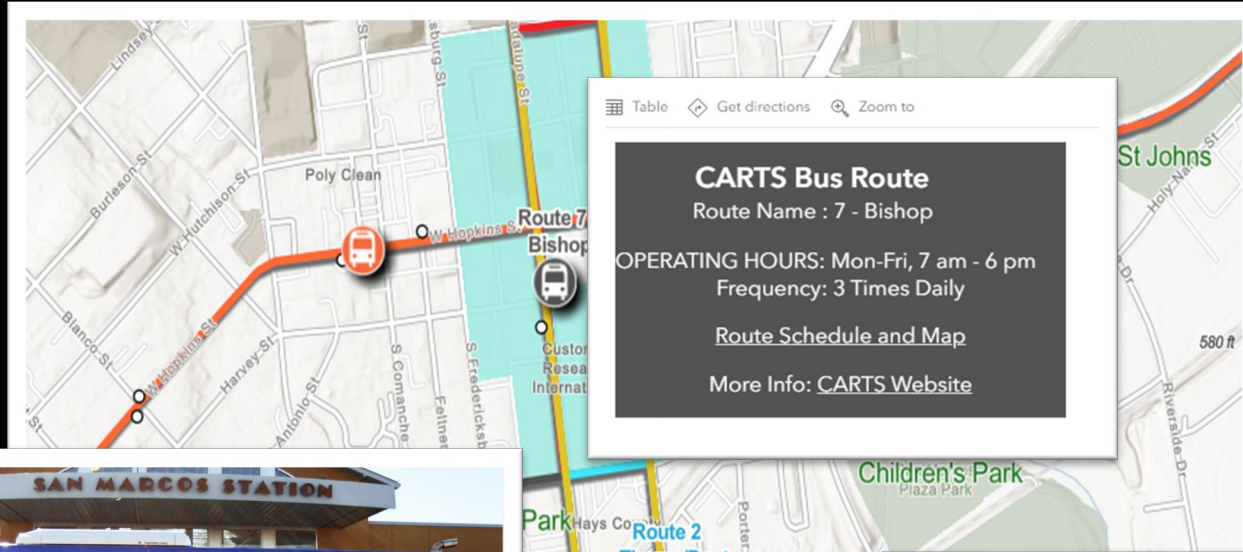
- Alarms received from TACTICS (Traffic Signal Mgmt. System)
- Provides real-time notification of closed railroad crossings
- Provides alerts when crossing closed for more than 10 minutes

YouTube LiveStream Traffic Cameras

- LiveStream traffic camera feeds to YouTube
- Utilize CamStreamer App
- Axis PTZ Cameras
calc locations
- Do not store footage,
only real-time streaming
video
- Cost: \$300 / camera



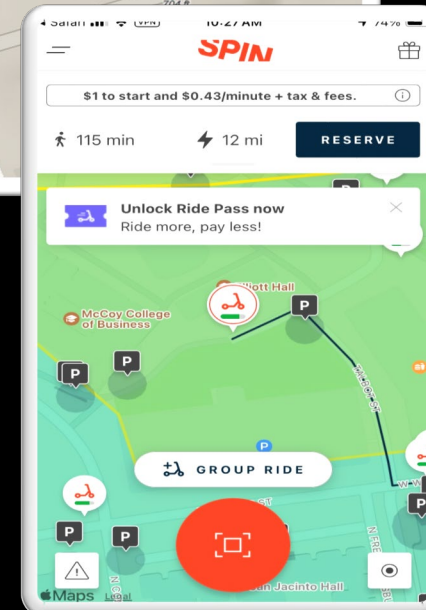
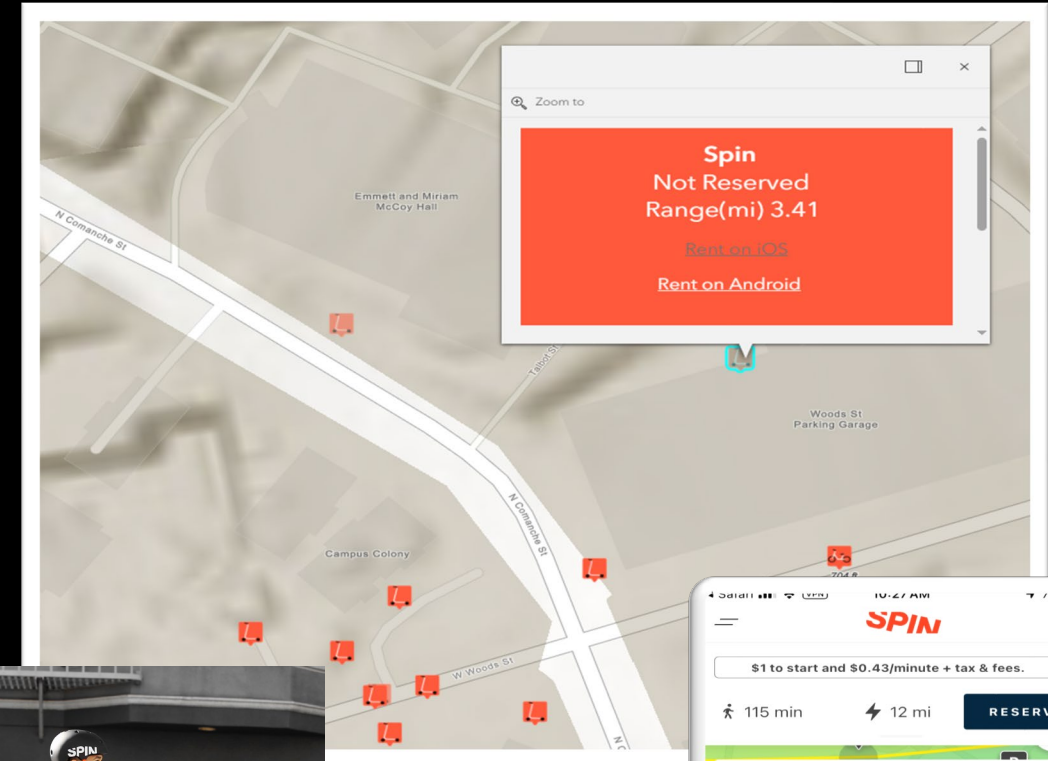
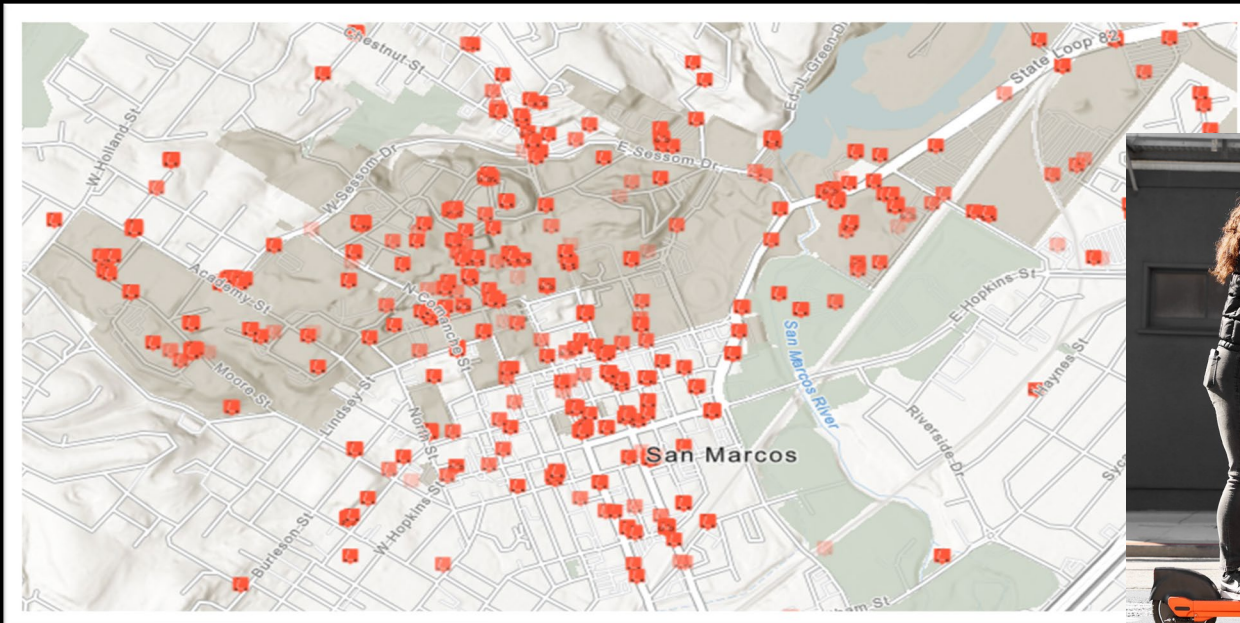
SMTX/Go Highlights: Bus Tracker



- Real-time bus locations
- Links to route schedules, website, and bus stops
- Buses outfitted with mobile devices, running ESRI Quick Capture
- Quick Capture records bus latitude and longitude every 30 seconds
- Bus location is sent to the Location Sharing in ArcGIS Online
- **Costs:**
 - Tablets: \$0 (with service)
 - Cellular Data plan: \$81/tablet
 - Total: 7 x \$81 = \$567/month

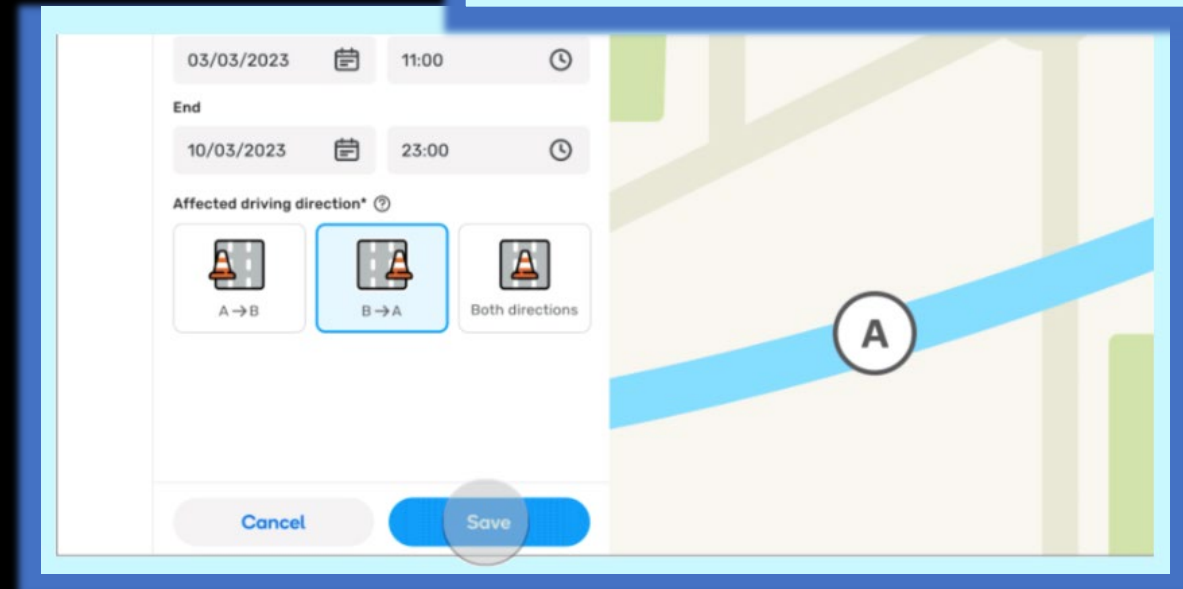
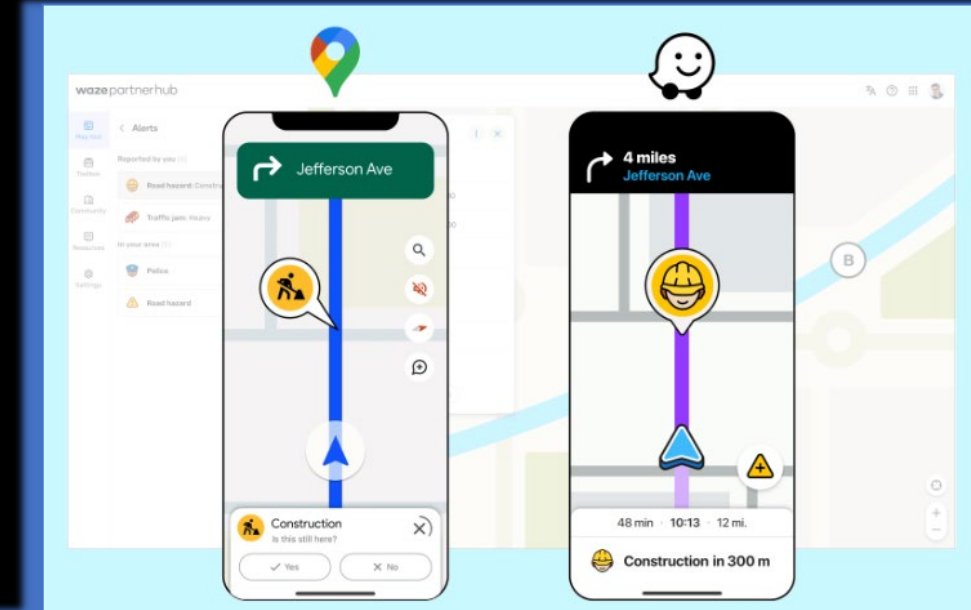
SMTX/Go Highlights: Spin Scooters/Bikes

- JSON data-feed provided by SPIN API – updates 60 sec.
- ESRI GeoEvent server populates GIS with SPIN data
- Shows locations of available scooters/bikes
- Scooter Symbol transparency based on battery range
- Clicking a scooter presents a nice popup for more info
- *Currently Unavailable. City is soliciting proposals for a new vendor.*



SMTX/Go Highlights: Waze for Cities

- Waze for Cities (formerly Connected Citizens program) partner since 2018
- Reach more drivers through Waze and Google maps
- Share planned and real-time road closures and incidents
- Update road closures on Waze and Google maps
- Receive alerts of major events and traffic incidents
- Waze provides road closure portal. GeoEvent Server not required.



SMTX/Go: Total Integration Costs

One-Time Cost:

CamStreamer App (21 x \$300):	\$6,300.00	
API Development	<u>\$0.00</u>	(provided by vendors)
Sub Total First Year Cost:	\$6,300.00	

Annual Cost:

GeoEvent Server:	\$6,100.00	per year
Traffic Signal Radio Communication:	\$0.00	per year
Bus Tracker (Data Plan):	\$6,804.00	per year
Waze:	<u>\$0.00</u>	per year
Sub Total Annual Cost:	\$12,904.00	

Total First Year Cost: \$19,204.00*

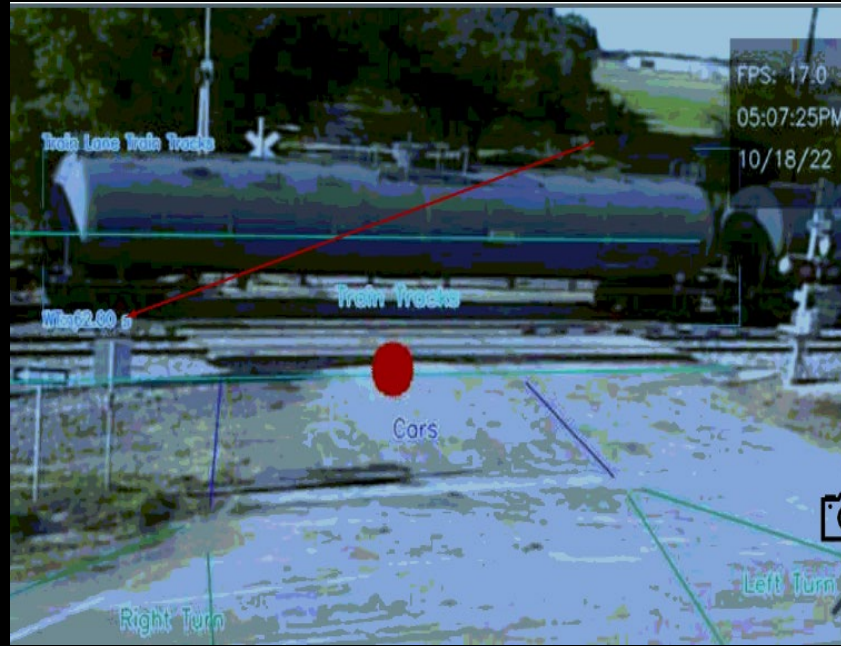
**Cost does not include Traffic Signal Management System & Communication System*

SMTX/Go: Next Steps & Real-World Sandbox

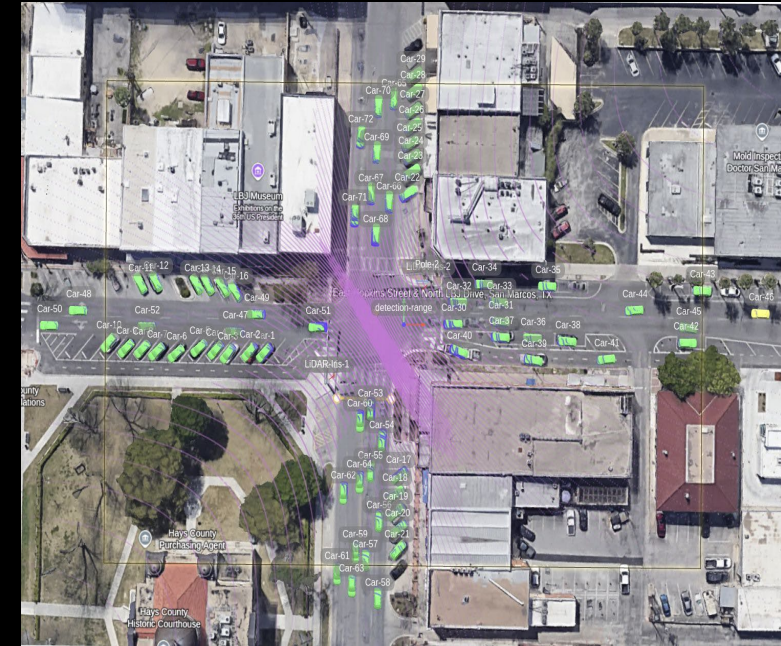
San Marcos is working with vendors and researchers to test new, real-time technology and applications for automatic alerts



Radar Pedestrian Safety System
Iteris, Inc.



Video AI Railroad Crossing System
CURRUX Vision



LIDAR Detection System
UT Arlington

SMTX/Go:

<http://smtxgo.sanmarcostx.gov/>