

SMTX/GO

Developing a Virtual Traffic Management Center (TMC) and Traveler Information System on a Budget

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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
- ✓ Public Transit
- ✓ Microtransit
- ✓ DriveTexas

Needs for a Virtual TMC



The 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
- Integrate all traffic systems
 - Traffic Signals
 - Cameras
 - Opticom
 - Transit
 - Road Closures
 - Traffic Incidents
- Need to share information between departments
 - Public Works
 - Fire
 - EOC

The Evolution to a Traveler Information System





The Needs

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

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 multimodal 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 Network
 - ✓ GIS (ESRI GeoEvent Server)

GIS GeoEvent Server & APIs

https://gbfs.spin.pm/api/gbfs/v2_3/san_marcos/free_bike_status



"lat": 29 Integrates and Exploits real-time data

 Integrates real-time streaming data into ArcGIS

"lon": -9 "is_disab "is_reser

vehicle

"last rep

"current "current

pricing

- Performs continuous processing and real-time analytics
- Sends updates and alerts to those who need it where they need it



Application Programing Interface (API)
 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

ArcGIS GeoEvent Server

A tool that allows organizations to integrate real-time event-based data streams into their enterprise geographic information system (GIS)

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





<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_4_Status> <Preempt_5_Status>OFF</Preempt_6_Status>

SMTX/Go Highlights: Railroad Crossings



Provides alerts when crossing closed for more than 10 minutes

YouTube Traffic Cameras

- LiveStream traffic cameras to YouTube
- CamStreamer App
- \$300 / camera
- Axis PTZ Cameras
- 20 locations
- Do not store footage, only realtime streaming video



SMTX/Go Highlights: Bus Tracker



- Real-time bus locations
- Routes schedules ncluded
- Links to 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

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





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: Next Steps & Real-World Sandbox

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







Radar Pedestrian Safety System Iteris, Inc. Video AI Railroad Crossing System Paradigm Traffic Systems, Inc CURRUX Vision

LIDAR Detection System UT Arlington

SMTX/Go: Live Demo

http://smtxgo.sanmarcostx.gov/