

Case Study

REDUCING OFF-RAMP QUEUE WAIT TIMES IN REAL-TIME

Effective signal adjustment based
on crowdsourced multi-location
traffic data



Overview

Florida is located in the Southeastern United States, bordered by the Gulf of Mexico. The state, known for its warm weather, is a center for tourism and the home of multiple sports franchises.

Across Florida there is over 12,000 miles of state highway, 20 commercial airports, and 15 sea-ports, making it the 7th largest export state in the U.S.



The Florida Department of Transportation (FDOT)

FDOT aims to create a transportation system that stimulates growth while eliminating congestion and fatalities for the safety and prosperity of their communities.

District 1, the district of focus for this case study, is made up of 12 counties and hosts a population of 2.7 million people. In District 1, 42 million miles of travel occur on state highways each day.

Company: Florida Department of Transportation (FDOT)

Date: August, 2021

Website: <https://www.fdot.gov/>



The Challenge

Florida Department of Transportation (FDOT)'s mission is to provide safe transportation systems that preserve the environment and communities. FDOT wanted to actively manage offramps queue spillbacks on I-75 freeway on multiple locations.

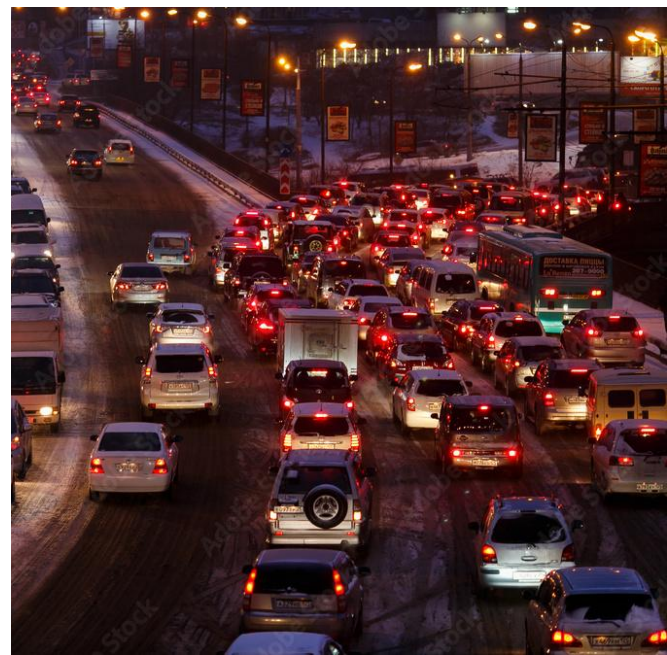
Additionally, FDOT wanted to reduce serious crashes and fatalities on a corridor through signal retiming efforts. Their goal was to reduce speeds along the corridor with minimal impact to the overall travel time. To achieve these goals, FDOT needed one central travel time and speed data source for all projects for ease of use and flexibility in future projects.

When exploring solutions for data collection, FDOT considered sensor detection and other hardware solutions; however, these alternatives did not provide the flexibility that FDOT required to collect real-time data in multiple locations simultaneously.

The Solution

FDOT chose SMATS data analytics platform iNode™, with integrated crowdsourced data, to provide real-time traffic data. With a crowdsourced software method, multiple projects could take place simultaneously across different locations. The increased functionality gave the agency greater efficiency, and eliminated the need for hardware installation or retrieval.

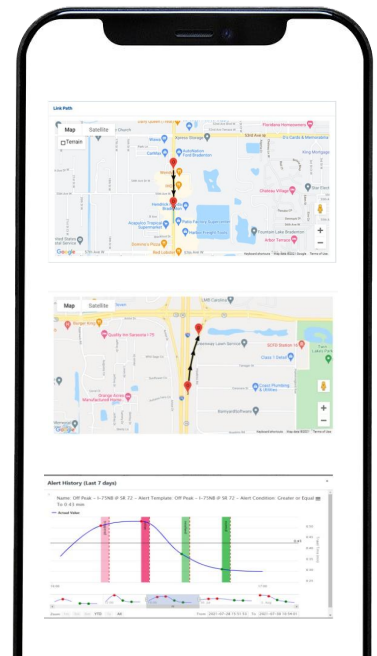
iNode™ allowed FDOT to capture speed and travel time data on any section of the roadway with user-defined origin and destination points on the map. Data was sourced from “floating cars”, making it completely anonymous to respect public privacy.



The Results

FDOT used the SMATS iNode™ platform and crowdsourced data to successfully control ramp spillbacks and conduct speed studies. The iNode™ dashboard provided an overview of all links and locations, and was color coded to monitor congestion for more than 50 road segments. The links on ramps of interest generated notifications prompting signal adjustments every time a travel time predefined threshold was exceeded for offramps. On July 28 for example, when the threshold was reached, the ramp signal was adjusted, and after 5 minutes the queue had dissipated thanks to adjustments by staff.

FDOT was also able to collect spot speed on arterial roads, with no additional installations. By setting up links along the corridor of interest, speed data could be collected for use in retiming efforts, aimed at reducing speeds with minimal travel time increases. FDOT was able to collect travel time and speed data for both before and after periods of the project, and required no onsite installation or maintenance.



SMATS' iNode™ for FDOT

With SMATS iNode™, FDOT could capture real-time travel-time data for multiple road segments and off-ramps in one centralized, easy to analyze platform. This meant that when ramp queues hit a certain threshold, real-time alert notifications would be sent to the selected employees, allowing for fast, effective, real-time ramp monitoring. The arterial speed data collection helped to improve safety while maintaining the mobility.

FDOT could collect traffic data that were anonymous, cost-effective, and environmentally friendly. The iNode™ data analytics platform offered unlimited users access, meaning different agencies and counties could all utilize data as needed. FDOT could also trigger alerts based on threshold using the iNode™ platform.

SMATS Traffic Solutions



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