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GLOBAL TRAFFIC TECHNOLOGIES

CASE STUDY:
Capital District Transportation Authority

Overview

Headquartered in Albany, New York, the Capital District Transportation Authority (CDTA) oversees bus-based public transportation for nearly 769,000 residents. Over half of the population resides within a quarter mile of one of CDTA's 2,640 bus stops, making public transit a primary method of transportation for many and resulting in millions of rides annually.

Tens of thousands of riders rely on CDTA to reach their destinations when they choose public transportation. But what happens when a bus arrives at scheduled stops at the wrong time? With so many residents utilizing public transit in the CDTA district, schedule adherence is essential for improving user experiences and increasing ridership.

The Challenge

CDTA is continuously striving to innovate and improve the quality of its service. A key focus is leveraging its technology stack in new and innovative ways to improve operations and work more collaboratively with other city agencies. Success results in better schedule adherence, increased community & taxpayer value, and improved rider experiences, ultimately increasing ridership.

Yet, obstacles and problems existed that limited achieving these goals and objectives:

1. There is an inability to monitor Transit Signal Priority (TSP) system performance and make quick adjustments.
2. It is challenging to leverage technology because of disparate systems.
3. Collaboration across teams is complex due to limited data integration.
4. Longer-term improvements to lower the cost of operating fixed route services are difficult to plan and implement due to limited data.

Collaborating with their current providers and partners, CDTA determined that the GTT and Miovision solution was viable for implementation and testing in the field.

The Approach

Global Traffic Technologies (GTT), in collaboration with Miovision, supported a CDTA pilot with three key objectives:

1. Minimize schedule delays and demonstrate TSP efficacy with data.
2. Combine existing and emerging technology to validate TSP.
3. Improve operational efficiency across agencies through collaboration.

The 4-week project involved collecting and analyzing the data of a TSP environment, including 40 miles of Bus Rapid Transit (BRT), 143 intersections, 60+ BRT buses, and seven partnership agreements.

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The methodology involved joining GTT breadcrumb and Miovision Signal Phase and Timing (SPaT) message data, synchronizing timestamps to a common clock, and matching TSP requests to controller events at 76 intersections throughout the corridors.

Metrics were calculated for average delays, savings, and changes. Key attributes included the intersection signal cycle the bus entered and exited and what kind of TSP was granted. The impact on signal delays and stops on red categorized TSP events as effective or ineffective.

The Results

CDTA experienced significant benefits during the pilot without adding hardware to traffic cabinets. Average signal delays improved by 43%, and average stops on red improved by 22%, with similar benefits for both route directions.

Another key benefit of the pilot program was empirical validation of the effectiveness and efficiency of CDTA's deployed technology and operational practices. Examples included traffic signal programming and coordination, CAD/AVL (Computer-Aided Dispatch/Automatic Vehicle Location), and stakeholder relations and partnerships.

The pilot demonstrated a field-proven solution for creating a single source of truth that transforms raw data into valuable information for improving operational efficiency and rider experience. Accurate data and better information provide a better picture of the system's overall performance that informs essential decision-making. For example, CDTA learned their previous TSP configuration helped when a bus was behind schedule by more than 3 minutes, so turning TSP to always-on, increasing schedule aggressiveness, and decreasing behind-schedule thresholds would improve outcomes. Other ways to improve include verifying that all traffic controllers can grant TSP from all required directions and verifying the configuration of all approach zones.

The combined GTT and Miovision solution helps CDTA to overcome present and future challenges to better serve the community by increasing ridership and improving experiences. New technologies allow more collaboration across transit operators, transportation partners, and traffic agencies than ever, improving road safety, travel time, on-time accuracy, and transit delays. CDTA's planned next steps include system-wide validation of TSP effectiveness, review of signal timings and programming, additional on-time performance improvements, and better collaboration on funding opportunities.

Average Stops on Red Reduction
22%

Average Signal Delay Reduction
43%

Operating BRT Buses
60+