SCHOOL BUS PRIORITY

Connected Vehicle Student Safety Pilot Program

Report Prepared by:

Kimley»Horn

Report Prepared for:

applied INFORMATION

Project Partners:

Metro Trafix

THE CITY OF ALPHARETTA

iATL

Fulton County Schools Where Students Come First

HEM Data Data Acquisition & Analysis Solutions

BLUE BIRD

Temple

September 2022

EXECUTIVE SUMMARY

Applied Information, Inc. (AI) has partnered with Blue Bird Corporation (Blue Bird), Navistar, Inc. (IC Bus), the Infrastructure Automotive Technology Laboratory (iATL), MetroTrafix, HEM Data, Temple, Inc. (Temple), the Fulton County School System (FCSS), the City of Alpharetta (City), and Kimley-Horn to implement a first of its kind School Bus Priority – Connected Vehicle Student Safety Pilot Program (Pilot Program). The primary goal of the Pilot Program is to improve safety and mobility for school bus drivers and students as they travel to and from school each day by deploying cutting-edge connected vehicle (CV) technology. CV technology is deployed on FCSS buses and at traffic signals along the school bus route that provide priority service to the school bus, in the form of a green light, as it approaches each traffic signal along its route and thereby allows it to pass through the intersection unimpeded.

By providing priority service to the school bus, the Pilot Program sought to reduce travel times, improve route reliability, increase average bus speeds, and reduce the total number of times the bus must stop at an intersection which, when taken together, will enable the Pilot Program to deliver better on time performance and enhance safety of the school bus driver and students. The Pilot Program also sought to reduce the total fuel consumed by the school bus which will reduce harmful emissions and FCSS expenditures on fuel required to operate the bus. Two FCSS school buses, one diesel-fueled school bus and one propane-fueled school bus, were equipped with CV technology as part of the Pilot Program for a period of two months to conduct a Before and After Analysis (B&AA). The before and after period each lasted one month and the data for the analysis was collected directly from the school bus as well the FCSS data logger. Bus drivers of each school bus were interviewed as part of the Pilot Program to obtain feedback and document any observed qualitative benefits of the Pilot Program.

Once completed, the B&AA demonstrated significant and measurable improvements in each of the key performance measures analyzed as part of the Pilot Program. All performance measures calculated as part of the B&AA showed improvements ranging between 7% and 40%. **Table i** includes the average improvement, shown as a percentage, in route travel time, average school bus speed, and the total number of stops between the before and after analysis periods. **Table ii** shows the average improvement in fuel consumption and the average improvement in miles per gallon (MPG) for each bus and the overall Pilot Program.

Table i – Travel Time, Speed, Number of Stops Results Summary

Bus	Average Improvement (%)		
	Travel Time	Speed	Number of Stops
IC Bus	-12.4%	14.2%	-40.2%
Blue Bird Bus	-14.0%	20.5%	-40.5%
Program Summary	-13.3%	18.0%	-40.4%

Table ii – Fuel Consumption Results Summary

Bus	Average Improvement (%)	
	MPG	Fuel/Emissions
IC Bus	13.4%	-12.4%
Blue Bird Bus	6.7%	-7.4%

The Pilot Program, as highlighted in the above tables, demonstrated a clear and measurable reduction in route travel time for both school buses as a result of the decrease in total number of unscheduled stops and an increase in average speed of the bus along the route. Less time on the road and fewer bus stops equates to direct safety and mobility benefits for the bus driver, students, parents, nearby motorists, and the FCSS. The Pilot Program enabled bus drivers to more frequently arrive at school on time and allow students to eat breakfast before going to class and starting their day.

Improved on time performance as a result of the Pilot Program meant less time that buses were running behind schedule which reduced stress on the bus driver and allowed them to spend more time focused on safe driving and onboard student behavior. Experience has shown that students onboard a school bus are more likely to stand up and/or engage in unsafe behaviors when the bus stops. By reducing the number of times the bus make unscheduled stops along its route, the Pilot Program was able to reduce the likelihood that students engage in these types of activities and generally created a more safe environment onboard the school bus.

Last, but certainly not least, the reduction in travel times, higher average speeds, and less frequent stops resulted in a significant decrease in the amount of fuel consumed by the school bus. The reduction in fuel consumption produced by the Pilot Program translates to direct savings of FCSS expenditures on fuel and a reduces harmful emissions from the school bus. By reducing emissions, the Pilot Program can improve overall air quality and create a more healthy and livable community.