Transportation Optimization and Mobility Enhancements
for the City of Harrisonburg

Funding source: Infrastructure Investment and Jobs Act; Strengthening Mobility & Revolutionizing Transportation (SMART) planning grant; U.S. Department of Transportation

Project Description. Whereas the U.S. Department of Transportation seeks to fund scalable, proven technology that improves transportation, yet has not been extensively deployed, the City of Harrisonburg intends to submit a proposal to study a combination of technologies to determine how they can best be used to optimized transit and traffic operations, throughout the city, and plan for their future full-scale implementation. The following activities will be completed as part of this project:

1. Study the effects of the City's existing Centracs Edaptive traffic signal adaptive system (currently operating on the Port Republic Road corridor) on transit performance on the Green, Red, Black, Gray, Pink, and Route 6 transit routes;
2. Implement centralized, route-based priority using Centracs Transit Priority on transit routes studied in step 1, integrating it with the Edaptive system. Optimize operations between the two technologies. Study the effect of the integrated system on transit performance on these transit routes;
3. Implement and optimize centralized, route-based priority using Centracs Transit Priority on Routes 1, 2, 6, and Blue & Purple transit routes (Reservoir Street), without Edaptive. Study the effect of the Transit Priority technology on transit performance on these routes;
4. Conduct a comparative analysis of the performance results produced in steps 1-3 to determine the most suitable approach for optimizing transit operations on the two corridors;
5. Determine the cost/benefit of implementing Transit Priority, with or without Edaptive, on the city's other transit corridors, based on study results, lessons learned, and traffic conditions on other transit corridors and
6. Conduct planning activities to prepare for the implementation of Centracs Transit Priority and/or Edaptive technologies, according to study recommendations.

Centracs Transit Priority is a technology that when integrated with the City's local transit management system, rapidly cloud-communicates with GPS technology installed on transit buses to adapt traffic signal phasing to bus schedules, such that buses are rarely delayed from running on their published schedules, a problem our local transit system encounters frequently due to congestion.

The Centracs Edaptive system builds upon coordinated signal plans to maximize efficiency of traffic throughput during peak traffic periods. It does this by adapting to traffic conditions, in real time, to optimize the distribution of green time to each leg of the intersections on a corridor, based on programable parameters that manage the levels of service between the major approaches, minor approaches, and alternative modes. The Edaptive system was installed on the Port Republic Road corridor in the fall of 2022 and is the only place in the City that it is currently exists.

Why this? The City initially pursued the Centracs Edaptive technology on the Port Republic Road corridor because its multiple peak periods of traffic throughout the day result in more congestion and safety issues than any other corridor. While early results show an improvement in traffic operations, the transit delay has not improved enough to earn riders' confidence. It is anticipated that adding Transit Priority to the Edaptive system will greatly improve the reliability of the transit schedule, thereby addressing the primary issue cited by students when asked why they drive to campus, instead of using the bus. If the increased reliability of transit service induced a mode shift to transit, as expected, traffic operations, safety, and reliability of the corridor could be much further improved for all modes, and additional environmental and travel benefits realized.

The study will examine the feasibility and benefits of expanding the technologies to the other transit corridors (US Routes 42, 11, 33, Reservoir Street, and Mason Street) to provide a host of benefits, citywide. At the conclusion of the planning process, the City intends to apply for funding to implement these technologies on additional corridors, as recommended by the study.