In 2017, a connected vehicle (CV) corridor utilizing dedicated short-range communication (DSRC) technology was built along Redwood Road, Salt Lake City, Utah. One main goal of this CV corridor is to implement transit signal priority (TSP) when the bus is behind its published schedule by a certain threshold. For providing better signal coordination to buses, the signal plan for this CV corridor was retiming in October 2018. Data collected from 1) UTA transit operation system (SIRI) 2) DSRC communications; 3) Automated Traffic Signal Performance Measures (ATSPM) system were utilized to analyze the TSP performance before and after the signal retiming.

**Abstract**

DSRC-based connected vehicles system

- DSRC hardware
  - Four vendors: Savari, Arada, Cohda, and Lear
  - 24 of 30 Intersections with DSRC. Skipped freeway interchanges, CFIs, Reversible Lanes, TRAX

- Software
  - TSP application software is based on Multi-Modal Intelligent Traffic Signal System (MMITSS)
  - Software running on Linux processor

- RSU mounted on signal pole, mast arm, luminaire pole
- OBU mounted on roof of bus and inner bus

**Priority Request Rules**

UTA buses operate with a 30-minute headway during the early morning hours and late evening hours, a 60-minute headway after 9:00 PM, and a 15-minute headway during the rest time of the day. Equipped buses on the corridor were allowed to request TSP when:
1. The bus was behind published schedule by a given threshold (e.g. 5 min)
2. The bus had at least 20% occupancy (9 passengers)

**Result Analysis**

Rate of TSP requested and served before and after signal retiming:

- the average rate of TSP served before retiming is 33.13%, which is lower than that of 35.29% after retiming.

**Data Description**

System operation Timeline for this study:

- August, September, November, December in 2018

**Conclusions**

Results revealed that the TSP served rate after signal retiming is 35.29% which is higher that of 33.12% before signal retiming. As a result, the bus reliability for the northbound and southbound of the corridor improved by 2.65% and 1.21% respectively after signal retiming. Besides, the bus travel time and bus operation time all reduced after signal retiming.