

c. Signal Operations

Traffic signal optimization projects provide for improved safety and increased person throughput on arterial corridors. This is accomplished by the retiming of signals to be more responsive to traffic flows, thereby reducing delay to motorists and decreasing automobile emissions. In studies from around the country, the benefit cost ratio of improving signal timings can range up to 40:1 by providing reduction in travel time delays, number of stops and fuel consumed.

The major emphasis of the signal system optimization program projects in 2013 was to increase the rate of traffic signal timing modifications that were installed in the controllers at the intersections after the analysis was completed. In 2013, the signal timings were put into 90% of the controllers. This represented a 25% to 35% increase over previous years.

The SHA has 249 signal systems across the State comprised of 1,524 signals. The process of upgrading signal timing includes gathering new traffic volume data, performing traffic modeling, developing adjustments to the timing patterns and conducting travel time analysis to evaluate the before and after results of the adjustments. A total of 313 signals were reviewed and 222 signals were retimed and changes to the timings implemented. This represents 29 signal systems. Some of the signal systems that were retimed include the following:

- US 1 Hyattsville
- MD 3 Crofton
- MD 8 Stevensville
- MD 24 Bel Air
- MD 27 Mt Airy
- MD 235 Lexington Park

The MD 3 and MD 235 projects provided the highest benefits associated with any of the 29 signal system upgrades. Travel times were reduced by up to 3 minutes in those corridors during the peak periods. Overall, the signal retiming and optimization modifications provided an estimated reduction of over 900,000 hours of delay for motorists. The fuel, delay and emissions savings resulted in approximately \$29.4 million total annual user cost savings.





d. Transit Signal Prioritization

A balanced system of automobile, transit, bicycle and pedestrian usage will provide benefits to all users of the corridor. From a transit standpoint, one way to improve on-time performance is through the use of signal prioritization and queue jump/bypass lanes at signalized intersections. This approach allows buses the ability to continue to operate at a constant pace and reduces the variation in travel times for buses over the entire route. This provides for more consistent on-time performance and reduces the variation in arrival times at stops along the route. One on-going initiative is being led by the Washington Metropolitan Transportation Authority (WMATA). WMATA is evaluating locations in the US 1 corridor for signal prioritization. Equipment testing is anticipated to take place soon. Montgomery County has completed planning efforts to implement transit signal priority capabilities along major transit corridors in the County. A joint state/county policy and criteria for location identification has been developed, and corridors have been screened to determine the most beneficial locations for potential implementation. Future deployment remains unfunded at this time.

2. Multi-Modal

a. Park and Ride

The SHA and MDTA have established a park and ride lot network throughout the State of Maryland. This assists in reducing vehicle trips to an urban area. Many of the lots are served by transit which increases the number of transit trips. Even in locations where transit service is not provided, carpools result in less total vehicle trips on the network, thereby, improving overall congestion and reliability. Together SHA and MDTA operate 105 park and ride lots in 20 counties providing a total of 12,742 spaces. These range in size from less than 15 spaces to over 800 spaces (MD 5 in the Waldorf area of Charles County and MD 665 at Riva Road in the Annapolis area of Anne Arundel County). A new 202 space park and ride lot was constructed in 2013 as part of the InterCounty Connector project (MD 200) at MD 97. Due to resurfacing projects at park and ride lots, capacity changes occurred in the number of spaces at I-695 and Cromwell Bridge Road (11 additional spaces were added) and at I-195/MD 166 (43 spaces reduced) lot. In addition, 735 LED luminaries were installed to upgrade lighting at the lots.