



MD 187 South of I-270

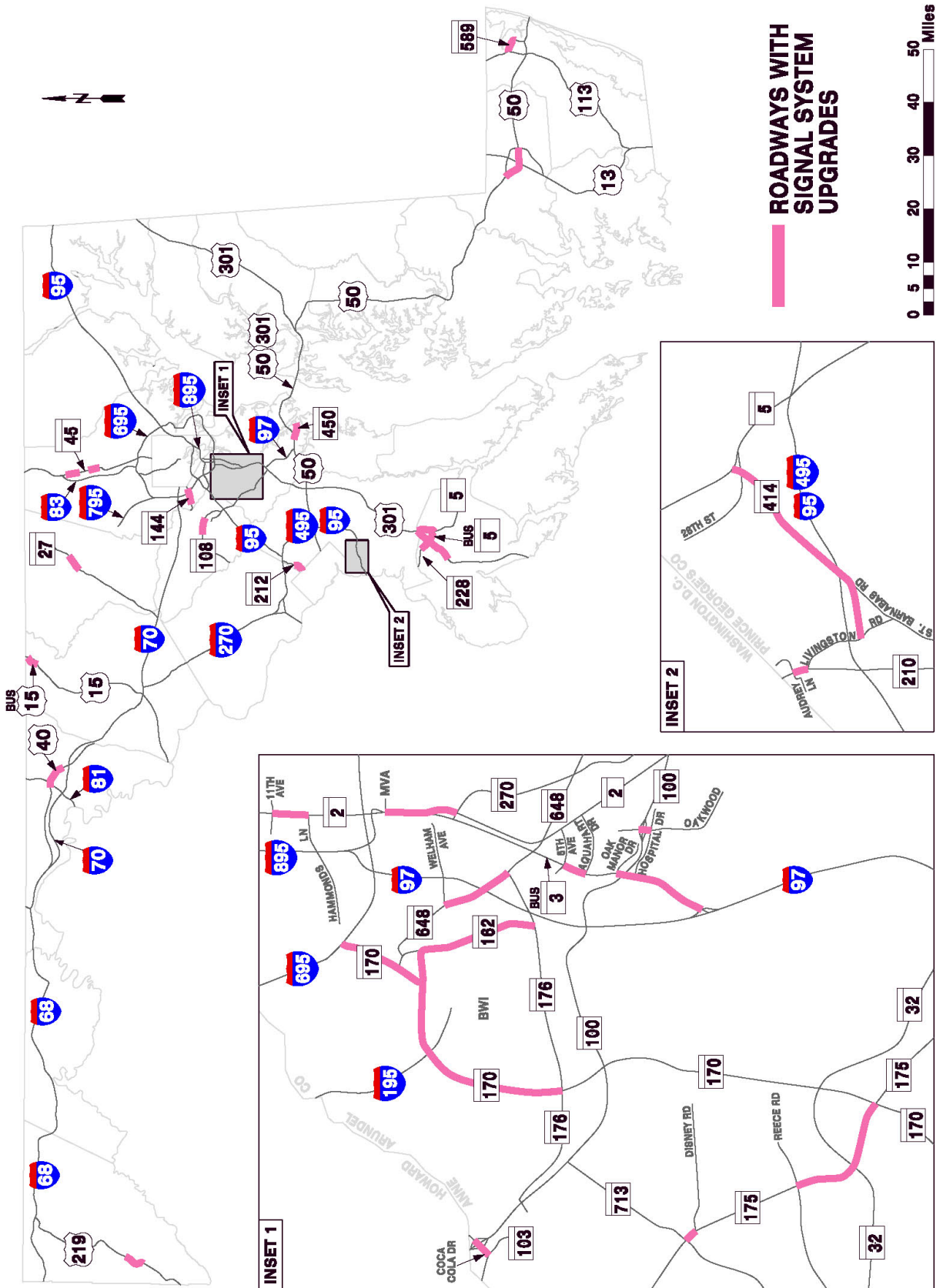
c. Signal Operations

One of the most cost effective ways to improve mobility on arterial highways is to improve signal system performance. Traffic signal optimization projects provide 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 addition, re-timings not only improve traffic progression but also provide a more walkable environment. In studies from around the country, the benefit cost ratio of improving signal timings range up to 40:1 by providing reduction in travel time delays, number of stops and fuel consumed.

The SHA operates and maintains 1,541 signals in 252 systems. 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. The major emphasis of the signal system optimization program projects in the last few years is to increase the rate of traffic signal timing modifications that were installed in the controllers at the intersections after the analysis was completed. In 2014, new signal timings were implemented into 65% of the controllers with many of the remaining intersections expected to be installed in early 2015.

In calendar year 2014, a total of 409 signals were reviewed and 221 signals were proposed to be retimed, including 29 signal systems. The signal systems that were retimed and new signal timings were implemented are included on the following map:

SIGNAL SYSTEM UPGRADES





MD 166 Park and Ride

The MD 175 project in Odenton provided the highest benefits associated with any of the 29 signal system upgrades. The network delay reduction associated with this project amounted to an estimated 102,000 vehicle hours annually. Overall, the signal retiming and optimization modifications provided an estimated reduction of 866,000 hours of delay for motorists and saving almost 300,000 gallons of gasoline. The fuel, delay and emissions savings resulted in approximately \$29.6 million total annual user cost savings.

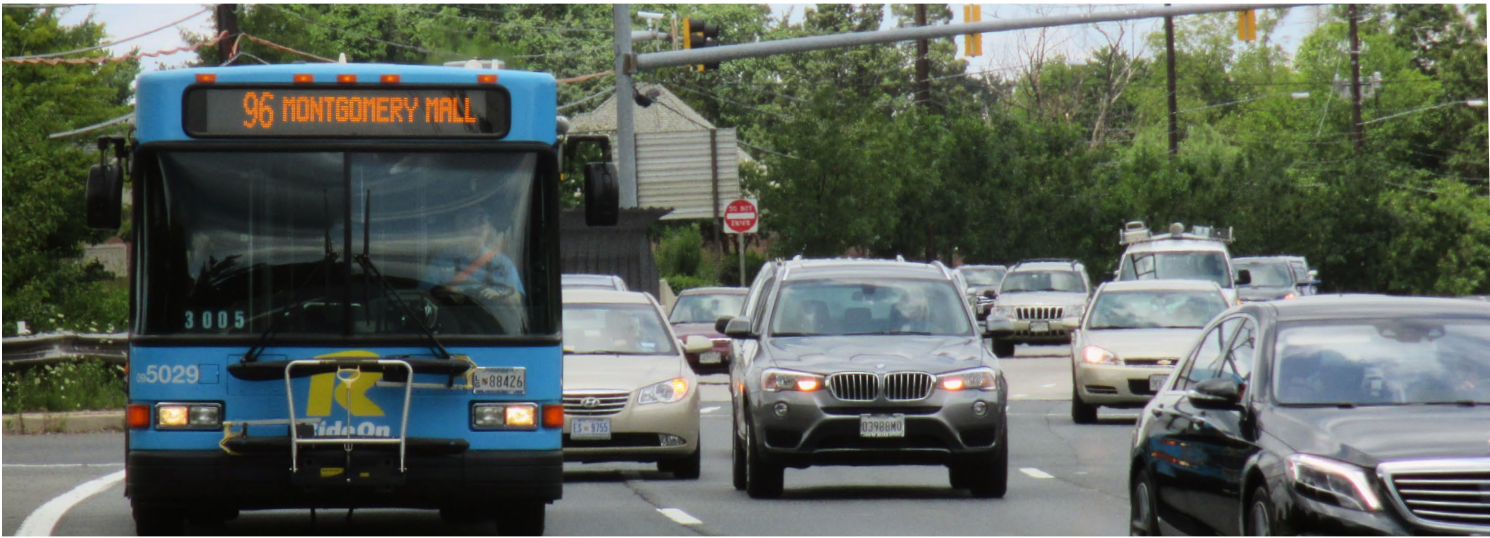
2. MULTI-MODAL

a. Park and Ride

Park and ride lots reduce single occupant vehicles on the roadway network and encourage transit use and ride-sharing. The SHA and MDTA have established a park and ride lot network in Maryland. SHA partners with the Maryland Transit Administration and local transit agencies to encourage transit connections to the lots. The mutually beneficial relationship increases transit trips and reduces congestion. Together SHA and MDTA operate 104 park and ride lots in 20 counties providing a total of 13,062 spaces, ranging in size from less than 15 spaces to more than 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 are the largest). A new 98 space park and ride lot was constructed in 2014 in Washington County at I-81 and MD 68. Other expansions include 75 new spaces at MD 4 at MD 408 in Anne Arundel County, 50 additional spaces at the I-83 at MD 439 lot in northern Baltimore County and 99 new spaces at I-70 at MD 17 in Frederick County. The lot in Charles County at MD 231 and the County Fairgrounds was eliminated resulting in a loss of 20 spaces. Other minor adjustments occurred in the number of spaces in the network.

The 104 lots were surveyed during the spring and fall of 2014 to determine the number of occupied spaces. Over 7,500 spaces were utilized on a given day accounting for about 60% of the total spaces. The park and ride lots which saw the largest increase in the number of motorists parking were:

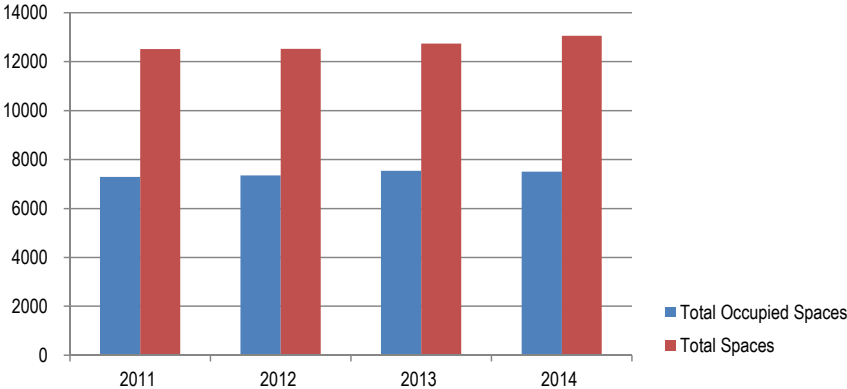
- MD 210 @ MD 373
- I-95 @ I-495
- I-70 @ MD 65
- MD 32 @ Broken Land Parkway
- I-195 @ MD 166
- I-95 @ MD 152



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The surveys at these six lots indicate a minimum of a 25 vehicle increase in usage and up to 115 vehicles at the MD 210 and MD 373 lot in southern Prince George’s County. It is estimated SHA and MDTA park and ride lot facilities result in a 112 million reduction in VMT on roadways. This mileage reduction amounts to a savings of approximately \$63 million in annual user costs. The total occupied spaces and total number of spaces are illustrated in the following graph along with the annual user savings over the past three years.

SHA/MDTA PARK AND RIDE LOT SPACES AND USERS



SHA/MDTA PARK AND RIDE SAVINGS TO MOTORISTS (MILLIONS)

