



EXECUTIVE SUMMARY

Background

The existing Bay Bridge is the only roadway crossing of the Chesapeake Bay in Maryland. Trips across the Bay Bridge consist of two types of travel: local trips (such as work related and discretionary trips) with origins and destinations relatively close to the shores, and regional travel (such as commerce and beach traffic) with origins and destinations elsewhere in Maryland and beyond. Traffic associated with all types of trips across the Bay has been steadily increasing since the parallel spans were constructed; the original two-lane bridge was constructed in 1952 and the second three-lane bridge was constructed in 1973.

The location for the existing Bay Bridge was selected in the 1930's based on a number of factors, including the growing state highway network, ship navigation, and access to the lower Eastern Shore. Since 1952, population and job growth on both sides of the Bay have increased significantly, resulting in an increase in the volumes of local and regional trips, and increased congestion and its associated effects (e.g., accidents, increased truck traffic, delays, environmental concerns, and others). For example, between 1970 and 2000, the population of Anne Arundel County increased from 299,825 to 491,383. The Maryland Department of Planning (MDP) projects the Anne Arundel County population to increase to 541,250 by 2015. For Queen Anne's County, between 1970 and 2000, the population increased from 18,506 to 41,456. MDP projects the population in Queen Anne's County to increase to 53,550 by 2015.

The US50/301 corridor is experiencing congestion today, and is projected to experience even higher levels of congestion in the future. Most significant are the constraints that cause eastbound delays between the Parole area in Anne Arundel County and the Bay Bridge. The Bay Bridge is a critical portion of the US 50/301 corridor that is the most susceptible to factors that can cause or exacerbate congestion. For example, because it is a bridge with no shoulders, reconstruction and rehabilitation work takes longer and creates difficulties with maintaining traffic flow.

Further, based on the current condition of the eastbound bridge deck and the projected increases in traffic volumes, it is anticipated that the deck will require rehabilitation between 2015 and 2020. Depending on the type and method of construction, the rehabilitation could require long-term single lane closures or complete nighttime bridge closures of the eastbound bridge. Because the bridge is projected to carry significantly higher traffic volumes by 2015-2020, the rehabilitation would likely result in substantial travel time delays. For example the current Average Daily Traffic (ADT) during an average weekday is 61,000 and is projected to be 86,000 by 2025, an increase of 41 percent. The ADT for a Saturday in the summer is 95,000 and is projected to grow to 135,000 by 2025, an increase of 42 percent.

Recognizing these facts, the Authority has begun studies to formulate a long-term improvement plan for the William Preston Lane Jr. Memorial (Bay) Bridge Transportation Facility Project.

Bay Bridge Needs Report

a. Initiation of the Needs Report

The Bay Bridge is owned and operated by the Authority, while the approach roadway system is predominantly owned and operated by the State Highway Administration. Portions of the approach roadways are also maintained by the local county and municipal jurisdictions. The Authority – with the cooperation of various regional planning partners, including staff from a number of metropolitan planning organizations, Maryland Department of Transportation (MDOT), Virginia Department of Transportation (VDOT) and Delaware Department of Transportation (DelDOT) – initiated a study of the Bay Bridge, to begin the process of identifying the transportation and safety needs associated with the crossing. This study resulted in the Needs Report, which is now being released.

b. Purpose and Methodology of the Needs Report

The overall purpose of the Authority's initial Needs Report was to identify the long-range improvement needs of its transportation facility project through preliminary identification of issues such as transportation demand and safety. This process has ultimately led to the conclusion that addressing the transportation and safety needs at the Bay Bridge requires consideration of other corridor and, ultimately, statewide issues. The Needs Report addresses one part of the problem: What are the needs associated with the Bay Bridge?

The first step in the Authority's Needs Report was to identify a study area. The transportation needs associated with the Bay Bridge can be separated into two major areas:

- Capacity, safety, operations, and maintenance of the bridge and toll plaza.
- Capacity, safety, operations, and maintenance of the system of roadways leading to and from the Bay Bridge.

Because the transportation needs associated with the Bay Bridge extend beyond the bridge itself, the Bay Bridge study area was defined as an area extending a distance of 5.8 miles along U.S. Route 50/301, between the Oceanic Drive overpass in Anne Arundel County and the MD 8 overpass in Queen Anne's County. Within the study limits, U.S. Route 50/301 includes the Bay Bridge, the two parallel steel bridge structures that span 4.3 miles from shore to shore across the Chesapeake Bay.

In undertaking the Needs Report, the following factors were evaluated:

- Travel Patterns
- Geometric Conditions
- Travel Demand and Traffic Operations
- Maintenance and Rehabilitation Needs
- Safety

c. Key Findings

To understand the physical limitations of the bridge, an assessment of its geometric condition in light of the latest engineering standards was conducted. An assessment of the maintenance and rehabilitation needs of the bridge, based on the Authority's Long Range Plan, was also performed. Travel demand and traffic operational analyses of the bridge and the toll plazas were also conducted. And finally, a safety analysis was conducted to understand the types and locations of accidents in the study area and their possible causes.

In general, the bridge meets current geometric design standards with the exception of the offsets between travel lanes and the bridge rails. The lack of roadside shoulders or buffer areas results in the loss of a lane or roadway closures during incident management activities including clearance of disabled vehicles. This has an impact on the vehicular capacity of the bridge.

To understand the travel patterns in the study area, an origin-destination survey was conducted for eastbound traffic traveling over the Bay Bridge on both an average weekday and an average summer weekend day. This study also revealed the percentage of truck traffic using the bridge. The origin-destination studies indicate that most of the typical summer weekend eastbound bridge traffic is traveling between the Baltimore-Washington metropolitan area and the lower Eastern Shore and between the Baltimore region and both the lower

Eastern Shore and Queen Anne's County on an average weekday. In general, the Bay Bridge carries approximately 53 percent more traffic on an average summer weekend day (95,000 vehicles) than on an average weekday (61,000 vehicles) and by 2025, the daily volumes are expected to increase to approximately 135,000 vehicles on an average summer weekend day and 86,000 vehicles on an average weekday. Trucks account for approximately five percent of total traffic on an average summer weekend day and 14 percent on an average weekday.

During a three-year study period, a total of 402 accidents occurred in the study area. Although there are no similar bridges or toll plazas to make an exact comparison, the accident statistics suggest that the study area experienced a volume of rear-end collisions significantly higher than the statewide rate for similar, rural, four-lane divided highways.

Additional Needs Data

Recognizing that the congestion issues in the US 50/301 corridor are not only related to the Bay Bridge. The Authority looked at a travel time speed study for the US 50/301 corridor in the eastbound direction conducted in May and June of 2003 as part the evaluation of a Toll Sponsorship Pilot Program. The study measured travel speeds, queues, and delays. Two distinct eastbound areas of congestion were observed.

- The first area of congestion was between the Parole area and the Severn River Bridge, with queue lengths on the order of two miles. In this section, I-97 intersects US 50/301 and the number US 50/301 eastbound lanes is reduced from four to three as the roadway approaches the Severn River Bridge. Free flowing speeds were again observed from the Severn River Bridge to two miles prior to the Bay Bridge.
- The second area of congestion, beginning at the Bay Bridge, is due to reduced lane capacity on the Bay Bridge relative to the approach lanes, and weave/merge movements associated with the toll plaza.

These two queues are often perceived as one continuous delay. It is anticipated that future traffic volumes could increase to the point where the queues begin to encroach upon one another. On a typical summer Friday or Saturday, traffic delays exist over a six-hour period and travel times associated with these delays are increasing. These undesirable operating conditions are expected to worsen significantly, upwards of 12 hours per summer weekend day by 2025. Likewise, travel time delays in this 16-mile segment of approach roadway will deteriorate in much the same fashion in the coming years. By 2025, these types of delays will begin to occur during peak weekday periods, as well. This level of congestion is difficult for bridge drivers, causes increased accidents, and can severely impact access to nearby communities.

Beyond the Transportation Needs Reports: Ongoing and Next Steps in the Process

To begin to understand the diverse and complex issues associated with addressing the transportation needs, the Authority is collecting data and information about the environment and transportation system in the corridor. This information will serve as a starting point for more detailed future engineering and environmental studies of a Bay crossing. As part of this data collection effort, the Authority:

- has reviewed several historic Bay Bridge documents to learn about what crossings have been studied in the past and to determine if any are still applicable today;
- is compiling an inventory of roadway planning, design, and construction projects as well as a review of area comprehensive plans, to understand and document the features of the existing and future transportation system; and
- is identifying and documenting resources in the Study area by inventorying socioeconomic, cultural, and natural environmental features in the study area.

The Authority is also evaluating the legal and process issues that could affect the direction, scope, and constraints of a study of feasible solutions.

In addition, to complete the assessment, an understanding of the needs in the US 50/301 corridor, of which the bridge is an integral part, is also required. Assessments of other systems affected by crossings of the Chesapeake Bay could be or have been undertaken by MDOT, the Maryland Department of Planning (MDP), Maryland Department of the Environment (MDE) and other agencies over the course of several years. These additional studies should contribute to an understanding of the needs across the corridor in the context of statewide and regional plans, such as congestion management recommendations; transit opportunities; development and growth control measures; impacts to natural, cultural, and socio-economic resources; and opportunities for economic growth. Once identified, the needs of the entire system could be addressed in concert, through a statewide effort.

The Bay Bridge Transportation Needs Report represents the first step in identifying the needs, understanding the feasibility of addressing the needs, and developing feasible solutions for a unique and complicated project within the framework of the regulatory and legislative process. The Authority will begin to address these needs through a Feasibility Review. The Feasibility Review will include a Task Force on Traffic Capacity Across the Chesapeake Bay, consisting of representatives from the Chesapeake Bay region and other parts of the State. The purpose of the Task Force is to assist the Authority in evaluating the need for additional capacity, and identifying issues to be considered in addressing those needs. The Feasibility Review will serve as a transition between the Needs Report and future project planning studies.

The Feasibility Review will be a significant undertaking for the State of Maryland. A study of this magnitude and complexity requires a partnership between elected officials, state and federal agencies, and the public within Maryland and beyond state lines. Therefore, the Authority is presenting and will continue to present a variety of future action proposals to the Maryland Department of Transportation for consideration and action.