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Vision: Customers will move conveniently and safely through our facilities as the Authority meets the demands of travel and commerce in the 21st century. The Authority will seek new ways to improve transportation in Maryland and the region through partnerships with the Maryland Department of Transportation and others. Innovative engineering, state-of-the-art technology, professional law enforcement, and results-oriented management will be used to reach this vision. *Source: Maryland Transportation Authority 2001 Annual Report*



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Values: We are committed to preserving our facilities and assisting in the development of Maryland’s transportation system. We are responsible stewards of Maryland’s environment and natural resources. We maintain attractive facilities that contribute to traveler confidence and to the quality of the lives of customers, neighbors and our co-workers. We are committed to the safety and security of travelers, our neighbors and our co-workers. *Source: Maryland Transportation Authority 2001 Annual Report*

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Southbound I-95 entering Maryland from Delaware.
 Photo: Maryland Transportation Authority Archives.



Message from the Executive Secretary

Inside the State of Maryland, I-95 provides 110 miles of safe and efficient transportation between the Woodrow Wilson Bridge and the Delaware state line. The I-95 Master Plan addresses the portion of I-95 between the northern limits of Baltimore City and Delaware, which is designated as the John F. Kennedy Memorial Highway (JFK). The Maryland Transportation Authority (Authority) has developed this Master Plan to preserve the integrity of this key transportation facility and maintain the high quality of services and infrastructure along the JFK.

The Master Plan study considered the potential transportation needs and services in a comprehensive manner for the purpose of developing a consistent long-term plan for the improvement, enhancement and management of the JFK. The Master Plan development considered the need to:

- Maintain consistently high levels of safety and transportation service for I-95 users,
- Support national, regional and local mobility,
- Support existing and planned intermodal (air, water, rail, transit) transportation development through the provision of high quality access and service,
- Support approved Master Plans, Smart Growth initiatives, air quality conformity plans and economic development efforts,
- Enhance and preserve (or mitigate impacts to) environmental resources,
- Encourage the utilization of parallel arterial routes for local transportation needs,
- Develop highway alternatives that support transit system use, and
- Provide enhancements to improve convenience, safety and public appreciation of the facility and its services.

Planning for the future needs of travelers using the JFK, in coordination with numerous agencies, the public and special interest groups, has been both a challenging and rewarding effort. This is a critical step in the implementation of major improvements to the JFK, which will assure safe and efficient transportation for Maryland and regional travelers well into the 21st Century.

The participation of the Federal Highway Administration (FHWA), the Maryland Department of Transportation (MDOT), the State and Federal Regulatory Agencies, and others in the development of the Master Plan has been instrumental in the success of the study. We would like to thank the study participants for their assistance and encouragement throughout the study. Together we will continue to address the transportation needs and safety of the JFK while protecting Maryland's environment for future generations to enjoy.

Sincerely,

Thomas L. Osborne
Executive Secretary



Summary

Overview

The I-95 Master Plan is a compilation of numerous studies, outreach, and documentation efforts conducted between 2000 and 2002 to identify and recommend solutions that address existing and future transportation needs and safety along the John F. Kennedy Memorial Highway (JFK).

The Master Plan study area encompasses 49 miles of I-95, beginning at the I-95/I-895 (N) Split on the northeast side of Baltimore City and extending to the Delaware state line (**Figure 1**). The study area extends through eastern Baltimore County, through southeastern Harford County, across the one-mile long Millard E. Tydings Memorial Bridge over the Susquehanna River, and continues through central Cecil County. Tolls are collected on northbound I-95 at the toll plaza located immediately north of the Millard E. Tydings Memorial Bridge.

The study area includes eleven (11) interchanges, two (2) travel plazas located in the median (Maryland House and Chesapeake House), and a truck weigh station just north of the Susquehanna River, in the vicinity of the toll plaza. The majority of I-95 within Maryland has four (4) travel lanes in each direction, including the southern 16 miles of the study area (from I-895 (N) to MD 24); however, the northern 33 miles of the study area only has three (3) travel lanes in each direction.

The Master Plan goals included:

- Encouraging early participation by State/Federal Departments of Transportation (DOT), Metropolitan Planning Organizations (MPO) and State/Federal resource regulatory agencies involved in transportation decision-making processes;
- Identifying long-range transportation needs of the study area through a preliminary identification of corridor level issues such as transportation demand, safety, Congestion Management Study (CMS) recommendations, transit opportunities, Smart Growth, natural/cultural resources and socio-economic issues;
- Developing and obtaining concurrence on a study area purpose and need statement;

- Developing and obtaining concurrence on the range of modal alternatives to be evaluated during future independent projects;
- Developing and obtaining concurrence on future independent project(s) purpose and need statement(s),
- Developing schedules for future independent project(s) based on needs;
- Streamlining the project planning process for future independent projects through the early identification of key environmental and community concerns; and
- Promoting several key Visions and Values contained in the Maryland Transportation Authority's (Authority), "Annual Report."

The Authority, in cooperation with the Federal Highway Administration (FHWA) and the Maryland Department of Transportation (MDOT), developed a Master Plan study approach to comprehensively identify long-range transportation needs; to establish clear goals for system maintenance, preservation and enhancement; and to ensure development of environmentally sensitive and intermodal-friendly solutions for the JFK.

Natural Environment and Environmental Streamlining

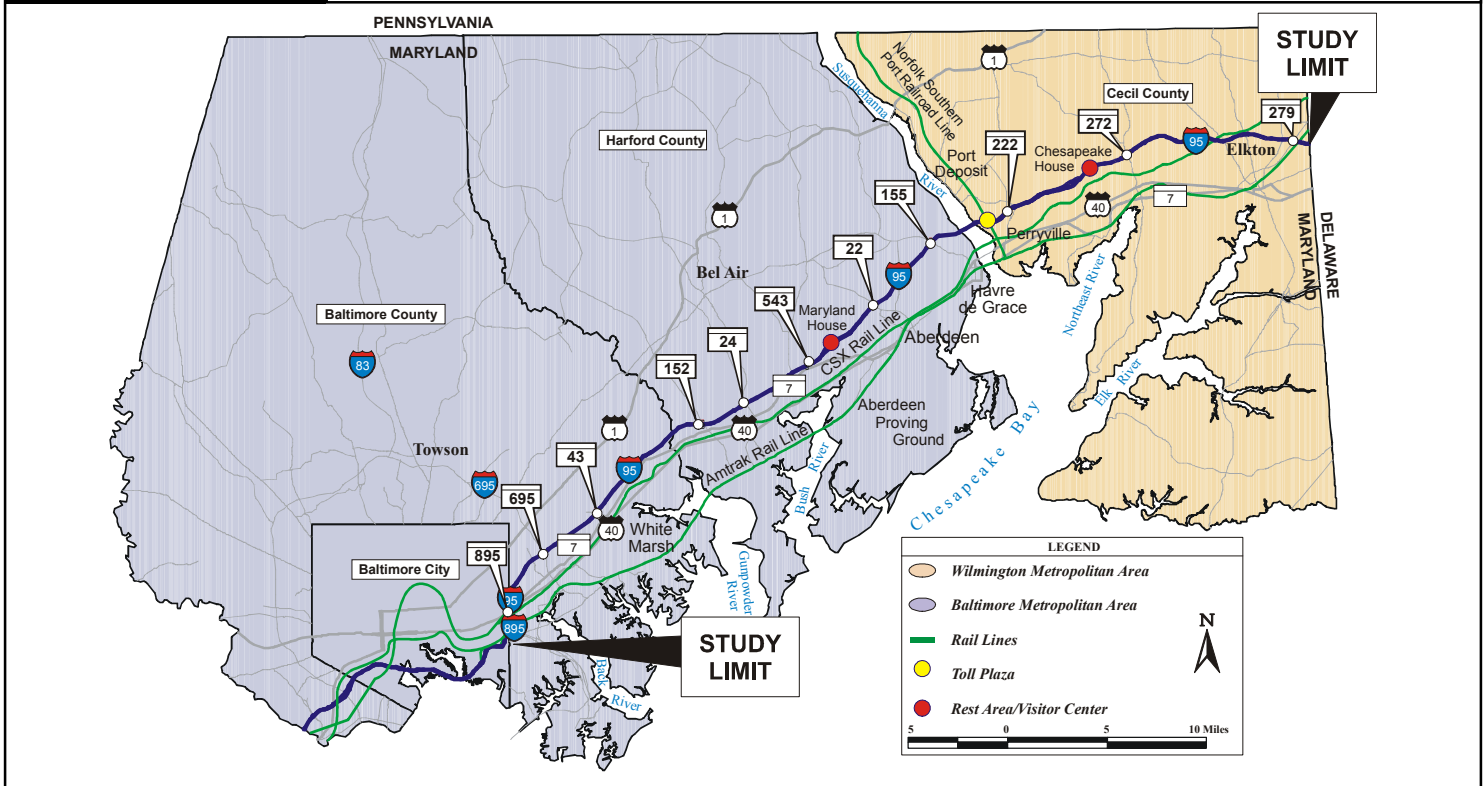
The early consideration of environmental resources is a unique component of the Master Plan. Environmental and regulatory agency representatives worked closely with the Authority to assure that key environmental resources are considered in future improvements to the JFK.

An initial environmental inventory was developed to assist in the assessment of future independent projects within the 49-mile study area. The inventory includes resources such as wetlands, streams, state and local parks, historic properties, and rare, threatened and endangered species.

The Master Plan Study was conducted in a manner consistent with the environmental streamlining guidelines developed by the Mid-Atlantic Transportation & Environmental (MATE) task force to address the "Transportation Equity Act for the 21st Century's" (TEA-21) call for improved and earlier coordination among agencies involved in decision-making processes. In keeping with the goals of MATE and TEA-21, the Master

FIGURE 1

I-95 Master Plan Study Area Map



The JFK study area includes 49 miles of I-95 located between the Baltimore City/County line and the Maryland/Delaware state line.

Plan identifies corridor-wide maintenance, safety and transportation improvement needs while ensuring early identification of environmental and community concerns.

The study team conducted an environmental compliance scoping workshop in October 2000. At this workshop, federal, state and local regulatory agency representatives established the scope of environmental studies to be performed and documented during the study.

At the workshop, attendees identified three Master Plan concurrence points. The three concurrence points (concurrence obtained Winter, 2001 through Fall, 2002) are:

1. The (Master Plan) Study Area Purpose and Need Statement (March, 2001)
2. Future Independent Project Purpose and Need Statement(s) (July, 2001)
3. The Range of Modal Alternatives to be evaluated during Future Independent Projects (June, 2002)

At the workshop, attendees agreed on the commenting/concurring status of the following agencies:

Commenting Agencies

- National Park Service (NPS) ¹
- Maryland Department of Planning (MDP)
- Maryland Historical Trust (MHT)
- Baltimore Regional Transportation Board (BRTB)
- Wilmington Metropolitan Area Planning Council (WILMAPCO)

Concurring Agencies

- Federal Highway Administration (FHWA)
- Federal Transit Administration (FTA) ²
- US Environmental Protection Agency (EPA)
- US Army Corps of Engineers (COE)
- US Fish and Wildlife Service (USFWS) ³
- National Marine Fisheries Service (NMFS)
- Maryland Department of the Environment (MDE)
- Maryland Department of Natural Resources (DNR)

¹ NPS did not participate as no federal parks were identified within the study area.

² In February 2002, FTA requested that they be considered a commenting agency.

³ In February 2002, USFWS informed the study team that they could no longer staff the study and should be denoted as having taken no action.



Highway Concepts

Six (6) highway concepts were evaluated as a part of the study. These concepts represent a broad range of potential highway improvements for the study area. A summary discussion of the concept evaluations can be found in the body of this document. A full discussion can be found in the "I-95 Master Plan Range of Modal Alternatives (ROMA)," published in June 2002. Three concepts, C-1, C-5 and C-6, were recommended for further study. Concepts C-5 and C-6 represent a family of alternatives which encompass variations of Concepts C-2, C-3 and C-4.

The six highway concepts evaluated included:

Concept C-1: No-Build - In this concept, the JFK would be maintained with no major improvements or lane additions.

Concept C-2: All Lanes Tolled - This concept involves electronic tolling of all lanes along the entire length of the JFK within the study area.

Concept C-3: High Occupancy Vehicle (HOV) Lanes South of MD 24 - This concept involves the addition of one HOV lane per direction between I-695 and MD 24, the addition of two general-purpose lanes per direction between the I-895 split and I-695, and the addition of one general-purpose lane per direction north of MD 24.

Concept C-4: Two-Lane Separated and Reversible Roadway in Median South of MD 543 - This concept involves the provision of a two-lane separated and reversible facility in the median of the JFK from south of I-695 to MD 543, and one additional general-purpose lane per direction from north of MD 543 to the Delaware state line.

Concept C-5: Separated Two-Lane Managed Roadways in Median South of MD 543 - In this concept managed lanes would be provided between I-895 and MD 543. One additional general-purpose lane per direction would be provided north of MD 543. At a minimum, four general-purpose lanes per direction would be provided throughout the entire 49-mile study area. The managed lanes concept was evaluated as a two-lane per direction, barrier separated tolled expressway.

Concept C-6: All General-Purpose Lanes - In this concept the number of general-purpose lanes would be increased, as needed, to accommodate the projected traffic throughout the

49-mile study area. In addition, a two-lane collector distributor roadway would be provided from north of MD 43 to I-695 to improve traffic operations and safety.

Transit

It is a goal of the State of Maryland to provide a balanced network of highway and transit services. Transit choices will be created by enhancing, improving, and building upon the services and infrastructure already in place, and by providing new transit services where opportunities exist.

The Authority has coordinated with the Maryland Transit Administration (MTA) throughout the Master Plan study process. Transit was evaluated for its affect on JFK travel demand through the use of travel demand model scenarios.

MTA has developed a long-term plan for meeting transit needs in the Baltimore region. The plan calls for expanding bus service and eventually providing rail service in the corridor, in addition to supplementing the existing Maryland Rail Commuter Service (MARC) Train service.

As transit projects are adopted into the region's approved, constrained, long-range plan and travel demand models, their effect will be incorporated into future project planning efforts. In addition, the Authority and MTA will work closely during the project planning process to ensure that transit strategies and services are coordinated with highway improvements.

Traffic

In the 1970s and 1980s, traffic growth along I-95 within the study area averaged approximately 6% per year. In the 1990s, traffic growth averaged 3% per year. The average annual traffic growth rate is approximately 2.6% over the next 2 decades.

Currently, truck volumes remain steady throughout much of the day accounting for approximately 10% to 15% of the total weekday traffic along the JFK but only 5% of peak period, peak direction traffic in the urban southern section. Trucks constitute approximately 5% to 6% of the total weekend traffic.



In the future, the duration of at-capacity conditions is likely to increase. Instead of one peak hour of congestion, the JFK is expected to experience capacity conditions for a period of two to three hours each day (peak spread).

Weekend traffic is less likely to divert to parallel travel routes, thus weekend congestion will be more focused on the JFK, resulting in at-capacity conditions for longer periods of time (peak periods). Information on traffic along the JFK can be found in the "*I-95 Master Plan Study, I-95 Travel Demand Forecasting Methodology*," published in June 2001.

Safety

Although the JFK is generally a safe facility, as reflected by the current average accident rate, sections of the corridor have, in the past, had significantly higher accident rates than the statewide average. These sections include areas near interchange ramps, weaving areas, and the toll plaza which have exhibited congestion related accident patterns such as an increase in rear-end, sideswipe, and run-off the road accidents. Safety improvements have been implemented to address these areas of concern. As travel demand on the JFK increases and peak (congested) periods lengthen, opportunities for motorists to enter, exit, and change lanes on the facility will be reduced, increasing the potential for congestion related accident patterns over longer sections of the facility ("*I-95 Master Plan Study, Purpose and Need Statement*," March 2001).

Operations & Maintenance

Operations and maintenance activities are expected to increase over time as travel demand increases and security measures resulting from "homeland protection" directives are implemented. Preliminary investigation indicates that the JFK may need one additional maintenance yard; expansion of existing intelligent transportation systems and increased emergency response provisions. Operations and maintenance needs will be considered during future project planning studies.

Facility Enhancements

Roadside facility enhancements improve the comfort and convenience of the highway system increasing the safety of the traveling public. The JFK has two public travel plazas (Maryland and Chesapeake Houses) within the

highway median. The travel plazas currently include public restrooms, information services, gas stations, shops and food services. While the travel plazas provide a safe haven for weary travelers to refresh themselves, park and ride lots adjacent to each of the eleven JFK interchanges provide opportunities for a combination of ride share and inter-modal transfers. Commercial vehicles are prohibited from parking at many of the existing park and ride lots, which are frequently in or adjacent to commercial or residential neighborhoods. However, trucks and buses are permitted to park at the two travel plazas, the weigh station and a number of private truck stops located along the corridor. It is anticipated that the travel plazas, park and ride lots and truck parking areas will be maintained and improved to accommodate the increasing number of visitors.

Preliminary Project Costs and Funding

Preliminary project costs to implement the Master Plan highway concepts were developed. The anticipated total project cost (in 2003 dollars) is approximately 2 billion dollars. Toll revenue analyses and strategies to address anticipated funding needs will be prepared during annual capital budgeting and project planning activities.

Legal Issues

The JFK capital, operations, maintenance and enforcement budget is funded from Authority revenue sources. It does not rely on Federal funding, although the JFK has been adopted as an Interstate highway and included in the National Highway System. An agreement between the State of Maryland and the FHWA establishes rules and regulations for the operation of the JFK. Additional regulations pertaining to the development and use of the JFK can be found in the Maryland Transportation Code, Annotated, Sections 4-401, 4-403, 4-404, and Sections 2-1401 through 2-1414.



A. Introduction

1. Overview of Maryland Transportation Authority's System

Since 1971, the Maryland Transportation Authority (Authority) has been responsible for constructing, operating, maintaining, supervising, and financing the seven tolled roadway facilities within the State of Maryland. These seven facilities include a turnpike (John F. Kennedy Memorial Highway), two tunnels (Fort McHenry Tunnel and Baltimore Harbor Tunnel Thruway), and four bridges (Thomas J. Hatem Memorial Bridge, Francis Scott Key Memorial Bridge, Governor Harry W. Nice Memorial Bridge and William Preston Lane Jr. Memorial (Bay) Bridge) that serve as vital links in Maryland's transportation system.

Initial construction of the Authority's toll facilities was financed through revenue bonds. The Authority assists the State in achieving its transportation goals by advancing the safe, secure and convenient movement of people and goods for the benefit of Maryland's citizens. Tolls, other revenues and bonding capacity are used to develop, operate, provide law enforcement for and maintain the Authority's highway, bridges and tunnels. These facilities serve as vital links in the State's transportation network. Acting on behalf of the Maryland Department of Transportation, the Authority also finances and constructs capital projects to improve Maryland's transportation

system, including terminal facilities at the Port of Baltimore and the Baltimore/Washington International Airport. In addition, the Authority provides law enforcement at the port and airport facilities.

The Authority is one of 17 toll authorities/agencies in the northeastern United States participating in the E-ZPassSM Interagency Group (IAG). The IAG members have worked together to implement a regional network of electronic toll collection systems extending from Maine through Maryland. All 17 IAG members have installed, or are in the process of installing, electronic toll collection systems with compatible technology. As of May 2002, E-ZPassSM is available at all seven of the Authority's toll facilities.

2. John F. Kennedy Memorial Highway (JFK) Study Area

I-95 in Maryland extends 110 miles from the Woodrow Wilson Bridge at the Virginia commonwealth line to the Delaware state line. It provides continuity for regional traffic from Florida to Maine and operates as an important backbone for commuter traffic within Maryland. As the "East Coast's Main Street", I-95 serves high volumes of regional commercial/business and recreational traffic.

On November 16, 1963, President John F. Kennedy participated in the ribbon cutting ceremony for the opening of the portion of I-95 between I-695 (Baltimore Beltway) and Delaware. Maryland renamed the highway in his honor



President John F. Kennedy participates in the ribbon cutting ceremony for the opening of the portion of I-95 between MD 43, White Marsh and the Delaware state line. Following his assassination 6 days later in Dallas, Texas, Maryland renamed the highway in his honor. Photo: Maryland Transportation Authority Archives.



following his assassination 6 days later in Dallas, Texas. In the 40 years since its dedication, the JFK has developed into a major interstate corridor, serving both regional transportation needs and Baltimore metropolitan area commuter trips.

The study area, encompasses 49 miles of I-95, beginning at the I-95/I-895 (N) Split on the northeast side of Baltimore City and extending to the Delaware state line (**Figure 1, Page 6**). The study area extends from eastern Baltimore County, through southeastern Harford County, across the Millard E. Tydings Memorial Bridge, and continues through central Cecil County.

The study area includes eleven (11) interchanges, two (2) travel plazas located in the median (Maryland House and Chesapeake House), and a truck weigh station just north of the Susquehanna River, in the vicinity of the toll plaza. The majority of I-95 within Maryland has four (4) lanes in each direction, including the southern 16 miles of the study area (from I-895 (N) to MD 24); however, the northern 33 miles of the study area only has three (3) travel lanes in each direction.

The Millard E. Tydings Memorial Bridge crosses the Susquehanna River at the Harford and Cecil County border. The bridge has six travel lanes (without shoulders) and spans nearly one mile (5,056 feet) of the river. Located immediately north of the Millard E. Tydings Memorial Bridge is the toll plaza. It is a “one-way” toll collection facility consisting of twelve manual and electronic toll collection (ETC) lanes in the northbound direction. Adjacent to the toll plaza are complete weigh and inspection stations utilizing weigh-in-motion and static scales. The weigh station is also the location of a pilot Commercial Vehicle Information System Network (CVISN) program utilizing electronic identification devices and databases to communicate commercial vehicle data between states.

3. Master Plan Goals and Implementation Methodology

The Authority, in cooperation with the Federal Highway Administration (FHWA) and the Maryland Department of Transportation (MDOT), developed a Master Plan study approach to comprehensively identify long-range transportation needs; to establish clear goals for system maintenance, preservation and enhancement; and to ensure development of feasible, environmentally sensitive and intermodal-friendly solutions for the JFK.

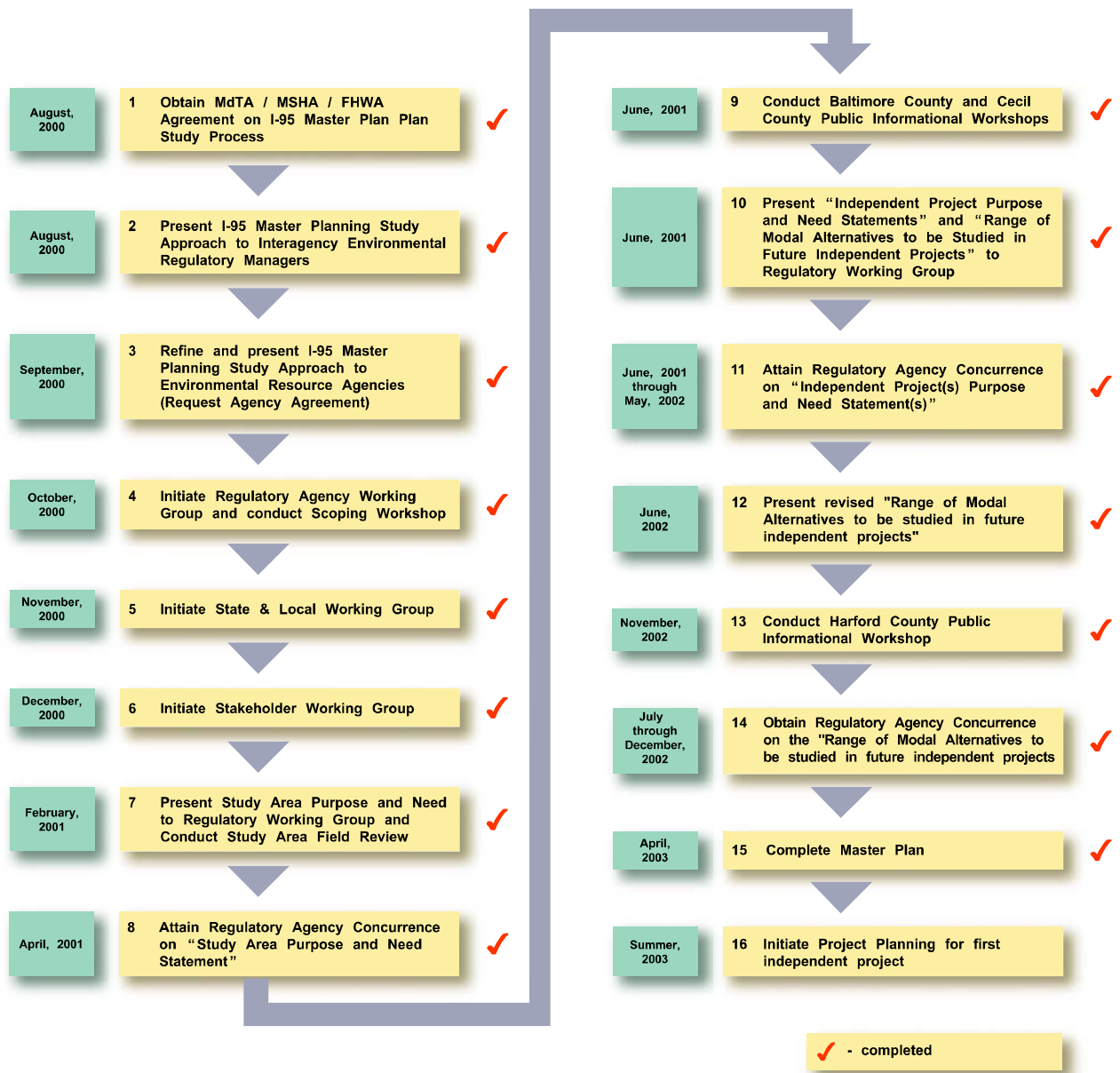
The Master Plan goals included:

- Encouraging early participation by state/federal Departments of Transportation (DOTs), Metropolitan Planning Organizations (MPO) and state/federal resource/regulatory agencies involved in transportation decision-making processes;
- Identifying long-range transportation needs of the JFK through a preliminary identification of corridor level issues such as transportation demand, safety, Congestion Management Study (CMS) recommendations, transit opportunities, Smart Growth, natural/cultural resources and socio-economic issues;
- Developing and obtaining concurrence on a study area purpose and need statement;
- Developing and obtaining concurrence on future independent project(s) purpose and need statement(s);
- Developing and obtaining concurrence on the range of modal alternatives to be evaluated during future independent projects;
- Developing schedules for the future independent project(s) based on needs;
- Streamlining the project planning process for future independent project(s) through the early identification of key environmental and community concerns; and
- Promoting several of the Authority’s key Visions and Values contained in the Authority’s, “*Annual Report*”.

The Master Plan process was unique in its environmental approach, providing an opportunity to build consensus among environmental regulatory and transportation agencies. The study documentation provided the agencies with the background knowledge necessary to expedite future regulatory actions for the ultimate construction of the Master Plan recommendations streamlining future project planning and design activities. The Authority, in cooperation with FHWA and MDOT, has fostered this collaborative effort consistent with the streamlined guidelines developed by the Mid-Atlantic Transportation and Environmental (MATE) Task Force to address the Transportation Equity Act for the 21st Century’s (TEA-21) call for improved and early coordination with agencies involved in decision-making processes. A flow chart depicting the Master Plan’s process is shown in **Figure 2**.

FIGURE 2

Master Plan Process





B. Need for Improvement

1. Existing Traffic Volumes (2000)

Average daily traffic volumes (ADTs) on the John F. Kennedy Memorial Highway (JFK) range from approximately 165,000 vehicles per day (vpd) between I-695/Baltimore Beltway and MD 43/White Marsh Boulevard to approximately 67,000 vpd at the Delaware state line (**Table 1**). Information on existing traffic along the JFK can be found in “I-95 Master Plan Study, Purpose and Need Statement,” March 2001.

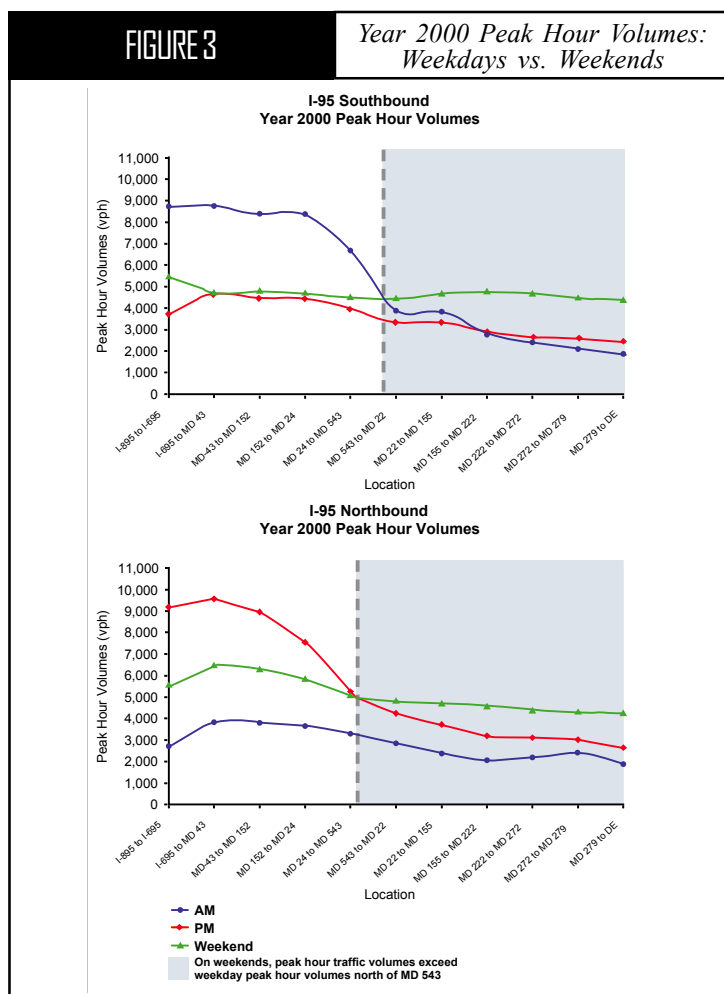
Based on an analysis of existing traffic volumes along the JFK and field surveys, approximately 70% to 75% of the total traffic crossing the Susquehanna River is through traffic, originating from or destined to points in Delaware or further north. Through traffic constitutes approximately 40% of the total traffic volume at the Baltimore/Harford county line. Traffic volumes within the study area south of MD 543 (Creswell Road) are highest during the weekday peak period (i.e. commuter traffic). North of MD 543, the highest traffic volumes along the JFK occur during the weekends (i.e. regional traffic) (**Figure 3**).

Highway Network

The JFK serves as the “backbone” of the transportation system in northeastern Baltimore County, Harford County, and Cecil County. A number of other critical state highways serve both local and regional traffic.

| TABLE 1 | | Average Daily Traffic (ADT) |
|----------|---------------------------------|-----------------------------|
| Location | | Year 2000 |
| 1 | I-895/I-95 split North to I-695 | 154,000 |
| 2 | I-695 to MD 43 | 165,000 |
| 3 | MD 43 to MD 152 | 160,000 |
| 4 | MD 152 to MD 24 | 145,000 |
| 5 | MD 24 to MD 543 | 114,000 |
| 6 | MD 543 to MD 22 | 96,000 |
| 7 | MD 22 to MD 155 | 83,000 |
| 8 | MD 155 to MD 222 | 77,000 |
| 9 | MD 222 to MD 272 | 75,000 |
| 10 | MD 272 to MD 279 | 75,000 |
| 11 | MD 279 to Delaware state line | 67,000 |

- US 40 – A four lane principal arterial highway paralleling the JFK to the east, from Baltimore City to Wilmington, Delaware. Recent localized improvements enhance the “people-friendly” scale of the highway. Improvements have included sidewalks, lights, and landscaping. This highway traverses much of the continent, from the Boardwalk in Atlantic City, New Jersey to just east of Salt Lake City, Utah. US 40’s western terminus was once the Golden Gate Park in San Francisco, California.
- MD 7 – A two lane, collector roadway completed in 1938, parallels the JFK to the east from Baltimore City to Elkton in Cecil County. Also known as Philadelphia Road, MD 7 merges into US 40 from Aberdeen to Havre de Grace in Harford County.
- US 1 – A four to six lane principle arterial highway paralleling the JFK to the west extending from Washington, D.C. to Pennsylvania. The Conowingo Dam, which opened in 1928, is located to the west of Havre de Grace and carries US 1 across the Susquehanna River.





Trucks - The percent of trucks within the JFK traffic stream is generally higher than the percent of trucks traveling on comparable statewide facilities. Truck volumes remain steady throughout the day accounting for approximately 10% to 15% of the total weekday traffic along the JFK, but only 5% of the peak period traffic. Trucks constitute approximately 5% to 6% of the total weekend traffic.

Vehicle Occupancy - During a weekday peak hour count sampled in April 2001, approximately 12% to 16% of passenger vehicles on the JFK had an auto occupancy of two or more occupants north of MD 43 (White Marsh Boulevard). This percentage increased to 27% during the mid-day hours. A concurrent sample taken at the JFK toll plaza indicated that 32% to 37% of the peak period weekday passenger vehicles carried two or more occupants. During a sample count on a weekend afternoon in May 2001, 66% of the vehicles on the JFK at the toll plaza had two or more occupants.

Measure - Level of Service (LOS) is a quality measure describing operational conditions within a traffic stream, based on indicators such as travel speed, travel time, delay, freedom to maneuver, comfort and convenience. Six levels of services are defined, ranging from A to F (**Figure 4**). For freeway segments, LOS A describes free flow operations, where drivers are almost completely unimpeded in their ability to maneuver within the traffic stream and travel at the posted speed. LOS E describes operation at the capacity of the roadway. Under these conditions, vehicles are closely spaced and have little room to maneuver within the traffic stream. Although able to travel at relatively high speeds, the level of comfort afforded the driver at LOS E is poor and minor incidents may precipitate a breakdown in vehicular flow. LOS F describes breakdowns in vehicular flow, when demand exceeds the available roadway capacity.

Existing (2000) conditions

The northbound JFK, from the I-895 split to north of MD 43 is operating at LOS E/F each weekday evening and the southbound JFK, from north of MD 43 to the I-895 split is operating at LOS E/F each weekday morning. **Figure 5** depicts the existing (2000) and future (2020) LOS for both weekday and weekend peak traffic periods.

2. Travel Demand Model

Travel demand models are used to assess the impact of major transportation improvements. These computerized models use various inputs to replicate the existing transportation system and forecast future traffic volumes. Model inputs include socio-economic, roadway and transit data. The socio-economic data includes households, population and employment by type. The model generates the number of trips to and from small study areas called transportation analysis zones (TAZs). The models forecast traffic volumes through an iterative process taking into account the highway network, roadway capacity, speed, costs, transit service and accessibility and availability and parking costs. Information on travel demand forecasting and model assumptions can be found in the “I-95 Master Plan Study, I-95 Travel Demand Forecasting Methodology,” June 2001 Report.

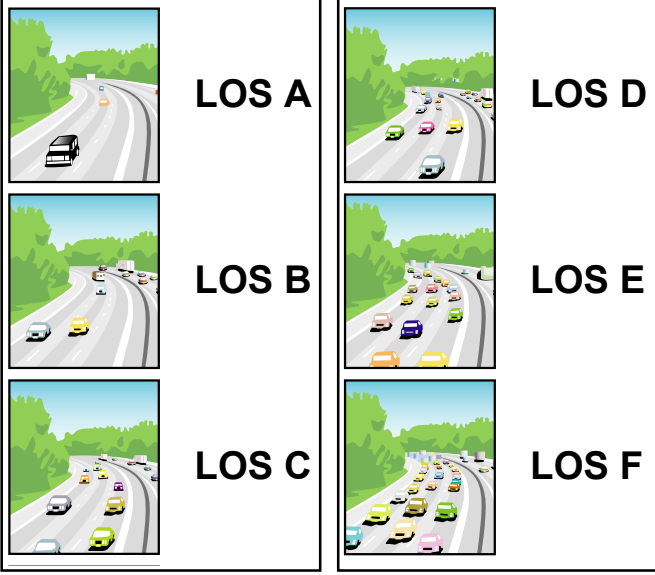
Model Assumptions - The transportation evaluation of the study area utilized design year (2020) travel demand forecasts based on the Baltimore Regional Transportation Board (BRTB)/Baltimore Metropolitan Council’s (BMC) and the Wilmington Area Planning Council’s (WILMAPCO) latest approved travel demand models as of the October 2000 Scoping Workshop. The portions of the study area within each Metropolitan Planning Organization’s (MPO’s) model area are shown in **Figure 1, Page 6**.

Socio-Economic Forecast - Baltimore, Harford and Cecil Counties are non-attainment areas for ozone. Non-attainment areas do not meet federal standards as defined by the National Ambient Air Quality Standards (NAAQS). The Baltimore Regional Transportation Board (BRTB), which includes Baltimore and Harford Counties in their cachment area, and the Wilmington Area Planning Council (WILMAPCO), which includes Cecil County in its cachment area, are the metropolitan planning organizations (MPOs) responsible for preparing plans to improve regional air quality. These plans are evaluated based on air quality models, which have a transportation element. Due to the non-attainment status of the counties in these regions, only MPO approved model inputs as of October 2000 were used. The following socio-economic databases were included in the transportation demand model for the study:

- Baltimore Regional Transportation Board/Baltimore Metropolitan Council (BRTB/BMC) Round 5B (approved July, 2000)

FIGURE 4

Levels of Service (LOS)



There are six Levels of Service (LOS) categories ranging from A to F.

- Wilmington Area Planning Council (WILMAPCO) MTP (approved March, 2000)

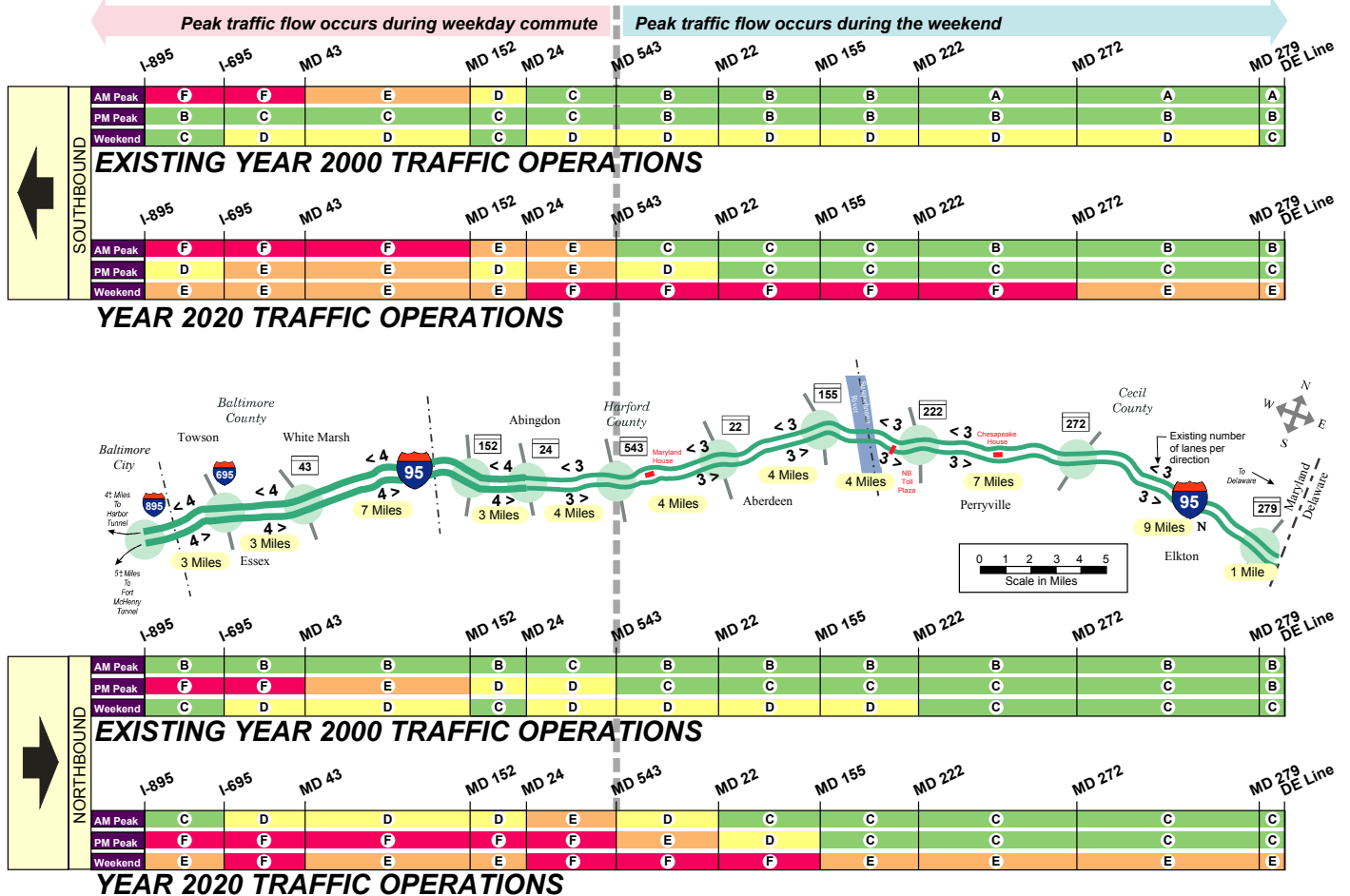
The combined MPO forecasts predicted the following growth rates for the study area between 2000 and 2020:

- Baltimore County: 9% increase in the number of households and 15% increase in employment;
- Harford County: 29% increase in the number of households and 33% increase in employment;
- Cecil County: 28% increase in the number of households and 15% increase in employment.

Base Roadway Network: The study's travel demand model assumed a base roadway network in accordance with the latest approved constrained long-range plan (CLRP) transportation networks (approved by the MPOs as of October, 2000). The existing (2000) highway network and the following improvements to roadways within the study

FIGURE 5

Levels of Service Within the JFK Study Area



Existing and projected levels of service within the study area by roadway segment, direction of travel, and time of travel.



area were included in the travel demand model's base roadway network:

- I-695 from I-95 to I-83 widened from 6 to 8 lanes,
- MD 43 extended to MD 150 (Eastern Blvd) with 4 lanes,
- MD 7 from MD 543 to MD 159 widened from 2 to 4 lanes,
- US 1 from Baltimore County line to MD 147 widened from 4 to 6 lanes,
- US 1 from MD 147 to Hickory widened from 2 to 4 lanes,
- MD 152 from Edgewood Arsenal to US 40 widened from 2 to 4 lanes,
- MD 152 from I-95 to MD 147 widened from 2 to 4 lanes,
- MD 7 from MD 43 to Campbell Boulevard widened from 2 to 4 lanes,
- MD 272 from I-95 to Northeast Creek widened from 2 to 4 lanes,
- MD 24 from Singer Road to MD 7 widened from 4 to 6 lanes, and
- MD 543 from MD 136 to I-95 widened from 2 to 4 lanes.

The assumed base roadway network used in the study's travel demand model did not include planned JFK improvements, although the approved CLRP, as of October 2000, assumed the following improvements:

- I-95 from I-695 to MD 24, Addition of 1 HOV lane (BRTB/BMC),
- I-95 from MD 24 to MD 22, Addition of 1 General Purpose (GP) lane (BRTB/BMC), and
- I-95 from Susquehanna River to Delaware state line Addition of 1 GP lane (WILMAPCO).

Base Transit Network: The study's travel demand model assumed a base transit network in accordance with the latest CLRP transportation network (approved by the MPOs as of October, 2000). The existing transit network and the following improvements to transit services within the study area were included in the base transit network:

- Express Bus Service: Bel Air to White Marsh,
- Express Bus Service: Bel Air to Hunt Valley,
- Express Bus Service: Bel Air to Towson,
- Express Bus Service: White Marsh to Harford County, and
- Circulation Bus Service: White Marsh Loop.

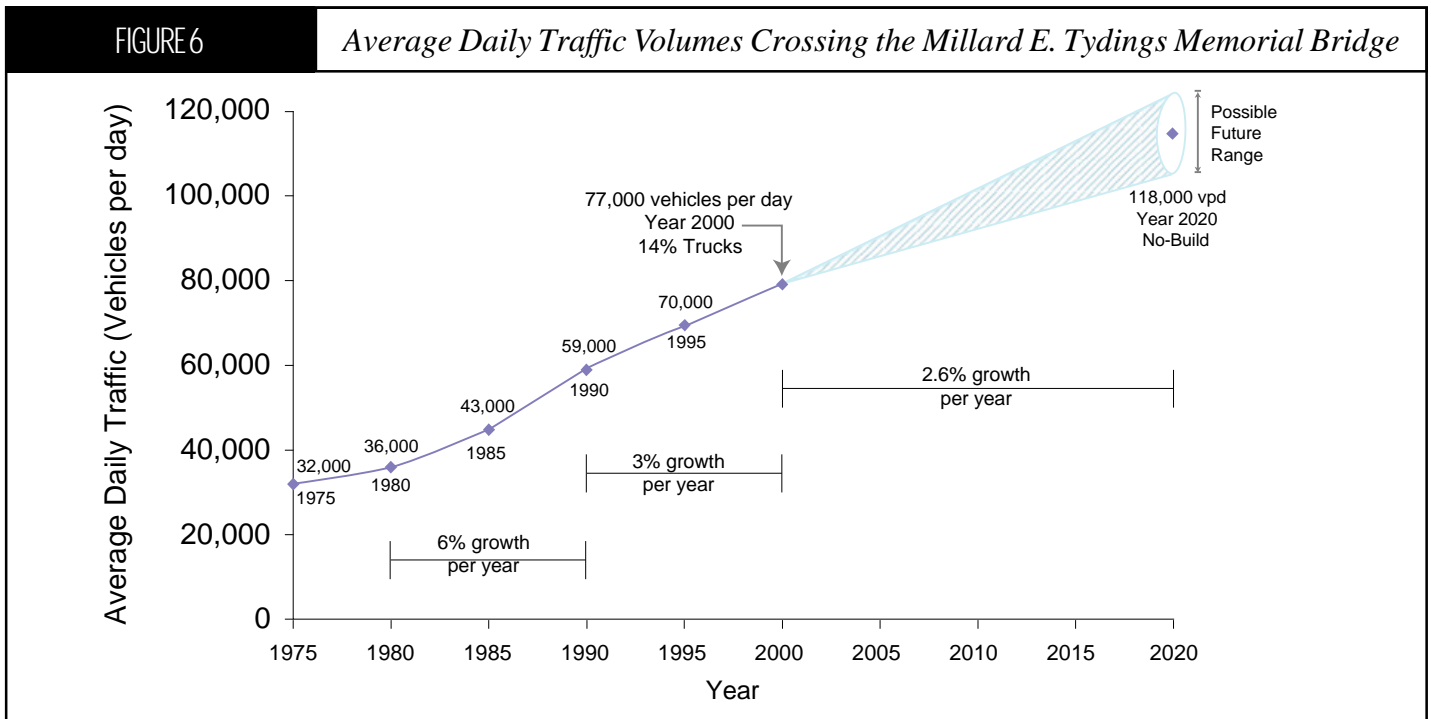
Enhanced Transit Network: Transit services that were not included in the CLRP were included in some of the travel demand models to evaluate the effects of an enhanced transit system. The enhanced transit network assumed the following transit improvements which are subject to funding availability and the outcome of future studies by the Maryland Transit Administration (MTA), Delaware Department of Transportation (DelDOT), South Eastern Pennsylvania Transportation Authority (SEPTA), the local jurisdictions and others:

- Light Rail from downtown Baltimore to White Marsh (Note: MTA's current Regional Rail Plan anticipates the alignment of this rail transit connection would be adjacent to Perring Parkway);
- Reduction in headways for express bus service Route 410, 411, and 420;
- Express Bus Service: White Marsh to Hunt Valley;
- Express Bus Service: White Marsh to Towson;
- Express Bus Service: White Marsh to Owings Mills;
- Express Bus Service: White Marsh to Woodlawn;
- Circulation Bus Service: Edgewood;
- Circulation Bus Service: Bel Air to Abingdon;
- Circulation Bus Service: Bel Air to Forest Hill;
- Enhanced Maryland Rail Commuter (MARC) Commuter Rail Service including feeder buses;
- Unconstrained parking at rail stations; and
- Extension of SEPTA R-2 Service to Elkton, Maryland.

3 Design Year (2020) Traffic Volumes

In the 1970s and 1980s, traffic growth on I-95 within the study area averaged approximately 6% per year. In the 1990s, traffic growth averaged 3% per year (**Figure 6**). The travel demand models project a decreasing traffic growth rate continuing the trend, over the next two decades, approximating an average 2020 annual growth rate of 2.6%.

A No-Build travel demand model assuming no improvements to the JFK was developed. The average annual daily traffic (ADT) volumes forecast ranges from approximately 231,000 vpd between I-695/Beltway and MD 43/White Marsh Boulevard, to approximately 108,000 vpd at the Delaware state line; an increase of 40% and 61% above existing conditions, respectively. **Table 2** lists existing (2000) traffic volumes, anticipated traffic volumes for the design year (2020), and the anticipated year in which LOS F conditions will be reached.



Average daily traffic volumes crossing the Millard E. Tydings Memorial Bridge provide a typical example of volumes within the JFK study area.

Weekday

Analyses indicate that in 2020, during weekday peak periods, the JFK south of MD 24 would be operating at or above its theoretical capacity. During the AM peak hour, the southbound JFK would operate at LOS F between I-895(N) and MD 152, and LOS E between MD 152 and MD 543. During the PM peak hour, the northbound JFK would operate at LOS F between I-895(N) and MD 543 and LOS E between MD 543 and MD 22.

Weekend

North of MD 543, 2020 weekend peak period traffic volumes along the JFK will continue to exceed 2020 weekday peak period traffic volumes. South of MD 543, weekend volumes are expected to increase significantly with peak period weekend volumes approaching 75 to 90% of peak period weekday volumes. Currently, weekend peak period traffic volumes are approximately 65% of weekday peak period traffic volumes.

By 2020, during the weekend peak period, the JFK is expected to operate at LOS F between MD 24 and MD 272 and at LOS E south of MD 24 and between MD 272 and the Delaware state line.

Future (2020) Conditions

Without improvement, much of the JFK will operate at a LOS E/F during weekday and weekend peak periods. On weekdays, there will be a diversion of commuter trips to parallel routes, such as US 1, US 40 and MD 7. Such diversions will result in congestion along the entire highway network and increase the potential for accidents and delays throughout the transportation system. The duration of at-capacity conditions is likely to increase for weekday operations converting the existing peak hour of travel to an extended peak period of travel (more than one hour).

| Location | Average Daily Traffic | | Year LOS "F" is anticipated |
|-----------------------------------|-----------------------|---------|-----------------------------|
| | 2000 | 2020 | |
| 1 I-895/I-95 split North to I-695 | 154,000 | 220,000 | Existing |
| 2 I-695 to MD 43 | 165,000 | 231,000 | |
| 3 MD 43 to MD 152 | 160,000 | 224,000 | 2005 |
| 4 MD 152 to MD 24 | 145,000 | 208,000 | 2010 to 2015 |
| 5 MD 24 to MD 543 | 114,000 | 175,000 | |
| 6 MD 543 to MD 22 | 96,000 | 145,000 | |
| 7 MD 22 to MD 155 | 83,000 | 127,000 | 2015 |
| 8 MD 155 to MD 222 | 77,000 | 118,000 | 2020 |
| 9 MD 222 to MD 272 | 75,000 | 116,000 | |
| 10 MD 272 to MD 279 | 75,000 | 118,000 | Beyond 2020 |
| 11 MD 279 to Delaware State Line | 67,000 | 108,000 | |

Regional weekend traffic composed of motorists less familiar with the local highway network is not expected to divert to the parallel routes. This will result in extended periods of at-capacity operating conditions on the JFK. **Figure 5, Page 14**, depicts the existing (2000) and future (2020) LOS for both weekday and weekend peak traffic periods (“*I-95 Master Plan Study, I-95 Travel Demand Forecasting Methodology*,” June 2001).

4. Safety

A total of 3,178 accidents were reported to the police for the five-year period beginning on January 1, 1995 and ending on December 31, 1999. The overall accident rate for the JFK [38.0 accidents per 100 million vehicle miles traveled (MVMT)] was 15% below the average rate for similar state maintained highways (44.8 acc/100 MVMT). Fatal and injury accident rates along the JFK were approximately 20% below the statewide average rate. The accident rate for rural sections of the JFK during this study period was 34.6/100 MVMT compared to the average statewide rate of 39.7 acc/100 MVMT. A comparison of accident rates for the Year 1999 for urban highway segments is shown in **Figure 7**.

Candidate Safety Improvement Locations (CSIL) were identified by the Maryland State Highway Administration (MSHA) at or near the nine interchanges between I-695 and MD 272 (**Figure 8**). For the most part, these CSILs are categorized as a secondary concern since the accident rates did not significantly exceed the statewide average rate for similar facilities. CSILs of primary concern were identified at three locations in 1995. These locations

included the MD 24 and MD 543 interchanges and the toll plaza located just south of the MD 222 interchange. Safety improvements were implemented to address these areas of concern and no locations have been designated as primary CSILs since 1995.

Although the JFK is generally a safe facility, as reflected by the current average accident rate, sections of the corridor have, in the past, had significantly higher accident rates than the Statewide average. These sections include areas near interchange ramps, weaving areas, and the toll plaza which have exhibited congestion related accident patterns such as an increase in rear-end, sideswipe, and run-off the road accidents. Safety improvements have been implemented to address these areas of concern. As travel demand on the JFK increases and peak (congested) periods lengthen, opportunities for motorists to enter, exit, and change lanes on the facility will be reduced, increasing the potential for congestion related accident patterns over longer sections of the facility (“*I-95 Master Plan Study, Purpose and Need Statement*,” March 2001).

5. Master Plan Purpose and Need

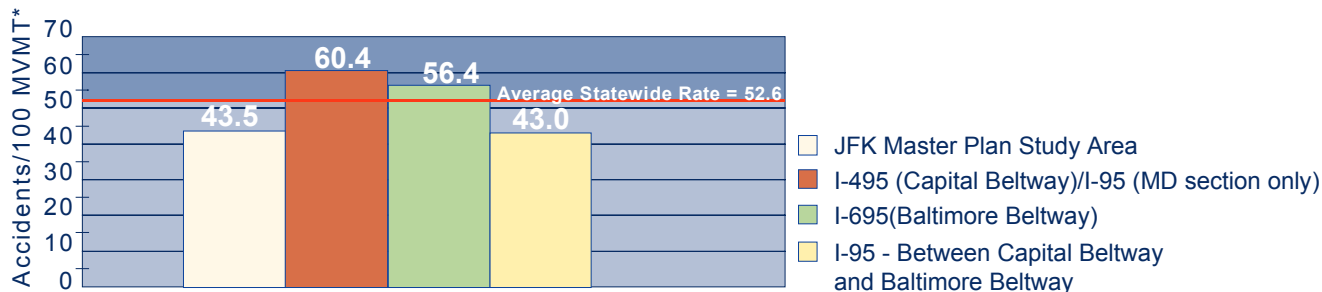
The master plan study provided an opportunity to consider transportation needs and services in a comprehensive manner for the purpose of developing a consistent long-term plan for improvement, enhancement and management of the study area. The study “*Purpose and Need Statement*” describes specific factors including travel demand/LOS, safety, land use/economic development, intermodal connectivity, facility enhancements and other transportation projects that will be used to identify needs.



The Millard E. Tydings Memorial Bridge (located in Master Plan Section 300) provides a north/south connection of I-95 over the Susquehanna River. Photo: Maryland Transportation Authority Archives.

FIGURE 7

Accident Rate Comparison for the Year 1999



Source: Maryland State Highway Administration
Office of Traffic and Safety

* - MVMT = Million Vehicle Miles Traveled

Although I-95 is generally a safe facility, sections of the corridor have had significantly higher accident rates than the statewide average for similar state maintained highways.

6 Identification of Independent Project Sections along the JFK

- Not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.”

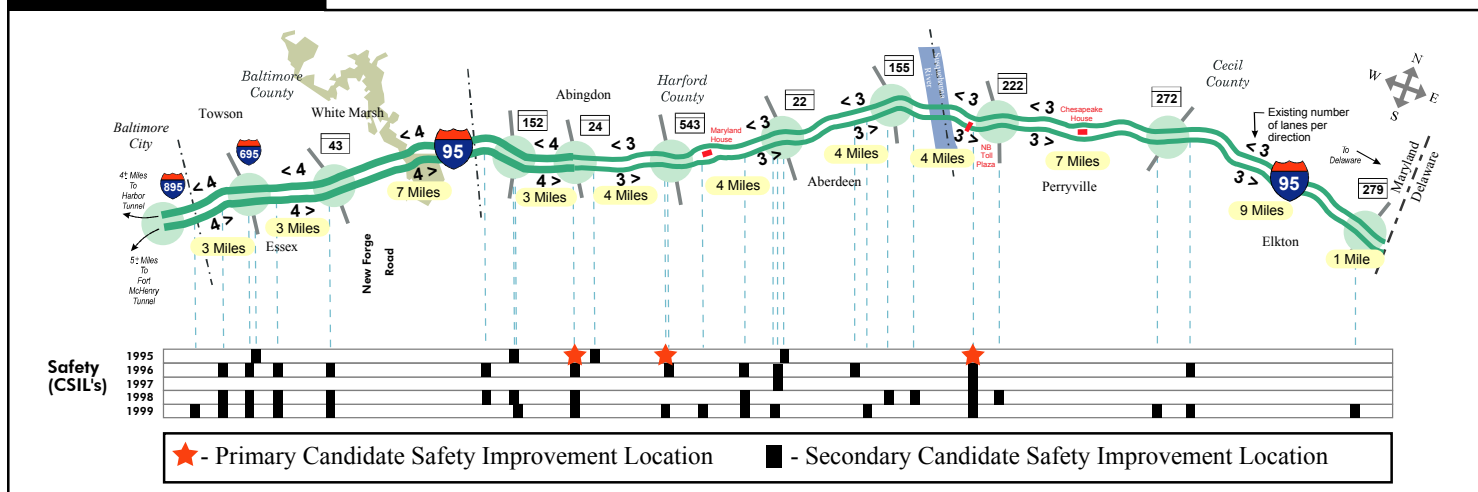
The Federal Highway Administration (FHWA) Title 23 CFR 771.111 (f) states that the following three (3) criteria must be considered to ensure that all transportation alternatives are fully evaluated and to avoid commitments to future transportation improvements before they are fully evaluated. Independent projects must:

When establishing logical termini, FHWA’s Technical Memorandum “Guidance on the Development of Logical Project Termini” (1993) suggests that a “project should satisfy an identified need.” Furthermore, it defines logical termini as “(1) rational end points for a transportation improvement, and (2) rational end points for a review of the environmental impacts,” with the latter frequently covering “a broader geographic area than the strict limits of the transportation improvements.”

- “Connect logical termini and be of sufficient length to address environmental matters on a broad scope;
- Have independent utility or independent significance, i.e., be usable and be a reasonable expenditure, even if additional transportation improvements in the area are not made; and

FIGURE 8

Candidate Safety Improvement Locations (CSILs)



Candidate Safety Improvement Locations (CSILs) have been identified within the JFK study area.



The July 5, 2001 Master Plan Study “A Description of Logical Termini” paper related the logical termini criteria to the Master Plan needs in order to establish rational endpoints for future independent projects within the study area (Figure 9). A full discussion of the project sections can be found in the paper and the July 5, 2001 “Master

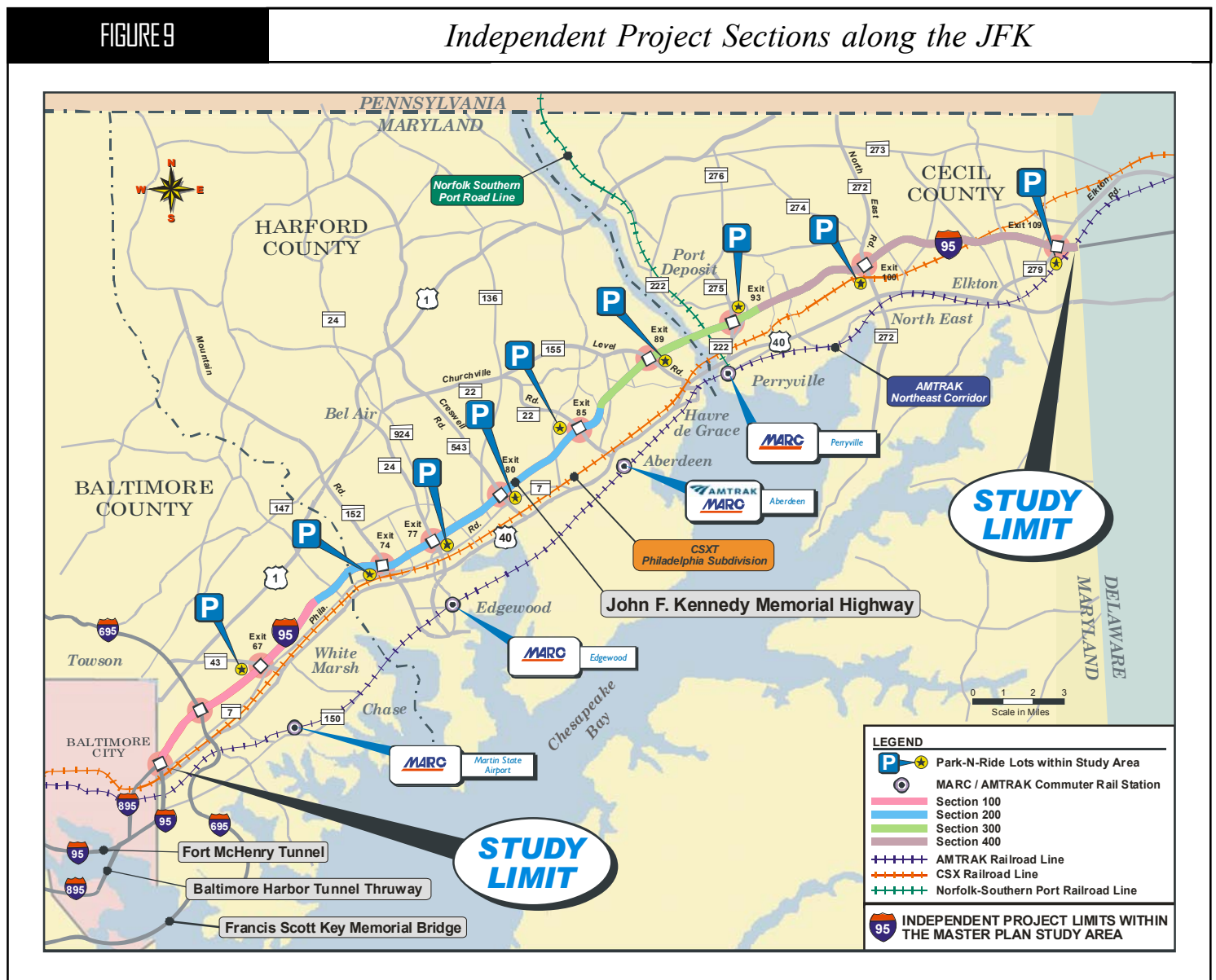
Plan Study Section 100, 200, 300 and 400 Purpose and Need Statements.” Tables 3 and 4 summarize the established project limits, purpose and need for each independent project.

| Section | Project Limit | Project Limit | County(s) | Miles |
|---------|---------------|---------------|---------------|-------|
| 100 | I-895 (N) | N of MD 43 | Baltimore | 8 |
| 200 | N of MD 43 | N of MD 22 | Harford | 17 |
| 300 | N of MD 22 | N of MD 222 | Harford/Cecil | 8 |
| 400 | N of MD 222 | N of MD 279 | Cecil | 16 |

| Section | Purpose and Need Summary | Time of Need |
|---------|--|--------------|
| 100 | Relieve existing congestion. | 2000 |
| 200 | Relieve congestion resulting from long-term traffic trends as well as existing and planned development. | 2005-2015 |
| 300 | Address safety concerns at the Millard E. Tydings Memorial Bridge and the toll plaza. Relieve congestion from long-term regional growth. | 2015 |
| 400 | Relieve congestion resulting from long-term regional growth and anticipated development. | 2020 |

FIGURE 9

Independent Project Sections along the JFK



The JFK study area contains four sections, each of which will be addressed as an independent project. Current locations of Park-N-Ride Lots and MARC/AMTRAK Commuter Rail Stations within the entire JFK study area are also shown.



C. HIGHWAY CONCEPTS

I. 2020 Travel Demand Forecasts

Seven travel demand models (scenarios) were developed to evaluate future traffic operations along the JFK under a variety of transportation system conditions. Average daily traffic (ADT), weekday AM peak hour, weekday PM peak hour and weekend peak hour traffic volumes were forecast for each of the seven scenarios. The seven scenarios are identified by letter (A through G). Five of the seven scenarios (C through G) assume JFK highway improvements. The seven scenarios represent a broad grouping of possible solutions to the identified transportation needs (“I-95 Master Plan Study, I-95 Travel Demand Forecasting Methodology,” June 2001).

A conceptualized flow diagram for the highway/transit relationship in the travel demand modeling process is shown in **Figure 10**. Please refer to **Section B.2** for descriptions of the base roadway and transit networks and the enhanced transit network.

The seven scenarios are:

Scenario A-The base roadway (no JFK improvements) and transit network, demand constrained by roadway capacity.

Scenario B-The base roadway (no JFK improvements) and enhanced transit network, demand constrained by roadway capacity.

Scenario C-The base roadway and transit network with improvements to the JFK, demand unconstrained by roadway capacity.

Scenario D-The base roadway and transit network with managed lane improvements to the JFK, demand constrained by roadway capacity.

Scenario E-The base roadway and enhanced transit network with an HOV lane on the JFK, demand unconstrained by roadway capacity.

Scenario F-The base roadway and enhanced transit network with managed lane improvements to the JFK, demand constrained by roadway capacity.

Scenario G-The base roadway and transit network with the JFK tolled along its entire length, demand unconstrained by roadway capacity.

The traffic volumes forecast for the seven scenarios are presented in **Tables 5 through 8**.

The following terms are referenced in **Tables 5 through 8**:

Screenline: An imaginary continuous line drawn across two or more roads, each road providing access to/from a common region. The traffic volumes on each of the roads intersecting the imaginary line can be added together to determine the total volume of traffic entering or leaving the region, regardless of the specific road chosen by each motorist. For example, a residential community may have three roads connecting it to an interstate facility, one carrying 2,000 vehicles per day (vpd), one carrying 5,000 vpd and one carrying 10,000 vpd. A screenline drawn across these three roads would show that a total of 17,000 vpd travel between the community and the interstate, regardless of the road traveled. For the study area, screenlines are an effective tool in analyzing traffic patterns because the JFK is accessed by many roads originating in a single community or area.

Constrained Forecast: Projected traffic volumes for a road or road network that are based on the limited (i.e., “constrained”) capacity of the road system. Typically, constrained forecasts account for traffic that might be diverted onto adjacent roads, or shifts in travel time or mode as a result of peak period congestion.

Unconstrained Forecast: Projected traffic volumes for a road or road network, based purely on demand. Unconstrained forecasts do not account for capacity constraints of the road system; they simply represent the desired demand of the motorists to get from point A to point B in the shortest amount of time and/or the most direct route.

Table 5: Comparison of Average Daily Traffic Volumes

This table depicts the anticipated year 2020 daily traffic volumes on the JFK, US 1, US 40 and MD 7. Comparing Scenario G to Scenario A indicates that the tolling of all lanes along the JFK would cause numerous motorists to diverge to parallel routes such as US 1, US 40 and MD 7. Traffic volumes on these facilities would increase by 25% to 70% creating operational failures (LOS F) at many of the intersections along those routes. Increased congestion on the parallel routes would increase system wide travel times and make access to adjacent businesses and residences more difficult.

FIGURE 10

2020 Travel Demand Forecasting Model Diagram

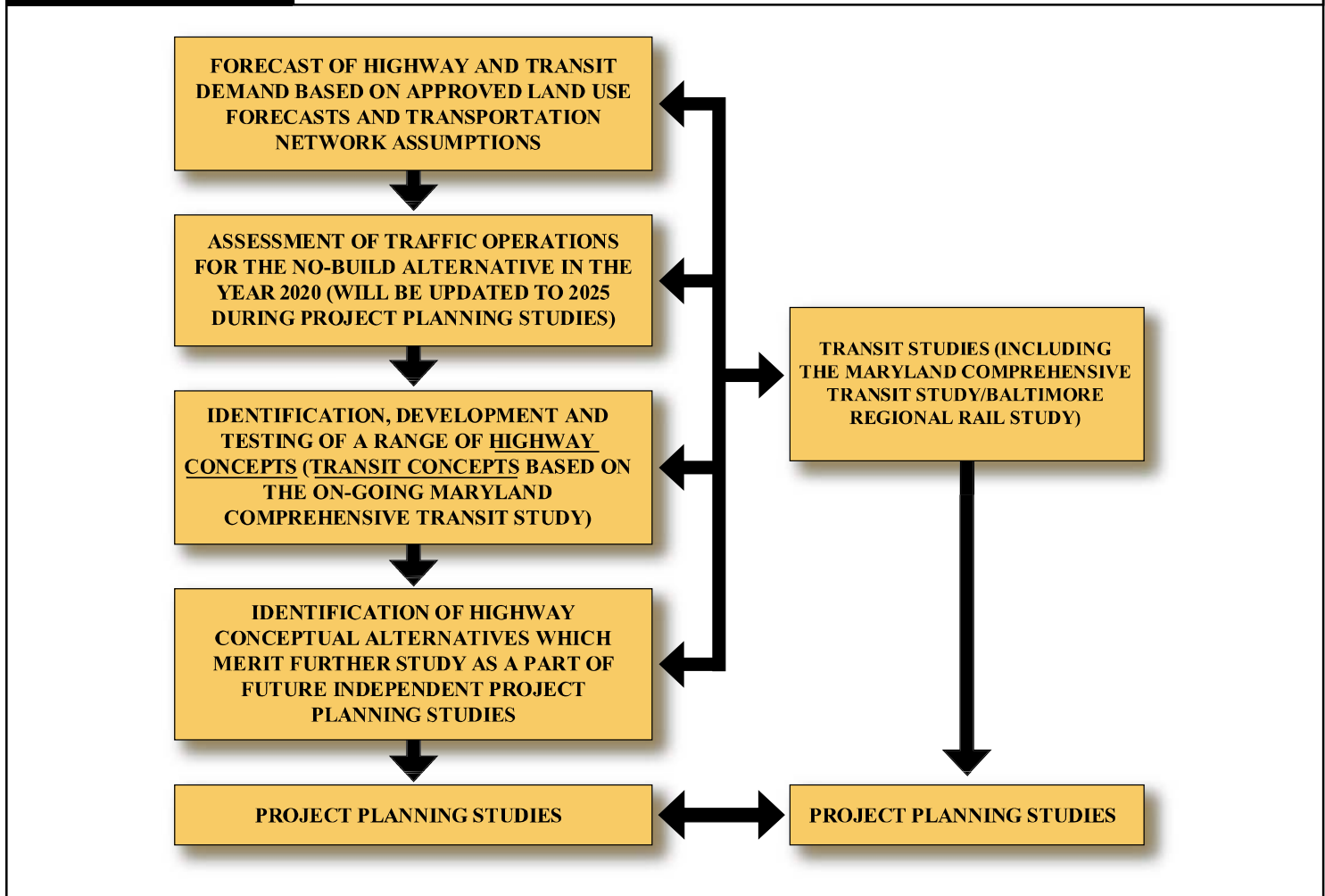


Figure 10 shows a generalized travel demand forecasting methodology. Travel demand models (scenarios) utilized the Baltimore Metropolitan Council's and the Wilmington Area Planning Council's latest approved regional travel demand model.

Table 6: Comparison of Weekday Peak Hour Traffic Volumes - The volumes shown in **Table 6** depict the existing and year 2020 peak hour, peak direction traffic volume forecast for the seven scenarios. The scenarios with no improvements to the JFK have lower peak hour traffic volumes than the build alternatives except for Scenario G. The reduced peak hour traffic volumes reflect a diversion of trips to parallel routes and an expanded peak period. Instead of one peak hour, peak traffic volumes will occur for a period of 3-4 hours. Comparing those scenarios with and without improvements to the JFK the estimated total delay for JFK trips between MD 24 and south of I-695 increase by approximately 16,000 vehicles-hours per day under the no build and build condition.

Table 7: Comparison of Weekend Peak Hour Traffic Volumes - **Table 7** depicts the existing and year 2020 weekend peak hour volumes. These volumes represent the 30th highest weekend hour. Due to the regional (long

distance) nature of trips on the JFK during the weekend and motorists unfamiliar with alternative routes, traffic volumes will stay roughly the same between the seven scenarios. The difference will be in the way the JFK operates with the build scenarios allowing for better levels of service, higher operating speeds and less delay.

Table 8: Comparison of Daily Two Way Transit Trips - The number of transit trips across three screenlines is identified in **Table 8**. Transit trips are anticipated to increase under all scenarios by the year 2020. The enhanced transit network will provide more opportunities and thereby provide higher ridership numbers than the base transit scenarios.

Please refer to **Section B.2** for a discussion of roadway and transit network configurations.



| TABLE 5 | | Comparison of Average Daily Traffic Volumes | | | | | | |
|----------------------------------|-------------------------------------|---|---|--|--|--|--|---|
| Screenline Location ¹ | Existing Daily Traffic Volume (vpd) | Year 2020 Travel Demand Scenarios | | | | | | |
| | | Scenario A (vpd) No-Build Constrained ² Base Transit ⁴ | Scenario B (vpd) No-Build Constrained ² Enhanced Transit ⁵ | Scenario C (vpd) Build Unconstrained ³ Base Transit ⁴ | Scenario D (vpd) Build Constrained ² Base Transit ⁴ | Scenario E (vpd) Build HOV Unconstrained ³ Enhanced Transit ⁵ | Scenario F (vpd) Build Constrained ² Enhanced Transit ⁵ | Scenario G (vpd) Build All Tolled Unconstrained ³ Enhanced Transit ⁵ |
| South of MD 43 | | | | | | | | |
| US 1 | 34,000 | 49,000 | 48,000 | 44,500 | 46,000 | 45,000 | 45,500 | 70,000 |
| I-95 | 165,000 | 231,000 | 227,700 | 243,100 | 238,000 | 236,700 | 233,600 | 160,700 |
| MD 7 | 13,000 | 19,000 | 18,000 | 17,000 | 18,000 | 17,500 | 17,500 | 22,000 |
| US 40 | 34,000 | 46,500 | 45,000 | 41,500 | 43,500 | 42,000 | 43,000 | 53,000 |
| South of MD 24 | | | | | | | | |
| US 1 | 27,000 | 40,000 | 39,500 | 37,000 | 38,500 | 37,500 | 38,000 | 63,000 |
| I-95 | 145,000 | 207,800 | 205,400 | 215,300 | 212,700 | 211,700 | 210,800 | 143,700 |
| US 40 | 25,000 | 35,000 | 34,000 | 31,500 | 32,500 | 32,000 | 32,000 | 50,000 |
| MD 7 | 7,000 | 13,500 | 13,000 | 12,000 | 12,000 | 12,000 | 12,000 | 20,000 |
| At Susquehanna River | | | | | | | | |
| US 1 | 8,000 | 13,000 | 13,000 | 13,000 | 13,000 | 13,000 | 13,000 | 18,000 |
| I-95 | 77,200 | 118,400 | 117,300 | 119,900 | 119,900 | 118,800 | 118,800 | 88,000 |
| US 40 | 25,000 | 35,000 | 34,500 | 34,500 | 34,500 | 34,000 | 34,000 | 46,000 |
| At Delaware state line | | | | | | | | |
| I-95 | 66,600 | 108,300 | 107,000 | 109,200 | 109,200 | 107,900 | 107,900 | 79,000 |

Notes: vpd=vehicles per day

- 1-Screenline - An imaginary straight line which divides an internal study area into parts to compare volumes at a similar location.
- 2-Constrained Forecast - The projected traffic volumes on a facility would be limited by the capacity of the facility
- 3-Unconstrained Forecast - The projected traffic volumes represent the desired demand of motorists to use the facility
- 4-Base Transit - approved transit network
- 5-Enhanced Transit - approved transit network with additional improvements subject to funding availability and the outcome of future studies

| TABLE 6 | | Comparison of Weekday Peak Hour Volumes | | | | | | |
|--|-------------------------------------|---|---|--|--|--|--|---|
| Screenline Location ¹ | Existing Daily Traffic Volume (vph) | Year 2020 Travel Demand Scenarios | | | | | | |
| | | Scenario A (vph) No-Build Constrained ² Base Transit ⁴ | Scenario B (vph) No-Build Constrained ² Enhanced Transit ⁵ | Scenario C (vph) Build Unconstrained ³ Base Transit ⁴ | Scenario D (vph) Build Constrained ² Base Transit ⁴ | Scenario E (vph) Build HOV Unconstrained ³ Enhanced Transit ⁵ | Scenario F (vph) Build Constrained ² Enhanced Transit ⁵ | Scenario G (vph) Build All Tolled Unconstrained ³ Enhanced Transit ⁵ |
| South of MD 43 (Northbound p.m. Peak Hour) | | | | | | | | |
| US 1 | 1,800 | 3,050 | 2,850 | 2,300 | 2,650 | 2,350 | 2,450 | 3,500 |
| I-95 | 9,300 | 10,200 | 10,000 | 12,800 | 11,475 | 11,800 | 11,200 | 9,250 |
| MD 7 | 900 | 1,475 | 1,425 | 1,200 | 1,425 | 1,250 | 1,300 | 1,550 |
| US 40 | 1,600 | 2,700 | 2,450 | 1,950 | 2,400 | 2,050 | 2,300 | 2,850 |
| South of MD 24 (Northbound p.m. Peak Hour) | | | | | | | | |
| US 1 | 1,400 | 2,400 | 2,300 | 1,900 | 2,000 | 1,925 | 1,950 | 2,900 |
| I-95 | 7,150 | 8,875 | 8,750 | 10,250 | 9,900 | 9,950 | 9,725 | 7,300 |
| US 40 | 1,400 | 2,400 | 2,250 | 1,800 | 1,900 | 1,825 | 1,825 | 2,750 |
| MD 7 | 550 | 1,050 | 1,000 | 900 | 900 | 900 | 900 | 1,350 |
| At Susquehanna River (Northbound p.m. Peak Hour) | | | | | | | | |
| US 1 | 450 | 700 | 700 | 700 | 700 | 700 | 700 | 950 |
| I-95 | 3,000 | 4,150 | 4,050 | 4,350 | 4,350 | 4,275 | 4,275 | 3,300 |
| US 40 | 1,200 | 1,750 | 1,700 | 1,700 | 1,700 | 1,650 | 1,650 | 2,100 |
| At Delaware state line (Southbound a.m. Peak Hour) | | | | | | | | |
| I-95 | 1,350 | 2,275 | 2,250 | 2,400 | 2,400 | 2,375 | 2,375 | 1,800 |

Notes: vph=vehicles per hour

- 1-Screenline - An imaginary straight line which divides an internal study area into parts to compare volumes at a similar location.
- 2-Constrained Forecast - The projected traffic volumes on a facility would be limited by the capacity of the facility
- 3-Unconstrained Forecast - The projected traffic volumes represent the desired demand of motorists to use the facility
- 4-Base Transit - approved transit network
- 5-Enhanced Transit - approved transit network with additional improvements subject to funding availability and the outcome of future studies



| TABLE 7 | | Comparison of Weekend Peak Hour Volumes¹ | | | | | | |
|--|---|--|-------------------------------|----------------------------|---------------------------|-------------------------------|-------------------------------|--------------------------------------|
| Location | Existing Peak Hour Weekend Traffic Volume (vpd) | Year 2020 Travel Demand Scenarios | | | | | | |
| | | Scenario A (vph) No-Build | Scenario B (vph) No-Build | Scenario C (vph) Build | Scenario D (vph) Build | Scenario E (vph) Build HOV | Scenario F (vph) Build | Scenario G (vph) Build All Tolled |
| | | Constrained ³ | Constrained ³ | Unconstrained ⁴ | Constrained ³ | Unconstrained ⁴ | Constrained ³ | Unconstrained ⁴ |
| | | Base Transit ⁵ | Enhanced Transit ⁶ | Base Transit ⁵ | Base Transit ⁵ | Enhanced Transit ⁶ | Enhanced Transit ⁶ | Enhanced Transit ⁶ |
| South of MD 43 (Northbound Peak Hour) I-95 | 6,300 | 9,050 | 8,650 | 9,300 | 9,300 | 8,975 | 8,975 | Not Available ² |
| South of MD 24 (Northbound Peak Hour) I-95 | 5,600 | 8,200 | 7,950 | 8,450 | 8,450 | 8,250 | 8,250 | Not Available ² |
| At Susquehanna River (Southbound Peak Hour) I-95 | 4,700 | 6,900 | 6,850 | 7,100 | 7,100 | 7,050 | 7,050 | Not Available ² |
| At Delaware state line (Northbound Peak Hour) I-95 | 4,100 | 6,100 | 6,050 | 6,350 | 6,350 | 6,300 | 6,300 | Not Available ² |

Notes: vph=vehicles per hour

1-Represents approximately the 30th highest hour for the entire year on the weekend

2-Under Scenario G, All lanes Tolled, an assessment of peak period weekend was not completed; see Table 6 for peak period weekday results.

3-**Constrained Forecast** - The projected traffic volumes on a facility would be limited by the capacity of the facility

4-**Unconstrained Forecast** - The projected traffic volumes represent the desired demand of motorists to use the facility

5-**Base Transit** - approved transit network

6-**Enhanced Transit** - approved transit network with additional improvements subject to funding availability and the outcome of future studies

| TABLE 8 | | Comparison of Daily Two Way Transit Trips | | | | | | |
|-----------------|------------------------|--|-------------------------------|----------------------------|---------------------------|-------------------------------|-------------------------------|-------------------------------|
| Location | Existing Transit Usage | Year 2020 Travel Demand Scenarios | | | | | | |
| | | Scenario A No-Build | Scenario B No-Build | Scenario C Build | Scenario D Build | Scenario E Build HOV | Scenario F Build | Scenario G Build All Tolled |
| | | Constrained ¹ | Constrained ¹ | Unconstrained ² | Constrained ¹ | Unconstrained ² | Constrained ¹ | Unconstrained ² |
| | | Base Transit ³ | Enhanced Transit ⁴ | Base Transit ³ | Base Transit ³ | Enhanced Transit ⁴ | Enhanced Transit ⁴ | Enhanced Transit ⁴ |
| South of MD 43 | 3,100 | 6,000 | 9,500 | 5,000 | 5,500 | 7,500 | 8,500 | 14,000 |
| South of MD 24 | 1,200 | 3,500 | 6,000 | 2,500 | 3,000 | 4,500 | 5,500 | 8,000 |
| South of MD 222 | 100 | 300 | 300 | 200 | 300 | 300 | 300 | 800 |

1-**Constrained Forecast** - The projected traffic volumes on a facility would be limited by the capacity of the facility

2-**Unconstrained Forecast** - The projected traffic volumes represent the desired demand of motorists to use the facility

3-**Base Transit** - approved transit network

4-**Enhanced Transit** - approved transit network with additional improvements subject to funding availability and the outcome of future studies



2. Highway Concept Terms

A number of highway improvement concepts have been developed. The following terms are referenced in the following sections:

- **General Purpose (GP) Lanes** - Lanes open to all traffic.
- **Tolled Expressway** - Managed lanes on which vehicles are charged a toll. Electronic monitoring and payment is anticipated.
- **Managed Lanes** - Lanes separated from the GP lanes and operating under some form of restricted use. Management strategies may include restrictions at access locations (i.e., at ramps); restrictions by vehicle class (i.e., cars, buses, trucks, occupancy, commercial); restrictions by time of day; and/or toll options. Managed lanes could potentially have a shared use, such as serving commuter and transit traffic during peak hours and commercial traffic (trucks) only during non-peak hours.
- **High Occupancy Vehicle (HOV) Lanes** - Lanes on which only vehicles with the driver and at least one or more passengers are permitted. Restricted use could be limited to specific time periods.
- **Shared Transit Lane** - Managed lane on which transit vehicles are permitted in combination with another vehicle class. Restricted use could be limited to specific time periods.
- **Truck Only Lanes** - Managed lanes that are restricted to truck use only. Restricted use could be limited to specific time periods.
- **Collector-Distributor (C-D) Roads** - Lanes separated from through traffic where reduced speed merge, diverge and weave movements could occur more safely.

3. Criteria for Evaluation of Highway Modal Concepts

The following criteria was developed to guide the evaluation of the conceptual highway alternatives with the specific goal of improving the John F. Kennedy Memorial Highway (JFK) in a manner that will promote the safe, secure and convenient movement of people and goods for the benefit of the citizens of Maryland (“I-95 Master Plan

Study - Range of Modal Alternatives to be Evaluated during Future Independent Projects,” June 2002).

- Wherever it is anticipated that two or more lanes of new capacity are needed, physical separation between the existing and new lanes and access or use restrictions will be included in the range of alternatives analyzed.
- Identify alternatives that will provide at least a Level of Service (LOS) “E” or better during the weekday peak period for the design year traffic levels and at least a LOS “D” during weekday operations on any new lanes physically separated from the existing lanes and operating under a lane management strategy. During normal (non-holiday/event) weekend peak periods, the goal will be to provide a LOS “D” or better and during peak holiday/event periods the goal will be to provide at least a LOS “E” or better.

4. Highway Concepts

Six (6) conceptual highway alternatives, representing a broad range of potential highway improvements, were developed and evaluated. All concepts were evaluated with base or enhanced transit assumptions (“I-95 Master Plan Study - Range of Modal Alternatives to be Evaluated during Future Independent Projects,” June 2002).

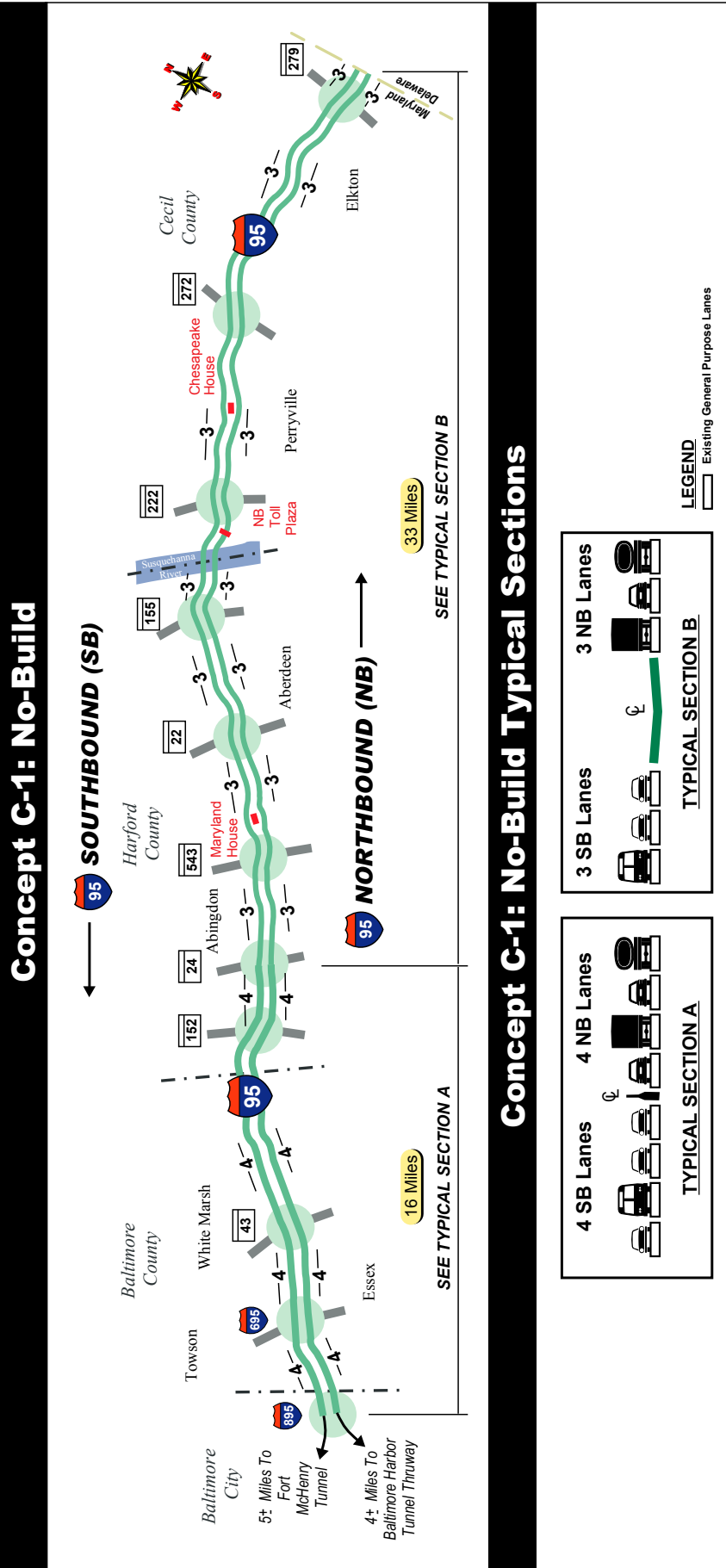
Concept C-1: No-Build - The No-Build concept retains the existing I-95 highway and associated interchanges in their present configurations while allowing for routine maintenance and safety upgrades (**Figure 11**). The existing JFK would remain four lanes per direction from the I-895 (N) split to MD 24, and three lanes per direction from MD 24 to the Delaware state line. Under Concept C-1, there are a total of 326 existing GP lane miles along the JFK.

The analysis of Concept C-1 showed similar results with both the base transit and enhanced transit assumptions (Scenarios A and B). Despite an increase in transit ridership with the enhanced transit assumption, motorists who used parallel routes (US 40, US 1, MD 7), or traveled in an off peak time period would be attracted back to the JFK; therefore, the JFK traffic volume forecast and levels of service remained the same under both base and enhanced transit assumptions.

Concept C-1 is recommended for further evaluation.

Highway Concepts: C-1 - No-Build

FIGURE 11



This concept is recommended for further study.



Concept C-2: All Lanes Tolled - In this concept, all existing and any additional travel lanes throughout the entire 49-mile length of the JFK would be tolled (**Figure 12**). The basic premise of this concept is to reduce pavement expansion by managing the existing travel lanes. In addition, auxiliary (collector-distributor) lanes would be provided to improve traffic operations and safety where needed. This concept assumes four lanes per direction between I-895 and MD 24; and three lanes per direction between MD 24 and the Delaware state line.

Under Concept C-2, there would be a total of approximately 338 lane miles along the JFK, reflecting an increase of approximately 12 lane miles over existing conditions.

Tolling of all lanes, Scenario G, is expected to increase peak hour traffic volumes on parallel routes (primarily US 40, US 1 and MD 7) by 25% to 70% causing operational failures along the entire highway network. Improvements to the parallel routes may increase environmental and community impacts related to transportation needs.

Concept C-2 is not recommended for further evaluation.

Concept C-3: HOV Lanes - This concept includes additional GP lanes between the I-895 split and I-695, one new HOV lane per direction between I-695 and MD 24, and one additional GP lane per direction north of MD 24 (**Figure 13**). HOV lanes are expected to create an incentive for carpooling. However, in this instance, the HOV lanes may have limited value since motorists would be required to cross 3 or more GP lanes in order to access the HOV lane (located adjacent to the median).

Under Concept C-3 there would be a total of approximately 404 GP lane miles and 26 HOV lane miles, reflecting an increase of approximately 104 lane miles over existing conditions.

The existing average auto occupancy rate for vehicles on the JFK exceeds the average rate (11%) for other freeways with existing HOV lanes. Today, vehicles with two or more occupants within the study area comprise 12% to 16% of weekday peak-period traffic (north of MD 43) and 66% of weekend mid-day traffic (Susquehanna River).

The traffic analyses (Scenario E) indicate that during the weekday the peak hour/peak direction traffic in the general use lanes would operate at or above capacity (LOS E and LOS F) in the southern section of the study area (I-895 to MD 543) while the HOV lane would operate between LOS

B and LOS C. In summary, LOS F is anticipated during the weekday on some sections of the GP lanes with no dramatic relief provided by the single HOV lane.

During the weekend peak periods, when the HOV lane is open to all traffic, the JFK is projected to operate between LOS C and LOS E throughout the study area, resulting in somewhat improved traffic operations in comparison to Concept C-1.

Concept C-3 is not recommended for further evaluation.

Concept C-4: Reversible Lanes - This concept includes a two-lane separated and reversible roadway in the median from south of I-695 to MD 543 and one new GP lane per direction north of MD 543 (**Figure 14**). The reversible roadway could be operated as managed lanes (HOV, tolled expressway, or other) in the peak direction during weekday and weekend peak periods.

Under Concept C-4 there would be a total of approximately 392 GP lane miles and 80 reversible lane miles, reflecting an increase of approximately 146 lane miles over existing conditions.

During the weekday, the peak hour/peak direction traffic (Scenarios C, D and F) in the GP lanes is projected to operate at or above capacity (between LOS E and LOS F), while capacity is available in the reversible lanes which are projected to operate between LOS A and LOS B.

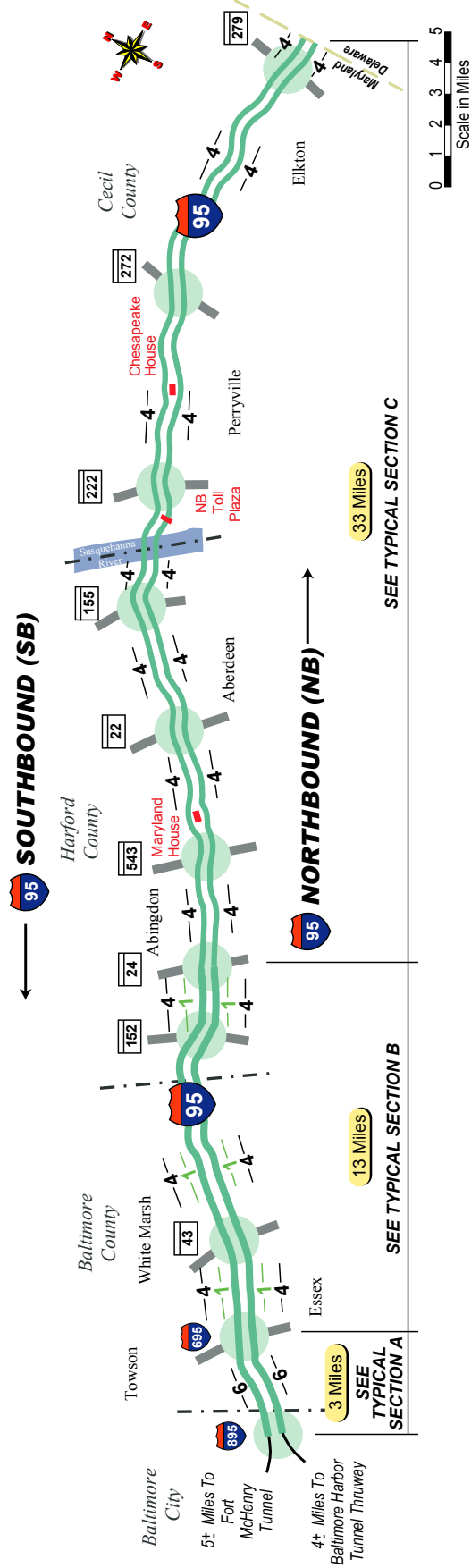
During the weekend, the section south of MD 543 is projected to operate at or above capacity (between LOS E and LOS F) in the direction in which the reversible roadway is not in operation.

It is anticipated that the reversible facility would work well, during weekday peak periods (flow 65% in the peak direction). However, serious operational and maintenance concerns would arise in the southern portion of the corridor during weekend peak periods when peak directions of flow are not established (50% north/50% south). Reversing traffic flow direction may take up to one hour for each four-mile section of roadway and will reduce roadway capacity during flow reversal.

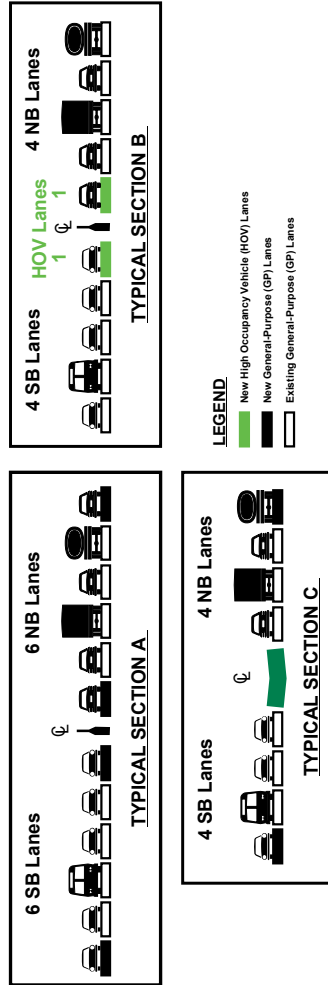
Since the peak traffic volumes on the JFK during holidays and weekends are evenly distributed between directions (50/50 split), this concept does not offer the necessary flexibility for successful traffic management of regional traffic flows. In addition, extensive geometric modifications

Highway Concepts: C-3 - HOV Lanes

Concept C-3: HOV Lanes



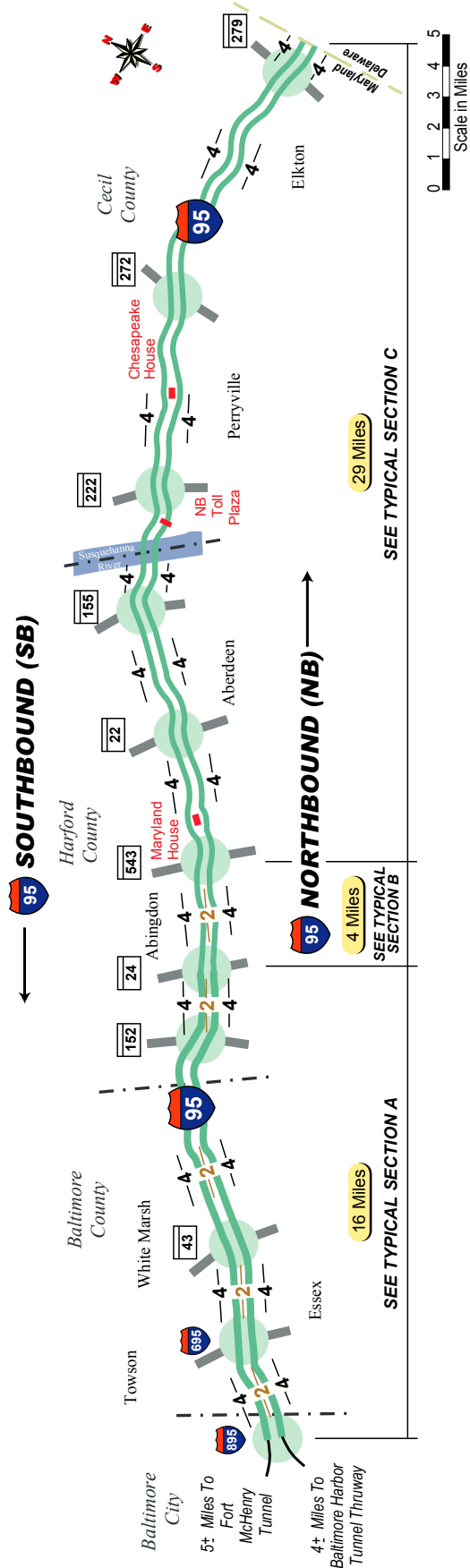
Concept C-3: HOV Lanes Typical Sections



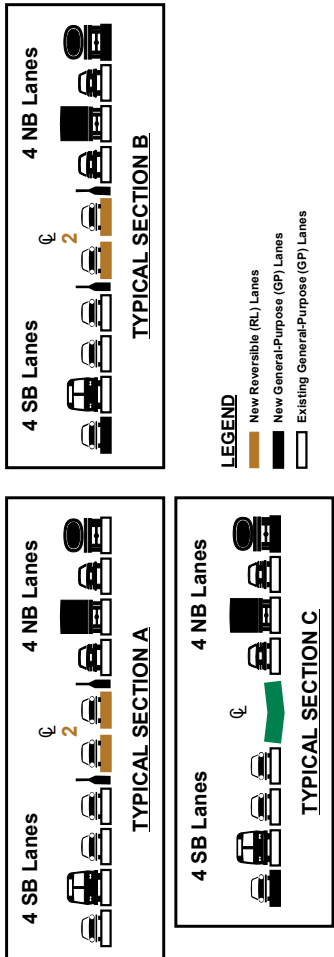
This concept is not recommended for further study.

Highway Concepts: C-4 - Reversible Lanes

Concept C-4: Reversible Lanes



Concept C-4: Two-Lane Separated and Reversible Roadway in Median Typical Sections



This concept is not recommended for further study.



would be essential at connecting interchanges and bridge replacement would be required, incurring substantial cost due to restricted placement opportunities for structural piers.

Concept C-4 is not recommended for further evaluation.

Concept C-5: Managed Roadways - This concept includes two managed lanes per direction between I-895 and MD 543, and one additional GP lane per direction north of MD 24 (**Figure 15**). In addition, a C-D roadway is provided from I-695 to north of MD 43.

The managed lanes could operate under a single management strategy 24-hours per day, or on a “time-share basis” with different restrictions at different times of day. Management strategies could include restrictions at access locations (ramps), by time of day (peak, off-peak), by vehicle type (trucks, buses), by type of use (commercial or occupancy-HOV), by price (tolling) or by direction (reversible). Managed lanes could be designed for flexibility so that management strategies can be modified over time to maximize person moving capacity, optimize vehicle carrying capacity, and achieve transportation and community goals.

Under Concept C-5 there would be approximately 382 GP lane miles, 80 managed lane miles, and 20 C-D lane miles reflecting an increase of approximately 156 lane miles over existing conditions.

During the weekday, the peak hour/peak direction traffic (Scenarios C, D, E, and F) in the GP lanes is projected to operate at or above capacity (between LOS E and LOS F), while capacity is available in the managed lanes which are projected to operate between LOS A and LOS B. Modification of the management strategy to improve the traffic split between the GP and managed lanes should provide a better level of service for all lanes.

During a “time-share basis” scenario evaluated for the weekday a.m. and p.m. off-peak direction a truck only restriction was assumed. Under the off-peak truck only management strategy the GP lanes are projected to operate between LOS C and LOS D and the truck only lanes are projected to operate at LOS A. The operation of the managed lanes on a “time-shared basis” with the proposed trucks only strategy is expected to enhance overall traffic safety by reducing the potential for conflicts between heavy vehicles and passenger vehicles.

During the weekend peak hour, the mainline GP lanes are projected to operate between LOS D and LOS E throughout the corridor.

Although an analysis of Concept C-5 suggests that there is no significant difference in the JFK travel demand between the base transit and enhanced transit assumptions, the enhanced transit network is expected to reduce the JFK travel demand by approximately 700 vehicles during weekday peak periods. Periods of congestion are expected to continue in the GP lanes; however, travel demand management may be achieved through successful operation of the managed lanes.

Concept C-5 is recommended for further evaluation.

Concept C-6: General Purpose Lanes - This concept includes the provision of additional GP lanes as necessary to accommodate the projected traffic demand (**Figure 16**). In order to reach a desirable weekday and weekend LOS E and LOS D, respectively, this concept would provide the following number of lanes per direction: six lanes between I-895 and I-695; five mainline and two C-D lanes between I-695 and north of MD 43; six lanes between north of MD 43 and MD 152; five lanes between MD 152 and MD 543; and four lanes north of MD 543.

Under Concept C-6 there would be approximately 448 GP lane miles and 20 Collector-Distributor lane miles, reflecting an increase of approximately 142 lane miles over existing conditions.

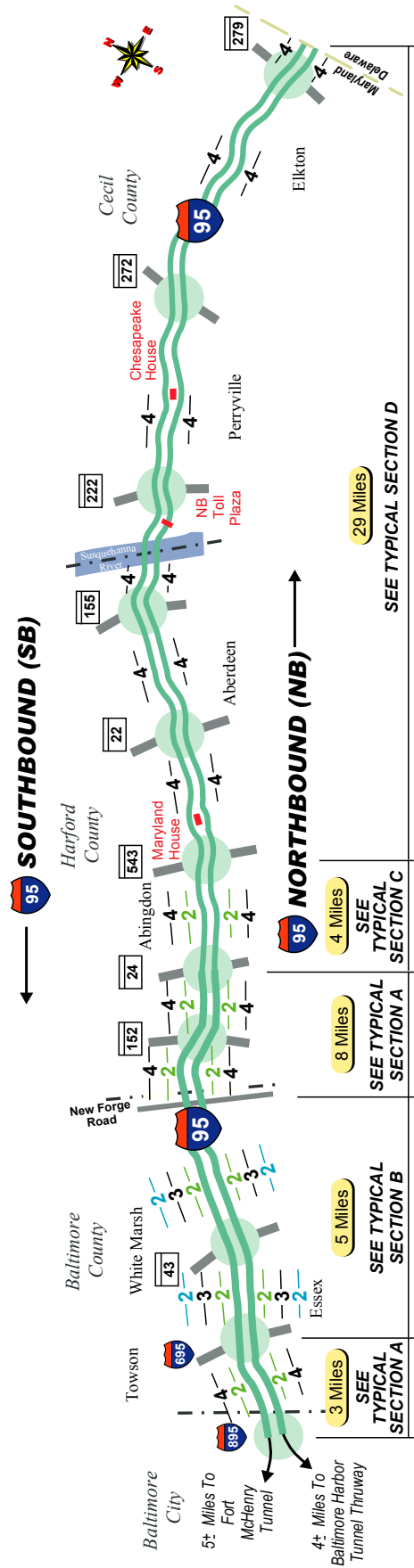
This concept provides good overall traffic operations for both weekday and weekend peak periods. However, due to the number of accessible travel lanes provided, there is no readily available means to implement a travel demand management program and limited incentive for transit or carpooling. It should be noted that the environmental and socio-economic consequences for Concept C-6, could be larger than those anticipated for Concepts C-1, C-3, C-4 and C-5.

Concept C-6 is recommended for further evaluation.

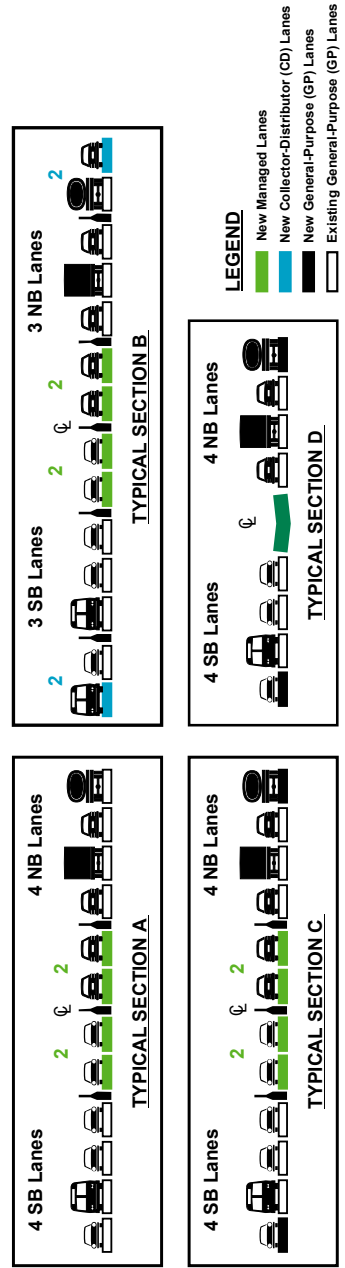
In summary, three highway improvement concepts, C-1 (No-Build), C-5 (Managed Roadways) and C-6 (General Purpose Lanes) were recommended for further study. Although it appears that several concepts have been eliminated, Concepts C-5 and C-6 represent a larger family of alternatives encompassing variations of Concepts C-2 (All Tolloed Lanes), C-3 (HOV Lanes) and C-4 (Reversible Lanes).

Highway Concepts: C-5 - Managed Roadways

Concept C-5: Managed Roadways



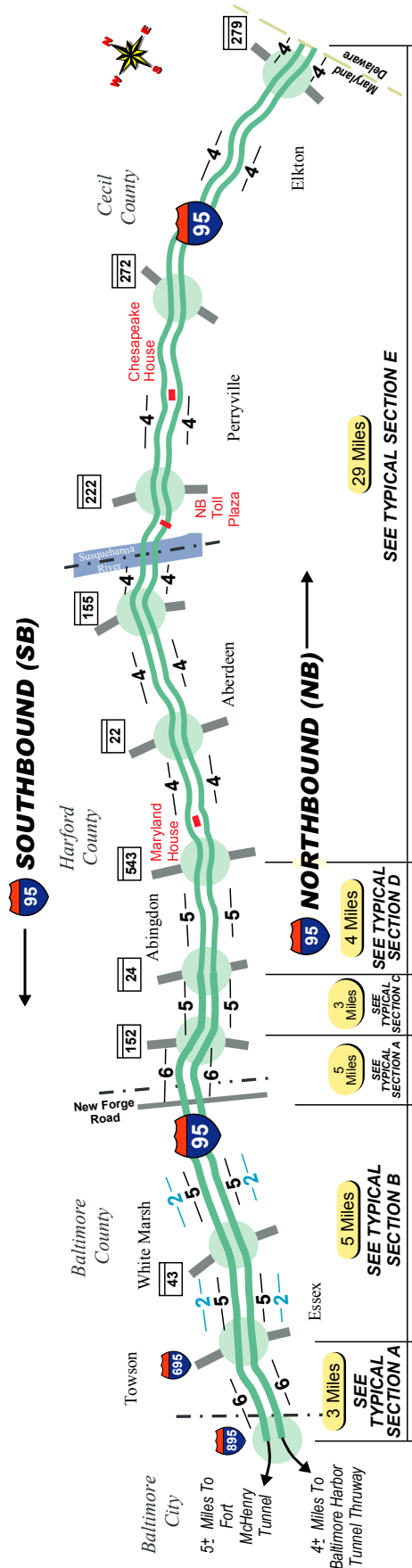
Concept C-5: Separated Two-Lane Managed Roadways in Median Typical Sections



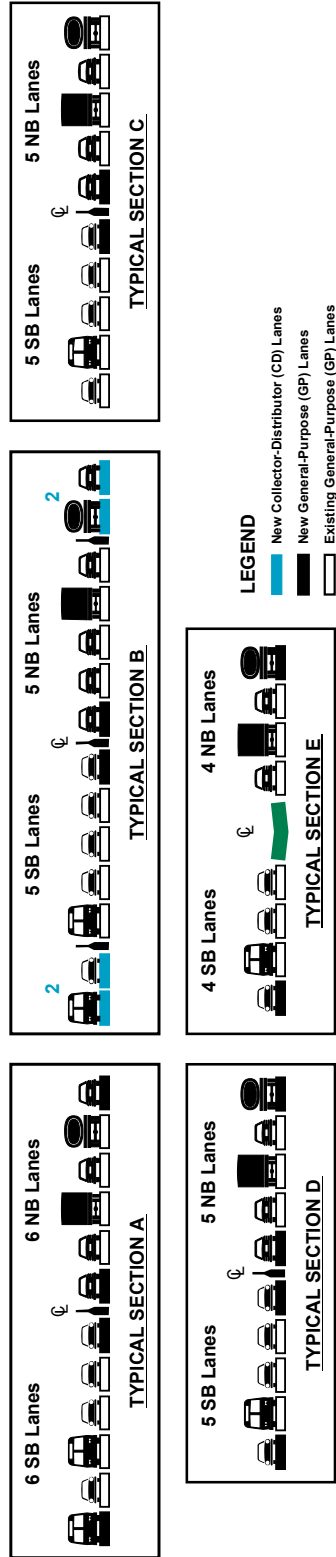
This concept is recommended for further study.

Highway Concepts: C-6 - General Purpose Lanes

Concept C-6: General Purpose Lanes



Concept C-6: All General Purpose Lanes Typical Sections



This concept is recommended for further study.



D. Multi-Modal Considerations

The John F. Kennedy Memorial Highway (JFK) is part of an established multi-modal corridor. Amtrak, Maryland Rail Commuter (MARC) and commercial bus services carry one of every seven passenger trips across the Susquehanna River. Additional bus transit on the JFK is provided by the Maryland Transit Administration (MTA) and the local jurisdictions.

The effect that improvements to the parallel transit systems and facilities would have on highway demand along the JFK was evaluated during the Master Plan Study. Travel demand model results indicate that even if all of the transit alternatives in the regional plan and all of the transit alternatives currently identified by transit providers as potentially reasonable or feasible for future implementation were implemented, there would not be a significant change in the JFK travel demand. It is anticipated that capacity created on the JFK by increased transit use would be absorbed by trips diverted to the JFK from parallel routes, such as MD 7, US 40 and US 1. The transit alternatives provide congestion relief on the parallel routes. Therefore, in addition to transit initiatives, the need for roadway improvements to the JFK remains critical to the preservation of the transportation network within the study area.

I. Passenger Service

a. Amtrak

Improvements in Amtrak service are dependent on larger, national issues and policy decisions, including Amtrak’s fiscal standing. Historically, Amtrak’s NorthEast Corridor (NEC) which parallels the JFK, has been its highest used, most successful rail passenger service. It is anticipated that the market will continue to place a high demand on Amtrak in the NEC, and that improvements will continue to be made, including additional high-speed and regular rail service, station improvements, increased customer amenities, track installation and maintenance, and other operational or infrastructure improvements to enhance performance and reliability.

b. MARC

MTA’s long-term plan for meeting transit needs in the JFK corridor calls for expanding bus service and eventually providing light rail service in the corridor, in addition to supplementing the existing MARC train service. Currently, commuter rail (MARC) averages 400 riders per peak period with station stops at Perryville, Aberdeen, Edgewood, and Martin State Airport (*Figure 9, Page 19*). Most passengers using the service are destined for Union Station in Washington, D.C. Improved connections between Pennsylvania Station in midtown Baltimore and the heart of downtown, which are currently being studied by MTA, could, if implemented, result in increased MARC usage.

c. Private Bus Service

Improvements will be market-based for private sector operators. It is likely that transit scenarios meeting specialized regional needs will continue. Improvements that could enhance services include improved stations, rest area facilities and efficient intermodal connections.

d. Public Transit Service

The improvements to public transit services are dependent on need and funding availability. Highway enhancements such as transit or shared transit preferences and enhanced park-and-ride or transit station access may improve transit use. These transit options if implemented or continued, could improve and maintain the transit share of commuter trips to “urban” areas accessed by the JFK:

- restructured and enhanced services on commuter bus routes;
- extended fixed rail service from Johns Hopkins Hospital to White Marsh;
- increased Maryland Rail Commuter (MARC) and South Eastern Pennsylvania Transportation Authority (SEPTA) R2 services, including additional peak period, midday, evening, and weekend service; and
- enhanced aesthetics, parking and access at transit stations.

Similarly, the following options if implemented or continued could improve and maintain the transit share of commuter trips to “suburban” areas:



- “Access to Jobs” Program - Provides bus and van transportation for urban area residents to access jobs in more suburban and rural areas. For example, this program currently provides Baltimore City residents with access to the growing job markets in Harford and Baltimore counties.
- Suburban Activity Centers Service
 - Provide suburb-to-suburb bus service from I-95/ MD 43 White Marsh area to Towson, Hunt Valley, Owings Mills and other major activity centers.
 - Connect multi-modal centers and regional rail systems.
 - Initiate MARC feeder service to Martin State Airport, Aberdeen, Edgewood and Perryville. (Baltimore Region Rail System Plan, June, 2002).
 - Expand service on SEPTA’s R2 line.
 - Expand neighborhood shuttle and circulator service to Edgewood, Bel Air/Abingdon, Bel Air/Forest Hill, Foxridge (White Marsh) and Hawthorne (White Marsh).
- Expansion of existing services, increasing hours of operation, and days of service.
- Expansion of County-Wide Deviated Fixed Route Service. Expand service to Conowingo, Port Deposit, Perryville, and Chesapeake City (typically a bus route, from which drivers may deviate when telephoned requests for “front door” service are received).

The following system-wide transit enhancements which may apply to multiple modes of transit in the study area are being implemented or are under consideration by state, regional and local transit operators:

- Smart Card Technology – A fare card that could be used to pay for all transit fares. Ultimately, the card could be used interchangeably for other purchases, much as credit cards are used today.
- Security Enhancements - Improved lighting at stations, bus stops, and park-and-ride lots; video surveillance cameras; and additional transit police.

- Marketing and Customer Information – Improved provisions of readily available and understandable route maps and timetables; bus stop and station signing; web pages and kiosks with real time transit information; and increased marketing of transit. For example, “Talking buses” which provide passenger information have been added to the MTA bus fleet.
- Improved Bus Stops and Shelters – Improved shelters, bike racks, sidewalks and concrete waiting areas, landscaping, and customer information to facilitate pedestrian and bicycle access.
- Bus Rapid Transit - Bus transit lanes, priority treatment in congested areas and signal pre-emption and queue jumper lanes are under consideration in the Baltimore and Washington urban areas.

2. Freight Rail Service

Freight rail service in the study area is provided by three major rail lines: Amtrak’s North East Corridor (NEC), CSX Transportation’s (CSXT) Philadelphia Subdivision, and Norfolk-Southern’s (NS) Port Road Line (**Figure 9, Page 19**). Amtrak’s service is limited to high priority/low bulk and weight packages. CSXT and NS operate 60 to 70 freight trains per day within the study area. In the vicinity of the JFK, forty-six of every 100 tons of freight carried across the Susquehanna River are carried by rail.

The MTA and the Maryland Port Administration (MPA) are participating in regional initiatives to enhance and expand long and short-haul freight rail service. Additionally, equipment, control, and infrastructure improvements are under consideration by the private freight rail operators. These initiatives are included in the Mid-Atlantic Rail Study, prepared for the Freight & Passenger Subcommittee of the I-95 Coalition. The study group, comprised of representatives from Amtrak, Norfolk-Southern and CSX, as well as state Departments of Transportation (DOT) in the mid-Atlantic region, identified major freight rail and passenger bottlenecks and potential solutions paralleling the north-south corridors of I-81 and I-95.



3 Facility Enhancements

a. Truck Operations

Truck volumes on the JFK account for approximately 10% to 15% of the total weekday traffic but only 5% of peak period traffic. Trucks constitute approximately 5% to 6% of the total weekend traffic. The Authority currently provides truck parking at the Maryland and Chesapeake House travel plazas.

Currently, there are 1,675 private and 192 public parking spaces for trucks along the JFK. Field observations indicate that there is typically a surplus of private parking spaces along I-95 at night, while trucks are parked illegally along highway shoulders and at public rest areas, particularly the Baltimore Beltway (I-695) and the Maryland House.

Recent initiatives have been implemented in Maryland to increase the availability of adequate truck parking spaces including:

- Permitting trucks to park at weigh stations,
- Improving signs for truck facilities, and
- Developing and distributing a truck map noting the location of parking facilities and amenities.

On the JFK, expansion of parking areas, provision of full shoulders for emergency pull-offs, highway signs, development of maps, and other truck operation enhancement services may improve highway safety.

b. Bike/Pedestrian Accommodations

Maryland Transportation Code, Annotated, Sections 2-601 thru 2-607, "Bicycle and Pedestrian Access," generally states that access by pedestrian and bicycle riders shall be considered in all phases of transportation planning. Md. TR Code, Ann., Section 21-1405 prohibits pedestrians and bicyclists on the JFK and other toll facilities. The JFK's high-speed access controlled operation is not conducive to safe operation of a conjoined pedestrian and bicycle facility. However, the bicycle and pedestrian crossings of the JFK are maintained to facilitate bicycle and pedestrian trail integrity.

The East Coast Greenway is a proposed 2,600-mile multi-modal transportation corridor for non-motorized users

connecting the East Coast states from Florida to Maine, paralleling I-95 and the Appalachian Trail. Planning efforts for the Greenway have attempted to address bicycle and pedestrian access needs through the use of current highway, trail and rail rights-of-way that are accessible and potentially underutilized. The exact route and alignment of the East Coast Greenway has not been determined.

4. Intermodal Connectivity

a. Port, Rail and Airport Connectivity

The JFK provides access to or supports the larger transportation system including transit systems, the local commuter rail system (MARC), the national railroad systems (CSXT, NS and Amtrak), Baltimore Washington International (BWI) and Martin State Airports, and the Port of Baltimore. Improving service, accessibility and utilization of non-highway transportation systems for the transport of people and goods will help meet anticipated transportation needs.

South of the study area, the BWI Airport hosts fifty airlines that handle approximately 250,000 tons of air freight and serve approximately 48,000 passengers per day. Five miles east of the study area, Martin State Airport in Baltimore County supports general aviation and air freight transport services. Continued and successful growth of both airports is highly dependent on efficient surface transportation links such as the JFK.

The Maryland Port Administration (Port) operates six (6) major truck/rail/water terminals at the Port of Baltimore, including Seagirt Marine Terminal, Dundalk Marine Terminal, North Locust Point, South Locust Point, Fairfield Auto Terminal and the Seagirt Intermodal Container Transfer Facility. The Port of Baltimore processes more than 30 million tons of containerized goods annually and is regarded as one of America's top container terminals. This is due, in large part, to the proximity and accessibility of an efficient and convenient highway and rail network. The Port generates \$1.4 billion in annual revenue and employs nearly 127,000 Marylanders. The continued growth and prosperity of Port facilities is dependent on the provision of high quality surface transportation services such as the JFK.



b. Park-and-Ride Access

Park-and-ride lots exist in close proximity to every JFK interchange, except at the I-695 and I-895 interchanges (*Figure 9, Page 19*). Access from the JFK to the park-and-ride lots facilitate travel demand programs such as ride-sharing, and car-pooling.

c. Travel Plazas

The JFK's two travel plazas, the Maryland and the Chesapeake House, provide an array of services to motorists. In addition to food and automotive services, comprehensive tourist-information services are available. The Maryland House offers a full-service business and information center, which includes fax and photocopy services, an ATM and U.S. Postal Service branch. Nearly 5.4 million customers visited the Authority's Maryland House and Chesapeake House Travel Plazas in the year 2001. To provide better service to these travelers, the Authority has made extensive improvements to both facilities. Efforts at the Chesapeake House included new landscaping that enhances the beauty of the complex and reduces maintenance requirements, new trash receptacles, upgraded signs and new benches. Improvements at the Maryland House included new landscaping, resurfacing of parking lots, repaving of ramps and structural upgrades to the building.

d. Operations and Maintenance

Operations and maintenance activities are expected to increase over time as travel demand increases and security measures resulting from "homeland protection" directives are implemented. Preliminary investigation indicates that the JFK may need one additional maintenance yard; expansion of existing intelligent transportation systems and emergency response provisions. Operations and maintenance needs will be considered during future project planning studies.

e. Other Transportation Projects

A number of ongoing or recently completed studies have focused on various transportation improvement concepts that could be developed within or near the study area. The future project planning studies will provide an opportunity to consider concepts that provide an integrated, consistent and continuous transportation network throughout the study

area. Current projects and studies include:

- Intelligent Transportation Systems (ITS) Improvements –installation of electronic toll collection, video cameras and other devices to improve highway operations.
- February 1999, Maryland Congestion Management Study (CMS) - Baltimore Regional Transportation Board (BRTB) approved CMS study. The CMS provides a systematic, high-level analysis of causes and solutions to traffic congestion and mobility needs in 28 transportation corridors in Maryland, including the JFK study area.
- Maryland Comprehensive Transit Plan (MCTP), June 2001 - Statewide study prepared by the Maryland Transit Administration (MTA) that provides a framework for long-term development of a comprehensive transit system throughout the state.
- Baltimore Region Rail System Plan, Fall 2002 - MTA region-wide study of potential new high capacity transit corridors.
- Baltimore Region New Corridor Studies - Project planning studies of the Baltimore Region Rail System Plan for a portion of the Green Line. The Green Line includes an extension of the Johns Hopkins Hospital Metro Station to a new terminus at Morgan State University, an extension to White Marsh, an I-95 intermodal station and a Martin State Airport station.
- Bayview MARC Station Feasibility Study – Study of a new MARC Commuter Rail station adjacent to the I-895/Lombard Street ramps and the Johns Hopkins Bayview Campus.
- Maryland Freight Movement Study - MDOT study to consider the needs of the State's freight transport network in systematic terms. Its objectives are to define Maryland's role in regional, national, and global freight movement, evaluate the existing freight distribution network, identify initiatives and prepare an action plan.
- Mid-Atlantic Rail Study -Study performed jointly by five states, the I-95 Corridor Coalition, NS, CSX and Amtrak. The study identified a range of physical and operational improvements to rail corridors paralleling I-95 and I-81. If the identified improvements were implemented,



anticipated results would include improved passenger and freight-rail system safety, speed and reliability; increased competitiveness with trucking to offset highway congestion; and the provision of economic benefits to region’s shippers, businesses and passengers.

5. Intelligent Transportation Systems (ITS)

ITS evolved from the Intelligent Vehicle Highway System mandates of the 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) legislation. ITS is the application of technologies, including information processing, communications, control, and electronics, to transportation systems. ITS utilizes technology to:

- improve safety,
- reduce congestion,
- increase and provide higher quality mobility,
- reduce environmental impact,
- improve energy efficiency, and
- improve economic productivity of transportation systems.

Categories of ITS user services that are either currently in operation on the JFK or will be implemented in the foreseeable future include:

- Commercial Vehicle Information Systems and Networks (CVISN)
- Electronic Toll Collection (ETC)
- Advanced Traveler Information Systems (ATIS)
- Freeway Incident Traffic Management (FITMs)

a. Commercial Vehicle Information Systems & Networks (CVISN)

CVISN is a pilot electronic clearance system that permits state enforcement (police) and transportation agencies to electronically monitor the weight, travel log and permit status of over-the-road commercial vehicles. A vehicle-mounted transponder unit and overhead-mounted receiver units are utilized to identify pre-registered commercial vehicles. Vehicles which meet state established standards may bypass weigh stations reducing wear on truck scales, wear on vehicles, and delays. The southbound JFK weigh station, near the toll plaza, is a “pilot” CVISN implementation site. Future expansion of the CVISN program is expected.

b. Electronic Toll Collection (ETC)

The Authority is one of 17 toll authorities/agencies in the northeastern United States participating in the E-ZPassSM Interagency Group (IAG). The IAG members have worked together to implement a regional network of electronic toll collection systems extending from Maine through Maryland. All 17 IAG members have installed, or are in the process of installing, electronic toll collection systems with compatible technology. As of May 2002, E-ZPassSM is available at all seven of the Authority’s toll facilities.

c. Advanced Traveler Information Systems (ATIS)

Advanced traveler information is provided to facility users prior to starting a trip through the Authority’s and Maryland State Highway Administration’s (SHA) Coordinated Highway Action Response Team’s (CHART) websites. In addition, motorists are provided information through: Traveler Advisory Radios (TAR) and Dynamic Message Signs (DMS).

Currently, the Authority provides traffic advisory, construction, and weather-related facility information through its website (www.mdt.state.md.us). The SHA CHART website (www.chart.state.md.us) also provides traveler advisory information.

- Traffic Map: Shows travel speeds along highway routes and the location of incidents. Currently, the CHART map does not provide travel speed data for the JFK.
- Live Traffic Cameras: Live feeds from cameras located throughout the State. As cameras are installed along the JFK, the feeds will be made available through the CHART website.
- Local Weather: Current weather information and forecasts for the Baltimore area. Information from SHA’s and the Authority’s roadway weather information stations can be accessed directly through a Statewide map on the CHART website.
- Traveler Advisory Radio (TAR): There are currently five TAR systems in place on the JFK, with each having a range of approximately 3-5 miles. Through stationary signs along the facility, motorists are advised to tune to an AM radio station for up-to-date travel advisory information on highway conditions.



- Dynamic Message Signs (DMS): There are currently 19 overhead DMS on the JFK, nine northbound and 10 southbound. The signs are controlled from the Authority Operations Center (AOC), which is located at the Fort McHenry Tunnel.
- Emergency Communications (#77): Through signs posted along the facility, motorists are encouraged to report incidents on the JFK by dialing #77 on their cellular phones. Messages received by the system are directed to the nearest emergency communication center, which may be a Maryland State Police (MSP) barracks or Authority Police detachment. Emergency response units are then dispatched to the problem location. Typically, there are six police patrol cars on the JFK 24-hours a day. In addition, there are three courtesy patrol vehicles providing towing and emergency repair services during peak traffic hours.
- Roadway Weather Information Stations (RWIS): Self-contained units monitoring air temperature, relative humidity, visibility, wind speed and direction, and precipitation type. Currently, on the JFK there is one RWIS at the north end of the Millard E. Tydings Memorial Bridge and one at the Baltimore Beltway (I-695) interchange. Weather stations are monitored by the AOC and Authority operations and maintenance personnel via the State's intra-net system. Supplemental weather-related information is provided through pavement sensors. These in-ground units monitor pavement surface temperature, condition (dry, wet, snowy, and icy) and chloride content, as well as sub-surface temperature. Information from these stations are used for a variety of response actions, including snow/emergency weather unit dispatch, and implementation of wind restrictions or warnings.
- Automatic Traffic Recorders (ATR): There are currently 18 ATRs on the JFK. Each has the capability of monitoring traffic volumes, by 14 Federal Highway Administration vehicle-classifications, and travel speeds.
- Closed Circuit Television (CCTV) Cameras: One northbound and one southbound camera have been or are being installed at every interchange on the JFK. CCTVs monitor roadway conditions on the JFK and adjacent roadways.

d. Freeway Incident Traffic Management Response (FITM)

Maryland's "Managing for Results (MFR)" program requires each state agency to develop strategies to fulfill the agency's mission, as well as measurable goals to monitor how well the agency is doing. One of the Authority's MFR goals is to improve highway safety on its facilities.

A proactive component of the Authority's incident management program is the Freeway Incident Traffic Management (FITM) plan. The FITM plan provides the Authority and its partners with an incident management action plan. Incident management partners include: transportation agencies, the Maryland Department of Natural Resources, the Maryland Department of the Environment, State and local police, fire and rescue, and private tow operators.

During an incident, communications from the site are transmitted to Maryland State Police Barracks 'M' (at the JFK), and then to the AOC, the Statewide Operations Center (SOC) in Hanover, and lastly to SHA District 2 and/or 4 offices, who provide traffic management services on routes that parallel and/or connect to the JFK. On a monthly basis, key members of the response team meet to critique incidents that occurred during the previous month. In addition, the Authority's Incident Management Committee, comprising operations managers and Authority Police commanders, meets monthly to share ideas about ways of reducing incidents and improving response to incidents when they occur.

E Consistency with Statewide and Federal Initiatives

I. Legislative Issues

a. Federal Legislation

The Maryland Transportation Authority (Authority) has not utilized federal funding for its capital improvement projects. However, even in the absence of Federal funding, some Federal regulations may still apply to the Authority's capital projects. In general, the Federal environmental laws apply to a project if the project utilizes federal funds or requires discretionary federal actions. In the case of the JFK improvements, there are two federal actions that may be required: (1) The Federal Highway Administration's (FHWA's) Interstate Access Point Approval, and (2) the Corps of Engineers' Section 404 (wetlands permits) approval. Before these federal actions can be taken, the proposed improvements must be reviewed under the National Environmental Policy Act (42 USC 4321) and Section 106 of the National Historic Preservation Act (16 USC 470f).

The Clean Air Act prohibits federal agencies from funding or otherwise supporting projects that do not "conform" to the State's plans for meeting federally established air quality standards. Pursuant to this law, air quality conformity findings are required for transportation projects in areas that have not yet attained (or that only recently attained) compliance with the federal air quality standards.

In order to satisfy the conformity requirement, a transportation project must be included in the regions 20-year Long-Range Plan (LRP) and the regions 6-year Transportation Improvement Program (TIP). The LRP and TIP must conform to the applicable State Implementation Plan (SIP). The SIP is the State's plan for reducing emissions to achieve or maintain the federally established air quality standards. The intent of the conformity requirement is to ensure that all federally assisted undertakings (including transportation projects) are consistent with the state's overall strategies for meeting federal air quality standards.

To comply with the air quality conformity requirements, the Authority is coordinating with the Maryland Department of Transportation (MDOT), the Baltimore Regional Transportation Board (BRTB), the Wilmington Area Planning Council (WILMAPCO), and Baltimore, Harford

and Cecil Counties to include the Master Plan improvements in the regional LRPs, TIPs, SIPs and local area master plans.

b. State Legislation

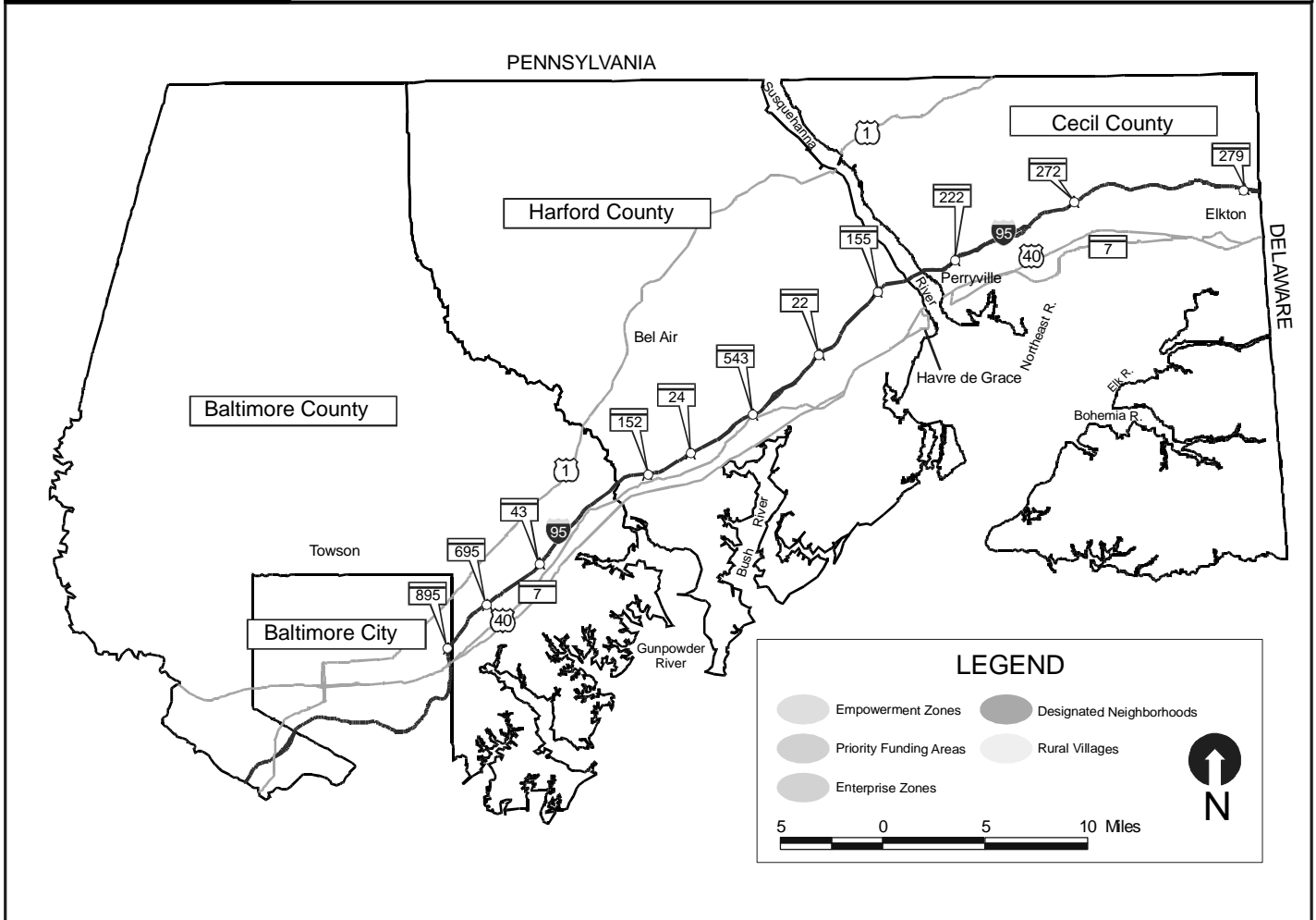
The following is a brief description of State legislative mandates that were considered during the study and should be considered during future project planning:

- **Smart Growth and Neighborhood Conservation:** The 1997 General Assembly adopted several specific programs, which together form the Smart Growth Initiatives. Collectively, these initiatives aim to direct State resources to revitalize older developed areas, preserve some of Maryland's valuable resource and open space lands, and discourage sprawling development into rural areas. The Smart Growth legislation allows the State to direct its programs and funding to support locally designated growth areas called Priority Funding Areas (PFA) and specifically to protect rural areas from sprawl development. Existing communities and other areas may be designated by local jurisdictions as PFAs. If the designated areas meet the criteria set forth in accordance with Smart Growth guidelines the Maryland Department of Planning certifies the PFA. The PFA legislation limits most state infrastructure funding and economic development, housing and other growth related program funding to PFA areas (*Figure 17*).



The JFK contains numerous undisturbed viewsheds. The Environmental Protection Agency has encouraged the Authority to work with local governments to preserve the integrity of these viewsheds. Photo: Maryland Transportation Authority Archives.

Priority Funding Areas and Planning Designation Areas Map - Smart Growth Initiatives



The Smart Growth Initiatives aim to direct State resources to revitalize older developed areas, preserve some of Maryland's valuable resource and open space lands, and discourage the continuation of sprawling development into rural areas.

In general, the Smart Growth law allows state funding to be used only for transportation projects that are located "within" of the proposed improvements to the JFK are either PFAs. The law provides several exceptions to this general rule. Some of those exceptions require the approval of the Board of Public Works. For example, a project that provide a means for managing transportation demand in a "connects" PFAs can proceed with state funding under certain circumstances, but only after receiving approval from the Board of Public Works.

Most of the study area is within, or adjacent to, designated PFAs and in areas where local Master Plans support the Smart Growth initiatives.

The JFK improvements are exempt from the Smart Growth law, because the improvements are located on an existing transportation systems (US 40, US 1, MARC, Amtrak, etc.) "transportation facilities project" as defined in the Smart Growth law. Nonetheless, the Authority is proceeding in a manner that promotes the objectives of the Smart Growth law. The proposed Master Plan improvements are consistent with Smart Growth policies. The current facility is access-controlled, and no additional access points are



- Maryland Transportation Code, Annotated, Section 4-401, “Control of Entrances and Exits.” States that: “If the Authority considers it necessary or desirable to insure the proper operation and maintenance of any transportation facilities project, it may designate, establish, limit, and control the entrances and exits of the project and may prohibit entrance or exit from any undesignated point.”
- Md. TR Code, Ann., Section 4-403, “Railroad Tracks on Kennedy Highway Prohibited.” States that: “The Authority may not permit any person to locate railroad tracks on any part of the John F. Kennedy Memorial Highway.”
- Md. TR Code, Ann., Section 4-404, “Service Facilities on Kennedy Highway.” States that the Authority shall construct gasoline service facilities as needed along the JFK and assure that there is a reasonable choice of services at each facility to deter monopolies and promote business competition.
- Md. TR Code, Ann., Sections 2-601 thru 2-607, “Bicycle and Pedestrian Access.” Generally states that access by pedestrian and bicycle riders shall be considered in all phases of transportation planning.
- Md. TR Code, Ann., Section 21-1405, “Pedestrians and Bicycles Prohibited.” Prohibits pedestrians and bicyclists on the JFK and other toll facilities.

2. Land Use and Economic Development

Several proposed developments located in the study area will impact future traffic volumes and LOS along the JFK. Conversely, improvement to the JFK will support local economic development efforts in approved growth areas, which is a key conclusion found in the Study Area Purpose and Need Statement. The following describes the existing and projected land use and economic development that may affect the study area.

Existing Land Use - The study area is located within portions of Baltimore, Harford and Cecil Counties in Maryland.

Within Baltimore County, the study area is divided by the Urban-Rural Demarcation Line (URDL), which crosses the JFK at the Gunpowder River. As discussed in the Master Plan for Baltimore County, planning efforts in the area south of the URDL, where more urbanization has taken place, emphasize economic development, public safety, education,

and community conservation. North of the URDL, much of the area is rural and is protected from urban sprawl and encroaching development through land use designations of low-density residential, agriculture, and sensitive environmental areas. The White Marsh Town Center at the JFK/MD 43 interchange, located south of the URDL, is the most significant commercial development within the study area.

The 1977 Harford County Master Plan identified the MD 24/924 corridor, which crosses the JFK as a designated growth envelope. Areas within development envelopes are designated for low, medium and high-density uses, while areas located outside of the development envelope are designated for agricultural or low-density residential use. Designated development envelopes include the I-95 interchanges with MD 24, MD 543 and MD 22.

The areas around the MD 24, MD 543 and MD 22 interchanges are increasingly urban as Harford County undergoes rapid commercial, business and residential development. The Edgewood Arsenal, located at the south end of MD 24 is a major center for the research, development, and testing of military equipment and vehicles. Forest, residential and agriculture are the three primary land uses between MD 24 and MD 543. North of MD 543, the southern side of the JFK between MD 22 and MD 462 defines the corporate limits of the City of Aberdeen, which has a dense residential and commercial land use. The southern limits of the City of Aberdeen abut the Aberdeen Proving Grounds and the Perryman Peninsula, the peninsula is the major focus of local economic development initiatives. The areas between the Gunpowder River State Park and MD 24 and north of MD 22 to the Delaware state line contain primarily low density residential, forest and agricultural land uses abutting most of the study area.

The Cecil County portion of the study area is primarily forested or in agricultural use, with residential land uses mixed throughout. Portions of the study area are within the corporate limits of Perryville and Elkton, which are experiencing commercial and residential development.

Future Development - All development indicators, except population projections for Baltimore City, point to a continuing expansion in employment and residential growth within the study area through the year 2020. Recent and on-going changes to State and County land development



policies and plans will strongly influence the pace and location of growth along the corridor.

In Baltimore County, the Honeygo development is a 62-acre residential community, located west of the JFK below the Gunpowder River. This development is expected to have approximately 3,500 units when completed. The Middle River Employment Center (MREC) development site, located east of Route 40, near the present terminus of MD 43 is projected to add between 6 and 7 million square feet of industrial space, with 10,000 to 15,000 new jobs. The existing area is sparsely developed.

Local Master Plans support the State mandated “Smart Growth” initiatives. The JFK and the parallel transportation systems (US 1, MD 7, US 40, MARC, etc.) must be carefully managed to provide for both regional travel growth and local growth resulting from development within designated PFAs.

Land Use Considerations in Future Project Planning Studies - Project planning studies will be conducted for each of the independent projects (Sections 100 through 400). The revised travel forecasts associated with these studies will analyze regional land use projections as approved by the responsible Metropolitan Planning Organization. Additionally, travel forecasting and project planning activities will consider the following land use related issues:

- The potential for induced development and secondary and cumulative environmental impacts;
- Consistency with locally adopted land use plans; and
- Consistency with Maryland’s Smart Growth initiatives.



F. Environmental Streamlining and the Natural Environment

1. Introduction

The Maryland Transportation Authority (Authority), in cooperation with the Federal Highway Administration (FHWA) and the Maryland Department of Transportation (MDOT), developed an approach for the Master Plan process to comprehensively identify long-range transportation needs; establish clear goals for system maintenance, preservation and enhancement; and ensure development of feasible, environmentally and intermodal friendly solutions for the study area. The Master Plan process was developed in a manner consistent with the May 2000 streamlined guidelines developed by the Mid-Atlantic Transportation & Environmental (MATE) Task Force. MATE guidelines were established in response to the Transportation Equity Act for the 21st Century's (TEA-21) call for improved and earlier coordination among transportation decision-making agencies.

2. Master Plan Concurrence Points

The study team conducted an environmental compliance-scoping workshop in October 2000. At this workshop, federal, state and local regulatory agency representatives established the scope of environmental studies to be performed and documented during the study. The commenting/concurring agencies included:

Commenting Agencies

- National Park Service (NPS)¹
- Maryland Department of Planning (MDP)
- Maryland Historical Trust (MHT)
- Baltimore Regional Transportation Board (BRTB)
- Wilmington Metropolitan Area Planning Council (WILMAPCO)

Concurring Agencies

- Federal Highway Administration (FHWA)
- Federal Transit Administration (FTA)²
- US Environmental Protection Agency (EPA)
- US Army Corps of Engineers (COE)
- US Fish and Wildlife Service (USFWS)³
- National Marine Fisheries Service (NMFS)
- Maryland Department of the Environment (MDE)
- Maryland Department of Natural Resources (DNR)

Notes:

1-NPS did not participate as no federal parks were identified within the study area.

2-In February 2002, FTA requested that they be considered a commenting agency.

3-In February 2002, USFWS informed the study team that they could no longer staff the study and should be denoted as having taken no action.

At the workshop, attendees identified three concurrence points for the study. The three concurrence points were established in order to streamline future efforts in the planning and design of transportation improvements identified in the study. The three concurrence points are:

1. The (Master Plan) Study Area Purpose and Need Statement (March, 2001)
2. Future Independent Project Purpose and Need Statement(s) (April, 2001)
3. The Range of Modal Alternatives to be Evaluated during Future Independent Projects (June, 2002)

The Authority staff formally presented the JFK study area Purpose and Need Statement (concurrence point No. 1) to federal, state and local agencies in February 2001. Agency comments/concurrence was requested by April 2001. In June 2001, a formal presentation was made to the same agencies on the Independent Purpose and Need Statements for Sections 100, 200, 300, and 400 (concurrence point No. 2). In June 2002, the Range of Modal Alternatives to be Evaluated during Future Independent Projects (concurrence point No. 3) was presented. Agency concurrence is shown in **Table 9**, and a summary of agency comments is shown in the Appendix.

3. Environmental Inventory

The Master Plan study included an environmental inventory of the area surrounding the JFK. The inventory includes natural environment, socio-economic and cultural, land use/land cover and community facilities, as well as state priority funding area mapping extracted from existing data sources. The inventory effort did not include field reconnaissance or surveys.



TABLE 9

Independent Project Purpose and Need Statements/Status of Comments/Concurrence Forms

|  I-95 MASTER PLAN Summary of Status of Comment/Concurrence Forms | | | | | | |
|--|--|-------------------|-------------------|---------------------------------------|---|-----------------------------|
| Agency | | Commenting Agency | Concurring Agency | Study Area Purpose and Need Statement | Independent Project Purpose and Need Statements | Range of Modal Alternatives |
| | | | | DATE RECEIVED | | |
| Federal Agencies | | | | | | |
| 1 | Federal Highway Administration (FHWA) | | ✓ | 4.26.01 | 9.17.01 | 7.18.02 |
| 2 | United States Army Corps of Engineers (COE) | | ✓ | 3.22.01, 8.28.01 | 9.19.01 | 7.08.02 |
| 3 | National Marine Fisheries Service (NMFS) | | ✓ | 5.2.01 | 5.24.02 | 9.10.02 |
| 4 | United States Environmental Protection Agency (EPA) | | ✓ | | 7.16.01 and 5.1.02 | 11.12.02 |
| 5 | Federal Transit Administration (FTA) | | ✓ | 5.18.01 | 2.20.02 | |
| 6 | United States Fish and Wildlife Service (FWS) | | ✓ | 2.25.02 | 2.25.02 | |
| State and Regional Agencies | | | | | | |
| 7 | Maryland Department of Natural Resources (DNR) | | ✓ | 5.2.01 | 8.16.01 | 8.20.02 |
| 8 | Maryland Historical Trust (MHT) | ✓ | | 4.24.01 | 5.3.02 | 7.03.02 |
| 9 | Maryland Department of the Environment (MDE) | | ✓ | 5.14.01 | 4.22.02 | 8.05.02 |
| 10 | Maryland Department of Planning (MDP) | ✓ | | 5.16.01 | 7.18.01 | 8.05.02 |
| 11 | Baltimore Metropolitan Council/ Baltimore Regional Transportation Board (BRTB) | ✓ | | 3.27.01 | 8.13.01 | |
| 12 | Wilmington Metropolitan Area Planning Council (WILMAPCO) | ✓ | | 4.12.01 | 8.01.01 (Section 400) | 9.01.02 |

Summary of the participating Environmental Regulatory Agencies concurrence on Study Area Purpose and Need, Independent Project Purpose and Need and the Range of Modal Alternatives.



In February 2001, the study team conducted a workshop and field tour. Federal and state regulatory agency representatives participated in the workshop and field tour to review the environmental inventory and the preliminary independent project purpose and need statements. **Figure 18** is a summary of the study area environmental resources.

The environmental inventory workshop and field tour provided agency representatives with:

- An early overview of key resources in the study area;
- An opportunity to discuss key natural environmental and community issues to be addresses in the future independent projects; and
- Decision-making support for concurrences on three study concurrence points.

The “*I-95 Master Plan Study, Environmental Mapping Series*” was published in June 2001.

4. Resource Protection, Preservation and Mitigation

A goal of the Master Plan was to build consensus among transportation decision-making and environmental regulatory agencies at the master plan stage. Early consensus building provides agencies with the background knowledge of key environmental and community streamlining future planning and design activities.

Throughout the study, agency mitigation preferences and priorities were sought. The Environmental Protection Agency (EPA), for example, expressed a desire for advanced mitigation, protection of scenic view sheds, and mitigation prioritization to stressed watersheds (especially watersheds containing streams currently exceeding, or at risk for exceeding, the Clean Water Act’s threshold for total maximum daily pollutant loadings). Similarly, the Maryland Department of Natural Resources (DNR) requested that best management practices aimed at improving water quality be considered in the construction of future improvements.

Recommendations made during the study will be considered during the Section 100, 200, 300 and 400 project planning studies. A resource agency workshop held to exchange data at the conclusion of this study included development of a list of primary resource protection areas, a list of agency desired primary mitigation concerns/methods, and a plan for the consideration of advanced mitigation for the first project planning study area (Section 100).

In summary, the Authority’s early and continued coordination with federal and state environmental regulatory agencies was a unique component of the Master Plan study and acknowledgment of the potential environmental impacts that may result from improvements to the JFK. The partnership developed with agencies that participated in the Master Plan was instrumental in creating the Master Plan’s balance of transportation improvements and safety enhancements that will preserve and minimize anticipated environmental impacts. The Authority intends to maintain its position as a good environmental steward through continued partnership with environmental agencies and the development of proactive action plans such as the Master Plan.



G. Public and Agency Outreach

The study incorporated a comprehensive outreach program to ensure that study area stakeholders would have an opportunity to comment early in the decision-making process. Three working groups were established: a Stakeholders Working Group; a State and Local Working Group; and a Regulatory Agency Working Group.

1. Stakeholder Working Group

A Stakeholder Working Group was formed to ensure that the issues and concerns of a broad cross section of transportation users/dependents and neighbors were discussed as early as possible in the planning process.

The Mid-Atlantic Transportation & Environmental (MATE) Task Force developed streamlining guidelines for transportation project development. One important streamlining goal is to: "...encourage the participation of all stakeholders, including the MPO and the public, throughout the transportation planning and project development process."

Stakeholder Working Group

Representatives of:

- 1000 Friends of Maryland*
- AAA - Baltimore Area
- Amtrak*
- Baltimore County Chamber of Commerce*
- Case Industrial Partners
- Cecil County Chamber of Commerce
- Cecil County Historical Society
- Chesapeake Bay Foundation
- Commercial Transportation Inc.
- CSX Transportation
- DelMarVa Rail Passenger Assoc.
- DEN-EL Transfer*
- Environmental Defense Fund*
- Greyhound Commercial Services
- Harford County Chamber of Commerce
- Independent Truckers & Drivers Assoc.*
- Maryland Department of Transportation (MDOT)*
- Maryland Port Administration (MPA)*
- Marylanders for Efficient & Safe Highways*
- Norfolk Southern Corp. (NS)*
- Terminal Transportation Services*
- Maryland Distribution Council*

(* Active participants)

In addition, MATE guidelines state that after a formal concurrence, agencies will not revisit a milestone unless there is substantive new information that warrants reconsideration.

2. State and Local Working Group

A State and Local Working Group was formed to develop a forum for state and local agency representatives to cooperate in data collection and analysis efforts. The working group also assisted in the identification of state and local concerns; developed and reviewed the Purpose and Need Statement for the entire study area; and reviewed the Logical Termini (independent sections) for future projects.

State and Local Working Group

Representatives of:

- Baltimore City
- Baltimore County
- Baltimore Regional Transportation Board (BRTB)
- Cecil County
- Cecil County Municipalities – Represented by Town of Elkton
- City of Aberdeen
- City of Havre de Grace
- Federal Highway Administration (FHWA)
- Federal Transit Administration (FTA)
- Harford County
- Maryland Department of Planning (MDP)
- Maryland Department of Transportation (MDOT)
- Maryland State Highway Administration (MSHA)
- Maryland Transit Administration (MTA)
- Town of Bel Air
- Wilmington Metropolitan Area Planning Council (WILMAPCO)



The goals of the State and Local Working Group are to:

- Provide a forum for a cooperative data collection and analysis effort;
- Identify state and local concerns and/or needs;
- Provide input for development of purpose and need statements;
- Provide input for development of modal alternatives.

3 Regulatory Agency Working Group

The Regulatory Agency Working Group was formed to identify the environmental and community resource concerns and/or issues.

Activities completed by this Working Group include:

- Agreement on concurrence points and concurrence methods;
- Identification of sensitive environmental and community issues to be inventoried and the provision of existing inventory data;
- Discussion on extent of study vs. future independent project studies;
- Discussion of public involvement efforts; and
- Discussion of transportation needs and impacts.

Regulatory Agency Working Group

- Federal Highway Administration (FHWA)
- Federal Transit Administration (FTA)
- Maryland Department of Environment (MDOE)
- Maryland Department of Natural Resources (MDNR)
- Maryland Department of Planning (MDP)
- Maryland Department of Transportation (MDOT)
- Maryland Historical Trust (MHT)
- U.S. Army Corps of Engineers (COE)
- U.S. Environmental Protection Agency (EPA)
- U.S. National Marine Fisheries (NMF)
- Wilmington Metropolitan Area Planning Council (WILMAPCO)
- Baltimore Regional Transportation Board (BRTB)
- U.S. Fish and Wildlife Service (USFWS)

4. Public Informational Workshops

Three public informational workshops were held between June 2001 and November 2002, in Baltimore, Cecil and Harford Counties, to gather additional information and input from the public. The primary purpose of these workshops was to acquaint the public with the Master Plan. Numerous exhibits were on display to describe the study area, the Master Plan process, study participants, potential transportation solutions and other on-going transportation studies. Announcements for these workshops were placed in regional and local area newspapers and distributed via electronic media. A brief brochure was prepared for distribution at the workshops.

The Authority created a study website. This site is accessible through the Authority's home page:

<http://www.mdtransportationauthority.com>



H. Preliminary Schedule of Highway Improvements

The estimated construction cost for the JFK improvements is approximately \$2 billion. Costs for each section of the JFK (Sections 100-400) will vary depending on the selected concept (refer to Section C). Estimated construction costs and planning schedules for each independent project identified during the Master Plan study are shown in Tables 10 and 11:

| TABLE 10 | | Estimated Costs and Time of Need | |
|--------------------|-------------------------|---|--|
| JFK Section | Approximate Cost | Time of Need | |
| 100 | \$750 million | Today | |
| 200 | \$600 million | 2010-2015 | |
| 300 | \$350 million | 2015 | |
| 400 | \$350 million | 2020 | |

| TABLE 11 | | Preliminary Project Planning Schedule | |
|--------------------|-----------------------------|--|--|
| JFK Section | Anticipated Document | Length of Project Planning | |
| 100 | CE/EA | 2-3 years | |
| 200 | EA/EIS | 3-4 years | |
| 300 | EIS | 3-4 years | |
| 400 | CE/EA | 2-3 years | |



I. Master Plan Support Documents and Studies

TABLE 12

List of Master Plan Technical Reports and Documents

The following is a list of technical reports and documents that were developed in support of the Master Plan studies:

| NO. | DATE OF PUBLICATION | PUBLICATION TITLE |
|------------|----------------------------|---|
| 1 | October, 2000 | Scoping Workshop Workbook |
| 2 | December, 2000 | I-95 Stakeholders Working Group Packet - <i>I-895 Split (N) to the Delaware State Line</i> |
| 3 | February, 2001 | I-95 Aerial Photo Series |
| 4 | March, 2001 | I-95 Master Plan Study, Purpose and Need Statement |
| 5 | June, 2001 | I-95 Master Plan Study, I-95 Travel Demand Forecasting Methodology |
| 6 | June, 2001 | Vehicle Occupancy Data Report (21 pages) |
| 7 | June, 2001 | I-95 Master Plan Study Public Workshop Displays (6.5.2001 @ Middle River Middle School; 6.21.2001 @ Perryville High School; 11.19.02 @ Abingdon Fire Company) |
| 8 | July, 2001 | Description of Logical Termini - <i>I-895 Split (N) to the Delaware State Line</i> |
| 9 | July, 2001 | Purpose and Need Statement - <i>I-95 from I-895 Split to North of MD 43 (Section 100)</i> |
| 10 | July, 2001 | Purpose and Need Statement - <i>I-95 from North of MD 43 to North of MD 22 (Section 200)</i> |
| 11 | July, 2001 | Purpose and Need Statement - <i>I-95 from North of MD 22 to MD 222 (Section 300)</i> |
| 12 | July, 2001 | Purpose and Need Statement - <i>I-95 from North of MD 222 to Delaware State Line (Section 400)</i> |
| 13 | June, 2002 | I-95 Master Plan - Range of Modal Alternatives To Be Evaluated During Future Independent Projects |
| 14 | July, 2002 | I-95 Master Plan Study, Environmental Mapping Series (39 pages) |



|  I-95 MASTER PLAN Study Area Purpose and Need Statement Status of Comment/Concurrence Forms | | | | | | |
|---|---|--|-------------------|----------|------------------------|--|
| Agency | Contact Person/s | Commenting Agency | Concurring Agency | Received | Comments | |
| Federal Agencies | | | | | | |
| 1 | National Park Service (NPS) | Cynthia Wilkerson | ✓ | | | |
| 2 | Federal Highway Administration (FHWA) | Nelson Castellanos; Dan Johnson; Steve Rapley | | ✓ | 4.26.01 | |
| 3 | United States Army Corps of Engineers (USACE) | Paul Wetlauffer | | ✓ | 3.22.01, 8.28.01 | |
| 4 | National Marine Fisheries Service (NMFS) | John Nichols | | ✓ | 5.2.01 | |
| 5 | United States Environmental Protection Agency (USEPA) | Rich Pepino; Denise Rigney; Todd Lutte | | ✓ | | |
| 6 | Federal Transit Administration (FTA) | Gail McFadden-Roberts | | ✓ | 5.18.01 | |
| 7 | Fish and Wildlife Service (FWS) | Robert Zepp | | ✓ | 2.25.02 | Notice provided that the FWS did not plan to participate further in the project reviews. |
| State and Regional Agencies | | | | | | |
| 8 | Maryland Department of Natural Resources (DNR) | Ray Dintaman; Greg Golden; Dawnn McCleary (Chesapeake Bay Critical Area Commission) | | ✓ | 5.2.01 | Concurrence has been coordinated between the DNR, Environmental Review Unit, and the CBCAC. The concurrence represents the review and position of DNR as a whole. |
| 9 | Maryland Historical Trust | Elizabeth Cole | ✓ | | 4.24.01 | Further consultation is needed to complete the Section 106 review of this undertaking as project planning proceeds. |
| 10 | Maryland Department of the Environment (MDE) | Elder Ghigiarelli; David Boellner | | ✓ | 5.2.01 | |
| 11 | Maryland Department of Planning (MDP) | Roy Kienitz; David Whitaker; Bihui Xi | ✓ | | 5.14.01 | <p>Travel demand is increasing at an historic rate greater than 5 % over the last 20 years. Comment: This statement should differentiate between interstate travel demand and local travel demand.</p> <p>Significant new land development is anticipated in all three counties through which the study area passes, as well as beyond the study limits. Under the Smart Growth and Neighborhood Conservation Act of 1997, in-state growth is slated for certified Priority Funding Areas (PFA's). Providing well-managed infrastructure to support growth within PFA's is consistent with Maryland's Smart Growth Initiative, while highway induced growth outside of PFA's will be discouraged. Comment: This statement should differentiate between growth within PFA's and outside of PFA's. Providing infrastructure to support growth outside of PFA's is not consistent with the Smart Growth and Neighborhood Conservation Act.</p> <p>Plans are underway to expand many of the non-highway transportation systems within the region that are dependent on the I-95 study section for access. Comment: Please identify the specific non-highway transportation systems that are referred to in this sentence.</p> |
| Agency | Contact Person/s | Commenting Agency | Concurring Agency | Received | Comments | |
| State and Regional Agencies (Continued) | | | | | | |
| 12 | Baltimore Metropolitan Council/ Baltimore Regional Transportation Board (BMC/BRTB) | Craig Forrest; Paul Farragut; Regina Aris; Harvey Bloom | ✓ | | 3.27.01 | Resolution #01-13 in support of the Purpose and Need Statement for the I-95 Master Plan Study was approved by the members of the BRTB. |
| 13 | Wilmington Metropolitan Area Planning Council (Wilmapco) | Ray Miller; Ted Matley; Tigist Zegeye | ✓ | | 4.12.01 and 7.31.01 | Wilmapco agrees with the I-95 Master Study Purpose and Need and commends the Maryland Transportation Authority for their thorough consideration of transit, non-motorized and freight needs in Cecil County. 7.31.01 comments - Wilmapco does not support widening in the Cecil County area prior to the year listed in the approved constrained long range plan. Wilmapco suggests that methods to provide toll plazas congestion relief be investigated prior to widening. Pedestrian and bicycle access should be considered. |



| I-95 MASTER PLAN Independent Project Purpose and Need Statements Status of Comment/Concurrence Forms | | | | | | | | | |
|---|---|--|-------------------|-----------------------------|----------------------|----------------------|----------------------|----------------------|--|
| Agency | Contact Person/s | Commenting Agency | Concurring Agency | Received (Sections 100-400) | | | | Comments | |
| | | | | 100 | 200 | 300 | 400 | | |
| Federal Agencies | | | | | | | | | |
| 1 | National Park Service (NPS) | Cynthia Wilkerson | ✓ | | | | | | |
| 2 | Federal Highway Administration (FHWA) | Nelson Castellanos; Dan Johnson; Steve Rapley | | ✓ | 9.17.01 | 9.17.01 | 9.17.01 | 9.17.01 | Concurs without comments. |
| 3 | United States Army Corps of Engineers (USACE) | Paul Wetlauffer | | ✓ | 8.28.01 | 8.28.01 | 8.28.01 | 8.28.01 | The Corps concurs with the following condition. If Section 300 is constructed ahead of Sections 100 and 200, justification will be provided to demonstrate that the improvements in Section 300 have independent utility. |
| 4 | National Marine Fisheries Service (NMFS) | Timothy Goodger | | ✓ | 5.24.02 | 5.24.02 | 5.24.02 | 5.9.02 | Concurs without comments. |
| 5 | United States Environmental Protection Agency (USEPA) | Rich Pepino; Denise Rigney; Todd Lutte | | ✓ | 7.16.01 | 5.1.02 | 5.1.02 | 5.1.02 | Concurs without comments. |
| 6 | Federal Transit Administration (FTA) | Gail McFadden-Roberts | | ✓ | 2.20.02 | 2.20.02 | 2.20.02 | 2.20.02 | Does not concur. FTA has elected to change their status from a concurring agency to a commenting agency. |
| 7 | Fish and Wildlife Service (FWS) | Robert Zepp | | ✓ | 2.25.02 | 2.25.02 | 2.25.02 | 2.25.02 | Responded with "No Action". FWS does not plan to participate further in this project. |
| State and Regional Agencies | | | | | | | | | |
| 8 | Maryland Department of Natural Resources (DNR) | Ray Dintaman; Greg Golden; Dawnn McCleary (Chesapeake Bay Critical Area Commission) | | ✓ | 8.16.01 | 8.16.01 | 8.16.01 | 8.16.01 | DNR, in coordination with the CBCAC, concurs with minor comments. |
| 9 | Maryland Historical Trust | Elizabeth Cole | ✓ | | 4.23.02 | 5.3.02 | 5.3.02 | 5.3.02 | No comments. |
| 10 | Maryland Department of the Environment (MDE) | Elder Ghigiarelli; David Boellner | | ✓ | 4.22.02 | 4.22.02 | 4.22.02 | 4.22.02 | Concurs without comments. |
| 11 | Maryland Department of Planning (MDP) | David Whitaker | ✓ | | 7.18.01 & 8.13.01 | 7.18.01 & 8.13.01 | 7.18.01 & 8.13.01 | 7.18.01 & 8.13.01 | No comments. |
| 12 | Baltimore Metropolitan Council/ Baltimore Regional Transportation Board (BMC/BRTB) | Craig Forrest; Paul Farragut; Regina Aris; Harvey Bloom | ✓ | | 7.18.01 | 7.18.01 | 7.18.01 | 7.18.01 | Provided comments. |
| 13 | Wilmington Metropolitan Area Planning Council (Wilmapco) | Ray Miller; Ted Matley; Tigist Zegeye | ✓ | | | | | 8.1.01 | 1. Wilmapco does not support widening I-95 in Cecil County prior to the year listed in the approved 2025 Metropolitan Transportation Plan (MTP). 2. Wilmapco suggests that methods to provide toll plaza congestion relief be investigated prior to widening. 3. Pedestrian and bicycle access should be considered. |



I-95 MASTER PLAN

**Range of Modal Alternatives to be Evaluated During Future Independent Projects
Status of Comment/Concurrence Forms**

| Agency | Contact Person/s | Commenting Agency | Concurring Agency | Date Received | Comments |
|--|--|---|-------------------|---------------|--|
| Federal Agencies | | | | | |
| 1 | National Park Service (NPS) | Cynthia Wilkerson | ✓ | | |
| 2 | Federal Highway Administration (FHWA) | Nelson Castellanos; Dan Johnson; Steve Rapley | | 7.18.02 | Concurrence/Comment Form was received. FHWA Concurs (without comments). |
| 3 | United States Army Corps of Engineers (USACE) | Paul Wetlaufer | | 7.8.02 | Concurrence/Comment Form was received. USACE Concurs (without comments). |
| 4 | National Marine Fisheries Service (NMFS) | John Nichols, Timothy Goodger | | 9.10.02 | Concurrence/Comment Form was received. NMFS Concurs (with comments). Comments: Environmental Inventory of this document should include discussion of the presence of the endangered short nose sturgeon in the Susquehanna River and possibly Gunpowder Falls. Section 7 consultation is required for proposed replacement and/or modification of both riverine crossings. |
| 5 | United States Environmental Protection Agency (USEPA) | Rich Pepino; Denise Rigney; Todd Lutte; Bill Arguto | | 11.12.02 | Concurrence/Comment Form was received. EPA Concurs (with minor comments). Comments: 1) It is unclear if TDM/TSM measures can be incorporated into the alternatives. 2) The detailed inventory of the environmental resources in the study area is very useful. Even at this early stage it might prove informative to have a discussion or tabulation of the environmental, cultural and social impacts of each alternative. 3) All the alternatives presented, except for the no build alternative, appear to have a significant impact to the Susquehanna River bridge. A discussion of this phase of the project may be instrumental in understanding the potential environmental effects of the alternatives. 4) It may be interesting for public review to provide the estimated cost of the alternative vs. the level of service provided vs. the environmental impact of the alternative. |
| 6 | Federal Transit Administration (FTA) | Gail McFadden-Roberts | | | |
| 7 | Fish and Wildlife Service (FWS) | Robert Zepp | | | Responded with "No Action". FWS does not plan to participate further in this project. |
| State and Regional Agencies | | | | | |
| 8 | Maryland Department of Natural Resources (DNR) | Ray Dintaman; Greg Golden; Dawnn McCleary (Chesapeake Bay Critical Area Commission) | | 8.20.02 | Concurrence/Comment Form was received. DNR Concurs (without comments). |
| 9 | Maryland Historical Trust | Elizabeth Cole | ✓ | 7.3.02 | Concurrence/Comment Form was received. MHT has no comments. |
| 10 | Maryland Department of the Environment (MDE) | Elder Ghigiarelli; David Boellner | | 8.2.02 | Concurrence/Comment Form was received. MDE Concurs (without comments). |
| Agency | Contact Person/s | Commenting Agency | Concurring Agency | Date Received | Comments |
| State and Regional Agencies (Continued) | | | | | |
| 11 | Maryland Department of Planning (MDP) | Harriet Tregoning; Roy Kienitz; David Whitaker; Bihui Xi | ✓ | 8.5.02 | Concurrence Comment Form was received. Comments: 1) Analysis of the two build alternatives recommended for further study (alternatives C-5 and C-6) reveals major shortcomings in both options. 2) Analysis performed so far on all options has failed to investigate land use effects and other important questions. 3) Innovative strategies should be developed for improving travel options in the I-95 corridor and minimizing the negative effects of any new highway capacity, and this effort would be best performed before a majority of the options now under consideration are precluded from further study. |
| 12 | Maryland Transit Administration (MTA) | Henry Kay | ✓ | 8.5.02 | Concerns with text on Page C-1 which states that service enhancements are under study by the MTA, and further implies that responsibility for funding their implementation lies with the MTA. While it is true that these service concepts have been proposed in MTA plans, MTA is not at this time undertaking any additional study of them except in a general way such as regular analysis of Commuter Bus performance and an on-going update of the MARC Master Plan. None of the new Commuter Bus or local bus services are under study, nor is a comprehensive enhancement to MARC service or stations in this area. MTA maintains an interest in building ridership, but does not have capital or operating funding at this time to study or implement them and has concerns that the text may be misleading in this regard. |
| 13 | Baltimore Metropolitan Council/ Baltimore Regional Transportation Board (BMC/BRTB) | Craig Forrest; Paul Farragut; Regina Aris; Harvey Bloom | ✓ | | |
| 14 | Wilmington Metropolitan Area Planning Council (Wilmapco) | Ray Miller; Ted Matley; Tigist Zegeye | ✓ | 8.1.02 | Concurrence/Comment Form was received. Comments: Of the recommended concepts pertaining to Cecil County, we agree with retention of Concept C-1 (No-Build) and Concept C-6 (Full-Build) as baselines for comparison with other concepts. We also support Concept C-5 as recommended for further study recognizing its potential to affect travel demand, mode choice and safety. It is our understanding that all three recommended concepts will look at transit and TDM measures as part of detailed project planning activities. It is also our understanding that improvements in Cecil County will begin after 2015 as described in the adopted WILMAPCO Metropolitan Transportation Plan (MTP). |