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# **BAY TRANSIT**

## **TRANSIT DEVELOPMENT PLAN:**

### **FISCAL YEARS 2010 – 2015**

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*Prepared for:*



*Prepared by:*



*Under contract to:*



*October 2009*

# Table of Contents

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## 1.0 Overview of Bay Transit

1.1	History .....	1-1
1.2	Governance .....	1-2
1.3	Organizational Structure .....	1-4
1.4	Transit Services Provided and Areas Served .....	1-6
1.5	Fare Structure .....	1-7
1.6	Fleet .....	1-7
1.7	Existing Facilities .....	1-7
1.8	Transit Security Program .....	1-8
1.9	Public Outreach .....	1-8

## 2.0 Goals, Objectives, and Standards

2.1	Goals and Objectives .....	2-1
2.2	Service Performance Standards .....	2-5

## 3.0 Service and System Evaluation

3.1	Historical and Existing Service Perspective .....	3-1
3.2	Peer System Review .....	3-4
3.3	Public On-Board Passenger Survey .....	3-6
3.4	Level of Support for Transit .....	3-9
3.5	Focus Groups and General Community Input .....	3-10
3.6	Recent Changes in Patronage, Operating Costs, and Operating Revenue ..	3-11
3.7	Deviations from Service Standards and Potential Remedies .....	3-14
3.8	Potential Solutions to Gaps or Service Deficiencies .....	3-17
3.9	Potential Remedies for Equipment and Facility Deficiencies .....	3-17
3.10	Title VI Report and FTA Quadrennial Review .....	3-18

## 4.0 Service Expansion Project Descriptions

4.1	Demographic Analysis of Anticipated Population and Employment Changes .....	4-1
4.2	Potential Service Expansion and Facility Needs .....	4-6

4.3 Estimates of Capital and Operating Costs for Identified Improvements..... 4-14

**5.0 Service and Facility Recommendations**

5.1 Service Recommendations ..... 5-1  
5.2 Facility Recommendations..... 5-2  
5.3 Other Recommendations..... 5-4

**6.0 Capital Improvement Program**

6.1 Vehicle Replacement Program ..... 6-1  
6.2 Facility Improvement Program ..... 6-1

**7.0 Financial Plan**

7.1 Operation and Maintenance Costs and Funding Sources ..... 7-1  
7.2 Bus Purchase Costs and Funding Sources..... 7-5  
7.3 Facility Improvement Costs and Funding Sources..... 7-6

**8.0 TDP Monitoring and Evaluation**

8.1 Coordination with Other Plans and Programs..... 8-1  
8.2 Service Performance Monitoring..... 8-2  
8.3 Annual TDP Monitoring ..... 8-2

**Appendices**

- A. *FTA Triennial Review Report\**
- B. *Title VI Report\**
- C. Fleet Inventory from DRPT’s On-Line Grant Application System (OLGA)
- D. Operating and Capital Expenses and Revenues – A 3-Year Retrospective
- E. Transit Rider On-Board Survey Results
- F. Stakeholder’s Meeting Minutes: March 12, 2009

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*\*Currently defined as a service that is provided in a rural portion of the Commonwealth, Bay Transit is not required to prepare and submit its own separate Title VI report or the associated FTA Quadrennial Review; therefore, Appendix A and Appendix B are not included as part of this document.*

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<b>Table 1-1.</b>	<b>Bay Transit Fare Structure</b>
<b>Table 3-1.</b>	<b>Operating Statistics for Bay Transit, FY2006-FY2008</b>
<b>Table 3-2.</b>	<b>Peer Group Comparison Summary</b>
<b>Table 3-3.</b>	<b>Bay Transit System Revenues and Operating Assistance FY2006-FY2008</b>
<b>Table 3-4.</b>	<b>Allocation of Net Operating Assistance FY2006- FY2008</b>
<b>Table 4-1.</b>	<b>Present Day Population and Employment Summary</b>
<b>Table 4-2.</b>	<b>Future Year Bay Transit Service Area Population Estimates (All Ages)</b>
<b>Table 4-3.</b>	<b>Future Year Bay Transit Service Area Population Estimates of Elderly Persons (65 or Older)</b>
<b>Table 4-4.</b>	<b>Bay Transit Fleet Replacement Program, FY2009-FY2015</b>
<b>Table 4-5.</b>	<b>Estimated Cost of Base Fleet Vehicle Replacement Program, FY2009-FY2015</b>
<b>Table 4-6.</b>	<b>Operating Statistics of Bay Transit, FY2008-FY2015</b>
<b>Table 4-7.</b>	<b>System Revenues and Operating Assistance of Bay Transit, FY2008-FY2015</b>
<b>Table 4-8.</b>	<b>Estimated Annual Operating Miles of Proposed Fixed Routes</b>
<b>Table 4-9.</b>	<b>Estimated Cost per Revenue Mile of Proposed Fixed Routes</b>
<b>Table 4-10.</b>	<b>Estimated Annual Operating Miles of Proposed Fixed Routes</b>
<b>Table 4-11.</b>	<b>Capital Cost of Proposed Fixed-Route Service Expansions</b>
<b>Table 4-12.</b>	<b>Total Annual Cost of Proposed Fixed-Route Service Expansions</b>
<b>Table 4-13.</b>	<b>Cost Estimate for Computerized Scheduling and Dispatching System</b>
<b>Table 4-14.</b>	<b>Annual Passenger Estimation for Bay Transit</b>
<b>Table 7-1.</b>	<b>TDP Financial Plan for Funding Annual O&amp;M Costs</b>
<b>Table 7-2.</b>	<b>TDP Financial Plan for Funding Bus Purchases</b>
<b>Table 7-3.</b>	<b>TDP Financial Plan for Funding Facility Improvements</b>

## List of Figures

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- Figure 1-1. Counties Served by Bay Transit
- Figure 1-2. Bay Transit Organizational Chart
- Figure 3-1. Annual Passengers, FY 2006-FY 2008
- Figure 3-2. Annual Operating Costs, FY 2006-FY 2008
- Figure 3-3. Cost Per Passenger, FY 2006-FY 2008
- Figure 3-4. Peer Comparison
- Figure 3-5. Bay Transit System Revenues and Operating Assistance FY2006-FY2008
- Figure 3-6. Allocation of Net Operating Assistance FY2006 – FY2008
- Figure 4-1. Projected Population (All Bay Transit Service Jurisdictions)
- Figure 4-2. Proposed Fixed-Route Services
- Figure 4-3. Northern Neck Proposed Fixed Transit Routes

## 1.0 OVERVIEW OF BAY TRANSIT

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### 1.1 History

Bay Transit began its operations in 1996 in Gloucester County, in the coastal area directly east of Richmond, Virginia.

From its beginning, Bay Transit has been an operating division of Bay Aging, a multi-county Area Agency on Aging. Bay Aging initiated the transit service with one bus and provided only two days of demand-responsive, door-to-door type service per week, with a focus on the provision of basic transportation services to residents of Gloucester County.

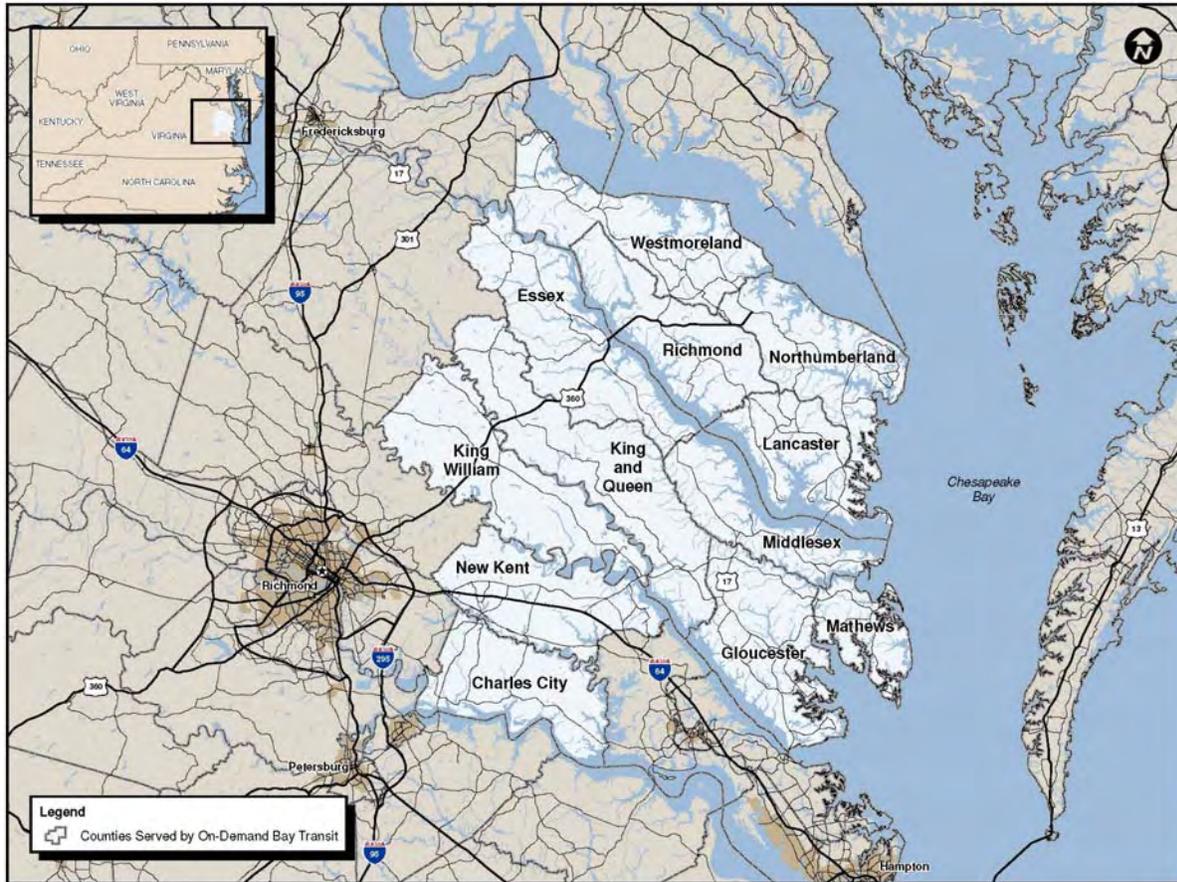
Service soon grew to a fleet of two buses in 1998, and it has continued to steadily expand over the years. Through the use of a rural public transportation demonstration funding grant from the Virginia Department of Rail and Public Transportation (DRPT), which required a five percent local government match, service was expanded first into Lancaster County and then in December 1999 into Essex County.

Bay Transit's new transit service enjoyed interest and support from the public. Citizens of the local governments asked County supervisors to request transit service from Bay Transit. Bay Transit would typically provide service on a demonstration basis, and then would continue to operate these services with the use of federal, state, and local government financial support to supplement passenger fares. Currently, local government financial support represents 25 to 30 percent of annual operating expenses.

With the good reputation for quality service developed during the initial years of the operation, Bay Transit has continued to look for ways to expand their services. Initially, the individual counties imposed service restrictions that essentially created a group of ten separate small systems. However, inter-county on-demand service was soon requested and service demands for the local community colleges increased in Gloucester County and Richmond County.

Today, Bay Transit operates on-demand public transportation services in 12 counties: Charles City, Essex, Gloucester, King and Queen, King William, Lancaster, Mathews, Middlesex, New Kent, Northumberland, Richmond, and Westmoreland. Bay Transit also serves the towns of West Point and Colonial Beach and runs seasonal trolley service in the towns of Kilmarnock, Irvington, White Stone, Urbanna, and Colonial Beach.

Based on 2000 Census data, the 12-county area served by Bay Transit, shown in **Figure 1-1**, covers approximately 2,700 square miles and has an estimated population of approximately 150,000 people.



**Figure 1-1. Counties Served by Bay Transit**

From its initial fleet of just a few vehicles, Bay Transit has grown to now include in 2009 a fleet of 68 vehicles comprised of 12 to 14 passenger handicapped accessible buses, vans, trolleys, and service and support vehicles that serve all ages of passengers and all trip purposes.<sup>1</sup> The system carried over 156,000 passenger trips in 2008.

Recently, on April 27, 2009, Bay Transit broke ground for a new operations and maintenance facility at 111 Commerce Parkway in the Commerce Park of Warsaw. The almost 11,000 square foot facility will include an area for operations and dispatch, as well as a fleet maintenance shop.

## 1.2 Governance

The operation of Bay Transit is managed by Bay Aging, the regional Area Agency for Aging (AAA). Bay Aging is a nonprofit organization that provides services for older adults and persons with disabilities of all ages in the Middle Peninsula and Northern Neck regions of the Commonwealth.

<sup>1</sup> NOTE: Seven of the 12 to 14 passenger vehicles will be sold in the summer of 2009.

The Bay Aging Board of Directors consists of one director from each of 10 counties and one member-at-large, as shown below.

**Bay Aging  
Board of Directors  
2008 - 2009**

<i>Mr. Luther J. Derby, Jr.</i> P. O. Box 267 Tappahannock, VA 22560	Essex County
<i>Mr. Joseph Curry</i> P. o. Box 737 Kilmarnock, VA 22482	Lancaster County
<i>Mr. Ed Clayton</i> 1205 Aarons Beach Road Diggs, VA 23045	Mathews County
<i>Mrs. Carolyn Gray, Secretary</i> 3945 Folly Neck Road Warsaw, VA 22572	Richmond County
<i>Dr. Elton Smith, Jr.</i> P. O. Box 27 Shacklefords, Virginia 23156	King & Queen County
<i>Mr. Kenneth E. Smith, Treasurer</i> 7083 Tracey Court Gloucester, VA 23061	Gloucester County
<i>Mrs. Diana Pitts</i> P. O. Box 191 Urbanna, VA 23175	Middlesex County
<i>Mr. Manuel Haynie, Vice Chairman</i> Bayside Realty P. O. Box 281 Reedville, VA 22539	Northumberland County
<i>Ms. Sara Looney</i> 3 Marshall Avenue Colonial Beach, Va. 22443	Westmoreland Co.

*Mr. Jim Mickens, Chairman*  
1809 Churchville Road  
West Point, VA 23181

King William Co.

*Mr. James N. Carter, Jr.*  
P O. Box 300  
Irvington, VA 22480

At Large Board Member

### **1.3 Organizational Structure**

Bay Aging supervises the operation of Bay Transit. A senior manager from Bay Aging serves as the overall Transit Director, with two Division Managers responsible for the management of the day-to-day operations of Bay Transit.

There are five major operations/dispatch offices for Bay Transit. These offices are located in Essex County, Gloucester County, Lancaster County, the Town of Colonial Beach, and New Kent County. Each office has a Regional Operations Supervisor who reports to the respective Division Manager.

Currently, Bay Transit has a total of 90 employees. Of this total, 16 are full-time and 74 are part-time employees. The latter group primarily represents the vehicle drivers. The full-time staff constitutes the management, administration operations, scheduling personnel, and some full-time drivers. All of these individuals are employees of Bay Aging.

An organization chart for Bay Transit is shown in **Figure 1-2** below.

# Bay Aging/Bay Transit Organizational Chart

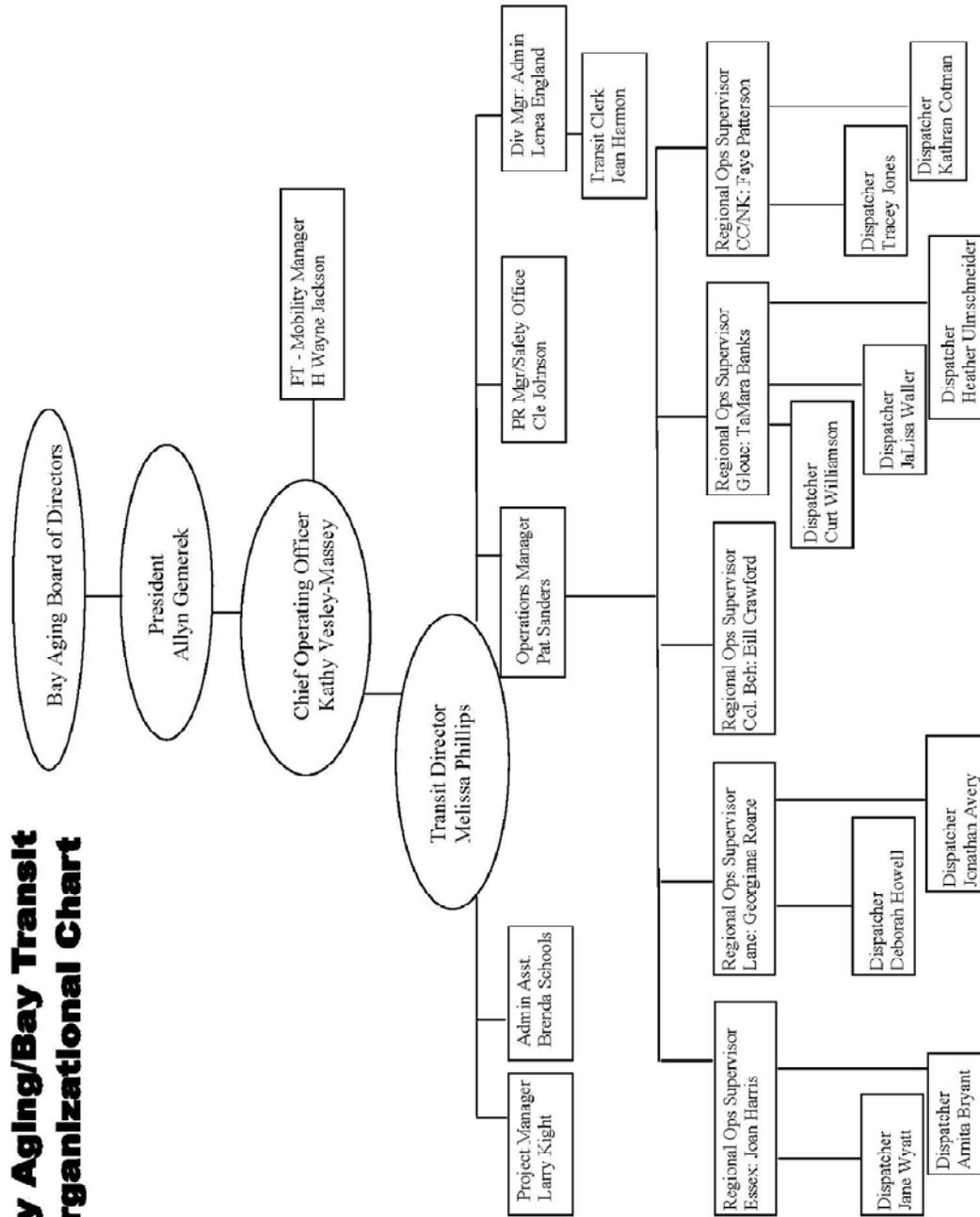


Figure 1-2. Bay Transit Organizational Chart

## 1.4 Transit Services Provided and Areas Served

**Areas Served.** As shown in **Figure 1-1** in Section 1.1, the service areas include the counties of Charles City, New Kent, Essex, Gloucester, King and Queen, King William, Lancaster, Mathews, Middlesex, Northumberland, Richmond, and Westmoreland and the Towns of West Point and Colonial Beach.

**Transit Services Provided.** Bay Transit currently provides on-demand services in all counties within the Middle Peninsula and Northern Neck Planning District Commission (PDC) regions from 6:00 AM to 6:00 PM, Monday through Friday. Riders are requested to call Bay Transit at least 24 hours in advance of the scheduled appointment. In 2008, Bay Transit provided over 156,000 passenger trips, with over half of these being work-related trips. It is estimated that the average one-way distance of the typical passenger trip provided by Bay Transit is between 9 and 12 miles. Bay Transit buses offer fixed-route service in the towns of Colonial Beach and West Point. Three trolleys provide fixed-route service in the towns of Kilmarnock, Irvington, White Stone, Colonial Beach, and Urbanna during the summer months and some fall and winter holiday weekends.

The availability of Federal Job Access and Reverse Commuting (JARC) program funding has been important in recent years for the operation of Bay Transit. With this funding and the local government funding match, Bay Transit was able to operate late evening services (6 PM to 8 PM). When the JARC funding ended, Bay Transit was forced to eliminate the late evening services. Previously provided midday services also were reduced. Work trip-related transit services are now being primarily provided only during the AM and PM peak periods.

Several years ago, Bay Transit developed an initial plan for potential system growth, but recent limitations on funding provided by the different federal, state, and local government agencies is the major constraint on the ability to expand the services beyond what is presently being provided. As described above, Bay Transit has had to eliminate some previously operated services due to program funding restraints. While this action resulted in some modest ridership declines, the high cost of gasoline in 2008 resulted in continuing growth in transit demands and ridership has been returning to previously observed levels in recent months.

In January, 2009, VDRPT announced an 8.469 percent decrease in the amount of formula assistance that would be provided by the Commonwealth in Fiscal Year 2009. Subsequently, in February, 2009, Bay Transit cut one hour of service per day on at least one bus in each county. VDRPT has announced additional operating expense reductions of 10 percent for FY 2010.

Similarly, since DRPT recently changed their policy on state operating assistance support due to a reduced level of available funding, and with the 2008 federal regulations restricting the provision of charter services by public transportation agencies, Bay Transit

is no longer able to provide charter services to local charity or non-profit events. Local agencies appreciated this service and several complaints were generated when it was discontinued.

## 1.5 Fare Structure

The Bay Transit fare structure for the demand-responsive services is shown in **Table 1-1**. The base boarding fare for most of the Bay Transit services is a flat-fee of \$1.00 per trip. There is an additional \$1.00 fee charged when a rider transfers from one bus to another. Only one county (Lancaster County) is charging a base boarding fare of \$2.00 per trip. Trolley fares are \$.25 per ride per person.

Bay Transit accepts cash fares on an exact fare basis and does not have a dedicated fare box in their vehicles. Another payment method that is used by Bay Transit is a booklet of ten tickets sold at a discounted price of \$8.00 per booklet.

**Table 1-1. Bay Transit Fare Structure**

Base Fare – all areas except Lancaster County	\$1.00/trip
Base Fare – Lancaster County	\$2.00/trip
Additional fare for transfer	\$1.00
Booklet of 10 tickets – discounted fare	\$8.00

Local businesses and the community colleges do not contribute funding to Bay Transit, and little or no funding resources have been provided from commercial revenues.

## 1.6 Fleet

Bay Transit’s major services are provided in the form of demand-response services. Based on the vehicle data available from DRPT, Bay Transit presently has a total inventory of 68 vehicles located in the facilities of the different counties. Thirty-three (33) of these 68 vehicles have diesel engines, while the other 35 vehicles use gasoline engines. The passenger fleet primarily consists of 12 to 14 passenger handicapped accessible vans. **Appendix C** at the end of this report details the Bay Transit’s fleet inventory, including vehicle identification number, make, model, year, seated capacity, engine type, wheelchair accessibility, and service type.

## 1.7 Existing Facilities

The service area of Bay Transit covers the counties of Charles City, New Kent, Essex, Gloucester, King and Queen, King William, Lancaster, Mathews, Middlesex,

Northumberland, Richmond, and Westmoreland and the Towns of West Point and Colonial Beach. Since this area is large, Bay Transit has several facilities to store and maintain their vehicles. Currently, Bay Transit has a central administrative office in Urbanna in the same complex that houses the Bay Aging main offices. In addition, operations facilities are located in Essex County, Gloucester County, Lancaster County, New Kent County, and the Town of Colonial Beach.

Recently, on April 27, 2009, Bay Transit broke ground for a new operations and maintenance facility at 111 Commerce Parkway in the Commerce Park of Warsaw. The almost 11,000 square foot facility will include an area for operations and dispatch, as well as a fleet maintenance shop with two vehicle bays with lifts. The facility is scheduled to be open in the summer of 2010.

## **1.8 Transit Security Program**

Currently, Bay Transit does not have GPS devices, on-vehicle cameras, or alarm sensors installed in their vehicles. All vehicles have two-way radios on board to allow communication with each of the operations facilities.

## **1.9 Public Outreach**

The service area of Bay Transit is rural and a majority of the local residents are considered to be low-income. While Bay Transit provides public transportation for “all people, of all ages, for all reasons”, most of Bay Transit’s services currently are perceived to be primarily for the elderly in the region.

While some limited surveys of passengers have been conducted in past years, these have focused more on the ridership in one or a small group of counties. Bay Transit has not conducted any system-wide surveys or surveys of non-riders.

## 2.0 GOALS, OBJECTIVES, AND STANDARDS

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Bay Transit is a service of Bay Aging. Bay Aging is a non-profit, 501(c) (3) Area Agency for Aging that has been serving the residents of the Middle Peninsula and Northern Neck regions of the Commonwealth since 1978.

While the focus of the parent agency, Bay Aging, is on the provision of programs and services for older adults and persons with disabilities of all ages, the stated vision of Bay Transit is:

***“Public Transportation Service for ALL People,  
of ALL Ages, for ALL Reasons!”<sup>2</sup>***

This mission statement of Bay Transit is:

***We believe that every citizen must be assured accessible and safe transportation to the local destination of their choice without regard for disability, age, or economic status.***

In support of its defined mission, Bay Transit is enhancing its generalized operating policies and procedures that will be reviewed and acknowledged by each of the system’s employees.

### 2.1 Goals and Objectives

As a non-profit community transit service for a 12-county region, Bay Transit provides primarily 24-hour advance reservation, on-demand, curb-to-curb transit service. Seasonal trolley fixed-route services are provided in Urbanna, Kilmarnock, and Colonial Beach.

As part of this TDP work effort, specific goals, objectives, and standards have been defined to guide Bay Transit operations and activities over the TDP time period. Goals center on specific themes. Objectives have been defined within each goal. Future updates of the Long-Range Rural Transportation Plans for the Middle Peninsula PDC and the Northern Neck PDC regions and specific town and county Comprehensive Plans should take into consideration these goals and objectives.

**GOAL 1: Provide reliable demand-responsive service, and modified fixed-route service, that meets the transportation needs for all residents of the Bay Transit service area.**

**Objective 1.1:** Provide transit service connections between residential areas and commercial areas with jobs, education, shopping, and medical services.

This objective is to be accomplished through the following minimum activities:

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<sup>2</sup> <http://www.baytransit.org/>

- Document and record customer service requests.
- Coordinate regularly with the Towns and Counties and to identify planned new developments that might warrant transit service.
- Survey riders at least once every five years to determine rider service needs.

**Objective 1.2:** Provide easily identifiable stop locations along routes and passenger shelters, if warranted.

This objective is to be accomplished through the following minimum activities:

- Establish safe bus stop locations when modifying an existing alignment or implementing new service.
- Work with Town and County Public Works Department and Virginia Department of Transportation (VDOT) staff in developing stops with high ridership demands.
- Monitor ridership activity at high demand stops to determine if/when passenger waiting shelters are needed.

<b>GOAL 2: Market existing transit services.</b>
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**Objective 2.1:** Actively market transit services as a viable travel option within the entire Bay Transit service area.

This objective is to be accomplished through the following minimum activities:

- Maintain “Bay Transit System, Route, and Schedule Guide” for users of the transit system.
- Continue to update transit information on the Bay Transit and Bay Aging web sites and establish links to those web sites maintained by the towns, counties, and PDCs within the service area.
- Participate in community events to promote public transportation.
- Maintain a mailing list of organizations and social service agencies that represent markets that are likely to ride transit and provide service information to those organizations and agencies.

**Objective 2.2:** Explore potential demand to expand hours of operation and/or cost-effective transit service to areas outside of the current 12-county Bay Transit service area.

This objective is to be accomplished through the following minimum activities:

- Initiate exploration meetings with Town, County, and PDC staff and local officials to determine potential transit service needs.

- Such meetings should take place no less frequently than once a year.

**GOAL 3: Deliver modified fixed-route and demand-responsive services in a cost-effective manner.**

**Objective 3.1:** Maintain a system-wide farebox recovery ratio (farebox revenues/total operating expenses) that meets or exceeds standards identified in **Section 2.2** of this TDP.

This objective is to be accomplished through the following minimum activities:

- Record and monitor trends in passenger trips by route and county service area.
- Record and monitor monthly transit operations expenses and farebox revenues.

**Objective 3.2:** Hold administrative costs to approximately 20 percent of total operating budget.

This objective is to be accomplished through the following minimum activities:

- Continue to record and monitor monthly transit operations expenses and farebox revenues.

**Objective 3.3:** Achieve system-wide demand-responsive and modified fixed-route ridership levels that meet or exceed standards identified in **Section 2.2** of this TDP.

This objective is to be accomplished through the following minimum activities:

- Maintain and monitor monthly ridership reports for all demand-responsive and fixed-route services, with ridership reported on a county-level basis for all demand-responsive operations and on a route-segment basis for all fixed-route services.
- Implement corrective measures if ridership falls below established standards for specific county operations or town-level fixed-route services for more than two (2) months in a row. Such corrective measures may include: modifications to vehicle dispatching and scheduling procedures for demand-responsive operations, route alignment for fixed-route services, service frequency, and span of service and/or fare adjustments.

**GOAL 4: Deliver modified fixed-route and demand-responsive services in a safe manner.**

**Objective 4.1:** Ensure that transit service operators maintain an accident rate less than the standard identified in **Section 2.2** of this TDP.

This objective is to be accomplished through the following minimum activities:

- Maintain a training program for new employees.
- Review Operating Policies and Procedures at least once a year and update as necessary.
- Review those policies and procedures as part of all training efforts with new staff. Also review with existing staff at least once every two years.

**Objective 4.2:** Ensure that an adequate fleet of vehicles is maintained for demand-responsive services.

This objective is to be accomplished through the following minimum activities:

- Identify the need for replacement vehicles based on industry standards for defined useful life of vehicles. For most buses operated by Bay Transit, the defined useful life is four years or 100,000 revenue miles of service.
- Maintain a spare ratio of at least 10 percent of total number of vehicles at all times for each of the three principal multi-county sub regions (Northern Neck, Middle Peninsula, and Charles City/New Kent Counties) for demand-responsive services.

**GOAL 5: Provide transit services that are accessible to citizens.**

**Objective 5.1:** Provide transit services that are accessible to all population groups within the 12-county Bay Transit service area.

This objective is to be accomplished through the following minimum activities:

- Comply with the applicable requirements of the Americans with Disabilities Act (ADA).
- Provide the ADA-eligible population with door-to-door paratransit service that is comparable to service provided by the fixed-route system in those towns where fixed routes are being operated.

## 2.2 Service Performance Standards

This TDP work effort has identified the following service standards to be monitored on a monthly basis by Bay Transit administrative staff.

### Ridership Service Productivity Measures

The following system-wide service standards are proposed based on a review of ridership characteristics over the past several months:

Modified Fixed-Route Standard – Monthly system-wide fixed-route ridership should maintain levels equivalent to 1.40 passenger trips per revenue hour.

Demand-Response Standard – Monthly demand-response service should maintain ridership levels equivalent to 2.0 passenger trips per revenue-hour with average one-way ride times **not exceeding** 50 minutes. Monthly demand-response service should maintain ridership levels equivalent to 1.5 passenger trips per revenue-hour with average one-way ride times **exceeding** 50 minutes.

Corrective measures should be investigated if ridership on Bay Transit's services fall below the levels identified above for a period of three (3) consecutive months.

### Cost-Effectiveness Measures

Fixed-Route Standard - Bay Transit's farebox recovery ratio (farebox revenues as a percentage of operating expenses) for fixed-route services shall remain at approximately 2.0 percent. Corrective measures should be investigated if the farebox recovery ratio falls below this standard for three (3) consecutive months.

Demand-Response Standard – Bay Transit's farebox recovery ratio for demand-response service should remain within the range of 5.0 to 8.0 percent. Corrective measures should be investigated if these thresholds are not met for three (3) consecutive months.

### Vehicle Maintenance Performance Measures

The following two standards shall be monitored with regards to vehicle maintenance performance:

Bus Preventive Maintenance Inspections – Preventive maintenance shall be conducted on all vehicles in the transit fleet per the vehicle manufacturer recommendations.

Revenue Vehicle Failures – Bay Transit should maintain a standard of no more than 0.15 revenue vehicle failures per 1,000 revenue bus-miles of service.

## 3.0 SERVICE AND SYSTEM EVALUATION

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The purpose of this chapter is to describe the recent performance of the Bay Transit system relative to generally accepted performance standards for the demand-responsive transit mode associated with this system. This assessment describes the manner in which Bay Transit is providing public transportation services to the residents of the 12-county region in which it operates. Each of the following sections discusses one facet of this evaluation process.

### 3.1 Historical and Existing Service Perspective

Bay Transit is one of the newer public transportation systems in the Commonwealth of Virginia. From the initiation of service in Gloucester County in 1996, the system has expanded to now offer services across a total of 12 counties.

As the system has continued to grow and expand, changes have been regularly observed in virtually all relevant comparative factors, from the number of revenue-miles and revenue-hours operated each year to the total system operating costs and the number of passengers transported. With many of the service changes having been observed over just the past several years, it is difficult to apply a traditional five-year service history to the system.

The most comprehensive assembly of statewide system performance data for public transit systems in Virginia was published in 2007.<sup>3</sup> Although the title of this statewide transit performance report indicates that it presents data for the period FY 2002 – FY 2006, this information is typically only provided for the larger and better established urban bus and rail systems in the Commonwealth.

In the case of Bay Transit, and virtually all of the other small municipal and rural public transit systems in the state, only data for FY 2006 is provided in this report. As a result, the historical evaluation of Bay Transit operations associated with this TDP has only been able to consider the three-year period from FY 2006 through FY 2008. **Table 3-1** and the subsequent charts illustrate several operating statistics in each of these three years.

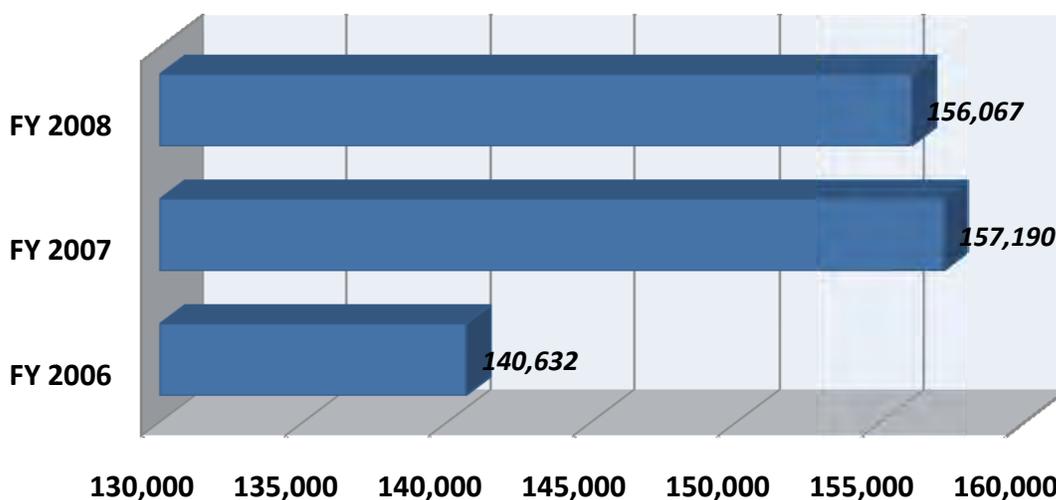
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<sup>3</sup> Virginia Transit Performance Report (FY2002-FY2006); Virginia Department of Rail and Public Transportation; Richmond, Virginia; 2007.

**Table 3-1. Operating Statistics for Bay Transit, FY2006-FY2008**

Operating Statistics	FY 2006	FY 2007	FY 2008
Annual Passengers	140,632	157,190	156,067
Annual Operating Costs	\$ 1,779,269	\$ 2,146,390	\$ 2,459,305
Annual Revenue Miles	1,214,502	1,510,293	1,664,376
Annual Revenue Hours	61,822	70,876	75,045
Passengers per Revenue Mile	0.12	0.10	0.09
Passengers per Revenue Hour	2.27	2.22	2.08
Cost per Passenger	\$12.65	\$13.65	\$15.76
Cost per Revenue Mile	\$1.47	\$1.42	\$1.48
Cost per Revenue Hour	\$28.78	\$30.28	\$32.77

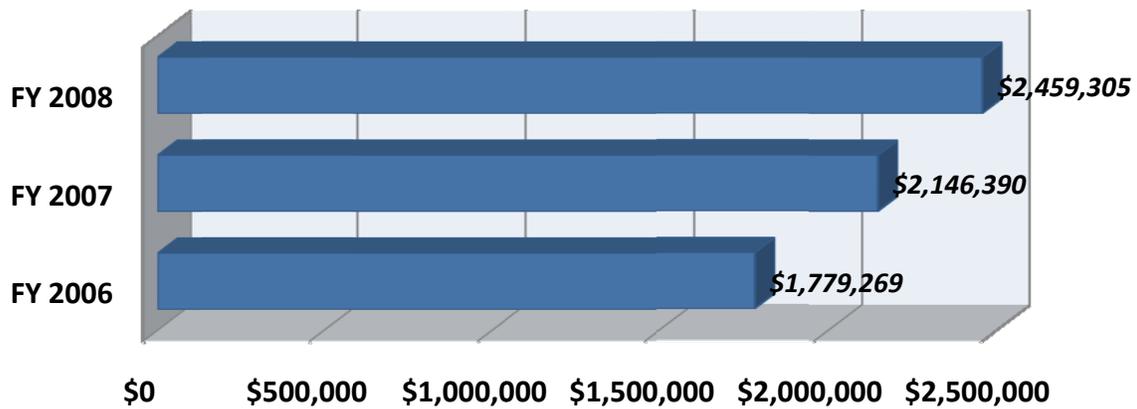
Source: Bay Transit



**Figure 3-1. Annual Passengers, FY 2006-FY 2008**

As shown in the **Figure 3-1** above, the number of annual passengers increased from 140,632 persons in FY 2006 to 156,067 in FY 2008, with the annual ridership in FY 2007 being slightly higher at 157,190 persons. This net increase in ridership of 15,435 persons over a period of two years represents an 11 percent increase over this time period.

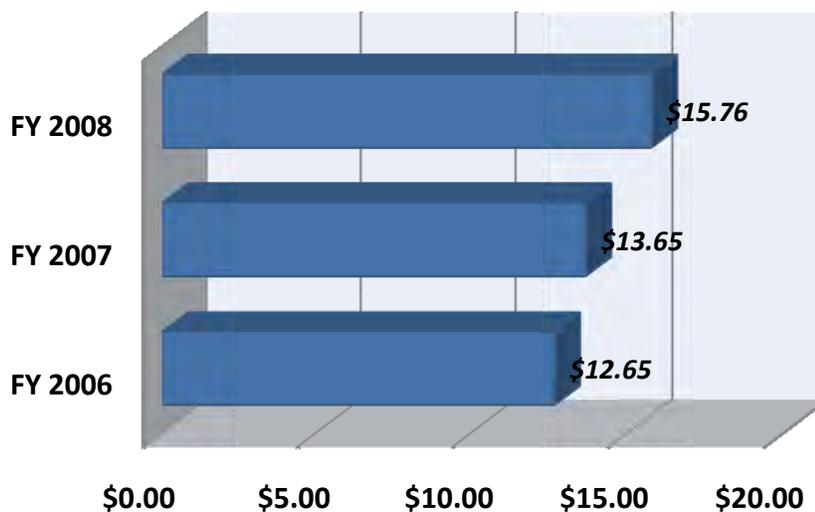
Much of this reported ridership increase appears to be attributable to the continuing expansion in the amount of transit service being provided by Bay Transit, from 1.21 million revenue miles in FY 2006 to 1.66 million revenue miles in FY 2008 (an increase of 37.2 percent), and from 61,822 revenue hours in FY 2006 to 75,045 revenue hours in FY 2009 (a 21.4 percent increase).



**Figure 3-2. Annual Operating Costs, FY 2006-FY 2008**

As would be expected with increases of this magnitude in the amount of service provided, annual system operating costs, shown in the **Figure 3-2** above, also experienced a significant increase, from \$1.78 million in FY 2006 to \$2.46 million in FY 2008 (an increase of 38.2 percent).

When these total annual values are expressed in terms of unit factors, somewhat different conclusions can be drawn. For example, the average passengers per revenue hour value of 2.27 observed in FY 2006 declined to a value of 2.08 passengers per revenue hour in FY 2008. Yet this only represents an 8.4 percent decline in this productivity factor. Even at this lowered value, the factor is still in an acceptable range.



**Figure 3-3. Cost Per Passenger, FY 2006-FY 2008**

Similarly, as shown above in **Figure 3-3**, the average cost per passenger increased from \$12.65 per passenger in FY 2006 to \$15.76 per passenger in FY 2008, or a change of approximately 24.6 percent. Much of this increase appears to be attributable to the observed increase in system operating costs, with much of the increase due to both significantly more service being

provided and the higher fuel costs experienced during FY 2008 for the gasoline and diesel-powered vehicle fleet operated by Bay Transit.

All of these cost and ridership response factors will need to be regularly monitored and reported by the system's management in order to identify trends of both a positive and a negative nature.

### **3.2 Peer System Review**

A peer system review compares system characteristics and performance for Bay Transit with those of other systems of similar size and operational characteristics. While comparing Virginia systems to those in other states is certainly appropriate, in the case of rural demand-response systems, there are advantages to keeping the comparison limited to other Virginia systems. This is due to the fact that state funding rules and procedures and the relationship of rural public systems to various human services agencies can differ greatly from state to state. Thus, the systems considered for inclusion in this peer system review were limited to systems within Virginia.

A number of criteria were used to select the systems to be included in the comparison. Only rural systems operating exclusively or primarily demand-responsive service were considered, due to the relatively unique operating environments and characteristics of these systems. Another of the criteria was that the systems all be multi-county operations. This is also due to the operating environments of these systems as well as the general trip characteristics of these types of systems. Other criteria used in the selection of the peer systems included service area population, system size, and the number of annual passenger trips served.

Based on these criteria, three systems were selected for inclusion in the peer system review. These systems include Mountain Empire Transit (MEOC), 4-County Transit, and JAUNT. These systems are all multi-county rural systems providing primarily or exclusively demand-responsive service. **Table 3-2** and **Figure 3-4** summarize the general system characteristics and key performance indicators for the three selected systems and Bay Transit for FY 2008. The average values for the peer systems are also included in the table.

Bay Transit's service area population is very close to the average for the three peer systems. The average for the peer systems for both of these measures is higher than it otherwise would be due to the size of the JAUNT system. This is impacted by the fact that JAUNT's service area includes a small urban area rather than strictly a rural area.

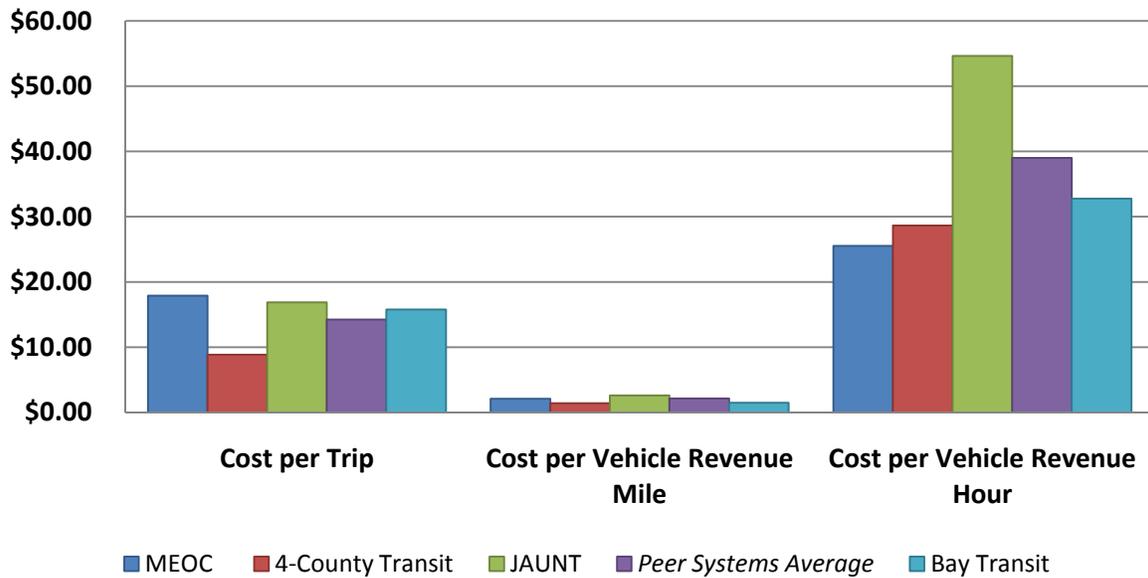
Bay Transit's annual vehicle revenue miles and vehicle revenue hours are both higher than the average for the three peer systems, with the total number of vehicle miles being considerably higher. This is due to the fact that the geographical size of Bay's service area is quite large, resulting in relatively longer trips and higher miles per hour than that of any of the peer systems.

The annual number of unlinked passenger trips for Bay Transit is more than ten percent lower than the peer system average for both JAUNT and 4-County Transit, but higher than the total number of trips for MEOC. Bay Transit’s rate of passengers per revenue mile is the lowest of the four systems. This also is most likely due to the size of the service area and the fact that the average passenger trip is quite likely longer than those of the other systems. By contrast, while Bay Transit’s rate of passengers per revenue hour is also lower than the peer system average, it is not the lowest of the four systems.

As shown in **Table 3-2** and in **Figure 3-4**, the overall average unit operating cost for Bay Transit is quite comparable to the values of the peer systems. While Bay Transit’s cost per trip of \$15.76 is above the average for the three peer systems, this is due to the extremely low value reported for 4-County Transit. Bay’s cost per trip is actually lower than that for the other two peer systems and certainly appears to be in line with other systems within Virginia.

**Table 3-2. Peer Group Comparison Summary**

<b>Characteristics and Performance Indicators</b>	<b>MEOC</b>	<b>4-County Transit</b>	<b>JAUNT</b>	<b>Peer Systems Average</b>	<b>Bay Transit</b>
Service Area Population	91,019	114,940	200,000	135,320	130,000
Total System Operating Cost	\$1,354,143	\$1,629,633	\$4,566,275	2,516,684	\$2,459,305
Total Vehicle Revenue Miles	647,584	1,154,672	1,750,276	1,184,177	1,664,376
Total Vehicle Revenue Hours	53,059	56,874	83,564	64,499	75,045
Total Unlinked Passenger Trips	75,641	184,140	270,875	176,885	156,067
Passengers per Revenue Mile	0.12	0.16	0.15	0.15	0.09
Passengers per Revenue Hour	1.43	3.24	3.24	2.74	2.08
Cost per Trip	\$17.90	\$8.85	\$16.86	\$14.23	\$15.76
Cost per Vehicle Revenue Mile	\$2.09	\$1.41	\$2.61	\$2.13	\$1.48
Cost per Vehicle Revenue Hour	\$25.52	\$28.65	\$54.64	\$39.02	\$32.77



**Figure 3-4. Peer Comparison**

Bay Transit’s cost per vehicle revenue mile of \$1.48 is more than 30 percent below the peer system average of \$2.13 per vehicle revenue mile, and it is lower than two of the three systems. Similarly, Bay Transit’s cost per vehicle revenue hour of \$32.77 is approximately 16 percent lower than the peer system average of \$39.02 per vehicle revenue hour.

Overall, while Bay Transit’s productivity values are lower than those of its peers, this is primarily due to the nature of the system’s service area and the relatively long passenger trips that it provides. The unit cost figures for Bay Transit are certainly in line with those of its peer systems indicating a reasonable level of system efficiency.

### 3.3 Public On-Board Passenger Survey

**Appendix E** at the end of this report presents a technical memorandum with detailed findings from the on-board transit rider survey.

Using these survey results, the typical Bay Transit rider can be characterized as follows:

#### Passenger Demographics:

- *Gender:* The majority of the passengers are female.
- *Age:* The findings suggest that Bay Transit is providing basic mobility services to a broad cross-section of the service area population and is not, as some might perceive it to be, a system transporting only elderly residents.
- *Race:* African-American and Caucasian are the top two races using Bay Transit service, representing over 90 percent of ridership.

- *Education Level:* Approximately 80 percent of the passengers indicated that they either possessed a high school degree (48 percent) or had not graduated from high school (32 percent).
- *Annual Household Income:* Persons with low income are the major users of Bay Transit.
- *Frequency of Ridership:* A high level of repeat ridership further indicates that Bay Transit is providing an essential mobility service to a broad cross-section of its passengers.

**Passenger Trip Characteristics:**

- *Trip Origin/Destination:* The vast majority (84.7 percent) of the passengers started their trips from their home. The results demonstrate that the current ridership is using the Bay Transit system for basic mobility purposes between their homes and their workplace or other important destinations.
- *Reason for Riding Bay Transit:* The responses indicate that the current ridership can be classified as “transit captives”; that is, they have few if any other travel options available and if the current transit service was not provided, the subject trip would probably not be made.

**Service Ratings:**

The service factors presented for rating were as follows:

- |                           |  |
|---------------------------|--|
| • Reservation procedures  | • Sense of security on the buses       |
| • Bus on-time performance | • Cleanliness of buses                 |
| • Hours of bus service    | • Courtesy/friendliness of bus drivers |
| • Cost of bus fare        | • Overall service rating               |

For each of these eight evaluation measurements, those that responded to the survey provided combined ratings of “Very Good” or “Good” in the range of approximately 80-95 percent for almost every measurement. The findings represent a very positive reaction from the passengers of Bay Transit. They also indicate that the current users are satisfied with the overall services provided by Bay Transit.

### **Future Service Needs:**

More than half of respondents viewed the following suggested areas of potential service improvement as being “Very Important” or “Somewhat Important”

- Less advance time to schedule trip
- Expand hours / days of service

### **3.4 Level of Support for Transit**

Bay Transit has received a positive reaction from the people of the region and residents regularly express the opinion that it is a good service for the community. When Bay Transit initiated their services, not all counties in the Middle Peninsula and Northern Neck PDC regions were covered. Citizens of the local governments asked County supervisors to request transit service from Bay Transit, and this service would typically be provided initially on a demonstration basis for some period of time. If determined to be successful, the service would continue with the use of federal, state, and local government financial support to supplement passenger fares. The system has been successful, as Bay Transit now provides service to a 12-county area.

The change in transit service demand appears to be generally keeping pace with observed population growth in the region. Bay Transit developed an initial plan for potential system growth, but recent limitations on funding provided by the different federal, state, and local government agencies is the major constraint on the ability to expand the services beyond what is presently being provided.

A stakeholder’s meeting was conducted on March 12, 2009 (meeting minutes included in **Appendix F**). At this meeting, the following comments were offered by the attendees regarding the current Bay Transit service:

- A representative of DRPT indicated that funding was an issue for each transit system in Virginia. However, DRPT had matched the maximized funding available for Bay Transit for the last couple of years.
- A representative of the Town of Colonial Beach mentioned that there were certain demands for transit services from Colonial Beach to the community of Montross, but apparently the services cannot be provided by Bay Transit due to funding limitations.
- Westmoreland County, the second biggest county in Northern Neck, currently has only one Bay Transit vehicle for transit services.
- Colonial Beach has their own buses running transit services, with the representative of Colonial Beach expressing the willingness that they would like to cooperate with Bay Transit to develop a plan to provide more transit services between the jurisdictions.

- Some private business owners have expressed a willingness to substitute the operating cost for Bay Transit fixed-route services if the route can serve their locations.
- One representative suggested that Bay Transit should obtain the opinions of people who currently do not use the transit services to help determine their willingness to use transit services if the transit system fits their needs.
- Representatives at this stakeholder’s meeting expressed the following suggestions for Bay Transit’s consideration:
  - Request Stimulus Funding to purchase additional vehicles
  - Keep the fare at its current level
  - Consider the potential for commuter rail service to Richmond in the long term future
  - Work with Westmoreland County to provide more buses
  - Support for drivers to have more training
  - Expand services to the areas that attract tourists
  - Build walking and biking trails to connect major attractions
  - Reroute Bay Transit services to cover more areas
- One representative suggested that DRPT should encourage carpool, vanpool, and other transportation programs to increase use of the public transit systems.

In general, there appears to be a good level of local government support for the continued operation of Bay Transit, but the finances of all the local governments are being strained at the present time. As a result, the potential for significant increases in local operating assistance is viewed as being unlikely over the next few years.

### **3.5 Focus Groups and General Community Input**

DRPT recently changed their previous policy on state operating assistance support due to a reduced level of available funding. Combined with the effects of new federal regulations issued by FTA restricting the provision of local charter type services by public transportation agencies, Bay Transit is no longer able to provide transit services to local charity organizations or the sponsors of local non-profit events.

This change has generated a number of complaints from many local agencies with respect to the challenges it presents to increasing community involvement with such activities. These local community groups and private citizens are supportive of providing additional public transit services in the region, but they are unable to generate local government support for increased public funding.

During the course of the TDP development process, Bay Transit agency staff and the consulting team received a number of suggestions from the representatives of the counties that currently have Bay Transit services. Most of those that offered these suggestions are not users of the system. What they suggested as potential service improvements included better on-time

performance and an expanded service frequency (longer hours of operation during the day as opposed to initiation of service on weekends).

### **3.6 Recent Changes in Patronage, Operating Costs, and Operating Revenue**

Over the past three years, the number of annual passengers transported by Bay Transit has increased from 140,632 persons in FY 2006 to 156,067 in FY 2008, with the annual ridership in FY 2007 being slightly higher at 157,190 persons. This net increase in annual ridership of 15,435 persons over a period of two years represents an 11 percent increase over this time period. Much of this reported ridership increase appears to be attributable to the continuing expansion in transit service; from 1.21 million revenue miles in FY 2006 to 1.66 million revenue miles in FY 2008 (an increase of 37.2 percent in revenue miles), and from 61,822 revenue hours in FY 2006 to 75,045 revenue hours in FY 2008 (a 21.4 percent increase in annual revenue hours).

As would be expected with increases in services of this magnitude, annual system operating costs have also experienced a significant increase, from \$1.78 million in FY 2006 to \$2.46 million in FY 2008 (an increase of 38.2 percent).

When these total annual values are expressed in terms of unit factors, somewhat different conclusions can be drawn. For example, the average passengers per revenue hour value of 2.27 observed in FY 2006 declined to a value of 2.08 passengers per revenue hour in FY 2008. Yet this change only represents an 8.4 percent decline in this productivity factor. Even at this lowered value, the factor is still in an acceptable range when compared to the average of the three peer transit systems (see Section 3.2).

Similarly, the average cost per passenger increased from \$12.65 per passenger in FY 2006 to \$15.76 per passenger in FY 2008, or a change of approximately 24.6 percent. Much of this increase appears to be attributable to the observed increase in system operating costs, with much of the increase due to both significantly more service being provided and the higher fuel costs experienced during FY 2008 for the predominantly diesel and gasoline powered vehicle fleet operated by Bay Transit.

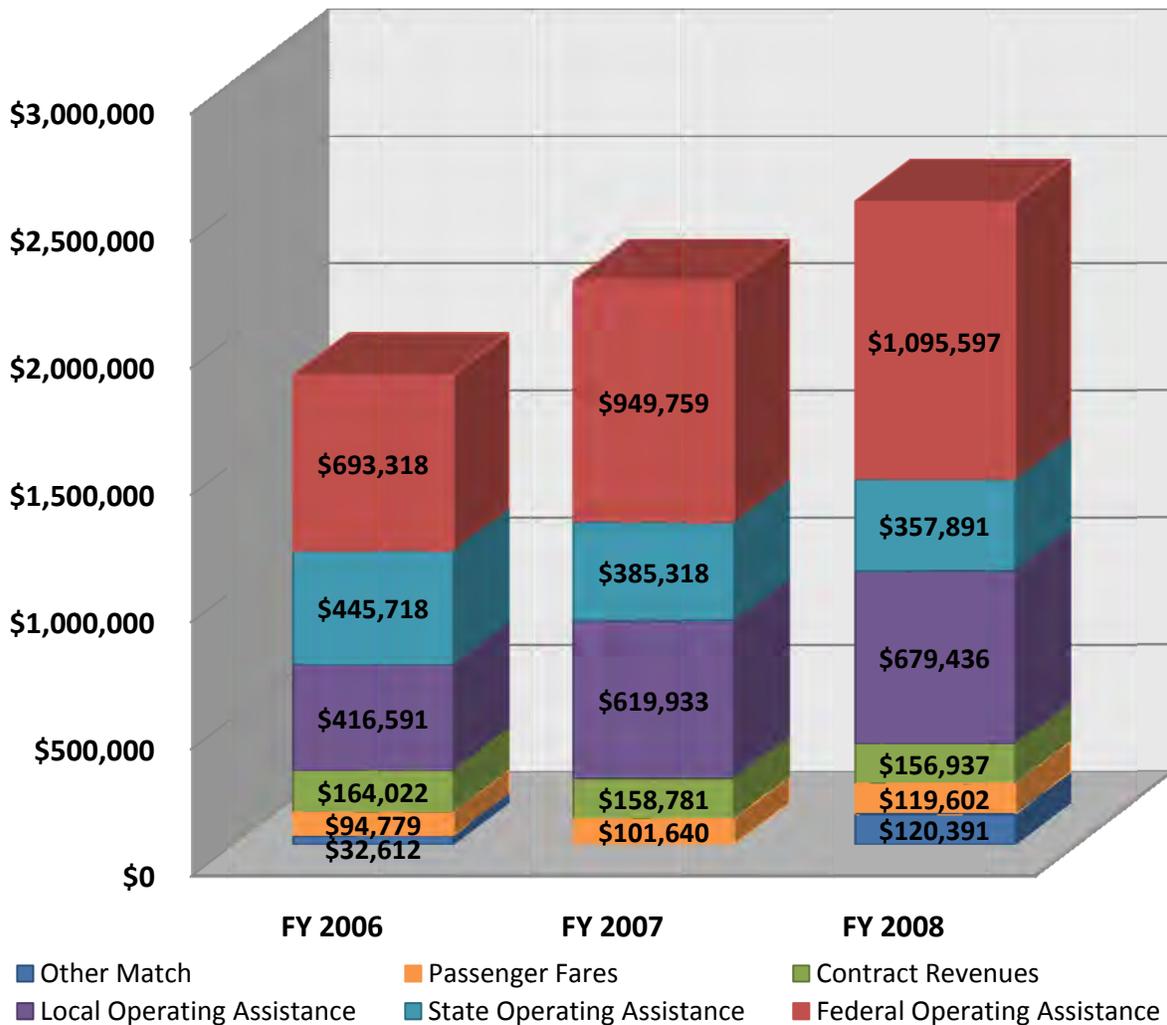
All of these cost and ridership response factors need to be regularly monitored and reported by the system's management in order to identify trends of both a positive and a negative nature.

**Table 3-3** and **Figure 3-5** present a summary of the Bay Transit system's annual revenues and operating assistance for Fiscal Years 2006 to 2008. As shown in the table, system passenger revenues experienced consistent growth over this period, from \$94,779 in FY 2006 to \$119,602 in FY 2008. This represents an increase of approximately 26.2 percent over the two year period, a rate of increase higher than the 11 percent increase in annual passengers reported in **Table 3-1**. The average revenue per passenger of \$0.67 in FY 2006 increased to a value of \$0.77 per passenger in FY 2008. Contract revenues were \$164,022 in FY 2006 and decreased slightly to \$156,937 in FY 2008.

**Table 3-3. Bay Transit System Revenues and Operating Assistance  
FY2006-FY2008**

<b>System Revenues and Operating Assistance</b>	<b>FY2006</b>	<b>FY2007</b>	<b>FY2008</b>
Passenger Fares	\$ 94,779	\$ 101,640	\$ 119,602
Contract Revenues	\$ 164,022	\$ 158,781	\$ 156,937
Local Operating Assistance	\$ 416,591	\$ 619,933	\$ 679,436
State Operating Assistance	\$ 445,718	\$ 385,318	\$ 357,891
Federal Operating Assistance	\$ 693,318	\$ 949,759	\$ 1,095,597
Other Match	\$ 32,612		\$ 120,391
<b>Totals</b>	<b>\$ 1,847,040</b>	<b>\$ 2,215,431</b>	<b>\$ 2,529,854</b>

Source: Bay Transit



**Figure 3-5. Bay Transit System Revenues and Operating Assistance  
FY2006-FY2008**

As noted earlier in this chapter, total system operating costs have steadily increased in recent years. The total annual system operating costs (defined here as passenger fares + contract revenues + operating assistance) are reported to have increased from \$1,847,040 in FY 2006 to \$2,529,854 in FY 2008. This represents an increase of approximately 37 percent. With system revenue miles of service increasing from 1.21 million miles in FY 2006 to 1.66 million miles in FY 2008, the observed increase in total system operating costs appears to be reasonable.

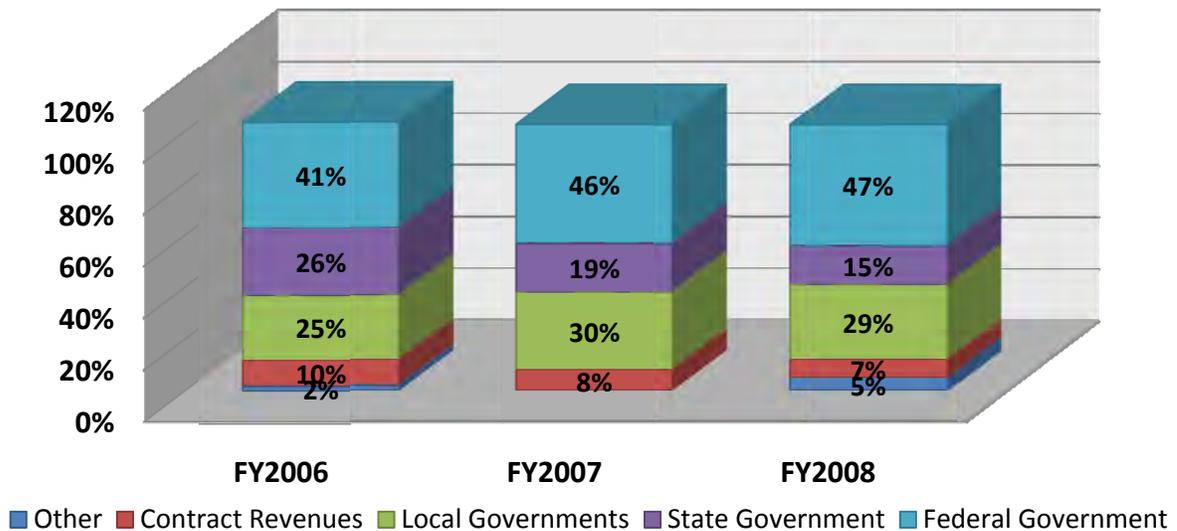
Total reported revenues (passenger fares + contract revenues) in FY 2006 of \$258,801 represented approximately 14.0 percent of the total reported operating cost of \$1,847,040. In FY 2008, the total reported revenues of \$276,539 represented approximately 10.9 percent of the total reported operating costs in that fiscal year. Passenger fares alone represented 5.1 percent of total reported operating costs in FY 2006, 4.6 percent of total reported operating costs in FY 2007, and 4.7 percent of total reported operating costs in FY 2008. As shown in the chart, in all three years, most of Bay Transit’s income is from federal and local operating assistance.

As shown in **Table 3-4** and **Figure 3-6**, the share of operating assistance provided by local governments, the Commonwealth of Virginia, and the Federal government have fluctuated somewhat from year to year. The Federal Transit Administration’s share of total net operating costs has ranged from 41 percent in FY 2006, 46 percent in FY 2007, and 47 percent in FY 2008.

**Table 3-4. Allocation of Net Operating Assistance  
FY2006-FY2008**

<b>Funding Source</b>	<b>FY2006</b>	<b>FY2007</b>	<b>FY2008</b>
Local Governments	25%	30%	29%
State Government	26%	19%	15%
Federal Government	41%	46%	47%
Contract Revenues	10%	8%	7%
Other	2%		5%
Totals	104%	103%	103%

*Source: Bay Transit*



**Figure 3-6. Allocation of Net Operating Assistance FY2006 – FY2008**

State operating assistance funding provided by the Department of Rail and Public Transportation has fluctuated between 26 percent of total net operating cost in FY 2006 to 19 percent in FY 2007 and 15 percent in FY 2008. Local government, contract revenue, and other funding has fluctuated to cover the remaining difference, from 37 percent of total net operating costs in FY 2006 to 38 percent in FY 2007 and to 41 percent in FY 2008.

### 3.7 Deviations from Service Standards and Potential Remedies

As a demand-responsive public transportation program whose service area encompasses a large and generally low-density rural portion of the Commonwealth, there are a number of different service standards and operating guidelines that can be applied to the operations of the Bay Transit system. Some of these service standards and operating guidelines have been developed at a national level through research sponsored by the Federal Transit Administration (FTA) or by the Transit Cooperative Research Program (TCRP) of the Transportation Research Board. Others have been developed with a focus on rural public transit services being operated in an individual state. At the present time, DRPT has not developed a set of general transit service standards for application to rural systems such as Bay Transit.

In May 2002, the Maryland Transit Administration of the Maryland Department of Transportation published a report titled “Maryland Transit Guidelines.” Prepared in conjunction with the Maryland Comprehensive Transit Plan (MCTP), the Maryland Transit Guidelines were defined as having four primary objectives or purposes<sup>4</sup>:

1. Provide technical guidance to transit agencies and transit providers throughout Maryland.

<sup>4</sup> Maryland Transit Guidelines, Maryland Transit Administration, Baltimore, Maryland; May 2002, Page 2.

2. Create consistency in transit service and infrastructure throughout Maryland.
3. Establish measurable guidelines for transit.
4. Provide a basis for securing funding for transit improvements.

The Maryland Transit Guidelines encompassed all of the transit modes operating in the state, from large urban fixed-guideway systems to small urban area bus and rural demand-responsive services. For the purposes of the Bay Transit TDP, the following Maryland service guidelines developed for application to rural, general public, demand-responsive transit services will be applied:

- Reservations
- Span of Service
- System Access and Availability
- Directness
- Dependability
- Rider Compliance and No Show Policy
- Financial
- Productivity

The application of each of these guidelines to the current operations of Bay Transit is discussed below.

*Reservations.* This criterion delineates both the minimum and maximum amount of time in advance of requested service that a rider is required to place a reservation with the transit system operator. The MTA minimum reservation period for non-ADA service such as that operated by Bay Transit is “noon on the prior day” and the maximum reservation period is two weeks. Bay Transit requires a 24-hour advance notice for individual trips and allows for regular trips to be prescheduled several weeks in advance. **The current service satisfies this service guideline.**

*Span of Service.* The MTA guidelines define “span of service” as the duration of time when service is “made available” and is measured from the earliest to the latest pick-up times. For rural, non-ADA services, the MTA guidelines define span of service as from 7:00 AM to 6:00 PM on weekdays. Bay Transit currently operates Monday through Friday between the hours of 6:00 AM and 6:00 PM. **The current service satisfies this service guideline.**

*Loading Guideline.* The MTA service guidelines indicate that no standees are permitted at any time on demand-responsive vehicles throughout the State of Maryland. **Bay Transit satisfies this guideline by requiring all passengers to wear seatbelts at all times on the vehicles and never allowing standees on any trip.**

System Access and Availability. The MTA guidelines define the minimum “access” for demand-responsive service to be the provision of “curb-to-curb” transportation. This guideline is being satisfied by Bay Transit. The MTA guideline for “availability” defined compliance as service being provided for any trip purpose on a space/time available basis within the agency’s operating service area. **Bay Transit is in full compliance with this guideline across the 12-county area that it serves.**

Directness. The MTA guidelines recommend that a demand-responsive trip should take no more than an hour (60 minutes) for a driving distance of up to 20 miles and discourage transfers on demand-response systems. Bay Transit does not schedule passenger transfers for those trips that have both their origin and their destination within a single county service area. Transfers are limited to those trips that require a passenger to use separate vehicles when traveling from one county to another. **Given the large geographic size of the 12-county region served by Bay Transit, non-adherence to this MTA guideline is deemed to be reasonable and acceptable. Based on a review of a small random sample of driver logs and reservation sheets, the maximum trip time guideline is being satisfied.**

Dependability. The MTA guideline for dependability measures whether the service is operated as scheduled and whether the service picks up all passengers who have made reservations. The MTA service guidelines involve two criteria: schedule adherence and trip fulfillment. The MTA schedule adherence criteria define “on-time” as being 15 minutes early to 15 minutes late for pick-ups, and up to 15 minutes late for drop-offs. The associated “on-time” percentage for pick-ups and drop-offs is 90 percent. Bay Transit currently operates a manual dispatching system with modest levels of computer assistance. Driver assignment sheets define the time of all scheduled pick-ups over the course of the service day and drivers record the actual times that pick-ups and drop-offs take place for each trip. **Based on a review of a small random sample of driver logs and reservation sheets, the schedule adherence guidelines appear to be satisfied. Similarly, the trip fulfillment criterion is being satisfied by all scheduled trips being served.**

Rider Compliance and No Show Policy. All demand-responsive transit system operators should strive to provide all eligible patrons with no turn downs. To accomplish this objective, persons that are consistent “no shows” must be denied service so that other riders can use the available system capacity. Since its earliest days of operation, Bay Transit has implemented and maintained a consistent set of policies related to rider compliance and “no shows”. Records are maintained of those persons who make a reservation but are not available to be picked up within the designated time period or who cancel a reservation on short notice. Written notification is provided to these individuals of the potential for suspension of service if the situation continues. Suspension of service has been applied where necessary and appropriate. **It appears that this service criterion is being satisfied.**

Financial. The cost of operating a demand-response transit system can be measured by several basic financial factors. The most commonly used factors are the average system-wide cost per passenger and the average system-wide cost per vehicle hour of service provided. **As described**

**earlier in this chapter, Bay Transit appears to be operating a very efficient and cost effective service.** The current average cost per passenger during FY 2008 was \$15.76, and Bay Transit's average cost per vehicle hour of service provided was \$32.77 during FY 2008, a value approximately 16 percent lower than the average experienced by the other three peer transit systems.

Productivity. The most useful measure of a demand-response system's productivity is passengers per revenue hour because it provides the operating agency with a method to measure service without focusing on operating costs. As noted earlier in this chapter, Bay Transit's system-wide passenger per revenue hour factor during FY 2008 was 2.08, as compared to the average value for this factor experienced by the three peer transit systems of 2.74. Given the fact that most of the peer systems provide service to much smaller geographic areas, typically only a single county as opposed to the 12-county region served by Bay Transit, this finding is not unexpected. Comparing this operating statistic for Bay Transit to the same measure for its most comparable peer system, MEOC Transit, results in a much more favorable finding. While Bay Transit carried 2.08 passengers per revenue hour during FY 2008, MEOC Transit carried 1.43 passengers per revenue hour. **It would thus appear that Bay Transit is providing service in a very cost-effective manner.**

### **3.8 Potential Solutions to Gaps or Service Deficiencies**

Bay Transit's services are essentially all demand-response in nature. Year-round fixed-route services are offered weekdays in the Towns of Colonial Beach and West Point. Three seasonal trolleys run seasonal weekend fixed routes in the towns of Colonial Beach, Kilmarnock, White Stone, Irvington, and Urbanna.

As described above, the system appears to be providing these services in an efficient and cost-effective manner. As evidenced by the results of the on-board ridership survey, the current passengers appear to be pleased and supportive of the transit services that are being provided.

With that said, the service factor of "On-time Performance" may be the single most important factor that the current riders believe is in need of improvement. This factor has also been noted by the Bay Transit management, who recently initiated a needs assessment for paratransit services scheduling software. The primary purpose of this project is to assess the current primarily manual scheduling practices of Bay Transit and to recommend scheduling and dispatching software that can be employed to increase operational efficiencies and ridership. This needs assessment project began in May 2009 and is planned to be completed by the end of 2009.

### **3.9 Potential Remedies for Equipment and Facility Deficiencies**

Since the initiation of service in 1996, Bay Transit has been successful in both acquiring the vehicles required to operate its service on a regular basis and in obtaining federal, state, and local government operating assistance. However, they have been constrained by limitations on

obtaining appropriate administrative and maintenance facilities. The Bay Transit senior management and administrative staff currently share space with their co-workers of Bay Aging at the latter's main offices in Urbanna, Middlesex County. Actual operations and maintenance functions are distributed across a number of locations on both the Northern Neck and Middle Peninsula portions of the 12-county service area. Area operations managers typically work out of the Bay Aging offices in their particular area, with vehicle maintenance services provided by private contractors.

Recognizing the need to address this issue, Bay Transit has been working closely with DRPT and its local government partners over the past several years on the planning and design of its first new dedicated operations and maintenance facility. This work culminated on April 27, 2009 with groundbreaking ceremonies in the Commerce Park of Warsaw, Virginia for an 11,000 square foot transit facility that will include space for operations and dispatch functions as well as a fleet maintenance shop consisting of two vehicle bays with lifts. The combined design and construction cost for the Bay Transit operations and maintenance facility is \$2,720,327.<sup>5</sup> The construction of this new facility is anticipated to be completed by Spring 2010, with operations out of the center beginning in Summer 2010. The Warsaw center will serve as the dispatch location for all twelve (12) counties.

Bay Transit is also beginning to plan for the development of a Middle Peninsula administration and maintenance facility to accommodate its needs in the central and southern portions of the Middle Peninsula and those in New Kent and Charles City Counties. The specific location for this facility has not yet been identified. The current thinking of Bay Transit management is that this facility should be in operation within the next five to seven years, or within the time-frame associated with this initial Transit Development Plan.

### **3.10 Title VI Report and FTA Quadrennial Review**

As a designated subrecipient of FTA capital and operating assistance funding through the Virginia Department of Rail and Public Transportation (DRPT) whose services are provided in a rural portion of the Commonwealth, Bay Transit is not required to prepare and submit its own separate Title VI report or the associated FTA Quadrennial Review. However, Bay Transit is still required to follow the Title VI and Title VI-dependent guidelines for Federal Transit Administration recipients as described in FTA Circular C 4702.1A. Thus, for example, the appropriate provisions of the NEPA process were followed in connection with the planning, design, and construction of the new Warsaw transit operations and maintenance center. Similarly, all official publications issued by Bay Transit include appropriate language concerning non-discrimination.

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<sup>5</sup> Bay Transit has Groundbreaking Ceremony for Warsaw Transit Facility;  
<http://www.drpt.virginia.gov/nnews/details.aspx?id=379>.

## 4.0 SERVICE EXPANSION PROJECT DESCRIPTIONS

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This chapter presents a description of potential service and facility improvement needs over the multi-year duration of the transit plan. This discussion should be viewed not as a “wish list”, but rather as documentation of those reasonable potential actions to improve the existing transit system over the next five to seven years. The contents of this chapter include the following elements:

- Demographic analysis that identifies anticipated changes in population and employment within the service area.
- A description of potential needs based on the work undertaken to date in connection with the TDP development. This work reflects inputs from the transit agency staff, other regional stakeholders, and the technical analysis undertaken by the members of the consultant team.
- Preliminary capital and operating cost estimates associated with each of the various identified potential needs and a discussion of potential policy, funding, or operating issues associated with the defined needs. This data will include estimates of potential ridership response to the various service improvements.

Each of these topics is discussed in more detail below.

### 4.1 Demographic Analysis of Anticipated Population and Employment Changes

The Bay Transit service area encompasses a 12-county region in the eastern part of the Commonwealth of Virginia that is predominantly rural in character. With the exception of a number of small urban centers that house concentrations of population and employment, most of the land area is primarily agricultural, forest, or wetlands.

As shown on **Table 4-1**, the estimated present day population of the Bay Transit service area (based on 2008 data) is approximately 168,300 persons, spread across a total land area for the 12 counties of approximately 2,664 square miles. The resulting average population density is approximately 63.2 persons per square mile.

The more densely-populated portion of the region is composed of the six counties that constitute the Middle Peninsula PDC. These six counties contain approximately 92,240 persons, or approximately 55 percent of the total service area population.

The four counties that comprise the Northern Neck PDC area contain approximately 50,987 persons, or approximately 30 percent of the regional total, with the two counties (Charles City County and New Kent County) within the Richmond Regional PDC containing the remaining 25,037 persons, or approximately 15 percent of the regional total.

Between 2000 and 2008, the Richmond Region population grew the most (22.8 percent), followed by the Middle Peninsula (10.2 percent). The Northern Neck grew very little (3.3 percent).

Recent estimates assembled by the Virginia Employment Commission show that the total employment within these twelve counties is approximately 80,500 jobs. As shown in **Table 4-1**, this estimate includes approximately 45,200 jobs in the six Middle Peninsula PDC counties, approximately 22,800 jobs in the four Northern Neck PDC counties, and the remaining 12,400 jobs in Charles City and New Kent Counties.

**Table 4-1. Present Day Population and Employment Summary**

PDC and Counties	Population		Percent Change in Population	County Area (Sq. Miles)	Population Density (Persons/Sq.Mi.)		2009 Employment
	2000	2008			2000	2008	
<b>PDC 18 - Middle Peninsula</b>							
Essex County	9,989	11,091	11.0%	276.4	36.1	40.1	5,382
Gloucester County	34,780	38,656	11.1%	253.3	137.3	152.6	19,702
King and Queen County	6,630	6,830	3.0%	324.4	20.4	21.1	3,110
King William County	13,146	16,040	22.0%	285.2	46.1	56.2	7,965
Mathews County	9,207	9,038	-1.8%	103.1	89.3	87.7	4,242
Middlesex County	9,932	10,585	6.6%	142.3	69.8	74.4	4,841
<i>Total PDC 18</i>	<i>83,684</i>	<i>92,240</i>	<i>10.2%</i>	<i>1384.7</i>	<i>60.4</i>	<i>66.6</i>	<i>45,242</i>
<b>PDC 17 - Northern Neck</b>							
Lancaster County	11,567	11,466	-0.9%	150.0	77.1	76.4	5,153
Northumberland County	12,259	12,915	5.4%	216.4	56.6	59.7	5,468
Richmond County	8,809	9,144	3.8%	206.1	42.7	44.4	3,877
Westmoreland County	16,718	17,462	4.5%	277.7	60.2	62.9	8,338
<i>Total PDC 17</i>	<i>49,353</i>	<i>50,987</i>	<i>3.3%</i>	<i>850.2</i>	<i>58.0</i>	<i>60.0</i>	<i>22,836</i>
<b>PDC 15 - Richmond Region</b>							
Charles City County	6,926	7,212	4.1%	204.0	34.0	35.4	3,541
New Kent County	13,462	17,825	32.4%	225.0	59.8	79.2	8,861
<i>Total PDC 15 (partial)</i>	<i>20,388</i>	<i>25,037</i>	<i>22.8%</i>	<i>429.0</i>	<i>47.5</i>	<i>58.4</i>	<i>12,402</i>
<b>Service Area Total</b>	<b>153,425</b>	<b>168,264</b>	<b>9.7%</b>	<b>2663.9</b>	<b>57.6</b>	<b>63.2</b>	<b>80,480</b>

*Sources:*

2000 Population and County Area - 2000 Census

2008 Population Estimates - <http://quickfacts.census.gov/qfd/states/51/51036.html>

2009 Employment Data (Average: January – June 2009) - Virginia Employment Commission

Future year forecasts of population for each of the 12 counties in the Bay Transit service area for the years 2010, 2020, and 2030 were obtained from the Virginia Employment Commission.

Employment projections for these rural counties were not available from the Virginia Employment Commission.

For the purposes of the Bay Transit TDP, a future plan horizon year of 2015 has been identified, six years from the current base transit operations year of 2009. **Table 4-2** presents estimates of future population for the years 2010, 2015, 2020, and 2030 for each of the Bay Transit service area counties. The 2015 estimates were interpolated from the 2010 and 2020 estimates.

**Table 4-2. Future Year Bay Transit Service Area Population Estimates (All Ages)**

PDC and Counties	2010	2015	2020	2030	Change: 2010-2015	
					Number	Percent
PDC 18 - Middle Peninsula						
Essex County	10,969	11,465	11,960	12,974	496	4.5%
Gloucester County	40,474	43,244	46,013	51,824	2,770	6.8%
King and Queen County	6,891	7,039	7,187	7,564	148	2.1%
King William County	16,187	17,653	19,119	22,227	1,466	9.1%
Mathews County	9,097	9,087	9,077	9,068	-10	-0.1%
Middlesex County	11,012	11,534	12,055	13,181	522	4.7%
<i>Total PDC 18</i>	<i>94,630</i>	<i>100,021</i>	<i>105,411</i>	<i>116,838</i>	<i>5,391</i>	<i>5.7%</i>
PDC 17 - Northern Neck						
Lancaster County	11,485	11,481	11,477	11,478	-4	0.0%
Northumberland County	13,420	14,004	14,587	15,821	584	4.3%
Richmond County	8,333	9,117	9,900	10,512	784	9.4%
Westmoreland County	17,483	17,910	18,336	19,261	427	2.4%
<i>Total PDC 17</i>	<i>50,721</i>	<i>52,511</i>	<i>54,300</i>	<i>57,072</i>	<i>1,790</i>	<i>3.5%</i>
PDC 15 - Richmond Region PDC						
Charles City County	7,431	7,682	7,932	8,749	251	3.4%
New Kent County	18,681	21,176	23,671	29,496	2,495	13.4%
<i>Total PDC 15 (partial)</i>	<i>26,112</i>	<i>28,858</i>	<i>31,603</i>	<i>38,245</i>	<i>2,746</i>	<i>10.5%</i>
<b>Service Area Total</b>	<b>171,463</b>	<b>181,389</b>	<b>191,314</b>	<b>212,155</b>	<b>9,926</b>	<b>5.8%</b>

*Source: 2000 Census and Virginia Employment Commission Community Profiles for each county.*

As **Table 4-2** shows, almost all of the Bay Transit service area counties are projected to experience increases in population from 2010 to 2015. Only Mathews County and Lancaster County are projected to experience very small decreases in population. In these two counties, the anticipated percentage change resulting from these decreases is expected to be less than 0.1 percent, which can be considered as no change in the total population. For the overall Bay Transit service area, the total estimated population increase is projected to be 9,926 persons from 2010 to 2015, or a percentage change over this period of 5.8 percent. On an average annual basis, this equates to approximately 1.1 percent per year.

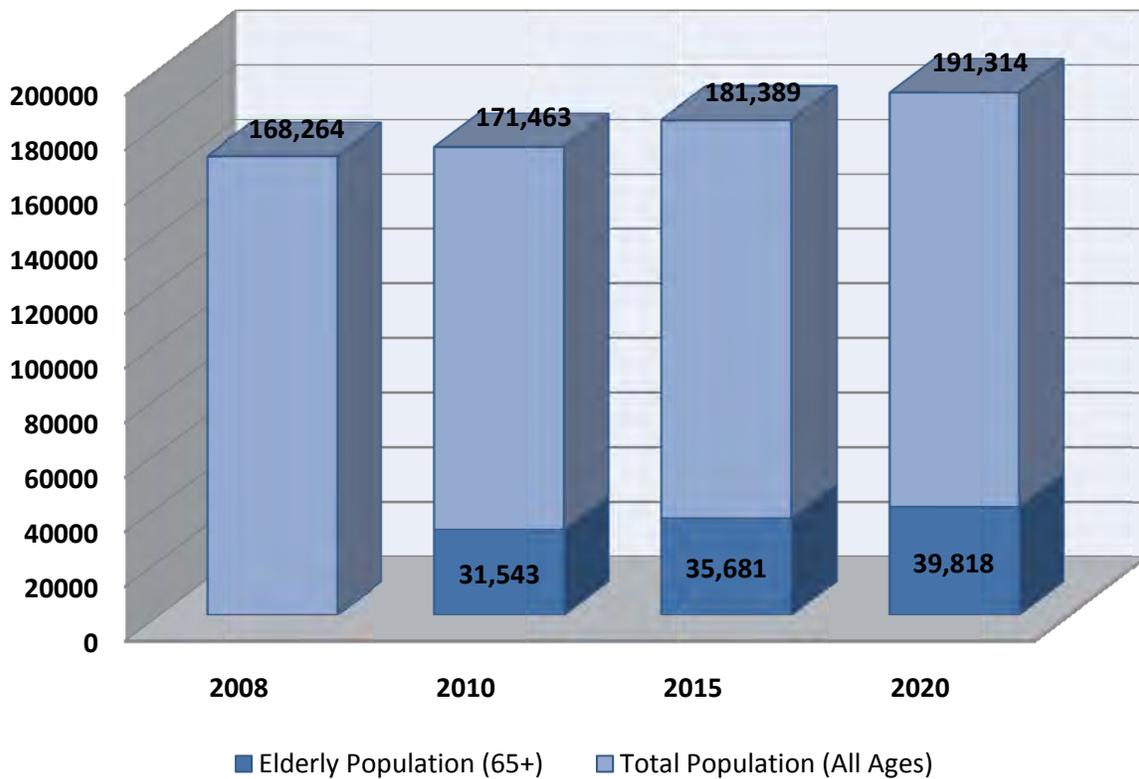
**Table 4-3** illustrates the current and projected future service area population of persons age 65 or older.

**Table 4-3. Future Year Bay Transit Service Area Population Estimates of Elderly Persons (65 or Older)**

PDC and Counties	2010	2015	2020	Change, 2010-2015	
				Number	Percent
PDC 18 - Middle Peninsula					
Essex County	1,914	2,143	2,372	229	12.0%
Gloucester County	5,676	7,016	8,356	1,340	23.6%
King and Queen County	1,265	1,385	1,505	120	9.5%
King William County	2,118	2,647	3,175	529	25.0%
Mathews County	2,198	2,253	2,307	55	2.5%
Middlesex County	2,706	2,933	3,160	227	8.4%
<i>Total PDC 18</i>	<i>15,877</i>	<i>18,376</i>	<i>20,875</i>	<i>2,499</i>	<i>15.7%</i>
PDC 17 - Northern Neck					
Lancaster County	3,122	3,019	2,916	-103	-3.3%
Northumberland County	3,944	4,050	4,156	106	2.7%
Richmond County	1,688	1,767	1,846	79	4.7%
Westmoreland County	3,422	3,616	3,809	194	5.7%
<i>Total PDC 17</i>	<i>12,176</i>	<i>12,452</i>	<i>12,727</i>	<i>276</i>	<i>2.3%</i>
PDC 15 - Richmond Region PDC					
Charles City County	1,193	1,453	1,712	260	21.8%
New Kent County	2,297	3,401	4,504	1,104	48.0%
<i>Total PDC 15 (partial)</i>	<i>3,490</i>	<i>4,853</i>	<i>6,216</i>	<i>1,363</i>	<i>39.1%</i>
<b>Service Area Total</b>	<b>31,543</b>	<b>35,681</b>	<b>39,818</b>	<b>4,138</b>	<b>13.1%</b>

*Source: 2000 Census and Virginia Employment Commission Community Profiles for each county.*

As shown on **Table 4-3**, the population of elderly persons age 65 or older is projected to increase from 2010 to 2015 for all counties in the Bay Transit service area except Lancaster County. Lancaster County is projected to experience a decrease of approximately 103 persons age 65 or older between 2010 and 2015. This value represents a 3.3 percent decrease in the elderly population of this county. For the overall Bay Transit service area, the total number of elderly persons is projected to increase from approximately 31,543 persons in 2010 to approximately 35,681 persons in 2015. This change in the number of elderly residents of 4,138 persons from 2010 to 2015 represents a percentage change of approximately 13.1 percent, or approximately 2.5 percent per year. **Figure 4-1** below presents the existing population and the projected total and elderly populations for the Bay Transit service area jurisdictions in the years 2010, 2015, and 2020, compared to the 2008 base year. The elderly population (65+) for 2008 was not readily available, but it can be assumed that it is a similar portion of the total population as 2010.



**Figure 4-1. Projected Population (All Bay Transit Service Jurisdictions)**

## 4.2 Potential Service Expansion and Facility Needs

As described in previous sections of this TDP document, Bay Transit has been a steadily growing and expanding system for over a decade. Since the initiation of service in 1996 with one vehicle in Gloucester County, the system has grown to a fleet of 68 vehicles operating across a 12-county region.

The fundamental question now facing the agency is how best to improve upon the current system. One of the basic facility needs is the continuation of the historical transit vehicle replacement and fleet expansion program. This activity continues today, most recently with the designation in April 2009 of Bay Transit as one of the rural and small urban public transit systems in Virginia to receive Federal Recovery Act stimulus funding. Through this program, Bay Transit was identified as the recipient of seven replacement passenger transport vans at a total cost of \$395,900. This allocation will take the form of 100 percent Federal funding with no state or local matching funds required. The average cost of each of these vehicles is approximately \$56,500.

In recent years, Bay Transit has typically acquired five to ten vehicles in any given year, an average of seven or eight vehicles each year. The seven vehicles to be obtained during 2009 using Federal Recovery Act stimulus funding thus represents the system’s recently observed typical vehicle acquisition / replacement cycle. Assuming that this typical vehicle replacement

cycle is continued over the next several years, **Table 4-4** illustrates the total passenger fleet size and the anticipated average vehicle age between 2009 and the TDP horizon year of 2015.

**Table 4-4. Bay Transit Fleet Replacement Program, FY2009-FY2015**

Passenger Vehicle Fleet		Calendar Year 2008 - 2015							
Model Year	No. of Vehicles	2008	2009	2010	2011	2012	2013	2014	2015
1988	1	1							
1999									
1990	1	1							
1991	1	1							
1992	1	1							
1993									
1994	1	1							
1995	1	1							
1996									
1997									
1998	1	1							
1999	2	2							
2000	1	1							
2001	2	2	2						
2002	6	6	6						
2003	7	7	7	7					
2004									
2005	7	7	7	7	7				
2006	10	10	10	10	10	10	5		
2007	5	5	5	5	5	5	5	5	
2008	10	10	10	10	10	10	10	10	10
2009	-		7	7	7	7	7	7	7
2010	-			7	7	7	7	7	7
2011	-				7	7	7	7	7
2012	-					7	7	7	7
2013	-						7	7	7
2014	-							7	7
2015	-								7
Total Vehicles	57	57	54	53	53	53	55	57	59
Average Age		5.6	4.3	4.1	4.1	4.2	4.4	4.5	4.7

*Assumptions: Current fleet size remains relatively constant; 7 vehicles to be acquired each year starting 2009.*

Applying the average vehicle acquisition cost of \$56,500 in the current year (2009) and applying an average annual inflation rate of 2.0 percent over the period of 2010 to 2015, the typical average annual cost associated with the acquisition of several replacement vehicles each year over this period is shown in **Table 4-5**.

**Table 4-5. Estimated Cost of Base Fleet Vehicle Replacement Program, FY2009-FY2015**

Model Year	Avg. Vehicle Cost	2008	2009	2010	2011	2012	2013	2014	2015	Total Cost
2009	\$56,500	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2010	\$57,600	\$ -	\$ -	\$403,200	\$ -	\$ -	\$ -	\$ -	\$ -	\$403,200
2011	\$58,800	\$ -	\$ -	\$ -	\$411,600	\$ -	\$ -	\$ -	\$ -	\$411,600
2012	\$60,000	\$ -	\$ -	\$ -	\$ -	\$420,000	\$ -	\$ -	\$ -	\$420,000
2013	\$61,200	\$ -	\$ -	\$ -	\$ -	\$ -	\$428,400	\$ -	\$ -	\$428,400
2014	\$62,400	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$436,800	\$ -	\$436,800
2015	\$63,600	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$445,200	\$445,200
	Totals	\$ -	\$ -	\$415,100	\$436,100	\$457,800	\$480,900	\$504,700	\$529,900	\$2,545,200

*Note: Average Vehicle Cost each year assumes 2.0 percent inflation rate.*

As illustrated in **Table 4-5**, the average vehicle cost today of \$56,500 could increase to approximately \$63,600 by the year 2015 assuming an average annual inflation rate of 2.0 percent, and with the average vehicle cost rounded to the nearest \$100. The total estimated cost of acquiring seven vehicles each year for a period of six years would be approximately \$2,545,200.

**Table 4-6** and **Table 4-7**, respectively, illustrate the anticipated operating statistics and operating assistance funding levels associated with the continuing operation of the Bay Transit system at present day service levels. These tables assume that the currently observed vehicle miles and hours of service would remain basically unchanged over the next several years, with the anticipated increase in service area population defining the magnitude of the anticipated passenger growth. The latest available budget information for Bay Transit is FY 2010. Therefore, operating expenses are assumed to experience an average annual increase of approximately 2.0 percent starting from FY 2011 to FY 2015.

**Table 4-6. Operating Statistics of Bay Transit, FY2008-FY2015**

<b>Operating Statistics</b>	<b>FY2008</b>	<b>FY2009</b>	<b>FY2010</b>	<b>FY2011</b>	<b>FY2012</b>	<b>FY2013</b>	<b>FY2014</b>	<b>FY2015</b>
Annual Passengers	156,067	157,784	159,519	161,274	163,048	164,842	166,655	168,488
Annual Operating Costs	\$ 2,459,305	\$ 2,420,176	\$ 2,582,544	\$ 2,634,195	\$ 2,686,879	\$ 2,740,616	\$ 2,795,429	\$ 2,851,337
Annual Revenue Miles	1,664,376	1,664,456	1,664,456	1,664,456	1,664,456	1,664,456	1,664,456	1,664,456
Annual Revenue Hours	75,045	75,175	75,175	75,175	75,175	75,175	75,175	75,175
Passengers per Revenue Mile	0.094	0.095	0.096	0.097	0.098	0.099	0.100	0.101
Passengers per Revenue Hour	2.08	2.10	2.12	2.15	2.17	2.19	2.22	2.24
Cost per Passenger	\$15.76	\$15.34	\$16.19	\$16.33	\$16.48	\$16.63	\$16.77	\$16.92
Cost per Revenue Mile	\$1.48	\$1.45	\$1.55	\$1.58	\$1.61	\$1.65	\$1.68	\$1.71
Cost per Revenue Hour	\$32.77	\$32.19	\$34.35	\$35.04	\$35.74	\$36.46	\$37.19	\$37.93

1. The percentage of Annual Passenger increase is assumed to be 1.1% based on the regional population increase, beginning in FY 2009.
2. FY2010 Operating Cost obtained from DRPT FY2010 district budget data. Beginning in FY2011, the Annual Operating Cost calculated assuming a 2.0%/year inflation rate.
3. Annual Revenue Miles assumed to be constant through the life of the TDP period.
4. Annual Revenue Hours for FY 2009 provided by Bay Transit and assumed to be constant through the life of the TDP period.
5. FY2010 Passenger Fare and Contract Revenue Total obtained from DRPT FY2010 district budget data and assumed to be constant through the life of the TDP period.
6. Federal Operating Assistance reflects estimated FTA Section 5311 and FTA 5316 funds; assumed to remain flat at FY2010 levels.
7. FY2010 State Operating Assistance obtained from DRPT FY2010 district budget data. The increase in State Operating Assistance, as per DRPT, is assumed to be 1.77% in FY2011, 2.90% in FY2011-FY2012, 3.50% in FY2012-FY2013, 3.16% in FY2013-FY2014, and 3.16% in FY2014-FY2015.
8. Net Operating Cost calculated as Total Cost less Passenger Fares and Contract Revenues.

**Table 4-7. System Revenues and Operating Assistance of Bay Transit, 2008-2015**

<b>System Revenues and Operating Assistance</b>	<b>FY2008</b>	<b>FY2009</b>	<b>FY2010</b>	<b>FY2011</b>	<b>FY2012</b>	<b>FY2013</b>	<b>FY2014</b>	<b>FY2015</b>
Passenger Fares	\$119,602	\$120,000	\$ 121,234	\$ 122,568	\$ 123,917	\$ 125,280	\$ 126,658	\$ 128,051
Contract Revenues	\$156,937	\$157,000	\$ 25,000	\$ 25,000	\$ 25,000	\$ 25,000	\$ 25,000	\$ 25,000
Local Operating Assistance	\$679,436	\$621,219	\$757,793	\$799,821	\$837,315	\$872,444	\$909,785	\$947,704
State Operating Assistance	\$357,891	\$411,839	\$469,501	\$477,811	\$491,668	\$508,876	\$524,957	\$541,545
Federal Operating Assistance	\$1,095,597	\$1,071,118	\$1,208,972	\$1,209,000	\$1,209,000	\$1,209,000	\$1,209,000	\$ 1,209,000
Other Match	\$120,391	\$39,000						
<b>Totals</b>	<b>\$2,529,854</b>	<b>\$2,420,176</b>	<b>\$2,582,500</b>	<b>\$2,634,200</b>	<b>\$2,686,900</b>	<b>\$2,740,600</b>	<b>\$2,795,400</b>	<b>\$ 2,851,300</b>
<b>Net Operating Cost</b>	<b>\$2,253,315</b>	<b>\$2,143,176</b>	<b>\$2,436,266</b>	<b>\$2,486,632</b>	<b>\$2,537,983</b>	<b>\$2,590,320</b>	<b>\$2,643,742</b>	<b>\$2,698,249</b>

1. The percentage of Annual Passenger increase is assumed to be 1.1% based on the regional population increase, beginning in FY 2009.
2. FY2010 Operating Cost obtained from DRPT FY2010 district budget data. Beginning in FY2011, the Annual Operating Cost calculated assuming a 2.0%/year inflation rate.
3. Annual Revenue Miles assumed to be constant through the life of the TDP period.
4. Annual Revenue Hours for FY 2009 provided by Bay Transit and assumed to be constant through the life of the TDP period.
5. FY2010 to FY2015 Passenger Fare and Contract Revenue Total estimate obtained from Diana Giles, CFO, Bay Transit.
6. Federal Operating Assistance reflects estimated FTA Section 5311 and FTA 5316 funds; assumed to remain flat at FY2010 levels.
7. FY2010 State Operating Assistance obtained from DRPT FY2010 district budget data. The increase in State Operating Assistance, as per DRPT, is assumed to be 1.77% in FY2011, 2.90% in FY2011-FY2012, 3.50% in FY2012-FY2013, 3.16% in FY2013-FY2014, and 3.16% in FY2014-FY2015.
8. Net Operating Cost calculated as Total Cost less Passenger Fares and Contract Revenues.

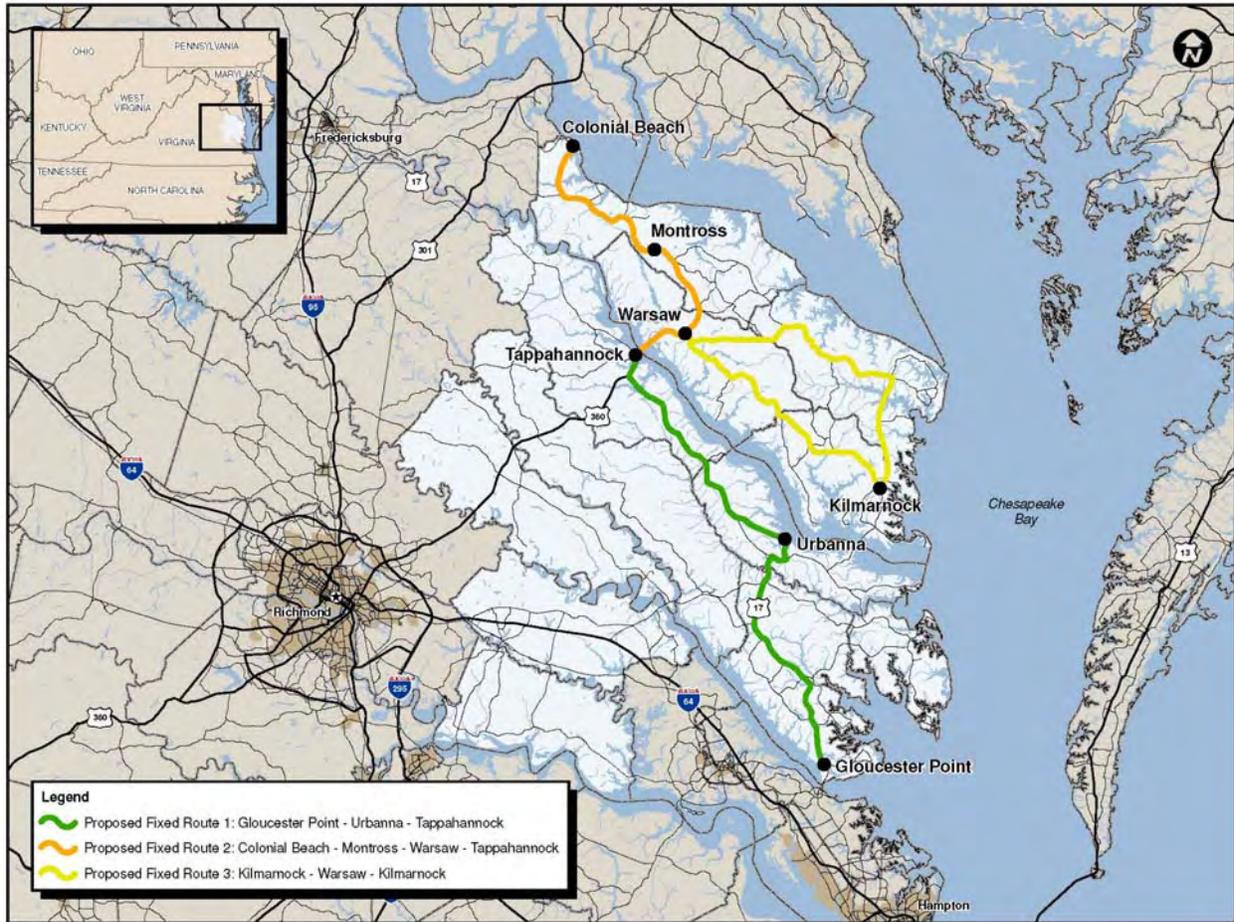
## **Potential Service Expansions**

As described in previous sections of this TDP document, currently Bay Transit only provides demand-response transit services. However, the staff of Bay Transit and several stakeholders have identified the potential need in the region for the initiation of fixed-route services. Based on the demand of services, three potential fixed routes have been identified in this TDP, as shown in **Figure 4-2** and described below:

- ❖ **Proposed Fixed-Route 1:** Gloucester Point – Urbanna – Tappahannock: This route starts from Gloucester and follows Rt. 17 to get to Urbanna and then to Tappahannock. The one-way distance of this route is approximate 62 miles and travel time is estimated at 1 ½ hours for a one-way trip. The following figure shows the proposed route.
- ❖ **Proposed Fixed-Route 2:** Colonial Beach – Montross – Warsaw – Tappahannock: This route starts from Colonial Beach and follows Rt. 205 to Montross, then Rt. 3 to Warsaw, and then travels to Tappahannock via Rt. 360. The one-way distance of this route is approximately 40 miles, and travel time is estimated at 1 hour for a one-way trip. The following figure shows the proposed route.
- ❖ **Proposed Fixed-Route 3:** Kilmarnock – Warsaw – Kilmarnock: This route is a loop route. It starts from Kilmarnock to get to Warsaw via Rt. 3 and then follows Rt. 360 and Rt. 200 to return to Kilmarnock. The loop distance of this route is approximately 70 miles, and travel time is estimated at 1 ½ hours for a typical one-loop trip. The following figure shows the proposed route.

The routes shown in **Figure 4-3** were submitted by the Northern Neck Planning District Commission as their suggestion for potential new fixed-route services. Note that the green route in Figure 4-3 matches the Proposed Fixed-Route 2 and the red loop route in Figure 4-3 matches Proposed Fixed-Route 3. The PDC suggested the following service details for these potential routes:

1. The loop could be implemented in two or more phases. The Colonial Beach-to-Warsaw segment might be Phase One as it would provide service between two regional employment centers, as well as regularly scheduled transportation to/from Rappahannock Community College.
2. The ideal fixed-route schedule would be six or seven days a week, with buses running primarily from 6 AM to 9 AM and 4 PM to 7 PM on weekdays, and another schedule on weekends, depending on demand.



**Figure 4-2. Proposed Fixed-Route Services**

Two additional suggestions for expanded service were presented at the Final Stakeholder Meeting on October 7, 2009. This meeting was held to discuss the contents of this TDP and review its final recommendations. During the general question and answer period at the end of the meeting, the following two services were discussed and it was agreed that they would be included in the TDP for reevaluation and consideration, if funding were to become available in the future:

1. Commuter service from New Kent/Charles City to Richmond or Williamsburg. This service would be provided Monday through Friday, with one trip in the morning and a return trip in the evening.
2. The extension of existing demand-response service to include later evening hours (after 6:00 PM) and/or weekend service (primarily Saturday).

# Northern Neck Proposed Fixed Transit Routes



Map Prepared by the Northern Neck Rideshare Program, August 2009

**Figure 4-3. Northern Neck Proposed Fixed Transit Routes**

### ***Computerized Scheduling and Dispatching System***

Another transit service improvement that Bay Transit has proposed is the planned acquisition of a computerized scheduling and dispatching system. Bay Transit is presently using manual methods to schedule and dispatch their vehicles.

Based on their experiences with the manual method, they have found that it is not an efficient means to operate their system. Therefore, Bay Transit currently is in the early phases of a process to acquire a computerized scheduling and dispatching system to operate their system. A needs assessment of paratransit services scheduling software has recently been initiated, with completion expected by the end of calendar year 2009. The funding mechanism for the acquisition of the computerized scheduling and dispatching system has not yet been identified.

Based upon limited experience in other communities, it is anticipated that implementation of such a computerized scheduling and dispatching system may be able to achieve operational efficiencies. Bay Transit suggests that the overall annual system ridership could experience an increase of approximately 10 percent per year following implementation of the system (assumed as FY 2012).

### ***Administration and Maintenance Center***

Based on the transit demand growth in the Bay Transit service area, a new administration and maintenance center has been proposed to be built in the Middle Peninsula. It has been assumed that this new facility could be funded and constructed within the five to seven year TDP time-frame. The size of this proposed administration and maintenance center is assumed to be similar to that of the Warsaw facility, which broke ground on April 27, 2009 and is anticipated to be completed in 2010.

## **4.3 Estimates of Capital and Operating Costs for Identified Improvements**

The previous section identified the potential improvement needs for Bay Transit. In this section, the capital and operating costs associated with these improvements are evaluated and estimated.

### ***1. The cost of three fixed-route services***

The cost of the three new proposed routes includes the capital cost and estimated operating cost. The capital cost for the new fixed routes are anticipated to include the cost for the required new vehicle purchase. The operating cost includes all the expenses for the operation of the transit service. For examples: the salaries of Bay Transit staff, motor fuels, motor tires and parts, etc.

The latest available budget information from FY 2009 was used to estimate both future capital and operating cost. All cost estimations are based on this current year budget information with

the application of an assumed 2.0 percent annual inflation rate for each of the future years through the TDP horizon year of 2015.

It is assumed that these new fixed routes will be implemented in FY 2012, and that the transit services will be operated 12 hours per day, 5 days per week. The total number of operating days for the transit service is assumed to be 250 days per year. Two options are considered for each route: one vehicle running the route or two vehicles running the route. Based on the information associated with the Federal Recovery Act stimulus funding allocation to Bay Transit, the anticipated average cost of each of these additional required vehicles is approximately \$56,500.

The methodology to determine the operating cost of the fixed-route services is based on the annual operating miles of fixed routes and the cost per revenue mile. The annual number of revenue miles associated with each of the three proposed routes is the product of the miles of each round trip on the route, the number of round trips assumed to be operated per day on each route, and the assumed number of service days per year.

**Table 4-8** below summarizes the annual operating miles of the proposed fixed routes described in the previous section. It should be noted that a 5 percent deadhead mileage factor has been added to the initially estimated annual revenue miles of service for each route to arrive at the estimated total annual operating miles for the route.

**Table 4-8. Estimated Annual Operating Miles of Proposed Fixed Routes**

Proposed Fixed Route	Option	Annual Operating Miles of Proposed Fixed Routes					
		FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Route (1) Gloucester Point – Urbanna – Tappahannock	Option 1 – one vehicle	0	0	130,200	130,200	130,200	130,200
	Option 2 – two vehicles	0	0	260,400	260,400	260,400	260,400
Route (2) Colonial Beach – Montross – Warsaw – Tappahannock	Option 1	0	0	126,000	126,000	126,000	126,000
	Option 2	0	0	252,000	252,000	252,000	252,000
Route (3) Kilmarnock – Warsaw – Kilmarnock	Option 1	0	0	147,000	147,000	147,000	147,000
	Option 2	0	0	294,000	294,000	294,000	294,000
<b>Totals</b>	Option 1	0	0	<b>403,200</b>	<b>403,200</b>	<b>403,200</b>	<b>403,200</b>
	Option 2	0	0	<b>806,400</b>	<b>806,400</b>	<b>806,400</b>	<b>806,400</b>

*Note: Total annual operating miles = total estimated revenue miles plus 5 percent deadhead mileage.*

Based on the FY 2009 Bay Transit budget information, the average cost per revenue mile of operation is \$1.48 per mile. By applying an annual inflation rate of 2.0 percent, the cost per revenue mile for each of the future years is summarized in **Table 4-9** below.

**Table 4-9. Estimated Cost per Revenue Mile of Proposed Fixed Routes**

Proposed Fixed Route		Cost per Revenue Mile					
		FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Route (1) Gloucester Point – Urbanna – Tappahannock	Option 1	\$1.48	\$1.51	\$1.54	\$1.57	\$1.60	\$1.63
	Option 2	\$1.48	\$1.51	\$1.54	\$1.57	\$1.60	\$1.63
Route (2) Colonial Beach – Montross – Warsaw – Tappahannock	Option 1	\$1.48	\$1.51	\$1.54	\$1.57	\$1.60	\$1.63
	Option 2	\$1.48	\$1.51	\$1.54	\$1.57	\$1.60	\$1.63
Route (3) Kilmarnock – Warsaw – Kilmarnock	Option 1	\$1.48	\$1.51	\$1.54	\$1.57	\$1.60	\$1.63
	Option 2	\$1.48	\$1.51	\$1.54	\$1.57	\$1.60	\$1.63

Note: Present (FY2009) cost per revenue mile = 1.45 dollar/mile. Assumed annual inflation rate is 2 percent.

The annual operating costs for the proposed fixed routes are calculated by multiplying the estimated number of annual operating miles by the average cost per revenue mile. **Table 4-10** summarizes the estimated annual operating costs for each of the proposed fixed-route services.

**Table 4-10. Estimated Annual Operating Miles of Proposed Fixed Routes**

Proposed Fixed Route		Operating Cost					
		FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Route (1) Gloucester Point – Urbanna – Tappahannock	Option 1	\$ -	\$ -	\$200,300	\$204,400	\$208,400	\$212,600
	Option 2	\$ -	\$ -	\$400,700	\$408,700	\$416,900	\$425,200
Route (2) Colonial Beach – Montross – Warsaw – Tappahannock	Option 1	\$ -	\$ -	\$193,900	\$197,800	\$201,700	\$205,700
	Option 2	\$ -	\$ -	\$387,800	\$395,500	\$403,400	\$411,500
Route (3) Kilmarnock – Warsaw – Kilmarnock	Option 1	\$ -	\$ -	\$226,200	\$230,700	\$235,300	\$240,000
	Option 2	\$ -	\$ -	\$452,400	\$461,400	\$470,700	\$480,100
<b>Total</b>	Option 1	\$ -	\$ -	<b>\$620,400</b>	<b>632,900</b>	<b>\$645,400</b>	<b>\$658,300</b>
	Option 2	\$ -	\$ -	<b>\$1,240,900</b>	<b>\$1,265,600</b>	<b>\$1,291,000</b>	<b>\$1,316,800</b>

For these proposed fixed-route services, the anticipated need for new vehicle purchases is the capital cost for the system. It is assumed that the services will be operated in FY 2012 and that replacement vehicles will be purchased in FY 2015 to conform to normal four-year service life per 100,000 miles of revenue service criteria. **Table 4-11** below summarizes the capital cost of the proposed fixed-route services.

**Table 4-11. Capital Cost of Proposed Fixed-Route Service Expansions**

Proposed Fixed Route	Option	Capital Costs					
		FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Route (1) Gloucester Point – Urbanna – Tappahannock	Option 1 – one vehicle	\$ -	\$ -	\$ 60,000	\$ -	\$ -	\$ 63,700
	Option 2 – two vehicles	\$ -	\$ -	\$ 120,000	\$ -	\$ -	\$ 127,300
Route (2) Colonial Beach – Montross – Warsaw – Tappahannock	Option 1 – one vehicle	\$ -	\$ -	\$ 60,000	\$ -	\$ -	\$ 63,700
	Option 2 – two vehicles	\$ -	\$ -	\$ 120,000	\$ -	\$ -	\$ 127,300
Route (3) Kilmarnock – Warsaw – Kilmarnock	Option 1 – one vehicle	\$ -	\$ -	\$ 60,000	\$ -	\$ -	\$ 63,700
	Option 2 – two vehicles	\$ -	\$ -	\$ 120,000	\$ -	\$ -	\$ 127,300

*Note: Present (FY2009) vehicle purchase cost is \$56,500 per vehicle. Assumed annual inflation rate is 2 percent.*

The combination of the estimated annual operating cost and the capital cost in the year in which it is expected to occur is the total estimated cost of the proposed fixed-route service expansions. These totals are summarized in **Table 4-12**.

**Table 4-12. Total Annual Cost of Proposed Fixed-Route Service Expansions**

Proposed Fixed Route			Total Cost					
			FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Route (1) Gloucester Point – Urbanna – Tappahannock	Option 1	Operating Cost	\$ -	\$ -	\$200,300	\$204,400	\$208,400	\$212,600
		Capital Cost	\$ -	\$ -	\$60,000	\$ -	\$ -	\$63,700
	Option 2	Operating Cost	\$ -	\$ -	\$400,700	\$408,700	\$416,900	\$425,200
		Capital Cost	\$ -	\$ -	\$120,000	\$ -	\$ -	\$127,300
<b>Subtotal</b>	<b>Option 1 Cost</b>		\$ -	\$ -	<b>\$260,300</b>	<b>\$204,400</b>	<b>\$208,400</b>	<b>\$276,300</b>
	<b>Option 2 Cost</b>		\$ -	\$ -	<b>\$520,700</b>	<b>\$408,700</b>	<b>\$416,900</b>	<b>\$552,500</b>
Route (2) Colonial Beach – Montross – Warsaw – Tappahannock	Option 1	Operating Cost	\$ -	\$ -	\$193,900	\$197,800	\$201,700	\$205,700
		Capital Cost	\$ -	\$ -	\$60,000	\$ -	\$ -	\$63,700
	Option 2	Operating Cost	\$ -	\$ -	\$387,800	\$395,500	\$403,400	\$411,500
		Capital Cost	\$ -	\$ -	\$120,000	\$ -	\$ -	\$127,300
<b>Subtotal</b>	<b>Option 1 Cost</b>		\$ -	\$ -	<b>\$253,900</b>	<b>\$197,800</b>	<b>\$201,700</b>	<b>\$269,400</b>
	<b>Option 2 Cost</b>		\$ -	\$ -	<b>\$507,800</b>	<b>\$395,500</b>	<b>\$403,400</b>	<b>\$538,800</b>
Route (3) Kilmarnock – Warsaw – Kilmarnock	Option 1	Operating Cost	\$ -	\$ -	\$226,200	\$230,700	\$235,300	\$240,000
		Capital Cost	\$ -	\$ -	\$60,000	\$ -	\$ -	\$63,700
	Option 2	Operating Cost	\$ -	\$ -	\$452,400	\$461,400	\$470,700	\$480,100
		Capital Cost	\$ -	\$ -	\$120,000	\$ -	\$ -	\$127,300
<b>total</b>	<b>Option 1 Cost</b>		\$ -	\$ -	<b>\$286,200</b>	<b>\$230,700</b>	<b>\$235,300</b>	<b>\$303,700</b>
	<b>Option 2 Cost</b>		\$ -	\$ -	<b>\$572,400</b>	<b>\$461,400</b>	<b>\$470,700</b>	<b>\$607,400</b>
<b>Grand Total</b>	<b>Option 1 Cost</b>		\$ -	\$ -	<b>\$800,400</b>	<b>\$632,900</b>	<b>\$645,400</b>	<b>\$849,400</b>
	<b>Option 2 Cost</b>		\$ -	\$ -	<b>\$1,600,900</b>	<b>\$1,265,600</b>	<b>\$1,291,000</b>	<b>\$1,698,700</b>

## 2. The cost of the planned computerized scheduling and dispatching system

As described in the previous section, the planned computerized scheduling and dispatching system is the system improvement Bay Transit is in the initial phases of acquisition. Bay Transit initiated a contract with a consulting firm to research the appropriate scheduling and dispatching software for Bay Transit in April 2009. It is assumed that this system will be acquired and first operated within the TDP's six-year time-frame.

A similar study was conducted by PBS&J in 2008 for Loudoun County, Virginia. As the research results showed, there are different kinds of software that could be applied to a transit system such as Bay Transit. The average cost of this type of software is approximately \$350,000, with an annual licensing fee of approximately \$2,000. Assuming similar software is implemented for Bay Transit by FY 2012, **Table 4-13** below summarizes the cost estimation of the software.

**Table 4-13. Cost Estimate for Computerized Scheduling and Dispatching System**

	Total Cost					
	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
	\$ -	\$ -	\$2,122	\$2,165	\$2,208	\$ 2,252
Scheduling and Dispatching System	Capital Cost					
	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
	\$ -	\$364,140	\$ -	\$ -	\$ -	\$ -
	Total Cost					
	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
	\$ -	\$364,140	\$2,122	\$2,165	\$ 2,208	\$ 2,252

*Note: Present (FY2009) system cost is \$350,000 with annual licensing fee of \$2,000. Assumed annual inflation rate is 2 percent. Costs for the system will be finalized in a subsequent update to the TDP once an RFP is issued and proposals are received.*

Due to the improved operational efficiencies, Bay Transit expects that their annual system ridership will increase by approximately 10 percent in the year following the software implementation (FY 2012). The estimated annual ridership with and without the dispatching system is summarized in **Table 4-14** below.

**Table 4-14. Annual Passenger Estimation for Bay Transit**

Passengers	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Annual Passengers w/o dispatching system*	159,519	161,274	163,048	164,842	166,655	168,488
<b>Annual Passengers w/dispatching system</b>	159,519	161,274	<b>179,353</b>	<b>197,810</b>	<b>199,986</b>	<b>202,186</b>

*\* Note: It is assumed that a 1.1 percent annual passenger increase will occur on the current base system due to area growth. Then with the software implementation, starting in FY 2012, an additional 10 percent ridership increase is expected.*

### ***3. The cost of a new Administration and Maintenance Center***

The funding for this administration and maintenance facility has been previously identified as a Federal earmark without the requirement of any local matching funds. The total allocated budget for the center is \$2,615,113 and it is expected that this new facility could be constructed at the end of the TDP's six-year time-frame in FY 2015. Note that based on a review of preliminary feasibility studies, the cost of the facility is estimated to be slightly higher than this budgeted amount.

## 5.0 SERVICE AND FACILITY RECOMMENDATIONS

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This chapter identifies service and facility needs that are recommended for inclusion over the multi-year duration of the transit plan. A more comprehensive listing of potential services and facility needs were identified in the prior chapter of this TDP. Recommended service and facility improvements presented in this chapter are based on the anticipated funding availability levels during the TDP time period.

Where sufficient federal, state, and local funding has been identified for either the estimated capital or operating costs associated with a specific recommendation, the activity has been categorized as achievable under the fiscally “constrained” transit development plan. Where a substantial portion or the total required amount of estimated capital or operating costs for a specific action cannot be easily identified, the activity has been identified as being in need of additional funding and has been considered to be achievable only under the fiscally “unconstrained” transit development plan. This designation does not mean that the action cannot be accomplished during the six-year TDP cycle ending in FY 2015, but rather that additional sources of federal, state, or local funding beyond those currently anticipated to be available to the Bay Transit system will need to be identified and committed to the specific project.

### 5.1 Service Recommendations

Chapter 4 of this TDP identified the following potential service improvements for consideration over the TDP’s six-year time period of FY 2010 to FY 2015 in addition to the continuation of the current Bay Transit level of operations:

- The initiation of fixed-route services.
  - Proposed Fixed-Route 1: Gloucester Point – Urbanna – Tappahannock
  - Proposed Fixed-Route 2: Colonial Beach – Montross – Warsaw – Tappahannock
  - Proposed Fixed-Route 3: Kilmarnock – Warsaw – Kilmarnock

As was noted in Chapter 4, two options were proposed for each route, the first being the operation of each of the three routes with a single bus, and the second being the use of two buses on each route to provide more reasonable headways on the order of once an hour. It was assumed that both of the proposed routes could start operation in FY 2012 if the necessary capital and operating funding could be made available. The estimated annual total costs of these options were approximately \$800,000 (Option 1) and \$1.6 million (Option 2) in first year of operation (FY 2012).

Taking into consideration the current Bay Transit financial condition and anticipated funding levels in the near-term future, it appears to be unlikely that Bay Transit would be financially able to initiate the new fixed-route services.

As was described in Chapter 3, the total annual revenues (passenger fares and contract revenues) generated by Bay Transit's operations in FY 2008 represented approximately 10.9 percent of the total annual operating costs. The remaining net operating costs were funded during that year through a combination of local government (29 percent), state government (15 percent) and federal government (47 percent) funds.

Because of the recent economic downturn, it is expected that the local government tax base will not be growing at a significant rate. In addition, future federal and state funding levels are somewhat uncertain at this point, with the level of state operating assistance support having recently experienced a reduction in funding.

**Therefore, it is recommended that Bay Transit's top priority as defined in this TDP be a focus on maintaining the current demand-response service levels in the near-term.** The proposed initiation of three new fixed-route services should only be considered an element of the "unconstrained" TDP program of projects. Should additional operating assistance funds become available from federal, state, or local sources, one or more of these three routes could be designated as an element of the "constrained" TDP program of projects.

## **5.2 Facility Recommendations**

Chapter 4 of this TDP identified several potential facility improvements for consideration over the TDP's six-year time period. The improvements are as follows:

- Existing operating vehicle acquisition / replacement as vehicles reach the end of their designated useful life
- Computerized Scheduling and Dispatching System
- Administration and Maintenance Center in the Middle Peninsula

### ***Existing operating vehicle acquisition / replacement***

The American Recovery and Reinvestment Act (ARRA) identified Bay Transit as one of the rural and small urban public transit systems in Virginia to receive Federal Recovery Act stimulus funding. Through this program, Bay Transit was identified as the recipient of seven replacement passenger transport vans at a total cost of \$395,900. This allocation will take the form of 100 percent Federal funding with no state or local matching funds required.

Therefore, it is expected that seven vehicles will be replaced for Bay Transit in FY 2009 using the ARRA stimulus funding. In addition, Bay Transit has typically acquired an average of 7 or 8 vehicles each year. Assuming that during the TDP's six-year time period, the typical vehicle replacement schedule is continued, then from FY 2009 to FY 2015, Bay Transit should be expected to be able to acquire approximately seven new/replacement vehicles each year, as shown in **Table 4-4**. This historically observed vehicle replacement schedule is thus viewed as an element of the "constrained" TDP program of projects.

### ***Computerized Scheduling and Dispatching System***

As described in Chapter 4 of this TDP, Bay Transit currently is in the early phases of a process to acquire a computerized scheduling and dispatching system to improve the operations of their system. A needs assessment of paratransit services scheduling software has recently been initiated, with the completion of this activity expected by the end of calendar year 2009. The funding mechanism for the acquisition of the computerized scheduling and dispatching system has not yet been identified; however, it is assumed that this system will be acquired and first operated within the TDP's six-year time-frame.

### ***Administration and Maintenance Center***

Construction of a new operations and maintenance facility for Bay Transit in Warsaw, Virginia began on April 27, 2009, and it is anticipated to be completed in 2010. Based on the transit demand growth in the Bay Transit service area, an administration and maintenance center has been proposed to be built in the Middle Peninsula.

The funding for this administration and maintenance facility has been previously identified as a Federal earmark without the requirement of any local matching funds. The total allocated budget for this facility is \$2,615,113, and it is expected that this new facility could be constructed at the end of the TDP's six-year time-frame in FY 2015. Note that based on a review of preliminary feasibility studies, the cost of the facility is estimated to be slightly higher than this budgeted amount.

Since the funding for this facility has already been identified and approved, this project should be defined as an element of the "constrained" TDP list of projects for Bay Transit.

Assuming the allocated capital funding from Federal and state governments and ARRA stimulus funding are all available for Bay Transit in the TDP's six-year time-frame, the facility improvements recommended for implementation for each year are as follows:

#### **FY2009**

Seven replacement vehicles (ARRA stimulus funding)

#### **FY2010**

Seven replacement vehicles

#### **FY2011**

Seven replacement vehicles  
Computerized Scheduling and Dispatching System

#### **FY2012**

Seven replacement vehicles

**FY2013**

Seven replacement vehicles

**FY2014**

Seven replacement vehicles

Construction of an Administration and Maintenance Center in the Middle Peninsula

**FY2015**

Seven replacement vehicles

### **5.3 Other Recommendations**

The comments received from the on-board survey conducted for Bay Transit in February and March 2009 suggested that Bay Transit consider the extension of their service hours to include weekend service. These riders currently have to seek a family member or friend's assistance or use other options to travel on weekends. This request may be a potential service improvement that Bay Transit can study further following the acquisition and implementation of the computerized scheduling and dispatching system. No specific time-frame has been identified for this study effort, and no local government funding has been assumed in the TDP's financial plan.

The installation of surveillance cameras and GPS devices for the vehicles of Bay Transit are another potential improvement that Bay Transit could consider. Currently, no surveillance cameras or GPS devices are installed in the buses. However, based on Bay Transit's current request for a computerized scheduling and dispatching system, this type of equipment may be needed for the implementation of all aspects of the dispatching system. With the computerized scheduling and dispatching software not yet acquired or implemented, no specific time-frame has been identified for the possible installation of the on-board surveillance cameras and GPS devices, and no funding sources have been assumed in the TDP's financial plan.

## 6.0 CAPITAL IMPROVEMENT PROGRAM

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This chapter describes those capital programs (vehicles, facilities, and equipment) required to carry out the operations and services set forth in the TDP service and facility recommendations that were presented in the prior chapter.

### 6.1 Vehicle Replacement Program

As was noted in prior chapters of this TDP, Bay Transit presently has a total vehicle inventory of 68 vehicles located in the facilities of the different counties. Thirty-three (33) of these 68 vehicles have diesel engines, with the other 35 vehicles using gasoline engines. The passenger fleet primarily consists of 12 to 14 passenger handicapped accessible vans. Model years range from 1988 through 2008.

In recent years, Bay Transit has typically acquired five to ten vehicles in any given year, an average of seven or eight vehicles each year. These represent both replacements for existing vehicles that have reached the end of their useful life and the acquisition of additional vehicles for the provision of expanded services. The seven vehicles to be obtained during 2009 using Federal Recovery Act stimulus funding thus represent the system's recently observed typical vehicle acquisition / replacement cycle. This allocation will take the form of 100 percent Federal funding with no state or local matching funds required.

Assuming that this typical vehicle replacement cycle is continued over the next several years through available funding from Federal, State, and Local governments, **Table 4-4** illustrates the total passenger fleet size and the anticipated average vehicle age between 2008 and the TDP horizon year of 2015.

### 6.2 Facility Improvement Program

Chapter 4 of this TDP also identified two potential facility improvements for Bay Transit over the TDP's six-year time period. These two improvements were the acquisition of a computerized scheduling and dispatching system and the construction of an administration and maintenance center.

Bay Transit currently is in the early phases of a process to acquire a computerized scheduling and dispatching system to improve the operations of their system. A needs assessment of paratransit services scheduling software has recently been initiated, with the completion of this activity expected by the end of calendar year 2009. The funding mechanism for the acquisition of the computerized scheduling and dispatching system has not yet been identified; however, it is assumed that this system will be acquired and first operated within the TDP's six-year time-frame.

The funding for the planning, design, site acquisition, and construction of the administration and maintenance facility has been previously identified as a Federal earmark without the

requirement for any local matching funds. Note that based on a review of preliminary feasibility studies, the cost of the facility is estimated to be slightly higher than the budgeted amount. It is expected that this new facility could be constructed near the end of the TDP's six-year time-frame in FY 2015.

## 7.0 FINANCIAL PLAN

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The financial plan is a principal product of the TDP. It is in this chapter that an agency demonstrates its ability to provide a sustainable level of transit service over the TDP time period, including the rehabilitation and replacement of capital assets. This chapter identifies potential funding sources for annual operating and maintenance costs, funding requirements and sources for bus purchases, and funding requirements and sources for other facility improvements.

### 7.1 Operation and Maintenance Costs and Funding Sources

Based on the latest budget information available from Bay Transit, the system's operating budget was approximately \$2.4 million in FY 2009. Funding sources for the adopted FY 2009 operating budget were as follows:

- Federal Funds - \$1,071,118 (44%)
- State Funds - \$411,839 (17%)
- Local Government and Other Match Funds - \$660,210 (27%)
- Passenger Fares and Contract Revenues - \$277,000 (11%)

This TDP's financial plan begins with these costs and funding sources and those in the currently proposed FY 2010 system budget as the "base year" values for the estimation of future year operating costs and revenue streams.

Annual operation and maintenance (O&M) costs during the TDP time period are projected to grow from approximately \$2.4 million in the FY 2009-FY 2010 period to over \$2.8 million by FY 2015. It is assumed that a two percent annual inflation rate is applied to these "base year" costs to estimate the annual O&M costs over the TDP time period.

Federal operating assistance funds are assumed to remain at essentially a constant amount during the TDP time period. In FY 2010, the presently budgeted federal operating assistance fund level of \$1,208,972 is projected to cover approximately 47 percent of Bay Transit's total annual O&M costs. This percentage is projected to decrease each year during the TDP time period since the total O&M costs are assumed to increase at a rate of two percent each year due to inflationary factors, and the amount of annual Federal operating assistance funds are assumed to remain at a constant level of approximately \$1,209,000 from FY 2011 through FY 2015.

The Virginia Department of Rail and Public Transportation (DRPT) has identified \$469,501 in state operating assistance for Bay Transit in FY 2010 in its Transportation Improvement Program. The DRPT's TIP reflects a 19 percent growth in state operating allocations from its Mass Transit Trust Fund on a statewide basis between FY 2010 and FY 2015. Based on the

information from DRPT, little growth in the allocation of state operating assistance funding to Bay Transit has been assumed beyond the FY 2010 budgeted amount over the duration of this TDP cycle. The percentage increases in the anticipated annual state operating assistance are 1.77% in FY 2010-FY 2011, 2.90% in FY 2011-FY 2012, 3.50% in FY 2012-FY 2013, 3.16% in FY 2013-FY 2014, and 3.16% in FY 2014-FY 2015. The annual state operating funding level will be increased by these percentage increases from the FY 2010 funding level (approximately \$469,500) through the TDP time period.

State formula assistance grants for public transportation operating expenses are awarded on the basis of the total annual amount of state funds available expressed as a percentage of the total annual amount of transit operating expenses, subject to a cap of 95% of eligible expenditures. Eligible expenditures are defined as costs of administration, fuel, tires, and maintenance parts and supplies (payroll costs of mechanics and drivers are excluded). Projections for state operating assistance, as identified in the TDP financial plan, have been provided for planning purposes and may fluctuate up or down based on the aforementioned parameters.

State capital program grants from the Mass Transit Trust Funds (MTTF) are awarded to all public transportation capital projects deemed to be eligible, reasonable, and appropriate at a uniform level of state participation. The goal is to reach the maximum state share of capital expenses of 95%, but there have not been sufficient funds to support transit capital projects at this level since the Mass Transit Trust Fund was created in 1986. This level of participation or “state share” of capital project expenses is calculated by dividing the amount of state funds available for capital projects each year by the amount needed to support the non-federal share of all eligible transit capital projects for the year. Beginning in FY 2008, additional capital funds from the Transportation Capital Projects bond proceeds authorized under Chapter 896 of the 2007 Acts of Assembly have been available annually at a maximum state matching share of 80% in the Transit Capital Fund.

The estimated annual farebox and other revenues for Bay Transit are assumed to remain essentially the same between FY 2009 and FY 2011. This assumption reflects the very modest changes in service area population that are anticipated during this period of no more than 1.0 percent each year, and no anticipated change in the annual revenue vehicle-hours of operation to be provided across the Bay Transit service area.

Farebox and other revenues are projected to increase more noticeably from FY 2012 to FY 2015 due to the operational efficiencies that are expected to be experienced by the system as a result of the implementation of the computerized scheduling and dispatching system. As discussed earlier in Chapter 4 of this TDP, Bay Transit anticipates that the implementation of this computerized scheduling and dispatching system in FY 2011 could generate a 10 percent increase in ridership compared to those anticipated without consideration of this operational improvement in FY 2012.

**Table 7-1** presents the TDP financial plan for the funding of the annual O&M costs through the TDP six-year time period. Using the assumptions identified above of the level of Federal and State operating assistance funding, the required local government funding requirements are anticipated to steadily increase through the TDP time period, from approximately \$694,471 in FY 2010 to approximately \$891,192 in FY 2015.

As a percentage of the total estimated system operating costs, the local government share is anticipated to increase from approximately 27 percent of the total annual cost in FY 2010 to approximately 31 percent of the total annual cost in FY 2015.

**Table 7-1. TDP Financial Plan for Funding Annual O&M Costs**

TDP Financial Plan for: Service O&M Costs	FY2008	FY2009	FY2010	FY2011	FY2012	FY2013	FY2014	FY2015
Annual Revenue Hours	75,045	75,175	75,175	75,175	75,175	75,175	75,175	75,175
Annual Operating Costs	\$ 2,459,305	\$ 2,420,176	\$2,582,544	\$2,634,195	\$2,686,879	\$2,740,616	\$2,795,429	\$2,851,337
Anticipated Funding Sources								
Federal	\$ 1,095,597	\$ 1,071,118	\$1,208,972	\$1,209,000	\$1,209,000	\$1,209,000	\$1,209,000	\$1,209,000
State	\$357,891	\$411,839	\$469,501	\$477,811	\$491,668	\$508,876	\$524,957	\$541,545
Farebox	\$119,602	\$120,000	\$121,234	\$122,568	\$ 123,917	\$125,280	\$126,658	\$128,051
<i>Farebox Recovery Ratio</i>	5%	5%	5%	5%	5%	5%	5%	4%
Other (Contract Rev & Other)	\$277,328	\$196,000	\$25,000	\$25,000	\$25,000	\$25,000	\$25,000	\$ 25,000
Local Gov't Funding Required	\$679,436	\$621,219	\$757,837	\$799,816	\$837,294	\$872,460	\$909,814	\$947,741
<i>Local Gov't Funding Percentage</i>	28%	26%	29%	30%	31%	32%	33%	33%

*Notes:*

- 1. Annual Revenue Hours for FY 2009 provided by Bay Transit and assumed to be constant through the life of the TDP period.*
- 2. FY2010 Operating Cost obtained from DRPT FY2010 district budget data. Beginning in FY2011, the Annual Operating Cost calculated assuming a 2.0%/year inflation rate .*
- 3. Federal Operating Assistance reflects estimated FTA Section 5311 and FTA 5316 funds; assumed to remain flat at FY2010 levels.*
- 4. FY2010 State Operating Assistance obtained from DRPT FY2010 district budget data. The increase in State Operating Assistance, as per DRPT, is assumed to be 1.77% in FY2011, 2.90% in FY2011-FY2012, 3.50% in FY2012-FY2013, 3.16% in FY2013-FY2014, and 3.16% in FY2014-FY2015 .*
- 5. FY2010 to FY2015 Passenger Fare and Contract Revenue Total estimate obtained from Diana Giles, CFO, Bay Transit.*

## 7.2 Bus Purchase Costs and Funding Sources

As noted in Chapter 6 of this TDP, no service expansion has been proposed that would increase Bay Transit's bus fleet size. The bus purchases during the TDP time period are only for bus replacements.

In FY 2009, Bay Transit has been identified as the recipient of seven replacement passenger transport vans at a total cost of \$395,900 through ARRA funds. This allocation will take the form of 100 percent Federal funding, with no state or local matching funds required.

Assuming that the historically observed cycle of seven vehicle replacements per year for Bay Transit is continued between FY 2011 and the TDP horizon year of FY 2015, the remaining bus purchases have been assumed to be funded through FTA's Section 5311 Program. This assumption anticipates a continuation of the traditional shared allocation of costs with 80 percent funding provided by the Federal Government, 10 percent funding by the State Government, and 10 percent funding by the Local Governments. For the bus purchase prices, a 2 percent annual inflation rate is applied. **Table 7-2** presents the suggested TDP financial plan for funding bus purchases through the TDP six-year time period.

**Table 7-2. TDP Financial Plan for Funding Bus Purchases**

<b>TDP Financial Plan for Bus Replacements</b>	<b>FY2009</b>	<b>FY2010</b>	<b>FY2011</b>	<b>FY2012</b>	<b>FY2013</b>	<b>FY2014</b>	<b>FY2015</b>
Bus Replacements	7 buses						
Bus Replacement Costs	\$395,900	\$403,400	\$411,500	\$419,700	\$428,100	\$436,700	\$ 445,400
<b>Anticipated Funding Sources</b>							
Federal - ARRA	\$395,900	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Federal - FTA 5311 Program (80%)	\$ -	\$322,700	\$329,200	\$335,800	\$342,500	\$349,400	\$356,300
State (10%)	\$ -	\$ 40,300	\$41,200	\$42,000	\$42,800	\$43,700	\$44,500
Local Government Funding Required (10%)	\$ -	\$ 40,300	\$41,200	\$42,000	\$42,800	\$43,700	\$44,500

*(All Costs in Year of Expenditure Dollars)*

Notes:

1. Bus replacements by year identified in Chapter 6 of TDP.
2. Bus replacement costs assumed to be \$56,500 in current year (FY2009) dollars.
3. Table reflects 2.0 percent per year inflation in bus acquisition costs.
4. FY2009 buses being acquired through the use of ARRA funding.
5. All other buses assume 80 percent funding through FTA Section 5311 program, 10 percent funding from State, and remaining 10 percent from local governments.

### 7.3 Facility Improvement Costs and Funding Sources

Several facility improvements have been identified for Bay Transit. These improvements include the acquisition and implementation of a computerized scheduling and dispatching system and the construction of an administration and maintenance center. It also should be noticed that the construction of a new operations and maintenance facility for Bay Transit in Warsaw, Virginia began on April 27, 2009, and it is anticipated to be completed in 2010.

Based the findings from a similar study conducted by PBS&J in 2008 for Loudoun County, Virginia, the average cost of acquiring the computerized scheduling package software suitable for Bay Transit's needs is estimated to be approximately \$350,000. With the application of a two percent annual inflation rate to the assumed current year cost of \$350,000, the cost of this computerized scheduling package software is estimated at approximately \$364,140 in FY 2011. The funding mechanism for the acquisition of the computerized scheduling and dispatching system has not yet been identified; however, it is assumed that this system will be acquired and first operated within the TDP's six-year time-frame.

The administration and maintenance center has been proposed to be built somewhere in the Middle Peninsula. The funding for this administration and maintenance facility has been previously identified as a Federal earmark without the requirement of any local government matching funds. The total allocated budget for this facility is \$2,615,113, and it is expected that this new facility could be constructed at the end of the TDP's six-year time-frame in FY 2015. Note that based on a review of preliminary feasibility studies, the cost of the facility is estimated to be slightly higher than this budgeted amount.

**Table 7-3** presents the TDP financial plan for the funding of these two additional facility improvements through the TDP six-year time period.

**Table 7-3. TDP Financial Plan for Funding Facility Improvements**

<b>TDP Financial Plan for: Facility Improvements</b>	<b>FY2009</b>	<b>FY2010</b>	<b>FY2011</b>	<b>FY2012</b>	<b>FY2013</b>	<b>FY2014</b>	<b>FY2015</b>
Computerized Scheduling Package	\$30,000	\$ -	\$364,140	\$2,122	\$2,165	\$2,208	\$ 2,252
Warsaw Multimodal Facility	\$ -	\$917,000	\$ -	\$ -	\$ -	\$ -	\$ -
Second Maint. and Operations Center	\$ -	\$ -	\$ -	\$ -	\$ -	\$2,615,100	\$ -
<i>Total Facility Improvement Costs</i>	<i>\$30,000</i>	<i>\$917,000</i>	<i>\$364,140</i>	<i>\$2,122</i>	<i>\$2,165</i>	<i>\$2,617,308</i>	<i>\$2,252</i>
<b>Anticipated Funding Sources</b>							
Federal - ARRA	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Federal - FTA 5309 and 5311 Programs	\$ -	\$733,600	\$291,300	\$1,700	\$1,700	\$2,093,800	\$1,800
State	\$30,000	\$183,400	\$36,400	\$200	\$200	\$523,500	\$200
Local Gov't Funding Required	\$ -	\$ -	\$36,400	\$200	\$200	\$ -	\$200

*Notes:*

1. Facility improvement costs identified in Chapter 4 of TDP.
2. Table reflects 2.0%/year inflation in capital costs beginning in FY2010.
3. The cost of the Computerized Scheduling Package includes \$30,000 for a feasibility study conducted in FY2009, the budgeted package purchase price of \$350,000 (FY2009 dollar), and the annual license fee of \$2,000. Costs for the system will be finalized in a subsequent update to the TDP once an RFP is issued and proposals are received.
4. Warsaw Multimodal Facility and the Second Maintenance and Operation Center funded through SAFETEA-LU Federal and State allocations, no Local Funding required.
5. Capital expenditures in FY2011 and beyond assume 80% funding through FTA programs, 10% State funding, and remaining 10% Local Funding.
6. The total construction budget of Warsaw Multimodal Facility is approximately \$2.7 million. \$917,000 is allocated in FY2010. The remaining budget has been spent in land acquisition, site plan design, building plan design, etc. in the previous years.

## 8.0 TDP MONITORING AND EVALUATION

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Similar to any other multi-year duration planning document, the transit development plan (TDP) for a specific public transit system must be regularly monitored and evaluated in order to maintain its usefulness over time. The previous chapters of this TDP have presented a comprehensive evaluation of the Bay Transit system's service and cost characteristics. The key elements that have been addressed in this TDP effort include:

- The development of suggested goals, objectives, and general performance standards that can be used to help guide the further development of Bay Transit's services.
- A detailed evaluation of existing service characteristics, with a discussion of the system's current strengths and weaknesses.
- A peer agency review that compares the recent service and financial characteristics of Bay Transit to those of other similar systems operating in the Commonwealth of Virginia.
- An on-board ridership survey that identified the primary socioeconomic characteristics of the current riders, their satisfaction with the existing services, and potential service improvements that are desired by the riders.
- A description of potential service and facility improvements for consideration in the TDP.
- A series of recommended service and facility improvements for inclusion in the TDP, with the year of the improvements identified as appropriate.
- A discussion of the funding requirements and potential funding sources for the capital and operating costs associated with the recommended service and facility improvements.

This TDP represents an initial step in the future service and facility improvements for the Bay Transit system. In order to ensure the relevance of the TDP over time, it will be important for Bay Transit to regularly coordinate with other transportation and land use planning efforts across its multi-jurisdictional service area, to continue to monitor service performance, and to provide DRPT with annual updates regarding implementation of the ultimately adopted TDP service and facility improvements program.

### 8.1 Coordination with Other Plans and Programs

The completion of this TDP requires that it be coordinated with a variety of other ongoing land use and transportation planning efforts at the county, regional, and statewide levels. For example, the public transit-oriented goals and objectives suggested by this TDP should be reviewed and incorporated into the transportation-related goals and objectives sections of each of the county comprehensive plans for the 12 counties that are currently being served by Bay

Transit. The multi-jurisdictional long-range regional transportation plans developed by the Northern Neck, Middle Peninsula, and Richmond Regional Planning District Commissions, in cooperation with the Virginia Department of Transportation (VDOT) and the Department of Rail and Public Transportation (DRPT), should also include appropriate references to the Bay Transit TDP.

At the statewide level, the TDP recommendations for Bay Transit should be incorporated into the public transportation elements of the DRPT developed six-year state transportation improvement program (SYTIP) and the statewide multimodal long-range transportation plan VTrans2035.

## **8.2 Service Performance Monitoring**

In prior chapters of this TDP, a group of specific system-wide performance measures and operating guidelines have been identified for application to a rural demand-responsive public transit system such as Bay Transit. The adoption of these operating guidelines will allow for the system's management to regularly monitor the performance of Bay Transit to help ensure that existing performance characteristics do not degrade over time.

Where changes in performance are identified, appropriate corrective measures should be investigated. These corrective actions might involve route adjustments for local fixed-route services, modifications to service frequency (headway), and/or span of service adjustments. Bay Transit presently has a basic performance monitoring program in place, with an emphasis on tracking ridership, service-hours, service-miles, and operating costs and revenues on a monthly basis at the county and system-wide levels. As the system continues to grow and develop, this process should be expanded as necessary.

An important element of this performance monitoring process should be a regularly scheduled update of the on-board ridership survey conducted as part of this TDP process. In order to comply with current DRPT guidelines, a new on-board survey should be undertaken at least once during each six-year TDP cycle. With the initial system-wide survey being conducted in the spring of 2009, the next such survey should be conducted no later than during the spring of 2015.

## **8.3 Annual TDP Monitoring**

The current TDP guidelines issued by DRPT require the submittal of an annual update letter that describes the progress being taken towards implementing the TDP's recommendations and any significant changes to the currently adopted TDP. These changes should include, but not be limited to, system expansions or reductions, new services or facilities being planned or implemented, organizational/governance changes, changes to the current fare structure, or other actions. The recommended contents of this "TDP Update" letter include, but are not limited to, the following:

- A summary of ridership trends at the system and service area/local route level for each of the previous 12 months.
- A description of those TDP goals and objectives that have been advanced over the previous 12 months.
- A description of any service and facility improvements that have been implemented in the previous 12 months, including the identification of those that were identified in this TDP.
- An update to the TDP's list of recommended service and facility improvements. This update should specifically identify those service or facility improvements that are being shifted to a new year, are being eliminated, and/or are being added. This update of recommended improvements should be extended one more fiscal year into the future in order to maintain a six-year TDP planning period.
- A summary description of current fiscal year capital and operating costs and the associated federal, state, and local funding sources.
- Updates to the capital and operating financial plan tables presented in Chapter 7 of this TDP. These tables should be extended one more fiscal year into the future in order to maintain a six-year TDP planning period.