

West Street Transit Study

DRAFT

July 2009



Acknowledgements

The City of Annapolis initiated this study with the Maryland Transit Administration, and with the assistance of Anne Arundel County, Annapolis Transit, and the Maryland State Highway Administration, the Project Team consisting of Kittelson & Associates, Inc. and The Faux Group assembled this report as a The West Street Transit Vision. Without the contributions of the City Appointed Advisory Committee and representatives from these groups, this study would not have been possible. We want to thank all of the individuals who spent time and participated in this study.



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Executive Summary

INTRODUCTION

The City of Annapolis (City) initiated a study in the fall of 2008 with funding support from the Maryland Transit Administration (MTA) to create a premier transit route along the West Street corridor. The Project Team, consisting of Kittelson & Associates, Inc. (KAI) and The Faux Group (TFG), has conducted a preliminary evaluation of West Street as a priority transit corridor consistent with the City and Anne Arundel County's plans for more direct transit connectivity between major destinations in downtown Annapolis, Inner West Street and Parole Towne Centre, and districts targeted for growth and reinvestment along the length of the corridor. The study area is generally bounded by the Annapolis Mall and downtown Annapolis. Areas along roads adjacent and parallel to West Street were also evaluated. They include sections of MD Route 2 (Solomon's Island Road), Old Solomon's Island Road, Forest Drive, Riva Road, and Somerville Road bordering the Annapolis Towne Centre at Parole, Jennifer Road near the Anne Arundel Medical Center and Main Street downtown.

During the course of the study, the Project Team met with a City appointed Advisory Committee comprised of representatives from each of the Annapolis City Council districts and the Parole area. Its members provided perspectives of corridor residents and businesses. Staff from the City of Annapolis, Anne Arundel County, the MTA, and Maryland State Highway Administration (SHA) also participated to provide information, technical support, and guidance. The analysis and recommendations of this early effort are designed to (1) initiate a public dialogue of the ideas, (2) investigate major transit generators and future destinations, (3) understand and improve upon the conditions for transit users in the corridor, and, (4) launch an initial set of concepts. The study findings and recommendations will be presented to the City's Planning Commission, City Council, and County leadership for support and direction.

This report focuses on many of the physical elements required to create a transit-friendly access route between two of Annapolis' major economic centers. It summarizes operating characteristics of the transit options including stop location and route concepts based on existing destinations. The report discusses mode options considering the physical constraints of the corridor, the development of adjacent parcels along the route, and potential sources of funding for startup service and ongoing operations.



Captions (Left): Major new development anchors the Westgate Circle at Spa Road and Taylor Avenue, creating a new neighborhood of hotels, offices, retail and residential land use.

(Below) Westgate Circle & Streetscape prior to redevelopment.





Caption: A potential future for West Street : Mixed land uses in more transit-oriented densities. Roundabouts that reinforce the West Street's history are used to manage all modes of traffic at intersections.

This effort will require follow-up analysis for three main elements: the transit service, street enhancements, and new real estate development. First, the concepts for proposed transit service will be more fully developed in Annapolis Transit's Transit Development Plan (TSP) for near-term system redesign in coming months. Second, physical improvements to West Street and the local street network will require technical refinement with support of the Maryland State Highway Administration and local Departments of Public Works. Finally, changes to zoning and any new development regulations that support transit density and design will require detailed and targeted planning by the City of Annapolis and Anne Arundel County. Public participation is anticipated for each of these follow up initiatives.

Corridor Selection

The West Street corridor contains several of the region's landmark attractions, from the City Dock and US Naval Academy in downtown to the recently completed Annapolis Towne Centre at Parole. The design and density of long awaited redevelopments in Parole and the Westgate Circle areas have created new anchors to reinforce a linear transit connection along West Street. As one of a handful of regional links, West Street connects Annapolis and Parole to the regional highway system reinforcing its importance as one of the City's principle access routes. The scale of the route and its potential to connect with major transit facilities, regional bicycle routes, and pedestrian-oriented destinations suggest that West Street can become the City gateway that offers a comfortable alternative to auto travel.

The purpose of this study is to refine the transportation concept that can help to implement a new vision for the West Street corridor presented in the City's Comprehensive Plan and the County's Parole Towne Centre Plan. The concept will both integrate travel modes and enhance the corridor with a desirable transit option. Working with the Advisory Committee, the Team investigated a number of transit routes connecting the area's many destinations and recognized investment opportunities. The West Street corridor, with minor deviations, emerged as the most logical route for high quality transit service. The centrality and connectivity of West Street deemed it the preferred route most likely, of all options considered, to increase overall transit use and spur new investment in transit-supportive land use.

Corridor Transit Vision

The West Street corridor is home to many area attractions. It links the City Core with its two colleges, state, county and city government centers, to Parole, the County's growing mixed-use town center. West Street is also the City's historic entrance and was the route taken by the American army on its way to the last major battle of the Revolutionary War. Portions of this corridor were served by trains and streetcars in the past.

Several areas between these destinations (especially Outer West Street) have future development potential. Appropriately, the City is interested in more walkable, sustainable forms of transportation to connect these destinations, and to link them by transit with neighborhoods and business districts beyond the corridor. Any change should realize the full potential of the corridor to become a desirable place to live and work. It will help to focus anticipated growth to an area suitable for development with significant regional access, existing services and aging infrastructure.

West Street presents the opportunity to create a transit-based route that will distinguish the area and provide access to corridor destinations for all roadway users. The draft Annapolis Comprehensive Plan and other prior studies identify West Street as one of the four gateways to Annapolis. Text from the 2009 draft Comprehensive Plan states the following:

"Noting that West Street was the historic entrance to the city, demarcate this "Gateway" into the city with streetscape improvements and other design features to convey arrival and welcome. It is recommended that the street transition to an urban boulevard in character with widened sidewalks, enhanced pedestrian and bicycle crossings, street trees, transit features, and street lights."

This statement shows the importance of West Street to the identity of Maryland's capital city and emphasizes the need for streetscape improvements. To that end, the Comprehensive Plan and a 2004 study completed by the SHA identify, to varying degrees of detail, the possibility of installing roundabouts at several intersections on West Street. These documents have identified roundabouts as one method of

emphasizing a gateway entrance to the City and reducing the need for mid-block left turn access along most of Outer West Street. This change offers the possibility to reallocate space for wider sidewalks and street trees. Roundabouts have been discussed at Old Solomon's Island Road, Gibraltar Avenue, and Chinquapin Round Road.

Listed below are the five goals developed from communications with the Advisory Committee and agency staff. These goals are provided to evaluate proposals for the range of corridor improvements considered in this study:

1. Provide a high quality distinctive transit circulator route that:
 - Connects downtown, Inner West Street, Parole Town Center, and the development in between;
 - Serves local residents, workers, tourists and visitors;
 - Is part of a reconfigured transit system that is more intuitive and makes transit significantly more attractive and convenient for those who ride from choice as well as need;
 - Uses distinctively branded vehicles and stops with frequent service in the near term; and,
 - Includes the planning and standards necessary to allow for conversion to fixed-rail service once a critical mass of development, ridership demand and funding can be projected to support that level of investment.
2. Establish an Intermodal Transit Center centrally located serving both the City and County and links local transit services with regional services, provides for some transit parking, and catalyzes quality transit-oriented development along the corridor.
3. Encourage transit-supporting redevelopment attractive to businesses and residents wishing to walk, bicycle or use transit, with densities, designs and a mix of uses that support economic vitality with reduced levels of traffic and parking demand.
4. Create a distinct and attractive Capital City Gateway with a more cohesive street edge with commercial access via local streets rather than driveways, possibly using roundabouts to manage traffic at Old Solomon's Island, Gibraltar Avenue, and Chinquapin Round Road
5. Plan an attractive and functional road and streetscape corridor, designed for an integration of modes; adequate vehicular traffic capacity/flow and greatly increased transit and pedestrian activity within and to the corridor, incorporating selected monumental features that reflect the corridor's history in Revolutionary Period.



Caption: Downtown's trademark streets (below) and a possible future integrating transit-friendly streetscape along West Street (top) encourages travel by non-auto modes.



Premier Transit Service

The main feature of this study, proposed to distinguish the West Street corridor from other regional access roads, is a premier well-connected transit service. A direct transit link between downtown Annapolis and Parole occurs hourly. More frequent, half-hour, service requires a transfer between two routes at the Spa Road Transfer Center. Introducing a new frequent and direct transit service in the corridor can provide an important transportation option, encouraging residents, workers and visitors to choose transit for their travel between destinations.

The new service is intended to serve a broad range of users with a goal of making transit significantly more attractive and convenient for those who ride out of choice and for those who have limited options. The new transit service should have some of the following characteristics to distinguish it as a reliable transportation option for a variety of user groups and trip purposes:

- Short wait times for passengers
- Access to many destinations with few transfers
- Comfortable attractive stops with easy to navigate customer information, and
- Safe access along wide uninterrupted sidewalks & across streets with marked crosswalks and short block spacing.

The Consultant Team and Advisory Committee concluded that a branded rubber-tire circulator service is the preferred option for the near-term. The location, design and quality of the stops should suggest that transit will become a permanent feature of travel along the route to support goals for corridor reinvestment. Parking management and transit incentives associated with new development will reinforce the success and community support of the cost of transit.

Today, the location, density and relationships between destinations do not support the level of funding necessary to support an investment in fixed rail. The confined width of the street and the many activities that take place within it, including significant business access and high levels of motorized traffic, present significant challenges to the introduction of fixed-rail service. However, future conversion to fixed-rail service should not be eliminated as a possibility and will need the benefit of a more detailed planning effort. A future fixed-rail investment would

require that area plans provide for a critical mass of development that can produce acceptable levels of ridership, funding sources adequate to cover higher construction costs, route adjustments that do not encroach on historic resources, and geometric alterations to accommodate streetcar turns at several key intersections.

Initial service envisioned in this study is recommended to be a high quality, distinctive transit circulator route focused mainly on West Street with 15 to 30 minute headways and a long span of daily service connecting downtown, Parole, and the key destinations in between. The service should draw a broad range of users: local residents, business to business workers, tourists and visitors. This will require branding and marketing that not only raises awareness of and interest in the service, but that delivers on that brand as a positive experience. It should be responsive to user convenience and support the redevelopment opportunities in the corridor with thoughtful and direct connections and amenities. The goal is to make transit significantly more attractive and desirable for those who ride both from choice and from necessity.

A quality transit service is also defined by the infrastructure network that enhances the rider experience of comfort, security and convenience. To become more walkable and comfortable and better integrate the variety of travel modes along the corridor, land uses and overall appearance on the corridor will need to provide:

- Wide, shaded and continuous sidewalks with fewer driveways and supporting adjacent building frontage;
- Side street or rear access to businesses in traditional block rather than strip development patterns; and
- Bicycle and pedestrian links to nearby bicycle routes, open space and residential zones.

A premium transit service and supporting street network will reinforce real estate trends already present in the market. The Outer West Street corridor can be the next area to reflect shifts in market demand for people seeking to live and work in walkable places proximate to major activity centers with high value recreational and cultural amenity.



1. Future Mixed use Intermodal Center at City Gateway
2. Existing Outer West Street Business District/ Gateway Development Opportunity
3. Parole Neighborhood
4. 1901 West Street – Apartment Complex & Chinquapin Development Opportunity
5. Homewood & Germantown Neighborhoods
6. Bates Performing Arts Magnet
7. Bates Complex
8. Future Urban Business District Development Opportunity
9. Maryland Hall for the Arts
10. Westgate Development Node - Park Place, Weston Hotel & Proposed Performing Arts Center
11. Inner West Street Business District
12. Clay Street & Presidents Hill Neighborhoods
13. Murray Hill Neighborhood
14. Lowes Hotel & Conference Center
15. County Seat – Arundel Center
16. Downtown
17. City Hall
18. City Dock/Events/ Academy Gate/Sailing Hall of Fame
19. Ward 1 Neighborhoods
20. State Legislative and Executive Government Complex
21. State Courts & Government Complex at Taylor
22. Marine Corp Stadium & Leased Parking Lot
23. West Annapolis Retail Center/Grocery Store & Future Development Opportunity
24. West Annapolis Neighborhoods
25. PGMA Residential District
26. Anne Arundel Medical Center/Hospital
27. Westfield Mall
28. Parole Town Center
29. Harbor Center, Festival Center & Home Depot Cluster
30. Naval Academy
31. Central Library on West Street
32. Existing Industrial Employment Area
33. US Internetworking Offices
34. Social Services Building
35. Spa Road Transfer Center
36. Greyhound Bus Station

Legend

- West St Concept A
- West St Concept B
- Potential Transit Stops
- Existing Buildings
- Destination Type**
- Hotel/Cultural Attraction
- ⊗ Mixed Use

July 2009

RECOMMENDED ACTIONS

The recommendations from this study include physical improvements along West Street involving coordination between the City of Annapolis and Anne Arundel County. The transit proposal for West Street affects and considers Annapolis Transit’s system-wide route network. The current system, relying on “pulse” transfers for all routes at a single location, will potentially give way to a more intuitive route network based on the existing major streets and multiple transfer points at major destinations. For current riders, this approach will improve system reliability reducing the impact of a single late bus on the entire system. For new riders, transit use will be a more logical transition built upon current navigation patterns along major streets. Routes that follow these major road patterns will also be easier to operate and promote; helping to build overall transit ridership. The following sections summarize the near-term and longer-term improvements for West Street.

Near-Term

Establish a West Street circulator bus route as a branded, frequent service, promoting transit use and transit-oriented development. Near-term actions include the following:

- **Transit Development Plans:** The Annapolis Transit TDP should evaluate route concepts developed in this report. It should identify a broad range of target populations that would want to use such a service and specifically assess transit interest and incentive potential in the Parole and Westgate Circle new developments.
- **Transit System Shift:** Following the recommendations refined in the TDP, Annapolis Transit should be reconfigured as an arterial-based system, with a route along West Street.
- **Branded Bus Route:** The circulator bus route along West Street should be established as a distinctively branded, route and marketed through a range of incentives implemented by an area-specific Transportation Management Association.
- **Intermodal Center Planning:** The City of Annapolis, Anne Arundel County, and MTA should continue

to work together on the development of an Intermodal Transit Center. Purpose and Need and Site Selection studies should be funded and completed as part of the implementation of arterial-based transit network conversion plan.

- **Intermodal Center Public-Private TOD Development:** The City and County should work with the property owners in the targeted areas to locate a specific site, work with the Maryland Department of Transportation (MDOT) and MTA prepare a plan and implementation strategy for the intermodal functions and surrounding private redevelopment.
- **State Road Enhancements:** SHA, the City, and the County should work together to evaluate options, design and implement various road improvement, access management and beautification plans for the State-maintained sections of the route, particularly the West Street (MD 450) corridor between Solomon’s Island Road (MD 2) to the Westgate Circle at the intersection of Taylor Avenue and Spa Road.
- **Access Management:** The City and SHA should begin work with local businesses and property owners to develop an Access Management Strategy and specific improvements to improve safety due to an abundance of turning conflict points. The strategy should reach consensus on a plan to reduce the number of driveways and provide for shared access through parking areas and along new streets adjacent to and behind businesses.

- **Pedestrian and Bicycle:** The City and County should work to improve pedestrian and bicycle systems and specific connections to destinations in and around the study area with a focus on access to bus stops, existing trail facilities and commercial/employment areas.
- **Development Standards:** The City should incorporate transit and pedestrian-enhancing parking supply/location and street design standards in the proposed Outer West Street Sub-Area Plan. Parties who undertake development and renovations should comply with these standards to help incrementally build the desired corridor character and preserve key corridor assets.



Caption: The DC Circulator is a branded service attractive to residents, employees and visitors in downtown DC.

Longer-Term

Refine area plans to determine a long-term transportation strategy that identifies level of investment in transit and details the design of a more permanent transit solution for the West Street Corridor. Key steps include:

- Transit Feasibility Assessment and Investment Strategy: The City, County, and MTA should evaluate the potential for transit each of the mode options over the long term based on ridership and planned densities. This should occur after the arterial bus route has been functioning with an established rider base; and, the City has completed its Outer West Street Sub-Area Plan that identifies a rezoning program and transportation system characteristics.
- Prepare a Long-Term Implementation Plan: With the mode-specific decisions coming from the Outer West Street Plan, any Parole plan updates in identifying the scale of development and transportation system support, prepare a detailed plan to make permanent investments in West Street transit link. This may include a series of steps to acquire and construct an intermodal center, establish high functioning stops integral to new development, historic character preservation and an optimal route.



Caption: A future streetcar on West Street will require a long-term investment strategy for land use and street redesign.

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Introduction and Background

BACKGROUND AND PROCESS

The City of Annapolis, in partnership with Anne Arundel County and the Maryland Transit Administration (MTA), initiated a study to evaluate transit in the West Street corridor in the fall of 2008. The Project Team, consisting of Kittelson & Associates, Inc. (KAI) and The Faux Group (TFG), was asked to evaluate West Street as a priority transit corridor consistent with City and Anne Arundel County plans for greater transit connectivity between major destinations in downtown Annapolis and Parole Town Center.

During the course of the study, the Project Team met three times, in January, February, and April, with an Advisory Committee comprised of staff from the City of Annapolis, Anne Arundel County, and the MTA and community and business representatives invited by the City Council of Annapolis. Several technical meetings were held with staff from the MTA, the City of Annapolis, Anne Arundel County, and the Maryland State Highway Administration (SHA) to facilitate coordination, support and guidance. The resulting study recommendations will be presented to the City's Planning Commission, City Council, and County leadership for support.

This study was designed to initiate a public dialogue about a long-term transit investment in the corridor, to investigate major transit generators and redevelopment opportunities to determine a route, to understand the conditions for transit users in the corridor, and to launch an initial set of concepts that could be more fully developed in local Transit Development Plans and refined area planning.

The first goals of this study are to develop and select an initial concept for enhanced transit in the corridor and assess the initial feasibility of those concepts. Another goal is to plan for corridor road and streetscape enhancements that help support a premier transit service, attract development, and serve as an attractive gateway to the State Capital. For both goals, the study will recommend next steps needed on the part of several entities to pursue for the selected concepts. The City Appointed Advisory Committee, City of Annapolis, and Anne Arundel County reviewed the transportation goals and opportunities for the West Street corridor and helped to draft the following project principles.



Caption: The first of several meetings with the Advisory Committee and Project Team to develop a transit plan for the West Street corridor.



These principles were used to guide the study process and evaluate route concepts developed by the Project Team:

- Create a circulator that serves the major trip generators in the City's downtown and the Parole area of the County at their "front doors":
- Develop a Transit System that will attract riders to choose transit:
- Maintain vehicular flow and access to corridor businesses:
- Create a compact route with potential for short loops:
- Integrate with regional transit and plan for a system that minimizes transfers for riders, supplementing rather than replacing the existing downtown shuttle and remote parking system at the Navy-Marine Corps Stadium;
- Serve a wide set of user groups including:
 - Existing Annapolis fixed-route transit riders
 - Existing area residents and workers for trips within the corridor currently made in personal vehicles such as travel between home and work, shopping and services, and business to business
 - Existing trips to and from regional destinations via access to regional transit networks at one or more transfer locations
 - New trips spurred by economic development along the new route and
 - Regional or local tourists/visitors arriving to the area by car and other modes and accessing attractions via transit either by parking at one of the corridor hotels or by using remote parking at the intermodal center
- Create a positive visual impact for the gateway to the City and
- Plan for both interim and permanent alignments & a mode, preserving the potential to enhance the service to a fixed-rail streetcar if that is appropriate in the future.

Within these principles, the Advisory Committee was most concerned that this service would attract a broad range of users and could begin to significantly improve travel options area-wide and specifically in this popular and growing corridor.

The following chapter reviews the conditions within the West Street study corridor and begins to consider how these principles can be addressed.

The Corridor Study Area

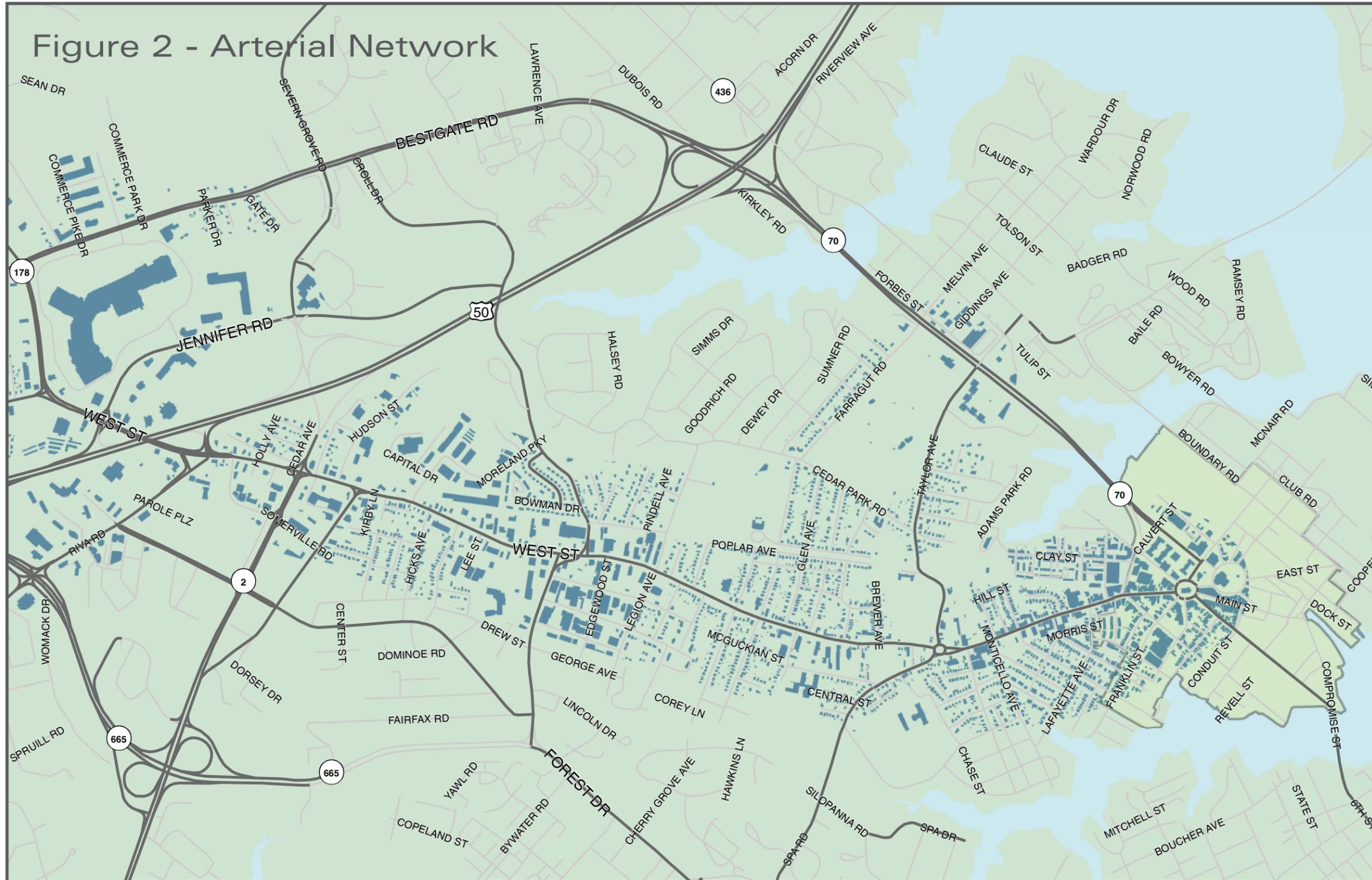
The project's study area comprises a roughly three-mile segment of Main and West Streets in the City of Annapolis and the Parole section of Anne Arundel County. The study area includes adjacent or parallel roadways to West Street (MD 450), such as sections of Solomon's Island Road (MD 2), Old Solomon's Island Road, Forest Drive, Riva Road and Somerville Road bordering the Annapolis Towne Centre at Parole, Jennifer Road near the Anne Arundel Medical Center, and Main Street downtown.

The corridor is a diverse area that includes the historic downtown, residential neighborhoods, growing commercial districts, aging industrial zones and major employment centers. Extending from Westfield Annapolis Mall to Church Circle, the corridor provides access to many local and regional destinations in Annapolis, Parole, and Anne Arundel County. From the charm of downtown, to West Street's new hotels and shopping approaching Westgate Circle, and then through restaurant and business zones flanking Outer West Street, to the retail centers and a hospital complex along Jennifer Road, each part of the corridor has a different feel. The area is home to approximately 8,330 residents and 19,400 jobs¹.

The employment, residential, and cultural areas on the corridor draw both residents and visitors to the area. City Dock in downtown attracts tourists during the summer months. The Anne Arundel Medical Center employs hundreds of people to care for patients and manage the facility. Residents of the greater area make use of a vast array of shopping, dining and employment options throughout the study area. The tight network of traditional blocks flanking Inner West Street give way to more strip and center oriented commercial development patterns beyond the Annapolis Library and the Homewood/Germantown neighborhood. Major road and natural features create barriers to important connections, and walking is often internally oriented in the project-based centers of Outer West Street and Parole.



¹ <http://lehd.did.census.gov/led/> and 2000 Transportation Analysis Zone data from the Baltimore Metropolitan Council



Caption: The arterial framework in the study area is based on a series of roadways which form the “bones” of the transportation network shaped by peninsulas near the water. Arterials farther from the water, near Outer West Street and Parole, grow into a greater network to support roadway accessibility.

EXISTING ROADWAY NETWORK

The existing and planned transportation facilities, such as roadways, transit routes, bicycle and pedestrian routes, have a direct effect on the access residents and visitors have to the homes, businesses, and employment centers that make up the greater Annapolis area. They all rely on a system of local and regional roads to make efficient connections. Annapolis Transit uses major streets to provide fixed-route, deviated fixed-route, and free shuttle service. Additionally, the MTA offers commuter bus service oriented from two-major Park & Ride Lots.

The higher order roads, including interstates and highways, provide regional access both to and from the area. While these facilities provide convenient accessibility for vehicles, they are often barriers to local travel by all modes. US 50 in Parole, for example, limits travel between districts in Parole. The few connections that exist use arterial streets unfriendly to pedestrian and bicycle travel. Arterial streets become important local links connecting neighborhoods and districts to one another and to the regional road system. Anne Arundel County's geography creates a high demand on a particular type of arterial that feeds water-oriented development in its many peninsulas. West Street's function within the area's arterial framework (see Figure 2) performs this function, being the main route to many neighborhoods along it. Moving out into Parole, the network of arterials grows to support a greater number of access options. Because arterial roads are able to link many places efficiently, they are typically the "bones" of good transit service.

CORRIDOR SEGMENTS

The priority travel mode along West Street varies according to roadway segment. Changes in land use diversity, design, and density as one moves along the corridor reinforces an inconsistent street section type. For example, walking and biking are comfortable modes to navigate Inner West Street. In contrast, segments of Outer West Street are dominated by parking lots and driveways with a very different distribution of density supporting local streets.

Both the City and County are working to advance plans to improve their respective areas for walking and bicycling. Network-building to that end will be discussed as elements key to the concept of improved transit.

Segments 1 & 2: Downtown & Inner West Street

Main Street begins at a traffic circle near the Annapolis harbor and extends uphill to Church Circle. Many businesses and institutions have a Main Street address or are within easy walking distance to various points along Inner West Street. These include City Hall, the State Government complex, the Banneker-Douglass Museum, the County Courthouse, the US Naval Academy, and St. John's College. The downtown area is renowned for its walkability. Many residents and visitors use transit today.

Inner West Street stretches six blocks from Church Circle to Westgate Circle and transitions from the retail and restaurants of downtown to residential homes. This area has been developing as an urban mixed use corridor for some time and has an attractive streetscape in place. It is home to the Annapolis Visitor Center and the Inner West Street Business District, the Seat of County government at the Arundel Center, and a host of government services are located along the route. Beyond the Lowes Hotel and Conference Center, approaching the Westgate Circle, is the recent Park Place redevelopment with 50,000 square feet of office space, 150,000 square feet of office, 225 hotel rooms, 208 condominium units, and a proposed 900 seat performing arts center. Nearby is the Severn Bank building (200 Westgate Circle), with 85,000 square feet of combined office space and ground floor retail. Just beyond the corridor are longstanding residential neighborhoods of Murray Hill, Clay Street and Presidential Hill.

Segments 3 & 4: Central & Outer West Street

Central West Street is a mix of single-family residential homes and businesses with tree-lined streets with front yards and porches between Westgate Circle and Legion Avenue. This area is the narrowest roadway segment of West Street, with only two lanes traversing the Annapolis National, Brewer Hill, and St. Mary's Cemeteries. Just outside of downtown Annapolis, the corridor passes through the Homewood and Germantown neighborhoods. Just beyond West Street are several important cultural assets: the Bates Performing



Caption: Downtown is home to many businesses and institutions in an area renowned for its walkability and proximity to the water.



Caption: West St Corridor (10): These single-family homes along Central West Street are typical of the Germantown/Homewood neighborhoods.



Caption: The Annapolis Towne Centre at Parole has improved the streetscape and pedestrian environment with wider sidewalks and windowed store fronts adjacent to the sidewalks.

Arts Magnet School, the Bates Center, and the Maryland Hall for the Arts. The corridor is targeted to become a low scale commercial district.

Outer West Street, from Legion Avenue to Route 2 (Solomon’s Island Road), is generally an auto-oriented landscape with several car dealerships and large parking lots associated with existing commercial and industrial businesses. It is home to many businesses and draws over 1,100 employees from the greater Annapolis area.² It is targeted to receive much of the City’s growth over the next 20 years.

Segments 5 & 6: South Parole & Annapolis Mall

The Annapolis Towne Centre at Parole is a large development that provides high-density housing, employment, and retail for the region. The buildings and parking garages built just south of West Street preview a new mixed-use neighborhood and the potential for further development.

Westfield Annapolis Mall and surrounding retail have served as a very successful regional shopping destination since it opened in 1980. The Mall has a recently completed expansion that attracts shoppers from around the region. The nearby Anne Arundel Medical Center draws 3,500 employees, as well as patients from the region for medical care.

² 2006 Census data

OTHER STUDIES

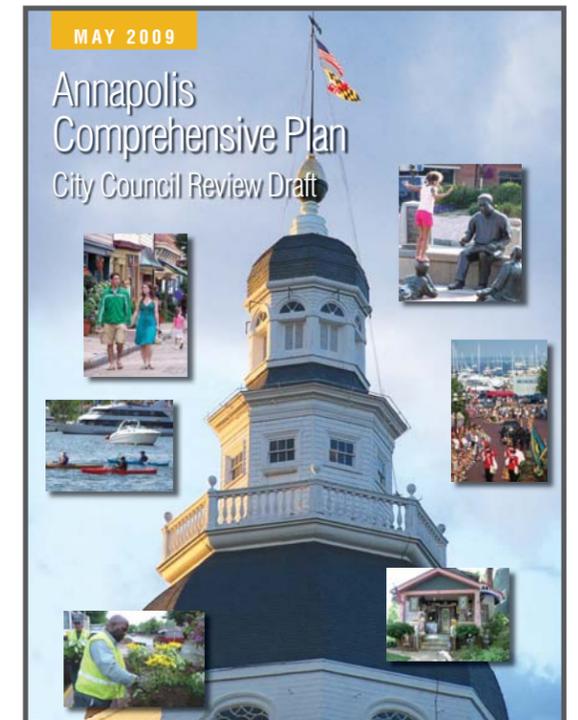
Studies relating to the West Street corridor have recently been completed or are currently underway. The Project Team and steering committee reviewed the relevant studies completed and plans for ongoing studies to incorporate findings and guide the recommendations of this study. The following section includes brief summaries of the studies reviewed.

City of Annapolis Comprehensive Plan

The City of Annapolis Comprehensive Plan is currently being updated. The existing Comprehensive Plan was completed in 1998, and the updated Comprehensive Plan was released in draft form May 2009. Both the 1998 and 2009 versions of the Comprehensive Plan were reviewed and are reflected in the goals guiding this study.

The Annapolis Comprehensive Plan documents the existing natural resources, population, and infrastructure of the Annapolis region and provides guidance for the future of the area. Infrastructure, land use, and transportation are sections of the Comprehensive Plan that will have the greatest affect on the future of the West Street corridor.

The draft plan defines several major opportunity sites and suggests an organizing framework for road improvements in the West Street corridor. Among other key recommendations, it reconfirms the City’s policy to provide the option of using public transit to all residents, to increasingly orient development design, diversity, and density towards transit use and the development of locations on the West Street corridor, and to create an intermodal hub there.



Transit Development Plans

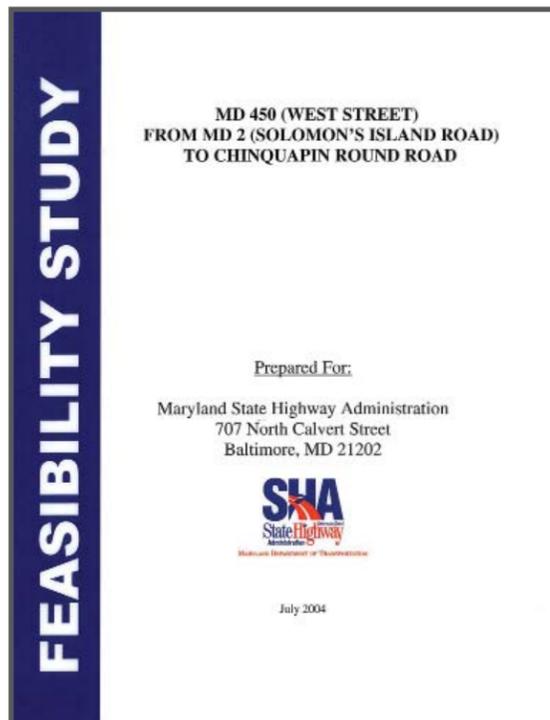
A TDP provides an assessment and recommendations for transit system improvements over a five-year timeframe. Funded by the MTA, two such plans will help to guide near-term decisions for the West Street Corridor. The Anne Arundel County TDP is nearing completion, and the City of Annapolis TDP is just beginning its regular update.

The service alternatives in the draft Anne Arundel County TDP include a recommendation for a new transit route linking downtown Annapolis and Parole on West Street, Riva Road, and Jennifer Road in addition to

a new Parole circulator and other route changes.

The Annapolis TDP is just getting underway. Initial discussions suggest the plan will assess the potential to restructure and simplify the Annapolis Transit route configuration. Currently, the pulse transit system requires all routes to meet at roughly the same time at the Transfer Center on Spa Road. Riders then transfer between routes that typically run in large loops throughout the City. The Plan is expected to recommend a shift from the existing "pulse" system to an arterial-based system in the near future. This restructuring supports the concept of a route focused on West Street discussed in this report. A switch to an arterial-

based system will route buses using key arterials in the City (e.g., West Street, Forest Drive, and Riva Road) and will not force riders to pass through and transfer at a single Transfer Center.



Outer West Street (MD 450) Study

A July 2004 feasibility study was completed by the SHA for West Street from Route 2 (Old Solomon's Island Road) to Chinquapin Round Road. The study presented gateway concepts to identify the corridor as a major entrance to the City of Annapolis.

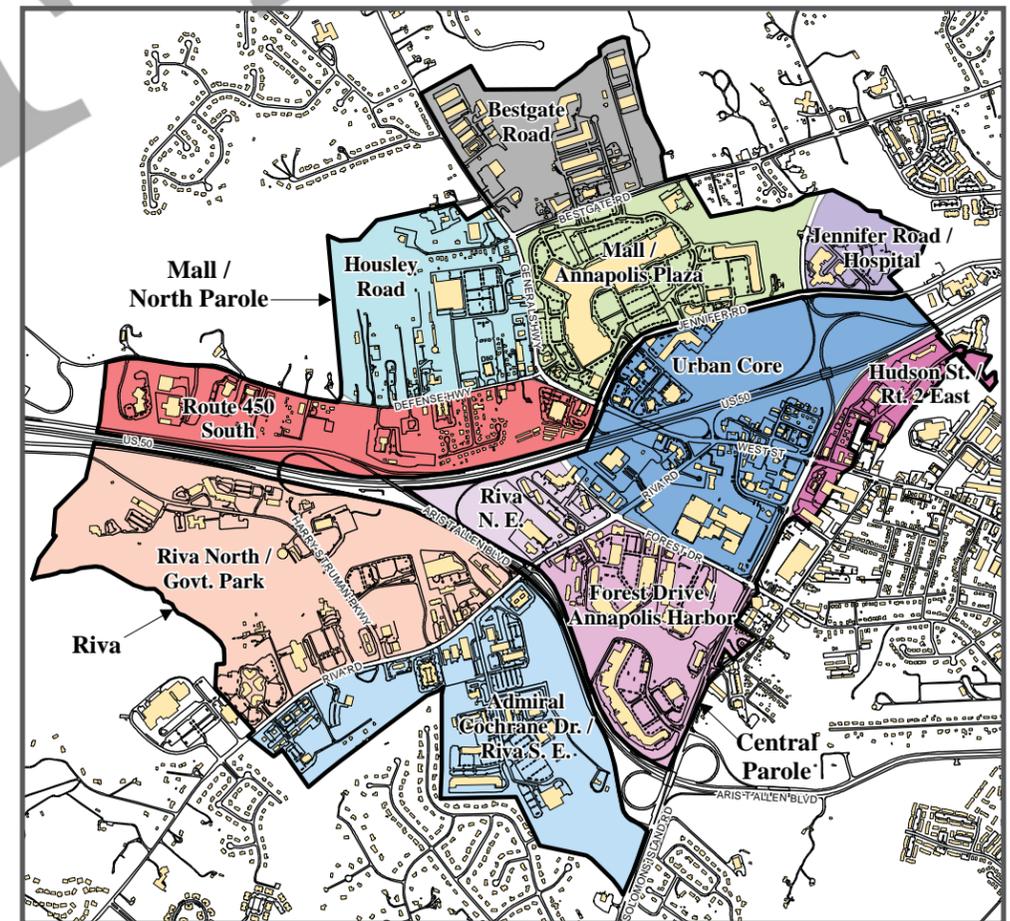
The study evaluated traffic operations for two alternatives proposed for the corridor. Alternative A proposed maintaining the existing lane configurations on West Street, making aesthetic improvements to the medians and sidewalks, and providing space for a bicycle lane in some locations. Alternative B included the aesthetic improvements in Alternative A, with adjustments to lane configurations that were projected to achieve an intersection level-of-service of "D" or better during peak travel times.

The study additionally proposed a two-lane roundabout at the West Street/MD 393 (Old Solomon's Island Road) intersection to further accentuate the location as a gateway into Annapolis.

Anne Arundel County Plans

The team reviewed the Anne Arundel County Pedestrian and Bicycle Master Plan (March 2003), the Parole Urban Design Concept Plan (1994), the Parole Community Legacy Plan (2004), and the Intermodal Center Feasibility (2003) study, among others. They helped to inform the study's consideration of future development potential to be served by transit and additional links of supporting transportation infrastructure for greater internal connectivity for a variety of modes.

Caption: Parole consists of a variety of different subareas, each with their own mix of businesses and destinations. The West Street Transit Study has focused on the Urban Core, Mall/Annapolis Plaza, and Jennifer Road/Hospital subareas.



TRANSIT

Service Characteristics

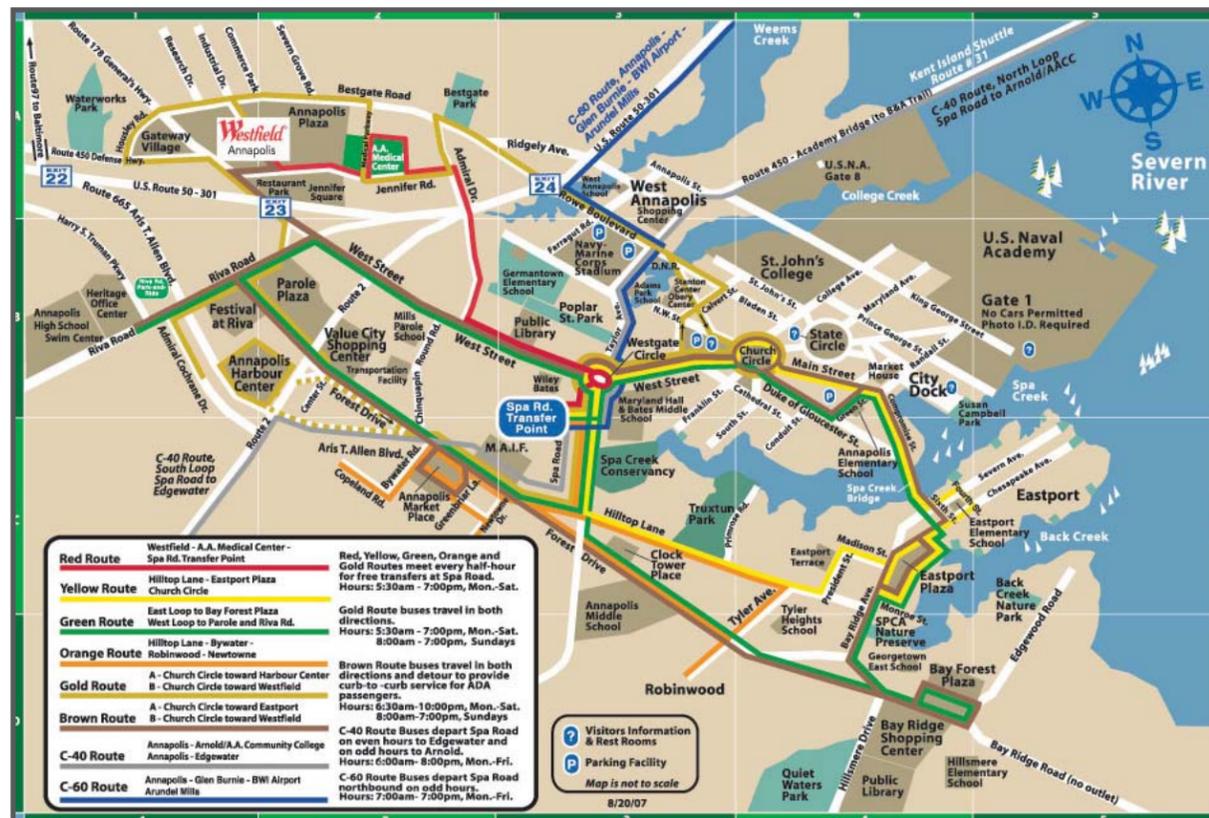
Annapolis Transit serves the City of Annapolis with seven general-public, fixed-route bus lines. The Red, Yellow, Green West, Green East, Orange, Gold A, and Gold B lines are designed to operate as a “pulse” system, where all routes meet at the Spa Road Transfer Center to allow riders to transfer or wait for transferring passengers from other lines to complete their trip. Routes meet at the Spa Road Transfer Point on the hour and/or half-hour. In addition, two deviated fixed-route lines, Brown A and Brown B, operate in a clockwise and counterclockwise loop, respectively, through the city. These nine routes are collectively referred to as the “city routes” or the “city service” and are shown in Exhibit 2.

The Red, Yellow, and Orange routes operate every half-hour; the others operate hourly. Service operates on all routes from 5:30 a.m. to 7:00 p.m., Monday through Saturday. The Brown A and Brown B routes operate later in the evening and also on Sundays, and the Gold A and Gold B routes also operate on Sundays.

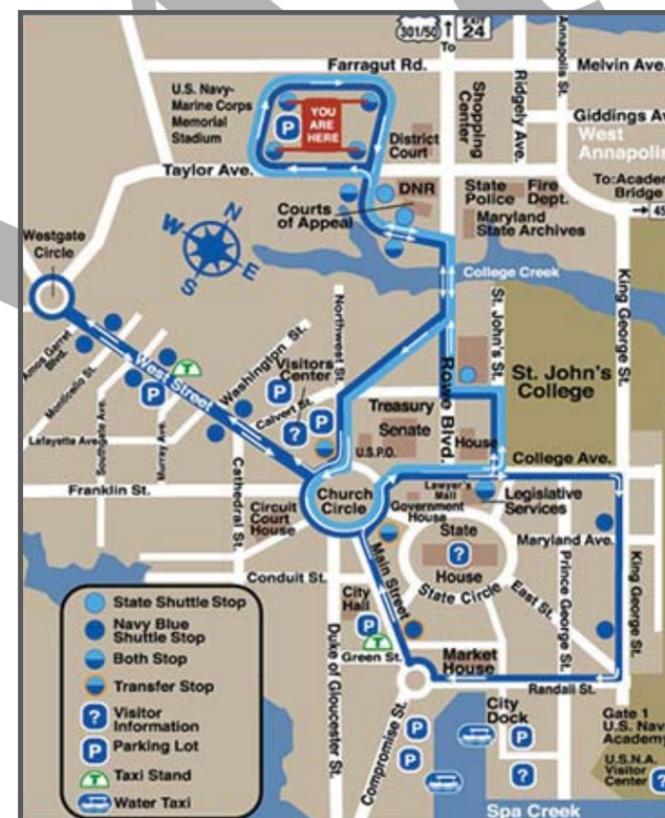
Two other routes, the State Shuttle and the Navy Blue Shuttle, provide free shuttle service between downtown Annapolis and the Navy-Marine Corps Memorial Stadium. Three other routes, the C-40, C-50, and C-60, connect Annapolis with outlying areas of Anne Arundel County. Each of these “county routes” operates every two hours, between 7:00 a.m. and 7:00 p.m., Monday through Friday. Both the shuttle service and county routes are also shown on the route map.

On West Street, from Jennifer Road to Church Circle, there are 13 stops for Annapolis Transit and regional bus routes. Over the approximately three-mile stretch, bus stops are located every two and two-thirds block on average.

Exhibit 2 - Fixed Route & Free Shuttle Transit Service



Caption: Annapolis Transit currently operates fixed-route bus lines in a “pulse” system where all routes meet at the Spa Road Transfer Center.

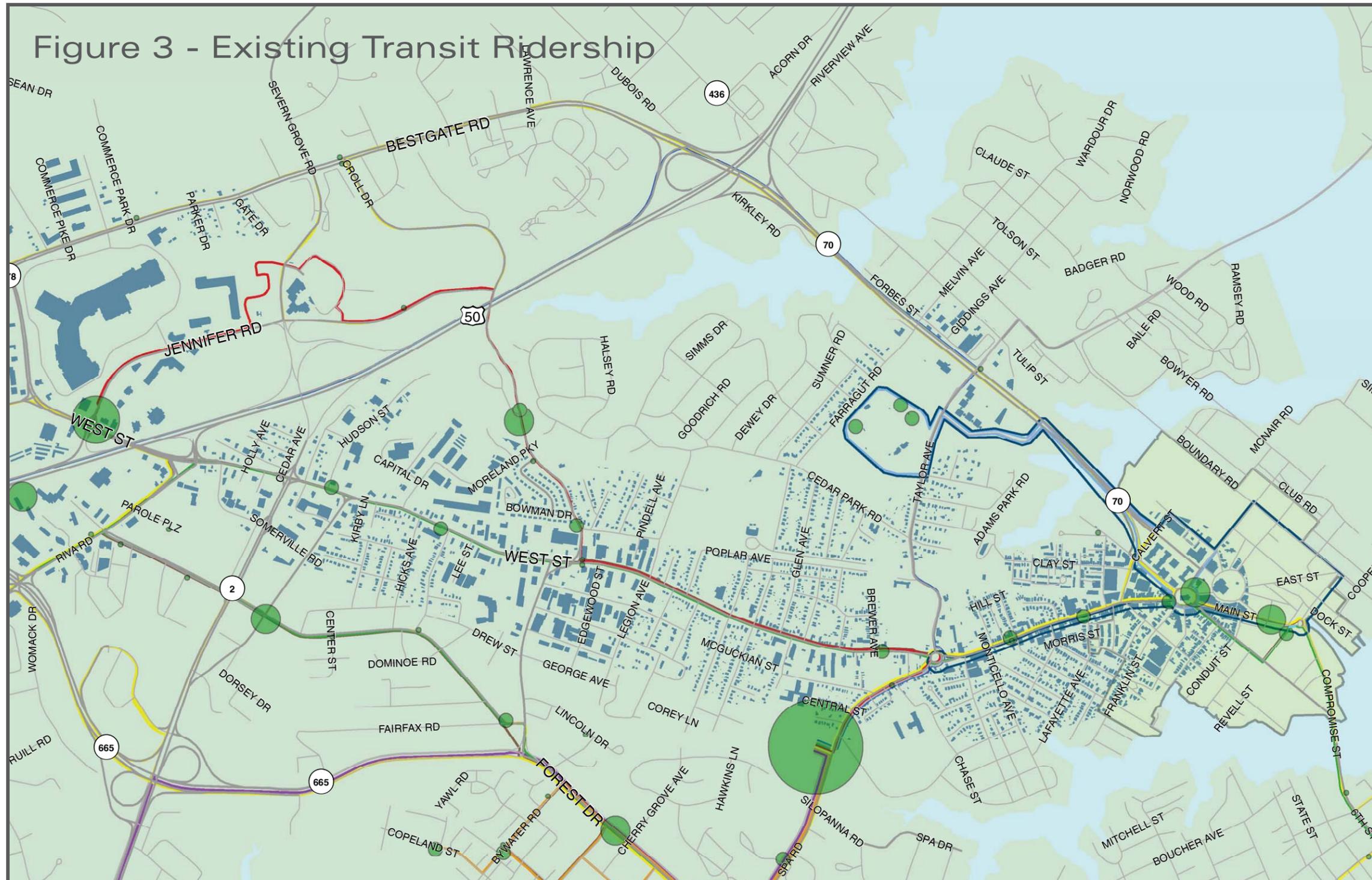


Caption: Two other transit routes, the State Shuttle and Navy Blue Shuttle, provide free shuttle service between downtown Annapolis and the Navy-Marine Corps Memorial Stadium.

Ridership

Based on ridership counts completed by the MTA during May and June of 2007, Annapolis Transit carried a weekday average of approximately 3,770 riders. The Yellow, Orange, and Red routes were the busiest, with daily ridership of 770, 700, and 680, respectively. The remaining routes each averaged between 230 and 300 daily riders. Figure 3 shows the weekly ridership totals for Annapolis Transit stops.

Within the West Street corridor, the MTA ridership survey counted 664 boardings at existing stops within the project study area (which did not include the Spa Road Transfer Station). These boardings came from 22 of the 55 stops in the study area, while the others had little to no ridership in the survey. The majority of this ridership came from stops along West Street or on Jennifer Road, with 20 percent coming from other stops in downtown, along Admiral Drive, Forest Drive, or Spa Road in the study area.



Caption: Existing ridership in the study area is highest at the Spa Road Transfer Center where all the bus routes meet for riders to transfer. Downtown and Westfield Annapolis Mall follow with the second and third highest ridership numbers.

Legend

Existing Bus Stops Average Weekly Boardings

- fewer than 10
- 11 to 35
- 36 to 80
- 81 to 265
- more than 265

Exhibit 3 shows the average monthly boardings for each of the routes within the Annapolis Transit system from July 2007 through June 2008, as provided by Annapolis Transit.

Exhibit 3 - Average Monthly Boardings

Route	Average Ridership per Month
Stadium Shuttle	32,440
Navy Blue Shuttle	4,400
Yellow Route	15,341
Orange Route	15,634
Red Route	17,749
Green Route	12,199
Gold Route	16,016
Brown Route	17,221
C40 Route	1,139
C50 Route	296
C60 Route	884
TOTAL	134,423

On-Time Performance

The MTA survey found that 51 percent of all trips operated on time, with seven percent of trips beginning early, 43 percent of trips leaving 5 to 15 minutes late, and four percent of trips leaving more than 15 minutes late. Some routes were consistently later than others, with the Green-E route having 17 percent of trips very late and 20 percent for the Gold-B.

Regional Bus Routes

In addition to the local service operated by Annapolis Transit, the corridor is also served by three MTA commuter bus routes, often referred to as the Dillon routes because they are operated on contract by the Dillon Bus Company. Route 951 connects the Navy-Marine Corps Memorial Stadium with the New Carrollton Station via downtown, West Street, and the Harry S. Truman and Davidson Park & Ride lots. The 922 and 950 Routes connect Queen Anne’s County, Annapolis, and the Truman Park & Ride lot with Washington, each with slightly different stops in the downtown D.C. Exhibit 4 lists the number of buses per weekday and the ridership from the Stadium, the West Street corridor, and the Truman Park & Ride taken from counts in September 2008.

Exhibit 4 - Regional Bus Route Ridership

	AM Inbound Routes Serving West St.	AM Inbound Routes Serving Truman Park & Ride	AM Stadium Boardings	AM West St. Boardings	AM Truman Park & Ride Boardings	All Other AM Boardings	Total AM Boardings
MTA Route 921	5	5	7	11	26	62	106
MTA Route 922	5	10	4	36	323	58	421
MTA Route 950	7	15	6	35	462	116	619
	PM Outbound Routes Serving West St.	PM Outbound Routes Serving Truman Park & Ride	PM Stadium Alightings	PM West St. Alightings	PM Truman Park & Ride Alightings	All Other PM Alightings	Total PM Alightings
MTA Route 921	7	7	4	23	30	62	119
MTA Route 922	5	10	2	21	323	53	399
MTA Route 950	7	14	3	30	439	133	605

Issues & Opportunities

Having provided some basic information about the existing conditions in the project study area in the last chapter, this chapter contains analysis of the issues and opportunities surrounding transit, land use, and the roadway network, starting generally and then focusing in on specific segments of the West Street corridor.

TRANSIT

Systemwide Transit Issues

The “pulse” system currently used by Annapolis Transit has a number of benefits for users; it ensures that all trips can be made with just one transfer, and it makes sure those transfers take place between all routes. However, the pulse system also means that a delay on a single route delays every route, it requires the routes to all have ½ hour travel times, and for some trips it requires a transfer unnecessarily. With growing traffic congestion in Annapolis, the system is now experiencing significant delays, with only 51 percent of buses operating on-time.

MTA conducted a review of Annapolis Transit service in 2007 which recommended that the pulse system be reevaluated relative to the benefits of a new, arterial-based system. The Annapolis Transit Development Plan, currently underway, will evaluate the existing service using data previously collected, a recently collected on-board survey of riders, and a broad survey of the Annapolis community for their perceptions of transit, willingness to use transit, and what changes might make them more likely to ride transit. That study will determine whether to shift to an arterial-based transit system, what the reconfigured routes would look like, and how the transition would occur.

Additionally, the number of boardings on the MTA regional bus routes along West Street and at the Navy-Marine Corps Stadium are relatively low and those segments could be eliminated if there was a frequent and direct local route that connected the downtown, West Street, and the regional routes close to the Harry S Truman Park & Ride.

West Street Route Concepts

The West Street Corridor contains the two stops with the highest non-transfer boardings, one in downtown Annapolis and the other at the Westfield Mall in Parole. However, these are currently only directly

connected the Brown route, which runs hourly in a clockwise and counterclockwise in a circle consisting predominately of West Street and Forest Drive. One of the key goals of this study was to develop a transit service that would connect these key destinations in a way that would build transit ridership and encourage the development of the corridor as a walkable, mixed-use gateway.

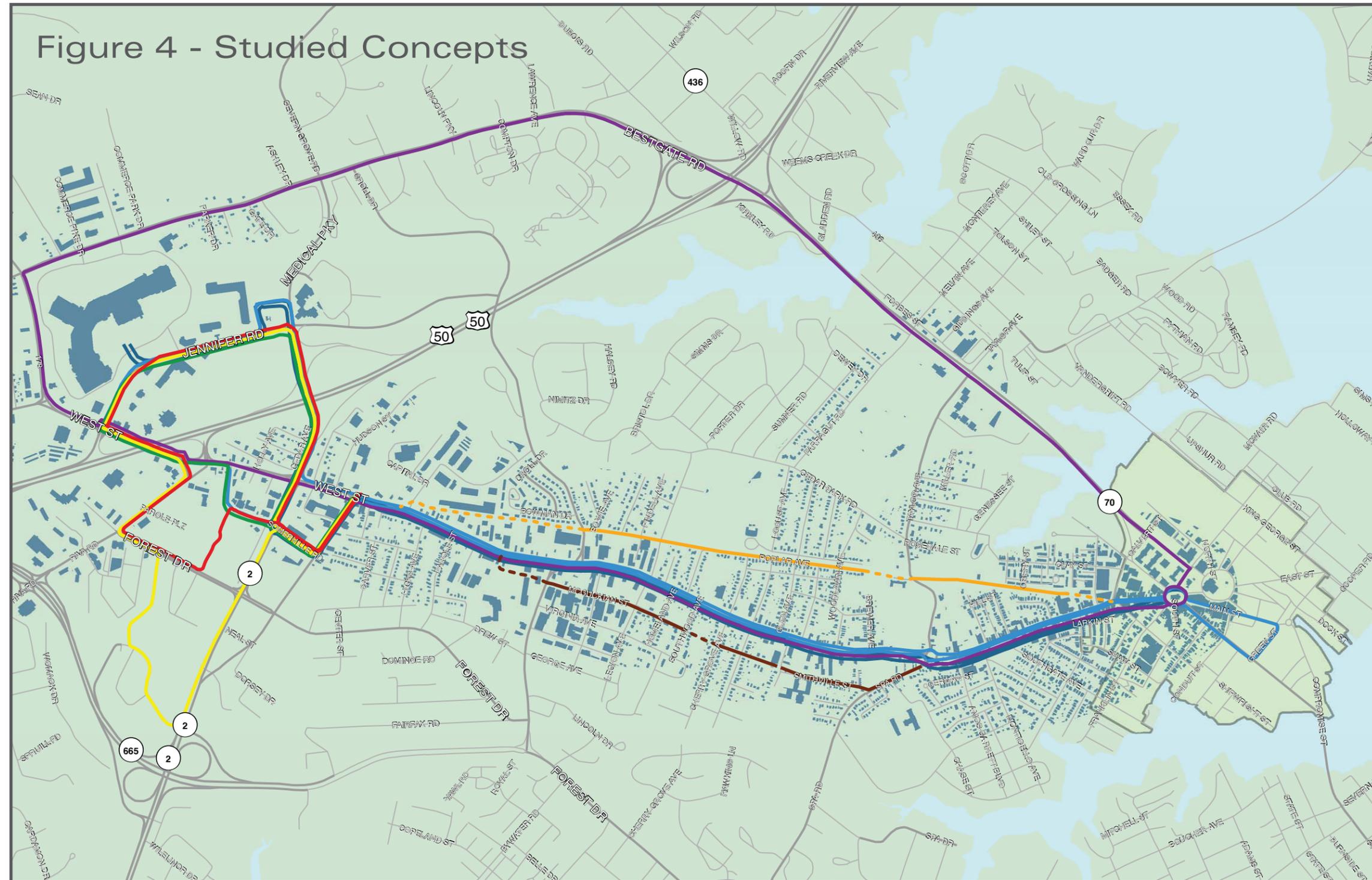
The transit route and stop location concepts for West Street are the result of several iterations of potential routes with participation from the Advisory Committee and ongoing studies. The two routes were derived from several possible concepts, which were narrowed down through consideration of the existing and future trip generators, destinations, and transportation facilities. Figure 4 shows the route concepts considered as part of this study.

At the February 19, 2009, meeting of the West Street Committee, the meeting attendees broke out into three different groups to provide guidance about the key destinations to serve in different segments of the corridor, the appropriate locations for stops, the potential for redevelopment, and the appropriate roadway segments for the route. Based on the consensus of the group to focus the route, several route options were ruled out, primarily routes along Rowe Boulevard, Poplar Avenue, and McGuckian Street. Meeting attendees did suggest looking at a short deviation off of West Street to Smithville Street to serve some potential redevelopment sites, an improved stop at the Westgate Circle, and proximity to some key destinations such as the Maryland Hall for Creative Arts, the US Naval Academy and City Dock.

The two route concepts, shown in Figure 5, developed in the Committee meetings run between the Annapolis downtown and Westfield Annapolis Mall, but differ slightly at each end of the route. Concept “A” includes loops at each end of the route, while Concept “B” has a loop to serve more of downtown but at the Parole end does not have a loop for greatest operating efficiency.



Caption: The bus stop at the corner of Calvert and West Streets in downtown Annapolis is one of the highest volume stops in the Annapolis Transit system.



Legend

- Parole Loop to Annapolis Harbor Center
- Parole Loop to Forest Drive
- Parole Loop to Somerville Road
- Poplar Avenue
- Rowe Boulevard Loop
- Smithville Street
- West Street Concept "A"
- West Street Concept "B"

Caption: A number of routes were considered as part of this study to ensure that all options were taken into consideration. This figure shows several of the route concepts that were studied as part of this project.

Concept "A"

Beginning in downtown Annapolis, Concept "A" uses Main Street and Duke of Gloucester Street to serve destinations near the water at City Dock and comes within walking distance of the US Naval Academy. The route continues out of downtown towards Westgate Circle, where stops on each side of the roundabout serve the residential and commercial developments nearby. Further west on West Street, stop locations near Glen Avenue, Southwood Avenue, and between Admiral Drive and Chinquapin Round Road serves existing neighborhoods car dealerships and large employment zone and the 1901 West development.

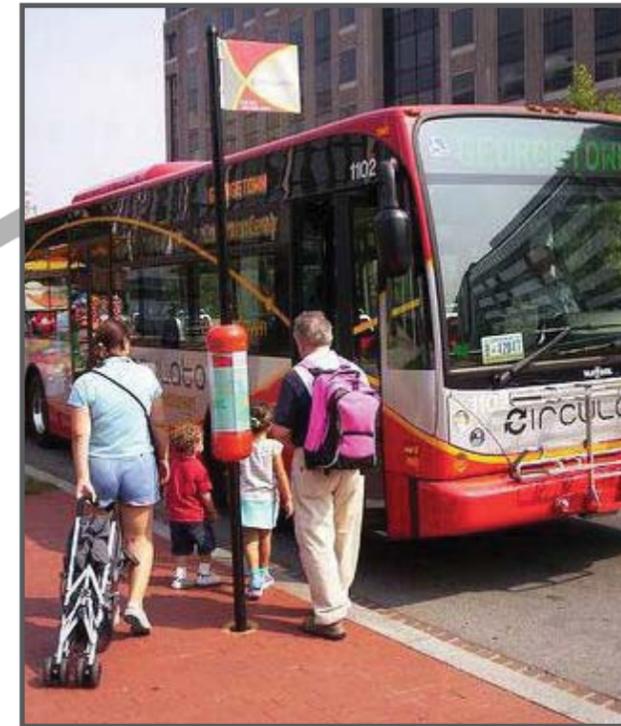
Heading westbound, Concept "A" leaves West Street at Route 2 (Old Solomon's Island Road) to go north to serve the Anne Arundel Medical Center before continuing on Jennifer Road towards the Westfield Annapolis Mall. Stops are provided at both locations. Upon arriving back on West Street, the route then shifts south to Somerville Road to serve the Annapolis Towne Centre at Parole with a stop on the eastern edge of the development. The route will then return to West Street to head eastbound.

Concept "B"

Concept "B" begins at Church Circle in downtown before heading on West Street along the same route as Concept "A" until it reaches Old Solomon's Island Road, where both directions of the route shift to the south. Here the route travels on Somerville Road before heading to Route 2 (Solomon's Island Road). Once a plan for an intermodal center in this area is completed, the route should be aligned to serve the center.

Concept "B" continues on Route 2 (Solomon's Island Road) to serve the Anne Arundel Medical Center and travels on Jennifer Road to the Westfield Annapolis Mall, where it will turn around to reverse the route.

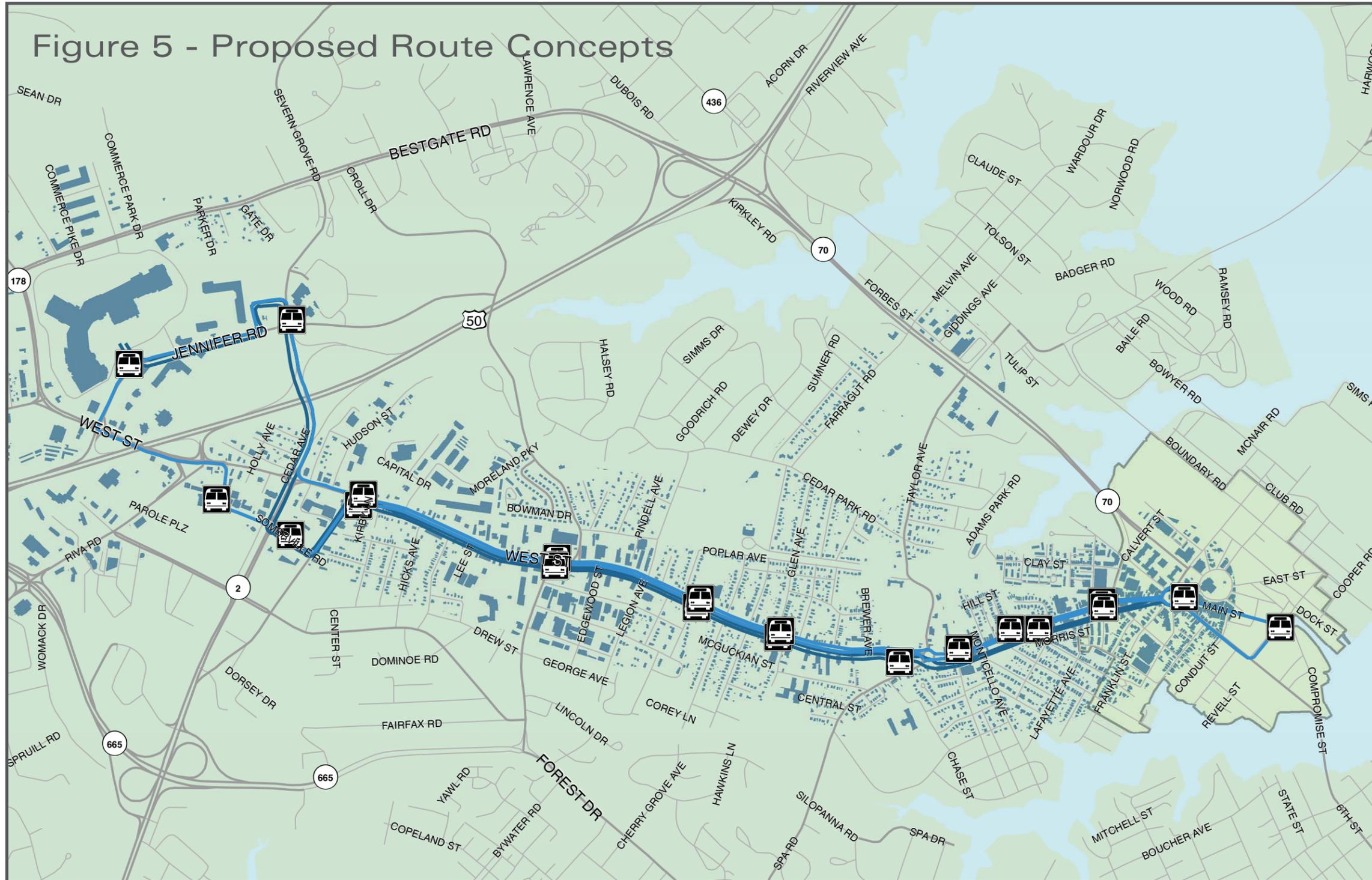
Both of these route concepts will be evaluated in the City of Annapolis' Transit Development Plan from an operations perspective and integrated to determine how to on this corridor with other arterial routes.



Caption (top right): D.C. Circulator: Washington, D.C. has developed a network of 5 Circulator routes that are well-branded and connect key destinations near the downtown. The route map on the side of vehicle effectively conveys the destinations to potential riders.



Caption (bottom right): Portland Streetcar: The streetcar in Portland, OR has become a national model for using transit to spur mixed-use development at densities that wouldn't have been viable without attractive, high-quality transit service.



Caption: The two route concepts shown illustrate slight variations on a route that would connect downtown Annapolis and Parole in order to improve transportation options and support changing land use in the corridor.

Transit Mode Options

This section details the characteristics of the two modes and transit technologies most appropriate to the West Street corridor:

- Rubber-tire circulator service (enhanced local bus service); and,
- Fixed-rail streetcar service.

The following matrix summarizes the benefits and limitations of both.

Exhibit 5 - Transit Mode Summary

	Rubber-Tire Circulator	Fixed-Rail Streetcar
Primary Goal	Connecting Destinations	Stimulating Development
Design	Downtown Retail & Parking Focus	Urban Living & Redevelopment Focus
Cost	Lower Capital & Operating Costs	Funding Commitment & Permanence Attracts Development
Perception	Flexibility Allows for Route Modification	Quiet Ride, Easy to Navigate for Rider

The types of vehicles available, their operating and maintenance characteristics, how each system is perceived by riders and real estate investors, and the costs associated with building, maintaining and operating each system are all important factors to consider as various options are evaluated. The narrow space available along most of the corridor suggests that the transit service will operate in mixed traffic rather than in its own right-of-way. Both modes are able to benefit from recent advances in technology and innovation for travel priority at intersections, schedule adherence through electronic tracking, and low-floor vehicle access in stop design. Both rubber-tire and fixed-rail vehicles should have amenities to ensure they are ADA compliant. Characteristics that vary according to mode will be important to determine route feasibility and potential costs. These will be reviewed and compared in this section.

RUBBER-TIRE CIRCULATOR

The bus is the most commonly used form of public transportation in North America and can be operated on a variety of types of roadway,

ranging from streets with mixed traffic to exclusive busways. Trolley and circulator service are offered in downtown environments within several systems throughout the U.S.

Buses have been in operation in the U.S. since shortly after the turn of the 20th century. This is a highly developed mode of transportation, although a number of fairly significant changes have emerged recently. The flexibility of bus service is one of the reasons for its wide use and success around the world. Bus routes can be easily altered to meet a change in demand or operating conditions, particularly when they are not designed for separated space operations.

FIXED-RAIL STREETCAR

The streetcar is one of the three major types of light-rail transit. Streetcars operate along mostly shared or segregated rights-of-way, with one- or more car trains. Vehicle types and ages can vary greatly. When streetcars replace a local bus route, they typically attract a larger share of potential riders. However, since fixed costs for fixed rail are significantly higher than bus, they require higher levels of density and ridership to justify costs.

As of 2003, seven streetcar systems were operating in the U.S. and Canada. This is a well-established transit technology, and one that is highly regarded by the public and local business development professionals who acknowledge the potential for streetcars and trolleys to add to an area's historic character and economic importance.

Examples from Other Cities

Listed below are descriptions of successful circulator systems, some rubber-tire and some fixed-rail, some of their characteristics, and the key lessons that they can provide for the West Street corridor.

DC CIRCULATOR – WASHINGTON, DC

The Washington Metropolitan Transit Authority and the District Department of Transportation jointly operate the D.C. Circulator in cooperation with local business improvement districts and other organizations. The D.C. Circulator started operations in July 2005, charges \$1 per ride, and uses modern, 40-foot long, low-floor, diesel-powered buses to serve a mix of commuters, residents, and tourists. The D.C. Circulator debuted with two routes and now has five routes that connect destinations around the the City core. As of December 2008, the system was averaging 10,000 riders per day. The system has a very distinct identity and serves the tourist market well, connecting key destinations. For example the debut of the service linked Union Station to Georgetown along K Street.

CHARM CITY CIRCULATOR – BALTIMORE, MARYLAND

The City of Baltimore will be starting three downtown shuttle routes in September 2009. The routes will be free, and operating costs are being funded by an increase in taxes on paid parking within the City of Baltimore, with the majority of the revenue coming from



Caption: The DC Circulator distinguishes its five routes linking cultural, entertainment and business destinations with unique branding and modern vehicles.



Caption: The Charm City Circulator begins service this fall with three downtown routes that will have many of the key characteristics of modern streetcars with quiet, electric powered, open-floor plan vehicles.

garages in downtown. The routes will connect to tourist destinations, employment centers, residential neighborhoods, commercial districts, parking garages, and transit stations. The routes will be operated by Veolia with 10 minute headways and new, 35-foot electric buses with a diesel turbine engine to recharge the batteries. The routes will explore

the potential to build ridership with rubber-tire routes that have many of the key characteristics of modern streetcars (quiet, electric powered, open-floor plan vehicles running on short headways and connecting neighborhood, tourist, and employment destinations). A section of the route linking Penn Station to the Inner Harbor will potentially be replaced by the Charles Street electric Trolley.

PIKE RIDE – ARLINGTON, VIRGINIA

Pike Ride is a combination of WMATA and Arlington Transit bus routes that serve Columbia Pike and started in September 2003. The initiative has involved increases in bus service in the corridor and a common branding element to distinguish the stops and routes operating on Columbia Pike. The route's ridership grew by about 30 percent in the first 6 months of operation due largely to a branding and marketing campaign that emphasized the distinguishing characteristics of the service. Plans have been prepared for the construction of a streetcar route in the corridor, and will be implemented once funding is in place. Pike Ride is an example of a well-branded set of services on a single corridor that is moving towards eventual fixed-rail service.

PORTLAND STREETCAR – PORTLAND, OREGON

Portland's streetcar is the most successful US example of the modern streetcar to have been implemented over the past decade. It has served

as a model for projects that have since opened in Tacoma and Seattle and are in construction in Tucson, Arizona, and in planning stages in Washington, D.C., Baltimore, and many other cities. Portland Streetcar uses vehicles from a Czech design that are 66 feet long, smaller than most light rail vehicles in the U.S. The route started as a 4.8 mile route, has been extended three times to date, and just received a federal funding commitment for a new 3.3 mile extension to the east side of Portland. The Portland Streetcar is the poster child for development spurred by a transit-investment. Its construction was a condition of developers in the Pearl District, a defunct rail yard targeted by the City to receive growth, along the first leg of the line. The area has since seen over 1.5 billion in new investment.

TECO LINE STREETCAR – TAMPA, FLORIDA

Tampa's 2.3 mile streetcar line connects downtown Tampa with the historic Ybor City commercial district, passing by the Florida Aquarium, the St. Pete Times Forum, cruise ship terminals, the Tampa Convention Center, and several hotels along the route. The route largely consists of single track sections in exclusive right-of-way, using a fleet predominantly composed of replica historic cars. The line is operated by Hillsborough Area Regional Transit (HART) in partnership with the City of Tampa and local business groups. The Tampa City Council has approved a 1/3 mile extension further into downtown and has plans for two more extensions. The streetcar line has made extensive use of sponsorships, receiving \$1 million from the local power company for naming rights and also has a special assessment district that helps fund operating costs. The route focuses on tourist attractions, and ridership is highest on the weekends, evenings, and at local festivals and other special events. The residential community is still being built around the TECO streetcar, but its ridership has been based on special events and connecting tourists downtown to a historic entertainment district.



Caption: In Tampa, the streetcar line focuses on tourist attractions, and ridership is highest on the weekends, evenings, and at local festivals and other special events

Potential Ridership Market

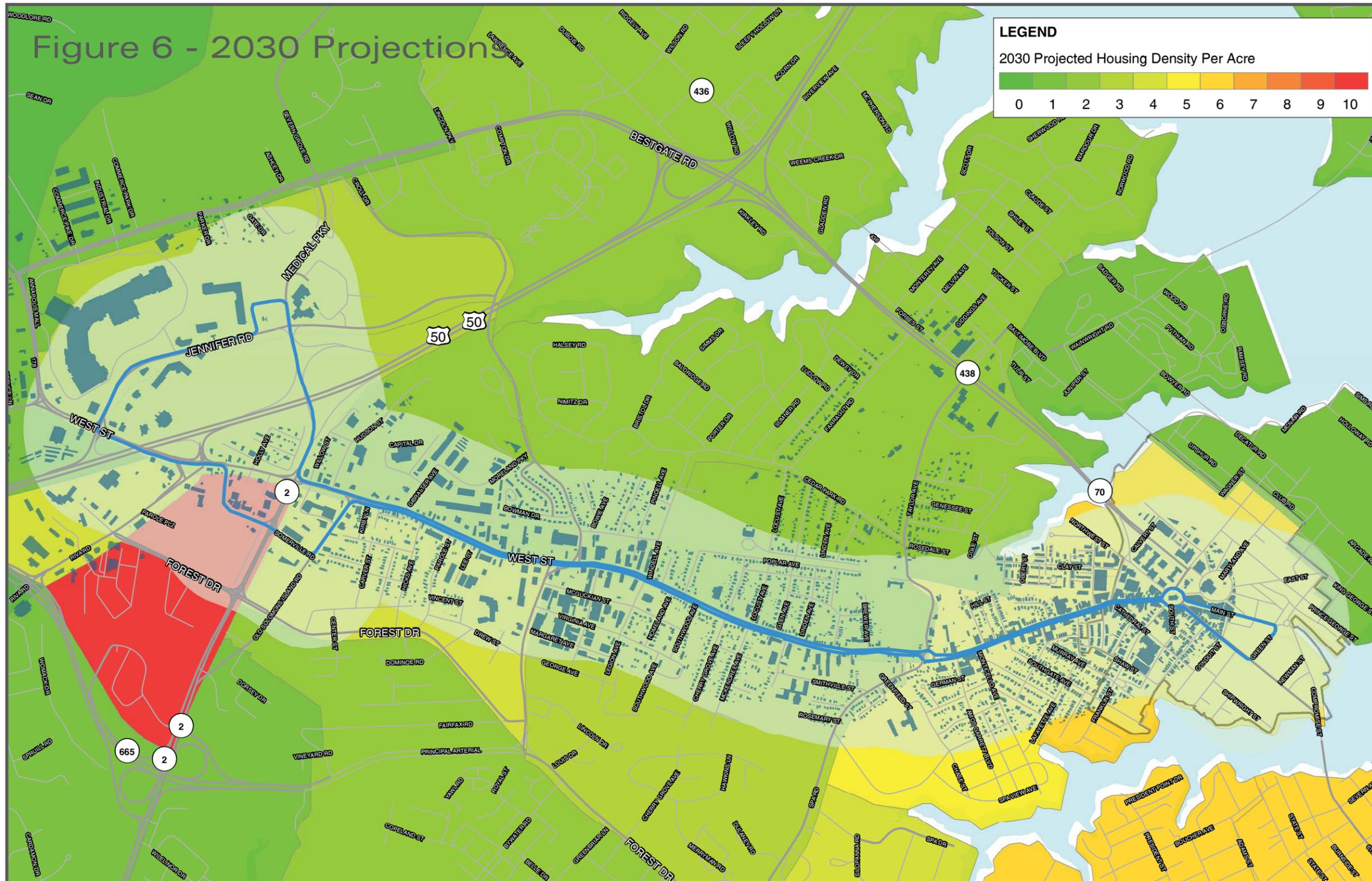
Successful transit routes like those described above need to serve a market of riders, ideally several groups of riders to generate farebox revenue and justify the investment in vehicles, stops, and operating costs. Some of the routes described above rely predominantly on tourists while others are more focused on short trips between commercial districts and, to a lesser extent, work commute trips.

The ridership for a transit route along West Street from downtown Annapolis to the Annapolis Towne Center at Parole, the Anne Arundel Medical Center, and the Westfield Mall would include individuals living and working within the corridor, tourists visiting destinations within the corridor, and residents and customers of new development projects built in the corridor.

According to 2006 data from the US Census Bureau's Longitudinal-Employer Household Dynamics data and the Transportation Analysis Zones (TAZ) data provided by the Baltimore Metropolitan Council (BMC), the area within 1/4 mile of the route concepts described above contains 19,474 primary jobs (2006), 8,377 total residents (2000), and 3,167 residents employed in primary jobs (2006). The corridor has more employment than residents, not surprising given that

it includes downtown Annapolis, the Westfield Mall, and the Anne Arundel Medical Center but connected by the relatively-low density residential neighborhoods of Central West Street. Most surprising piece is that only 578 of those resident employees work within the corridor. More than half of the corridor residents work in Anne Arundel County (including the City) and a quarter work in the City itself, while half of the employees working in the corridor come from Anne Arundel County with only 12 percent living within the City.

This data does not include the Westgate Circle and the Annapolis Town Center at Parole, expected to significantly raise residential densities. It points toward a trend in support of zoning changes suggested in the



Caption: This map shows projected future gross densities from the Baltimore Metropolitan Council, with the greatest increase in residential density occurring in the Parole area. This data does not incorporate any changes that would be associated with the draft Annapolis Comprehensive Plan. Future employment density shows employment growth in Parole and around Westgate Circle.

draft Annapolis Comprehensive Plan. The 2030 TAZ projections show a 57 percent increase in households; the data is believed to include Westgate and Parole development plans but not the proposed changes in the Comprehensive Plan.

A key factor in successful, efficient and cost effective transit service is a concentration of riders, or densities of households, jobs or both, along the line. Few sources exist to guide the appropriate level of density for different modes of transit. Most research has found that net densities of between seven and nine residential units per acre are necessary for bus service with headways of a half hour or less. The density necessary for more frequent bus service is typically in the range of 15 units per acre³, with a successful streetcar project requiring greater densities to achieve levels of ridership that would support the investment in the infrastructure. FTA's 2003 Summary Analysis of Transit-Supportive Land Use for New Starts Projects describes land use circumstances under which New Starts proposals were given high ratings. If a region is considering pursuing New Starts funding in the long term, tailoring indicators to New Starts criteria is worthwhile. "Typical" station area population densities in the 2003 analysis were about 6 to 9 persons per acre in urban neighborhoods and 2 to 5 persons per acre in suburban neighborhoods. Projects with medium or higher ratings tended to serve employment centers with over 100,000 jobs. The most highly rated projects tended to serve centers with more than 200,000 jobs.

As shown in Figure 6, the projected gross 2030 residential densities in the West Street corridor are between 3 and 10 units per acre, with the highest densities in the Annapolis Towne Center at Parole and in downtown Annapolis. These densities, when converted to net residential density, might be sufficient to support frequent bus service, but are unlikely to provide the ridership necessary to support a fixed-rail streetcar service. This is, of course, just one way of measuring the potential ridership and does not take into account ridership from tourists, between businesses, and other visitors. However, as the City of Annapolis' Comprehensive Plan moves forward and a more detailed small area plan and zoning is developed for Outer West Street, it is worth considering the density desired and whether that may be sufficient to support fixed-rail streetcar service in the future.

³ Pushkarev and Zupan (1987)

The four million tourists that visit Annapolis each year could be an important part of future transit ridership, but tourist-oriented destinations along the corridor are few. Most of the existing tourist destinations (historic district, Naval Academy, State House, Banneker-Douglass Museum, National Sailing Hall of Fame, St. John's College, etc.) are located within walking distance of the waterfront in downtown Annapolis. A West Street transit route could bring tourists from hotels in Parole and along West Street. People arriving at the proposed Intermodal Center could also use the service, similar to the way in which the existing shuttles link downtown to the Navy-Marine Corps Stadium lot. Additionally, as destinations like the Maryland Hall for Creative Arts and the areas around Westgate Circle and Parole grow, a transit route along West Street will create a greater synergy among the various destinations with Parole residents traveling into downtown and tourists lodging in and exploring areas beyond the historic district.

Branding, Marketing, and Incentives

The development of a new route provides the opportunity to create a distinct identity for West Street. The route map itself can create a visual impression of the system that is memorable and part of the brand concept. Routes primarily located on a single arterial roadway are a first step that can be further reinforced with distinctive color schemes for vehicles (where possible), at stop locations, and in promotional materials. While the West Street route is not expected to start out as fixed-rail, its stops and other supportive amenities should be located and built to suggest permanence and a long-term commitment to public investment in the corridor.

The West Street route should be considered for new vehicles, amenities, and other services added to the Annapolis Transit system. This could include the use of distinctive new buses for this route along with shelters for the stop locations.

Real-time bus information should be provided with the introduction of service on West Street to reinforce a strong commitment to customer-



Caption: The streets of historic Annapolis attracts residents daily and four million tourists annually.

oriented quality transit. This Global Positioning System (GPS) based system will allow riders to know when to expect an arriving vehicle through signs installed at stops and local participating destinations, and via the internet on cellular phones or computers. Another improvement that would help attract choice riders would be the addition of Annapolis Transit schedule information to the Google Maps trip planning function.



Caption: This photo of West Street, off of Church Circle, illustrates the compact, walkable, and narrow streets of Annapolis' historic downtown.

Finally, a host of marketing and outreach opportunities should be offered through the various visitor and community information organizations and websites to expand transit ridership on this corridor and throughout the Annapolis/Parole area. This includes direct marketing to the businesses, government agencies, and local educational institutions through a corridor focused Transportation Management Association; adjusting parking supply requirements and pricing strategies to encourage transit use and "park-once" concepts; partnering with MTA and/or WMATA on a "smart" fare card system recognized by multiple transit systems in the region; and providing commuter-oriented resources such as a "guaranteed ride home" or visitor-oriented services, such as trip planning via transit.

ISSUES & OPPORTUNITIES BY SEGMENT

The following discussion presents the characteristics and attributes of the study area organized according to routing segment. The types of riders that will likely be attracted to the service, aesthetics of the streetscape, and the geometric constraints for transit vehicles are discussed for each segment.

In addition, the traffic impacts associated with the transit route will be different for each segment. Traffic volumes vary widely on West Street, with Annual Average Daily Traffic in both directions ranging from 15,000 vehicles in Inner West Street to over 33,000 vehicles at the intersection with Solomon's Island Road⁴. The critical issues associated with each segment that may not apply to other segments are also detailed.

⁴ Source: Maryland Traffic Volume Maps, 2006

Segment 1: Downtown

The aesthetics and atmosphere of downtown Annapolis attract residents and visitors to explore the historic section of the city. However, many of the attributes that make the area desirable, such as narrow streets and sidewalks and a historic district designation, present challenges to accommodating large transit vehicles on the roadways.

The pedestrian-scaled streets and short blocks typically in downtown Annapolis have a tendency to encourage people to walk farther distances to use transit. This suggests that a downtown stop will have a broader reach for potential transit patrons than those in less pedestrian-oriented areas, which may not be reflected in this study's ridership evaluation. The limited supply of free parking in downtown and the amenable pedestrian environment favor the use of the transit services that are available, particularly the free shuttle routes operating to and from The Navy Marine-Corps Memorial Stadium.

While downtown provides a number of attractions, the area still may lack the density necessary to justify an investment in streetcar or fixed-rail transit service. The projected 2030 housing density for downtown Annapolis is approximately 6 houses per square acre. While this housing density would support an intermediate bus route with roughly half-hour headways, higher housing densities are recommended in new development to support a frequent bus or fixed-rail service.

The number of available housing units could possibly be increased if there are underutilized buildings where upper floors are not currently occupied and could be used as apartments.

A strong retail and tourist destination in downtown is the City Dock area, drawing people to the harbor, the Sailing Museum and a variety of shops and restaurants. The area is particularly popular for annual boat show events and on the weekends. City Dock was considered an important destination for a direct connection by the Advisory Committee.

Downtown's narrow streets and tight turns present major challenges for fixed-rail transit vehicles. Concept "A" includes a loop in downtown along Duke of Gloucester Street, Green Street and Main Street. Reaching destinations in the dock area would require the transit vehicle to negotiate several small scale intersections.

Figure 7 - Fixed-Rail Vehicle Path at Church Circle



Caption (above): This figure shows the possible path of a fixed-rail vehicle turning around Church Circle in downtown. In general, a fixed-rail vehicle would remain in the outside circulating lane, but would merge with traffic where the number of lanes changes.

Caption (right): This figure shows the potential paths of fixed-rail vehicles in the east and west directions through Westgate Circle.

Figure 8 - Fixed-Rail Vehicle Path at Westgate Circle



Concept “B” shows a route ending at Church Circle. This shorter route would be more likely to accommodate a fixed-rail vehicle and would also avoid Main Street where congestion is sometimes an issue. This stop would be the closest to most destinations in the historic area, including City Dock.

Another challenge for fixed-rail service in downtown is the likelihood that electric propulsion would require the use of overhead trolley wire. Concepts “A” and “B” both would pass through a section of the City’s designated historic area where overhead wires have been removed and are typically not permitted, with Concept “A” stopping at Church Circle and Concept “B” traveling down to the waterfront at Market Place. Hybrid electric-powered streetcar vehicles are generally designed to run without overhead trolley wire but only for very limited amounts of time and at very low speeds.

The Charles Street Trolley Corporation in Baltimore has been exploring the option of a streetcar with on-board battery power so that it could run off-wire for several blocks as part of its regular service. While it is possible that new vehicle options will become available in the coming years, it is difficult to estimate the cost for a product not currently on the market or in development.

Another potential issue for a fixed-rail route in downtown is the turn-around at Church Circle. From preliminary estimates on the turning radius of fixed-rail vehicles and existing geometry of the traffic circle, a 66-foot articulated fixed-rail vehicle would fit within the existing road space around the Circle. Figure 7 shows the path a vehicle would take around the Circle while staying in the outside lane.

An initial traffic evaluation suggests that a streetcar in Church Circle is likely to delay circulating traffic at the stop on the east side of the Circle. Additionally, while a fixed-rail vehicle is moving through the Circle, its steel wheels holding the track will cause a squealing sound.

Segment 2: Inner West Street

Inner West Street transitions from the historic buildings of downtown to newer developments at Westgate Circle. In between, residential neighborhoods have tree-lined streets and sidewalks to encourage walking. Narrow street sections on West Street and a lack of parallel

through streets concentrate motor vehicles, transit, and pedestrians on a well-defined traditional “main street” section of the corridor.

Throughout this entire section, transit vehicles will use the same lanes as auto traffic. Two travel lanes are present, one in each direction, through Inner West Street. While the roadway is three lanes wide in some sections, usually an outside lane is dedicated to parking, or a center lane is used for left-turn movements at intersections.

Concepts “A” and “B” have nearly the same alignment through Inner West Street, with the only differences at transition points on either end of the segment at Church Circle and Westgate Circle. Both routes maintain east and westbound directions on West Street, and propose stops at existing bus stop locations spaced every 3 to 4 blocks.

Narrow streets make it difficult to accommodate pull-outs for transit vehicles. At transit stops drivers will likely experience some delay while waiting for passengers to board or alight, since opportunities to pass are limited.

From preliminary estimates on the turning radius of fixed-rail vehicles and the existing geometry of West Street through this section, a fixed-rail vehicle located in the existing travel lanes would not seem to present any fatal flaws.

Segment 3: Central West Street

The narrow, two-lane roadway section of West Street in this part of the corridor ensures that cars and transit vehicles will share the same lane in either direction. However, both Concepts “A” and “B” do not include stops on the sections of roadway that are the narrowest. Concept “B” also includes an option for the route to divert to Smithville Street to the south, thus avoiding the two-lane section.

For both concepts, stops should be placed on the entering side of Westgate Circle. In the westbound direction, the stop should be placed on the east side of the roundabout, and if possible after the roadway widens to allow automobiles to pass a stopped transit vehicle waiting for passengers. Overall the stops suggested in these concepts are not intended as pull-outs, except where on-street parking exists. Stopping in a travel lane will result in general traffic delays and so stop locations



Caption (above): Looking toward downtown from Westgate Circle, this photo shows the transition from the historic downtown into areas of newer development.

Caption (right): This narrow section of West Street is constrained by two cemeteries on either side of the roadway.



need to be carefully analyzed to minimize the delays to other vehicles using transit signal priority where appropriate.

The eastbound direction should include a stop before entering the roundabout but will differ slightly between Concepts "A" and "B." Concept "A" could potentially include a stop on the west side of Westgate Circle and if possible after the roadway widens to enter the roundabout. Since Concept "B" diverts to Smithville Street and Spa Road, a section of the parking lane could be used for a stop.

A preliminary evaluation of the turning radius needed for fixed-rail vehicles within the existing geometry of Westgate Circle, shown in Figure 8, does not indicate the presence of any fatal flaws for a fixed-rail vehicle in the existing travel lanes. In both directions, the transit vehicle would remain in the outside lane of the roundabout and circulate as any other vehicle would through the intersection.

BIKE FACILITIES

Numerous bicycle facilities are present and planned in and near the West Street corridor. Transit and bicycling attract many of the same users and should be planned to compliment and support one another. The bicycle facilities should minimize any barriers to complete systems and offer sufficient and frequent bike parking, particularly in retail and employment areas. Improvements to transit should be tied to improvements for bicyclists to maximize the synergy between the two networks.

In this section of the corridor, the Poplar Avenue Trail runs in an old railroad right-of-way parallel to West Street. Bicyclists have varying levels of comfort and direct, off-street facilities such as the Poplar Avenue Trail provide a good alternative to riding on West Street. The presence of high traffic volumes and limited right-of-way along this section of West Street presents a challenge when adding transit stops. If space cannot be provided to separate bicycles from faster-traveling cars the trail should be extended from its current terminus at Admiral Drive farther into Outer West Street.

Segment 4: Outer West Street

INTERMODAL CENTER

A long expressed need in the corridor and a key element of this study is the concept of an Intermodal Center along West Street. Plans prepared by both the County and the City call for such a center. Anne Arundel County Executive's May 2008 Transportation Priorities letter to the



Caption: This example of an intermodal center in Orlando shows a design that allows several buses to stop while passengers board. The roof serves as a practical element of the center, but is designed to mimic the shape of waves in the nearby ocean.

Maryland Secretary of Transportation lists the "Parole Intermodal Facility" as the County's third highest priority.

The proposed Intermodal Center would serve as a hub for the meeting of various local and regional transit services. Riders would be able to transfer between local routes and to regional services. Transit patrons could be dropped off or park their cars and board transit to move about the City and Parole. The location should be easily accessible to major arterial roads. It should advance urban design concepts for Outer West Street and Parole, recognizing the ability of new projects to create quality places and enhance walking and bicycling. The site should be large enough for both the intermodal center and significant new private development to help catalyze quality transit oriented development at the City gateway. Exhibit 6 illustrates a concept prepared for an intermodal center on a site proposed within the Parole Plaza redevelopment in 2003.

Exhibit 6 - Intermodal Center Rendering



Caption: An intermodal center was proposed on a site within the Parole Plaza redevelopment in 2003. The site has since been developed without the proposed center.

A Purpose and Need study should build upon this study and assess long-term needs of growing transit demand and limitations of the Harry S. Truman Park & Ride and the Annapolis Transfer Center on Spa Road. A Site Selection study should be undertaken to investigate options, including an area proposed by the City that lies close to the County line between Route 2 (Solomon's Island Road), Old Solomon's Island Road, and West Street, as shown in Figure 11 under Land Use in this section.

Roadway Improvements

While enhancements may be needed to accommodate and promote bus and fixed-rail transit at various locations in the corridor, the primary area of focus should be on the section of West Street from Route 2 (Solomon's Island Road) to Westgate Circle, shown in Figures 9 and 10. This is the section with the greatest opportunity for new growth and a recognized need for corridor reinvestment and improvement. This study recommends that SHA and the City work together to

design improvements. Plans should recognize a full integration of modes, particularly increased transit and walking share of trip-making associated with planned increases in development densities and mix of uses. Design elements of any improvements should not eliminate the possibility of fixed-rail transit in the longer run.

Several elements are identified for further development in a design concept for West Street. They include:

- Future lane configurations, particularly in current three and four-lane sections, for transit stop location either in traffic or accommodated using bus pullouts;
- Improvements needed to reduce congestion and enhance intersection operations;
- Access management measures that rely on fewer driveways and more local streets to insure safe and sufficient access to existing and new development;
- Improvements to create a safe and attractive continuous pedestrian network needed to facilitate transit access and a quality public realm;
- The introduction of bike accommodation and connections to business districts, neighborhoods and bike trails per the City and County plans;
- Monumental features and qualities incorporated into beautification improvements consistent with the City gateway and Washington & Rochambeau Revolutionary Route context; and
- Accommodation of all of the above elements without impairing the viability of key parcels by requiring undue acquisition of land from frontage properties, many of which are of shallow depth.

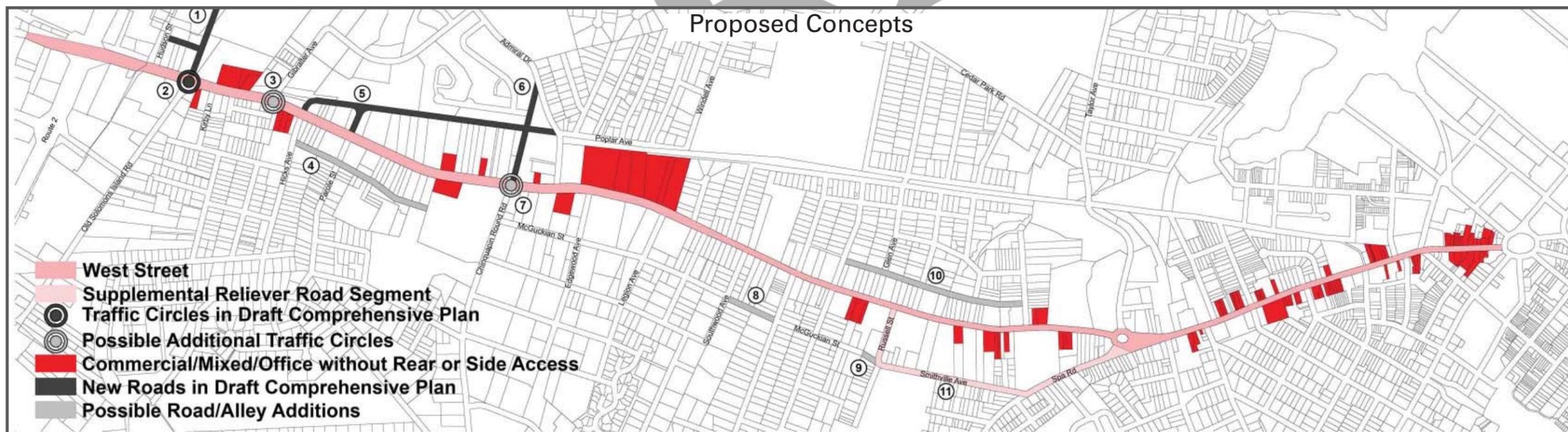
The City plan already identifies several congestion reduction and capacity enhancement projects, as does SHA's 2004 study of a section of that corridor. That study evaluated several other items to improve safety and corridor management in the design planning process. The elements recommended for consideration are shown and numbered on Figure 10.

1. Develop a connecting street to Old Solomon's Road to Hudson Street to give this large opportunity area now accessed by right-in/right-out movement only, full movement access to West Street.
2. Construct a roundabout at Old Solomon's Road to create a monumental City Gateway and improve intersection functions leading to the Intermodal area.
3. Create a roundabout at Gibraltar Avenue to improve intersection functions caused by left turns into this large industrial area. Alternatively, signalization should also be investigated.
4. Extend a rear alley south of West Street, possibly from Hicks Avenue to Chinguapin Round Road, to create rear access to homes and businesses now

Figure 9 - Existing Conditions



Figure 10 - Proposed Concepts



relying only on driveways on West Street.

5. Extend a rear alley north of West Street, possibly from Gibraltar Avenue to Admiral Drive, to create rear access to businesses now relying only on driveways from West Street and to complete the Poplar Ave alternative to bicyclists on West Street.
6. Extend Chinquapin Round Road to Admiral Drive to remove the one block jog needed today for cross-city traffic. Several design options for this are proposed in the City's Comprehensive Plan and may be incorporated into plans for the redevelopment of the public housing complex overseen by the City Housing Authority.
7. Create a roundabout at Chinquapin Round Road to improve intersection functions and allow U-turns if a median design is selected for the road section between Chinquapin Round Road and Gibraltar Avenue. This intersection will be an excellent location for a pocket park and/or monumental element with or without the roundabout.
8. Extend McGuckian Street from Southwood Avenue to Russell Street.
9. Create a series of shared alleys or connected rear parking lot treatments along the back of the Central West Street lots on the north side of West Street (These are very shallow lots).
10. Improve Russell Street as it connects to Smithville Avenue, one block to the south of West Street as a parallel reliever route. West Street, as it passes through the Central West Street opportunity area, is very narrow and widening is constrained by shallow lots and three cemeteries set close to the street.
11. Signal spacing and timing plans should be evaluated to provide for corridor traffic and speed management and to provide block spacing and pedestrian crossings at more frequent intervals.

ACCESS MANAGEMENT

The Figure 9 illustrates the approximate number and locations of commercial parcels in the outer West Corridor whose parking can only be reached via driveways directly on West Street. Approximately 90 parcels appear to have at least one such driveway in the section between Route 2 (Solomon's Island Road) and Westgate Circle, an average of one driveway every 120 feet. This condition greatly increases conflicts and variable travel speeds, reducing road capacity and safety for all modes. Cars slow to turn into driveways, stop in the travel lane to turn left, and cross frequently in the path of pedestrians and bicyclists traveling along West Street.

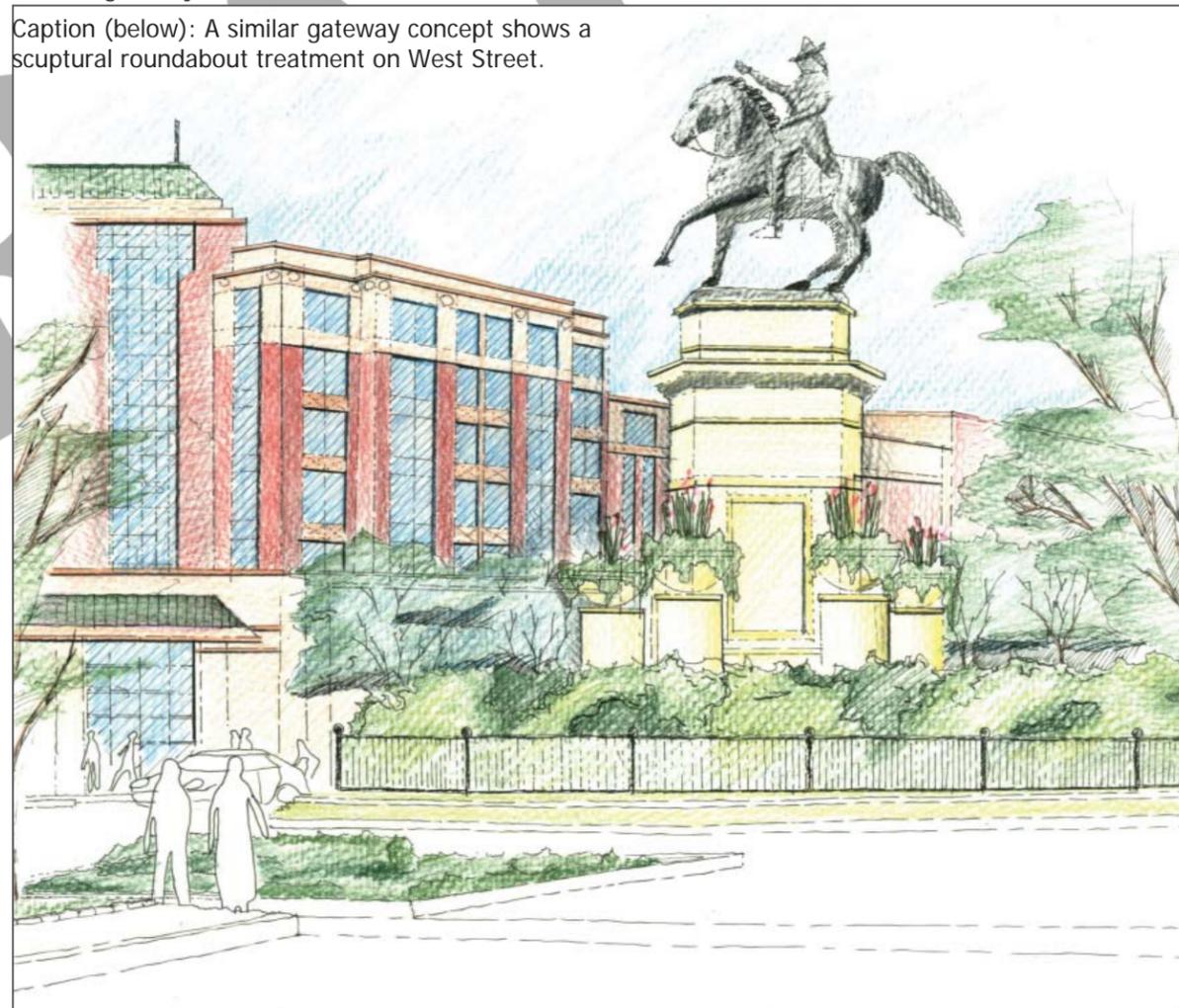
Figure 9 demonstrates how the proposed road and alley improvements might reduce the number of lots with only front access by two-thirds to about 30 properties. These improvements could reduce the need

to add center medians in narrow sections of the corridor by allowing left turns to occur at signalized intersections and roundabouts. The three roundabouts proposed will also permit reductions in mid-block left turns in some segments by allowing drivers to make U-turns to return to desired destinations. Other recommendations for access management include several measures that are being considered, such as reducing the number of driveway curb cuts by combining several business access points to fewer driveways, encouraging side or rear access to parcels, and creating interconnected parking lots and drives within each block.

Caption (right): Richmond's Monument Avenue, much wider than West Street, offers an example of a historically themed gateway into downtown.



Caption (below): A similar gateway concept shows a sculptural roundabout treatment on West Street.





GATEWAY IMPROVEMENTS

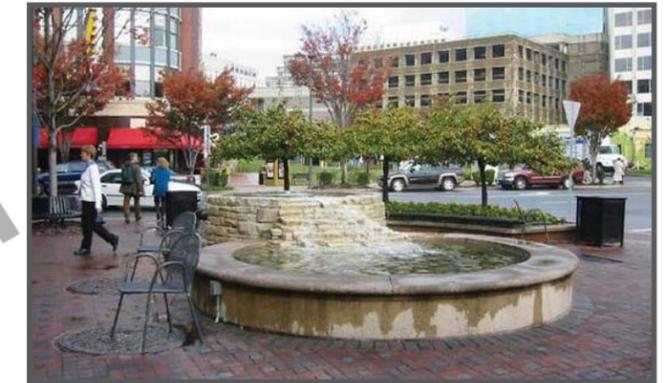
The Project Team recommends that the West Street corridor be given a special identity and character that could be reinforced through various means. West Street’s history could be incorporated into public spaces, including sculptures and monuments to give the corridor a more gracious and monumental character. These elements should help to create a defining gateway element and reflect the

Caption: The addition of wider sidewalks, marked crosswalks with pedestrian refuge islands, and trees invites pedestrians to West Street, shown here at the intersection with Route 2 (Solomon’s Island Road). Increased pedestrian activity on the corridor and better access at intersections increases the viability of enhanced transit service for the area.



corridor’s national historic significance. These elements will also help promote the transit system to tourists and visitors who come to the area for its history.

Historic themes may be used in the branding of corridor service. A unique opportunity available to build upon the National Park Service’s proposed Washington & Rochambeau Revolutionary Route, commemorates the route used by the revolutionary troops on their march into Annapolis to board boats on their way to the Battle of Yorktown. Other historic themes recognize that West Street is the route George Washington took when coming to Annapolis to resign his Commission after the war and is also the site of the first organized horse racing in America. This occurred on this street as horsemen raced to the Three Mile Oak site in Parole and back. Vehicle or promotional art can use images of soldiers marching or horses racing to brand “fast” and “revolutionary” transit service.



Caption: A “pocket” park, such as this one in Bethesda, is an example of a public space brought about through a “bonus” development process.

Specific elements that can be used to assist with this design effort include the following:

- Constructing a series of roundabouts with decorative island treatments and monument sites in the manner of Monument Avenue Richmond Virginia should be considered.
- Landscaping medians in the wider sections of the corridor and in the areas leading to the roundabouts.
- Private pocket parks and plazas could be added along the street. The bonus development process used on Wisconsin Avenue in Bethesda resulted in many significant urban spaces and sculptural elements. A similar undertaking may be suitable in this area to create a monumental character through public private partnerships.
- Landscaped strips/tree lawns with street trees are recommended throughout the corridor to shade walkers, separate them from traffic and create a more pleasant environment. Shorter trees can be placed under the power lines. Full size trees should be used wherever possible, either between the walk and the curb or behind the walkway.

SIDEWALKS, CROSSWALKS, AND STREETScape

A system of safe and comfortable walks and crosswalks is essential to good transit. This network needs to be continuous throughout the corridor, connecting to adjacent neighborhoods, side streets and front doors of corridor developments. Sidewalks need to be fully accessible for the full range of pedestrian mobility types. A variety of conditions will need to be created as a part of a road improvement project and private development. With little or no public right-of-way and walkways along much of the corridor, the new streetscape will need to be created through a combination of right-of-way acquisitions and pedestrian easements on private property. This study recommends the following preliminary standards for consideration for inclusion in new City standards.

- Preferred Condition in new development on deep lots and Urban Centers Opportunity Areas: Install 5' planting bed with street trees at the back of curb, 8' to 10' wide sidewalk or wider to allow café seating followed by either a building face or a 4' wide planting bed with hedge or low wall to screen any vehicular areas.
- Standard Preferred Condition: Install a 5' planting bed with street trees at the back of a curb, and install 5' to 8' wide sidewalk or wider followed by either a building face or a wall or a 4' wide planting bed to screen any abutting parking and vehicular areas.
- Constrained Condition: On renovation sites where more width would remove parking to the degree that development is no longer viable, install 4' wide planting bed with street trees and 5' wide sidewalks free of obstructions. Install a 4' wide planting bed with either hedge or low wall to screen any abutting parking and vehicular areas. Special standards will be needed for auto display areas that abut the walk.
- Minimum Condition: Install 5' wide sidewalks free of obstructions and starting at the back of curb where more width would require the demolition of an existing building.
- Crosswalks: Marked crosswalks are recommended at every side street and every signalized intersection and roundabout.
- Street furnishings and lighting: On Inner West Street, a standard palette of furnishings, paving details, transit shelters and light fixtures should be selected to help define the corridor as an important part of the City.
- Overhead Power lines: While overhead lines are a significant visual blight in this corridor, the cost of undergrounding them along the entire route would be too great to consider without outside funding. Strategic plantings of low and taller street trees will help to mitigate the visual impacts. Where private development occurs utility poles should be relocated to rear alleys, and where appropriate, segments should be considered for placement underground.
- Trolley wire: Planning will need to consider the possibility of locating overhead trolley wire if the West Street route is upgraded to a fixed-rail streetcar.

STREETSCAPE CONCEPTS

The three streetscape concepts presented on the next page provide guidance on the character of the street under constrained, minimum, and preferred conditions. The variations in depth of parcels and width available suggest that the cross-section of the roadway will change. Space for infrastructure elements, such as travel lanes, street trees,

Caption: Pedestrian enhancements at lower volume roads, shown here at the intersection of West Street and Holly Avenue, increase the attractiveness of the roadway for all users. The addition of street lighting at intersections particularly adds to the safety of the crosswalks at night, and the wider sidewalks ensure there is plenty of room to walk side-by-side.





Caption: This example from Bethesda, Maryland shows an inviting pedestrian environment with shops and restaurants.

street “furniture”, sidewalks, and parking will need to be planned in greater detail block-by-block to establish greater consistency and a phasing plan.

As shown in the constrained conditions concept, some sections of roadway may require that parking for businesses and retailers occur on one side of the sidewalk. In this situation, there may only be enough space for a minimum sidewalk and landscape buffer for pedestrians. The figure also shows that plantings and, where necessary, utilities may be placed in the landscape buffer.

The minimum conditions concept shows sections of roadway where buildings are situated next to the sidewalk. In these locations, a minimum sidewalk is provided and a landscape buffer should also be accommodated where possible.

The streetscape concept for the preferred conditions shows sections of roadway where it is possible to accommodate a wider sidewalk and landscape buffer for pedestrians. The buildings are located next to the sidewalk and create an improved atmosphere over areas where only parking is provided. This arrangement makes business visible from the street and sidewalk, helping them to attract passing

customers. Additionally, wider sidewalks along the entire route improve access for the disabled, people with strollers, and create a more attractive space for pedestrians.

LAND USE

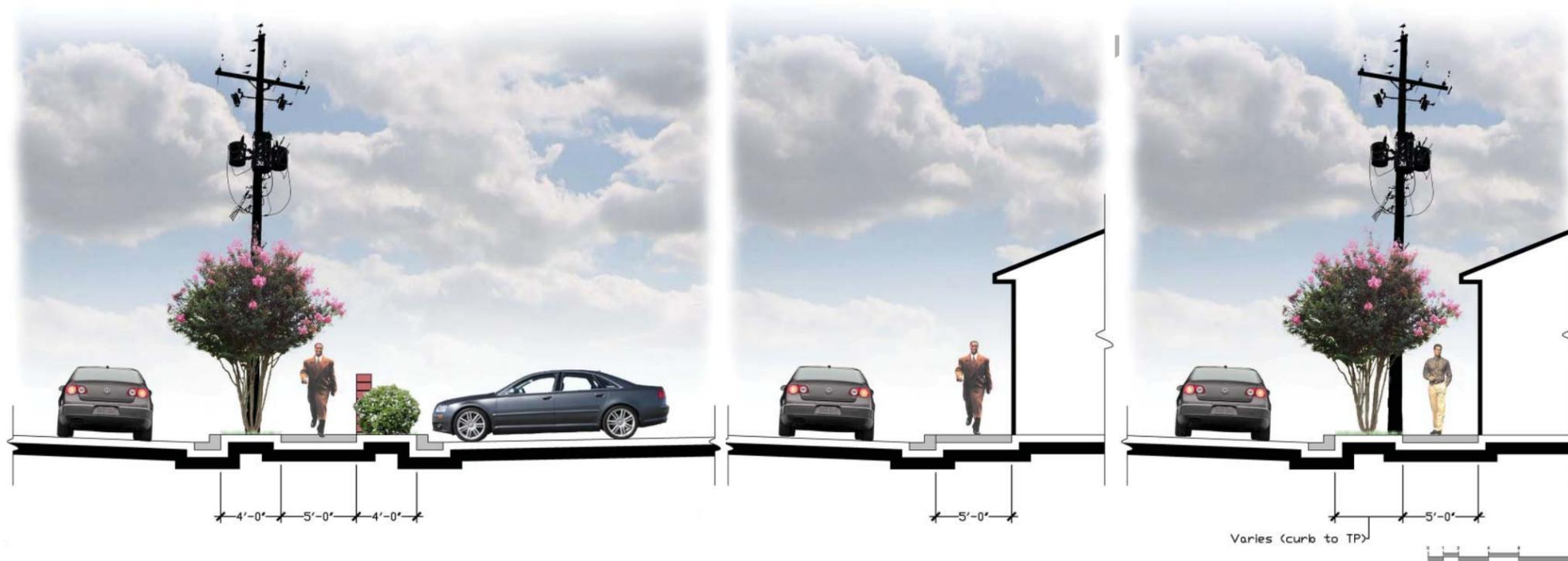
The City reports that the Outer West Street area is currently home to approximately 2.5 million square feet of commercial development. The City’s draft comprehensive plan identifies the West Street corridor as its primary growth opportunity. As shown Figure 11, Opportunity Sites, the City is designating most of the corridor frontage as opportunity sites for urban-style, higher-density, mixed-use redevelopment and infill in order to promote transit use.

The City estimates that these areas could yield approximately 1,440 new homes and 1.1 million square feet of additional non-residential development, of which 350,000 square feet will be net new space. With the introduction of quality transit and amenities as envisioned in this study, these areas could support greater density. The City plans to prepare a Sector Plan for Outer and Central West Street to plan for this growth in more detail. Currently, the densities planned for the designated areas are as follows:

- Urban Center: mixed use with up to 35 to 45 Dwelling Units per Acre (DUA)
- Urban Center Low: mixed use with up to 10 to 20 DUA
- Urban Commercial 3 to 4 story mixed commercial growth

Segment 5: Parole Area

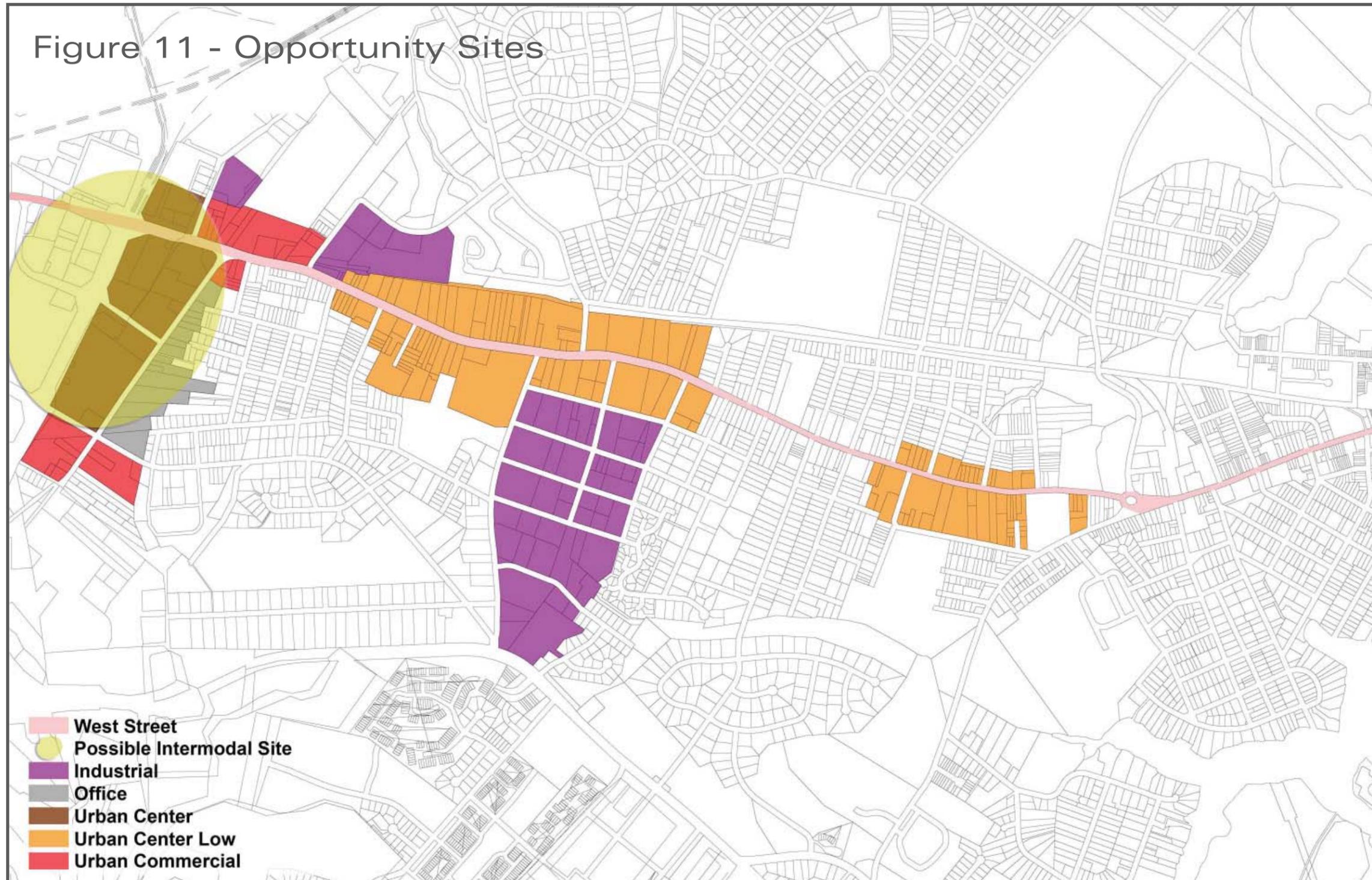
The proposed route connects the recently completed Annapolis Towne Centre at Parole to downtown and destinations on West Street. Parole is a popular destination providing a new mixed-use retail center and a concentration of new residential options. A premier transit service has the potential to complement existing development, increase the attractiveness of the area for new development, and reduce the need for car ownership and use.



Constrained Conditions

Minimum Conditions

Figure 11 - Opportunity Sites



LAND USE

In the County, the route loops through the Parole Growth Management Area. The County's Current Parole Urban Design Concept Plan and zoning permit some of the highest density in the County. Buildings of 8 to 16 stories high, residential densities of up to 45 units to the acre, and commercial densities of 0.75 to 1.2 Floor-Area Ratio (FAR) are allowed. The developments already built and in the pipeline for the Parole areas, designated as the key generators, exceed 4 million square feet of commercial and institutional space and several hundred residential units. These key generators are the Anne Arundel Medical Center Hospital, Westfield Annapolis Mall and Parole Town Center, USI Headquarters, and Home Depot/Festival at Riva retail centers.

As sites in and around this side of the Parole Town Center area redevelop, transit stop location for route efficiency and proximity to the highest levels of density will be important elements of transit's success. Drawing patrons will also rely on a well-designed system of street access to stops and through-connections that support travel from other sites. Building orientation in support of these links and incentives to use transit are also important aspects of site review and traffic mitigation options.

TRANSIT FACILITIES

Concept "A" proposes a two-way transit route on Route 2 (Solomon's Island Road) with a stop on Somerville Road, opposite Route 2 from the Annapolis Towne Centre at Parole. The route continues from the Towne Centre at Parole to the Anne Arundel Medical Center and Westfield Annapolis Mall.

Concept "B" proposes a counterclockwise, one-way loop with stops at the Medical Center and Mall. However, the stop on Somerville Road is proposed to be on the west side of Route 2 (Solomon's Island Road) and closer to the Annapolis Towne Centre.

Both route concepts were developed while considering some of the physical challenges that make it difficult for large transit vehicles to access the core of Parole. The street network constructed with the development includes traffic circles and

relatively narrow streets, which can be challenging for transit vehicles to negotiate.

The routes were also developed to stay close to the West Street corridor. Forest Drive, for example, was considered as an alternative to Somerville Road, but, like Solomon's Island Road (MD 2), it too is not friendly to pedestrians due to orientation of new development and surface parking at the street edge. As Forest Drive redevelops, it might be a more suitable alternative to Somerville Road offering more central access to new density and potentially provide a transfer stop for a Forest Drive route.

PEDESTRIAN AND BICYCLE FACILITIES

The sidewalk and infrastructure improvements developed as part of the Annapolis Towne Centre at Parole create a walkable environment inside the development. The existing barriers to other destinations created by major arterial routes like MD 2 and a generally poor network of streets will need thoughtful attention to accommodate the pedestrian and bicyclist in the future.

For example, any redevelopment of sites along MD 2, including a possible Intermodal Center, would be difficult to reach by pedestrians and cyclists given high travel speeds and the width of the road. Intermodal Center locations in this part of Parole will need to examine and recommend pedestrian and bicycle access routes from major generators such as the Annapolis Towne Centre at Parole. Any concepts to bridge MD 2 for crossings in the event that they cannot be safely accommodated at-grade would need to be fully integrated into plazas that help to make the grade separation work on either side of the road.

Caption: Sites in and around Parole have been targeted by developers and will at some point redevelop. It will be critical that these sites contemplate transit stops and pedestrian access routes to and through new development by guiding building orientation.



Segment 6: Westfield Mall and Medical Center

The proposed routes connect the Westfield Annapolis Mall and Anne Arundel Medical Center along Jennifer Road with destination downtown and along West Street. The many retailers, offices, and medical services of these locations provide significant employment. The Medical Center alone draws 3500 workers daily, about 18% of the total study area employment, in addition to patients and their families. Numerous retailer and restaurants bring in both patrons and employees in significant numbers every day.

TRANSIT FACILITIES

The current Mall bus stop is one of the highest in the system. A premier transit service has the potential to be used by greater numbers of patrons and a wider range of users, particularly with proposed transit incentives and other marketing efforts. A quality transit service will begin to raise awareness of alternative travel options and potentially reduce the demand for parking, particularly by those working in this district. Some workers may choose to live along the route. Older households drawn to the corridor for convenient access to health services and a host of retail, entertainment, dining and cultural venues will want to have the option of this new transit connection. Accompanied with high-quality pedestrian and bicycle access to and from the transit stations, the route would connect the Westfield Annapolis Mall and the Anne Arundel County Medical Center area with areas east in the County and City.

Concept "A" proposes a two-way transit route with a stop in front of the Medical Center on Route 2 before turning east onto Jennifer Road. The route continues on Jennifer Road to Westfield Annapolis Mall. The route will stop at the Mall and turn around to continue back on Jennifer Road and Route 2 to Parole.

Concept "B" proposes a counterclockwise, one-way loop with similar stops at the Medical Center and Mall. However, rather than turning around at the Mall, the route will continue on Jennifer Road to West Street before continuing into Parole.

Both route concepts were developed while considering the best locations for stops to serve the Mall and Medical Center. It is important for the transit route to stop adjacent to main entrances of both destinations,

particularly given the vast size of these complexes and the suburban nature of the walking environment.

The stop at the Medical Center should be in front of the center on MD 2 to avoid difficult pedestrian crossings of MD 2 or Jennifer Road. The stop at the Mall should be positioned so it can serve destinations on both sides of Jennifer Road, and also close to a Mall entry door to reduce the walk distance to destinations in and around the Mall.



Caption: Arundel Medical Center provides 3,500 corridor jobs.

CAPITAL COSTS AND FUNDING SOURCES

This final section describes the issues related to funding and costs of the route concepts. Planning level cost estimates are provided for consideration of the alternatives as both fixed-rail and rubber-tire options are evaluated for the route. The financing commitments made toward capital construction and long-term operating expenses of the service are key to the feasibility of a circulator project.

Rubber-Tire Capital Costs

The rubber-tire alternative could initially be implemented with little additional cost, simply through a reallocation of buses at existing stops. However, the approximately 22 stops for the route should be upgraded to include shelters with real-time information and other amenities appropriate for this type of project, where they are possible. Additionally, new, low-floor, hybrid vehicles would make the system more attractive to riders and more environmentally sound. The shelter improvements would cost between \$10,000 and 15,000 each, and total approximately between \$220,000 to 330,000 for the corridor.

Additionally, new, low-floor, hybrid vehicles would be important to brand the service on West Street. It would also enhance the service's attractiveness to riders (with faster low-floor boarding, better design and comfort), environmentalists and neighbors (with noise and fume reduction) along its route. The operator for Baltimore's new circulator bus system recently purchased 21 new 35-foot hybrid-electric, passenger vehicles at a cost of \$583,000 each. Annapolis Transit has funding for new vehicles already in the works, and even frequent service on this corridor would only require a limited number of vehicles given the short length of the route. A planning level estimate of the number of buses required to maintain 15-minute headways is three, for a total estimated cost of around \$1.8 million.

Fixed-Rail Capital Costs

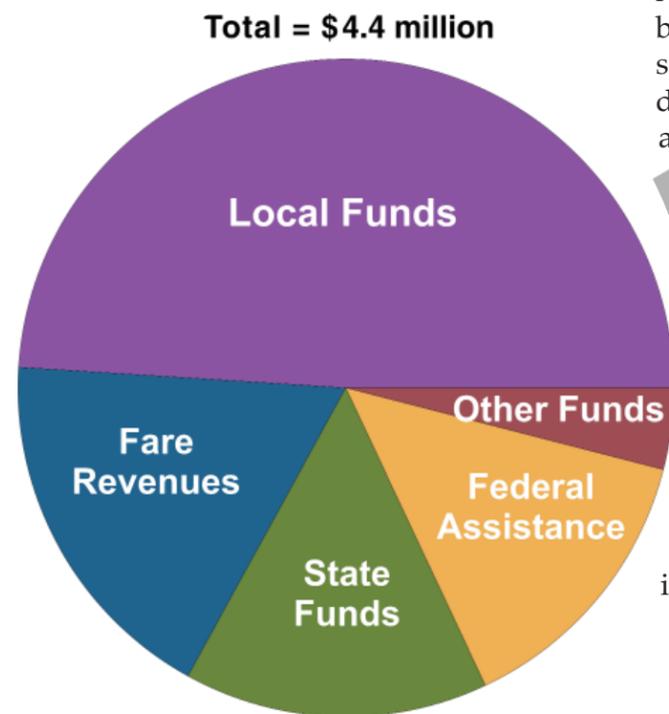
A preliminary estimate of the capital cost of the fixed-rail alternative is \$20 to \$30 million per mile and approximately \$140 to 210 million

in total, in 2009 dollars. This would provide for construction, vehicles, and a maintenance facility for a line that is roughly 7 miles in length extending between downtown to the Westfield Annapolis Mall. Cost estimates vary widely based upon the potential for relocation of utilities.

The cost to build a fixed-rail system in Annapolis would likely be on the high end of the estimated range due to expensive utility relocation and costs associated with an alternative to trolley wires in the historic area downtown. One such system, using an underground third rail, operates in Bordeaux, France, but has not yet become available in North America.

Operating Costs

Operating costs for a fixed-rail are more expensive than rubber-tire service due to the need to have operators trained to operate a new vehicle type and specialized maintenance for those vehicles. A 2005 study of streetcar service in Portland, Oregon, found that the operating cost per service hour was \$130 for streetcar compared to \$85 per hour for local bus service, a 52 percent premium.



Caption: Existing Annapolis Transit operating funds.

The primary factor in operating costs will be the service frequency. Currently, Annapolis Transit routes run with 30 minute headways. A preliminary route alignment between downtown Annapolis and Parole along West Street in the draft Anne Arundel County Transit Development Plan recommended 30 minute peak headways and 60 minute off-peak headways. If the commitment is made to implement a transit service that is expected to attract a broad range of riders, 15 minute headways during the peak periods and 30 minute headways during the off-peak period are recommended based on national research⁵ to respond to user expectations.

Service less frequent than every 15 minute makes it challenging to attract “choice” riders and makes on-time performance more important. However, there is some potential that real-time information about exactly where the vehicle is and when it is arriving can offset some of the infrequency.

Funding Sources

Several potential sources of funds should be considered for both rubber-tire and fixed-rail alternatives

The current operating funds for Annapolis Transit come from a variety of sources. Local general revenue funds comprise nearly half of the annual \$4.4 million operating budget, while fare revenues contribute almost 20 percent to operations. The remaining costs are covered by state funds (15 percent), Federal assistance (14 percent), and other funds (4 percent).

The existing funding structure for Annapolis Transit should be used as the first step in the implementation of a premier transit service on West Street by obtaining funds from several sources. In addition to the existing funding, there are several Federal programs to assist transit agencies enhance their system.

Very Small Starts is administered by the Federal Transit Administration (FTA) to provide funds for simple, low-cost projects (under \$50 million in total cost and less than \$3 million per mile). Individual bus, rail or ferry projects need to include improvements to transit stations, low-floor vehicles, special branding of service, and other characteristics that are consistent with the development of a premier transit service.

⁵ *Transit Capacity and Quality of Service Manual, Second Edition*. Transportation Research Board.

The Small Starts program is also an FTA funding source developed in the SAFETEA-LU bill in 2003 that was initially intended to provide capital funding for streetcar and bus rapid transit (BRT) projects. As an alternative to the FTA New Starts program, Small Starts funds recognize that streetcars offer a more local approach to light rail projects, with lower financial costs and a focus on enhancing urban district rather than regional connections. Most projects to receive funds have been BRT. It is also worth noting that low-floor vehicles are necessary to receive Small Starts funding. However, new legislation has been introduced in 2009 to create a better Federal funding source for streetcar products and similar text will likely be in the reauthorization of SAFETEA-LU.

Given that Federal funding is competitive and will only cover a portion of the cost of a project, local and state funding sources need to be explored. Listed below are just some of the possible funding sources that have been considered for other similar projects.

Tax Increment Financing (TIF) is an attractive option, but only for fixed-rail projects because it provides funds from anticipated increased property values that are expected to come with the new infrastructure. TIFs work by diverting property tax revenues in the corridor above the current level of tax revenue to paying off bonds used for construction. In doing so, this form of funding does not reduce tax revenues currently being collected and only takes the additional tax dollars until the project is completed. However, because the TIF affects bond ratings, local jurisdictions tend to be cautious and apply it judiciously. Some areas have also explored the use of TIF with sales tax and parking revenues instead of or in addition to property taxes.

Special assessment districts entail the creation of an additional property tax added and paid by properties within a limited area and have been used in some locations to generate operating or capital funds for fixed-rail projects. When used for this purpose, the tax is added to properties within a ¼ mile or less of a new fixed-rail transit project and it can be applied to all properties in a corridor or can exempt different classes of properties (such as owner-occupied detached residential properties).

Some jurisdictions have used revenue from parking to generate funding for their transit capital and/or operating costs. The City of Portland paid for \$28.6 million or 28 percent of their capital cost for their initial streetcar line through bonds backed by a \$0.20 increase in short-term parking rates at City-owned garages. Nearly all of the funding for the City of Baltimore’s new Charm City Circulator is coming from an increase in the tax on paid parking spaces (private and public) in the City.

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Conclusions & Recommendations

This study marks the beginning of a process to initiate a direct and long-term high quality transit connection between downtown Annapolis and Parole Towne Centre along the West Street corridor. The changes in land use emerging along the route, particularly dramatic around the Westgate Circle and in the Annapolis Towne Centre at Parole, begin to engage the area's regional economic centers along West Street into a more linear set of nodes. Reliable, attractive and efficient transit offers the opportunity to bridge these nodes and shift travel to more sustainable modes greatly reducing the negative effects of growth, more traffic and more parking demand.

The following summarizes key elements of a roadmap for moving forward. It targets changes to transit, as well as roadway network and land use elements required to support them. These changes will help to create the envisioned mixed-use, transit-oriented places of long-time plans along the corridor. The road that already connects these unique neighborhoods and districts will be equipped with another convenient option. The new service will also link each district to the greater Annapolis area and the region directly from the corridor through a new Intermodal Center. Realizing these changes will require coordination between agencies at the City, County, and State, support and collaboration from business interests and property owners, and a thorough understanding and engagement of community members and transit riders.

The findings of this study suggest a phased approach to attain the goals identified. People and businesses relocating to new homes and jobs in the corridor are often in a period of personal change. It is during this time of change that new travel choices for day-to-day activities can also be introduced. The pedestrian-oriented designs and mix of uses will begin to permit people to walk to reach a variety of daily needs. Moving quickly to enhance availability and awareness of a viable transit option for longer local trips is key to establishing sustained travel patterns. Therefore, the phasing of recommendations discussed in this study should follow a three-step process:

- Establish a West Street circulator bus route as a branded, frequent service, promoting transit use and transit-oriented development, and using existing funding and staff resources where possible.
- Track sources of demand for the service and work with existing, new and perspective riders to respond to service improvement suggestions and specific travel needs; and, with Planning Staffs to understand plans for full transit

integration into site plan review.

- Refine plans to determine a long-term transportation strategy identifying a long term investment in transit and detailing the design features of a more permanent transit solution for the West Street Corridor that includes stop locations integrated into corridor project designs.

The following sections summarize the near-term and longer-term actions to include these recommendations in an effective strategy.

Near-Term

Complete Transit Development Plans (TDP): The Anne Arundel and Annapolis TDPs should evaluate route concepts developed in this report within the context of an arterial system; refining the stop locations and route concepts to ensure effective operation, evaluating how this route would connect to other routes, developing recommendations on service frequency and operating costs, and estimating potential ridership. The Annapolis TDP should also identify a broad range of target populations that would want to use such a service, specifically assessing transit interest among residents of the Parole and Westgate Circle developments and the potential to use incentives to build transit ridership throughout the system.

Initiate Proposed Transit System Shift: Following the recommendations refined in the TDP, Annapolis Transit may be reconfigured as an arterial-based system. A circulator bus route should be established along West Street to integrate with system changes are proposed.

Create a West Street Branded Bus Service: The circulator bus route along West Street should be established as a distinctively branded route and marketed through a range of incentives implemented by an area-specific Transportation Management Association. The service should use high quality visual and promotional tools to brand the route, the quality of service and amenities. These could use historic themes of the corridor and should target users most interested in the transit option of travel.

Establish a Transportation Management Association: The organization should have a home within an existing corridor organization and engage the Annapolis Chamber, Visitors Center, West Street and Parole area business associations focusing marketing initially toward employees and tourists.

Initiate Collaborative Intermodal Center Planning: The City of Annapolis, Anne Arundel County, and MTA should continue to work together to develop an Intermodal Transit Center. The County's 2008 State Transportation Priorities calls out the Parole Intermodal Center as necessary to support current and increasing transit demand for regional service connectivity to Washington, Baltimore, and Fort Meade. The City of Annapolis supports this concept to better integrate land use with local transit support. Purpose & Need and Site Selection studies should be funded to identify how the Center would enhance service, the approach to and supply of parking appropriate to support transit, the potential of the Center to be developed as a private-public partnership, the types and densities of supportive land uses, and the size and location needs and opportunities. The study should be integrated with any plans conversion of local bus service to an arterial-based system.

Prepare Plans for an Intermodal Center Transit Oriented Development: The City and County should work with the property owners in the targeted areas to locate a specific site and work with the Maryland Department of Transportation (MDOT) and MTA to prepare a plan and implementation strategy for the intermodal functions and surrounding private redevelopment.

Update West Street Corridor Study to include Safety, Pedestrian and Transit Accommodation: SHA, the City, and the County should work together to evaluate, design, and implement various road improvement, access management and beautification plans for the State-maintained sections of the route, particularly the West Street (MD 450) corridor between Solomon's Island Road (MD 2) to the Westgate Circle at the intersection of Taylor Avenue and Spa Road. The effort should reduce the number of driveways, restrict turning movements through the construction of a median in appropriate segments, evaluate the addition of roundabouts to manage speeds and provide alternative congestion relief and left-turn options, increase sidewalk width and add a landscaped buffer, consider on-street bicycle facilities, and evaluate the need and potential for

additional roadway capacity. In the end, the decisions about additional capacity should be informed by existing and future conditions, but are primarily policy decisions about the character desired for this corridor. These improvements should be done in a manner that does not significantly limit the potential for the introduction of a fixed-rail streetcar in the future.

Initiate Access Management Outreach: The City and SHA should begin work with local businesses and property owners to develop an Access Management Strategy and specific improvements to address safety and walkability issues related to the abundance of turning conflict points. The strategy should reach consensus on a plan to reduce the number of driveways and provide for shared access through parking areas and along new streets adjacent to and behind businesses.

Coordinate Pedestrian and Bicycle Systems Improvement Strategies: The City and County should work to improve pedestrian and bicycle systems and specific connections to destinations in and around the study area with a focus on access to bus stops, existing trail facilities and commercial/employment areas. These improvements will address the needs of the City's disabled residents and visitors while also improving connections that increase the effectiveness of the surrounding transit, bicycle, and pedestrian networks.



Adopt City Comprehensive Plan & Initiate an Outer West Street

Small Area Plan: The draft Comprehensive Plan identifies areas for potential redevelopment and speaks generally to increased density and a mix of uses in the corridor. These need to be further refined to determine the level of density that is desired, what level of transit investment is justified based on those densities, and the levels of traffic that will likely be generated. The traffic forecasting methods to assess new development impacts should reflect increases in non-auto mode share from mixing uses, managing parking and promoting transit use. SHA should be involved in these discussions so that plans for corridor roadway improvements recognize changes in zoning.

Assess Development Codes to Promote Transit-Supportive Development Patterns: The City and County should incorporate transit and pedestrian-enhancing parking supply/location and street design standards. All new development and renovations should comply with these standards to help incrementally build the desired corridor character and preserve key corridor assets.

Longer-Term

Key steps include:

Undertake a Transit Feasibility Assessment and Investment Strategy: The City, County, and MTA should evaluate the potential for transit mode options over the long term based on ridership and planned densities. This should occur after the arterial bus route has been functioning with an established rider base and after the City has completed its Outer West Street Sub-Area Plan, identifying a rezoning program and transportation system characteristics.

Prepare a Long-Term Implementation Plan: The project stakeholders should develop a detailed plan to make permanent investments in West Street transit, informed by the mode-specific decisions coming from the Outer West Street Plan and the Transit Feasibility Assessment & Investment Strategy, and any Parole plan updates refining the scale of development and supporting transportation system. This Implementation Plan may include a series of steps to acquire and construct the Intermodal Center, establish high functioning stops integral to new development, enhance preservation of the corridor's historic character, and implementation of an upgrade of the West Street route to fixed-rail.