West Annapolis Sector Study

September 2014

Prepared for the
City of Annapolis

by
Environmental Resources Management

ERM

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Executive Summary

Background

The City's 2009 Comprehensive Plan identifies West Annapolis as one of four Opportunity Areas—locations where the City intends to direct new growth and development. The Comprehensive Plan also recommended the preparation of a Sector Study to better understand and address the site-specific considerations of growth and development policies. In response to this action item, the West Annapolis Sector Study was initiated in May 2013.

As a detailed planning effort, the Sector Study focuses on the topics identified in the Comprehensive Plan and by community stakeholders: traffic and transportation, economic market conditions, land use and land development, recreation, and community character. Elements such as natural resources, water resources, public facilities, and infrastructure (other than transportation infrastructure) are addressed in the Comprehensive Plan, and not in the Sector Study.

The Sector Study is structured around four primary issues:

- **Transportation:** A detailed examination of recurring (i.e., rush hour) and non-recurring (i.e., special event) traffic impacts on West Annapolis, as well as vehicle, bicycle, and pedestrian circulation and safety needs within West Annapolis.
- **Market Analysis:** A comprehensive update of the economic and market data relevant to development in the local and surrounding area, and a re-evaluation of the Comprehensive Plan's development projections.
- **Recreation and Open Space:** Potential new recreation and open space facilities, in light of limited available land and the loss of recreation space as a result of West Annapolis Elementary School's renovation.
- **Land Use/Zoning/Community Design:** identification of changes in land development regulations and urban design tools to enhance the character of West Annapolis.

The Sector Study was guided by an 11-member Steering Committee that held eight meetings over the course of the yearlong process. Public outreach included interviews with the owners and/or managers of 11 West Annapolis businesses, as well as two public meetings.

Findings

Transportation

Chapter 2 presents the Traffic Study designed and conducted for this Sector Study. Some of the key findings include:

- Numerous deficiencies in the non-motorized transportation network have been documented in the study area, creating gaps and barriers for pedestrian, bicycle and transit travel. These include missing sidewalks, crosswalks, pedestrian signals, and bicycle lanes, as well as limited transit service.
- The existing level of service during the PM peak hour on non-event days (i.e., no special activities occurring in downtown Annapolis or at Navy-Marine Corps Memorial Stadium) is a D or better at all signalized intersections, although several minor street stop-controlled approaches operate at a level of service E or F.

- Travel time measurements during non-event conditions document that the fastest travel times crossing the Severn River or leaving downtown Annapolis are provided by the highest capacity roadways (US 50 and Rowe Blvd.).
- An origin-destination analysis revealed that approximately a quarter of the traffic Baltimore-Annapolis Blvd. carries is neither originating from nor destined to West Annapolis.
- Stakeholder agencies such as the Maryland Transportation Authority, State Highway Administration, US Naval Academy and Anne Arundel County Department of Public Works are aware of the event traffic conditions, have deployed numerous Intelligent Transportation System devices, and have employed many traffic management strategies, to varying degrees of success. However, to date, only limited coordination has occurred with the City.
- Public and business owner concerns include internal neighborhood traffic circulation and safety, parking, non-local traffic diversions, transit service and bicycle and pedestrian accommodations.
- There are currently no funded roadway improvement projects in the study area according to State, County and City capital improvement programs.
- Without any roadway improvements, at least one signalized intersection would fail by 2018 (i.e., five years after initiation of this Sector Study), and others approach saturation during the PM peak hour of either event or non-event conditions.

Market Analysis

The 2009 Comprehensive Plan found demand for up to 110 new housing units and 135,000 square feet of new non-residential space, much of which would be included in an anticipated redevelopment of the Graul's shopping center at the corner of Rowe Blvd. and Taylor Avenue. The nationwide recession of 2007-09, continued community opposition to substantial new development, and worsening traffic congestion call these development projections into question.

As a result of these changed conditions, and as described in Chapter 3, the Sector Study revisited the market analysis. The market analysis conducted for the Sector Study found that:

- The market could support approximately 20,000 square feet of new retail/commercial uses by 2018, and as much as 67,000 square feet by 2030. The best retail "fit" for the study area includes:
    - Furniture and/or hardware stores, especially antiques: this business type builds on existing offerings with a stronger antiques cluster, and to cater to the upscale tastes of residents (demand is included in the "miscellaneous retail" category).
    - Limited service restaurants, such as coffee shops, delis, etc. The analysis above finds supports for 3,500 to 6,300 square feet (SF) of additional restaurant space in West Annapolis.
    - Smaller full service restaurants: together with limited service restaurants, these establishments would provide an array of dining options.
    - Health and Beauty, and Related: West Annapolis provides neighborhood serving retail and services, among them health and beauty stores (i.e., pilates studios or hairdressers). In addition, and in support of the retail offerings, there are a number of health-related establishments in the market area that would support this additional retail.
- The market would support up to 34 new housing units through 2018.

Given the current make-up of the West Annapolis area, and the lack of potential infill sites (undeveloped or underdeveloped parcels with redevelopment potential), while there is supportable demand, there is insufficient land/building space available to achieve the potential development described in the 2009 Comprehensive Plan. Moreover, current residents of West Annapolis are generally (although not

unanimously) opposed to major redevelopment of the Graul's shopping center and to large-scale development in West Annapolis overall—as was described in the 2009 Comprehensive Plan.

Some new residential development could occur as single-property developments (i.e., infill, accessory units, etc.). Should an appropriate development site be located, larger scale residential development could be supported after approximately 2018 as the residential market continues to regain strength and private residential developers reenter the market. However, no such developments are proposed by this Sector Study.

Land Use and Zoning

Findings related to land use and zoning include:

- Annapolis Street between Taylor and Melvin Avenues (the central spine of the B1 zoning district) is generally acknowledged to represent the desired aesthetic character of the West Annapolis business district, and that street's appearance gives the entire community much of its public identity.
- While full-service restaurants are desired by residents, current parking requirements for such establishments are essentially impossible to achieve.
- Several businesses reported concerns (particularly in the past) about code enforcement.
- Business owners noted a lack of clear wayfinding and coordinated, distinct signage within the business district (including directions to parking and overall information).
- Many recommendations of the 2009 Streetscape Study remain valid.

Recreation and Open Space

Findings related to recreation and open space include:

- West Annapolis is served by a limited number of public recreation sites and open spaces, and access to recreational facilities outside of the community is difficult due to both distance and the presence of barriers, in the form of major roads such as Rowe Blvd. and Baltimore-Annapolis Blvd.[1]
- The ball fields and playgrounds at West Annapolis Elementary School are the community's only large public space for recreation. A planned modernization of West Annapolis Elementary School will consume a substantial portion of this recreation space.

Recommendations

Chapter 5 presents the full list of recommended implementation actions to address the findings and concerns described above. Key recommendations include:

- Widen and reconfigure Baltimore-Annapolis Blvd. between Taylor Avenue and Bowyer Road (USNA Gate 8).
- Install intersection chokers along Melvin Avenue as traffic a calming measure.
- Consider citywide measures that would address traffic in West Annapolis and other areas. Recommendations include an ITS Plan for roads, parking, and transit, and a regional traffic management system and operations center (with state and county participation) to address traffic in Anne Arundel County and the Annapolis area.

[1] For purposes of this report, "Baltimore-Annapolis Blvd." is the road that extends from the intersection of Taylor Avenue and Annapolis Street to the Naval Academy Bridge. The portion of Baltimore-Annapolis Blvd. from Taylor Avenue to King George Street is signed as MD Route 424, while the remainder of the road is signed as MD Route 450.

- Complete the sidewalk network in West Annapolis, including new sidewalks, curb cuts, and pavement markings.
- Revise the City's Zoning Code to reduce the number of required parking spaces for restaurants in the B1 district. Review the City's Zoning Code to ensure that shared parking requirements and procedures are streamlined and consistent with best practices in other jurisdictions.
- Pursue new recreation and open space facilities, including an interpretive station and environmental restoration of the wetland area at the north end of Shiley and Tolson Streets; a floating dock; and a linear park along the former right of way of the B&A railroad (this trail would not extend past Old Crossing Ln. into the Wardour community).

1. Introduction

1.1 Purpose of the Sector Study

Located between Rowe Blvd. (MD Route 70), Weems Creek, the U.S. Naval Academy, and Taylor Avenue, West Annapolis is a vibrant, diverse neighborhood in the City of Annapolis. The City's 2009 Comprehensive Plan identifies West Annapolis as one of four Opportunity Areas—locations where the City intends to direct new growth and development. To provide detailed planning to address these issues, the Comprehensive Plan also calls for the preparation of a Sector Study. In response to this action item, the West Annapolis Sector Study was initiated in May 2013. Figure 1.1 shows the Study Area for the West Annapolis Sector Study.

Figure 1.1: Study Area

As a detailed planning effort, the Sector Study focuses on the topics identified in the Comprehensive Plan and by community stakeholders: traffic and transportation, economic market conditions, land use and land development, recreation, and community character. Elements such as natural resources, water resources, public facilities, and infrastructure (other than transportation infrastructure) are addressed in the Comprehensive Plan.

The Sector Study would be the first detailed planning document that focuses on West Annapolis, and is intended to be an amendment to the City of Annapolis Comprehensive Plan.

1.2 Community Profile

History[2]

West Annapolis boasts a long and stable history, dating to the 230-acre "patent" (or land deed) issued by the Calvert family to planter John Norwood in 1658, just 24 years after Maryland's 1634 founding. The patent was expanded by Norwood's descendants in 1686 to include what is now Wardour. The West Annapolis peninsula remained a plantation and farm until approximately 1869, when the land was sold to Luther Giddings. Giddings sold two parcels to other families, beginning the transition from farm to developed community

> In 1890, the Giddings sisters contracted George T. Melvin to develop the land. Melvin…created a plat, dividing the entire parcel into 50'x150'foot lots. An early drawing showed orchards on several sections of the property. In 1890, the Maryland Legislature passed an Act authorizing the land to become the Incorporated Town of West Annapolis. Melvin enticed potential buyers with the advantages of living in a town so close to the city.

With Weems Creek serving as a northern boundary, The Baltimore and Annapolis (B&A) Railroad served as a de facto southern boundary of West Annapolis. The B&A began service in 1887, with two West Annapolis stops—one in Wardour near the foot of the former Severn River trestle crossing, and one near the current fire station. The B&A Railroad continued passenger service until 1950, and freight service until the trestle was declared unsafe in 1968. The B&A right of way remains largely untouched east of Annapolis Street.

The Giddings Plat set forth the grid system in what is now West Annapolis proper. Elizabeth Giddings, the eventual owner of the undeveloped property on the peninsula, desired a different development approach. She eventually contracted with Frederick Law Olmsted, Jr. (son of the legendary landscape architect) to design the development of Wardour, with larger lots that more closely followed the topography. The development of West Annapolis generally occurred at a gradual pace beginning with the 1890 plat, with individual families purchasing lots and building homes. West Annapolis was annexed into the City of Annapolis in 1951, but retains its unique character and distinct sense of history.

Demographics

Table 1.1 summarizes that information, along with demographic information for the City of Annapolis as a whole. Additional information can be found in Section 3.2 (in the Market Analysis).

Table 1.1: Demographic Profile, West Annapolis and the City of Annapolis, 2012

	West Annapolis	City of Annapolis
Population	1,040	38,596
Median Age	41.4	36.7
Households	447	16,146
Average Household Size	2.15	2.35
At-Place Employment	1,268	26,973
Labor Force (2010)	805	31,127
Median Household Income	$107,313	$70,377
Per Capita Income	$49,994	$41,429
Median Home Value (2005-9)	$806,667	$418,611

Sources: ESRI Business Solutions, U.S. Census, American Community Survey, Vantage Point 2013

[2] Information in this section is taken from: "West Annapolis – Our Roots in History" by Virginia Vroblesky, available at the West Annapolis Civic Association website (http://westannapolis.org/aboutwa/wahistory-vrobleski.htm), and "History of West Annapolis", by Harold R. Parkinson, available at the West Annapolis Business Affiliation website (http://www.westannapolisbusiness.org/wa-history.html).

As shown in Table 1.1, West Annapolis generally has smaller households, an older population, and higher incomes and home values than the City as a whole. Notably, West Annapolis has more at-place employment (jobs within the community) than population, indicating that West Annapolis is, to some degree, a destination for commuters. This reflects the concentration of businesses along Annapolis, Ridgely, and Forbes Streets.

1.2 Recent Planning Context

Among the Comprehensive Plan's findings regarding West Annapolis were:

- substantial demand for new residential and non-residential development. Specifically, the Comprehensive Plan estimated that West Annapolis could, at buildout, accommodate approximately 110 new housing units and 135,000 square feet of new non-residential space;
- the need to define and maintain the anticipated development character of West Annapolis;
- the need for "detailed area planning that allows more stakeholder and community input and more thorough consideration of the issues important to the area's future character and economic viability";
- traffic issues, including overflow traffic using Rowe Blvd., Taylor Avenue, and Baltimore-Annapolis Blvd. [3]; and
- other transportation concerns, including local vehicular circulation, pedestrian and bicycle facilities and connectivity, parking, and transit.

Since adoption of the Comprehensive Plan in 2009, much has changed in Annapolis. In particular, the Comprehensive Plan was prepared using economic data that pre-dated (or only reflected the start of) the nationwide recession of 2007-09. The recession substantially reduced the demand for new residential and non-residential development in Annapolis and throughout the region, calling the Comprehensive Plan's development projections into question.

In addition to economic changes, traffic congestion in West Annapolis has increased, and is arguably the dominant issue facing residents and businesses. The community is likely to lose a substantial amount of public open space due to the planned renovation of West Annapolis Elementary School. As a result of these and other changes, the focus of the West Annapolis Sector Study—this document—is different from that envisioned by the 2009 Comprehensive Plan.

1.3 Study Area

Figure 1.1 shows the Study Area for the West Annapolis Sector Study. While the Comprehensive Plan's Opportunity Area excluded the Wardour neighborhood (the area zoned R1-A in Figure 4.1 below), the Sector Study recognizes that Wardour is affected by many of the same issues as the rest of West Annapolis, and thus includes Wardour. Unless specified otherwise, references to "West Annapolis" in this document pertain to the entire Study Area, including Wardour. No land use, zoning, recreation, or economic development recommendations are envisioned for the Wardour portion of the study area.

1.4 Focus of the Sector Study

The Sector Study's discussion of existing conditions, community concerns, and future opportunities is structured around four primary issues, described below.

[3] For purposes of this report, "Baltimore-Annapolis Blvd." is the road that extends from the intersection of Taylor Avenue and Annapolis Street to the Naval Academy Bridge. The portion of Baltimore-Annapolis Blvd. from Taylor Avenue to King George Street is signed as MD Route 424, while the remainder of the road is signed as MD Route 450.

Transportation

Events at Navy-Marine Corps Memorial Stadium, City Dock, state government offices, and elsewhere in Annapolis cause traffic surges through the West Annapolis neighborhood throughout the year. In addition, periodic heavy traffic on U.S. Route 50 (particularly related to beach traffic) causes cut-through traffic on Rowe Blvd., Taylor Avenue, and , as well as Ridgely Avenue and Annapolis Street. The Traffic Study element of the Sector Study (Section 2) examines these traffic patterns in detail, and recommends approaches to managing them. In addition, the Sector Study and Traffic Study also address vehicle, bicycle, and pedestrian needs within West Annapolis.

Market Analysis

As described above, the 2009 Comprehensive Plan identified the demand and capacity for approximately 110 new residential units and 135,000 square feet of new commercial, retail, and office uses in West Annapolis. The Market Analysis element of the Sector Study (Chapter 3) updates the economic and market data relevant to development in the local and surrounding area, and that re-evaluates the Comprehensive Plan's development projections.

Recreation and Open Space

West Annapolis has a limited amount of public recreation and open space, and relatively little space for new recreation and open space facilities. The pending loss of part of the West Annapolis Elementary School open space heightens the need to identify other recreation and open space options. The Sector Study identifies potential new recreation and open space facilities.

Land Use/Zoning/Community Design

West Annapolis is known for its "village" character, but existing land development regulations do not necessarily support this unique setting. In addition, there are opportunities to enhance the character of West Annapolis through urban design enhancements. The Sector Study identifies changes in land development regulations and urban design tools to enhance the character of West Annapolis.

1.5 Public Engagement Process

As described above in Section 1.1, one of the objectives of the Sector Study was to provide meaningful public input into the detailed planning issues, concerns, and opportunities that affect West Annapolis. This objective reflects the recommendations of the 2009 Comprehensive Plan, as well as the wishes of many members of the West Annapolis community. Specific public engagement efforts undertaken as part of the Sector Study are described below.

Steering Committee

At the outset of the Sector Study process, the City appointed an 11-member Steering Committee to provide input into the process, and to promote two-way communication between the City and the West Annapolis community. The steering committee held eight meetings over the course of the yearlong process. These meetings provided an opportunity to review and comment on key aspects of the Sector Study, including transportation, the market analysis, recreation, land use, and urban design. Steering Committee members represented City departments (Planning and Zoning, Public Works, and Transportation); the US Naval Academy; West Annapolis civic and business groups, and the MainStreets Annapolis Partnership. Representatives from the City's consultant team also attended Steering Committee meetings.[4]

In addition, the Steering Committee hosted presentations by other officials, including:

[4] The Consultant Team was led by Environmental Resources Management (ERM), and also included Sabra-Wang & Associates (SWA) for traffic and transportation planning, and Vantage Point Development Advisors for economic and market research.

- Maritime issues on Weems Creek and the Severn River, presented by J.P. Walters, the City's Harbormaster;
- The renovation and expansion of West Annapolis Elementary School, presented by representatives from Anne Arundel County Public Schools (AACPS) and the architecture team responsible for the redesign of the school;
- Constraints and opportunities for public recreation and open space, presented by Brian Woodward, the City's Director of Recreation and Parks; and
- Discussions of existing traffic conditions, the relationship between local (to/from West Annapolis) and non-local traffic, and opportunities to better manage traffic, presented by members of the consultant team.

Business Owner Interviews

To understand the economic and market forces that affect West Annapolis businesses, City staff and members of the consultant team conducted interviews with the owners and/or managers of 11 businesses in West Annapolis.[5] While each interviewee had his or her own unique set of needs and perspectives, several common themes and topics emerged from the interviews. Those topics are incorporated into the overall findings of Chapter 3.

Public Meetings

The City hosted two public meetings to inform and solicit public input about planning issues in West Annapolis, as well as to receive comments on the Sector Study itself. Both meetings were held at the Taylor Avenue Fire Station. Each meeting is summarized below. Specific suggestions or concerns raised by the public at or following these meetings are included in the relevant portions of Chapter 2.

Public Meeting 1: June 24, 2013

The objectives of the first public meeting included:

- Sharing information about existing conditions in West Annapolis, including traffic, economic considerations, recreation, land use, urban design, and related issues; and
- Providing members of the public an opportunity to discuss issues, concerns, and opportunities that they felt ought to be addressed in the Sector Study.

The meeting consisted of a presentation, followed by a question-and-answer session with representatives from City government and the consultant team. Members of the public were encouraged to submit written comments (on paper or via e-mail), and "stations" were established throughout the meeting room to give attendees the opportunity to discuss specific issues one-on-one (rather than in front of the audience). Approximately 25 people attended the meeting. Following the meeting, the City and its consultants began preparation of a Preliminary Concept for the Sector Study (see below).

Public Meeting 2: December 2, 2013

The primary purpose of the second public meeting was to present the Preliminary Concept to the public, and to obtain feedback on that concept. The City's consultant team presented the concept in detail, along with additional background information necessary to support its recommendations. The format of the December meeting mirrored that of the June meeting: a presentation, question-and-answer session, topic-specific stations, and opportunities to comment in writing and by e-mail. Approximately 20 people attended the second meeting.

[5] Because interviewees were promised confidentiality, the list of businesses representatives interviewed, and specific statements made by interviewees are not included in this document.

Preliminary Concept

The Preliminary Concept documented the initial recommendations for the overall direction of the West Annapolis Sector Study. The Preliminary Concept was informed by the public engagement activities, Market Analysis, Transportation Analysis, and other background studies described in Section 1. The Preliminary Concept was presented at the December 3, 2013 public meeting. It contained brief statements of the Sector Plan's recommended policies, physical improvements, and code changes, as well as suggested actions by private business and residents. The intent of December 3 public meeting—and of the Preliminary Concept itself—was to solicit additional public input, and to further refine the Sector Study.

Public Review and Adoption Process

As an amendment to the City of Annapolis Comprehensive Plan, the Sector Study would supersede the Comprehensive Plan's policies and implementation actions for the West Annapolis Opportunity Area. In accordance with city and state laws for such amendments, the Sector Study was reviewed and discussed at a public hearing before the City of Annapolis Planning Commission on DATE. The Planning Commission recommended adoption of the Sector Study [with the amendments listed below—or include text generally describing changes made as a result of the Planning Commission review] on DATE.

A public hearing before the Annapolis City Council was held on DATE, and the City Council adopted the Sector Study as an amendment to the Comprehensive Plan on DATE.

2. Traffic Study

2.1 Introduction

Purpose and Need

As part of the West Annapolis Sector Plan, the City of Annapolis requested a traffic study be conducted. The intent of the transportation component of the West Annapolis Sector Plan is to 1) better understand and manage non-recurring congestion induced by traffic bypassing US 50 and City/ Naval Academy special events, 2) improve overall circulation and safety of the West Annapolis roadway network, and 3) enhance mobility and safety for non-motorized modes of travel—including walking and biking including connections to downtown Annapolis. This traffic study is informed by, and gives information to the concurrent land use planning and public outreach efforts.

The traffic study is organized to:

- present existing conditions, including baseline normal and event traffic data, traffic operations, roadway safety, and non-motorized facilities;
- assesses future conditions including future traffic growth, land use changes, and traffic operations; and
- discuss recommended alternatives to support a more complete transportation network that enhances pedestrian and bicycle safety and access, transit options, reduces conflicts, enhances business access, improves the overall streetscape, and provides additional vehicle capacity at critical intersections.

The recommendations in this plan are not intended to replace the City's ongoing multimodal planning, the goal of which is to increase multimodal options and service. Due to the specific needs of the West Annapolis community, this plan focuses on solutions to ongoing vehicular traffic congestion. Additionally, with the input of key stakeholders, this plan identifies strategies to enhance management of special event and seasonal traffic demands to better balance the needs of regional and local mobility and reduce traffic congestion during normal rush hour and event peak periods.

Study Area

The West Annapolis neighborhood is located in the northeast portion of the City of Annapolis, and is roughly bounded by Weems Creek to the north, MD 70/ Rowe Blvd. to the west, Baltimore-Annapolis Blvd. and Taylor Avenue to the south, and the Severn River to the east. Figure 1.1 shows the limits of the study area. West Annapolis is primarily a residential neighborhood with an elementary school and a number of businesses clustered on Forbes Street, Ridgely Avenue, and Annapolis Street. A variety of events take place within and adjacent to the neighborhood, including events at Navy-Marine Corps Memorial Stadium, craft shows, etc. In addition, the City of Annapolis hosts numerous other events and activities that generate traffic (legislative sessions, boat shows, etc.). The close proximity of West Annapolis to US 50 can cause non- recurring congestion to cut through the neighborhood in the summer months or during incidents.

2.2 Existing Conditions

Roadways

Several State and Municipal roadways traverse the study area (Figure 1.1). This section provides a brief description of each roadway:

MD 70 (Rowe Blvd.): MD 70 is a State-maintained, two-way, four-lane, divided secondary arterial roadway that runs north-south through the study area. It is not classified as part of the National Highway

System. It connects downtown Annapolis with US Route 50. MD 70 has exclusive left and right turn lanes at Taylor Avenue and Melvin Road. The posted speed limit is 45 miles per hour.

MD 435 (Taylor Avenue): MD 435 is a State-maintained, two-way, two-lane, undivided secondary arterial that runs east-west through the study area. It is not classified as part of the National Highway System. It connects West Street to the U.S. Naval Academy. MD 435 has exclusive left turn lanes at Rowe Blvd.. The posted speed limit is 30 miles per hour.

MD 436 (Ridgely Avenue): MD 436 is a State-maintained two-way, two-lane, undivided collector roadway that runs north-south through the study area. It is not classified as part of the National Highway System. It connects Taylor Avenue to Bestgate Road and crosses the Weems Creek. The posted speed limit is 30 miles per hour. A drawbridge carries Ridgely Avenue over Weems Creek.

MD 450 (Baltimore-Annapolis Blvd.): MD 450 is a State-maintained, two-way, two-lane, secondary arterial that runs east-west through the study area. It is classified as part of the National Highway System. It connects downtown Annapolis with MD 2 (Governor Ritchie Highway) and crosses the Severn River via the Naval Academy Bridge. The posted speed limit is 40 miles per hour.

Melvin Avenue: Melvin Avenue is a City-maintained, two-way, two-lane, local residential road (MU 2090) that runs east-west. It serves the West Annapolis neighborhood, and is the primary access point to the Wardour neighborhood. It has on-street parking, and a posted speed limit of 25 miles per hour, except during school hours when it is 15 miles per hour.

Giddings Avenue: Giddings Avenue is a City-maintained, two-way, two-lane, local residential road (MU 1270) that runs east-west and serves the West Annapolis neighborhood. It has on-street parking, and a posted speed limit of 25 miles per hour.

Annapolis Street: Annapolis Street is a City-maintained, two-way, two-lane, local residential road (MU 120) that runs east-west and serves the West Annapolis neighborhood. It has on- street parking and a posted speed limit of 25 miles per hour.

The following intersections, illustrated in Figure 2.1 were included in this study:

- MD 70 (Rowe Blvd.) at Melvin Ave./Farragut Rd.
- MD 70 (Rowe Blvd.) at MD 435 (Taylor Ave.)
- Forbes St. at Melvin Ave.
- MD 435 (Taylor Ave.) at MD 436 (Ridgely Ave.)
- MD 435 (Taylor Ave.) at Annapolis St.
- Baltimore-Annapolis Blvd. at King George St. (MD 435 at MD 450)
- Baltimore-Annapolis Blvd.(MD 450) at Bowyer Rd./Perry Circle
- Baltimore-Annapolis Blvd.(MD 450) at Badger Rd.
- Melvin Ave. at Annapolis St.
- Melvin Ave. at MD 436 (Ridgely Ave.)

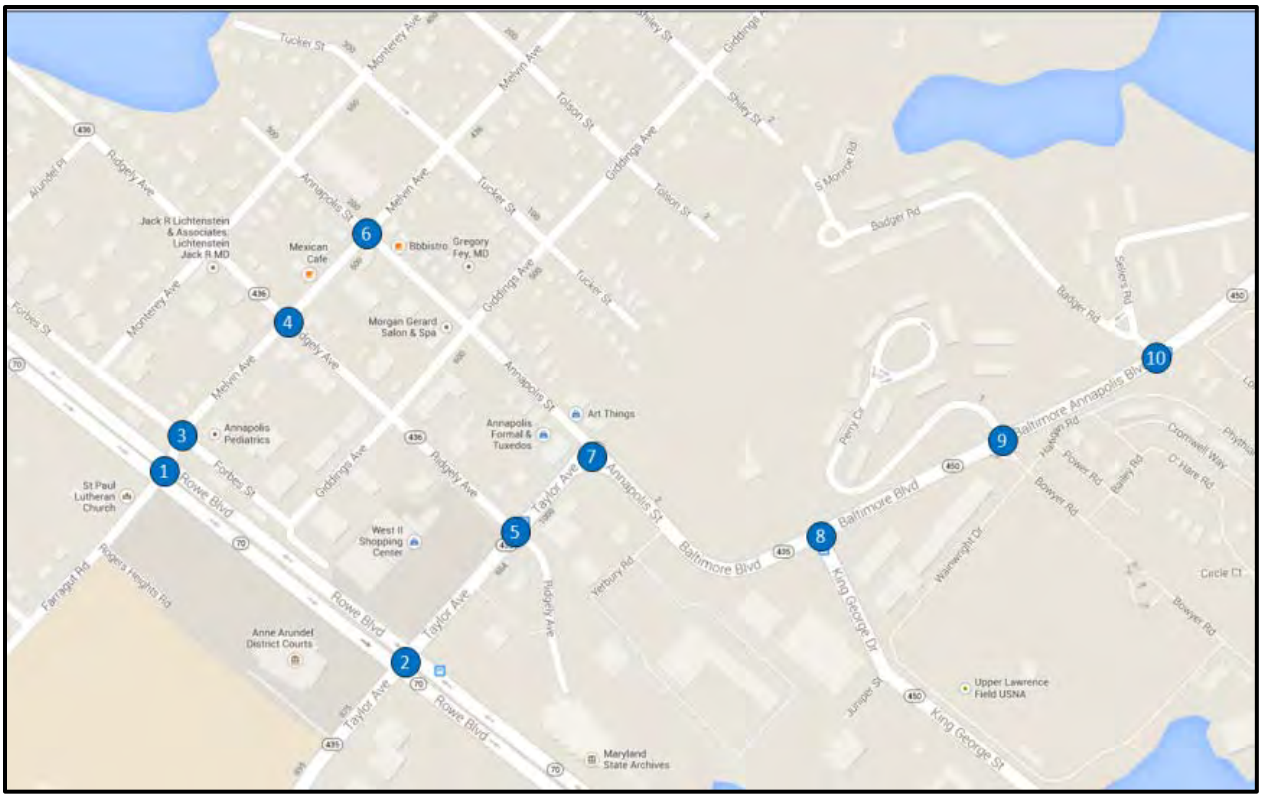


Figure 2.1: Existing Study Intersections

Existing Non-Event Traffic Volumes

Vehicle, bicycle, and pedestrian intersection and daily traffic count data were compiled from available sources such as the Maryland State Highway Administration's (SHA) Traffic Monitoring System, or from the City. Where no recent (less than two year old) traffic count data were available, new traffic counts were collected. Non-event intersection traffic counts were collected for the PM peak (3:30 PM to 6:00 PM). Historical counts indicated highest volumes occurred during the PM peak hour and events typically occur during the PM peak hour so the AM peak hour was not considered to be critical and was not included.

Figure 2.2 summarizes the existing traffic controls and lane configurations, while Figure 2.3 illustrates the existing non-event PM peak hour intersection balanced vehicle traffic volumes. Figure 2.4 summarizes the non-event PM peak hour pedestrian traffic volumes and Figure 2.5 summarizes the non-event average daily traffic volumes, respectively. Detailed intersection photographs are included in Appendix A. Detailed traffic count reports are included in Appendices B and C.

The heaviest movements in the evening commuter rush hour on non-event days are northbound along MD 70 and eastbound along Baltimore-Annapolis Blvd. leaving downtown Annapolis. The intersections with the largest pedestrian volumes in the evening commuter rush hour on non-event days are Rowe Blvd. at Taylor Avenue and Baltimore-Annapolis Blvd. at U.S. Naval Academy Gate 8. The roadways with the highest non-event daily traffic volumes are Rowe Blvd. (MD 70) and Baltimore-Annapolis Blvd.

Pedestrian and Bicycle Facilities

Pedestrian and bicycle facilities and amenities were inventoried and connectivity and gaps of the non-motorized network were evaluated. Figures 2.6 and 2.7 show existing pedestrian and bicycle facilities within the study area. Several deficiencies are observed in the existing network of pedestrian and bicycle facilities:

- Sidewalk is missing along portions of Ridgely Avenue and Forbes Street;

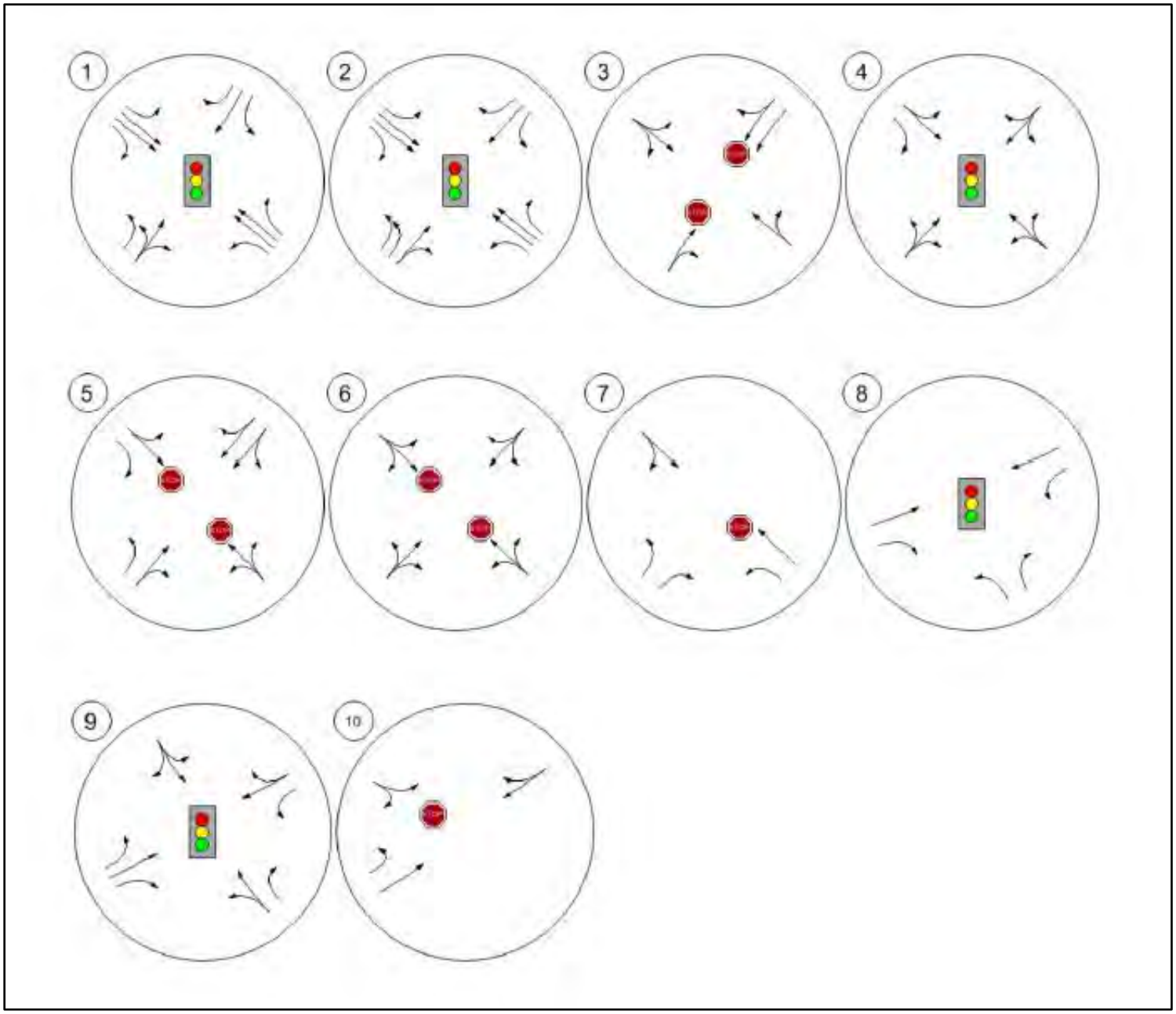


Figure 2.2: Existing Intersection Traffic Controls

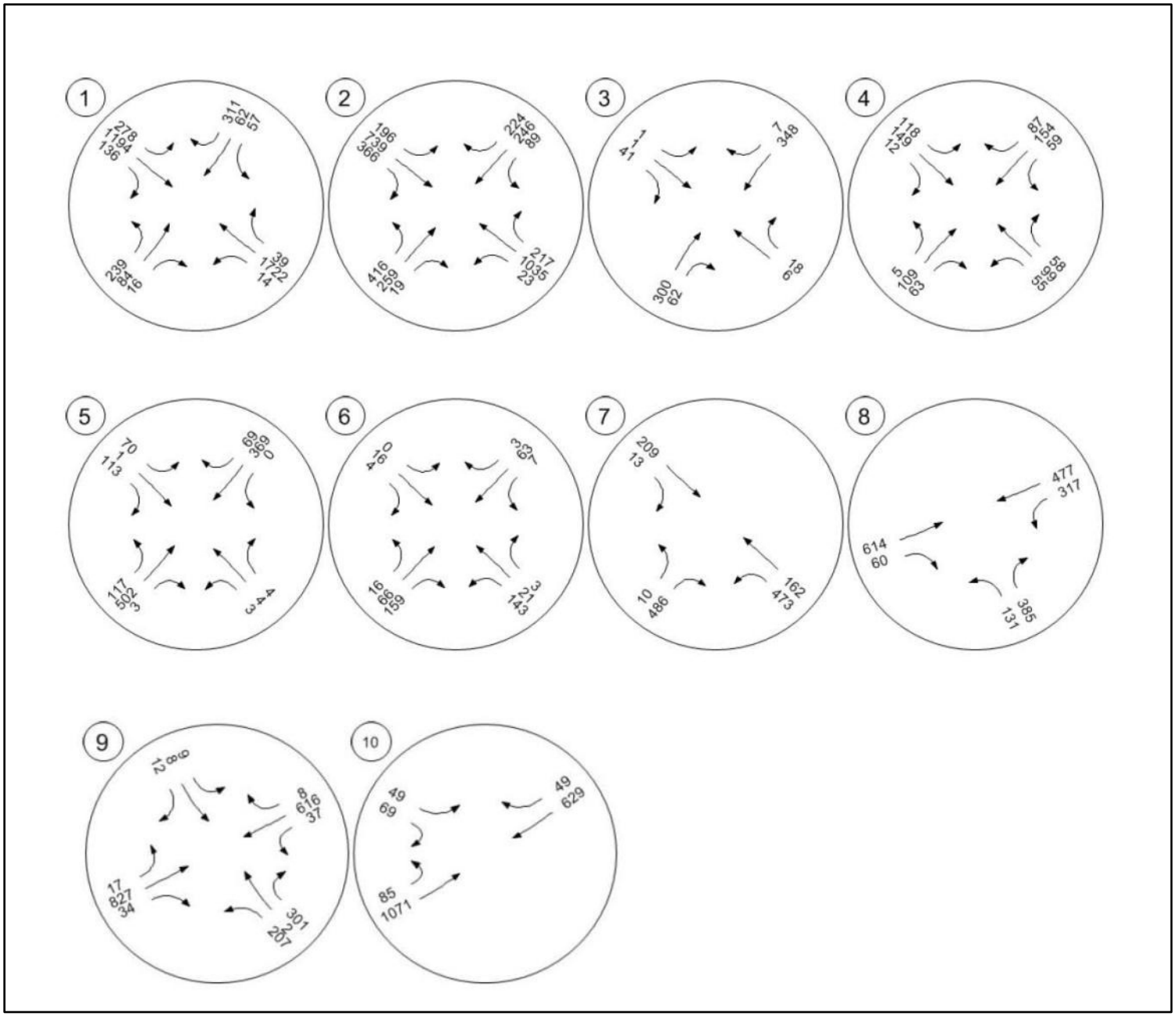


Figure 2.3: Existing Non-Event PM Peak Hour Traffic Volumes

Figure 2.4: Existing Non-Event PM Peak Hour Pedestrian Traffic Volumes

Figure 2.5: Existing Non-Event Average Daily Traffic Volumes

- The signalized intersection of Ridgely Avenue and Melvin Avenue is missing marked crosswalks, pedestrian signals, pedestrian pushbuttons and ADA ramps;
- The intersection of Ridgely Avenue and Taylor Avenue is missing marked crosswalks;
- The intersection of Annapolis Street and Taylor Avenue is missing marked crosswalks;
- The intersection of Ridgely Avenue and Giddings Avenue is missing marked crosswalks;
- The intersections of Baltimore-Annapolis Blvd. and King George Street, and Baltimore-Annapolis Blvd.;
- USNA Gate 8 has pedestrian signals but they are not countdown compatible;
- Curb ramps are generally provided at intersections through the study area where sidewalk is provided, but not all curb ramps meet current ADA standards; and
- A designated bicycle lane is provided on Melvin Avenue east of Annapolis Street, but it is not connected to existing signed bicycle routes on Rowe Blvd., Taylor Avenue or Baltimore-Annapolis Blvd.

Table 2.1 summarizes the pedestrian/bicycle amenities in West Annapolis.

Transit Service

Two transit operators provide service within the study area, the City of Annapolis (Gold Route) and the Maryland Transit Administration (Route 14).

Bus stops currently exist at the intersections of Rowe Blvd./ Taylor Avenue and Baltimore-Annapolis Blvd./King George Street for both the City of Annapolis (Gold Route) and MTA (Route 14). The Gold Route has additional stops at Baltimore-Annapolis Blvd./Badger Road and east of the study area on Rowe Blvd.. All bus stops provide signage only, with no other amenities are provided with the exception of the Badger Road intersection, which provides benches and a shelter on the northwest corner, and a route information sign on the southwest corner.

Table 2.2 shows headways (time between buses) and ridership of each route. Figure 2.8 shows a map of each route and bus stop throughout the study area.

The State Shuttle makes a constant loop between Navy Stadium and the legislative buildings but does not have any stops in the study area. It should also be noted that the City's Navy Blue Shuttle used to run through West Annapolis along Annapolis Street and Melvin Avenue but that service has been discontinued.

Roadway Crash Analysis

To address safety concerns, a crash analysis was performed based on data provided by the City of Annapolis and SHA's Office of Traffic and Safety, Traffic Safety Analysis Division for the study intersections. The data span the time period from January 1, 2009 to December 31, 2011. Crash data from 2012 and 2013 was not available at the time of analysis. Crash data were reviewed to identify crash trends and probable causes, and to correlate those findings with existing intersection geometrics as well as physical road and operational characteristics. Notable findings include:

- There were a total of thirty-seven police-reported crashes at all of the subject intersections over the three-year period. Twenty-three occurred at the intersection of Rowe Blvd. and Taylor Avenue.
- Twenty-six of those crashes (70%) resulted in property-damage only, while the other eleven (30%) included injuries. No fatalities were reported.

Table 2.1: Pedestrian Amenities

Intersection	Sidewalks	Marked Crosswalks	Pedestrian Signals?	Push Buttons To Cross?	Pedestrian Refuge?	Curb Ramps
	(leg of intersection—N = North, S = South, E = East, W = West)					*(corner)*
Rowe Blvd. at Melvin Ave./Farragut Rd.	All	N, W, E	Yes	Yes	Yes	All
Rowe Blvd. at Taylor Ave.	All	All	Yes	Yes	Yes	All
Forbes St. at Melvin Ave.	Missing north leg	none	n/a	n/a	n/a	Missing NW corner
Taylor Ave. at Ridgely Ave.	Missing north side of east leg	none	n/a	n/a	n/a	All
Taylor Ave. at Annapolis St.	Missing east side of south leg	none	n/a	n/a	n/a	all
Annapolis St. at King George St.	Missing north side of west leg	E, S	yes	yes	n/a	All
Baltimore-Annapolis Blvd. at Bowyer Rd./Perry Circle	Missing north side of west leg	N, E	yes	yes	n/a	Missing southwest corner
Baltimore-Annapolis Blvd. at Badger Rd.	Missing north side west leg	None	n/a	n/a	n/a	none
Melvin Ave. at Annapolis St.	Missing south side of west leg	All	n/a	n/a	n/a	all
Melvin Ave at Ridgely Ave	Missing south leg east side and east leg south side	None	No	No	n/a	Missing southwest corner

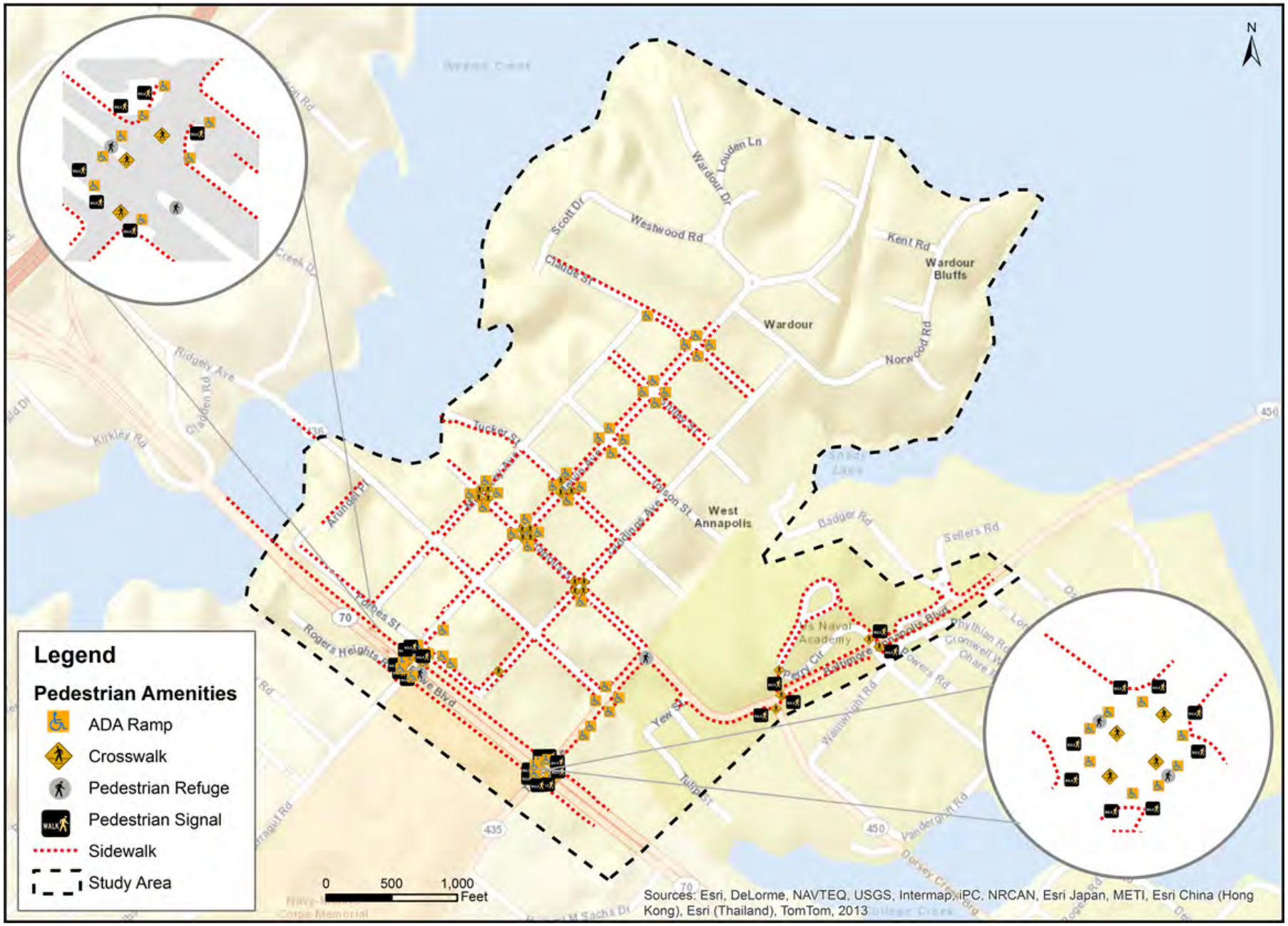


Figure 2.6: Existing Pedestrian Facilities

Figure 2.7: Existing Bicycle Facilities

Table 2.2: Bus Route Headways and Ridership

		Headway (minutes)				
Route	Operator	Peak	Off-Peak	Weekend	Major Destinations	Est. Avg. Weekday Ridership
14	MTA	60	60	60	Annapolis, Jumpers Hole, Patapsco	3,000
Gold	City of Annapolis	60	60	60	Edgewater, Anne Arundel Community College, Church Circle	1,000

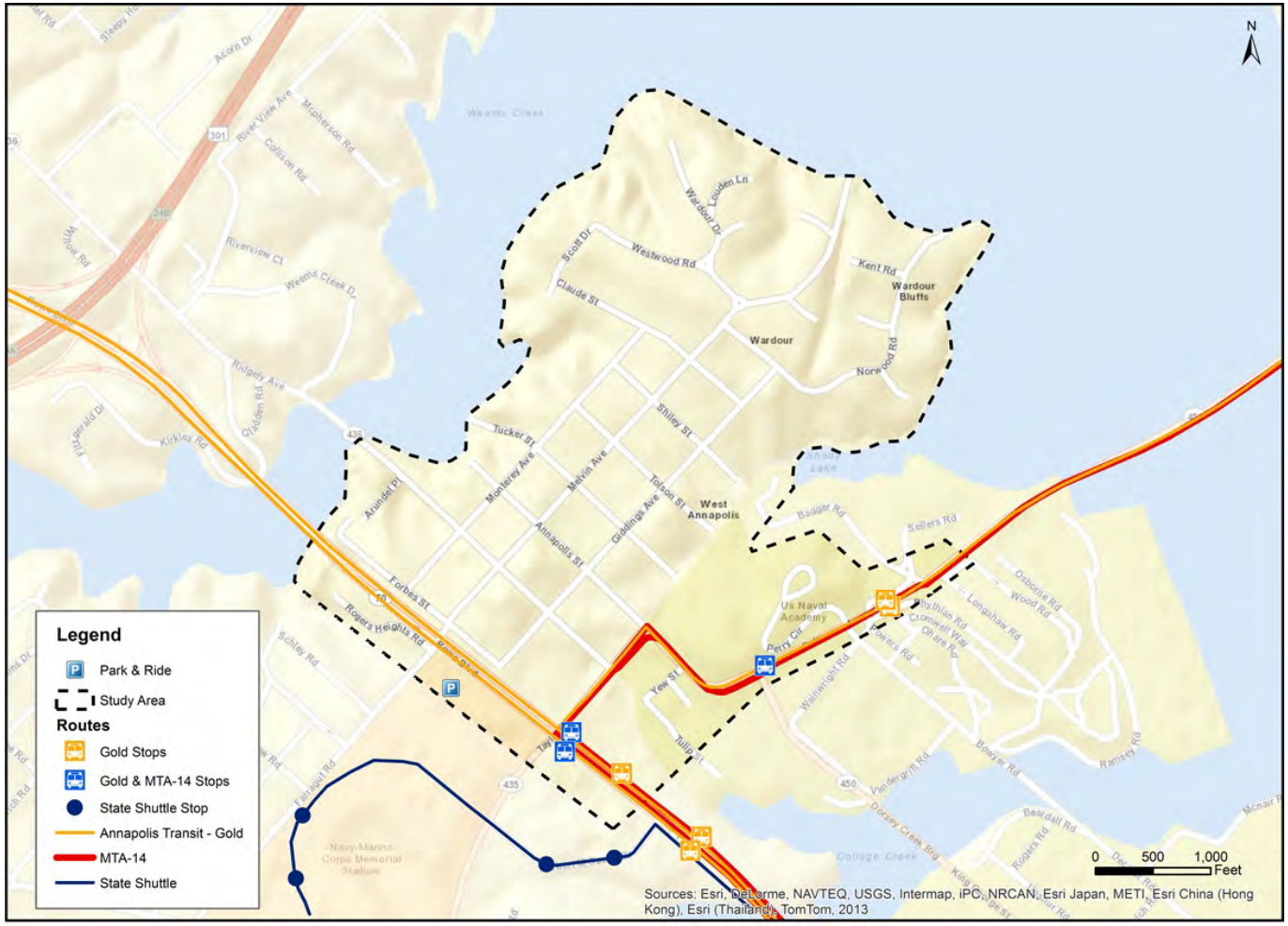


Figure 2.8: Existing Transit Services

- Five intersections reported zero crashes: Melvin Avenue/ Annapolis Street, Melvin Avenue/ Forbes Street, Baltimore-Annapolis Blvd./ King George Drive, Baltimore-Annapolis Blvd./ Gate 8 USNA Entrance, and Baltimore-Annapolis Blvd./ Badger Road.
- The predominant crash type was rear-end, which occurred sixteen times, followed by eight angle collisions. Only three pedestrian crashes were reported and no bicycle crashes were reported. Other crash types included side swipes, fixed objects, and left- turn.
- The number of crashes decreased during the study period: 14 in 2009, 12 in 2010, and 11 in 2011.
- Most crashes occurred during daylight hours, as listed below:
    - noon to 6 PM: 16 crashes
    - 6 AM to noon: 11 crashes
    - 6 PM to midnight: 5 crashes
    - Midnight to 6 AM: 3 crashes
- Reported probable causes included:
    - failure to give full attention: 22 crashes
    - driving too fast for conditions: 3 crashes
    - failure to obey signal/yield sign: 2 crashes
    - fell asleep, or followed too closely: 1 crash each
    - other causes: 8 crashes

The crash data are illustrated in Figure 2.9 and summarized in Table 2.3. Detailed crash reports are included in Appendix D.

Existing Non-Event Intersection Capacity and Level of Service

Intersection capacity analyses were performed using the Highway Capacity Manual (HCM) methodology for all study intersections. Performance measures of effectiveness include level of service (LOS), volume-to-capacity (v/c) ratio, and average vehicle delay. Key performance measures are defined below. Table 2.4 shows the letter grades and their corresponding delay values for different Levels of Service.

- **Level of Service (LOS):** LOS is a "qualitative measure describing operational conditions within a traffic stream." (Highway Capacity Manual. Transportation Research Board, Washington, D.C. 2000) LOS ranges from A to F, where a LOS A represents optimal conditions and a LOS F represents saturated or failing conditions.
- **Volume to Capacity (v/c) Ratio:** The v/c ratio is the ratio of current flow rate to capacity and is used to assess the sufficiency of a roadway facility such as an intersection. A v/c ratio of 1.0 indicates that the facility is operating at capacity, and a ratio greater than 1.0 indicates that the facility is failing as the number of vehicles exceeds the roadway capacity.

Existing signal timings and phasing were obtained from the City of Annapolis SHA and coded into a Synchro traffic model along with existing traffic volumes and roadway geometry. Signals along Rowe Blvd. operated in a coordinated and actuated system, with cycle lengths (the amount of time to complete the green-amber-red sequence for all legs of the intersection) of 200 seconds during the PM peak period. Signals along Baltimore-Annapolis Blvd. also operate in a coordinated and actuated system, with cycle lengths of 180 seconds. The results of the existing conditions intersection capacity analysis are summarized in Table 2.5. Detailed HCM worksheets are included in Appendix E.

Figure 2.9: Intersection Crash Summary

Table 2.3: Summary of Intersection Crash Reports

Intersection	Total Crashes	Fatal	Injury	Prop. Damage	Pedestrian	Bicycle
MD 70 (Rowe Blvd.) at Melvin Ave./Farragut Rd.	6	0	1	5	0	0
MD 70 (Rowe Blvd.) at MD 435 (Taylor Ave.)	23	0	9	14	2	0
Forbes St. at Melvin Ave.	0	0	0	0	0	0
MD 435 (Taylor Ave.) at MD 436 (Ridgely Ave.)	5	0	0	5	0	0
MD 435 (Taylor Ave.) at Annapolis St.	2	0	1	1	1	0
Annapolis St./Baltimore-Annapolis Blvd. at King George St.	0	0	0	0	0	0
Baltimore-Annapolis Blvd. at Bowyer Rd./Perry Cir.	0	0	0	0	0	0
Baltimore-Annapolis Blvd. at Badger Rd.	0	0	0	0	0	0
Melvin Ave. at Annapolis St.	0	0	0	0	0	0
Melvin Ave. at MD 436 (Ridgely Ave.)	1	0	0	1	0	0

Table 2.4: Intersection Level of Service Delay Ranges

Unsignalized intersections	Signalized intersections

Level of service	Delay range (sec)	Level of service	Delay range (sec)
A	<10	A	<10
B	>10 and <15	B	>10 and <20
C	>15 and <25	C	>20 and <35
D	>25 and <35	D	>35 and <55
E	>35 and <50	E	>55 and <80
F	>50	F	>80

Table 2.5: Summary of Existing Non-Event Intersection Capacity Analysis (PM Peak)

Intersection	Control	Average Delay (sec/veh)	Volume-to-Capacity Ratio	Level of Service
Rowe Blvd. at Melvin Ave./Farragut Rd.	Signal	48.2	0.88	D
Rowe Blvd. at Taylor Ave.	Signal	54.4	0.70	D
Taylor Ave. at Ridgely Ave.1	2-Way Stop	42.6	0.69	E
Taylor Ave. at Annapolis St.1	2-Way Stop	47.6	0.11	E
Annapolis St. at King George St.	Signal	27.4	0.61	C
Baltimore-Annapolis Blvd. at Bowyer Rd./Perry Cir.	Signal	32.1	0.76	C
Baltimore-Annapolis Blvd. at Badger Rd.1	2-Way Stop	>500	3.74	F
Melvin Ave. at Annapolis St.	2-Way Stop	13.4	0.31	B
Melvin Ave. at Forbes St.	2-Way Stop	16.2	0.15	C
Melvin Avenue and Ridgely Avenue	Signal	29.2	0.53	C

1-Level of Service, Delay, and V/C for stop-controlled movement only

The results of the HCM analysis show that all signalized intersections operate at a LOS D or better during the evening non-event peak hour. LOS D is significant because the intersection is approaching unstable flow, but the delay is still considered tolerable. Any condition worse than LOS D results in unstable flow and intolerable delay. As denoted by the Table 2.5 footnote, LOS E or F exist for stop-controlled movements even in several cases with v/c ratios well below 1.0, indicating that the lengthy delays associated with them are incurred by relatively few vehicles and would not justify the expense of additional traffic control.

This is common for minor street approaches during peak conditions. For example, the LOS F rating at the Badger Road intersection applies only to traffic exiting Badger Road itself, and not to traffic on Baltimore-Annapolis Blvd. (those approaches typically operate at LOS A during the PM peak hour because they are free movements). Similarly, the non-stop controlled approaches (free movements) at Taylor Avenue at Ridgely Avenue and Taylor Avenue at Annapolis Street operate with an LOS A during the PM peak hour. Only very minor delay (<10 seconds) is experienced by left turning vehicles on these free approaches. Figure 2.10 illustrates the PM non-event level of service, detailed HCM reports can be found in Appendix E.

Existing Non-Event Travel Times

Vehicle travel time studies were performed during the evening rush hour period for the study area in order to establish baseline 'non-event' traffic conditions for the week prior to the 'event' conditions (the event day is defined in Section 2.3). Travel time runs were performed using the "floating car" methodology. In this method, a test vehicle is driven at an average speed along a roadway, allowing vehicular speed to be dictated by the platoon speed, not the posted speed limit. Drivers were instructed to "pass as many cars as pass you" and remain consistent in driving behavior. Cumulative travel time measurements begin when the test vehicle passes the stop line at the first intersection, and end when the vehicle passes the stop line

at the last intersection along the route being evaluated. The Engineer recorded additional observations of queues, turn bay overflows, average link running speeds, and test vehicle queue position during all runs.

Figure 2.10: Existing Non-Event PM Peak Hour Intersection Level of Service

**Note - See discussion above (Section II.F) for more details on LOS.*

A minimum of four runs were performed in each direction along each route. The onboard GPS equipment recorded spatial position of the test vehicle every second of each run. The Tru-Traffic software application was used to synthesize the data collected into time- space distance vs. speed profiles as well as cumulative travel time profiles. Three routes were chosen to compare crossing the Severn River:

- via US 50
- via Rowe Blvd. to Baltimore-Annapolis Blvd. through West Annapolis, and
- via West Street to Taylor Avenue to Baltimore-Annapolis Blvd. through west Annapolis.

Three routes were chosen to compare leaving downtown Annapolis to points north of US 50:

- via Rowe Blvd. to Bestgate Road
- via King George Street to Ridgely Blvd. to Bestgate Road through West Annapolis
- via King George Street to Baltimore-Annapolis Blvd. to Ritchie Highway through West Annapolis

The routes listed above are intended to represent typical commute patterns (or alternate commute routes taken by drivers in congested conditions), and are illustrated in Figure 2.11. Field-measured travel times

are summarized in Table 2.6. Detailed travel time reports are included in Appendix F. The results of the non-event travel time indicate that the fastest travel times are provided along the highest capacity roadways such as US 50 and MD 70.

Table 2.6: Existing Non-Event PM Peak Period Average Field-Measured Travel Times min:sec

Route	Direction	Time
A: US 50 from West Street (MD 450) to Ritchie Hwy (MD 2)	Eastbound	6:12
B: US 50 to Rowe Blvd. (MD 70) to Taylor Ave/Baltimore-Annapolis Blvd. to Ritchie Hwy. (MD 2)	Eastbound	12:18
C: US 50 to West Street (MD 450) to Taylor Ave/Baltimore-Annapolis Blvd. to Ritchie Hwy. (MD 2)	Eastbound	23:12
1: Rowe Blvd. (MD 70)	Northbound	4:54
2: King George St. (MD 450) to Annapolis St. (MD 436)	Northbound	17:42
3: King George St. to Baltimore-Annapolis Blvd. to US 50	Northbound	9:18

Existing Non-Event Origin-Destination Analysis

An origin-destination study was performed within the study area. The purpose of the origin-destination analysis is to determine the percentage of vehicles traveling through the study area network without an origin or destination within the study area. The origin- destination survey points are illustrated in Figure 2.12. Ten total stations were selected. The origin-destination data were collected using randomly sampled anonymous Bluetooth data over a 168-hour (7-day) period during the first week of August 2013, which included both non-event and event time periods (see Section 2.3).

The origin-destination percentage of through traffic utilizing local roadways is summarized in Table 2.7; a detailed O-D matrix is included in Appendix G. The results show that of all of the O-D pairings, Baltimore-Annapolis Blvd. was found to carry the most through (non-local) traffic. This finding is consistent with the functional classification of State Route 450.

Table 2.7: Summary of Non-Event Origin-Destination Analysis

Station /Origin	Station/ Destination	Percentage of Sampled Traffic Matching
6) Rowe Blvd. south of US 50	1) Baltimore-Annapolis Blvd east of Severn River Bridge	5.5%
4) Taylor Avenue west of Rowe Blvd	1) Baltimore-Annapolis Blvd east of Severn River Bridge	22.5%
7) Ridgely Ave north of Weems Creek	2) King George Street south of Baltimore-Annapolis Blvd	13%
2) King George St. south of Baltimore-Annapolis Blvd	7) Ridgely Ave north of Weems Creek	1.5%

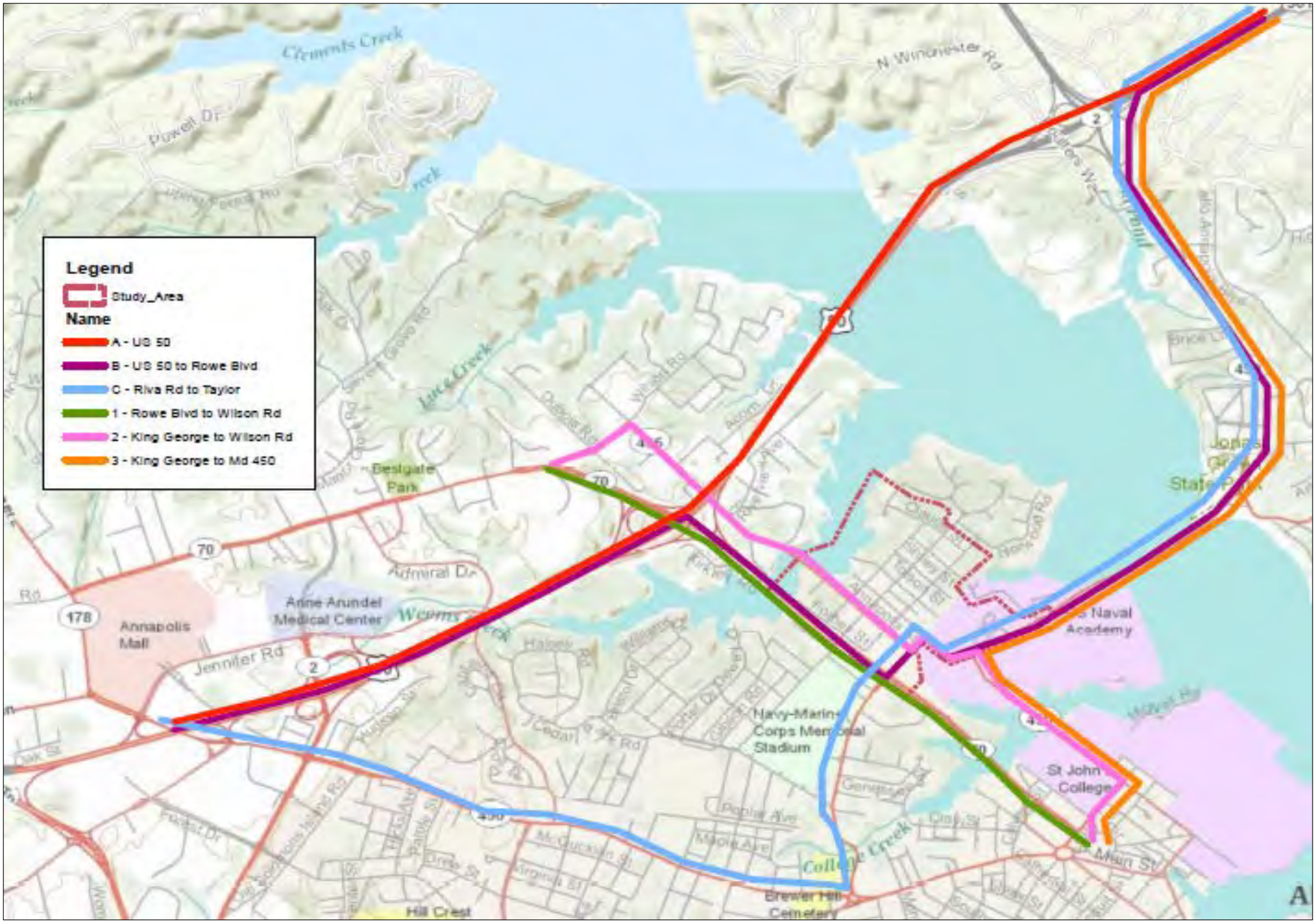


Figure 2.11: Travel Time Routes

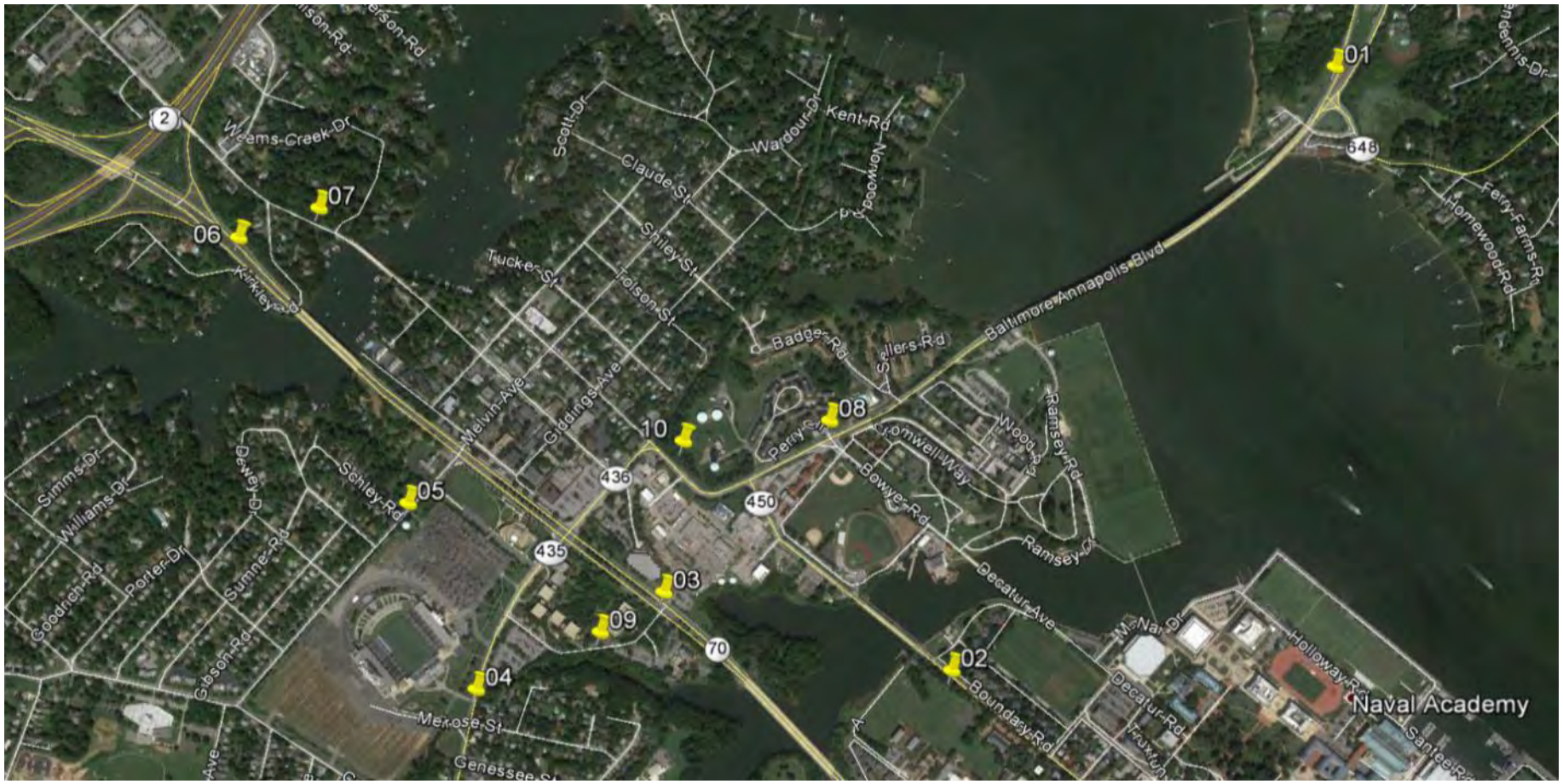


Figure 2.12: Origin-Destinations Pairings

2.3 Event Conditions

Event Calendar

In order to better understand the nature of traffic demands, specifically the frequency and duration of non-recurring/special event traffic patterns, a 2013 special event calendar was compiled--including existing events in the Annapolis area, as well as in Ocean City (as a proxy for US 50 traffic demand). For example, the month of May is shown in Figure 2.13.

Date	WeekDay	Event	Event Type
18-May	Saturday	Naval Academy Commissioning Week	Downtown Annapolis
19-May	Sunday	Naval Academy Commissioning Week	Downtown Annapolis
20-May	Monday	Naval Academy Commissioning Week	Downtown Annapolis
21-May	Tuesday	Naval Academy Commissioning Week	Downtown Annapolis
22-May	Wednesday	Naval Academy Commissioning Week	Downtown Annapolis
23-May	Thursday	Naval Academy Commissioning Week	Downtown Annapolis
24-May	Friday	Naval Academy Commissioning Week	Downtown Annapolis
25-May	Saturday	Ocean City Arts & Crafts Festival	Ocean City
26-May	Sunday	Ocean City Arts & Crafts Festival	Ocean City
27-May	Monday	Memoral Day	Holiday

Figure 2.13: Event Calendar

In addition, stakeholder interviews provided input into local traffic operations, and specifically knowledge of events. Stakeholders included SHA District 5, SHA Coordinated Highway Action Response Team (CHART), Anne Arundel County Department of Public Works, Maryland Transportation Authority, Naval Academy, and the City of Annapolis. Over 75 event days were identified by name, date, and primary location, including legislative sessions, football games, footraces, Academy commissioning, festivals, and boat shows.

Based on this information, the weekend of August 2, 2013 was selected to capture both Friday afternoon beach traffic, as well as traffic associated with the Rotary Club Crab Feast event at Navy-Marine Corps Memorial Stadium. While this date was not the single highest confluence of event-related activity in the calendar year, stakeholders generally agreed that the August 2 weekend would be a period of high non-local traffic typical of event conditions and could be studied within the project schedule. During this time period, supplemental evening peak period intersection traffic counts, daily traffic counts, travel time runs and origin-destination data were collected. A full event listing is included in Appendix G.

Event Traffic Volumes

Based on the selected event period of Friday August 2, 2013, supplemental traffic data including intersection traffic counts, daily traffic counts, vehicle travel times and vehicle origin-destination pairings were collected at key locations and analyzed. The locations of the event traffic data collection are shown in Figure 2.14.

Existing event PM peak hour traffic volumes are shown in Figure 2.15, and overall total intersection entering vehicle volumes are shown in Figure 2.16. The traffic data shows that during event time periods, overall intersection total entering volumes are generally at or below the totals on a normal weekday commuter peak hour. Also, the peak hour shifts earlier, for example at Rowe Blvd. and Taylor Avenue the normal peak hour is 5:00 to 6:00 PM, however on the event day it occurred at 3:30 to 4:30 PM. However, some shifts in traffic patterns are notable. Traffic volumes are between 20 to 40% lower on westbound (outbound) Rowe Blvd. than during normal commuter peak hours, but 20% higher on eastbound Baltimore-Annapolis Blvd.

Figure 2.14: Summary of Event Traffic Data Collection Locations

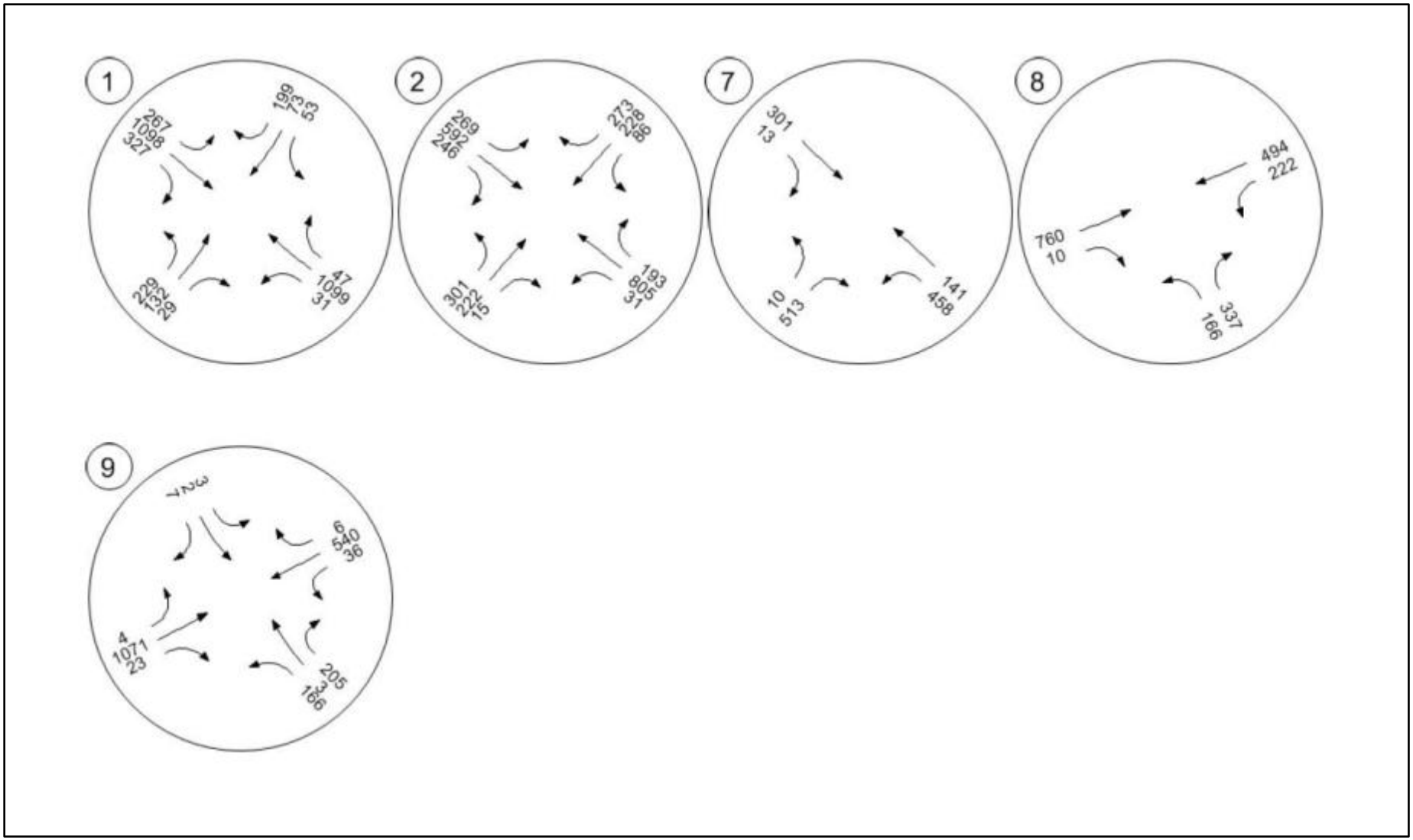


Figure 2.15: Existing Event PM Peak Hour Traffic Volumes

Turning movements in and out of Melvin Avenue at Rowe were not higher than during normal commuter periods; although southbound Annapolis Street at Taylor Avenue was 30% higher than during normal commuter periods. Detailed event traffic counts and movement by movement comparisons included in Appendix B.

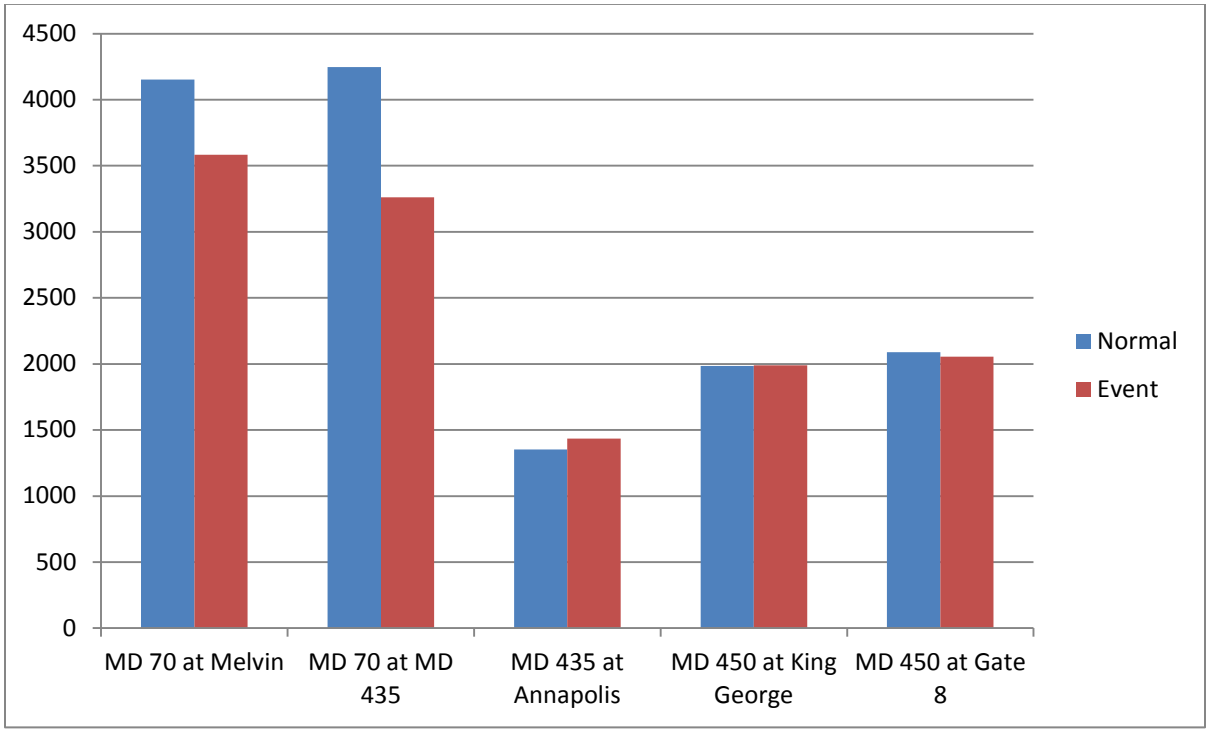


Figure 2.16: Non-Event versus Event Total Intersection Traffic Volumes

For the comparison of daily traffic count volumes, Figure 2.17 illustrates the shifts in event day traffic volumes in comparison to the non-event weekdays. Along eastbound Baltimore-Annapolis Blvd. and northbound King George Street, the event traffic volumes peak earlier and longer than normal days. Along eastbound Ridgely Avenue, event traffic volumes are higher than normal weekdays. However, along northbound Rowe Blvd. event traffic volumes are lower than normal weekdays. Detailed event daily traffic counts are included in Appendix C.

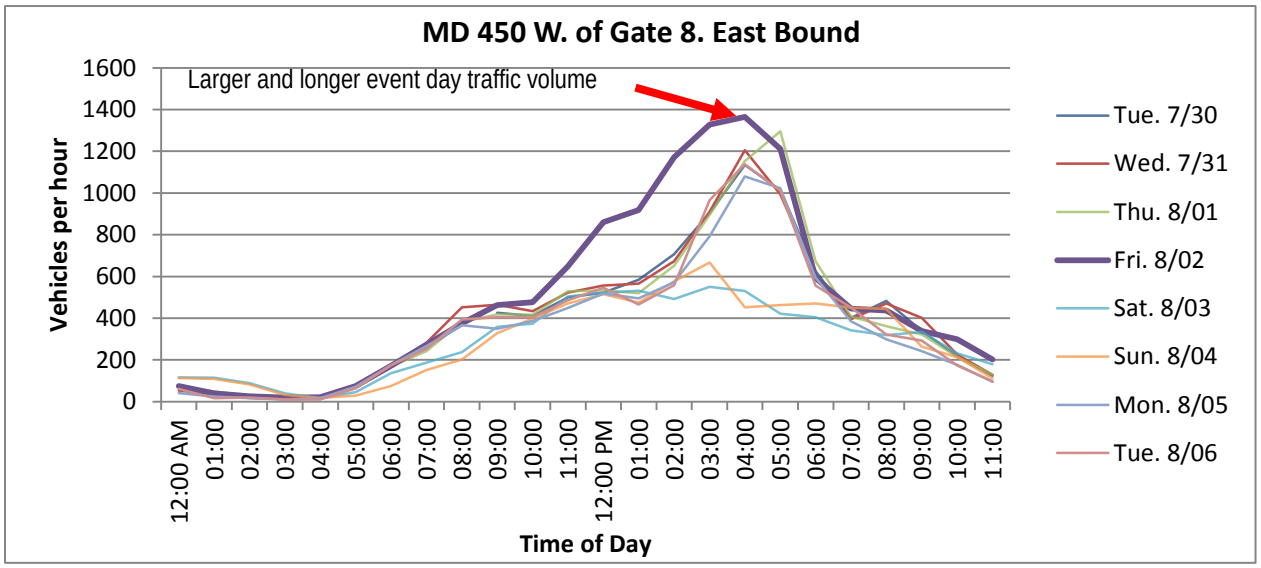
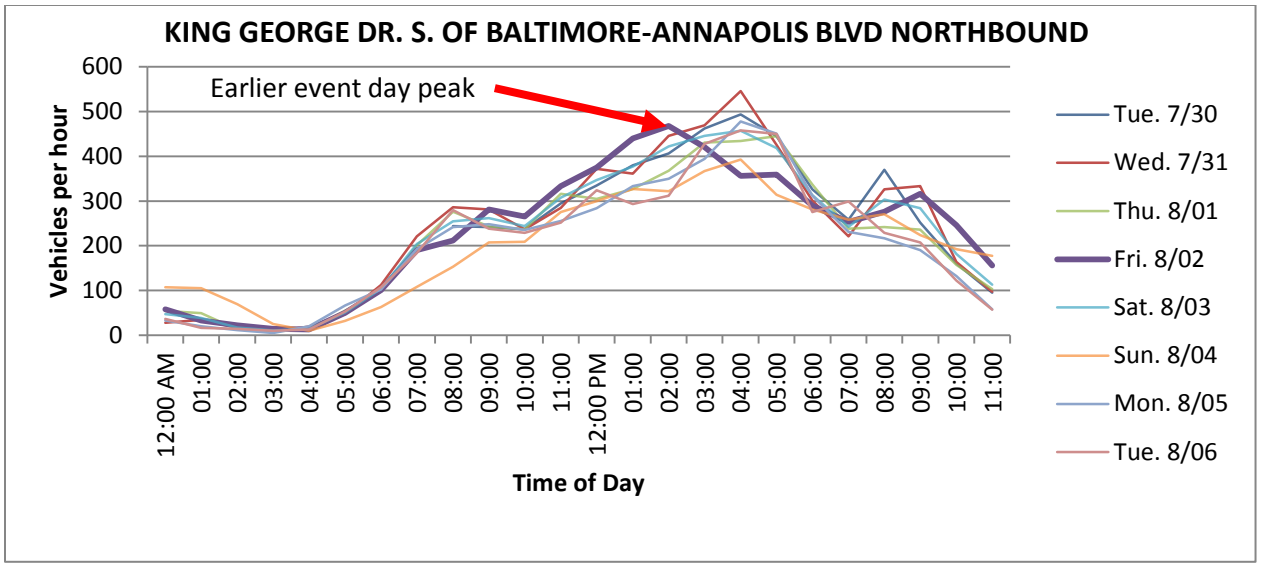
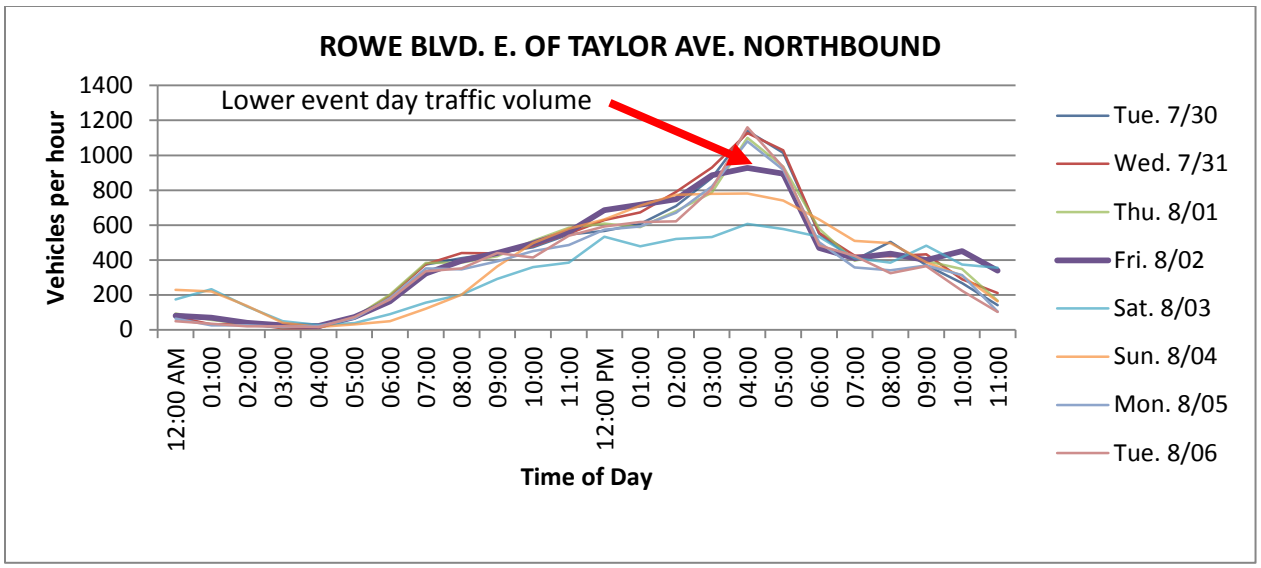


Figure 2.17: Non-Event versus Event Total Daily Traffic Volumes





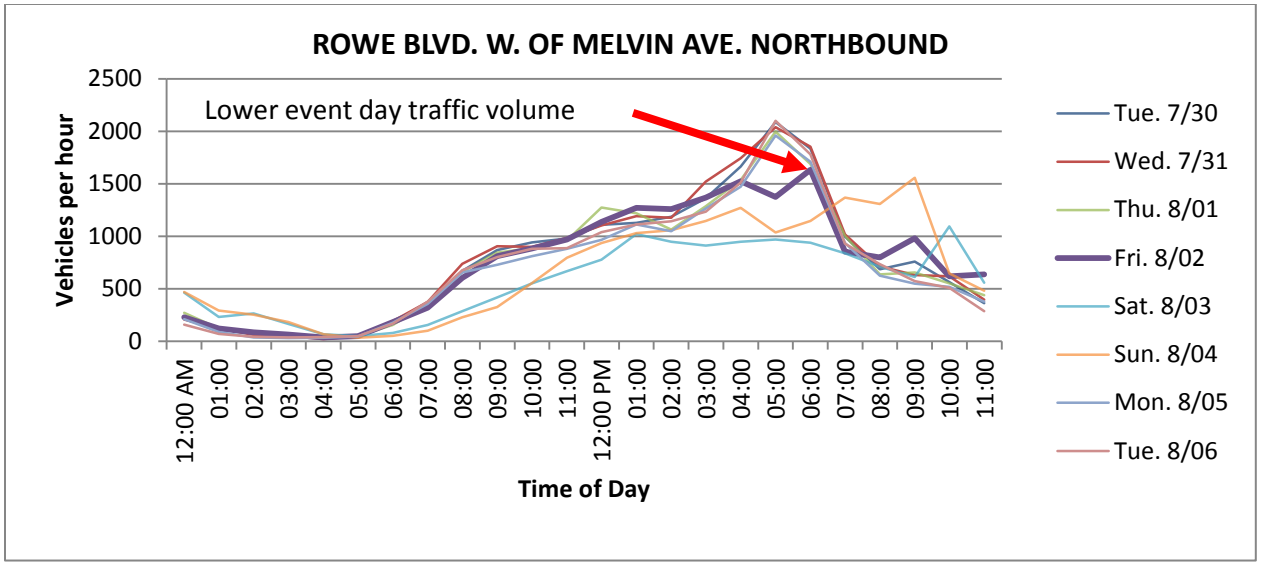


Figure 2.17 (Continued): Non-Event versus Event Total Daily Traffic Volumes

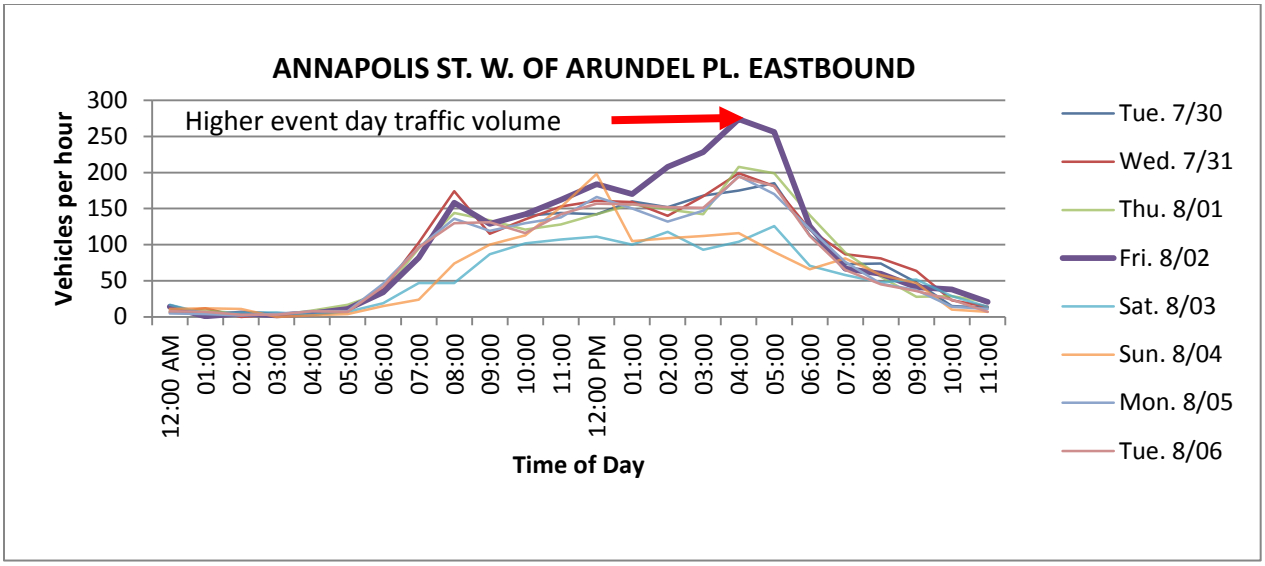


Figure 2.17 (Continued): Non-Event versus Event Total Daily Traffic Volumes

Event Travel Times

As with non-event conditions, vehicle travel time studies were performed during the event conditions evening rush hour period. The same GPS-based data collection methodology was employed, and the same routes either crossing the Severn River or leaving downtown Annapolis were followed. A comparison of non-event versus event average peak period travel times are presented in Table 2.8. The results confirm the pronounced influence of event traffic patterns on travel times in the West Annapolis area. All routes were found to have travel times of at least twice as long, and in the case of US 50 almost three times as long as normal conditions. Detailed travel time reports can be found in Appendix F.

Table 2.8: Non-Event vs. Event PM Peak Period Average Field-Measured Travel Times

Route	Direction	Non-Event Time (min:sec)	Event Time (min:sec)
A: US 50 from West Street (MD 450) to Ritchie Hwy (MD 2)	Eastbound	6:12	16:00
B: US 50 to Rowe Blvd. (MD 70) to Taylor Ave/Baltimore-Annapolis Blvd. to Ritchie Hwy. (MD 2)	Eastbound	12:18	23:12
C: US 50 to West Street (MD 450) to Taylor Ave/Baltimore-Annapolis Blvd. to Ritchie Hwy. (MD 2)	Eastbound	23:12	47:12
1: Rowe Blvd. (MD 70)	Northbound	4:54	23:30
2: King George St. (MD 450) to Annapolis St. (MD 436)	Northbound	17:42	49:12
3: King George St. to Baltimore-Annapolis Blvd. to US 50	Northbound	9:18	16:00

To further illustrate the influence of severe congestion along US 50, information for the event week was obtained from the Regional Integrated Transportation Information System (RITIS), and is shown in Figure 2.18. RITIS is an automated data sharing system that maintains numerous real-time data feeds related to traffic conditions, incidents, weather, etc. used by the University of Maryland, SHA and other third party vendors providing traveler information. The plot shows that for a period of nearly five hours the afternoon of Friday, August 2nd, 2013 speeds along eastbound US 50 were only at 15% of the free flow speeds, and the queue length from the Bay Bridge reached 11 miles in length. The residual impact of the US 50 congestion is exemplified through spillback and reduced speeds on crossing arterial roadways and documented traffic diversion (increases in eastbound traffic) on parallel facilities such as Baltimore-Annapolis Blvd.

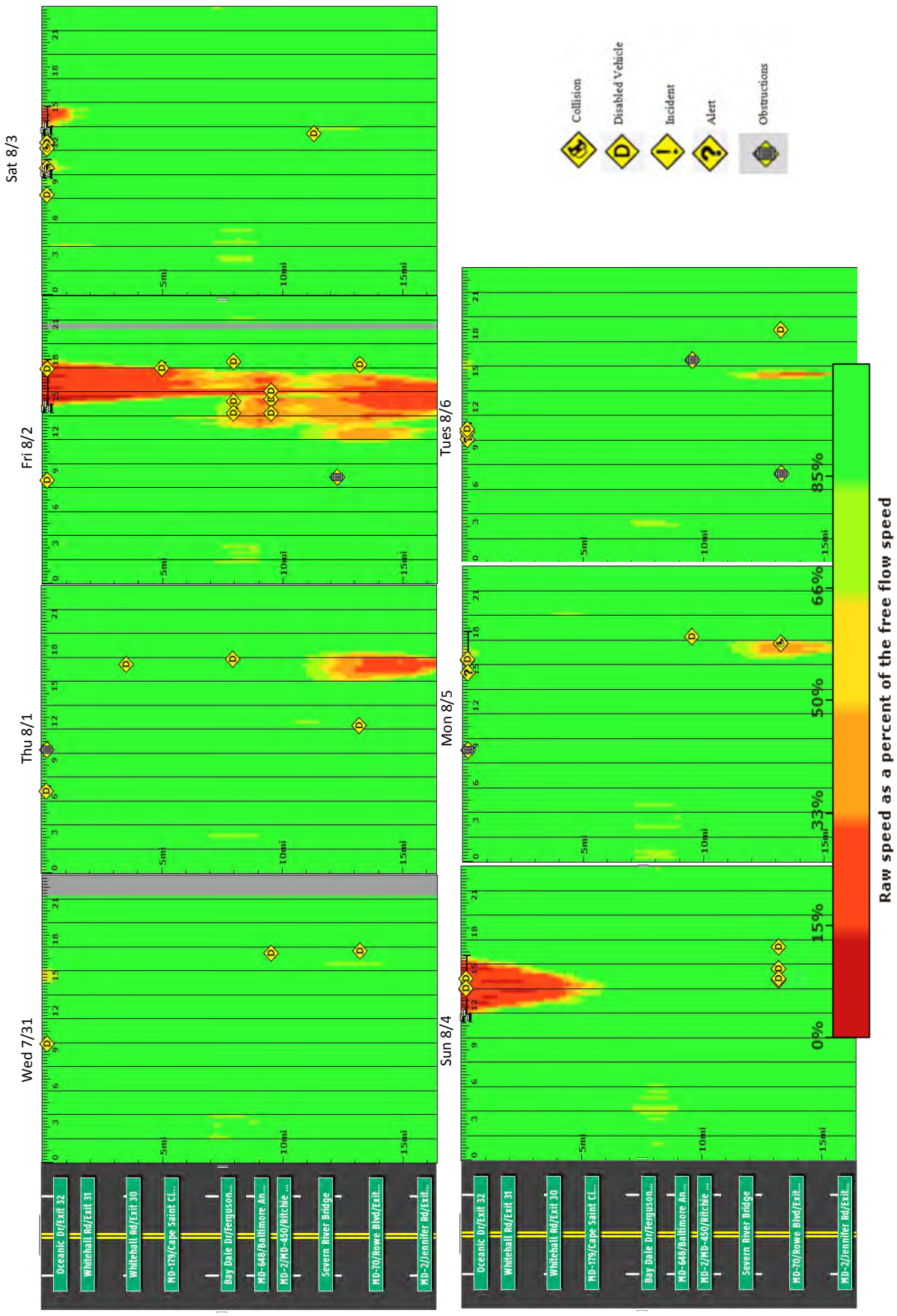


Figure 2.18: US 50 Average Travel Speeds

Event Origin and Destination

An examination of the event origin-destination data are presented in Table 2.9, detailed origin-destination matrices are included in Appendix D. The analysis reveals that non- local traffic increases noticeably on Rowe Blvd. southbound (5.3%) and Baltimore-Annapolis Blvd. eastbound (7.5%) on event days.

Table 2.9: Non-Event vs. Event Origin-Destination Analysis

Station /Origin	Station/ Destination	Percentage of Sampled Traffic Matching – Total Sample	Percentage of Sampled Traffic Matching – Event Day
6) Rowe Blvd. south of US 50	1) Baltimore-Annapolis Blvd east of Severn River Bridge	5.5%	10.8%
4) Taylor Avenue west of Rowe Blvd	1) Baltimore-Annapolis Blvd east of Severn River Bridge	22.5%	29.5%
7) Ridgely Ave north of Weems Creek	2) King George Street south of Baltimore-Annapolis Blvd	13.0%	15.5%
2) King George Street south of Baltimore-Annapolis Blvd	7) Ridgely Ave north of Weems Creek	1.5%	1.5%

Event Traffic Conditions Field Observations

Field observations of traffic congestion were documented by engineers performing the travel time runs during the event conditions. Based on the synthesis of traffic volumes and speeds, August 2nd was representative of event conditions, since the congestion on US 50 lasted from noon to approximately 5 PM, and included both demand exceeding capacity as well as incidents caused by several disabled vehicles. Some observations from the conditions that occurred on that "event" day are provided below.

- Congestion on US 50, Rowe, Taylor/Baltimore Avenue, and King George Avenues all started early and ended early on that Friday. Demand heading eastbound on US 50 and leaving downtown Annapolis began earlier than typical on an average non-event weekday.
- At 4 PM, stop and go traffic eastbound on the US 50 through lanes extended back from the Bay Bridge to the Solomon's Island Road (MD 2) exit; however travel speeds in the exit lanes to Rowe Blvd. remained near posted speeds, which encouraged drivers to bypass significant delays by using the exit only lanes and then attempting to merge back onto US 50 eastbound at the ramp diverge gore.
- There were also significant delays both northbound and southbound along Rowe Blvd. from about 3:45 pm to 5:00 pm. Vehicles sat through multiple cycles of signals at both Melvin and Rowe. It was reported by the Academy that a convoy of school buses heading to the Academy and traveling south on Rowe and turning left on Taylor Avenue, which exceeded the storage capacity of that turn lane, may have contributed to some of this congestion.
- At 4:45 pm, northbound through traffic on Rowe Blvd. was backed up in stop and go traffic from College Creek to Taylor Blvd. (see above). Vehicles were observed to wait through up to five full traffic signal cycles to clear Taylor Avenue. Part of the residual queuing on northbound Taylor Avenue was caused by southbound Rowe Blvd. left turns to Taylor Avenue, and Taylor Avenue eastbound through traffic blocking intersection due to downstream congestion on Taylor. The northbound right-turn lane along Rowe Blvd. approaching Taylor was not congested, and was noted to encourage some drivers to divert their trip northbound on Rowe Blvd. to eastbound on Taylor Avenue and then northbound on Ridgely.
- Northbound on King George Street was backed up at 4:30 pm as far as St. John's College Iglehart Hall. This was caused by the backup from the signal at King George and Baltimore Avenue. King George was free flowing in both directions by 5:30 pm. Eastbound traffic along Baltimore-Annapolis Blvd./ Taylor Avenue was backed up from the US Naval Academy Gate 8 to Rowe

- Blvd.. This resulted in excessive queues for motorists egressing Ridgely Avenue onto Taylor Avenue.
- Similarly, as shown in Figure 2.19, there was also significant queuing on southbound Annapolis Street from Taylor Avenue spilling back past Giddings Avenue. It was observed that some of these vehicles were turning from Rowe Blvd. onto Melvin Avenue and then turning south on Annapolis Street attempting to avoid the Rowe Blvd./Taylor Avenue intersection.
- Because of its dispersed arrivals and departures, the Rotary Club Crab Feast did not have a noticeable impact on the traffic later in the day. There were some small delays reported earlier caused by directing people to/from entrances along Rowe Blvd..
- All facilities appeared to be in free flow conditions by 5:30 pm.

Figure 2.19: Photo of queuing on southbound Annapolis Street

Event Intersection Capacity and Level of Service

Intersection capacity analyses were performed for the event conditions using the Highway Capacity Manual (HCM) methodology for key intersections where event traffic data were collected. The results of the future analysis are shown in Table 2.10. Detailed HCM worksheets are included in Appendix E. The results of the HCM analysis show that under event conditions, two intersections reported a deteriorated level of service by one letter grade, Rowe Blvd. at Taylor Avenue and Taylor Avenue at Annapolis Street.

Table 2.10: Non-Event (Event) PM Peak Period Intersection Capacity Analysis

Intersection	Control	Average Delay (sec/veh)	Volume-to-Capacity Ratio	Level of Service
Rowe Blvd. at Melvin Ave./Farragut Rd.	Signal	48.2 (41.8)	0.88 (0.69)	D (D)
Rowe Blvd. at Taylor Ave.	Signal	54.4 (58.6)	0.70 (0.76)	D (E)
Taylor Ave. at Annapolis St.1	2-Way Stop	47.6 (52.3)	0.11 (0.12)	E (F)
Annapolis St. at King George St.	Signal	27.4 (30.8)	0.61 (0.68)	C (C)
Baltimore-Annapolis Blvd. at Bowyer Rd./Perry Cir.	Signal	32.1 (34.9)	0.76 (0.89)	C (C)

2.4 Additional Background Input

Previous Studies and Recommendations

In addition to collecting and synthesizing event traffic data, a review of previous studies and recommendations was undertaken. A brief list of the reports which were obtained and reviewed is noted below:

- *Corridor Growth Management Plan*, 2012, Anne Arundel County
- *Annapolis Comprehensive Plan*, 2009, City of Annapolis

- *Annapolis Regional Transportation Vision and Master Plan*, 2006 Annapolis Regional Transportation Management Agency
- *Bay Bridge Transportation Needs Report*, 2004, Maryland Transportation Authority
- *Bay Bridge Toll Sponsorship Pilot Program*, 2004, Maryland Transportation Authority
- *City Dock Traffic Study*, 2011, City of Annapolis
- *City of Annapolis Transit Development Plan*, 2010, Maryland Transit Administration
- *US 50 At Severn River Bridge Feasibility Study*, 2011, Maryland SHA
- *West Annapolis Parking Study*, 2002, City of Annapolis
- *US Naval Academy at Route 450*, 2008, United State Naval Academy
- *Bicycle Master Plan*, 2011, City of Annapolis

Key highlights of previously recommended improvements for study area roadways are summarized below in Table 2.11. These recommendations may not be approved by the responsible roadway agency, may be unfunded, or may be mutually exclusive, but are presented for documentation purposes and will be considered in developing final recommendations for this report. A detailed matrix is included in Appendix H.

Stakeholder and Public Input

As part of the information gathering for this study, stakeholder agencies including the Maryland Transportation Authority, SHA (Office of Traffic and District 5), Anne Arundel County Department of Public Works, and the U.S. Naval Academy were contacted to discuss transportation challenges and current and future traffic management strategies relating to both recurring congestion and event congestion. A brief summary is presented below; detailed interview notes are included in Appendix I.

- The Transportation Authority is responsible for the Bay Bridge, which experiences both recurring and event congestion. The Authority feels event congestion related to seasonal traffic, USNA events, and Eastern Shore events are more pronounced than commuter congestion. In addition, unpredictable weather, emergency construction and crash incident events can also result in long traffic delays. The Authority employs several traffic monitoring, traveler information and active traffic management strategies including reversible lanes. The Authority develops coordinated traffic management plans with SHA, the Maryland State Police and Queen Anne's County.
- The SHA District 5 is responsible for day to day traffic operations in several counties including Anne Arundel County. District 5 staff noted that commuter congestion on Rowe Blvd. is heavier in the weekday afternoons, and expressed concerns about the left-turn lane capacity from southbound Rowe to eastbound Taylor Avenue. The District confirmed that during events in Annapolis or severe delays at the Bay Bridge, traffic on Rowe Blvd. southbound into downtown Annapolis can back up onto US 50. The District suggested using more portable electronic message boards during events to provide traveler and parking information.

Table 2.11: Summary of Selected Recommendations from Previous Studies

Roadway

- Widen US 50 from 6 to 8 lanes between I-97 and the Chesapeake Bay Bridge (including widening the Severn River Bridge)
- Configure separate express and local travel lanes along US 50 between I-97 and MD 2
- Reconfigure US 50 over the Severn River Bridge to provide a 4th eastbound lane
- Construct intersection improvements along Taylor Avenue between West Street and Rowe Blvd to increase vehicle capacity
- Install a reversible lane with a moveable barrier along US 50 on the Severn River Bridge to provide a 4th lane in the peak direction
- Construct 2-lane roundabouts along Baltimore-Annapolis Blvd. at King George Street and U.S.N.A. Gate 8 to improve traffic flow
- Change Annapolis Street to one-way northbound to reduce cut-through traffic, add angled parking
- Upgrade the traffic controls at Annapolis and Melvin to a full signal or a mini-roundabout.

Transit

- Initiate the operation of all-day transit service with 15-minute peak hour headways along US 50 with stops at Navy Stadium Park & Ride lot, Parole Town Center, Harry S. Truman Park and Ride, Davidsonville, Bowie and continued service to key destinations in downtown Washington, D.C.
- Initiate a new high-frequency local transit service along a route that includes Taylor Street, Inner West Street, Church Circle, Duke of Gloucester, Green Street, Randall Street, King George Street, College Avenue, and Rowe Blvd.

Pedestrian and Bicycle

- Install dedicated bike lanes on Rowe Blvd. from Calvert Street to US 50.
- Install a bike share system for downtown, West Annapolis (2 locations) and Eastport
- Improve pedestrian crossings along Taylor Avenue
- Install a signed bike route along Shiley Street and Badger Road between Melvin Avenue and Baltimore-Annapolis Blvd.
- Install shared bicycle lane markings along Annapolis Street between Taylor Avenue and Melvin Avenue, Melvin Avenue between Rowe Blvd and Annapolis Street and Ridgely Avenue between Melvin Avenue and Bestgate Road
- Upgrade signed bicycle route on Taylor Avenue to bicycle lanes

Parking

- Construct a new off-street parking structure in West Annapolis
- Implement parking time limits and/ or metered parking to manage residential on-street parking demand and reduce commercial parking spillover
- Consider angled parking on select blocks to increase supply

Intelligent Transportation Systems

- Implement ramp metering between MD 665 and MD 2
- Deploy variable speed limits and dynamic lane marking to improve traffic management along US 50 between I-97 and the Bay Bridge
- Install temporary Variable Message Signs along US 50 to provide enhanced traveler information before and during events

- The SHA's CHART program is responsible for traffic monitoring and management statewide for recurring, incident, special event, weather and construction conditions. CHART notes both recurring and event congestion on all study area State roads including US 50, MD 70, MD 450 and MD 2. CHART commented on traffic increases during special events in the Annapolis area, but noted that they are more attuned to the summer season when US 50 carries significant beach traffic. They are also concerned about US 50 through traffic using the Rowe Blvd. exit lanes and/ or U-turning on Rowe Blvd. as a bypass. CHART employs numerous traffic monitoring and traffic management programs including CCTV, roadway sensors, electronic message signs and incident response teams. CHART suggested continuing to post travel time information to motorists on US 50, and continuing to share CCTV feeds with the City and County DPW and City, County and State police as suggested traffic management strategies.

- The Anne Arundel County Department of Public Works does not maintain any roadways in the West Annapolis neighborhood, but is aware of event-related traffic congestion along the US 50 corridor and greater Annapolis area which impacts County roads such as Bestgate Drive.
- The U.S. Naval Academy is responsible for roadways within the secure Academy perimeter. They are aware of spillover traffic from US 50 on Baltimore-Annapolis Blvd., and its impact on ingress and egress of Academy traffic. They note about 10 major Academy events per year that generate high traffic demands, due to vehicle traffic, security checks, and high bus volumes. The Academy also noted that power outages in the area often cause traffic congestion due to signals going dark. Military police are often deployed to direct traffic along Baltimore-Annapolis Blvd. at these times. The Academy suggested intersection improvements along Taylor/ Baltimore-Annapolis Blvd., signal timing improvements, restriping the Severn River Bridge for 2 lanes eastbound and 1 lane westbound, and providing more space for biking and jogging on Baltimore-Annapolis Blvd. The Academy has long-term plans to connect facilities west of King George Street when the King George Street bridge is rehabilitated though the creation of an underpass, which would reduce traffic on King George Street.
- The City of Annapolis Departments of Public Works and Transportation, also a stakeholder, has begun to work collaboratively with event organizers to develop transportation plans for major City events to develop parking plans, and deploy portable electronic message boards to provide traveler information.

Other stakeholder engagement included the June 24, 2013 public meeting and business owner interviews described in Section 1.5. A brief summary of the transportation-related issues emerging from that public interaction is presented below, and illustrated in Figure 2.20.

- Internal Neighborhood Circulation / Safety
  - Need for speed management on Melvin Avenue and Annapolis Street
  - Lack of respect for traffic signals, flashing intersection control beacon and all-
  - way stop signs within neighborhood
  - Skewed geometry at the intersection of Melvin Avenue and Forbes Street
  - Signal timing coordination along Baltimore-Annapolis Blvd.
  - Footraces and stadium event street closures often restrict neighborhood access
  - for residents
  - Vehicle queues during recurring commuter rush hours as well as special events along Rowe Blvd., Taylor Avenue and Baltimore-Annapolis Blvd. block access to neighborhood,
  - Business owners perceive that recurring and event traffic discourage potential customers and therefore reduce economic activity and vitality
  - Revised access to West Annapolis Elementary School
- Parking
  - Not enough signage to clearly define on-street parking regulations and off- street parking locations
  - Overflow parking observed at Graul's during stadium events
  - Consider parking code requirement reductions to support small businesses
- Diversions/Cut -Through Traffic
  - Melvin Avenue and Annapolis Street are used by non-local traffic to bypass
  - Rowe Blvd. and Taylor Avenue

Figure 2.20: Summary of Public Input on Transportation

- Transit
  - Lack of City bus service between West Annapolis and City Dock/ West Street hurts businesses and limits travel options for residents
- Bike & Pedestrian
  - Need for improved pedestrian crossings of Rowe Blvd.
  - Missing sidewalks and crosswalks on Ridgely Avenue, Melvin Avenue, Annapolis Street
  - Lack of designated bicycle routes in and out of neighborhood

Current Traffic Management and Operational Strategies

Traffic management and operational (TM&O) strategies typically focus on short-term day-to-day approaches to enhance roadway/traffic operations, as well as better manage the demand for travel on the roadway network. TM&O strategies enhance operations of the existing transportation network without directly providing increased roadway capacity. Through better management of the transportation network and traffic control systems, traffic can flow more efficiently without the provision of any additional roadway capacity. This section presents a brief description of a range of TM&O measures, followed by a discussion of specific applications that the City and other stakeholder agencies currently employ.

Traffic Signal System Operations

Traffic signal coordination can improve traffic flow through a corridor by reducing delay and unnecessary stops at traffic signals. It allows traffic to flow more efficiently through a group of intersections and can also result in benefits to air quality due to decreased idling of vehicles.

Traffic-responsive signal control that adjusts signal timing parameters such as cycle lengths, in real-time has the ability to improve traffic operations when compared to traditional fixed-time control systems. These systems use vehicle detection to manage signal coordination and optimize flow throughout the roadway network. Different measures of effectiveness such as optimal travel time on the mainline or reduced overall delay can be targeted depending on the priorities of the area or corridor. The County currently has adaptive control on several corridors, such as Riva Road, Jennifer Road and Forest Drive, and the State is considering several more.

Traffic Monitoring and Real-Time Traveler Information

Real-time detection of traffic conditions and communication throughout the transportation system is the principle behind intelligent transportation systems. The collection and monitoring of roadway conditions such as speeds, lane closures, construction, etc. as well as transit and parking conditions can not only reduce incident response times or optimize signal timing changes, but can also pass valuable information on to the traveling public (see Figure 2.21). Typical monitoring devices include Closed Circuit Television (CCTV) cameras, Automated Traffic Recorders (ATR), vehicle probe data, roadway weather sensors, and Automatic Vehicle Location (AVL) Systems.

Figure 2.21: Examples of Real-Time Information Signage

Traveler information can be disseminated in real-time through a variety of media including permanent freeway electronic message boards, telephone (e.g. 511), portable roadside electronic message boards, highway advisory radio, internet, and in-vehicle or handheld/ mobile navigation systems. Travelers who are informed about driving conditions, transit and parking conditions, event and incident delays and detours that may impact their travel can use the information to make decisions and increase the mobility, safety, and satisfaction of their trip.

Event Traffic Management

Event traffic management is a specific type of traveler information that guides travelers through atypical roadway, transit, or parking situations. These could include crashes, police activity, disabled vehicles, inclement weather, construction, or special events. Typically, for special events the event organizer, along with Annapolis DOT or DPW staff develop a customized event traffic management plan, based on estimated attendees, that may include designated and overflow parking locations, roadway closures/ detour routes, provision of subscription bus services to help facilitate patron ingress and egress. In response, the roadway, transit and parking agencies may develop additional strategies such as modified signal timing plans, parking wayfinding signage, traditional and social media public outreach, special local access accommodations, modified transit service, and variable message signing.

Active Traffic Management

Active traffic management takes advantage of technology to adapt traffic controls to changing traffic conditions throughout the day and over time. These strategies allow traffic to use the existing infrastructure in the most efficient way possible and help smooth out the flow of traffic. Based on the traffic conditions at the time, drivers can be directed through the roadway network at varying speeds, lane configurations, or priorities in order to optimize system performance. In addition to responding to daily congestion, these techniques can be employed to minimize driver confusion and balance local and through traffic in construction zones, inclement weather conditions or during special events.

Examples of active traffic management include variable speed limits, dynamic lane markings, variable toll pricing, and ramp meters (see Figure 2.22). Variable speed limits can help keep flow smooth along or between lanes, reducing friction between vehicles across lanes and preventing sudden changes in flow speeds. Dynamic lane markings allow underused lanes or even shoulders to be reassigned in order to maximize the efficiency of the roadway. Ramp metering ensures that vehicles entering a freeway do so in a regular fashion so that traffic flow along the mainline is not overly interrupted.

A number of regional traffic monitoring systems currently employ several of the above referenced ITS devices and TM&O strategies. For example, SHA's CHART currently monitors, responds, and shares information from Closed Circuit Television Cameras, Variable Message Signing, Highway Advisory Radio, Roadway Weather Information Systems, and Automated Traffic Recorders to respond to incidents, construction, weather, and special events and provide real-time travel information such as travel times to the general public. Based on stakeholder interviews, Table 2.12 presents the current M&O activities by the transportation system owners/ operators in West Annapolis.

Figure 2.22: Examples of Active Traffic Management Signage

Table 2.12: Summary of Current ITS equipment and TM&O Strategies

Agency	Facilities	ITS Devices	Strategies
Maryland Transportation Authority	Bay Bridge	CCTV Roadway Sensors Dynamic Message Signs	Reversible lanes Variable speeds Electronic toll collection Incident response Traveler Information -Pre-Trip (Web, Radio) -Real time (Highway Advisory Radio
SHA	State numbered roadways	CCTV Highway Advisory Roadway Sensors Automatic Traffic Recorders	Incident Response Traveler Information (511, Web, Radio) Adaptive Signal Control
Maryland Transit Administration	State transit buses	Automatic Vehicle Location	Traveler Information (Next Bus)
Anne Arundel County Department of Public Works	County streets	CCTV	Adaptive Signal Control
City of Annapolis DOT	City streets and buses	Portable Message Signs	Traveler Information (website)
U.S. Naval Academy	Roadways within secure academy perimeter		Point traffic control

2.5 Future Conditions

This section briefly addresses future land use changes, currently programmed transportation improvements, future year traffic projections and future year PM peak hour intersection capacity analysis.

Planned Land Use Changes

The Market Analysis for this Sector Study (Chapter 3) indicates that the West Annapolis neighborhood could absorb up to 20,000 square feet of new commercial space (e.g. restaurants, home furnishings and health and beauty such as salons or yoga and pilates studios), and a minimal number of new housing units through 2018.

Programmed Transportation Network Improvements

A review of the SHA's five-year Capital Improvement Program revealed that the Anne Arundel County Department of Public Works, and City of Annapolis had no currently funded roadway, transit, or pedestrian and bicycle improvement projects located in West Annapolis.

Future Year Traffic Projections

Calculation of future year traffic incorporated a projection of new vehicle trips from the new land uses (as described in Section 3), as well as estimation of growth in existing traffic volumes.

Projecting the number of new vehicular trips generated by a proposed new development is a critical aspect of assessing future traffic impact. The objective of a trip generation analysis is to forecast the number of new trips that will begin or end at a proposed land use. A primary source for data on vehicular trip generation is the Trip Generation Handbook published by the Institute of Transportation Engineers. The Handbook compiles data from numerous studies of trip rates at hundreds of specific types of land uses such as recreational, residential, commercial, office, institutional, and industrial throughout the country. The data are sorted by various time periods such as morning and evening peak hour, and plotted against independent variables for specific land uses such as square feet of commercial space, number of

hotel rooms, number of dwelling units, etc. The data are presented in chart format with mean averages, standard deviations, and fitted curve linear regression equations, where enough data are available.

Several site-specific factors can reduce the number of new personal vehicular trips generated by a new development or land use. These include 1) the availability of non- vehicular modes of transportation such as sidewalks, bicycle facilities, and public transportation; 2) the effect of pass-by traffic which includes vehicles already on the roadway network making an intermediate stop on the way from an origin to a primary trip destination without a route diversion, and 3) the effect of internally captured trips composed of traffic originating and destined for differing land uses within the same development that do not travel on the external public roadway network. An example of an internal trip would be a trip from an office building to a restaurant or from a hotel to an office building within the same development. Although a reduction in the raw forecasted vehicle trips would be expected due to walking and biking trips within the neighborhood, as well as pass-by trips for commercial uses, no adjustments were made due to the lack of detailed information to support such adjustments.

Using the ITE Trip Generation Manual, 9th Edition (2012), raw daily and peak hour trip generation rates were determined based on the future land uses. Land use category 814 (Specialty Retail) was selected. A small number of residential dwelling units (less than 5) could be built but such development is not specifically planned, and was therefore not modeled. In total, future development through 2018 would result in approximately 886 new vehicle trips per day, and 54 PM peak-hour vehicle trips.

To document historical growth in traffic volumes along the study roadways, a review of historical average daily traffic (ADT) data published by the SHA was performed:

- For Rowe Blvd. (MD 70) south of US 50, between 2002 and 2012, ADT changed from 40,450 to 40,800, a change of 1%.
- For Taylor Avenue (MD 435) east of Rowe Blvd., between 2002 and 2012 ADT changed from 11,425 to 13,200, a change of 15%
- For Ridgely Avenue (MD 436) north of Taylor Avenue, between 2002 and 2012 ADT changed from 5025 to 5270, a change of 5%
- For Baltimore-Annapolis Blvd. east of the Severn River Bridge, between 2002 and 2012 ADT changed from 17,375 to 18660, a change of 7.5%

To project year 2018 forecasts, including growth in existing traffic as well as account for the unknown location of specific new development locations, a conservative annual average compounded growth rate of 3% was applied for five years.

Future PM Peak Hour Intersection Capacity and Level of Service

Intersection capacity analyses were performed for the future conditions using the Highway Capacity Manual (HCM) methodology for key intersections. Signal timing plans were optimized as part of the analysis. The results of the future analysis are shown in Table 2.13. Detailed HCM worksheets are included in Appendix E. The results of the HCM analysis show that under future conditions, the signalized intersection of Rowe Blvd. and Melvin Avenue is projected to operate over capacity as the v/c ratio is greater than 1.0. The intersection of Baltimore-Annapolis Blvd. at US Naval Academy Gate 8 deteriorates one letter grade to a level of service D, and the volume-to-capacity ratio is approaching 1.0. As detailed in Section 2.2, the v/c ratio is well under 1.0 at Taylor Avenue at Annapolis Street even though the LOS is an F.

Table 2.13: Summary of Future PM Intersection Capacity Analysis Non-Event (Event)

Intersection	Control	Average Delay (sec/veh)	Volume-to-Capacity Ratio	Level of Service
Rowe Blvd. at Melvin Ave./Farragut Rd.	Signal	70.6 (40.6)	1.06 (0.85)	E (D)
Rowe Blvd. at Taylor Ave.	Signal	52.9 (48.8)	0.95 (0.87)	D (D)
Taylor Ave. at Annapolis St.	2-Way Stop	85.9 (101.5)	0.22 (0.25)	F (F)
Annapolis St. at King George St.	Signal	29.7 (33.6)	0.86 (0.91)	C (C)
Baltimore-Annapolis Blvd. at Bowyer Rd./Perry Cir.	Signal	46.4 (39.4)	0.98 (0.97)	D (D)

2.6 Summary of Findings

The following is a summary of the key findings of the West Annapolis Sector Plan traffic study:

- Ten signalized intersections were studied along Rowe Blvd., Taylor Avenue, Baltimore-Annapolis Blvd., and Ridgely Avenue and Melvin Avenue.
- The highest non-event daily traffic volumes were along Rowe Blvd. and Baltimore-Annapolis Blvd.
- Significant pedestrian volumes were observed at Rowe Blvd./Taylor Avenue and Baltimore-Annapolis Blvd./ US Naval Academy Gate 8.
- Numerous deficiencies in the non-motorized transportation network were documented in the study area, creating gaps and barriers for pedestrian, bicycle and transit travel. These include missing sidewalks, crosswalks, pedestrian signals, and bicycle lanes, as well as limited transit service.
- Crash history included a total of thirty-seven collisions over the past three years at all study intersections. Twenty-three occurred at the intersection of Rowe Blvd. and Taylor Avenue. Five intersections reported no crashes. Only three crashes involved pedestrians, and no fatalities were reported.
- Existing non-event level of service during the PM peak hour is a D or better at all signalized intersections, although several minor street stop-controlled approaches operate at a level of service E or F.
- Travel time measurements during non-event conditions document that the fastest travel times crossing the Severn River or leaving downtown Annapolis are provided by the highest capacity roadways (US 50 and Rowe Blvd.).
- An origin-destination analysis revealed that approximately a quarter of the traffic Baltimore-Annapolis Blvd. carries is neither originating from nor destined to West Annapolis.
- Stakeholder agencies such as the Maryland Transportation Authority, SHA, US Naval Academy and Anne Arundel County DPW are aware of the event traffic conditions, have deployed numerous ITS devices, and have employed numerous traffic management strategies, to varying degrees of success. However only limited coordination has occurred with the City.
- Public and business owner concerns include internal neighborhood traffic circulation and safety, parking, non-local traffic diversions, transit service and bicycle and pedestrian accommodations.
- An analysis of Friday August 2, 2013 event traffic data, including extended and severe congestion along US 50, revealed an earlier afternoon peak hour, higher and more non- local traffic volumes on eastbound Baltimore-Annapolis Blvd. and southbound Annapolis Street, and significantly longer travel times across the Severn River Bridge and leaving downtown Annapolis.
- Event day traffic resulted in deteriorated and failing level of service at one signalized intersection and two unsignalized intersections.

- Future land use changes identified in the West Annapolis Market Feasibility Study report could add as much as 20,000 SF of new commercial space, with no substantial increase in residential units. This would translate into 900 new daily vehicle trips distributed on the study area roadways, or about 75 new PM peak hour vehicle trips.
- There are currently no funded roadway improvement projects in the study area according to State, County and City capital improvement programs.
- Under future conditions, without any roadway improvements, at least one signalized intersection fails, and others approach saturation during the PM peak hour of either event or non-event conditions. Several individual approach movements fail, such as eastbound Baltimore-Annapolis Blvd. at Perry Circle/USNA Gate 8.

2.7 Recommendations

The development of recommendations focused on 1) balancing local and through traffic through enhanced event traffic management, 2) improving neighborhood circulation and 3) improving accessibility and safety for non-motorized roadway users. Types of improvements considered included:

- **Short-term physical and operational improvements** such as signing, pavement marking, signal phasing/ timing, upgraded intersection traffic control (e.g. signalization or roundabouts), partial access restrictions, and traffic calming;
- **Long-term physical modifications** such as intersection improvements;
- **Non-motorized access improvements** such as new sidewalks, improved pedestrian crossings, bicycle facilities and enhanced transit services; and
- **Enhanced Intelligent Transportation Systems /Traffic Management** such as CCTV, adaptive signal timing, portable and permanent electronic message signs, dynamic lane use, event transportation plans, and improved dissemination of traveler information.

Numerous recommendations were created, many of which are long-term and/or city-wide in nature. The following summarizes recommended improvements by mode:

Pedestrian and Bicycle Improvements

The completion of missing gaps and barriers in the pedestrian and bicycle network is recommended to fully realize the potential of West Annapolis as a walkable and bicycle- friendly neighborhood. For pedestrian and bicycle improvements proposed on State roadways, additional coordination and approval will be required.

1. Ridgely Avenue: Construct full sidewalks, missing ADA ramps, pedestrian signals and crosswalk markings along Ridgely Avenue between Taylor Avenue and the Weems Creek drawbridge.[6]
2. Melvin Avenue: Construct missing sidewalks along Melvin Avenue between Rowe Blvd. and Annapolis St., and more clearly mark bicycle lanes (consider different colored pavement).
3. New East-West Pedestrian Link: Create a pedestrian and bicycle gateway or plaza between Graul's and Annapolis St.
4. Baltimore-Annapolis Blvd.: Upgrade traffic signals to provide countdown pedestrian indications.[4]
5. Taylor Avenue: Install a marked crosswalk on the west leg at Annapolis Street.
6. Rowe Blvd.: Implement advanced pedestrian WALK timing plans during peak pedestrian hours, and install accented pedestrian crossing treatments (e.g. stamped asphalt) to improve visibility.

[6] SHA has initiated a design project to install pedestrian signals, crosswalks, and ADA ramps, and to construct missing sidewalk segments at these intersections.

7. Implement Bike Share: The implementation of a bicycle share system in Annapolis, with two stations in West Annapolis, should be viewed as an enhancement of the public transportation network, as often bicycle sharing systems often attract as many or more riders as bus routes. Bike trips and would be ideal for replacing shorter auto trips between West Annapolis and City Dock, Eastport or West Street.
8. Implement Bicycle Master Plan Recommendations: The 2011 Bicycle Master Plan recommendations were reviewed for this study and were found to be compatible with the goals of the Sector Plan:
    a. Shiley Street: Connect the Baltimore-Annapolis Blvd./ Naval Academy Bridge bikeway to West Annapolis by installing a signed bike route along Shiley Street and Badger Road between Melvin Avenue and Baltimore-Annapolis Blvd.
    b. Annapolis Street: Install a new bicycle route with shared lane markings along Annapolis Street between Taylor Avenue and Melvin Avenue.
    c. Melvin Avenue: Install a new bicycle route with shared lane markings along Melvin Avenue between Rowe Blvd. and Annapolis Street.
    d. Ridgely Avenue: Install a new bicycle route with shared lane markings along Ridgley Avenue between Melvin Avenue and Bestgate Road.
    e. Taylor Avenue: Upgrade the existing signed bicycle route along Taylor Avenue between Rowe Blvd. and Annapolis Street with designated bicycle lanes.
    f. Construct Parklets as Opportunity Area Gateway Features: Ridgely and Annapolis Street are designated as primary pedestrian and bicycle areas within the neighborhood. One way to facilitate this emphasis is to construct parklets. Parklets are small, often temporary and movable, public spaces carved out of the general paved area of the right of way. They are commonly not larger than one or two curbside parking spaces and offer seating, greenery, or other active uses.

Transit Service Improvements

The enhancement of local transit service during select time periods, and the provision of passenger amenities can attract new riders and improve the comfort of existing riders.

1. Expand the Circulator Trolley service to provide 10- minute headway service to locations within West Annapolis during weekday lunch hours and evenings, weekends and all special events. The route could follow the previous Navy Blue Shuttle route which utilized Annapolis Street, Giddings Avenue, Ridgely Avenue and Melvin Avenue.
2. Improve the frequency of the existing Gold line during peak hours and events, recommended headways are 15 minutes, 30 minutes during off-peak and weekend.
3. Upgrade existing bus stops along Taylor Avenue and Baltimore-Annapolis Blvd. to provide shelters, benches, real-time traveler information and West Annapolis neighborhood branding identification/ wayfinding signing. New bus stops should also be considered within West Annapolis pending the final routing of the Circulator.

ITS/Traffic Management

The deployment of additional ITS devices along selected roadways in the West Annapolis area will enhance the City's ability to provide real-time traveler information and improve traffic management during event periods. Additional coordination with and approval from SHA will be required for ITS device locations proposed on state roadways.

1. Install new ITS devices
    a. CCTV: Install cameras on Rowe Blvd., Taylor Avenue, Baltimore-Annapolis Blvd., and King George Street.

b. Permanent Variable Message Signs: Install permanent electronic message boards on Rowe Blvd. southbound north of Weems Creek and northbound south of College Creek, Taylor Avenue eastbound west of Rowe Blvd., and King George Street south of College Creek. These signs could show travel times via US 50 and West Street (MD 450) to provide factual reasons for non-local drivers to avoid West Annapolis as a commuter route.

c. Automated Enforcement: Install speed cameras along Melvin Avenue near West Annapolis Elementary School.

d. Adaptive Signal Controls: Consider installing adaptive signal timing hardware and software along Rowe Blvd. and Baltimore-Annapolis Blvd. (including the signal on the east end of the Naval Academy Bridge) for use during event conditions. [7]

e. Automatic Vehicle Location: Install AVL on City transit vehicles to provide real-time next bus information.

2. Implement Active Traffic Management along US 50:
(These items are recommendations to SHA, which has the authority to design and implement them.)

   a. Provide channelization along US 50: The separation of local and through lanes on US 50 EB between Exit 23A and 24 could improve traffic flow along eastbound US 50 as well as reduce the diversion of traffic through West Annapolis. By creating barrier separation of local traffic, with slip entrance and exit lanes, weaving can occur in the lower speed local lanes.

   b. Install Variable Speed Limits to better manage speed differentials during seasonal traffic demands

3. Event Transportation Management Plans: Develop standard event traffic management plans including traffic, transit, parking, portable variable message signs and an event traffic web page for footraces, stadium events, USNA events, and City Dock events. The City should also consider making the operation of the event traffic management plans a City function, funded by the event permitting fees.

4. Develop a Citywide strategic ITS plan for roadways, parking and transit: The purpose of a citywide strategic ITS plan would be to identify traffic signals, communications (wireless and fiber), transit priority and smart parking technology needs, hardware and software specifications, costs and integration needs to provide enhanced management of transportation assets within the City and to other transportation management centers

5. Develop Integrated Interagency Traffic Management Capabilities: Improved traffic operations coordination across agencies is critical for sharing real-time traffic conditions among roadway, transit and parking operators. Currently, the state and regional traffic management capabilities are focused on the major regional facilities (e.g. US 50) and do not cover state or local arterial roadways within the City of Annapolis. An example of integrated action would be allowing the City to view the existing US 50 CCTV feeds, and allowing CHART, USNA and DPW to view the proposed West Annapolis CCTV feeds. The City should consider the feasibility of a consolidated regional Annapolis transportation operations center. The existing and decentralized transportation management centers maintained by the County and State do not meet the needs of the greater Annapolis area and provide enough coverage for City roadways and City events.

Roadway Improvements

The recommendations below reflect consideration of the direction balance of traffic volumes, non-local traffic volumes, street direction flow, future intersection operations, and guidelines established in the Manual on Uniform Traffic Control Devices.

1. Traffic Control Modifications - the modification of traffic control devices at select locations in the neighborhood is important to standardize traffic controls, improve driver compliance, adhere to guidance in the Manual of Uniform Traffic Control Devices (MUTCD)—an industry standard

[7] Investigation of this option should consider whether adaptive signals could inhibit police traffic control of intersections.

publication, and improve pedestrian access. Due to drainage issues and limited available right-of-way to provide a curbed island, roundabouts and mini-circles were not considered to be feasible.

a. Taylor Avenue at Ridgely Avenue: Upgrade the existing fire house activated flashing traffic signal to include pedestrian signals and a pedestrian-actuated WALK phase.

b. Annapolis Street at Melvin Avenue: Insufficient traffic data were collected to fully evaluate the satisfaction of MUTCD thresholds for full signals; however, it is estimated that the current pedestrian and vehicle volumes would not meet the threshold. Instead, the City should upgrade the existing intersection control beacon to a pedestrian hybrid beacon. The pedestrian hybrid beacon (PHB), also known as a HAWK (High-intensity Activated CrossWalK), is used to warn and control traffic at an unsignalized location. The beacon would remain dark until actuated by a pedestrian pressing a walk button. An example of an existing PHB in Washington, D.C., is shown in Figure 2.23. The intersection would remain operationally as a 2-way stop (facing Annapolis Street). When a pedestrian phase is requested, all four approaches would show a red indication to vehicles while the pedestrians crossed. ; With future pedestrian network improvements and additional business in the Opportunity Area, the threshold for full signalization may be satisfied.

Figure 2.23: HAWK beacon at Georgia Avenue & Hemlock Street NW, Washington, D.C.

2. Traffic Calming: Install intersection chokers to reduce traffic speeds and pedestrian crossing distances at:

   a. Annapolis Street and Giddings Avenue (chokers could be replaced by an ornamental intersection with stamped or raised pavement, etc.);

   b. Melvin Avenue at Ridgely Avenue;

   c. Melvin Avenue at Annapolis Street; and

   d. Other intersections on Melvin Avenue (up to Claude Street), as appropriate.

3. Intersection Improvements: Baltimore-Annapolis Blvd. between King George and Gate 8: Widen Baltimore-Annapolis Blvd. between King George Street and US Naval Academy Gate 8 to provide four travel lanes, two eastbound and two westbound at all times. The existing left-turn movement from eastbound Baltimore-Annapolis Blvd. into the Academy would need to be rerouted via a jug handle using Perry Circle. Although the overall intersection is not projected to fail under future conditions, the eastbound approach fails and residual queues spill back through multiple upstream intersections. This improvement would result in a level of service B under future conditions and eliminate all residual queuing.

Conceptual Improvement Plans

An illustration of the recommended pedestrian, bicycle and transit improvements is shown in Figure 2.24, and recommended roadway and ITS improvements is shown in Figure 2.25. Figure 2.26 illustrates the traffic calming recommendations, and Figure 2.27 provides a conceptual plan of the Baltimore-Annapolis Blvd. roadway widening.

Figure 2.24: Recommended Pedestrian, Bicycle and Transit Improvements

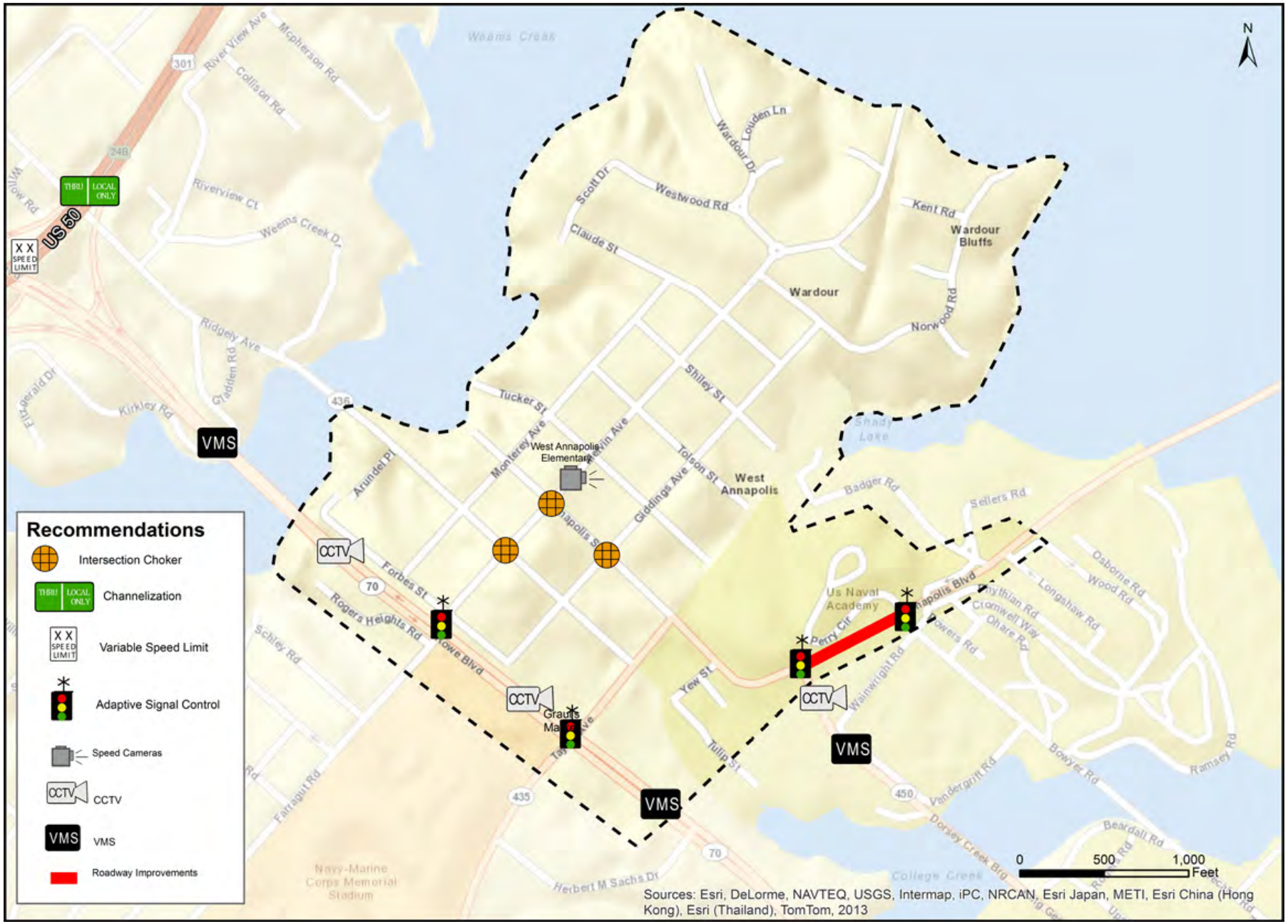


Figure 2.25: Recommended Roadway and ITS Improvements

Figure 2.26: Traffic Calming Rendering for Melvin Avenue at Annapolis Street

This concept maintains existing storm water drainage, filters some run-off, reduces pedestrian exposure and maintains existing bicycle lanes.

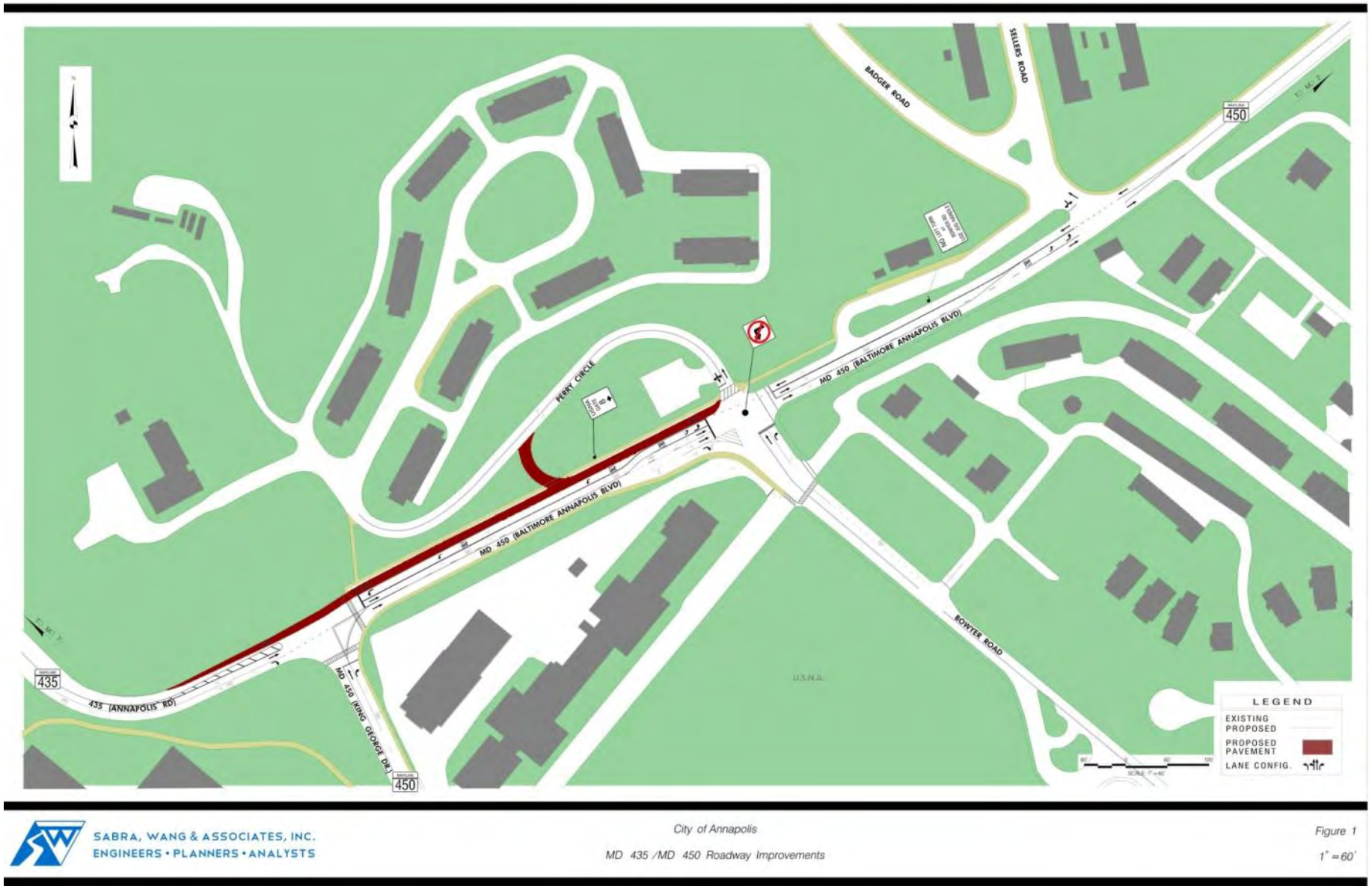


Figure 2.27: Baltimore-Annapolis Blvd. Roadway Improvement Alternative

Transportation Project Prioritization

Developing the prioritization for the potential improvements described above involved the consideration of several factors (described below) that correlate to the Sector Study's goals and objectives. A summary of the screening results is shown in Figure 2.28.

Overall, the intersection pedestrian treatments, traffic control upgrades and traffic calming improvements would achieve the quickest, most positive, and most cost-effective impacts. The ITS traffic management strategies such as variable speed limits and improved event management plans would also have a high short-term impact. Other improvements, such as new sidewalks or bicycle facilities would have modest benefit but individually do not have a high positive impact on traffic operations. The proposed roadway improvements—especially the widening of Baltimore-Annapolis Blvd. at Gate 8—would provide a high traffic operational benefit, but would be costly and would require a longer timeframe for delivery.

- **Timeframe:** the ability to construct a physical improvement or deploy a proposed operational strategy or ITS device. Short (within 2 years), Mid (2-5 years) and Long (beyond 5 years) term timeframes were identified. Shorter timeframes were considered more optimal.
- **Construction/ Operational Cost:** The total expected dollar value to design and construct or operated a proposed improvement/ management strategy. Lower costs were considered more optimal.
- **Construction Feasibility (environmental, right-of-way impact, etc.)**: The likely degree of construction impacts on sensitive environmental features such as streams, wetlands, or personal property such as homes and business. Lower impact was considered more optimal.
- **Network Connectivity and Circulation:** The ability of a proposed improvement to fill missing gaps or remove barriers and create a more connected transportation network overall or for a particular mode of travel (or for multiple modes of travel). Higher connectivity was considered more optimal.
- **Traffic Safety:** The likely benefit of a proposed physical improvement or operational/ management strategy to reduce vehicle conflicts with other vehicles or other modes and reduce the risk of crashes. High safety benefits were considered more optimal.
- **Traffic Operations (Normal and Event):** The likely benefit of a proposed physical improvement or operational/ management strategy to reduce vehicle congestion (delays and queues) and improve throughput and overall levels of service. High traffic operational benefits were considered more optimal.

	Recommendation	Implementation Timeframe	Construction or Operation Costs	Construction or Implementation Feasibility	Improvement to Network Connectivity and Circulation	Improvement to Traffic Safety	Traffic Operations Improvement NORMAL PEAK	Traffic Operations Improvement EVENT PEAK
Pedestrian	1. Install ADA ramps, sidewalks, pedestrian signals, and crosswalks along Ridgely Ave.	MID						
	2. Construct missing sidewalk links along Melvin Ave.	MID						
	3. Construct a pedestrian gateway/plaza between Graul's and Annapolis St.	LONG						
	4. Install pedestrian countdown indicators at traffic signals on Baltimore-Annapolis Blvd.	SHORT						
	5. Install crosswalks and implement advanced pedestrian WALK phases along Rowe Blvd.	SHORT						
Bicycle	6. Implement a bike share program	LONG						
	7a. Install a new signed bike route connecting the Academy to West Annapolis	SHORT						
	7b-d. Install bicycle route with shared lane markings on Annapolis, Melvin, and Ridgely Aves	SHORT						
	7e. Upgrade existing bike route along Taylor Ave to a designated bike lane	MID						
	7f. Implement a parklets system	MID						
Transit	1. Expand Circulator Trolley service during peak times	MID						
	2. Improve Gold Line headways to 15/30 minutes during peak/off-peak times, respectively	MID						
	3. Install shelters, benches, and lighting at existing Gold Line bus stops	SHORT						
ITS/Traffic Management	1a. Implement CCTV on Rowe Blvd., Taylor Ave., Baltimore Blvd., and King George St.	MID						
	1b. Install variable message signs on Rowe Blvd., Taylor Ave., and King George St.	MID						
	1c. Install speed cameras along Melvin Ave near the West Annapolis Elementary School	MID						
	1d. Install adaptive signals (3-4) along Rowe and Baltimore-Annapolis Blvds	MID						
	1e. Install automatic vehicle location devices on city buses to provide real-time traveler info	MID						
	2a. Provide for local vs. through traffic channelization between exits 23 and 24 on US 50	LONG						
	2b. Install variable speed limit signs along US 50	SHORT						
	3. Develop standard traffic management plans for events	MID						
	4. Develop a city wide strategic ITS plan	MID	n/a	n/a	n/a	n/a	n/a	n/a
	5. Coordinate interagency traffic and ITS management capabilities	MID						
Roadway	1a. Install pedestrian signal at existing fire house traffic signal at Taylor and Ridgely Aves	SHORT						
	1b. Install a pedestrian hybrid beacon at Annapolis St and Melvin Ave	SHORT						
	2. Implement traffic calming measures at three key locations	SHORT						
	3. Widen Baltimore Blvd between King George St and Gate 8 to a consistent four lanes	LONG						

Rating Key: Less Optimal | | Most Optimal

Figure 2.28: Traffic and Transportation Prioritization Summary

Preliminary Construction Cost Estimates

Planning level construction cost estimates were developed for all proposed physical pedestrian, bicycle, roadway, bus stop and ITS improvements, and operational costs for transit service enhancements. Table 2.14 shows these estimates.

Table 2.14: Preliminary Construction Cost Estimates for Transportation Improvements

	Proposed Improvement	Unit	Unit Quantity	Unit Cost	Total
Pedestrian	1. Installing pedestrian improvements	Cost per curb ramp	20	$800	$16,000
		Cost per linear foot	2,000	$30	$60,000
		Cost per ped. signal	10	$1,500	$15,000
	2. Completing sidewalk gaps	Cost per linear foot	750	$8	$6,000
		Cost per curb ramp	10	$800	$8,000
		Cost per linear foot	500	$30	$15,000
	4. Upgrading existing traffic signals for countdown/accessible pedestrian signals	Cost per intersection	2	$50,000	$100,000
	5. Installing crosswalk pavement treatments	Cost per square foot	250	$10	$2,500
Bicycle	6. Implementing a bike share program	Costs per station	4	$10,000	$40,000
	7a. Installing a new signed bike route	Cost per mile	0.5	$2,000	$1,000
	7b-d. Installing shared lane bicycle markings	Cost per mile	0.6	$5,000	$3,000
	7e. Upgrading existing route to designated bike lane	Cost per mile	0.2	$ 10,000	$2,000
	7f. Implementing a parklets system	Cost per parklet	10	$5,000	$50,000
Transit	1. Expanding Circulator Trolley service	Cost per service hour	8,000	$60	$480,000
	2. Improving Gold Line service	Cost per service hour	17,500	$60	$1,050,000
	3. Upgrade existing bus stops	Cost per bus stop	10	$7,500	$75,000
ITS/Traffic Management	1a. Implementing a CCTV system	Cost per camera	12	$5,000	$60,000
	1b. Installing variable message signs	Cost per sign	4	$250,000	$1,000,000
	1c. Installing speed cameras	Cost per camera	2	$15,000	$30,000
	1d. Installing adaptive signals	Cost per intersection	4	$35,000	$140,000
	1e. Providing real-time transit location (AVL)	Cost per bus	22	$2,000	$44,000
	4. Developing a strategic ITS plan	Study Fee	1	$250,000	$250,000
Roadway/Traffic Control	1a. Upgrading existing emergency signal with countdown/accessible pedestrian signals	Cost per intersection	1	$75,000	$75,000
	1b. Installing pedestrian hybrid beacons	Cost per intersection	1	$ 150,000	$150,000
	2. Implementing traffic calming measures	Cost per intersection	5	$5,000	$25,000
	2a. Constructing channelized local lanes	Lump Sum	1	$2,000,000	$2,000,000
	3. Widening Baltimore Blvd	Lump Sum	1	$3,000,000	$3,000,000
Grand Total					$ 8,697,500

Cost estimate sources include the SHA Construction Cost Estimation Manual, Maryland Transit Administration service plans, previous SHA bid tabs, and Federal Highway PedSafe and Research, Innovation and Technology Administration ITS database.

The total cost of all recommended improvements on City and State roadways would be nearly $9 million, broken down as follows:

- $225,000 for pedestrian infrastructure

- $100,000 for bicycle infrastructure
- $1,600,000 for transit stop and service enhancements
- $1,500,000 for ITS and Traffic Management
- $5,000,000 for roadway improvements along US 50 and Baltimore Blvd.

Note that the estimate does not include costs for new transit vehicles (buses), which are estimated at $350,000 each. In addition, ITS device deployment cost estimates do not account for system implementation and monitoring.

Potential Funding Sources

New bicycle and pedestrian enhancements and infrastructure costs may require stand- alone projects and necessitate federal Transportation Enhancement Program (TEP) or National Recreation Trails Program (RTP) funds and/or a combination of the state programs as detailed below or be smaller parts of other routine maintenance projects.

State Managed Federal Bicycle and Pedestrian Funding Programs

1. **Transportation Alternatives Program (TA)**
   The TA Program spends approximately $10 million annually, with applications due March 1 every year. Implementing TA eligible projects and requires a local match of 50%.
2. **National Recreation Trails Program (RTP)**
   The Recreational Trails Program (RTP) is a grant program of the U.S. Department of Transportation's Federal Highway Administration (FHWA) that provides funds to States to develop and maintain recreational trails and trail-related facilities for both non-motorized and motorized recreational trail uses. The NRT Program within the state receives approximately $1 Million annually in federal funds to assist jurisdictions in developing smaller scale trail head and restoration projects at a cap of $30,000 with federal funds matched at 20%.

State Managed and Funded Bicycle and Pedestrian Funding Programs

1. **Bikeway Retrofit Program**
   The Bicycle Retrofit Program was created in 2000 in order to integrate bicycling into mainstream transportation facilities and promote a broad-based strategic approach to making communities more bicycle friendly. Projects include bicycle signage installation, removing bicycling obstructions, restriping wider shoulders, as well as reconstructing off-road facilities adjacent to roadways. For this program, a "bicycle retrofit" means an on-road or off-road improvement to bicycle access. Funds can be utilized for bicycle route signage, replacement of drainage grates that are not bicycle compliant along state roadways, roadway restriping to accommodate bicycle lanes, shoulder rehabilitation and off road bicycle hiker/biker path connections where feasible. As part of this program, SHA is evaluating existing state roads to determine how we can retrofit state roads to better accommodate cyclists.
2. **Sidewalk Retrofit Program**
   Fund 79 – Sidewalk Retrofit is a Capital Program Fund administered by SHA. The program provides funding for construction of sidewalks along state highways and reconstruction of/replacement of existing sidewalks if it is a part of a revitalization effort in an officially designated urban revitalization area. In order to be considered for this fund, local governments must submit an official request. Projects within Designated Neighborhoods can be funded 100 percent (outside 50 percent). Projects within Priority Funding Areas may be funded 75 percent. Projects within a Priority Funding Area that show substantial public risk or significant impediment to pedestrian access may be funded 100 percent. Local government must acquire the necessary right-of-way and accept maintenance and legal liability. The projects must demonstrate a risk in public safety. All improvements are made ADA compliant.

For the Sidewalk Retrofit Program, a "retrofit sidewalk" means a sidewalk that is constructed along a State route (Maryland & U.S. routes other than expressways). The reconstruction or replacement of sidewalks, for the purpose of repair or maintenance, is covered under this program only if it is an essential part of a revitalization effort in an officially designated revitalization area. Only retrofit sidewalk projects along state highways are eligible for funding. Amenities beyond the scope of a basic sidewalk may be eligible for consideration for transportation enhancement funding if the location is in an historic district or a revitalization area. In accordance with State law, the cost for retrofit sidewalks shall be shared equally between SHA and the local government. Within designated revitalization areas, a local jurisdiction may request reimbursement for up to 100% of the cost to construct sidewalks.

Guidelines used in selecting retrofit sidewalk projects include:

- Location – Sidewalks must be along state highway routes.
- Safety – The project should demonstrate safety benefits to pedestrians. It should reduce the existing or potential pedestrian/vehicle conflicts by providing a separation from vehicular traffic. It should also provide or improve mobility for the general and disabled population.
- Designated Revitalization Areas – Priority should be given to projects that demonstrate that the addition of sidewalks will benefit revitalization by providing access to business, commercial and/or recreational areas that does not currently exist. Highest priority should be given to projects in designated revitalization areas.
- Local Pedestrian Policy and Commitment – The local jurisdiction should show evidence that they are in support of pedestrian facilities. Sidewalks should be included in the local jurisdiction's Master Plan. Continuity and Integration – It should be evident that the inclusion of the pedestrian facilities will provide a connection to an existing or proposed pedestrian network, e.g. the sidewalk will help to provide a critical link.
- Pedestrian Traffic – It should be evident that there is either existing or projected pedestrian traffic.
- The support for pedestrian facilities can either be denoted by actual pedestrian counts or by evidence of well-worn paths. The projected use can be based on experience with other similar facilities in similar land use settings.
- Community Support – The project should have the support of the adjacent community that will be potential users of the facility.

4. **ADA Compliance Program**
Fund 33 – ADA Retrofit is a Capital Program Fund administered by SHA. The program addresses existing non-compliant elements of the sidewalk system along state roadways not addressed under other programs. The goal is to provide accommodations for persons with disabilities through a commitment to remove barriers that impede free movement for all pedestrians along State roadways.

5. **Pedestrian Access to Transit**
Fund 78 – Pedestrian Access to Transit is a Capital Program Fund administered by SHA. The primary focus of this program is to provide pedestrian access to transit (bus) stops through the construction of sidewalks. In addition, this program evaluates opportunities to improve pedestrian access to Transit Oriented Development sites that are located along State roadway facilities. Similar to the Sidewalk Retrofit Program, The Pedestrian Access to Transit Program is a dedicated funding source designed to be utilized for projects that will provide better pedestrian access to transit facilities such as metro, MARC or light rail stations, bus depots or other transit centers.

6. **SHA's Safety and Spot Improvement Program**
The Safety and Spot Improvement Program addresses projects that improve safety and highway locations with geometric deficiencies. Fund 76 is one component of Maryland's Highway Safety

Programs, whose main objective is to reduce the number and severity of crashes in Maryland to the lowest attainable levels. Although the Safety and Spot Improvement Program has a relatively small budget compared to the entire Statewide Transportation Fund, the program is extremely cost effective in terms of reducing injury and fatality-involved crashes on Maryland's highways.

7. **Urban Street Reconstruction**
   SHA's Urban Street Reconstruction is a system preservation fund that enables rehabilitation through urban areas where pavement and drainage reconstruction can assist in the development of sidewalk with local participation as well as other street furniture, landscaping and urban amenities.

8. **Community Enhancement Program**
   Fund 84 - Community Safety and Enhancement (CSE) is a Capital Program Fund administered by MSHA. The program provides funding for improvements where the emphasis is on enhancing the existing infrastructure to promote economic revitalization such as resurfacing, reconstructing drainage, curb and gutter, landscaping, signing, parking bays, and lighting. CSE program projects are initiated by a community contacting MDHA requesting assistance addressing traffic issues concerning pedestrians, transit riders, bicyclists and motorists. Projects are selected on technical criteria and ranked by technical need, but part of the eligibility criteria is in the hands of the community as well. The CSE program gives priority to roadway improvements on state highway located in State Designated Neighborhoods within Priority Funding Areas where the improvement will spur economic revelation, contribute to other revitalization activities and, as the name implies, promote neighborhood conservation.

   Formerly known as the Neighborhood Conservation Program, the Community Enhancement Program was established in 1996 as a way to stimulate older communities for economic growth. The projects enhance livability, walkability and often times bicycling in communities. Projects typically include streetscapes and intersection improvements in urbanized areas.

3. Market Analysis

3.1 Introduction

Study Purpose

The purpose of this market analysis is to provide the City of Annapolis with a retail and residential market analysis for the West Annapolis Sector Study. The goal of the market analysis is to identify the most likely future development types in the study area, with a specific focus on the West II (Graul's) Shopping Center at the corner of Taylor Ave. and Rowe Blvd within the City of Annapolis.

This chapter updates the non-residential square footage and housing unit development assumptions described in 2009 Comprehensive Plan, in light of current economic and market conditions in the region. Baseline research for the market analysis included examination of existing and projected demographic and economic factors for the study area, lifestyle characteristics, household/retail expenditures, consumer spending patterns, per capita and household income, and retail sales.

Vantage Point also analyzed available historical and emerging local trends, such as planned or potential residential and non-residential projects in and around Annapolis, to understand how they are shaping the market for different types of businesses and residential development in the Annapolis area.

Report Organization

The market analysis is organized into six (6) sections and one appendix:

- Section 3.1 Introduction
- Section 3.2 Economic & Market Profile
- Section 3.3 Shopper Intercept / Merchant Surveys
- Section 3.4 Defining the Retail Mix
- Section 3.5 Retail Analysis & Supportable Development
- Section 3.6 Residential Demand
- Appendix K Competitive Retail Center Inventory

3.2 Economic and Market Profile

Overview

To understand the economic and market conditions in which West Annapolis retail businesses and residential markets operates, Vantage Point performed a baseline economic and demographic profile, which examines existing demographic and economic factors for West Annapolis and surrounding geographic areas, including the City of Annapolis and the 5-minute and 15-minute drive time areas. Characteristics and trends of households and employment within these areas were then compared to similar characteristics within the predefined geographies to identify market opportunities for retail within the study area.

Analysis Areas

The study area includes the boundaries of West Annapolis, which can be roughly defined as bound by: the Weems Creek to the north, Rowe Blvd to the west, Taylor Ave to the south, and the Chesapeake Bay / Severn River to the east (see Figure 1.1). While this is not technically the West Annapolis Development

Area, as defined in the City's 2009 Comprehensive Plan, the area shown in Figure 1.1 includes all residents of the West Annapolis peninsula.

Other geographies assessed as part of this analysis include a 5-minute drive time area (primary trade area), a 15-minute trade area (for residential) and the City of Annapolis.

- 5-minute Retail Trade Area: The five minute drive time area represents the primary trade area for retail sales in the West Annapolis neighborhood. Because of the size of the stores, limited transportation access and limited overall offerings, the West Annapolis retail sector is primarily neighborhood serving, with the exception of art/antiques businesses. If marketed effectively, these two sectors can draw from a larger trade area.
- 15-minute Residential Trade Area: The region represents a 15-minute drive-time from the center of the West Annapolis commercial area, and is the primary market area for residential market potentials. Again, based on development opportunities, size of the market and transportation issues, West Annapolis is not judged to have significant regional housing attraction potential. The lack of available sites suggests any residential development will be of a smaller, neighborhood scale, and thus will have a more close-in market reach.
- City of Annapolis: The City of Annapolis is included in part or in whole in the 5- and 15-minute drive times, and is used in the analysis as a reference and comparison point for demographics and findings.

Demographic & Economic Profile

To evaluate the depth and characteristics of potential demand presented by households and firms for retail uses, an assessment of the demographic and economic conditions of West Annapolis and surrounding areas was performed. As summarized in Table 3.1, compared to surrounding geographies West Annapolis has:

- An estimated population of 1,040, representing 2.6 percent of the city's population (38,596);
- An estimated 447 households, representing 2.8 percent of the city's households (16,146);
- An estimated 2.5 percent of West Annapolis labor force and 4.7 percent of the city at place employment, indicating that the City's share of population and employment / labor force is larger;
- A smaller average household in West Annapolis (2.15) compared to the city (2.35);
- A higher median household income in West Annapolis ($107,313) compared to the city ($70,377), the 5 minute drive time area ($88,614) or the 15 minute drive time area ($97,226);;
- An older population (median age of (41.1) compared to the city (36.7);
- More expensive home values in West Annapolis (median home value $806,667) compared to the city ($418,600); and
- A slightly older resident population, compared to surrounding geographies.

Table 3.2 shows the household income distribution in West Annapolis, compared to other reference geographies. The highest income range of households in the West Annapolis households (27.4 percent) earn between $100,000 to $149,999 annually, while an estimated 17.1 percent of the households earn between $150,000 and $199,999 and 14.8 percent earn between $75,000 and $99,999, demonstrating that affluent nature of this community. In West Annapolis, the percent of household income greater than $100,000 is 56.2% in 2012 and is expected to be 61.2% in 2017. The 5-min, 15-min, and City of Annapolis respectively had 45.8%, 48.9%, and 36.5% of household income greater than $100,000 in 2012 and are expected to have 52.1%, 54.2%, and 42.7% in 2017.

Table 3.1: Demographic & Economic Profile

	West Annapolis		City of Annapolis		5-min		15-min	
	2012	2017	2012	2017	2012	2017	2012	2017
Population	1,040	1,122	38,596	39,620	14,362	14,642	145,833	151,427
Households	447	481	16,146	16,580	6,238	6,351	55,853	58,179
Average Household Size	2.15	2.17	2.35	2.35	2.10	2.11	2.50	2.49
At Place Employment	1,268		26,973		19,146		83,905	
Median Household Income	$107,313	$114,153	$70,377	$85,636	$88,614	$102,829	$97,226	$105,541
Per Capita Income	$49,994	$57,585	$41,429	$49,603	$49,156	$57,238	$46,384	$54,357
Median Age	41.4	42.4	36.7	37.3	37.9	38.6	41.1	41.7
Labor Force (2010)		805		31,127		12,272		116,804
Median Home Value (2005-2009)		$806,667		$418,611		$530,962		N/A

Source: ESRI Business Solutions, U.S. Census, American Community Survey, Vantage Point 2013

Table 3.2: Households by Income (2012-2017)

	West Annapolis				5-min			
	2012		2017		2012		2017	
Household Income Range	*Num.*	*Pct.*	*Num.*	*Pct.*	*Num.*	*Pct.*	*Num.*	*Pct.*
< $15,000	9	2.0%	8	1.7%	533	8.5%	499	7.9%
$15,000 - $24,999	18	4.0%	13	2.7%	335	5.4%	253	4.0%
$25,000 - $34,999	26	5.8%	20	4.2%	394	6.3%	297	4.7%
$35,000 - $49,999	25	5.6%	18	3.8%	558	8.9%	411	6.5%
$50,000 - $74,999	51	11.5%	41	8.6%	902	14.5%	735	11.6%
$75,000 - $99,999	66	14.8%	86	18.0%	658	10.5%	845	13.3%
$100,000 - $149,999	122	27.4%	135	28.2%	1,337	21.4%	1,503	23.7%
$150,000 - $199,999	76	17.1%	94	19.6%	880	14.1%	1,054	16.6%
$200,000 +	52	11.7%	64	13.4%	643	10.3%	753	11.9%
Total	445	100%	479	100.0%	6,240	100.0%	6,350	100%
	15-min				City of Annapolis			
	2012		2017		2012		2017	
Household Income Range	*Num.*	*Pct.*	*Num.*	*Pct.*	*Num.*	*Pct.*	*Num.*	*Pct.*
< $15,000	2,895	5.2%	2,623	4.5%	1,652	10.2%	1,534	9.3%
$15,000 - $24,999	2,586	4.6%	1,976	3.4%	1,320	8.2%	1,038	6.3%
$25,000 - $34,999	2,605	4.7%	2,076	3.6%	1,154	7.1%	987	6.0%
$35,000 - $49,999	4,561	8.2%	3,426	5.9%	1,726	10.7%	1,368	8.3%
$50,000 - $74,999	8,676	15.5%	7,206	12.4%	2,578	16.0%	2,170	13.1%
$75,000 - $99,999	7,238	13.0%	9,317	16.0%	1,828	11.3%	2,399	14.5%
$100,000 - $149,999	12,986	23.3%	14,435	24.8%	2,667	16.5%	3,147	19.0%
$150,000 - $199,999	7,041	12.6%	8,550	14.7%	1,498	9.3%	1,910	11.5%
$200,000 +	7,264	13.0%	8,569	14.7%	1,723	10.7%	2,027	12.2%
Total	55,852	100%	58,178	100.%	16,146	100.%	16,580	100%

Source: ESRI Business Solutions, Vantage Point 2013

Households with families comprise a larger portion of households in West Annapolis than in the city as whole and other reference areas, as shown in Table 3.3. West Annapolis also has a larger share of households with persons over the age of 65.

Table 3.3: Households by Type 2010

Area	Family	Non-Family	Households with Persons 65+
West Annapolis	91.0%	9.0%	29.4%
5-min drive time	80.4%	19.6%	21.8%
15-min drive time	90.2%	9.8%	25.2%
City of Annapolis	54.1%	45.9%	21.8%

Source: ESRI Business Solutions, Vantage Point 2013

Table 3.4 shows the racial distribution of West Annapolis and the reference geographies. West Annapolis has a substantially higher share of white residents (92 percent) than other areas.

Table 3.4: Population by Race / Ethnicity (2012-2017)

	West Annapolis				5-min			
	2012		2017		2012		2017	
Race/Ethnicity	*Num.*	*Pct.*	*Num.*	*Pct.*	*Num.*	*Pct.*	*Num.*	*Pct.*
White	956	92.0%	1,020	90.8%	11,413	79.5%	11,258	76.9%
Black	40	3.8%	48	4.3%	1,922	13.4%	2,124	14.5%
American Indian	1	0.1%	2	0.2%	28	0.2%	33	0.2%
Asian / Pacific Islander	14	1.3%	18	1.6%	311	2.2%	362	2.5%
Some Other Race	7	0.7%	10	0.9%	410	2.9%	550	3.8%
Two or More Races	21	2.0%	25	2.2%	277	1.9%	315	2.2%
Total	1,039	100.0%	1,123	100.0%	14,361	100.0%	14,642	100.0%
	15-min				City of Annapolis			
	2012		2017		2012		2017	
Race/Ethnicity	*Num.*	*Pct.*	*Num.*	*Pct.*	*Num.*	*Pct.*	*Num.*	*Pct.*
White	116,599	80.0%	117,685	77.7%	23,189	60.1%	22,663	57.2%
Black	16,619	11.4%	18,217	12.0%	9,946	25.8%	10,399	26.2%
American Indian	385	0.3%	480	0.3%	99	0.3%	112	0.3%
Asian / Pacific Islander	3,532	2.4%	4,239	2.8%	842	2.2%	934	2.4%
Some Other Race	5,155	3.5%	6,631	4.4%	3,515	9.1%	4,402	11.1%
Two or More Races	3,544	2.4%	4,176	2.8%	1,005	2.6%	1,109	2.8%
Total	145,834	100.0%	151,428	100.0%	38,596	100.0%	39,619	100.0%

Source: ESRI Business Solutions, Vantage Point 2013

Labor force is defined as every individual of working age residing within a specific geography. As shown in Table 3.5, the City of Annapolis' labor force consists of 8,873 working-age residents who are working or seeking employment. Of that total, three industries account for 77 percent of employment: services (58 percent), retail trade (9.9 percent), and government (9.1 percent).

Table 3.5: Labor Force by Industry (2012)

Industry Sector	West Annapolis		5-min		15-min		City of Annapolis	
	Num.	*Pct.*	*Num.*	*Pct.*	*Num.*	*Pct.*	*Num.*	*Pct.*
Agriculture	4	0.3%	45	0.2%	1,115	1.3%	120	0.43%
Construction	19	1.5%	232	1.2%	4,169	4.9%	799	2.89%
Manufacturing	24	1.9%	501	2.6%	2,425	2.8%	1,199	4.33%
Wholesale Trade	11	0.9%	211	1.1%	1,732	2.0%	526	1.90%
Retail Trade	245	19.0%	3,199	16.5%	16,673	19.6%	4,401	15.91%
Transportation/Utilities	12	0.9%	650	3.3%	2,555	3.0%	1,257	4.54%
Information	73	5.7%	409	2.1%	1,894	2.2%	880	3.18%
Finance, Insurance, Real Estate	78	6.1%	1,144	5.9%	4,666	5.5%	2,018	7.29%
Services	772	59.9%	6,677	34.4%	36,386	42.7%	9,814	35.48%
Government	50	3.9%	6,367	32.8%	13,560	15.9%	6,649	24.04%
Total	1,288	100%	19,435	100.00%	85,175	100.00%	27,663	100.00%

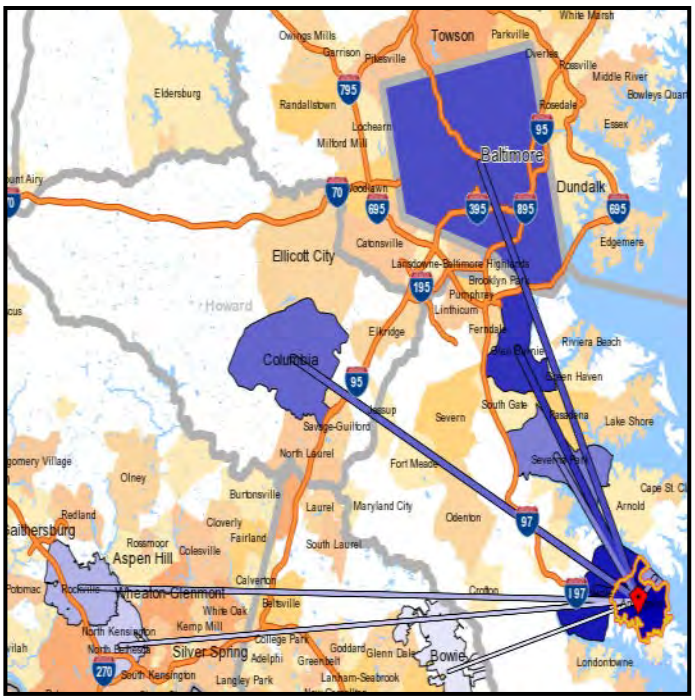
Source: ESRI Business Solutions, Vantage Point 2013

Table 3.6 shows commuting data from the 2010 U.S. Census. Of the 8,873 working-age residents of the City of Annapolis, approximately 19.7 percent work in the City of Annapolis, with the remaining residents working in surrounding communities such as Parole (11.8 percent), Glen Burnie (5.1 percent), Baltimore City (4.6 percent), Columbia (1.5 percent), Severna Park (1.5 percent), the U.S. Naval Academy (1.3 percent), and other locations.

Table 3.6: Employment Location of City of Annapolis Residents

Location	Percent
Annapolis	19.7%
Parole	11.8%
Glen Burnie	5.1%
Baltimore City	4.6%
Columbia	1.5%
Severna Park	1.5%
Naval Academy	1.3%
Rockville	1.2%
North Bethesda	1.1%
Bowie	1.0%
Other Locations	51.2%
Total	100.0%

Source: US Census Bureau 2010, Vantage Point



At-place employment refers to all employees of establishments located in a specific geography, regardless of where those employees live. It is distinctive from the labor force in that an at-place employee may or may not reside in the same geography as their job.

There are 27,284 at-place employees in the City of Annapolis (compared to a labor force of 8,873 working-age residents). The at-place employment compared to labor force suggests that the City has a

relatively higher number of in-commuters (e.g. at-place employees that live outside the City) than out-commuters (e.g. residents that work outside the City). Three industries account for 72.6 percent of at-place employment: retail trade (23.3 percent), services (31.1 percent), and government (18.2 percent).

Approximately 12.2 percent of at-place employees who work in the City of Annapolis also live in the City. The remaining employees residing in a wide variety of surrounding communities such as Baltimore City (4.9 percent), Arnold (4.6 percent), Severn Park (2.7 percent), Parole (2.3 percent) and Glen Burnie (1.8 percent), and other locations (Table 3.7).

Table 3.7: Residential Location of Workers Employed in the City of Annapolis

Location	Percent
Annapolis	12.2%
Baltimore City	4.9%
Arnold	4.6%
Severna Park	2.7%
Parole	2.3%
Glen Burnie	1.8%
Bowie	1.6%
South Gate	1.6%
Cape St. Claire	1.5%
Crofton	1.4%
Other Locations	65.4%
Total	100.0%

Source: US Census Bureau 2010, Vantage Point

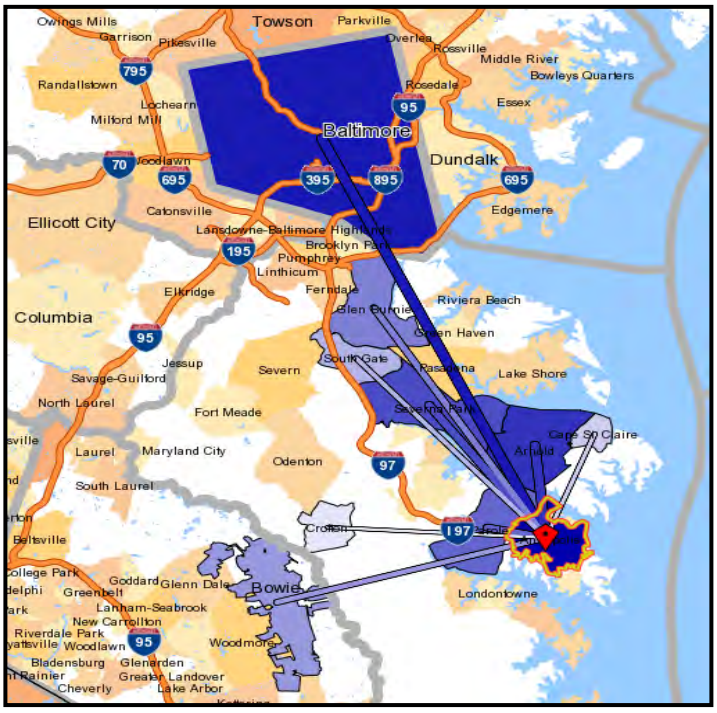


Table 3.8 summarizes the educational attainment of West Annapolis and the reference geographies. More than 55 percent of West Annapolis residents have a bachelor's degree or higher, compared to 38.8 percent in the City as a whole, 50.6 percent in the 5-minute drive time area, and 44.5 percent in the 15-minute drive time area.

Table 3.8: Population 25+ by Education Attainment (2005-2009)

Educational Attainment	West Annapolis	City of Annapolis	5-min	15-min
Less than 9th Grade	0.7%	5.3%	2.8%	2.6%
9th - 12th Grade, No Diploma	1.6%	7.6%	3.4%	4.9%
High School Graduate	3.8%	24.1%	2.6%	21.1%
Some College, No Degree	24.2%	17.1%	17.8%	18.2%
Associate Degree	2.5%	4.6%	5.6%	6.2%
Bachelor's Degree	31.0%	22.6%	29.3%	25.8%
Graduate / Professional Degree	25.4%	16.2%	21.3%	18.7%

Source: ESRI Business Solutions, Vantage Point 2013

3.3 Shopper Intercept / Merchant Surveys

Overview

Under a previous assignment with the City of Annapolis analyzing retail trends in the City, Vantage Point conducted various forms of surveying—including on-site intercept shopper surveys and online shopper surveys—to determine consumer preferences, shopping patterns and characteristics of West Annapolis residents, shoppers and visitors. The purpose of these surveys was to test the findings derived from the retail analysis and supportable development along with input received from key stakeholder interviews. Key data points surveyed from Annapolis residents, shoppers and visitors included type of locational shopping preferences, frequency of shopping, amount spent per retail trip, and retail desires and needs.

Survey Types

Vantage Point created various types and methods of surveys to identify shopper preferences of residents and visitors in the City of Annapolis. The surveys consisted of the following:

- On-site Shopper Intercept Survey (Initial): The onsite intercept survey was conducted during a mid-week and weekend period at various locations throughout the West Annapolis.
- Online Shopper's Preference Survey: Vantage Point utilized SurveyMonkey.com to create and administer an online shopper's preference survey, and posted a link advertising the survey on the City of Annapolis's Economic Development Corporations website. As a result, 94 online surveys were submitted by miscellaneous individuals.
- On-site Shopper Intercept Survey (May Visitors): As a follow-up survey to capture shopper preferences of potential seasonal residents and visitors, Vantage Point conducted an additional on-site shopper intercept survey at two different locations in the City in May 2012. Those locations were: 1) Dock Street, and 2) the Hillman Garage. As a result, 176 individuals participated in the survey.

These surveys are in addition to the information provided in the business owner interviews described in Section 1.5.

Results / Findings

This section describes the results and findings from the survey methods described above.

On-site Shoppers Intercept Survey (March-April 2012)

The 245 individuals participating in the survey indicated that they would like to see the following types of retail in the following commercial retail zones:

- **Forest Drive:** Full-service restaurants, sporting goods / hobby, specialty food stores, clothing and shoe stores, limited-service restaurants
- **Outer West Street:** Book and music stores, sporting goods / hobby, specialty food stores, jewelry, luggage and goods stores
- **Inner West Street:** Limited-service restaurants, specialty food stores, full-service restaurant, clothing and shoe stores, bars / taverns, book and music stores
- **Downtown:** Clothing and shoe stores, full-service restaurants, bars / taverns, and sporting goods / hobby
- **Eastport:** Clothing and shoe stores, specialty food stores, book and music stores, limited-service restaurants, electronics and appliance stores, and full-service restaurants
- **West Annapolis:** Limited-service restaurants, specialty food stores, full-service restaurants, sporting goods / hobby

Online Shopper's Preference Survey 2012

94 individuals participated in the online survey

- A majority (51.2 percent) of the surveyed individuals shop in the City of Annapolis several times a week. The remaining individuals surveyed visit once a week (13.8 percent), less than once a month (12.8 percent), once a month (10.6 percent), several times a month (8.5 percent), and never (2.1 percent).
- Of the individuals surveyed, 44.6 percent typically spend between $51 and $100 on an average retail trip in Annapolis, while 42.4 percent spend between $20 and $50. The remaining 13.0 percent of the individuals spend between $101 and $200.
- 50.5 percent of the surveyed individuals typically spend $51 to $100 on an average restaurant / dining trip in Annapolis, while 32.3 percent spend $21 to $50, 11.8 percent spend over $100, and the remaining 5.4 percent spend $1 to $20.
- A substantial majority (77.7 percent) of the individuals surveyed typically shop for retail goods at the Parole / Towne Center, while 70.2 percent shop at Westfield Mall, among various other locations throughout Annapolis and the region.
- The individuals surveyed, identified a clear need for the following shopping categories in the City of Annapolis: specialty food stores, book, periodical and music stores, full-service restaurants, and limited-service eating places. In addition, various other retail uses were identified as most likely being needed and include health and personal care stores, clothing and shoe stores, and office supplies, stationary and gift stores.
- A majority (67.3 percent) of the individuals surveyed would like to see the Market House become a multi-tenant market.
- A large portion of the individuals surveyed are part of a high income household, with 30.8 percent range between $125,000 and $200,000, 26.4 percent range between $75,000 and $125,000, and 25.3 percent over $200,000.

On-site Shoppers Intercept Survey (May 2012)

176 individuals participated in the survey

- A majority (57 percent) of the surveyed individuals live in the greater Annapolis area. The remaining individuals were from another state (16 percent), Washington DC / Northern Virginia (12 percent), Baltimore (11 percent), or elsewhere (4 percent).
- The initial purpose for visiting Annapolis was to shop and dine (36 percent), other (18 percent), visit historic / tourism attractions (16 percent), visit the USNA (11 percent), visit family and friends (10 percent), and visit due to other reasons such as boating, special events, and entertainment (9 percent).
- Aside from the 44 percent of surveyed individuals who were Annapolis residents, most other respondents were visiting Annapolis for a day trip only (40 percent). Other individuals were visiting for 3-4 days (7 percent), 2 days (3 percent), 5-7 days (3 percent) or longer (3 percent).
- A majority (51 percent) of the surveyed individuals visit Annapolis at least once a week, while 14 percent visit several times per month and 11 percent visit several times a year.
- The size of groups typically visiting Annapolis was generally small: individuals visiting unaccompanied accounted for 23 percent or respondents, while groups of two individuals accounted for 40 percent of respondents. The remaining 38 percent of the individuals surveyed were traveling in groups ranging from 3 to 20+ individuals.
- A large majority (80 percent) of groups visiting Annapolis did not include children.

- A majority (52 percent) of the individuals surveyed typically spend $20 - $50 on retail goods in an average visit to Annapolis, while 35 percent spend $51 - $100, 8 percent spend $101 - $200, and 5 percent spend over $200.
- 32 percent of the individuals surveyed typically spend $21 - $50 on restaurant / dining in an average visit to Annapolis, while 31 percent spend $1 - $20, 30 percent spend $51 - $100, and 8 percent spend over $100.
- Of the individuals surveyed, over 50 percent agree that a specialty food store / market specializing in seafood and produce are needed in Annapolis.
- 26% of the individuals surveyed have a household income range less than $50,000, while 22 percent range $50,000 to $75,000, 19 percent range $75,000 to $125,000, 9 percent range $125,000 and $200,000, 5 percent over $200,000, and 19 percent prefer not to respond.

Summary

Shopping and dining are the main reasons that individuals and small groups, typically unaccompanied by children, visit Annapolis. Respondents are predominantly Annapolis area residents, or those that frequently make day trips to Annapolis. The majority of respondents visit Parole Town Center or Westfield Mall for their retail shopping. Respondents typically spend up to $100 per retail trip to the City of Annapolis, and spend between $21 and $50 on dining and restaurant trips. Respondents have a strong desire to see specialty retail stores, full-service restaurants and limited-service eating places in the City of Annapolis, and over two-thirds of all respondents would like the Market House to be filled with multiple tenants.

3.4 Defining the Retail Mix

Retail Capture, Shopper Preferences and Tapestry Analysis

This section of the market analysis translates the demographic, household, income and other economic base variables into target market niches for the West Annapolis commercial area. In crafting these recommendations for retail targets, Vantage Point combined the quantitative data with the shopper preferences and insights gained from interviews with key stakeholders, interviews with retail/commercial brokerage specialists and an analysis of Tapestry Segmentation (described below). The purpose and results of the tapestry analysis are presented in the following paragraphs in summary, and then referenced in the recommendations for the West Annapolis commercial area.

Tapestry Analysis

To identify the lifestyle characteristics, product preferences and spending patterns of local residents within the West Annapolis commercial trade area, an evaluation of top “household tapestry” segments was performed. ESRI Business Solutions uses demographic information such as labor force characteristics, median income, age, and spending habits to categorize neighborhoods according to a trademarked Community Tapestry classification system.

Companies, agencies, and organizations often utilize segmentation to separate and categorize consumer markets to specifically identify their best customers and prospects. Neighborhoods are a source of people who are formed together by their similar interests; as such, housing, land value, available labor, infrastructure, transportation, school system, and other factors, and remain stable over decades. Intangibles such as economic opportunities, lifestyles, and overall ambience often separate and characterize neighborhoods.

Table 3.9 shows the tapestry segmentation of residents within the West Annapolis commercial trade area. The text below describes these segments in terms of their economic and demographic characteristics at the national level (i.e. the statistics in the descriptive paragraphs represent averages for neighborhoods across the United States, not in West Annapolis specifically).

Table 3.9: Tapestry Segmentation Area Profile (Percent of Households)

Tapestry Segmentation Category	West Annapolis	5-Minute Area	15-Minute Area
Urban Chic	74.7%	26.3%	9.1%
Prosperous Empty Nesters	16.1%	11.7%	1.3%
Military Proximity	9.2%	2.2%	0.3%
Enterprising Professionals	-	19.1%	3.5%
Laptops and Lattes	-	15.4%	2.0%
In Style	-	7.7%	14.0%
Other*	0.0%	17.6%	69.8%

Source: ESRI Business Solutions, Vantage Point

* *The ESRI Tapestry Segmentation system includes 65 individual definitions corresponding to a wide variety of lifestyles and behaviors. The 15-minute area is comprised of 14 tapestry segments in addition to those shown in Table 3.9, none of which encompasses more than 11 percent of the total population.*

Urban Chic

Residents are professionals who live a sophisticated, exclusive lifestyle and consist mainly of married couple families. With a median age of 42.7 years and median household income of $82,524, the population is well educated, and popular jobs include management, professional, and sales positions in industry sectors such as scientific, technical, educational, or health care services. As these residents typically reside in urban settings, homeownership is at 69 percent and median home value is $723,596, more than three and one-half times that of the national median. These residents focus on lifestyle more than ambience, and shop at upscale establishments. Approximately 20 percent of households earn income from self-employment. These residents travel extensively, visit museums, attend dance performances, and drink imported wine and upscale coffee. Approximately 75 percent of the households in West Annapolis are characterized within the Urban Chic tapestry segment, versus approximately 25 percent of the households in the primary market area.

Prosperous Empty Nesters

Approximately 60 percent of residents are aged 55 years or older. Forty percent composed of married couples with no children living at home. The median age is 47.6 years, and median household income of $63,382. This population segment describes residents enjoying the move from child-rearing to retirement. Individuals still working are in well-established careers holding professional and management positions, especially in the education and health care industry sectors. These residents live in well-established neighborhoods, and housing consists mainly of single-family structures, with 77 percent of the units being built before 1980. Based on preferences, these residents place a high value on their physical and financial well-being. Nearly 70 percent have attended college. This segment comprises 16.1 percent of households in West Annapolis, a larger proportion compared with the 5-min (11.7%) or 15-min (1.3%) drive time area.

Military Proximity

Residents are the second youngest of the Tapestry segments, with a median age of 22.4 years. These residents are young, married, and beginning parenthood. The Armed Forces is a common career type for these residents: more than ¾ of the labor force are on active duty. The median household income is $41,240, and 72 percent of these residents have attended college. Moving is routine for Military Proximity residents, as 90 percent have moved within the last five years. Life revolves primarily around the family. They can be see shopping for children's products and clothing at major discount department stores. They subscribe to cable television, entertain their children with DVD's, and are comfortable with personal computers and the Internet. This segment comprises 9.2 percent of households in West Annapolis, a larger proportion compared with the 5-min (2.2%) or 15-min (0.3%) area.

Enterprising Professionals

Residents are young, educated, single, married, working professionals. They have a median age of 32.8 years and median household income is $63,837. More than ¾ of these residents have attended college. The most popular occupations among this segment specialize in management, finance, computer, sales, and office/administrative support. Individuals in this segment are young and mobile with increasing consumer clout. They communicate heavily through e-mail and cell phones. They are interested in computer, science, and technology magazines and often listen to alternative, public-all-talk, and sports radio. This is the second most predominant segment (19.1%) of households with in the 5-min area, although it is not part of the West Annapolis tapestry.

Laptops and Lattes

Residents are typically single and rent their homes rather than own. The average household size is 1.8 people, with a median age is 37.6 years and median household income is $84,612. The majority of housing is apartments in multiunit buildings. These individuals go online to check their e-mail, trade and track investments, check-up on the most recent news, and shop on sites such as amazon.com. They also place orders via phone. For recreation, these residents enjoy going to the movies, dance performances, rock concerts, museums, bars, nightclubs, baseball and football games, and professional basketball games. They regularly exercise at a health club and practice yoga, play tennis, and golf. This segment consists of 15.4 percent of the households in the 5-min area, compared to the 15-min (2.0%) area, but is not part of the West Annapolis tapestry.

In Style

Residents are typically professional couples, with a median household income of $65,387 and a median age of 40.5 years. They are more educated compared to national averages. Nearly half (46 percent) of employed residents have professional or management positions. They live in affluent neighborhoods of metropolitan areas. These individuals are computer savvy and go online to research real estate information, do their banking, track investments, and trade stocks, etc. They utilize financial planners to invest in stocks, bonds, money market funds, money market bank accounts, and securities. They stay fit by exercising and eating a healthy diet. They hire professional household cleaning services and utilize contractors for kitchen remodeling. This segment comprises 14.0 percent of the 15-min area (14.0%), 7.7% of the 5-min area, and is not present in West Annapolis.

Impact on the Retail Mix

The Tapestry segments described above provide an overall summary of the characteristics of the residents in West Annapolis. These characteristics can inform the ideal mix of retail categories, type within the category and price point. Approximately 3/4 of West Annapolis households are characterized within the Urban Chic Tapestry Segment versus approximately 1/4 of the households in the primary market area. Urban Chic residents are characterized as well educated professionals whose retail and entertainment interests include upscale stores, food, and drink; natural/organic foods and health products; museums, dance, and other cultural activities.

3.5 Retail Analysis & Supportive Development

Overview

This section of the report analyzes the retail supportable development for West Annapolis based on a reasonable capture of the 5-minute drive time area and projected capture of retail potential based on 2013-2018 growth in households and income. The retail analysis in this section focuses on the primary trade area for West Annapolis, the five-minute drive time market area. The retail capture projections and recommended retail types in this section are based on retail sales and expenditure calculations, field surveys, interviews, secondary data and shopper preference needs from a shopper intercept and internet survey conducted in 2012. The methodology is described in greater detail below.

The retail development targets presented in this section reflect Vantage Point's quantitative analysis of potential sales, store performance, and supportable square footage, as well as the qualitative results of the shopper preference surveys and key stakeholder interviews. The results and recommendations provided here offer a general guide for the types of retail uses that could be targeted in West Annapolis, and should be used as one of a number of tools and data sources in addressing area goals and objectives, and as appropriate, enhancing/expanding existing retail and/or attracting new retailers.

The West Annapolis commercial area includes a variety of retail, commercial and service uses creating an eclectic and attractive commercial area. The area includes the West II Shopping Center anchored by Graul's Market supermarket; various retail establishments, including PNC Bank, Rite Aid, Redd's Automotive, and a wide variety of specialized retailers along Annapolis Street. The area also includes various food establishments, including Gus Leanos Deli, BB Bistro, Regina's Restaurant, Great Harvest Bread, Canton Restaurant, Naval Bagels, Bella Italia, and 7-Eleven.

Retail Analysis & Supportable Development Methodology

Vantage Point examined a variety of retail categories, provided by ESRI Business Solutions, as well as demographic data, stakeholder interviews, previous shopper preference surveys, analysis of retail competition and other factors to determine potential retail opportunities for West Annapolis using the following 4-step method:

- Step #1: Identify Retail Trade Areas
- Step #2: Analyze the existing retail demand (expenditures) and retail supply (sales) to determine retail capture rates. (The proportion of demand in a given retail trade area that results in retail sales in West Annapolis.)
- Step #3: Determine the likely future (2018) retail demand in the 5 minute drive time primary trade area and the capture of retail expenditure potential and potential future West Annapolis retail sales
- Step #4: Translate the estimated future retail sales into supportable additional square feet and/or enhanced retail store performance (sales/SF) for West Annapolis by retail category.

Step 1: Identify Retail Trade Area

The primary retail trade area can be defined as the area from which majority of the retail demand for retail establishments in West Annapolis is derived. The definition of a Primary Trade Area is based on analysis of the following factors, all of which are described in greater detail in earlier sections of this report:

- Economic and demographic trends
- Transportation networks
- Drive times
- Physical boundaries
- Tapestry analysis
- Key stakeholder/commercial broker interviews
- Competitive retail centers
- Shopper preference surveys (in-person intercept and internet survey)

Based on the analysis of these factors, the primary trade area for which retail sales can be captured in West Annapolis is a five minute drive time surrounding the West Annapolis commercial neighborhood, and depicted in Figure 3.1 below.

Figure 3.1: Primary Trade Area for West Annapolis

Step 2: Analyze Expenditures and Sales to Determine Retail Capture Rates

Calculating the supportable square feet for small commercial areas is a challenging undertaking. The methodology described below includes both quantitative and qualitative analyses and findings that incorporate numerical data and non-numeric information from interviews and shopper preference surveys.

Quantitative Analysis. Utilizing data provided by ESRI Business Solutions, Vantage Point analyzed the retail demand and retail supply of relevant retail categories that are appropriate for the West Annapolis area. For each retail category, total expenditure potential (demand) is calculated and is defined as the total amount of spending potential by the residents of the trade area for a typical good or service. The percent of total household income spent is based on the demographic characteristics of the trade area. Area retail supply is also estimated for each trade area based on the number of establishments and employees. Existing sales are in turn estimated based upon the characteristics of supply and available secondary data.

Qualitative Analysis. Using our experience in Annapolis and being a West Annapolis business, Vantage Point conducted interviews, a field survey and other secondary source data gathering and analysis to confirm and adjust the ESRI data. This firsthand, on the ground approach provides important context and reality to the forecasts.

In estimating the order of magnitude of retail sales, performance level (sales per square foot) of stores in West Annapolis, Vantage Point undertook field surveys, interviews and secondary data analysis to identify the characteristics of West Annapolis businesses in terms of number and type of establishments and number of employees as shown in Table 3.10. There are a total of 28 retail establishments employing 174 persons based upon our field surveys, interviews and data analysis.

Table 3.10: West Annapolis, Business/Employees, June 2013

Category	Establishments		Employees	
	Num.	*Pct.*	*Num.*	*Pct.*
Retail	*28*	*9.8%*	*174*	*13.7%*
Auto Related	2	0.7%	4	0.3%
Food Stores	3	1.0%	27	2.1%
Furniture & Home Furnishings	1	0.3%	3	0.2%
Health/Beauty Products	3	1.0%	18	1.4%
Miscellaneous Store Retails	12	4.2%	51	4.0%
Eating/Drinking	7	2.4%	71	5.6%
Personal Services	*8*	*2.8%*	*39*	*3.1%*
Beauty	5	1.7%	24	1.9%
Health	3	1.0%	15	1.2%
Finance Insurance/Real Estate	*23*	*8.0%*	*78*	*6.2%*
Services Summary	*189*	*65.9%*	*772*	*60.9%*
Professional Science/Technical	65	22.6%	253	20.0%
HealthCare/Social Service	44	15.3%	187	14.7%
Other Services	80	27.9%	332	26.2%
Other	*39*	*13.6%*	*205*	*16.2%*
Totals	287	100.0	1,268	100.0%
Total Population	1,040			
Employees per Resident	1.22			

Source: ESRI, VPDA Field Surveys and Estimates

Vantage Point furthermore estimated the approximate square footage by store type, estimated sales by store type and calculated estimated existing sales per square foot. We undertook an iterative process based upon field surveys, interviews and data sources to refine our estimates as shown in Table 3.11.

The estimated 28 stores occupy approximately 88,500 SF and in 2013 are generating retail sales estimated at approximately $25.3 million or almost $300 per square foot. Based upon our field surveys, key stakeholder interviews and available secondary data sources and our experience in similar communities, these appear to be reasonable estimates.

These sales estimates for West Annapolis were then compared with estimated retail demand (expenditures) within the five minute drive time trade area. This allowed us to quantify the capture rates by various store types. Capture rates represent the proportion of retail potential or expenditures within the five minute drive time primary trade area that occur or are "captured" by retail establishments within West Annapolis.

Table 3.11: West Annapolis Retail Sales, Capture Rate of Primary Market Area (5-Minute Drive)

Retail Type	West Annapolis Existing SF (Est.)	West Annapolis Existing Sales Per SF ($)	West Annapolis Existing Sales ($)	5-min Primary Market Area Existing Sales ($)	Net Capture Rate (Sales/Demand)
Auto Related	3,500	$338	$1,183,400	$46,954,049	2.5%
Food Stores	32,000	$410	$13,142,700	$48,014,716	27.4%
Furniture/Home Furnishings	1,500	$213	$319,200	$5,529,340	5.8%
Health/Beauty Products	9,000	$246	$2,076,400	$18,032,818	11.5%

Misc. Retail Stores	25,000	$137	$3,415,500	$66,764,476	5.1%
Eating/Drinking	17,500	$296	$5,171,300	$27,741,162	18.6%
Total/Average	88,500	$298	$25,308,500	$213,036,561	11.9%

Source: ESRI, VPDA

These were "tested" for reasonableness based upon the supply and demand within the five minute drive time primary trade area. Based upon this analysis minor adjustments were made to the initial estimates of sales in West Annapolis to reflect the competitive market position within the primary trade area. Given the nature of the competitive supply within West Annapolis and the primary trade area, the overall average capture rate of approximately 12% is reasonable. Similarly, given the orientation of the retail supply in West Annapolis toward food stores, anchored by Graul's and the number of eating and drinking places higher capture rates would have been expected for these store types. As shown in the table the capture rate for food stores is approximately 27% and almost 19% for eating and drinking places.

The existing inventory of approximately 88,500 SF with sales of approximately $25.3 million or about 12% of the sales potential within the primary trade area establishes the base from which potential future retail sales, supportable square footage and retail mix can be evaluated.

Step 3: Determine the Future West Annapolis Retail Sales

Potential future retail sales levels in West Annapolis will be a function of growth in households and household expenditures within the primary trade area. Increased retail demand from the growth within the primary trade area, combined with the ability of the West Annapolis retail component to capture an increased proportion of this retail sales potential, will determine future West Annapolis sales. The number of households within the primary trade area is expected to increase by 1.8% over the 2013 through 2018 timeframe. During this time frame household income in the trade area is projected to increase at a rate of 3.2% per year, reflecting a combination of modest inflationary gains and even more modest gains in real income.

As shown in Table 3.12, the growth in the primary trade area households and household income will result in an increase of retail expenditures, i.e. demand potential from $213 million in 2013 to almost $251 million by 2018.

With improvements and enhanced marketing and merchandising within the West Annapolis area there is an opportunity to increase the current capture rate. We assume that an emphasis on specialty retail and eating and drinking places could result in approximately a 20% increase in the rate of capture. Other retail store types are assumed to increase their capture rate by approximately 10%. Estimates of capture rate for food stores are somewhat problematic as the current food stores enjoy a relatively high capture rate already. Given this already high capture rate we assume the ability to maintain this high capture rate and modestly increase it by 10%. In shown in the table the average capture rate is projected to increase from almost 12% to approximately 13.5%. Establishment types with the highest potential capture rate include food stores at approximately 30% and eating and drinking places at approximately 22.4%.

Table 3.12: Potential 2018 Retail Demand/Sales

Retail Type	Primary Trade Area Demand	West Annapolis Capture Rate	Potential West Annapolis Sales
Auto Related	$55,311,870	2.8%	$1,533,450
Food Stores	$56,561,335	30.1%	$17,030,311
Furniture & Home Furnishings	$6,513,563	6.4%	$413,619
Health/Beauty Products	$21,242,660	12.7%	$2,690,599
Miscellaneous Store Retails	$78,648,553	6.1%	$4,828,151
Eating/Drinking	$32,679,089	22.4%	$7,310,150

Total/Average	$250,957,069	13.5%	$33,806,279

Source: ESRI, VPDA

Applying the estimated capture rates to the potential retail demand allows us to estimate potential 2018 retail sales in West Annapolis. Overall retail sales are expected to increase from approximately $25.3 million to $33.8 million. This reflects a combination of both inflationary and real dollar increases. About one third of the increase reflects inflationary gains, about one third increases in retail capture rates and about one third of growth in households in the primary trade area and real dollar increases in primary trade area household income.

Step 4: Determine the Future West Annapolis Supportable Square Feet/Store Performance

These projected retail sales increases can be translated into enhanced performance for existing retail establishments and/or support for additional retail square footage. Given the shortage of available potential new retail sites and the current performance level (sales per square feet) of existing West Annapolis retail establishments it is envisioned that the preponderance of this increased retail sales potential will translate into improved performance for existing establishments with minor potential infill. The analysis however provides guidance on the type of retail establishments that can be emphasized and supported.

In order to assist in providing guidance for the community, retail merchants and the public sector, we have evaluated the potential implications of 2018 retail sales in West Annapolis from both potential additional supportable square footage and the potential enhanced sales performance of existing establishments.

Table 3.13 displays the 2013 West Annapolis retail inventory in terms of square footage and the projected 2018 West Annapolis retail sales by store type in order to estimate additional supportable square feet.

Table 3.13: Potential 2018 Supportable Square Feet by Retail Category

Retail Type	Potential 2018 West Annapolis Sales	Baseline Sales Performance ($/SF)	Estimated 2018 Sales @ Estimated Performance Level	2018 Residual Sales Potential to Support Additional SF	2018 Additional Supportable SF
Auto Related	$1,533,450	$372	$1,301,300	$232,150	624
Food Stores	$17,030,311	$451	$14,432,000	$2,598,311	5,761
Furniture\Home Furnishings	$413,619	$234	$351,450	$62,169	265
Health/Beauty Products	$2,690,599	$271	$2,435,400	$255,199	943
Misc. Retail Stores	$4,828,151	$151	$3,767,500	$1,060,651	7,038
Eating/Drinking	$7,310,150	$326	$5,698,000	$1,612,150	4,951
Total/Average	$33,806,279	$328	$27,985,650	$5,820,629	19,584

Source: ESRI, VPDA

A projected baseline sales performance has been estimated assuming that sales per square foot increases over the 2013 through 2018 timeframe at approximately the rate of inflation or 2% per year, (commonly referred to as sales in existing stores). Applying this baseline sales performance to the existing inventory allows us to estimate the proportion of 2018 sales that would be captured by existing stores (given this sales performance assumption). The difference between the sales captured by establishments in the existing 2013 inventory and total 2018 retail sales results in the calculation of residual sales potential that is available to support additional retail square footage. For purposes of analysis we have assumed that the potential additional stores would experience the same sales per square foot performance levels as the existing establishments.

Based upon these assumptions up to almost 20,000 SF of additional retail space could be supported. This would be comprised primarily of specialty retail opportunities (7,000 SF), eating and drinking places

(5,000 SF) and food stores (almost 6,000 SF). Given the lack of potential sites for retail expansion it is unlikely that this additional retail space could be built. A large portion of the additional retail demand would likely result in enhanced performance of existing establishments.

Table 3.14 displays an analysis of how performance of existing retail establishments could be increased over 2013 through 2018 timeframe, assuming there was no change in the 2013 inventory. In this scenario the potential 2018 retail sales volume by store type is compared to the existing 2013 retail inventory by store type. As shown in the table while the projected baseline sales per square foot increasing at the rate of inflation averages $328 per square foot; the potential sales performance could average $382 per square foot given the projected 2018 sales and no increase in the 2013 retail inventory. This would represent a 16% higher sales performance level. The sales performance levels however are all capable of taking place within the existing retail sales inventory. The following section of the report discusses the potential implications of these findings.

Table 3.14: Potential 2018 Sales/SF Performance by Retail Category

Retail Type	2013 Existing Square Feet	Potential 2018 West Annapolis Sales	Baseline Sales Performance ($/SF)	Sales Performance (No Change in Retail SF)
Auto Related	3,500	$1,533,450	$372	$438
Food Stores	32,000	$17,030,311	$451	$532
Furniture\Home Furnishings	1,500	$413,619	$234	$276
Health/Beauty Products	9,000	$2,690,599	$271	$299
Misc. Retail Stores	25,000	$4,828,151	$151	$193
Eating/Drinking	17,500	$7,310,150	$326	$418
Total/Average	88,500	$33,806,279	$328	$382

Source: ESRI, VPDA

Findings and Retail Recommendations

Based on the analysis in previous analysis sections coupled with the 2012 shopper surveys, key stakeholder interviews and our field survey, the following retail categories should be considered for the West Annapolis area. These recommendations should be tempered with the understanding that smaller, more unique and eclectic offerings make up the bulk of the retail in West Annapolis, especially along Annapolis Street and that a combination of enhancing retail performance and modest retail infill are the most likely scenarios.

- Furniture, especially antiques: this business type builds on existing offerings with a stronger antiques cluster, and to cater to the upscale tastes of residents (demand is included in the "miscellaneous retail" category)
- Limited service restaurants: the analysis above supports 3.500SF -6,300SF of additional restaurant space in West Annapolis. Based on the results of the 2012 survey and observations of the area, both limited service and full service restaurants would be appropriate.
- Smaller full service restaurants: together with limited service restaurants, these establishments would provide an array of dining options.
- Health and Beauty, and Related: West Annapolis provides neighborhood serving retail and services, among them health and beauty stores. In addition, and in support of the retail offerings, there are a number of health related establishments in the market area that would support this additional retail.

3.6 Market Analysis: Residential Demand

This section assesses the current and potential future demand for residential development in the greater West Annapolis area, and then estimates how much of that demand could specifically be captured by new West Annapolis residential development. The section in organized in to four components:

- Market area definition
- Existing housing market supply and demand trends
- Sources of demand
- Potential Barton Farm capture

Market Areas and Conditions

For the purposes of this analysis, the residential market area from which the West Annapolis neighborhood could draw the majority of its demand capture will come from within a 30-minute drive time. In reality, new home owners could come from anywhere in the state or country; however, is it necessary for forecasting purposes to define a more specific area. Vantage Point's assumption is that, absent any new residential units, inflow (residents moving to West Annapolis) and outflow (residents moving away from West Annapolis) will cancel each other out; thus, the new household growth is the demand base.

Sources of Demand: Household Growth

The analysis below takes into consideration two measures of household growth and uses both to inform the projections and recommendations:

- West Annapolis Neighborhood: The growth in the West Annapolis area itself will make up one end of the range of potential residential growth.
- 30-Minute Drive time Area: Similar to the methodology employed for retail above, the relative share of the West Annapolis households to households in the 30-minute drive time will be calculated and used for forecasting purposes.

Potential Market Capture

Table 3.15 shows the projected household growth in West Annapolis and the 30-minute drive time, as well as the relative ratio of West Annapolis households to the 30-minute drive time over the 2012-2017 time period.

Table 3.15: Housing Unit Projection, West Annapolis, 2012-2017

	Census 2010	2012	2017	2013-2018 Change	Annual Change
West Annapolis	434	447	481	34	7
30-minute drive time area	405,718	410,816	424,733	13,917	2,783
West Annapolis Share of HHs	0.107%	0.109%	0.113%	0.04%	0.008%

Source: ESRI, Vantage Point

Residential Conclusions

Using the two methods of calculating residential demand, the West Annapolis area could absorb as many as 16 to 34 new units over the 2013-2018 time period, or approximately 3-7 units annually. This finding utilizes conservative capture rates, and would require additional land availability or multi-level development. Given the current make-up of the West Annapolis area, and lack of potential infill sites,

while there is supportable demand, there is insufficient land/building space available to achieve this potential.

New residential development in the short-term will likely be infill, rehab and other single-property developments. Should an appropriate development site be located, larger scale residential development could be supported in the mid-term as the residential market continues to regain strength and private residential developers reenter the market.

3.7 Long Term Forecasts

While demographic trends can fairly accurately be forecast out 20-30 years, the lens by which market forecasts are made is typically much shorter. The forecasts provided above represent the present to 2018 time period. Given the current trends and growth in the market, it is reasonable to project that these absorption growth rates will continue to 2020 as well as to over the 2020-2030 period as well. In which case, the retail absorption in the West Annapolis district would be an additional 7,800 SF through 2020, for a total of 27,400. Over the 2020-2030 period, and assuming a comparable growth in population and income, an additional 40,000 square feet would be supportable in the greater West Annapolis District. This represents a total of over 67,000 SF of additional retail square feet in West Annapolis.

Similarly, the residential projections through 2018 would be expected to continue at the same, or likely a slightly faster rate, though the 2020 period and full 2030 Comprehensive Planning period. This would result in the support for approximately 120 new households in the West Annapolis area over the present-2030 time period.

Supportable vs. Achievable

It is important to note, as described in greater detail below, that the present-to-2030 forecasts above represent the total "potential supportable" retail square feet and residential units in the District, but not necessarily what is practical, physically supportable or recommended. In the section below, constraints on development that would capture the full development potential are described in greater detail.

Constraints on Development

The retail forecasts in this section and the residential forecasts in the following section present the total possible absorption of space over the 2013-2030 comprehensive plan period. That is not to say that this amount of space will physically fit within the area or that current policies, preferences, and/or ordinances will allow for it to occur.

Neighborhood Character and Culture

A primary constraint on development, at present, is that the forecasts above do not fit within the current West Annapolis neighborhood character and culture. This is a walkable tight-knit, single family detached district with small ground floor retail with commercial density only in the southeast corner. The addition of the maximum supportable residential units or retail space would require significant increase in residential density and the redevelopment of the dense commercial node. At this time, such density increases are not favorable to the existing citizen base. The plan should reflect that should the neighborhood character change, there is sufficient potential demand to increase residential densities.

Land Constraint

A common theme expressed by business owner interviews, as well as stakeholders contacted throughout the Sector Study process, was the degree to which regional traffic affects the economic potential of West Annapolis. In particular, stakeholders often feel that traffic (especially on weekends) discourages or prevents potential customers from entering West Annapolis. The causes and recommended approaches to address traffic congestion in West Annapolis are discussed in Chapter 2. While a study of the links between traffic and reduced economic activity was beyond the scope of this study, it is reasonable to conclude that improved traffic conditions would reduce barriers (perceived or actual) for potential West Annapolis customers.

Land Constraint

The West Annapolis neighborhood is largely built out as a suburban residential neighborhood with low density retail, low rise office and a commercial node along Rowe Blvd and Taylor Ave. As such, there is limited land availability for additional retail uses. The largest opportunity for additional retail is in the Rowe/Taylor area but would require redevelopment of existing parcels currently occupied with income producing companies. Looking longer term, out to 2020 or beyond, redevelopment of the Grauls shopping center (not planned at this time) to a higher density development, possibly with second floor uses and structured parking, would allow for significant increase in the retail space available in the market.'

Parking Constraint

While there is sufficient off-street parking in the overall West Annapolis District for West Annapolis business uses, that parking is not being shared, nor is it included in a parking management plan. From field surveys conducted as part of this project, it is evident that the offices along Giddings and Ridgely have a modest daily parking surplus, and that their parking lots are largely empty from 6:00pm on.

More important, current City parking requirements and residential parking zones in the West Annapolis area may be barriers to recruiting some of the uses described in Section 3.6. Because there is no formalized policy or accommodation for shared parking, restaurants, delis and other uses with larger parking needs (and larger parking requirements under City codes) are not able to secure or construct the required amount parking, and thus cannot locate in the District. This prevents one of the stronger and higher potential uses, an upscale full service restaurant, from locating in West Annapolis.

Shared parking is a tool through which adjacent property owners share their parking lots and reduce the number of parking spaces that each would provide on their individual properties. In a shared or managed parking program, parking can be shared among different buildings and facilities in an area to take advantage of different peak periods. For example, an office complex can efficiently share parking facilities with a restaurant or special events, since offices require maximum parking during weekdays, while restaurants and special events require maximum parking during evenings and weekends. As a result, the total amount of off-street parking for the District overall could potentially be reduced 40-60% compared to the sum of standard off-street parking requirements for each destination

Shared Parking has been used in traditional, walkable, commercial nodes for decades, including communities throughout Maryland. Such mixed-use neighborhoods often have shops, offices, residences, and entertainment uses side-by-side. By taking advantage of different peak hours of parking demand, shared parking reduces the costs and land requirements of parking.

Once permitted under City codes, shared parking could be implemented on an individual basis (i.e., two businesses agreeing to share parking), or district-wide. Parking districts are often implemented and encouraged by establishing parking sharing brokerage services to match potential sharing partners, which can be provided by a *Transportation Management Association*, local government agency, or business improvement districts. West Annapolis could form an oversight committee that responds to concerns of business owners and operates the parking sharing brokerage committee.

To enable shared parking, the City's zoning ordinance (and any other relevant land development ordinances) should be amended. This revised language should introduce the principals behind shared parking, the conditions under which shared parking is a viable solution—such as when it is determined that cumulative shared parking for multiple establishments with different peak parking periods is a viable solution. The zoning ordinance can still require minimum parking conditions per use, and parking can be distributed to local private lots based on the parking occupancy rates and parking generation tables. New development process can utilize "Shared Parking Agreements" during the development and zoning process to account for parking requirements.

Planning Implications

The forecasts described in this report provide guidance through the 2018 period, or approximately 5 years. Based on current trends in household growth, expenditure potential and other factors, the absorption rate through the 2018 period would be expected to continue through the 2030 period. However, the physical boundaries of the West Annapolis district will not increase over that period and the only way to increase retail/residential absorption is to increase development density, which at the time of this report was not the desire of the West Annapolis resident or business base.

4. Additional Background Studies and Findings

This section summarizes findings related to existing land use, zoning, and recreation conditions in West Annapolis.

4.1 Land Use and Zoning, and Community Design

Land Use, Zoning, and Code Enforcement

Figure 4.1 shows the existing zoning districts in the Study Area. The majority of the Study Area is residential in character, with higher-intensity and higher-density uses closer to major roads (Rowe Blvd., Taylor Avenue, and Baltimore-Annapolis Blvd.). Existing land uses in the Study Area are generally consistent with their zoning regulations. The Wardour neighborhood is mostly zoned R1-A. Residences in this area tend to be large, with large lots and irregular lot sizes and arrangements. This character contrasts with the R1 district in West Annapolis, which generally follows a more linear development pattern. The R3 district is a part of the Naval Academy housing complex to the north and west of Badger Road. The R4 district denotes the Mariners Cove apartment complex.

The B1 (Convenience Shopping) district is also visually residential in appearance, consisting of businesses housed in former residential structures, or non-residential buildings that are residential in scale and character, with little off-street parking. The businesses in the B1 district have minimal off-street parking, and include a mix of local-serving establishments, such as limited-service restaurants, and boutiques whose clientele comes from throughout central Maryland. The B2 (Community Shopping) district covers the Graul's shopping center, Hardesty Funeral Home, an office building (often referred to as the McCrone Building, for one of its largest tenants), the Seven-11 at the corner of Ridgely and Taylor, and their respective parking lots. Development in the remainder of the non-residential districts consists primarily of small to medium sized professional office buildings, many of which have dedicated off-street parking.

Observations from West Annapolis business owner interviews and other public comments received during the Sector Study process are summarized below.

- Interviewees noted that, while neighborhood residents would appreciate the presence of additional full-service restaurants, especially on Annapolis Street, current parking requirements for such establishments in the B1 zoning district are essentially impossible to achieve, given the limited land supply.
- Several businesses reported negative and even adversarial interactions with the City's code enforcement inspectors (particularly in the past), which led to delays in repairs, construction, and store openings.[8] Similarly, comments were made that the City's parking enforcement officials have not been prompt in posting parking restrictions for the business district's seasonal festivals, leading to parking violations being issued to drivers who were unaware of the restrictions.
- Business owners noted a lack of clear wayfinding and coordinated, distinct signage within the business district (including directions to parking and overall information).

Community Design and Aesthetics

Annapolis Street between Taylor and Melvin Avenues (the central spine of the B1 district) is generally acknowledged to represent the desired aesthetic character of the West Annapolis business district, and that street's appearance gives the entire community much of its public identity. West Annapolis has no formal homeowners' association. The Wardour Improvement Association (WIA) maintains open space within Wardour.

[8] Interviewees did not indicate whether they believed that this situation had improved in recent years.

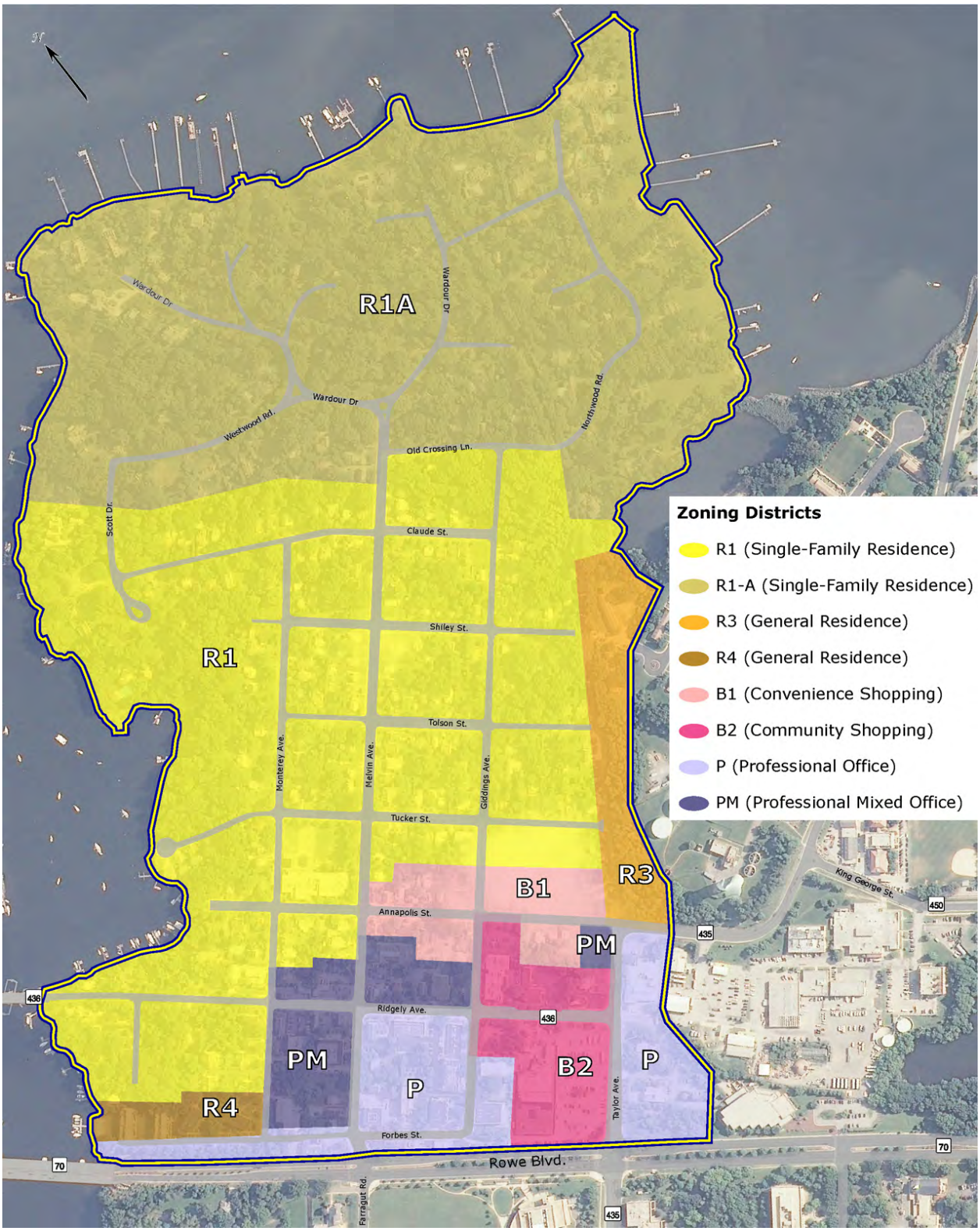


Figure 4.1: Zoning

Observations from West Annapolis business owner interviews and other public comments received during the Sector Study process are summarized below.

- Some business owners indicated that Annapolis Street's appearance does not convey the message that it is a business district, and that an enhanced streetscape would improve the business

environment. Specific ideas included wider sidewalks, more uniform street furniture, and pedestrian-oriented lighting. The lack of upkeep of vacant properties was a related concern.

The 2009 Annapolis Street Streetscape Study (included in this Sector Study as Appendix L) evaluated and made recommendations to improve Annapolis Street's visual appearance and commercial vitality. Major Study recommendations included:

- Create a focal point around the Annapolis/Giddings intersection. The recommended design included a small central circle containing a gazebo or similar structure.
- Develop a distinct signage system to enhance wayfinding and branding.
- Install distinct and consistent lighting, street furniture, and landscaping.
- Install traffic calming at intersections.
- Streamline parking policies and layouts.
- Improve and/or construct sidewalks to ensure safety, meet ADA requirements, encourage walking, and improve visual appearance.

The Streetscape Study was not an amendment to the Comprehensive Plan, and its recommendations therefore do not constitute official City policy. Nonetheless, West Annapolis residents participated in the Streetscape Study, continue to support many of its recommendations, and see the Study as a guide for how to improve the B1 district.

4.2 Recreation and Open Space

Overview

As stated in the Comprehensive Plan, recreation and open space are "integral to quality of life and…are an important part of the urban living experience." Park and recreation facilities can also be economic drivers, either through direct revenue-generating activities (i.e., user or rental fees) or indirect support of businesses. As an example, some West Annapolis business owners and residents point out that water-based recreation in Annapolis often generates onshore purchases of supplies and groceries, as well as restaurant patronage.

West Annapolis is served by a limited number of public recreation sites and open spaces. Public recreation facilities include the West Annapolis Elementary School fields and the Tucker Street boat ramp. In addition the Wardour Improvement Association (WIA) owns and maintains Wardour beach on the Severn River. WIA covenants allow access by residents of Wardour only. The WIA also owns additional lands throughout the Wardour community, including the majority of the former Baltimore and Annapolis Railroad right of way and several other parcels that generally contain natural ravines draining to Weems Creek and the Severn River. These parcels are not marked or developed for public access, but do provide relatively natural open space within the community.

Rowe Blvd. is difficult to cross on foot or bicycle, and Baltimore-Annapolis Blvd. has narrow sidewalks and no marked bicycle lanes. These barriers make it difficult for West Annapolis residents to access other parks and recreational facilities in and near Annapolis (such as the Baltimore-Annapolis trail across the Naval Academy Bridge, as well as parks in other neighborhoods).

Elementary School Property

The ball fields and playgrounds at West Annapolis Elementary School are the community's only large public space for recreation. The school grounds serve as a primary community gathering point for residents. Steering Committee members, interviewees, participants at public meetings, and others frequently described the importance and value of this recreational function.

A planned modernization of West Annapolis Elementary School will unfortunately consume a substantial portion of the school's public recreation space. As discussed during the July 11, 2013 Steering Committee meeting, school expansion is necessary to meet state school facility standards, and to provide space for a 40-student increase in capacity (from 274 to 314). The school modernization and redesign effort is led by AACPS, is separate from (and started considerably before) the Sector Study, and had a separate public engagement process. Construction could begin in 2014. The Sector Study acknowledges that the loss of open space at the school site will negatively impact the community; however, given the work that has been devoted to the school design process, the Sector Study does not recommend revisiting the school design on a comprehensive basis.

Issues and Sites Considered

Based on the information above, the need for new public recreation and open space serving West Annapolis is acute. One of the Sector Study's major objectives is to identify potential locations for such facilities, as well as the likely or intended use of those facilities.

As part of its deliberations, the Steering Committee identified and discussed the merits of several candidate locations for new recreation facilities. New recreational land could be acquired through a real estate transaction or voluntary dedication by the property owner, and not through eminent domain. New recreation and open space options considered are listed below.

- Conversion of the former Baltimore and Annapolis Railroad (B&A) right of way to a multipurpose trail. The trail would be connected to the B&A Trail at the Naval Academy Bridge through the Naval Academy housing campus via Beaver Road, and/or via an on-road trail along Baltimore-Annapolis Blvd. This concept would also link the informal recreation spaces at the east ends of Tolson, Shiley, and Tucker Streets. Subsequent recommendations from residents also suggested acquiring some land near the Wardour Bluffs apartment complex (adjacent to the B&A right of way at the end of Badger Road). This concept is included in the final Sector Study.
- Acquisition of infrequently-used parking spaces on Tucker Street, adjacent to West Annapolis Elementary School, and conversion of those parking spaces into additional school open space land (i.e., mitigating some of the open space lost due to school reconstruction).
- A vacant parcel at the corner of Claude Street and Giddings Avenue, for potential use as a tot lot or playground. This site was later determined to be needed for stormwater management, and is too close to adjacent houses to provide an appropriate site for a park.
- Undeveloped land on the north side of Annapolis Street between Tara's Gifts and Art Things (just north of Taylor Avenue), for potential use as a pocket park. This site was later determined to be unsuitable for a pocket park due to steep topography and the complexity of acquiring land.
- A floating dinghy dock in Weems Creek, in the vicinity of (and with a walkway connected to) the Tucker Street boat ramp. Such a facility would facilitate public water access (including fishing or crabbing, in addition to boating) for a wide variety of users, and could also enhance economic opportunities in West Annapolis (i.e., marketing Graul's as a provisioning location for sailors).
- A recreational path near the wetland area along the unimproved right-of-way at the west end of Shiley and Tolson Streets (adjacent to the portion of Weems Creek known locally as "Wimsey Cove"). After discussion with nearby landowners and a tour of the area in question, the concept of a recreational trail was determined to be infeasible, and the walking trail concept was eliminated. Stormwater drains to Weems Creek from outfalls in both the Shiley and Tolson rights of way, and existing paths are on private property.

  However, there remains an opportunity to include an interpretive exhibit and overlook on City-owned property on Monterey Street (at Tolson Street). Such a project should be combined with future environmental restoration projects to improve stormwater management along both the Shiley and Tolson rights of way (see Section 5.4 for additional detail).

5. Summary of Recommendations and Implementation Actions

This section summarizes the recommendations of the West Annapolis Sector Study. Brackets following each bullet point indicate the entities responsible for implementation (either the City, Maryland SHA, Anne Arundel County, the US Naval Academy, or the West Annapolis Business Community), with the primary responsible agency or entity listed first. Figure 5.1 depicts the overall Sector Study recommendations.

5.1 Traffic and Transportation

Additional description of traffic and transportation recommendations, along with recommended priorities and preliminary cost estimates are provided in Section 2.7. The recommendations in this section and in Section 2.7 reflect input from SHA.

Road Improvements (Capital Projects)

- Widen and reconfigure Baltimore-Annapolis Blvd. between Taylor Avenue and Bowyer Road (USNA Gate 8). As shown in Figure 5.2, this proposed project would allow for separate through and turning movements, and would remove left turn movements into Gate 8, adding capacity and relieving some recurring congestion. [Maryland SHA, City of Annapolis]
- Contribute to and support the state's eventual recommended solutions to manage traffic on the US 50 Severn River Bridge. [MD SHA, City]
- Construct intersection chokers (widened curbs at intersections) to reduce traffic speeds and pedestrian crossing distances on Melvin Avenue at Ridgely Avenue, Annapolis Street (coordinated with West Annapolis Elementary School redesign), and other cross streets, as appropriate . Consider additional traffic calming measures for Melvin Avenue if chokers prove to be insufficient. [City]
- Modify traffic signals: Pursue installation of a "pedestrian hybrid" traffic signal at the Annapolis Street/Melvin Avenue intersection. This type of signal remains dark (or potentially in the same flashing yellow configuration as currently exists) until activated by a pedestrian pressing a "walk" button. Upgrade the existing flashing fire house signal to include pedestrian signals and phases. [City]

Traffic/Transportation Management

- Consider installing new Intelligent Transportation System (ITS) devices, such as closed-circuit television monitoring of key roads and intersections, permanent and temporary electronic message signs, speed cameras on Melvin Avenue near West Annapolis ES, and adaptive traffic signal controls for use during special events and extreme traffic conditions. [MD SHA, City]
- Work with SHA to design and implement Active Traffic Management along US 50, including barrier separation of local and through traffic, and variable speed limit controls to improve safety during seasonal traffic demand peaks. [MD SHA, City]
- Develop standard event management plans that include West Annapolis, specifically for events at the USNA stadium, main campus, City Dock, and other citywide events such as races or walks. Ensure that these plans reflect the input of residents and businesses in affected neighborhoods. Ensure that event fees fully fund City management of event traffic. [City, MD SHA]
- Consider citywide measures that would address traffic in West Annapolis and other areas. Recommendations include an ITS Plan for roads, parking, and transit; and a regional traffic management system and operations center (with state and county participation) to address traffic throughout Anne Arundel County and the Annapolis area. [MD SHA, Anne Arundel County, City]
- Install "Local Traffic Only" signs at entry points and turn lanes on Rowe Blvd. [City, MD SHA]

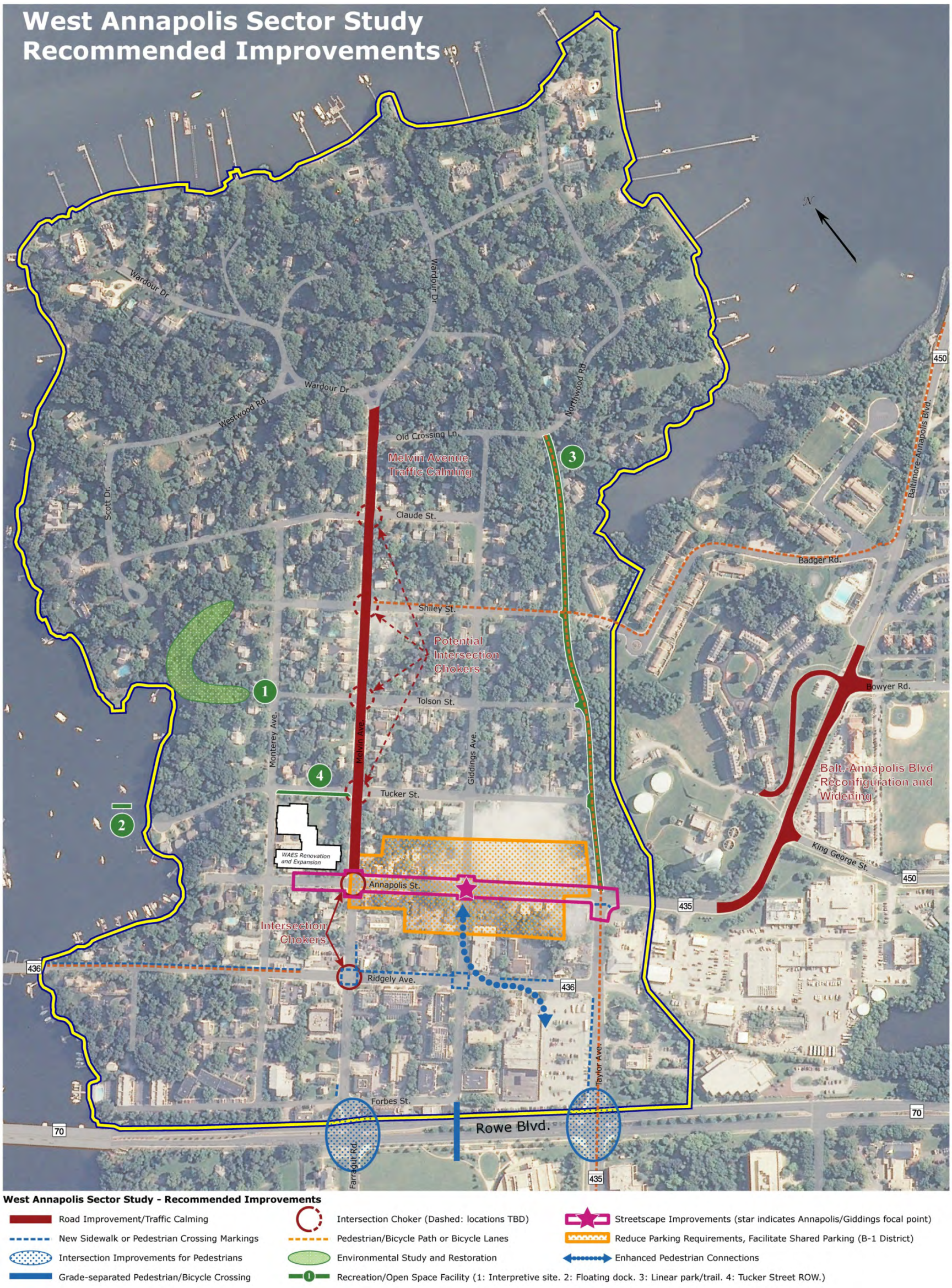


Figure 5.1: Sector Study Recommendations

Pedestrian/Bicycle

- Complete the sidewalk network in West Annapolis, especially on the north side of Ridgely Avenue between Taylor Avenue and Melvin Avenue, along Taylor Avenue adjacent to the Graul's shopping Center, and along Melvin Avenue between Rowe Blvd and Annapolis Street. [MD SHA, City]
- Repair existing sidewalks throughout West Annapolis. [City, MD SHA]
- Provide pedestrian markings and ADA-compliant ramps at all intersections served, or intended to be served by sidewalks, especially the intersections of Ridgely Avenue with Giddings, Melvin, and Monterey Avenues.
- Provide signage and pedestrian environment improvements (e.g., special paving, lighting, or other amenities, as appropriate) to guide pedestrians between the Graul's shopping center and Annapolis Street to reinforce both retail clusters and reduce traffic and parking demand. [City, MD SHA]
- Improve pedestrian safety for crossing Rowe Blvd. at Taylor Avenue and at the Melvin/Farragut intersection via high-visibility crosswalks, signage, and traffic signal prioritization. [MD SHA, City]
- Study the feasibility and conceptual design of one or more grade-separated (i.e., bridge) crossings of Rowe Blvd., especially if the Annapolis Branch Library is sited on currently vacant land at the intersection of Farragut and Rowe. This measure was not recommended through the Sector Study transportation analysis, but was suggested by many community stakeholders. [MD SHA, City]
- Develop an extension of the B&A Trail (with a separate off-road path) along Baltimore-Annapolis Blvd. and through West Annapolis, via Badger Road in the USNA housing area. [City, USNA, MD SHA]
- Implement the City Bicycle Master Plan's recommendations for West Annapolis (see Figure 5.3), including bike sharing stations, installation of bicycle lanes on Taylor Avenue, connection of West Annapolis to the stadium site via the Melvin Avenue/Farragut Road crossing, and the potential use of some sidewalks as shared pedestrian/bicycle facilities. [City, MD SHA]
- Coordinate with state and county agencies to develop options to extend bicycle and pedestrian connectivity on Ridgely Avenue across the Weems Creek drawbridge. [City, MD SHA, County]

Transit [City of Annapolis]

- Consider establishing regular Circulator Trolley service to West Annapolis—potentially with new bus stops—starting initially on weekends and at midday.
- Increase the frequency of Gold Line transit stops in West Annapolis during peak commute hours and during special events.
- Upgrade West Annapolis transit stops to include seating and shelters, as well as West Annapolis "branding" identification/ signage and community information/guide maps.

Parking [City of Annapolis]

- Revise the City's Zoning Code to reduce the number of required parking spaces for restaurants in the B1 district. This would facilitate establishment of full-service restaurants in the West Annapolis business district. A universal change to the B1 zoning would also affect portions of Eastport. The City should consider the potential impacts of such a change.
- Review the City's Zoning Code to ensure that shared parking requirements and procedures are streamlined and consistent with best practices in other jurisdictions.
- Initiate dialogue with the Navy Athletic Association to allow free parking at the Stadium lot (with validation) for courthouse users—to prevent illegal parking in the Graul's parking lot.
- Develop uniform parking signage designs and/or standards to be used by businesses to direct customers to individual or shared parking lots.

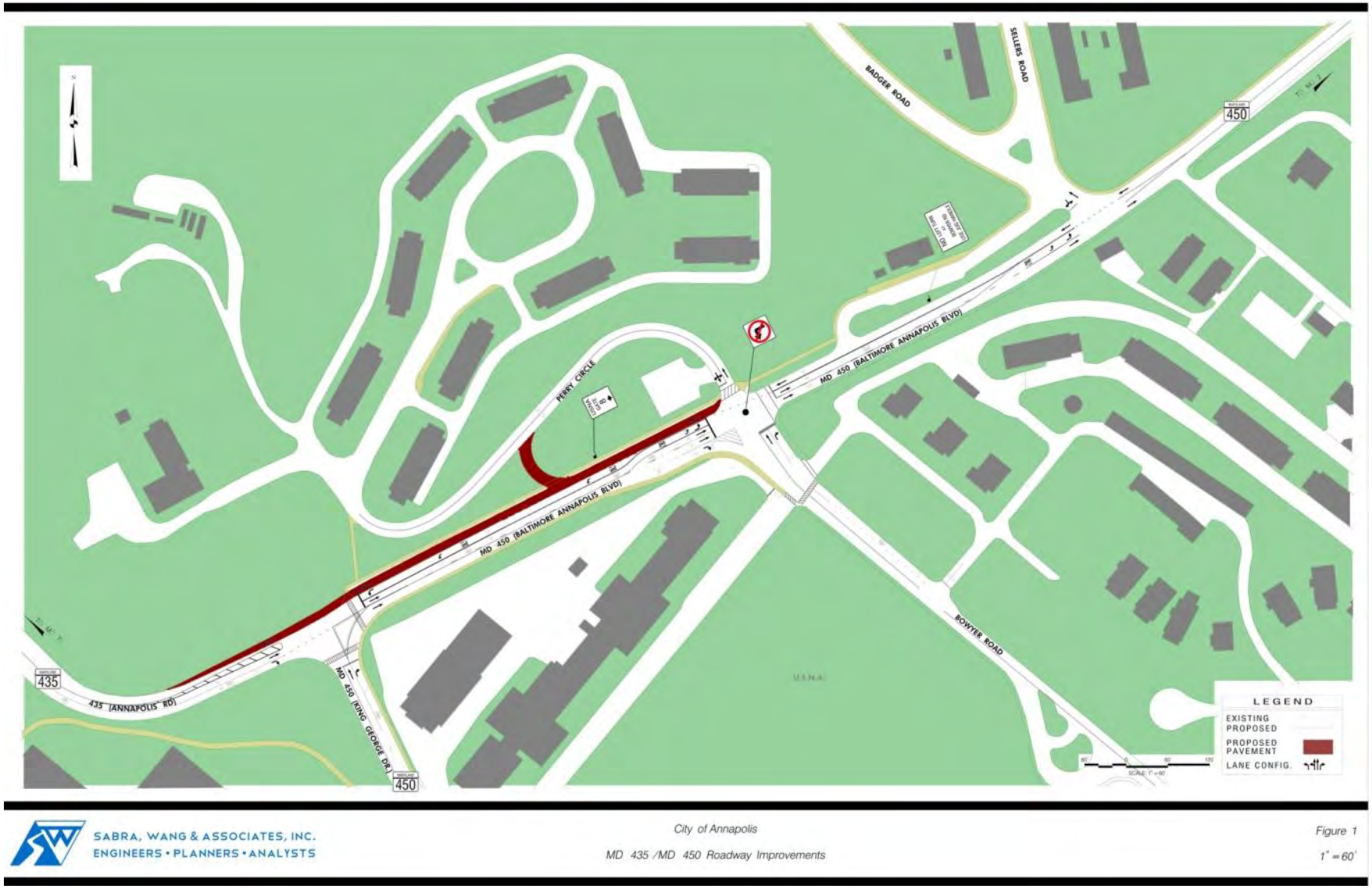


Figure 5.2: Conceptual Improvements to Baltimore Annapolis Blvd.

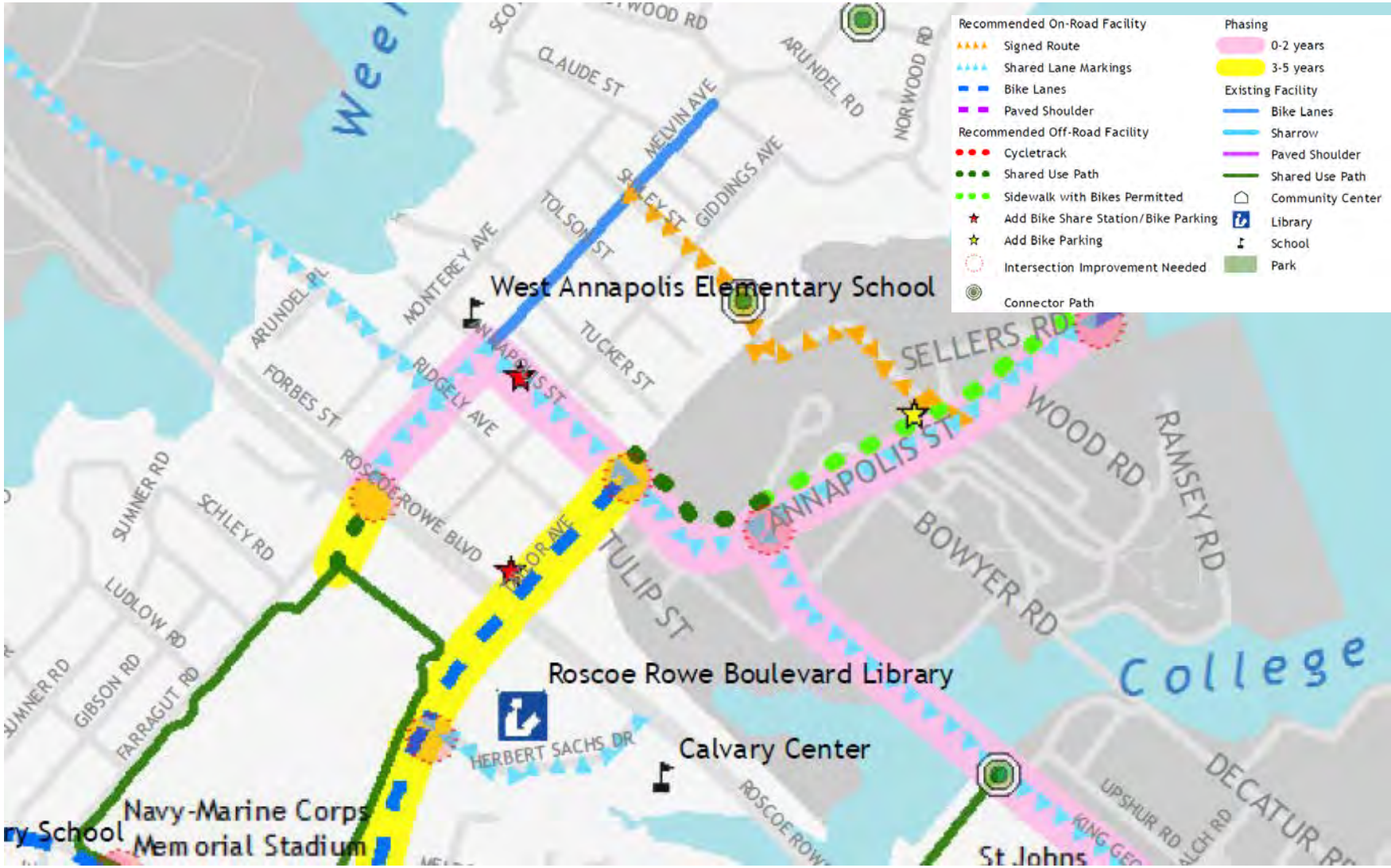


Figure 5.3: Annapolis Bicycle Master Plan Recommendations, West Annapolis

5.2 Economic Development [City of Annapolis, Business Community]

- Review administrative procedures to ensure that the City is responsive to West Annapolis needs, including: permitting, shared parking, prompt posting of temporary parking restriction signage for street festivals, and ensuring that West Annapolis is given equal footing (in the City's online information and printed materials) with other neighborhood commercial areas in the City.
- In conjunction with local business groups, continue to recruit businesses to the West Annapolis business district (Annapolis Street, Ridgely Avenue, Forbes Street, and the connecting roads between them) that build on the district's existing character, specifically:
    - Furniture and antiques stores;
    - Health and beauty-related businesses; and
    - Restaurants, including additional limited-service or small, full-service establishments.
- Ensure that parking and other land development regulations are revised as necessary and appropriate to remove barriers to such business recruitment.
- In conjunction with local business groups, develop a marketing campaign to advertise the West Annapolis business district, including advertising on Circulator buses and in official City literature.
- Work with businesses to establish voluntary but mutually acceptable "standard" hours of operation, especially for weekends and evenings, to ensure that the business district is coordinated, lively, and inviting during these peak shopping times.

5.3 Land Use, Zoning, and Community Design [City of Annapolis]

- Implement recommendations of the Annapolis Street Streetscape Plan (2008) related to:
    - design elements such as signage, street furniture, and light fixtures
    - special paving at the intersections of Annapolis Street with Taylor Avenue (SHA coordination required), Giddings Avenue, and Annapolis Street.
- Explore options, using the Streetscape Plan as a guide, for alteration of the Annapolis Street/Giddings Avenue intersection to convert it into a "town square" public space, while still maintaining traffic flow (see Figure 5.4). As part of this concept, install a gazebo-style information booth to orient visitors and provide a gathering point for residents.
- Ensure that property maintenance codes are enforced, especially for vacant buildings.
- Consider options for widening the Annapolis Street sidewalk. [City]
- Where appropriate and feasible, use the MainStreets Annapolis Partnership Design Handbook (in progress as of spring 2014) as a guide for the exterior appearance of new development, redevelopment, or exterior renovations of buildings in the West Annapolis business district (i.e., the B1, B2, PM and P zoning districts within the study area), and to ensure compliance with existing Site Design Standards (see Chapter 21.62 of the City's Code of Ordinances).
- As part of future physical improvements to Annapolis Street (i.e. sidewalk widening, repaved intersections, etc.), work with Baltimore Gas & Electric and other utility providers to place utility lines underground.
- This Sector Study does not support implementation of the Urban Center Low concept contained in the 2009 Comprehensive Plan; it further recommends retaining existing zoning district

designations and regulations in West Annapolis, except for the recommended change in parking requirements in the B1 district (see Section 4.1).

- As part of future Comprehensive Plan updates, the City should evaluate the effects of potential increased density (i.e., due to long-term redevelopment of the Graul's site) on school capacity.
- Conduct an historic survey of properties to catalogue the historic features of West Annapolis.

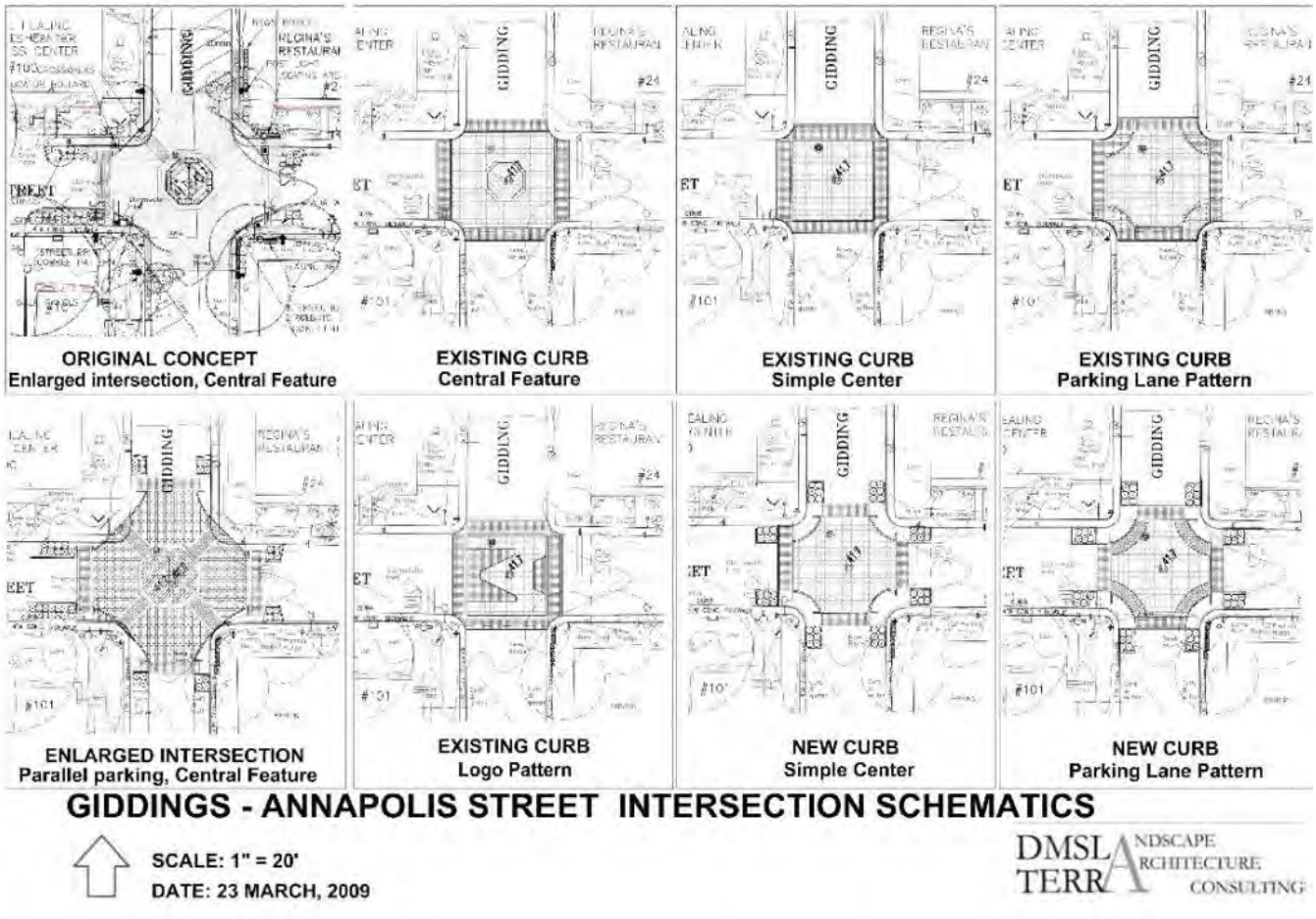


Figure 5.4: Annapolis Street Streetscape Plan Designs for the Annapolis/Giddings Intersection

5.4 Recreation, Open Space, and Environmental Considerations [City of Annapolis, Business Community]

Pursue the new recreation and open space facilities listed below, as well as other opportunities that arise. The numbers below correspond only to the Concept map, and do not indicate any specific priority or preference.

1. An interpretive station for the wetland area that feeds into Wimsey Cove (where the unimproved Shiley and Tolson Street rights of way converge at Weems Creek). Active use of or access to the wetland area is not envisioned, but interpretive materials should describe the ecological and historical significance of this ecosystem. A small portion of the undeveloped right of way on the north side of the Tolson/Monterey intersection could be used for an interpretive exhibit describing the ecological functions and historical setting of the wetland area, in conjunction with projects (funded by federal, state, or City government or non-governmental organizations) designed to reduce the effects of

stormwater flows. In developing the interpretive station, the City should work with the Severn Riverkeeper, the Maryland Department of Natural Resources, and community organizations to evaluate, design, and implement restoration projects to address water quality concerns caused by existing stormwater discharges in the unimproved Shiley and Tolson Street rights of way.

2. Floating dock adjacent and connected to the Tucker Street boat ramp. This dock would provide access for paddlers, and could also be used as a crabbing/fishing site.
3. Linear park and pedestrian/bicycle trail along the former B&A Railroad bed. In addition to serving the community, this could also serve as part of the connection of the B&A Trail to central Annapolis. This trail would not extend into the Wardour community (i.e., past Old Crossing Ln.).
4. As part of the anticipated reconstruction of West Annapolis Elementary School, work with AACPS to convert the existing parking on Tucker Street into an extension of the school's athletic fields/open space.