Anne Arundel County Transportation Center Feasibility Study

January 2020

Baltimore Metropolitan Council

BRTB Baltimore Regional Transportation Board

ANNE ARUNDEL COUNTY MARYLAND

KFH GROUP

WRA

Table of Contents

1.0 Executive Summary 1
2.0 Introduction 3
3.0 Existing Service and Previous Studies 4
3.1 AAOT 4
3.2 Annapolis Transit 6
3.2 Regional Transportation Agency (RTA) Existing Service 8
3.3 Other Transit Services 10
3.4 MDOT MTA 10
3.4.1 MDOT MTA LocalLink 67: Marley Neck (Energy Parkway) to Downtown (City Hall) 11
3.4.2 MDOT MTA LocalLink 69/70: Patapsco Light Rail Station to Annapolis/Jumpers Hole 12
3.4.3 MDOT MTA LocalLink 75: Patapsco Light Rail Station to Parkway Center 13
3.4.4 MDOT MTA Express Bus Link 164: Riviera Beach to Downtown 14
3.4.5 MDOT MTA Commuter Bus Service Route 201: Gaithersburg Park & Ride to BWI Marshall Airport 15
3.4.6 MDOT MTA Commuter Bus Route 210: Kent Island and Downtown Baltimore 16
3.4.7 MDOT MTA Commuter Bus Route 215: Annapolis and Downtown Baltimore 17
3.4.8 MDOT MTA Commuter Bus Route 220: Annapolis to Washington, D.C. 18
3.4.9 MDOT MTA Commuter Bus Route 230: Severna Park and Parole/Annapolis to Washington, D.C. 19
3.4.10 MDOT MTA Commuter Bus Route 250: Kent Narrows, Stevensville, and Davidsonville Park & Ride Lots to Downtown Washington, D.C. 20
3.4.11 MDOT MTA Commuter Bus Route 260: Severna Park and Davidsonville to Washington, D.C. 21
3.4.12 Young Transportation Services Commuter Bus Route 921: New Carrollton to Annapolis 22
3.4.13 MDOT MTA Light RailLink Service 22
3.4.14 MDOT MTA MARC Commuter Rail Service 24
3.5 Washington Metropolitan Area Transit Authority (WMATA) 26
3.6 Intercity Bus 26
3.6.1 Greyhound 26
3.6.2 Megabus 26
3.7 Existing Passenger Terminals and Park & Ride Lots 26
3.7.1 Arundel Mills Mall Transit Center 26

3.7.2 MDOT MTA Cromwell Light RailLink Station 27
3.7.3 MDOT MTA MARC Odenton Station 27
3.7.4 MDOT MTA MARC Dorsey Station 27
3.7.5 MDOT MTA Light RailLink BWI Business District Station 27
3.7.6 Amtrak/MARC BWI Rail Station 27
3.7.7 BWI Airport Shuttle 27
3.7.8 Park and Ride Lots 27
3.8 Planned Services 28
3.8.1 Central Maryland Transit Development Plan 28
3.8.2 City of Annapolis Transit Development Plan 30
3.8.3 Existing and Planned - Key locations 30
3.9 Facility Needs and Considerations 39
3.9.1 Location Issues 40
3.9.2 Local Usage Versus Transfers 40
3.9.3 Need for Flexibility in Design 42
4.0 Site Screening 43
4.1 Initial Screening 43
4.1.1 Existing Ridership 44
4.1.2 Site Eliminated 45
4.1.3 Sites Identified 48
4.1.4 Income and Housing by Census Tract 49
4.1.5 Existing Zoning 51
4.1.6 TOD Potential 52
4.1.7 Westfield Mall TOD 53
4.1.8 Annapolis Exchange TOD 54
4.1.9 Harry S. Truman Park and Ride TOD 55
4.2 Secondary Screening 56
4.3 Site Access and Layout 56
4.3.1 Westfield Mall Site Plan 57
4.3.2 Harry S. Truman Site Plan 58
5.0 Facility Prototype 60
5.1 Program Elements 60
5.2 Building Concept Plan 60
5.3 Westfield Mall Site Plan and Rendering 62
5.4 Harry S. Truman Park and Ride Site Plan and Rendering 64

6.0 Cost Estimate and Financial Plan 66
6.1 Westfield Mall Cost Estimate 66
6.2 Harry S. Truman Park and Ride Cost Estimate 68
7.0 Operational Plan 71
7.1 Transit Network Improvement Needs 71
7.2 Conceptual Plan 71
7.3 Operating Plan for Service Modifications 72
7.3.1 Adjusted Service Network 72
7.3.1.1 Layover 73
7.4 Local/Regional Routes Westfield Mall Analysis 73
7.4.1 AAOT – Yellow Route 73
7.4.2 AAOT – Gold Route Edgewater 80
7.4.3 AAOT – Gold Route College Parkway 80
7.4.4 AT Brown Route 80
7.4.5 AT Green Route 84
7.4.6 AT Red Route 84
7.4.7 AT Purple Route North 84
7.4.8 AT Purple Route South 84
7.5 Local/Regional Routes Harry S. Truman Park and Ride Analysis 91
7.5.1 Local/Regional Routes – Evaluation Based on Current Route Speeds 95
7.6 Commuter Routes 95
7.6.1 MDOT MTA Commuter Bus Route 210 Kent Island - Annapolis/Baltimore 99
7.6.2 MDOT MTA Commuter Bus Route 215 Downtown Baltimore to Annapolis 102
7.7 Decision Themes 104
8.0 Conclusion and Next Steps 106

List of Figures

Figure 1: AAOT Service Area 6
Figure 2: AT Service Area 7
Figure 3: Central Maryland RTA Service Area 8
Figure 4: RTA Routes Serving Anne Arundel County Service Area 9
Figure 5: MDOT MTA LocalLink 67 – Curtis Bay/Energy Parkway to North Avenue 11
Figure 6: MDOT MTA LocalLink 69/70: Patapsco Light Rail Station to Annapolis/Jumpers Hole 12
Figure 7: MDOT MTA LocalLink 75: Patapsco Light Rail Station to Parkway Center 13
Figure 8: MDOT MTA Express Bus Link 164 – Riviera Beach to Downtown 14
Figure 9: MDOT MTA Commuter Bus 201: Gaithersburg Park & Ride-BWI Marshall Airport 15
Figure 10: MDOT MTA Commuter Bus Route 210: Kent Island and Downtown Baltimore 16
Figure 11: MDOT MTA Commuter Bus Route 215 : Annapolis and Downtown Baltimore 17
Figure 12: MDOT MTA Commuter Bus Route 220: Annapolis to Washington D.C. 18
Figure 13: MDOT MTA Commuter Bus Route 230: Severna Park and Parole/Annapolis to Washington D.C. 19
Figure 14: MDOT MTA Commuter Bus Route 250: Kent Narrows to Washington D.C. 20
Figure 15: MDOT MTA Commuter Bus Route 260: Severna Park and Davidsonville to Washington D.C. 21
Figure 16: Young Transportation Commuter Bus Route 921: Annapolis to New Carrollton Metrorail Station 22
Figure 17: Microtransit Concept City of Annapolis TDP 31
Figure 18: Transit Service Arundel Mills Mall 32
Figure 19: Transit Service Westfield Mall 33
Figure 20: Transit Service Harry S. Truman Park and Ride Lot 34
Figure 21: Existing Bus Facilities 44
Figure 22: Study Area 45
Figure 23: Parole Growth Management Area 47
Figure 24: Potential Transit Center Sites 48
Figure 25: Percent of Families Below the Poverty Level 49
Figure 26: Number of Subsidized Housing Units 50
Figure 27: Parole Area Zoning 51
Figure 28: Westfield Mall TOD 53
Figure 29: Annapolis Exchange TOD 54
Figure 30: Harry S. Truman Park and Ride TOD 55
Figure 31: Westfield Mall Concept Plan 57
Figure 32: Harry S. Truman Park and Ride Concept Plan 58
Figure 33: Harry S. Truman Park and Ride Alternative Concept 59
Figure 34: Transit Center Elevation View Sketch 61
Figure 35: Transit Center Plan View Sketch 61
Figure 36: Westfield Mall Site Plan 62
Figure 37: Westfield Mall Perspective 63
Figure 38: Harry S. Truman Park and Ride Site Plan 64
Figure 39: Harry S. Truman Park and Ride Perspective 65
Figure 40: Westfield Mall Current Location 72
Figure 41: AAOT Yellow Route – Options 1 & 2 78

Figure 42: AAOT Yellow Route – Option 3 79
Figure 43: AAOT - Gold Route Edgewater 81
Figure 44: AAOT - Gold Route College Parkway (AACC) – Option 1 82
Figure 45: AT Brown Route – Options 1 & 2 83
Figure 46: AT Green Route – Options 1 & 2 86
Figure 47: AT Red Route – Options 1 & 2 87
Figure 48: AT Purple Route North – Option 1 88
Figure 49: AT Purple Route South – Option 1 & 2 89
Figure 50: AT Purple Route South – Option 3 90
Figure 51: Local Route Segment from Westfield Mall to Harry S. Truman Park and Ride 92
Figure 52: MDOT MTA Commuter Bus Route 210 Northbound – Options 1 & 2 100
Figure 53: MDOT MTA Commuter Bus Route 210 Southbound – Option 1 101
Figure 54: MDOT MTA Commuter Bus Route 215 – Option 1 103

List of Tables

Table 1: AAOT Routes 5
Table 2: AT Routes 7
Table 3: RTA Routes Serving Anne Arundel County 9
Table 4: MDOT MTA Bus Service in Anne Arundel County 10
Table 5: MDOT MTA Intersecting Rail Service 10
Table 6: MDOT MTA Light RailLink Service in Central Maryland 23
Table 7: MDOT MTA MARC Service in Central Maryland 25
Table 8: WMATA Services in Anne Arundel County 26
Table 9: Park & Ride Lots in Anne Arundel County 28
Table 10: Route Overlap Connections at Arundel Mills 35
Table 11: Route Overlap Connections at Westfield Mall 36
Table 12: Route Overlap Connections at Harry S. Truman Park and Ride Lot 38
Table 13: Potential Bus Bay Requirements – Parole Transit Routes 41
Table 14: Potential Space Requirements – Arundel Mills 42
Table 15: AT – APC Boarding Data at Westfield Mall 42
Table 16: Commuter Bus Boarding's at Park and Ride Lots 45
Table 17: Anne Arundel County Zoning Designations 52
Table 18: Proposed PGMA Policy 52
Table 19: Site Comparison Matrix 56
Table 20: Preliminary Cost Estimate Westfield Mall 67
Table 21: Summary Cost Estimate Westfield Mall 68
Table 22: Preliminary Cost Estimate Harry S. Truman Park and Ride 69
Table 23: Summary Cost Estimate Harry S. Truman Park and Ride 70
Table 24: Local/Regional Routes Proposed Route Alternatives Time Chart 74
Table 25: Local/Regional Proposed Route Alternative Time Chart Serving Harry S. Truman 93
Table 26: Route Analysis to Westfield Mall and Harry S. Truman Based on MPH 96
Table 27: MDOT MTA Commuter Bus Routes Proposed Route Alternatives Time Chart 98
Table 28: Local Service Operations Summary 105

List of Acronyms

AAOT	Anne Arundel County Office of Transportation
ADA	Americans with Disabilities Act
AT	Annapolis Transit
BMC	Baltimore Metropolitan Council
BWI	Thurgood Marshall Baltimore-Washington International Airport
MARC	Maryland Area Regional Commuter
MDOT MTA	Maryland Department of Transportation - Maryland Transit Administration
MDOT SHA	Maryland Department of Transportation – State Highway Administration
RTA	Regional Transportation Agency of Central Maryland
TDP	Transit Development Plan
TNC	Transportation Network Company
TOD	Transit Oriented Development
UPWP	Unified Planning Work Program
WMATA	Washington Metropolitan Area Transit Authority

1.0 Executive Summary

The Anne Arundel County Multimodal Transportation Center Feasibility Study has been prepared with the input and guidance of the Baltimore Metropolitan Council, Anne Arundel County Department of Transportation and Annapolis Transit. The study is intended to recommend the best locations for a transit center for the greater Annapolis area. The transit center feasibility study is a preliminary screening exercise and is the foundation for the next step as the basis to guide future decisions regarding the location of one or more transit centers in the Parole area.

The transit center feasibility study is intended to address the needs of various local and regional transit providers while maintaining a safe and comfortable environment for pedestrians, cyclists and motorists. Adjoining land use, environmental features, transit-oriented development opportunities, low income households, location of subsidized housing, site access and circulation, facility design, current and planned ridership growth were factors in the initial site screening process. Two sites were eliminated from the original screening process; Arundel Mills Mall located between MD 295 and MD 100 and the Annapolis Exchange site located in the Parole Growth Management Area, between US 50 and Jennifer Road.

In a presentation to the County Executive it was decided to retain two sites for further evaluation; Westfield Mall and Harry S. Truman Park and Ride. At the Westfield Mall site, the transit center would be located on the mall property near the intersections of Generals Highway 178 and Bestgate Road. Bus service to Westfield Mall would continue as it does today. Harry S. Truman Park and Ride would be reconfigured with the transit center located in the area where customers currently wait for buses.

Conceptual site and architectural plans were drawn for each site accommodating pedestrian, bicycle, vehicle and bus access. One 2,500 square foot building prototype was designed and illustrated at both sites. Conceptual order of magnitude cost estimates were developed. Construction cost at Westfield Mall transit center were estimated at $8.4M, slightly higher than $7.7M for Harry S. Truman Park and Ride transit center.

Each site serves different purposes for the transit customer. Westfield Mall is primarily an origin and destination, for the community and employees of the mall. Local transit providers offer service to Westfield Mall throughout the day. Harry S. Truman Park and Ride is long haul commuter based with morning and evening peak commuter bus service requiring all day parking.

It is recommended that both the Westfield Mall transit center and Harry S. Truman Park and Ride improvements move forward as separate but related projects. The Westfield Mall transit center would be designed and constructed primarily for local bus services in close collaboration with; the Mall's ownership, Annapolis Transit and Anne Arundel County. The Harry S. Truman Park and Ride improvements would reconstruct the existing bus loading area to upgrade the passenger amenities and meet ADA requirements. It would be designed and constructed in close collaboration with MDOT MTA and MDOT SHA primarily for commuter and intercity bus services with provision for local bus routes. During design, consideration must be given to maintaining the

current number of commuter parking spaces and addressing peak period traffic congestion for vehicles exiting the park and ride spaces.

As the transit center feasibility study moves forward, details will need to be further refined and decisions made. Funding will need to be identified and secured for preliminary design, engineering and construction. The order of magnitude cost estimate may be used as a basis for the project's inclusion in the Transportation Improvement Program. Addition of the transit center concept in Anne Arundel County's Parole Growth Management Plan, may further strengthen the validation for a transit center in Parole.

2.0 Introduction

The Anne Arundel County Transportation Center Feasibility Study has been prepared with the input and guidance of the Baltimore Metropolitan Council (BMC), Anne Arundel County Office of Planning and Zoning, Anne Arundel County Office of Transportation (AAOT) and Annapolis Transit (AT). The AAOT was awarded funds through the Unified Planning Work Program (UPWP) to study the feasibility for the development of a multi-modal transit center for the state's capital. The study is managed by BMC with Anne Arundel County staff acting as an integral part of the study. BMC staff provides technical support to the Baltimore Regional Transportation Board, the designated Metropolitan Planning Organization for the Baltimore region.

This multi-modal feasibility study is intended to address the needs of various transit providers and provide a safe and comfortable environment for pedestrians, cyclists and motorists. The terminal facilities planning elements take into consideration the likely lifetime of a transit passenger terminal facility (forty years) to serve near- and long-term future transit services in Anne Arundel County.

This report is a preliminary screening exercise, intended to serve as a guide for future transit center decisions. It provides an overview of existing and planned transit services and passenger facilities in Anne Arundel County and includes services with regional connections.

The primary objectives of this work are:

- Research past studies and plans to identify changes in land use policy and transportation
- Develop a facility prototype based on existing route structure and future ridership
- Identify potential transit center sites
- Evaluate pedestrian site accessibility via walking and bicycling
- Evaluate transit vehicle site access and circulation
- Identify adjacent land uses and the potential influence and redevelopment opportunities
- Develop conceptual site and architectural plans
- Summarize order of magnitude cost estimate for preferred site location

3.0 Existing Service and Previous Studies

Anne Arundel County is served by several providers of local service that are funded and coordinated by the AAOT. In the western side of the County there are several routes provided by the Regional Transit Agency of Central Maryland (RTA), which provides fixed-route service linking Howard, Prince George's and Anne Arundel counties, along with some routes entirely within Anne Arundel. The RTA also provides Americans with Disabilities Act (ADA) complementary paratransit. In the City of Annapolis, AT provides local fixed-route bus service and ADA complementary paratransit.

The study region is also served by other transit providers. Central Maryland is located between the Washington, D.C. and Baltimore metropolitan areas, and there are transit routes from each urban area linking them with Anne Arundel County. These services include Maryland Department of Transportation Maryland Transit Administration (MDOT MTA) services from Anne Arundel County to Baltimore; and Washington Metropolitan Area Transit Authority (WMATA) services providing connections from Anne Arundel County Thurgood Marshall Baltimore-Washington International Airport (BWI) and Crofton to the Washington Metro rail system. In addition, there are regional services provided by the MDOT MTA through its Maryland Area Regional Commuter (MARC) commuter rail services and commuter bus program. There are also intercity connections in the region, including Amtrak and Megabus.

Specialized transportation services, including demand-response service for seniors and persons with disabilities are provided by the AAOT. Other specialized transportation providers focus on the needs of populations. Finally, there are numerous private taxi firms, and ride sourcing or transportation network companies (TNC) such as Uber and Lyft.

This section begins by examining the transit services provided by the AAOT, AT, and the RTA in Anne Arundel County. This is followed by an overview of the services provided by MDOT MTA, and an analysis of the existing transit facilities.

3.1 AAOT

The AAOT has been developing a County transit program over the past two years primarily by consolidating services funded by the County, but previously operated by other providers. Table 1: AAOT Routes presents an overview of these services, and Figure 1 AAOT Service Area presents a map.

One new service is the County Connector shuttle between Arundel Mills and BWI, which replaced County participation in the RTA Route 501 which previously ran between Columbia and BWI via Arundel Mills. It now terminates at Arundel Mills, and riders who wish to reach BWI have the option of transferring to the County Connector or the MTA LocalLink 75. Similarly, Anne Arundel has taken over the former RTA 201 and 202 routes. A modified and rebranded service formerly operated by the RTA in the Crofton-Piney Branch-Odenton area has become the County's Crofton Connector.

The County was previously contributing to AT to operate the Gold and Yellow routes, which connect Westfield (Annapolis) Mall with points in the County. Rather than fund the City to operate

these, the County is now the operator of these routes. The County has separated the Gold Route into two separate routes, and has modified hours and frequencies.

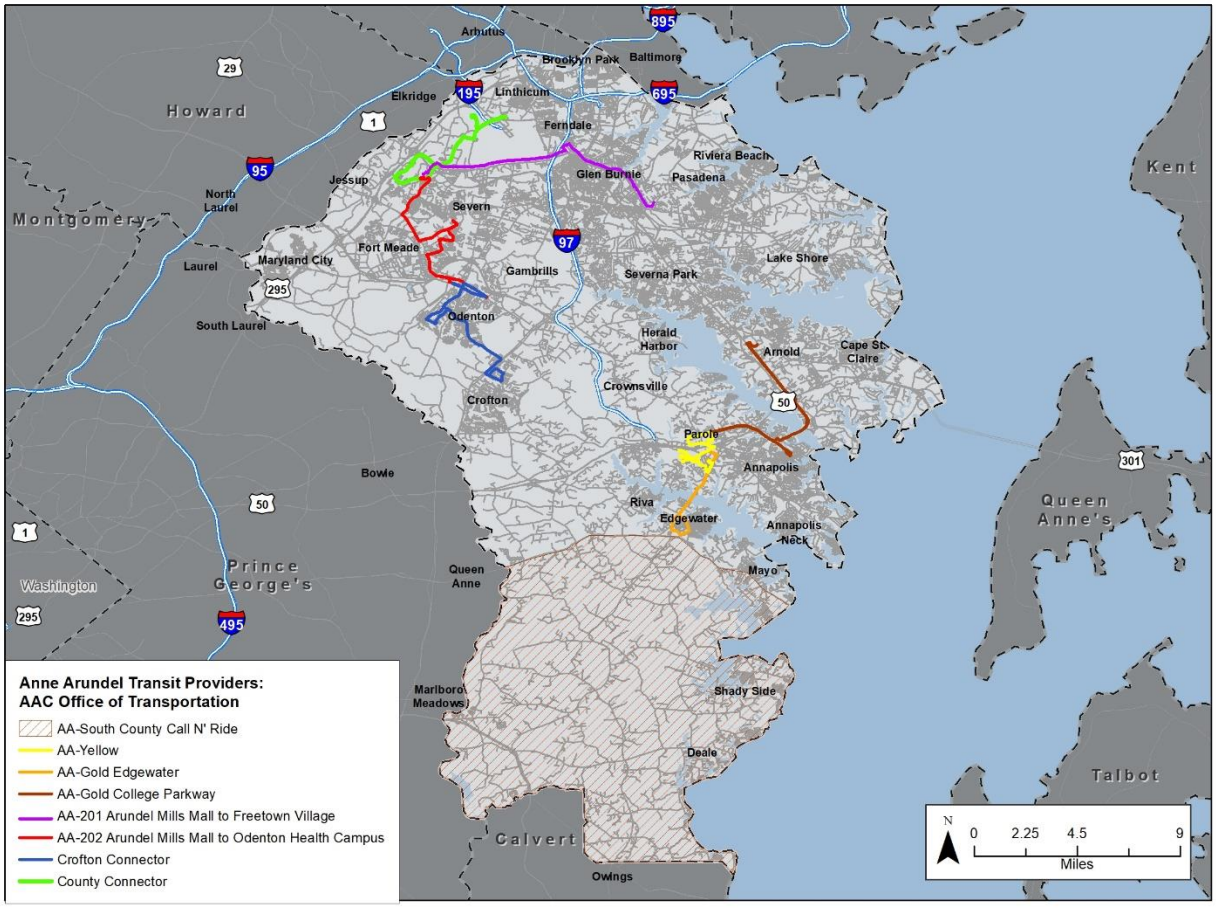
Responding to public needs, the AAOT has also implemented a completely new weekday service in South County, connecting the Gold-Edgewater route to three on-demand service zones that cover the area south of Route 214. As a Call n'Ride demand response service it requires an advance reservation, but is open to the general public.

The recently completed Central Maryland Transit Development Plan identifies a five- to ten-year plan for a substantial increase in the AAOT services. It is discussed in a subsequent section on planned services.

Table 1: AAOT Routes

Route	Service Area (County)	Service Characteristics			
		Day	Span	Peak Headways	Off-Peak Headways
County Connector: BWI Light Rail-BWI MARC/Amtrak-Arundel Mills - West County	Anne Arundel County	Weekday	5:30 am – 12:40 am	19-36 min	50-55 min
		Saturday	7:15 am – 11:50 am	53-55 min	Same
		Sunday	8:15 am – 9:40 pm	55-60 min	Same
AA-201: Arundel Mills Mall – Freetown Village	Anne Arundel County	Weekday	5:50 am – 12:39 pm	15-30 min	45-90 min
		Saturday	7 am-12:50 am	30 min	90 min
		Sunday	9:10 am-11:20 pm	90 min	Same
AA-202: Fort Meade-Arundel Mills Mall – Odenton MARC Station-West County	Anne Arundel County	Weekday	6:15 am-12:07 pm	15-45 min	45-90 min
		Saturday	8:00 am-12:13 pm	90 min	Same
		Sunday	8:45 am-11:40 pm	90 min	Same
Crofton Connector: Crofton-Piney Orchard - Odenton	Anne Arundel County	Weekday	5:45 am – 7:35 pm	Varies by segment-20-90 min	Same
South County Call N'Ride: Demand Response Zones to connection to Edgewater Gold at Edgewater Library	Anne Arundel County	Weekday	7:00 am – 7:00 pm	Two Hour Advance Reservation	Same
Annapolis Connector-Gold Routes-Edgewater to Westfield Mall	Anne Arundel County	Weekday	6:00 am – 8:55 pm	60 min	Same
		Saturday	8:00 am – 8:55 pm	60 min	Same
		Sunday	8:00 am – 8:55 pm	60 min	Same
Annapolis Connector-Gold Route-Arnold/Anne Arundel Community College (AACC) to Westfield Mall	Anne Arundel County	Weekday	6:00 am-9:55 pm	120 minutes	Same
		Saturday	7:20 am-9:55 pm	120 min	Same
		Sunday	7:20 am-9:55 pm	120 min	Same
Annapolis Connector Yellow Route: Westfield Mall -Truman Parkway/MVA – Harbour Center via Riva Road	Anne Arundel County	Weekday	6:00 am – 6:52 pm	60 min	60 min
		Saturday	8:00 am – 5:52 pm	60 min	60 min

Figure 1: AAOT Service Area



3.2 Annapolis Transit

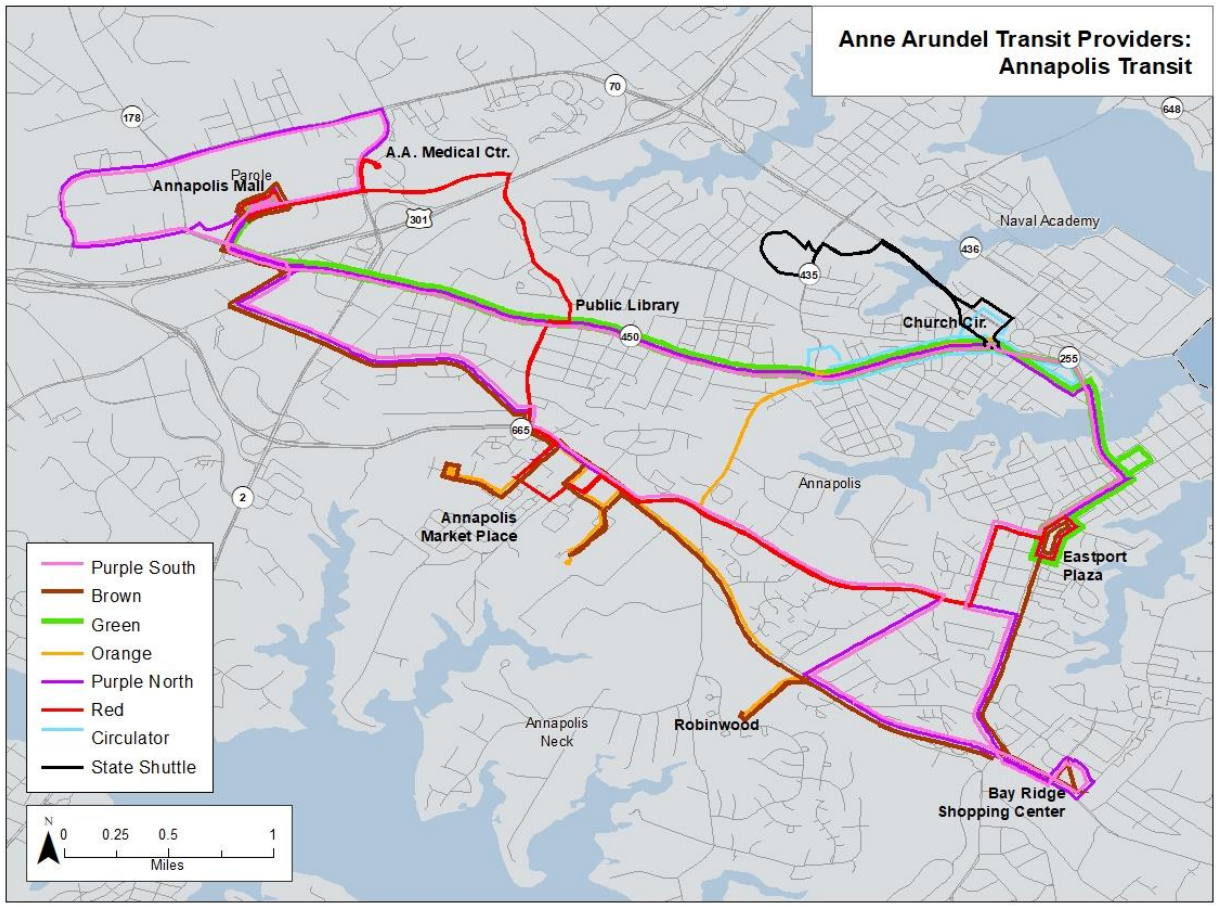
The Annapolis Department of Transportation plans and operates public transportation services, known as AT. The AT service area includes the City of Annapolis and surrounding Anne Arundel County area of Parole. AT currently operates five bus routes, two downtown shuttles, and ADA complementary paratransit service for people with disabilities who are not able to ride the fixed routes.

AT operates five color-coded routes; Brown, Green, Orange, Red and Purple. These are known as the “Rainbow Routes.” The Rainbow Routes operate on weekdays starting as early as 5:30 am and run until around 7:00 pm. Additionally, most Rainbow Routes also operate on Saturdays between 7:30 am and 7:00 pm, except for the Orange Route. The Purple Route provides evening service from 7:00 pm to 10:40 pm, Monday through Saturday and all-day service from 7:00 am to 8:10 pm on Sundays. This information is detailed in Table 2 and Figure 2.

Table 2: AT Routes

Route	Service Area (City/County)	Service Characteristics			
		Day	Span	Peak Headways	Off-Peak Headways
Brown Route	City of Annapolis	Weekday	5:34 am – 7:08 am	-	30 min.
		Saturday	7:15 am – 7:08 am	-	45 min.
Green Route	City of Annapolis	Weekday	5:30 am – 6:54 pm	-	30 min.
		Saturday	7:30 am – 6:54 pm	-	60 min.
Orange Route	City of Annapolis	Weekday	5:30 am – 6:42 pm	-	45 min.
Red Route	City of Annapolis	Weekday	5:30 am – 6:55 pm	-	30 min.
		Saturday	7:30 am – 6:54 pm	-	60 min.
Purple North Route	City of Annapolis	Weekday	7:00 pm – 10:36 pm	-	75 min.
		Saturday	7:00 pm – 10:36 pm	-	75 min.
		Sunday	7:05 am – 8:06 pm	-	75 min.
Purple South Route	City of Annapolis	Weekday	6:57 pm – 10:39 pm	-	75 min.
		Saturday	6:57 pm – 10:39 pm	-	75 min.
		Sunday	7:00 am – 8:09 pm	-	75 min.

Figure 2: AT Service Area



3.2 Regional Transportation Agency (RTA) Existing Service

The RTA operates fixed-route and demand-response services within; Anne Arundel, Howard, and northern Prince George's counties and the City of Laurel (Figure 3). The RTA service area is located in the largely suburban counties between Baltimore and Washington, D.C. It formerly provided a number of routes into Anne Arundel County that are now operated by Anne Arundel County. The remaining RTA services into Anne Arundel provide connections from RTA transfer points to key transfer locations in Anne Arundel County. The 501 route provides a link between Columbia and Arundel Mills Mall, and the 502 provides a link between Laurel and Arundel Mills Mall.

Table 3 presents the service characteristics of the RTA routes serving Anne Arundel County, which include service area; origin-destination, days of service, span of service, and headways. The routes are displayed on the map in Figure 4.

Figure 3: Central Maryland RTA Service Area

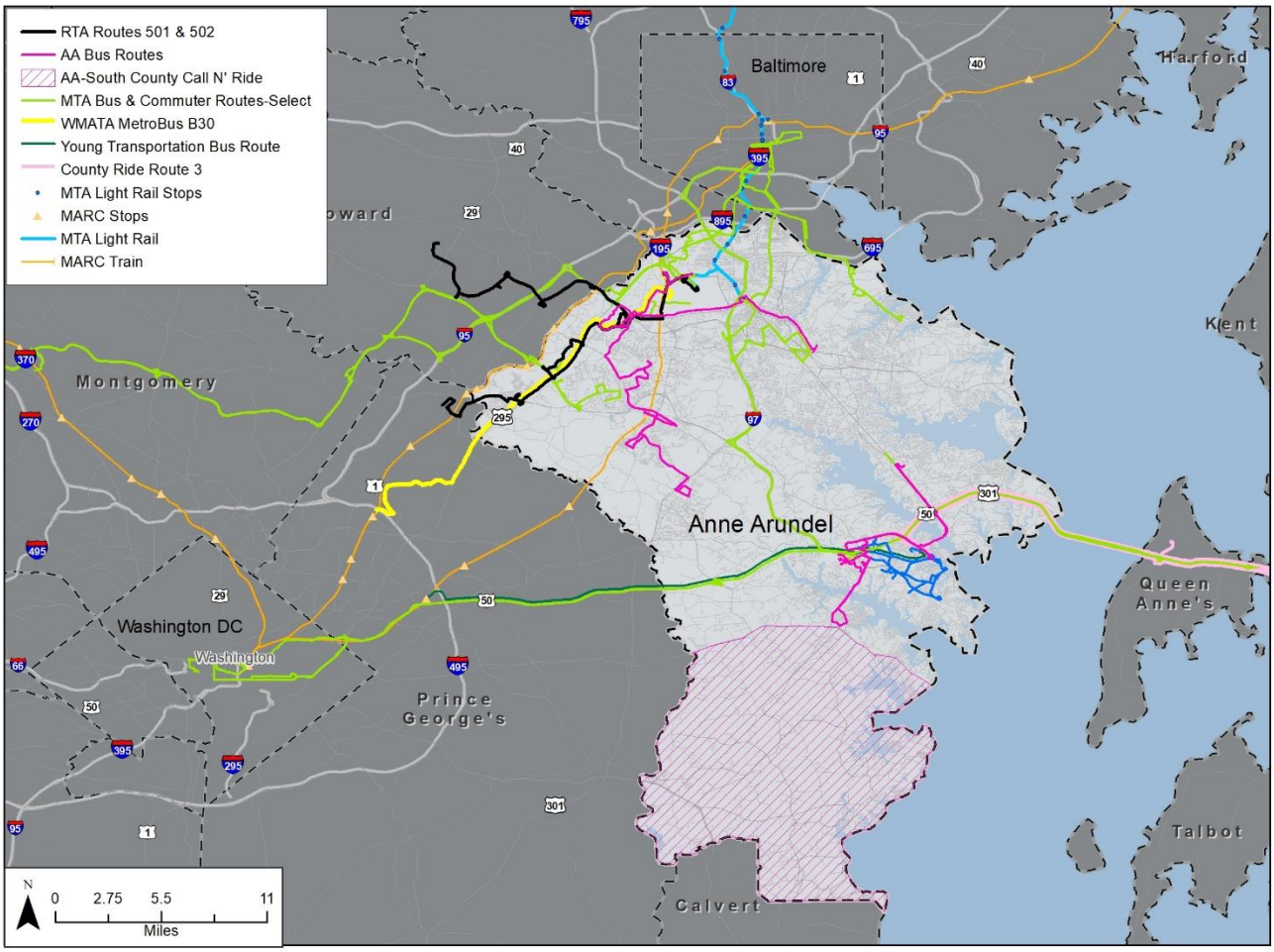
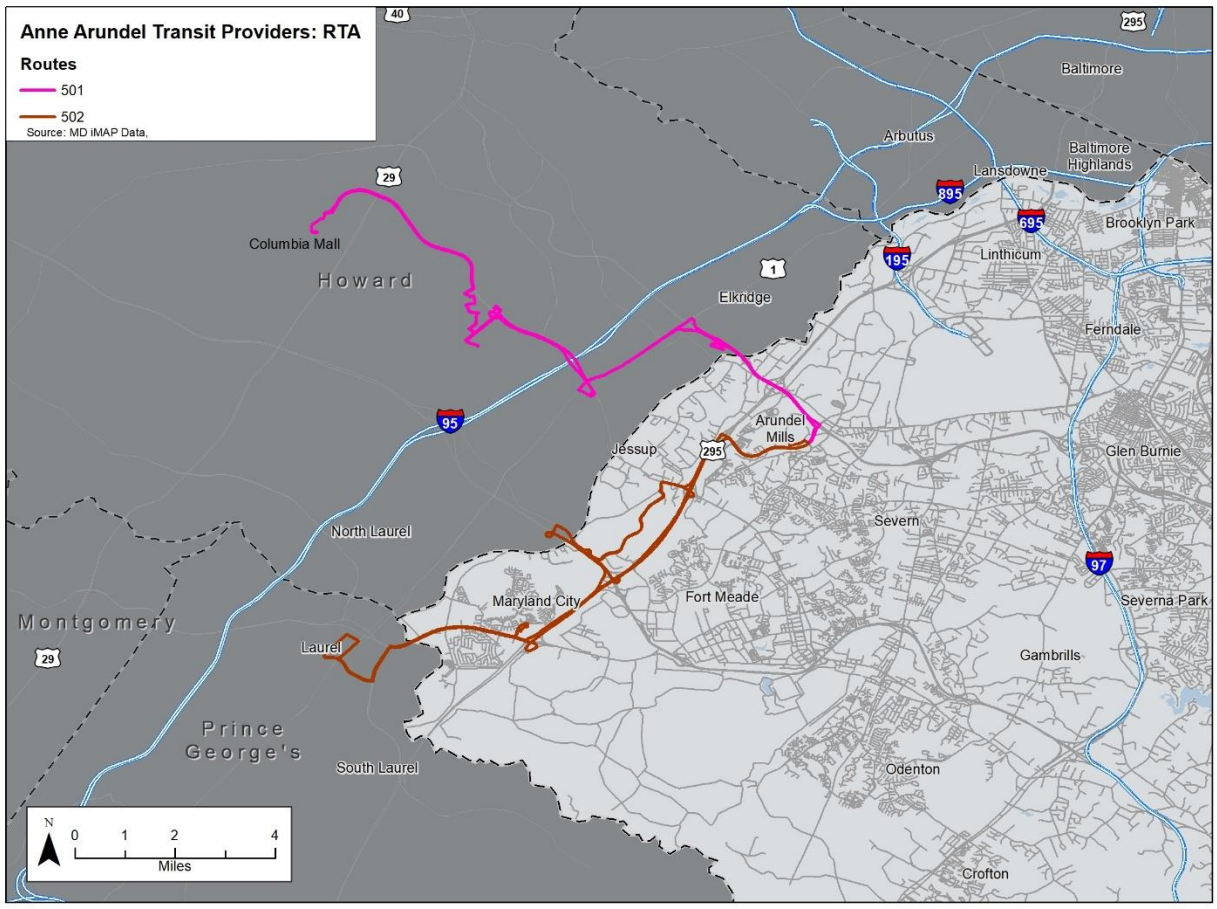


Table 3: RTA Routes Serving Anne Arundel County

Route	Service Area (County)	Service Characteristics			
		Day	Span	Peak Headways	Off-Peak Headways
501/Silver: Columbia Mall – Arundel Mills/AACC	Howard County, Anne Arundel County	Weekday	5:55 am – 10:51 pm	60 minutes	Same
		Saturday	7:00am – 10:47pm	60 minutes	Same
		Sunday	9:00am – 7:49 pm	60 minutes	Same
502/B: Towne Centre at Laurel – Arundel Mills Mall	Prince George's County, Anne Arundel County	Weekday	6:00am – 10:37 pm	60 minutes	Same
		Saturday	9:00am – 10:22 pm	120 minutes	Same
		Sunday	10:00am – 8 :22 pm	120 minutes	Same

Source: Central Maryland RTA Route Maps & Schedules, 2019

Figure 4: RTA Routes Serving Anne Arundel County Service Area



3.3 Other Transit Services

Four other agencies operate transit services within Anne Arundel County. The MDOT MTA operates local bus, express bus, commuter bus, commuter rail, and light rail services within the service area, primarily providing connections to Baltimore. Washington Metropolitan Area Transit Authority (WMATA) provides bus services within the area, primarily providing connections to the Metrorail system and Washington, D.C.

3.4 MDOT MTA

The MDOT MTA operates 12 bus routes; three local, one express, and 8 commuter bus routes within Anne Arundel County. Two commuter rail lines – the Camden Line and Penn Line – serve Anne Arundel stops. One light rail line with two termini serves the area. Table 4 and Table 5 identify the route, origin and destination, type of service, days of operation, and routes that serve Anne Arundel County.

Table 4: MDOT MTA Bus Service in Anne Arundel County

Route	Origin-Destination	Type	Days of Operation
MDOT MTA Service – Anne Arundel County			
LocalLink 67	Marley Neck (Energy Parkway)-Downtown	Local	Daily
LocalLink 69/70	Patapsco Light Rail Station-Jumpers Hole	Local	Daily
LocalLink 75	Patapsco Light Rail Station-Parkway Center	Local	Daily
Express Bus Link 164	Riviera Beach-Downtown	Express	Weekday
201	Gaithersburg Park & Ride-BWI Marshall Airport	Commuter	Weekday
210	Kent Island-Annapolis-Downtown Baltimore	Commuter	Weekday
215	Annapolis- Downtown Baltimore	Commuter	Weekday
220	Annapolis-Washington, D.C.	Commuter	Weekday
230	Severna Park & Ride-Washington, D.C.	Commuter	Weekday
250	Kent Narrows/Stevensville/Davidsonville Park & Ride	Commuter	Weekday
260	Severna Park/Davidsonville-Washington, D.C.	Commuter	Weekday
291	Annapolis-New Carrollton	Commuter	Weekday

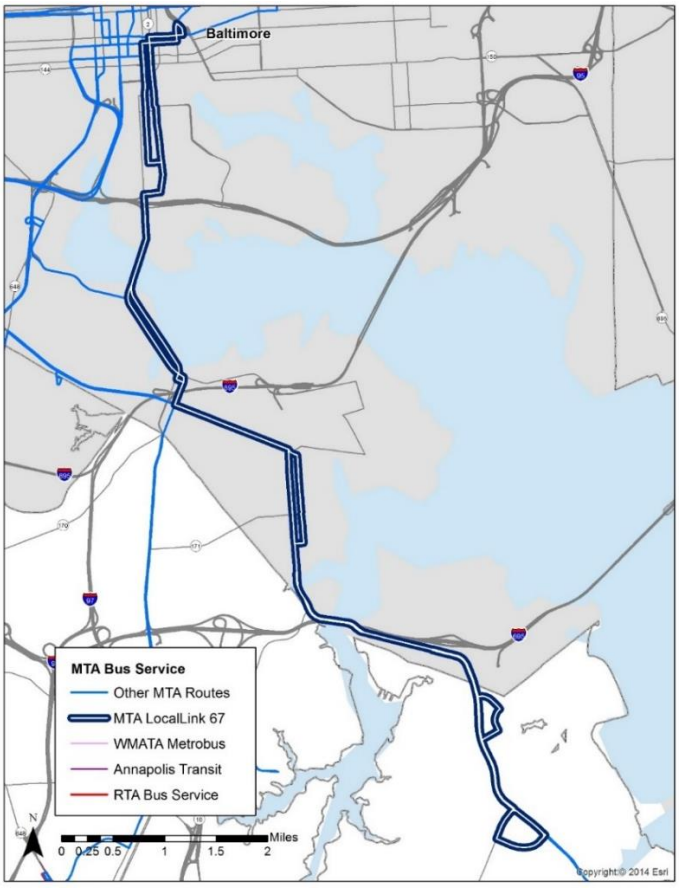
Table 5: MDOT MTA Intersecting Rail Service

Route	Origin-Destination	Type	Station
Camden Line	Baltimore Camden Station – Washington, D.C. Union Station	Commuter Rail	Jessup
			Savage
			Laurel
			Muirkirk
			College Park
Penn Line	Baltimore Penn Station – Washington, D.C. Union Station	Commuter Rail	BWI Rail Station
			Odenton
Hunt Valley – Cromwell/Glen Burnie		Light Rail	Cromwell/Glen Burnie
Hunt Valley – BWI Marshall Airport		Light Rail	BWI Business District
			BWI Marshall Airport

3.4.1 MDOT MTA LocalLink 67: Marley Neck (Energy Parkway) to Downtown (City Hall)

MDOT MTA LocalLink 67 provides local bus service connecting northeastern Anne Arundel County to downtown Baltimore. Key origins include Energy Business Park, Marley Neck and Curtis Bay. There is weekday and weekend service (both days). The Anne Arundel County portion of the route originates at Marley Neck, makes a deviation into Marley Neck Industrial Park providing service to the Under Armour Factory House, and then continues north. Weekdays, from Marley Neck there are six a.m. northbound trips and ten southbound a.m. trips between 4:57 a.m. and 9:55 a.m., no late morning service, and then 13 northbound and 14 southbound trips between 12:21 p.m. and 1:06 a.m. Weekend service is reduced to four a.m. and 8 p.m. trips each way. Fares are MDOT MTA local bus fares, and there is no connectivity to RTA bus services on these services. The service was formerly called MDOT MTA Route 64, and it was heavily modified as part of the BaltimoreLink restructuring. As noted above, the section between Marley Neck/Energy Parkway and Curtis Bay was replaced with a new service, LocalLink 67, which will continue to downtown Baltimore. The former service between Curtis Bay and North Avenue was incorporated into the new higher-frequency City Link Silver service (but without the deviation into Port Covington), which is a longer route that extends to University Parkway and the Morgan State University campus. Riviera Beach is now served by Express Bus Link 164. LocalLink 67 can be seen in Figure 5.

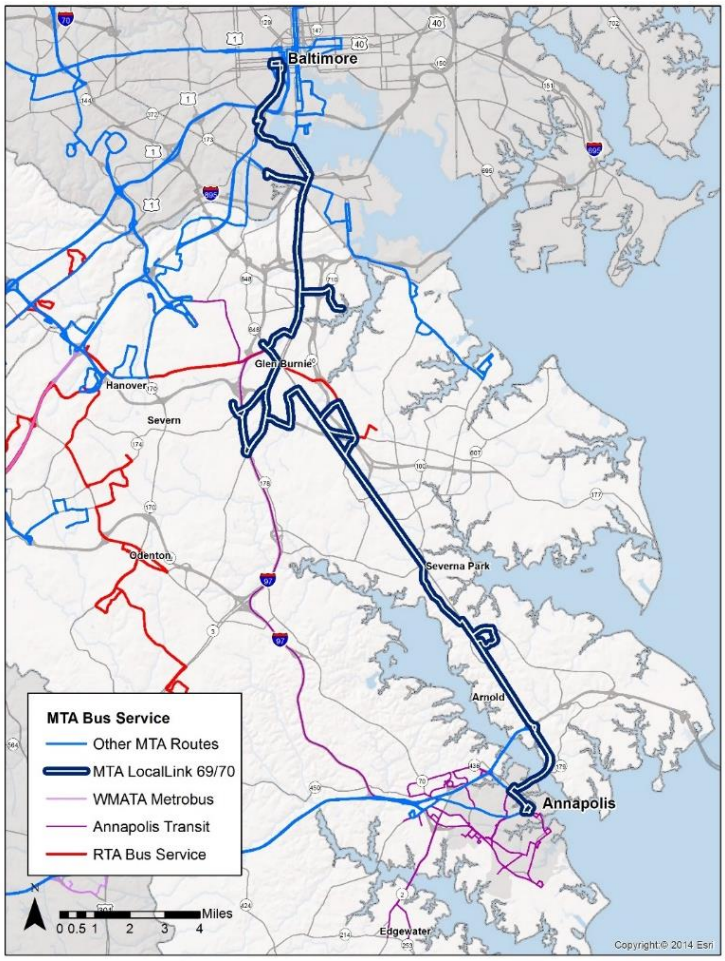
Figure 5: MDOT MTA LocalLink 67 – Curtis Bay/Energy Parkway to North Avenue



3.4.2 MDOT MTA LocalLink 69/70: Patapsco Light Rail Station to Annapolis/Jumpers Hole

The BaltimoreLink plan rebrands the former MDOT MTA Route 14, with the Jumper's Hole service now called LocalLink 69, and the routing to Annapolis called LocalLink 70 (Figure 6). The only change on both services is the elimination of the service to Bayview Industrial Park. This local service route serves key Anne Arundel County points including Brooklyn Park, Glen Burnie, Cromwell Light Rail Station, Pasadena, Severna Park, Anne Arundel Community College, and Baltimore Washington Medical Center (not all trips). There are deviations on different trips and not all destinations are served on each schedule. There are 14 trips to Annapolis, and another route that only goes as far as Jumpers Hole Road. Service operates from 4:45 a.m. to 2:00 a.m. on weekdays, and from 6:00 a.m. to midnight on Saturday and Sunday. The frequency on weekdays and Saturday is 60 minutes, stretching to 65 minutes on Sunday (10 a.m. to 7:00 p.m.) and two hours at other times on Sunday. There is limited service to downtown Baltimore (University of Maryland Transit Center) when the light rail system is not operating. Connections to RTA Route 201/J can be made at Cromwell Light Rail Station.

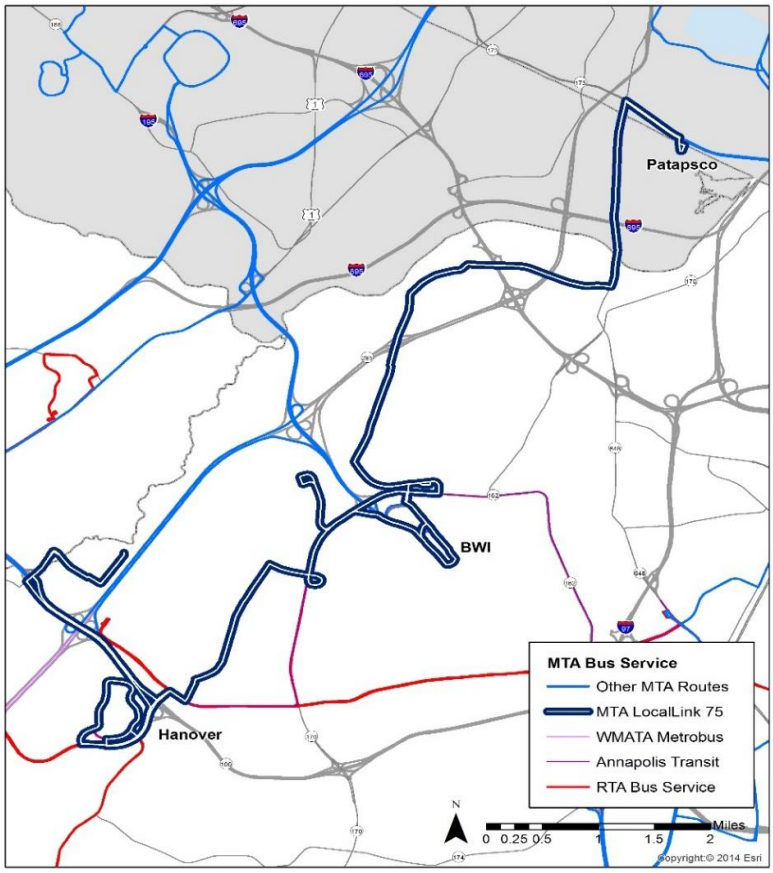
Figure 6: MDOT MTA LocalLink 69/70: Patapsco Light Rail Station to Annapolis/Jumpers Hole



3.4.3 MDOT MTA LocalLink 75: Patapsco Light Rail Station to Parkway Center

This local service in western Anne Arundel County recently was changed as part of the BaltimoreLink restructuring. Formerly MDOT MTA Route 17, the changes include a rebranding to the LocalLink 75 name, elimination of service to Parkway Center South, and service to Parkway Center North only during the morning peak. A routing change moved service from Aviation Boulevard/Dorsey Road to New Ridge Road to serve the Baltimore Commons Business Park. LocalLink 75 connects Patapsco Light Rail Station with the Nursery Road business area, BWI Business Park, BWI Marshall Airport, BWI Amtrak/MARC Rail Station, Arundel Mills Mall and Parkway Center North. The span of service is 24 hours, and there is an extension to downtown Baltimore when light rail service is not operating. However, not all stops are served at all times - and headways vary from 30 to 60 minutes. Daytime service between Patapsco and Arundel Mills Mall is provided on all trips, but the extension to Parkway Center North now operates only during the morning peak period. At night, service operates from the University of Maryland Transit Center downtown (rather than Patapsco Light Rail) to Arundel Mills Mall. Fares are MDOT MTA local bus fares. There is connecting service to RTA's Route 201/J, the RTA 501/Silver, and RTA 502/B; AAOT's AA 202/K and County Connector at Arundel Mills Mall. The route alignment is shown in Figure 7.

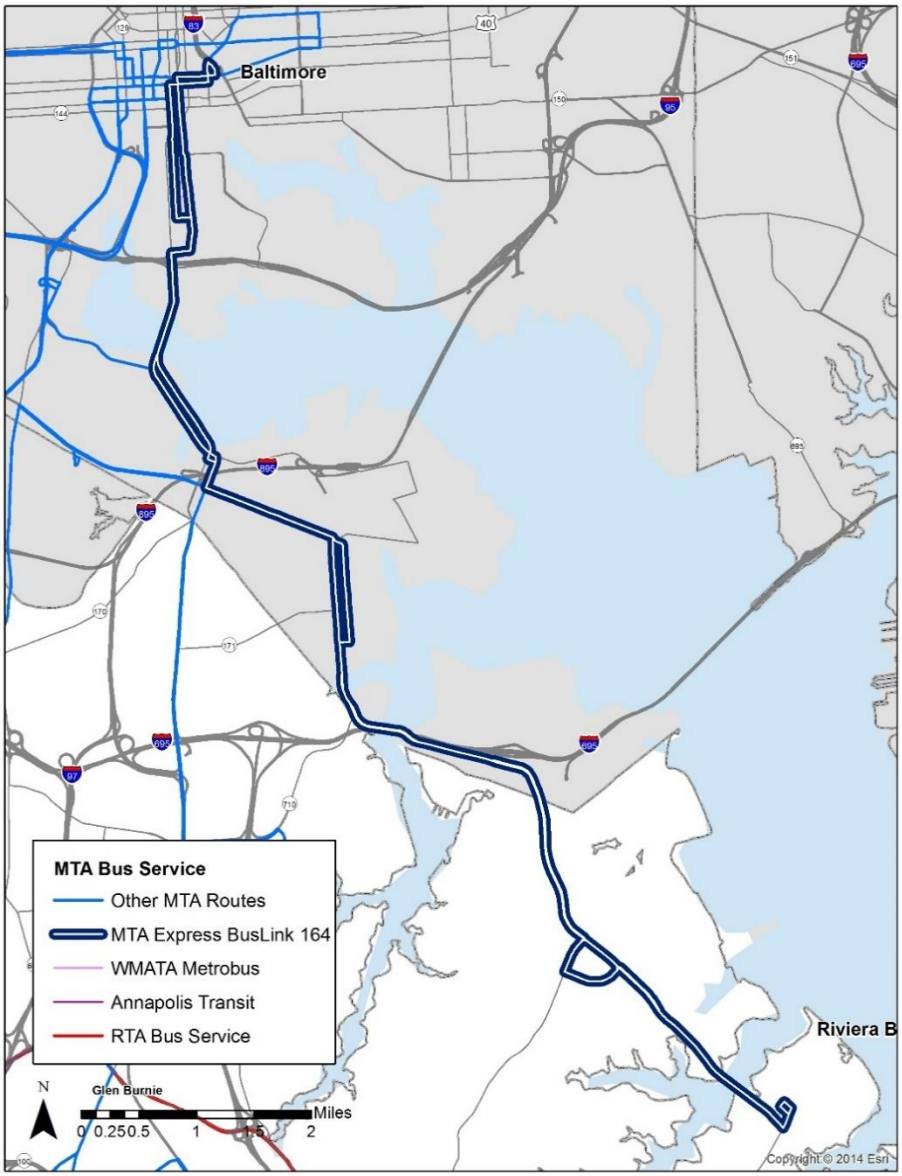
Figure 7: MDOT MTA LocalLink 75: Patapsco Light Rail Station to Parkway Center



3.4.4 MDOT MTA Express Bus Link 164: Riviera Beach to Downtown

Between Riviera Beach and downtown, a new Express Bus Link 164 provides service on weekdays only. Despite the name, the service operates as a local service making all stops. However, the frequency was reduced to two morning (5:55 a.m. and 7:45 a.m.) and two evening peak trips (leaving City Hall at 3:30 p.m. and 5:15 p.m.) because of the current low ridership from Riviera Beach. The service originates in Riviera Beach, deviates through Brandon Woods via Energy Parkway, and continues to Hawkins Point, through Curtis Bay to downtown Brooklyn, Harbor Hospital and then to Charles Center and City Hall. The Express Bus Link 164 route is presented in Figure 8.

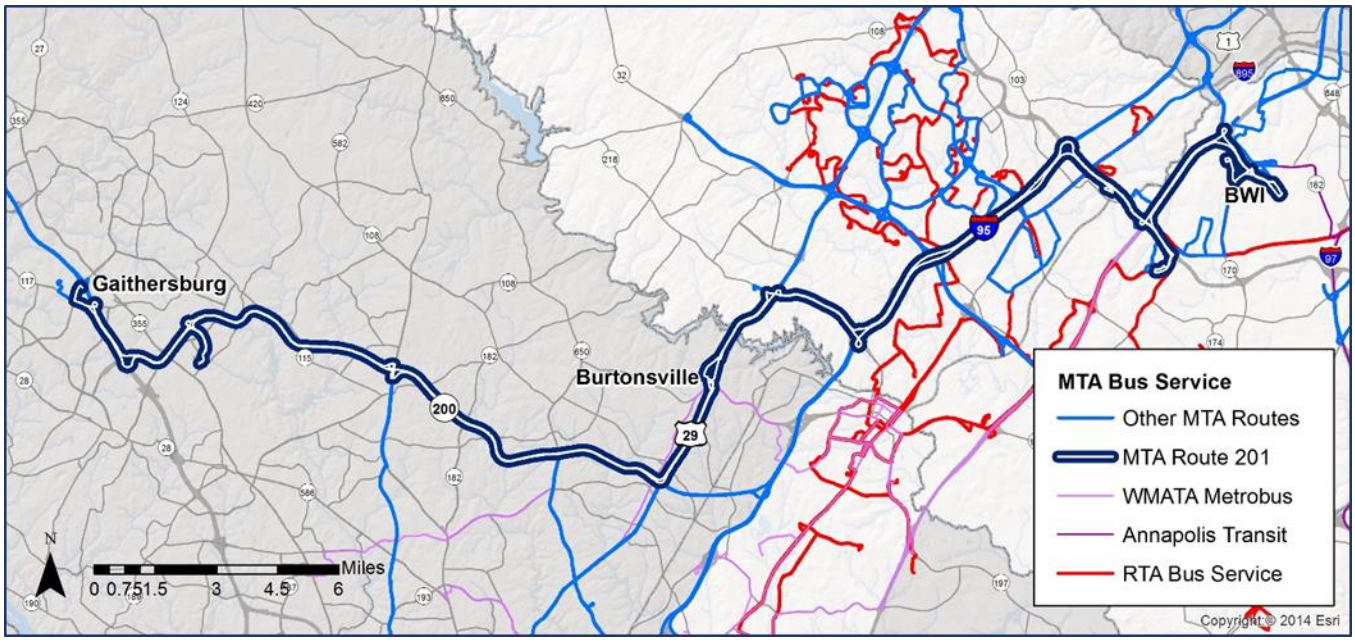
Figure 8: MDOT MTA Express Bus Link 164 – Riviera Beach to Downtown



3.4.5 MDOT MTA Commuter Bus Service Route 201: Gaithersburg Park & Ride to BWI Marshall Airport

Route 201 operates from Gaithersburg to BWI Marshall Airport. It traverses Howard County, but has only one stop in Howard County at the Dorsey MARC station. Although this route operates on weekends, the Dorsey stops are weekday only because that is when there are MARC trains operating. On weekdays there are six eastbound stops at Dorsey Station between 1:56 p.m. and 6:56 p.m., and six westbound stops: four between 5:25 a.m. and 8:25 a.m., one at 1:25 p.m. and one at 10:25 p.m. It is described more fully in the Anne Arundel County MDOT MTA services. Figure 9 presents the route of the MDOT MTA 201.

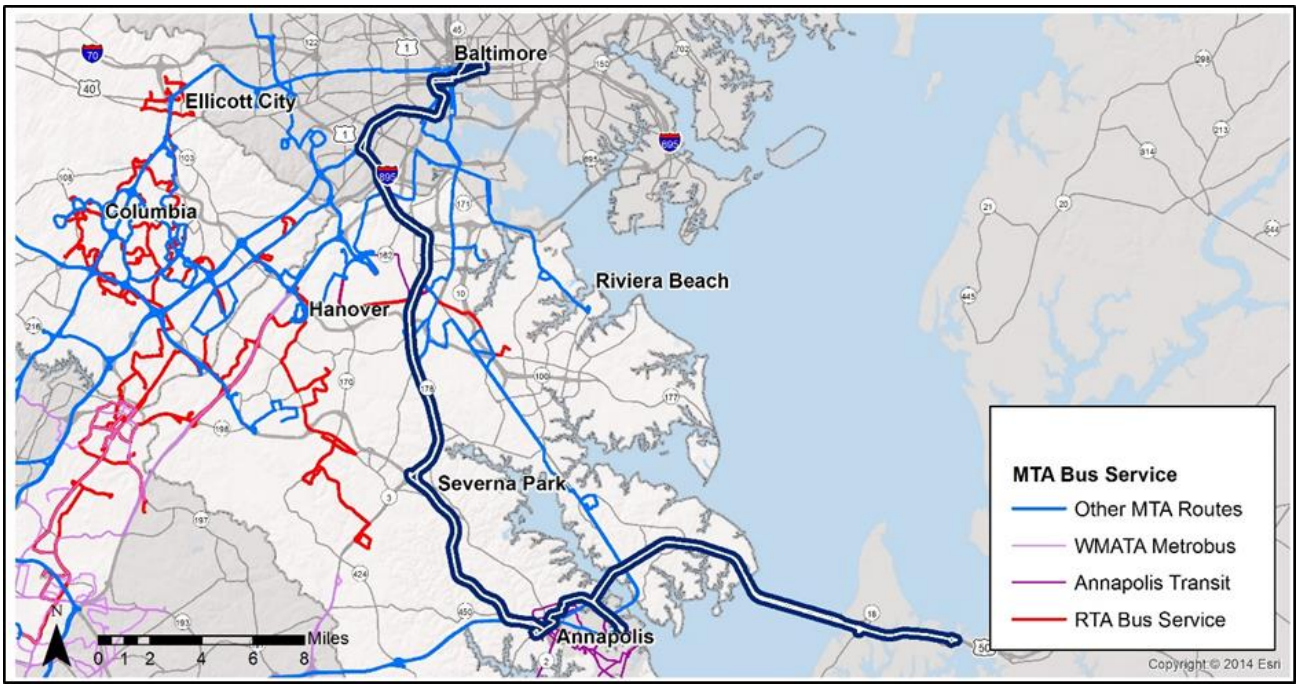
Figure 9: MDOT MTA Commuter Bus 201: Gaithersburg Park & Ride-BWI Marshall Airport



3.4.6 MDOT MTA Commuter Bus Route 210: Kent Island and Downtown Baltimore

Commuter Route 210 offers commuter bus service between Kent Island (with four stops in Annapolis) and Downtown Baltimore. It runs weekdays only; with four northbound trips between 5:30 a.m. and 7:30 a.m., and five southbound trips between 3:10 p.m. and 5:10 p.m. MDOT MTA Commuter Route 210 is shown in Figure 10.

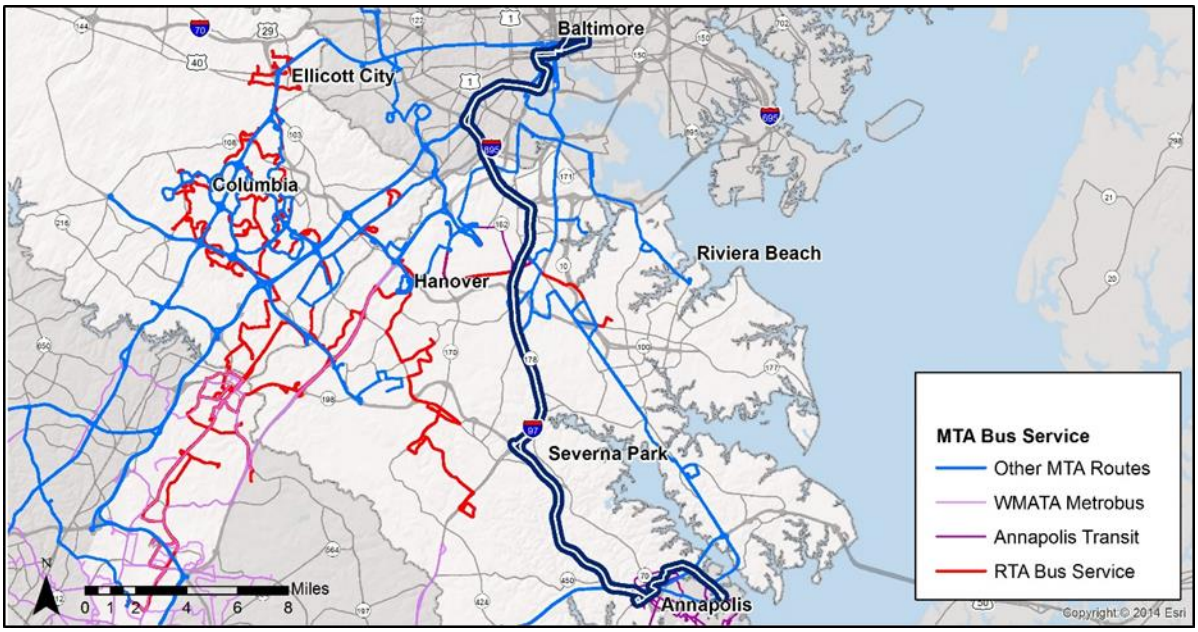
Figure 10: MDOT MTA Commuter Bus Route 210: Kent Island and Downtown Baltimore



3.4.7 MDOT MTA Commuter Bus Route 215: Annapolis and Downtown Baltimore

Commuter Route 215 offers commuter bus service between Annapolis (with one stop at the Cromwell Light Rail Station) and Downtown Baltimore. It runs weekdays only; with three southbound trips between 5:45 a.m. and 7:45 a.m., and three northbound trips between 3:17 p.m. and 5:17 p.m. MDOT MTA Commuter Route 215 is shown in Figure 11.

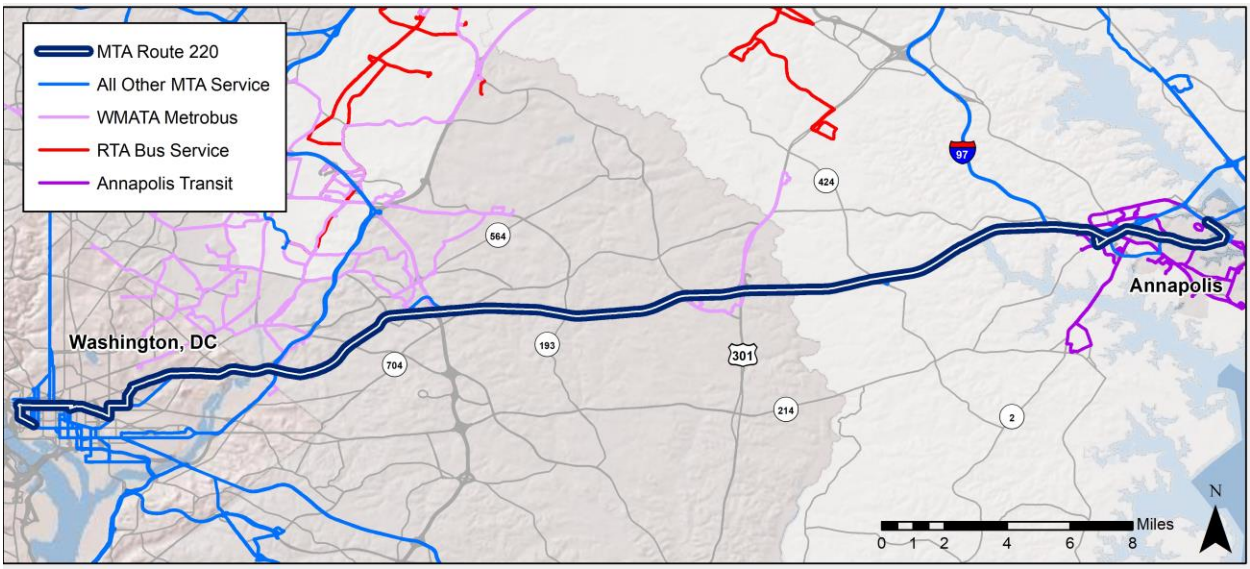
Figure 11: MDOT MTA Commuter Bus Route 215 : Annapolis and Downtown Baltimore



3.4.8 MDOT MTA Commuter Bus Route 220: Annapolis to Washington, D.C.

Twelve round-trips per weekday are operated on Commuter Route 220 connecting Anne Arundel County with downtown Washington, D.C. In the morning, six trips originate at the Harry S. Truman Park and Ride in Parole, and then operate express service to K Street NE on Capitol Hill. They are provided on half-hour headways from 5:30 a.m. to 8:00 a.m. Another six trips originate in Annapolis, leaving Rowe Boulevard and Taylor Avenue between 4:55 a.m. and 7:25 a.m., making on-street stops on West Street and Riva Road on the way to the Harry S. Truman Park and Ride, after which the service operates express to downtown. In the evening the pattern is reversed, with a total of fourteen departures from downtown stops between 12:15 p.m. and 6:30 p.m. Two make stops at Davidsonville Park and Ride and stop at Harry S. Truman Park and Ride. Seven of them make on-street stops on West Street. MDOT MTA Commuter Route 220 is shown in Figure 12.

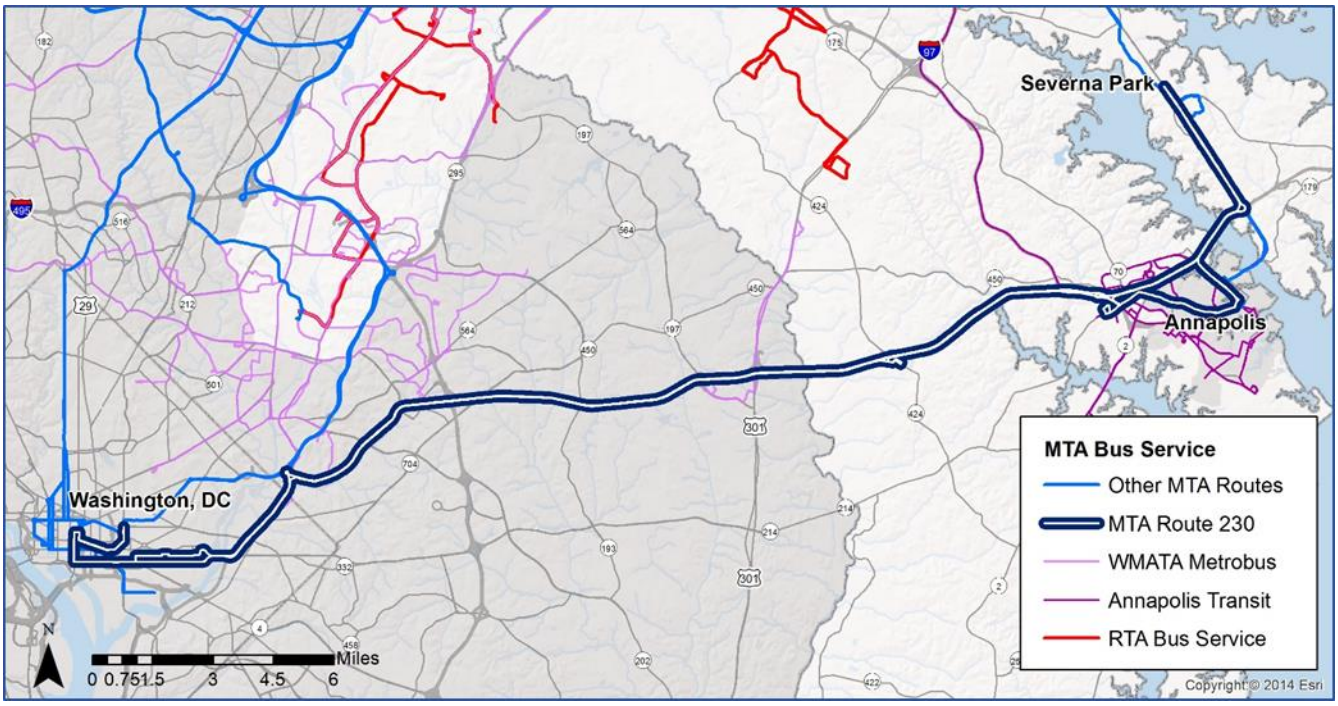
Figure 12: MDOT MTA Commuter Bus Route 220: Annapolis to Washington D.C.



3.4.9 MDOT MTA Commuter Bus Route 230: Severna Park and Parole/Annapolis to Washington, D.C.

Ten round-trips per weekday are operated on Commuter Route 230. In the morning five trips originate at the Severna Park Park and Ride between 6:00 a.m. and 7:00 a.m. They operate express to the Harry S. Truman Park and Ride in Parole, and then express to Capitol Hill. Another five trips originate in Annapolis, leaving Rowe Boulevard and Taylor Avenue between 5:10 a.m. and 7:10 a.m., making on-street stops on West Street and Riva Road on the way to the Harry S. Truman Park and Ride, after which the service operates express to Capitol Hill. In the evening the pattern is reversed, with a total of ten departures from Union Station between 12:05 p.m. and 6:00 p.m. Three of them make stops at Davidsonville Park and Ride, all of them stop at the Harry S. Truman Park and Ride, seven make on-street stops on West Street, and seven continue to the Severna Park Park and Ride. The service is operated under contract by Dillon's Bus service. MDOT MTA Commuter Route 230 is shown in Figure 13.

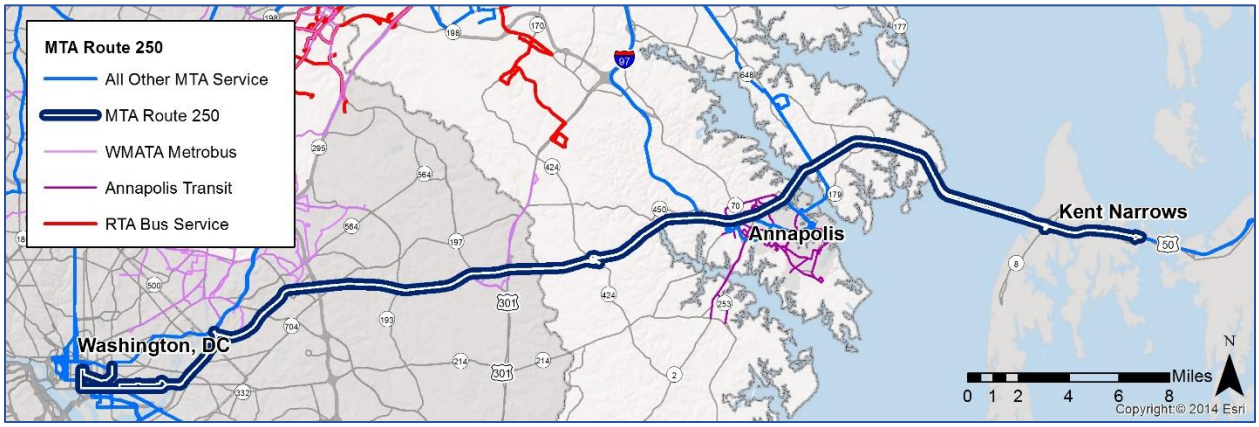
Figure 13: MDOT MTA Commuter Bus Route 230: Severna Park and Parole/Annapolis to Washington D.C.



3.4.10 MDOT MTA Commuter Bus Route 250: Kent Narrows, Stevensville, and Davidsonville Park & Ride Lots to Downtown Washington, D.C.

This commuter bus service originates in Queen Anne's County, and has one stop in Anne Arundel County, at the Davidsonville Park and Ride lot at U.S. 50 and MD 424. The service is weekday peak hours only, with six inbound trips departing Davidsonville between 5:20 a.m. and 7:26 a.m. Six afternoon return trips leave Union Station between 3:16 p.m. and 5:20 p.m. MDOT MTA Commuter Route 250 is shown in Figure 14.

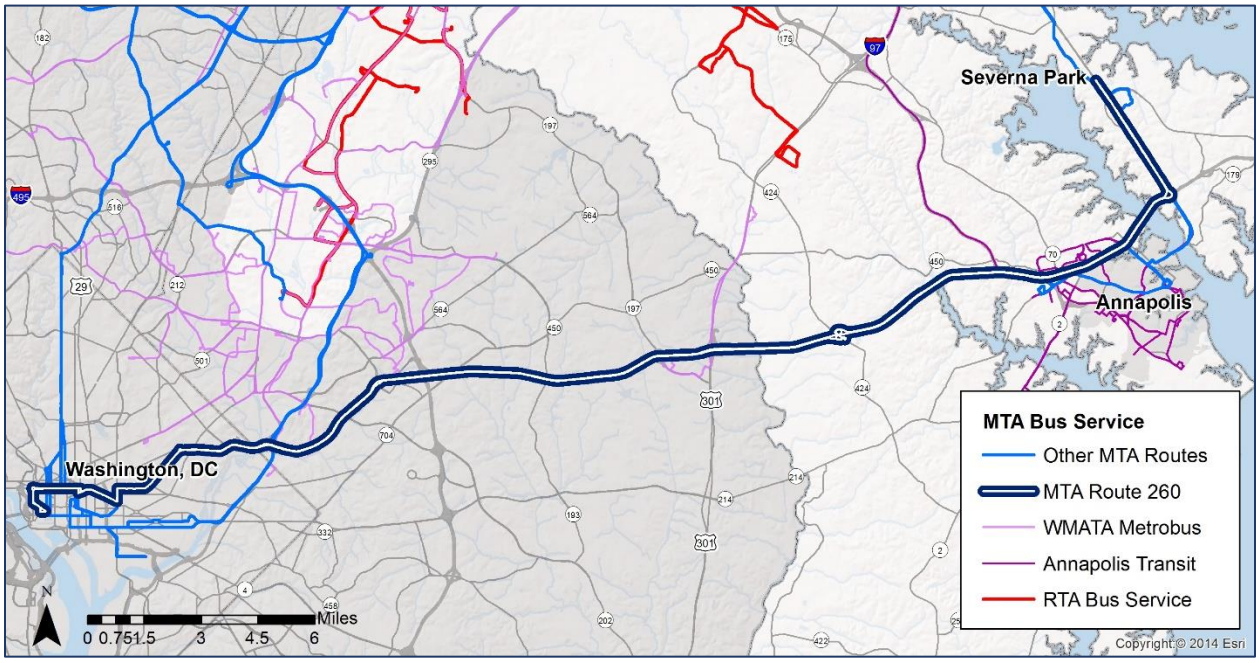
Figure 14: MDOT MTA Commuter Bus Route 250: Kent Narrows to Washington D.C.



3.4.11 MDOT MTA Commuter Bus Route 260: Severna Park and Davidsonville to Washington, D.C.

Anne Arundel County is also served by another MDOT MTA Commuter Bus route that originates at the Severna Park, Park and Ride, stops at the Davidsonville Park and Ride, and continues to K Street in downtown Washington, D.C. The service is weekday only, peak hour with six inbound trips between 5:10 a.m. and 7:40 a.m., and outbound trips in the afternoon between 3:15 p.m. and 5:45 p.m. The service is operated under contract by Dillon's Bus Service, Inc. MDOT MTA Commuter Route 260 is shown in Figure 15.

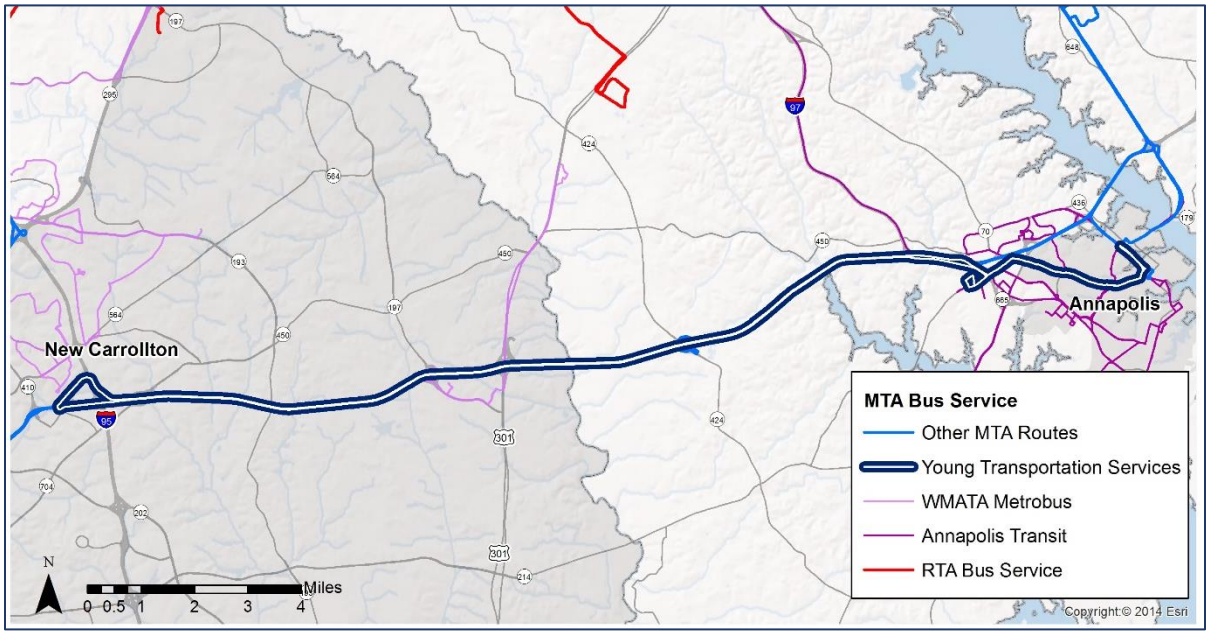
Figure 15: MDOT MTA Commuter Bus Route 260: Severna Park and Davidsonville to Washington D.C.



3.4.12 Young Transportation Services Commuter Bus Route 921: New Carrollton to Annapolis

In addition to the MDOT MTA commuter bus service, Young Transportation Services, a private for-profit firm, operates the daily commuter service between New Carrollton Metrorail and Annapolis with no state, federal or local subsidy. Figure 16 presents the route. Weekday service includes five a.m. roundtrips and four p.m. roundtrips, with three a.m. and four p.m. trips on Saturday and two a.m. and three p.m. trips on Sunday. There are 15 potential Annapolis stops that include Taylor Avenue, downtown, West Street, Parole, the Anne Arundel Medical Center, Westfield Mall and the Harry S. Truman Park and Ride. An intermediate stop is made at the Davidsonville Park and Ride. Young Transportation Services (Route 921) is shown in Figure 16.

Figure 16: Young Transportation Commuter Bus Route 921: Annapolis to New Carrollton Metrorail Station



3.4.13 MDOT MTA Light RailLink Service

MDOT MTA operates light rail service into the study area on two north-south lines that link the northern suburbs of Baltimore, downtown, and portions of Anne Arundel County. These two lines share tracks through much of their length but are split at both the north and south ends. One of the lines connects Hunt Valley and BWI Marshall Airport, with shared stops in Anne Arundel County at Nursery Road, North Linthicum, Linthicum, and the spur stops at BWI Business District, and BWI Marshall Airport. The other line connects Timonium with Cromwell-Glen Burnie, with the same shared stops at Nursery Road, North Linthicum and Linthicum, the spur stops at Ferndale and Cromwell in Glen Burnie. Table 6 summarizes the service levels, parking and connecting bus transit services at each station on these routes.

Table 6: MDOT MTA Light RailLink Service in Central Maryland

Light Rail - Anne Arundel County Stations						
Station Name	**Headway**	**Location**	**Number of Parking Spaces**	**Connecting Bus Service**		
				MTA Route Number	**Local Service Route Number**	**WMATA Route Number**
Hunt Valley-BWI Marshall Airport Route						
Nursery Road	Weekdays AM and PM 20 minutes Weekend Midday, PM: 30 minutes	6852 Baltimore Annapolis Boulevard Linthicum Heights, MD 21090	35 spaces	LocalLink 75	None	None
North Linthicum	Weekdays AM and PM 20 minutes Weekend Midday, PM 30 minutes	450 N. Camp Meade Road Linthicum Heights, MD 21090	324 spaces	None	None	None
Linthicum	Weekdays AM and PM 20 minutes Weekend Midday PM 30 minutes	595 Camp Meade Road Linthicum Heights, MD 21090	None	None	None	None
BWI Business District	Weekdays AM and PM 20 minutes Weekend Midday, PM 30 minutes	678 Elkridge Landing Road Linthicum Heights, MD 21090	34 spaces	LocalLink 75	AA County Connector Shuttle	B-30
BWI Marshall Airport	Weekdays AM and PM 20 minutes Weekend Midday PM 30 minutes	BWI Marshall Airport Baltimore, MD 21240-0766	No Light Rail Parking	LocalLink 75, Commuter 201	AA County Connector Shuttle	B-30
Timonium-Cromwell/Glen Burnie Route						
Ferndale	Weekdays AM and PM 20 minutes Weekend Midday, PM 30 minutes	10 Broadview Boulevard Glen Burnie, MD 21061	None	None	None	None
Cromwell/ Glen Burnie	Weekdays AM and PM 20 minutes Weekend Midday PM 30 minutes	7378 Baltimore Annapolis Boulevard Glen Burnie, MD 21061	765 spaces	LocalLink 69/70, Commuter 215	RTA 201/J	None

3.4.14 MDOT MTA MARC Commuter Rail Service

The MDOT MTA provides regional connections to the study area with two commuter rail lines that link Baltimore and Washington, D.C. with stops in the study area. The Penn Line services share the electrified Northeast Corridor tracks with Amtrak, with stops in the study area at the BWI MARC/Amtrak station and Odenton, both of which have very large commuter parking lots. It provides significant capacity with 28 daily (weekday) trains scheduled each way, with a higher level of frequency in the morning headed toward Washington, D.C. and a similar higher level in the evening headed away from Washington, D.C. The Penn Line also offers weekend service.

The Camden Line also links Washington, D.C., and Baltimore, but its terminus in Baltimore is Camden Station rather than Penn Station. The MARC services also share the tracks with CSX freight services. Stations in the study area include; Dorsey, Jessup, Savage and Laurel Park, they are all on the Howard/Anne Arundel County line. Compared to the Penn Line, frequencies are lower, with weekday service only. In the morning there are six southbound trains headed for Washington and three northbound, with the pattern reversed in the evening. There are no mid-day or weekend trains.

Table 7 summarizes the station locations, level of service, available parking and bus transit connections at each of the MARC stations in the study area.

Table 7: MDOT MTA MARC Service in Central Maryland

MARC - Anne Arundel County Stations						
Station Name	**Number of Trips**	**Location**	**Number of Parking Spaces**	**Connecting Bus Service**		
				MTA Route Number	**RTA Route Number**	**WMATA Route Number**
Penn Line - Anne Arundel County						
BWI MARC/Amtrak	AM 11 Northbound 15 Southbound Midday 4 Northbound 5 Southbound PM 13 Northbound 8 Southbound	2 Amtrak Way Linthicum, MD 21240	3,200 spaces	LocalLink 75 Commuter 201	AA County Connector Shuttle	B-30
Odenton	AM 11 Northbound 15 Southbound Midday 4 Northbound 5 Southbound PM 13 Northbound 8 Southbound	1400 Odenton Road, Odenton, MD 21113	1,977 spaces	None	RTA 504; AA Crofton Connector, AA 202	None
Camden Line – Anne Arundel/Howard County Stations						
Dorsey	Weekdays only AM 3 Northbound 6 Southbound Weekdays only Midday None Weekdays only PM 6 Northbound 3 Southbound	7000 Deerpath Road at MD 100, Elkridge, MD 21075	802 spaces	201 Commuter	RTA 501/Silver 409/Purple	None
Jessup	Weekdays only AM 3 Northbound 6 Southbound Weekdays only Midday None Weekdays only PM 6 Northbound 3 Southbound	8 Old Jessup Road Jessup, MD 20794	75 spaces	None	None	None
Savage	Weekdays only AM 3 Northbound 6 Southbound Weekdays only Midday None Weekdays only PM 6 Northbound 3 Southbound	9009 Dorsey Run Road Annapolis Junction, MD 20710	914 spaces	None	RTA 501/Silver	None
Laurel Park	Weekdays only AM 3 Northbound 6 Southbound Weekdays only Midday None Weekdays only PM 6 Northbound 3 Southbound	Laurel Racetrack Road Laurel, MD 20725	300 spaces	None	RTA 502/B	None

3.5 Washington Metropolitan Area Transit Authority (WMATA)

There are two WMATA routes that extend into Anne Arundel County. The Metrobus B-30 route links the Greenbelt Metrorail Station with BWI Marshall Airport and the BWI Business District Light Rail Station. It operates on weekdays only. In addition, Anne Arundel County is served by Metrobus B-29 which offers peak hour express service from the Crofton Country Club Park and Ride lot to Bowie and New Carrollton Metrorail Station - also weekdays only. Table 8 provides more information on these WMATA services.

Table 8: WMATA Services in Anne Arundel County

Route	Key Stops	Number of trips	Headway	Span	Transfer
B-30: BWI Marshall	Greenbelt Metro Station, Arundel Mills, BWI Business District Light Rail Station, BWI Marshall Airport	Weekdays - 14 trips each way	70 minutes	6:00am to 10:45pm	BWI Marshall Airport, Arundel Mills Mall, Greenbelt Metro Station
B-29: Crofton-New Carrollton	Crofton Country Club Park and Ride Lot, Gateway Center, Bowie, Covington, Bowie Town Center, Bowie Park and Ride Lot, New Carrollton Metrorail Station	Weekdays - 7 trips to/from Crofton (additional trips short-turn in Prince George's County)	AM peak 40 minutes PM peak 30 minutes No midday service	6am - 8:12am and 4:15pm - 10:18pm	New Carrollton Metrorail Station

3.6 Intercity Bus

3.6.1 Greyhound

Greyhound provides intercity bus service in Maryland. Two routes serve central Maryland. Their Baltimore to Washington, D.C. route travels the Baltimore-Washington Parkway through Central Maryland. There is a Greyhound stop at the 7-Eleven at 605 7th Street, in Laurel, where passengers can transfer to/from the RTA 503/E. The other route is from Baltimore to Salisbury, Maryland, it operates once a day (except Monday and Tuesday, when there is no service). The Annapolis stop is at the Harry S. Truman Park and Ride lot.

3.6.2 Megabus

Megabus provides daily service from Annapolis to New York City via the White Marsh Park and Ride lot north of Baltimore. The stop in Annapolis is located at the Harry S. Truman Park and Ride lot. The number of daily departures varies, with more frequency on Fridays and Sundays to accommodate weekend travel. On a peak day there are currently ten departures.

3.7 Existing Passenger Terminals and Park & Ride Lots

3.7.1 Arundel Mills Mall Transit Center

This transit center is located at 7000 Arundel Mills Circle, Hanover, Maryland 21076. The transit center serves as the transfer point for; MDOT MTA commuter bus route 201, RTA routes 501 and 502 and MDOT MTA LocalLink route 75. The transit center consists of roadside shelters with a pull-off lane.

3.7.2 MDOT MTA Cromwell Light RailLink Station

Cromwell Light RailLink station is located on Baltimore Annapolis Boulevard (MD-648) north of the intersection of Dorsey Road (8th Ave NW), Ferndale, Maryland 21061. The station primarily serves as an MDOT MTA light rail stop; and is served by MDOT MTA LocalLink Route 69, Route 70 and Commuter Bus 215; and RTA Route 201/J. There are 795 parking spaces available.

3.7.3 MDOT MTA MARC Odenton Station

Odenton MARC Station is located at 1400 Odenton Road, Odenton, Maryland 21113. The station primarily serves as a stop for the Penn Line commuter rail service between Baltimore and Washington, D.C. Both routings of the RTA Route 504, the AA202 and the Crofton Connector serve the station. There are 1300 parking spaces available.

3.7.4 MDOT MTA MARC Dorsey Station

Dorsey MARC Station is located at 7000 Route 100, which is on Exit 7, between US-1 and MD-295 in Elkridge, Maryland 21075. The Dorsey Station primarily serves as a stop for; Camden Line commuter rail service between Baltimore and Washington, D.C. RTA Routes 409/Purple and 501/Silver serve the station. There are 802 parking spaces available.

3.7.5 MDOT MTA Light RailLink BWI Business District Station

BWI Business District Light Rail Station is located in the BWI Business District on Aviation Boulevard, Linthicum, Heights, Maryland 21090 near the intersection with Terminal Road. It primarily serves as an MDOT MTA light rail stop and is served by; Anne Arundel County Connector Shuttle, MDOT MTA LocalLink 75 and commuter bus Route 201; and WMATA local bus Route B30. There are 36 parking spaces available.

3.7.6 Amtrak/MARC BWI Rail Station

Amtrak/MARC – BWI Rail Station is located at 7 Amtrak Way, Baltimore, Maryland 21240, near the intersection of Aviation Boulevard (MD-170) and Amtrak Way. It primarily serves as a stop for; the MARC Penn Line commuter rail and Amtrak intercity rail passenger service. The Anne Arundel County Connector Shuttle serves the station. MDOT MTA LocalLink 75, and MDOT MTA Commuter Bus 201 also serve the station. There are 1,600 parking spaces available.

3.7.7 BWI Airport Shuttle

BWI Airport Shuttle stops at Terminal A, E, and the International terminal at BWI Airport. At Terminal E connections are available to; Anne Arundel County Connector Shuttle, MDOT MTA light rail, MDOT MTA Commuter Bus 201, and MDOT MTA LocalLink bus Route 75.

3.7.8 Park and Ride Lots

Table 9 presents a list of park and ride lots in Anne Arundel County, the number of parking spaces available and average daily occupancy. Available data was gathered from Commuter Connections and SHA.

Table 9: Park & Ride Lots in Anne Arundel County

Name	Address	City/Town	Zip Code	Number of Spaces	Commuter Connections	SHA - Number of Spaces	Avg. Daily Occupancy
					Source reported		
Arundel Mills Mall	7000 Arundel Mills Circle	Hanover	21076	n/a			
Benfield	I-97 & Benfield Boulevard	Millersville	21108	93	82	82	33%
Bristol	MD 4 & MD 258	Lothian	20711	100	138	142	51%
BWI Airport	Flightime Drive & MD 170	BWI	21240	n/a			
BWI Amtrak/ MARC Station	Aviation Blvd. & Amtrak Way	BWI	21240	3200	3,189		
Crofton	Crofton Pkwy & Crain Hwy	Crofton	21114	100	205		
Cromwell Light Rail Station	7378 Baltimore Annapolis Blvd.	Glen Burnie	21061	795	795		
Davidsonville	John Hanson Hwy & Davidsonville Road	Davidsonville	21035	199	199	465	70%
Earleigh Heights Volunteer Fire Department	Governor Ritchie Hwy & Earleigh Heights Road	Severna Park	21146	50	64		
Glen Burnie County Government	Baltimore Annapolis Blvd & Governor Ritchie Hwy	Glen Burnie	21061	555	555		
Hahn Drive	7920 Ritchie Hwy	Glen Burnie	21061	200	200		
Hammonds Ferry Road	Hammonds Ferry Road & Baltimore Annapolis Blvd.	Linthicum	21090	203	203	208	12%
Harry S. Truman	Harry S. Truman Pkwy & Riva Rd	Annapolis	21401	800	480	800	68%
Jessup MARC Station	Jessup Rd & Old Jessup Road	Jessup	20794	100	100		
Lower Pindell Road	MD 4 & Lower Pindell Road	Lothian	20711	100	100	119	18%
Mountain Road	Mountain Rd & Catherine Ave	Pasadena	21122	n/a	100		
Navy-Marine Corps Stadium	Rowe Blvd & Taylor Avenue	Annapolis	21402	400	400		
North Linthicum Light Rail	Camp Meade Road & Baltimore Annapolis Blvd	Linthicum	21090	347	347		
Nursery Road Light Rail	Baltimore Annapolis Blvd & Nursery Rd	Linthicum	21090	37	37		

3.8 Planned Services

3.8.1 Central Maryland Transit Development Plan

The Central Maryland Transit Development Plan was intended to be a short term five to ten-year plan for services in; Howard County, Anne Arundel County and RTA services in northern Prince George's County. The recommended plan for Anne Arundel County built upon the existing RTA, AAOT and MDOT MTA services. It was presented as a phased approach with new fixed route service and a set of demand response services. The demand response service zones were intended to cover low-density area and connect to existing service trunk routes. The demand response service is referred to as Call N'Ride in the Transit Development Plan (TDP). Transit passenger amenities would need to be added at new routes stops where connecting to existing service and Call N'Ride zones.

The phased plan includes:

- Phase 1: Improvements to existing services
  - Route 201: Extend service from Freetown Village to Walmart, improve frequency to 30-minute peak, 45-minute mid-day and evening.
  - Route 202: Extend service to Coca-Cola facility, daily service to Odenton MARC Station, and improved frequency to 35 minutes peak, 45 off-peak.
  - Route 504: Improve frequency of fixed-route service to 30 minutes in peak hours.
- Phase 2: Glen Burnie area Call N'Rides connecting to existing MDOT MTA services, either bus or light rail.
  - Riviera Beach Call N'Ride.
  - Patapsco Light Rail Station to Glen Burnie District Court Call N'Ride
    - Patapsco Plaza to Cromwell Light Rail Station Call N'Ride.
  - Glen Burnie Call N'Ride.
- Phase 3: New fixed-route service, required complementary ADA paratransit service, and another Call N'Ride:
  - Annapolis (Westfield Mall) to Arundel Mills and BWI
  - South Glen Burnie Call N'Ride (connecting to new fixed-route service)
- Phase 4: New cross-county fixed-route, required ADA complementary paratransit service, and improvements to Gold route.
  - New fixed-route service from Anne Arundel Community College to Fort Meade/NSA via Severn.
  - ADA complementary paratransit for area served by new route.
  - Improvements to Gold Route (frequency improvements).
- Phase 5: Two new fixed-routes, connecting Call N'Ride, and additional ADA service.
  - New fixed-route connecting Crofton area and Annapolis Westfield Mall.
  - Expanded Call N'Ride in Crofton.
  - New fixed-route connecting Bowie-Crofton-Cromwell Light Rail.
  - Additional required ADA complementary paratransit for fixed-routes.

Facility requirements would be limited to those needed to accommodate one additional fixed route connection at Arundel Mills (Annapolis service), and two additional fixed routes at Westfield Mall/Annapolis (BWI/Arundel Mills service and Crofton connector). Potentially additional shelters and stops would be needed where new routes connect with Call N'Rides: Jumpers Hole, South Glen Burnie, and Crofton; and at major new stops on new routes - to be identified during the implementation process.

Highlights of the phased plan includes:

- Phase I: Improvements to existing service
- Phase II: Call N'Ride in the Glen Burnie area connect to existing MDOT MTA services, bus and light rail
- Phase III: New fixed-route service, required complementary ADA paratransit service and another Call N'Ride
- Phase IV: New cross-county fixed-route service, required ADA complementary paratransit service and improvements to the Gold route

- Phase V: Two new fixed-routes, connecting Call N'Ride and additional ADA service

3.8.2 City of Annapolis Transit Development Plan

The Draft Final City of Annapolis Transit Development Plan is a five-year plan. One of the most significant recommendations in the plan is restoring the core route bus network to the level of service in 2014. A short-term improvement suggested the establishment of a Pilot Feeder Connection Route to replace the Orange Route and links the East/Central Annapolis to the Brown and Red core routes at Annapolis Market Place.

Mid-term improvements include:

- Decreasing headways on the Brown Route to 15 minutes, Monday through Friday.
- Implementing 30-minute Headways on Pilot Feeder Connection Route if deemed successful.

Long-term improvements (potentially beyond the 5-year time horizon) are:

- Operating the Green Route every 30 minutes on Saturdays
- Decreasing headways on the Green Route to 15 minutes on weekdays during the peak hours
- Extending the Brown, Green, and Red routes evening hours
- Microtransit (see Figure 17).

The effect on facility needs is limited as most improvements are expansions in frequency or span. Potentially a bay would be needed to accommodate the proposed microtransit shuttle route-deviation service for the north side of Annapolis.

3.8.3 Existing and Planned - Key locations

The key potential locations for major terminal improvements are Parole and Arundel Mills - all the other terminals are where bus services connect to rail and already have some level of facilities. Considering potential connectivity, there are two locations where there is a high level of potential connectivity where multiple services connect, and there are very limited facilities.

At Arundel Mills, the County Connector connects with the 202 K. It is also a connection point with; the RTA 501 (to Columbia), the RTA 201 (to Freedom Village via Cromwell Light Rail and Odenton), the RTA 502 (to Laurel), MDOT MTA's LocalLink 75 (to BWI, BWI rail connections and Patapsco Light Rail to Baltimore), the MDOT MTA 201 Commuter Bus (to Gaithersburg), and the WMATA B-30 (to the Greenbelt Metro). The layout and location of stops are presented in Figure 18.

The other locations are in Parole. There are two locations in use at the moment. One is Westfield Mall in Annapolis (Figure 19); where the AAOT Yellow and Gold routes, the AT Green, Purple, Purple South and Red routes, MDOT MTA 210, 215, and 220, and Young Transportation Services Route 921 all connect. Potential future additions include a route from Annapolis to Arundel Mills/BWI, and a route from Annapolis to Crofton. The other location is the Harry S. Truman Park and Ride lot, which has limited local connectivity; only the AAOT Yellow, MDOT MTA Commuter

210, 220, and 230, Young Transportation Services 921, and intercity service provided by Megabus and Greyhound. This location is presented in Figure 20.

Figure 17: Microtransit Concept City of Annapolis TDP

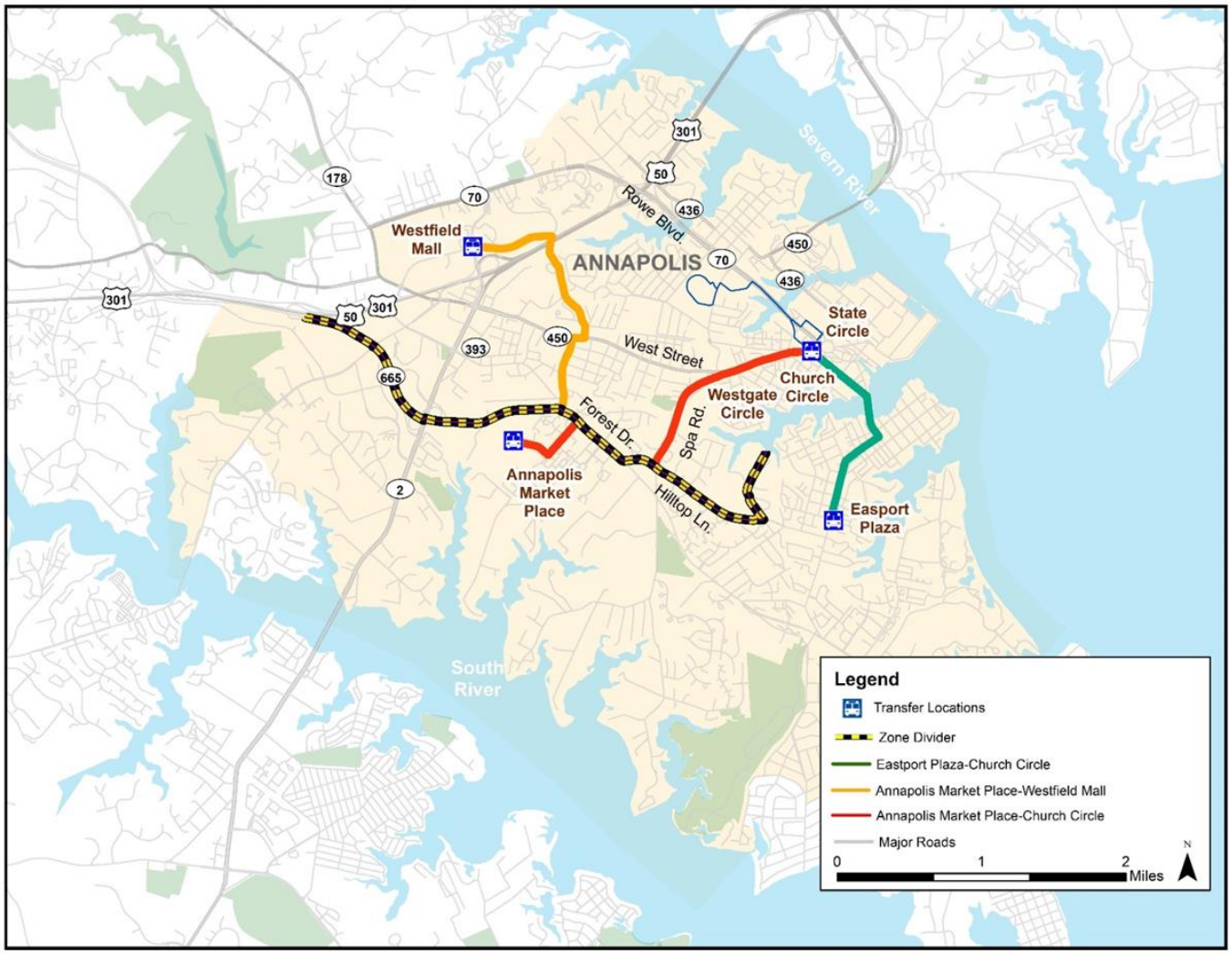


Figure 18: Transit Service Arundel Mills Mall

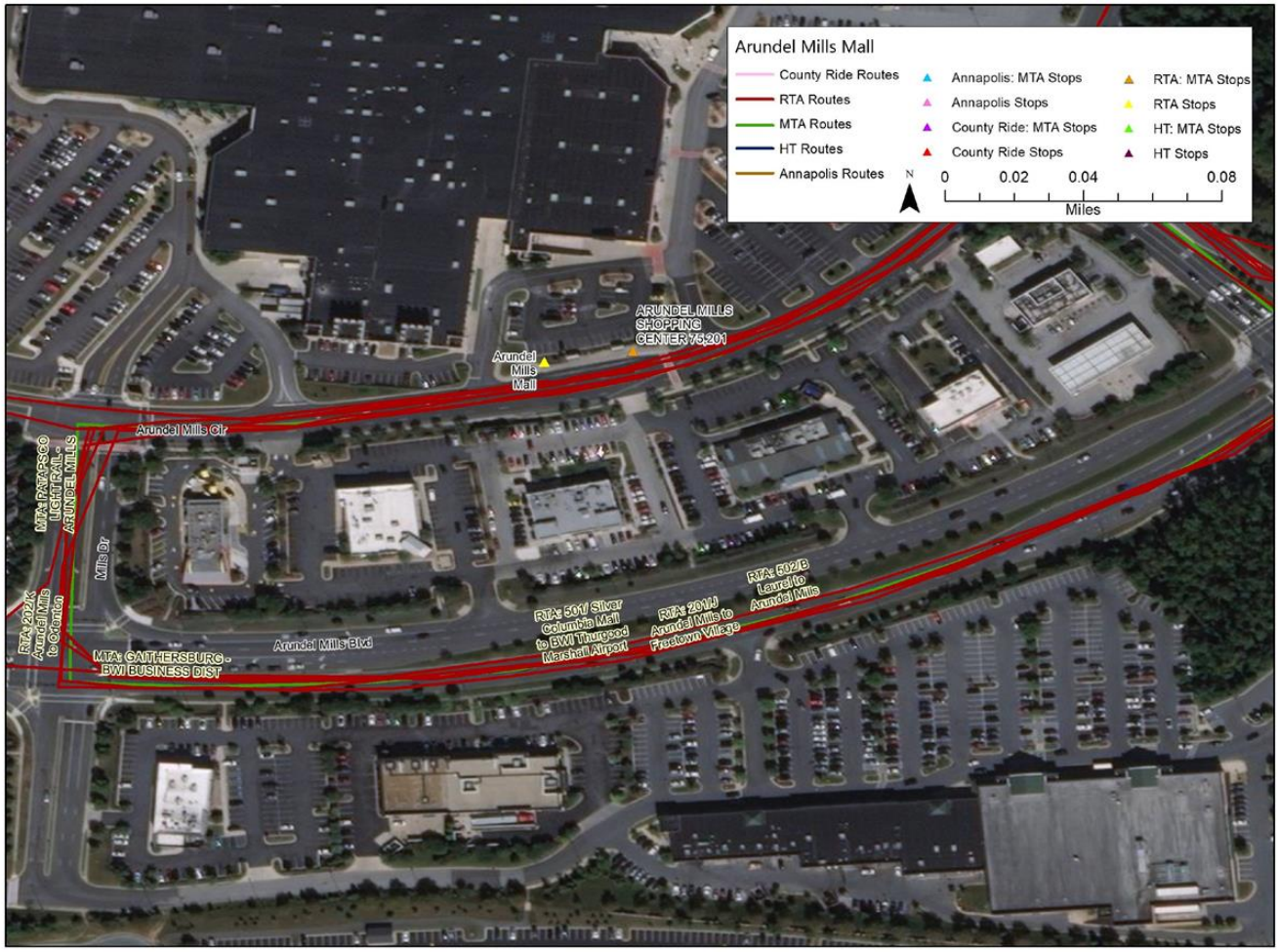


Figure 19: Transit Service Westfield Mall

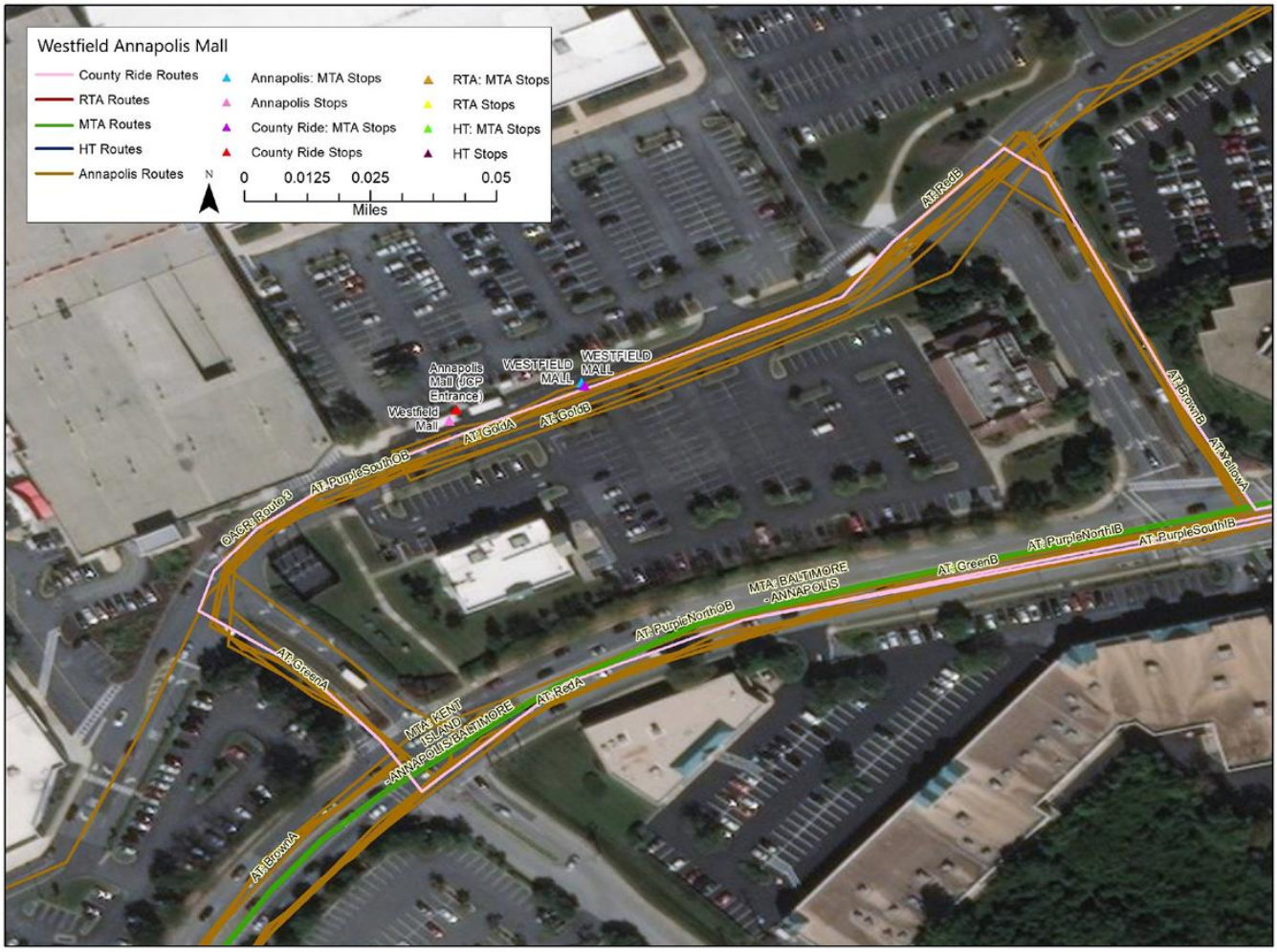


Figure 20: Transit Service Harry S. Truman Park and Ride Lot

Table 10 presents the routes currently serving Arundel Mills, and the current stop times. Table 11 presents the routes serving Westfield Mall in Parole, including their times by route. Table 12 lists all the routes currently serving the Harry S. Truman Park and Ride lot.

As can be seen, at any of the three locations there are numerous times when multiple buses should be present. The Red, Green, Yellow and Gold routes at Westfield Mall are a timed transfer, and a number of commuter bus stop times coincide. This is less true at Harry S. Truman, though there are sometimes when there could be two or more buses on site simultaneously. The Arundel Mills stop times show a degree of time coordination as well. For all these locations the ability to share a bus bay requires schedules with spacing of ten minutes, just to allow for capacity for late-running buses, or long dwell-times; in other words, differences in stop times of a few minutes may not allow routes to share a bay. For this reason, it would appear that in most cases the capacity of a transit facility would require one bus bay per route. Although there is a surprisingly high degree of schedule connectivity given the variety of providers, a longer-term vision might be that

terminals at each location would be a timed-transfer hub, like that in Columbia for the RTA. This also implies that we need a bay for each route.

Table 10: Route Overlap Connections at Arundel Mills

RTA			BWI Partnership	Anne Arundel County OOT	MTA	MTA Commuter Bus	WMATA
Route Number							
201	501	502	County Connector Shuttle	AA-202	LocalLink 75	201	B30
						4:00 AM	
					4:40 AM	5:00 AM	
			5:47 AM		5:50 AM	5:18 AM	
	6:00 AM	6:00 AM				6:00 AM	
			6:10 AM				
6:30 AM				6:15 AM		6:18 AM	6:33 AM
6:45 AM	6:52 AM	6:52 AM	6:38 AM		6:51 AM		
	7:00 AM	7:00 AM	7:01 AM	7:00 AM		7:00 AM	
7:20 AM							
7:30 AM			7:29 AM		7:12 AM	7:18 AM	7:19 AM
	7:52 AM	7:52 AM	7:52 AM	7:45 AM	7:52 AM		7:43 AM
8:05 AM	8:00 AM	8:00 AM				8:00 AM	
8:15 AM			8:20 AM		8:15 AM	8:18 AM	8:29 AM
8:50 AM	8:52 AM	8:54 AM	8:43 AM	8:30 AM	8:53 AM		8:53 AM
9:00 AM	9:00 AM	9:00 AM				9:00 AM	
			9:11 AM	9:15 AM		9:18 AM	
9:35 AM					9:42 AM		9:38 AM
9:45 AM	9:52 AM	9:54 AM			9:54 AM		
	10:00 AM	10:00 AM	10:00 AM	10:00 AM		10:00 AM	10:03 AM
10:20 AM						10:18 AM	
	10:50 AM	10:54 AM	10:56 AM	10:45 AM	10:55 AM		10:48 AM
11:05 AM	11:00 AM	11:00 AM				11:00 AM	
11:15 AM						11:18 AM	11:13 AM
	11:50 AM	11:52 AM	11:45 AM		11:55 AM		11:58 AM
	12:00 PM	12:00 PM				12:00 PM	

Table 11: Route Overlap Connections at Westfield Mall

Annapolis Transit					Anne Arundel County OOT		MTA Commuter Bus			Young Transportation Services
Brown	Green	Purple North	Purple South	Red	Gold	Yellow	210	215	220	921
									5:15 AM	
	5:30 AM			5:30 AM					5:30 AM	
5:45 AM									5:45 AM	
	5:54 AM			5:54 AM						
	6:00 AM			6:00 AM		6:00 AM	6:00 AM		6:00 AM	
6:15 AM	6:24 AM			6:24 AM	6:22 AM				6:15 AM	
6:38 AM	6:30 AM			6:30 AM	6:27 AM		6:30 AM		6:30 AM	6:32 AM
6:45 AM	6:54 AM			6:54 AM		6:52 AM		6:45 AM	6:45 AM	
7:08 AM	7:00 AM			7:00 AM		7:00 AM	7:00 AM		7:00 AM	
7:15 AM	7:24 AM			7:24 AM					7:15 AM	7:16 AM
7:38 AM	7:30 AM			7:30 AM	7:35 AM		7:30 AM		7:30 AM	
7:45 AM	7:54 AM			7:54 AM	7:40 AM	7:52 AM		7:45 AM		
8:08 AM	8:00 AM			8:00 AM	8:22 AM	8:00 AM	8:00 AM		8:00 AM	8:01 AM
8:15 AM	8:24 AM			8:24 AM						
8:38 AM	8:30 AM			8:30 AM	8:27 AM					
8:45 AM	8:54 AM			8:54 AM		8:52 AM		8:45 AM		
9:08 AM	9:00 AM			9:00 AM		9:00 AM				
9:15 AM	9:24 AM			9:24 AM						
9:38 AM	9:30 AM			9:30 AM	9:35 AM					9:32 AM
9:45 AM	9:54 AM			9:54 AM	9:40 AM	9:52 AM				
10:08 AM	10:00 AM			10:00 AM		10:00 AM				
10:15 AM	10:24 AM			10:24 AM	10:22 AM					
10:38 AM	10:30 AM			10:30 AM	10:27 AM					
10:45 AM	10:54 AM			10:54 AM		10:52 AM				
11:08 AM	11:00 AM			11:00 AM		11:00 AM				11:06 AM
11:15 AM	11:24 AM			11:24 AM						
11:38 AM	11:30 AM			11:30 AM	11:35 AM					
11:45 AM	11:54 AM			11:54 AM	11:40 AM	11:52 AM				

Annapolis Transit					Anne Arundel County OOT		MTA Commuter Bus			Young Transportation Services
Brown	Green	Purple North	Purple South	Red	Gold	Yellow	210	215	220	921
12:08 PM	12:00 PM			12:00 PM		12:00 PM				
12:15 PM	12:24 PM			12:24 PM	12:22 PM					
12:38 PM	12:30 PM			12:30 PM	12:27 PM					
12:45 PM	12:54 PM			12:54 PM		12:52 PM				
1:08 PM	1:00 PM			1:00 PM		1:00 PM				
1:15 PM	1:24 PM			1:24 PM					1:25 PM	
1:38 PM	1:30 PM			1:30 PM	1:35 PM				1:30 PM	
1:45 PM	1:54 PM			1:54 PM	1:40 PM	1:52 PM				
2:08 PM	2:00 PM			2:00 PM		2:00 PM				
2:15 PM	2:24 PM			2:24 PM	2:22 PM					
2:38 PM	2:30 PM			2:30 PM	2:27 PM					
2:45 PM	2:54 PM			2:54 PM		2:52 PM				2:51 PM
3:08 PM	3:00 PM			3:00 PM		3:00 PM				
3:15 PM	3:24 PM			3:24 PM						
3:38 PM	3:30 PM			3:30 PM	3:35 PM			3:30 PM		
3:45 PM	3:54 PM			3:54 PM	3:40 PM	3:52 PM				
4:08 PM	4:00 PM			4:00 PM		4:00 PM			4:10 PM	
4:15 PM	4:24 PM			4:24 PM	4:22 PM		4:18 PM		4:25 PM	4:21 PM
4:38 PM	4:30 PM			4:30 PM	4:27 PM			4:30 PM		
4:45 PM	4:54 PM			4:54 PM		4:52 PM	4:48 PM		4:40 PM	
5:08 PM	5:00 PM			5:00 PM		5:00 PM			5:10 PM	
5:15 PM	5:24 PM			5:24 PM			5:18 PM		5:25 PM	
5:38 PM	5:30 PM			5:30 PM	5:35 PM			5:30 PM		
5:45 PM	5:54 PM			5:54 PM	5:40 PM	5:52 PM	5:48 PM		5:40 PM	5:51 PM
6:08 PM	6:00 PM			6:00 PM		6:00 PM	6:10 PM		6:10 PM	
6:15 PM	6:24 PM			6:24 PM	6:22 PM				6:25 PM	
6:38 PM	6:30 PM			6:30 PM	6:27 PM				6:40 PM	
7:08 PM	6:54 PM	7:00 PM		6:54 PM		6:52 PM			7:10 PM	
			7:30 PM		7:35 PM					7:21 PM
		8:06 PM			7:40 PM				7:40 PM	
		8:15 PM	8:37 PM							
		9:21 PM	8:45 PM							
		9:30 PM	9:52 PM							
		10:36 PM	10:00 PM							

Table 12: Route Overlap Connections at Harry S. Truman Park and Ride Lot

Anne Arundel County OOT	MTA Commuter Bus			Megabus	Greyhound	Young Transportation Services
Route Number						
Yellow	210	220	230	Annaplis/ NY	Annapolis/ Baltimore	921
		5:15 AM	5:15 AM			
		5:30 AM	5:30 AM			
		5:45 AM	5:45 AM			
	6:10 AM	6:00 AM	6:00 AM			
6:20 AM		6:15 AM	6:15 AM	6:15 AM		
	6:40 AM	6:30 AM	6:30 AM			6:37 AM
		6:45 AM	6:45 AM			
		7:00 AM	7:00 AM			
7:20 AM	7:10 AM	7:15 AM	7:15 AM	7:15 AM		7:19 AM
		7:30 AM	7:30 AM			
	7:40 AM					
	8:10 AM	8:00 AM				8:04 AM
8:20 AM						
9:20 AM						9:37 AM
10:20 AM				10:50 AM		
11:20 AM				11:15 AM		11:09 AM
					11:45 AM	

Anne Arundel County OOT	MTA Commuter Bus			Megabus	Greyhound	Young Transportation Services
Route Number						
Yellow	210	220	230	Annaplis/ NY	Annapolis/ Baltimore	921
12:20 PM						
1:20 PM		1:25 PM	1:21 PM	1:15 PM		
						2:15 PM
2:20 PM					2:30 PM	
3:20 PM						
				3:50 PM		3:45 PM
	4:10 PM	4:10 PM	4:15 PM			
4:20 PM		4:25 PM	4:30 PM			
	4:40 PM			4:50 PM		
		4:40 PM	4:45 PM			
	5:10 PM	5:10 PM	5:02 PM			
5:20 PM		5:25 PM	5:18 PM	5:15 PM		5:15 PM
	5:40 PM					
		5:40 PM	5:34 PM			
			5:50 PM			
	6:10 PM	6:10 PM	6:02 PM			
6:20 PM		6:25 PM	6:25 PM			
		6:40 PM	6:40 PM			6:45 PM
				7:05 PM		
		7:10 PM				
			7:21 PM			
		7:40 PM				
				10:50 PM		

3.9 Facility Needs and Considerations

Table 13 presents the routes and their potential bus bay needs for those routes potentially connecting at Westfield Mall, the routes connecting at Harry S. Truman Park and Ride, and the scenario in which a single facility could be built that would eliminate the need to have capacity at both locations. Given the current existing routes, and those in current public plans, a facility at the

Mall would need ten bays. A transit facility at Harry S. Truman Park and Ride would require six, and a combined facility could require 12 (rather than 16) because each route would need only one bay at one location, rather than two locations. This is the same size identified in the previous terminal study for Annapolis. A similar count for Arundel Mills is presented in Table 14, calling for eight bays to service existing and planned service.

3.9.1 Location Issues

Location is a key issue. While a combined transit terminal offers some potential economies in terms of facility size, if it were built at the Harry S. Truman location (to accommodate the required parking) it would be strictly a transfer location, with little chance of walkup/local usage. It would also require a significant increase in AT bus services with the current routes extended from Westfield Mall to the Harry S. Truman lot. At Westfield Mall or at another location in Parole, there is at least the possibility that the transit terminal could be an origin or destination. However, there is likely no cost-effective way to accommodate the 800 Harry S. Truman parking spaces in Parole, and there might well be traffic issues adding trips to already-busy intersections.

3.9.2 Local Usage Versus Transfers

Currently the level of boardings at Westfield Mall on the local services shows some local usage, but not large numbers. Table 15 presents ridership counts at that stop for the; Brown, Gold, Green, Purple, Red and Yellow routes. This is daily weekday data from the passenger counters on the AT buses, plus the Saturday and Sunday data for all routes.

It is not known how many of these persons transfer to and from MDOT MTA routes, but they represent ridership that would not be using a terminal at the Harry S. Truman Park and Ride lot. To some extent this argues for a transit connection terminal at the Westfield Mall or someplace with significant existing or potential residential or employment, combined with improvements in amenities (shelters, real-time information, etc.) at the Harry S. Truman Park and Ride.

Table 13: Potential Bus Bay Requirements – Parole Transit Routes

Provider	Existing or Planned	Route Number	Terminal or Pass-Through	Notes	Bays Required
Westfield Annapolis Mall					
AAOT	Existing	Gold	Pass-Through	Timed connection with AT Red, Green, AAOT Yellow	1
AAOT	Existing	Yellow	Terminal	Timed connection with AT Red, Green, AAOT Gold	1
AAOT	Planned	Arundel Mills/BWI	Terminal	Plan for timed connections at either end	1
AAOT	Planned	Crofton	Terminal	Plan for timed connections at either end	1
Annapolis Transit	Existing	Green	Terminal	Timed connection with Red	1
Annapolis Transit	Existing	Red	Terminal	Timed connection with Green	1
Annapolis Transit	Existing	Purple North	Terminal	Evening only	0
Annapolis Transit	Existing	Purple South	Terminal	Evening only	0
Annapolis Transit	Planned	Microtransit	Terminal	Service design uncertain, may have timed stop	1
MTA Commuter	Existing	210	Pass-through		1
MTA Commuter	Existing	215	Pass-through		1
MTA Commuter	Existing	220	Pass-through		1
Young Transportation Services	Existing	921	Pass-through	Could share bay with Commuter Bus	0
Total Bays Requried					**10**
Harry S. Truman Park and Ride					
AAOT	Existing	Yellow	Pass-Through	Usually precedes or follows commuter bus times	1
MTA Commuter	Existing	210	Pass-Through		1
MTA Commuter	Existing	220	Pass-Through		1
MTA Commuter	Existing	230	Pass-Through		1
Megabus	Existing	New York route	Pass-Through	Intercity typically has longer dwell time Could share bay with Greyhound	1
Greyhound	Existing		Pass-Through	Intercity typically has longer dwell time Could share bay with Greyhound	0
Young Transportation Services	Existing	921	Pass-Through		1
Total Bays Requried					**6**
Combined Parole Terminal					
AAOT	Existing	Gold	Pass-Through	Timed connection with AT Red, Green, AAOT Yellow	1
AAOT	Existing	Yellow	Terminal	Timed connection with AT Red, Green, AAOT Gold	1
AAOT	Planned	Arundel Mills/BWI	Terminal	Plan for timed connections at either end	1
AAOT	Planned	Crofton	Terminal	Plan for timed connections at either end	1
Annapolis Transit	Existing	Green	Terminal	Timed connection with Red	1
Annapolis Transit	Existing	Red	Terminal	Timed connection with Green	1
Annapolis Transit	Existing	Purple North	Terminal	Evening only	0
Annapolis Transit	Existing	Purple South	Terminal	Evening only	0
Annapolis Transit	Planned	Microtransit	Terminal	Service design uncertain, may have timed stop	1
MTA Commuter	Existing	210	Pass-Through		1
MTA Commuter	Existing	215	Pass-Through		1
MTA Commuter	Existing	220	Pass-Through		1
MTA Commuter	Existing	230	Pass-Through		1
Intercity-Megabus and Greyhound	Existing		Pass-Through		1
Total Bays Requried					**12**

Table 14: Potential Space Requirements – Arundel Mills

Provider	Existing or Planned	Route Number	Terminal or Pass-Through	Notes	Bays Required
AAOT	Existing	County Connector	Pass-Through		
AAOT	Existing	202	Terminal		1
AAOT	Planned	Arundel Mills/BWI	Terminal	Plan for timed connections at either end	1
RTA	Existing	201	Terminal		1
RTA	Existing	501	Terminal	Stops at Mall stop before and after stop at AACC	1
RTA	Existing	502	Terminal		1
MTA		Local Link 75	Pass-Through		1
MTA Commuter		201	Pass-Through		1
WMATA		B-30	Pass-Through		1
Total Bays Requried					**8**

Table 15: AT – APC Boarding Data at Westfield Mall

Route	Ridership
Brown	45
Gold	24
Green	83
Purple	21
Red	66
Yellow	57
Total	**296**
Saturday	118
Sunday	39

3.9.3 Need for Flexibility in Design

Future transit needs are getting more difficult to predict, as energy prices and related policies are quite variable. While there are low energy prices now, the future is unknown, and policies addressing climate change may have an impact that could increase transit usage.

The estimates of capacity needs shown here assume that the existing and planned route structure would (generally) continue in future years, with growth in demand handled by additional frequency. It may be that additional capacity is needed to deal with new routes to address future development, and it would make sense to at least include land for some such expansion in a site location.

Technology is a big unknown. During the period of time that a new passenger facility would be in service, it is likely that autonomous vehicles will come into service. Combined with the existing technology used by providers of app-based service, the scope for vehicle sharing is likely to increase. This will likely have more impact on the local transit services, as the likely user cost for long-haul commuter services will be lower than for demand-response types of service with fewer passengers on longer trips. Use of a personal auto to reach the boarding points of commuter services could decline if there is a low-cost demand response first-mile/last-mile service. Conceivably, a terminal would need to be designed to allow for flexibility to convert transit bays to microtransit pick-up and drop-off locations. How many might be in use in 20 or 30 years is unknown.

4.0 Site Screening

The site screening evaluation effort began with a review of existing bus transit centers in the Annapolis vicinity. The site screening process is an evaluation of sites with the intent of eliminating sites found to be unsuitable for a transit center. Multiple factors for each site location were assessed during the screening process.

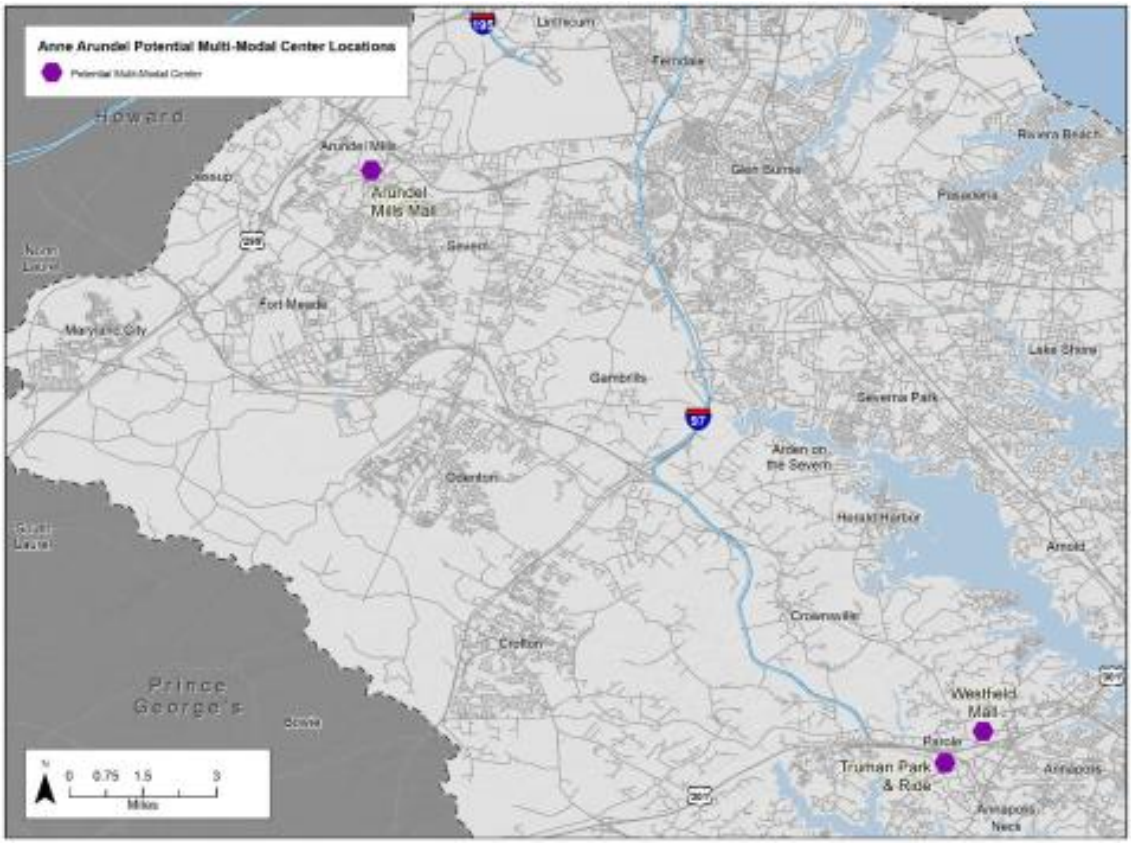
The transit center site screening included:

- Identification of potential sites
- Evaluation of site accessibility via walking and bicycling
- Evaluation of accessibility for transit vehicles and customer vehicles
- Recognition of adjacent land uses and the potential influence and development opportunities
- Development of conceptual site layout for bus capacity and bus access
- Creating a site comparison matrix

4.1 Initial Screening

The initial screening included three locations where bus service is currently operating. Each of the sites were evaluated as a potential location for a transit center. Figure 21 identifies the three locations, Arundel Mills Mall, Westfield Mall and Harry S. Truman Park and Ride. Arundel Mills Mall and Westfield Mall are similar with having both pass through bus service and act as a terminal location. Harry S. Truman Park and Ride is pass through service only. Existing service, geographic location, physical, environmental, community and current use at each location was assessed as part of the initial screening process.

Figure 21: Existing Bus Facilities



4.1.1 Existing Ridership

AT bus boardings at Westfield Mall indicate reasonable ridership with 296 average weekday boardings. Most trips at the mall are origin or destination. Similar trips are generated to and from Arundel Mills Mall with RTA bus service. Commuter bus service is available at both Westfield and Arundel Mills. Table 16 shows low commuter bus ridership at both mall locations.

Harry S. Truman Park and Ride is predominantly a transit stop for longer haul Mega Bus and commuter bus trips. AT routes do connect at Harry S. Truman Park and Ride.

Commuter bus operates at all three sites with the highest commuter bus daily ridership at Harry S. Truman Park and Ride lot at 573 average daily boardings. The Truman site is designed as a commuter lot with generous space to accommodate all day parking.

The location of a transit center in Parole certainly has benefits offering bus connections and future expansion between multiple bus services. Westfield Mall, Arundel Mills Mall and the Harry S. Truman Park and Ride sites serve different ridership bases, with existing bus service and reasonable ridership.

Table 16: Commuter Bus Boarding's at Park and Ride Lots

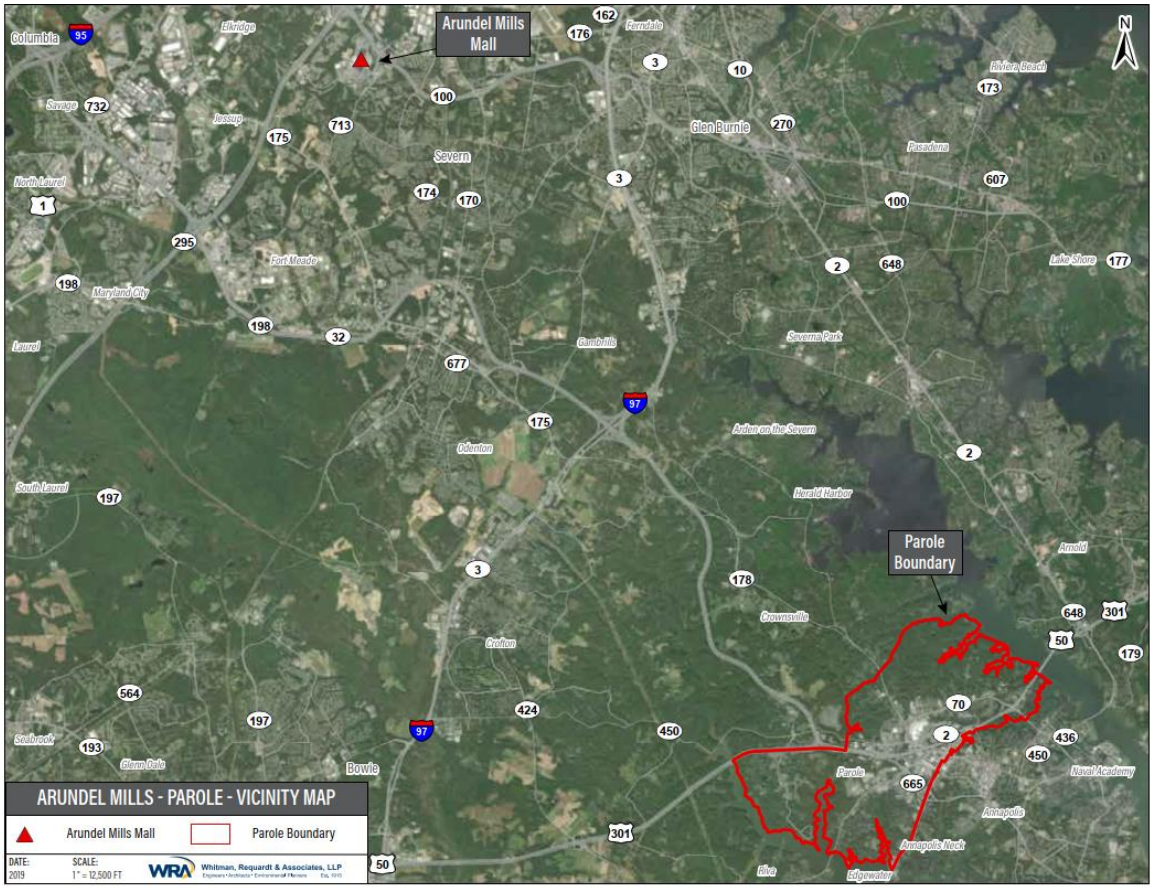
Commuter Bus Boardings - Park and Ride Lots	On	Off	Avg. ridership
Westfield Mall (Ring Rd. bus stop near J.C. Penney)	5	4	4
Harry S. Truman Park & Ride (Riva Rd. & Truman Pkwy.)	557	518	537
Arundel Mills Mall	61	60	60

4.1.2 Site Eliminated

The first stakeholder meeting held December 12, 2018 reviewed the study's goals and current operating condition in the Annapolis area. As part of the stakeholder meeting the group collectively discussed the elimination of Arundel Mills Mall from the process. Figure 22 identifies the location of Arundel Mills Mall and the distance to Parole and the adjacent City of Annapolis. With the elimination of Arundel Mills Mall, the site screening focused on Westfield Mall, Harry S. Truman Park and Ride and the opportunity to identify additional sites in the Parole area.

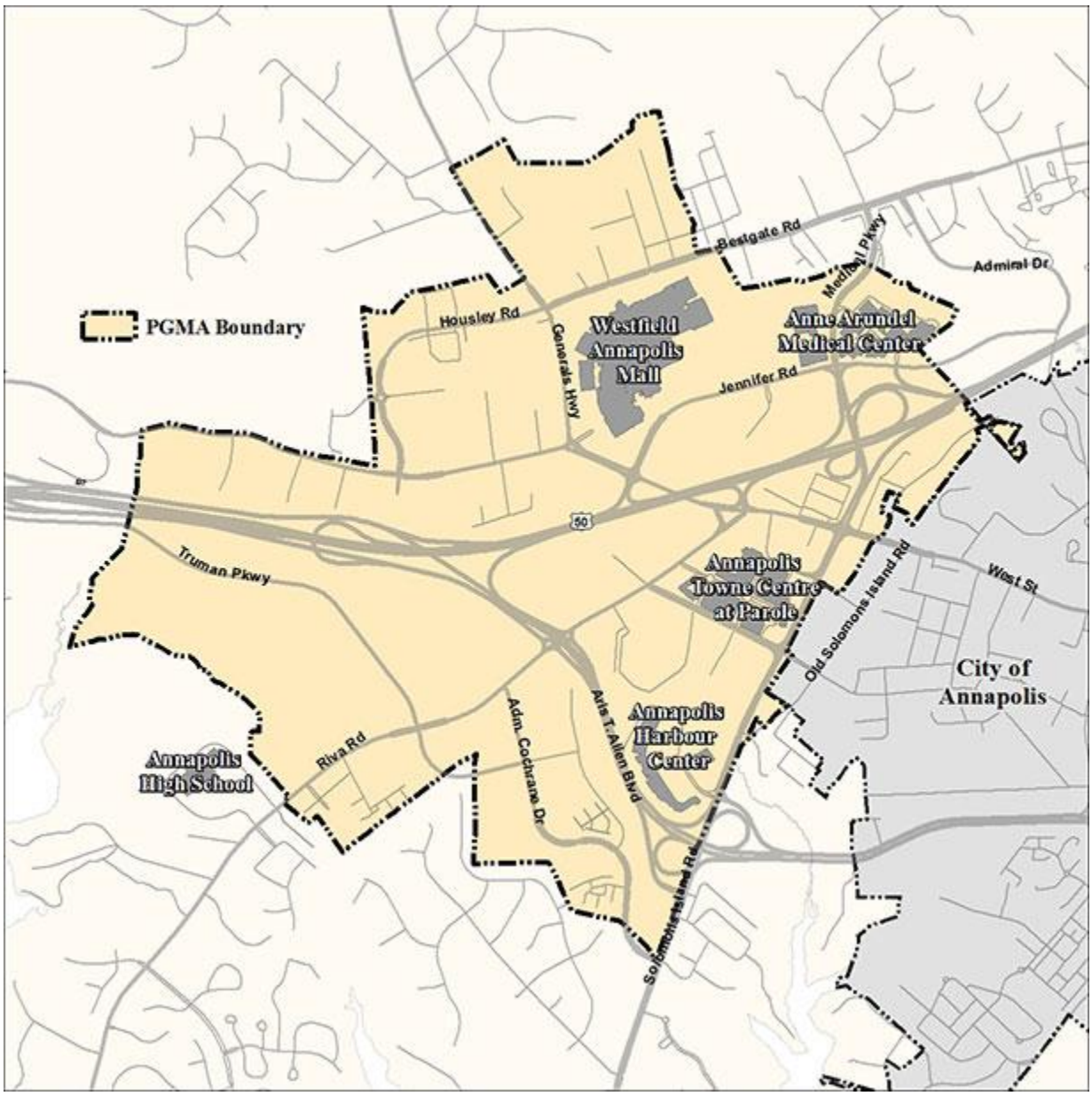
- Westfield Mall
- Harry S. Truman Park and Ride
- Parole Area

Figure 22: Study Area



The Parole area is one of three locations in Anne Arundel County targeted for development. Anne Arundel County is in the process of updating the master plan which guides land use and growth management standards. Figure 23 identifies the Parole Growth Management Plan designated boundary. The designated area includes Westfield Mall to the north of RT 50 and Harry S. Truman Park and Ride to the southwest of RT 50.

Figure 23: Parole Growth Management Area

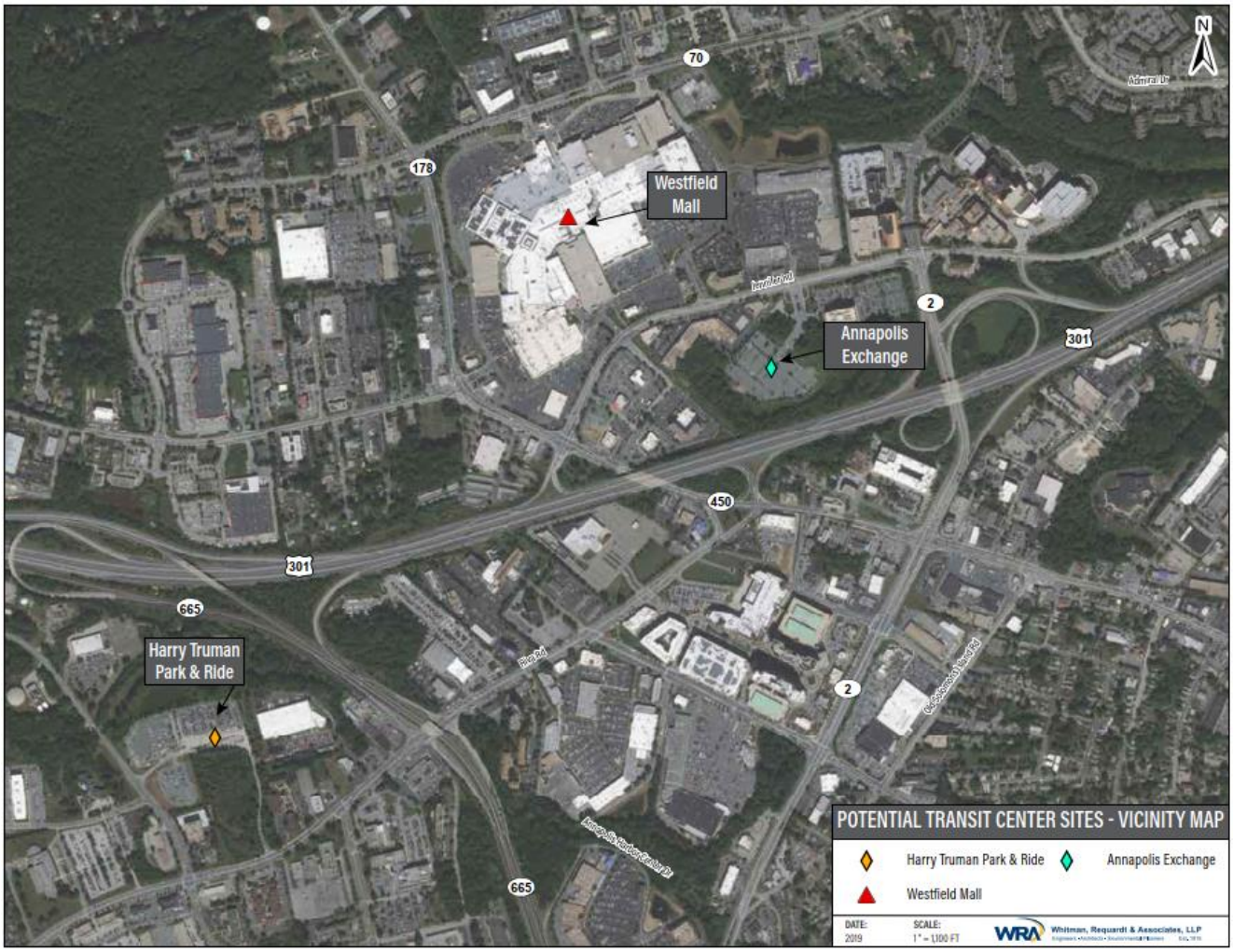


Parole Growth Management Area website 2019

4.1.3 Sites Identified

With the elimination of Arundel Mills Mall as a candidate site, the initial site screening focused on Westfield Mall and Harry S. Truman Park and Ride. A third site was introduced as a potential transit center location. The Annapolis Exchange site north of RT 50 and adjacent to Westfield Mall off Jennifer Road. The site is currently paved and used for parking for the adjacent medical center services. All three sites are within the Parole boundary as seen in Figure 24, Potential Transit Center Sites.

Figure 24: Potential Transit Center Sites



4.1.4 Income and Housing by Census Tract

As part of the site screening process income and subsidized housing in the Parole area was identified and mapped. The majority of Parole falls in the 0% to 3% of families below the poverty level as seen in Figure 25. The areas with higher percentage of families in poverty have access to AT bus service. There is significant benefit to residents especially those of low income or living in subsidized housing if transit routes and terminal transit centers are located nearby.

Figure 25: Percent of Families Below the Poverty Level

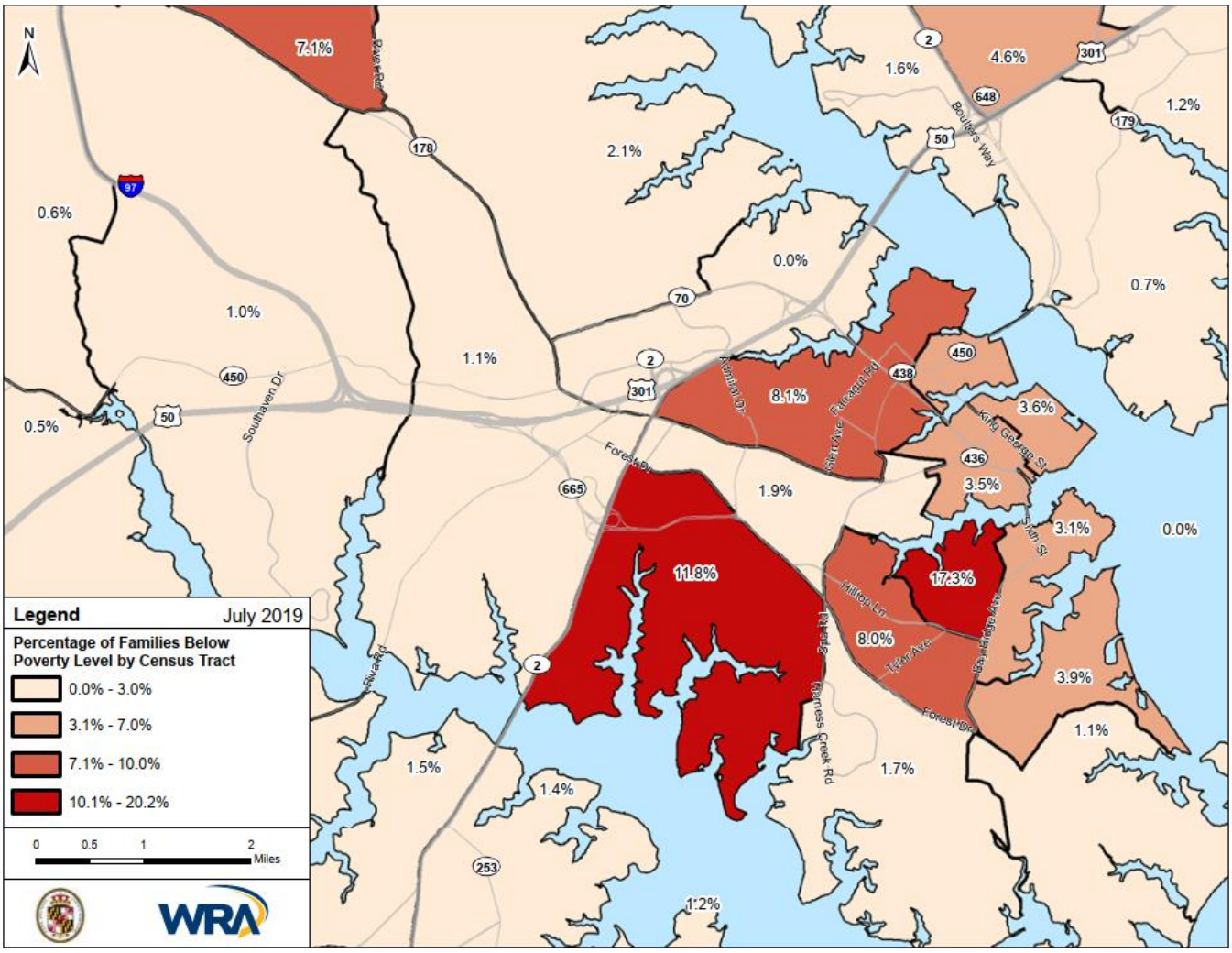


Figure 26 identifies the number of subsidized housing units per census tract. There is a relatively high number of subsidized housing units within Parole. AT bus routes serve the Parole area with most of the routes south of Route 50, looping though the Parole residential areas and historic Annapolis.

Figure 26: Number of Subsidized Housing Units

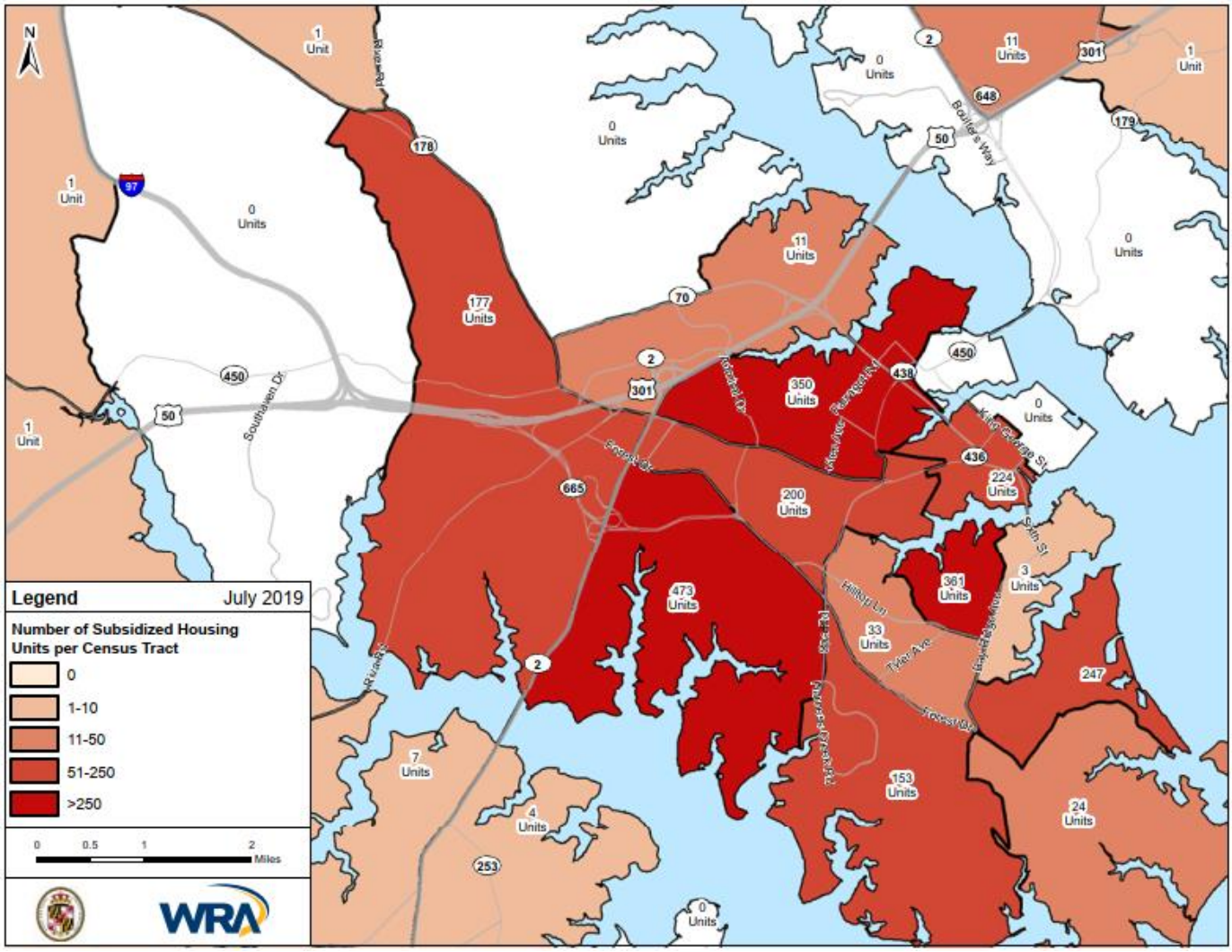
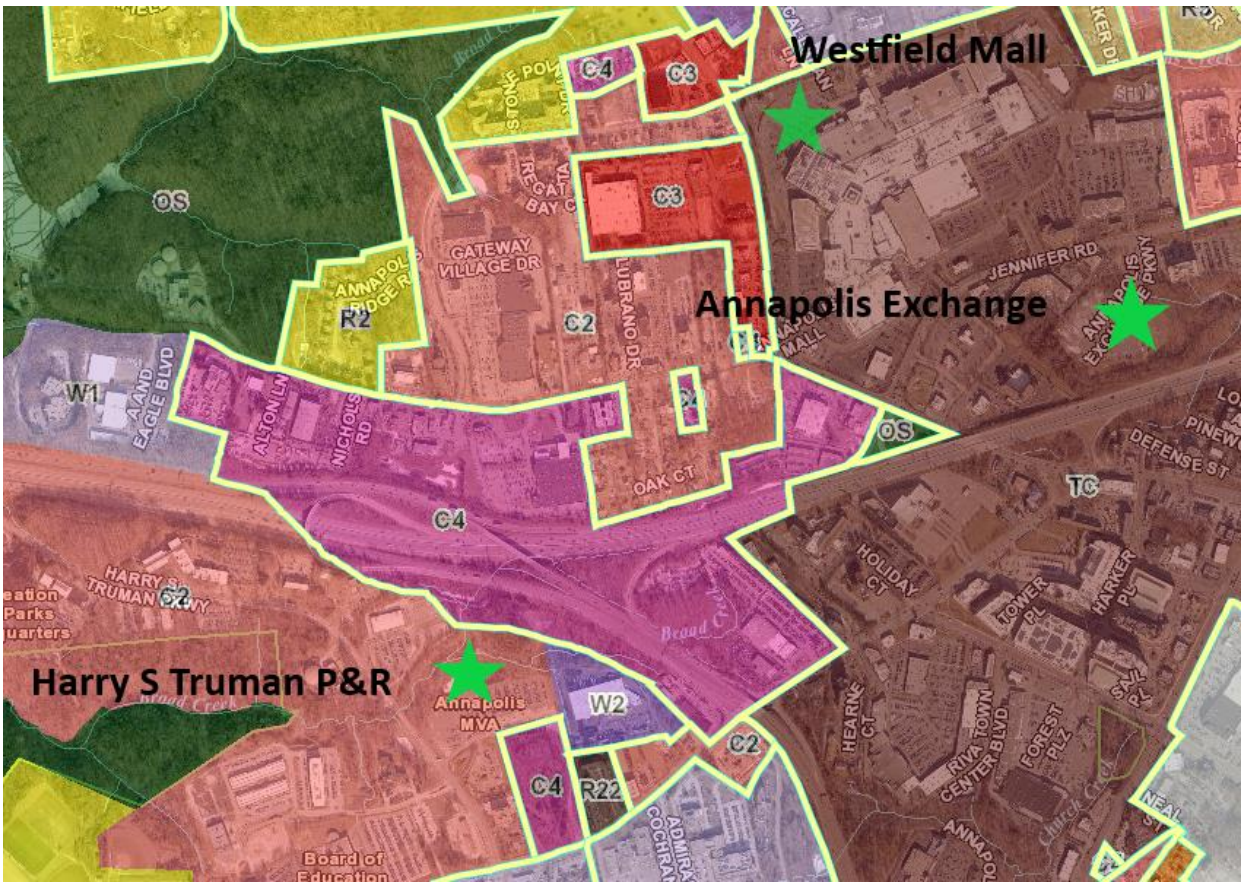


Figure 27: Parole Area Zoning



4.1.5 Existing Zoning

Westfield Mall and Annapolis Exchange fall within the TC Town Center district as shown in Figure 27. The Town Center district supports mixed use development with increased intensity. Westfield Mall and Annapolis Exchange are bordered to the east and west by; C2 and C3 commercial, office, restaurant and R2 residential use. Harry S. Truman is within C2 Commercial Office District zone. Truman site is bordered by light industrial and industrial use, supporting industrial, office, restaurants, and hotels. The small R22 area adjacent to the site is designated multi-family high density residential use. Table 17 defines Anne Arundel County zoning designations.

Table 17: Anne Arundel County Zoning Designations

C2 - Commercial Office Districts
This District is generally intended for office buildings. 50% of the floor area may be for a limited number of auxiliary commercial uses that typically support the office use. Restaurants are permitted as a stand-alone use. Minimum lot size is 20,000 square feet. Maximum lot coverage by structures and parking is 80%. Maximum Floor Area Ratio is 1.0 to 2.0 based on mix of uses. Maximum height is 60 feet based on minimum setbacks and can increase indefinitely provided setbacks are increased as per formula.
TC- Town Center District (Permitted Uses Code Reference - 18-9-302)
The Town Center District is designed to encourage mixed-use development with an increased intensity of use. Any commercial use that is permitted in a C3 District is permitted in a TC District as well as multifamily uses allowed in R15 and R22 Districts. No minimum lot size. Maximum Floor Area Ratio is 2.0. Maximum height is 45 feet based on minimum setbacks and can be increased to 60 feet provided setbacks are increased per formula.

The Parole Growth Management Plan has proposed Westfield Mall as Tier 2 Urban Center and the location of Harry S. Truman Park and Ride as Tier 3 Business Periphery. Table 18 defines the proposed Parole Growth Management Area policy.

Table 18: Proposed PGMA Policy

Zoning and Policy Area Analysis	**Existing PGMA Parole Growth Management Area**				**Proposed**		
	PGMA	**Proposed Structure**	**PGMA Height**	**Zoning**	**Tier**	**Policy Area**	**Max. Height Limits**
Westfield Mall	Town Center	Location is in an urban center, near a business periphery	6-8 floors with incentives	Town Center	2	Urban Center	6 stories
Harry S. Truman Park N Ride	Periphery	Located in a Business periphery	3-4 floors	C2 Commercial Office	3	Business Periphery	4 stories 3 in next to R5 or lower

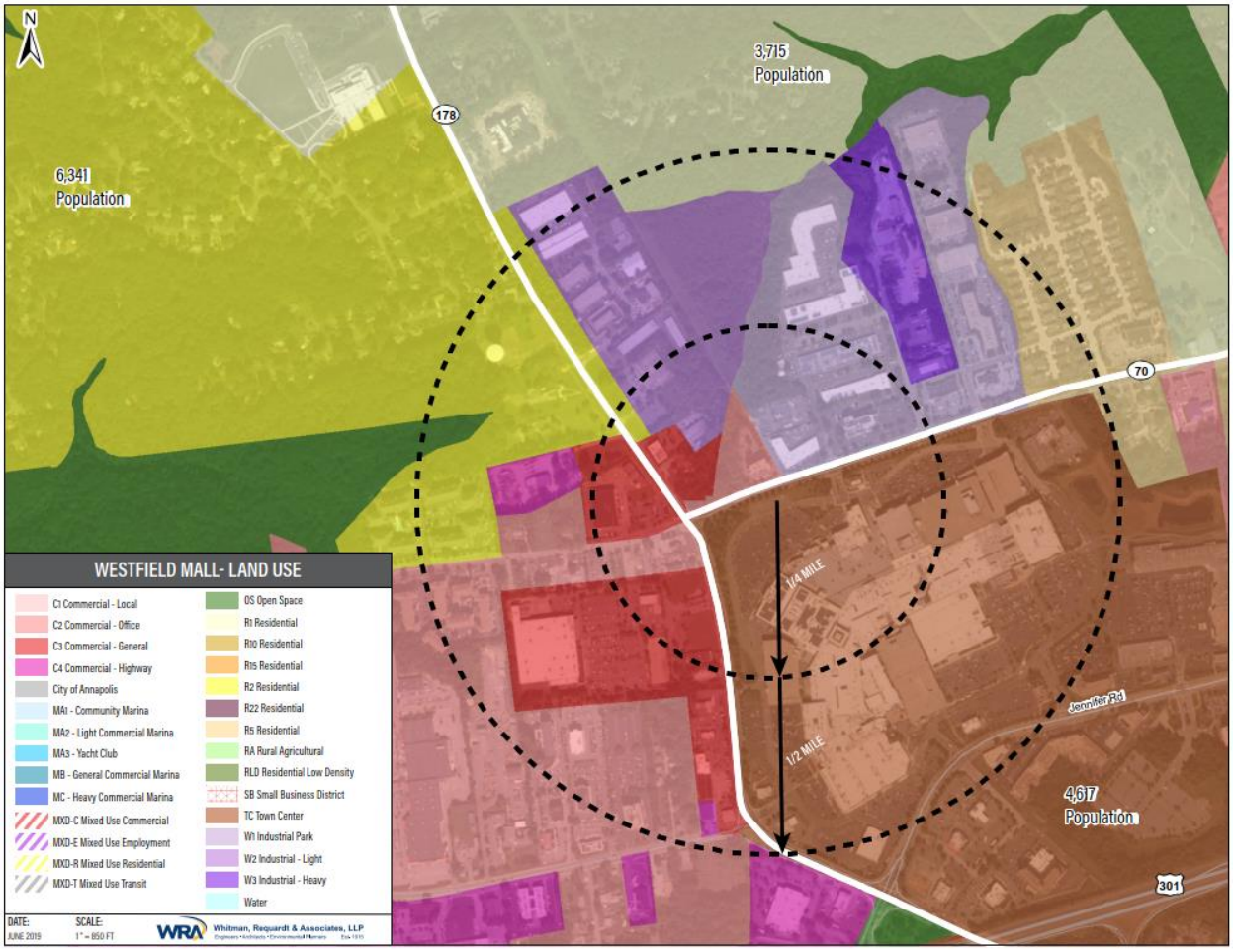
4.1.6 TOD Potential

Transit-oriented development or TOD is a type of development pattern which encourages and supports a mixture of housing, office, retail or other amenities integrated into a walkable and bikeable neighborhood. The general rule of thumb is to locate development within a half-mile of public transportation. The goal of TOD is to increase transit ridership and reduce the need to depend on a private car. This is achieved with housing, amenities and transit options within walking distance of one another.

4.1.7 Westfield Mall TOD

As seen in Figure 28 Westfield Mall TOD, the proposed transit center is located in the designated Town Center district with adjacent industrial, commercial and residential land use with in ¼ and ½ mile radius. Located off Bestgate Road and Generals Highway, pedestrian access from adjacent residential areas is good, sidewalks are available, and crosswalks are present at major intersections. Population density in the area is reasonable. Bicycle trails and bicycle friendly roads link the surrounding area to Westfield Mall.

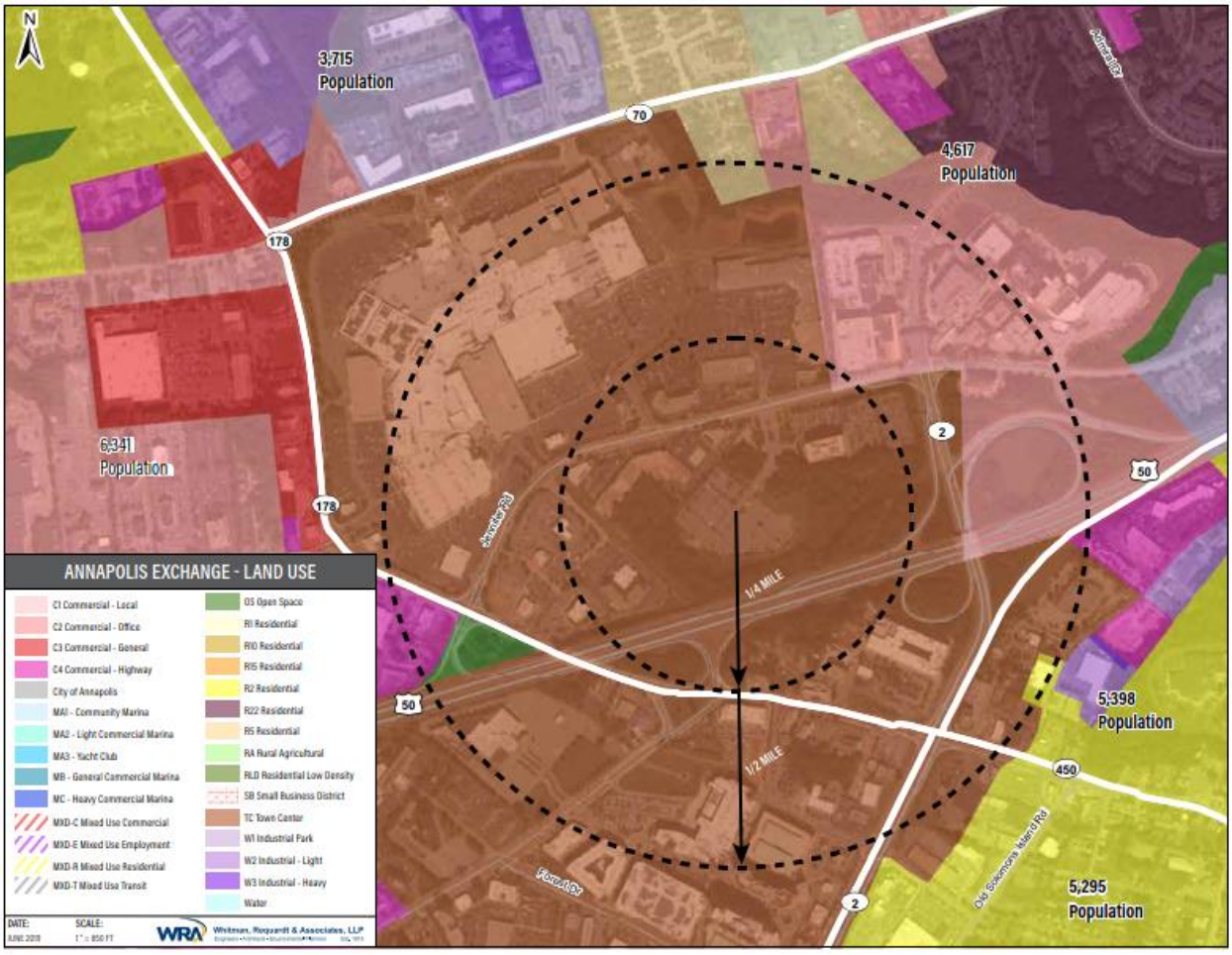
Figure 28: Westfield Mall TOD



4.1.8 Annapolis Exchange TOD

The majority of the Annapolis Exchange site falls within the Town Center designated zone. The Town Center zone is designed to encourage mixed use. Small portions within ½ mile radius of the proposed Annapolis Exchange transit center are zoned commercial and residential land use. As seen in Figure 29 Annapolis Exchange TOD, pedestrian and bicycle access is limited to Jennifer Road. The western portion of the site is wooded and includes Weems Creek limiting site access. The southern portion of the site is bordered by RT 50. Bus and vehicle access to the site is from Jennifer Road. Adjacent population density is relatively high, supporting TOD, although there are manmade and natural features which limit bike and pedestrian access to the site.

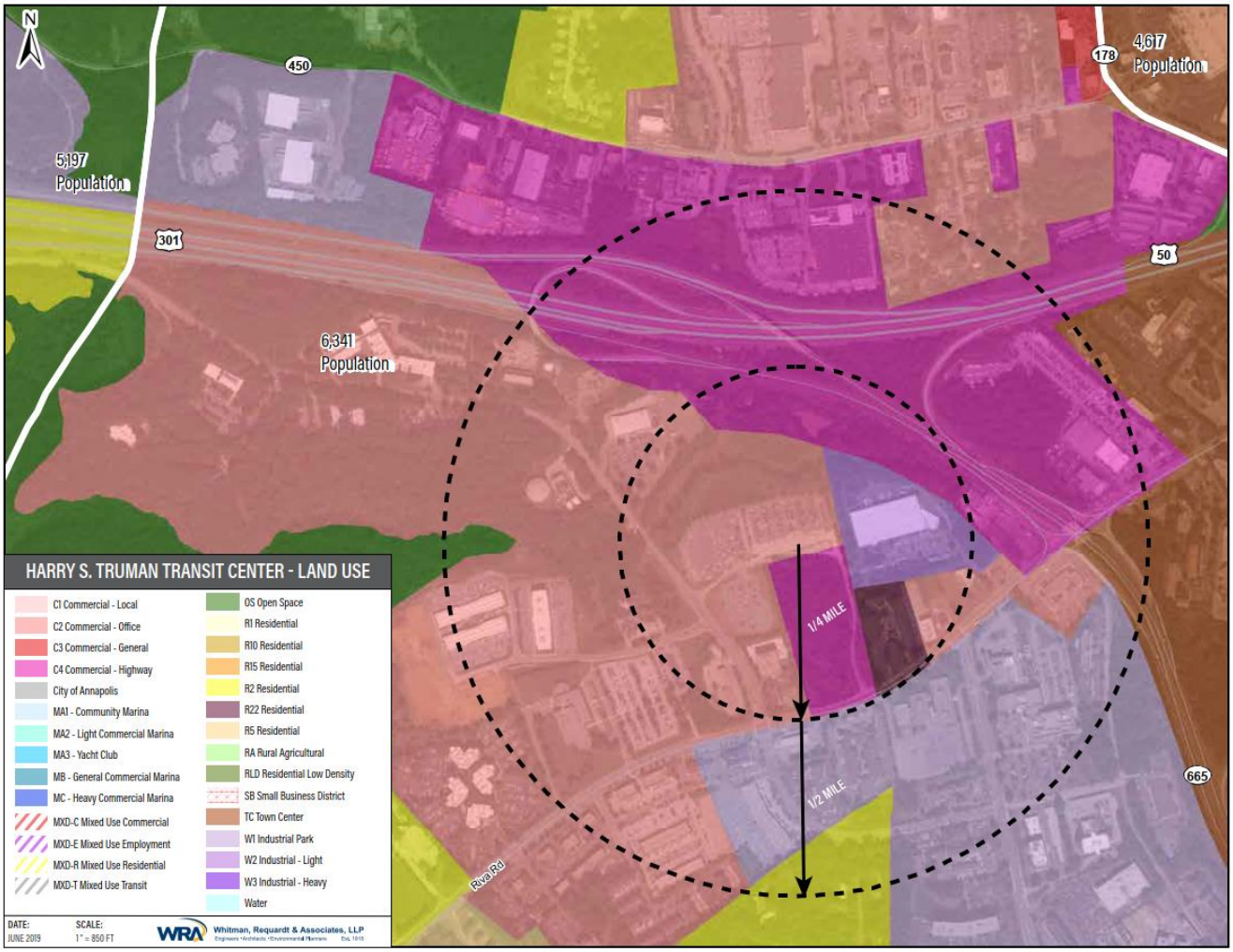
Figure 29: Annapolis Exchange TOD



4.1.9 Harry S. Truman Park and Ride TOD

Population densities at the Harry S. Truman Park and Ride are relatively low as seen in Figure 30. Pedestrian and bicycle access off Riva Road and Harry S. Truman Parkway are good with sidewalks and crosswalks available at intersections. Although, bicycle trails do not directly link from the site to adjacent amenities. Land use within the ¼ and ½ mile radius from the site is commercial, industrial and a small portion residential. The residential area within the ¼ mile radius has excellent pedestrian access to the site.

Figure 30: Harry S. Truman Park and Ride TOD



4.2 Secondary Screening

At the conclusion of the initial screening it was determined the Annapolis Exchange site was not a viable site to locate a transit center. The Annapolis Exchange site has; limited pedestrian and vehicle access, existing environmental features limiting transit center placement, operational limitations for bus service and adjacent land use that does not support robust TOD. This site was eliminated from further study.

The secondary screening is a more detailed look at Harry S. Truman Park and Ride and Westfield Mall sites. Table 19 Site Comparison Matrix compares each site evaluating; land use, potential for TOD, adjacent land use, pedestrian access, transportation infrastructure, and site capacity for growth; as information to compare each site. Each of these evaluation elements were used as screening measures.

Table 19: Site Comparison Matrix

	Westfield Mall	Harry S. Truman
Zoning	Town Center District	Commercial Office General Commercial
Use Adjacent Properties	Retail, Business, Residential	Business, Residential
Facility Design		
Bus Circulation	Bestgate Rd and Mall Ring Road	On Site
Building	2,500 SF	2,500 SF
TNC/Mobility Access	Yes	Yes
Parking Capacity	58 varies	800+
Bus Bays	10	12
Bike Storage	Yes	Yes
Expansion Potential	Yes	Yes
Bus Routes		
Pass Through	5	7
Terminal	5	None
Additional Bus Miles	492	1,546
Site Access		
Walking	300' from Mall	792' from Truman Parkway
Bicycling	On Road	On Road
Safety	Crosswalks at major intersections	Crosswalks at Riva Road
Vehicle Access	Generals Highway Bestgate Road Jennifer Road	Harry S. Truman Parkway Riva Road
Site Considerations		
Environmental	None	None
Community	Access 1/4 mile	No direct access

4.3 Site Access and Layout

A transit center must have good, safe ingress and egress for buses and adequate space for bus bays. The concept plan layout includes bus bays at each site designed to accommodate current operating schedules and takes into consideration expansion of bus operation. The site plan sketch gives an understanding of; bus access to the site, circulation on site to the transit center and bus bay configuration. Current bus service schedules were used to calculate the bus overlap, to incorporate adequate space for bus bays at each transit center.

4.3.1 Westfield Mall Site Plan

The transit center at Westfield Mall is located in the current parking area between Bestgate Road and the mall interior ring road (Figure 31). The transit center is designed with six bus bays along eastbound Bestgate Road and four bus bays along the mall ring road. Currently Westfield Mall services five pass through routes and five terminal bus routes. Ten bus bays accommodate expansion of bus service. Bus routing would remain the same with some bus routes circulating through the mall parking lot, similar to today's operation. The bus bays along Bestgate Road would not interrupt the existing through lanes of traffic. Well placed crosswalks would identify pedestrian paths to and from the mall and transit center. Sidewalks exist along Bestgate Road and the mall interior road. Parking which is displaced by the transit center, is identified on the mall's northwest property, near the intersection of Bestgate Road and Generals Highway.

Figure 31: Westfield Mall Concept Plan

4.3.2 Harry S. Truman Site Plan

The Harry S. Truman Park and Ride lot is designed to accommodate 12 bus bays. Bus circulation would be on either side of an island where the transit center would be located (Figure 32). The transit center would be constructed in the area of the existing paved bus stop. There would be minimal addition of pervious surface. Rain gardens could be designed to address runoff water retention. Bus circulation on site would be one way with eight bus bays on the north side and four bus bays on the south side of the transit center. Seven bus routes currently pass through this station. The concept plan includes twelve bus bays allowing for service expansion. The tear drop shaped parking lot to the south and adjacent to the transit center could be designated as handicapped. Pedestrian and bicycle access to the site remains the same, with existing well marked cross walks at Harry S. Truman Parkway and Riva Road. On site crosswalks would be placed to minimize pedestrian and bus conflict near the station area.

Figure 32: Harry S. Truman Park and Ride Concept Plan

An alternative layout at Harry S. Truman Park and Ride may be considered as an optional design concept as the project moves to final design. Figure 33 Harry S. Truman Park and Ride Alternative Concept presents a different site design to address internal vehicle and bus operations. This layout may be a desirable configuration; to accommodate pedestrians safety, bus movements and park and ride vehicle queuing at peak periods.

Figure 33: Harry S. Truman Park and Ride Alternative Concept

5.0 Facility Prototype

The facility prototype was designed for both sites. The architectural concept design takes into consideration the function and use of the building and how the facility integrates into the existing setting. The building site location designed for efficient transit circulation and pedestrian access, must be balanced with adjacent land use and viewshed. These key factors influence the layout and design of the transit center.

5.1 Program Elements

The program was developed with the input of; BMC and AAOT taking into consideration transit operation by AT, MDOT MTA and private carriers. The desired program elements for the site and transit center building include:

Site

- Bus bays for current operation and estimated increase in transit service
- Space for TNC pick up and drop off
- Bicycle parking
- Pedestrian access and circulation

Transit Center

- Minimize site disturbance
- Interior waiting space for 30 to 40 customers
- Restrooms
- Customer service office
- Mechanical space
- Approximately 2,500 square foot building

Site design ideas discussed with stakeholders and concluded additional elements could become part of the next phase of detailed site design and engineering.

- Pervious pavement
- Low flow toilets or grey water for flush
- Bicycle racks or corrals
- Planting areas designed for bio-retention

5.2 Building Concept Plan

The design concept for the Annapolis Transit Center is traditional architecture of the region, creating a pedestrian-scaled, civic oriented facility. The waiting rooms are the dominant feature of this prototypical station. The standing seam metal gabled roof informs the shape of the space which is anchored on both ends with arched windows. Enclosed by glass walls with a red brick base, the round supporting columns create an open porch-like feeling. The lower brick clad element houses the customer service office, two gender neutral rest rooms, and the supporting mechanical, electrical/IT, and housekeeping rooms. A covered bicycle storage porch attached to the building also provides cover at the entrances to the aforementioned rooms. Figure 34 and 35 building sketch plan shows the approximate building dimensions of 80’ long, 35’ wide and 29’

height. The transit center is accessible from either side and the end, allowing easy access to the bus bays.

Figure 34: Transit Center Elevation View Sketch

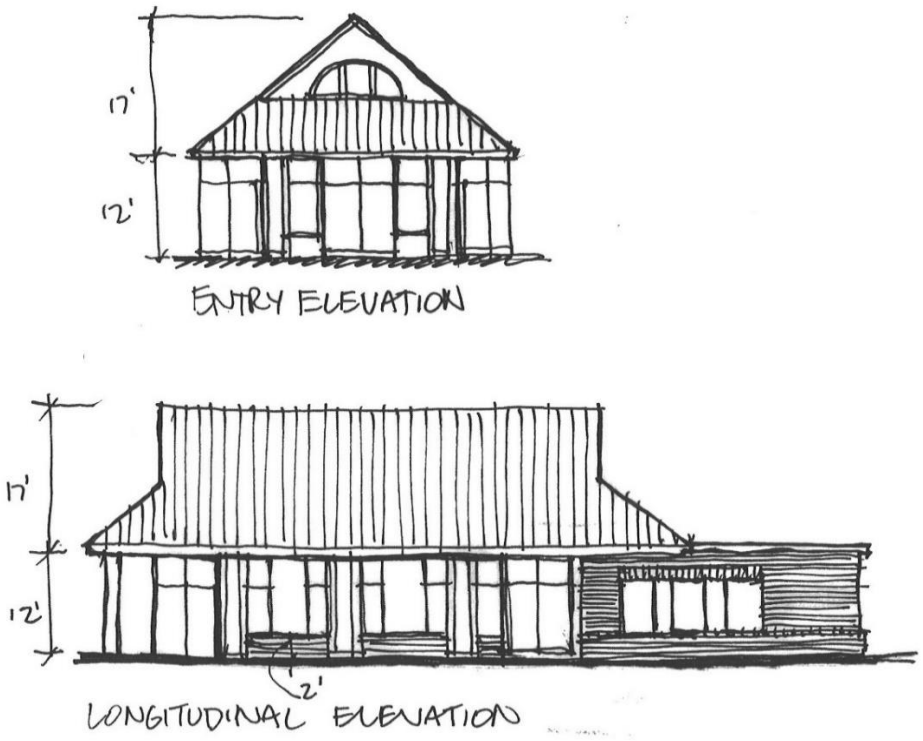
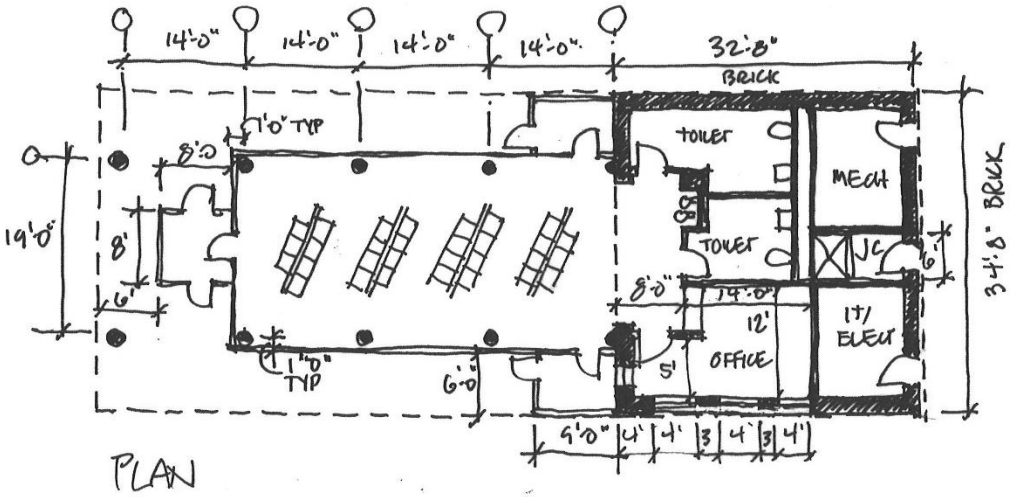


Figure 35: Transit Center Plan View Sketch



5.3 Westfield Mall Site Plan and Rendering

Westfield Mall site plan Figure 36 and rendering Figure 37 illustrates a center platform transit station, with building accessibility on either side. Four free standing customer bus shelters with seating provide additional exterior customer waiting area. The bus shelter roof materials are similar to the transit center. The paved platform area provides; adequate space for pedestrian circulation, access to bus stops and connection to adjacent uses and Westfield Mall. Displaced parking in the area of the transit center, is shown at the corner of Bestgate Road and Generals Highway.

Figure 36: Westfield Mall Site Plan

Figure 37: Westfield Mall Perspective

5.4 Harry S. Truman Park and Ride Site Plan and Rendering

The Harry S. Truman Park and Ride site plan Figure 38 and rendering Figure 39 is a center platform configuration with building access on either side. To allow for pedestrian movement there is approximately 15' feet of pavement from the building to the face of the curb where the bus bays are located. An enclosed area for bicycle parking is a covered area at the east end of the building. The landscaped area on the platform could act as a rain garden water storage area reducing run off. Two free standing bus shelters with seating located on either end of the building provide extra customer waiting area.

Figure 38: Harry S. Truman Park and Ride Site Plan

Figure 39: Harry S. Truman Park and Ride Perspective

6.0 Cost Estimate and Financial Plan

A cost estimate for site modification and construction was developed for each site. The cost estimate is based on three factors; direct labor cost, material cost and equipment costs. Direct labor costs are estimated by actual pay rates and projected production time established from historical data. Material costs using manufacturers and suppliers updated price lists or requests for quoting material costs. Equipment costs are taken from current industry standard equipment rental rates and adjusted to local or regional pricing.

The estimate is based on the preliminary sketch plan layout for Westfield Mall and Harry S. Truman Park and Ride. The cost estimates are therefore preliminary based on; existing condition mapping, aerial photos and site visits. The transit building is identified by lump sum cost. At this level of planning and design, there is not enough detail available to produce a final cost estimate. Contingencies have been built into the preliminary cost estimate to account for unknowns and design assumptions.

6.1 Westfield Mall Cost Estimate

The Westfield Mall preliminary cost estimate (Table 20 & 21) includes a 40% contingency for unknown design elements and 14.4% administration overhead cost. The transit center lump sum is estimated at $2M and includes custom bus shelter structures. The cost for earthwork and shoulders is significantly higher at Westfield Mall compared to Harry S. Truman Park and Ride site. The cost difference is due to constructing a new parking area to replace parking taken by the planned transit center.

Table 20: Preliminary Cost Estimate Westfield Mall

Category Code	Item Description	Unit	Quantity	Unit Cost	Total Cost	
CATEGORY 1	**PRELIMINARY**					**$967,950**
1001	30% OF CATEGORY 2, 4, 5, 6	**LS**	**1**	**$967,950**	**$967,950**	
CATEGORY 2	**EARTHWORK**					**$142,500**
2001	CLASS 1 EXCAVATION	**CY**	**3000**	**$30**	**$90,000**	
2002	COMMON BORROW	**CY**	**1500**	**$35**	**$52,500**	
CATEGORY 3	**DRAINAGE**					**$806,625**
3001	25% OF CATEGORY 2, 4, 5, & 6	**LS**	**1**	**$806,625**	**$806,625**	
CATEGORY 4	**STRUCTURES**					**$2,000,000**
4001	TRANSIT BUILDING	**LS**	**1**	**$2,000,000**	**$2,000,000**	
CATEGORY 5	**PAVING**					**$550,000**
5001	SUPERPAVE ASPHALT MIX - SURFACE	**TON**	**400**	**$150**	**$60,000**	
5002	SUPERPAVE ASPHALT MIX - BASE	**TON**	**1700**	**$100**	**$170,000**	
5003	4 INCH GRADED AGGREGATE BASE COURSE	**SY**	**6600**	**$15**	**$99,000**	
5004	6 INCH GRADED AGGREGATE BASE COURSE	**SY**	**1200**	**$20**	**$24,000**	
5005	10" CONCRETE BUS PADS	**SY**	**1200**	**$160**	**$192,000**	
5006	PAVEMENT MARKINGS	**LS**	**1**	**$5,000**	**$5,000**	
CATEGORY 6	**SHOULDERS**					**$534,000**
6001	COMBINATION CURB & GUTTER	**LF**	**3300**	**$40**	**$132,000**	
6002	SIDEWALK	**SF**	**20100**	**$20**	**$402,000**	
CATEGORY 7	**LANDSCAPE**					**$258,120**
7001	8% OF CATEGORY 2, 4, 5, and 6	**LS**	**1**	**$258,120**	**$258,120**	
CATEGORY 8	**TRAFFIC**					**$185,000**
8001	SIGNING	**LS**	**1**	**$10,000**	**$10,000**	
8002	ITS	**LS**	**1**	**$50,000**	**$50,000**	
8003	LIGHTING	**LS**	**1**	**$100,000**	**$100,000**	
8004	SECURITY	**LS**	**1**	**$25,000**	**$25,000**	
CATEGORY 8	**UTILITIES**					**$0**
8005	0% OF CATEGORY 2, 4, 5, and 6	**LS**	**0**	**$483,975**	**$0**	
	NEAT CONSTRUCTION COST					**$5,444,195**
	40% Contingency					**$2,177,678**
	14.4% Admin Overhead					**$783,964**
	TOTAL					**$8,405,837**
	TOTAL (ROUNDED)					**$8,410,000**

Table 21: Summary Cost Estimate Westfield Mall

Item Description	Total Cost
PRELIMINARY	$967,950
EARTHWORK	$142,500
DRAINAGE	$806,625
STRUCTURES	$2,000,000
PAVING	$550,000
SHOULDERS	$534,000
LANDSCAPE	$258,120
TRAFFIC	$185,000
NEAT CONSTRUCTION COST	$5,444,195
40% Contingency	$2,177,678
14.4% Administration Overhead	$783,964
TOTAL	$8,405,837
TOTAL (ROUNDED)	**$8,410,000**

6.2 Harry S. Truman Park and Ride Cost Estimate

The Harry S. Truman Park and Ride presumes the same transit center building 2,400 square foot and accompanying customer bus shelters. The built-in contingency is 40% and administration overhead rate of 14.4% similar to Westfield Mall. The preliminary cost estimates are represented in Tables 22 and 23.

Table 22: Preliminary Cost Estimate Harry S. Truman Park and Ride

Category Code	Item Description	Unit	Quantity	Unit Cost	Total Cost	
CATEGORY 1	**PRELIMINARY**					**$885,150**
1001	30% OF CATEGORY 2, 4, 5, 6	**LS**	**1**	**$885,150**	**$885,150**	
CATEGORY 2	**EARTHWORK**					**$66,500**
2001	CLASS 1 EXCAVATION	**CY**	**1400**	**$30**	**$42,000**	
2002	COMMON BORROW	**CY**	**700**	**$35**	**$24,500**	
CATEGORY 3	**DRAINAGE**					**$737,625**
3001	25% OF CATEGORY 2, 4, 5, & 6	**LS**	**1**	**$737,625**	**$737,625**	
CATEGORY 4	**STRUCTURES**					**$2,000,000**
4001	TRANSIT BUILDING	**LS**	**1**	**$2,000,000**	**$2,000,000**	
CATEGORY 5	**PAVING**					**$516,000**
5001	SUPERPAVE ASPHALT MIX - SURFACE	**TON**	**800**	**$150**	**$120,000**	
5002	SUPERPAVE ASPHALT MIX - BASE	**TON**	**100**	**$100**	**$10,000**	
5003	4 INCH GRADED AGGREGATE BASE COURSE	**SY**	**200**	**$15**	**$3,000**	
5004	6 INCH GRADED AGGREGATE BASE COURSE	**SY**	**2100**	**$20**	**$42,000**	
5005	10" CONCRETE BUS PADS	**SY**	**2100**	**$160**	**$336,000**	
5006	PAVEMENT MARKINGS	**LS**	**1**	**$5,000**	**$5,000**	
CATEGORY 6	**SHOULDERS**					**$368,000**
6001	COMBINATION CURB & GUTTER	**LF**	**2900**	**$40**	**$116,000**	
6002	SIDEWALK	**SF**	**12600**	**$20**	**$252,000**	
CATEGORY 7	**LANDSCAPE**					**$236,040**
7001	8% OF CATEGORY 2, 4, 5, and 6	**LS**	**1**	**$236,040**	**$236,040**	
CATEGORY 8	**TRAFFIC**					**$185,000**
8001	SIGNING	**LS**	**1**	**$10,000**	**$10,000**	
8002	ITS	**LS**	**1**	**$50,000**	**$50,000**	
8003	LIGHTING	**LS**	**1**	**$100,000**	**$100,000**	
8004	SECURITY	**LS**	**1**	**$25,000**	**$25,000**	
CATEGORY 8	**UTILITIES**					**$0**
8005	0% OF CATEGORY 2, 4, 5, and 6	**LS**	**0**	**$442,575**	**$0**	
	NEAT CONSTRUCTION COST					**$4,994,315**
	40% Contingency					**$1,997,726**
	14.4% Admin Overhead					**$719,181**
	TOTAL					**$7,711,222**
	TOTAL (ROUNDED)					**$7,720,000**

Table 23: Summary Cost Estimate Harry S. Truman Park and Ride

Item Description	Total Cost
PRELIMINARY	$885,150
EARTHWORK	$66,500
DRAINAGE	$737,625
STRUCTURES	$2,000,000
PAVING	$516,000
SHOULDERS	$368,000
LANDSCAPE	$236,040
TRAFFIC	$185,000
NEAT CONSTRUCTION COST	$4,994,315
40% Contingency	$1,997,726
14.4% Administration Overhead	$719,181
TOTAL	$7,711,222
TOTAL (ROUNDED)	$7,720,000

7.0 Operational Plan

The Anne Arundel/Annapolis area has recognized the growing need for a multimodal transportation center to serve existing and future transportation investments within the region. Based on the results of recent studies, the goal of this study is to create a new transportation center and gateway for the Anne Arundel/Annapolis area that provides personal transportation choices, enhances the image and effectiveness of public transportation, and serves as a catalyst for economic development. The plan was developed to provide local, commuter, and intercity bus operations transit centers at the two identified site locations; Westfield Mall and Harry S. Truman Park and Ride. As part of this process, which was presented in section 3.0 Existing Services and Previous Studies, the study team assessed existing routes and other opportunities to maximize the efficiency and effectiveness of public transportation for the region.

7.1 Transit Network Improvement Needs

The two locations that are being evaluated both provide unique opportunities, but in terms of operations they are very distinct in the transit populations that they serve. The Westfield Mall location is a hub to the local providers, with activity throughout the day. It draws ridership from existing residential and employment trip generators. Walkability and visibility are key components. In contrast, the Harry S. Truman Park and Ride location is commuter and intercity ridership dominated. It requires all day parking capacity and concentrated services in the peak commute hours. Because of this difference, there are potentially three options for locating a new facility; 1) consolidation of local and commuter services at the Westfield Mall, 2) consolidation of services at the Harry S. Truman location, or 3) developing two facilities that address the different markets and locations with improved facilities. This technical memorandum addresses the operational aspects related to each of these options.

Based on the proposed new transit center location at Westfield Mall, north side of the mall versus the current south side stop location, there are several potential areas for change in the service design, routes, and schedules that will be required. Ideally, any changes will promote greater connectivity by ultimately using timed transfers where appropriate to both locations. Additionally, the local transit development plans for the region identify service changes in the outlying years, specifically service to/from Westfield Mall – later hours of service and increased frequency of service. These would need to be reevaluated and updated based on the new Westfield Mall transit center location.

7.2 Conceptual Plan

Two preferred facility locations were targeted, and modest renderings produced that were endorsed through this process; they are displayed in Figures 36 Westfield Mall Site Plan and Figure 38 Harry S. Truman Park and Ride Site Plan. Both are major transfer points for the region's varied public transportation services. The facilities, and the services to these locations, were designed to be more passenger-friendly. The routes to the facilities continue to address more direct connections between high-density residential areas and major destinations throughout the service area. However, these renderings and associated plans do not show the parking area that would be required at the Westfield Mall location if all services were consolidated at the mall location.

7.3 Operating Plan for Service Modifications

As demonstrated in Section 3.0 Existing Services and Previous Studies, the region generally provides a high level of coverage. However, based on the proposed new transfer location at Westfield Mall, there are several potential areas for change in the service design, routes, and schedules that will be required. Ideally, any changes will promote greater connectivity by ultimately using timed transfers where appropriate to both locations. Additionally, the local transit development plans for the region identify service changes in the outlying years, specifically service to/from Westfield Mall – later hours of service and increased frequency of service. These would need to be reevaluated and updated based on the new Westfield Mall transfer facility location.

7.3.1 Adjusted Service Network

The service plan is described below, organized by each route that currently serves Westfield Mall. This analysis was necessitated by the relocation of the current bus transfer stop located on the south side of the mall access road across from Jared The Galleria of Jewelry (Figure 40) to the proposed location on the northwest side of the mall adjacent to Bestgate Road.

Figure 40: Westfield Mall Current Location

Source: Google Maps

The premise of this research was to display existing routes and the new service route(s) alignments that serve Westfield Mall. Each alternative evaluates the required operating time,

which will vary if changes in service frequency and/or capital needs are needed. This is largely a factor of each transit system's layover policy.

7.3.1.1 Layover

A central factor that comes into play in transit system efficiency is layover time, which is a key aspect of this analysis. Layovers can be defined as the time between the scheduled arrival and departure of a vehicle from a transit terminal (TRB, 2009). Another term used widely in transit groups is recovery time. Although the terms are similar, layover time refers to the rest time given to the operator between trips, whereas recovery time is the time built into the schedule to ensure an on-time departure for the next trip.

Layovers are typically 10-minutes long, depending on transit system practices and union contracts (TRB, 2009). Layovers are often calculated based on the routes given to the operator. A required layover typically varies from none at all to 10 percent of the route running time. Using this premise, most of the routes that serve Westfield Mall require a five to seven-minute layover.

7.4 Local/Regional Routes Westfield Mall Analysis

As identified in in Section 3.0 Existing Services and Previous Studies, the estimates of capacity needs assume that the existing and planned route structures would (generally) continue in future years, with growth in demand handled by additional frequency. Therefore, the analysis of the current routes examines route run times to determine if they are feasible utilizing the same resources. Table 24 details all the routes that serve Westfield Mall. To determine what effect the new facility will have on the route we calculated the proposed run time for the segment of the route that would need to be altered against the current alignment scheduled run time. Additionally, the overall route run time and scheduled layover times were documented, along with the new anticipated layover (slack) time.

7.4.1 AAOT – Yellow Route

Three options were explored for the Yellow Route and are displayed in Figures 41 and 42. They are:

- Option 1 – Outbound (via Generals Highway and Housley Road) and Inbound (via Annapolis Mall Road and Westgate Road)
    - It is anticipated the route will be faster from this new location, adding possibly four minutes of layover time (saving almost seven minutes outbound, though three minutes slower inbound).

- Option 2 – Outbound (via Generals Highway and Housley Road) and Inbound (via Annapolis Mall Road and Westgate Road)
    - This second alternative is predicted to be even quicker from this new location, adding potentially six minutes of layover time (seven minutes outbound and just one minute slower inbound).

- Option 3 – Reverse direction of the route around the mall (travel clockwise)
    - The alternative would have no change in time for the route.

Table 24: Local/Regional Routes Proposed Route Alternatives Time Chart

	Route	From	To	Scheduled Run Time (min.)	Option	Proposed Route Options	Proposed Typical Run time (min.)	Proposed Peak Run Time Range (min.)	Proposed Avg Peak Run time (min.)	Scheduled Route Run Time	Scheduled Current Layover (Slack Time)	Anticipated Layover (Slack) Time
Brown												
	Brown (Eastport to Mall)	Forest & Old Solomons Is.	Westfield	6	Option 1 Option 2	Via West St, Generals Hwy Via Jennifer Rd & Annapolis Mall	8 10	5-14 min 7-12 min	10 10	38 38	7 7	5 3
	Brown (Mall to Eastport)	Westfield	Forest & Old Solomons Is.	6	Option 1	Via West St, Generals Hwy	9	6-12 min	9	36	9	6
Green												
	Green (Eastport to Mall)	West & Sommerville	Westfield	4	Option 1 Option 2	Via West St, Generals Hwy Via Jennifer Rd & Annapolis Mall	4 5	3-10 min 4-8 min	7 6	24 24	6 6	6 5
	Green (Mall to Eastport)	Westfield	West & Sommerville	4	Option 1	Via West St, Generals Hwy	5	4-8 min	6	23	7	6

	Route	From	To	Scheduled Run Time (min.)	Option	Proposed Route Options	Proposed Typical Run time (min.)	Proposed Peak Run Time Range (min.)	Proposed Avg Peak Run time (min.)	Scheduled Route Run Time	Scheduled Current Layover (Slack Time)	Anticipated Layover (Slack) Time
Red												
	Red (Eastport to Mall)	Med. Ctr.	Westfield	4	Option 1	Via Jennifer Rd & Annapolis Mall	6	5-8 min	7	24	6	4
	Red (Mall to Eastport)	Westfield	Med. Ctr.	5	Option 1 Option 2	Via Annapolis Mall & Jennifer Rd Via Annapolis Mall, West St. & Jennifer Rd	6 6	5-8 min 6-10 min	7 8	25 25	5 5	4 4
Yellow												
	Yellow Outbound Yellow Inbound	Westfield Riva Rd/Claibourne	Housley Rd/Best Buy Westfield	11 4	Option 1 Option 1	Via Generals Hwy & Housley Rd. Via Jennifer Rd, Annapolis Mall and Bestgate Rd.	4 7	3-7 min 6-12 min	5 9	52	8	12

	Route	From	To	Scheduled Run Time (min.)	Option	Proposed Route Options	Proposed Typical Run time (min.)	Proposed Peak Run Time Range (min.)	Proposed Avg Peak Run time (min.)	Scheduled Route Run Time	Scheduled Current Layover (Slack Time)	Anticipated Layover (Slack) Time
	Yellow Outbound Yellow Inbound	Westfield Riva Rd/ Claibourne	Housley Rd/Best Buy Westfield	11 4	Option 1 Option 2	Via Generals Hwy & Housley Rd. Via West St. Generals Hwy & Bestgate Rd.	4 5	3-7 min 4-12 min	5 8	52	8	14
	Option 3- Reverse Direction					**Reverse Direction**	**No change in time**					
Purple North (A)												
	Outbound	Westfield	Annapolis T.C. at Parole	13	Option 1	Via Annapolis Mall Rd.	15	13-19 min	16	66	9	5
	Inbound	Forest & Old Solomon Island	Westfield	6	Option 1	Via Annapolis Mall Rd.	8	7-12 min	9			
Purple South (B)												
	Outbound	Westfield	Med. Ctr.	3	Option 1	Via Annapolis Rd. & Jennifer Rd.	6	5-8 min	7	67	8	7
	Inbound	Annapolis T.C. at Parole	Westfield	5	Option 1	Via West St., Generals Highway & Bestgate	3	3-7 min	5			
	Outbound				Option 2	See Fig. 49	no change in time but change in stop sequence, see Figure --					
	Inbound				Option 2	See Fig. 49	no change in time but change in stop sequence, see Figure --					
	Outbound				Option 3	Reverse Route direction	Total time taken by the route will decrease by 2 minutes.					

	Route	From	To	Scheduled Run Time (min.)	Option	Proposed Route Options	Proposed Typical Run time (min.)	Proposed Peak Run Time Range (min.)	Proposed Avg Peak Run time (min.)	Scheduled Route Run Time	Scheduled Current Layover (Slack Time)	Anticipated Layover (Slack) Time
	Inbound				Option 3	Reverse Route direction	Total time taken by the route will decrease by 2 minutes.					
Gold Edgewater (South)												
	K-Mart to Westfield Westfield to K-Mart	Harbor Center Westfield	Westfield Harbor Center	10 7	Option 1	Via West St, Bestgate & Generals Hwy Via West St, Generals Hwy	12 8	10-22 min 7-16 min	16 11	55	5	2
	K-Mart to Westfield Westfield to K-Mart	Harbor Center Westfield	Westfield Harbor Center	10 7	Option 2	Via West St, Bestgate & Generals Hwy Via Jennifer Rd & Annapolis Mall	13 8	10-22 min 7-16 min	16 11	55	5	1
Gold College Pkwy (North)												
	AACC to Westfield	Bestgate Rd./Harbor Gates Dr	Westfield	5	Option 1	Via Bestgate Rd.	3	3	3	75	5	7
	Westfield to AACC	Westfield	Bestgate Rd./Harbor Gates Dr	4	Option 1	Via Generals Hwy & Bestgate Rd.	4	3-6 min	4			

Figure 41: AAOT Yellow Route – Options 1 & 2

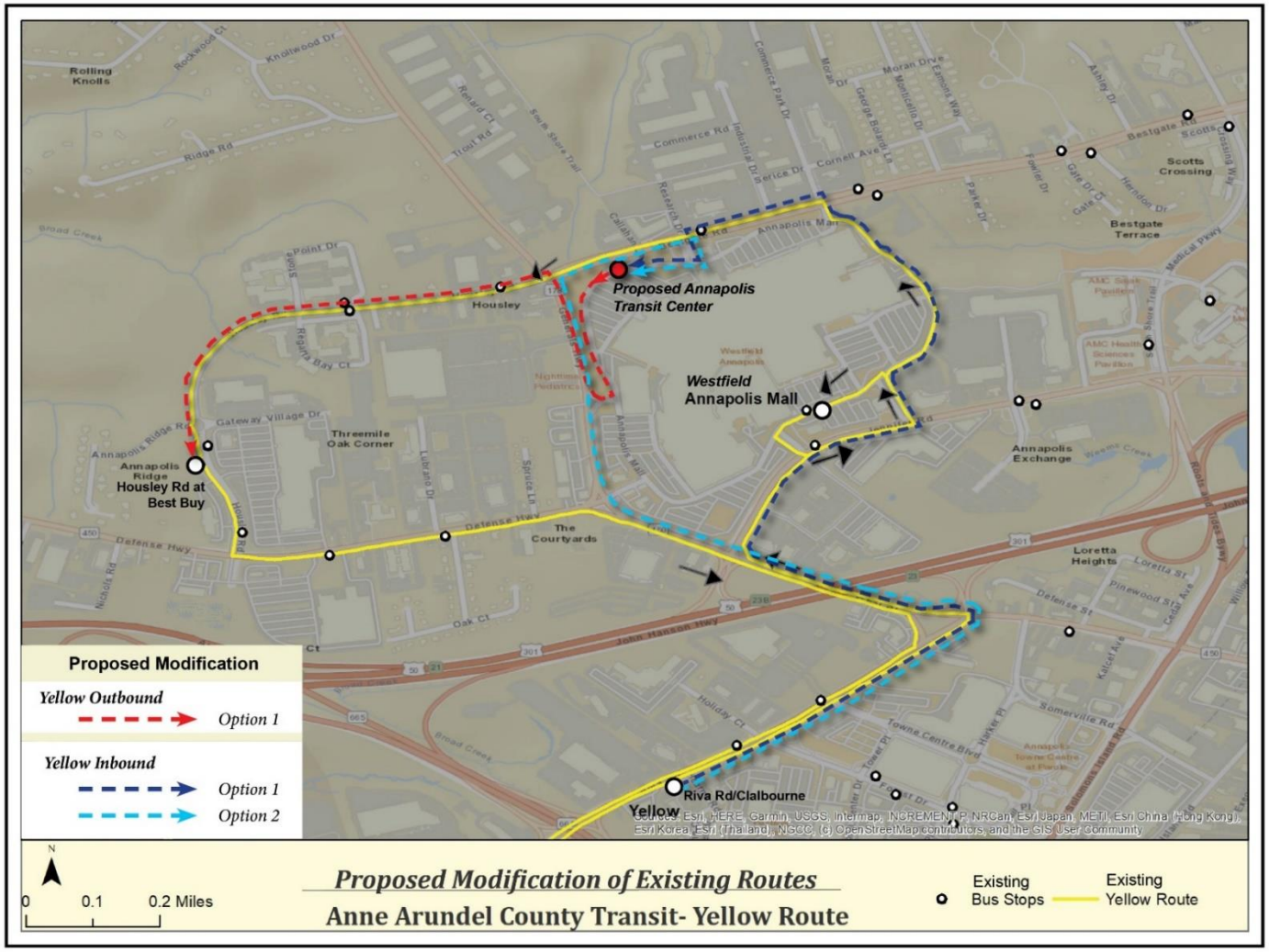
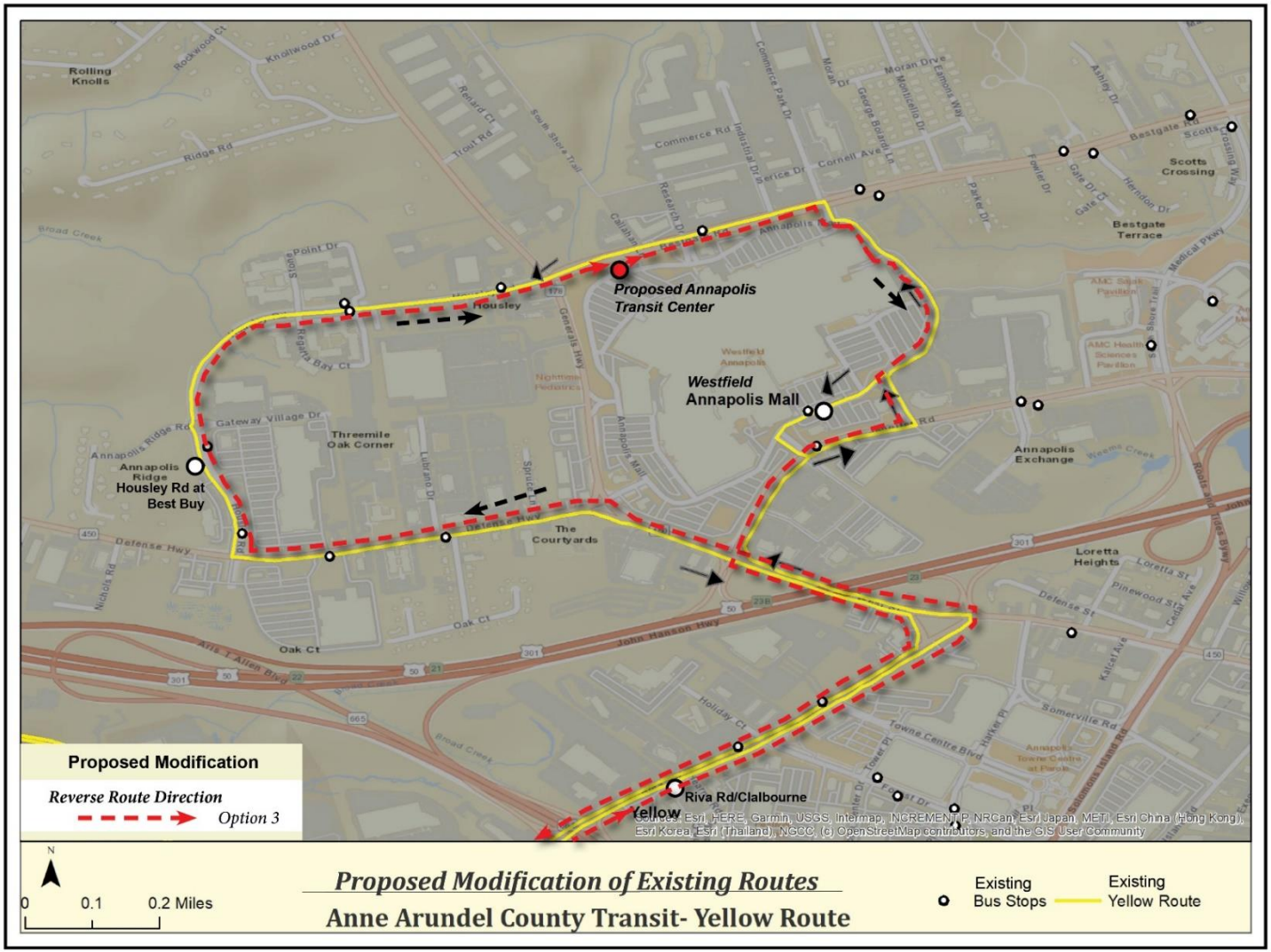


Figure 42: AAOT Yellow Route – Option 3



7.4.2 AAOT – Gold Route Edgewater

Two options were explored for the Gold Route Edgewater, as shown in Figure 43:

- Option 1 – Northbound (via West Street, Bestgate Road, and Generals Highway) and Southbound (via West Street and Generals Highway)
    - It is anticipated the route will be three minutes slower from this new location, adding two minutes to the northbound leg and one minute to the southbound leg. This would leave only two minutes for the layover.
- Option 2 – Northbound (via West Street, Bestgate Road, and Generals Highway) and Southbound (via Jennifer Road and Annapolis Mall Road)
    - This alternative would also be longer in time from this new location, adding three minutes to the northbound leg and one minute to the southbound leg. The projected layover time would be only one minute.

7.4.3 AAOT – Gold Route College Parkway

One option was explored for the Gold Route College Parkway as shown in Figure 44:

- Option 1 – Southbound (via Bestgate Road) and Northbound (via Generals Highway and Bestgate Road)
    - It is anticipated the new modified route will be faster from this new location, adding a modest two minutes of layover time (saving 2 minutes southbound and no change in time requirements northbound).

7.4.4 AT Brown Route

Two options were explored for the Brown Route as shown in Figure 45:

- Option 1 – Via West Street and Generals Highway
    - From Eastport to the Mall, it is anticipated the route will take at least an additional two minutes lowering the layover time from seven minutes to five minutes.
    - From the Mall to Eastport, the route run time will likely increase by three minutes lowering the layover time from nine minutes to six minutes.
- Option 2 – Via Jennifer Road and Annapolis Mall Road
    - From Eastport to the Mall an additional four minutes would be required resulting in only a three-minute layover.

Figure 43: AAOT - Gold Route Edgewater

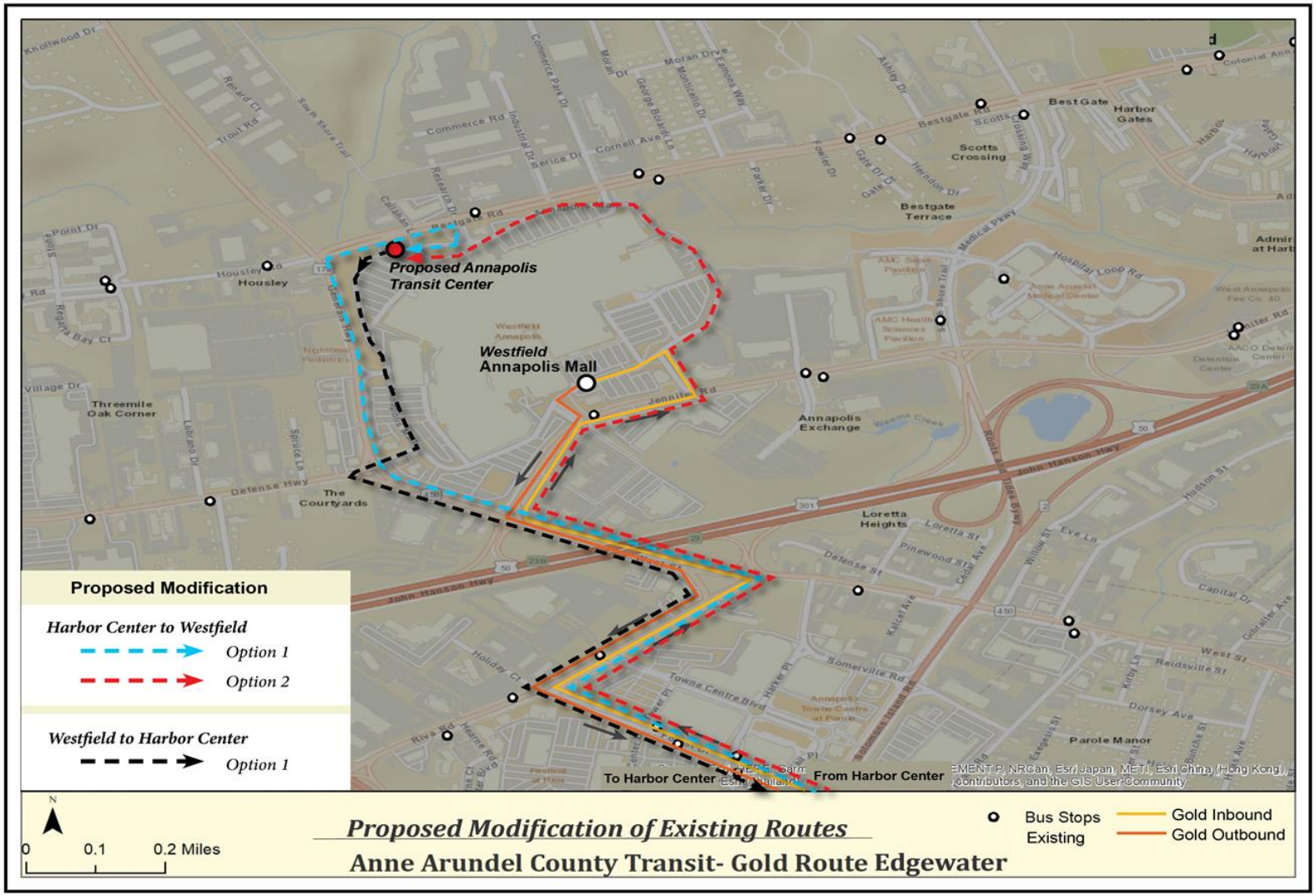


Figure 44: AAOT - Gold Route College Parkway (AACC) – Option 1

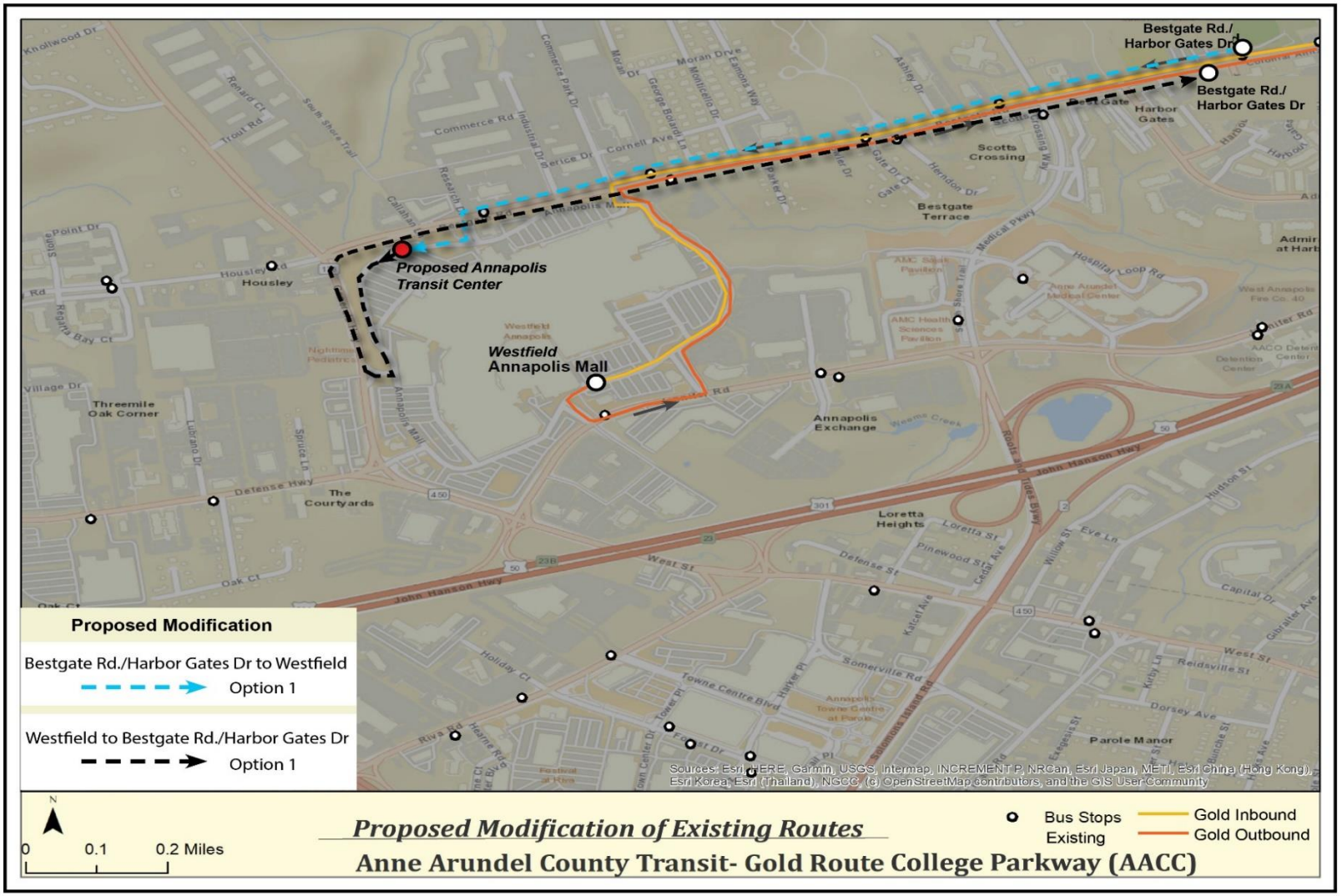
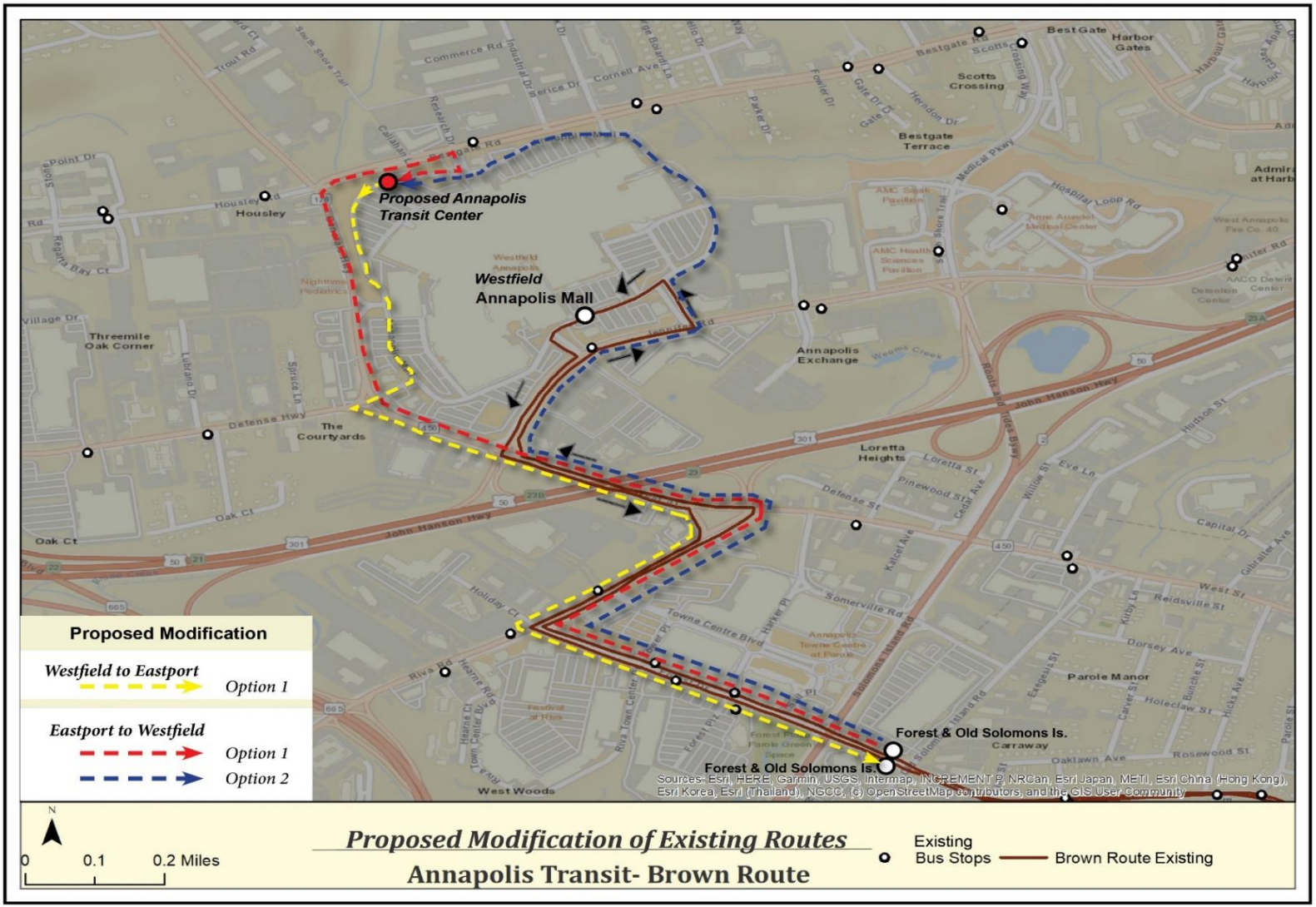


Figure 45: AT Brown Route – Options 1 & 2



7.4.5 AT Green Route

Two options were explored for the Green Route as shown in Figure 46:

- Option 1 – Via West Street and Generals Highway
    - From Eastport to the Mall, the same run time would be assumed.
    - From the Mall to Eastport, the route run time would only increase by one minute, lowering the layover from seven minutes to six minutes.
- Option 2 – Via Jennifer Road and Annapolis Mall Road
    - From Eastport to the Mall, only a modest one-minute increase in route time which lowers the layover time to five minutes.

7.4.6 AT Red Route

Two options were explored for the Red Route as shown in Figure 47:

- Option 1 – Via Jennifer Road and Annapolis Mall Road
    - Both from Eastport to the Mall and vice versa the Mall to Eastport, the new route would take at least two minutes longer in both directions, lowering the layover time from six minutes to four minutes at each hub.
- Option 2 – Via Jennifer Road and Annapolis Mall Road
    - From the Mall to Eastport, the route run time would only increase by one minute, likewise lowering the layover to four minutes.

7.4.7 AT Purple Route North

One option was examined for the Purple Route as shown in Figure 48:

- Option 1 – Outbound and Inbound via Annapolis Mall Road
    - Both outbound and inbound segments of the new route would take longer from the new facility location. The new route would take at least two minutes longer in both directions, lowering the layover time from nine minutes to five minutes at each hub.

7.4.8 AT Purple Route South

Three options were explored for the Purple Route South as shown in Figures 49 and 50:

- Option 1 – Outbound (via Annapolis Mall Road and Jennifer Road) and Inbound (via West Street, Generals Highway, and Bestgate Road)
    - It is anticipated the route will slightly slower from this new location, adding one minute of layover time (three minutes slower outbound, however saving almost two minutes inbound).
- Option 2 – Change in stop sequence along the existing route
    - The alternative would see no change in operating.

- Option 3 – Reverse direction of the route around Best Buy and Westfield Mall (travel clockwise)
    - By traveling in a clockwise manner a total time savings of two minutes would be realized, increasing the layover duration to ten minutes.

Figure 46: AT Green Route – Options 1 & 2

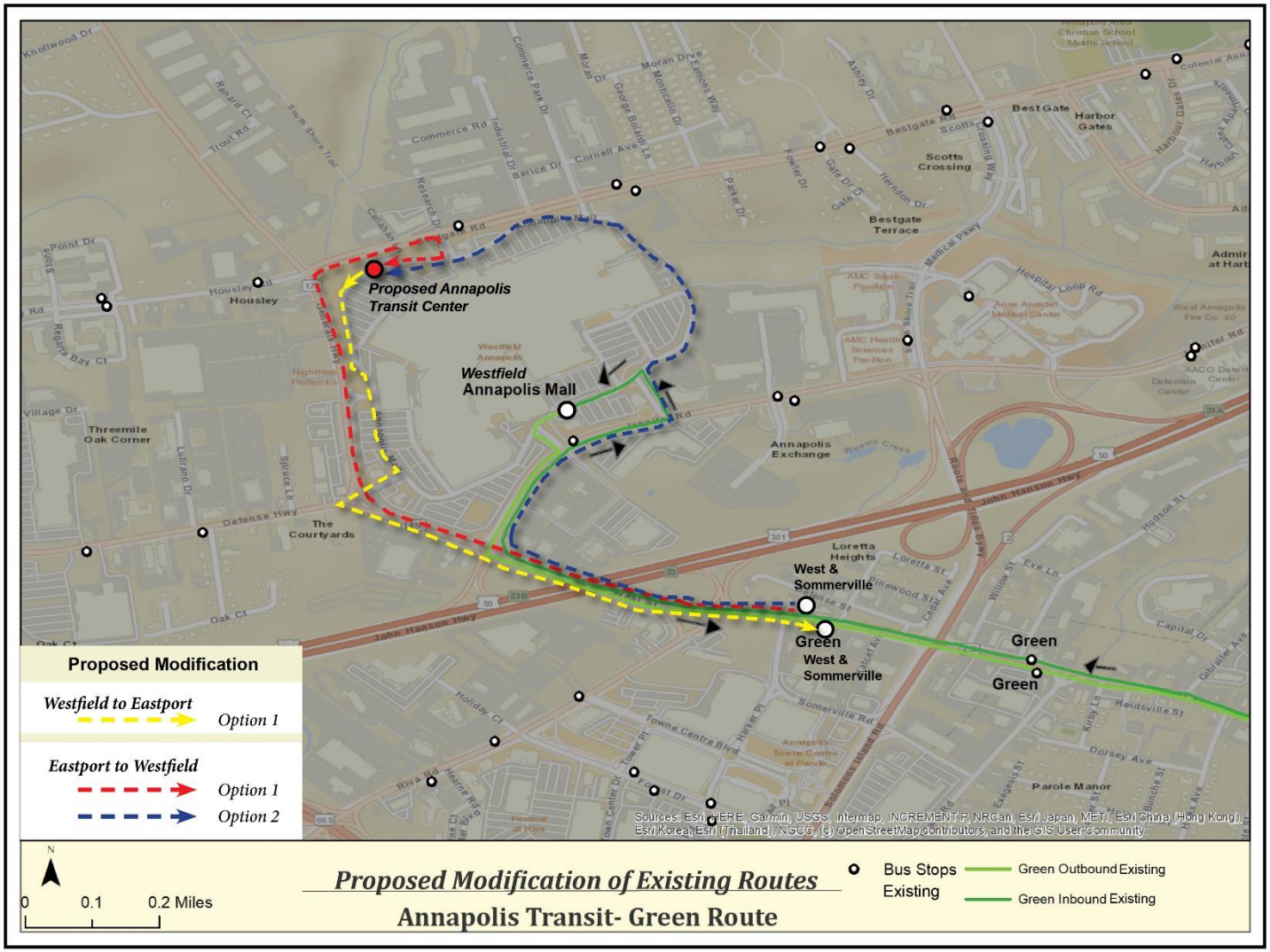


Figure 47: AT Red Route – Options 1 & 2

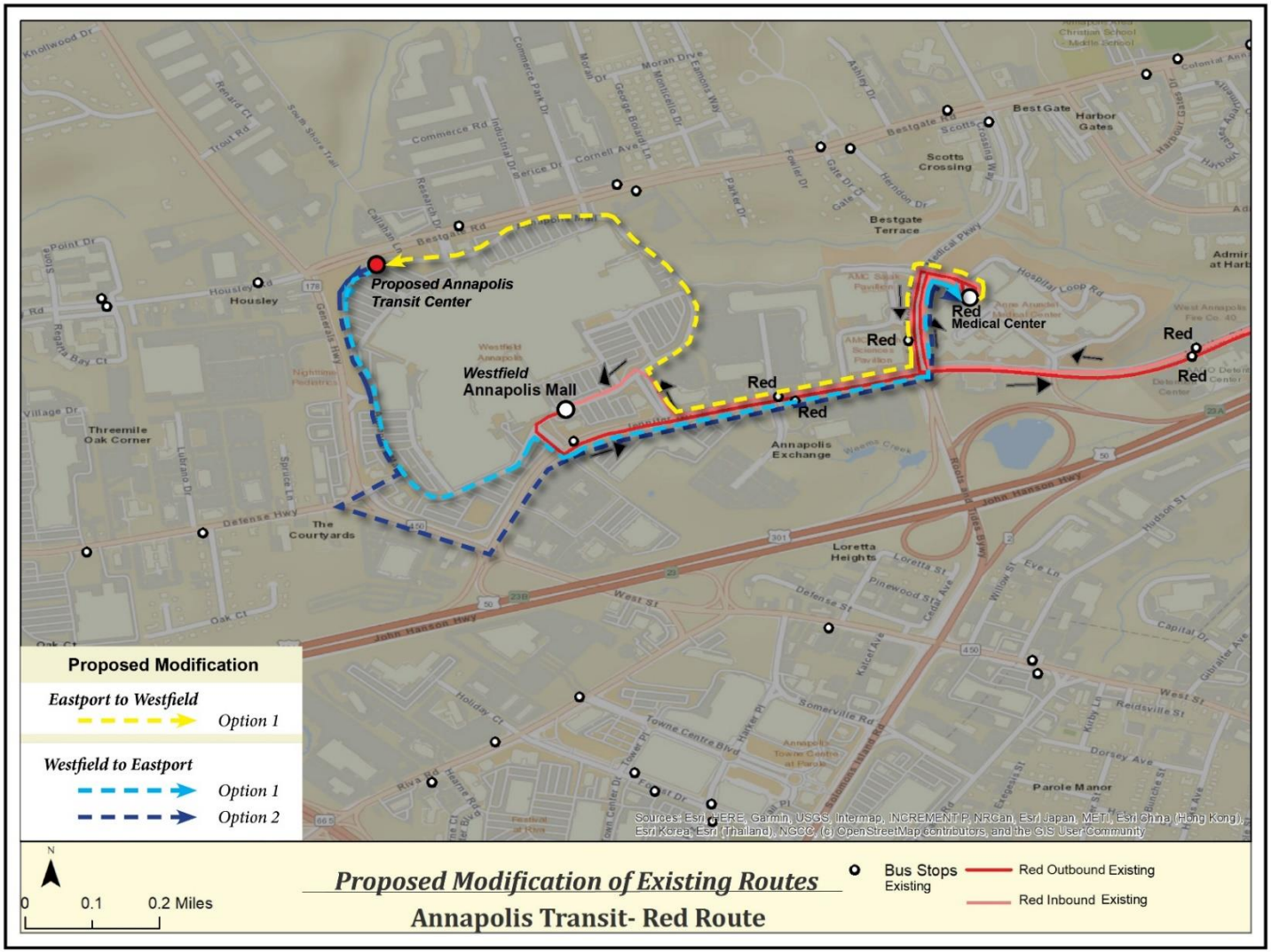


Figure 48: AT Purple Route North – Option 1

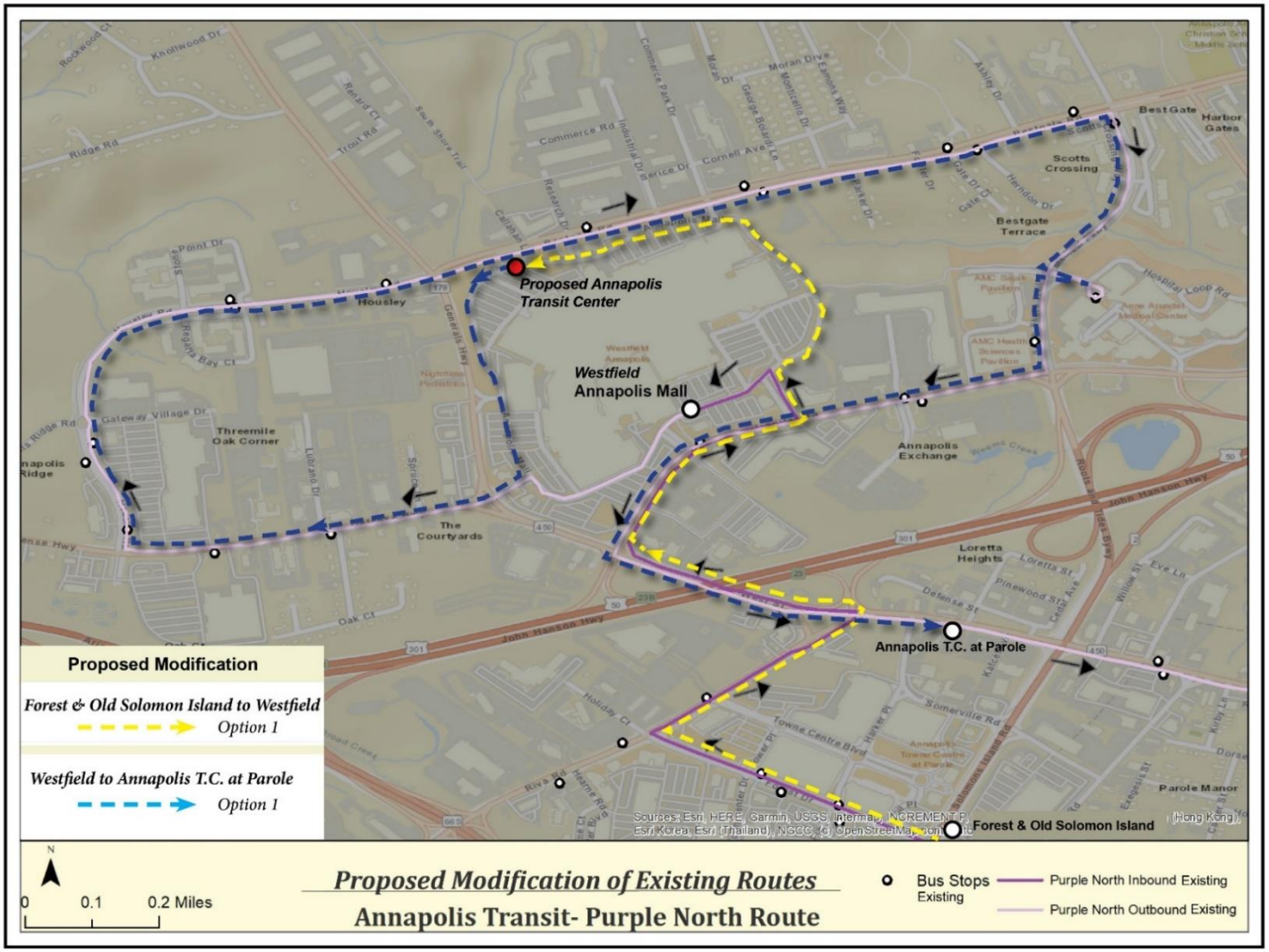


Figure 49: AT Purple Route South – Option 1 & 2

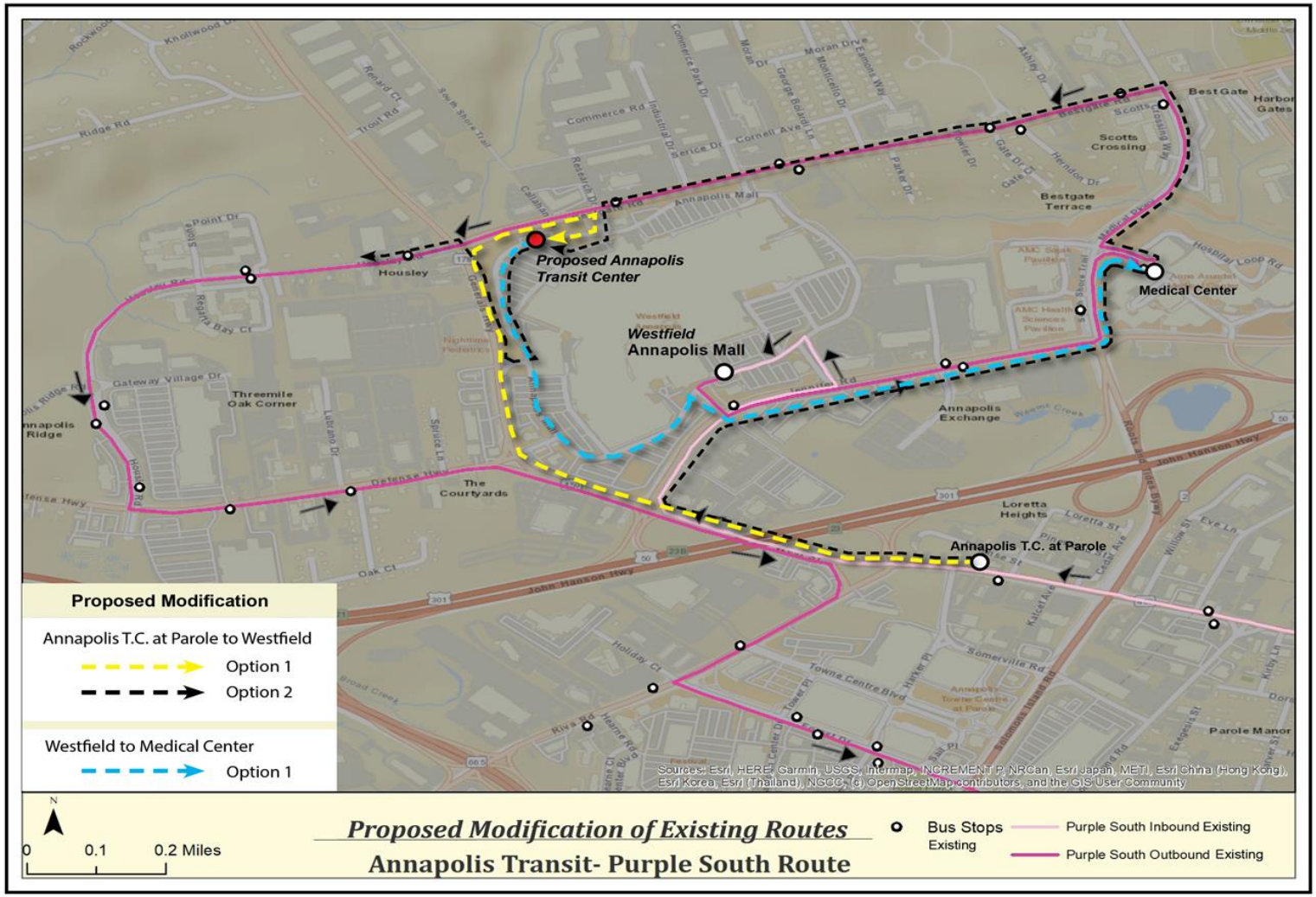
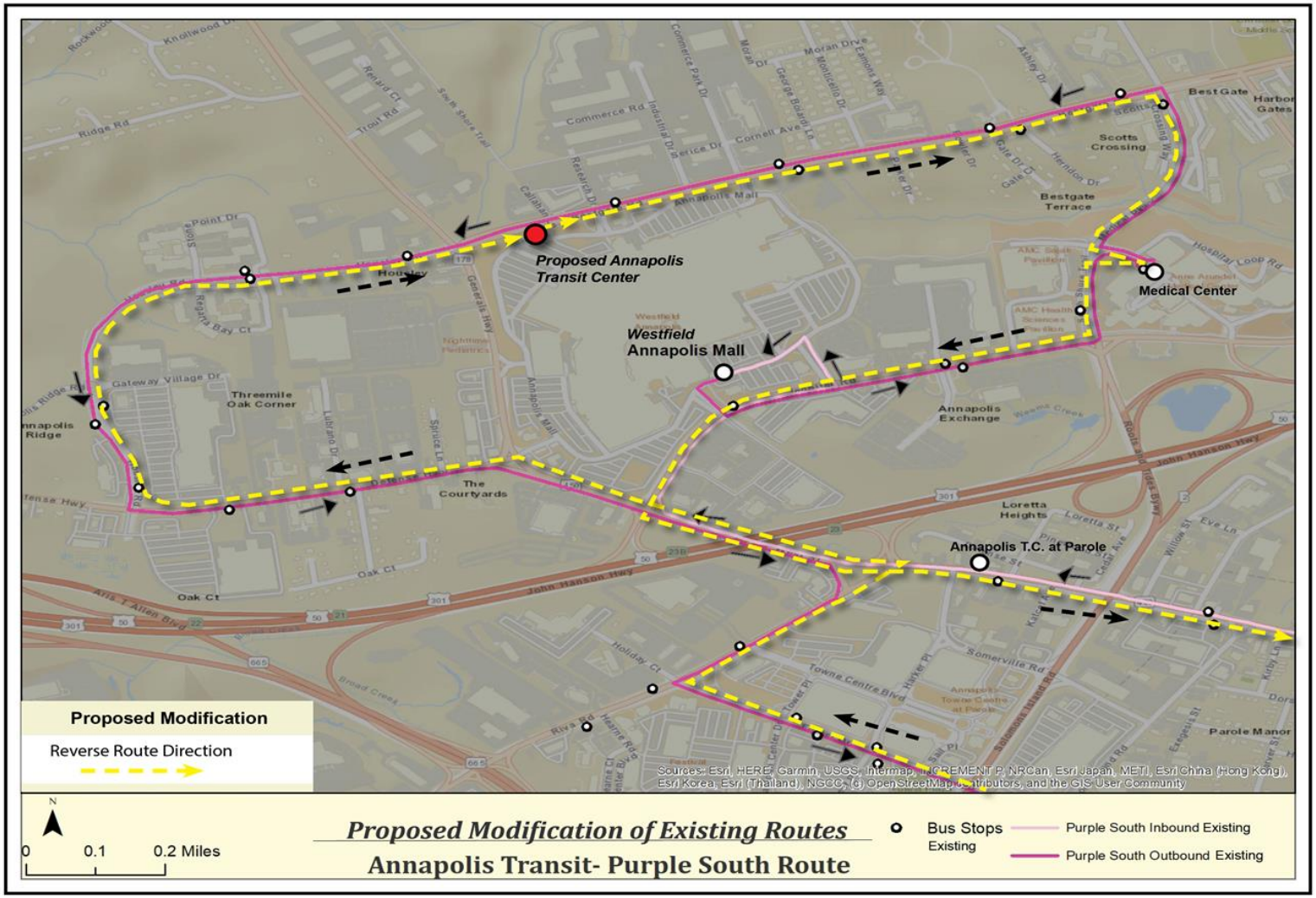


Figure 50: AT Purple Route South – Option 3



7.5 Local/Regional Routes Harry S. Truman Park and Ride Analysis

Identical to the examination of operations serving the new Westfield Mall facility, analysis of the current routes were assessed by extending each route serving Westfield Mall to the Harry S. Truman Park and Ride facility location shown in Figure 51. By establishing Harry S. Truman Park and Ride as the new hub and transfer point, likewise each route's run times were calculated to determine if they are feasible utilizing the same resources. Table 25 details all the routes that would connect at the new Harry S. Truman facility location. To determine what affect the new facility will have on the route we calculated the proposed run time for the segment of the route from the current Westfield Mall stop to the Harry S. Truman stop. Correspondingly, this was also performed for the return trip back to the Westfield Mall stop. Thus, each local route would add the same mileage/time between Westfield Mall and Harry S. Truman, with the exception of the Yellow Route which currently serves the Harry S. Truman location and the Purple North and Purple South routes which both circle around the mall via Housley Road/Bestgate Road/Medical Parkway/Jennifer Road prior to stopping at the current Westfield Mall stop. Our analysis assumes that this outer loop would only occur in the direction from Harry S. Truman to Westfield Mall. For purposes of clarity, the Purple North and Purple South assume the same additional mileage/time as the other local routes. Additionally, the overall route run time and scheduled layover times were documented, along with the new anticipated layover (slack) time.

Figure 51: Local Route Segment from Westfield Mall to Harry S. Truman Park and Ride

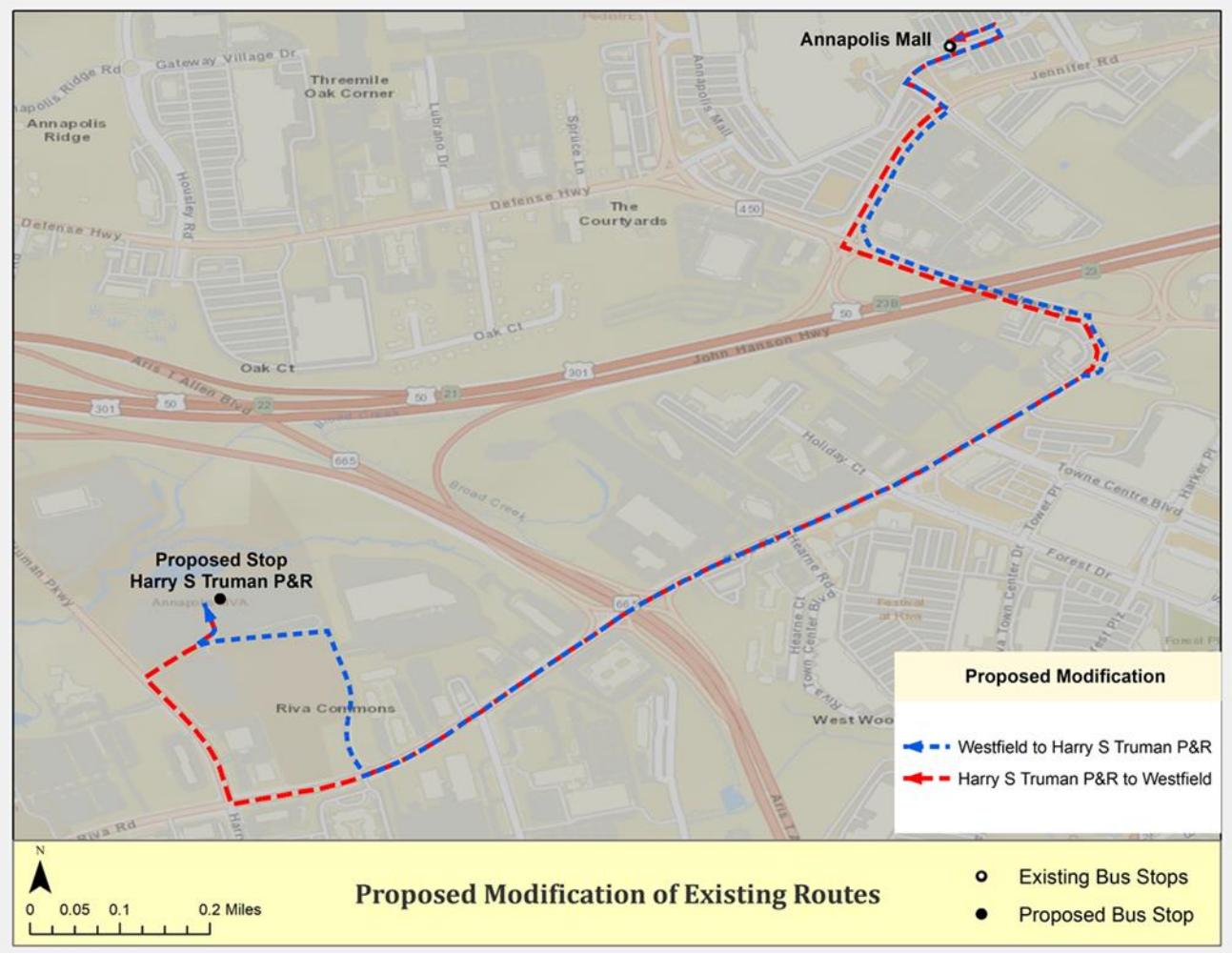


Table 25: Local/Regional Proposed Route Alternative Time Chart Serving Harry S. Truman

	Route Direction	From	To	Proposed Additional Typical Run Time (min.)	Proposed Peak Run Time Range (min.)	Proposed Avg. Peak Run Time (min.)	Current Scheduled Route Run Time	Scheduled Current Layover (Slack Time)	Anticipated Layover (Slack) Time
Brown									
	Eastport to Mall	Westfield	Harry S. Truman	7	7-14 min	10	38	7	0
	Mall to Eastport	Harry S. Truman	Westfield	9	9-18 min	13	36	9	0
Green									
	Eastport to Mall	Westfield	Harry S. Truman	7	7-14 min	10	24	6	-1
	Mall to Eastport	Harry S. Truman	Westfield	9	9-18 min	13	23	7	-2
Red									
	Eastport to Mall	Westfield	Harry S. Truman	7	7-14 min	10	24	6	-1
	Mall to Eastport	Harry S. Truman	Westfield	9	9-18 min	13	25	5	-4
Yellow									
	Outbound	Westfield	Harry S. Truman	0	Route Does Not Change		52	8	8
	Inbound	Harry S. Truman	Westfield	0	Route Does Not Change		52	8	8

	Route Direction	From	To	Proposed Additional Typical Run Time (min.)	Proposed Peak Run Time Range (min.)	Proposed Avg. Peak Run Time (min.)	Current Scheduled Route Run Time	Scheduled Current Layover (Slack Time)	Anticipated Layover (Slack) Time
Purple North									
	Eastport to Mall	Westfield	Harry S. Truman	7	7-14 min	10	66	9	-7
	Mall to Eastport	Harry S. Truman	Westfield	9	9-18 min	13			
Purple South									
	Eastport to Mall	Westfield	Harry S. Truman	7	7-14 min	10	66	9	-7
	Mall to Eastport	Harry S. Truman	Westfield	9	9-18 min	13			
Gold Edgewater									
	K-Mart to Westfield	Westfield	Harry S. Truman	7	7-14 min	10	55	5	-11
	Westfield to K-Mart	Harry S. Truman	Westfield	9	9-18 min	13			
Gold College Pkwy									
	AACC to Westfield	Westfield	Harry S. Truman	7	7-14 min	10	75	5	-11
	Westfield to AACC	Harry S. Truman	Westfield	9	9-18 min	13			

7.5.1 Local/Regional Routes – Evaluation Based on Current Route Speeds

A second approach was applied to validate that the above research was appropriate. The current route speeds were calculated and then applied to the proposed new routes for the identified two facility locations – Westfield Mall and Harry S. Truman. Table 26 details the new total run times by route and the change in overall route times.

7.6 Commuter Routes

As identified in section 3.0 Existing Service and Previous Studies, two MDOT MTA commuter bus routes provide service to Westfield Mall – MDOT MTA Commuter Route 210 and MDOT MTA Commuter Route 215. Although additional commuter and intercity bus service is provided to Annapolis, these are the only two being evaluated for potential service changes as a result. Similar to the analysis that was performed for the local/regional routes, the run times for these two MDOT MTA commuter routes were analyzed to determine if they are feasible utilizing the same resources. Table 27 details this assessment. Again, to determine what affect the new facility will have on the route we calculated the proposed run time for the segment of the route that would need to be altered against the current alignment scheduled run time. Unlike the local/regional bus analysis, the overall route run time and scheduled layover times were not part of this investigation. The published schedules demonstrate that either Westfield Mall nor the Harry S. Truman Park and Ride lot use these locations as layover destinations. Most likely if additional time is required, they would be added either to the front end or back end of the service route.

Table 26: Route Analysis to Westfield Mall and Harry S. Truman Based on MPH

	Route Direction	Route Miles	Route Run Time	MPH	Westfield Mall New Location			Harry S. Truman Park and Ride		
					Route Miles	Route Run Time	Change in Run Time	Route Miles	Route Run Time	Change in Run Time
Brown										
	Inbound	9.99	38	15.77	10.19	39	1	11.49	44	6
	Outbound	9.26	36	15.43	9.46	37	1	11.26	44	8
	Total	19.25	74	15.61	19.65	76	2	22.75	87	13
Green										
	Inbound	5.04	24	12.60	5.54	26	2	6.54	31	7
	Outbound	4.98	23	12.99	5.18	24	1	6.98	32	9
	Total	10.02	47	12.79	10.72	50	3	13.52	63	16
Red										
	Inbound	6.21	24	15.53	6.71	26	2	7.71	30	6
	Outbound	5.96	25	14.30	6.46	27	2	7.96	33	8
	Total	12.17	49	14.90	13.17	53	4	15.67	63	14
Yellow										
	Total	10.82	52	12.48	No Change*	52	0	No Change**	52	0

	Route Direction	Route Miles	Route Run Time	MPH	Westfield Mall New Location			Harry S. Truman Park and Ride		
					Route Miles	Route Run Time	Change in Run Time	Route Miles	Route Run Time	Change in Run Time
Purple North										
	Inbound	8.83	35	15.14	9.23	37	2	10.33	41	6
	Outbound	8.21	31	15.89	8.21	31	0	10.21	39	8
	Total	17.04	66	15.49	17.44	68	2	20.54	80	14
Purple South										
	Inbound	4.79	25	11.50	5.19	27	2	6.29	33	8
	Outbound	11.14	42	15.91	11.64	44	2	13.14	50	8
	Total	15.93	67	14.27	16.83	71	4	19.43	82	15
Gold Edgewater										
	Northbound	6.99	30	13.98	7.29	31	1	8.49	36	6
	Southbound	6.81	25	16.34	7.01	26	1	8.81	32	7
	Total	13.8	55	15.05	14.3	57	2	17.3	69	14
Gold College Pkwy										
	Southbound	10.75	39	16.54	10.55	38	-1	12.25	44	5
	Northbound	10.75	36	17.92	10.85	36	0	12.75	43	7
	Total	21.5	75	17.20	21.4	75	0	25	87	12

*Reverse direction on new proposed route so no change in miles/time.

**Yellow Route currently serves Harry S. Truman P&R Lot.

Table 27: MDOT MTA Commuter Bus Routes Proposed Route Alternatives Time Chart

	Route	From	To	Scheduled Run Time (min.)	#	Proposed Route Options	Proposed Typical Run time (min.)	Proposed Peak Run time Range (min.)	Proposed Avg Peak Run time (min.)
MTA 215									
	Southbound (AM)	Cromwell Station	Westfield	26	Option 1	Via West St, Bestgate & Generals Hwy	22	24-40 min	35
	Southbound (AM)	Westfield	Medical Ctr.	3	Option 1	Via Bestgate & Medical Pkwy	3	4	4
	Northbound (PM)	Medical Ctr.	Westfield	3	Option 1	Via Bestgate Rd Via Jennifer Rd	5 5	4-7 min 5-8 min	6 7
	Northbound (PM)	Westfield	Cromwell Station	20	Option 1	Via Annapolis Rd & West St	20	22-35 min	28
MTA 210									
	Northbound (AM) Starts at Castle Marine P&R	Stevensville Park & Ride	Westfield	25	Option 1	Via Bestgate	20	18-30 min	24
	Northbound (AM) Starts at Annapolis Downtown	Medical Ctr.	Westfield	3	Option 1 Option 2	Via Bestgate Rd Via Jennifer Rd	5 6	4-6 min 5-7 min	5 6
	Northbound (AM)	Westfield	Harry S. Truman Park & Ride	10	Option 1	Annapolis Rd & West St	9	6-12 min	9
	Southbound (PM)	Harry S. Truman Park & Ride	Westfield	8	Option 1	Via West St, Bestgate & Generals Hwy	6	6-18 min	12
	Southbound (PM) Ends at Annapolis Downtown	Westfield	Medical Ctr.	3	Option 1	Via Bestgate	3	4	4
	Southbound (PM) Ends at Castle Marine P&R	Westfield	Stevensville Park & Ride	25	Option 1	Via Bestgate	20	20-35 min	28

7.6.1 MDOT MTA Commuter Bus Route 210 Kent Island - Annapolis/Baltimore

One option was examined for the MDOT MTA Commuter Bus Route 210 as shown in Figure 52 and 53:

- Option 1 – Northbound – AM (to Baltimore via Westfield Mall and Harry S. Truman Park and Ride)
    - From Stevensville Park and Ride Lot (Queen Anne's County) to Westfield Mall, the new route is anticipated to arrive five minutes faster for the trips that do not serve Anne Arundel Medical Center (three out of the five morning trips).
    - For the two routes that serve Anne Arundel Medical Center, trips from here and then to Westfield Mall will likely increase by two minutes (Option 1 via Bestgate Road) or three minutes (Option 2 via Jennifer Road) over the existing route.
    - From Westfield Mall to the Harry S. Truman Park and Ride a modest one-minute shorter trip is expected.
    - Overall Northbound time savings from the new proposed route is six minutes for three of the runs (directly from Stevensville Park and Ride lot to Westfield Mall) and a three to four-minute reduction in route time when serving the Anne Arundel Medical Center.

- Option 1 – Southbound – PM (from Baltimore via Westfield Mall and Harry S. Truman Park and Ride)
    - From Harry S. Truman Park and Ride to Westfield Mall (via West Street, Bestgate Road and Generals Highway), the new route in this direction is predicted to arrive two minutes faster than the existing route.
    - For the two routes that serve Anne Arundel Medical Center, trips from Westfield Mall to this location (via Bestgate Road) will take about the same time as the current route.
    - From Westfield Mall to the Stevensville Park and Ride Lot a five-minute speedier trip is anticipated similar to the morning leg of this trip.
    - Overall Southbound time savings from the new proposed route is seven minutes.

Figure 52: MDOT MTA Commuter Bus Route 210 Northbound – Options 1 & 2

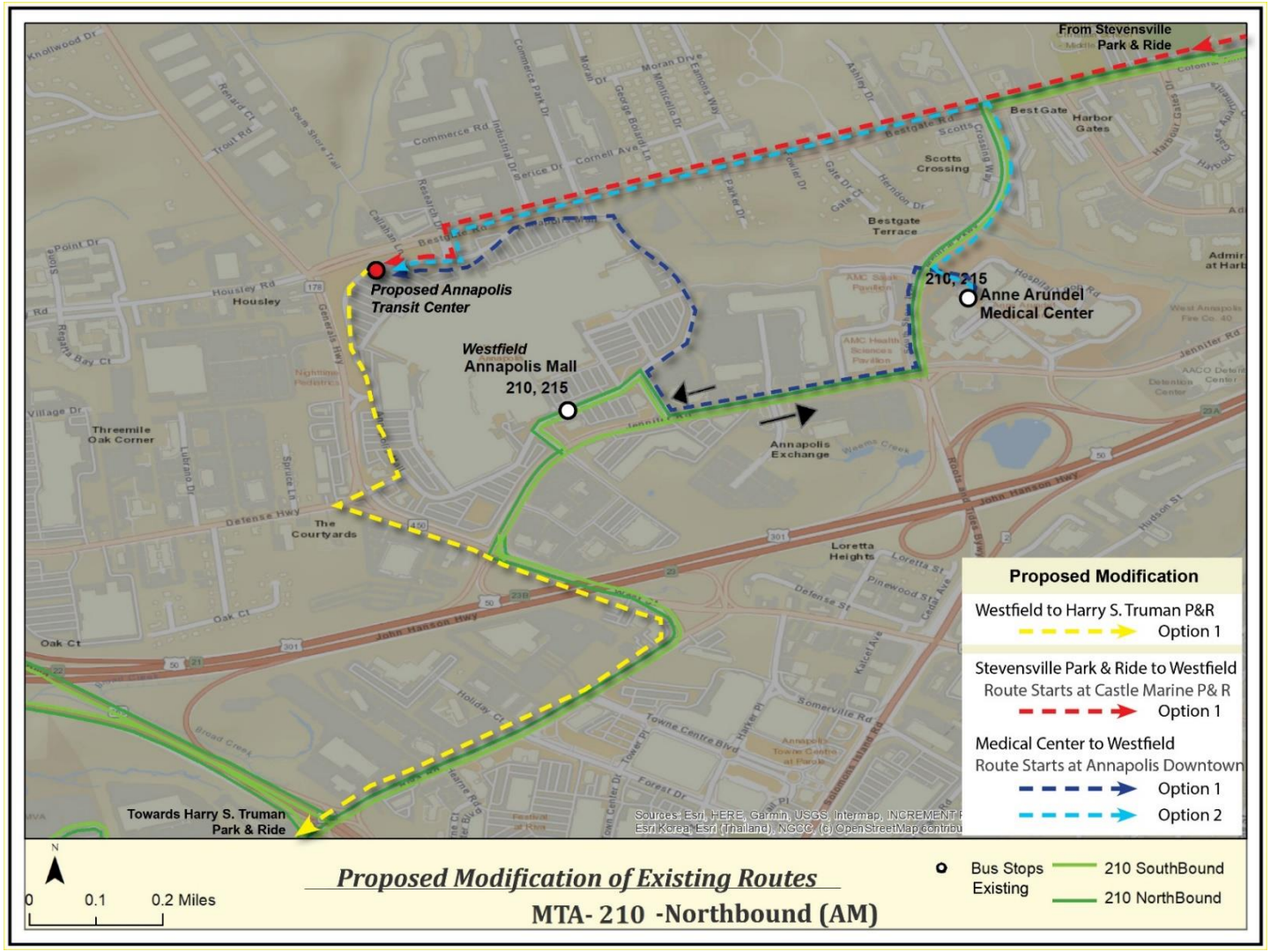
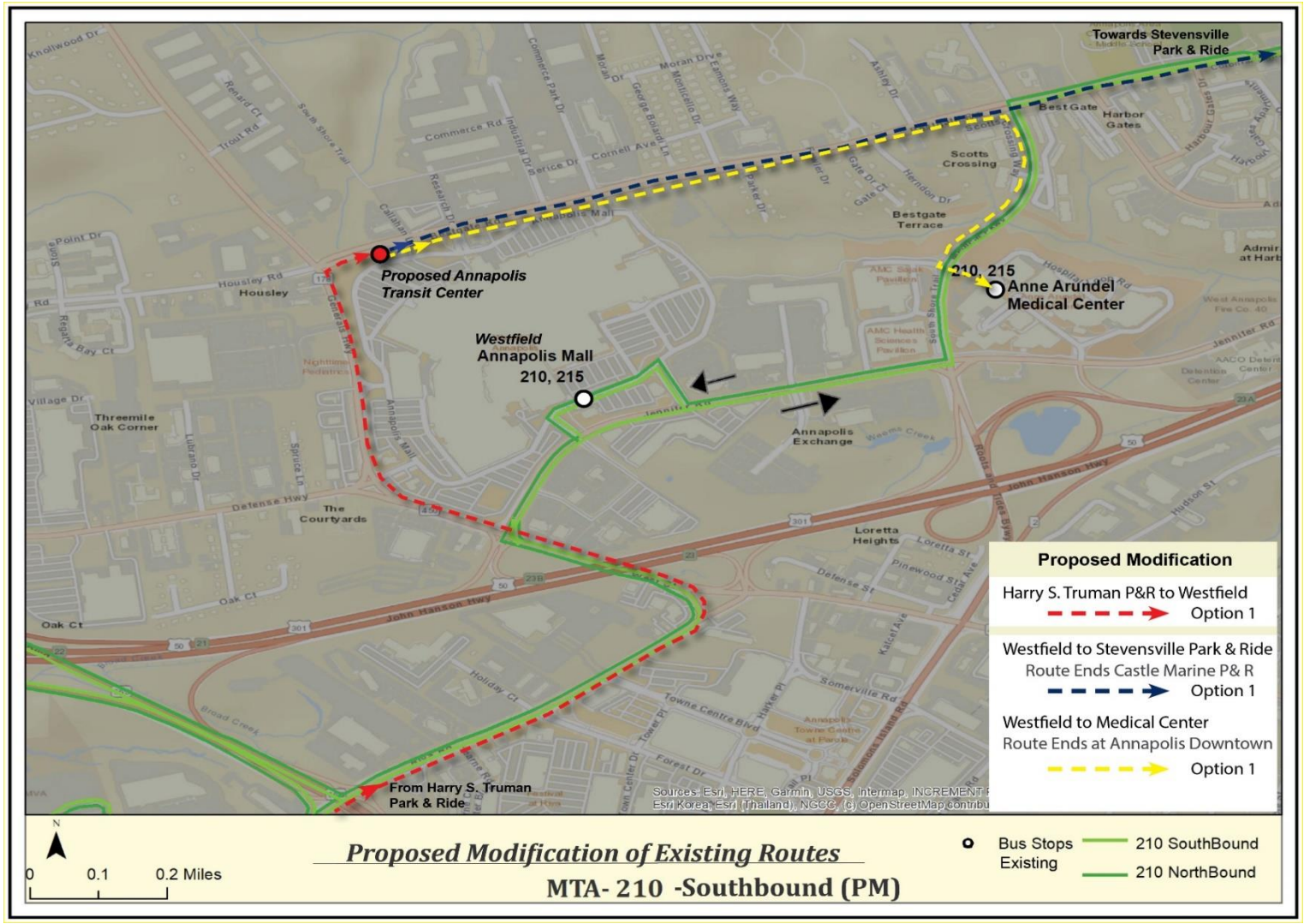


Figure 53: MDOT MTA Commuter Bus Route 210 Southbound – Option 1



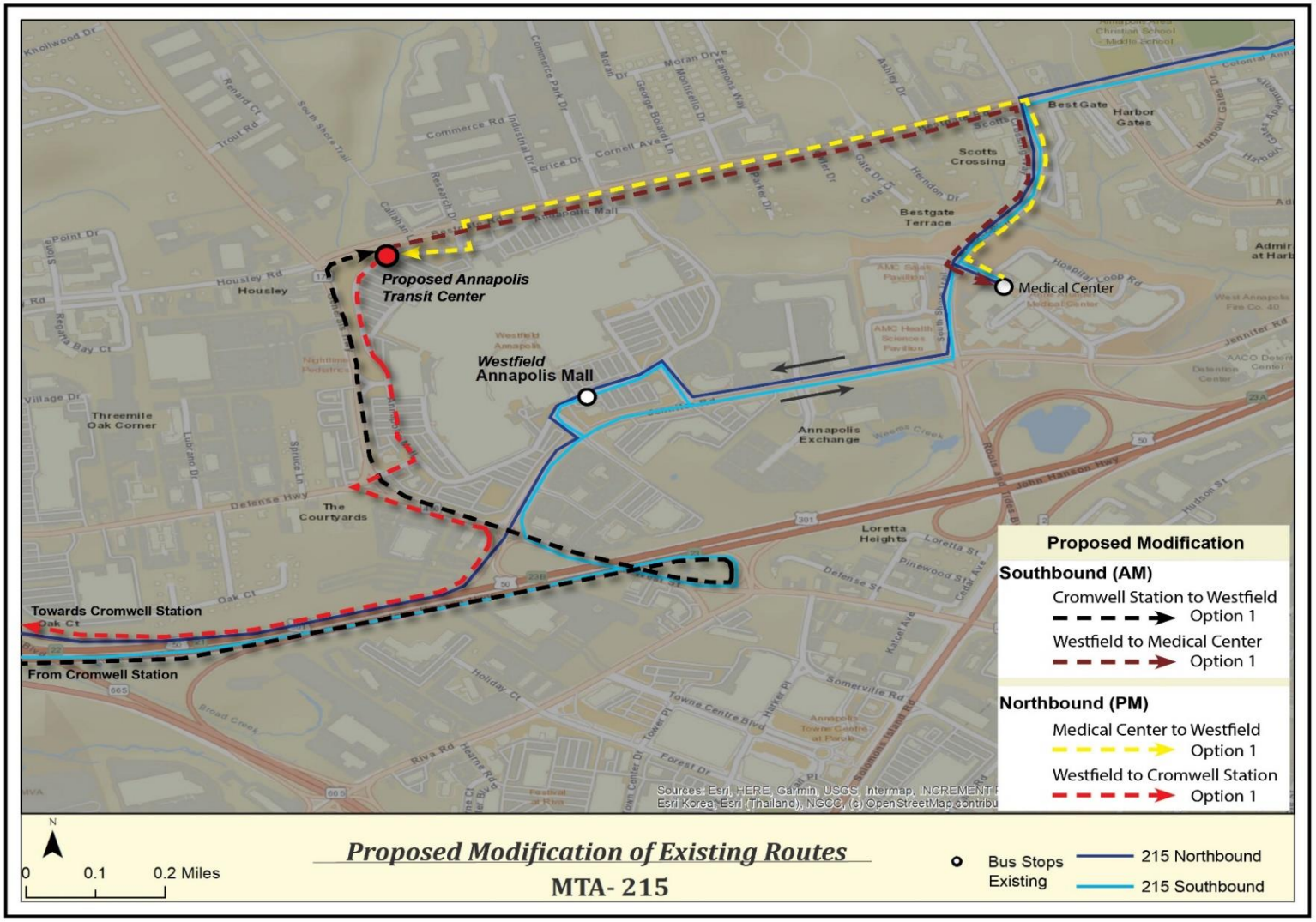
7.6.2 MDOT MTA Commuter Bus Route 215 Downtown Baltimore to Annapolis

One option was examined for the MDOT MTA Commuter Bus Route 215 as shown in Figure 54:

- Option 1 – Southbound – AM (Baltimore to Westfield Mall and Anne Arundel Medical Center)
    - From Cromwell Light Rail Station to Westfield Mall, the new route is anticipated to arrive four minutes faster.
    - From Westfield Mall to Anne Arundel Medical Center (via Bestgate Road and Medical Parkway), no change in operating time is anticipated.
    - Therefore, the overall Southbound time savings from the new proposed route is four minutes.

- Option 1 – Northbound – PM (Westfield Mall and Anne Arundel Medical Center to Baltimore)
    - From Anne Arundel Medical Center to Westfield Mall (via West Street, Bestgate Road and Generals Highway), the new route will likely increase by two minutes (via Bestgate Road or via Jennifer Road) over the existing route.
    - For the two routes that serve Anne Arundel Medical Center, trips from Westfield Mall to this location (via Bestgate Road) will take about the same time as the current route.
    - From Westfield Mall to Cromwell Light Rail Station the same operating time as the current route is predicted.
    - Overall the new Northbound route would take two minutes longer over the existing MDOT MTA 210 Route.

Figure 54: MDOT MTA Commuter Bus Route 215 – Option 1



7.7 Decision Themes

Decisions regarding the development of future transit passenger facilities for the Annapolis area will be driven by the requirements of the different transit markets served by the local routes and the commuter/intercity services. The commuter/intercity services will require at least as much commuter parking as is provided in the current lot, and providing that at the Westfield Mall location would require a substantial parking structure that would need to provide all the commuter capacity plus spaces to replace the current Mall parking that would be displaced by such a structure. It is not clear that future plans for the Mall area can accommodate such a structure. In addition, there are no functional reasons to move the commuter bus stops to the Mall. Commuter bus users have destinations elsewhere, and very few would access the commuter buses on local transit, while local transit users value the Mall, medical center and adjacent land uses as key trip origins and destinations. For these reasons the option of consolidating all services at the Mall is not evaluated further.

This leaves the options of consolidating all services at the Harry S. Truman lot, or having two facilities, one at the Mall and one at the Truman lot, each tailored to meet the service needs of the transit markets. Operational considerations are a major factor to be considered in evaluating these two options—can the additional miles needed to connect the local transit routes to the Truman location be provided without significant increases in operating costs?

Table 28 is a synopsis of the local routes that are affected by the potential locations. For each location, the table presents an analysis of the required changes in layover times to meet current headways. If the layover times are positive, it indicates that the service could be provided on the current headway without adding buses or lengthening headways (though very short estimated layover times potentially could affect schedule reliability and might need to be addressed by revisions to the route). Estimates of layover times that are negative indicate that either additional vehicles would be needed to meet the current headways, or that headways would need to be lengthened.

As can be seen, the additional time and miles needed to connect the local routes to the Truman location all lead to negative times and would require either additional vehicles or major headway adjustments. Both options have budgetary repercussions. Adjusting the headways would not require additional capital or staff, however it might extend the hours of operation (or if financially constrained shorten the span of service). To keep the current headways an additional vehicle(s) would be required, adding a potential capital expense as well as additional operating dollars to operate that vehicle. These costs would be compounded in future years if plans to decrease headways to 15 minutes are ever implemented.

The option of consolidating all services at the Mall would require the construction of a major parking structure. This operational analysis reveals that the option of consolidating all services at the Truman lot would entail substantial additional ongoing operating costs and potential bus capital (with little user benefit from connecting the commuter and local services). The option of providing the improved facility at the Mall for local services while addressing any needs for improvements in passenger amenities, accessibility and condition for commuter passengers at the Truman lot is a logical means of providing the desired user benefits while minimizing future operating and capital costs.

Table 28: Local Service Operations Summary

Route	Current Run Time	Current Headway (minutes)	Current Layover Time (minutes)*	New Westfield Location		Harry S. Truman	
				Calculated Layover			
				Time Analysis	MPH Analysis	Time Analysis	MPH Analysis
AAOT – Yellow Route	52	60	8	No Change	No Change	No Change	No Change
AAOT – Gold Route Edgewater	55	60	5	2	3	-11	-9
AAOT – Gold Route College Parkway	75	80	5	7	5	-11	-7
AT – Brown Route	74	30	7/7	5/6	6/6	0/0	1/-1
AT – Green Route	47	30	6/7	6/6	4/6	-1/-2	-1/-2
AT – Red Route	49	30	6/5	4/4	4/3	-1/-4	0/-3
AT – Purple Route North	66	75	9	5	7	-7	-5
AT – Purple Route South	67	75	8	7	4	-7	-7

*Layover times with two values denotes a layover on each end of the route.

8.0 Conclusion and Next Steps

The report identifies two sites as potential locations for the Annapolis Transit Center; Westfield Mall and Harry S. Truman Park and Ride lot. Consideration was given to combining the two existing transit sites to one location but due to frequency of service, parking, and operational considerations was determined not feasible to combine transit hubs.

Each site serves different purposes for the transit customer. Westfield Mall is primarily an origin and destination, for the community and employees of the mall. Local transit providers offer service to Westfield Mall throughout the day. Harry S. Truman Park and Ride is long haul commuter based with morning and evening peak commuter bus service requiring all day parking. Local and private bus operators serve Harry S. Truman Park and Ride lot on a limited basis during the day.

It is recommended that both the Westfield Mall transit center and Harry S. Truman Park and Ride improvements move forward as separate but related projects. The Westfield Mall transit center would be designed and constructed primarily for local bus services in close collaboration with; the Mall's ownership, AT and Anne Arundel County. The Harry S. Truman Park and Ride improvements would reconstruct the existing bus loading area to upgrade the passenger amenities and meet ADA requirements. It would be designed and constructed in close collaboration with MDOT MTA and MDOT SHA primarily for commuter and intercity bus services with provision for local bus routes. During design, consideration must be given to maintaining the current number of commuter parking spaces while addressing pedestrian safety and peak period traffic congestion for vehicles exiting the park and ride spaces.

The operation of a transit center involves multiple stakeholders. Coordination and collaboration among local, state agencies and private entities will need to continue to make the project a success. Funding will need to be requested depending on the County's desire for additional studies or move to the next level of preliminary design and engineering. The order of magnitude cost estimate may be used as the basis for inclusion in the Transportation Improvement Program. And the addition of; the transit center concept in Anne Arundel County's Parole Growth Management Plan, upcoming master plans or in support TOD mixed use planning, may further strengthen the justification for the construction of a transit center.