


# Central Avenue-Metro Blue Line Corridor TOD Implementation Project Mobility Study



**TOD**  
Transit-Oriented Development



# Abstract

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**Abstract:** Phase 3 of the Central Avenue Transit-Oriented Development (TOD) Mobility Study was initiated in order to investigate needs along the corridor and prepare guidance that would assist the Prince George's County Planning Department and The Maryland-National Capital Park and Planning Commission (M-NCPPC) with implementing the approved Subregion 4 Sector Plan. The effort included an analysis of the existing transportation network including roadways, pedestrian, bicycle, and transit facilities; refinement of feasible transportation solutions; review of existing county design guidelines and policies; and tailoring of broad "Complete Streets" policies to specifically implement concepts in the study area.

# **Central Avenue-Metro Blue Line Corridor TOD Implementation Project Mobility Study**

**July 2013**

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**Section 1**  
**Executive Summary**

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## EXECUTIVE SUMMARY

The Central Avenue (MD 214) corridor in Prince George’s County has the potential to become a center of livable neighborhoods, retail districts, and employment zones. The adopted Subregion 4 Master Plan and Sectional Map Amendment (the Subregion 4 Sector Plan) envisions that the corridor’s high level of regional connectivity, particularly with its four Blue Line Metrorail stations, can help to bring new economic development, retail, and housing investment. This Corridor TOD Implementation Project looks at Central Avenue and the study area’s streets, transit infrastructure, and open space as the assets on which to build a more flexible transportation framework that can support the land use and development changes envisioned. The study tests proposed land use and Complete Streets concepts on future traffic conditions. It investigates current criteria, regulatory guidance, and funding opportunities, and then proposes a series of actions that will help to bring about more affordable, comfortable, convenient, connected, and healthy transportation network. It identifies critical leadership and support roles of partner transportation agencies to fund proposed improvements, amend operating procedures, and fine-tune regulating guidance to bring about the envisioned change.

Central Avenue is the major road focus of this study. As a vital regional arterial, it provides a critical link for travel between the east side of downtown Washington, D.C. and Anacostia, identified as East Capital Street in Washington, D.C, into Prince George’s County, where it connects to FedEx Field, the Capital Beltway (I495/I95) and ultimately to Anne Arundel County. The study area, running between the District of Columbia/Prince George’s County, Maryland boundary at Southern Avenue east to I-495, has been widened over the years to reflect this important traffic function. Central Avenue provides six general traffic lanes and has separated space for left turning vehicles at its major intersections. Sidewalks exist along much of the corridor but are narrow, without separation from traffic lanes, and with little or no landscaping. Opportunities to safely cross the street on foot are few. Neighbors feel that access from their homes onto the highway at unsignalized intersecting streets is unsafe.

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An **arterial** is a high-capacity, urban road designed to carry traffic through an area as efficiently as possible.

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The disconnected street system, characteristic of post-1950 suburban development patterns, requires that the majority of trips made by residents include travel on Central Avenue. The area’s lack of connectivity and few parallel routes adds considerable local traffic to that which passes through the area on its way to and from the District of Columbia, the Beltway, and points beyond.

The Washington Metropolitan Area Transit Authority’s (WMATA) Blue Line Metrorail service began running parallel to Central Avenue in recent years, introducing new regional connectivity options for residents. With the exception of station access from the main roads when the Blue Line opened for service at the Capitol Heights and Addison Road stations in 1980, very little in the road network changed. Morgan Boulevard and Largo stations, which opened in 2004, were situated away from Central Avenue along county collector roads. Adjacent land use did not adequately consider walking access to and from stations and included large parking areas that invited car commuting to these suburban stations.

The approved Subregion 4 Master Plan envisions a more diverse mix of land uses and greater densities at Metro station locations along the Central Avenue corridor. It envisions a more walkable place; comfortable, convenient and affordable to residents of all ages. The Master Plan of Transportation prioritizes “Complete Streets” in its policy guidance. These plans are combined in this document to help identify ways Central Avenue and its surrounding road network can change

to better serve the future travel and livability of the corridor. Creating a more connected “complete network,” combined with land use and density change, will offer more route options, shorten trip lengths, and permit more trips to be made on foot or bicycle to daily destinations.

This document creates a decision-making framework and a set of priority actions that can build the places described in the sector plan for Central Avenue. As one of the county’s earliest Complete Streets initiatives, the study provides a pilot analysis for broader application countywide. Changes in decision-making criteria and processes have been proposed and will need to be adopted and adapted over time to successfully create the transit-serviceable communities that recent investment in Metrorail has made possible. Suggested changes in policy, regulations, and program are discussed in this report and include a focus on the following areas:

- Reducing parking requirements for development
- Creating a transit-oriented development review checklist
- Establishing a mid-block crossing policy
- Improving street lighting
- Requiring multimodal connections in new development
- Requiring walkable block lengths
- Implementing new legislation requiring developer contributions to pedestrian and bicycle connections
- Requiring sidewalks on both sides of all new streets in TOD and urban areas
- Typing and designing new streets according to Complete Streets principles

Agency decision-makers with site plan and traffic impact study review responsibility in the Prince George’s County Department of Public Works and Transportation (DPW&T); traffic engineers from the Maryland State Highway Administration (SHA); and bus planners from WMATA, will need to help advance the recommendations of this plan. They, and other agency colleagues, generously provided time to the consultant team and project management staff to meet individually and collectively to help bring ideas and identify resources on behalf of their agencies. These resources included funding, technical guidance, and administrative processes.

Recommendations include short-term projects and planning for immediate action initiated by the Sabra Wang/Toole Design Group collaboration during Phases 1 and 2 of this study. The work of this Phase 3 effort built upon Phase 1 and 2 and created an existing conditions analysis. Phase 3 investigated the long term needs and potential opportunities of proposed land use and transportation concepts. Land use, density and site location prepared under separate contract by AECOM was used to update the county’s traffic model results for the Phase 3 traffic micro simulation and street connectivity planning.

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## Report Organization

The chapters of this report are organized according to the topic areas below. They present and summarize the results of the Phase 3 analysis conducted for the Central Avenue TOD Mobility Study area and discuss recommendations for action by the identified agency or multi-agency collaboration.

1. *Previous Planning*: Presents a general overview of the corridor study area, previous planning work conducted for the area, and the process used to develop the Phase 3 Central Avenue TOD Mobility Study.
2. *Existing Conditions*: Summary of existing demographics, land use patterns, market conditions, multimodal transportation facilities, operations, and safety in the study area.
3. *Design and Policy Review*: Recommends changes to existing transportation, land use, and development review policies and design standards to better support Complete Streets and TOD.
4. *Complete Streets Strategies*: Presents a new street type, standard cross sections, and network improvements to enhance multimodal safety and access in the study area and lay the groundwork for a future Transportation Network Functional Overlay.
5. *Future Conditions*: Evaluates transportation conditions in 2035 and the feasibility of alternative improvement strategies such as reallocating roadway space on Central Avenue.
6. *Implementation*: Identifies short- and long-term projects to begin implementing Complete Streets and TOD.







## **Section 2**

### **Project Overview**

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## PROJECT OVERVIEW

### Project Scope

Phase 3 of the Central Avenue Transit-Oriented Development (TOD) Mobility Study was initiated in order to investigate needs along the corridor and prepare guidance that would assist the Prince George's County Planning Department and The Maryland-National Capital Park and Planning Commission (M-NCPPC) with implementing the approved Subregion 4 Sector Plan. The effort included an analysis of the existing transportation network including roadways, pedestrian, bicycle, and transit facilities; refinement of feasible transportation solutions; review of existing county design guidelines and policies; and tailoring of broad "Complete Streets" policies to specifically implement concepts in the study area. These recommendations are structured to support the overarching vision for the study area and the following guiding principles:

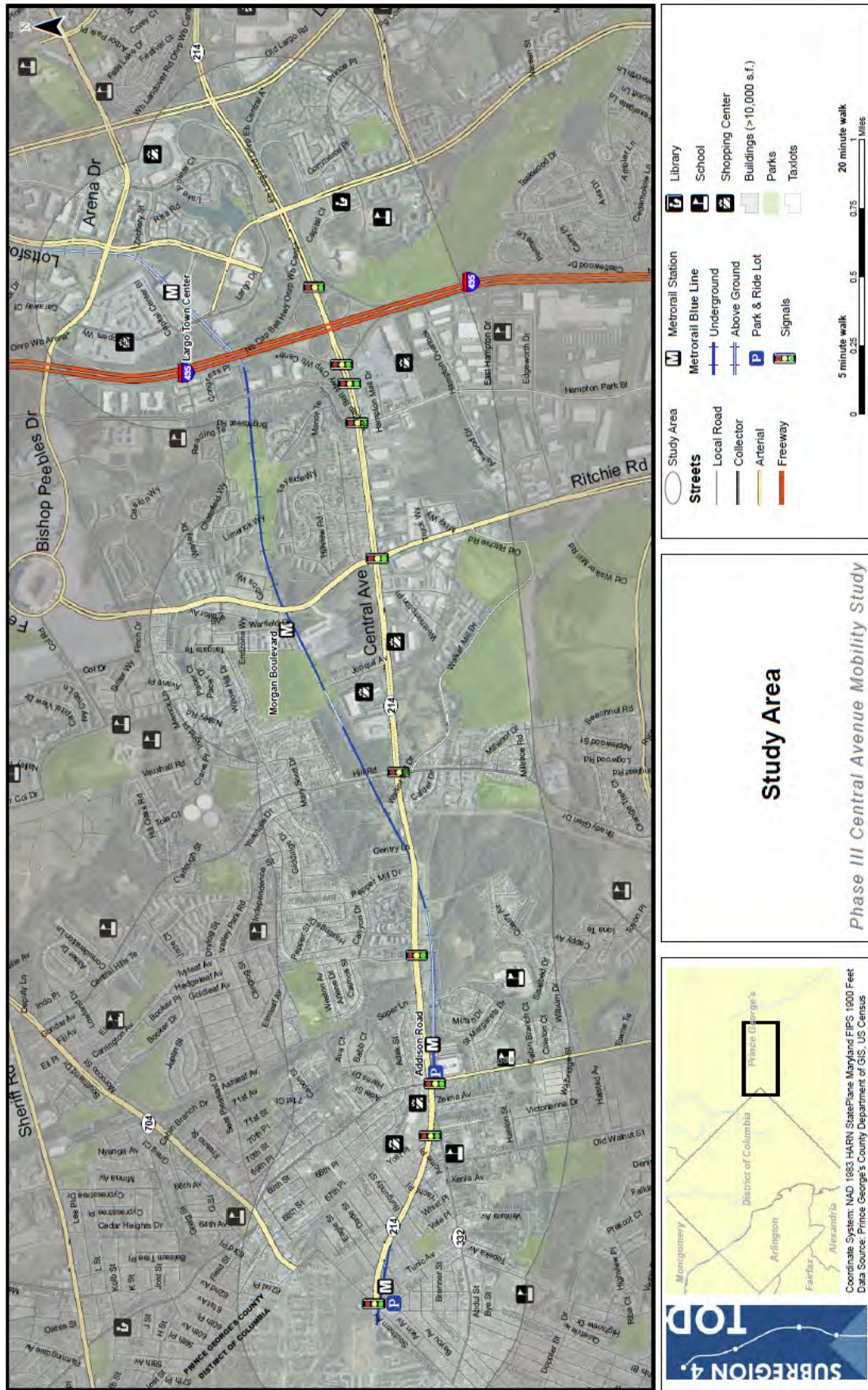
- **Complete streets and networks to support Complete Communities.** Complete streets are designed to ensure that all users are safely, comfortably, and adequately accommodated along roadways. Streets should be treated as public space available for use by pedestrians and cyclists in addition to vehicles. Complete networks also provide direct connections between destinations for pedestrians and cyclists, either through street extensions or an integrated trails network. Complete communities expand on this principle further and provide strong connections between the transportation network and surrounding land uses. Within Prince George's County, every project should contribute to a complete community that supports social, economic, and personal health, mobility, choice, and neighborhood vitality. Convenient and comfortable transit access should be implemented into all new projects, and a greater emphasis should be placed on pedestrians when street improvements are made.
- **Livability.** Ultimately, the vision for the project is to increase livability among the neighborhoods and communities on and around Central Avenue. This vision requires a progressive, integrative, and well-planned relationship between transportation and public health, housing, cultural resources, and the natural environment. Implementing a mixed-use land development plan supported by a broad range of transportation options will increase destinations that meet daily needs and would increase livability in the area.
- **Offer a range of safe, comfortable, affordable, and convenient transportation options.** The role of a multimodal network is to provide reliable, connected transportation options that are accessible to all residents. Complete network improvements could bring the entire study area within a 1 mile walk, approximately 20 minutes, from a Metrorail station. Bicycle connections to Metrorail stations, local destinations, and "low stress" bicycle facilities, such as neighborhood greenways, could make cycling more accessible and attractive as a transportation option. A collector network—a series of low- to moderate-capacity roads that move traffic from local streets to arterial roads—would manage local trips and alleviate traffic from Central Avenue.
- **Leverage rail station assets to advance livability through economic development and private sector investment.** The land use, complete street/network, and policy recommendations developed through this process can support the addition of residents, businesses, and employment on the corridor in more walkable,

bikable, transit-oriented patterns. As these areas develop, the policies developed and adopted will help guide the implementation of physical improvements to further the goals of Prince Georges County and the residents living along Central Avenue. Due to its proximity to transit, station area sites can bring new jobs to the corridor without adding the levels of traffic that more suburban locations generate. Redevelopment of the Morgan Boulevard site can help to build comfortable and safe connections between the station and nearby areas.

## Study Area

The corridor is approximately four miles long and includes properties within one-half mile of Central Avenue and the four Metro Blue Line stations (Figure 1). From west to east, the Metro stations within the study corridor are: Capitol Heights, Addison Road-Seat Pleasant, Morgan Boulevard, and Largo Town Center. Largo Town Center, the final stop on the Blue Line, is situated just east of the Capital Beltway. FedEx Field, home of the Washington Redskins National Football League team, is located approximately one mile north of the Morgan Boulevard Metro station. The land within the Central Avenue corridor is under the purview of several jurisdictions, including Prince George's County, the City of Seat Pleasant, and the Town of Capitol Heights. Central Avenue/East Capitol Street Extended (MD 214) is a state road, maintained by the Maryland State Highway Administration (SHA).

FIGURE 1. STUDY AREA





## Future Vision for Central Avenue

Consider the Central Avenue corridor 25 years into the future. Due to the introduction of Complete Streets policies there are many more intersecting streets and trail connections that are inviting to pedestrians and bicyclists. Less-experienced bicyclists use neighborhood greenways because they are comfortable and away from the faster traffic on Central Avenue. Younger residents travel to and from school, to area parks, and to visit friends on foot and by bike on sidewalks, in bike lanes, and along trails. Older residents enjoy trail connections for healthy recreation as well as transportation. Fewer travel lanes on Central Avenue, four instead of six, do not substantially increase motorists' travel time because there are more points of access to the road, intersections are managed with shorter cycle lengths, and speeds along the road are more consistent. More people are walking, biking, and using transit. The behavior of motorists sharing Central Avenue with bicyclists and pedestrians, each in their own dedicated space, creates a safer environment for all users. In short, Central Avenue functions more as an urban boulevard rather than an arterial roadway.

New mixed-use and transit-oriented places replace surface parking lots around Metro stations. Residential and retail development is oriented towards Central Avenue to take advantage of the increase in pedestrian activity and visibility. New residents and office workers support more retail business. Development has added employment and shopping options to existing neighborhoods, and it is all thanks to Prince Georges County's thoughtful, community-oriented approach to private investment.

Improvement in the business and economic outlook, combined with a greater number of choices of housing types available for a range of markets, helps older residents age in the communities they know and younger residents find housing in the places where they have grown up. Deep connections to the place that Central Avenue has become is evident from the physical appearance of the area, as the long-time residents of Seat Pleasant, Capital Heights, Morgan Boulevard, and Largo have engaged over the years to ensure that change brings about what is fundamentally important to community life. More work, school, and shopping trips are done locally, which helps to strengthen relationships between residents, area businesses, and neighborhood civic institutions. The positive and forward-thinking improvements in the transportation network, land use changes, and community friendly planning policies encourage growth and investment by government and transit agency partners, as well as the private sector.



*The future vision for Central Avenue includes improved access to transit, comfortable walking and biking facilities, and improved crossings of Central Avenue.*



**Section 3**  
**Previous Plans & Public Engagement**

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## PREVIOUS PLANS & PUBLIC ENGAGEMENT

### Connection to Previous Plans and Existing Policies

Phase 3 of the TOD Mobility Study builds upon the recommendations of the 2010 *Approved Subregion 4 Master Plan and Sectional Map Amendment (SMA)*, the 2009 *Approved Countywide Master Plan of Transportation (MPOT)*, and Phases 1 and 2 of the Central Avenue TOD Mobility Study. This project will further develop and identify strategies to support and facilitate a multimodal, fully integrated transportation network throughout the Sector Plan area, including recommending Complete Streets policy and implementation strategies. The Complete Streets implementation strategies provide the basis for development of a future Transportation Network Functional Overlay that designates street types, assigns networked elements (including transit routes and truck access), and establishes the relationship of the transportation network within the plan area to surrounding communities.

### Subregion 4 Master Plan

In 2010, the Prince George's County Council approved the *Subregion 4 Master Plan and Sectional Map Amendment (SMA)*. The *Subregion 4 Master Plan* establishes land use and development policies to implement the goals and policy recommendations of the 2002 *Prince George's County Approved General Plan*. The General Plan designates Subregion 4 as an area located within the Developed Tier, which places special emphasis on policies that will strengthen neighborhoods, support economic development along corridors, capitalize on transportation investments, and encourage transit-supporting, mixed-use, pedestrian-oriented neighborhoods. The Subregion 4 Master Plan further highlights the General Plan's goals by recognizing that the Central Avenue-Metro Blue Line corridor presents significant transit-oriented development (TOD) and economic investment potential for the county.

Phase 3 of the TOD Mobility Study supports the *Subregion 4 Master Plan*, which envisions a fully integrated multimodal transportation system around each of the corridor's four Metro stations. Once completed, current plans for redevelopment are expected to substantially increase the 12,600 passenger trips made each day at the 4 stations. Metro's proposed goal of tripling the number of passengers who access Metrorail stations by bicycle within the next ten years will also generate increased demand for bicycle adequate facilities. Realizing these visions will require the county to overcome several constraints, including an auto-oriented development pattern, limited right-of-way, and limited funding for multimodal improvements. The Central Avenue TOD Mobility Study makes low-cost recommendations to resolve these constraints, but additional coordination with the county and SHA staff will be essential to ensure implementation of these recommendations.

### COUNTY MASTER PLAN OF TRANSPORTATION

Phase 3 of the TOD Mobility Study will refine and implement the *Master Plan of Transportation's (MPOT)* vision for TOD, Complete Streets, and a multimodal transportation network. The goal of the MPOT is to provide county residents and workers with a safe, affordable, multimodal transportation system—which includes bicycle and pedestrian facilities, bus and rail transit service, and a road network—that effectively contributes to the timely achievement of the General Plan goals for growth, development, and revitalization.



The MPOT supports TOD as compact, transit-supporting, mixed-use development that integrates land use and density, site design, parking and accessibility into a specific vision for areas within a quarter- to half-mile of transit stations. The MPOT also supports the concept of, and provides policies and strategies for, achieving Complete Streets, which is integral to achieving the goals and vision of the sector plan. Complete Streets accommodates all users of streets, roads, and highways, including pedestrians, bicyclists, transit-users, motorists, seniors, and persons with disabilities. It also provides improved choices for travelers who may want alternatives to single-occupancy vehicles.

## CENTRAL AVENUE TOD MOBILITY STUDY PHASE 1 AND PHASE 2

During Phase 1 of the Central Avenue TOD Mobility Study, short-term improvements to western Central Avenue were identified. In Phase 2, the short-term improvements to western Central Avenue were refined and analyzed, and short-term improvements to eastern Central Avenue were identified. Phase 3 builds on the analysis and results of the two prior phases to develop a long-term, corridorwide strategy for the implementation of TOD and Complete Streets.

Phase 1 of the Central Avenue TOD Mobility Study, *Pedestrian and Bicycle Access and Circulation (Transportation Land use Connections Program)*, set the stage to apply Complete Streets principles to enhance pedestrian safety and improve access and mobility for pedestrians and bicyclists. Phase 1, conducted in FY 2011, reviewed pedestrian and bicycle safety and access for the Capitol Heights and Addison Road- Seat Pleasant Metro stations.

Beginning in the fourth quarter of FY 2011, Phase 2 of the Central Avenue TOD Mobility Study (a neighborhood and metro station access and streetscape improvement plan) was completed. This phase emphasized pedestrian and bicycle safety, and access for the Morgan Boulevard and Largo Metro stations, as well as the Central Avenue corridor between Hill Road/Shady Glen Drive and the Capital Beltway (1-95/1-495). Phase 2 produced preliminary recommendations for improvements at these locations, along with potential low-cost funding sources to implement the recommended improvements.

## Public Involvement Process

Public involvement is a key element to understanding the existing conditions and transportation needs of the corridor. The Phase 3 analysis was informed by feedback received through multiple public outreach meetings and an interactive map featured on the project website. Public meetings were held over the course of the project, focusing on a range of different issues, including:

- **Western Corridor (Southern Avenue to Hill Road) Issues.** November 29, 2011 from 6:45-9:00 p.m. at St. Margaret's Church.
- **Eastern Corridor (Hill Road to I-495) Issues.** December 8, 2011 from 6:45-9:00 p.m. at the Sports and Learning Center.
- **Market Analysis.** April 12, 2012 from 7:00 to 9:00 p.m. at the Sports and Learning Center.
- **Existing and Future Transportation Analysis.** April 26, 2012 from 7:00 to 9:00 p.m. at the Sports and Learning Center.
- **Complete Streets Open House.** May 17, 2012 from 7:00 to 9:00 p.m. at the Sports and Learning Center.

All public meetings were held at St. Margaret’s Church near the Addison Road Metrorail station and the Sports and Learning Center near the Morgan Boulevard Metrorail station. All meetings included informational presentations on the project and group discussion of public needs and expectations through mapping and table exercises.

Public agency stakeholders were also engaged throughout the project development process. Stakeholder interviews and meetings were conducted with the Prince George’s County Department of Public Works and Transportation (DPW&T), Maryland State Highway Administration (SHA), Washington Metropolitan Area Transit Authority (WMATA), Maryland-National Capital Park and Planning Commission (M-NCPPC), District of Columbia Department of Transportation (DDOT), and others to identify issues and obtain agency feedback on recommendations.

A summary of the feedback received from these meetings and the project website can be found in Appendix 1. The community and agency feedback from these outreach meetings informed the analysis and recommendations for this report.



*Residents shared their vision and concerns for the study area through group discussion and mapping exercises during multiple public meetings.*





**Section 4**  
**Existing Conditions**

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## EXISTING CONDITIONS

As shown in Figure 1, the study area is defined as the area within one-half mile of the Central Avenue (MD 214) corridor from the Washington, D.C. boundary to the Central Avenue/Landover Road (MD 202) intersection and includes areas within one-half mile of the four Metrorail stations on the corridor. The existing conditions analysis provides an overview of this study area, existing transportation facilities, and a safety analysis for the Central Avenue Corridor. The existing conditions analysis includes feedback received from public and agency outreach meetings and an interactive map on the project website. A summary of community comments received both from meetings and the website can be found in Appendix 1.

### Land Use and Demographics

The current land use pattern along the corridor is clustered with few “mixed use” land areas, as shown in Figure 2. Retail, residential, and industrial uses are segregated. These land use patterns require residents to travel long distances to reach shopping, employment, and other destinations; as a result, they do not support access by walking, bicycling, or transit.

As shown in Figure 3, several dense residential areas along the Central Avenue corridor are priority opportunity areas to improve Metrorail station, pedestrian, and bicycle connections:

- Camden Summerfields (adjacent to the Morgan Boulevard Metrorail Station)
- Largo Town Center (east of I-495 and north of Central Avenue (MD 214))
- Carmondy Hills–Pepper Mill Village (near Hill Road/Seat Pleasant Drive)
- North Englewood (near Landover Road (MD 202)/Martin Luther King Jr. Hwy (MD 704))
- Lake Arbor (near Landover Road (MD 202)/Lake Arbor Way)



FIGURE 2. LAND USE & POINTS OF INTEREST

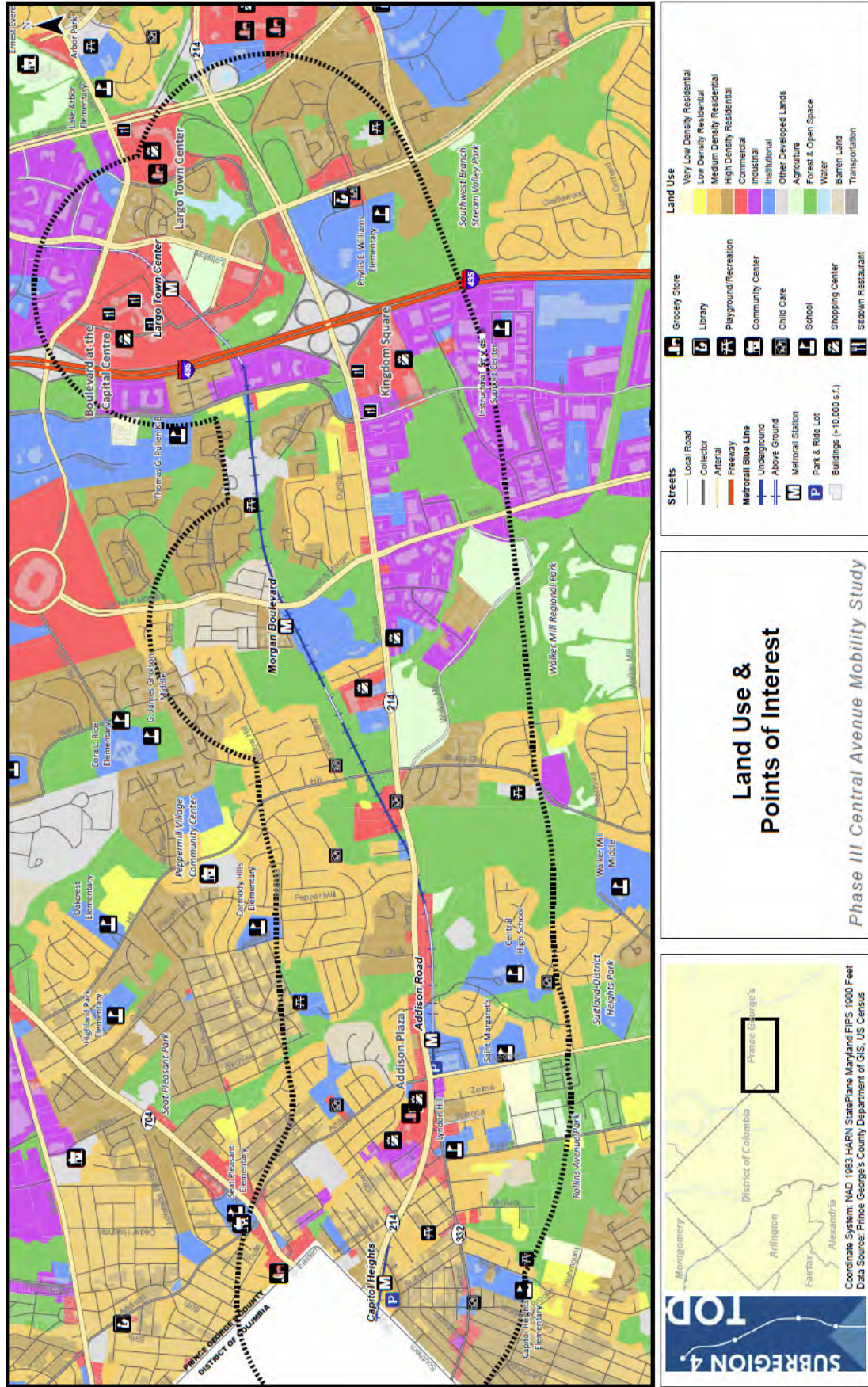
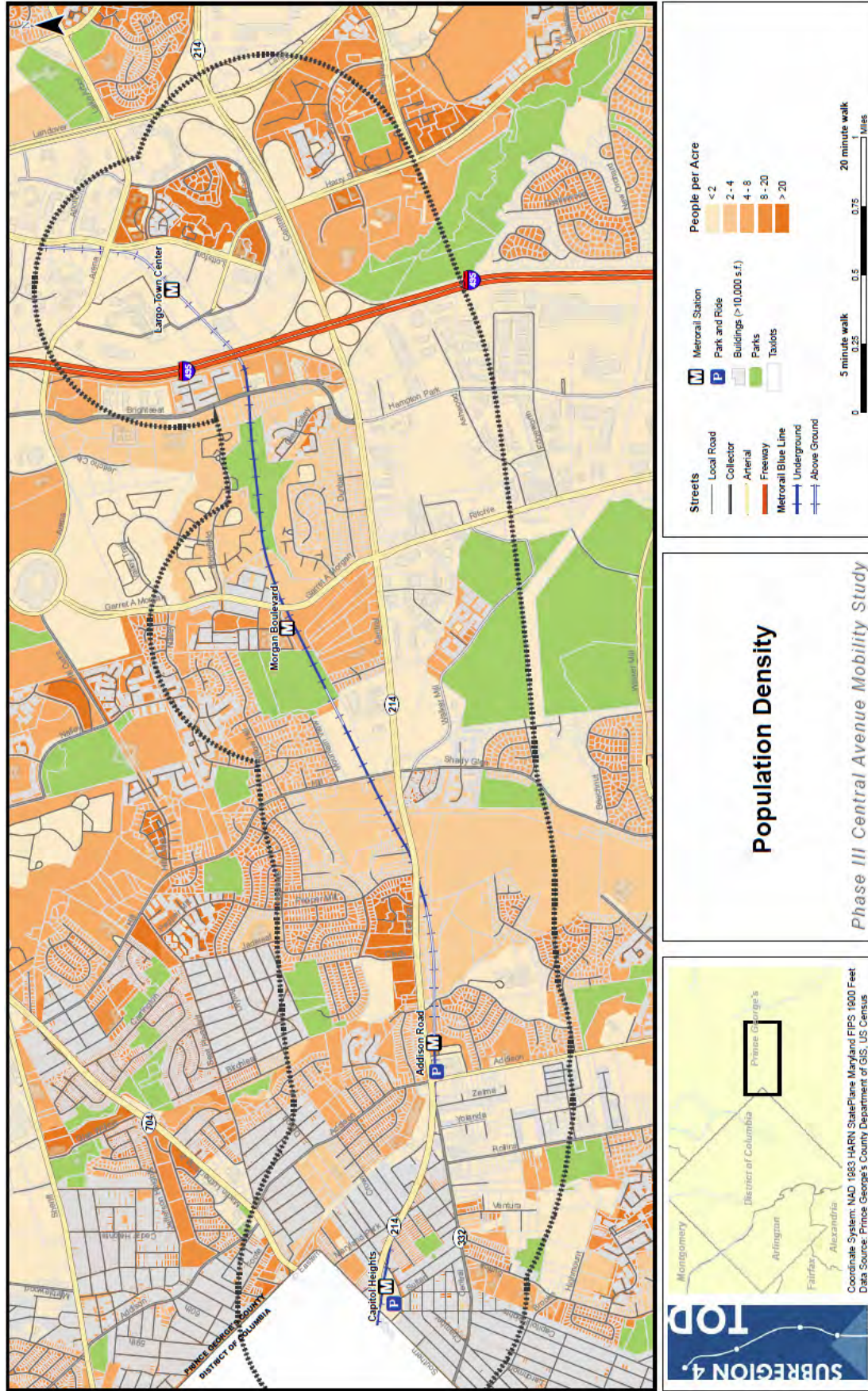




FIGURE 3. POPULATION DENSITY





Areas with high concentrations of youth (residents under 18) and senior citizens (residents over 65), as shown in Figure 4 and Figure 5, are also priority areas for improving connections to schools, transit, parks, and other community destinations. Locations with a high concentration of youth or senior residents include:

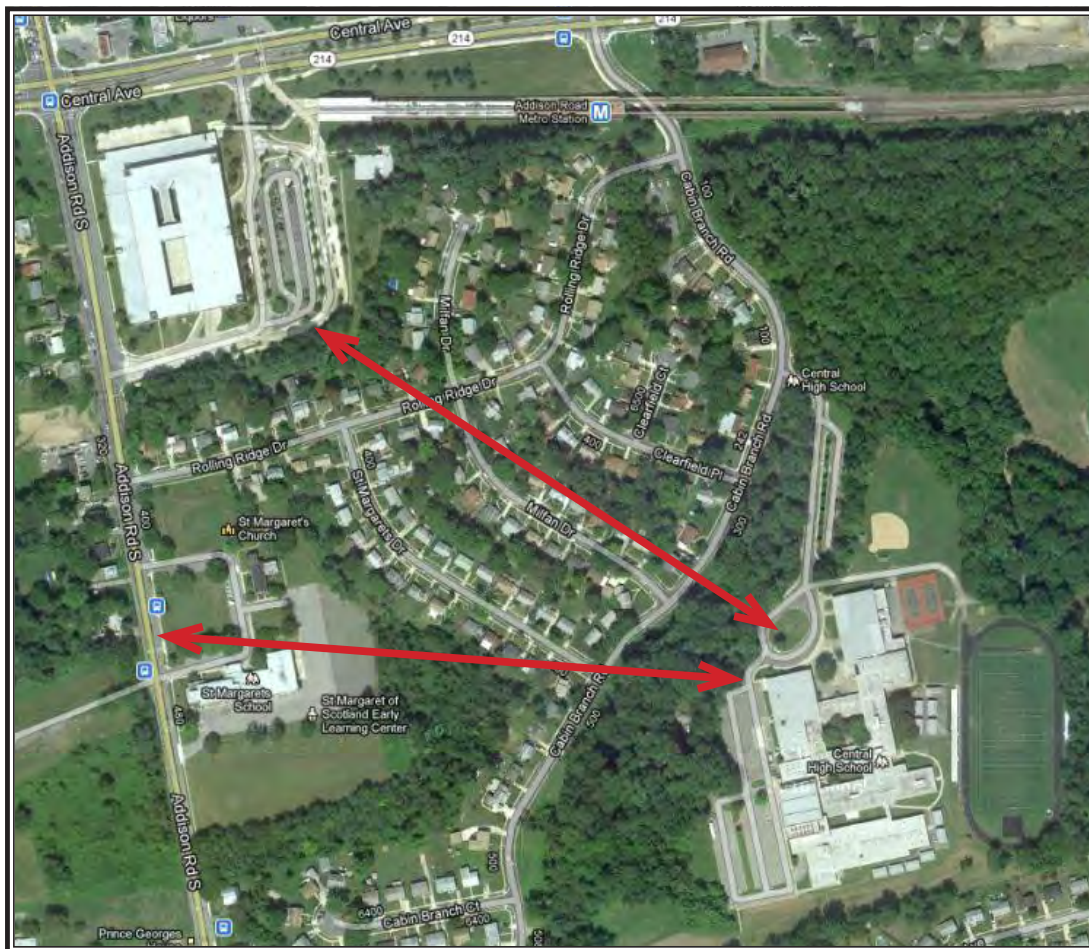
**Youth Population:**

- Camden Summerfields (Adjacent to the Morgan Boulevard Metrorail Station)
- Carmony Hills–Pepper Mill Village (Near Hill Road/Seat Pleasant Drive)
- Seat Pleasant (Along Martin Luther King Jr. Highway)

**Senior Citizens Population:**

- Brightseat Road (Near FedEx Field)
- Walker Mill (Adjacent to Addison Road South)
- Capitol Heights (South of Old Central Avenue/MD 332)

As shown in Figure 6, the two areas with the highest employment density are located south of Central Avenue and in the Largo Town Center. These are also priority areas to connect to surrounding bus stops and the Morgan Boulevard and Largo Town Center Metrorail stations.



*There are currently no direct pedestrian connections between Central High School and nearby residential areas or transit stops.*



FIGURE 4. YOUTH (UNDER 18) POPULATION DENSITY

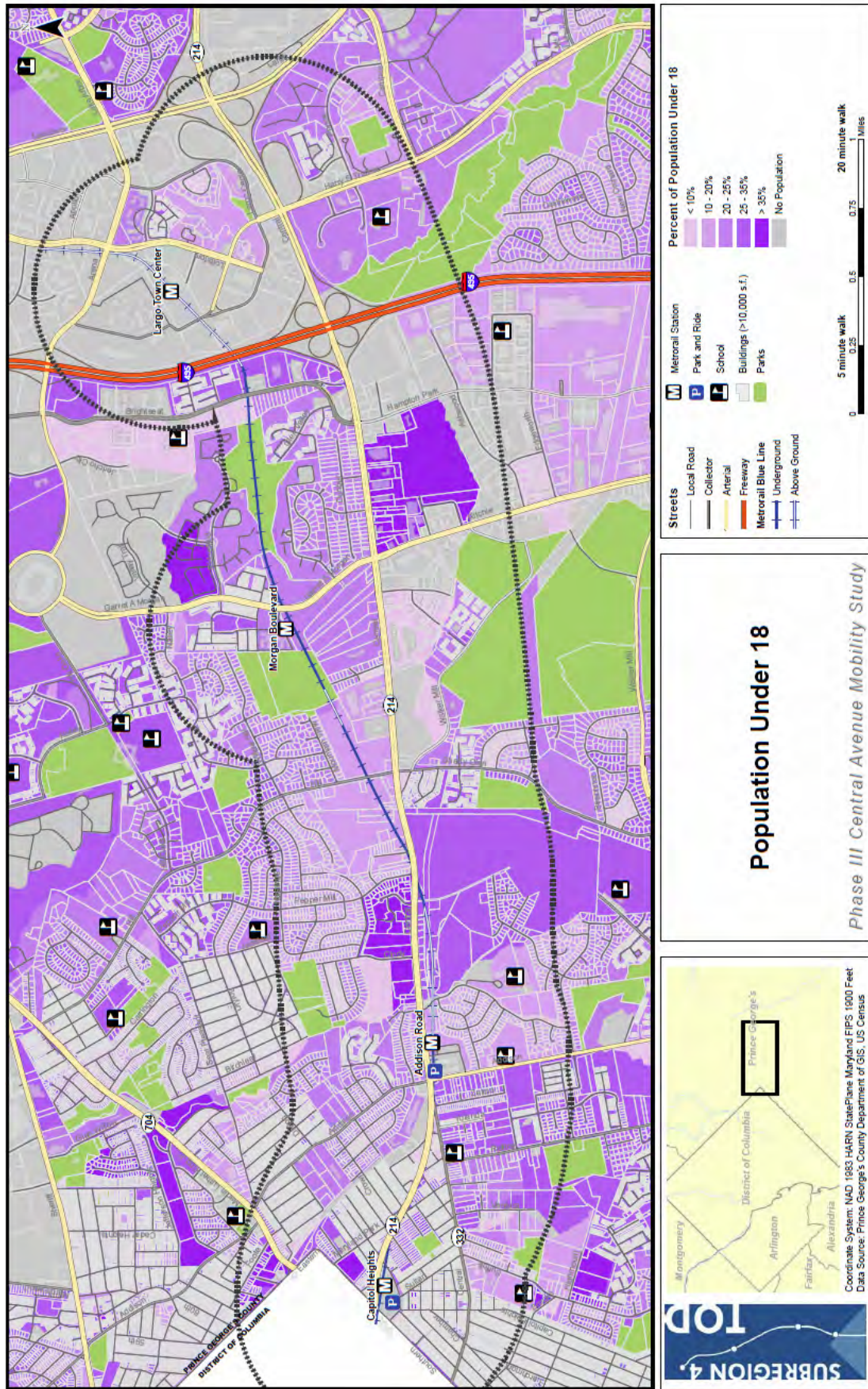




FIGURE 5. SENIOR (OVER 65) POPULATION DENSITY

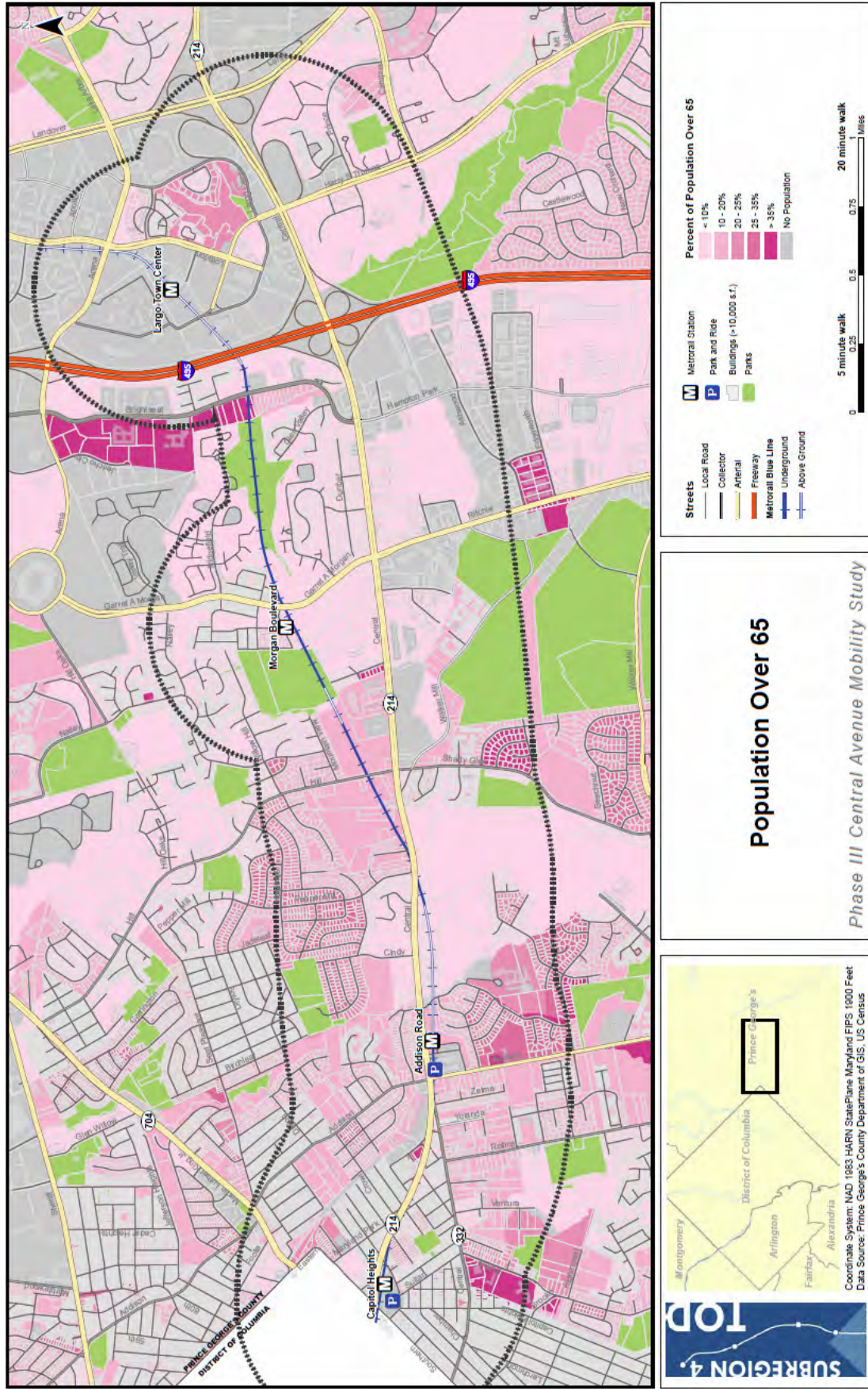
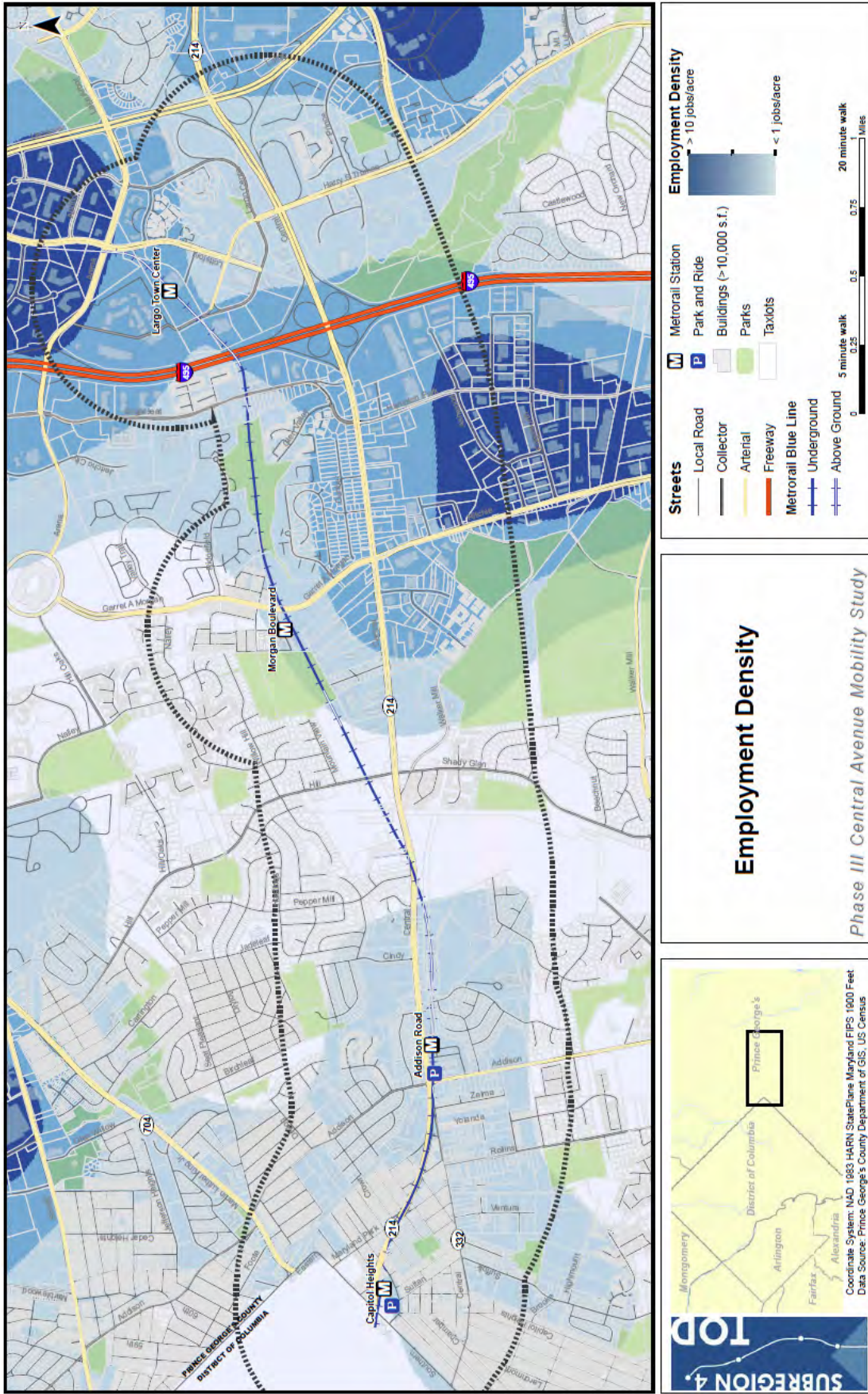




FIGURE 6. EMPLOYMENT DENSITY



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## Existing Market Conditions<sup>1</sup>

As part of the Phase 3 work, and presented in a separate report, AECOM developed a market analysis for the Central Avenue project area. The key objectives of the market analysis study were to:

- Identify and define short and long term realistic market opportunities
- Outline the TOD development potential at each of the four stations
- Identify catalytic projects for early opportunities
- Look at infrastructure needs and alternative funding opportunities for implementation
- Identify proactive approaches to support TOD and economic growth
- Define potential marketing and branding strategies to attract TOD

The study outlines the benefits of TOD, which may include: increased access to amenities and employment, less parking demand, place-making, improved pedestrian activity, decreased emissions, compact land form, decrease in auto-dependency, increased equity for lower-income households, and increased value and marketability of nearby residential and commercial properties. Market opportunities were quantified and provided to the Kittelson Team in order to analyze traffic conditions and transportation needs for the future. The following discussion presents key findings of that study.

The Central Avenue corridor is an important gateway to Prince George’s County and has a high potential for successful TOD implementation. Weekly average weekday ridership is over 12,000 at the four transit stops in the corridor–this could be increased with the addition of residential and commercial development at and near Metro stations, especially at the Largo Metro station, which is recognized by Prince George’s County as a priority TOD site. Furthermore, several large publically owned parcels of land are close to all four Metro station locations, and the county has Transit District Overlay and Development District Overlay Zones in place to facilitate TOD.

### RESIDENTIAL MARKET ANALYSIS FINDINGS

Opportunities for growth in the residential market for homeownership are derived from established, stable neighborhoods that are relatively affordable and in close proximity to employment, cultural, and entertainment opportunities. There are positive indications that the rental market is stable, as vacancy rates have declined since 2009. Negatives for the residential market are slowing, but still decreasing average sales prices for home, a decline in the total number of units sold, a high countywide foreclosure rate, and a decrease in year-over-year rent growth. Overall, the residential market has a total demand of approximately 2,000 to 2,500 total units along the corridor by 2033, with the potential for workforce and/or senior housing.

### RETAIL MARKET SUMMARY FINDINGS

Opportunities for growth in the retail market are derived from the area being relatively underserved by retail, and high levels of residents’ retail spending occurs outside of the Central Avenue corridor. In particular, the area can support more restaurants, bars, and retail stores that sell electronics and sporting goods. Currently, retail space within the Boulevard at the Capital Centre is performing well. Supermarkets present a market opportunity in the area, but the market is

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<sup>1</sup> Central Avenue Market & Branding Study, AECOM, Aug 2012.

competitive and several other options are available within a ten- minute drive. A new Wal-Mart proposed for the Capitol Gateway area, just inside the District of Columbia, will have implications for other retailers in the area if it is built, but opportunities exist for synergistic retail to complement the big-box retailer. Overall, retail demand is between 175,000 – 235,000 SF over the next several years, likely grouped into two or three clusters to maximize visibility, transit and vehicular access, and proximity to residential and office development.

## OFFICE MARKET

The Central Avenue corridor presents a number of opportunities for new office space, mainly predicated on the easy access to Washington, D.C. and the Beltway. The projected demand over the next 20 years lies between 180,000 and 280,000 square feet of new space. A good deal of this office space could be developed as part of a mixed-use project located near a Metro station, with the Morgan Boulevard station providing the most land and potential. Opportunities for new space include a large federal or institutional tenant such as a medical center, though competition is expected to be strong. Currently, the high amounts of vacant office space throughout Prince George’s County impact demand for new space.

## Connectivity and Urban Form

Most of the study area is within a 20-minute walk to a Metrorail station, if direct connections were present. Walk times are longer, however, due to poor connectivity and the cul-de-sac nature of the streets. Wide cross sections, long distances between intersections, and limited crossing locations make Central Avenue a barrier to north-south connectivity. This is evident in Figure 7 and Figure 8, which shows the difference between the potential area within a 20-minute walk of Metro stations and the actual area currently reachable within a 20-minute walk. As shown in Table 1, future connectivity improvements could increase the service area and population within a 10-minute walk of the Morgan Boulevard and Largo Town Center’s stations by 500 percent.

TABLE 1. POTENTIAL AND EXISTING NETWORK WALKABILITY

Metro Station	Area (Acres) Reachable Within a 10 Minute Walk		Population Reachable Within a 10 Minute Walk	
	Existing Network	Potential	Existing Network	Potential
Morgan Blvd.	88.0	502	476	2,716
Largo Town Center	103.1	502	558	2,716

Potential reachable population estimated based on average overall population density in the study area (5.41 residents/acre).



FIGURE 7. POTENTIAL WALKABLE AREA

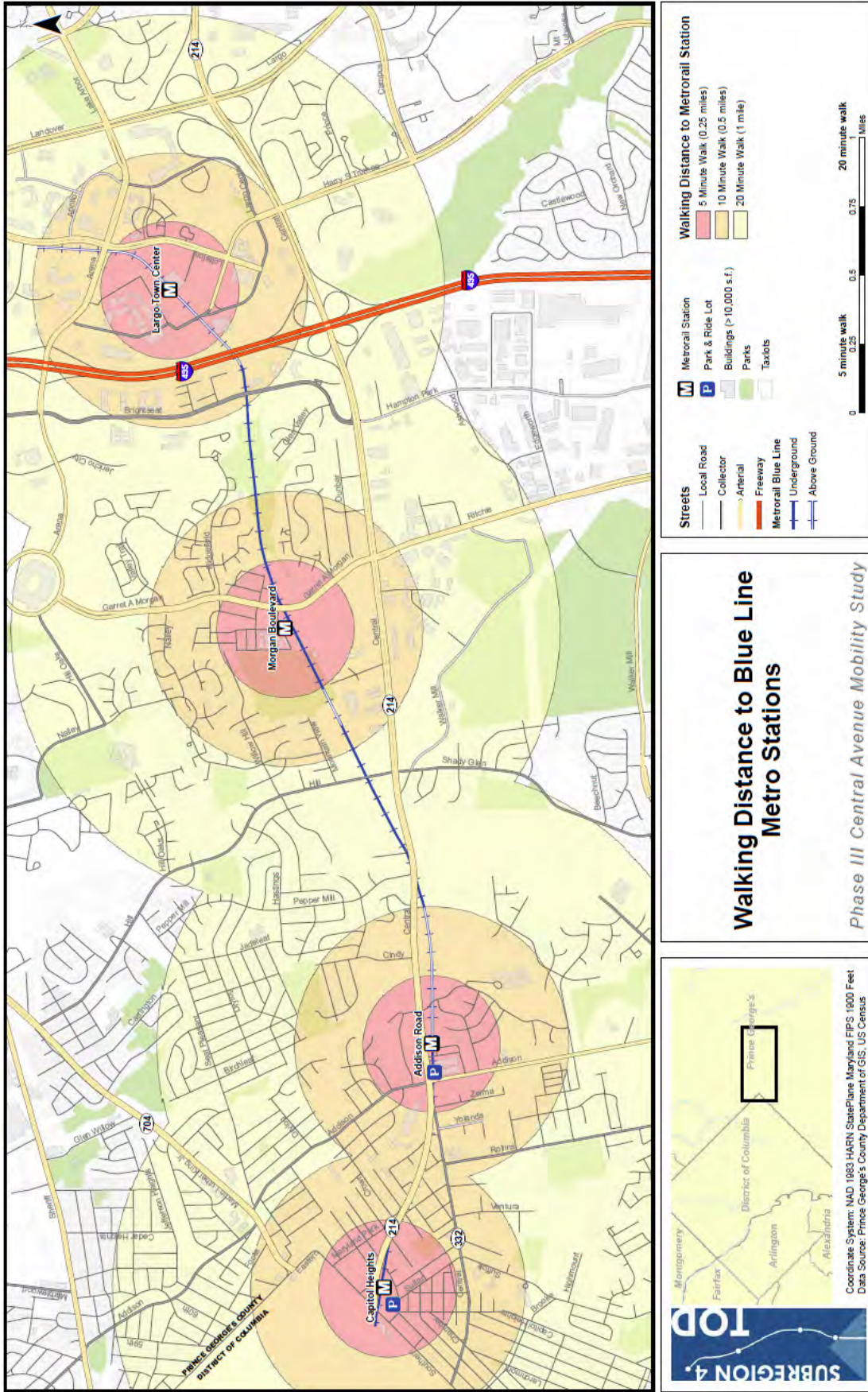
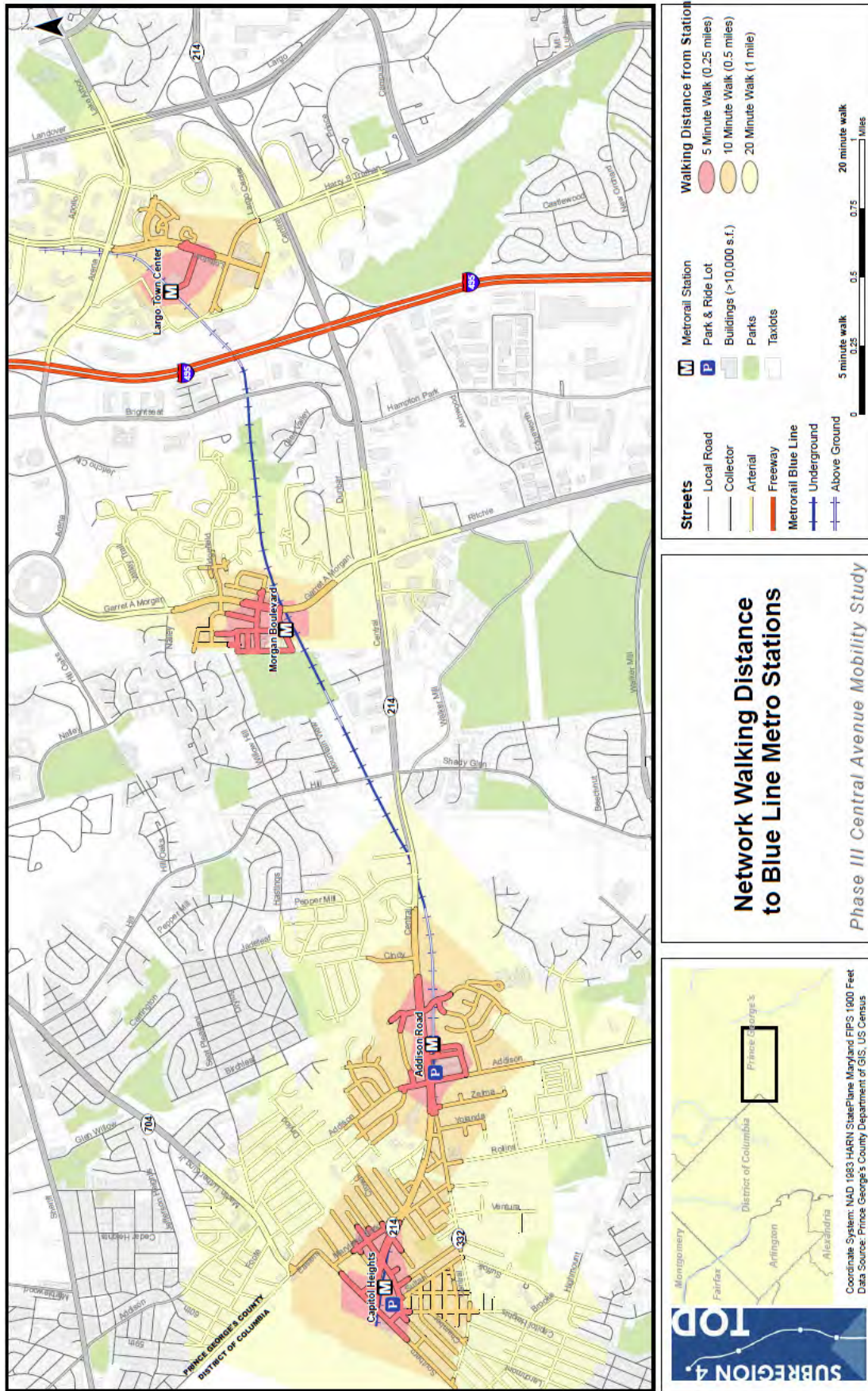




FIGURE 8. EXISTING NETWORK WALKABILITY





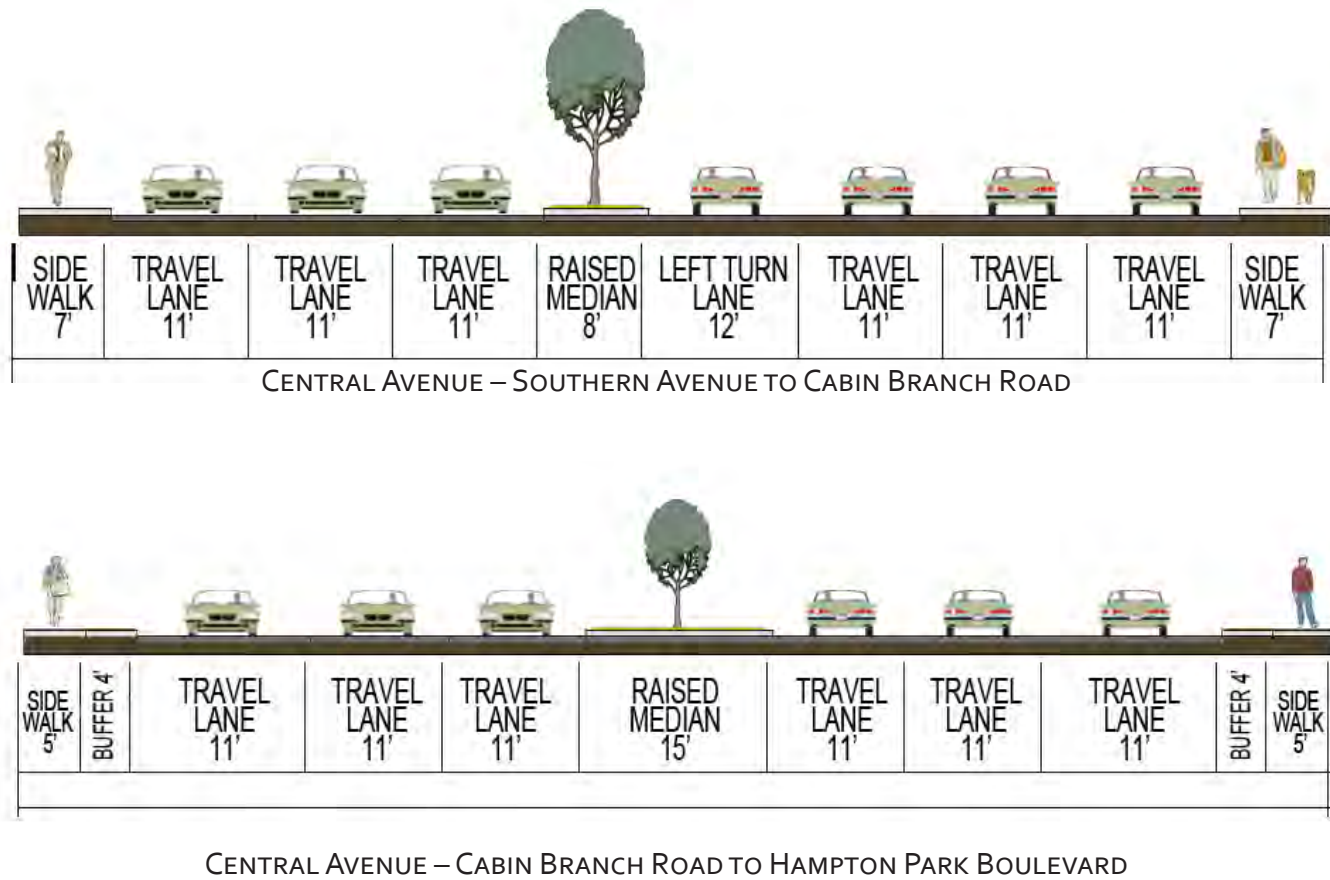
## Overview of Transportation Facilities

This section describes the existing transportation network and facilities in the Central Avenue corridor and the broader project area.

### CENTRAL AVENUE CROSS-SECTION

Central Avenue is a seven-lane principal arterial from the Washington, D.C. border to the Capital Beltway, where its functional classification then transitions into an expressway. The western portion of the corridor (Southern Avenue to Cabin Branch Road) has a 100-foot right-of-way, three 11-foot travel lanes in each direction, a raised median, and 7-foot sidewalks on both sides of the street. The eastern half of the corridor has a 105-foot right-of-way, two 11-foot travel lanes and an outer 14-foot travel lane in each direction, a raised median, and 5-foot sidewalks on both sides of the road. Figure 9 illustrates the typical cross sections of Central Avenue.

FIGURE 9. CENTRAL AVENUE TYPICAL CROSS SECTIONS



## PEDESTRIAN FACILITIES

Figure 10 shows the locations of existing pedestrian and bicycle facilities in the study area. Pedestrian challenges in the study area include: inadequate pedestrian facilities, poor lighting, missing crosswalks, freeway ramps, and channelized right turns along the corridor. Central Avenue has long crossings and few marked crosswalks. Pedestrians will not typically walk more than 200 feet to cross the street, and mid-block opportunities should be considered if signal spacing is over 400 feet. The closest spacing between marked crosswalks on the corridor is 480 feet and the farthest is about 4,225 feet. Pedestrian facilities are also discontinuous in the study area, and connections to key destinations and transit services are poor. Priority destinations for pedestrians include: the Metrorail stations, the commercial shopping center near Hampton Park Boulevard, FedEx Field, Largo Town Center, and several schools.

As part of the existing conditions assessment, a pedestrian level of service (LOS) analysis was completed. Figure 11 shows the results of the pedestrian LOS analysis. A high pedestrian LOS is characterized by wider sidewalks separated from vehicle travel lanes. Signalized intersections with the highest pedestrian LOS have few conflicts between pedestrians and turning vehicles (i.e., protected left-turn signal phasing) and minor street approaches with short pedestrian crossing distances.<sup>2</sup> The locations with the lowest pedestrian LOS—including Southern Avenue and East Capitol Extended—lack sidewalks, have sidewalks that are not separated from traffic, have high volumes on the minor approach, and/or have channelized right turns.<sup>3</sup>

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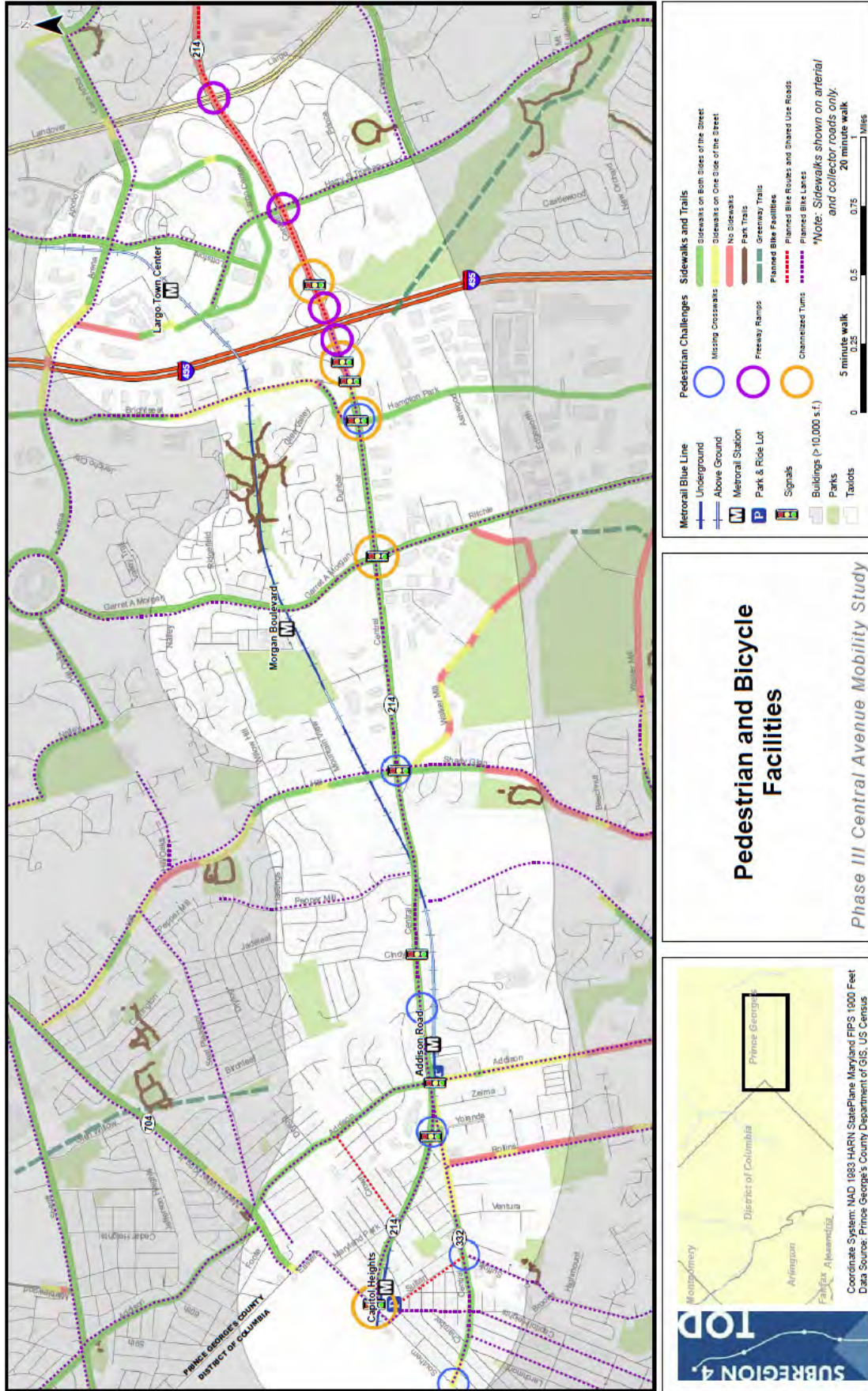
**Channelized lanes** are intended to improve traffic flow at intersections; they are lanes separated or dedicated to right turns. They are problematic for cyclists and pedestrians, as it makes it difficult for them to cross the street.

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<sup>2</sup> The I-495 ramp intersections received unexpectedly high LOS rankings, despite the lack of pedestrian facilities in this portion of the study area. This is due to the fact that the ramp approaches are a single lane serving a single traffic movement, which would typically indicate an intersection with a short crossing distance and predictable interactions between pedestrians and vehicles. This portion of the study area presents unique challenges not accounted for in the MMLOS methodology; as a result, engineering judgment is required.

<sup>3</sup> The pedestrian LOS model is scaled in such a way that signalized intersections cannot score lower than a LOS D. As a result, the pedestrian LOS at intersections must be considered relative to each other with the understanding that the intersection could not score below a LOS D.

FIGURE 10. PEDESTRIAN AND BICYCLE FACILITIES



## Pedestrian and Bicycle Facilities

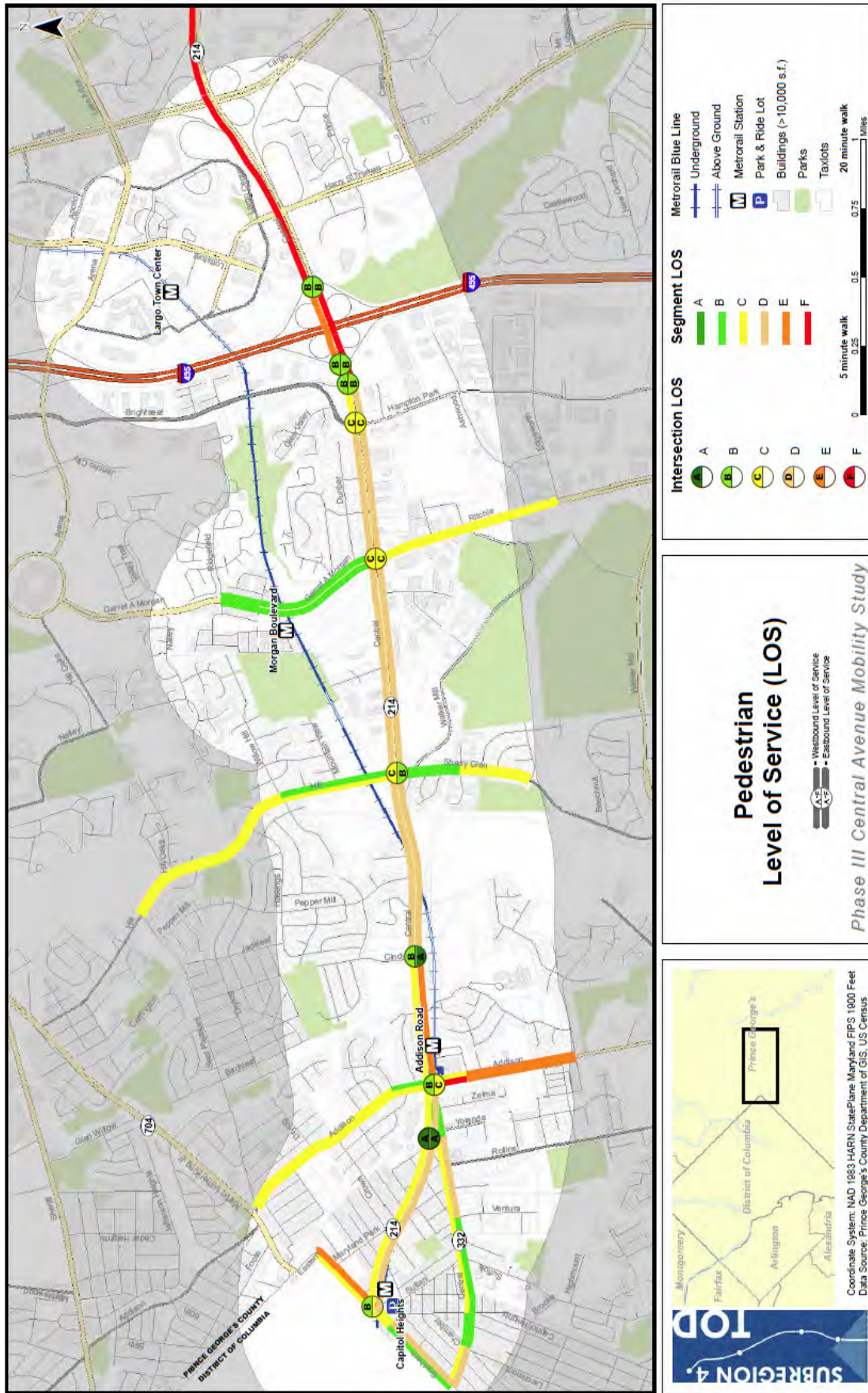
Phase III Central Avenue Mobility Study

**TOP SUBREGION 4**

Coordinate System: NAD 1983 HARN StatePlane Maryland FIPS 1800 Feet  
 Data Source: Prince George's County Department of GIS, US Census



FIGURE 11. PEDESTRIAN LEVEL OF SERVICE



## BICYCLE FACILITIES

Figure 10 shows the locations of planned bicycle facilities identified in the Prince George’s County 2010 Bicycle Master Plan. Bike lanes and bike routes are not provided along the corridor. The challenges of limited bicycle facilities, lack of connectivity, high traffic speeds and volumes, and an unsupportive land use pattern result in low bicycle volumes in the study area. Substantial amounts of bicycle parking at Metro stations is left unused due to these challenges.

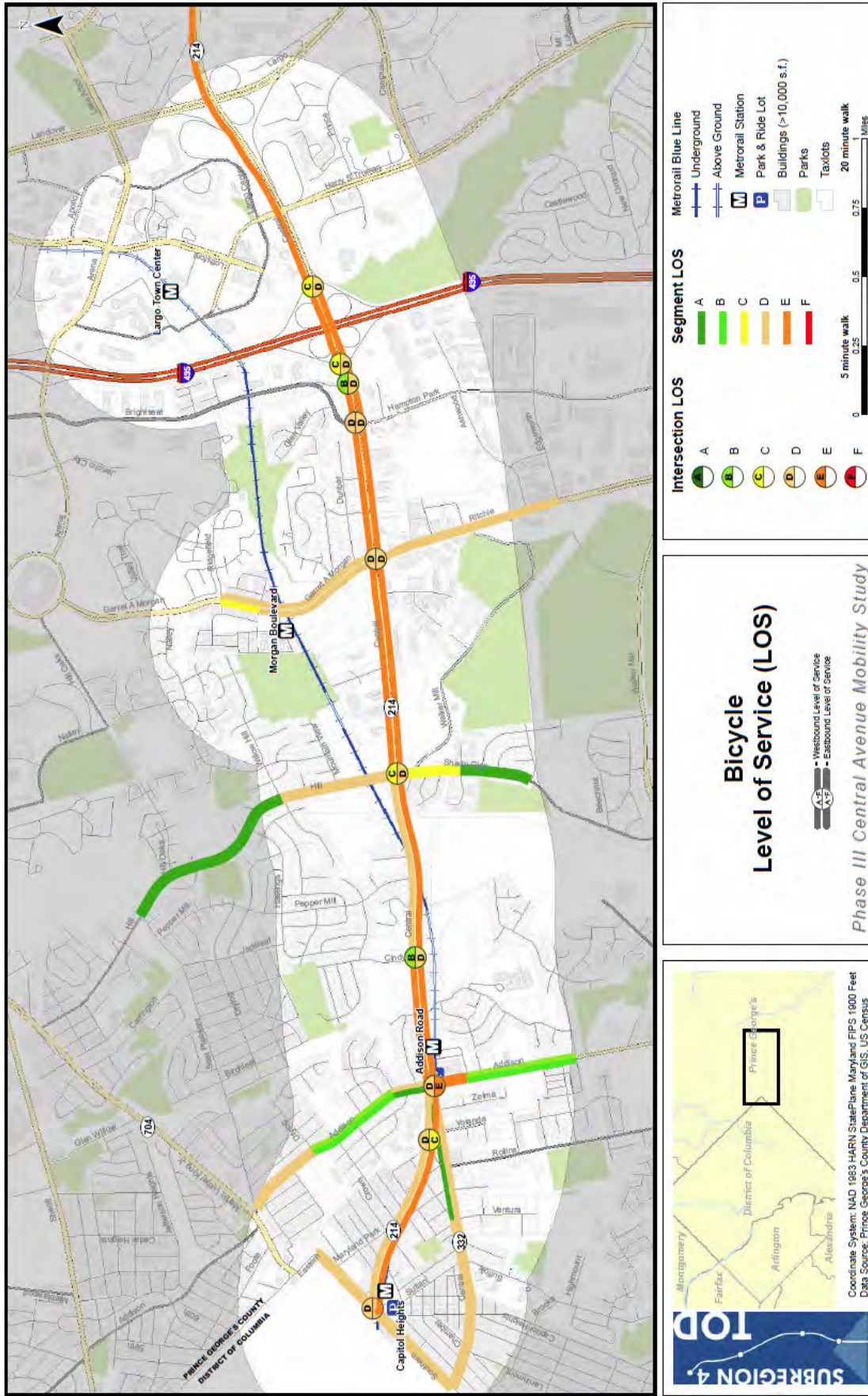
Figure 12 shows the results of the bicycle level of service (LOS) analysis that was conducted as part of the existing conditions analysis. Bicycle LOS is based on factors such as outside lane width, shoulder or bike lane width, traffic volume, speed, and the crossing distance at signalized intersections. Only advanced bicyclists currently travel on Central Avenue due to high traffic volumes, speed, and a lack of roadway space. Adding bike lanes may attract additional cyclists. Parallel routes to Central Avenue are also lacking, indicating that connectivity may be improved for short trips within the study area.



*Improving bicycle connections to transit and providing bike racks on buses can make it easier for passengers to access stations and increase the effective service area of stations.*



FIGURE 12. BICYCLE LEVEL OF SERVICE



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## TRANSIT SERVICE AND ACCESS

Figure 13 shows existing transit facilities in the study area. Transit services available in the study area include the Metrorail Blue Line and 16 bus transit lines operated by Metrobus and TheBus. Daily ridership ranges from 1,500 to 5,600 on each line. The transit system includes express bus routes and routes that offer service 24 hours a day on weekdays. Weekend service is available on some bus routes and the Metrorail Blue Line. Metrobus and TheBus routes travel along most of the arterial and collector roadways in the study area, with stops within a five-minute walk of the majority of residents and workers in the study area. Most of Central Avenue (MD 214) is served by three to four bus routes.

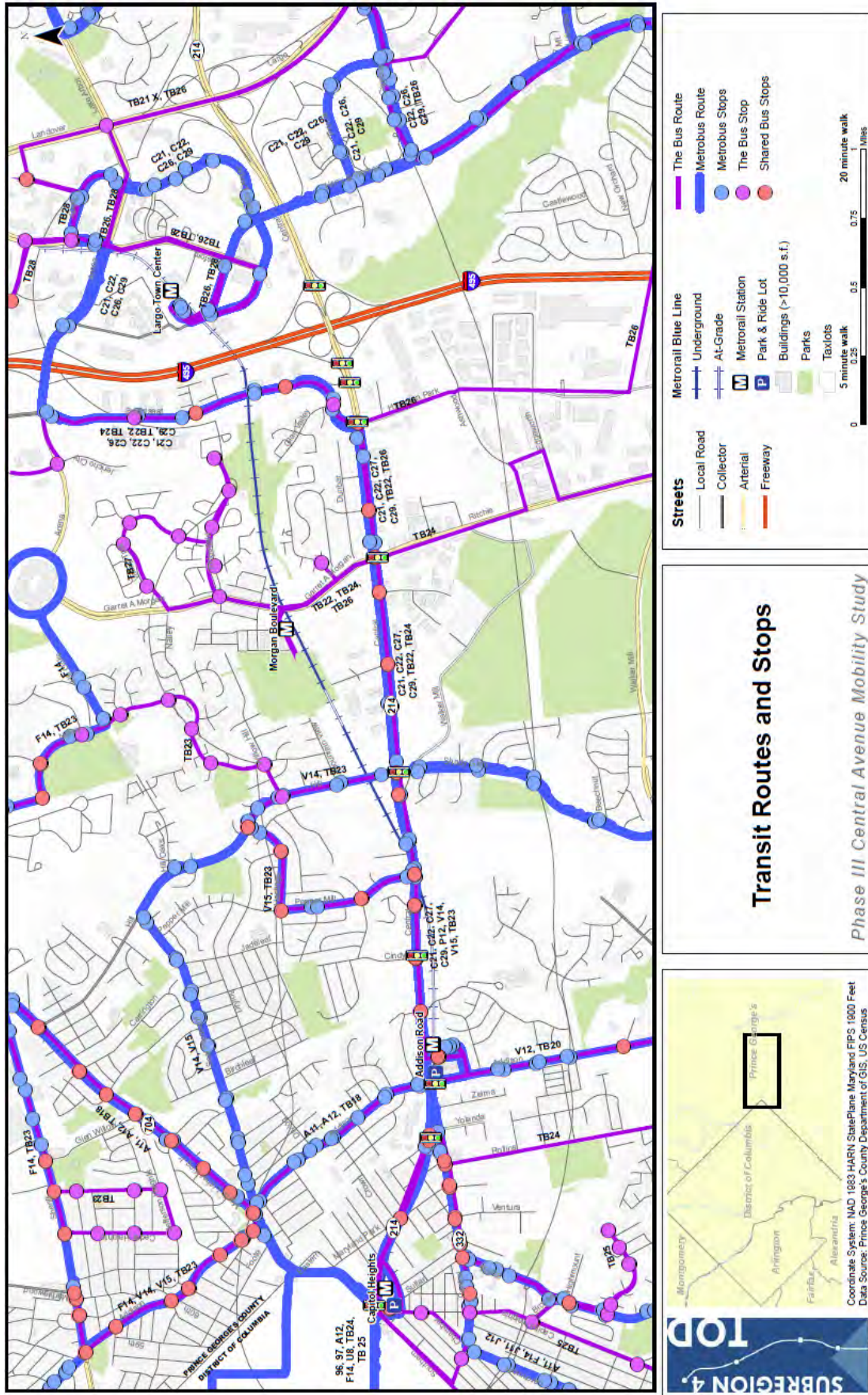
Transit LOS was calculated for arterial and collector roadways and signalized intersections served by Metrobus and/or TheBus routes. The results of the transit LOS analysis are shown in Figure 14. Deficiencies include infrequent bus service, poor on-time performance, lack of shelters, and segments without any bus stops. Additional challenges include: bus stops located far from marked pedestrian crossings, transit stops that do not connect to surrounding areas by pedestrian facilities, unlit bus stops, and indirect routes.

Small improvements to existing facilities can potentially increase ridership and improve the user's transit experience. Stops with potential to generate high ridership that should be prioritized for improvements include:

- Capitol Heights, Addison Road, Morgan Boulevard and Largo Town Center Metrorail stations
- Bus stops near the Central Avenue (MD 214)/Addison Road intersection
- Bus stops near Kingdom Square (Southwest of the I-495 interchange) and Largo Town Center



FIGURE 13. EXISTING TRANSIT FACILITIES



Transit Routes and Stops

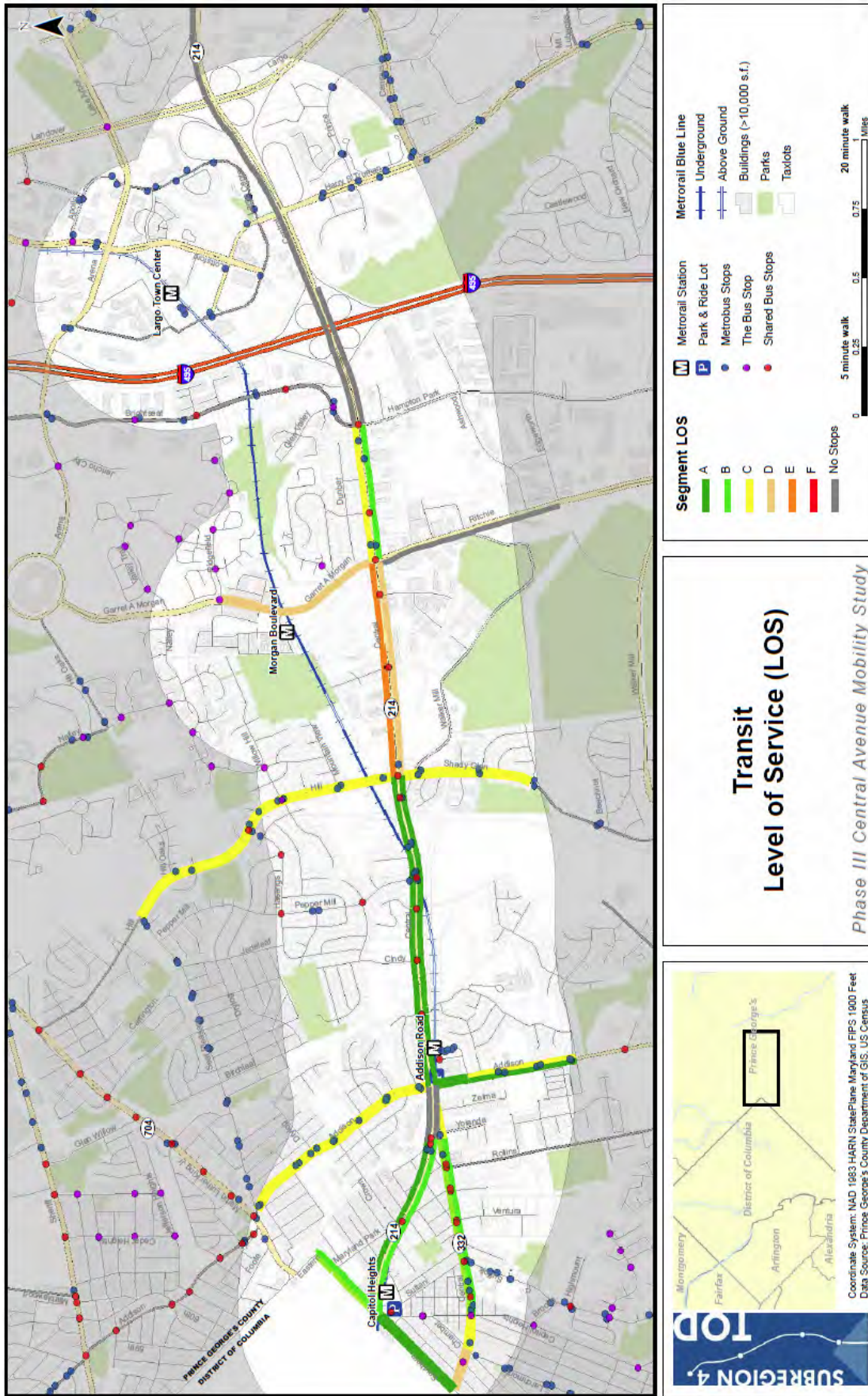
Phase III Central Avenue Mobility Study

**SUBREGION 4**

Coordinate System: NAD 1983 HARN StatePlane Maryland FIPS 1000 Feet  
 Data Source: Prince George's County Department of GIS, US Census



FIGURE 14. TRANSIT LEVEL OF SERVICE



## TRAFFIC OPERATIONS

Figure 15 shows the functional classification of streets within the study area. Design guidance for each classification is contained in DPW&T’s Specifications and Standards for Roadways and Bridges and evaluated in the “Design and Policy Review” section of this report.

As part of the existing conditions assessment, a link-level operational analysis was conducted for Central Avenue and other arterial and collector roadways in the study area<sup>4</sup>. The LOS segment analysis can be used to broadly evaluate the performance of the road network and help identify areas that may need improvement. Central Avenue segments, as well as cross streets on the north and south sides of Central Avenue, were analyzed for peak hour traffic delay. Figure 16 shows the LOS of key intersections and roadway segments within the study area.

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**A Link-Level Operational Analysis** determines if roadways and signals provide acceptable moving levels of service during a specific period of time.

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### *Central Avenue*

Central Avenue (MD 214) is a seven-lane arterial with a landscaped median within the study area. Access to properties on the north and south side is generally restricted to right-in, right-out movements. The speed limit along Central Avenue is 30 mph between Southern Avenue and Pepper Mill Road and 40 mph east of Pepper Mill Road; however, the roadway is designed for speeds greater than those posted. The Subregion 4 TOD Implementation Project Phase II: Alternative Concepts Technical Memorandum showed that all signalized intersections on Central Avenue currently meet SHA and M-NCPPC performance standards and operate at LOS D or higher during the morning and afternoon peak periods.

For the majority of the corridor during the morning peak hour, the LOS segment methodology shows that the corridor operates at LOS C. Directional flows in the afternoon peak hour are more balanced than during the morning peak hour. Similar to the morning peak hour, during the afternoon peak the majority of segments between signalized intersections operate at LOS C. The segment near the ramp terminals performs at LOS F.

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LOS is a measure used by traffic engineers to determine the traffic flow of a roadway. Level D indicates that the road is at capacity, it is highly congested, and drivers have limited freedom to maneuver.

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<sup>4</sup> A complete explanation of segment LOS may be found in the 2010 HCM in Chapter 16. The assumptions used in the analysis are detailed on page 16-26. The summary table that was used to determine the peak hour segment LOS is Exhibit 16-14 on page 16-27. The Central Avenue study area meets most of the 2010 Highway Capacity Manual (HCM) assumptions necessary to generate daily service volumes, with the exception of cycle length, weighted g/C ratio, and percent of traffic during left/right onto cross streets. It is estimated that the missing assumptions cause little effect on the overall results. The LOS segment analysis may be expected to slightly overestimate the operational performance of Central Avenue (MD 214).



FIGURE 15. STREET CLASSIFICATION

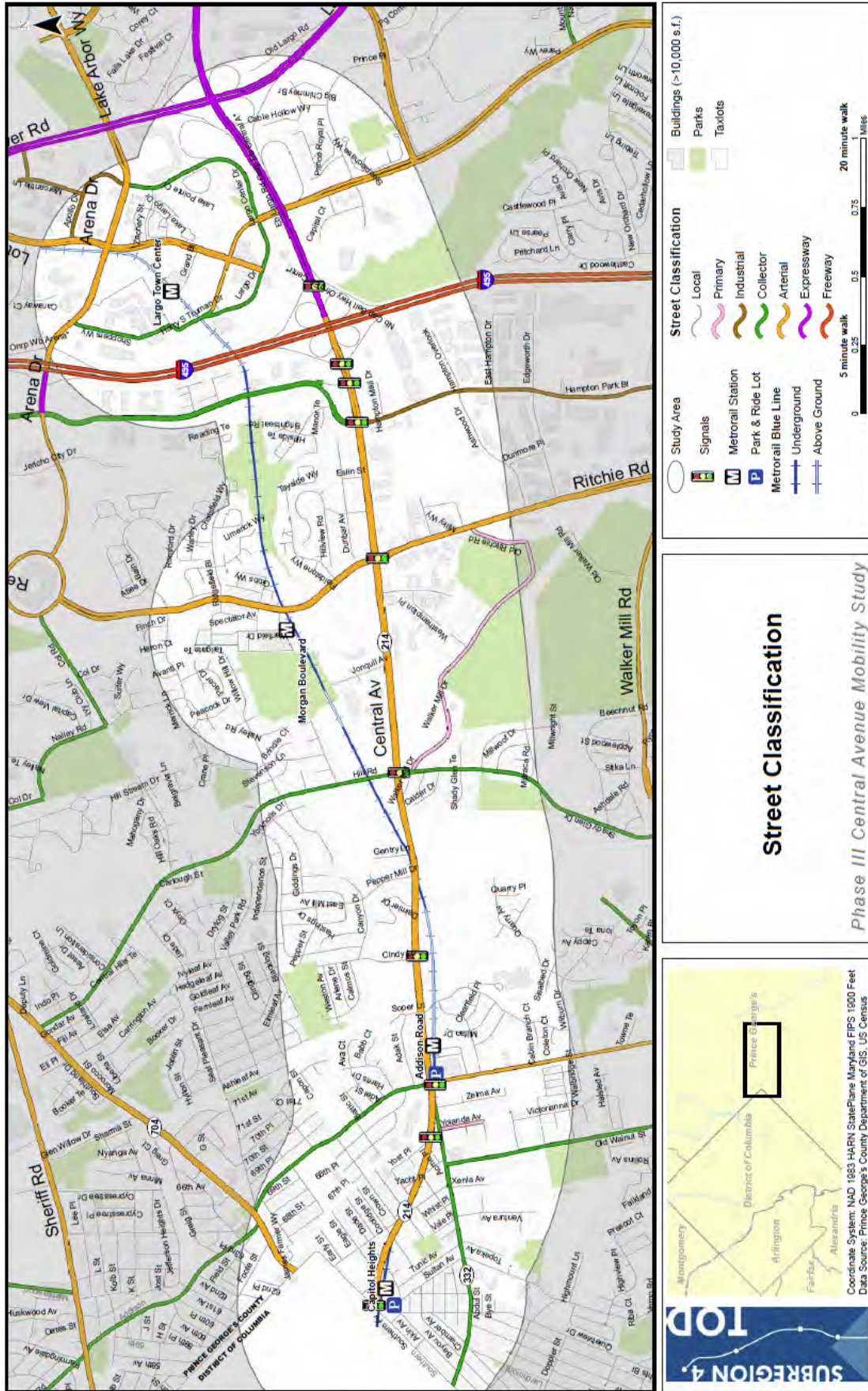
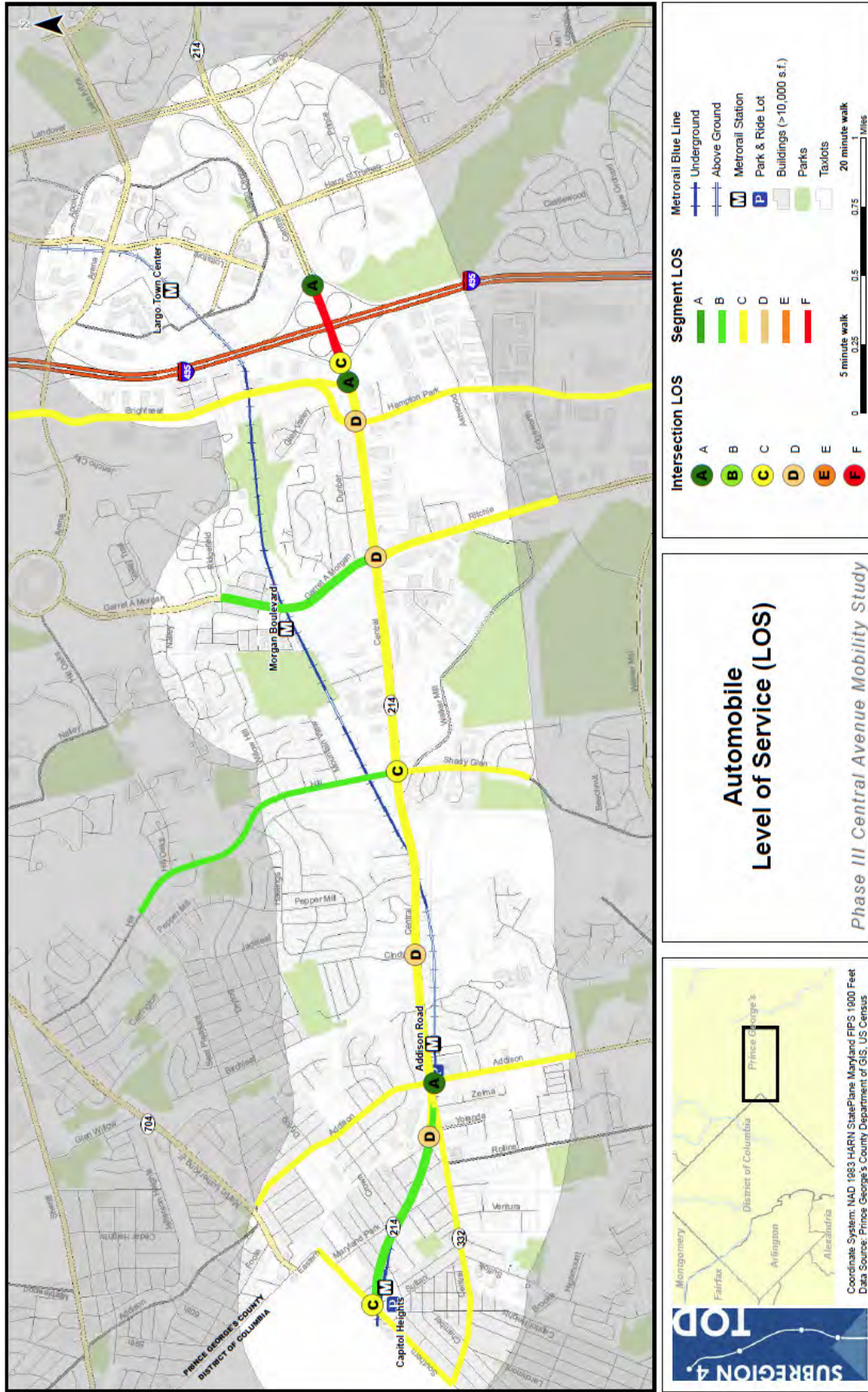




FIGURE 16. INTERSECTION OPERATIONS AND LINK LEVEL OF SERVICE



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### *Cross Streets*

Six major side streets cross Central Avenue in the project corridor. The cross streets range in cross-section from two to six lanes, and have speed limits between 30 and 35 miles per hour. For both the morning and afternoon peak hours, the segment LOS for the northbound and southbound intersecting street approaches ranges from LOS B to C. The directional factor for the side streets, which generally falls within a range of between 55 and 60 percent of total volume, means that side street volumes are more evenly distributed than traffic on Central Avenue.

### *Safety Analysis*

The existing conditions analysis included a review of crash histories at study intersections along Central Avenue (MD 214) to identify crash-reduction opportunities. MDOT provided crash data for the study intersections from January 2008 through December 2010.

#### DESCRIPTIVE CRASH STATISTICS

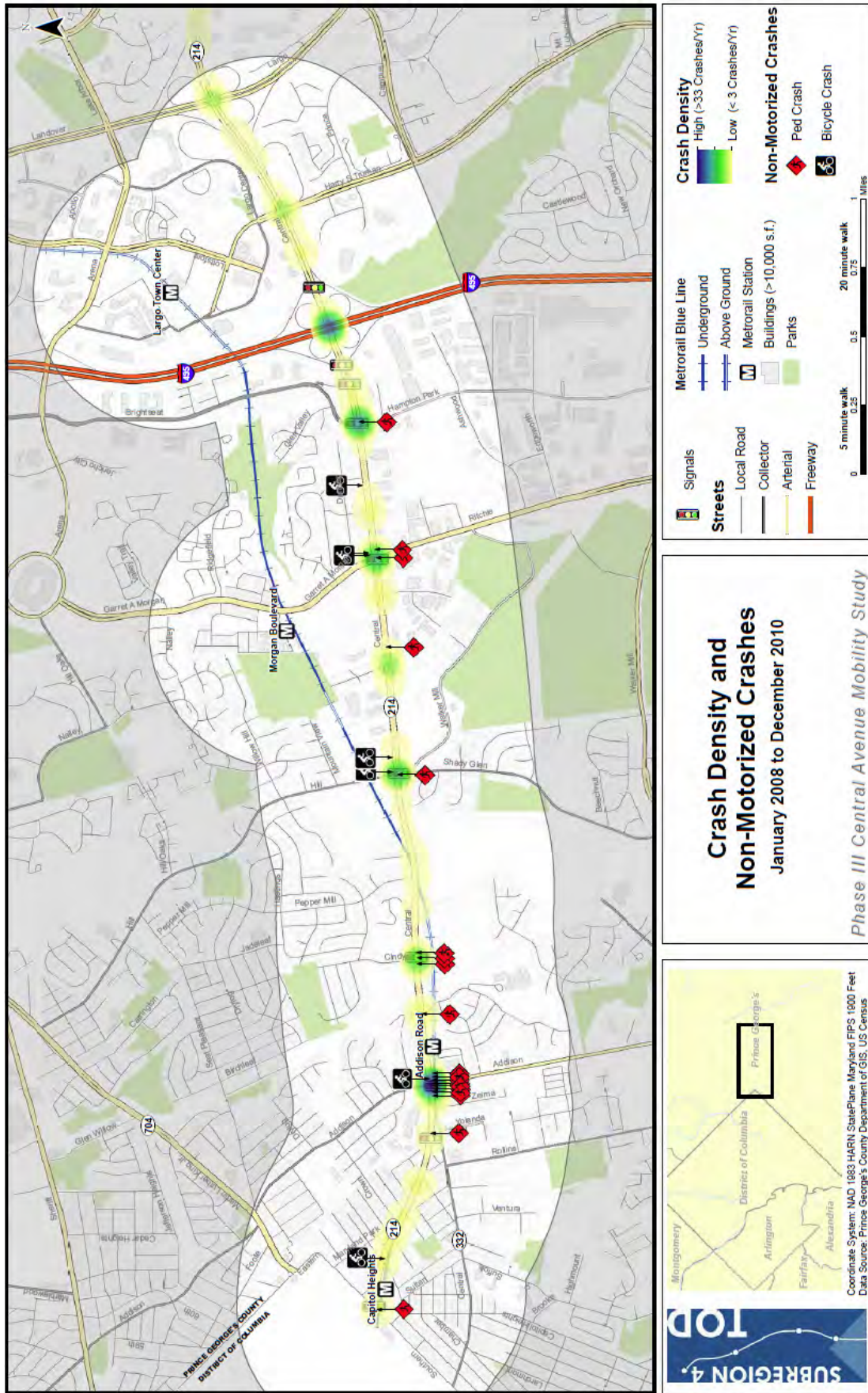
Crashes were examined based on crash type, direction, severity, weather, roadway condition, lighting, time of day, day of week, and year. Figure 17 shows crash density along Central Avenue and identifies pedestrian and bicycle crash locations. The area along the corridor with the highest frequency of crashes for the reporting period was the Addison Road/Central Avenue intersection with 98 reported crashes, followed by the roadway segment between the I-95 on/off ramps with 77 reported crashes. There were three other intersections with more than 40 reported crashes: Hampton Park Boulevard/Central Avenue Intersection (60 crashes); Shady Glen Drive/Central Avenue Intersection (57 crashes); and Ritchie Highway/Central Avenue Intersection (46 crashes). The remaining intersections experienced 20 or fewer total reported crashes. Crash data characteristics for the five study areas with the highest frequency of crashes and information regarding the fatal crashes reported are discussed below.

#### *Addison Road/Central Avenue*

The Addison Road/Central Avenue intersection had the highest frequency of total reported crashes. There were 31 reported rear-end crashes, 21 reported head-on crashes, two reported fatal crashes, and nine reported pedestrian/bicycle crashes. The majority of the crashes occurred during night hours. Protected left-turn signal phasing and modifications to increase the level of lighting at the intersection may help reduce crashes.



FIGURE 17. CRASH DENSITIES ALONG CENTRAL AVENUE



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### ***Roadway Segment between I-95 On/Off Ramps***

A total of 77 crashes were reported for the roadway segment between the I-95 On/Off Ramps. There were 30 reported rear-end crashes and 20 reported fixed-object crashes. These crashes are likely related to the weaving section on Central Avenue (MD 214) between the I-95 On/Off Ramps. Modifying the lane numbers and arrangements within the section may help mitigate crashes. The percentage of injury crashes on this roadway segment was 57 percent; no fatal crashes were reported.

### ***Hampton Park Boulevard/Central Avenue***

The Hampton Park Boulevard/Central Avenue intersection recorded 60 crashes. There were no reported fatal crashes, 40 reported crashes were property damage-only crashes, 19 reported rear-end crashes, and 11 reported side-swipe crashes. The majority of crashes occurred in the eastbound direction, likely due to the right-turn only lane in the eastbound direction and five nearby driveways. Modifying lane configurations and consolidating access points may help mitigate crashes.

### ***Shady Glen Drive/Central Avenue***

The Shady Glen Drive/Central Avenue intersection experienced 57 reported crashes. The reported crashes have the following distribution: 19 rear-end, 13 head-on, and 11 angle crashes. Approximately 44 percent of the reported crashes occurred during night hours. Increasing the level of lighting may help mitigate crashes. Two fatal crashes were reported. The fatal crashes appear to be random events not indicative of a trend or pattern at the intersection.

### ***Ritchie Highway/Central Avenue***

The Ritchie Highway/Central Avenue study intersection experienced 46 reported crashes, including 18 injury crashes and one fatal crash. There were 27 reported rear-end crashes. The rear-end crashes at the intersection tended to occur in the eastbound direction, which may be related to the driveways located within the last 350 feet approaching the intersection. Consolidating these driveways may help reduce crashes. There was one reported fatal crash: a pedestrian was struck at night. Increasing lighting may help reduce crashes.

### ***Fatal Crashes at Other Study Intersections***

There were two reported fatal crashes at Maryland Park Drive. One was the result of a head-on collision and the other was a fixed-object crash. Both occurred at night. One reported fatal crash occurred at Cabin Branch Road as the result of a truck hitting a pedestrian at night. Another fatal crash occurred at West Hampton Drive as the result of two eastbound vehicles colliding.

## **CONTRIBUTING AND MITIGATION FACTORS**

KAI analyzed the contributing factors coded in the crash data for each study intersection. Approximately 40 percent of the crashes had contributing factors related to failure to pay attention. Other prevalent contributing factors were speeding and failure to obey traffic signals. Potential mitigation factors include: increased lighting, pedestrian signals, signal-phasing changes such as protected left turns or leading pedestrian intervals, providing a right-turn lane on major approaches, increased enforcement, and installing medians on multi-lane roads.

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## Existing Conditions Conclusions and Recommendations

### LAND USE AND URBAN FORM

Land use patterns indicate that development is currently clustered and organized in single-use patterns. Central Avenue is characterized by low-density suburban development, fostering a transportation network with low connectivity. This forces trips onto Central Avenue (MD 214) and limits the catchment area of Metrorail stations for pedestrians. It is difficult to use any mode other than a motor vehicle for local trips.

Mixed-use development zoning and land use should be encouraged. Opportunities for multimodal connections include: Central Avenue and Hill Road/Shady Glen Avenue, Central Avenue and Jonquil Avenue, Central Avenue and Brightseat Road/Hampton Park Boulevard, Harry S. Truman Drive and the Largo Town Center, trail connections at the Central Avenue/Morgan Boulevard Metrorail station, east-west trail connections to Metro stations, and trail connections to Metro stations from neighborhoods. Proposed land use policy and zoning changes are discussed in the “Design and Policy Review” section of this report. A map of all recommended network/connectivity improvements is included in the “Complete Streets Strategies” section of this report.

### PEDESTRIAN FACILITIES

The analysis of the pedestrian facilities identified areas where LOS is deficient and pedestrians mobility is challenged due to roadway segment and intersection design and poor network connectivity. Low-performing intersections and roadway segments had an LOS C or lower. Segment deficiencies include: lack of adequate sidewalks, the freeway nature of the roadway, few crossing opportunities, lack of buffers between the traffic and pedestrians on Central Avenue (MD 214), and the poor connectivity of the street network. Intersection deficiencies include: pedestrian delay at unsignalized intersections, wide crossing distance, channelized right turns and freeway ramps, low light, and high traffic volumes and speeds.

Opportunities to address pedestrian challenges and improve level of service in the study area are evaluated in the “Complete Streets Strategies” and “Future Conditions” sections of this report. Specific recommendations include:

- Install a pedestrian hybrid beacon at the Addison Road Metro crossing.
- Improve signal timing on Central Avenue to reduce pedestrian delay. Cycle lengths should be reduced to 120 seconds with adequate pedestrian clearance time.
- Reduce cross-section widths and create buffers between traffic and sidewalks.

Additional opportunities include installing: full or pedestrian traffic signals with marked crosswalks, hybrid pedestrian beacons, rectangular rapid-flashing beacons, signage, signal modifications (e.g., protected left turns), and/or removing travel lanes to narrow crosswalk distances.



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## BICYCLE FACILITIES

The only bicycle accommodation in the study area is the bicycle parking at the Metrorail stations. Dedicated road space is not provided on any of the study area streets and parallel alternatives to Central Avenue (MD 214) that could provide low-volume/speed routes for cyclists is unavailable. Priority roadways for bicycle facility improvements include segments along Central Avenue (MD 214) and Garret A. Morgan Boulevard/Ritchie Road with LOS D or E. In these areas bike lanes or shoulder bikeways could improve bicycle LOS, rider comfort, and encourage biking for the more experienced bicyclist. Priority intersections for bicycle improvements include Central Avenue/Addison Road, Central Avenue/Garrett Morgan Boulevard, and Central Avenue/Hampton Park Boulevard where wide intersections leave cyclists vulnerable as it takes longer to cross the intersection.

Potential opportunities for improved bicycle mobility, attractive to a broader range of skill-levels, are evaluated in the “Complete Streets Strategies” and “Future Conditions” section of this report. They include reallocating road space for bicycle facilities and creating parallel routes as bicycle-friendly alternatives to Central Avenue.

## TRANSIT

Transit challenges include bus routes with unreliable and infrequent service. Several streets experience poor on-time performance and service gaps exist on Central Avenue from Old Central Avenue to Addison Road and from Hampton Park Road to east of I-495. The lack of bus services here creates a transit divide between the east and west side of I-495.

Opportunities to improve transit accessibility and LOS are evaluated in the “Complete Streets Strategies” and “Future Conditions” sections of this report. Options include:

- Relocating bus stops closer to pedestrian crossings and increasing the number of stops to 4 or 5 per mile.
- Widening sidewalks near bus stops, removing obstructions near waiting areas, installing shelters, and adding or improving lighting.
- Redesigning long and circuitous bus routes into shorter, simpler ones. This can create a transit system that achieves redundancy, efficiency and routes that run parallel to each other and cover a larger area more effectively.
- Converting stations to intermodal hubs where people can transfer from rail to bus, expanding potential ridership to people that live or work near bus stops.
- Improving facilities near the Central Avenue (MD 214)/Addison Road intersection to make them more visible and more attractive to new riders.
- Creating a “transit-oriented” atmosphere in the shopping center near Kingdom Square and the Largo Town Center to make taking transit more attractive for nearby residents who would otherwise drive.

## TRAFFIC

During both the morning and afternoon peak hours, all segments of Central Avenue perform at LOS C, except for the area near the I-495 ramp terminals, which performs at LOS F.<sup>5</sup> The six major signalized cross streets with Central Avenue operate at LOS B or LOS C. The corridor is auto-oriented, and motorized vehicles have the highest overall LOS of any of the modes for the corridor.

Opportunities to improve roadway design and connectivity are evaluated in the “Complete Streets Strategies” and “Future Conditions” sections of this report. Options include:

- Implementing parallel routes to Central Avenue (MD 214).
- Reallocating road space to accommodate active modes.
- Implementing protected left turns, improved signal phasing, and 120-second cycle lengths.
- Applying access-management strategies along Central Avenue (MD 214).

## SAFETY

The priority areas for safety improvements are:

1. The Addison Road/Central Avenue intersection
2. The segment of Central Avenue between I-95 on/off ramps
3. The Hampton Park Boulevard/Central Avenue intersection
4. The Shady Glen Drive/Central Avenue intersection
5. The Ritchie Highway/Central Avenue intersection

The most prevalent contributing factor was “Failure to Give Full Attention” followed by speeding and failure to obey a traffic signal.

Potential safety mitigations include:

- Implementing protected left-turn signal phasing on Central Avenue (MD 214)
- Improvements at and on approaches to intersections
- Adjusting clearance times
- Making intersections more comfortable to pedestrians
- Installing pedestrian countdown signals
- Providing leading pedestrian interval (LPI)
- Improving weaving distance between I-95 on/off ramps

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<sup>5</sup> The eight-lane sections of Central Avenue near the I-495 interchange lie outside the HCM methodology for determining segment LOS.





**Section 5**  
**Design and Policy Review**

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## DESIGN AND POLICY REVIEW

As part of the analysis conducted for the Central Avenue Transit-Oriented Development Implementation Project, the consultant team worked with community members, local agencies, and stakeholders to identify transportation issues and values, as well as obstacles to achieving transit-oriented development in the study area. The team also reviewed existing state and county transportation practices, policies, and guidelines to identify potential gaps or inconsistencies in supporting active transportation, transit, and complete Streets. Through this review, several key issues related to achieving transit-oriented development and complete streets were identified, including:

- Multiple zoning classifications and plans provide alternate design guidance for TOD areas without clear implementation guidance or consistent enforcement
- Needed refinements to the county’s Complete Streets policy
- Challenges associated with adequate public facilities requirements
- Street design guidelines that limit or discourage network connectivity
- Excessive minimum parking requirements
- Lack of a mid-block crossing policy
- Capital and maintenance funding for sidewalks and lighting

This section presents a discussion of these key issues and offers suggested policy revisions or new approaches based on peer examples identified through a review of best practices. A summary of the policy review and case studies illustrating best practices to incorporate Complete Streets principles into development review and project development is presented in Appendix 2.

### Transit-Oriented Development Zones

#### TRANSIT DISTRICT AND DEVELOPMENT DISTRICT OVERLAY ZONES

As shown in Figure 18, the Capitol Heights Metro Station area is designated as a Transit District Overlay Zone (TDOZ), while Addison Road, Morgan Boulevard, and Largo Town Center areas are designated Development District Overlay Zones (DDOZs). These overlays precede approval of the 2002 *Prince George’s County Approved General Plan* and were intended to give direction to landowners and the county during the development review process and establish policies and standards to support mixed-use, pedestrian-friendly, transit-oriented neighborhoods. Both overlay zones were design-oriented, placing a great deal of emphasis on architectural detailing. However, administration of these overlays was difficult due to their complexity, and their application was inconsistent occasionally contradicting both the General Plan and applicable master plan and sector plan recommendations for land use centers and corridors.

As shown in Figure 19, the 2002 *Prince George’s County Approved General Plan* designates Central Avenue as a “Corridor,” the Capitol Heights and Addison Road Metro stations as “Community Centers,” the Morgan Boulevard Metro Station as a “Regional Center,” and the Largo Town Center Metro Station as a “Metropolitan Center.” Similar to TDOZs and DDOZs, centers and corridors are designated to promote more intense development and mixed uses. Table 2 shows

the target development intensities within different center types. The General Plan does not define the extent of each center’s core or edge, so the core is generally assumed to be the area within ¼ mile of the Metro station, while the edge is assumed to be the area ¼ to ½ mile from the station.

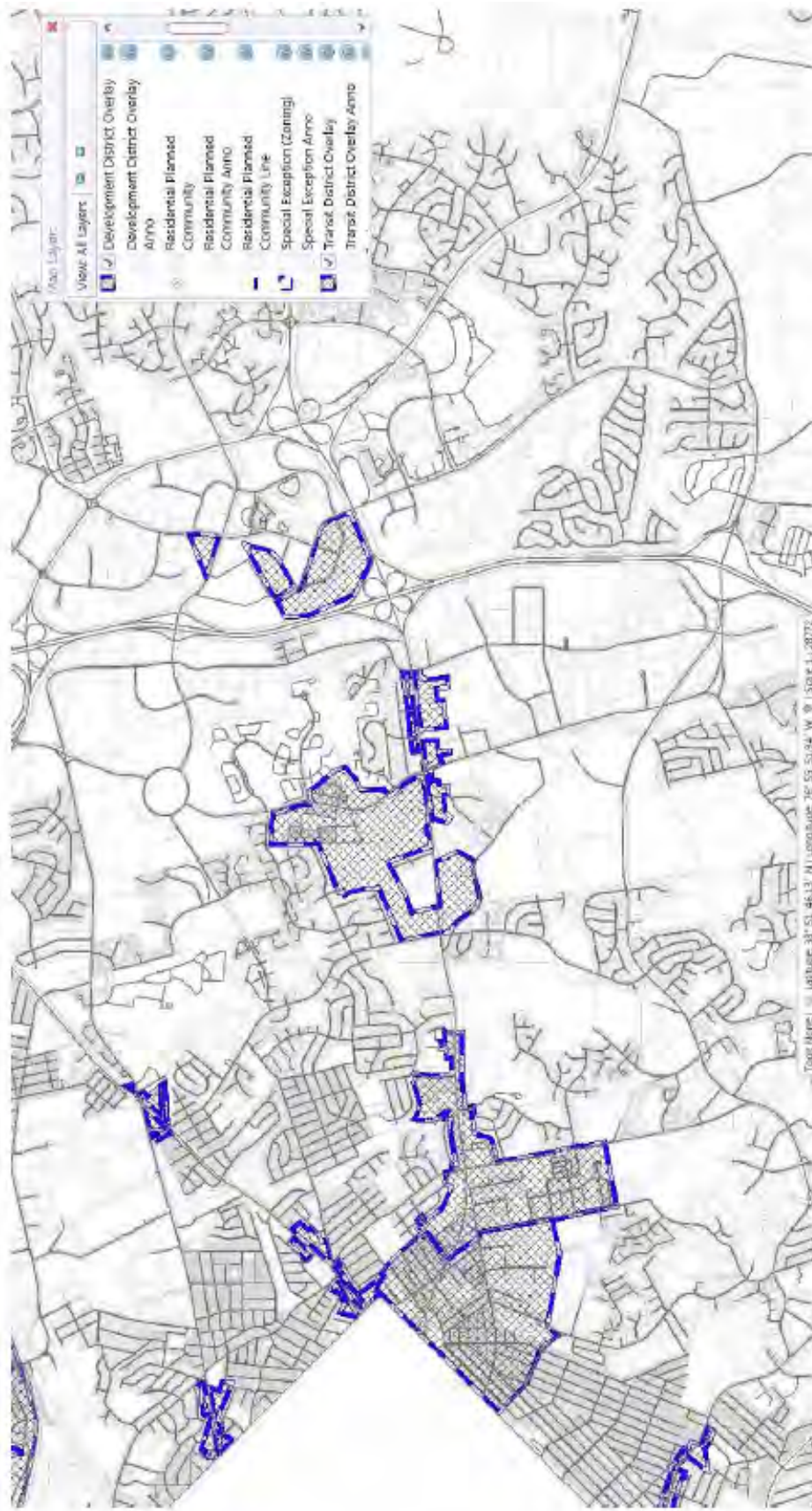
TABLE 2. DEVELOPMENT INTENSITY TARGETS IN CENTERS

Land Use		Metropolitan Center		Regional Center		Community Center	
		Core	Edge	Core	Edge	Core	Edge
Residential Density	Min. (DU/acre)	30	20	24	8	15	4
	Max. (DU/acre)	N/A	40	N/A	30	30	20
Nonresidential Intensity	Min. (FAR)	2.0	0.5	1.0	0.5	0.25	0.15
	Max. (FAR)	N/A	1.5	N/A	1.5	1.0	0.30
Employment Density	Employee/acre	100	N/A	50	N/A	25	N/A

*Subtitle 27A: Urban Centers and Corridor Nodes Development Code* of the Prince George’s County Code was adopted in 2010. The Subtitle specifies development review and approval procedures and design regulations that implement the recommendations of the 2002 General Plan and ensure future transit-oriented, pedestrian-friendly, mixed-use development in selected centers and corridor nodes. This process includes development of regulating plans and functional overlays that identify the design and placement of buildings, public spaces, and streets within each center or node.

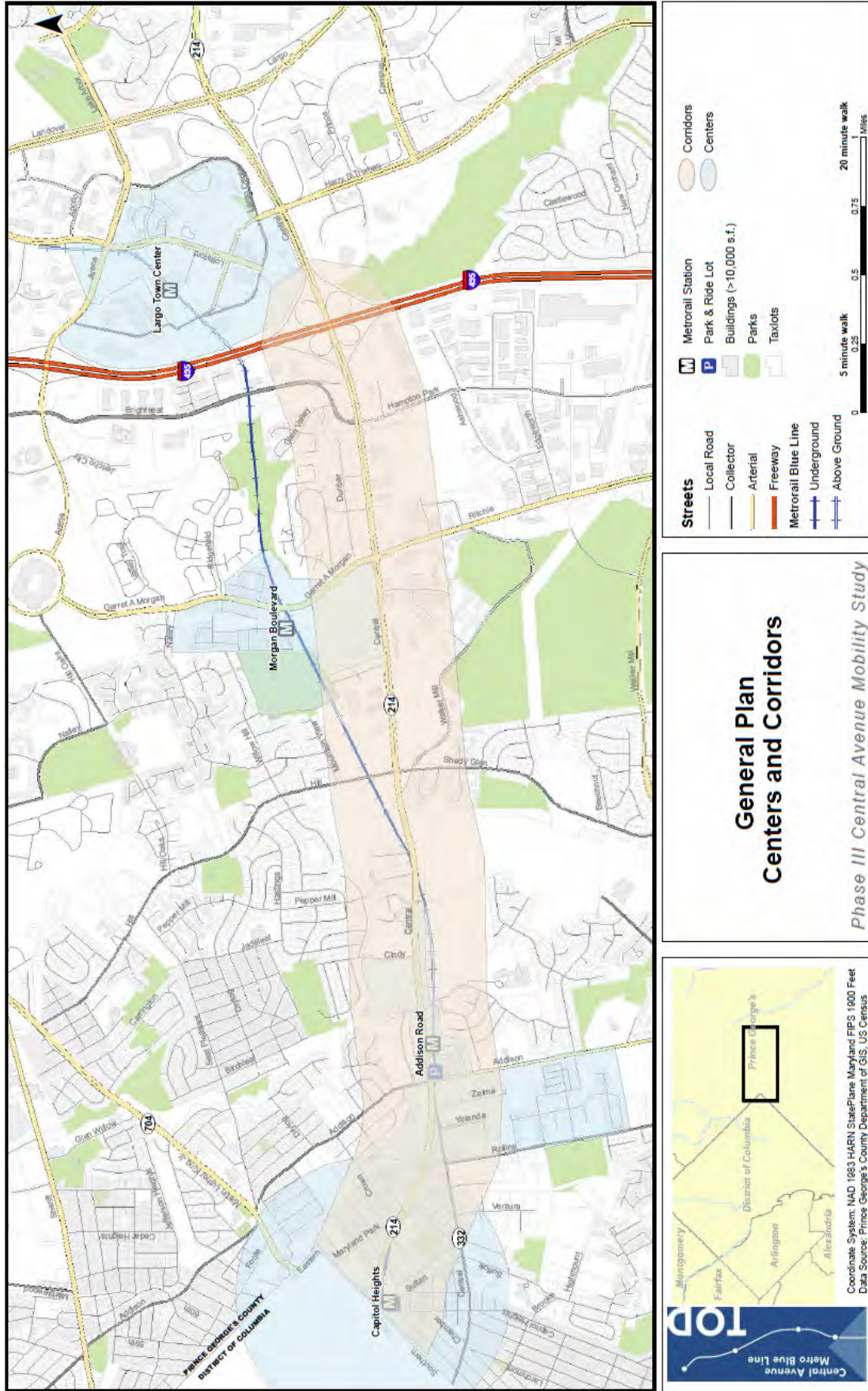


FIGURE 18. TRANSIT AND DEVELOPMENT DISTRICT OVERLAY ZONES



**Development District and Transit District Overlays (Source: PGAtlas.com)**

FIGURE 19. CENTERS AND CORRIDORS





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## Complete Streets Policies

The *Approved Countywide Master Plan of Transportation* (MPOT) identifies ten complete street principles for the county (originally developed as part of the pedestrian plan for the Prince George’s Plaza Transit District) and seven Complete Streets policies, one of which is to “work with the State Highway Administration and the Prince George’s County Department of Public Works and Transportation to develop a Complete Streets policy.”

These principles and policies provide a starting point for a future formalized, countywide Complete Streets policy that can be developed from a policy template approved on May 16, 2012, by the National Capital Region Transportation Planning Board (TPB). The Complete Streets Policy for the National Capital Region encourages TPB member jurisdictions and agencies to adopt a Complete Streets policy that includes common elements that the TPB believes represent current best practices. The TPB defines a Complete Streets policy as a directive “that ensures the safe and adequate accommodation, in all phases of project planning, development, and operations, of all users of the transportation network, including pedestrians and transit riders of all ages and abilities, bicyclists, individuals with disabilities, motorists, freight vehicles, and emergency vehicles, in a manner appropriate to the function and context of the facility.” The TPB policy includes a template for local Complete Streets policies and recommends jurisdictions follow the “ten elements of an ideal Complete Streets policy” endorsed by the National Complete Streets Coalition when developing local policies. (These ten principles differ from the principles identified in the MPOT.)

Table 3 lists the “Elements of an Ideal Complete Streets Policy” identified in the TPB approved policy and those elements currently addressed in the MPOT and where additional analysis is needed. Elements of an ideal Complete Streets policy that are not addressed in MPOT are discussed in more detail below.

TABLE 3. EVALUATION OF COMPLETE STREETS POLICY ELEMENTS

TPB Recommended Policy Element	Addressed in MPOT Principles & Policy?
Includes a vision for how and why the community wants to complete its streets.	Yes
Specifies that “all users” includes pedestrians, bicyclists, and transit passengers of all ages and abilities as well as trucks, buses, and automobiles.	Yes
Encourages street connectivity and aims to create a comprehensive, integrated, connected network for all modes.	Yes
Is adoptable by all agencies to cover all roads.	Yes
Applies to both new and retrofit projects, including design, planning, maintenance, and operations for the entire right-of-way.	Yes – new and retrofit No – project phases
Makes any exceptions specific and sets a clear procedure that requires high-level of approval of exceptions.	No
Directs the use of the latest and best design standards while recognizing the need for flexibility in balancing user needs.	Yes
Directs that Complete Streets solutions will complement the context of the community.	Yes
Establishes performance standards with measurable outcomes.	No
Includes specific next steps for implementation of policy, such as: <ul style="list-style-type: none"> <li>• revising agency procedures and regulations to reflect policy</li> <li>• developing or adopting new design guidelines</li> <li>• offering training for staff responsible for implementing the policy</li> <li>• gathering data on how well streets are serving user groups</li> </ul>	No

APPLICATION AND EXCEPTIONS

For Complete Street design principles to be enforced, Complete Streets policies should clearly state what types and phases of projects the policy applies to (e.g., new development, retrofit projects, design, operations, and maintenance) and a procedure for approving exceptions. Section 24-128.01 of the county Code specifies that new and redevelopment projects must comply with the county’s Adequate Public Facilities Requirements (discussed below) for pedestrian, bicycle, and motor vehicle facilities. County policy does not yet address how Complete Streets principles should be applied to maintenance or operations.

The TPB Complete Streets policy template includes a draft list of inclusions and project-specific exemptions. DPW&T and other County staff should refine these lists as needed, identify a standard procedure for approving exemptions (e.g., senior manager review and approval), and incorporate this language into a revised, stand-alone Complete Streets policy. The Complete Streets project review checklists included in the “Complete Streets Strategies” section of this report present a recommended, easy-to-use standard procedure for evaluating project compliance with and/or exemption from Complete Streets requirements.

## PERFORMANCE MEASUREMENT AND IMPLEMENTATION

Performance standards should be established to measure the impacts of Complete Streets and specific next steps should be identified to implement the policy. Common measures used to evaluate the success of transit-oriented development and the contribution of individual developments towards Complete Streets goals include:

- Mode split and volumes by mode
- Safety (e.g., crashes, fatalities, and injuries by mode)
- Level of service/comfort (e.g., pedestrian, bicycle, vehicle, and transit level of service)
- Accessibility (e.g., percent of residents/employees within ¼ mile of a Metro station and/or bikeway, number of destinations accessible within a ½ mile walk)
- Connectivity (e.g., average block length, percent of signalized intersections with marked crosswalks on all approaches, percent of intersections that are cul-de-sacs)

Many of these measures would require additional data-collection efforts to be evaluated consistently and to facilitate before and after evaluations. Accessibility and connectivity are recommended preliminary measures because they can be easily estimated using available GIS and census data. The county’s Adequate Pedestrian and Bikeway Facilities Requirements (discussed below) also require the county to adopt a multimodal level-of-service measure. The multimodal level of service analysis presented in the “Existing Conditions” section of this report was developed using the 2010 Highway Capacity Manual MMLOS methodology and can serve as a baseline for future evaluations.

County staff, including DPW&T, Parks and Recreation, Board of Education, and DER, should be consulted to refine measures and methodologies and incorporate this language into a revised, stand-alone Complete Streets policy. The Complete Streets project review checklists included in the “Complete Streets Strategies” section of this report present draft recommended measures for evaluating development compliance, transit-oriented development, and Complete Streets requirements.

## Adequate Public Facilities Requirements

The Adequate Public Facility Requirements (APFRs) in the Prince George’s County Code are intended to ensure that developers and property owners contribute to the cost of providing new services and facilities needed as a result of new development, thereby preventing these costs from being borne by existing taxpayers. APFRs in the county currently require an intersection- or link-based study of auto capacity to determine the adequacy of transportation facilities.

Existing APFRs in the county specify a minimum auto level of service (LOS) and volume to capacity (v/c) ratio standard for all study intersection and roadway links. In the study area, which is in the Developed Tier, these standards are LOS E and  $v/c = 1.0$ .

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The APFRs have historically focused on auto travel and had unintended consequences, including limiting infill development in targeted growth areas, focusing transportation improvements on serving single- occupancy vehicles, and spurring development at the fringes of urbanizing areas where there is available vehicle capacity. For example, in centers where compact, high-density development is desired, once traffic levels exceed the LOS threshold established by the APFR (even if the traffic is regional through traffic not generated by local development/destinations), new development projects cannot move forward unless additional vehicle capacity is provided, which would contradict the goals for designated centers. These conflicts and unintended effects make implementation of high-density, transit-oriented development expensive and difficult within the county.

In June 2010, Kittelson & Associates, Inc. published the Alternative Adequate Public Transportation Facilities Ordinances and Review Procedures Study, which was prepared under a previous contract with M-NCPPC. This study recommended revisions to the APFRs to address these obstacles and enable high-density and transit-oriented development in center and corridors. The study outlines an implementation process for applying revised APFRs to enable transit-oriented development in centers, including:

- A revised site plan review process (see Figure 20).
- Guidance on transportation elements to include in a site plan review checklist and traffic impact study (see Table 4 – these elements have been incorporated into the checklists presented in the “Complete Streets Strategies” section of this report).
- Guidance on Traffic Impact Fee Assessments in centers.

The county has begun to implement some of the recommendations of this study through the update of the Guidelines for the Analysis of the Traffic Impact of Development Proposals, tentatively known as the Transportation Review Guidelines (discussed below).

FIGURE 20. PROPOSED SITE PLAN REVIEW PROCESS FOR CENTERS

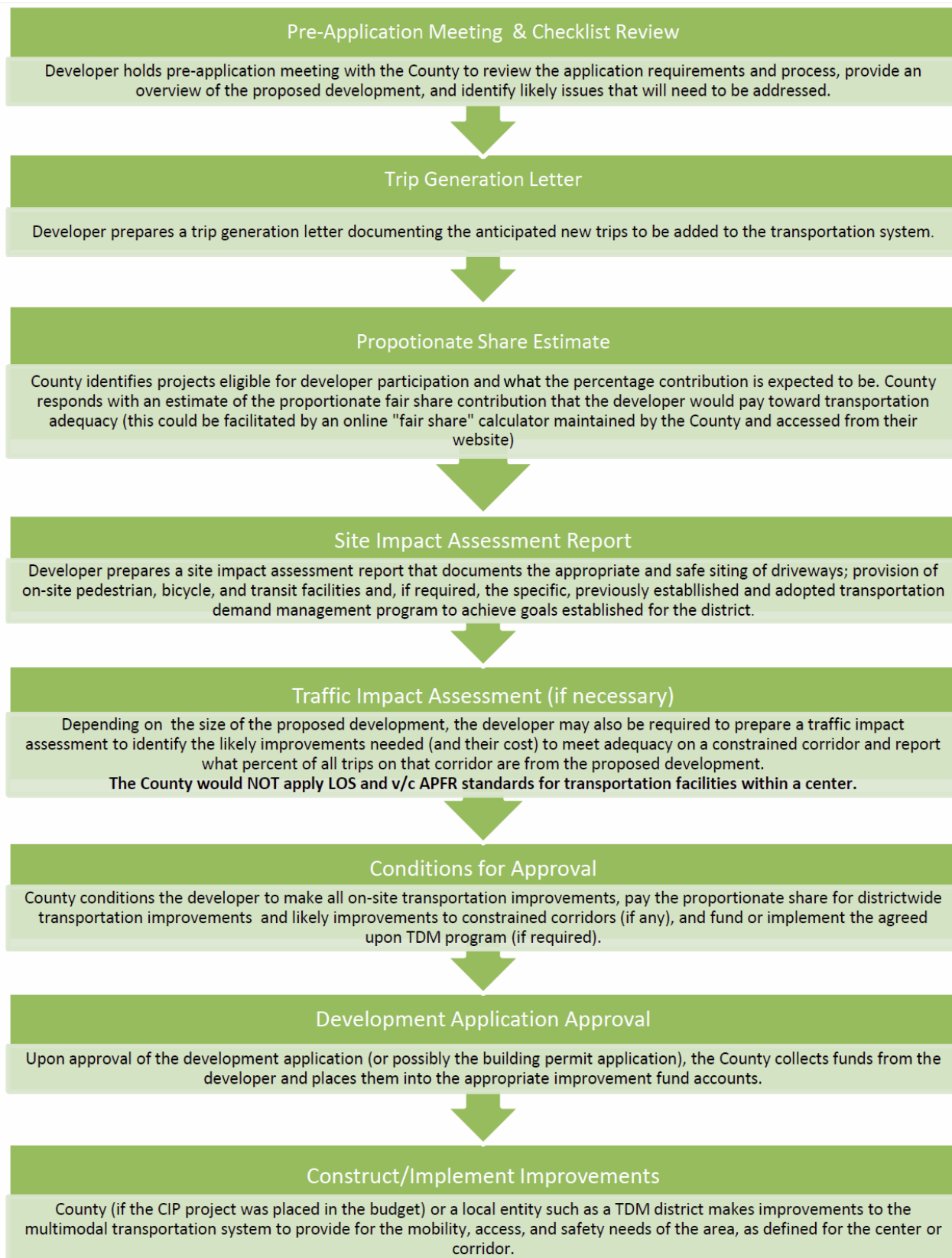


TABLE 4. ELEMENTS FOR INCLUSION IN TRANSPORTATION SITE PLAN REVIEW AND IMPACT STUDIES

Transportation Element	Description
Parking	<ul style="list-style-type: none"> <li>• Number of parking spaces and parking ratio</li> <li>• Location and number of carpool, vanpool, and/or car-sharing spaces</li> <li>• Parking management strategies, including pricing and/or time restrictions</li> <li>• Potential shared parking opportunities</li> </ul>
Site Access and Street Spacing	<ul style="list-style-type: none"> <li>• Location of driveways and driveway spacing, including preference for lower hierarchy streets where possible</li> <li>• Pedestrian-friendly driveway design features</li> <li>• Adherence to block length standards for public streets (e.g., maximum block length of 400 feet)</li> <li>• Opportunities for shared access and/or driveway consolidation with adjacent properties</li> <li>• Access routes for all modes, including freight/deliveries</li> </ul>
Pedestrian Connectivity	<ul style="list-style-type: none"> <li>• On-site pedestrian circulation routes</li> <li>• Proximity of building entrances to sidewalks and transit stops</li> <li>• Locate pedestrian generators in close proximity to safe crossings of major streets</li> <li>• Connections to off-site pedestrian generators: schools, parks, libraries, commercial districts</li> </ul>
Bicycle Accommodation	<ul style="list-style-type: none"> <li>• Number of bike parking spaces and proximity of parking to entrances</li> <li>• Availability of long-term bike storage (e.g. lockers) for employees and residents</li> <li>• On-site shower and locker facilities for riders</li> </ul>
Transit Connectivity	<ul style="list-style-type: none"> <li>• Pedestrian and bicycle connections to stops</li> <li>• Proximity of transit stops to building entrances and safe road crossings</li> <li>• Adequate sidewalk space for passenger loading/unloading, waiting, and passing pedestrian traffic</li> <li>• Benches, shelters, or other amenities provided at high volume stops</li> </ul>
Trip Characteristics	<ul style="list-style-type: none"> <li>• Trips generated</li> <li>• Mode split</li> <li>• VMT generated (pending established methodology for calculation)</li> <li>• Trip length (pending established methodology for calculation)</li> <li>• Transportation Demand Management plan</li> </ul>



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## ADEQUATE PUBLIC PEDESTRIAN AND BIKEWAY FACILITIES REQUIREMENT

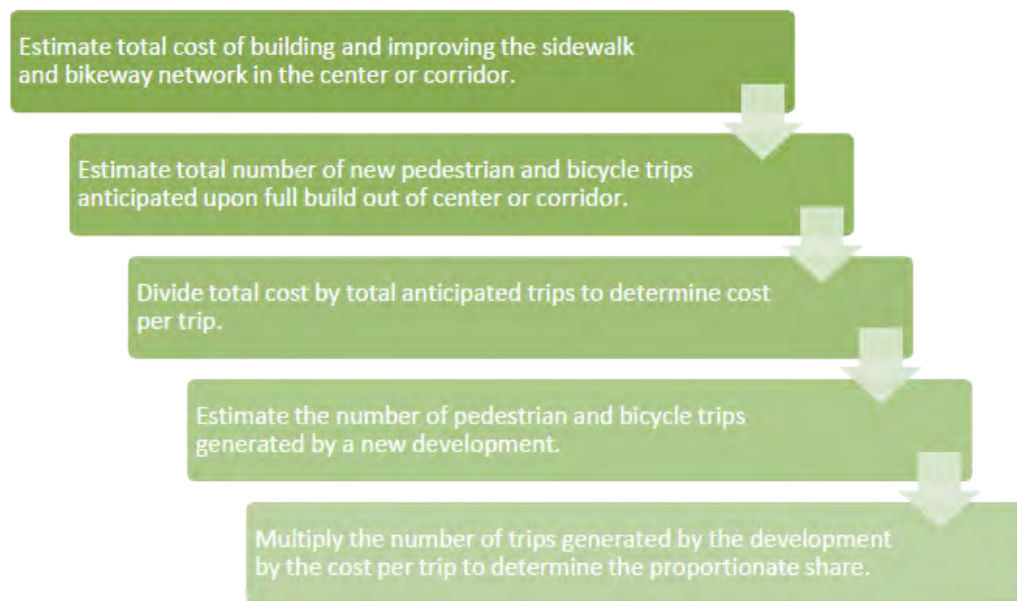
On April 24, 2012, the Prince George’s County Council unanimously passed CB-2-2012, adding Section 24-128.01 Adequate Public Pedestrian and Bikeway Facilities Required in County Centers and Corridors to the Prince George’s County Code. This section implements several of the recommendations of the Adequate Public Facilities for Roads (APFR) Review Study and the M-NCPPC Complete Streets policy by revising the APFR to include standards for adequacy of nonmotorized transportation facilities—sidewalks, bikeways, and pathways—in centers and corridors. It also establishes requirements for developers within centers and corridors to construct on- and off-site pedestrian and bikeway facilities and other streetscape improvements as part of any development project.

Successfully implementing the new APFR will also require the following activities:

- Identify appropriate multimodal level of service or level of comfort standards and methodologies to assess design features affecting pedestrians and bicyclists. The following provisions are recommended:
  - o Incorporate the recommended transportation elements, identified in Table 4 above, into the development review process and traffic impact study requirements.
  - o Identify LOS standards for pedestrian and bicycle facilities that are consistent with General Plan policies for corridors and centers. Alternative adequate facilities standards to LOS should be defined.
  - o Adopt the 2010 Highway Capacity Manual’s multimodal level of service methodology as the preferred method of evaluating the adequacy of multimodal facilities. It is the most recent version and is consistent with the analysis conducted for the Central Avenue TOD Implementation Study.
  - o Refine and incorporate the checklists presented in the “Complete Streets Strategies” section of this report as an easy-to-use implementation tool.
- Adopt amendments and revisions to the Department’s General Specifications and Standards for Highway and Street Construction and the Specifications and Standards for Highway Traffic Signals to incorporate appropriate Complete Streets principles. Based on a review of the current standards, the following revisions are recommended:
  - o Sidewalks are currently “required on both sides of arterial, collector, and industrial roadways with no exceptions,” but the standard is much less rigid for residential streets. Since making it easier for residents to walk from their homes to destinations is a primary goal of transit-oriented development and Complete Streets, sidewalks should be required on both sides of residential streets in centers and corridors.
  - o The current general specifications “support design criteria that promote minimum traffic volumes and lowest possible speeds on residential streets” and provide standard design details for multiple traffic calming features. Up-to-date guidance should also be provided for applying the range of techniques to ensure consistent, appropriate application.
  - o The current general specifications state that on residential streets a “discontinuous street pattern is also desirable, provided that the maximum travel distance from the furthest residence to the nearest collector road is limited to 0.5 miles and that a motorist need not make more than three turning movements.” This language is inconsistent with guidance presented earlier in the guidelines, which states that “where possible, each street should be extended to intersect another street or to be intercepted by other streets... to eliminate any need for a cul-de-sac.” The language encouraging discontinuous street patterns should be replaced with a recommendation to maximize connectivity for all users and to create a network that provides alternative routes for different trip types. In areas where extending streets to enhance connectivity is not feasible, pedestrian and bicycle connections should still be made.

- Define how a rational nexus and rough proportionality will be determined for off-site pedestrian and bicycle improvements in order to reduce legal challenges when implementing the APFR. These issues are partially addressed by the limits Section 24-128.01 places on developer/property owner’s financial responsibility for off-site improvements (e.g., improvements shall not exceed 5 percent of total development cost). However, the county should develop a methodology for estimating the pedestrian and bicycle “impacts” of developments so that they can ensure the mitigations they request of developers are in “rough proportion” to the stress their development puts on the system. Figure 21 illustrates a recommended process for estimating proportionate share costs of non-motorized system improvements.

FIGURE 21. PROPORTIONATE SHARE COST ESTIMATION PROCESS



The process presented in Figure 21 can be conducted for individual modes, or by lumping new trips generated by all modes together. CB-2 mandates that developers pay their share to construct off-site improvements. The cost-cap in CB-2 is designed to ensure that developers are not unreasonably burdened, and the rational nexus will explain the link between the development and the recommended off-site improvements.

## Network Connectivity

A major transportation challenge facing the Central Avenue corridor is the suburban nature of the existing roadway network. The area is characterized by cul-de-sac residential neighborhoods, a low-level of connectivity, and a single major arterial that serves the majority of trips in and through the study area. As discussed above, the current county roadway design standards continue to encourage a discontinuous street pattern in residential areas, making transit-oriented development difficult to achieve.

Revising existing policies and design standards to maximize connectivity for all modes supports transit-oriented development in multiple ways:

- Provides alternative routes for local and regional trips, removing traffic from Central Avenue and reducing pressure to continue expanding arterials to meet APFR requirements. Alternative parallel routes to Central

Avenue also provide more attractive, lower speed and volume routes for pedestrians and bicyclists. These routes may encourage a larger number of people to walk and bike who would not be comfortable traveling along a high-speed, high-volume arterial.

- Encourages shorter trips and carpooling. A well-connected network provides direct routes between origins and destinations, making it more convenient for residents and visitors to walk or bike to destinations. Vehicle trip lengths can also be reduced due to availability of more direct routes.
- Increases pedestrian safety. Pedestrians generally take the most direct route between destinations. Providing short (300-500 foot) blocks and a high level of connectivity makes it more likely that pedestrians will cross at intersections, as opposed to jaywalking, which may increase pedestrian safety.

Revisions to the county's street construction standards should include the establishment of a maximum block length of 500 feet in order to ensure connectivity for all modes and improve access to transit.

## Parking Requirements

The Prince George's County Code establishes minimum off-street parking requirements for different land uses within the county. In comparison to similar urban areas nationwide, these standards are exceptionally high. The procedures outlined in the code for establishing reduced parking requirements in centers and select zones are also complicated and provide only a minimal reduction.

Excessive parking requirements conflict with transit-oriented development in multiple ways:

- The space that must be dedicated to parking makes it difficult to achieve transit-supportive building densities. Structured parking can minimize the footprint of parking, but would have low utilization and create a cost disincentive for developers.
- Large expanses of surface parking reduce the walkability of an area by making destinations farther apart and creating an unattractive pedestrian environment.
- Readily available parking encourages the majority of trips to continue being made by personal vehicle. In the absence of a parking pricing strategy, the incentive to walk, bike, or take transit is dramatically reduced.

The majority of jurisdictions that have successfully implemented transit-oriented development have either replaced parking minimums with parking maximums or adopted significantly reduced parking requirements for all uses within designated areas. In the study area, the 2000 Approved Sector Plan and Sectional Map for the Addison Road Metro Station and Vicinity (ARM) and the 2008 Approved Capitol Heights Transit District Development Plan and Transit District Overlay Zoning Map Amendment (CHTTP) both recommend parking maximums for station areas, but these maximums do not appear to have been applied and are not referenced in the County Code where developers look for parking guidance when developing site plans. It is recommended that the county adopt parking maximums for centers and corridors as an amendment to Subtitle 27A of the county Code. The parking maximum code used by Portland, Oregon in areas served by transit could serve as a model for the county when developing code language (see case study in Appendix 2).

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## Midblock Crossings

The Prince George’s County DPW&T Street Construction Review Checklist currently states that midblock crossings are not permitted, effectively limiting the county’s ability to improve pedestrian connectivity and support transit-oriented development in some areas. Given the long block lengths in the study area, locations of concentrated pedestrian activity, and limited crossing opportunities along Central Avenue, pedestrians are often faced with the option of jaywalking or walking far out of their way to reach a marked crossing. In most cases, pedestrians will choose to jaywalk, which creates conflicts between pedestrians and motorists who do not anticipate pedestrians in unmarked crossing locations.

Midblock crossings at select locations with high crossing demand (e.g., Metro stations, bus stops, trail crossings, and school or park entrances) can encourage pedestrians to cross at designated areas, increase safety, and make walking and transit more attractive travel options. Delay incurred by vehicle traffic at midblock crossings is frequently cited as a negative impact of midblock crossings; however, within transit-oriented areas, pedestrian level of service should be prioritized and, as shown in the “Existing Conditions” section of this report, adequate vehicle capacity is not a concern in the study area.

To provide additional flexibility to address pedestrian safety and connectivity needs, the county should adopt a midblock crossing policy that provides specific criteria for appropriate use of midblock crossings (e.g., distance from nearest signal, proximity of key destinations, traffic volume, etc.). The midblock crossing policy adopted by Washington County, Oregon could serve as a model to the county when developing this policy.

## Sidewalk Funding and Maintenance

A major challenge to implementing Complete Streets policies in the study area is the need to retrofit existing streets that were constructed without sidewalks or where sidewalk widening and repair are needed. Prince George’s County does not currently have a dedicated funding source for sidewalk retrofit projects or sidewalk maintenance. CB-2-2012 provides one mechanism for the county to leverage new development to complete the network and serve growing pedestrian demand. Another strategy used by some jurisdictions nationwide is to adopt code stating that adjacent property owners are responsible for maintaining all sidewalks in the public right-of-way adjacent to their property.

## Policy Recommendations

### COMPLETE STREETS

- Refine the TPB list of project types that are included and exempted from Complete Streets requirements.
- Refine the checklists in the “Complete Street Strategies” section of this report and implement them as a standard procedure for approving exemptions and evaluating compliance with Complete Streets principles.
- Establish performance standards to measure the impacts of Complete Streets policies. Accessibility and connectivity measures are recommended for short term adoption. MMLOS using the 2010 Highway Capacity Manual methodology is also recommended, using the analysis conducted for the Central Avenue TOD Implementation Plan as a baseline.

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## ADEQUATE PUBLIC FACILITIES REQUIREMENTS

- Incorporate the recommended transportation elements identified in Table 4 into the development review process and traffic impact study requirements.
  - o Identify LOS standards for pedestrian and bicycle facilities that are consistent with General Plan policies for corridors and centers. Alternative adequate facilities standards to LOS should be defined.
  - o Adopt the 2010 Highway Capacity Manual MMLOS methodology as an approved tool to evaluate the adequacy of multimodal facilities.
  - o Refine and incorporate the checklists presented in the “Complete Street Strategies” section of this report as an easy-to use implementation tool.
- Adopt amendments and revisions to the DPW&T’s General Specifications and Standards for Highway and Street Construction and the Specifications and Standards for Highway Traffic Signals to incorporate appropriate Complete Streets principles.
  - o Require sidewalks on both sides of residential streets.
  - o Provide additional guidance on where traffic-calming treatments are, or are not, appropriate.
  - o Replace language encouraging discontinuous street patterns with a recommendation to maximize connectivity for all users. In areas where extending streets to enhance connectivity is not feasible, pedestrian and bicycle connection should still be made.
- Develop and adopt a methodology similar to that presented in Figure 21 to estimate the pedestrian and bicycle “impacts” of development so that mitigations requested of developers are in “rough proportion” to the stress their development puts on the system.

## PARKING REQUIREMENTS

- Amend Subtitle 27A to include parking maximums for centers and corridors.

## MIDBLOCK CROSSINGS

- Adopt a midblock crossing policy that allows midblock crossings in limited circumstances and provides specific criteria for appropriate use of midblock crossings (e.g., distance from nearest signal, proximity of key destinations, traffic volume, etc.). This policy should be developed with concurrence from SHA and DPW&T.

## SIDEWALK FUNDING AND MAINTENANCE

- Adopt a policy requiring property owners to maintain sidewalks adjacent to their property.







**Section 6**  
**Complete Streets Strategies**

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## COMPLETE STREETS STRATEGIES

### Purpose

The purpose of this section is to outline strategies for implementing Complete Streets policies in the study area. These strategies recommended include:

- Multimodal complete street and trail typologies
- Typical sections
- Design guidelines
- Network enhancements
- Implementation checklists

Together, these strategies establish the basis for a future Transportation Network Functional Overlay (TNFO) for the study area. In coordination with a regulating plan, the TNFO will provide a mechanism for implementing transit-oriented development with concentrations of medium- to high-density and mixed uses, as well as a complete, well-connected network serving pedestrians, bicyclists, motor vehicles, and transit.

### Complete Street Typology & Typical Sections

Complete Streets treat roadways as multi-purpose public space and are designed to improve access for all modes, rather than prioritizing automobile throughput. The existing roadway functional classification system, summarized in Figure 5, is based primarily on vehicle mobility, access, volumes, and speeds. As a result, roadways are frequently designed from the "inside-out," beginning with auto facilities and allocating remaining right-of-way, if any, to other modes. Successfully implementing Complete Streets will require a new roadway typology that is multimodal, considers adjacent land uses, desired streetscape elements, and encourages design from the "outside-in." This section presents a recommended "complete street typology" for the study area, which could be adapted for application to all of Prince George's County.<sup>1</sup>

The new street types are intended to inform planning decisions when altering existing streets and when reviewing new or improved streets as part of development projects. The typical sections and design guidance presented for the new street types are not intended to create strict standards or make any existing roads "non-conforming." Instead, they provide guidance for new roadways built as part of new development or redevelopment, and identify desirable roadway elements to complement adjacent land uses when reconstructing existing roadways, as right-of-way allows. The complete street typology is consistent with the MPOT Complete Streets policy and is based upon existing DPW&T and M-NCPPC functional classification standards.

The five Complete Streets classifications described below identify the desirable roadway elements and design priorities for different land use contexts. A typical cross section is provided for each classification to show a representative example of what the implemented street type could look like. The exact combinations and widths of the individual streetscape elements should be designed to meet the specific context and apply engineering judgment.

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<sup>1</sup> Changing DPW&T standards or adopting supplementary guidance is a multi-year process, and not every planning effort should recommend different design standards.



Functional Classification	Sample of Typical Features
Arterial Road (Urban and Rural)	<ul style="list-style-type: none"> <li>• 4 to 6 through-travel lanes</li> <li>• Median with left-turn lane</li> <li>• Prohibits on-street parking</li> <li>• Hiker/biker trails in urban areas only</li> </ul>
Major Collector Road (Urban and Rural)	<ul style="list-style-type: none"> <li>• 4 through-travel lanes</li> <li>• Median (may be painted) with left-turn lane</li> <li>• Generally prohibits on-street parking</li> <li>• Hiker/biker trails or bike lanes in urban areas only</li> </ul>
Collector Road (Urban and Rural)	<ul style="list-style-type: none"> <li>• Painted center line</li> <li>• 4 through lanes</li> <li>• Allows parking</li> <li>• Hiker/biker trails or bike lanes in urban areas only</li> </ul>
Urban Commercial and Industrial Road	<ul style="list-style-type: none"> <li>• Painted center line</li> <li>• 4 through lanes</li> <li>• Allows for frequent turning movements</li> <li>• Allows for parking</li> <li>• Requires curbed roadside and large curb radii</li> <li>• May include sidewalks</li> </ul>
Primary Residential Road (Urban and Rural)	<ul style="list-style-type: none"> <li>• Serves adjacent properties with clear two-way roadway</li> <li>• Low speeds with interruptions at intersections and driveways</li> <li>• Painted center line</li> <li>• Restricts on-street parking and turns for driveways</li> <li>• Urban areas only: includes sidewalks</li> </ul>
Secondary Residential Road (Urban and Rural)	<ul style="list-style-type: none"> <li>• Serves adjacent properties with clear one-lane roadway</li> <li>• Few parking restrictions</li> <li>• Urban areas only: includes sidewalks</li> </ul>

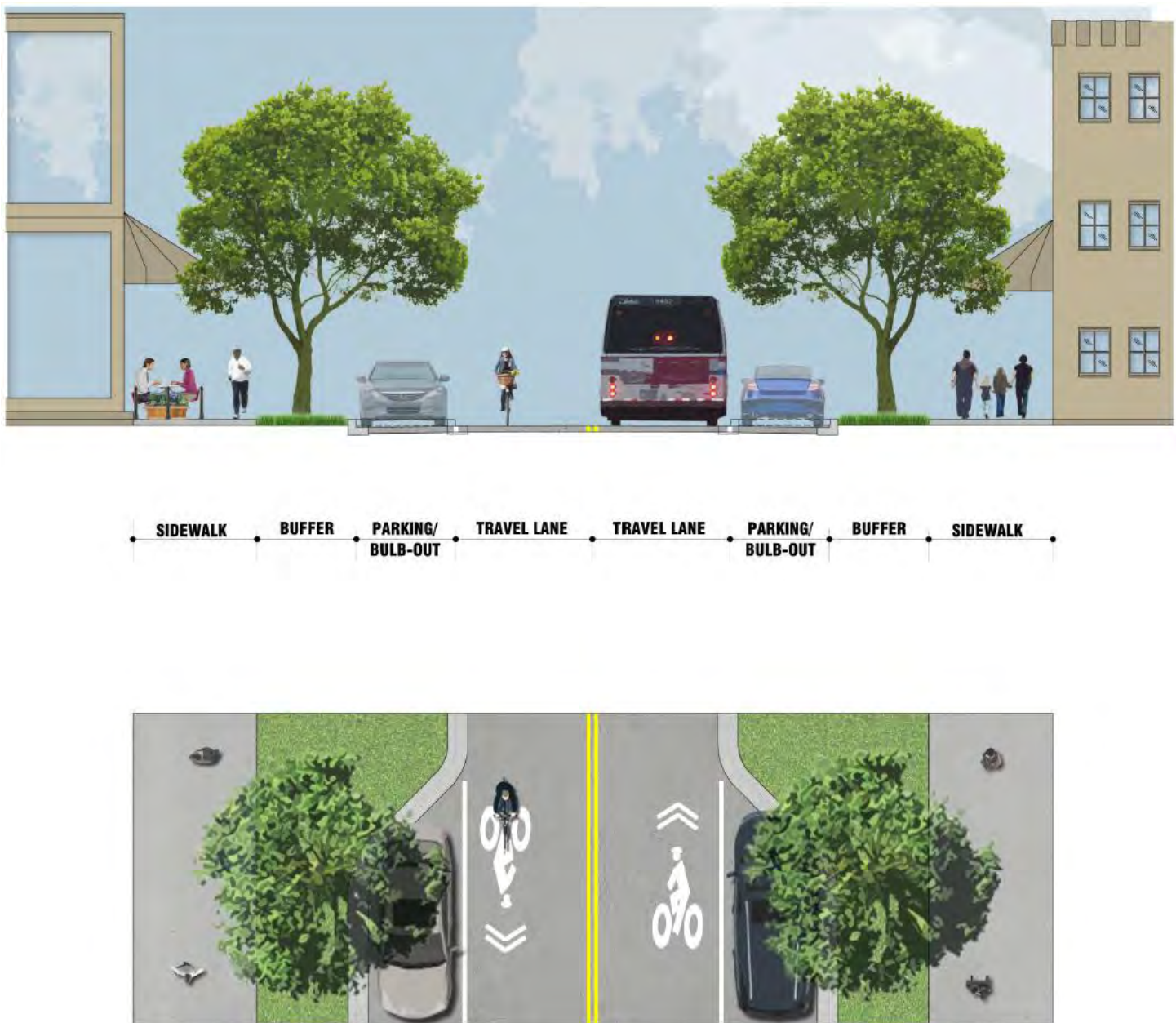
- **Neighborhood Greenways** form a grid of pedestrian- and bicycle-friendly streets along primarily residential blocks. Street widths are generally narrow and allow on-street parking. Neighborhood greenway streets include traffic-calming elements such as traffic circles, landscaped buffers, chicanes, or curb extensions in order to discourage through motor-vehicle traffic and lower vehicle speeds and volumes. As a result, neighborhood greenways are comfortable walking and bicycling routes for residents with a wide range of abilities. A typical neighborhood greenway cross section is shown in Figure 22.

FIGURE 22. TYPICAL NEIGHBORHOOD GREENWAY CROSS SECTION



- Neighborhood Commercial Streets** front residential and neighborhood-serving commercial uses, mixed both vertically and block-by-block. Buffer areas and sidewalks are wide to accommodate pedestrians and street furniture. Restricted curb cuts maintain the integrity of frontage space. Single lanes and on-street parking with bulb-outs (curb extensions) will slow vehicle speeds and encourage shared space with bicycles. As neighborhood hubs, these streets should be designed to facilitate community events such as farmers markets and festivals. A typical neighborhood commercial street cross section is shown in Figure 23.

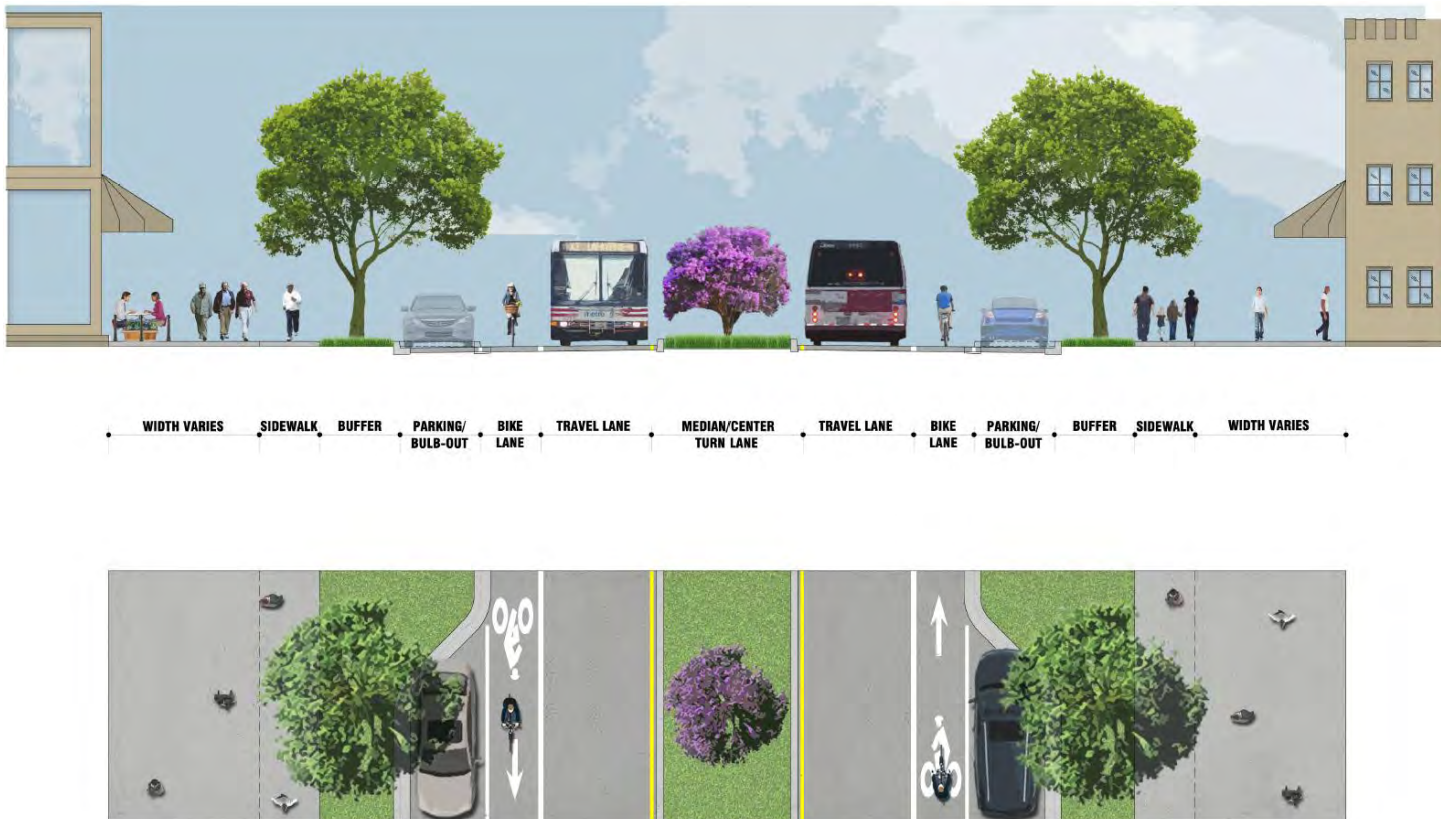
FIGURE 23. TYPICAL NEIGHBORHOOD COMMERCIAL CROSS SECTION





- **Avenues** form a large-scale grid of streets that provide multimodal connections between neighborhoods. They are characterized by similar surrounding land uses and streetscape features as Neighborhood Commercial streets, but have greater densities and/or higher traffic volumes that require the addition of medians, center turn lanes, and dedicated bicycle lanes. These streets form important links between neighborhoods and are often signalized where they intersect with other avenues, neighborhood boulevards, and regional boulevards. A typical Avenue cross section is shown in Figure 24.

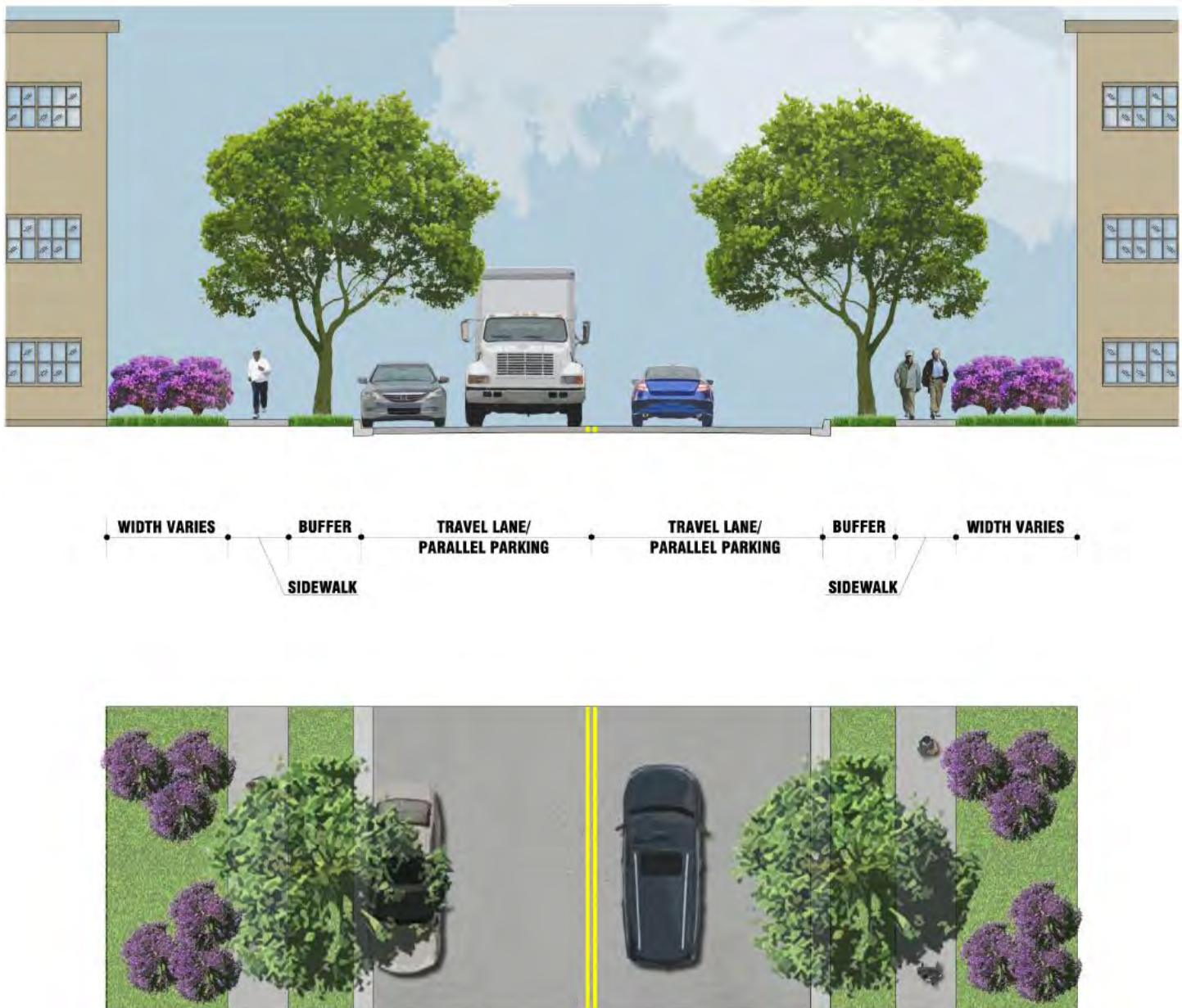
FIGURE 24. TYPICAL AVENUE CROSS SECTION





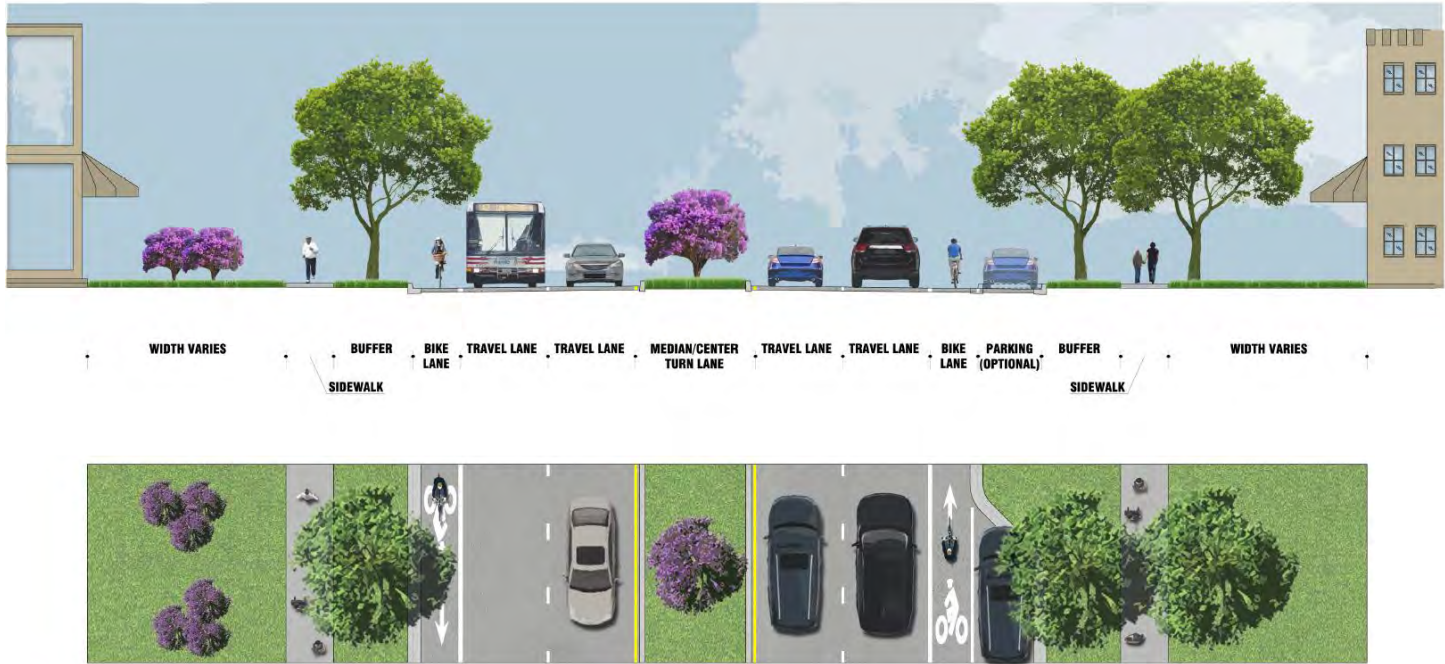
- Industrial-Commercial Streets** serve manufacturing and large commercial uses. With low land use densities and generally low non-motorized traffic volumes, the streetscapes on these streets should soften the often intense land uses and provide on-site stormwater treatment. These streets often form important links in bicycle routes. Areas with this street type typically feature wide and frequent driveway access points. The width, length, and number of driveway access points should be limited within a multimodal context and continue to serve motor vehicle access needs. A typical industrial-commercial street cross section is shown in Figure 25.

FIGURE 25. TYPICAL INDUSTRIAL-COMMERCIAL STREET CROSS SECTION



- **Neighborhood Boulevards** serve mixed land use areas similar to avenues, but with higher densities and higher traffic volumes that would necessitate two lanes in each direction. Neighborhood boulevards have bicycle lanes and may have on-street parking on one or both sides depending on the immediate adjacent land use. A typical neighborhood boulevard cross section is shown in Figure 26.

FIGURE 26. TYPICAL NEIGHBORHOOD BOULEVARD CROSS SECTION



- Regional Boulevards** serve regional destinations, through vehicle, and transit trips. The right-of-way accommodates the highest traffic volumes and high-capacity transit routes, and features the most widely-spaced traffic signals located only at intersections with other arterials and connectors. Both right- and left-dedicated turn lanes facilitate vehicle movements. There is generally no on-street parking, and unsignalized intersections with avenues tend to be right-in/right-out and may feature pedestrian crossing amenities such as HAWK signals. The high volumes of all users encourage separated facilities by mode, including transit priority lanes and shared-use paths for bicycles and pedestrians. The only location appropriate for this street typology in the study area is Central Ave east of Cabin Branch Road. A typical regional boulevard cross section is shown in Figure 27.

**HAWK** are High-Intensity Activated Crosswalk signals used to stop road traffic and allow pedestrians to cross safely. They are much more advanced than the traditional pedestrian crosswalk signals.

FIGURE 27. TYPICAL REGIONAL BOULEVARD CROSS SECTION





## Trail Typology

In addition to the street network, trails will provide vital links for pedestrians and bicyclists in the future study area transportation network. Trails are shared-use facilities that are separated from the roadway and may be located on access ways or easements outside of the street right-of-way. Trails serve both recreation and transportation functions and may be constructed and managed by DPW&T or Parks and Recreation. The two types of trails identified to fill local and regional gaps in the non-motorized transportation system are below:

- Neighborhood Trails** provide connections between destinations or trail types and are generally short (less than one mile) in length. Neighborhood trails can also provide internal, non-motorized circulation networks within large developments, parks, or campuses. Minimum total width for neighborhood trails is eight feet, though ten foot or wider widths are preferable where space is available and where usage is expected to be high. Separate trail surfaces may be provided for pedestrians and bicycles, or striping may be used to distinguish areas for different users and directions of travel. If located along a roadway, neighborhood trails should be set back a minimum of two feet, with a preferred setback of five feet.
- Regional Trails** are generally long (greater than one mile) linear trails that connect regional destinations and facilitate long-distance, non-motorized trips. These trails are primarily located outside the public right-of-way and provide a comfortable walking and biking environment with few interruptions due to intersections. Regional trails experience a fairly equal split between commuter and recreational use. Minimum total width for these trails is 12 to 14 feet, though wider widths should be provided where space is available and usage is expected to be high. Wider trails can accommodate two center bicycle lanes, each bordered by a 5 foot pedestrian lane, and 2 to 5 foot buffers on the roadway side.

## Complete Network Recommendations

Taken together, the street and trail types described above establish a framework for implementing a complete network within the study area, serving transportation needs within neighborhoods, between neighborhoods, and across the corridor. Figure 28 illustrates the function characteristics of each of the new street and trail types.

FIGURE 28. RECOMMENDED STREET TYPES AND FUNCTIONAL CHARACTERISTICS

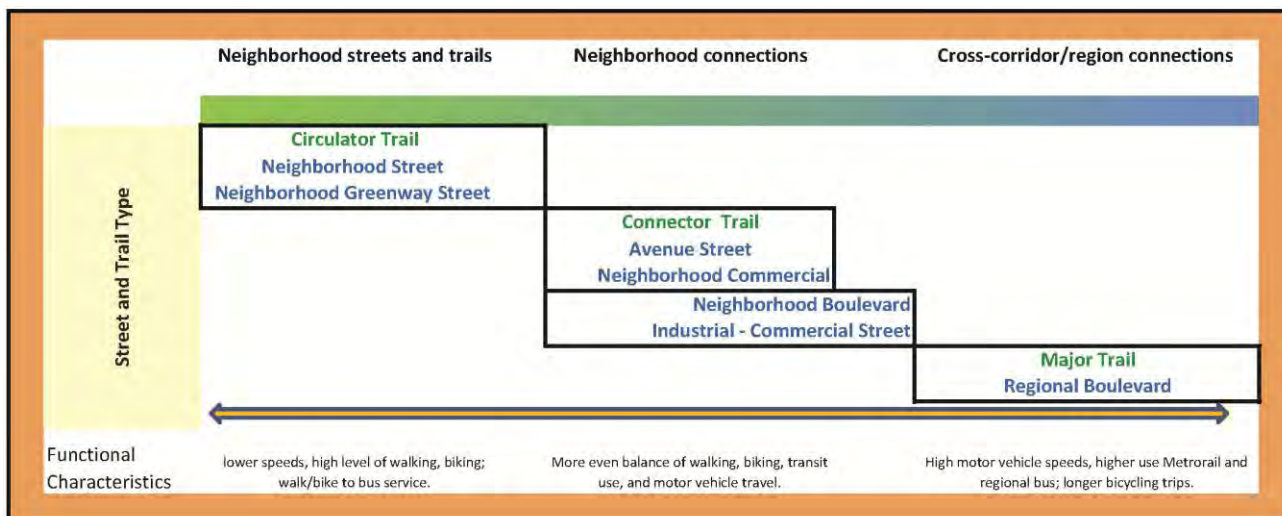




Figure 29 shows the proposed application of the new street and trail types to the existing transportation network. The map also shows the locations of proposed new street and trail connections to increase connectivity for all modes and develop a complete network. The future multimodal network is recommended in order to improve overall safety, mobility, and access within the corridor.

Constraints of the existing transportation network are evident when looking at existing and potential walking access to Metrorail stations, illustrated in Figures 7 and 8. Future development, particularly TOD adjacent to each of the stations, presents an opportunity to improve access for all modes with several key transportation network elements:

- New walking and bicycling facilities along existing streets
- New streets and trails providing circulation within and connections between developments
- New trails that connect neighborhoods directly to Metrorail stations and/or the regional trail network

The proposed network map is intended to illustrate conceptual future connections and does not represent precise alignments. Proposed street and trail types are intended to provide general guidance on future multimodal facility function and cross section. Detailed design elements (e.g., crossing treatments, lighting, and landscaping) are discussed in more detail below and should be selected to suit individual contexts using engineering judgment.

## Complete Street Design Treatments

The street and trail types discussed above provide a general overview of the future function and cross section of facilities. In order to integrate these facilities with surrounding land uses and create a safe, comfortable network for users, detailed design treatments will need to be selected and incorporated into the design of streets. Table 5 presents an overview of traffic calming, pedestrian, and bicycle treatments that support implementation of Complete Streets and TOD. Specific design treatments should be selected to suit individual contexts using engineering judgment.

FIGURE 29. PROPOSED FUTURE NETWORK

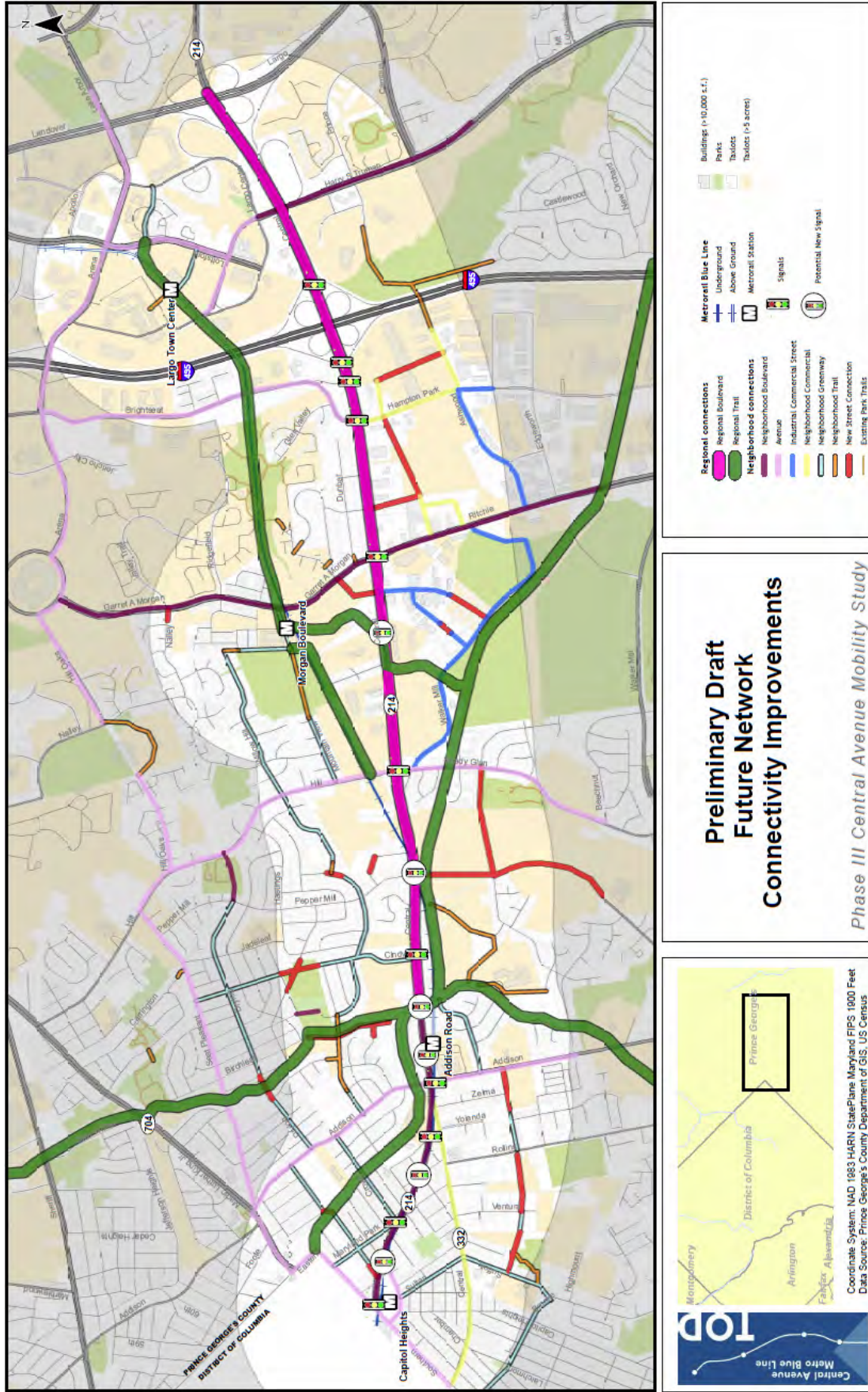


TABLE 5. OVERVIEW OF COMPLETE STREET DESIGN TREATMENTS

Treatment	Description	Advantages	Disadvantages
<i>Traffic Calming Treatments</i>			
Reduced Curb Radii	Reconstructing a street corner with a smaller radius to reduce vehicle turning speeds.	<ul style="list-style-type: none"> <li>• Forces sharper turn by right-turning motorists.</li> <li>• Improves safety of pedestrians by reducing crossing width and slowing motorists.</li> <li>• Reduces speed of right-turning motorists.</li> </ul>	<ul style="list-style-type: none"> <li>• Space may not be available.</li> <li>• Can be expensive.</li> <li>• Can make access more difficult for buses and large trucks.</li> </ul>
Narrow Travel Lanes	Restriping of existing travel lanes to reduce width.	<ul style="list-style-type: none"> <li>• Slows traffic.</li> <li>• Provides more space for bicyclists and possible bicycle lanes.</li> </ul>	<ul style="list-style-type: none"> <li>• Possible increase in vehicle-vehicle crashes.</li> </ul>
On-Street Parking	Full-time parking provided adjacent to the curb or just beyond a buffered bicycle zone (protected bicycle lanes).	<ul style="list-style-type: none"> <li>• Increases safety by placing a physical barrier between moving vehicles and pedestrians.</li> <li>• Reduces the speed of traffic traveling adjacent to the parked vehicles.</li> <li>• Provides parking.</li> </ul>	<ul style="list-style-type: none"> <li>• Can be dangerous for bicyclists riding in door zone.</li> <li>• Ineffective at reducing speeds if travel lane is very wide.</li> <li>• Reduces sight lines for motorists entering the street from driveways.</li> </ul>
Rumble Strips	Pavement surface treatments intended to cause drivers to experience vehicle vibrations signaling the drivers to slow down. Best used with other traffic calming treatments.	<ul style="list-style-type: none"> <li>• Reduces speeds.</li> <li>• Low cost.</li> </ul>	<ul style="list-style-type: none"> <li>• Vibration noise created may be inappropriate in residential areas.</li> <li>• Perceived more as a warning to slow down than a physical measure that forces slower speeds.</li> <li>• Less effective over time.</li> <li>• Can create a hazard for cyclists.</li> </ul>
Speed Humps	Speed humps are wide, rounded, mountable obstructions installed on the pavement surface across travel lanes, intended to cause vehicles to slow.	<ul style="list-style-type: none"> <li>• Inexpensive.</li> <li>• Very effective in slowing travel speeds.</li> <li>• Easily navigated by bicyclists.</li> </ul>	<ul style="list-style-type: none"> <li>• May be considered loud or noisy to nearby residents.</li> <li>• Forces emergency vehicles to slow down.</li> <li>• Inappropriate on streets with bus traffic due to rider comfort &amp; reduced travel speeds.</li> <li>• Creates a high-speed traffic hazard.</li> </ul>

Treatment	Description	Advantages	Disadvantages
Speed Tables	Speed tables are similar to speed humps except they have a flat-top. Generally wider than speed humps, gentler on vehicles, and generally used on higher order roads than bumps or humps because they allow a smoother ride and higher speeds.	<ul style="list-style-type: none"> <li>• Slows traffic.</li> <li>• Smoother ride than humps and bumps.</li> <li>• Not as effective in reducing speeds as humps and bumps.</li> <li>• More applicable for higher order roads (collectors).</li> <li>• Compatible with bicycle use, particularly on low-volume streets.</li> </ul>	<ul style="list-style-type: none"> <li>• Higher design speed.</li> <li>• Can be expensive if used with textured materials.</li> <li>• May be considered loud or noisy to nearby residents.</li> </ul>
Chicane	A series of fixed objects, usually extensions of the curb, which alter a straight roadway into a zigzag or serpentine path to slow vehicles. Can also be created by alternating on-street parking between sides of street.	<ul style="list-style-type: none"> <li>• Reduces speeds of motorists.</li> <li>• Easily negotiated by larger vehicles such as buses, trucks, and fire trucks.</li> <li>• Noise is not as common as with speed humps or rumble strips.</li> <li>• Potential to increase trees, landscaping and water runoff treatment.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduces on-street space for parking.</li> <li>• Maneuvering can be difficult for larger vehicles such as buses, trucks, and fire trucks.</li> <li>• Potential for motorist collision with the physical chicane.</li> <li>• Needs landscape maintenance.</li> </ul>
Choker	Narrowing of a street, often mid-block, and sometimes near an intersection. May be done with curb extensions, landscaping or edge islands in the street. They can form safe crossings if marked as crosswalks. Chokers can leave the street section with two narrow lanes or be taken down to one lane, thus requiring approaching drivers to yield to one another.	<ul style="list-style-type: none"> <li>• Reduces speeds and volumes of motorists.</li> <li>• Shortens crossing distances for pedestrians if used at mid-block crossings.</li> <li>• Provides pedestrian refuge area.</li> <li>• Can reduce traffic volumes.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential for motorist collision with the physical choker.</li> <li>• Reduces on-street space for parking.</li> <li>• Compatible with bicycling only when specified space is provided.</li> <li>• Design challenges if used on narrow streets without on-street parking.</li> <li>• May divert traffic to alternate streets.</li> </ul>



Treatment	Description	Advantages	Disadvantages
<p>Raised Intersection</p>	<p>The entire area of an intersection is raised above normal pavement surface level to reduce vehicle speed through the intersection and provide a better view of pedestrians and motorists in the intersection.</p>	<ul style="list-style-type: none"> <li>• Reduces speeds through intersections.</li> <li>• Reduces red light running at high speeds.</li> <li>• Calms two streets at once where collisions are most prevalent.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential drainage issues.</li> <li>• Less effective in reducing speeds than humps, tables, or raised crosswalks.</li> <li>• Expensive.</li> </ul>
<p><i>Intersection Safety Enhancements</i></p>			
<p>Prohibit Right-Turns on Red</p>	<p>Mounted sign eliminates the right of motorists to make a right turn at a red light. Can be used full-time or under restricted time intervals.</p>	<ul style="list-style-type: none"> <li>• Reduces conflicts between motorists and pedestrians.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduces time motorists have to make a right turn.</li> <li>• Potential vehicle queuing.</li> </ul>
<p>Signal Timing Modification</p>	<p>Adjustments of existing signal timings to more readily accommodate all modes. Could include reducing the amount of green time to decrease the amount of time pedestrians wait at signals.</p>	<ul style="list-style-type: none"> <li>• Improves conditions for pedestrians.</li> <li>• Improves overall safety of intersection.</li> </ul>	<ul style="list-style-type: none"> <li>• Improving conditions for one mode is often done at the expense of others (e.g., giving more green time to pedestrians often means motorists receive less green time).</li> </ul>
<p>Leading Pedestrian Interval</p>	<p>Pedestrians are given advance time to begin crossing at the crosswalk before conflicting vehicles start moving.</p>	<ul style="list-style-type: none"> <li>• Puts pedestrians well into the crosswalk and more visible before vehicles begin moving into the crossing zone.</li> <li>• Improves pedestrian safety.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduces green time for conflicting vehicle movements.</li> <li>• Can add to delays at highly congested intersections.</li> </ul>
<p>Push Button Retrofit</p>	<p>Signs above the pedestrian push-button that indicate direction of crossing. "Confirm" press buttons acknowledge activation through a light or sound after called by a pedestrian.</p>	<ul style="list-style-type: none"> <li>• Confirm press buttons have been shown to increase the number of pedestrians using the push-button.</li> <li>• Pedestrians more likely to wait for the Walk phase signal.</li> </ul>	<ul style="list-style-type: none"> <li>• Expense of implementing comprehensively.</li> </ul>

Treatment	Description	Advantages	Disadvantages
Pedestrian Countdown Signal	Walk/Don't Walk pedestrian signals with countdown signal informing pedestrians of the time remaining to cross the street.	<ul style="list-style-type: none"> <li>Fewer pedestrians cross the street late in the countdown as compared to signal heads with only the Flashing-Don't-Walk light.</li> </ul>	<ul style="list-style-type: none"> <li>Expense of implementing comprehensively.</li> </ul>
Protected Left-Turn	Allows left-turning vehicles a protected movement (i.e., no conflicting movements), generally involving the installation of a left-turn arrow.	<ul style="list-style-type: none"> <li>Removes conflicts between left-turning vehicles and oncoming, through-movement vehicles.</li> <li>Improves left-turning operations.</li> </ul>	<ul style="list-style-type: none"> <li>Less green time for through and right-turn movements.</li> <li>Less green time for pedestrian crossings.</li> </ul>
Reduce or Add Lane; Modify Existing Geometry	Modify the existing intersection geometry to respond to conditions including reducing pedestrian crossing exposure to traffic, adding or eliminating a traffic movement, creating space for the type and level of pedestrian activity, reducing speed of turning vehicles.	<ul style="list-style-type: none"> <li>Improve safety or capacity according to situation.</li> <li>Increase or decrease user delay according to situation.</li> </ul>	<ul style="list-style-type: none"> <li>Lack of right of way and/or physical space.</li> <li>High cost and long timeframe.</li> </ul>
Roundabout	Raised circular island intersection treatment where all entries are yield controlled, circulating vehicles have the right of way, and pedestrian access is allowed only across the roundabout legs.	<ul style="list-style-type: none"> <li>Yield control reduces wait times, thus getting traffic more steadily through the intersection.</li> <li>Reduces the severity of crashes relative to signalized intersections.</li> <li>Reduces conflict points compared to a signalized intersection.</li> </ul>	<ul style="list-style-type: none"> <li>Requires substantial right of way for construction</li> <li>Pedestrians are not provided with a protected signal phase where all traffic is stopped; rely on driver courtesy and respect for pedestrian right-of-way in the crosswalk.</li> <li>High cost.</li> </ul>

Treatment	Description	Advantages	Disadvantages
<i>Pedestrian Crossing Treatments</i>			
In-Street “Yield for Pedestrian” Sign	Signs placed in the middle of crosswalks to increase driver awareness of pedestrians and the legal responsibility to yield right-of-way to pedestrians in crosswalk.	<ul style="list-style-type: none"> <li>• Increases the number of motorists that yield to pedestrians in the crosswalk.</li> <li>• Reinforces the right of pedestrian in the carriage-way.</li> </ul>	<ul style="list-style-type: none"> <li>• If used too often, motorists have a tendency to ignore the signs.</li> </ul>
High-Visibility Crosswalk	Clear, reflective roadway markings and accompanying devices at intersections and priority pedestrian links, located only where motorists should expect pedestrians with sufficient sight distance and reaction time with prevailing travel speeds.	<ul style="list-style-type: none"> <li>• Warns motorists of potential for pedestrians.</li> <li>• Designates a preferred location for pedestrians.</li> <li>• Maryland law requires motorists to yield to pedestrians in or near the vehicle’s path in marked crosswalks.</li> </ul>	<ul style="list-style-type: none"> <li>• Most effective with other traffic control (signals, stop signs) or physical treatments (bulb outs) that help to reinforce crosswalks and support reduced vehicle speeds.</li> <li>• Motorists may ignore.</li> </ul>
Raised Crosswalk	A pedestrian crossing area raised above street grade to give motorists and pedestrians a better view of the crossing area. A raised crosswalk is essentially a speed table marked and signed for pedestrian crossing.	<ul style="list-style-type: none"> <li>• Provides better view for pedestrians and motorists.</li> <li>• Slows motorists travel speeds.</li> <li>• Broad application on both arterial &amp; collector streets.</li> </ul>	<ul style="list-style-type: none"> <li>• Can be difficult to navigate for large trucks, buses, and snow plows.</li> </ul>
Bulb-out/Curb Extension	An extension of the curb or the sidewalk into the street (in the form of a bulb), usually at an intersection, that narrows the vehicle path, inhibits fast turns, and shortens the crossing distance for pedestrians.	<ul style="list-style-type: none"> <li>• Shortens crossing distances for pedestrians.</li> <li>• Reduces motorist turning speeds.</li> <li>• Increases visibility for both motorists and pedestrians.</li> <li>• Enables permanent parking.</li> <li>• Enables tree and landscape planting, &amp; water runoff treatment.</li> </ul>	<ul style="list-style-type: none"> <li>• Can only be used on streets with unrestricted on- street parking.</li> <li>• Physical barrier can be exposed to traffic.</li> <li>• Greater cost and time to install than high-visibility crosswalks.</li> </ul>

Treatment	Description	Advantages	Disadvantages
Raised Median Island/ Pedestrian Refuge Area	Signs with a pedestrian-activated “strobe- light” flashing pattern that attracts attention and notifies motorists that pedestrians are crossing.	<ul style="list-style-type: none"> <li>Typically increases motorists yielding behavior.</li> <li>Pedestrians may not activate flashing light.</li> </ul>	<ul style="list-style-type: none"> <li>Motorists may not understand flashing lights.</li> </ul>
Pedestrian Hybrid Signal (HAWK)	Pedestrian-activated signal, unlit when not in use, begins with a yellow light alerting drivers to slow, and then a solid red light requires drivers to stop while pedestrians have the right-of-way to cross the street.	<ul style="list-style-type: none"> <li>A very high rate of motorists yielding to pedestrians.</li> <li>Drivers experience less delay at hybrid signals compared to other signalized intersections.</li> </ul>	<ul style="list-style-type: none"> <li>Expensive compared to other crossing treatments.</li> <li>Requires pedestrian activation.</li> </ul>
<i>Bicycle Accommodations</i>			
Wayfinding	Signs directing pedestrians and bicyclists towards destinations in and routes through the area, typically including distance and average walk/cycle times.	<ul style="list-style-type: none"> <li>Eases navigation for residents and visitors by bicycle.</li> <li>Provides guidance to destinations from streets and along multi-use trails.</li> <li>Offers another indication to motorists of the presences of bicycles.</li> </ul>	<ul style="list-style-type: none"> <li>Maintenance and vandalism.</li> </ul>
Bicycle Sharrows	A shared-lane marking, or sharrow, is a pavement marking used where space does not allow for a bike lane typically indicating that bicycles have equal right to the travel lane. Sharrows remind motorists of the presence of bicycles and indicate to cyclists where to safely ride within the roadway.	<ul style="list-style-type: none"> <li>Reduces wrong-way and sidewalk riding.</li> <li>Improves cyclists positioning in the roadway.</li> <li>Informs motorists of presence of bicyclists.</li> <li>Marks streets without adequate space for bike lanes.</li> </ul>	<ul style="list-style-type: none"> <li>Pavement marking maintenance.</li> <li>Not as protected as a bike lane.</li> </ul>



Treatment	Description	Advantages	Disadvantages
Bike Lanes	The area of roadway designated for non-motorized bicycle use, separated from vehicles by pavement markings.	<ul style="list-style-type: none"> <li>• Improves safety and comfort by increasing the visibility and awareness of cyclists.</li> <li>• Designates carriage-way space for bicyclists.</li> </ul>	<ul style="list-style-type: none"> <li>• May still conflict with motorists.</li> <li>• Motorists may illegally park in bike lane.</li> </ul>
Bike Box	Marked area in front of the stop bar at a signalized intersection that allows cyclists to correctly position themselves for turning movements during the red signal phase by pulling ahead of the queue.	<ul style="list-style-type: none"> <li>• Decreases conflicts and crashes between cars and bicycles.</li> <li>• Separates bicycles from cars at the intersection.</li> </ul>	<ul style="list-style-type: none"> <li>• Extensive public education required.</li> <li>• Pavement marking maintenance and costs.</li> </ul>
Bicycle Boulevard/ Neighborhood Greenway	Low volume and low speed streets that have been optimized for bicycle travel through treatments such as traffic calming and traffic reduction, signage and pavement markings, and intersection crossing treatments.	<ul style="list-style-type: none"> <li>• Converts well-connected streets prone to cut-through traffic to streets well-suited for bicycle transportation.</li> <li>• Allows through movements for cyclists while discouraging similar through trips by non-local motorized traffic.</li> <li>• Creates a comfortable, low-volume, low-speed space for bicyclists and pedestrians.</li> </ul>	<ul style="list-style-type: none"> <li>• Some treatments more expensive than others.</li> <li>• In areas with few alternative routes, reduces those that can relieve traffic during peak travel times.</li> </ul>
Cycle Track/ Protected Bike Lane	An exclusive bike facility physically separated from vehicle travel lanes, parking lanes, and sidewalks. Can be one-way, two-way, at street level, at sidewalk level, or at an intermediate level.	<ul style="list-style-type: none"> <li>• Buffer provides higher level of safety than bike lanes.</li> <li>• Reduces risk of “dooring” compared to a bike lane.</li> <li>• Attractive to a wider spectrum of the public than bike lanes.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential conflicts at intersections.</li> <li>• Can be expensive.</li> <li>• Requires more space than bike lane</li> </ul>

Treatment	Description	Advantages	Disadvantages
Shared-Use Pathway/ Sidepath	Paved pathways parallel to but away from the carriage-way and out of the path of turning vehicles designed with space adequate for safe use by both pedestrians and bicyclists. Appropriate for roads parallel to rail track, waterway or other conditions with infrequent cross traffic.	<ul style="list-style-type: none"> <li>• Separates bicyclists from vehicle traffic.</li> <li>• Combination of pedestrians and bicyclists requires less space than separate facilities for each.</li> </ul>	<ul style="list-style-type: none"> <li>• Needs adequate space to accommodate buffer from street and width to allow the passing of bicyclists and pedestrians.</li> <li>• Bicycle and pedestrian conflicts.</li> </ul>
Bicycle Parking	Devices and/or areas that allow secure bicycle parking, often located at areas of high bicycle and pedestrian traffic such as office and industrial areas, shopping centers, schools, and multi-use trails. Can be provided on a curb extension or in on-street parking spaces.	<ul style="list-style-type: none"> <li>• Provides a secure location to store and lock bicycles.</li> <li>• Locations are generally very close to and visible from the point of interest.</li> <li>• Relatively inexpensive and easy installation.</li> <li>• Encourages community bicycle use.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires space in potentially busy area.</li> <li>• May remove an on-street parking space.</li> </ul>

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## Complete Street Checklist

A Complete Streets Checklist is a useful tool for evaluating how each travel mode has been considered and accommodated in the process of planning or designing projects that are within or that impact the public right-of-way. The checklist approach also provides a simple means for assuring that the new adequate pedestrian and bicycle facilities requirements are incorporated into the design review process.

The draft 2012 Prince George’s County *Transportation Review Guidelines* include draft checklists for evaluating trip and parking credits for which a proposed development is eligible. The checklist presented below suggests potential revisions to these checklists and additional questions that could be added in order to make the checklists applicable to other projects such as scheduled repaving/restriping, or capital improvement projects.

The checklist included below is based on the draft 2012 Prince George’s County *Transportation Review Guidelines*, approved MPOT Complete Streets principles, and the Complete Streets design and policy recommendations for Prince George’s County discussed in the “Policy and Design Review” section of this report. The checklist is based on several assumptions about implementing Complete Streets and TOD:

- Street and trail types are part of a transportation-land use relationship inherent in all development projects, especially TOD. No project is a silo. Roadway reconstruction affects existing and prospective land uses, and those land uses influence the roadway cross-section.
- All projects, regardless of scope or owner (public/private), will contribute to creating the complete network. A complete network emerges with each roadway or development project, especially when attention is given to how a project fits into the network vision.
- Over time, a complete network will be established.
- Travel within the corridor can be shifted from primarily motor vehicle to a significant proportion of walking, bicycling, and transit trips. Loosely based on the “build it and they will come” theory, improvements to walking, biking, and transit transportation make these modes more attractive and possible to use.

The checklist addresses the following aspects of each project:

- **General Information** includes the type of project, land use, and project scope.
- **Site Context and Opportunities** addresses the surrounding land uses, destinations, and transportation facilities.
- **Complete Streets Assessment** evaluates the project design in relation to the “four D’s”—density, diversity, design, and destinations—and its ability to support TOD and Complete Streets.

In order for the checklist to effectively influence roadway and site design, it should be used by public agencies in all stages of project development, including development review, permit approval, street project design, planning, and maintenance processes.

Complete Streets Project Review Checklist

GENERAL PROJECT INFORMATION

- 1. Project Name \_\_\_\_\_ 2. Design Completion (%) \_\_\_\_\_
- 3. Project Area (precise street limits and scope) \_\_\_\_\_
- 4. Project Type:  Roadway Maintenance \_\_\_\_\_  Capital Improvement Project  Private Development
- 5. Project Description \_\_\_\_\_
- 6. Dates Started/Anticipated to Start: Planning \_\_/\_\_/\_\_ Preliminary Design \_\_/\_\_/\_\_ Final Design \_\_/\_\_/\_\_ Construction \_\_/\_\_/\_\_
- 7. Lead Agency or Entity: \_\_\_\_\_
- 8. Primary Contact: \_\_\_\_\_
- 9. Partner Agencies or Entities: \_\_\_\_\_

SITE CONTEXT & OPPORTUNITIES

- 10. Street Type: Identify the classification of the street(s) impacted by the project using the Proposed Complete Street Network map.  
\_\_\_\_\_
- 11. Land Use & Character: Describe the character of the project area, including predominant land uses, densities, and any historic districts or special zoning districts present. Describe the compatibility of the proposed design with these characteristics.  
\_\_\_\_\_  
\_\_\_\_\_
- 12. Trip Generators & Attractors: List any major sites, destinations, and trip generators within one half mile of the project area, including: transit stops with service frequency of at least 20 minutes during peak periods; public facilities (e.g., schools, libraries, parks, or post offices); recreational community, or cultural facilities; retail centers greater than 20,000 sf GFA; employment centers greater than 40,000 sf GFA; and existing sidewalks, paths, bike lanes, or cycle tracks. Describe how the proposed design provides connections to these sites.  
\_\_\_\_\_  
\_\_\_\_\_
- 13. Travel Patterns & Conditions: Describe existing and desired future walking, bicycling, transit, motor vehicle, and freight conditions within the project area. Describe how the proposed design addresses these conditions, including volumes, safety, comfort, connectivity, and quality of the street environment.  
\_\_\_\_\_  
\_\_\_\_\_
- 14. Opportunities: Identify opportunities to address safety, mobility, and access within the larger corridor.

Safety
<i>Example: Road project will install signal at intersection with companion bus stops.</i>

Mobility (within the corridor)
<i>Example: Re-striping project will stripe bike lanes.</i>

Access to rail and bus service
<i>Example: Development project will install bus shelter and lighting or project trail access to Metrorail station.</i>



**COMPLETE STREETS ASSESSMENT**

*Pedestrian Facilities - Does the proposed design:*

- 15. Provide adequate clear sidewalk widths along street frontages? (See Complete Street Typology guidelines, minimum 5 feet of clear sidewalk width required per ADA) .....  Yes  No
- 16. Provide recommended buffer widths between pedestrians and traffic? (See Complete Street Typology guidelines) .....  Yes  No
- 17. Include pedestrian facilities and designated crossings that provide direct connections to destinations identified in Question #12? .....  Yes  No
- 18. Provide pedestrian facilities for internal site circulation (e.g., walkways along and between buildings, walkways through parking lots to buildings, designated crossings of drive aisles)? .....  Yes  No
- 19. Provide walkway lighting that meets or exceeds County standards? .....  Yes  No
- 20. Minimize vehicle intrusions into the pedestrian zone (e.g., driveways, lay-by lanes)? .....  Yes  No
- 21. Provide designated pedestrian crossing opportunities every 300-500'? .....  Yes  No
- 22. Provide ADA compliant curb ramps where required and/or appropriate? .....  Yes  No

*Bicycle Facilities - Does the proposed design:*

- 23. Include bicycle facilities that provide direct connections to destinations identified in Question #12? .....  Yes  No
- 24. Include bicycle facilities identified in adopted plans and/or recommended bicycle facilities based on frontage street types? (See Complete Street Typology guidelines) .....  Yes  No
- 25. Provide adequate bicycle parking per County Code requirements? .....  Yes  No

*Transit Facilities - Does the proposed design:*

- 26. Include transit enhancements (e.g. bus shelter, bus or intermodal transfer stop, park-and-ride facility, bus stop pad or pull-out, direct cash contribution to transit service costs, other transit service or system enhancements/amenities that serve the subject property) or propose to defray the cost of transit enhancements on-site or within one half mile of the site? .....  Yes  No
  - a. If yes, are proposed transit enhancements connected to the site by adequate pedestrian facilities? .....  Yes  No
- 27. Provide lighting at on-site transit stops that meets or exceeds County standards? .....  Yes  No
- 28. Provide ADA compliant landing pads at on-site transit stops? .....  Yes  No
- 29. Provide a space for passengers to wait for, board, and alight transit vehicles that are separate from the walkway at on-site stops? .....  Yes  No

*Parking Facilities - Does the proposed design:*

- 30. Minimize off-street parking in comparison with Subtitle 27? .....  Yes  No
- 31. Incorporate shared parking? .....  Yes  No
- 32. Screen parking from the street (e.g., place it behind the building it serves, “wrap” it with commercial or residential space)? .....  Yes  No
- 33. Utilize structured parking for more than 75 percent of on-site parking? .....  Yes  No
- 34. Include a parking pricing strategy to control parking demand? .....  Yes  No

*Urban Design - Does the proposed design:*

- 35. Include streets and trails that create a connected, grid system (as opposed to cul-de-sacs)?.....  Yes  No
- 36. Include doors and street level windows that face the street and/or public parks and plazas?.....  Yes  No
- 37. Include buildings that come all the way to the street or build-to line? .....  Yes  No
- 38. Arrange retail, restaurant, and service uses to create an average of less than 150 feet between main entrances? .....  Yes  No
- 39. Minimize auto-oriented uses such as drive-in or drive-up facilities? .....  Yes  No
- 40. Achieve densities at or within ten percent of the maximum permitted density (if a Euclidean zone) or the density recommended by a master plan, sector plan, or general plan designation? .....  Yes  No
- 41. Convert low-intensity uses such as surface parking or single-story buildings to denser uses? .....  Yes  No
- 42. Include a mix of uses that will attract people throughout the day and week? .....  Yes  No
- 43. Include convenience uses (e.g., newsstands, coffee shops, daycare, dry cleaners) for surrounding residents, commercial tenants, and transit patrons within walking distance (one-half mile)? .....  Yes  No
- 44. Incorporate vertical mixed-use? .....  Yes  No







**Section 7**  
**Future Conditions**

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## FUTURE CONDITIONS

This chapter describes the alternatives analysis and identification of preferred concepts to accommodate the future vision for the Central Avenue corridor. Four alternatives were considered for the year of 2035, including a baseline “no-build” scenario from which the other three “build” alternatives were developed. The three build alternatives are as follows:

1. Central Avenue “Road Diet” between Southern Ave NE and Cabin Branch Road
2. Transit-Oriented Development (TOD) at the Morgan Boulevard Metro Station area
3. Pedestrian and bicycle connectivity around Largo Town Center

Each of the three scenarios above is presented as an alternative collection of transportation improvements in response to future changes in land use. The three “Build alternatives” were tested as they represent Complete Streets concept ideas proposed by this study and because they apply to specific conditions in the study area. For example, true transit-oriented, rather than transit-adjacent, development is proposed for the Morgan Boulevard station area, and a reduced general traffic lane with designated bicycle accommodation section, or a “road diet,” is proposed for the western end of the corridor.

The analysis presented in this chapter is designed to show how the future changes in land use, anticipated due to the location of four Metrorail stations, can—and should—be supported by transit-oriented street design and connectivity. Increased land use density, transportation mode diversity, and Complete Streets design elements have the potential to impact the appearance and operations of Central Avenue, as well as other arterials in the corridor. This chapter discusses how the regional travel demand model was used to provide an understanding of more detailed corridor intersection operations using Synchro—a signal timing software used to perform capacity analysis for signalized intersections. Results were used to evaluate concepts that are proposed in this study, particularly a significant number of new street connections that have not been modeled but are recognized as elements of project implementation.

### Background

Central Avenue (MD 214) was built and developed first as a rural and then as a suburban arterial from Washington, D.C. to Prince George’s County. Development during the prior 50 years was oriented in typical fashion toward traditional suburban land use and zoning patterns predicated on easy access to uncongested roadways and low-density retail properties with adequate parking. During the development period of Central Avenue corridor, transit accessibility, pedestrian and bicycle networks, and trip reducing opportunities, such as compact/mixed-use developments, were not prioritized.

The extension of WMATA’s Blue Line to Largo Town Center during the last ten years has brought about an opportunity for the Central Avenue corridor to support higher levels of activity and higher concentrations of land use without causing major traffic impacts on the road system. Experience and research<sup>1</sup> has shown that for a typical suburban arterial to efficiently support transit-adjacent neighborhoods, it must become part of a more connected road network that invites pedestrian and bicycle travel. The road itself must be easier to cross and provide more opportunities for safe crossing. Long-standing safety concerns dating back to the initial opening of the Addison Road Metrorail Station are evidence of the inconsistency between the arterial’s single mode (auto) design and its multimode (transit, pedestrian, auto) function.

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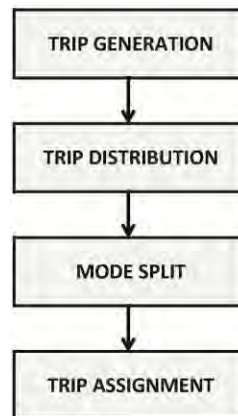
1 Ewing, Reed and Robert Cervero. *Travel and the Built Environment: A Synthesis*. Transportation Research Record, 1780: 87-144. 2001.

It has been proposed that Central Avenue, from the Capitol Heights Metro Station to the Addison Road Metro Station, operate as a neighborhood boulevard, a major road that provides designated space for bicycles and pedestrians and promotes compatible travel speeds. Morgan Boulevard, the major road leading to the Morgan Boulevard Station and FedEx Field, has also been proposed as a neighborhood boulevard with fewer general traffic lanes.

## Applying the 4-Step Model

The future alternatives were developed by incorporating and applying the traditional 4-step transportation modeling process, which is shown and described in Figure 30.

FIGURE 30. 4-STEP MODEL



For each of the Transportation Analysis Zones (TAZ) in the computer-based transportation demand model, the household and employment data generates a certain number of trips. In the second step, these trips are distributed throughout the network based on the strength of the attraction between trip generators (e.g., residences) and trip attractors (e.g., places of employment) in the model. The mode split step determines the number of trips for each available mode in the model—transit, single occupant vehicle, and high occupant vehicle (HOV 2 and HOV 3+). The county model (like many others) does not produce mode share for pedestrian or bicycling trips. The final step, trip assignment, places the trip flows onto the transit and road network.

Future transportation network improvements, which include changes in vehicle and transit infrastructure as well as alterations to transit services schedules, were incorporated into the travel-demand model by County staff. The following transportation improvements in the study area, which are included in the county's long-range fiscally-constrained transportation plan, are part of the future year model:

- Addition of an eastbound right-turn lane at the intersection of Central Avenue and Addison Road.
- Modification of southbound Hill Road to a five-lane approach that includes two left-turn lanes, a shared left-through lane, a through lane, and a right-turn-only lane.
- Modification of northbound Shady Glen to include two left-turn lanes, a through lane, and a shared through-right lane.
- Modification of westbound Central Avenue to include two left-turn lanes, two through lanes, and a shared through-right lane.

- Modification of northbound Ritchie Road to a five-lane approach that includes two left-turn lanes, a shared left-through lane, a through lane, and a right-turn-only lane.

Prince George’s County modeling staff ran the travel demand model and provided the outputs and results for use in the development of the future alternatives for the TOD Mobility project. The county model is calibrated and validated based on the recent land use, household, employment, and transportation network data. The data sources used to develop the travel demand model are described in Appendix 3. The methodology used to translate travel demand model output data into baseline roadway traffic volumes used established engineering principles and techniques. Future alternatives were developed by combining the travel demand model results with market study data and proposed land use scenarios developed by AECOM. The future scenario development methodology is described in Appendix 3.

**TRIP GENERATION**

The project study area in the Prince George’s County’s travel-demand model is comprised of 46 Transportation Analysis Zones (TAZ), and each of these zones contains the household and employment data used to produce and attract trips. The household and employment data in the model is shown in Table 6, and comes from MWCOC regional data and Prince George’s County community master plans. The growth rates in households and employment shown is the average across the entire area and may differ from TAZ to TAZ based upon characteristics of individual TAZs.

TABLE 6. HOUSEHOLD AND EMPLOYMENT DATA

Model Input	Year 2011	Year 2035	Annual Growth
Households	15,400	34,400	3.08%
Jobs	15,300	32,800	2.84%

Trip generation for the future conditions models consisted of the following:

***No-Build Scenario***

The No-Build scenario, which functions as the baseline for future conditions, used the model results after standardized application of the National Cooperative Highway Research Program (NCHRP) 255 traffic volume development processes, and included minimal volume balancing between intersections.

***Build Scenario #1: Road Diet***

The results of the market survey data presented a very different picture of residential and employment growth in the study corridor as compared to the assumptions that produced the travel demand results for the No-Build alternative. Table 7 contrasts the market-based analysis with the outputs from the county’s travel demand model.

Table 7. Household Comparison Between Travel Demand Model and Market Study

Forecasting Tool	Forecasted Household unit growth to 2035	Total Growth Expected
Travel Demand Model	19,000	123%
Market Study	2,000-2,500	13 – 16%
Road Diet Analysis	12,500	81%



In the road diet alternative, one-third of growth assumed in the travel model was projected not to occur. This is a highly conservative estimate relative to the results of the market study. The reduced growth assumptions have the following effects on traffic volumes at the intersections of Central Avenue/Southern Boulevard (near the Capitol Heights Metro station) and Central Avenue/Addison Road (near the Addison Road Metro station), and are shown in Table 8.

TABLE 8. BUILD SCENARIO #1: ROAD DIET TRIP GENERATION MODIFICATIONS

Metro Station Analysis Area	Model Household Growth (2011-2035)	Road Diet Household Growth (estimated)	New model trips generated		Final Road Diet trips (reduction from model)	
			A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour
Capitol Heights	1,481	987	730	610	487 (-243)	407 (-203)
Addison Road	1,716	1,144	539	494	360 (-179)	329 (-165)

**Build Scenario #2: Morgan Boulevard TOD**

The trip generation methodology for this alternative was based on the county’s preferred alternative for the Morgan Boulevard Station area, referred to as Mixed-Use Concept A. The trip generation methodology proceeded as follows:

1. Trip generation was determined for the existing 2011 land uses using the eighth edition of the Institute of Traffic Engineers Trip Generation Manual.
2. 2011-2035 natural growth in the TAZ (not including the TOD concept) was determined by comparing existing traffic volumes to the no-build traffic volumes.
3. Trip generation for the preferred alternative was determined using the eighth edition of the Institute of Traffic Engineers Trip Generation Manual.
4. Total year 2035 trips were calculated by combining the existing trips, the natural 2011-2035 growth, and the trips generated by the preferred alternative development.

TABLE 9. BUILD SCENARIO #2: MORGAN BOULEVARD TOD TRIP GENERATION

Time Period	Existing Trip Generation (2011)	Travel Demand Model Growth (2011-2035)	TOD Trip Generation	Total Trips (2035)
A.M. Peak Hour	1,472	525	1,257	3,254
P.M. Peak Hour	1,546	961	2,133	4,640

**Build Scenario #3: Largo Town Center**

The lack of additional analysis showing specific land use changes within the Largo Town Center required the team to assume no differences in the projections of the county’s travel demand model. For this alternative, the land use was

assumed to remain the same as the no-build model. This method allows for all the forecasted natural growth to occur, but would also include full-build of the currently vacant land in Largo Town Center based on existing zoning.

**TRIP DISTRIBUTION**

The county’s travel demand model produced the trip distribution matrix, which shows the total number of trips produced and attracted to each TAZ in the model. The trip distribution matrix for the no-build alternative was assumed to remain constant for the three build alternatives.

**MODE SPLIT**

Mode split is typically an output of the travel demand model. The mode split results are generated based on several independent variables in the travel demand model. Among the most common factors are: residential density, household income, number of vehicles in a household, distance from the Central Business District (CBD), and availability of transit.

*No-Build Scenario*

As the future baseline condition by definition, the volumes produced by the no-build model incorporate the output mode split from the travel demand model.

*Build Scenario #1: Central Avenue Road Diet*

Improvements to the pedestrian, bicycle, and trail infrastructure as part of the road diet alternative, in conjunction with future development that would be more favorable to non-automobile trips, provides an opportunity to reduce future vehicular trips. Data from the 2010 American Community Survey<sup>2</sup> shows that for Prince George’s County, two percent of workers 16 years and older either walked or bicycled to work. Based on this data, and assuming a conservative approach that there would be no increase in non-motorized mode share in the future, two percent of traffic was removed from the intersections of Central Avenue/Southern Boulevard and Central Avenue/Addison Road.

*Build Scenario #2: Morgan Boulevard TOD*

Total year 2035 trips generated by the TOD development at the Morgan Boulevard Metro station were factored using mode-split trip data by trip purpose from the travel-demand model. These data were used to account for walking, bicycling, transit, and carpooling trips. The traffic generated from the TOD were reduced based on pedestrian, bicycle, HOV 2+, HOV 3+, and transit mode share to determine the final number of vehicle trips in the A.M. and P.M. peak hours, as shown in Table 10.

**TABLE 10 BUILD SCENARIO #2: MORGAN BOULEVARD TOD MODE SPLIT REDUCTIONS**

Time Period	TOD Trip Generation	Work trips	Non-work trips	Transit Work Trips (15%)	Transit Non-Work Trips (5%)	Carpool Work Trips (5%)	Carpool Non-Work Trips (10%)	Ped/Bike Trips – all purposes (2%)	Final Auto Trips
A.M. Peak Hour	1,257	542	715	-81	-36	-27	-72	-25	1,016
P.M. Peak Hour	2,133	500	1,633	-75	-82	-25	-163	-43	1,745

<sup>2</sup> [http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS\\_10\\_1YR\\_B08301&prodType=table](http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_10_1YR_B08301&prodType=table).

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### ***Build Scenario #3: Largo Town Center***

No mode share reductions were taken for Largo Town Center. Given the uncertainty of what future transportation improvements and land use changes would be, it was assumed that a conservative approach would be most appropriate in evaluating the suggested roadway changes.<sup>3</sup>

#### **TRIP ASSIGNMENT**

The fourth and final step of the modeling process takes the trips and assigns them to the roadway network.

### ***No-Build Scenario***

The trip assignment produced by the travel demand model was used for this scenario without modification.

### ***Build Scenario #1: Road Diet***

An examination of the proposed future roadway network near Southern Boulevard area south of Central Avenue suggests that travel patterns are likely to change. Proposed roadway connections that lie south of and parallel to Central Avenue, specifically the alignment that connects various sections of Cumberland Street and Brooke Road, would provide northbound traffic with alternate routes to travel towards Washington, D.C. The new route choices help disperse traffic and reduce “point-loading” at Central Avenue/Southern Avenue SE.

The proposed traffic signal at Central Avenue/Davey Street creates an opportunity for vehicle traffic originating from areas east of Chamber Ave/Larchmont Ave and destined towards Washington, D.C. to avoid the congestion on Southern Ave by using Davey Avenue to make a left-turn onto Central Avenue. Therefore, for northbound through volumes on Southern Avenue, it is assumed that a small percentage would divert to take advantage of the less-congested traffic conditions on Davey Avenue. These vehicles were routed onto Davey Street, and then proceed through the Central Avenue/Southern Avenue intersection as westbound through traffic.

The proposed new east-west street connections that would run from Addison Road west to Rollins Avenue and Suffolk Ave., would allow some of the traffic to reach Central Avenue without traveling north on Addison Road. Proposed traffic signals at Central Avenue/Davey Road and at Central Avenue/Cabin Branch Road would make it easier for vehicles to access Central Avenue from these locations and reduce congestion at the Central Avenue/Addison Road intersection. The improvement in network connectivity via additional route choices and new traffic signals would enable vehicles to seek the less congested routes.

### ***Build Scenario #2: Morgan Boulevard TOD***

This scenario focused on development at a specific and single location. Therefore, there were no adjustments needed during the trip assignment step.

### ***Build Scenario #3: Largo Town Center***

Without any changes to the land use pattern other than what was provided by the travel demand model, this scenario did not require any modifications during the trip assignment step.

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<sup>3</sup> A study of Largo Town Center market and land use is currently underway, so was unavailable for this analysis.

**No-Build Scenario**

The final volumes developed through the 4-step modeling process, the NCHRP 255 procedures, and final post-processing and volume balancing were entered into the Synchro 8 traffic modeling software. The Synchro model contained the transportation network improvements assumed to occur by the year 2035. The no-build lane configurations for the study area are shown in Figure 31. The Synchro model was then used to evaluate traffic operations during the A.M. and P.M. peak hours, which are summarized in Table 11 and Table 12.

TABLE 11. COMPARISON BETWEEN 2011 EXISTING CONDITIONS AND 2035 NO-BUILD RESULTS—A.M. PEAK

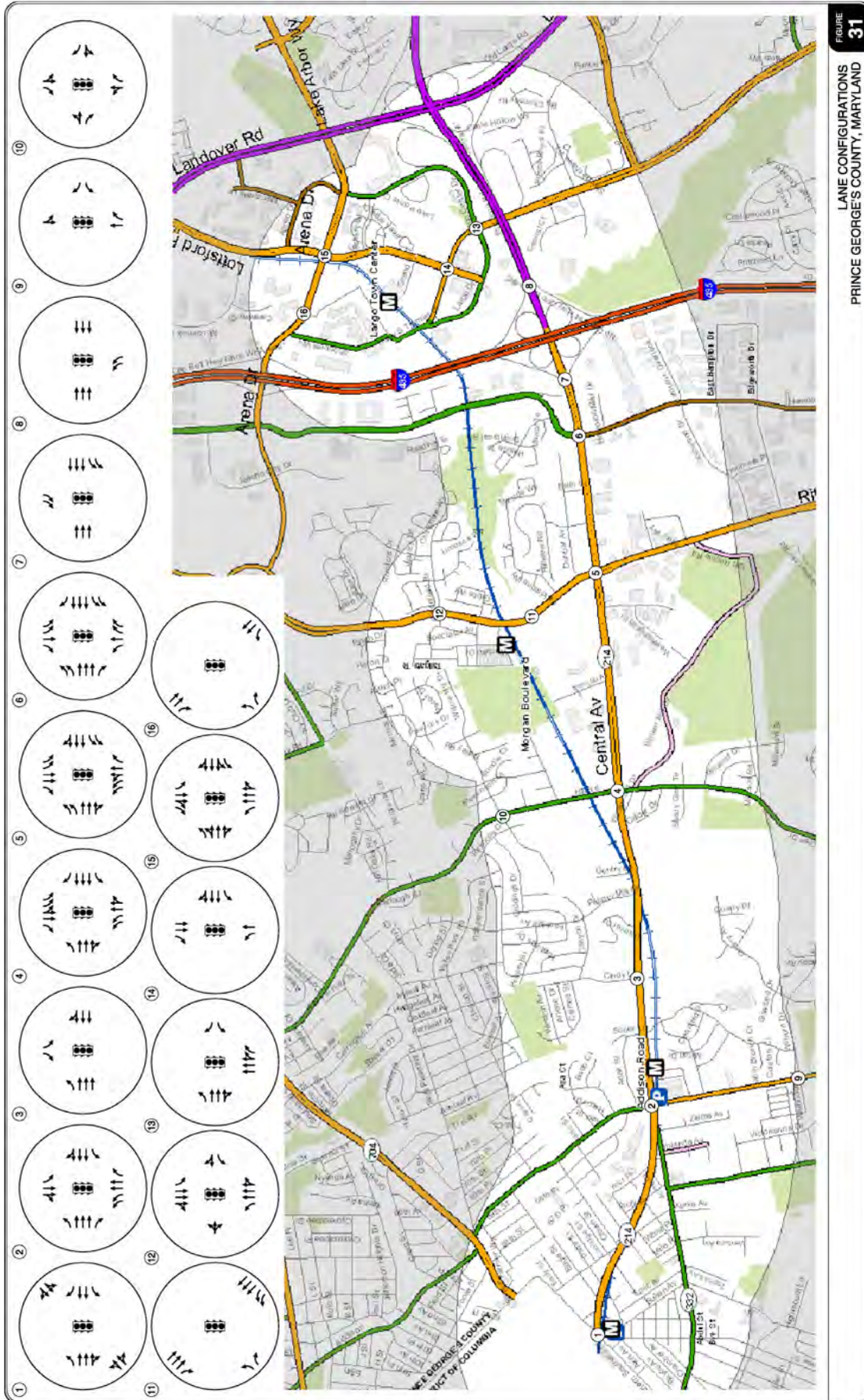
A.M. Peak	2011 Existing			2035 No-Build		
Central Avenue at:	LOS	Delay (s)	V/C	LOS	Delay (s)	V/C
Southern Ave SE	C	27.3	0.74	F	> 80	> 1.00
Addison Rd	C	26.5	0.66	D	51.4	0.86
Cindy Ln	A	7.4	0.49	A	7.7	0.64
Hill Rd/Shady Glen Dr	C	28.7	0.63	C	28.7	0.69
Morgan Boulevard/Ritchie Rd	C	32.9	0.59	D	41.7	0.78
Hampton Park Blvd/Brightseat Rd	D	41.1	0.60	D	51.0	0.84
I-95 SB Ramp	D	41.4	0.69	C	33.1	0.71
I-95 NB Ramp	A	9.9	0.64	B	10.9	0.80

TABLE 12. COMPARISON BETWEEN 2011 EXISTING CONDITIONS AND 2035 NO-BUILD RESULTS—P.M. PEAK

P.M. Peak	2011 Existing			2035 No-Build		
Central Avenue at:	LOS	Delay (s)	V/C	LOS	Delay (s)	V/C
Southern Ave SE	C	22.2	0.61	C	29.6	0.82
Addison Rd	D	38.5	0.81	F	> 80	0.89
Cindy Ln	A	4.9	0.46	A	6.3	0.54
Hill Rd/Shady Glen Dr	C	25.1	0.65	C	32.6	0.73
Morgan Boulevard/Ritchie Rd	D	48.8	0.79	D	48.9	0.83
Hampton Park Blvd/Brightseat Rd	D	39.7	0.80	F	> 80	0.93
I-95 SB Ramp	C	24.1	0.76	C	32.2	0.78
I-95 NB Ramp	A	6.8	0.64	A	9.3	0.60



FIGURE 31. NO-BUILD LANE CONFIGURATION



LANE CONFIGURATIONS  
PRINCE GEORGE'S COUNTY, MARYLAND  
FIGURE 31

The results for the A.M. peak hour show that, for all the intersections above, with one exception, the increased traffic volumes in the 2035 no-build scenario produce operations that degrade from those in existing conditions. The exception is for results at the I-95 southbound ramp terminal. For this intersection, the increased volume contributes to an increase in the volume-to-capacity ratio, but the LOS and delay at the intersection improves. The improvement stems from signal timing optimization at the ramp terminal. For all the intersections shown in Table 11, with the exception of Central Avenue/Southern Ave SE, which operates at LOS F, the intersections meet or exceed the Prince George's County's operational standard of LOS E for signalized intersections in urban areas.

Overall, the results for the P.M. peak hour are similar to the A.M. peak hour. The increased volume in the year 2035 no-build scenario leads to degraded intersection operations at all of the above intersections. All intersections perform at or better than the urban signalized intersection standard of LOS E except for Addison Road and Brightseat Road. All of the operational results for the above intersections may be seen in Figure 32 and Figure 33, and the complete traffic output for the no-build scenario, including 95th percentile queuing results, is contained in Appendix 4.

#### NO-BUILD CONCLUSIONS

Household and employment growth in the study area that is reflected in the travel demand model relies on the assumption that consistent and rapid growth is going to occur along the Central Avenue corridor. Based on the results of the market study, these growth rates seem to be quite accelerated, even though they reflect the maximum build-out of all the adopted community master plans. If less growth occurs, future intersection operations, which already meet the county's intersection standards, would perform even better than what is shown above. This would also be the case in the scenario where all the forecasted household and employment growth occurs, but growth in single-occupant-vehicle trips does not increase as fast as trips are generated. In either event, based on the results for the intersections on Central Avenue, the conclusion is that the existing roadway capacity is sufficient to accommodate all of the projected growth in the year 2035.



FIGURE 32. NO-BUILD OPERATIONAL RESULTS – A.M. PEAK HOUR

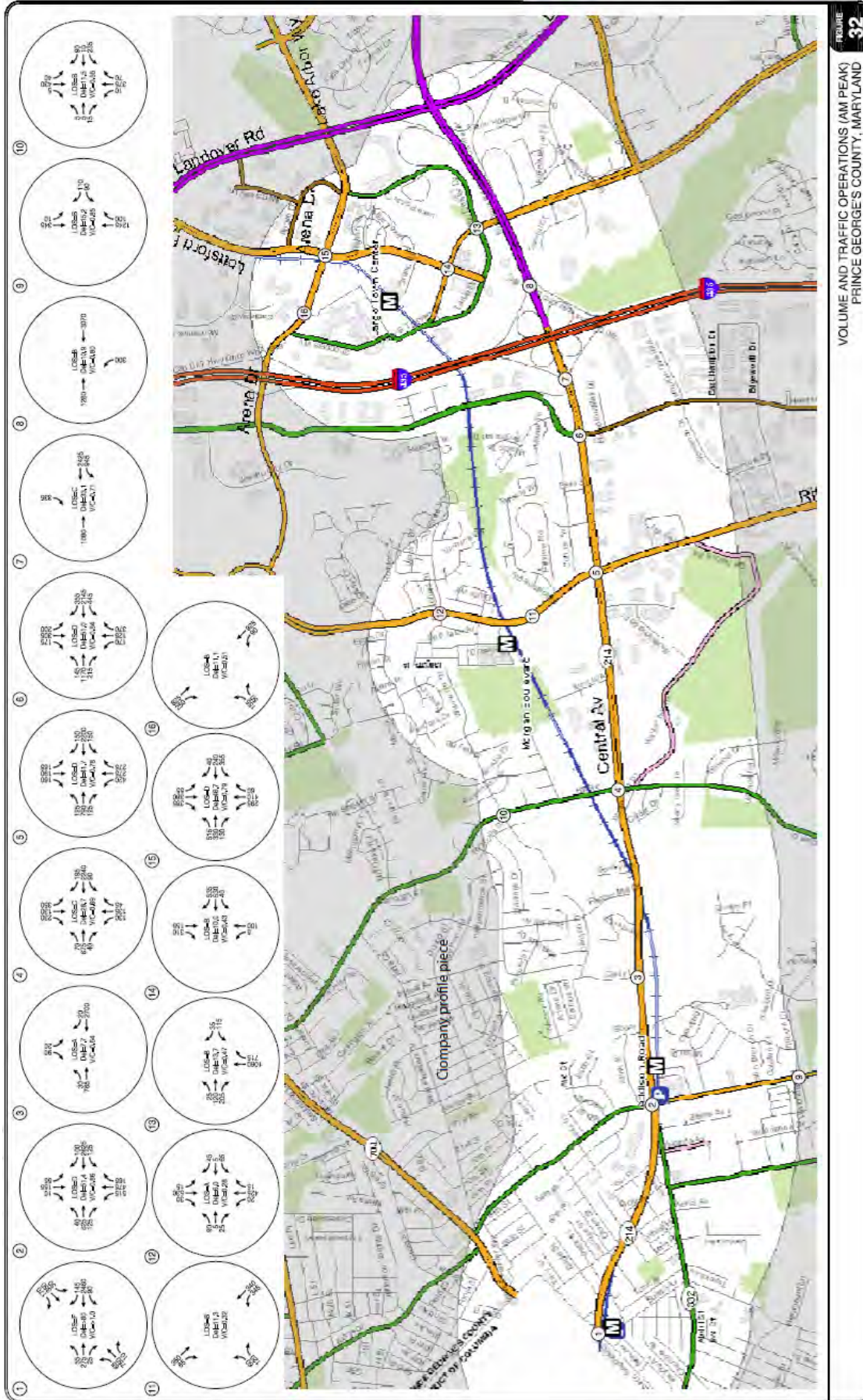
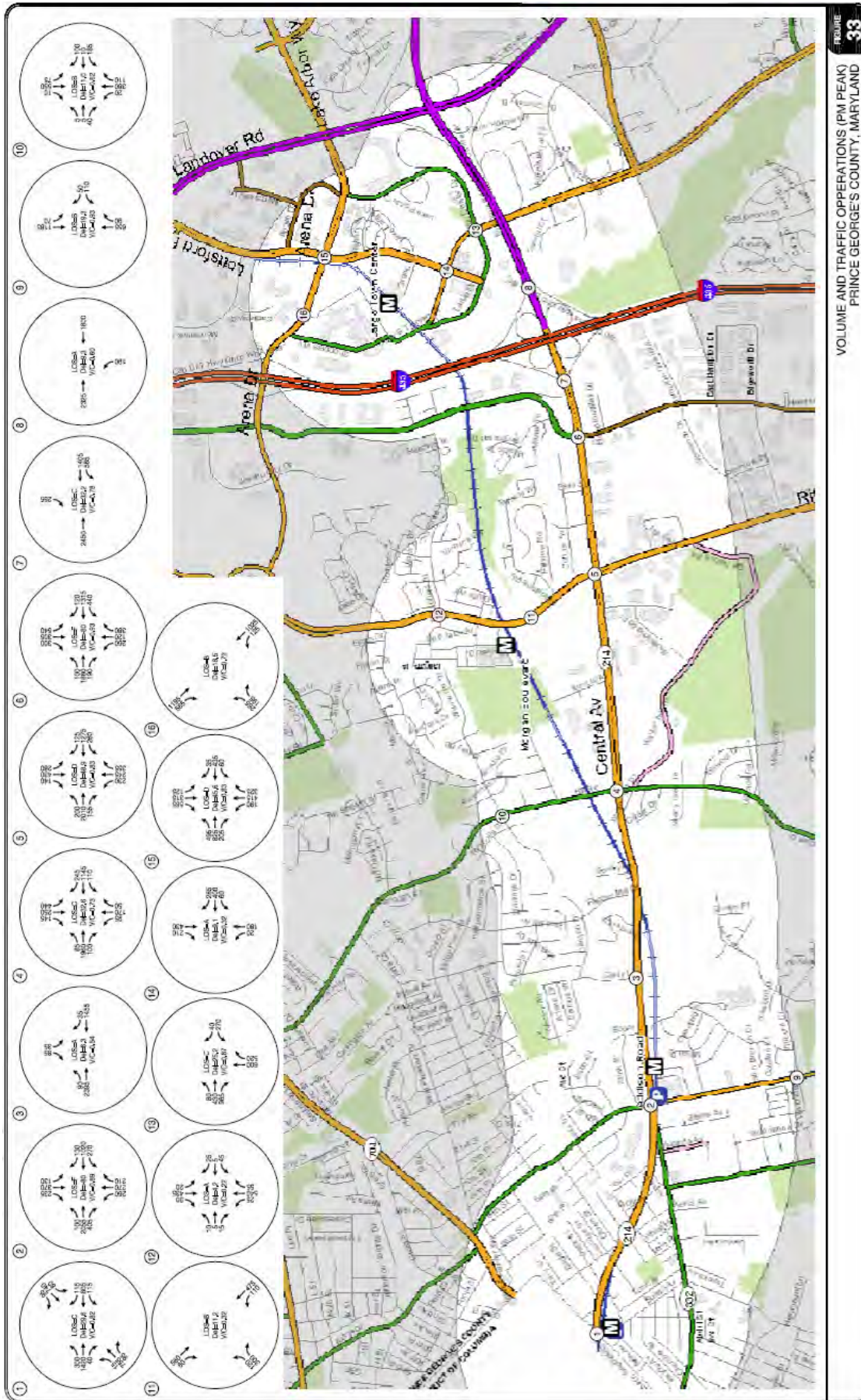


FIGURE 32. VOLUME AND TRAFFIC OPERATIONS (AM PEAK) PRINCE GEORGE'S COUNTY, MARYLAND



FIGURE 33. No-BUILD OPERATIONAL RESULTS – P.M. PEAK HOUR



VOLUME AND TRAFFIC OPERATIONS (P.M. PEAK)  
PRINCE GEORGE'S COUNTY, MARYLAND  
33



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## Build Scenario #1: Central Avenue Road Diet Results

“Road Diet” is a term used to describe reducing the number of motor vehicle travel lanes on a road in order to accommodate facilities for public transit and active transportation modes. The benefits of the road diet are varied and can include improving the character of the road, reducing traffic speeds, improving safety, increasing pedestrian and bicycling trips, creating space for landscaping and streetscape improvements, reducing vehicle miles traveled, increasing on-street parking, and encouraging a vibrant residential and business environment. Potential negative impacts of a road diet can include increased traffic congestion during peak hours and increased travel on parallel or alternate routes.

This alternative tests the ability of Central Avenue, between Southern Avenue and Cabin Branch Road, to accommodate future traffic with a reduction from a seven-lane to a five-lane cross section. The road diet would effectively remove one lane of traffic in each direction on Central Avenue for a distance of approximately 1.1 miles. The road diet alternative modeling included the following changes to the transportation network, as shown in Figure 34:

- At Southern Ave, the eastbound through lane was removed, the westbound right-turn storage was increased, and the signal cycle length and phase splits were optimized.
- At Davey Road, the eastbound and westbound through lanes were removed, and a traffic signal was installed.
- At Addison Road, the eastbound and westbound through lanes were removed, and the signal cycle length and phase splits were optimized.
- At the entrance to the Addison Metro Station on Central Avenue, the eastbound and westbound through lanes were removed, and the intersection was signalized.
- At Cabin Branch Road, the eastbound and westbound through lanes were removed, and a traffic signal was installed.

For this section of Central Avenue, the two travel lanes can be repurposed for several alternate uses, including a transitway, bus pullouts, bus queue jumps, buffered bicycle lanes, larger sidewalks, on-street parking, or a combination of these and other transportation improvements.

FIGURE 34. ROAD DIET LANE CONFIGURATIONS



PRINCE GEORGE'S COUNTY, MARYLAND  
 FIGURE 34

The analysis assumed that:

- The Central Avenue/Addison Road signal cycle remains 150 seconds long in the A.M. peak hour.
- To accommodate the higher volumes in the P.M. peak hour, the cycle length was increased to 180 seconds.
- Yellow and red clearance times were reduced to allow for greater vehicle throughput and to balance out the effect of eliminating one lane in each direction.
- Shortening of the roadway cross-section on Central Avenue allows pedestrian clearance times to be reduced.
- Signals between Southern Avenue and Cabin Branch Road were coordinated.

The signal phasing at the intersection was changed from northbound/southbound split phasing to left-turn protected. This intersection now operates with eight phases. There is an imbalance between the two northbound left turns and the single southbound left-turn lane. It appears possible to operate the left-turn phases concurrently if the median on the east leg of the intersection would be partially removed to allow the southbound left-turning vehicle paths to not overlap with the northbound left-turning vehicles. The reduced cross-section would make the median unnecessary to accommodate pedestrian movements across Central Avenue.

Three additional intersections are part of the Central Avenue road diet analysis area. They would be located at:

- Davey Road
- Addison Metro Station Entrance
- Cabin Branch Road

All three intersections are not currently signalized, and were analyzed as signalized intersections as part of this alternative. There are several benefits to adding traffic signals at these locations as part of the road diet scenario.

- As the area urbanizes and density increases, additional signals at intersections would help to slow traffic and provide additional locations for pedestrians to cross Central Avenue.
- New signals can make it easier to access retail development along Central Avenue.
- Signalizing the intersection at Davey Road would make it easier to access the Capitol Heights Metro station, and provides a nearby alternative to the congested Central Avenue/Southern Avenue intersection.
- Coordinating signal progression would maintain vehicle throughput in the corridor.
- A full signal at the intersection of Central Avenue/Addison Metro Station entrance would enhance pedestrian and vehicular access to and from the Metro station.

Results for all intersections analyzed for this alternative may be seen below in Table 13 and Table 14. Figure 35 and Figure 36 contain the HCM results and traffic volumes for the alternative. Complete HCM report outputs from Synchro, including 95th percentile queuing results, can be found in Appendix 5.

TABLE 13. COMPARISON BETWEEN 2035 NO-BUILD AND 2035 ROAD DIET RESULTS–A.M. PEAK

P.M. Peak	2035 No-Build			2035 Road Diet		
Central Avenue at:	LOS	Delay (s)	V/C	LOS	Delay (s)	V/C
Southern Avenue SE	F	> 80	>1.00	E	75.2	> 1.00
Davey Road <sup>1</sup>				A	10.3	0.83
Addison Road	D	51.4	0.86	E	66.9	0.97
Addison Road Metro Station Entrance <sup>1</sup>				D	51.7	1.00
Cabin Branch Road <sup>1</sup>				C	30.8	0.96

<sup>1</sup>Unsignalized in the No-Build scenario

TABLE 14. COMPARISON BETWEEN 2035 NO-BUILD AND 2035 ROAD DIET RESULTS–P.M. PEAK

P.M. Peak	2035 No-Build			2035 Road Diet		
Central Avenue at:	LOS	Delay (s)	V/C	LOS	Delay (s)	V/C
Southern Avenue SE	C	22.2	0.61	D	39.8	0.98
Davey Road <sup>1</sup>				B	13.3	0.70
Addison Road	D	38.5	0.81	E	73.6	> 1.00
Addison Road Metro Station Entrance <sup>1</sup>				C	29.3	0.94
Cabin Branch Road <sup>1</sup>				B	11.6	0.82

<sup>1</sup>Unsignalized in the No-Build scenario

### ROAD DIET CONCLUSIONS

Based on the operational results, which were derived from the county’s travel demand model, post- processing, pedestrian/bicycle mode share, and data from the market study, as well as the addition of three new traffic signals and alterations to existing timing settings, it appears that a road diet along Central Avenue would meet the Prince George's County operational standards for the A.M. and P.M. peak hours. While assumptions about growth and signal operations can vary, the analysis shows that a road diet along Central Avenue would meet standards while providing many other community, land use and livability benefits.

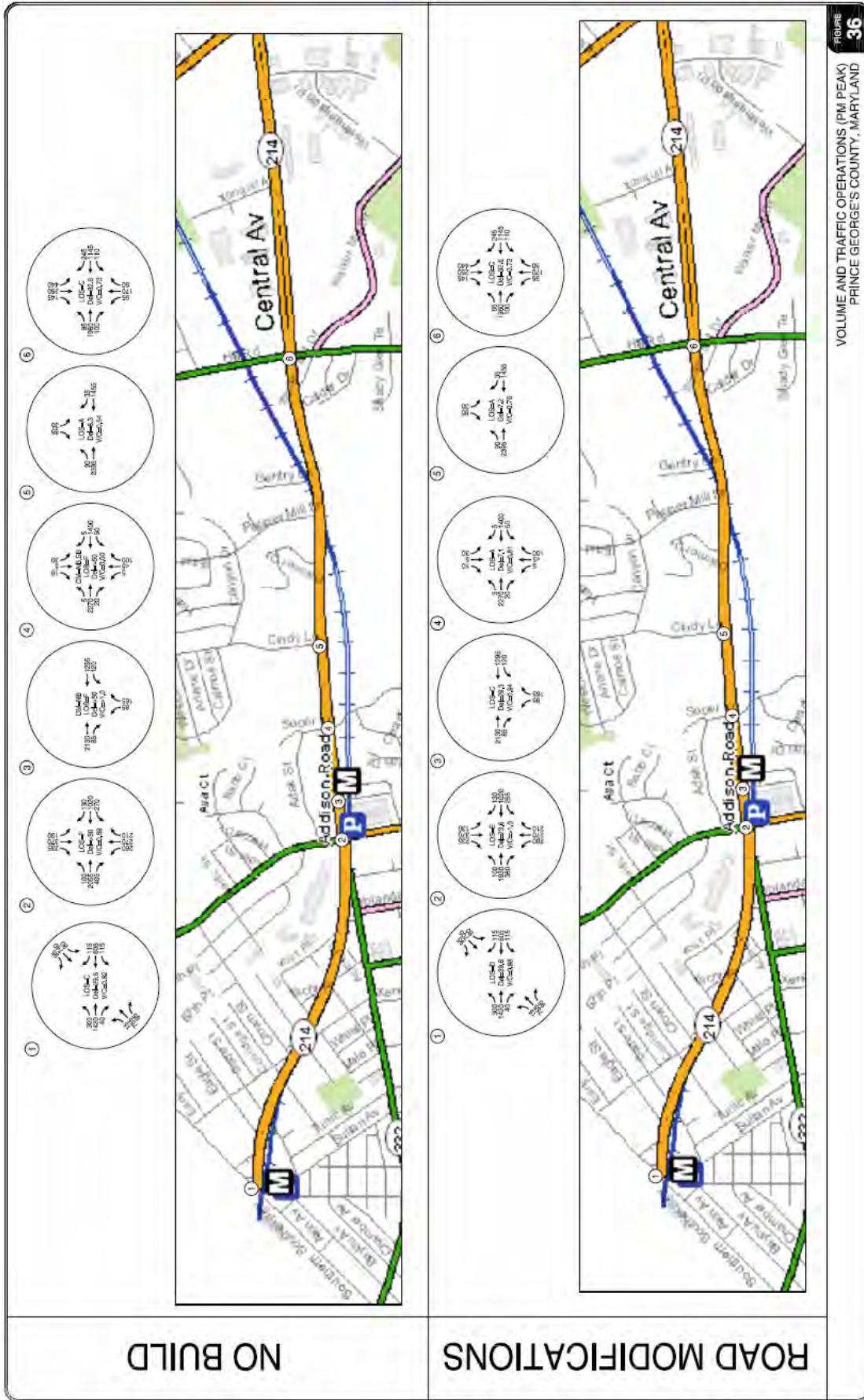


FIGURE 35. ROAD DIET HCM RESULTS – A.M.



VOLUMES AND TRAFFIC OPERATIONS (AM PEAK)  
PRINCE GEORGE'S COUNTY, MARYLAND

FIGURE 36. ROAD DIET HCM RESULTS – P.M. PEAK



## Build Scenario #2: Morgan Blvd TOD

The second Build alternative examined the future traffic operations of, and potential roadway modifications needed, near the Morgan Boulevard Metro Station to support a planned transit-oriented development. This section discusses this alternative, provides the results of the operational analysis, and assesses potential opportunities for roadway modifications that more effectively support transit-oriented development than current conditions.

Morgan Boulevard is currently an eight-lane arterial roadway providing access to the Morgan Boulevard Metro Station, several housing developments, and FedEx field. The study area for this analysis roughly includes the area north of Central Avenue, south of FedEx Field, east of Hill Road, and west of Brightseat Road. Today, the area's primary land uses are residential housing units (single-family detached, townhouse, and apartment), a small amount of retail, and a middle school. Morgan Boulevard Metro Station is a key transportation feature and includes a large park-and-ride lot.

The county's preferred alternative for the future analysis is the "Mixed Use Concept A." A rendering of the concept may be seen in Figure 8. The land uses as part of the preferred alternative provided the inputs into the 4-step modeling process was previously described. After the volumes were produced through the modeling process, a single post-processing modification was applied. The reason for the post-processing step was to normalize the results of the hand-adjusted trip generation and mode split steps with the travel demand model results to fully account for the effects of the TOD alternative, and adjust the year 2035 model volumes for use in Synchro. Appendix 6 contains the spreadsheet calculations for all the analysis steps.

Table 10 shows a comparison of the adjusted southbound volumes at Central Avenue/Hill Road and at Central Avenue/Morgan Boulevard based on the Morgan Boulevard TOD scenario and the no-build volumes from the model. The percent reduction from the no-build to the TOD model is shown in red and in parentheses.

TABLE 15. COMPARISON OF NO-BUILD AND MORGAN BOULEVARD TOD SOUTHBOUND APPROACH VOLUMES, 2035

Intersection	2035 No-Build		2035 Morgan Boulevard TOD	
	A.M. Peak Hour	P.M. Peak Hour	A.M. Peak Hour	P.M. Peak Hour
Central Avenue/Morgan Boulevard	515	850	482 (-6.4%)	823 (-3.2%)
Central Avenue/Hill Road	710	835	687 (-3.2%)	798 (-4.4%)







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Synchro was used to build traffic models to analyze the No-Build and Morgan Boulevard TOD scenarios at the intersection level. The intersections analyzed in the model are listed below:

- Hill Road/Willow Hill Road
- Central Avenue/Hill Road
- Central Avenue/Morgan Boulevard
- Metro Entrance/Morgan Boulevard
- Ridgefield Boulevard/Morgan Boulevard

The Morgan Boulevard TOD Synchro model reduced southbound volumes on Morgan Boulevard and Hill Road based on the adjustments shown in Table 10. The adjusted volumes for Central Avenue/Hill Road and Central Avenue/Morgan Boulevard were balanced with the other study intersections along Hill Road and Morgan Boulevard in Synchro. The Morgan Boulevard TOD Synchro model removed a through lane in each direction on Morgan Boulevard and optimized the signal timing. The removal of the through lane could provide additional roadway space for bicycle lanes, a transitway, or transit-specific priority infrastructure such as queue jumps or bus pullouts. The new lane configurations for the study area may be seen in Figure 9.

The HCM calculations were used in Synchro to analyze the volume-to-capacity (v/c) ratio and level of service for each of the intersections. Figure 10 and Figure 11 show a comparison of the lane configurations and A.M. and P.M. operations for the no-build and Morgan Boulevard TOD scenarios. Complete HCM report outputs from Synchro, including 95th percentile queuing results, can be found in Appendix 6.

FIGURE 38. NO-BUILD AND MORGAN BOULEVARD TOD SCENARIO-LANE CONFIGURATIONS

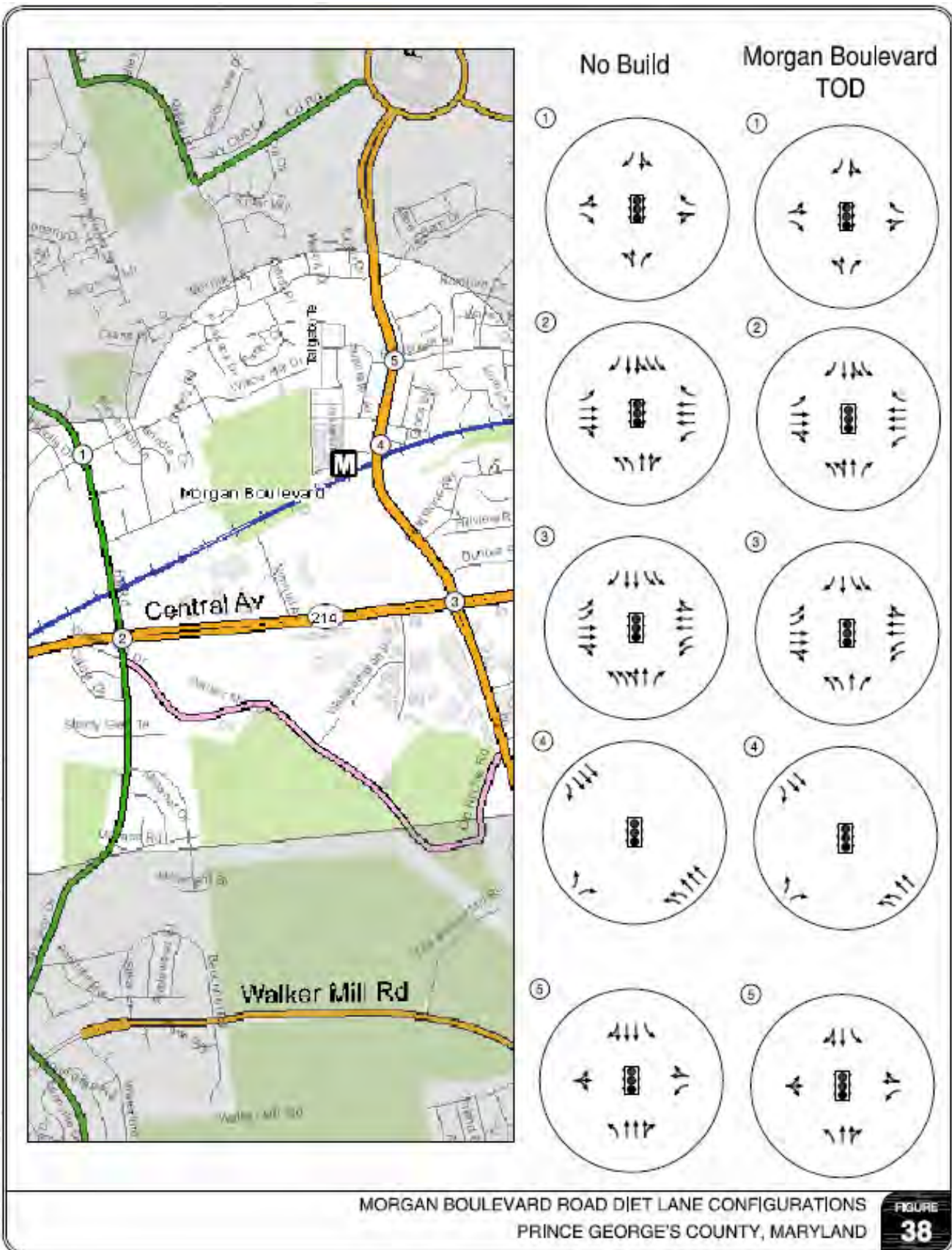


FIGURE 39. NO-BUILD AND MORGAN BOULEVARD TOD SCENARIO – A.M. PEAK HOUR

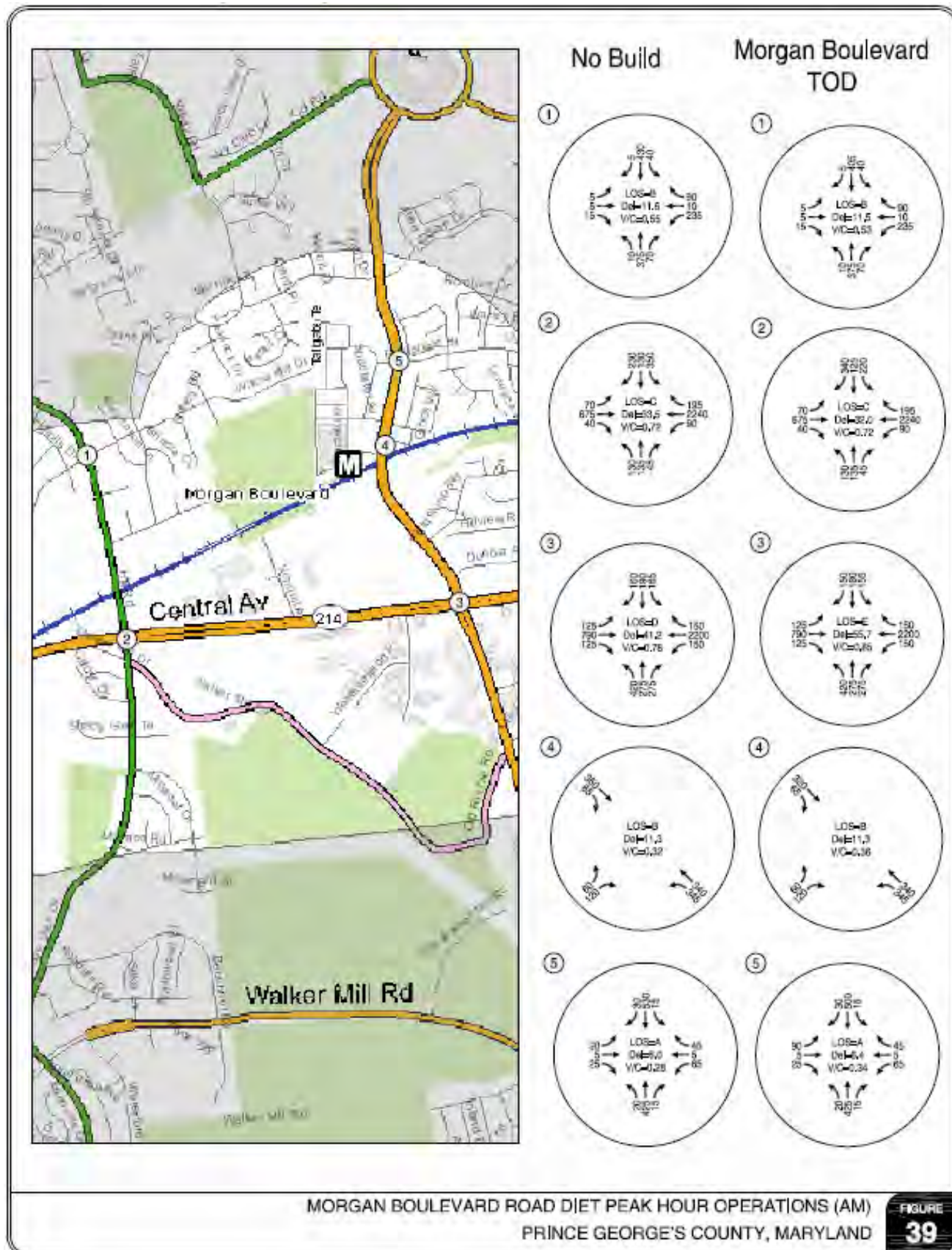
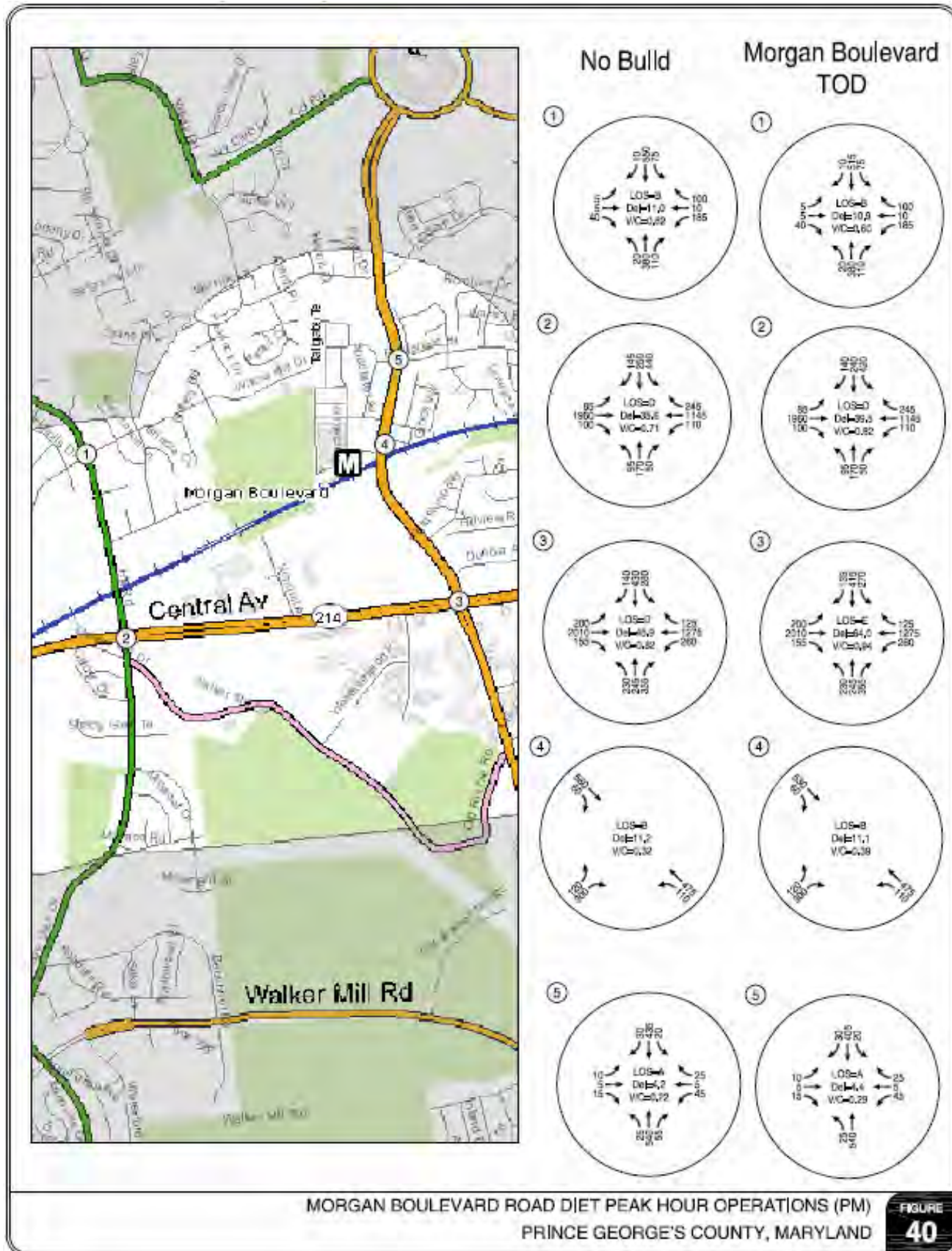




FIGURE 40. NO-BUILD AND MORGAN BOULEVARD TOD SCENARIO – P.M. OPERATIONS





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## MORGAN BOULEVARD CONCLUSIONS

The following are the results and conclusions for the Morgan Boulevard TOD analysis:

- The county's model predicts trip generation based on the maximum possible build-out for the area.
- Market-based economic projections for development suggest that the study area will grow slower than the travel demand model suggests.
- Traffic volumes projected based on trip-generation methods for the Morgan Boulevard TOD alternative indicate that traffic volumes are expected to be modestly lower than the model projections for maximum build-out.
- Morgan Boulevard has substantial extra capacity and would operate acceptably with the removal of a lane in each direction and still accommodate traffic volumes in 2035.
- All study intersections would operate at a LOS E or better and have a v/c ratio below 1.0.
- All study intersections meet the urban signalized intersection standards for Prince George's County.
- The lane-reduction treatment on Morgan Boulevard would not produce failing results at any of the study intersection.

Based on the findings, it is recommended that the county consider removing a lane in each direction on Morgan Boulevard. Removing a lane in each direction provides the opportunity to allocate roadway space to accommodate other modes (walking, biking, transit, etc.) while still allowing the roadway to operate acceptably for vehicles. This roadway space could be reallocated to support alternative modes of transit and create a more walkable, bikeable, and/or transit-friendly street.

### Build Scenario #3: Largo Town Center Results

The third build alternative examined was a high-level concept analysis at the Largo Town Center, which lies east of I-495, north of Central Avenue (MD 214), west of Landover Road (MD 202) and south of Arena Drive. This area contains a mix of land uses, including a large retail shopping center, a number of business parks, and residential developments, one of which is clustered around a small lake.

Largo Town Center is well-served by a number of transportation facilities. It is adjacent to I-495, which provides access to a series of large arterials within the study area via the interchanges at Arena Drive and Central Avenue (MD 214). Largo Town Center can also be reached via a number of connections to Landover Road to the east, by Lottsford Road to the north, and from Harry S Truman Drive to the south. WMATA's Blue Line terminates at Largo Town Center Metro Station, which contains a park-n-ride facility with over 2,300 parking spaces. Many of the residential developments, while walking distance to the Metro station, require out-of-direction travel to reach it. The sidewalk system is well-developed, but distances between the different land uses make the area less walkable than it could be. There are few bicycle and trail facilities that would make non-motorized travel safer and more attractive as an alternate mode of transportation.

Several large, undeveloped parcels in Largo Town Center provide opportunities for transit-oriented development. WMATA owns two parcels adjacent to the Metro station that total almost 25 acres. Three other parcels, totaling almost 30 acres, are also adjacent to and lie to the east and north of the station. Two other developable parcels are located in the study area, and they total approximately 28 acres combined.

The Largo Town Center alternative would seek to implement elements of the Complete Streets policies, discussed earlier in this report, with a goal to improve overall network connectivity. Connecting residential parcels together and providing new ways to access the arterial network would encourage residents to walk or bicycle to the Largo Town Center Metro station, shopping, and to work. Removing travel a lane in each direction on the arterial network allows the roadway space to be repurposed for bike lanes, wider sidewalks, on-street parking, or transit infrastructure improvements such as dedicated bus lanes, queue jumps, or bus- transit signal priority.

The following four intersections were analyzed as part of the alternative, with the modifications at each location noted. A diagram showing the reconfigured proposed intersections, contrasted with the No-Build, may be seen in Figure 41.

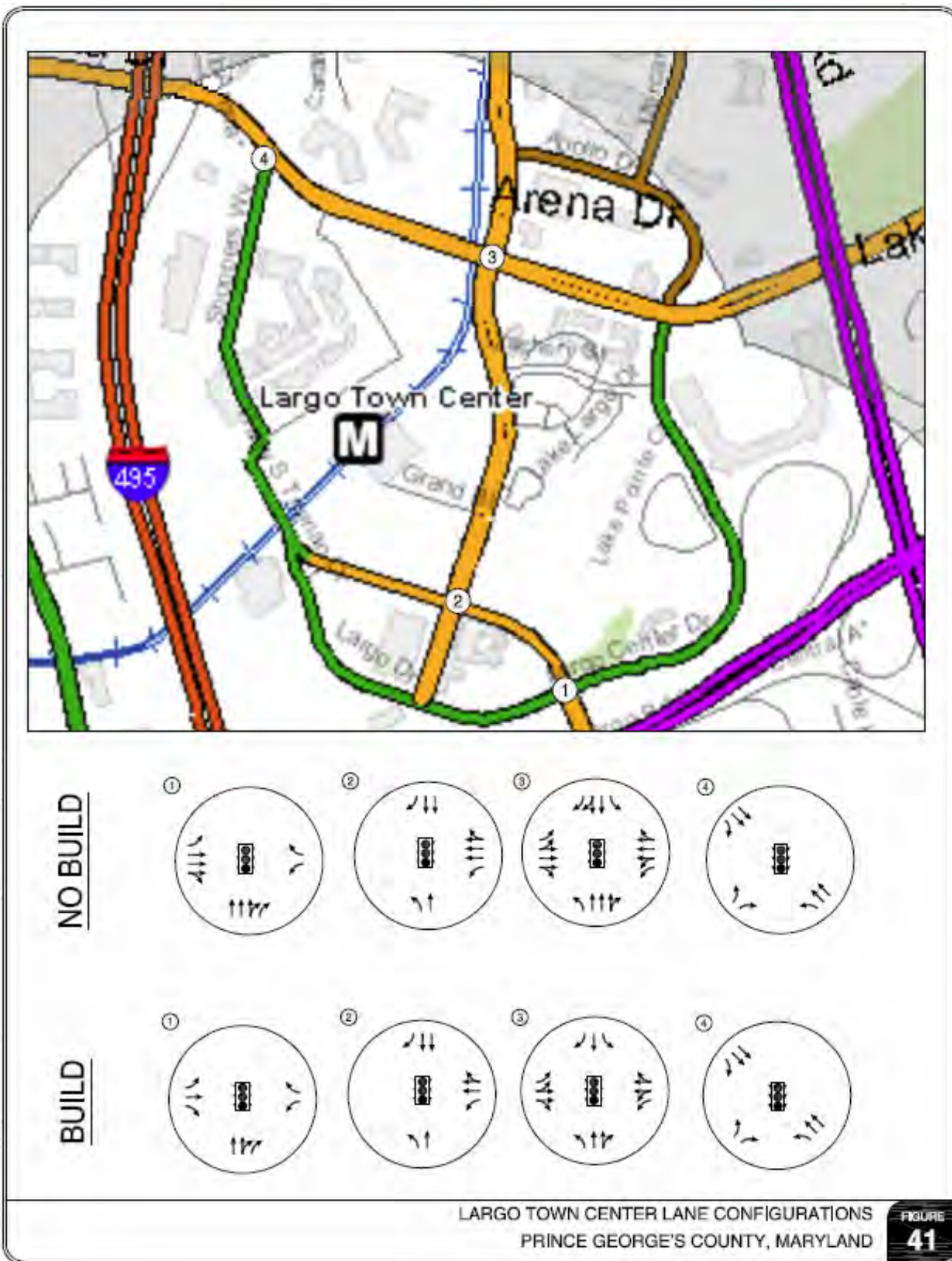
- Arena Drive/Shoppers Way:
  - y No changes made to the network at this location.
- Arena Drive/Lottsford Road:
  - y Alter the southbound approach to include a left-turn, through lane, and right-turn lane.
  - y Alter the eastbound approach to include a left-turn lane, a shared left-through lane, and a shared through-right lane.
  - y Alter the northbound approach to include a left-turn lane, a through lane, and a shared through-right lane.
  - y Alter the westbound approach to include a left-turn lane, a shared left-through lane, and a shared through-right lane.
- Harry S Truman Drive/Lottsford Road:
  - o Alter the westbound approach to include a left-turn lane, a through lane, and a shared through-right lane.
- Harry S Truman Drive/Largo Town Center Drive
  - o Alter the eastbound approach to include a left-turn lane, a through lane, and a right-turn lane.
  - o Alter the northbound approach to include a through lane, a shared through-right lane, and a right-turn lane.

Preliminary examination of the roadway network showed that it might be possible for these locations (and for the connecting roads) to meet or exceed the county's standard of LOS E for signalized intersection operations. Further confirmation was necessary and Synchro was used to complete the analysis.

## LARGO TOWN CENTER CONCLUSIONS

The Synchro model was produced by utilizing the existing traffic volumes created from the No-Build results from the travel-demand model and subsequent post-processing and network balancing. Changes to the transportation network were made. Signal cycles were adjusted as needed, and optimized to maintain progression and coordination with neighboring

FIGURE 41. NO-BUILD AND LARGO TOWN CENTER SCENARIO-LAND CONFIGURATIONS



intersections. Pedestrian clearance times were reduced due to the reduced cross-sections at the reconfigured intersections. Lane assignments were altered as needed to benefit vehicular movements based on future forecasted turning movements.

Table 16 and Table 17 provide the results of the Synchro analysis for the four intersections analyzed in the study area. The results of the Synchro analysis shows that with the lane reductions and intersection modifications, all four study intersections degrade from the No-Build scenario to the Largo Town Center scenario. This is to be expected, however, because vehicle capacity was removed in all cases, with the exception of the intersection of Shoppers Way/Arena Drive. Despite the reduction in capacity, all four intersections continue to perform at, or in excess of, the county’s standard of LOS E or better for signalized intersections. This is the case even though the No-Build volumes were not reduced as in the case with the other two Build scenarios. Full results may be seen in Figure 42 and Figure 43. Complete HCM report outputs from Synchro, including 95th percentile queuing results, can be found in Appendix 7.

TABLE 16. COMPARISON BETWEEN 2035 NO-BUILD AND 2035 LARGO TOWN CENTER RESULTS—A.M. PEAK

A.M. Peak	2035 No-Build			2035 Largo Town Center		
	LOS	Delay (s)	V/C	LOS	Delay (s)	V/C
Harry S Truman Dr/Largo Town Center Dr	B	13.7	0.47	B	16.4	0.61
Lottsford Rd/Harry S Truman Dr	B	10.0	0.43	B	10.8	0.49
Lottsford Rd/Arena Dr	D	46.7	0.79	E	78.2	0.92
Shoppers Way/Arena Dr	B	11.1	0.51	B	11.1	0.51

TABLE 17. COMPARISON BETWEEN 2035 NO-BUILD AND 2035 LARGO TOWN CENTER—P.M. PEAK

P.M. Peak	2035 No-Build			2035 Largo Town Center		
	LOS	Delay (s)	V/C	LOS	Delay (s)	V/C
Harry S Truman Dr/Largo Town Center Dr	C	25.2	0.67	C	31.2	0.87
Lottsford Rd/Harry S Truman Dr	A	9.1	0.32	A	9.8	0.38
Lottsford Rd/Arena Dr	D	45.6	0.83	E	67.0	0.96
Shoppers Way/Arena Dr	B	18.5	0.72	B	18.5	0.72

Were the vacant properties to be developed as mixed-use, transit-oriented, or less intensely than the future travel-demand model predicts, the impact of the lane reduction on the nearby roadways would have less impact. In either case, the analysis shows that there currently is, and will continue to be, an abundance of capacity in Largo Town Center, given the currently planned growth.



FIGURE 42. NO-BUILD AND LARGO TOWN CENTER SCENARIO – A.M. OPERATIONS

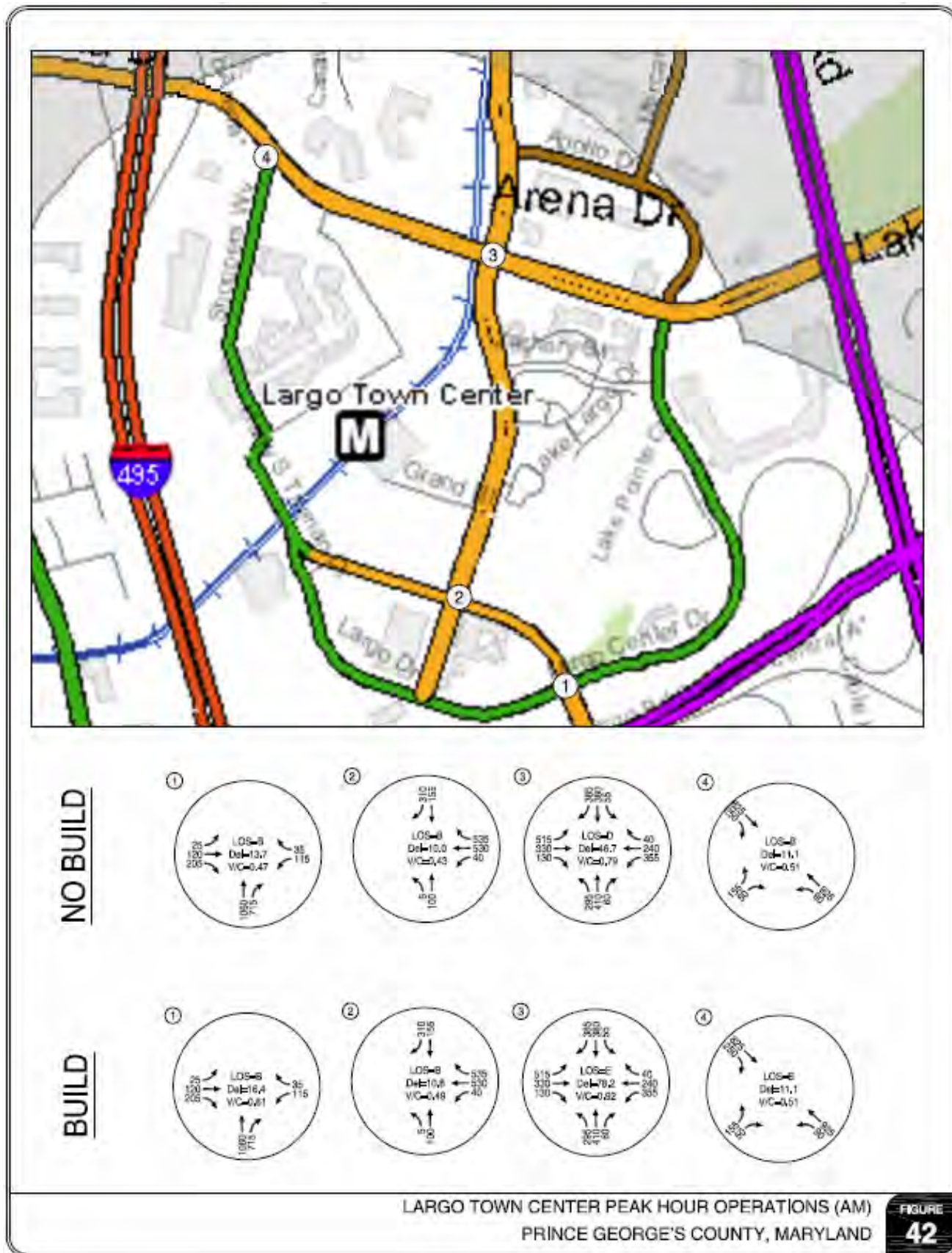


FIGURE 43. NO-BUILD AND LARGO TOWN CENTER SCENARIO – P.M. OPERATIONS

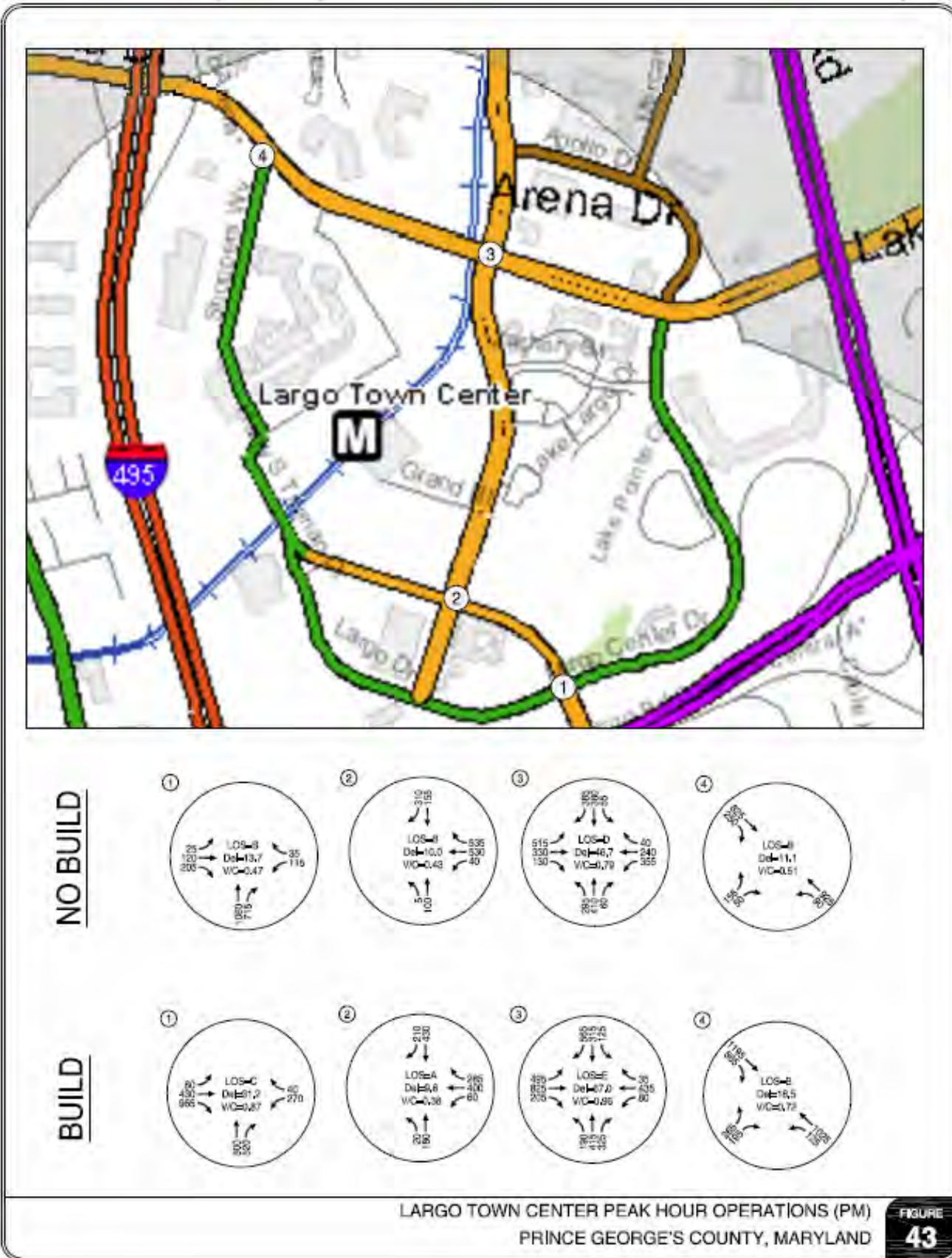


FIGURE 43

The following non-motorized transportation improvements are recommended for Largo Town Center in conjunction with the roadway changes above. These improvements would be helpful in implementing Complete Street policies, improving network connectivity, and increasing transit, bicycling, and walking in the study area. Not all improvements are necessary and they may be implemented in phases as development occurs and money becomes available.

Pedestrian improvements:

- Add a traffic signal and/or crosswalk at the intersection of Largo Town Center Drive and the entrance to the residential development across from the ramp to MD 214.
- Extend the sidewalk from the Largo Town Center Metro Station to the intersection of Lottsford Road and Zachery St.
- Add crosswalks from the residential developments east of Lottsford Road to the vacant parcels on the west side of Lottsford Road.
- Provide more access points from the residential developments east of Lottsford Road onto Lottsford Road.
- Add a crosswalk on the north side of Lottsford Road at Grand Boulevard.
- Add a crosswalk at the intersection of Arena Drive and Shoppers Way.
- Create a more direct connection from Lottsford Road to the back side of the Capital Center shopping center.

Bicycle improvements:

- Create a bike boulevard from the intersection of Arena Drive/Lottsford Road to Harry S Truman Drive/Lottsford Road and then south across Central Avenue.
- Improve bicycle parking at the Largo Town Center, the Capital Center shopping mall, and at the shopping center in the southeast quadrant of Arena Drive/Largo Town Center.

The plan proposes a combination of pedestrian, bicycle, and roadway repurposing (potentially creating a better-functioning transit network), and support of new connections with new development or redevelopment. The modeled analysis of Largo Town Center applied to other parts of the corridor suggests that new connections permit the existing network of streets to operate at much higher levels of efficiency and reinforce the urban boulevard concepts for Central Ave and Morgan Boulevard.





## **Section 8 Implementation**

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## IMPLEMENTATION

### Short-Term Projects

The Central Avenue Phase 3 work resulted in the identification of short-term projects that can be implemented in the next 12 to 36 months. These projects arose from extensive field work, analysis, and public input at a series of public engagement meetings. Each of these projects is described in this document in a single page. These one-page descriptions present the project simply and with key highlights. Figure 44 shows the location of each project with a map key reference. A legend includes the name for each project and each ‘one-pager’ includes this Map Key.

These projects were selected and justified through a process that included field visits, public input, stakeholder agency review, and a planning level feasibility and constructability analysis. Planning level traffic analysis was completed for several projects, primarily for the purpose of determining if the recommended traffic signal or road diet is warranted. Appendix 8 includes traffic analysis results for the Davey Street Road Diet project. Appendix 9 includes planning level cost estimates for short-term projects.

Overall, the short-term projects can be characterized as:

- Offering immediate solutions to priority community-identified needs. The Subregion 4 Transit- Oriented Development Implementation Project has placed a high value on public input and on being responsive to that input.
- Can be built quicker because they are relatively inexpensive and fit within existing public right-of-way (ROW). Transforming the transportation network can take time and be costly. Working within the existing Central Avenue public ROW to make substantial progress towards building a multimodal network is a critical tactic.
- Can introduce changes to existing policy as pilot initiatives that can be tested and help to remove administrative barriers. The Central Avenue Phase 3 project proposes an approach to the transportation land use connection that builds on Complete Streets, Complete Network, and Complete Community principles. These require a change in policy and practices – a process that can take time. The short-term projects identified here use existing policy in a way that supports the longer term vision for Central Avenue.

The one-page sheets that follow this introduction provide additional information on each project. These projects are ready to move towards implementation. The next steps for each are identified in Table 18.

TABLE 18. SHORT-TERM PROJECT NEXT STEPS

Project	Next Steps
S-1. Fully Operational Signal at Entrance to Addison Road Metrorail Station	<ul style="list-style-type: none"> <li>SHA to complete review of analysis.</li> </ul>
S-2. Fully Operational Signal at Cabin Branch Road	<ul style="list-style-type: none"> <li>Review decision by SHA not to pursue the traffic signal.</li> </ul>
S-3. Central High School Sidepath and School Entrance Improvements	<ul style="list-style-type: none"> <li>Develop a strategy for shortening the distance between signalized pedestrian crossings, especially near the Metrorail station.</li> </ul>
S-5. Central Avenue Corridorwide Bus Stop Improvements	<ul style="list-style-type: none"> <li>Work with county DPW&amp;T and Prince George's County Public Schools to assess field conditions and develop plan to make improvements.</li> </ul>
S-6. Davey Street Road Diet	<ul style="list-style-type: none"> <li>Determine availability of funds in WMATA's FY 2013 CIP budget for pedestrian and bicycle transit access improvements.</li> <li>Use existing field work and recommendations completed in 2011 as basis for improvements.</li> <li>Complete field engineering site visits for road diet.</li> </ul>
S-7. Central Avenue connector Trail Feasibility Study and Implementation Plan	<ul style="list-style-type: none"> <li>Develop strategy for a grant application from the MDOT Bikeways Program Grant and the WMATA FY 2013 CIP budget for pedestrian and bicycle transit access improvements.</li> <li>Determine other funding sources for the feasibility study, such as the Council of Governments TLC program.</li> </ul>
S-8. Watts Branch Trail Connection	<ul style="list-style-type: none"> <li>Coordinate with DC DOT.</li> <li>Design connection in FY 2013.</li> <li>Apply for MDOT Bikeways grant in spring 2013 to build connection.</li> </ul>
S-9. Maryland Park Drive Conversion to Neighborhood Greenway	<ul style="list-style-type: none"> <li>Continue to work with community groups to reach a consensus.</li> <li>Develop an implementation plan that includes a timeline and funding source.</li> <li>Identify early action items that can be completed through a Better Blocks approach.</li> </ul>
S-10. Southern Avenue-East Capitol Street Gateway into Prince George's County	<ul style="list-style-type: none"> <li>Coordinate with DC DOT.</li> </ul>

\*Note to reader: Project S4 is missing from the project list and map. This project was removed as a short-term project. The remaining projects were not re-numbered in order to preserve the number for these projects established in prior work.

FIGURE 44. SHORT TERM PROJECTS





<p><b>Project name</b>  <b>Fully Operational Signal at Entrance to Addison Road Metrorail station</b></p> <p>Map Key <b>S1</b></p>	<p><b>Responsible Agency</b>                  Maryland State Highway Administration</p> <p><b>Key Supporting Agencies</b>                  Prince George’s County Department of Public Works &amp; Transportation                  Washington Metropolitan Area Transit Authority</p>
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**Project Description**

This project will address safety, mobility and access needs at the entrance to the Addison Road Metrorail station on Central Avenue about 500 feet east of Addison Road. The recommendation is to install a fully operational signal that includes a pedestrian walk cycle to accommodate the heavy pedestrian flow (see Supporting Analysis below) across Central Avenue at that location. Few motorists yield to pedestrians in the current marked crosswalk. The improvements will also include a countdown pedestrian signal, high visibility crosswalk striping, and stop bars. The recommended changes would ensure this location meets [FHWA best practices for installation of marked crosswalks on arterials.](#)



This location is a high priority for the community. It was also the location of a pedestrian fatality in the last several years.

Benefits:

- ✓ Reduces the risk of pedestrian crashes by creating time and space for pedestrians to cross the roadway.
- ✓ Ensures the marked crosswalk meets FHWA best practices.

**Supporting Analysis**

Traffic counts – location meets warrants for full signal: 161 pedestrians crossing MD 214 during the pedestrian peak hour, which exceeds the minimum of 133 pedestrians per hour needed to meet 2009 Manual of Uniform Traffic Control Devices (MUTCD) signal warrants.

Crash data\* –as many as 75 crashes between Addison Road and the Metrorail station entrance, many involving pedestrians and bicyclist. Crashes at this location that are especially risky for pedestrians include motorists who are speeding and DUI; and nighttime crashes that occur on wet pavement. \*Crash data provided by the Maryland SHA.

**Estimated Cost:**

\$100,000



**ROW Required:**

None


**Potential Funding Resources:**

- Maryland SHA funds 76 and 78
- WMATA pedestrian and bicycle access funds



<p><b>Project name</b>  <b>Fully Operational Signal at Cabin Branch Road</b></p>	<p><b>Responsible Agency</b>                  Maryland State Highway Administration</p> <p><b>Key Supporting Agencies</b>                  Prince George’s County Department of Public Works &amp; Transportation                  Washington Metropolitan Area Transit Authority</p>
<p>Map Key </p> <p><b>Project Description</b>                  This project will address safety, mobility and access needs at the intersection of Central Avenue and Cabin Branch Road. Install a traffic signal that includes a pedestrian walk cycle at the intersection at Cabin Branch Road and Central Avenue. This signal will also address left turn needs on Central Avenue. Complementary improvements include high visibility crosswalk striping and stop bars. This signal is part of a series of crossing improvements near the Addison Road Metrorail station.</p> <p><b>Benefit:</b></p> <ul style="list-style-type: none"> <li>✓ Creates a second protected pedestrian crossing for Metrorail station access and using the bus stops along Central Avenue.</li> <li>✓ Provides a safer crossing for students and staff traveling to Central High School.</li> </ul>	 <p><b>Photo 1.</b> Pedestrians use this intersection to cross Central Avenue when traveling to and from the Metrorail station and Central High School.</p>
<p><b>Supporting Analysis</b>                  This location meets warrants for a signal (meets Warrant 2 and Warrant 3, Condition B). MD SHA is not inclined to support a signal because there are no line of sight issues, nor are there delays for motor vehicles turning left from Cabin Branch Road/Soper Lane onto Central Avenue.</p> <p>Crash data – Up to 40 pedestrian crashes in the intersection vicinity, including a fatality.</p>	<p><b>Estimated Cost:</b>                  \$125,000</p> <p><b>ROW Needs:</b>                  None</p> <p><b>Funding Source:</b>                  SHA – Fund 78, fund 79, SRTS, Fund 84, TEP</p>



<p><b>Project name</b>  <b>Central High School Sidewalk and School Entrance Improvements</b></p> <p>Map Key </p>	<p><b>Responsible Agency</b>                  Prince George's County Department of Public Works &amp; Transportation</p> <p><b>Key Supporting Agencies</b>                  Prince George's County Public Schools</p>
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**Project Description**

This project will address safety and mobility needs along Cabin Branch Road and at the high school entrance. for students traveling to and from school. Install a sidewalk on the east side of Cabin Branch Road between Central Avenue and the Central High School entrance. Install geometric and striping features at the school entrance, such as curb extensions, high visibility crosswalks, and a rectangular rapid flash beacon. This project is related to the full traffic signal proposes for the intersection of Cabin Branch Road and Central Avenue. Prince George's County Public Schools owns the property on the east side of Cabin Branch Road. The school entrance currently lacks crosswalks and other pedestrian crossing feastures.

Benefit:

- ✓ Improve crossing conditions for all travelers (students, faculty, staff and visitors) when entering or leaving the school.
- ✓ Improved walking conditions to the school along Cabin Branch Road for student living to the east.



Photo 1. Central High School entrance, looking north along Cabin Branch Road.




Photo 2. A curb extension and high visibility crosswalk such as this are recommended for the school entrance.




<p><b>Supporting Analysis</b></p> <p><u>Intersection Operations:</u>                  The high school entrance is the sole access point to the school for motorized traffic and one of a handful for non-motorized traffic. The high usage rate of this entrance and the fact that it accommodates all modes creates potential conflicts between motor vehicles and walkers/bicyclists. No traffic controls or pedestrian crossing facilities are present to organize and support travel in and out of the school camps.</p>	<p><b>Estimated Cost:</b>                  \$255,000</p> <p><b>ROW</b> -- None</p> <p><b>Potential Funding Resources:</b>                  Prince George's County Public Schools – Capital improvement program                  Prince George's County Department of Public Works &amp; Transportation -- Capital improvement program                  Maryland SHA -- fund 78, 79, 84; TEP</p>
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<p><b>Project name</b>  <b>Central Avenue Corridor-wide Bus Stop Improvements</b></p> <p>Map Key <span style="border: 1px solid black; padding: 2px;">S5</span></p>	<p><b>Responsible Agency</b>                  Prince George's County Department of Public Works &amp; Transportation</p> <p><b>Key Supporting Agencies</b>                  Washington Metropolitan Area Transit Authority                  Maryland State Highway Administration</p>
<p><b>Project Description</b></p> <p>This project will address safety and mobility needs, and will increase the overall quality of bus stops along Central Avenue by addressing poorly maintained and equipped bus stops. Specific improvements include installing ADA-compliant landing/waiting areas that are adjacent to but not part of the sidewalk, installing shelters and lighting at each stop, and establishing a more proactive maintenance program to reduce vegetation encroachment. In addition, some stops will be relocated in response to proposed changes resulting from the <a href="#">Central Avenue Line Metrobus study</a> and to provide preferable crossing locations between companion stops.</p> <p>The responsibility for bus stop improvements, including on-going maintenance, is spread among several agencies, including the Maryland SHA, the Prince George's County Department of Public Works and Transportation, and WMATA.</p> <p><b>Benefits:</b></p> <ul style="list-style-type: none"> <li>✓ Bus stops are better able to provide safe and comfortable points of access to/from Metrobus and TheBus service.</li> <li>✓ Bus stops would encourage ridership increases and reduce motor vehicle volumes on Central Avenue.</li> </ul> <div style="display: flex; align-items: center;">  <div style="margin-left: 10px;"> <p><small>Photo 1. Typical bus stop along Central Avenue can be enhanced with a shelter and trash can.</small></p> </div> </div>	
<p><b>Supporting Analysis</b></p> <p>Crashes along Central Avenue are concentrated near intersections, which are where bus stops are located. Community survey results suggest that area residents and workers would more likely ride the bus if bus stops were located closer to their homes or places of employment.</p>	<p><b>Estimated Cost:</b>                  \$12,000 to \$20,000 per stop</p> <p><b>ROW Required:</b>                  Varies by location.</p> <p><b>Potential Funding Resources:</b>                  WMATA – Federal Livability Grant (WMATA has applied for this grant. If awarded, 35 stops in Prince George's County can be upgraded).</p> <p>Prince George's County CIP</p>

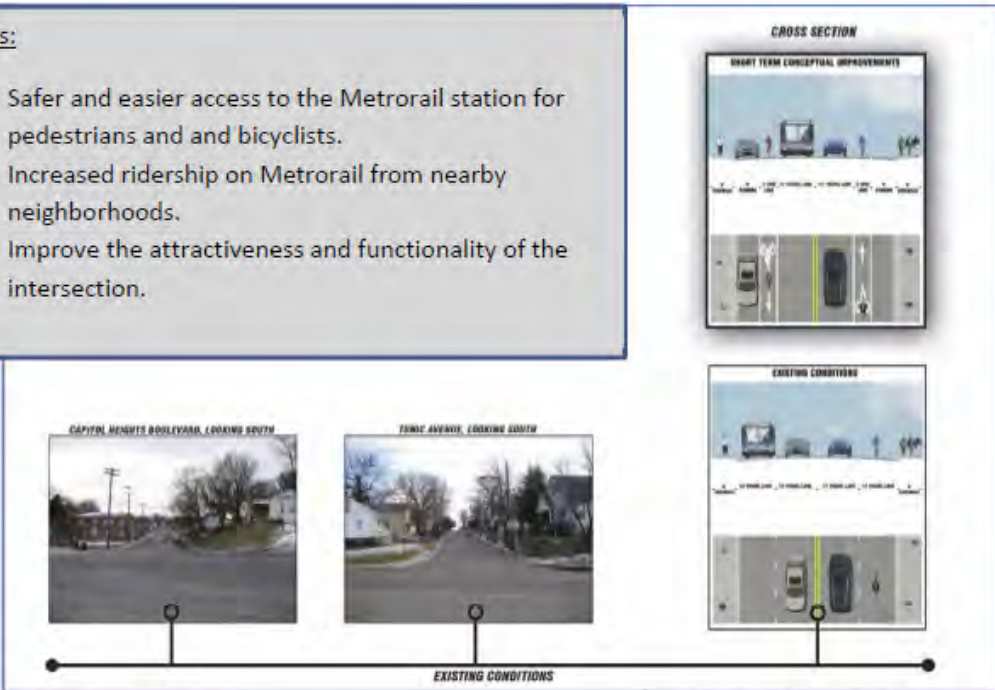


<p><b>Project name</b> <b>Davey Street Road Diet</b></p> <p>Map Key </p>	<p><b>Responsible Agency</b> Prince George’s County Department of Public Works &amp; Transportation</p> <p><b>Key Supporting Agencies</b> WMATA (north side only) SHA (Central Ave) DDOT (Southern Ave)</p>
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**Project Description**

This project will address safety and access needs by establishing safer places for pedestrians and bicyclists to travel to and from the Capitol Heights Metrorail station along Davey Street between Central Avenue and Southern Avenue. The road diet will improve the attractiveness and multi-modal functionality of the street. This project would better organize the existing roadway cross-section and include a total of two motor vehicle travel lanes, two bike lanes, on-street parking, update sidewalks and curb ramps to meet ADA guidelines, and improve pedestrian crossing conditions with curb extensions, curve radii reductions, and high visibility crosswalks.

- Benefits:
- ✓ Safer and easier access to the Metrorail station for pedestrians and and bicyclists.
  - ✓ Increased ridership on Metrorail from nearby neighborhoods.
  - ✓ Improve the attractiveness and functionality of the intersection.



**Supporting Analysis**  
Preliminary study indicates that a road diet would have little or no impact on traffic operations during the morning and afternoon peak hour.

**Estimated Design & Construction Cost:**  
\$689,000

**ROW Required:** None

**Potential Funding Resources:**  
WMATA – Access to transit CIP funds can be used for the north side of the roadway.  
DPW&T – for the remaining improvements.

<p><b>Project name</b>  <b>Central Avenue Connector Trail Feasibility Study and Implementation Plan</b></p> <p>Map Key <span style="border: 1px solid black; padding: 2px;">S7</span></p>	<p><b>Responsible Agency</b>                  Prince George's County Department of Public Works &amp; Transportation</p> <p><b>Key Supporting Agencies</b>                  Prince George's County Department of Parks &amp; Recreation                  Washington Metropolitan Area Transit Authority                  District of Columbia Department of Transportation</p>
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**Project Description**

This project will support safety, mobility and access improvements along the corridor by completing a feasibility study for trail that provides east-west connections for pedestrians and bicyclists to Metrorail stations and other destinations. The trail would travel between the Capitol Heights and Largo Town Center Metrorail stations, using a combination of WMATA right-of-way, neighborhood streets, existing trails, and planned trails. The feasibility study would include an implementation plan for short term and longer term projects. The study would help determine preferred and alternate alignment of connector trails, identify short term projects for implementation within 36 months, and develop a strategy for implementing longer term projects that includes opportunities created by anticipated redevelopment and public CIP projects.



**Benefits:**

- ✓ As it is completed, the connector trail will provide alternate travel routes for pedestrians and bicyclists, offering a level of intra-corridor mobility that does not exist today.
- ✓ Similar trail networks have been shown to substantially increase walking and bicycling trips.

**Supporting Analysis**


Roadway crossings would be evaluated within the feasibility study and lead to recommendations that incorporate best practices policies for geometric design, safety and traffic control.

**Estimated Cost:**  
 \$50,000 to \$75,000

**ROW**  
 A mix of land ownership, including public land, WMATA land, and some private ownership.

**Potential Funding Resources:**  
 MDOT Bikeways Grant Program  
 WMATA – Access to transit CIP funds



<p><b>Project name</b> <b>Watts Branch Trail Connection</b></p> <p>Map Key </p>	<p><b>Responsible Agency</b> Prince George’s County Department of Public Works &amp; Transportation</p> <p><b>Key Supporting Agencies</b> District of Columbia Department of Transportation Prince George’s County Department of Parks &amp; Recreation</p>
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**Project Description**

This project extends the Watts Branch Trail from its current terminus at 61<sup>st</sup> Street NE and Banks Place NE in the District of Columbia into Prince George’s County via Maryland Park Drive, establishing a connection to the trail from the north side of 63<sup>rd</sup> Street NE. The project addresses mobility and access needs in the corridor.

Reducing the number of turning movements at Banks/63<sup>rd</sup>/Southern/Eastern/Maryland Park will create more predictability for all modes. The project also recaptures roadway space for pedestrian and bicycle pathways, and improves pedestrian and bicycle crossing facilities as part of process to determine appropriate traffic controls at the intersection. It also connects with new sidewalks or on-road bicycle treatments resulting from or in anticipation of the conversion of Maryland Park Drive to a Neighborhood Greenway street.



**Benefits:**

- ✓ Trail access between Prince George’s County and the District of Columbia.
- ✓ Builds one of initial portions of the larger Watts Branch Trail project and is related to the Central Avenue Connector Trail.
- ✓ Connects with the Maryland Park Road Neighborhood Greenway conversion.



Photo 1. The trail connection can establish a visible crossing when entering Prince George’s County and connect with Maryland Park Drive.

**Supporting Analysis**

**Intersection Operations:**

Geometric changes include capturing two slip lanes and their adjacent channelization islands for non-motorized transportation.

**Estimated Design & Construction Cost:**  
\$261,000

**ROW Requirement**  
None

**Potential Funding Resources:**  
Prince George’s County Parks and Recreation  
District of Columbia Department of Transportation  
MDOT Bikeway Grant program



<p><b>Project name</b>  <b>Maryland Park Conversion to Neighborhood Greenway</b></p> <p style="text-align: right;">Map Key <span style="border: 1px solid black; padding: 2px 5px;">S9</span></p>	<p><b>Responsible Agency</b>                  Prince George’s County Department of Public Works &amp; Transportation</p> <p><b>Key Supporting Agencies</b>                  Prince George’s County Department of Housing and Community Development</p>
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**Project Description**

Safety and mobility needs will be addressed by converting Maryland Park Drive to a “neighborhood greenway” in order to manage motor vehicle traffic and improve walking and biking conditions. Meetings with adjacent and nearby neighbors and property owners to gain consensus on managing current and anticipated travel/traffic, and physical changes to the roadway and adjacent right-of-way are underway and on-going.

The area has been studied previously by the Prince George’s County Department of Public Works & Transportation. The current work provides a more comprehensive approach.

**Neighborhood greenways** serve travel within primarily residential neighborhoods. As such, the street width is narrower and allows on-street parking. It includes elements such as traffic circles, landscaped buffers/chicanes/curb extensions, and bikeways to discouraged through motor vehicle traffic, resulting in lower vehicle speeds and volumes. Buffer areas are generally fully landscaped.

**Benefits:**

- ✓ This project is part of the Watts Branch Trail project and completes an important gap in the trail network.
- ✓ As a Neighborhood Greenway, Maryland Park Drive would offer a multi-modal connection from adjacent neighborhoods to Central Avenue, increase safety and reduce or eliminate cut-through traffic.



Photo 3. Potential improvement: Low-profile traffic circle.

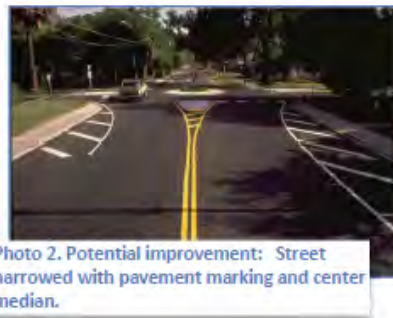


Photo 2. Potential improvement: Street narrowed with pavement marking and center median.



Photo 1. Potential improvement: Street narrowed using green streets elements.

**Supporting Analysis**

**Intersection Operations:** Evaluate roadway traffic operations and multi-modal level of service (MMLOS) on Maryland Park Drive before and after improvements are made. Address access needs at Southern Avenue NE and Central Avenue

**Safety:**

Using existing crash data, evaluate existing safety problems along Maryland Park Drive and at nearby intersections. Use predictive methods to evaluate roadway safety after changes are implemented.

**Estimated Cost:**

\$164,000


**ROW Required:**

None

**Potential Funding Resources:**

To be determined.



<p><b>Project name</b>  <b>Southern Avenue – East Capitol Street Gateway into Prince George’s County</b></p> <p>Map Key </p>	<p><b>Responsible Agency</b>                  Maryland State Highway Administration                  District of Columbia Department of Transportation</p> <p><b>Key Supporting Agencies</b>                  Washington Metropolitan Area Transit Authority                  Prince George’s County Department of Public Works &amp; Transportation</p>
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**Project Description**

This project will address safety, mobility and access needs at the intersection of Southern Avenue and East Capitol Street, (which is entirely within the District of Columbia to plan, design, fund and implement) and streetscape and gateway improvements on streets in Prince George’s County adjacent to the intersection.

The planned Walmart (in the District of Columbia on the northwest corner) is anticipated to generate additional additional pedestrian traffic at the intersection and creating an opportunity to establish an attractive and safe gateway to Prince George’s County. Recommendations are aimed at improving conditions for pedestrians crossing Southern Avenue at East Capitol Street, traveling to and from the Capitol Heights Metrorail station. Streetscape improvements include a continuation of the look and feel of East Capitol Street in the District of Columbia with trees and other greenspace, benches, pedestrian-oriented lighting, narrower lanes, on-street parking. See photos to the right.



East Capitol Street looking west into the District of Columbia.



East Capitol Street Extended looking east into Prince George's County.

**Benefits:**

- ✓ Streetscaping and gateway features provide welcome to Prince George’s County.
- ✓ Intersection is better configured and equipped to serve existing and increasing pedestrian traffic.
- ✓ New sidewalks and and crosswalks on the northeast corner, so pedestrians do not have to walk in the roadway or along an unpaved path.



Central Avenue could look like this.

**Supporting Analysis**

Intersection Operations:

Number of crashes between January 2008 and December 2010: \* Range between 6 and 9

\*Crash data provided by the Maryland SHA

**Estimated Cost:**

\$445,000 (pedestrian crossing improvements only)

**ROW:**

Existing right-of-way is within the District of Columbia.

**Potential funding source:**

Dependent upon the District of Columbia

## Long-Term Projects

Achieving the long-term vision for Central Avenue will require a significant effort from many partner agencies, including DPW&T, M-NCPPC, SHA, and others. In addition to the short-term projects discussed above, this report identifies multiple long-term strategies to achieve transit-oriented development and complete streets along the corridor. These strategies range from capital projects that change the way Central Avenue and surrounding streets look and operate to policy changes that will enable and promote the type of development needed to support the transit oriented development and a vibrant local economy.

Successful implementation of these strategies will require strong partnerships between local jurisdictions, public agencies, and the private sector; no one entity has the authority or resources to achieve the long-term vision on its own. Table 19 lists the long-term implementation strategies identified in this report and the agencies responsible for implementing them. Many of these tasks will require collaboration with other partner agencies in order to be successful.

TABLE 19. LONG-TERM IMPLEMENTATION STRATEGIES AND AGENCY RESPONSIBILITIES

Strategy	Next Steps	Responsible Agencies
<b>Capital Projects</b>		
Traffic signals	<ul style="list-style-type: none"> <li>Refine timing and phasing of signals installed as short-term improvements at Addison Road Metro and Cabin Branch Road.</li> <li>Continue to refine signal timing and coordination to reduce pedestrian delay, pedestrian/vehicle conflicts, and provide adequate clearance time.</li> <li>Conduct signal warrant analyses for high crossing demand locations (e.g. Maryland Park Drive, Jonquil Avenue)</li> <li>Install pedestrian countdown signals.</li> </ul>	<ul style="list-style-type: none"> <li>SHA, DPW&amp;T</li> </ul>
“Road diet” on Central Avenue	<ul style="list-style-type: none"> <li>Refine existing modeling and analysis and evaluate cross section alternatives.</li> <li>Identify streetscape guidelines and maintenance partnerships.</li> <li>Complete field engineering site visits for road diet.</li> </ul>	<ul style="list-style-type: none"> <li>SHA, DPW&amp;T, DDOT</li> </ul>
Connectivity improvements	<ul style="list-style-type: none"> <li>Implement street and trail connections identified in future network map to establish alternate/parallel routes to Central Avenue for all modes</li> </ul>	<ul style="list-style-type: none"> <li>DPW&amp;T, M-NCPPC, SHA</li> </ul>
Regional trail connections	<ul style="list-style-type: none"> <li>Complete construction of Central Avenue Connector Trail, Watts Branch Trail, and Central High School Trails.</li> <li>Begin planning and design for additional trail connection identified in the future network connections map.</li> </ul>	<ul style="list-style-type: none"> <li>M-NCPPC, DPW&amp;T, SHA, P&amp;R, DCDOT, School District</li> </ul>
Street lighting	<ul style="list-style-type: none"> <li>Identify priority locations for street lighting improvements (e.g. transit stops, high crash locations, multi-use paths)</li> <li>Identify funding and maintenance partnerships</li> </ul>	<ul style="list-style-type: none"> <li>DPW&amp;T, SHA, WMATA</li> </ul>

Strategy	Next Steps	Responsible Agencies
Transit stop improvements	<ul style="list-style-type: none"> <li>Continue short-term bus stop improvements program</li> <li>Identify funding and maintenance partnerships to improve sidewalks near bus stops and install shelters and lighting.</li> <li>Coordinate with developers to incorporate visible, high-quality transit stops into new development</li> </ul>	<ul style="list-style-type: none"> <li>WMATA, DPW&amp;T, SHA</li> </ul>
Sidewalk maintenance	<ul style="list-style-type: none"> <li>Identify funding and maintenance partnerships for ongoing sidewalk maintenance.</li> <li>Potentially revise County code to establish sidewalk maintenance as responsibility of adjacent property owner.</li> </ul>	<ul style="list-style-type: none"> <li>DPW&amp;T, SHA</li> </ul>
Bicycle facility improvements	<ul style="list-style-type: none"> <li>Refine and adopt bicycle network (e.g., bike lanes, trails, neighborhood greenways) identified in future network map.</li> <li>Enforce bicycle parking requirements in new development.</li> </ul>	<ul style="list-style-type: none"> <li>DPW&amp;T, SHA</li> </ul>
<b>Operations and Management Strategies</b>		
Refine, adopt, and implement TOD checklist	<ul style="list-style-type: none"> <li>Refine and adopt TOD checklist.</li> <li>Incorporate TOD checklist revisions into County Transportation Review Guidelines.</li> <li>Train staff on checklist implementation for development review, capital improvements, and maintenance projects.</li> </ul>	<ul style="list-style-type: none"> <li>DPW&amp;T, SHA, developers</li> </ul>
Implement Adequate Pedestrian and Bicycle Facilities Ordinance	<ul style="list-style-type: none"> <li>Develop methodology.</li> <li>Train staff on implementation.</li> <li>Require multimodal connections in conjunction with all new development.</li> </ul>	<ul style="list-style-type: none"> <li>DPW&amp;T, SHA, developers</li> </ul>
Transit service improvements	<ul style="list-style-type: none"> <li>Improve transit service reliability.</li> <li>Evaluate opportunities to increase directness of bus routes.</li> </ul>	<ul style="list-style-type: none"> <li>WMATA</li> </ul>
Access management	<ul style="list-style-type: none"> <li>Revise County code and Transportation Review Guidelines to encourage shared access strategies.</li> <li>Identify opportunity locations to consolidate existing driveways and curb cuts to improve pedestrian and vehicle safety.</li> </ul>	<ul style="list-style-type: none"> <li>DPW&amp;T, SHA</li> </ul>
FedEx Field Green Travel Options	<ul style="list-style-type: none"> <li>Coordinate with NFL and FedEx Field management to encourage walking, biking, transit, carpooling, and other "green travel options for games and other events.</li> </ul>	<ul style="list-style-type: none"> <li>NFL, FedEx Field management, DPW&amp;T, WMATA</li> </ul>
<b>Policy Strategies</b>		
Parking maximums	<ul style="list-style-type: none"> <li>Revise County code to establish parking maximums for developments within 0.5 miles of rail or high frequency transit</li> </ul>	<ul style="list-style-type: none"> <li>DPW&amp;T, developers</li> </ul>

Strategy	Next Steps	Responsible Agencies
Mid-block crossing policy	<ul style="list-style-type: none"> <li>• Develop process for evaluating benefits and risks of midblock crossing locations</li> <li>• Adopt policy documenting midblock crossing evaluation and approval process</li> <li>• Identify priority locations for midblock crossing improvements (e.g., rail or bus stations, schools, trail crossings)</li> </ul>	<ul style="list-style-type: none"> <li>• DPW&amp;T, SHA, WMATA</li> </ul>
Connectivity and block length requirements	<ul style="list-style-type: none"> <li>• Revise County design standards to encourage a connected street network.</li> <li>• Revise County Code to establish recommended maximum block lengths to maintain walkability.</li> </ul>	<ul style="list-style-type: none"> <li>• DPW&amp;T</li> </ul>
Sidewalk requirements	<ul style="list-style-type: none"> <li>• Revise County design standards to require sidewalks on both sides of all new streets in TOD and urban areas</li> </ul>	<ul style="list-style-type: none"> <li>• DPW&amp;T</li> </ul>
Complete Streets policy	<ul style="list-style-type: none"> <li>• Develop and adopt Complete Streets policy based on TPB template.</li> <li>• Refine and adopt Complete Street and trail typology and typical sections.</li> <li>• Refine and adopt future network map.</li> <li>• Refine and adopt complete streets design “toolkit” to streamline design approval/exception process.</li> </ul>	<ul style="list-style-type: none"> <li>• DPW&amp;T, SHA, M-NCPPC</li> </ul>





