FBI Headquarters Consolidation

Appendix D: Draft Transportation Impact Assessment: Landover

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Federal Bureau of Investigation Headquarters Consolidation

Draft Transportation Impact Assessment

Landover Site Alternative

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for

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1.0 Introduction

This report presents the findings of the transportation impact assessment (TIA) prepared as part of the Environmental Impact Statement (EIS) that will guide the evaluation of alternatives for a new permanent location for a proposed consolidated Federal Bureau of Investigation (FBI) Headquarters (HQ).

This TIA was performed to determine whether the proposed exchange action and development of a new consolidated FBI HQ is likely to have a significant impact on transportation, as defined under the National Environmental Policy Act (NEPA).

Three site alternatives in the National Capital Region (NCR) are under consideration for the location of FBI's consolidated HQ. These sites include the Greenbelt site known as Greenbelt Metro Station, and the Landover site known as the former Landover Mall, both in Prince George's County, Maryland, and the Springfield site known as the United States (U.S.) General Services Administration (GSA) Franconia Warehouse Complex located in Fairfax County, Virginia. This study analyzes the transportation impacts of developing a new consolidated FBI HQ in Landover, Maryland. Related TIAs examine the transportation impacts of developing a consolidated FBI HQ at two other alternative sites, while a third TIA examines the indirect impacts of the proposed exchange and future redevelopment of the existing FBI HQ at the J. Edgar Hoover (JEH) parcel in Northwest Washington, D.C. (see Appendices C, E, and B of the EIS, respectively). Future developers of the new consolidated FBI HQ would likely be required to conduct additional traffic impact studies according to the standards of the jurisdiction that result from changes to the proposed action and/or specific studies required for site plan approval and building or construction permits.

GSA proposes to convey its rights, title, and interests in a parcel (JEH parcel) located in Northwest Washington, D.C., in exchange for development of a new consolidated HQ at an alternative site. The proposed action constitutes a major Federal action that must be analyzed under the provisions of NEPA and Section 106 of the National Historic Preservation Act. Under NEPA, GSA must analyze the direct and indirect impacts of the proposed action.

To adequately analyze the direct impacts, GSA developed a conceptual site plan for the Landover site that best meets and accommodates the purpose of and need for the project. The proposed conceptual site plan describes the nature and possible form of future development that may occur on the Landover site to determine impacts of the proposed action. However, the final form and layout of the future HQ will be decided later in the process, after several other steps are completed.

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2.0 Background

Sections 2.1 and 2.2, respectively, introduce the proposed action and the purpose and need that have warranted this TIA. Section 2.3 outlines the NEPA requirements that initiated the evaluation of transportation impacts for the Landover site, and the framework for evaluating the transportation impacts at this site under each of the alternatives. Section 2.4 summarizes local land use plans within the study area. These plans establish a background for the remainder of the report and provide context for the evaluation of each alternative.

2.1 Proposed Action

The proposed action for the accompanying EIS encompasses two parts:

- acquisition of a consolidated FBI HQ at a new permanent location, and
- exchange of the JEH parcel.

The proposed action would allow GSA to leverage its current assets in exchange for property and services to support the space consolidation efforts of GSA and FBI. The exchange would convey the JEH parcel to the private sector consistent with local land use controls and redevelopment goals for Pennsylvania Avenue.

2.2 Purpose and Need

The purpose of the proposed action is to consolidate the existing FBI HQ offices into one location in the NCR and provide the FBI with an HQ that meets the Interagency Security Committee (ISC) Level V security standards. This standard is reserved for agencies with mission functions critical to national security or the continuation of government.

A consolidated FBI HQ is needed to support information sharing, collaboration, and integration of strategic priorities. Currently, the aging JEH building houses only 52 percent of HQ staff with the remainder dispersed over multiple locations in the NCR. Fragmentation resulting from FBI HQ's multiple locations diverts time and resources from investigations, hampers interoffice coordination, and decreases flexibility. Dispersion across multiple locations also gives rise to redundancy in operations and inefficient use of space. The consolidation is needed to eliminate redundancies and provide for significant time and space savings.

The proposed action is also needed to provide an FBI HQ that meets ISC Level V security standards. Currently, FBI HQ elements are housed in the JEH building and in multiple locations in the NCR that do not meet the ISC Level V security standard. The FBI needs a complex that supports the mission of the agency and allows it to defend against terrorists, weapons of mass destruction, and other threats. Additionally, as an integral agency for the management of intelligence and national security programs, the FBI needs an HQ that provides highly reliable utilities and infrastructure.

2.3 NEPA Requirements

Council on Environmental Quality (CEQ) regulations require that agencies analyze the potential direct and indirect impacts of the proposed action on the natural and human environment for each alternative, including a No-action Alternative. CEQ regulations define direct impacts as those "which are caused by the action and occur at the same time and place," and indirect impacts as those "caused by the action and are later in time... but are still reasonably foreseeable" (see 40 CFR § 1508.8[b]). Therefore, the EIS accompanying this TIA evaluates the direct and indirect impacts of the proposed action for each action alternative (Greenbelt, Landover, and Springfield) and for the No-action Alternative, which provides a baseline for evaluating the impacts of each action alternative. The four alternatives evaluated in the EIS are as follows:

- **No-action Alternative**: FBI HQ would not consolidate, and its staff and operations would remain dispersed throughout the NCR at JEH and other leased facilities.

- **Greenbelt Action Alternative**: FBI HQ staff and operations would be consolidated at the Greenbelt site, and the JEH parcel would be exchanged to an exchange partner. The range of indirect impacts resulting from the exchange of the JEH parcel is evaluated based on two reasonably foreseeable development scenarios (RFDSs).

- **Landover Action Alternative**: FBI HQ staff and operations would be consolidated at the Landover site, and the JEH parcel would be exchanged to an exchange partner. The range of indirect impacts resulting from the exchange of the JEH parcel is evaluated based on two RFDSs.

- **Springfield Action Alternative**: FBI HQ staff and operations would be consolidated at the Springfield site, and the JEH parcel would be exchanged to an exchange partner. The range of indirect impacts resulting from the exchange of the JEH parcel is evaluated based on two RFDSs. RFDSs are defined and described in detail in Section 2.5 of the EIS.

The exchange of the JEH parcel would be required to consolidate the FBI HQ at any of the sites under consideration; therefore, the exchange of the JEH parcel is a component of the proposed action common to each action alternative. This TIA analyzes the transportation conditions associated with the Landover site only; an assessment of the impacts under the Landover Action Alternative, which would include the exchange of the JEH parcel, is found in Section 4.2.9 of the EIS. To comprehensively evaluate transportation impacts for the Landover site, this TIA evaluates the following conditions:

- **Existing Condition**: existing transportation system conditions, current to the year 2014.

- **No-build Condition**: future transportation system conditions assuming FBI HQ *is not* consolidated at the Landover site for the horizon year of 2022.

- **Build Condition**: future transportation system conditions assuming FBI HQ *is* consolidated at the Landover site for the horizon year of 2022.

- **Build with Mitigation Condition**: future transportation system conditions assuming FBI HQ *is* consolidated at the Landover site for the horizon year of 2022 *and including* mitigation measures that would avoid or minimize adverse impacts on, or enhance the quality of, the natural and human environment.

The analysis presented in this report and summarized in Section 6.2.9 of the EIS details the evaluation of each condition for the Landover site.

The No-build and Build Conditions at the Landover site correspond to different alternatives, as shown in table 2-1. The No-build Condition at Landover corresponds to the EIS No-action Alternative. The No-build Condition at Landover also corresponds to the Greenbelt Action Alternative and the Springfield Action Alternative because FBI HQ would not be consolidated at Landover if either the Greenbelt site or the Springfield sites are chosen. The Build Condition for Landover corresponds to the EIS Landover Action Alternative.

Table 2-1: Landover Site Conditions Corresponding to Each Alternative

Alternatives Evaluated in the EIS	Landover Site	
	TIA No-build Condition	TIA Build Condition
No-action Alternative	x	
Greenbelt Action Alternative	x	
Landover Action Alternative		x
Springfield Action Alternative	x	

The analysis of the transportation impacts associated with the Springfield and Greenbelt sites is found in Section 7.2.9 and Section 5.2.9 of the EIS, respectively, as well as in the corresponding TIAs. Indirect transportation impacts associated with the future development of the JEH parcel are found in Section 4.2.9 of the EIS and in the corresponding TIA.

Impacts associated with the alternatives are analyzed in the No-build and Build Condition sections. Potential impacts are described in terms of:

- **Type**: the positive or negative effects of an action – ***beneficial***, reducing congestion or barriers and/or improving travel patterns, safety, or travel time; ***adverse*,** increasing congestion or barriers and/or degrading travel patterns, safety, or travel time.
- **Category**: the type of effects – ***direct effects*** are caused by the action and occur at the same time and place; ***indirect effects*** are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.
- **Duration**: the length of time of the effects – ***short-term***, lasting during construction or up to one year after; ***long-term***, lasting more than one year.
- **Intensity**: see below

The thresholds for determining the intensity of effects on local pedestrian, bicycle, transit, parking, traffic networks, and truck access are guided by the following definitions:

- **Not Measureable** – a localized impact that is barely perceptible to most users.
- **Beneficial or Adverse -** a localized impact that is measurable to most users.
- **Adverse Major** – a broad area impact that is highly noticeable and would substantially affect a large numbers of network users.

Because both traffic and transit entail extensive analysis, more detailed impact thresholds have been established for these transportation modes. See table 2-2 for these specific impact thresholds. Any impact thresholds included in table 2-2 would be compared to the previous condition or the No-action/No-build Condition, or against the corresponding condition of another site.

Table 2-2: Traffic and Transit Impact Thresholds

Impact Thresholds	Traffic	Transit
Adverse Major	Delays impact corridors of the study area creating more of a regional impact dealing with several intersections that are key to the operation of the roadway. A corridor can be defined as several adjacent intersections along the same roadway providing a vital connection between roadways or important passage through a highly congested area.	An increase in transit ridership that creates modest passenger delays, measured as increasing volumes above Washington Metropolitan Area Transportation Authority (WMATA) thresholds for capacity at any combination of two of the following: individual Metrorail facility elements (vertical elements, faregate aisles, or platform capacity) or bus routes (including substantial delays from roadway operations.
Adverse	Delays are localized, such as at independent intersections.	An increase in transit ridership that creates minimal passenger delays, measured as increasing volumes above WMATA thresholds for capacity at any one of the following: individual Metrorail facility elements (farecard vending machines) or bus routes (including substantial delays from roadway operations).
Not Measurable	Delays are not perceptible to most users and the number of users is within capacity. Improvements to traffic operations (travel time, throughput, or delays) are also not perceptible to most users.	Condition would not degrade or improve transit capacity or change the overall transit level of service provided to users.
Beneficial	Improvements to traffic operations (travel time, throughput, or delays)	An increase in transit service or capacity for Metrorail facility elements (farecard vending machines) and/or bus routes (including reduced delays from roadway operational improvements).

2.4 Local Land Use Plans

2.4.1 Existing Land Use

The Landover site was the previous location for the Landover Mall. There is an automotive maintenance business directly adjacent to the site, fronting Brightseat Road. Land uses surrounding the former mall site are primarily residential. Residential uses consist of the Maple Ridge apartment complex, along the west side of Brightseat Road, across from the site, and single-family homes to the north and west. Forty-nine buildings associated with the Glenarden apartments, located to the northwest of the site along Brightseat Road, were demolished in 2014 because of their poor condition (Washington Post 2014). Commercial uses in the study area include a liquor store on Brightseat Road, opposite the site, the Arena Plaza shopping center across Landover Road, to the south of the site, and Phase 1 of Woodmore Town Center, a planned mixed use development across the Capital Beltway to the east of the site. The 345-acre site currently contains several big box retail stores, and upon completion will feature 700,000 SF of retail, 1 million SF of office space, 922 residential units, 2 hotels and a conference center (Prince George's County Economic Development Corporation, 2013).

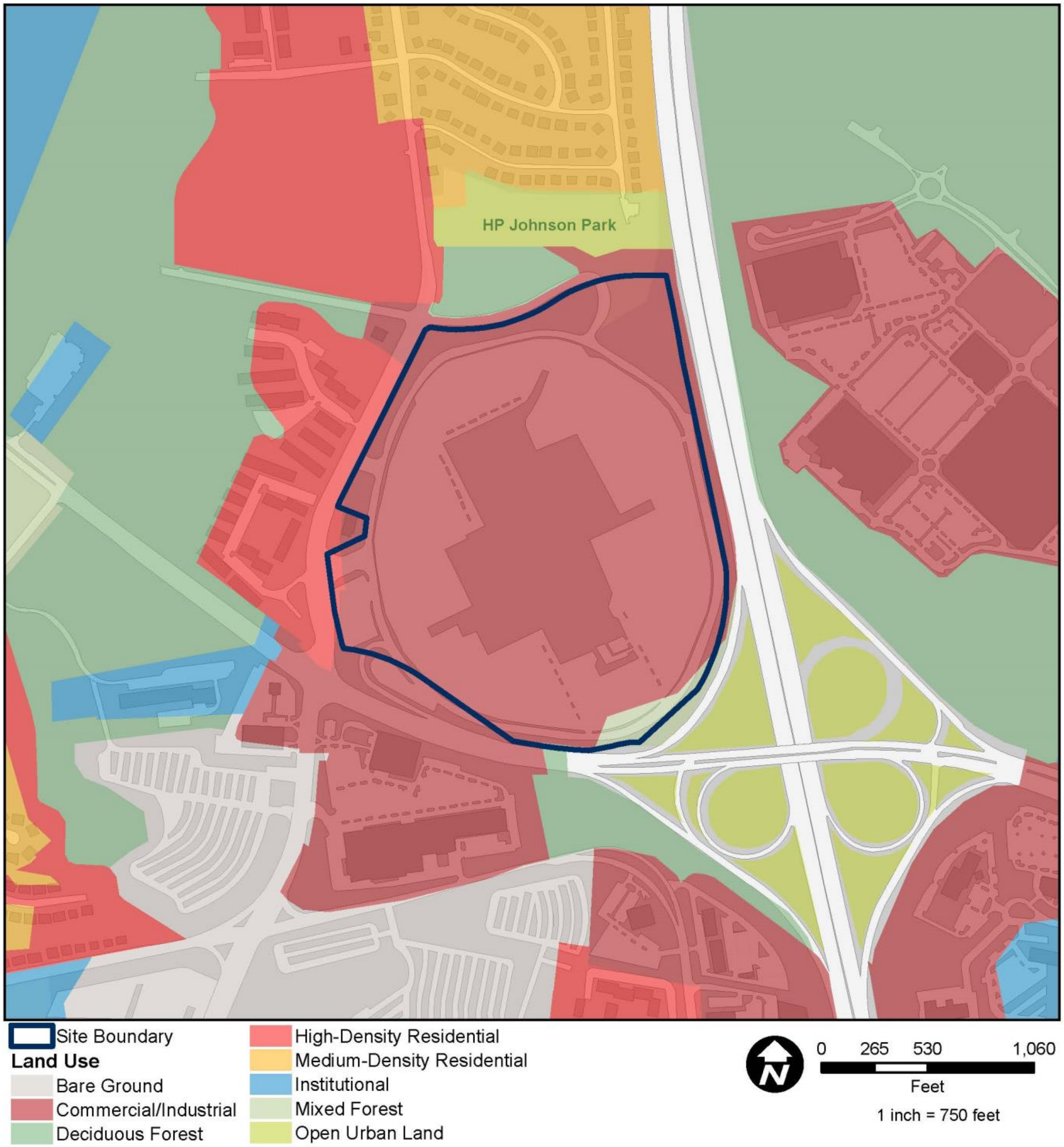
Recreational uses in the study area include Maryland-National Capital Park & Planning Commission's (M-NCPPC's) H.P. Johnson Park to the north of the site (Planning Commission Prince George's County Planning Department 2009), and the Prince George's County Sport and Learning Complex, approximately 0.75 mile to the southeast of the site. FedEx Field is located approximately 1 mile to the southwest. Figure 2-1 illustrates the land uses within a 0.25-mile radius of the site, as defined by Maryland Department of Planning.

2.4.2 Planning Context

The proposed Landover site is located on approximately 80 acres that was previously the site of the now closed Landover Mall. Opening in 1972 and owned by Lerner Enterprises, the mall was a major attraction through its opening years in Prince George's County (World Public Library 2015). The mall had many anchor stores and smaller tenants during its early years; however, as major anchors closed, the mall entered into a state of decline. In 2002, the mall was closed and eventually demolished by 2007. Sears was the only store that remained open amidst a sea of parking lots until it closed in early 2014 (O'Connell 2014).

Prior to the 1960s, the area surrounding the Landover site consisted of mostly vegetated and agricultural lands (GSA 2015). By the 1960s, increased development in the area in the form of residential apartment complexes to the north and west of the site and construction of highway systems had occurred. The area surrounding the site experienced continued construction of residential complexes and occasional commercial properties until about 1988. Since that time, the area surrounding the Landover site has remained largely the same with the exception of the construction of the FedEx Field Stadium for the Washington Redskins south of the property in 1994. Recent planning efforts in the area include the Landover Gateway Sector Plan and Sectional Map Amendment that envision the redevelopment of the Landover Mall and a network of sustainable, transit supporting, mixed-use, pedestrian-oriented, medium- to high-density neighborhoods.

Figure 2-1: Existing Land Use Map



Sources:
ESRI (2013), GSA (2013)
Prince George's County (2013)

2.4.3 Federal Elements of the Comprehensive Plan for the National Capital

The Federal Elements of the Comprehensive Plan for the National Capital address matters related to Federal properties and interests in the NCR, which include the District of Columbia; Montgomery and Prince George's Counties in Maryland; Arlington, Fairfax, Loudoun, and Prince William Counties in Virginia; and all cities within the boundaries of those counties. The Federal Elements were prepared pursuant to Section 4(a) of the National Capital Planning Act of 1952. The seven Federal Elements presented in the Comprehensive Plan are (1) Federal workplace, (2) foreign missions and international organizations, (3) transportation, (4) parks and open space, (5) Federal environment, (6) preservation and historic features, and (7) visitors. The National Capital Planning Commission (NCPC) develops and administers these Federal Elements, which were last updated in 2004 (NCPC 2004; GSA 2008).

The Federal Elements of the Comprehensive Plan for the NCR provide criteria for the location of Federal facilities and policies on Federal employment in the NCR. The goals of the elements regarding land use include:

- Maintain Washington, D.C., as the seat of the national government by enhancing the Federal workforce through efficiency, productivity, and economic well-being.
- Ensure Federal developments are compatible with adjacent neighborhood uses.
- Develop and maintain a multi-modal regional transportation system that meets the travel needs of residents, workers, and visitors.
- Conserve and enhance the park and open space system of the NCR.
- Promote an appropriate balance between open space resources and the built environment.
- Preserve and enhance upon the guiding principles of the L'Enfant and McMillan Plans.

The transportation policies included in the Federal Elements of the Comprehensive Plan are built upon the principles of transit-oriented development and smart growth (NCPC 2004). In conjunction with the location and design policies of the Federal Element, the transportation policies focus on maximizing the access of federal facilities to the region's extensive transit system. Goals regarding transportation for the NCR area include increased capacity and connectivity, congestion management and improved air quality, balanced land use and smart growth, and transportation options beyond the private automobile.

2.4.4 Plan Prince George's 2035

Plan Prince George's 2035 was initiated by the M-NCPPC to examine recommendations for guiding future development in Prince George's County. The plan designates eight regional transit centers as the focus of the county's planned growth and mixed-use development that have the capacity to become major economic generators (M-NCPPC 2014a). The plan contains recommended goals, policies, and strategies for a multitude of elements, including transportation and mobility.

Plan Prince George's 2035 policies are shaped by a desire to create a transportation network that provides convenient and equitable multi-modal access to jobs and services. The Purple line, a proposed 16-mile, 21 station east-west light rail transit line extending inside the Capital Beltway from New Carrollton to Bethesda in Montgomery County, is one of several planning efforts to realize a connected, equitable, and multi-modal transportation system. The Purple line would connect the major central business districts and activity centers of Takoma/Langley Park, College Park/University of Maryland, New Carrolton, Bethesda, and Silver Spring. The new line would provide direct connections to Metrorail at New Carrollton, College Park, Silver Spring, and Bethesda, which would link the Orange, Green, and Red lines.

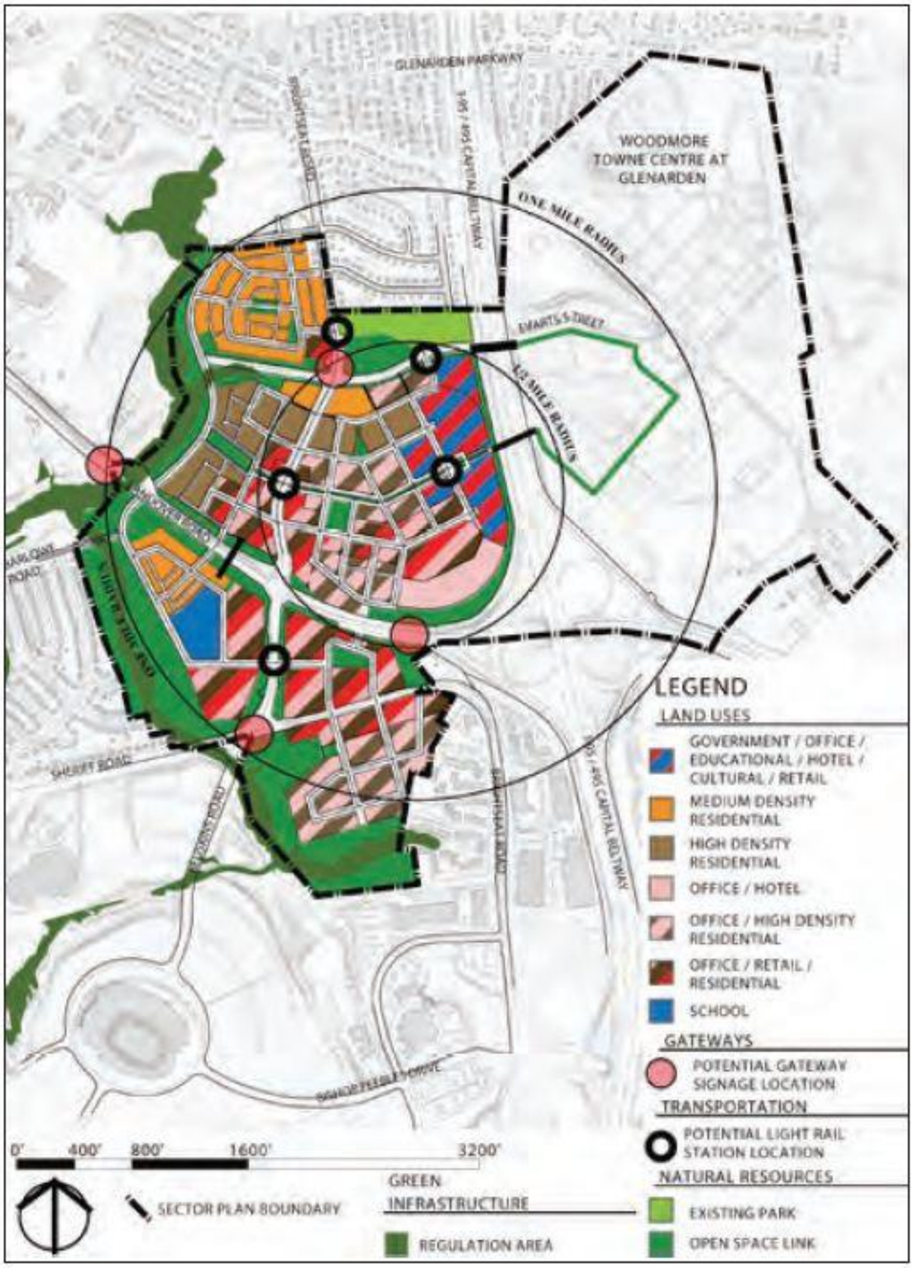
To ensure the vision of a strong multi-modal transportation network, the Plan Prince George's 2035 developed a variety of policies and strategies to move the project forward. The county plans to ensure countywide transportation improvements are integrated with and support the 2035 vision and land use pattern through capital road improvements and streetscape enhancements, designated bicycle-pedestrian priority areas (BPPAs), bike and car sharing programs, physical connections between new and existing developments, and the conversion of existing arterial roadways to multi-way boulevards where feasible.

The plan also envisions an expanded and improved transit service that would invest in existing bus service and new bus and light rail service. In addition, the plan would identify new transitway corridors to support the 2035 guidelines and priorities, implement the recommendations for MetroBus priority Corridor Networks recommended in Momentum – The Next Generation of Metro (Strategic Plan 2013–2015) (WMATA 2014a), use complete street practices to design and operate the transportation network to improve travel conditions, improve overall safety levels within the country's transportation network, and ensure that minimum and maximum parking requirements for transit-accessible areas are appropriate to advance the overall goals of Plan Prince George's 2035. Complete street policies and designs call for streets to be planned, built, operated, and maintained to enable safe, convenient transportation options for all users regardless of the mode of transportation or the age and abilities of the person.

2.4.5 Landover Gateway Sector Plan and Sectional Map Amendment

The Landover Gateway Sector Plan and Sectional Map Amendment was initiated by the Prince George's Planning Department in 2009 and recommends goals, policies, strategies, and actions pertaining to the development patterns, zoning, environmental infrastructure, transportation systems, public facilities, parks and recreation, economic development, and urban design of Landover, Maryland (i.e., the Landover Gateway) (M-NCPPC and Prince George's County Planning Department [PGC PD] 2009a). The Landover Gateway Sector Plan encompasses the area surrounding the previous location of the Landover Mall is shown in figure 2-2.

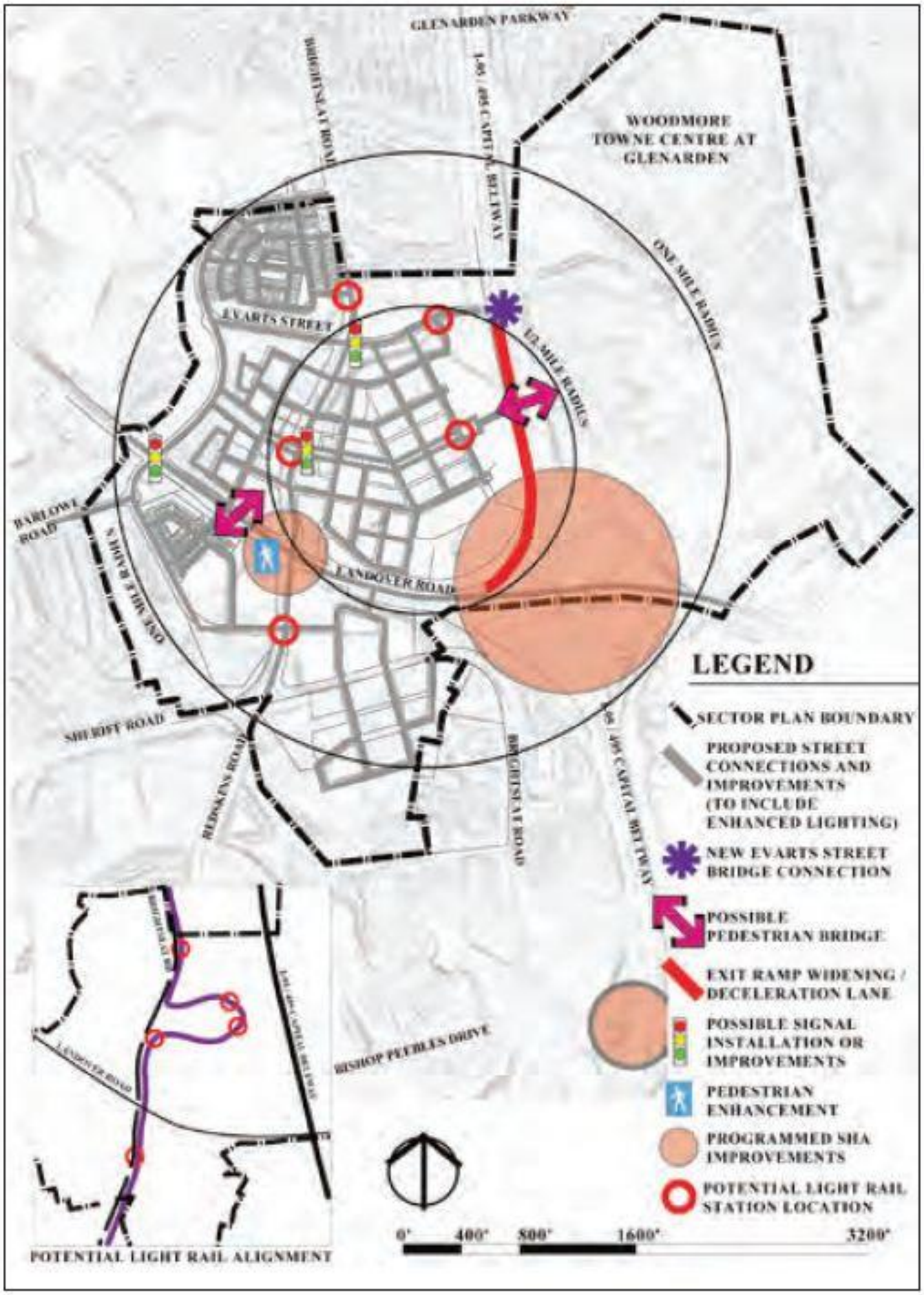
Figure 2-2: Landover Gateway Sector Plan Land Use Plan



Source: M-NCPPC and PGC PD (2009a)

The plan envisions a fully integrated, comprehensive, multi-modal transportation system that fully accommodates transit, automobiles, pedestrians, and bicyclists. A key component of the vision for the Landover Gateway is the delivery of a new transit service to support the development envisioned in the area. The transportation system would link Landover Gateway to other key destinations in the region, while encouraging travel on foot within the area by providing a safe pedestrian environment. The vision accommodates the addition of light-rail transit on Brightseat Road, new stop lights, additional pedestrian connections and bridges, and a new grid-like street network in the area inside of and surrounding the parcel of land previously occupied by the Landover Mall, as shown in figure 2-3.

Figure 2-3: Landover Gateway Sector Plan Transportation Network Vision



Source: M-NCPPC and PGC PD (2009a)

The vision for a new Landover Gateway includes initiatives to facilitate a pedestrian-oriented design. Key principles of pedestrian-oriented design include compact neighborhoods; proximity of residential and civic/commercial uses; a consistent street wall (a presence of buildings along the street with minimal setbacks) influenced by the placement of buildings on the lot in relation to the street; complete and interconnected sidewalks, trails, and transportation facilities; human-scale architecture; and provision of consistent eye-level details and amenities that make sidewalks inviting and comfortable for pedestrians.

The sector plan is composed of specific goals to move the initiative forward to achieve success, including:

- Improve existing and planned roadways to safely and efficiently manage current and forecast traffic volumes.
- Provide access to all existing and planned developments.
- Design appropriate streetscape treatments to encourage pedestrian and other nonmotorized transportation.
- Design and build a system of trails, sidewalks, and crosswalks that is pedestrian friendly.
- Provide direct bus services, fixed guideway transit, and/or light rail transit (LRT) (Purple line) to nearby Metrorail and Maryland Area Regional Commuter (MARC) rail stations and connect the sector plan area to New Carrollton Metro (Orange line), Morgan Boulevard, and/or Largo Metro Stations (Blue line).
- Provide a safe, direct, and well maintained bicycle trail network that links residents with employment centers, schools, parks, shopping areas, and transit stations. Provision of on-road bicycle lanes should be considered on all roadways serving the Landover Gateway area, except for MD 202, where a parallel off-road trail would be more appropriate.
- Develop advanced parking management for parking facilities within the sector plan area.
- Improve Landover Road to a six-lane expressway between the Capital Beltway and Barlow Road. Amenities within in the right-of-way should include an off-road trail, improved lighting, and special pedestrian crosswalks at the signalized intersection of MD 202 with Barlowe Road/Cattail Creek Drive/Evarts Street extended.

2.4.6 Purple Line Final Environmental Impact Statement

The Purple Line Final EIS provides a description and summary of the transportation and environmental impacts of a new east-west light rail transit service in Montgomery and Prince George's Counties, Maryland (MTA 2013). The Purple line project is proposed to provide faster, more direct, and more reliable east-west transit service connecting the major activity centers in the Purple line corridor at Bethesda, Silver Spring, Takoma/Langley Park, College Park, and New Carrollton; provide better connections to Metrorail services located in the corridor; and improve connectivity to the communities located between the Metrorail lines.

2.5 Regulatory Requirement and Transportation Assumption Agreement

2.5.1 National Capital Planning Commission Requirements

There a number of other assumptions that are considered in transportation analysis including those determined by regulatory requirement. An example of one assumption of this nature is the parking ratios developed for each alternative site as stated in the Federal Elements section of the Comprehensive Plan for the National Capital (NCPC 2004). In response to regional congestion and air quality levels, NCPC has recommended that parking be provided only for those federal employees who are unable to use other travel modes. To accomplish this policy, NCPC has created parking ratio goals for federal facilities based on their location to available transit services, walking distances and conditions in the surrounding area, and other criteria. Parking ratios are the number of parking spaces available per employee population. Suburban facilities beyond 2,000 feet of Metrorail should have

1.5 parking spaces for every employee (1.5:1) phasing to two parking spaces for every employee; therefore, the amount of parking at the Landover site has been determined based on this 1.5:1 requirement.

2.5.2 Jurisdictional Agreement

Prior to initiating the transportation analysis, it was essential to determine what analysis tools, data parameters, and assumptions would provide the basis of the analysis. In coordination with GSA, the project team met with Maryland State Highway Administrative (Maryland SHA), M-NCPPC, and Prince George's County to come to an agreement on the assumptions to follow for each site.

M-NCPPC, through its scoping process (M-NCPPC 2012a), requires that a scoping form be approved prior to analysis outlining the agreed upon level of detail, the data parameters, and type of analysis. These parameters and assumptions include a study area, trip generation, trip distribution, modal split, analysis years, analysis methods, and No-action/No-build transportation assumptions (background growth, planned developments, and planned roadway improvements).

Because access to the site was available by Interstate, the site agreements included guidance to analyze the Interstate facilities. This include which software to use, the specific facilities to study, the time period and EIS Condition, and pass/fail analysis threshold.

Appendix D1 contains the Landover Site Transportation Agreement.

3.0 Existing Condition: Landover Study Area

This chapter introduces the transportation study area for the Landover site in Prince George's County, Maryland. The chapter provides a summary of the existing transportation conditions within the study area as of March 2015, Data were collected between November 2014 and March 2015 with traffic counts obtained as early as March 2014 and include descriptions of the study area, pedestrian network, bicycle network, public transit system, parking conditions, truck access, traffic operations, and crash analysis. Separate TIA documents have been written for the other two site alternatives (Greenbelt and Springfield) and the JEH parcel in Washington, D.C.

3.1 Introduction

This section describes the transportation study area and the roadways serving it, followed by a summary of the data collection process.

3.1.1 Study Area Description

The proposed Landover site includes approximately 80 acres and was the previous site of the Landover Mall in a fairly populated suburb of Washington, D.C. The property is bordered by Evarts Street to the north, the Capital Beltway to the east, Landover Road to the south, and Brightseat Road to the west. Development around the property includes residential, park and recreation, commercial, and a new suburban shopping development east of the highway, and vacant commercial development, parking areas, and FedEx Field to the south. The property itself is now vacant; however, the asphalt-paved parking areas and driveways of the former mall remain but are slated for demolition.

The larger vehicular transportation study area, as shown in figure 3-1, extends from just east of U.S. Route 50 to the west to Ardwick-Ardmore Road to the north, Landover Road to the east, and Arena Drive to the south. The vehicular study area incorporates all of the intersections agreed upon for detailed study by GSA and the local and state transportation agencies, as well as the adjacent merge/diverge/weaves along I-95/I-495 for the existing ramps that would serve the proposed FBI vehicle trips. The vehicular traffic study area includes intersections between the proposed sites and regional highway network or last major decision point before entering a freeway facility. The determination of intersections to include for detailed study further considered the intersections along roadways reasonably anticipated to carry a substantial portion of employee vehicle traffic percent based on trip generation data. The study area only includes the selected intersections, but it does not have a clearly defined study boundary; it was established in consultation with Prince George's County, M-NCPPC, and Maryland SHA and includes a total of 24 intersections for the Existing Condition analysis.

The study area analyzed for the other transportation modes generally includes all areas within a 0.5-mile buffer of the site. A 0.5-mile radius was chosen in consultation with the Washington Metropolitan Area Transit Authority (WMATA) and is an industry standard for analyzing those pedestrian trips which are comfortably accessible to transit, and is commonly used as a typical walk-shed. For the Landover site, there are no Metrorail stations within 0.5 miles of the site, so impacts were evaluated for the closest Metrorail Station, which is just under two miles from the site. To be consistent among non-vehicular traffic modes, the bicycle and parking impacts were also evaluated within a 0.5-mile radius from the site.

3.1.2 Project Area Accessibility and Roadway Functional Classification

The Landover parcel is currently accessible via two locations on Brightseat Road to the west, one location on Evarts Street to the north, and an in-bound only access point from Landover Road. Landover Road provides regional east-west connections and direct access to the Capital Beltway (Interstate [I]-495), which borders the Landover site on the east side. The Capital Beltway provides regional access to Montgomery County and lower

Prince George's County in Maryland, as well as access to Northern Virginia. U.S. Route 50 (John Hanson Highway), slightly more than 1 mile west of the site via Landover Road, provides regional access to Washington, D.C., on the west and Annapolis on the east.

Figure 3-2 shows a map of roadway functional hierarchy classifications within the study area according to Maryland SHA (2014a). Functional classification is the process by which public streets and highways are grouped into classes according to the character of service they are intended to provide. Interstates, freeways, and expressways provide the highest level of service at the greatest speed for the longest uninterrupted distance, followed by principal arterials, minor arterials, collector roads, and finally local roads. The primary interstate within the study area providing regional access is the Capital Beltway (I-495). John Hanson Highway (U.S. Route 50), which is slightly more than 1 mile northeast of the site, also provides regional access and is classified as an "other freeway or expressway" by Maryland SHA. Within the study area, Landover Road (Maryland Route 202) is classified as a principal arterial. Minor arterials include Martin Luther King Jr. Highway (Maryland Route 704), Sheriff Road, Redskins Road, Crescent Road, and Arena Drive. In addition, collector roads in the study area include Brightseat Road, Ardwick-Ardmore Road, Barlow Road, and Kent Village Drive. Local roads in the study area include Evarts Street, Glenarden Parkway, Pinebrook Avenue, 75th Avenue, Dodge Park Road, Fire House Road, Kenmoor Drive, McCormick Drive, and Ruby Lockhart Boulevard.

Figure 3-1: Landover Transportation Study Area

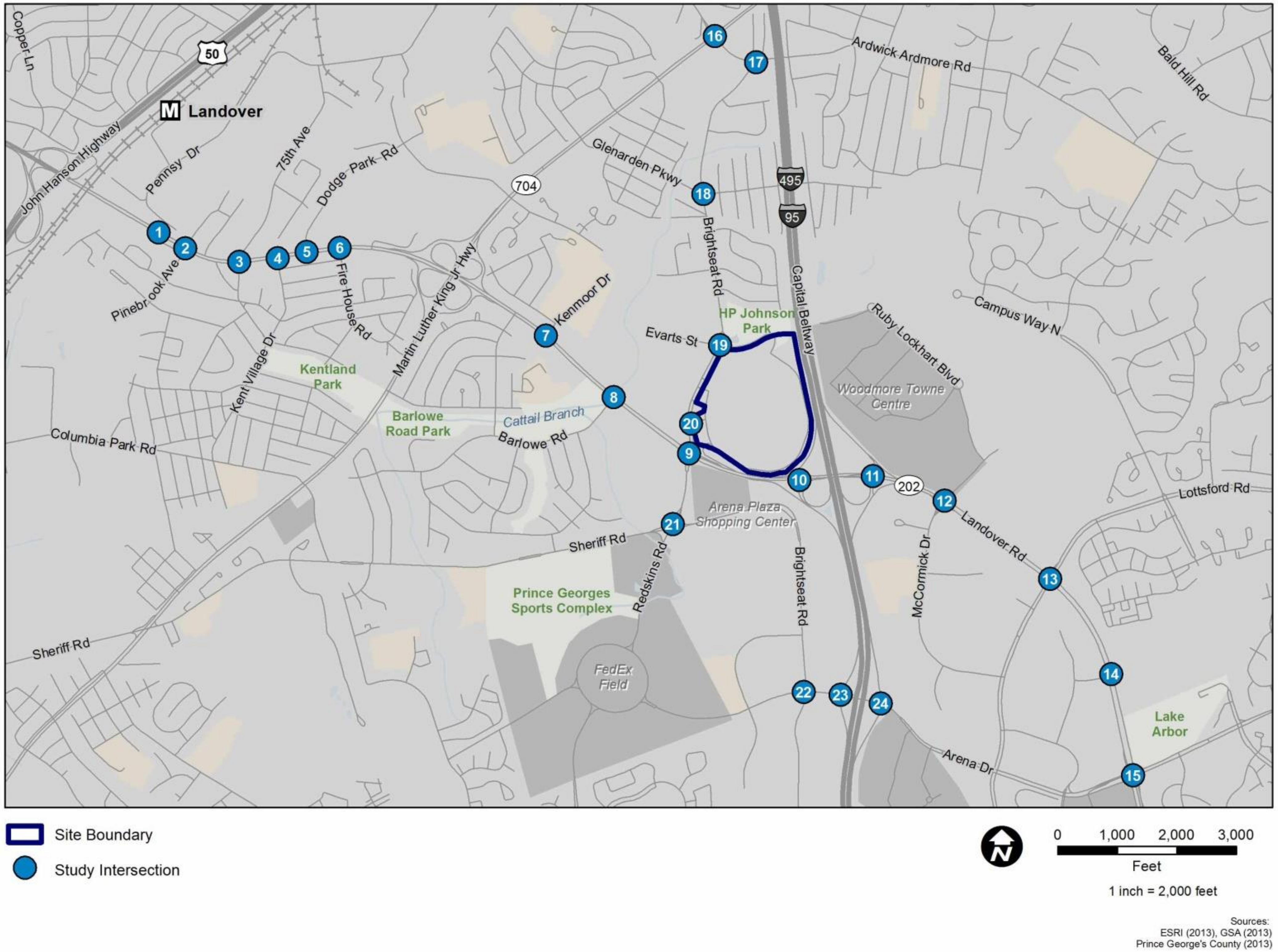


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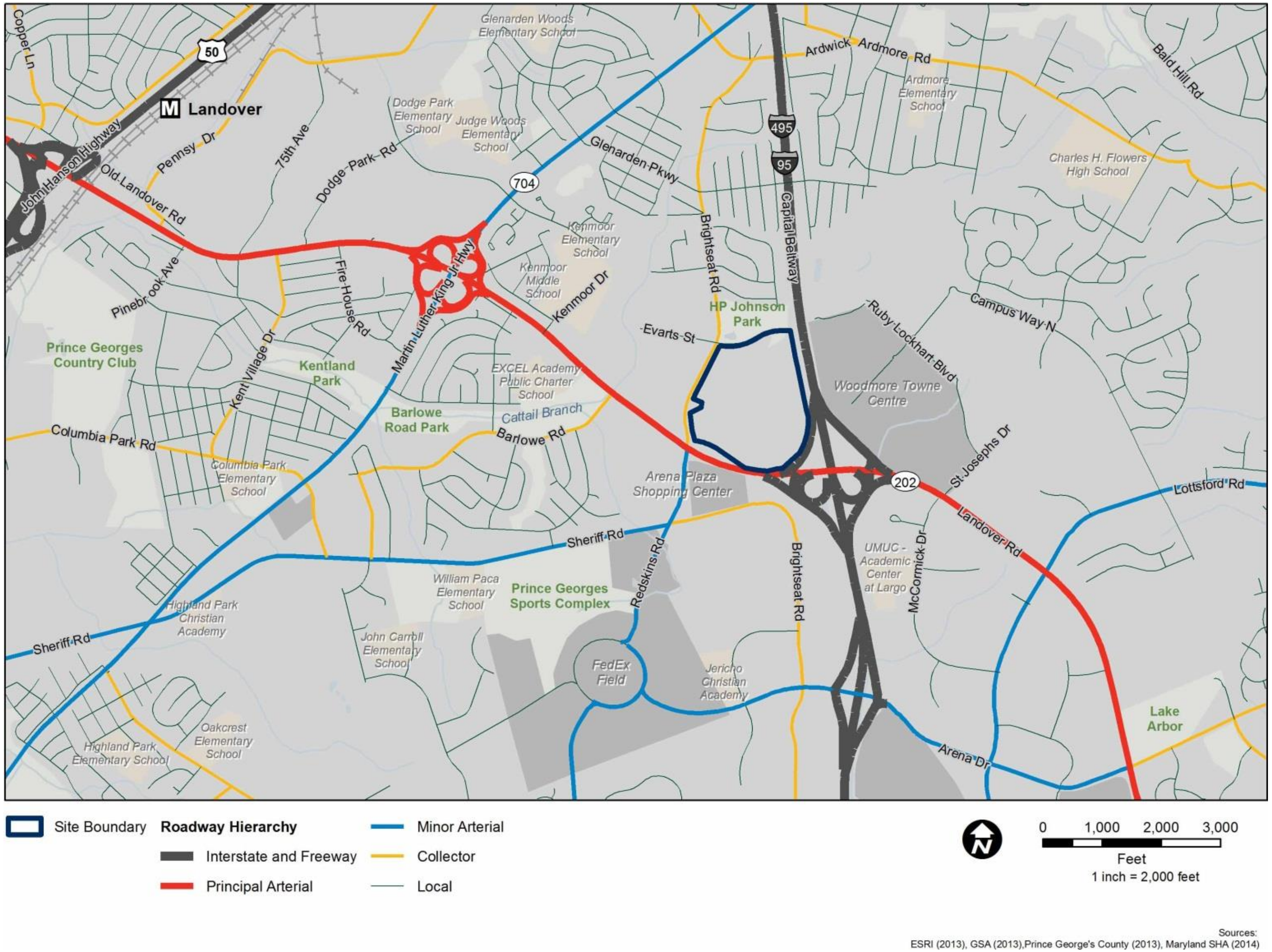
Figure 3-2: Roadway Hierarchy and Classification



3.1.3 Roadway Descriptions

The following section describes the roadways within the study area, including the roadway classification (arterials, collectors, local roads, etc.) assigned by Maryland SHA in their latest roadway functional classification from 2013, the number of lanes in each direction, the latest Annual Average Daily Traffic (AADT) volumes (12-months of traffic volumes averaged) available from Maryland SHA from 2013, and any noteworthy characteristics such as the roadway's role within the transportation network and if bike lanes are present. The information was collected from Maryland SHA's 2013 Functional Class GIS data (Maryland SHA 2014a), observations in the field, aerial imagery, and Maryland SHA's AADT's of Stations for the Years 2007–2013 (Maryland SHA 2014b).

Capital Beltway, also known as I-95/I-495, is north to south oriented along the eastern perimeter of the Landover site; the entire beltway completes a circle around the greater Washington, D.C., Metropolitan area connecting Maryland and Virginia. The roadway is classified as an interstate by Maryland SHA and comprises four to six lanes in each direction (2014a). The Capital Beltway connects to Landover Road, southeast of the site, and to John Hanson Highway (U.S. Route 50), northeast of the site. The speed limit of the Capital Beltway is 55 miles per hour (mph). From Landover Road (MD 202) to U.S. 50, the AADT volume on the Capital Beltway in 2013 was 226,800 vehicles (Maryland SHA 2014b).

John Hanson Highway, also known as U.S. Route 50, is classified as an "Other Freeway or Expressway" by Maryland SHA and has an east-west orientation (2014a). In each direction, there are three to five through lanes that extend southwest connecting with New York Avenue near Washington, D.C., and east towards Annapolis. In the vicinity of the Landover site, the roadway connects with the Capital Beltway, Martin Luther King Jr. Highway, and Landover Road. John Hanson Highway has a speed limit of 65 mph near the study area and has a 7.5 mile stretch of high occupancy vehicle (HOV) lanes between the Capital Beltway and U.S. Route 301 (Crain Highway) to the east (Maryland SHA 2015a). West of the study area, John Hanson Highway had an AADT of 97,000 vehicles in 2013 (Maryland SHA 2014b). East of the study area, it had an AADT of 146,100 vehicles in 2013.

Landover Road, **also known as Maryland Route 202,** has a curvilinear path with a general northwest to southeast orientation. It is classified by Maryland SHA as a principal arterial roadway and has three to six through lanes travelling in each direction, periodic left turn lanes, and a protected median (2014a). The roadway connects with the Arena Drive, Lottsford Road, the Capital Beltway, Brightseat Road, Martin Luther King Jr. Highway, and John Hanson Highway in the vicinity of the Landover site. Landover Road has a 40 mph speed limit west of the Landover site and a speed limit of 50 mph as Landover Road passes over the Capital Beltway. Directly south of the study area on Landover Road, the AADT was 52,200 vehicles in 2013 (Maryland SHA 2014b).

Martin Luther King Jr. Highway, also known as Maryland Route 704, is classified by Maryland SHA as a minor arterial roadway and primarily contains three through lanes in each direction near the study area, periodic left turn lanes, and a protected median (2014a). The roadway has a northeast to southwest orientation and connects with John Hanson Highway (U.S. Route 50), Ardwick-Ardmore Road, Landover Road, and Sheriff Road in the vicinity of the Landover site. Martin Luther King Jr. Highway has a speed limit of 40 mph. Northwest of the study area on Martin Luther King Jr. Highway, the AADT was 26,600 vehicles in 2013 (Maryland SHA 2014b).

Brightseat Road is classified by Maryland SHA as a major collector road and has three lanes in each direction between Evarts Street to the north and Sheriff Road/Redskins Road to the south, a general north-south orientation, and a protected median (2014a). North of Evarts Street and the Landover site, the roadway narrows to one wide lane in each direction, allowing street parking on either side of the road. To the south of the site, Brightseat Road turns east at the intersection with Sheriff and Redskins Roads, where it travels east for a short while before again traveling south; this stretch of Brightseat Road has two through lanes in each direction. The roadway provides connections to multiple residential neighborhoods as well as Evarts Street and Ardwick-

Ardmore Road to the north of the site and Landover Road, Redskins Road, Sheriff Road, and Arena Drive to the south. Brightseat Road has a speed limit of 35 mph. The AADT for Brightseat Road in 2013 was 11,800 vehicles (Maryland SHA 2014).

Redskins Road is classified as a minor arterial road by Maryland SHA and connects Sheriff Road and Brightseat Road with the FedEx Field and parking lot (2014a). The road has a north-south orientation that extends from where Brightseat Road turns at the intersection with Sheriff Road to the FedEx Field. Although there are four lanes in each direction, only three lanes in each direction are used on normal (non-game) days with the two lanes in the center intended to be used only on Redskins game days. On game days, the lane assignments are dynamic, changing based on demand. Redskins Road has a speed limit of 35 mph. In 2013, Redskins Road had an AADT of 8,400 vehicles (Maryland SHA 2014b).

Sheriff Road is classified by Maryland SHA as a minor arterial roadway. Sheriff Road has an east-west orientation that becomes Brightseat Road to the west at its intersection with Redskins Road (2014a). There are two through lanes of traffic in each direction with no median and center turning lanes at intersections. The Residential properties line this roadway, which also acts a connector to other larger roadways such as Martin Luther King Jr. Highway and Redskins Road/Brightseat Road. In some parts of the roadway where residential properties fronting the street, on-street parking can be found along both directions. The road has a 35 mph speed limit. In 2013, the AADT for Sheriff Road was 13,600 vehicles (Maryland SHA 2014b).

Evarts Street travels east to west across Brightseat Road north of the Landover site. On its eastern end, the roadway turns south to become a perimeter access road around the east side of the Landover site. The road is classified as a local roadway and has a 25 mph speed limit (2014a). On the west side of Brightseat Road, Evarts Street traverses a residential neighborhood and has one through lane in each direction. On-street parking is allowed except at the intersection with Brightseat Road. On the east side of Brightseat Road, north of the Landover site, Evarts Street travels between an M-NCPPC park and the vacant Landover Mall site, has one wide eastbound lane and two westbound lanes, and has no on-street parking restrictions. Prince George’s County has future plans to extend Evarts Street over the Capital Beltway to create a better street network and connect development west of the beltway with the Woodmore Towne Centre.

Glenarden Parkway provides access to residential neighborhoods and generally travels east to west with a northwest-southeast angle. The roadway is classified as a local road by Maryland SHA (2014a). Glenarden Parkway traverses a residential neighborhood with sidewalks on both sides and one through lane in each direction and provides ample space for on-street parking. The road connects Brightseat Road north of the site to Martin Luther King Jr. Highway on the west and over the Capital Beltway to the east, connecting with more residential neighborhoods. Glenarden Parkway has a speed limit of 25 mph.

Barlowe Road is classified by Maryland SHA as a major collector road (2014a). The roadway connects Landover Road to a series of subsidiary residential roads west of the site. In addition to residential properties, Barlowe Road also serves a neighborhood commercial shopping center and several community and government facilities. Barlowe Road has one through lane in each direction and includes protected sidewalks for pedestrians on both sides of the street. The roadway has a speed limit of 25 mph and on-street parking is allowed along select portions of the roadway. Barlowe Road had an AADT of 5,400 vehicles in 2013 (Maryland SHA 2014b).

A detailed inventory of the lane geometry was conducted through field reconnaissance and a study of aerial imagery. Based on this information, the existing lane geometry and traffic control type (signalized or unsignalized) of intersections in the study area is shown in figure 3-3.

Figure 3-3: Existing Lane Geometry and Traffic Control Type

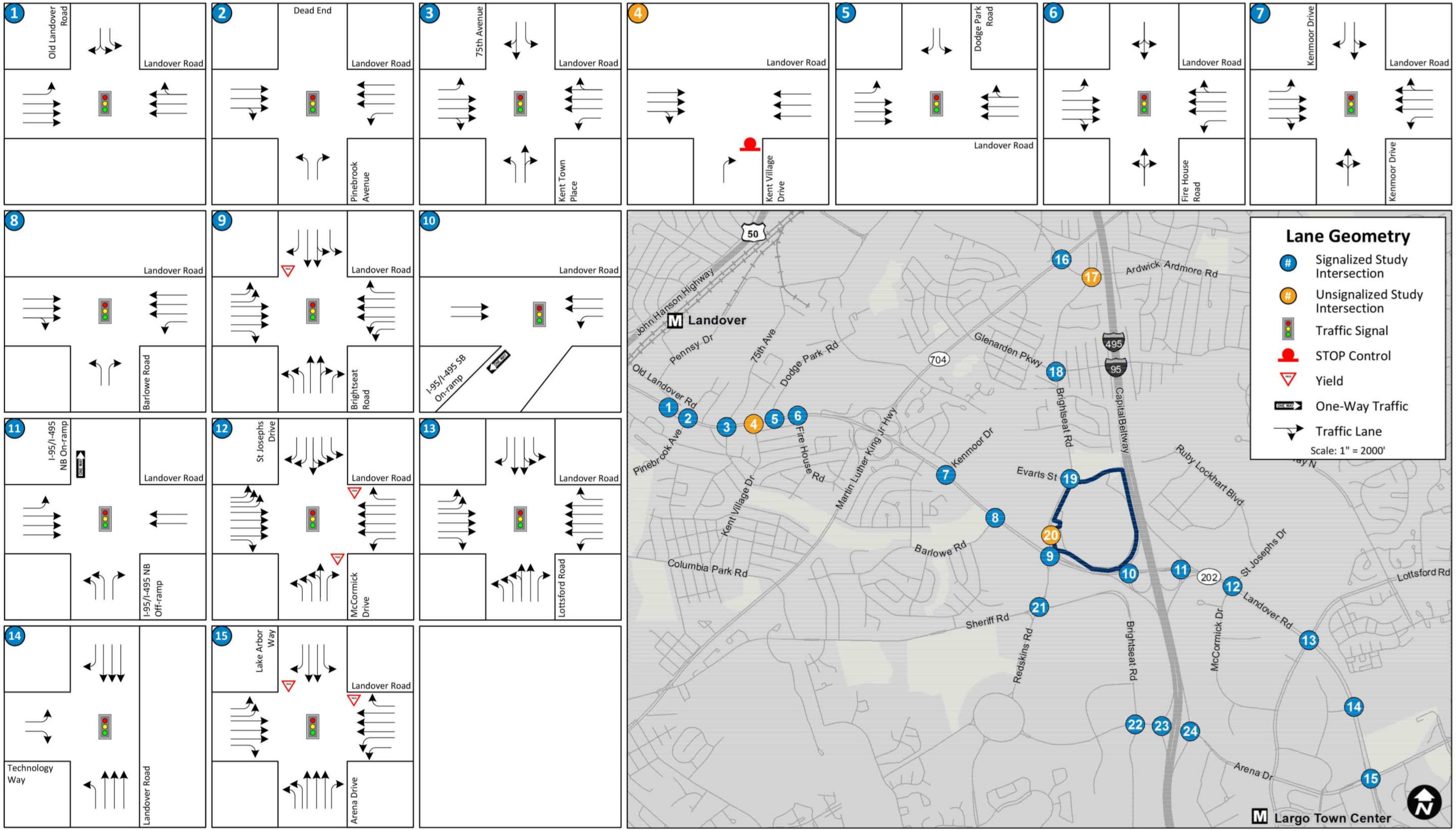
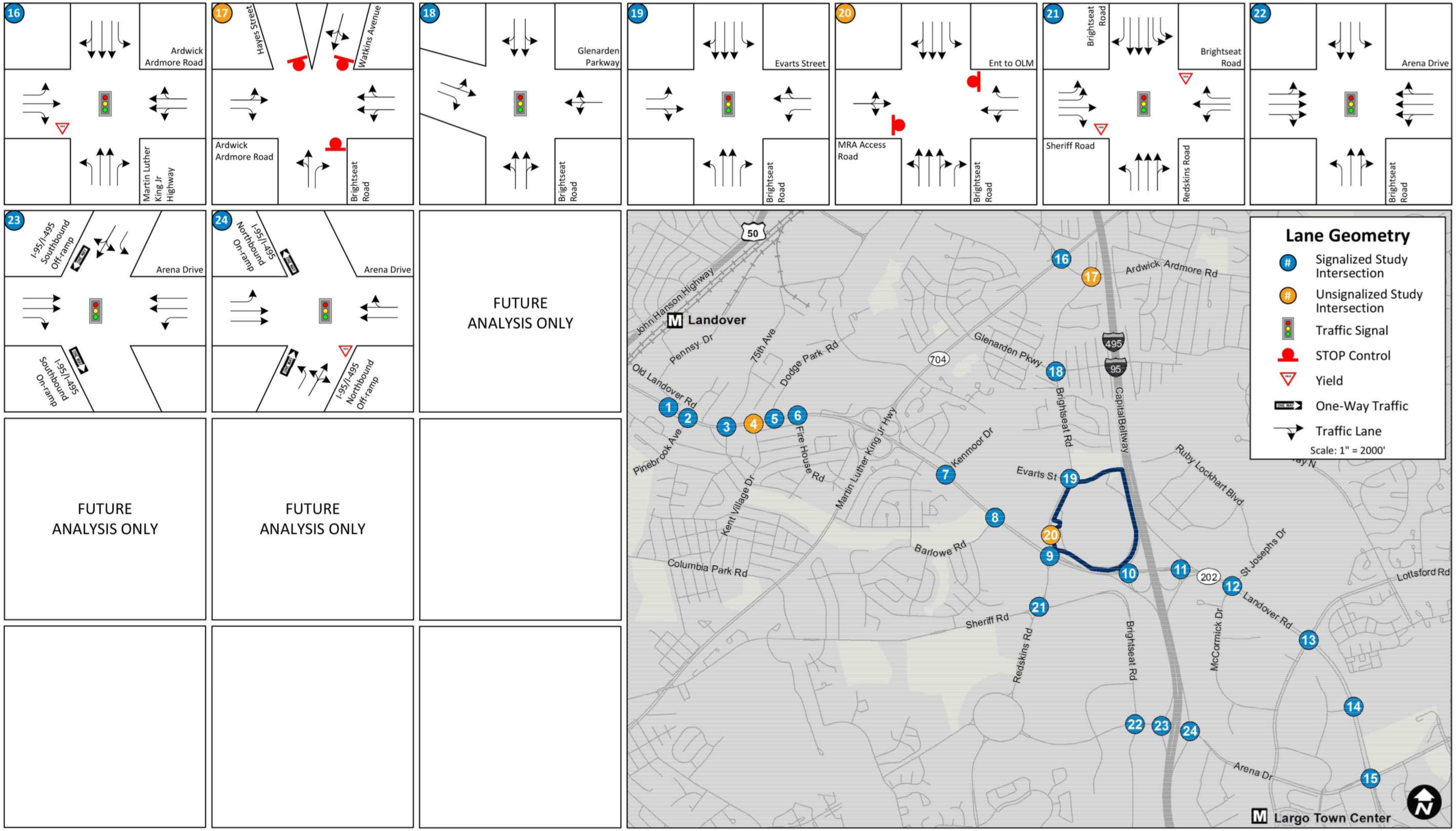


Figure 3-3: Existing Lane Geometry and Traffic Control Type (continued)



3.1.4 Data Collection

Intersection counts were obtained in spring 2014 and November 2014, between the hours of 6:30 AM and 9:30 AM in the morning and 4:00 PM and 7:00 PM in the evening (Appendix D2). Intersection counts include vehicular, truck, bicycle, and pedestrian volumes. Automated Traffic Recorder (ATR) counts were collected for interchange ramps and other select roadway segments, with a 24-hour weekday count for each roadway between January and February of 2015. The traffic counts were used in combination with signal timings from Maryland SHA and observations in the study area. Traffic counts were recorded on non-holiday Tuesdays, Wednesdays, and Thursdays to measure “typical” traffic conditions along the roadway network. Mondays, Fridays, and holidays tends to have lower and more variable traffic volumes since people tend to be on holiday and/or telework during this time.

After examining the count collection data for the study area, the peak AM and PM traffic hours were determined for both the arterial transportation system (intersection counts) and the interstate system (ATR for the mainlines and a combination of ATR and intersection counts for the ramp). These peak hours are shown in yellow bands on the charts in figures 3-4 through 3-6 (cumulative represents all turning movement volumes for all study area intersections summed together). The determination of a peak hour relied on the arterial system peak hour because the arterial system would be most impacted by the addition of a consolidated FBI HQ facility. In addition, the Interstate system morning peak hour is within 15 minutes of the arterial system and afternoon flows remain near the peak through the arterial system peak hour. The overall weekday AM peak hour used for the analysis occurs between 7:30 AM and 8:30 AM, and the weekday PM peak hour occurs between 5:00 PM and 6:00 PM. The same peak hours were extracted from the AM and PM peak period intersection turning movement volumes and placed into a diagram (see Figure 3-7). Volumes between intersections were compared to ensure volumes departing one intersection were no more than a 10 percent difference from the next downstream intersection, except if there were driveways between intersections serving retail (VDOT 2013).

Figure 3-7 shows the existing AM and PM weekday peak hour turning movement volumes occurring in the study area.

Figure 3-4: Landover Intersection (Arterial) Cumulative AM Volumes

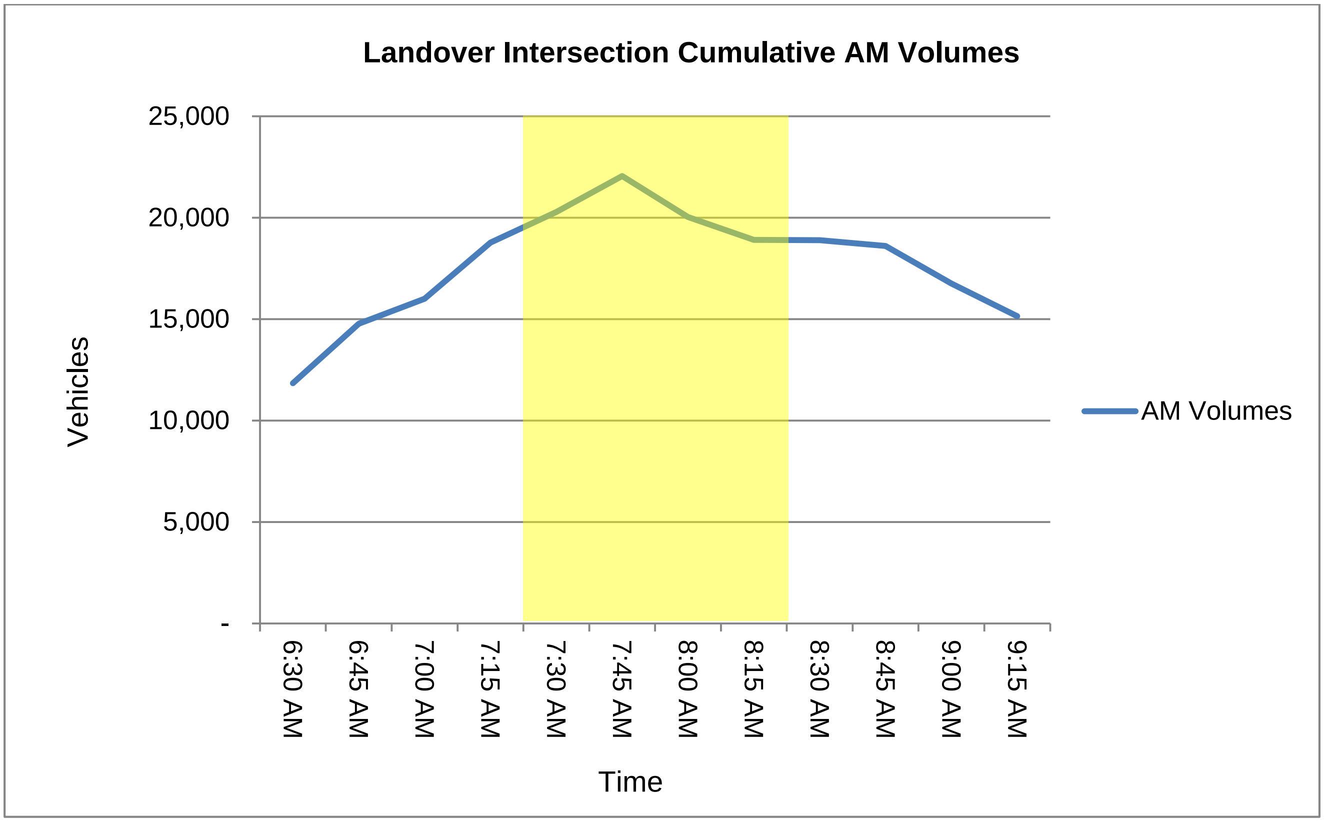


Figure 3-5: Landover Intersection (Arterial) Cumulative PM Volumes

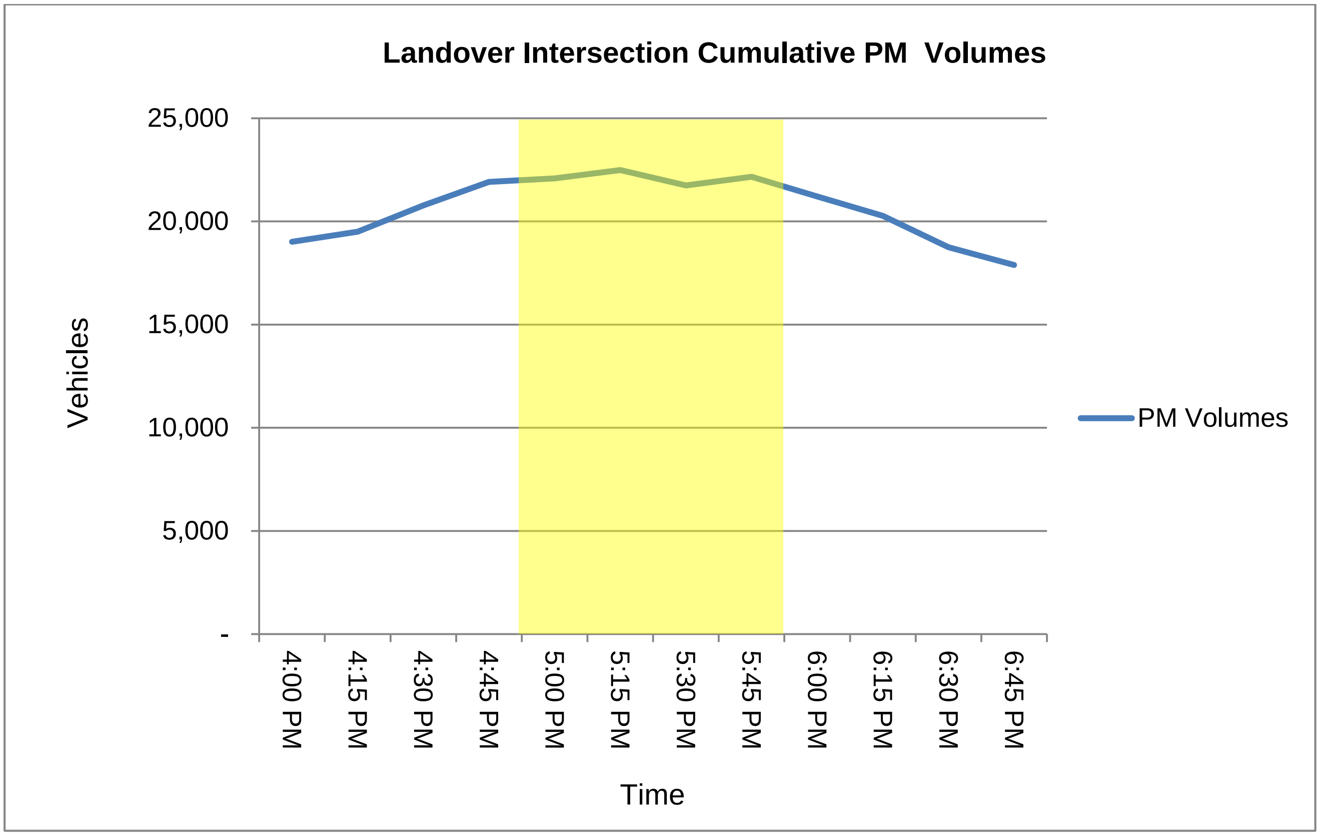


Figure 3-6: Landover Interstate Volumes

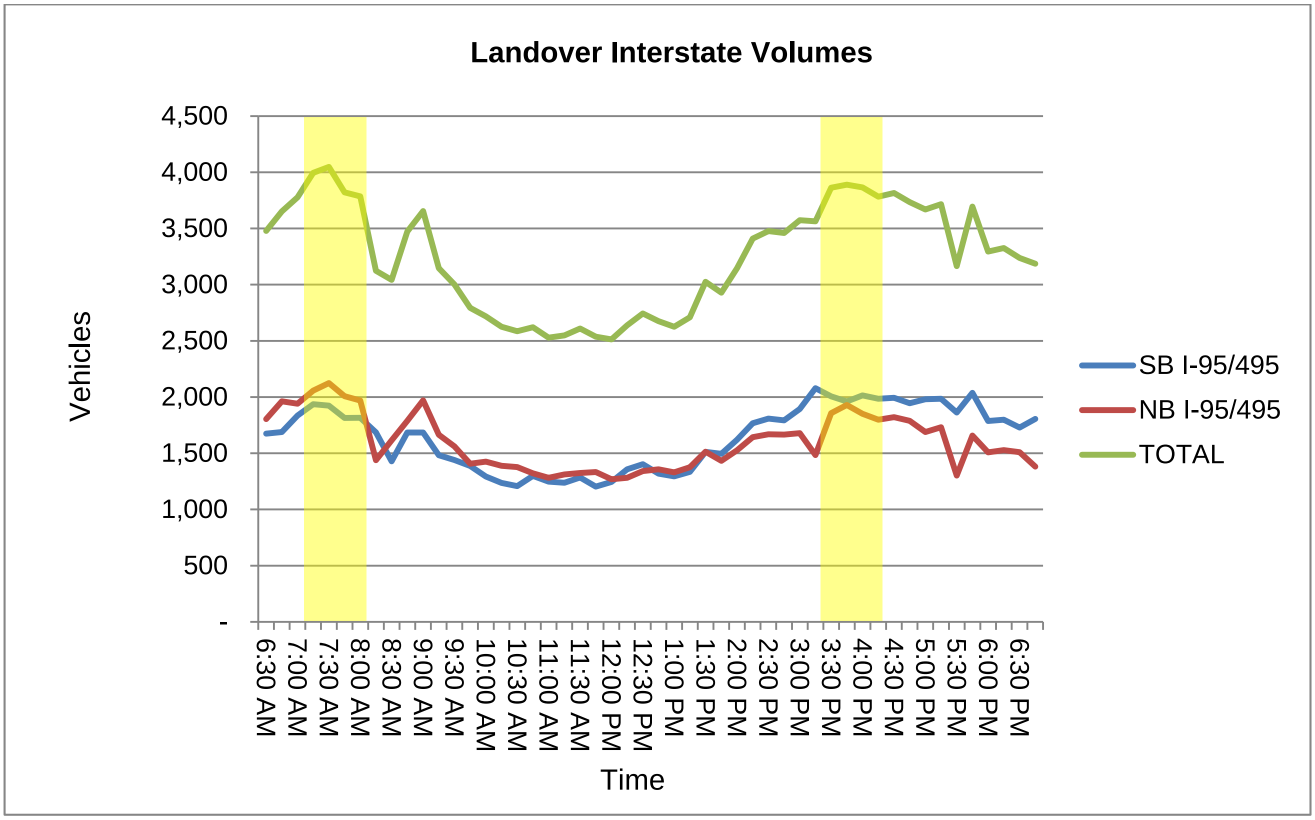


Figure 3-7: Existing Condition AM and PM Peak Hour Turning Movement Volumes

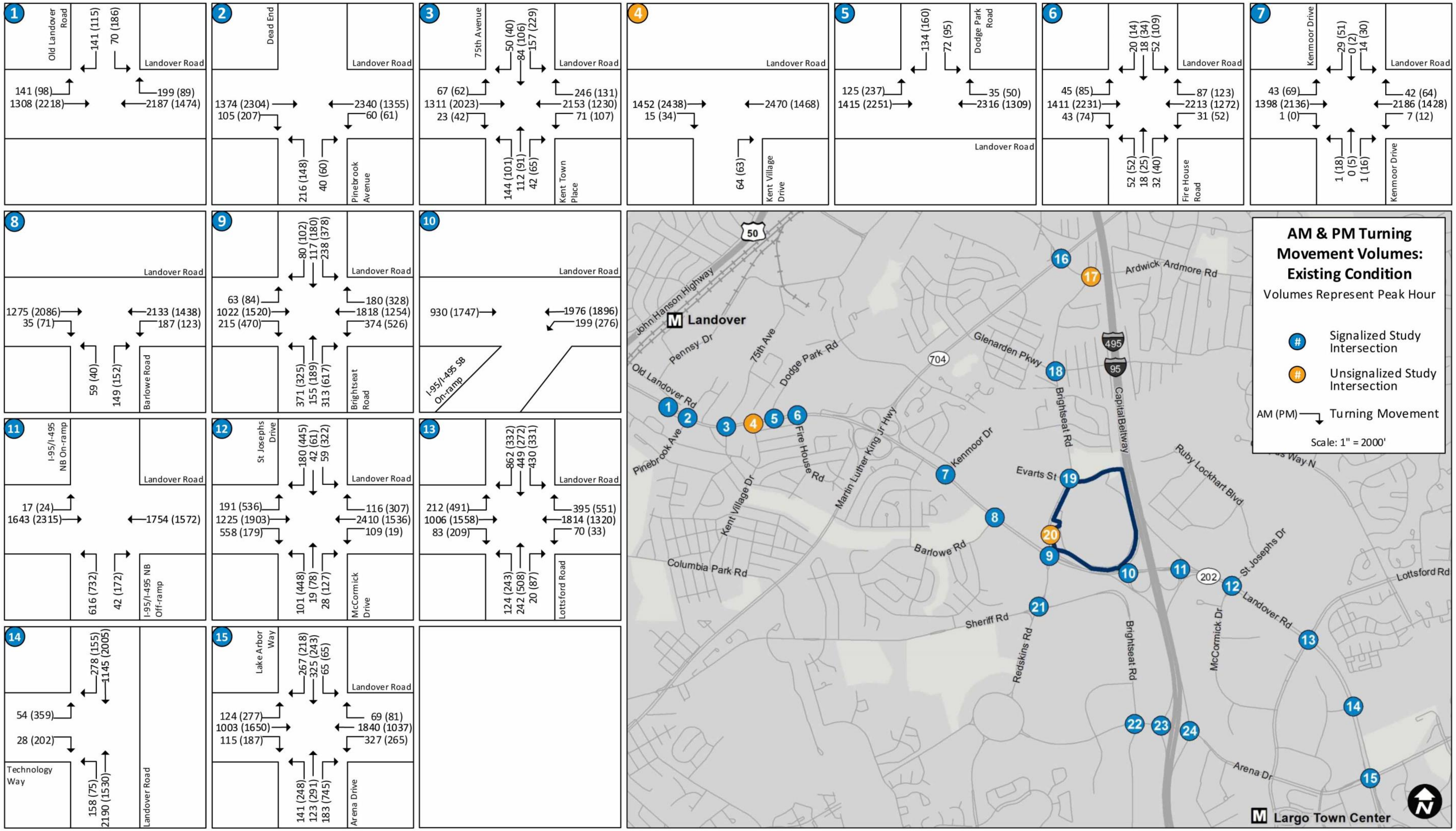
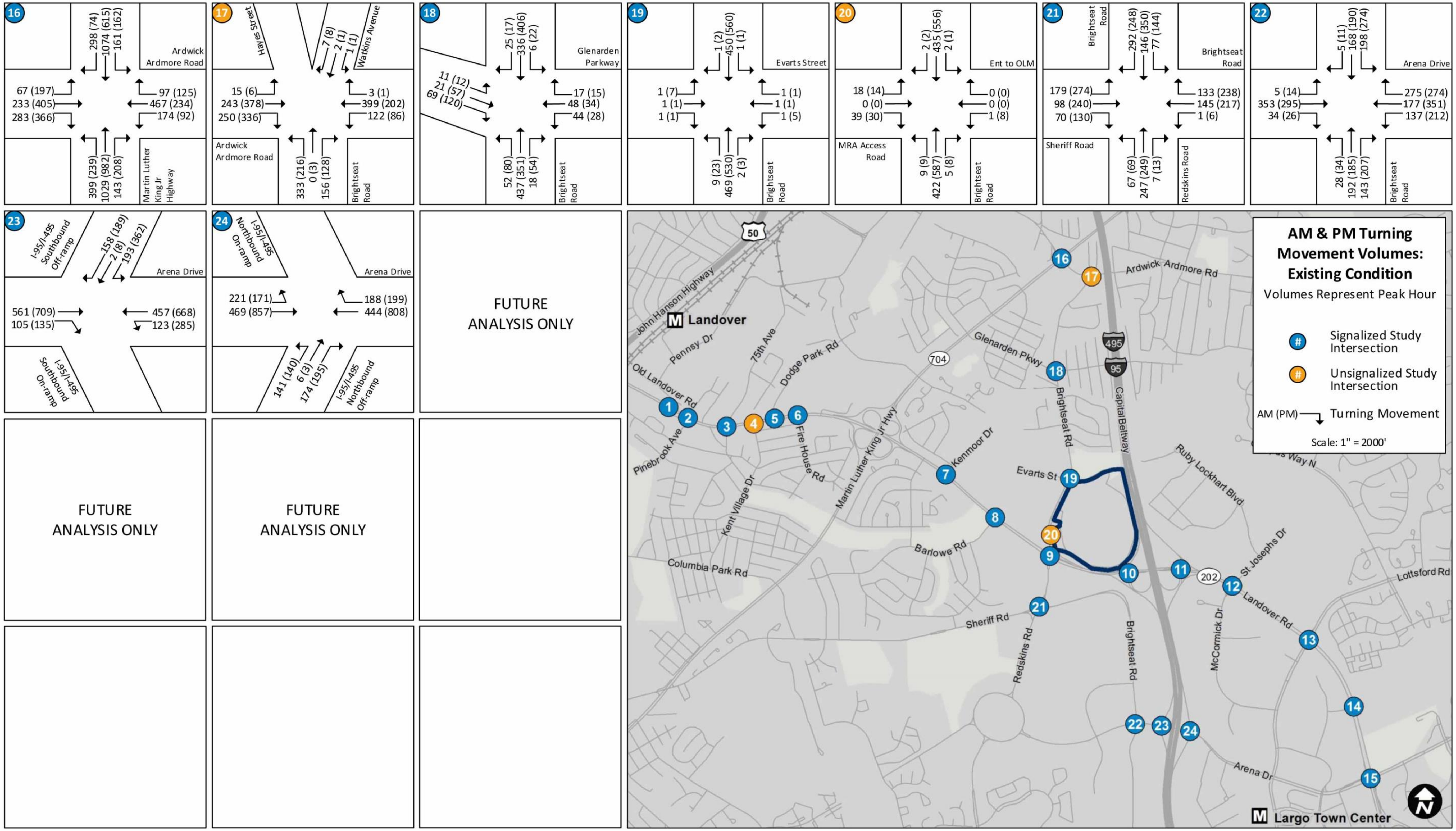


Figure 3-7: Existing Condition AM and PM Peak Hour Turning Movement Volumes (continued)



3.2 Pedestrian Network

Analysis of the pedestrian network for the Landover site includes observations and measurements of sidewalk widths within the 0.5-mile non-traffic study area. Sidewalk measurements and other observations for the alternative sites were recorded in the field in May of 2015 (Site Visit, May 1, 2015) and via imagery from Google maps with 2012/2014 images (https://maps.google.com/), and additional information was gathered from local area planning documents. Measurements were recorded from the edge of the sidewalk to the edge of the curb. This section includes a description of where sidewalks are present, origin and destination points of pedestrians and/or commonly used sidewalks in the study area, disruptions or obstacles in the pedestrian environment, and general Americans with Disabilities Act (ADA) compliance.

3.2.1 Overall Sidewalk Observations

Sidewalks are provided along a majority of the roads throughout the study area, including Brightseat Road, Evarts Street, and sections of Landover Road west of the Beltway. Towards the edge of the 0.5-mile study area, Glenarden Parkway, Sheriff Road, Redskins Road, Barlowe Road, Ruby Lockhart Boulevard, and McCormick Drive/St. Joseph’s Drive also have sidewalks. There are sections of roadway along Landover Road west of the Beltway and Brightseat Road that do not have walkways on both sides of the street, and Landover Road does not have sidewalks on either side of the street on the overpass over the Capital Beltway and west of the Beltway overpass. The majority of intersections in the study area have adequate accommodations—the sidewalks are in good condition (with only little overgrowth or few cracks) and pedestrian facilities such as crosswalks, signs/signals, and ramps are present at intersections.

The origins and destinations of pedestrian trips in the study area are a mix of retail, recreational, and residential. The Landover site is surrounded by residential neighborhoods that can produce dispersed pedestrian traffic along roadways. In the immediate vicinity of the Landover site there is little foot traffic because of the lack of attractions and designated areas to walk. However, Brightseat Liquor, at the southwest corner of Brightseat Road and Evarts Street, likely receives a reasonable amount of local pedestrian traffic given the pedestrian paths worn through the grass on the property. To the south of the site, many pedestrians use FedEx Field and the surrounding parking during special events.

Commonly used walkways around the Landover site include paths used to navigate to public transportation and residential locations, as well as Brightseat Liquor as noted above. These walkways include Brightseat Road for the A12 and F14 Metrobus routes and nearby residential areas. As described in Section 3.4 *Public Transit*, the bus stops with the highest weekday activity within 0.5-mile of the study area are the A12 and F14 bus stops at Brightseat Road and Maple Ridge Apartments across Brightseat Road from the Landover site, with average total weekday activity of between 175 and 215 total trips.

In addition to those places where the sidewalk network is fragmented or without adequate accommodations, there are a few areas of concern within the study area that negatively impact the quality and attractiveness of walking, including narrowed sidewalks due to vegetation overgrowth, uneven pathways, cracked pavement, and sidewalks that are less than 5 feet wide. The intersection of Brightseat Road and Landover Road (Route 202) was specifically identified as an area needing pedestrian safety improvements in the Landover Gateway Sector Plan and Sectional Map Amendment (M-NCPPC and PGC PD 2009a). Additionally, the major roads in the study area, such as Landover Road and the Capital Beltway, divide the area and make non-motorized transportation very difficult.

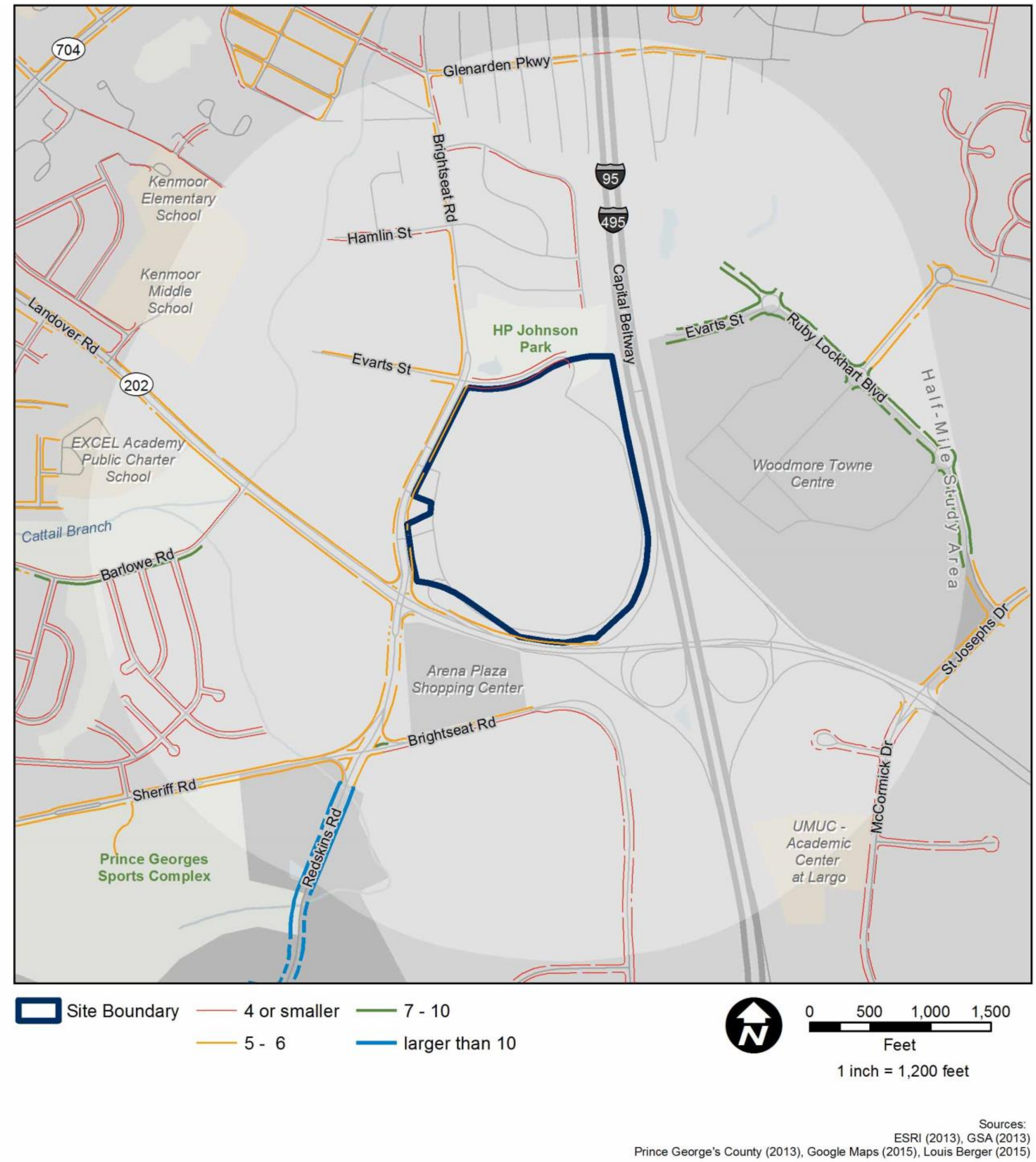
3.2.2 Accessibility Compliance

According to ADA, there is a minimum requirement for 3-foot clearances on street curb ramps as well as minimal slopes and detectable warnings (i.e., dome-shaped bumps) (United States Department of Justice [USDOJ] 2007). The majority of intersection crosswalks and their associated curb ramps in the study area did not meet ADA requirements because they lacked detectable warnings.

Federal Highway Administration (FHWA) guidelines recommend that sidewalks have a minimum width of 5.0 feet if setback from the curb or 6.0 feet if at the curb face (FHWA 2014). Any sidewalk width less than 5.0 feet must be 3.0 feet wide with 5-foot turn-around locations every 200 feet to meet the minimum requirements for people with disabilities (USDOJ 2010). Most of the sidewalks in the study area meet these width requirements with the exception of residential community sidewalks, including Barlowe Road, Ray Leonard Road, Palmer Park Road, Reicher Street, and Manson Street, where sidewalks are less than 5 feet wide and do not meet FHWA guidelines. Sidewalks on Brightseat Road, Evarts Street, and McCormick Drive are also less than 5 feet wide. Depending on turn-around locations, these narrower sidewalks also may not meet ADA requirements.

Figure 3-8 shows the existing pedestrian network.

Figure 3-8: Existing Pedestrian Network



3.3 Bicycle Network

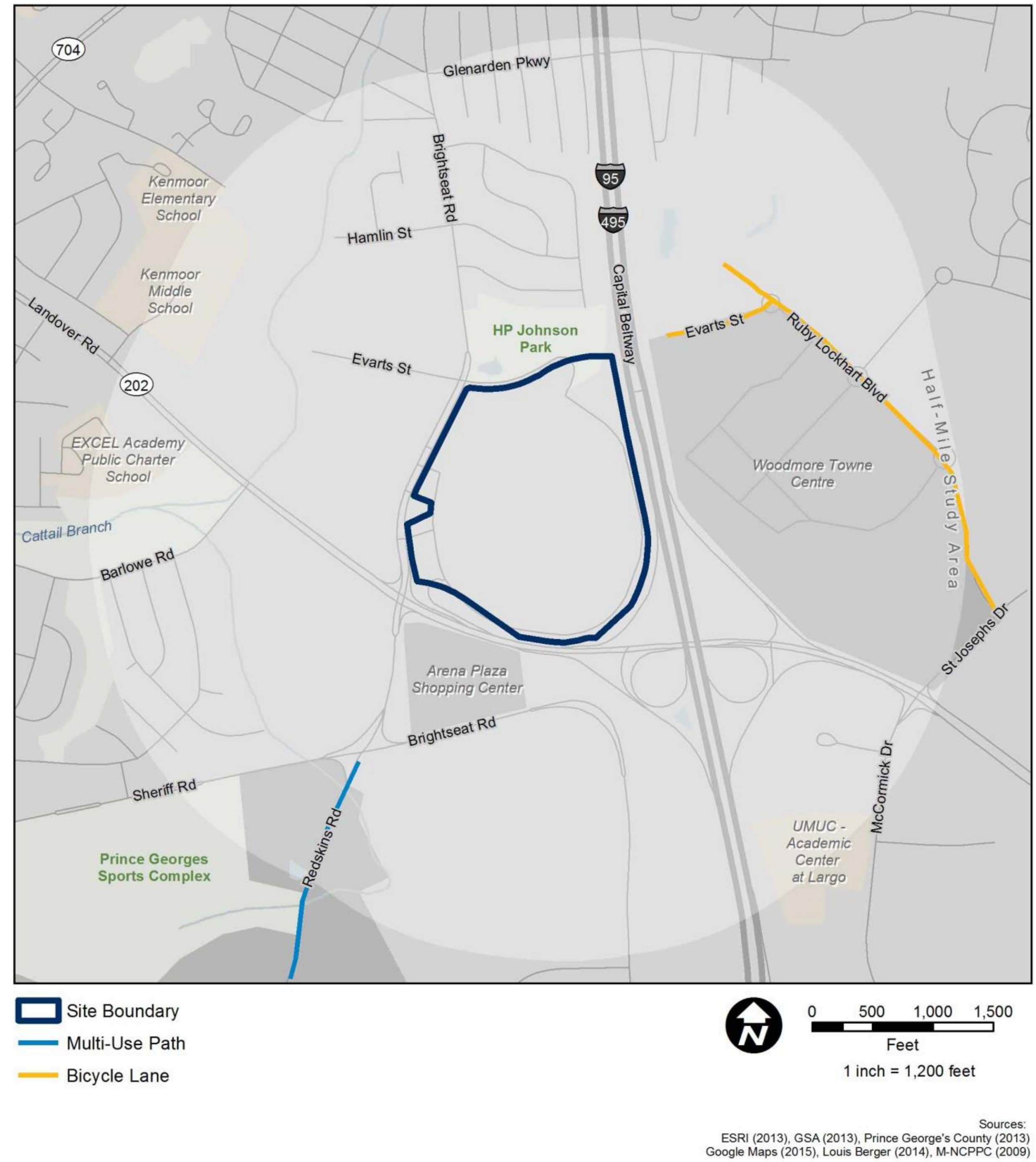
The Landover non-vehicular study area has three roadways with on-road bicycle accommodations: Ruby Lockhart Boulevard, a short portion of Campus Way North, and Evarts Street, all located east of the Capital Beltway (I-95/I-495) from the site. A mixed-use path, or sidepath, is located along Redskins Road connecting the intersection of Sheriff and Brightseat roads to FedEx Field. These mixed-use paths continue around FedEx Field and along portions of Arena Drive south of the study area. There are no bicycle accommodations directly adjacent to the site and there are no bikeshare services in the Landover site study area. Table 3-1 and figure 3-9 summarize bicycle accommodations in the study area.

Table 3-1: Bicycle Facilities in Site Study Area

Name	To/From	Type
Ruby Lockhart Boulevard	From northwest terminus (at St. Nicholas Way) to St. Joseph's Drive	Bicycle Lane (no bicycle lanes through roundabouts)
Campus Way North	Ruby Lockhart Boulevard to Campus Way North roundabout	Bicycle Lane
Evarts Street (Section East of the Beltway)	Entire length to Ruby Lockhart Boulevard	Bicycle Lane
Redskins Road	From Sheriff Road/Brightseat Road intersection to FedEx Way (circular road around FedEx Field)	Mixed-Use Path

Source: Largo Town Center Station Site Inventory, December 19, 2014; Google maps (https://maps.google.com/); M-NCPPC and PGC PD (2009a)

Figure 3-9: Existing Bicycle Facilities



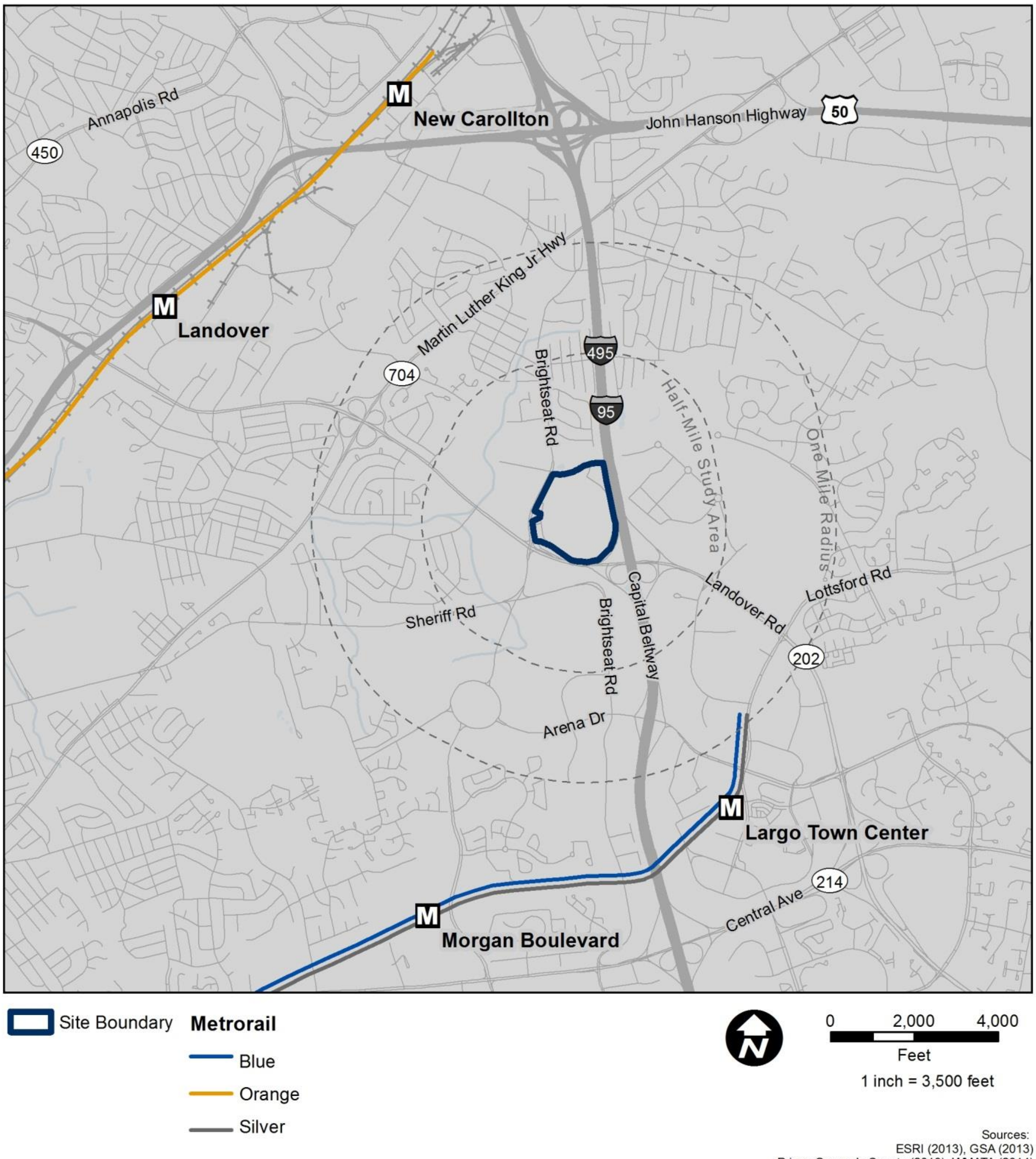
3.4 Public Transit

This section describes the existing conditions of Metrorail, local and intercity bus, shuttles, ridesharing (slugging), and carsharing within the Landover study area. There are no main transit hubs within the study area. Note that the station and bus analysis results throughout the TIA includes rounding; therefore, values may not add up to the precise value indicated.

3.4.1 Largo Town Center Metro Station

The site is located approximately 1.9 miles from the Largo Town Center and Morgan Boulevard Metro Stations, both served by the Blue and Silver lines (see figure 3-10). The project site is also located approximately 2.4 miles from the Landover Metro Station, which is served by the Orange line. GSA and the FBI have determined that if this site is selected, an employee shuttle to/from the site would use the Largo Town Center Metro Station. As a result, this TIA documents existing conditions at this Metrorail station.

Figure 3-10: Landover Study Area Metrorail Stations



3.4.1.1 Largo Town Center Metro Station Frequency of Service

During peak periods, a Blue line train is scheduled to serve Largo Town Center every 12 minutes, and a Silver line train is scheduled to serve the station every 6 minutes, effectively making the wait time for a train only 4 minutes if trains are on-time because 15 trains are scheduled to serve the station every hour. During midday and evening hours, trains are scheduled to serve the station every 6 minutes, but after 9:30 PM, trains are scheduled to serve the station every 10 minutes. On weekends, Blue and Silver line trains are scheduled to serve the station with an effective headway of every 6 to 10 minutes. Table 3-2 summarizes scheduled headways and spans of service by line at Largo Town Center Metro Station.

Table 3-2: Metrorail Frequency of Service at Largo Town Metro Center Station

Day	Period	Span of Service	Headway (Minutes)		
			Blue	Silver	Effective Headway
Weekday	Peak	5:00 AM to 9:30 AM/ 3:00 PM to 7:00 PM	12	6	4
	Midday	9:30 AM to 3:00 PM	12	12	6
	Evening	7:00 PM to 9:30 PM	12	12	6
	Late Night	9:30 PM to 12:00 AM [a]	20	20	10
Saturday	Daytime	7:00 AM to 9:30 PM	12	12	6
	Late Night	9:30 PM to 3:00 AM	20	20	10
Sunday	Daytime	7:00 AM to 9:30 PM	15	15	7.5
	Late Night	9:30 PM to 12:00 AM	20	20	10

[a] Service is extended to 3:00 AM on Fridays

Note: Effective headways are calculated by dividing an hour (60 minutes) by the total number of trains that are scheduled to serve the station during an hour. For example, 12 minute headway = 5 trains/hour, 6 minute headway = 10 trains/hour, 5+10 = 15 trains/hour and 60 ÷ 15 = 4 minute effective headways.

Source: WMATA (2014f)

3.4.1.2 Largo Town Center Metro Station Mode of Access, 2012

The *2012 Metrorail Passenger Survey* (WMATA 2013a) details mode of access to all Metrorail stations in the system. At Largo Town Center Metro Station, the majority of passengers drove to the station and parked (67 percent). Fourteen percent of passengers were dropped off at the station (using the Kiss & Ride lot), while 12 percent used a bus to access the station. Table 3-3 summarizes mode of access to the station.

Table 3-3: Mode of Access to Largo Town Center Metro Station in 2012

Mode	Percent of Total Passengers
Drove and Parked	67.0%
Kiss & Ride	13.8%
Metrobus	11.3%
Walked	5.2%
Carpooled and Parked	1.8%
TheBus	0.9%

Source: WMATA (2013a)

3.4.1.3 *Largo Town Center Metro Station Infrastructure*

The entrance to the Largo Town Center Metro Station is located off Harry Truman Drive. Pedestrian entrances are located on both sides of the tracks, with the northern side connecting to the station's bus loop and the southern side connecting to the Park & Ride garage and the Kiss & Ride lot. The two pedestrian entrances converge at the station mezzanine, located below the station platform.

The station has a large parking garage that can accommodate 2,341 cars. It also has 57 bicycle parking spaces, in the form of bicycle racks or bicycle lockers. Table 3-4 summarizes parking infrastructure at the station.

Table 3-4: Automobile and Bicycle Parking Details at Largo Town Center Metro Station

Type	Number
All-Day Parking Spaces	2,200
Long-Term Parking Spaces	0
Short-Term Metered Spaces	141
Bicycle Racks	9
Bicycle Lockers	48

Source: WMATA (2015a)

Largo Town Center Metro Station has several vertical and fare infrastructure elements. The station has two staircases, one elevator, and one escalator between the street level (Kiss & Ride/Park & Ride) and the mezzanine level. Between the mezzanine and the platform, there are two elevators, three escalators, and three staircases. Each escalator is paired with a staircase, with the escalator typically operating in the upward direction toward the platform and the staircases used in the downward direction toward the mezzanine because the mezzanine is located below the platform at Landover. The station mezzanine has 11 faregate aisles (including one ADA aisle) and several fare vending machines. Table 3-5 summarizes the vertical and fare infrastructure elements at Largo Town Center Metro Station.

Table 3-5: Largo Town Center Metro Station Vertical and Fare Infrastructure

Infrastructure	Location	Element	Number of Existing Elements	Notes
Vertical Circulation	Street to Mezzanine	Escalators	1	To Kiss & Ride/ Park & Ride
		Elevators	1	To Kiss & Ride/ Park & Ride
		Stairs	2	To Kiss & Ride/ Park & Ride
	Mezzanine to Platform	Escalators	3	-
		Elevators	2	-
		Stairs	3	-
Farecard Vendors		Passes Only	-	-
		Farecards and Passes	10	-
		SmarTrips	2	-
		Exit Fare	2	-
Faregate Aisles		Standard	10	-
		ADA	1	-
		Total	11	-

Source: Largo Town Center Station Site Inventory, December 19, 2014.

3.4.1.4 Largo Town Center Metro Station Bus Loop

Largo Town Center Metro Station has a bus loop on the north side of the station with ten bus bays, five of which are currently used. Metrobus routes and TheBus routes are separated into different bays, a common practice at Metrorail bus loops. Metrobus routes that serve common destinations (i.e., Routes C21 and C22) from the station bus loop are grouped into bays by direction, so that passengers can board whichever route arrives first.

All of the bus bays at Largo Town Center Metro Station are served by five buses per hour or less during the peak hour of bus service (between 8:00 AM and 9:00 AM). Bays F and B are served by the highest number of buses per hour, at five and four, respectively. WMATA standards call for a maximum of six buses per hour per bay (WMATA 2008). The maximum acceptable capacity (based on a 2-minute loading/unloading time and a 3-minute layover time) is 12 buses per hour (WMATA 2013b). Overall, only 17 buses per hour serve the station bus loop as a whole, while the WMATA standard capacity is 60 buses per hour and the maximum acceptable capacity is 120 buses per hour. Therefore, the station bus loop has significant excess capacity. Table 3-6 summarizes bus bay assignments and capacity at the Largo Town Center Metro Station bus loop.

Table 3-6: Station Bus Loop Bus Bay Assignments and Capacity at Largo Town Center Metro Station

Bay	Metrobus	TheBus	Peak Buses/ Hour
B	C26, C29 WB	-	4
C	C21 EB, C22 EB	-	3
D	C21 WB, C22 WB, C29 WB	-	2
E	-	26, 28	3
F	-	21	5
Empty	-	-	-
Empty	-	-	-
Empty	-	-	-
Empty	-	-	-
Empty	-	-	-
Total			**17**
WMATA Standard Capacity			**60**
Maximum Acceptable Capacity			**120**
Average Buses per Bay			**2**

Source: Largo Town Center Metro Station Site Inventory, December 19, 2014; WMATA (n.d.)

3.4.1.5 Largo Town Center Metro Station Ridership

Ridership details for Largo Town Center Metro Station were obtained from WMATA for October 2014. October data are commonly used by transit agencies for analysis because October is considered a stable month that is affected less by tourism, weather, and holidays than other months. Average weekday boardings (entries) at the station during this period totaled 4,740 passengers, and average weekday alightings (exits) totaled 4,911.

Ridership by Hour at Largo Town Center Metro Station

The peak entry hours at Largo Town Center Metro Station on weekdays are between 6:00 AM and 9:00 AM. The peak hour, 7:00 AM to 8:00 AM, had 1,187 entries. After 9:00 AM, entries steadily decrease and remain between 100 and 160 until 7:00 PM, when they decrease further. The large number of entries during the AM peak period compared to the PM peak period indicate that that station serves suburban residents who commute to D.C. or other jurisdictions to the west.

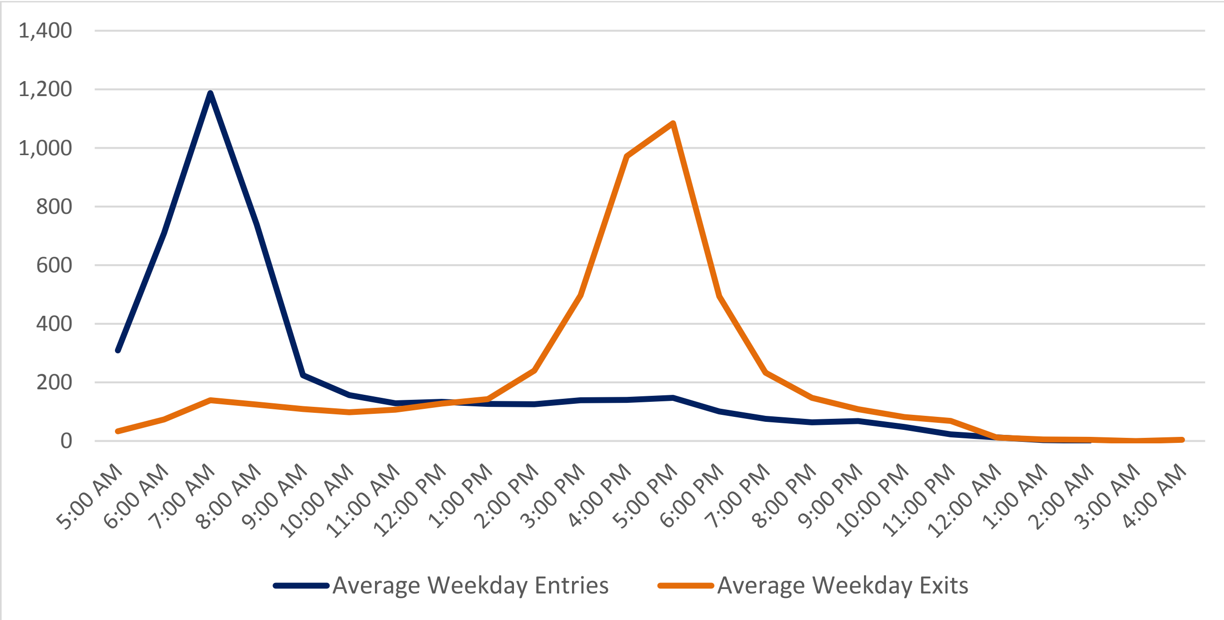
Exits at Largo Town Center Metro Station peak between 4:00 PM and 6:00 PM. The peak hour, 5:00 PM to 6:00 PM, had 1,084 exits. After 6:00 PM, exits slowly drop through the remainder of the evening. Exits remain below 200 during most of the morning and midday periods. Table 3-7 and figure 3-11 summarize ridership by hour at Largo Town Center Metro Station.

Table 3-7: Average Weekday Entries and Exits by Hour at Largo Town Center Metro Station

Hour	Average Weekday Entries	Average Weekday Exits
5 AM	309	33
6 AM	710	73
7 AM	1,187	139
8 AM	738	125
9 AM	224	109
10 AM	157	98
11 AM	129	107
12 PM	134	128
1 PM	127	143
2 PM	126	241
3 PM	139	497
4 PM	140	972
5 PM	148	1,084
6 PM	101	494
7 PM	76	233
8 PM	64	147
9 PM	68	109
10 PM	48	82
11 PM	23	69
12 AM	12	12
1 AM	3	5
2 AM	1	4
3 AM	0	0
4 AM	75	4
Total	**4,740**	**4,911**

Source: WMATA (2014c)

Figure 3-11: Average Weekday Entries and Exits by Hour at Largo Town Center Metro Station



Source: WMATA (2014c)

Peak 15-Minute Ridership at Largo Town Center Metro Station

The peak 15-minute period for entries at Largo Town Center Metro Station on weekdays is between 7:30 AM and 7:45 AM, when 327 passengers enter the station. The peak 15-minute period for exits is between 5:00 PM and 5:15 PM, when 356 passengers exit the station. Both of these periods fall within the overall peak hours for entries and exits at the station. Table 3-8 summarizes peak 15-minute and peak hour ridership at the station.

Table 3-8 Largo Town Center Metro Station Weekday Peak Hour and Peak 15-Minute Ridership

	Period	Time	Passengers
Entering	Peak 15-Min	7:30 AM	327
Entering	Peak Hour	7:00 AM	1,187
Exiting	Peak 15-Min	5:00 PM	356
Exiting	Peak Hour	5:00 PM	1,084

Source: WMATA (2014c)

3.4.1.6 Metrorail Origin-Destination for Largo Town Center Metro Station

The most common destinations for riders entering at Largo Town Center Metro Station are stations within downtown Washington, D.C. Nine out of the top 10 destination stations are in downtown Washington; the remaining station, Addison Road-Seat Pleasant, is in Prince George's County, Maryland. The top three destination stations include Farragut West (418 passengers), McPherson Square (282 passengers), and L'Enfant Plaza (274 passengers). All of the destination stations are served by the Blue and Silver lines, with the exception of Union Station, which is served by the Red line. Table 3-9 summarizes the top 10 destination stations for passengers entering at Largo Town Center Metro Station.

Table 3-9: Top Ten Destinations for Passengers Entering at Largo Town Center Metro Station

Rank	To Station	Jurisdiction	Metrorail Lines	From Largo Town Center	Percent of Total
1	Farragut West	Washington	Blue, Orange, Silver	418	9%
2	McPherson Square	Washington	Blue, Orange, Silver	282	6%
3	L'Enfant Plaza	Washington	Green, Yellow, Blue, Orange, Silver	274	6%
4	Metro Center	Washington	Blue, Orange, Silver, Red	239	5%
5	Foggy Bottom	Washington	Blue, Orange, Silver	237	5%
6	Addison Road	Prince George's County, MD	Blue, Silver	220	5%
7	Federal Triangle	Washington	Blue, Orange, Silver	199	4%
8	Smithsonian	Washington	Blue, Orange, Silver	173	4%
9	Federal Center SW	Washington	Blue, Orange, Silver	139	3%
10	Union Station	Washington	Red	135	3%
	Total Passengers Entering at Largo Town Center			**4,740**	

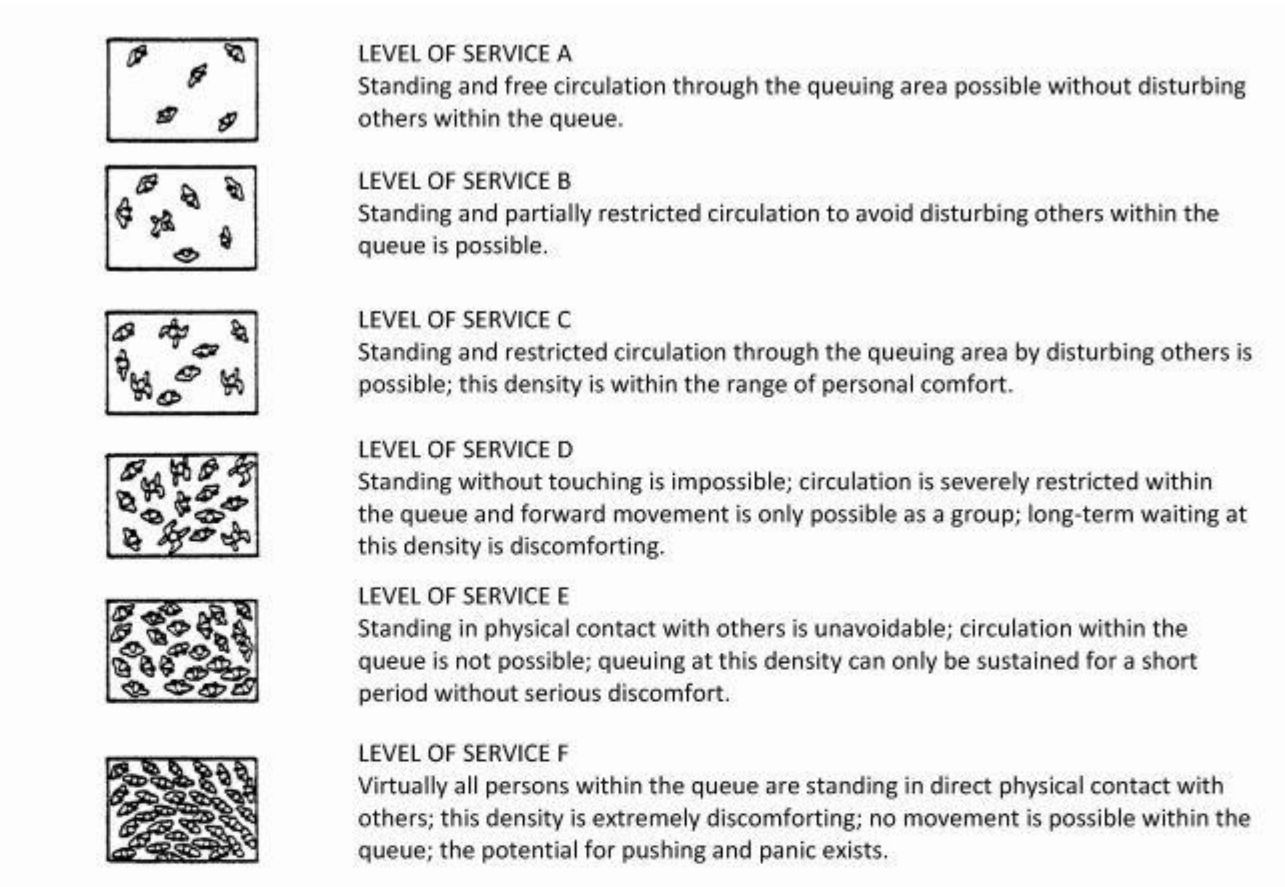
Source: WMATA (2014c)

3.4.1.7 Largo Town Center Metro Station Capacity Analysis

A capacity analysis was conducted for the vertical elements at the station, the station's faregate aisles, fare vending machines, and platform area. The platform area analysis and fare vending analysis used projected ridership from the peak entering period at the station – the time period when the most passengers would likely use fare vending machines and the highest number of passengers would be waiting on the platform. The remaining analyses, for vertical elements and faregate aisles, used the peak 15-minute period of ridership at the station. October 2014 faregate data provided by WMATA was used for all of the capacity analyses (WMATA 2014c). October data also were used in the analysis for the same reasons noted in Section 3.4.1.5. At Largo Town Center Metro Station, the peak 15-minute period of total ridership activity (entries and exits) was between 5:00 PM and 5:15 PM and the peak 15-minute entering period was between 7:30 AM and 7:45 AM.

At Largo Town Center Metro Station, there are two sets of vertical elements, those between the platform and the mezzanine level, and those between the mezzanine level and the Kiss & Ride lot and the Park & Ride garage, which are located at street level. None of the vertical elements, faregates, and fare vending machines are above capacity, defined as a volume-to-capacity (v/c) ratio of 0.7 by WMATA (see table 3-10). Additionally, there is sufficient capacity to accommodate the peak number of passengers on the station platform simultaneously at pedestrian level of service (LOS) B. Figure 3-12 illustrates the range of pedestrian level of service conditions. Appendix D3 further details the Largo Town Center Metro Station capacity analysis.

Figure 3-12: Pedestrian Level of Service Illustration



Source: TRB 2013

Table 3-10: Largo Town Center Metro Station Volume-to-Capacity Analysis Summary

Element		Volume to Capacity (V/C) Ratio
Street/ Mezzanine	Entry Escalators	-
	Exit Escalators	0.24
	Stairs	0.07
Mezzanine/ Platform	Entry Escalators	0.01
	Exit Escalators	0.12
	Stairs	0.17
Faregate Aisles		0.10
Fare Vending		0.07
Platform Peak LOS		B

3.4.1.8 *Largo Town Center Metro Station Emergency Evacuation*

Using the peak 15-minute ridership and National Fire Protection Association (NFPA) 130 assumptions and guidelines, the platform at Largo Town Center Metro Station could be evacuated in 1.5 minutes and the entire station could be evacuated to a point of safety within 4.4 minutes (TRB 2013). Appendix D4 further details the Largo Town Center Metro Station emergency evacuation analysis and NFPA expected evacuation timeframes.

3.4.2 Bus Services: Local

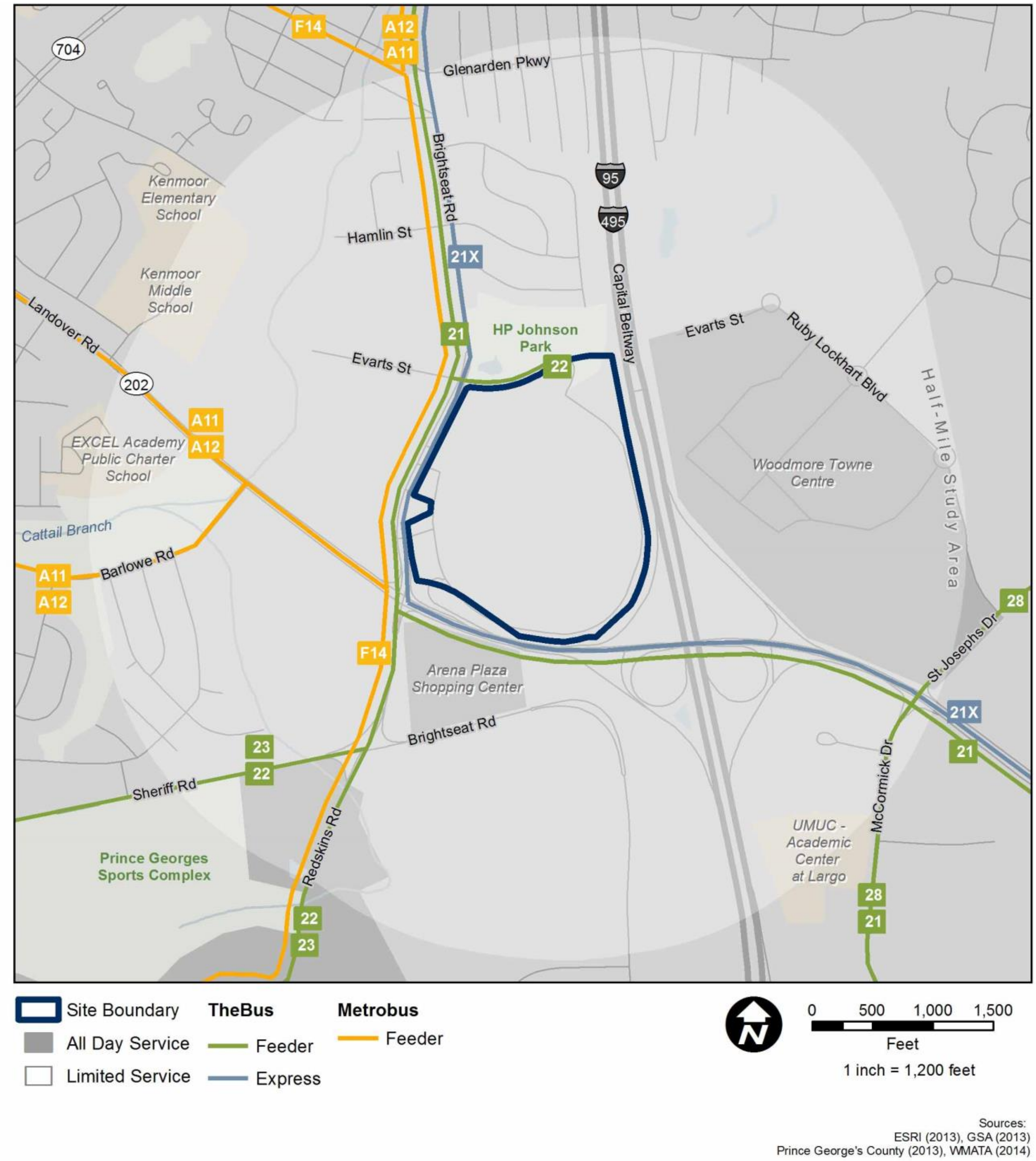
The Landover non-vehicular site study area is served by three WMATA Metrobus routes and four Prince George's County "TheBus" routes. All of these routes serve Metrorail stations in Prince George's County, including New Carrollton (Orange line), Morgan Boulevard (Blue and Silver lines), Addison Road (Blue and Silver lines), and Largo Town Center Metro Stations (Blue and Silver lines). TheBus Routes 21 and 22 both connect the New Carrollton Metro Station and the Largo Town Center Metro Station. Metrobus Routes A11 and A12 connect Prince George's Hospital and Seat Pleasant with the Addison Road Metro Station, while Route F14 connects the New Carrollton Metro Station, Seat Pleasant, the Naylor Road Metro Station, and the Capitol Heights Metro Station. Table 3-11 and figure 3-13 summarize the major characteristics of the bus routes that serve the study area.

Table 3-11: Major Service Characteristics of Bus Routes Serving the Study Area

Route	Agency	Description	Stop Serving Landover Site	Route Type	Major Destinations
21	TheBus	Upper Marlboro/ New Carrollton	Brightseat Road	Feeder	New Carrollton Metro Station, Largo Town Center Metro Station, Prince George's Community College, Equestrian Center
21X	TheBus	Prince George's Community College/ New Carrollton	Brightseat Road	Express	New Carrollton Metro Station, Prince George's Community College, Motor Vehicle Administration
22	TheBus	Morgan Boulevard/ Brightseat Road	Brightseat Road	Feeder	Morgan Boulevard Metro Station, Centre Point Office Park, Prince George's Sports Complex
23	TheBus	Seat Pleasant	Prince George's Sports Complex	Feeder	Addison Road Metro Station, Prince George's Sports Complex, Cheverly Metro Station, Seat Pleasant
28	TheBus	Inglewood Shuttle	9400 Peppercorn Place	Feeder	Largo Town Center Metro Station, Woodmore Towne Centre, Capital Centre
A11	WMATA	Martin Luther King Jr. Highway	Brightseat Road	Feeder	Capital Plaza, Prince George's Hospital, Seat Pleasant, Addison Road Metro Station
A12	WMATA	Martin Luther King Jr. Highway	Brightseat Road	Feeder	Capital Plaza, Prince George's Hospital, Landover Metro Station, Seat Pleasant, Addison Road Metro Station
F14	WMATA	Sheriff Road-Capitol Heights	Brightseat Road	Feeder	New Carrollton Metro Station, Seat Pleasant, Capitol Heights Metro Station, Addison Road Metro Station, Bradbury Heights, Fairfax Village, Naylor Road Metro Station

Source: WMATA (2014d); PGC DPWT (2013)

Figure 3-13: Bus Routes Serving the Study Area



3.4.2.1 Bus Frequency of Service

Weekday headways (wait time between bus arrivals) and span of service (hours of operation) by route and direction are detailed by time period in table 3-12. TheBus routes typically operate between 6:00 AM and 7:00 PM on weekdays only. No weekend service is provided on any TheBus route. Headways on TheBus routes vary from 20 minutes on Route 21X during the midday period (9:00 AM to 3:00 PM) to 51 minutes on Route 21 in the southbound direction during the midday period.

Service on Metrobus routes varies, with certain routes operating on weekdays or weekends only. Route A11 operates on Saturday mornings only, Route A12 operates seven days per week, and Route F14 operates on weekdays (including the late night period) and Saturdays. Weekday headways on Metrobus routes vary from 20 minutes on Route A12 during the PM peak period (3:00 PM to 7:00 PM) to 51 minutes on Route F14 southbound during the midday period. Route A12 has the most service of all the routes serving the study area, with 99 weekday trips and weekend service.

Table 3-12: Frequency of Service on Bus Routes Serving the Study Area

		Weekday								Saturday		Sunday	
Route & Direction	Agency	Headway (Minutes) 4AM to 6AM	6AM to 9AM	9AM to 3PM	3PM to 7PM	7PM to 11PM	11PM to 4AM	Number of Trips	Span of Service	Headway (Minutes)	Span of Service	Headway (Minutes)	Span of Service
21 North	TheBus	-	26	45	34	-	-	22	6:08 AM to 7:03 PM		-	-	-
21 South	TheBus	1 trip	26	51	27	1 trip	-	25	5:55 AM to 8:02 PM	-	-	-	-
21X North	TheBus	-	-	20	24	3 trips	-	-	9:02 AM to 8:20 PM	-	-	-	-
21X South	TheBus	-	23	20	30	2 trips	-	-	6:55 AM to 7:50 PM	-	-	-	-
22 North	TheBus	-	36	40	40	-	-	20	6:00 AM to 7:10 PM	-	-	-	-
22 South	TheBus	-	36	40	40	-	-	20	6:00 AM to 7:09 PM	-	-	-	-
23 North	TheBus	-	30	30	30	2 trips	-	28	6:07 AM to 8:38 PM	-	-	-	-
23 South	TheBus	-	30	30	30	2 trips	-	28	6:00 AM to 7:10 PM	-	-	-	-
28 North	TheBus	-	40	40	40	-	-	20	6:00 AM to 7:10 PM	-	-	-	-
28 South	TheBus	-	40	40	40	-	-	20	6:00 AM to 7:10 PM	-	-	-	-
A11 South	WMATA	-	-	-	-	-	-	-	-	69	5:50 AM to 6:59 AM	-	-
A12 North	WMATA	30	23	28	20	30	75	49	4:55 AM to 1:20 AM	45	6:00 AM to 12:02 AM	60	7:10 AM to 11:06 PM
A12 South	WMATA	30	23	26	20	30	75	50	5:10 AM to 1:19 AM	48	6:25 AM to 12:03 AM	60	6:05 AM to 11:56 PM
F14 North	WMATA	30	30	45	34	60	-	29	4:39 AM to 9:48 PM	51	10:02 AM to 7:19 PM	-	-
F14 South	WMATA	40	30	51	34	3 trips	-	26	5:06 AM to 9:46 PM	51	9:30 AM to 6:53 PM	-	-

Source: WMATA (2014d); PGC DPWT (2013)

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3.4.2.2 Ridership by Route

Weekday ridership by route (see table 3-13) was available for the Metrobus routes that serve the study area. Overall, Route A12 had the highest ridership, with an average of 3,688 passenger boardings per day. Route F12 had slightly less, with slightly more than 3,000 passenger boardings per day. Metrobus route A11 does not provide weekday service, and therefore is not shown. TheBus did not provide ridership data for this report.

Table 3-13: Average Weekday Ridership by Bus Route Serving the Study Area

Route	Agency	Description	Average Weekday Boardings
A12	WMATA	Martin Luther King Jr. Highway	3,688
F14	WMATA	Sheriff Road-Capitol Heights	3,035
21	TheBus	Upper Marlboro/New Carrollton	NA
21X	TheBus	Prince George's Community College/New Carrollton	NA
22	TheBus	Morgan Boulevard/Brightseat Road	NA
28	TheBus	Largo/Inglewood Shuttle	NA

Note: Ridership data unavailable for TheBus
Source: WMATA (2014e)

3.4.2.3 Ridership by Route and Direction

Ridership by route, direction, and time period was available for Metrobus routes only, and is summarized in table 3-14. Ridership is typically highest during the midday period and the PM peak period. Although service levels are slightly decreased during the midday period versus the peak periods, the longer span of the midday period increases ridership totals.

Table 3-14: Metrobus Ridership by Route, Direction, and Time Period in the Study Area

Route/Direction	AM Early	AM Peak	Midday	PM Peak	Early Night	Late Night	Weekday Total
A12 North	127	314	568	503	281	92	1,884
A12 South	131	301	544	514	241	73	1,804
F14 North	196	376	427	426	136	--	1,563
F14 South	113	392	372	459	135	--	1,472

Note: **AM Early** = 4:00 AM to 6:00 AM; **AM Peak** = 6:00 AM to 9:00 AM; **Midday** = 9:00 AM to 3:00 PM; **PM Peak** = 3:00 PM to 7:00 PM; **Early Night** = 7:00 PM to 11:00 PM; **Late Night** = 11:00 PM to 4:00 AM.
Source: WMATA (2014e)

Maximum passenger loads represent the maximum number of passengers on a given trip at one time. Weekday maximum passenger loads per trip were only available for Metrobus routes. Typical capacity is around 43 to 46 passengers on a 40-foot bus. During off-peak periods, there are no overcrowded buses on routes serving the Landover study area. During the AM peak period, Route F14 in both directions is slightly over capacity (highlighted in light blue in table 3-15). Table 3-15 summarizes maximum passenger loads by route, direction, and time period on Metrobus routes that serve the Landover study area.

Table 3-15: Study Area Metrobus Maximum Passenger Loads by Route, Direction, and Time Period

Route/ Direction	AM Early	AM Peak	Midday	PM Peak	Early Night	Late Night	Capacity per Trip
A12 North	31	42	32	33	29	23	46
A12 South	31	31	28	30	25	22	46
F14 North	38	**49**	39	43	25	-	46
F14 South	34	**48**	34	37	29	-	46

Note: **AM Early** = 4:00 AM to 6:00 AM; **AM Peak** = 6:00 AM to 9:00 AM; **Midday** = 9:00 AM to 3:00 PM; **PM Peak** = 3:00 PM to 7:00 PM; **Early Night** = 7:00 PM to 11:00 PM; **Late Night** = 11:00 PM to 4:00 AM
Source: WMATA (2014d)

As shown in table 3-16, Route F14 is the only route that experiences overcrowding, on three weekday trips.

Table 3-16: Study Area Total Number of Overcrowded Trips per Weekday

Route	Overcrowded Trips per Weekday	Total Weekday Trips
F14	3	55

3.4.2.4 Stop Level Ridership

Weekday ridership at the stop level was available for Metrobus routes only, and is summarized in table 3-17. The busiest bus stops are all located along Brightseat Road. Brightseat Road/Maple Ridge Apartments has the highest total activity with 212 boardings and alightings combined on the average weekday, according to WMATA's automatic passenger count data. This stop is located on the east side of Brightseat Road, adjacent to the site. The stop across the street from this location, Maple Ridge Apartments #2252, has the second most activity with 179 boardings and alightings combined on an average weekday. Maple Ridge is a large apartment complex located opposite the proposed site. Both of these stops are served by Metrobus Routes A12 and F14, and TheBus Routes 21 and 21X (ridership totals only reflect Metrobus ridership).

Table 3-17: Weekday Metrobus Ridership by Stop for Routes Serving the Study Area

Stop Name	Direction	Routes	Average Weekday		
			Boardings	Alightings	Total Activity
Brightseat Road/Maple Ridge Apts	NB	A12, F14	53	158	212
Brightseat Road/Maple Ridge Apts #2252	SB	A12, F14	154	25	179
Brightseat Road/Maple Ridge Apts #2400	SB	A12, F14	40	7	48
Brightseat Road/Mclain Avenue	NB	A12, F14	18	9	27
Brightseat Road/Evarts Street	NB	A12, F14	8	12	19
Brightseat Road/Landover Rd	NB	F14	12	7	18
Brightseat Road/Evarts Street	SB	A12, F14	12	5	17
Barlowe Road/Allendale Drive	EB	A12	9	7	16
Brightseat Road/Landover Road	SB	F14	5	9	14
Brightseat Road/Hamlin Street	NB	A12, F14	6	8	13
Barlowe Road/Allendale Drive	WB	A12	9	3	12
Brightseat Road/Reicher Street	SB	A12, F14	10	2	12
Landover Road (Rt 202)/Barlowe Road	WB	A12	7	3	10
Brightseat Road/Hamlin Street	SB	A12, F14	4	2	6
Barlowe Road/Landover Rd	SB	A12	4	1	5
Brightseat Road/Evarts Street	NB	A12, F14	1	4	5
Brightseat Road/Girard Street	SB	A12, F14	4	0	4
Brightseat Road/Girard Street	NB	A12, F14	1	3	4
Brightseat Road/Evarts Street	SB	A12, F14	2	0	3
Barlowe Road/Landover Road	NB	A12	1	1	2

Note: NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound
Source: WMATA (2014d)

Weekday maximum passenger loads by stop indicate that there is no actual overcrowding at stop locations in the study area (table 3-18) (WMATA 2014d). Maximum passenger loads at the stop level represent the maximum number of passengers on a single bus after leaving that stop location. Six stops on Route F14 in the northbound direction along Brightseat Road (McLain Avenue, Hamlin Street, Girard Street, Evarts Street nearside, Evarts Street farside, Landover Road, and Maple Ridge Apartments) have maximum passenger loads of 40 or 41 passengers, just under capacity. All other stops in the service area have maximum passenger loads of 28 passengers or fewer.

Table 3-18: Metrobus Stops with Highest Passenger Loads (Greater than 20) by Route and Direction in the Study Area

Route	Direction	Stop Name	Weekday Maximum Passenger Load
F14	North	Brightseat Road/Mclain Avenue	41
F14	North	Brightseat Road/Hamlin Street	40
F14	North	Brightseat Road/Girard Street	40
F14	North	Brightseat Road/Evarts Street (Nearside)	40
F14	North	Brightseat Road/Evarts Street (Farside)	40
F14	North	Brightseat Road/Landover Road	40
F14	North	Brightseat Road/Maple Ridge Apts	40
F14	South	Brightseat Road/Maple Ridge Apts #2252	28
F14	South	Brightseat Road/Landover Road	28
F14	South	Brightseat Road/Reicher Street	28
F14	South	Brightseat Road/Evarts Street	27
F14	South	Brightseat Road/Girard Street	27
F14	South	Brightseat Road/Hamlin Street	27
F14	South	Brightseat Road/Evarts Street	27
F14	South	Brightseat Road/Maple Ridge Apts #2400	27
A12	North	Barlowe Road/Landover Road	22
A12	North	Brightseat Road/Mclain Avenue	22
A12	North	Barlowe Road/Allendale Drive	22
A12	North	Brightseat Road/Evarts Street	22
A12	North	Brightseat Road d/Girard Street	22
A12	North	Brightseat Road/Hamlin Street	22
A12	North	Brightseat Road/Maple Ridge Apts	22
A12	North	Brightseat Road/Evarts Street	22
A12	North	Landover Road (Rt 202)/Barlowe Road	21
A12	North	Brightseat Road/Maple Ridge Apts #2252	21

Source: WMATA (2014d)

3.4.3 Bus Commuter

There are currently no commuter bus routes that serve the study area.

3.4.4 Shuttles

There are currently no shuttle bus routes that serve the study area.

3.4.5 Ridesharing (Slugging)

There are currently no slug lines in the Landover site study area.

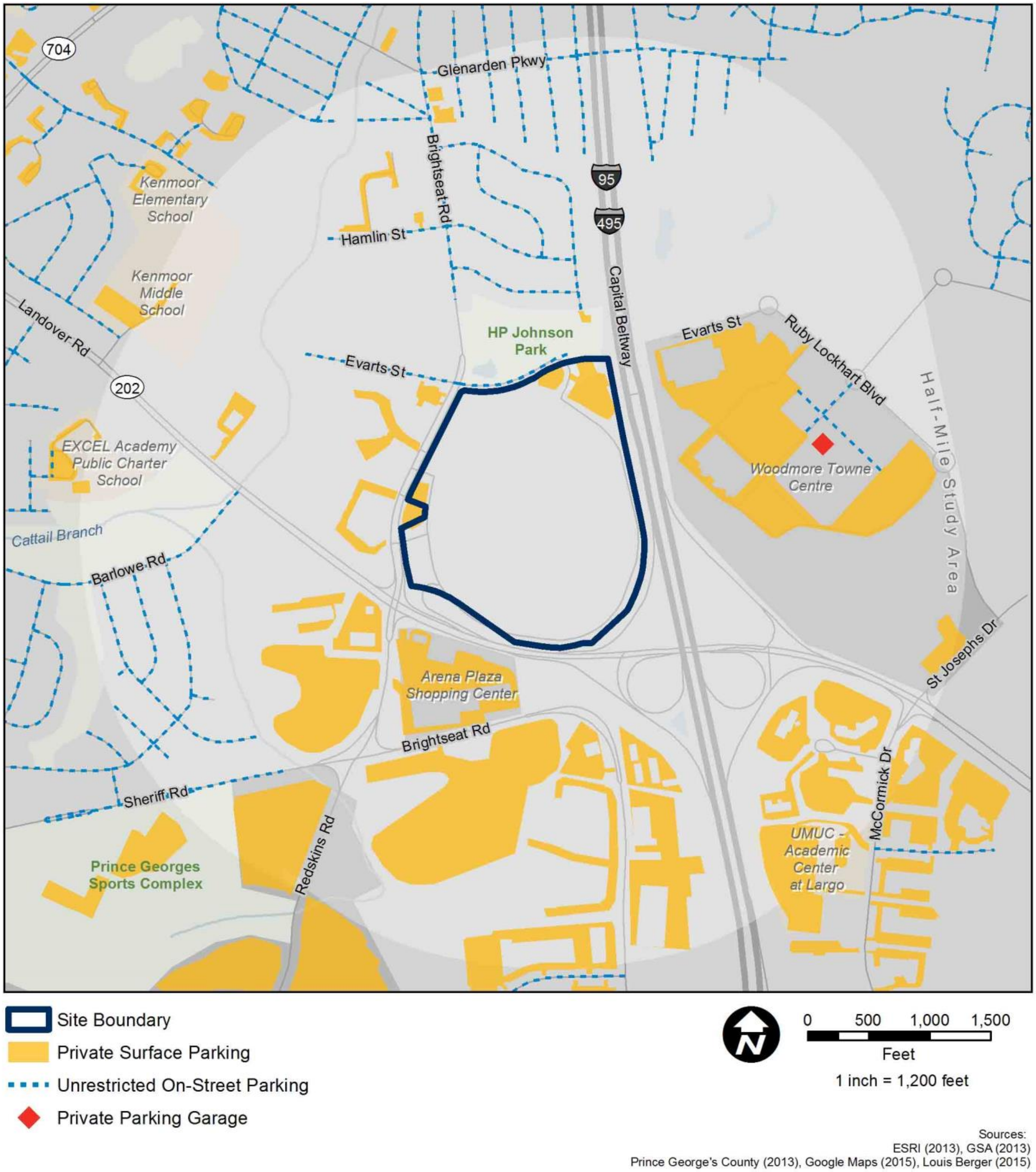
3.4.6 Carsharing

Previously, Zipcar was the only carshare company servicing the Landover study area, with four Zipcars parked at the Largo Town Center Metro Station (Zipcar 2015). Beginning on June 1, 2015, WMATA began a new partnership with Enterprise CarShare and ended its partnership with Zipcar (WMATA, 2015b). Enterprise currently has three vehicles available at the Largo Town Center Metro Station (Enterprise, 2015).

3.5 Parking

Parking near the Landover site includes restricted surface lots and on-street parking. On-street parking, as noted below, is limited to parallel parking in the study area and includes permit-only parking and non-restricted on-street parking. Information about parking in the study area was gathered using 2012/2014 Google maps (https://maps.google.com/) and onsite observations (Site Visit, May 1, 2015) that were focused on areas within 0.5 mile of the site (figure 3-14).

Figure 3-14: Parking in the Landover Study Area



Within 0.5 mile of the Landover site, there are several restricted surface lots. Immediately to the south of the Landover site, the Arena Plaza Shopping Center is located off of Brightseat Road. The mall is currently under-utilized. It has several hundred parking spots; however, the spots are permit parking only. According to signs on the property, if a vehicle is discovered on the premises without a permit, it will be towed. A partially paved field is

also located off of Brightseat Road across the street from the Arena Plaza Shopping Center south of the Iad Auto Dealership. The dealership does not allow parking for offsite visitors; however, the partially paved field is likely used for parking for large events at FedEx Field, but is otherwise marked as private property. Although a portion of the Fed Ex Field parking is also included in the 0.5-mile study area, more than half of the FedEx Field parking is more than 0.5 mile from the site to the south. This parking is restricted for stadium special event use only and the parking lots are a combination of partially and fully paved surface lots. An apartment neighborhood located southwest of both the Landover site and the abandoned Arena Plaza Shopping Center also has surface parking along the drive aisles providing access to the apartment buildings. Parking in that location is only valid with a permit; cars without a permit will be towed. Some of the surface parking lots for the commercial buildings southwest of both the Landover site and the Arena Plaza Shopping Center are restricted to users (violators will be towed); however, some of the commercial lots do not have parking restrictions posted.

Although the Woodmore Towne Centre and the office buildings near the intersection of Landover Road and McCormick Drive are within 0.5 mile of the Landover site, the beltway acts as a barrier between the Landover site and these facilities and their parking lots. With no sidewalks along the stretch of Landover Road that crosses the Capital Beltway, it is unlikely people parking at these locations would walk to the Landover site, therefore these lots would not be considered as a possibility for parking.

North of the Landover site, on-street parking in the single family residential neighborhoods north of the Landover site (Girard Street, Hamlin Street, and streets north) does not appear to be restricted to certain users. H.P. Johnson Park, north of the site, has about ten non-handicapped spaces intended for users of the park, and it does not appear to be connected to Evarts Street via sidewalks; therefore, it is unlikely to be used as parking by Landover site employees. Paved parking lots just to the northeast of the site, south of Evarts Street, are fenced off and marked as private property. Another residential neighborhood that is partially located within the 0.5-mile buffer from the Landover site, Palmer Park, is west of the site and north of FedEx Field. This neighborhood has available permitted street parking; however, the permit is enforced only on special event days at the football stadium. During the football off-season and days when an event is not occurring, the parking spots in the neighborhood are available. These parking spots were observed on Barlowe Road, Allendale Drive, Barlowe Place, and Ray Leonard Road.

Due west of the Landover site, approximately 40 surface parking spots are available at the Brightseat Liquor. The lot is 0.1 mile away from the Landover site and there are no parking restrictions posted. South of Brightseat Liquor, also about 0.1 mile away from the Landover site, across Brightseat Road is the Maple Ridge Apartment complex. Based on GIS analysis using Google street maps, March/April 2014 (https://maps.google.com/), there are approximately 400 surface parking spots available in the apartment complex; however, the spots are restricted to use by Maple Ridge Apartment residents, and cars without an appropriate apartment sticker will be towed. There is minimal on-street parking directly south of the Maple Ridge Apartments on an unnamed side street that provides access to the apartment complex, across the street from the Old Landover Mall entrance on Brightseat Road. This street may be additional parking for the apartment complex, but there are no restriction signs posted. Also west of the Landover site, the surface parking lot at the New Home Baptist Church north of Landover Road is restricted for church users only.

As previously noted, most of the residential streets typically allow on-street parking without permits as shown in figure 3-13. Although there are almost no expressly dedicated on-street parking spaces within a 0.5-mile of the Landover site, some on-street parallel parking does exist along Sheriff Road at the very edge of the 0.5-mile study area. Additionally, it also appears that vehicles looking for on-street parking could also park along Evarts Street, just north of the Landover site. East of Brightseat Road, Evarts Street is two-lanes westbound and one extra wide lane eastbound with very little traffic and no restrictions for on-street parking according to Google maps street view from 2012 (https://maps.google.com/). West of Brightseat Road, it appears vehicles may also park on Evarts

Street if they park west of the “no parking” areas close to the intersection of Evarts Street and Brightseat Road, an area previously used for parking by residents of the adjacent apartment buildings that are no longer present.

3.6 Truck Access

The currently vacant Landover site does not receive regular truck traffic. When the site was formerly occupied, truck access to the Landover site was the same as the access for regular vehicles.

3.7 Traffic Analysis

This section explains the tools, concepts, and definitions for analyzing the traffic operations; the process used to analyze the study area intersections; and the traffic analysis results. The Existing Condition describes the existing freeway mainline and ramp peak hour volumes in Section 3.7.6; however, the analysis process for the freeways is documented in the Build scenarios as agreed to by M-NCPPC and Maryland SHA (Landover Site Transportation Agreement, Appendix D1).

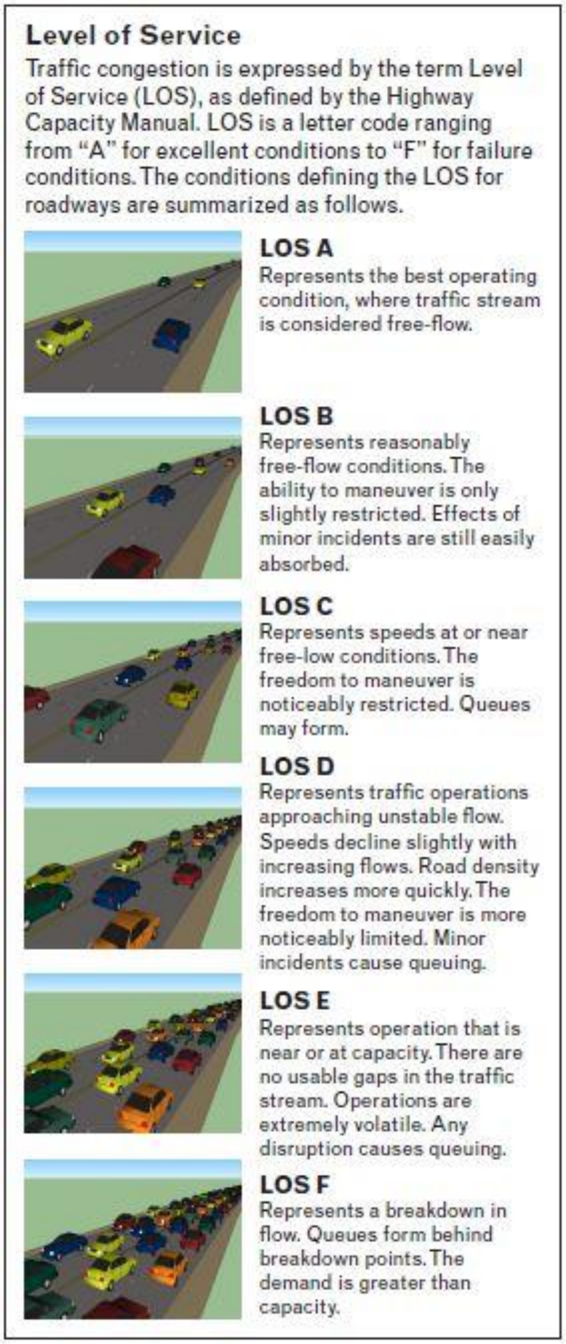
3.7.1 Analysis Tools

Study area intersections were analyzed using Synchro™ Traffic Signal Coordination Software Version 8.0 (Build 805, Revision 878) and SimTraffic™ Version 8.0 (Build 805, Revision 878). Two main analyses were performed for traffic, an intersection capacity analysis and an intersection queueing analysis. The intersection capacity analysis used the Synchro™ software tool and various input values as described below in Section 3.7.2 to determine the level of service (LOS), or driver perception of an intersection’s operation. The intersection capacity analysis determining LOS is described in Section 3.7.2 and the study area results are presented in Section 3.7.4. The intersection queuing analysis used both the Synchro™ and SimTraffic™ tools to determine different levels of queuing, or the length that vehicles may back up at an intersection. SimTraffic was used in addition to the standard Synchro tool to analyze queueing because it provides a more robust analysis of 95th percentile queuing than Synchro and it was the tool agreed upon by the parties to the Landover Site Transportation Agreement (Appendix D1). The intersection queuing analysis process is described in greater detail in Section 3.7.3, while the study area results of the queuing analysis are presented in Section 3.7.5.

3.7.2 Intersection Operations Analysis Method

LOS is the primary measure of traffic operations for both signalized and unsignalized intersections and freeway facilities. LOS is a standard performance measure developed by the transportation profession to quantify driver perception for such elements as travel time, number of stops, total amount of stopped delay, and impediments caused by other vehicles. LOS provides a scale that is intended to match the perception by motorists of the operation of the transportation facility and to provide a scale to compare different facilities. Detailed LOS descriptions are presented in figure 3-15.

Figure 3-15: Level of Service Diagram



Source: TRB (2000)

3.7.2.1 Signalized Intersection Level of Service

The LOS determination for signalized intersections in Maryland is guided by both the Highway Capacity Manual (HCM) 2000 method and the Critical Lane Volume (CLV) method based on the Landover Site Transportation Agreement.

HCM 2000 Method

The HCM 2000 method requires several inputs to determine an accurate LOS (TRB 2000). The primary inputs include:

- vehicular volumes;
- pedestrian volumes;
- traffic signal timings;
- roadway geometry;
- speed limits;
- truck percentages; and
- peak hour factor (measure of vehicle 15-minute flow rate).

The average vehicle control delay, measured in seconds per vehicle, is calculated using these parameters with the Synchro procedures. This represents the average extra delay in seconds per vehicle caused by the presence of a traffic control device or traffic signal and includes the time required to decelerate, stop, and accelerate. LOS can be characterized for the entire intersection, each intersection approach, and each lane group. Control delay is used to characterize LOS for the entire intersection or an approach. Control delay and v/c ratio are used to characterize LOS for a lane group. Delay quantifies the increase in travel time due to a traffic signal control. It is also a surrogate measure for driver discomfort and fuel consumption (TRB 2010). Signalized intersections or approaches that exceed a delay of 50 seconds have LOS E and 80 seconds have LOS F. Table 3-19 shows the average control delay and corresponding LOS for signalized intersections. Using the HCM 2000 method, LOS E and LOS F constitute failing operations.

Table 3-19: Signalized Intersection Control Delay and LOS Thresholds – HCM 2000 Method

LOS	Average Control Delay (seconds/vehicle)	Description
A	Less than or equal to 10	Stable conditions
B	>10-20	
C	>20-35	
D	>35-55	
E	>55-80	Unstable conditions
F	More than 80	Above capacity and unstable conditions

Source: TRB (2000)

To determine the LOS of an intersection, the critical input values are entered into the analysis software (Synchro™) and the average vehicle delay (seconds per vehicle) is calculated. Based on the average vehicle delay, the LOS is determined for all movements (left, through, and right), approaches, and the intersection as a whole. For the Landover site, the 24 existing conditions intersections analyzed consisted of 21 signalized intersections and 3 unsignalized intersections.

CLV Method

The CLV method also requires several inputs to determine LOS; these inputs include vehicular volumes and roadway geometry. Using these parameters, the CLV method measures the conflicted vehicle movements through an intersection (usually through volumes plus opposing left-turn volumes). Critical volume is determined by adding the highest vehicle conflicting movements along two perpendicular approaches (one east-west volume plus one north-south volume). Volumes are adjusted to reflect the number of lanes serving each vehicle move. Table 3-20 shows the CLV and corresponding LOS for signalized intersections. Using the CLV method, LOS F constitutes failing operations.

Table 3-20: Signalized Intersection CLV and LOS Thresholds – CLV Method

LOS	Critical Lane Volume (vehicles)	Description
A	Less than or equal to 1,000	Passing operation
B	>1,000 – 1,150	
C	> 1,150 – 1,300	
D	> 1,300 – 1,450	
E	< 1,450 – 1,600	
F	>1600	Failing operation

Source: M-NCPPC (2012a)

As noted above, acceptable operation of a signalized intersection for HCM 2000 method is LOS D and above, while acceptable or passing operation of signalized intersection for the CLV method is LOS E and above.

3.7.2.2 Unsignalized Intersection Levels of Service

The LOS for unsignalized intersections (STOP-controlled intersections or roundabouts) is based on the HCM 2000 method and requires several inputs to determine an accurate LOS, including:

- vehicular volumes;
- pedestrian volumes;
- roadway geometry;
- speed limits;
- truck percentages; and
- peak hour factor.

The average vehicle control delay, in seconds per vehicle, is calculated using these parameters with the HCM 2000 procedures (TRB 2000). This represents the average delay in seconds per vehicle caused by the presence of a stop sign or roundabout, and includes the time required to decelerate, stop, and accelerate.

LOS for a two-way STOP-Controlled (TWSC) intersection (i.e., unsignalized intersection) is determined for each minor-street movement or shared movement as well as the major-street left turns. LOS F is assigned to the movement if the v/c ratio for the movement exceeds 1.0 or it the movement's control delay exceeds 50 seconds. The LOS for TWSC intersections are different from the criteria used for signalized intersections primarily because user perceptions differ among transportation facility types. The expectation is that a signalized intersection is designed to carry higher traffic volumes and will present greater delay than an unsignalized intersection. Unsignalized intersections are also associated with more uncertainty for users because delays are less predictable than at signals, which can reduce a user's delay tolerance. LOS is not defined for the TWSC intersections as a whole or for major-street approaches for three main reasons: (a) major-street through-vehicles are assumed to experience zero delay; (b) the disproportionate number of major-street through-vehicles at a typical TWSC intersection skews the weighted average of all movements, resulting in a very low overall average delay for all vehicles; and (c) the resulting low delay can mask important LOS deficiencies for minor movements (TRB 2010).

The capacity of the controlled intersection legs is based primarily on three factors: the conflicting volume, the critical gap time defined as the number of seconds between vehicles passing the same point along the major street approach, and the follow-up time defined as the number of seconds between the departure of the first and second vehicle in queue along the minor street approach. The HCM-based capacity analysis procedure assumes that drivers are both consistent and homogeneous and assumes consistency for their critical gap time. Critical gap times are based on many factors including delay experienced by drivers on the approaches controlled by STOP signs. As delay increases, drivers become less patient and will accept shorter gaps, which results in higher capacities for unsignalized intersections that are operating at LOS D or worse. The unsignalized intersection procedure uses fixed critical gap times. Unless the critical gap times are adjusted, the procedure will have a tendency to overestimate the delay at unsignalized intersections that are operating at LOS D or worse. Also, poor operations at an unsignalized intersection will encourage some drivers to turn right and make a U-turn on the mainline or accept shorter critical gaps (safety issue) rather than attempt a turn left (TRB 2010).

Table 3-21 shows the average control delay and corresponding LOS for unsignalized intersections. It should be noted that the worst LOS at one-way and two-way STOP-controlled intersections represents the delay for the minor approach only. Using the HCM 2000 method, LOS E and F constitute failing operations.

Table 3-21: Unsignalized Intersection Control Delay and LOS Thresholds – HCM 2000 Method

LOS	Average Control Delay (seconds/vehicle)	Description
A	Less than or equal to 10	Stable conditions
B	>10-15	
C	>15-25	
D	>25-35	
E	>35-50	Unstable conditions
F	More than 50	Above capacity and unstable conditions

Source: TRB (2000)

3.7.2.3 Freeway Facilities

The LOS for freeway facilities is based on the HCM 2010 procedures (following the Landover Site Transportation Agreement) and requires several inputs to determine an accurate LOS (TRB 2010), including:

- vehicular volumes;
- roadway geometry;
- speed limits; and
- truck percentages.

Based on the HCM 2010 procedures, the average vehicle density in passenger cars per mile per lane is calculated. Table 3-22 shows the vehicle density and corresponding LOS. Freeway facilities are only analyzed for the Build Condition; however, the existing freeway volumes are provided in the Existing Condition and No-build

Condition to allow a comparison with future freeway volumes of the Build Condition. Using the HCM 2010 method, LOS E and F constitute failing operations.

Table 3-22: HCM Weaving Segments, Merge, and Diverge Facilities Level of Service

LOS	Density (passenger cars/mile/lane)	Description
A	Less than or equal to 10	Passing operation
B	>10-20	
C	>20-28	
D	>28-35	
E	>35	Unstable conditions
F	Demand Exceeds Capacity	Above capacity and unstable conditions

Source: TRB (2010)

3.7.3 Intersection Queuing Analysis Method

In addition to analyzing the vehicle delay, the vehicle queue lengths were calculated for each approach. The 50th percentile queue length is average queue length, calculated as the queue expected during 50 percent of the analysis period. The 95th percentile queue length is the worst-case scenario, calculated as the queue that has a 5 percent probability of being exceeded. A failing queue length is determined by a queue length exceeding the intersection approach storage capacity. As the available storage for each intersection approach differs, these values reflect whether the existing storage provides enough space for vehicles waiting to pass through the intersection without blocking another lane or another intersection. Because failing queues might occur along the same approach as a failing LOS, these values are calculated independently and might result in one approach receiving a failing LOS score, while another approach has a failing queue length. The study used Synchro™ to calculate the 50th percentile queue lengths and SimTraffic™ to calculate 95th percentile queue lengths for the 21 signalized intersections. Only the 95th percentile queue lengths were calculated in SimTraffic™ for the three unsignalized intersections (50th percentile not reported in SimTraffic or Synchro for unsignalized intersections).

As previously noted, SimTraffic was used to calculate the 95th percentile queue length for the approach at each study area intersection because it provides a more robust analysis than Synchro and this is the tool was agreed upon by the parties to the Landover Site Transportation Agreement. The use of SimTraffic involved calibrating the model, ensuring the model runs for the appropriate amount of time, and determining the number of simulation runs to be statistically within a plus or minus 5 percent error. The model was calibrated by adjusting link speeds, turning speeds, and vehicle positioning decision points (distance prior to decision point when vehicles position themselves in the correct lane for upcoming moves). The goal was to adjust the model to resemble a simulation closely representing existing conditions. Running the model included a seeding time (time for vehicles to completely travel the network) plus four, 15-minute recording times (totaling 60 minutes). Based on the distance from the farthest points on the network, a 10-minute seed time was applied. The minimum number of simulation runs was calculated by running the simulation for 10 runs. Based on the results of the 10 runs, the standard deviation was calculated using the vehicle hours of travel (VHT) metric. VHT provides a good indication of vehicle delays by requiring more simulations given facility operation and queuing issues. Using the calculated standard deviation, the number of simulations required was calculated to be within plus or minus 5 percent at the 95th percentile confidence level. Because SimTraffic varies quite a bit between runs in terms of VHT, even for small networks, a plus or minus 5 percent error was established. The number of simulation runs to reduce the error to 4 percent would require dozens of runs for little gain in accuracy. In some cases where little congestion occurred, 10 runs achieved better than a plus or minus 5 percent error. Appendix D5 contains the statistical Excel sheets used to determine the appropriate number of simulation runs.

3.7.4 Existing Condition Intersection Operations Analysis

Synchro™ was used to calculate the vehicle delay and LOS operation based on the HCM 2000 method for each study area intersection. Custom designed Excel sheets were used to calculate the LOS operation based on the CLV method.

3.7.4.1 Signalized Intersection Operations Analysis

Based on the Synchro™ and CLV-based Excel worksheet analysis, the majority of study intersections operate at acceptable overall conditions during the morning and afternoon peak hours. However, the following intersections in the study area operate with overall unacceptable conditions (LOS E or LOS F) using the HCM 2000 method (average control delay exceeds 55 seconds per vehicle) or LOS F using the CLV method (CLV greater than 1,600):

- Landover Road and Brightseat Road (Intersection #9) operate at LOS E during the PM peak hour
- Landover Road and Lottsford Road (Intersection #13) operate at LOS E during the PM peak hour
- Martin Luther King Jr. Highway and Ardwick-Ardmore Road (Intersection #16) operate at LOS F during the AM and PM peak hours. Using the CLV method, the intersection also fails with a CLV of LOS F during the AM peak hour. Only one failing LOS is needed (HCM 2000 or CLV) for an intersection to fail.

Using the HCM 2000 method, a total of 16 signalized intersection lane groups or overall approaches operate at unacceptable conditions (LOS E or LOS F) during the morning or afternoon peak hours. The lane group within the approach that is operating under unacceptable conditions is noted in parentheses; when “overall” is noted, the overall approach movements operate under unacceptable conditions.

- Landover Road and Old Landover Road (Intersection #1)
  - Eastbound Landover Road (left turns) and southbound Old Landover Road (overall) during the AM peak hour
  - Southbound Old Landover Road (overall) during the PM peak hour
- Landover Road and Pinebrook Avenue (Intersection #2)
  - Northbound Pinebrook Avenue (overall) during both the AM and PM peak hours
- Landover Road and Kent Town Place/75th Avenue (Intersection #3)
  - Eastbound Landover Road (left turns), northbound Kent Town Place (left turns), and southbound 75th Avenue (overall) during the AM peak hour
  - Westbound Landover Road (left turns) and southbound 75th Avenue (overall) during the PM peak hour
- Landover Road and Dodge Park Road (Intersection #5)
  - Eastbound Landover Road (left turns) and southbound Dodge Park Road (overall) during both the AM and PM peak hours
- Landover Road and Fire House Road (Intersection #6)
  - Southbound Fire House Road (overall) during the PM peak hour
- Landover Road and Kenmoor Drive (Intersection #7)
  - Northbound Kenmoor Drive (overall) and southbound Kenmoor Drive (overall) during both the AM and PM peak hours
- Landover Road and Barlowe Road (Intersection #8)
  - Northbound Barlowe Road (overall) during the AM and PM peak hours

    - Westbound Landover Road (left turns) during the PM peak hour
- Landover Road and Brightseat Road (Intersection #9)
    - Eastbound (left turns) and westbound (left turns) on Landover Road, and northbound (overall) and southbound (overall) on Brightseat Road in the AM peak hour
    - Eastbound (overall) and westbound (left turns) on Landover Road and both northbound and southbound (overall) on Brightseat Road during the PM peak hour
- Landover Road and the I-95/I-495 northbound off-ramp (Intersection #11)
    - Eastbound Landover Road (left turns) and northbound on the I-95/I-495 off ramp (overall) during both the AM and PM peak hours
- Landover Road and St. Joseph's Drive/McCormick Drive (Intersection #12)
    - Eastbound (left turns) and westbound (left turns) on Landover Road, northbound on McCormick Drive (left turns and combined left and through movement), and southbound on St. Joseph's Drive (left turns and combined left and through movements) during the AM peak hour
    - Eastbound Landover Road (left turns), westbound Landover Road (left and right turns), northbound McCormick Drive (overall), and southbound St. Joseph's Drive (overall) during the PM peak hour
- Landover Road and Lottsford Road (Intersection #13)
    - Eastbound Landover Road (through movement), westbound Landover Road (left and right turns), northbound Lottsford Road (overall), and southbound Lottsford Road (left and combined left and through movements) during the AM peak hour
    - Eastbound Landover Road (left turns), westbound Landover Road (left turns), northbound Lottsford Road (overall), and southbound Lottsford Road (left and combined left and through movements) during the PM peak hour
- Landover Road and Technology Way (Intersection #14)
    - Eastbound Technology Way (overall) during both the AM and PM peak hours
- Landover Road and Arena Drive/Lake Arbor Way (Intersection #15)
    - Eastbound Landover Road (left turns), westbound Landover Road (left turns), northbound Arena Drive (left and through movements), and southbound Lake Arbor Way (overall) during both the AM and PM peak hours
- Martin Luther King Jr. Highway and Ardwick-Ardmore Road (Intersection #16)
    - Eastbound Ardwick-Ardmore Road (lefts and throughs) and westbound Ardwick-Ardmore (all directions), northbound and southbound on Martin Luther King Jr. Highway (overall) during the AM peak hour
    - Eastbound and westbound (overall) on Ardwick-Ardmore Road and northbound (overall) and southbound (left turns) on Martin Luther King Jr. Highway during the PM peak hour
- Brightseat Road/Redskins Road and Sheriff Road/Brightseat Road (Intersection #21)
    - Eastbound Sheriff Road (left turns), westbound Brightseat Road (overall), and southbound Brightseat Road (left turns) during the AM peak hour
    - Westbound Brightseat Road (through movements) during the PM peak hour
- Arena Drive and the I-95/I-495 southbound ramps (Intersection #23)
    - Southbound I-95/I-495 off-ramp (overall) during both the AM and PM peak hours

3.7.4.2 Unsignalized Intersection Operations Analysis

Based on the unsignalized intersection analysis, the intersection of Brightseat Road and Ardwick-Ardmore Road (Intersection #17) operates with the Brightseat Road northbound approach exceeding an average control delay of 35 seconds during the AM peak hour. The resulting minor street approach exceeds 11 minutes or 667.6 seconds. As discussed above in Section 3.7.2.2, HCM 2000 procedures assume a constant critical gap and follow-up headway; therefore, the analysis results show an unrealistic value; however, they do indicate that the approach will fail and that based on the traffic count, the critical gap and follow-up headway used by drivers is less than the HCM 2000 calculated value of 7.6 and 3.6 seconds respectively. The other movements at the intersection operate at LOS C or better. The other unsignalized intersections in the study area operate with no failing minor street approaches during the AM and PM peak hours.

3.7.4.3 Complete Intersection Operations Analysis

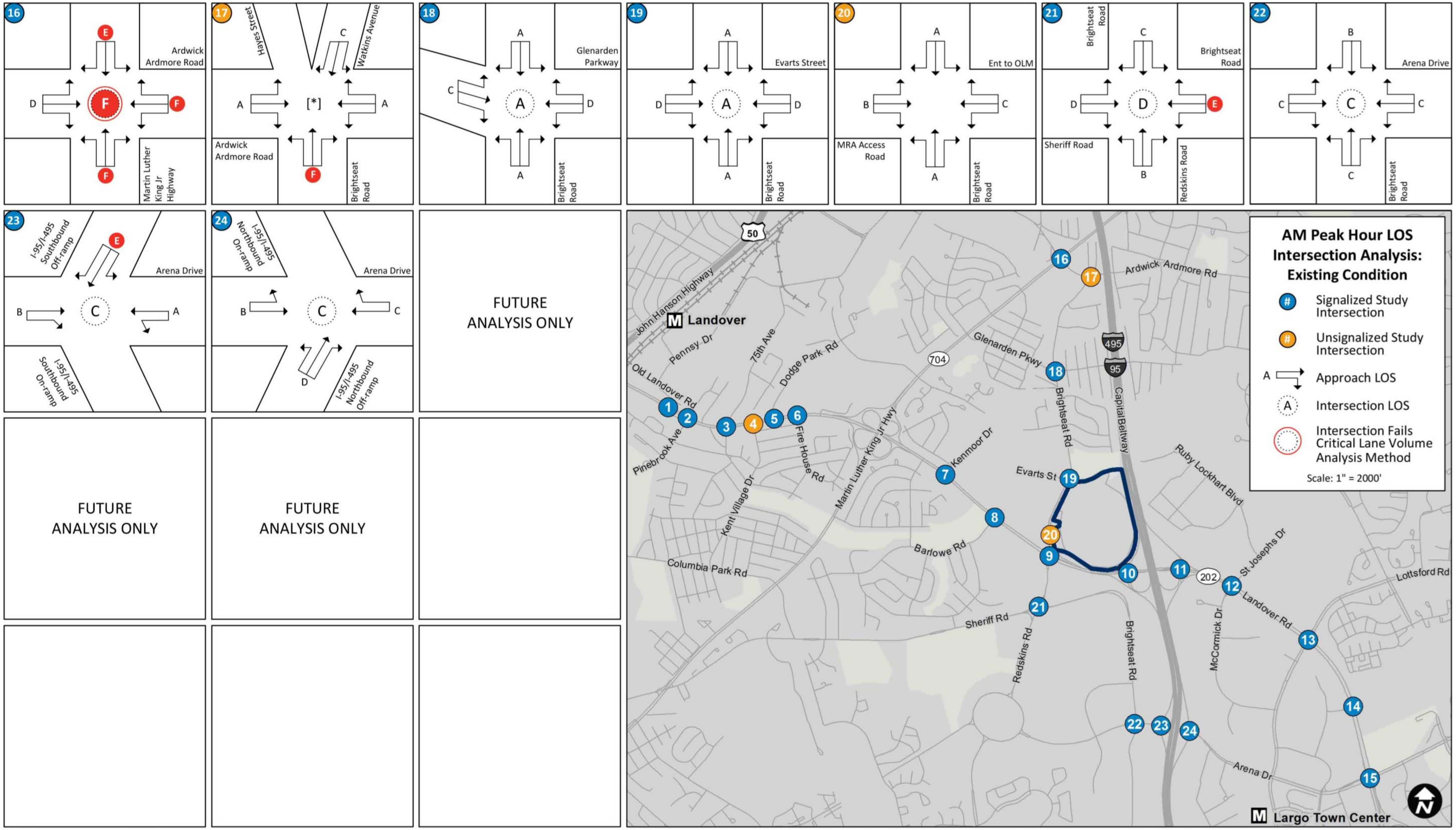
The average LOS for the various approaches to the intersection and the overall intersection LOS grade are depicted in figures 3-16 and 3-17 for AM and PM peak hours, respectively. Table 3-23 shows the results of the LOS capacity analysis and the intersection vehicle delay for the Existing Condition during the AM and PM peak hours.

Figure 3-16: Existing Condition Intersection LOS for AM Peak Hour

Note: One- or two-way STOP-Controlled unsignalized intersections do not have an overall intersection LOS value, since the mainline through move operates freely through the intersection. Red shaded circles denote intersections/approaches operating at LOS E or F.

[*] = Unsignalized intersection requires attention due to failing minor approach movement.

Figure 3-16: Existing Condition Intersection LOS for AM Peak Hour (continued)



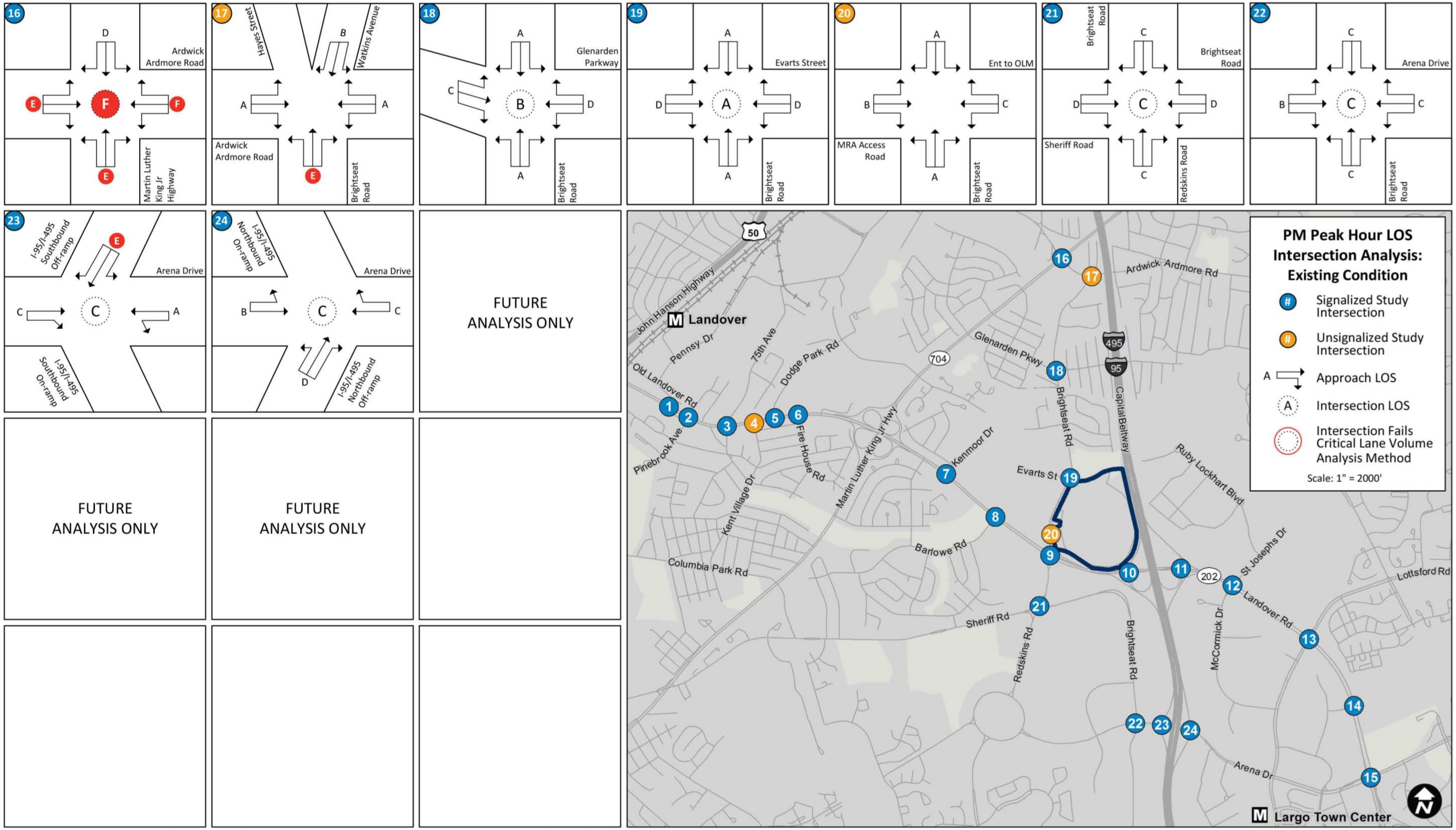
Note: One- or two-way STOP-Controlled unsignalized intersections do not have an overall intersection LOS value, since the mainline through move operates freely through the intersection. Red shaded circles denote intersections/approaches operating at LOS E or F.

[*] = Unsignalized intersection requires attention due to failing minor approach movement.

Figure 3-17: Existing Condition Intersection LOS for PM Peak Hour

Note: One- or two-way STOP-Controlled unsignalized intersections do not have an overall intersection LOS value, since the mainline through move operates freely through the intersection. Red shaded circles denote intersections/approaches operating at LOS E or F.

Figure 3-17: Existing Condition Intersection LOS for PM Peak Hour (continued)



Note: One- or two-way STOP-Controlled unsignalized intersections do not have an overall intersection LOS value, since the mainline through move operates freely through the intersection. Red shaded circles denote intersections/approaches operating at LOS E or F.

Table 3-23: Existing Condition AM and PM Peak Hour Operations Analysis

#	Intersection and Approach	Lane Group	AM Peak Hour					PM Peak Hour				
			HCM 2000		CLV		Check	HCM 2000		CLV		Check
			Delay (sec/veh)	LOS	Critical Lane Volume	LOS		Delay (sec/veh)	LOS	Critical Lane Volume	LOS	
1	**Landover Road & Old Landover Road (Signalized)**											
	EB (Landover Rd)	L	60.7	E				5.9	A			
	EB (Landover Rd)	T	2.1	A				4.7	A			
	EB Overall (Landover Rd)		**8.6**	**A**				**4.7**	**A**			
	WB (Landover Rd)	TR	6.1	A				16.4	B			
	WB Overall (Landover Rd)		**6.1**	**A**				**16.4**	**B**			
	SB (Old Landover Rd)	LR	66.7	E				65.4	E			
	SB Overall (Old Landover Rd)		**66.7**	**E**				**65.4**	**E**			
	Overall		**10.3**	**B**	**1,332**	**D**	**Pass**	**13.7**	**B**	**1,048**	**B**	**Pass**
2	**Landover Road & Pinebrook Avenue (Signalized)**											
	EB (Landover Rd)	TR	10.9	B				22.5	C			
	EB Overall (Landover Rd)		**10.9**	**B**				**22.5**	**C**			
	WB (Landover Rd)	L	7.0	A				45.9	D			
	WB (Landover Rd)	T	5.6	A				2.8	A			
	WB Overall (Landover Rd)		**5.6**	**A**				**4.9**	**A**			
	NB (Pinebrook Ave)	L	66.4	E				67.2	E			
	NB (Pinebrook Ave)	R	51.6	D				58.1	E			
	NB Overall (Pinebrook Ave)		**64.0**	**E**				**64.2**	**E**			
	Overall		**11.1**	**B**	**1,082**	**B**	**Pass**	**18.5**	**B**	**1,268**	**C**	**Pass**
3	**Landover Road & Kent Town Place/75th Avenue (Signalized)**											
	EB (Landover Rd)	L	75.3	E				4.9	A			
	EB (Landover Rd)	TR	7.5	A				7.1	A			
	EB Overall (Landover Rd)		**11.3**	**B**				**7.0**	**A**			
	WB (Landover Rd)	L	10.0	A				76.6	E			
	WB (Landover Rd)	TR	13.6	B				8.5	A			
	WB Overall (Landover Rd)		**13.5**	**B**				**13.6**	**B**			
	NB (Kent Town Pl)	L	59.9	E				52.0	D			
	NB (Kent Town Pl)	TR	49.3	D				48.9	D			
	NB Overall (Kent Town Pl)		**54.1**	**D**				**50.1**	**D**			
	SB (75th Ave)	L	110.6	F				264.5	F			
	SB (75th Ave)	TR	48.4	D				47.8	D			
	SB Overall (75th Ave)		**81.2**	**F**				**186.9**	**F**			
	Overall		**20.3**	**C**	**1,421**	**D**	**Pass**	**28.9**	**C**	**1,283**	**C**	**Pass**

Table 3-23: Existing Condition AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour					PM Peak Hour				
			HCM 2000		CLV		Check	HCM 2000		CLV		Check
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS		Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	
4	**Landover Road & Kent Village Drive (TWSC)**											
	EB (Landover Rd)	TR	-	-				-	-			
	EB Overall (Landover Rd)		**-**	**-**				**-**	**-**			
	WB (Landover Rd)	T	-	-				-	-			
	WB Overall (Landover Rd)		**-**	**-**				**-**	**-**			
	NB (Kent Village Dr)	R	9.3	A				10.5	B			
	NB Overall (Kent Village Dr)		**9.3**	**A**				**10.5**	**B**			
	Overall		**0.2**	**-**	**N/A**	**N/A**	**Pass**	**0.2**	**-**	**N/A**	**N/A**	**Pass**
5	**Landover Road & Dodge Park Road (Signalized)**											
	EB (Landover Rd)	L	76.7	E				78.1	E			
	EB (Landover Rd)	T	1.8	A				2.8	A			
	EB Overall (Landover Rd)		**8.1**	**A**				**11.2**	**B**			
	WB (Landover Rd)	TR	3.3	A				5.5	A			
	WB Overall (Landover Rd)		**3.3**	**A**				**5.5**	**A**			
	SB (Dodge Park Rd)	L	67.0	E				67.0	E			
	SB (Dodge Park Rd)	R	61.3	E				59.7	E			
	SB Overall (Dodge Park Rd)		**63.3**	**E**				**62.7**	**E**			
	Overall		**8.4**	**A**	**1,089**	**B**	**Pass**	**12.5**	**B**	**928**	**A**	**Pass**
6	**Landover Road & Fire House Road (Signalized)**											
	EB (Landover Rd)	L	42.1	D				13.6	B			
	EB (Landover Rd)	TR	10.9	B				14.9	B			
	EB Overall (Landover Rd)		**12.0**	**B**				**14.9**	**B**			
	WB (Landover Rd)	L	3.4	A				23.9	C			
	WB (Landover Rd)	TR	13.4	B				17.0	B			
	WB Overall (Landover Rd)		**13.2**	**B**				**17.3**	**B**			
	NB (Fire House Rd)	LTR	49.6	D				50.4	D			
	NB Overall (Fire House Rd)		**49.6**	**D**				**50.4**	**D**			
	SB (Fire House Rd)	LTR	48.5	D				57.8	E			
	SB Overall (Fire House Rd)		**48.5**	**D**				**57.8**	**E**			
	Overall		**14.7**	**B**	**1,110**	**B**	**Pass**	**18.6**	**B**	**1,182**	**C**	**Pass**

Table 3-23: Existing Condition AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour					PM Peak Hour				
			HCM 2000		CLV		Check	HCM 2000		CLV		Check
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS		Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	
7	**Landover Road & Kenmoor Drive (Signalized)**											
	EB (Landover Rd)	L	40.2	D				3.6	A			
	EB (Landover Rd)	TR	3.3	A				3.6	A			
	EB Overall (Landover Rd)		**4.5**	**A**				**3.6**	**A**			
	WB (Landover Rd)	L	5.4	A				5.5	A			
	WB (Landover Rd)	TR	8.2	A				3.0	A			
	WB Overall (Landover Rd)		**8.2**	**A**				**3.0**	**A**			
	NB (Kenmoor Dr)	LTR	66.4	E				81.1	F			
	NB Overall (Kenmoor Dr)		**66.4**	**E**				**81.1**	**F**			
	SB (Kenmoor Dr)	LT	68.5	E				83.8	F			
	SB (Kenmoor Dr)	R	66.6	E				78.1	E			
	SB Overall (Kenmoor Dr)		**67.2**	**E**				**80.3**	**F**			
	Overall		**7.6**	**A**	**883**	**A**	Pass	**6.1**	**A**	**873**	**A**	Pass
8	**Landover Road & Barlowe Road (Signalized)**											
	EB (Landover Rd)	TR	6.7	A				7.2	A			
	EB Overall (Landover Rd)		**6.7**	**A**				**7.2**	**A**			
	WB (Landover Rd)	L	21.9	C				67.2	E			
	WB (Landover Rd)	T	1.6	A				0.3	A			
	WB Overall (Landover Rd)		**3.4**	**A**				**6.4**	**A**			
	NB (Barlowe Rd)	L	66.6	E				81.5	F			
	NB (Barlowe Rd)	R	62.8	E				78.9	E			
	NB Overall (Barlowe Rd)		**63.8**	**E**				**79.4**	**E**			
	Overall		**8.0**	**A**	**848**	**A**	Pass	**10.9**	**B**	**961**	**A**	Pass

Table 3-23: Existing Condition AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour HCM 2000 Delay (sec/veh)	AM HCM 2000 LOS	AM CLV Critical Lane Volume	AM CLV LOS	AM Check	PM Peak Hour HCM 2000 Delay (sec/veh)	PM HCM 2000 LOS	PM CLV Critical Lane Volume	PM CLV LOS	PM Check
9	**Landover Road & Brightseat Road (Signalized)**											
	EB (Landover Rd)	L	73.2	E				94.2	F			
	EB (Landover Rd)	T	37.1	D				78.3	E			
	EB (Landover Rd)	R	46.8	D				21.4	C			
	EB Overall (Landover Rd)		**40.6**	**D**				**65.5**	**E**			
	WB (Landover Rd)	L	67.8	E				85.7	F			
	WB (Landover Rd)	T	31.5	C				38.1	D			
	WB (Landover Rd)	R	0.1	A				0.3	A			
	WB Overall (Landover Rd)		**34.7**	**C**				**45.8**	**D**			
	NB (Brightseat Rd)	L	74.0	E				68.9	E			
	NB (Brightseat Rd)	TR	58.1	E				73.1	E			
	NB (Brightseat Rd)	R	38.0	D				44.1	D			
	NB Overall (Brightseat Rd)		**62.2**	**E**				**64.0**	**E**			
	SB (Brightseat Rd)	L	65.0	E				79.6	E			
	SB (Brightseat Rd)	LT	61.5	E				72.6	E			
	SB (Brightseat Rd)	R	54.2	D				61.5	E			
	SB Overall (Brightseat Rd)		**61.1**	**E**				**72.9**	**E**			
	Overall		**43.3**	**D**	**1,141**	**B**	**Pass**	**59.2**	**E**	**1,489**	**E**	**Fail**
10	**Landover Road & I-95/I-495 Southbound On-Ramp (Signalized)**											
	EB (Landover Rd)	T	2.9	A				6.4	A			
	EB (Landover Rd)	R	0.8	A				0.8	A			
	EB Overall (Landover Rd)		**2.1**	**A**				**4.4**	**A**			
	WB (Landover Rd)	L	2.8	A				29.3	C			
	WB (Landover Rd)	T	0.4	A				0.4	A			
	WB Overall (Landover Rd)		**0.6**	**A**				**4.4**	**A**			
	Overall		**1.3**	**A**	**711**	**A**	**Pass**	**3.8**	**A**	**1,237**	**C**	**Pass**
11	**Landover Road & I-95/I-495 Northbound Off-Ramp (Signalized)**											
	EB (Landover Rd)	L	70.9	E				82.0	F			
	EB (Landover Rd)	T	11.1	B				14.8	B			
	EB (Landover Rd)	R	0.1	A				**0.1**	**A**			
	EB Overall (Landover Rd)		**10.7**	**B**				14.8	B			
	WB (Landover Rd)	T	11.9	B				34.2	C			
	WB Overall (Landover Rd)		**11.9**	**B**				**34.2**	**C**			
	NB (I-95/I-495 NB Off-Ramp)	L	152.3	F				86.3	F			
	NB (I-95/I-495 NB Off-Ramp)	R	51.6	D				59.3	E			
	NB Overall (I-95/I-495 NB Off-Ramp)		**145.5**	**F**				**80.4**	**F**			
	Overall		**31.6**	**C**	**1,352**	**D**	**Pass**	**32.1**	**C**	**1,328**	**D**	**Pass**

Table 3-23: Existing Condition AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour					PM Peak Hour				
			HCM 2000		CLV		Check	HCM 2000		CLV		Check
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS		Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	
12	**Landover Road & St Josephs Drive/McCormick Drive (Signalized)**											
	EB (Landover Rd)	L	74.2	E				72.2	E			
	EB (Landover Rd)	T	11.3	B				14.7	B			
	EB (Landover Rd)	R	0.9	A				0.1	A			
	EB Overall (Landover Rd)		**13.9**	**B**				**25.7**	**C**			
	WB (Landover Rd)	L	99.7	F				77.4	E			
	WB (Landover Rd)	T	13.2	B				36.0	D			
	WB (Landover Rd)	R	0.6	A				70.8	E			
	WB Overall (Landover Rd)		**16.4**	**B**				**42.5**	**D**			
	NB (McCormick Dr)	L	66.0	E				95.9	F			
	NB (McCormick Dr)	LT	66.8	E				108.0	F			
	NB (McCormick Dr)	R	0.0	A				0.1	A			
	NB Overall (McCormick Dr)		**53.8**	**D**				**80.5**	**F**			
	SB (St Josephs Dr)	L	60.4	E				73.8	E			
	SB (St Josephs Dr)	LT	62.1	E				75.5	E			
	SB (St Josephs Dr)	R	48.7	D				49.6	D			
	SB Overall (St Josephs Dr)		**53.0**	**D**				**61.3**	**E**			
	Overall		**18.7**	**B**	**900**	**A**	**Pass**	**42.6**	**D**	**1,106**	**B**	**Pass**
13	**Landover Road & Lottsford Road (Signalized)**											
	EB (Landover Rd)	L	49.8	D				106.8	F			
	EB (Landover Rd)	T	55.5	E				15.6	B			
	EB (Landover Rd)	R	0.1	A				0.2	A			
	EB Overall (Landover Rd)		**51.1**	**D**				**33.8**	**C**			
	WB (Landover Rd)	L	72.8	E				78.8	E			
	WB (Landover Rd)	T	35.2	D				29.9	C			
	WB (Landover Rd)	R	78.9	E				39.6	D			
	WB Overall (Landover Rd)		**44.4**	**D**				**33.7**	**C**			
	NB (Lottsford Rd)	L	58.2	E				72.6	E			
	NB (Lottsford Rd)	LT	66.0	E				254.0	F			
	NB (Lottsford Rd)	R	0.0	A				0.1	A			
	NB Overall (Lottsford Rd)		**60.4**	**E**				**182.4**	**F**			
	SB (Lottsford Rd)	L	91.3	F				89.1	F			
	SB (Lottsford Rd)	LT	77.2	E				80.8	F			
	SB (Lottsford Rd)	R	2.0	A				0.4	A			
	SB Overall (Lottsford Rd)		**40.9**	**D**				**53.1**	**D**			
	Overall		**46.1**	**D**	**1,264**	**C**	**Pass**	**59.0**	**E**	**1,244**	**C**	**Fail**

Table 3-23: Existing Condition AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour					PM Peak Hour				
			HCM 2000		CLV		Check	HCM 2000		CLV		Check
			Delay (sec/veh)	LOS	Critical Lane Volume	LOS		Delay (sec/veh)	LOS	Critical Lane Volume	LOS	
14	**Landover Road & Technology Way (Signalized)**											
	EB (Technology Way)	L	76.3	E				92.4	F			
	EB (Technology Way)	R	65.7	E				56.5	E			
	EB Overall (Technology Way)		**72.7**	**E**				**79.1**	**E**			
	NB (Landover Rd)	L	9.6	A				51.5	D			
	NB (Landover Rd)	T	1.0	A				12.9	B			
	NB Overall (Landover Rd)		**1.7**	**A**				**15.1**	**B**			
	SB (Landover Rd)	T	2.1	A				33.5	C			
	SB (Landover Rd)	R	5.3	A				27.1	C			
	SB Overall (Landover Rd)		**2.8**	**A**				**33.0**	**C**			
	Overall		**3.8**	**A**	**1,022**	**B**	**Pass**	**33.3**	**C**	**1,176**	**C**	**Pass**
15	**Landover Road & Arena Drive/Lake Arbor Way (Signalized)**											
	EB (Landover Rd)	L	60.8	E				114.2	F			
	EB (Landover Rd)	T	32.2	C				15.8	B			
	EB (Landover Rd)	R	0.1	A				0.1	A			
	EB Overall (Landover Rd)		**32.3**	**C**				**26.9**	**C**			
	WB (Landover Rd)	L	80.6	F				81.3	F			
	WB (Landover Rd)	T	28.4	C				25.3	C			
	WB (Landover Rd)	R	14.9	B				19.7	B			
	WB Overall (Landover Rd)		**35.7**	**D**				**36.0**	**D**			
	NB (Arena Dr)	L	65.4	E				78.5	E			
	NB (Arena Dr)	T	62.8	E				73.1	E			
	NB (Arena Dr)	R	0.2	A				1.5	A			
	NB Overall (Arena Dr)		**36.8**	**D**				**31.7**	**C**			
	SB (Lake Arbor Way)	L	58.3	E				73.8	E			
	SB (Lake Arbor Way)	T	65.9	E				79.0	E			
	SB (Lake Arbor Way)	R	71.8	E				71.9	E			
	SB Overall (Lake Arbor Way)		**67.6**	**E**				**75.3**	**E**			
	Overall		**39.3**	**D**	**1,033**	**B**	**Pass**	**35.2**	**D**	**1,053**	**B**	**Pass**

Table 3-23: Existing Condition AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour					PM Peak Hour				
			HCM 2000		CLV		Check	HCM 2000		CLV		Check
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS		Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	
16	**Martin Luther King Jr Highway (MLK Jr Hwy) & Ardwick-Ardmore Road (Signalized)**											
	EB (Ardwick Ardmore Rd)	L	61.2	E				57.7	E			
	EB (Ardwick Ardmore Rd)	T	112.2	F				117.6	F			
	EB (Ardwick Ardmore Rd)	R	0.4	A				0.5	A			
	EB Overall (Ardwick Ardmore Rd)		**51.5**	**D**				**58.4**	**E**			
	WB (Ardwick Ardmore Rd)	LTR	193.2	F				240.0	F			
	WB Overall (Ardwick Ardmore Rd)		**193.2**	**F**				**240.0**	**F**			
	NB (MLK Jr Hwy)	L	428.3	F				83.4	F			
	NB (MLK Jr Hwy)	T	59.2	E				58.0	E			
	NB (MLK Jr Hwy)	R	37.7	D				38.8	D			
	NB Overall (MLK Jr Hwy)		**151.8**	**F**				**59.0**	**E**			
	SB (MLK Jr Hwy)	L	97.6	F				80.2	F			
	SB (MLK Jr Hwy)	TR	63.2	E				45.2	D			
	SB Overall (MLK Jr Hwy)		**66.7**	**E**				**52.4**	**D**			
	Overall		**115.1**	**F**	**1,855**	**F**	**Fail**	**80.7**	**F**	**1,453**	**E**	**Fail**
17	**Brightseat Road & Ardwick-Ardmore Road (TWSC)**											
	EB (Ardwick Ardmore Rd)	LT	0.7	A				0.2	A			
	EB (Ardwick Ardmore Rd)	R	-	-				-	-			
	EB Overall (Ardwick Ardmore Rd)		**0.4**	**-**				**0.1**	**-**			
	WB (Ardwick Ardmore Rd)	LTR	4.8	A				5.4	A			
	WB Overall (Ardwick Ardmore Rd)		**2.9**	**-**				**3.5**	**-**			
	NB (Brightseat Rd)	LT	667.6	F				49.2	E			
	NB (Brightseat Rd)	R	-	-				-	-			
	NB Overall (Brightseat Rd)		**667.6**	**F**				**49.2**	**E**			
	SB (Brightseat Rd)	LTR	20.9	C				13.4	B			
	SB Overall (Brightseat Rd)		**20.9**	**C**				**13.4**	**B**			
	Overall		**209.8**	**-**	**N/A**	**N/A**	**Fail**	**12.5**	**-**	**N/A**	**N/A**	**Pass**

Table 3-23: Existing Condition AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour					PM Peak Hour				
			HCM 2000		CLV		Check	HCM 2000		CLV		Check
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS		Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	
18	**Brightseat Road & Glenarden Parkway (Signalized)**											
	EB (Glenarden Pkwy)	LT	31.0	C				36.2	D			
	EB (Glenarden Pkwy)	R	30.2	C				33.7	C			
	EB Overall (Glenarden Pkwy)		**30.5**	**C**				**34.6**	**C**			
	WB (Glenarden Pkwy)	LTR	36.6	D				37.3	D			
	WB Overall (Glenarden Pkwy)		**36.6**	**D**				**37.3**	**D**			
	NB (Brightseat Rd)	LTR	3.8	A				3.0	A			
	NB Overall (Brightseat Rd)		**3.8**	**A**				**3.0**	**A**			
	SB (Brightseat Rd)	LTR	3.6	A				3.1	A			
	SB Overall (Brightseat Rd)		**3.6**	**A**				**3.1**	**A**			
	Overall		**9.8**	**A**	**492**	**A**	Pass	**10.6**	**B**	**527**	**A**	Pass
19	**Brightseat Road & Evarts Street (Signalized)**											
	EB (Evarts St)	L	35.3	D				36.9	D			
	EB (Evarts St)	TR	35.4	D				33.9	C			
	EB Overall (Evarts St)		**35.4**	**D**				**36.4**	**D**			
	WB (Evarts St)	L	35.3	D				35.6	D			
	WB (Evarts St)	TR	35.4	D				33.9	C			
	WB Overall (Evarts St)		**35.4**	**D**				**35.2**	**D**			
	NB (Brightseat Rd)	L	1.3	A				1.5	A			
	NB (Brightseat Rd)	T	1.6	A				1.7	A			
	NB (Brightseat Rd)	R	1.2	A				1.3	A			
	NB Overall (Brightseat Rd)		**1.6**	**A**				**1.7**	**A**			
	SB (Brightseat Rd)	L	1.2	A				1.3	A			
	SB (Brightseat Rd)	TR	1.4	A				1.5	A			
	SB Overall (Brightseat Rd)		**1.4**	**A**				**1.5**	**A**			
	Overall		**1.7**	**A**	**261**	**A**	Pass	**2.1**	**A**	**308**	**A**	Pass

Table 3-23: Existing Condition AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour					PM Peak Hour				
			HCM 2000		CLV		Check	HCM 2000		CLV		Check
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS		Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	
20	**Brightseat Road & Entrance to Old Landover Mall (Ent to OLM)/Maple Ridge Apartments Access Road (MRA Access Rd) (TWSC)**											
	EB (MRA Access Rd)	LTR	12.0	B				14.3	B			
	EB Overall (MRA Access Rd)		**12.0**	**B**				**14.3**	**B**			
	WB (Ent to OLM)	LT	17.2	C				23.6	C			
	WB (Ent to OLM)	R	0.0	A				0.0	A			
	WB Overall (Ent to OLM)		**17.2**	**C**				**23.6**	**C**			
	NB (Brightseat Rd)	LTR	0.8	A				0.7	A			
	NB (Brightseat Rd)	R	-	-				-	-			
	NB Overall (Brightseat Rd)		**0.2**	**-**				**0.2**	**-**			
	SB (Brightseat Rd)	L	8.3	A				8.9	A			
	SB (Brightseat Rd)	TR	-	-				-	-			
	SB Overall (Brightseat Rd)		**0.0**	**-**				**0.0**	**-**			
	Overall		**0.9**	**-**	**N/A**	**N/A**	**Pass**	**0.8**	**-**	**N/A**	**N/A**	**Pass**
21	**Brightseat Road/Redskins Road & Sheriff Road/Brightseat Road (Signalized)**											
	EB (Sheriff Rd)	L	65.9	E				34.6	C			
	EB (Sheriff Rd)	T	42.2	D				40.2	D			
	EB (Sheriff Rd)	R	39.6	D				34.9	C			
	EB Overall (Sheriff Rd)		**53.9**	**D**				**36.8**	**D**			
	WB (Brightseat Rd)	L	50.6	D				45.8	D			
	WB (Brightseat Rd)	T	59.9	E				58.8	E			
	WB (Brightseat Rd)	R	52.7	D				48.6	D			
	WB Overall (Brightseat Rd)		**56.3**	**E**				**53.4**	**D**			
	NB (Redskins Rd)	L	13.4	B				17.2	B			
	NB (Redskins Rd)	TR	19.0	B				23.1	C			
	NB Overall (Redskins Rd)		**17.8**	**B**				**21.8**	**C**			
	SB (Brightseat Rd)	L	67.2	E				19.3	B			
	SB (Brightseat Rd)	T	19.4	B				25.1	C			
	SB (Brightseat Rd)	R	21.8	C				25.5	C			
	SB Overall (Brightseat Rd)		**27.9**	**C**				**24.1**	**C**			
	Overall		**37.1**	**D**	**396**	**A**	**Pass**	**33.8**	**C**	**580**	**A**	**Pass**

Table 3-23: Existing Condition AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour					PM Peak Hour				
			HCM 2000		CLV		Check	HCM 2000		CLV		Check
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS		Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	
22	**Brightseat Road & Arena Drive (Signalized)**											
	EB (Arena Dr)	LTR	22.5	C				17.1	B			
	EB Overall (Arena Dr)		**22.5**	**C**				**17.1**	**B**			
	WB (Arena Dr)	LTR	24.5	C				22.0	C			
	WB Overall (Arena Dr)		**24.5**	**C**				**22.0**	**C**			
	NB (Brightseat Rd)	L	19.1	B				27.6	C			
	NB (Brightseat Rd)	TR	22.6	C				33.5	C			
	NB Overall (Redskins Rd)		**22.3**	**C**				**33.1**	**C**			
	SB (Brightseat Rd)	L	9.7	A				21.6	C			
	SB (Brightseat Rd)	TR	12.2	B				21.6	C			
	SB Overall (Brightseat Rd)		**10.9**	**B**				**21.6**	**C**			
	Overall		**20.7**	**C**	**1,066**	**B**	**Pass**	**23.5**	**C**	**1,425**	**D**	**Pass**
23	**Arena Drive & I-95/I-495 Southbound Ramps (Signalized)**											
	EB (Arena Dr)	T	12.7	B				27.0	C			
	EB (Arena Dr)	R	10.8	B				22.0	C			
	EB Overall (Arena Dr)		**12.4**	**B**				**26.1**	**C**			
	WB (Arena Dr)	L	1.6	A				12.2	B			
	WB (Arena Dr)	T	1.5	A				1.7	A			
	WB Overall (Arena Dr)		**1.6**	**A**				**5.3**	**A**			
	SB (I-95/I-495 SB Off-Ramp)	L	56.9	E				61.8	E			
	SB (I-95/I-495 SB Off-Ramp)	LTR	65.5	E				63.1	E			
	SB Overall (I-95/I-495 SB Off-Ramp)		**61.2**	**E**				**62.5**	**E**			
	Overall		**20.4**	**C**	**708**	**A**	**Pass**	**26.6**	**C**	**1,089**	**B**	**Pass**

Table 3-23: Existing Condition AM and PM Peak Hour Operations Analysis (continued)

#	Intersection and Approach	Lane Group	AM Peak Hour					PM Peak Hour				
			HCM 2000		CLV		Check	HCM 2000		CLV		Check
			Delay (sec/ veh)	LOS	Critical Lane Volume	LOS		Delay (sec/ veh)	LOS	Critical Lane Volume	LOS	
24	**Arena Drive & I-95/I-495 Northbound Ramps (Signalized)**											
	EB (Arena Dr)	L	18.5	B				38.5	D			
	EB (Arena Dr)	T	9.1	A				4.4	A			
	EB Overall (Arena Dr)		**12.2**	**B**				**10.8**	**B**			
	WB (Arena Dr)	TR	23.7	C				30.5	C			
	WB Overall (Arena Dr)		**23.7**	**C**				**30.5**	**C**			
	NB (I-95/I-495 NB Off-Ramp)	L	39.4	D				39.7	D			
	NB (I-95/I-495 NB Off-Ramp)	LTR	37.3	D				40.2	D			
	NB Overall (I-95/I-495 NB Off-Ramp)		**38.1**	**D**				**40.0**	**D**			
	Overall		**22.0**	**C**	**918**	**A**	**Pass**	**23.8**	**C**	**1,096**	**B**	**Pass**

Notes:

EB = Eastbound, WB = Westbound, NB= Northbound, SB = Southbound

LTR = left / through / right lanes

LOS = Level of Service

TWSC = Two-way STOP-Controlled unsignalized intersection (TWSC intersections do not have an overall LOS)

Delay is Measured in Seconds Per Vehicle.

Red cells denote intersections or approaches operating at unacceptable conditions.

3.7.5 Existing Condition Intersection Queuing Analysis

Synchro™ was used to calculate the 50th percentile queue lengths and SimTraffic™ was used to calculate the 95th percentile queue lengths, as described in Section 3.7.3. The SimTraffic™ simulations have a statistical accuracy of plus or minus 4.7 percent error for the AM peak hour and 5.0 percent error for the PM peak hour simulations. Based on the Synchro™ and SimTraffic™ analysis, the following signalized intersection approaches experience failing queue lengths in Synchro™ or SimTraffic™ (queue exceeds available lane storage). The table provides the detail on queue length; the text notes the occasions where the intersection fails for either the 50th or 95th percentile (or sometimes both). Eleven signalized intersections would experience queuing lengths that would exceed the available storage capacity. The remaining intersections in the study area would provide sufficient storage for the anticipated demand. The lane group within the approach that is operating under unacceptable conditions is noted in parentheses.

- Landover Road and Old Landover Road (Intersection #1)
  - Southbound Old Landover Road (combined left and right turn lane) during the PM peak hour
- Landover Road and Kent Town Place/75th Avenue (Intersection #3)
  - Southbound 75th Avenue (left turns) during the PM peak hour
- Landover Road and Dodge Park Road (Intersection #5)
  - Eastbound Landover Road (left turns) during the PM peak hour
- Landover Road and Barlowe Road (Intersection #8)
  - Northbound Barlowe Road (right turns) during the PM peak hour

- Landover Road and Brightseat Road (Intersection #9)
  - Northbound Brightseat Road (left turns) during the AM peak hour, and eastbound (through movement) and westbound (left turns) on Landover Road during the PM peak hour
- Landover Road and the I-95/I-495 northbound off-ramp (Intersection #11)
  - Northbound I-95/I-495 off-ramp (left turns) during the AM peak hour, and westbound Landover Road (through movement) and northbound I-95/I-495 off-ramp (left and right turns) during the PM peak hour
- Landover Road and St. Joseph's Drive/McCormick Drive (Intersection #12)
  - Northbound McCormick Drive (right turns) during the PM peak hour
- Landover Road and Lottsford Road (Intersection #13)
  - Southbound Lottsford Road (left turns) during the AM peak hour, and northbound Lottsford Road (combined left and through movements and right turns) during the PM peak hour
- Landover Road and Arena Drive/Lake Arbor Way (Intersection #15)
  - Westbound Landover Road (left turns) during the AM peak hour
- Martin Luther King Jr. Highway and Ardwick-Ardmore Road (Intersection #16)
  - Westbound Ardwick-Ardmore Road (all movements), northbound Martin Luther King Jr. Highway (left turns and through movements), and southbound Martin Luther King Jr. Highway (left turns and combined through and right movements) during the AM peak hour
  - Eastbound Ardwick-Ardmore Road (left turns, through movement, and right turns), westbound Ardwick-Ardmore Road (all movements), and southbound Martin Luther King Jr. Highway (left turns and combined through and right movements) during the PM peak hour
- Brightseat Road/Redskins Road and Sheriff Road/Brightseat Road (Intersection #21)
  - Eastbound Sheriff Road (left turns) during the PM peak hour

Two of the three unsignalized intersections would not experience failing queue lengths for the 95th percentile, but the intersection of Brightseat Road and Ardwick-Ardmore Road (Intersection #17) would experience 95th percentile failing queues on northbound Brightseat Road (right turns) during both the AM and PM peak hours.

The remaining intersections in the study area have acceptable queue lengths. See table 3-24 for more details on the percentile values observed at each intersection. Note that the percentile values are expressed in feet, and an average car plus space between the next vehicle requires roughly 25 feet of space.

Table 3-24: Existing Condition Queuing Analysis for AM and PM Peak Hours

#	Intersection & Approach	Lane Group	Turning Bay/Link Length (feet)	AM Peak		PM Peak	
				50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th percentile (feet)
1	**Landover Road & Old Landover Road (Signalized)**						
	EB (Landover Rd)	L	1,000	114	190	16	90
	EB (Landover Rd)	T	1,673	68	118	214	239
	WB (Landover Rd)	TR	440	255	235	331	265
	SB (Old Landover Rd)	LR	147	40	143	109	#183
2	**Landover Road & Pinebrook Avenue (Signalized)**						
	EB (Landover Rd)	TR	440	259	192	758	425
	WB (Landover Rd)	L	250	14	69	37	89
	WB (Landover Rd)	T	881	204	170	90	120
	NB (Pinebrook Ave)	L	653	227	278	144	232
	NB (Pinebrook Ave)	R	653	0	101	0	107
3	**Landover Road & Kent Town Place/75th Avenue (Signalized)**						
	EB (Landover Rd)	L	200	44	116	4	82
	EB (Landover Rd)	TR	881	80	142	122	195
	WB (Landover Rd)	L	250	11	53	91	124
	WB (Landover Rd)	TR	555	141	321	100	154
	NB (Kent Town Pl)	L	250	136	230	108	165
	NB (Kent Town Pl)	TR	511	148	216	144	193
	SB (75th Ave)	L	685	180	428	~369	#776
	SB (75th Ave)	TR	685	121	208	117	512
4	**Landover Road & Kent Village Drive (TWSC)**						
	EB (Landover Rd)	TR	555	-	5	-	55
	WB (Landover Rd)	T	-	-	-	-	-
	NB (Kent Village Dr)	R	586	-	72	-	65
5	**Landover Road & Dodge Park Road (Signalized)**						
	EB (Landover Rd)	L	275	138	209	297	#317
	EB (Landover Rd)	T	412	59	76	88	255
	WB (Landover Rd)	TR	524	27	104	57	92
	SB (Dodge Park Rd)	L	529	85	129	112	145
	SB (Dodge Park Rd)	R	200	0	155	0	106
6	**Landover Road & Fire House Road (Signalized)**						
	EB (Landover Rd)	L	275	14	75	16	127
	EB (Landover Rd)	TR	524	219	180	325	372
	WB (Landover Rd)	L	300	3	80	16	88
	WB (Landover Rd)	TR	888	366	345	292	261
	NB (Fire House Rd)	LTR	345	91	144	106	156
	SB (Fire House Rd)	LTR	240	83	129	152	206

Table 3-24: Existing Condition Queuing Analysis for AM and PM Peak Hours (continued)

#	Intersection & Approach	Lane Group	Turning Bay/Link Length (feet)	AM Peak		PM Peak	
				50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th percentile (feet)
7	**Landover Road & Kenmoor Drive (Signalized)**						
	EB (Landover Rd)	L	250	6	63	8	59
	EB (Landover Rd)	TR	602	70	93	156	180
	WB (Landover Rd)	L	250	1	17	2	25
	WB (Landover Rd)	TR	1,440	241	214	59	100
	NB (Kenmoor Dr)	LTR	259	0	14	34	86
	SB (Kenmoor Dr)	LT	191	17	45	44	85
	SB (Kenmoor Dr)	R	150	0	55	0	56
8	**Landover Road & Barlowe Road (Signalized)**						
	EB (Landover Rd)	TR	1,440	129	214	402	304
	WB (Landover Rd)	L	300	68	143	96	177
	WB (Landover Rd)	T	1,499	50	260	3	72
	NB (Barlowe Rd)	L	445	68	125	51	141
	NB (Barlowe Rd)	R	125	0	107	0	#143
9	**Landover Road & Brightseat Road (Signalized)**						
	EB (Landover Rd)	L	340	41	66	64	222
	EB (Landover Rd)	T	1,499	306	281	~784	1129
	EB (Landover Rd)	R	1,000	33	74	124	607
	WB (Landover Rd)	L	597	204	220	~445	360
	WB (Landover Rd)	T	1,786	611	376	484	358
	WB (Landover Rd)	R	-	0	-	0	-
	NB (Brightseat Rd)	L	250	231	#252	221	227
	NB (Brightseat Rd)	TR	1,120	106	179	239	264
	NB (Brightseat Rd)	R	1,120	64	108	307	325
	SB (Brightseat Rd)	L	390	151	162	263	256
	SB (Brightseat Rd)	LT	390	149	174	248	258
	SB (Brightseat Rd)	R	390	0	21	0	-
10	**Landover Road & I-95/I-495 Southbound On-Ramp (Signalized)**						
	EB (Landover Rd)	T	1,786	120	85	200	345
	EB (Landover Rd)	R	1,786	53	116	99	158
	WB (Landover Rd)	L	700	0	80	139	206
	WB (Landover Rd)	T	-	0	-	0	-

Table 3-24: Existing Condition Queuing Analysis for AM and PM Peak Hours (continued)

#	Intersection & Approach	Lane Group	Turning Bay/Link Length (feet)	AM Peak		PM Peak	
				50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th percentile (feet)
11	**Landover Road & I-95/I-495 Northbound Off-Ramp (Signalized)**						
	EB (Landover Rd)	L	425	21	55	35	64
	EB (Landover Rd)	T	1,193	327	180	530	511
	EB (Landover Rd)	R	150	0	126	0	150
	WB (Landover Rd)	T	279	1070	143	745	#587
	NB (I-95/I-495 NB Off-Ramp)	L	190	~407	#332	458	#397
	NB (I-95/I-495 NB Off-Ramp)	R	190	0	88	165	#246
12	**Landover Road & St Josephs Drive/McCormick Drive (Signalized)**						
	EB (Landover Rd)	L	269	75	106	224	199
	EB (Landover Rd)	T	692	102	162	362	274
	EB (Landover Rd)	R	550	20	13	0	-
	WB (Landover Rd)	L	250	138	219	29	120
	WB (Landover Rd)	T	1,323	545	361	278	355
	WB (Landover Rd)	R	500	0	6	63	178
	NB (McCormick Dr)	L	375	52	77	282	307
	NB (McCormick Dr)	LT	500	52	107	285	436
	NB (McCormick Dr)	R	250	0	-	0	#298
	SB (St Josephs Dr)	L	465	30	56	171	183
	SB (St Josephs Dr)	LT	630	59	109	173	207
	SB (St Josephs Dr)	R	630	105	128	250	403
13	**Landover Road & Lottsford Road (Signalized)**						
	EB (Landover Rd)	L	700	115	154	342	321
	EB (Landover Rd)	T	736	434	384	239	216
	EB (Landover Rd)	R	-	0	-	0	-
	WB (Landover Rd)	L	500	81	129	47	83
	WB (Landover Rd)	T	587	329	348	301	285
	WB (Landover Rd)	R	-	46	-	197	-
	NB (Lottsford Rd)	L	500	64	113	148	464
	NB (Lottsford Rd)	LT	768	170	214	~567	#885
	NB (Lottsford Rd)	R	768	0	-	0	#998
	SB (Lottsford Rd)	L	350	330	#412	263	293
	SB (Lottsford Rd)	LT	962	341	490	273	312
	SB (Lottsford Rd)	R	961	0	100	0	-

Table 3-24: Existing Condition Queuing Analysis for AM and PM Peak Hours (continued)

#	Intersection & Approach	Lane Group	Turning Bay/Link Length (feet)	AM Peak		PM Peak	
				50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th percentile (feet)
14	**Landover Road & Technology Way (Signalized)**						
	EB (Technology Way)	L	554	65	97	482	504
	EB (Technology Way)	R	554	0	46	117	194
	NB (Landover Rd)	L	420	11	149	69	79
	NB (Landover Rd)	T	1,616	54	57	301	277
	SB (Landover Rd)	T	724	69	43	877	379
	SB (Landover Rd)	R	450	11	27	19	51
15	**Landover Road & Arena Drive/Lake Arbor Way (Signalized)**						
	EB (Landover Rd)	L	400	80	108	179	203
	EB (Landover Rd)	T	1,616	262	267	572	287
	EB (Landover Rd)	R	-	0	-	0	-
	WB (Landover Rd)	L	850	~220	234	197	218
	WB (Landover Rd)	T	1,144	668	326	316	241
	WB (Landover Rd)	R	1,157	0	-	5	12
	NB (Arena Dr)	L	897	84	103	183	218
	NB (Arena Dr)	T	1,495	44	72	134	236
	NB (Arena Dr)	R	-	0	-	0	-
	SB (Lake Arbor Way)	L	300	70	118	76	122
	SB (Lake Arbor Way)	T	1,003	173	216	161	193
	SB (Lake Arbor Way)	R	1,000	134	148	0	70
16	**Martin Luther King Jr Highway (MLK Jr Hwy) & Ardwick Ardmore Road (Signalized)**						
	EB (Ardwick Ardmore Rd)	L	275	81	195	235	#385
	EB (Ardwick Ardmore Rd)	T	700	309	363	~502	#878
	EB (Ardwick Ardmore Rd)	R	700	0	121	126	#803
	WB (Ardwick Ardmore Rd)	LTR	732	~626	688	~383	447
	NB (MLK Jr Hwy)	L	720	~686	#805	269	344
	NB (MLK Jr Hwy)	T	1,094	577	#1416	584	429
	NB (MLK Jr Hwy)	R	1,094	46	860	81	93
	SB (MLK Jr Hwy)	L	200	192	#268	209	#247
	SB (MLK Jr Hwy)	T	1,175	583	708	239	300
	SB (MLK Jr Hwy)	TR	200	583	#253	239	#216
17	**Brightseat Road & Ardwick Ardmore Road (TWSC)**						
	EB (Ardwick Ardmore Rd)	LT	732	-	40	-	15
	EB (Ardwick Ardmore Rd)	R	732	-	35	-	28
	WB (Ardwick Ardmore Rd)	LTR	716	-	78	-	81
	NB (Brightseat Rd)	LT	1,094	-	1085	-	250
	NB (Brightseat Rd)	R	150	-	#247	-	#155
	SB (Brightseat Rd)	LTR	239	-	43	-	31

Table 3-24: Existing Condition Queuing Analysis for AM and PM Peak Hours (continued)

#	Intersection & Approach	Lane Group	Turning Bay/Link Length (feet)	AM Peak		PM Peak	
				50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th percentile (feet)
18	**Brightseat Road & Glenarden Parkway (Signalized)**						
	EB (Glenarden Pkwy)	LT	471	17	45	42	72
	EB (Glenarden Pkwy)	R	471	0	30	0	39
	WB (Glenarden Pkwy)	LTR	954	58	112	41	97
	NB (Brightseat Rd)	LTR	2,028	44	97	30	109
	SB (Brightseat Rd)	LTR	412	26	65	33	77
19	**Brightseat Road & Evarts Street (Signalized)**						
	EB (Evarts St)	L	180	0	5	4	22
	EB (Evarts St)	TR	1,195	0	12	0	14
	WB (Evarts St)	L	910	0	5	2	21
	WB (Evarts St)	TR	910	0	15	0	14
	NB (Brightseat Rd)	L	220	0	11	0	17
	NB (Brightseat Rd)	T	732	0	20	0	28
	NB (Brightseat Rd)	R	732	0	-	0	0
	SB (Brightseat Rd)	L	120	0	8	0	-
	SB (Brightseat Rd)	TR	446	0	21	0	30
20	**Brightseat Road & Entrance to Old Landover Mall (Ent to OLM)/Maple Ridge Apartments Access Road (MRA Access Rd) (TWSC)**						
	EB (MRA Access Rd)	LTR	206	-	46	-	48
	WB (Ent to OLM)	LT	249	-	9	-	30
	WB (Ent to OLM)	R	-	-	-	-	-
	NB (Brightseat Rd)	LTR	390	-	6	-	13
	NB (Brightseat Rd)	R	-	-	-	-	-
	SB (Brightseat Rd)	L	536	-	4	-	5
	SB (Brightseat Rd)	TR	537	-	1	-	-
21	**Brightseat Road/Redskins Road & Sheriff Road/Brightseat Road (Signalized)**						
	EB (Sheriff Rd)	L	150	102	123	105	#164
	EB (Sheriff Rd)	T	966	86	127	196	276
	EB (Sheriff Rd)	R	-	0	-	0	-
	WB (Brightseat Rd)	L	478	1	3	5	13
	WB (Brightseat Rd)	T	478	150	191	228	265
	WB (Brightseat Rd)	R	300	0	-	0	68
	NB (Redskins Rd)	L	250	28	39	35	47
	NB (Redskins Rd)	TR	622	52	54	54	43
	SB (Brightseat Rd)	L	240	44	35	34	35
	SB (Brightseat Rd)	T	1,120	30	7	79	43
	SB (Brightseat Rd)	R	-	0	-	0	-

Table 3-24: Existing Condition Queuing Analysis for AM and PM Peak Hours (continued)

#	Intersection & Approach	Lane Group	Turning Bay/Link Length (feet)	AM Peak		PM Peak	
				50th Percentile (feet)	95th Percentile (feet)	50th Percentile (feet)	95th percentile (feet)
22	**Brightseat Road & Arena Drive (Signalized)**						
	EB (Arena Dr)	LTR	511	54	103	48	87
	WB (Arena Dr)	LTR	465	56	126	122	180
	NB (Brightseat Rd)	L	320	6	54	13	55
	NB (Brightseat Rd)	TR	617	40	143	55	154
	SB (Brightseat Rd)	L	210	47	167	105	207
	SB (Brightseat Rd)	TR	2,430	21	88	53	108
23	**Arena Drive & I-95/I-495 Southbound Ramps (Signalized)**						
	EB (Arena Dr)	T	465	122	152	238	233
	EB (Arena Dr)	R	465	0	53	0	57
	WB (Arena Dr)	L	250	6	93	84	206
	WB (Arena Dr)	T	664	13	58	13	95
	SB (I-95/I-495 SB Off-Ramp)	L	964	188	206	289	280
	SB (I-95/I-495 SB Off-Ramp)	LTR	964	198	249	266	290
24	**Arena Drive & I-95/I-495 Northbound Ramps (Signalized)**						
	EB (Arena Dr)	L	280	60	141	57	125
	EB (Arena Dr)	T	664	70	110	39	127
	WB (Arena Dr)	TR	894	194	232	395	299
	NB (I-95/I-495 NB Off-Ramp)	L	784	112	106	114	122
	NB (I-95/I-495 NB Off-Ramp)	LTR	784	16	107	80	79

Notes:

~ 50th percentile volume exceeds capacity, queue is theoretically infinitive.

95th percentile volume exceeds capacity, queue may be longer.

Red cells denote approaches and lane groups whose queuing length exceeds capacity.

EB = Eastbound, WB = Westbound, NB= Northbound, SB = Southbound

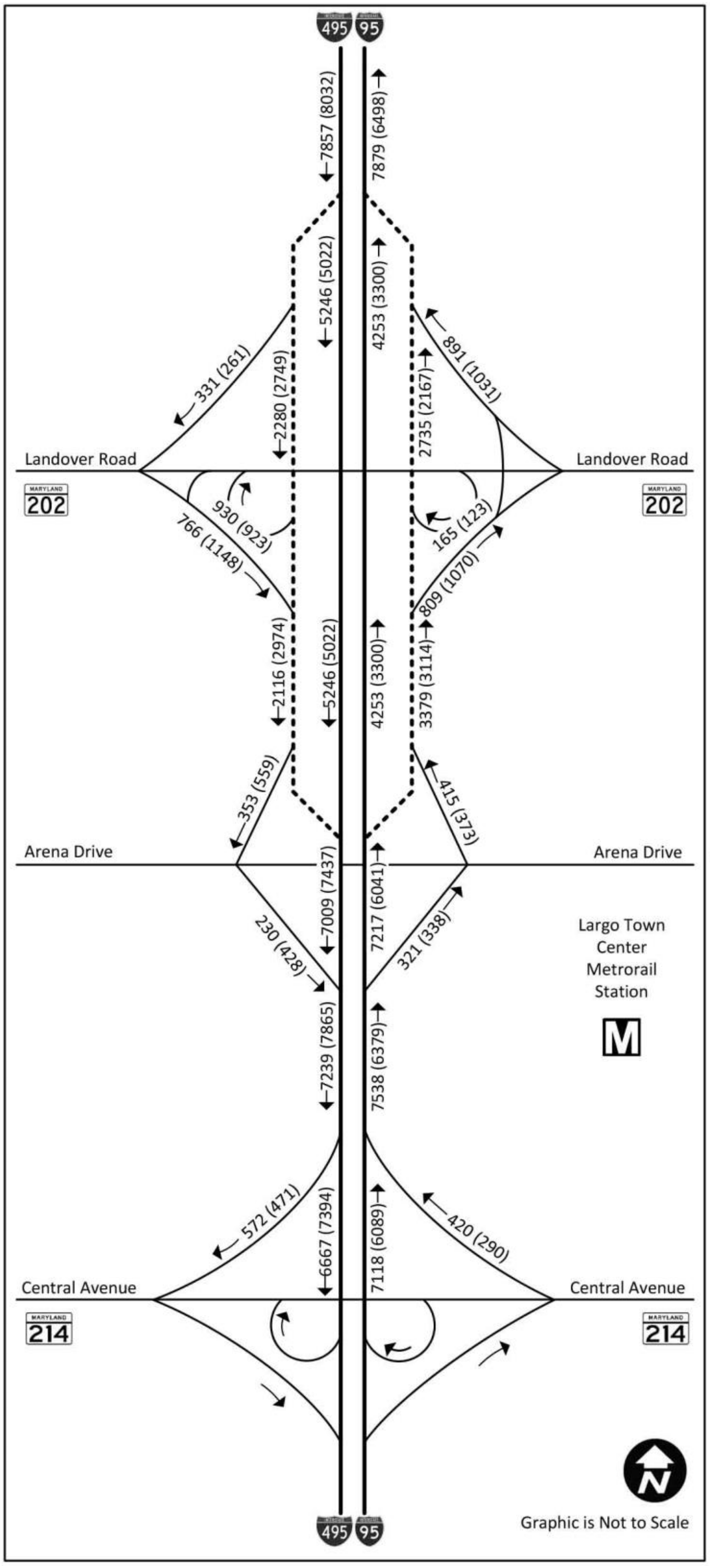
LTR = left / through / right lanes

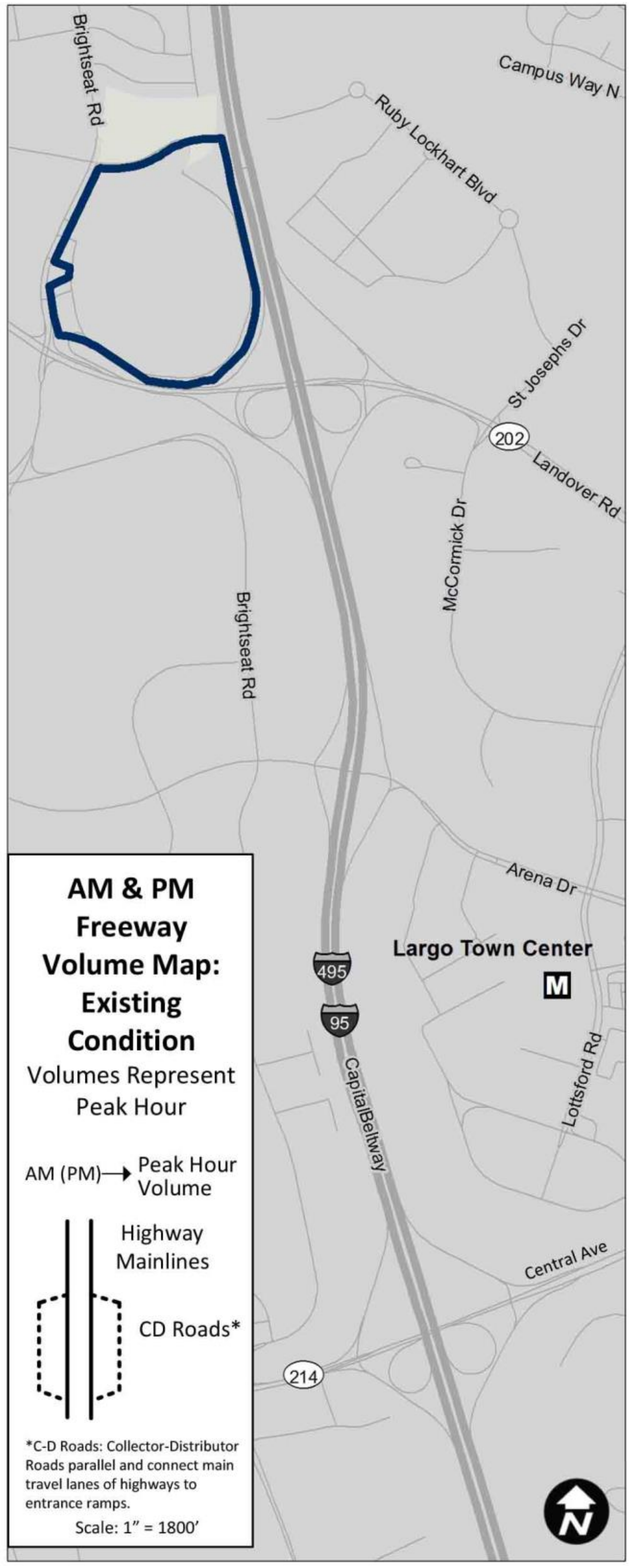
TWSC = Two-way STOP-Controlled unsignalized intersection

3.7.6 Freeway Volumes Results

Following the Landover Transportation Agreement, freeway analysis was not performed for the Existing Condition. However, the freeway ramp volumes are included in figure 3-18 to allow a comparison to the No-build, Build, and Build with Mitigation Condition freeway ramp volumes presented in Sections 4.7, 5.8, and 6.6, respectively. Full analysis of the freeway volumes is included in the Build with Mitigation Condition in Section 6.6.

Figure 3-18: Existing Condition Freeway Volumes





3.8 Crash Analysis

Crash ratings are used in transportation analyses to help determine where additional attention or examination of safety should be undertaken. Crash ratings are evaluated based on recorded crash information collected by a jurisdiction, in this case 3 years of data from Maryland SHA (2011–2013), and calculated using the accident information and the daily volume of vehicles that travel through the intersection (Maryland SHA 2015b). Crash ratings are calculated based on the number of crashes that would occur per million entering vehicles (MEV) using the following formula:

$$\text{Rate} = \frac{C * 1{,}000{,}000}{n * 365 * V}$$

In this formula, C is the total number of intersection-related crashes in the study period, *n* is the number of years of data (i.e., study period), and *V* is the traffic volumes entering the intersection daily. Daily traffic volumes were calculated from an average of the AM and PM peak hour traffic volumes (due to the large differences between AM and PM volumes for some intersections) and adjusted based on the percent of daily traffic that would likely use the intersection during the peak hour. Similar to the recent D.C. transportation study, the Maryland Avenue SW Transportation Study, peak hour was assumed to account for 9 percent of the daily volumes based on common assumptions that peak hour traffic volumes account for 8–12 percent of daily traffic depending on the surrounding land use pattern (DDOT 2013), with urban areas being higher and suburban areas being lower within that range. The 9 percent factor was also used because it brought the overall traffic volumes of intersections in line with the intersection volumes calculated from Maryland SHA AADT roadway volumes in the study area (Maryland SHA 2014b).

Crash and injury ratings for the intersections in the study area are presented in table 3-25. The intersection with the highest crash rating is Brightseat Road at Sheriff Road/Redskins Road, with a crash rating of 0.72 crashes per MEV. According to the Institute of Transportation Engineer's (ITE) *Transportation Impact Analyses for Site Development* (ITE 2010), an accident rate of 1.0 or higher is an indication that further study is needed. Since no study area intersections had an accident or crash rating of 1.0 or higher, no further safety analysis was performed for the study area.

Table 3-25: Intersection Crash Summary

Intersection Number	Intersection Name (Cross Streets)	Crash Rate (crashes/MEV*)	Injury Rate (crashes/MEV*)
1	Landover Road & Old Landover Road	0.11	0.15
2	Landover Road & Pinebrook Avenue	0.16	0.08
3	Landover Road & Kent Town Place/75th Avenue	0.38	0.38
4	Landover Road & Kent Village Drive	0.02	0.00
5	Landover Road & Dodge Park Road	0.36	0.22
6	Landover Road & Fire House Road	0.38	0.28
7	Landover Road & Kenmoor Drive	0.26	0.26
8	Landover Road & Barlowe Road	0.17	0.04
9	Landover Road & Brightseat Road	0.68	0.42
10	Landover Road & I-95 / I-495 Southbound On-Ramp	0.07	0.07
11	Landover Road & I-95 / I-495 Northbound Off-Ramp	0.13	0.06
12	Landover Road & St Josephs Drive/McCormick Drive	0.22	0.12
13	Landover Road & Lottsford Road	0.54	0.38
14	Landover Road & Technology Way	0.18	0.10
15	Landover Road & Arena Drive/Lake Arbor Way	0.33	0.17
16	Martin Luther King Jr Highway & Ardwick Ardmore Road	0.53	0.32
17	Brightseat Road & Ardwick Ardmore Road	0.34	0.28
18	Brightseat Road & Glenarden Parkway	0.14	0.36
19	Brightseat Road & Evarts Street	0.08	0.00
20	Brightseat Road & Entrance to Old Landover Mall/ Maple Ridge Apartments Access Road	0.08	0.08
21	Brightseat Road & Sheriff Road/Redskins Road	0.72	0.27
22	Brightseat Road & Arena Drive	0.65	0.35
23	Arena Drive & I-95 / I-495 Southbound Ramps	0.00	0.00
24	Arena Drive & I-95 / I-495 Northbound Ramps	0.04	0.08

Notes:*MEV = million entering vehicles
Intersections depicted in light blue have a crash rating over 1.0 and may warrant further analysis.
Sources: Maryland SHA crash and injury data from 2011-2013 (2015b); traffic counts.

4.0 Analysis of No-build Condition

This chapter introduces the No-build Condition for the Landover site and summarizes the potential impacts on the pedestrian network, bicycle network, public transit system, parking conditions, truck access, and traffic operations caused if the consolidation of FBI HQ at the Landover site does not occur.

The Landover No-build Condition is unique from the No-build Condition described in the FBI HQ Consolidation DEIS because it only analyzes the conditions at the Landover site and does not factor in the impacts from the exchange of the JEH parcel in Washington, DC. Under the No-build Condition, GSA would continue to maintain the FBI HQ building in Washington, D.C. or one of the other two sites would be selected. The Landover site would not be redeveloped as a new consolidated FBI HQ and would instead continue in its current use as vacant.

4.1 No-build Condition Improvements

The following sections describe the No-build Condition improvements within the Landover study area, including planned developments and planned roadway improvements.

4.1.1 Planned Developments

According to the Landover Site Transportation Agreement (Appendix D1), 12 planned developments are included as part of the No-build Condition. These developments range from small (7,000 SF of retail or 30,500 SF of office use) to large, mixed-use projects (up to 975,000 SF of office use or 560 residential units). The developments would be located primarily east of the Capital Beltway, both north and south of Landover Road (MD 202), and all are shown in figure 4-1. All of the following information on these planned developments was gathered through a meeting with M-NCPPC (Masog 2014).

Woodmore Towne Centre would be composed of 975,000 SF of office, 50,000 SF of retail, 1,423 residential units, and a 360-room hotel. The proposed mixed-use project would be located due east of the Landover site but separated by the Capital Beltway. The project would also be located near the northeast corner of the I-495 and Landover Road interchange accessed by St. Joseph's Drive from Landover Road. This proposed development represents an additional build-out of the Woodmore Towne Centre property that already contains large retail centers such as Costco and Wegmans.

Largo Park (Lots 3 and 4 Block D) would be composed of 80,000 SF of office, 9,000 SF of retail, 318 residential units, and 10,000 SF of restaurant space. The proposed mixed-use project would be located at the northwest corner of the Arena Drive and Lottsford Road intersection. It is assumed that the property would be accessible from both roadways.

King Property would be composed of 202,000 SF of office, 202,000 SF of retail, and 210 apartment units. The proposed mixed-use development would be located between Lottsford Road and St. Joseph's Drive east of Landover Road and would be accessible through Ruby Lockhart Boulevard from either Lottsford Road or St. Joseph's Drive.

Balk Hill Village would be composed of 238 residential units and located between the proposed King Property development and Campus Way east of the existing Woodmore Towne Centre. It would be accessible from St. Joseph's Drive or from Campus Way North. This proposed development is an additional build-out of the existing residential property that contains single-family homes and townhouses.

Hunters Ridge would be composed of 323 residential units and would be located near the northwest corner of Landover Road and 75th Avenue intersection. It would be accessible through 75th Avenue.

Largo Park (Lot 5 Block B) would be composed of 144,000 SF of office and located near the southwest corner of the Lottsford Road and Landover Road intersection. It is assumed the property would be accessible from Lottsford Road across from Lottsford Court.

Englewood Business Park (Lot 43) would be composed of 60,100 SF of flex office (half office and half warehouse) and would be located at the southwest corner of the Lottsford Road and McCormick Drive intersection. It is assumed the property would be accessible from both roadways.

Englewood Business Park (Lot 27) would be composed of 60,100 SF of flex office (half office and half warehouse) and is located near the northeast corner of the Lottsford Road and Apollo Drove intersection, north of Arena Drive. It is assumed the property would be accessible from Lottsford Road.

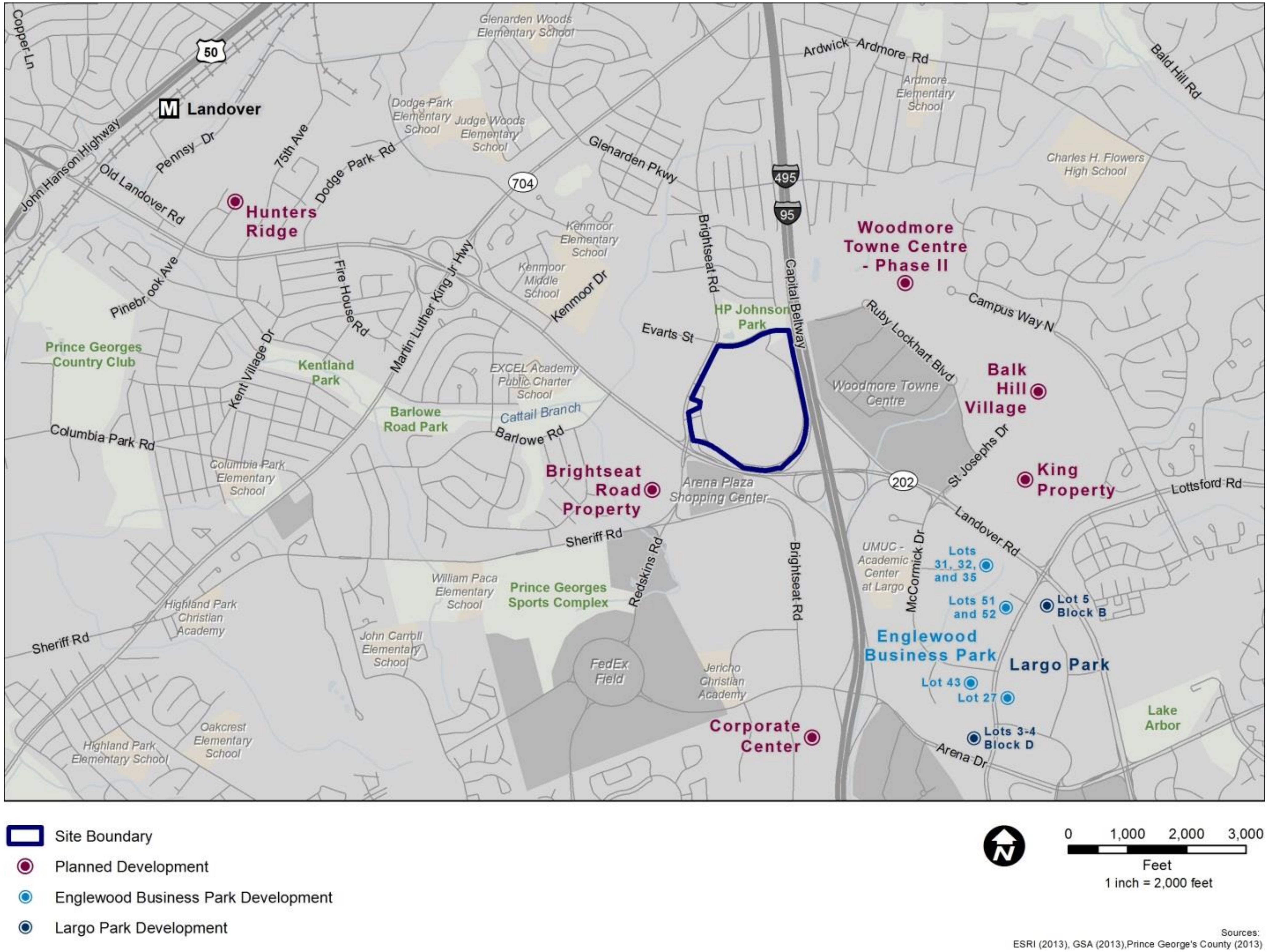
Englewood Business Park (Lots 51 and 52) would be composed of 7,000 SF of retail and is located near the southwest corner of the Lottsford Road and Lottsford Court intersection. It is assumed the property would be accessible from Lottsford Road.

Englewood Business Park (Lots 31, 32, and 35) would be composed of 144,800 SF of office and is located along Peppercorn Place south of Landover Road and west of McCormick Drive. It is assumed the property would be accessible from Peppercorn Place.

Corporate Center (Lot 4) would be composed of 123,000 SF of light industrial space and is located on Brightseat Road south of Arena Drive.

Brightseat Road Property would be composed of 380 residential units and is located at the northwest corner of Brightseat Road and Sheriff Road. The proposed property will be accessible from Brightseat Road and Barlowe Road.

Figure 4-1: Planned Development Projects



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4.1.2 Planned Roadway Improvements

According to the Landover Site Transportation Agreement (Appendix D1), there are no planned roadway improvements; however, a new signalized intersection under construction was identified through field visits. The intersection is located along Brightseat Road between Landover Road and Sheriff Road and is assumed to serve the new planned residential development called Brightseat Road Property on the western side of Brightseat Road. The traffic signal for this intersection was added to the modeled network to provide the most accurate simulation possible, but the operations are not reported in this report.

4.2 Pedestrian Network

According to the Maryland Department of Transportation (MDOT)/SHA 2015-2020 Transportation Improvement Program (TIP) (MDOT with Maryland SHA 2014), several regional and Prince George's County funding categories include funds for sidewalk, signing, lighting, pedestrian crossing, safety improvements, ADA improvements or retrofits, and/or traffic management improvements to benefit pedestrians. Specific details are not available about what projects would receive these funds. Some improvements could also be made to the existing pedestrian network with the addition of proposed development projects in proximity to the alternative site, such as the Brightseat Road Property project, located at the northwest corner of Brightseat and Sheriff Roads.

Overall under the No-build Condition, impacts to pedestrians near the Landover site would have no measurable direct impacts because the majority of planned projects and associated trips from No-build Condition projects would be east of the Capital Beltway. The small increase in vehicular traffic in the study area would not affect pedestrians crossing at the intersections closest to the Landover alternative site and would not affect pedestrians' access to the surrounding street network, due to pedestrian crossings and sidewalks still providing connections. Additionally, pedestrian conditions near the Landover site would remain primarily the same with the existing crossings and sidewalks providing connections.

4.3 Bicycle Network

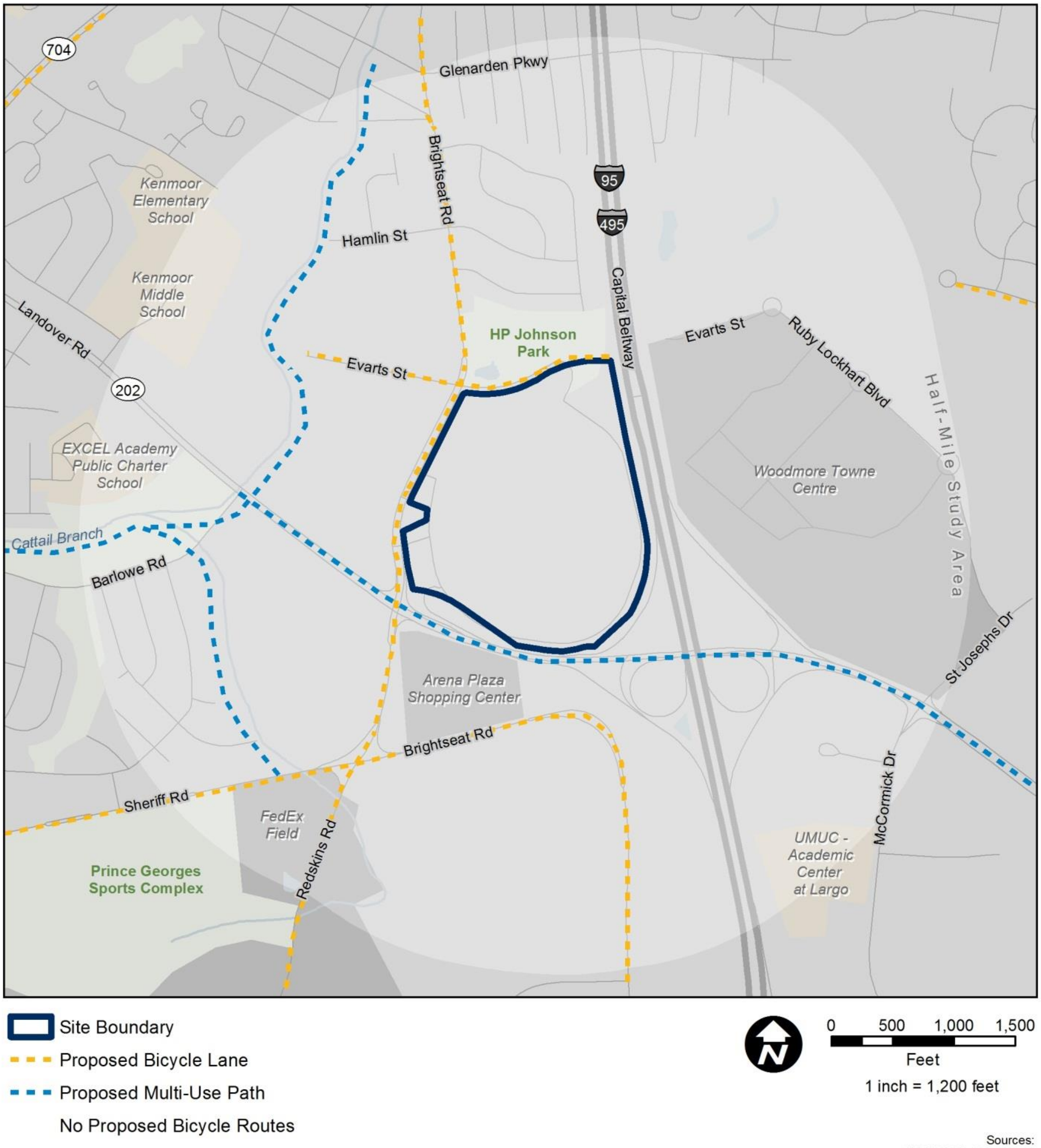
The Prince George's County Bikeway Master Plan recommends several new bicycle lanes and multi-use paths (or sidepaths) within the Landover study area, including three roads with bicycle lanes, one road with a multi-use path, and a multi-use path along the Cattail Branch River (see table 4-1 and figure 4-2) (M-NCPPC and PGC PD 2009b). Because there is no dated implementation associated with this plan, it is unclear if any recommendations would be completed by 2022. Therefore, the No-build Condition would have no measurable direct impacts on bicycle conditions in the study area unless planned improvements are implemented. If any of the bicycle facilities listed were implemented by 2022, they would have at least a direct, long-term, beneficial impact on the bicycle network.

Table 4-1: Recommended Bicycle Facilities in the Landover Study Area

Roadway/Guiding Feature	From/To	Type	Future Status
Landover Road (MD 202)	Barlowe Road to Central Avenue (MD 332)	Multi-Use Path	Proposed
Cattail Branch River	Martin Luther King Jr. Avenue (MD 704) to Glenarden Parkway; Sheriff Road to Barlowe Road	Multi-Use Path	Proposed
Brightseat Road	Landover Road to Ardwick-Ardmore Road	Bicycle Lane	Proposed
Redskins Boulevard	Landover Road to Central Avenue (MD 332)	Bicycle Lane	Proposed
Evarts Street/Campus Way	Cattail Branch River to Campus Way North east of I-95/I-495 [a] (extending to Harry Truman Drive))	Bicycle Lane	Proposed

[a] Small segment currently exists between Capital Beltway and Ruby Lockhart Boulevard.
Source: M-NCPPC and PGC PD (2009b)

Figure 4-2: Proposed Landover Area Bicycle Facilities



Sources:
ESRI (2013), GSA (2013)
Prince George's County (2013)

4.4 Public Transit

The following sections describe the No-build Condition for the bus and Metrorail modes within the Landover study area. Commuter bus, carsharing, slugging, and shuttles are not evaluated in the No-build Condition because future ridership information or planning documents were not available.

4.4.1 Projected Transit Growth

Growth in the transit mode was calculated for the year 2022 using regional transit growth rates and projected ridership associated with large planned projects in proximity to the site.

One proposed development, Largo Park, has projected transit trips located in proximity to the Largo Town Center Metro Station. Transit trips associated with this project were calculated based on ITE trip generation rates and the transit mode split determined in the traffic analysis section of this document (see *Trip Generation and Modal Split,* Section 4.7.2) and the Landover Site Transportation Agreement (Appendix D1). Prince George's County offers up to a 20 percent peak hour transit credit for development projects located near transit. The Largo Park mode split assigned 10 percent of AM peak hour and PM peak hour trips to transit, given its distance (1/3-mile) to Largo Town Center Metro Station. The transit mode split was further disaggregated into bus trips and Metrorail trips using bus and subway proportions from the 2009-2013 *American Community Survey* means of transportation data for the census tract containing the study area (U.S. Census Bureau 2009-2013). Metrorail trips associated with Largo Park were added to projected growth at Largo Town Center Metro Station; however, bus trips were not added to ridership on routes serving the Landover study area because none of these routes serve Largo Park or Largo Town Center Metro Station.

Regional transit growth rates were obtained using the MWCOG Version 2.3.57 Regional Travel Demand Model, which projects an annual growth rate of 2.1 percent between 2008 and 2025 on the Metrorail system and 1.9 percent on the region's bus network including Metrobus (MWCOG 2015). The Metrorail growth rate was applied to ridership at Largo Town Center Metro Station, with the additional Largo Park trips also added. The bus growth rate was applied to ridership on Metrobus routes serving the study area.

4.4.2 Metrorail Analysis

The Metrorail analysis was conducted using projected ridership growth in the system at the Largo Town Center Metro Station and ridership created by the one planned development project in the study area that would have transit trips.

4.4.2.1 Ridership Growth from Planned Projects

As previously mentioned, additional transit trips associated with the Largo Park development project were added to future projected ridership at Largo Town Center Metro Station. The peak hour non-SOV trips associated with the development (see Section 4.4.1 *Projected Transit Growth*) were disaggregated into peak hour Metrorail trips using subway proportions from the 2009-2013 *American Community Survey* (U.S. Census Bureau 2009-2013) transportation data for the census tract containing the development. The *American Community Survey* is an on-going annual sampling of demographic data across the United States conducted by the U.S. Census Bureau. The peak hour Metrorail passenger trips were then disaggregated into peak AM and PM 15-minute totals using the current AM and PM peak hour factors (PHF) at the station (WMATA 2014c). A PHF is the proportion of peak hour ridership that occurs during the peak 15-minute period in that hour. The additional Metrorail trips associated with the Largo Park development project are summarized in table 4-2. The station platform capacity analysis and the fare vending analysis uses AM peak 15-minute ridership, and the station vertical element and faregate capacity analysis, the passenger load analysis, and the emergency evacuation (NFPA 130) analysis use the PM peak 15-minute ridership.

Table 4-2: Projected Trips Associated with Largo Park Project

Period	Largo Park Total Non-SOV Trips Per Hour			Metrorail Proportion of Non-SOV	Metrorail Passenger Trips Per Hour			Peak Hour Factor	Metrorail Passenger Trips Per 15-Minutes		
	IN	OUT	TOTAL		Exits	Entries	Total		Exits	Entries	Total
AM Peak	19	15	34	63.9%	12	10	22	27.1%	3	3	6
PM Peak	19	20	39	63.9%	12	13	25	29.9%	4	4	8

Source: WMATA (2014d); Masog (2014)

4.4.2.2 Regional Transit Growth Rate

Background ridership growth at the station for 2022 was calculated based on the 2.1 percent Metrorail growth rate from the MWCOG travel demand model. Table 4-3 summarizes projected 2022 weekday entries at Largo Town Center Metro Station, including background growth and growth from planned projects. Average weekday exits are assumed to be the same or comparable to average weekday entries.

Table 4-3: Weekday 2022 Projected Metrorail Ridership at Largo Town Center Metro Station

Metro Station	Average Weekday Entries			
	2014	2022 with Background Growth	2022 Planned Development Projects	2022 Total No-build
Largo Town Center	4,740	5,585	22	5,607

Source: Masog (2014); WMATA (2014d); MWCOG (2015)

4.4.2.3 Metrorail Passenger Loads

Metrorail passenger loads at Largo Town Center Metro Station were calculated based on projected 2022 ridership. Because Largo Town Center is a terminal station, passenger loads are equal to the total number of exiting passengers per train in the outbound direction (trains ending at the station) or the total number of entering passengers per train in the inbound direction (trains beginning at the station). Outbound exiting passengers during the PM peak period were higher than inbound entering passengers during the AM peak period at the station, and therefore, PM peak 15-minute exits were used for this analysis. Projected ridership was calculated using the trips associated with any planned projects and the regional Metrorail growth rate. No expansion of WMATA's current Metrorail fleet was assumed for this analysis, to provide the most conservative estimate of potential capacity issues. WMATA's Momentum plan, the agency's vision for the future including near-term goals for 2025, does call for all eight-car trains on all lines during peak periods by the year 2020; however, this would require significant upgrades to electrical systems and a significant expansion of WMATA's current fleet of railcars (WMATA 2014c).

All trains were assumed to have six cars with the exception of Blue line trains, which typically have eight during peak periods (WMATA 2014b). Projected passenger loads by 2022 at the station are below 120 passengers per car, or what WMATA considers to be capacity. Table 4-4 summarizes passenger loads per car in 2022 under the No-build Condition using PM peak 15-minute exits.

Table 4-4: Projected Maximum Metrorail Passenger Loads at Largo Town Center Metro Station

Measure (PM Peak 15-Minute Exits)	Unit
2014 Maximum Passengers	356
2022 Passengers with Background Growth	419
2022 Passengers with Development Projects	4
2022 Total No-build Passengers	423
2022 Minimum Trains [a]	3
2022 Train Cars [b]	20
2022 No-build Maximum Passengers Per Car	**21**

[a] A 4-minute headway equates to 3.75 trains every 15 minutes. This figure was rounded down to three in order to provide the most conservative load estimate.
[b] Assuming one eight-car train (Blue line) and two six-car trains (Silver line) at Largo Town Center.
Source: Masog (2014); WMATA (2014d); MWCOG (2015)

4.4.2.4 Metrorail Station Capacity Analysis

A capacity analysis was conducted for the vertical elements (escalators and stairs), faregate aisles, fare vending machines, and platforms at Largo Town Center Metro Station. The analysis used peak 15-minute periods of ridership (entries and exits) at the station according to projected 2022 No-build ridership. No-build 2022 ridership includes Largo Park development trips at Largo Town Center Metro Station and projected regional transit growth of 2.1 percent per year.

Volume-to-capacity (v/c) ratios were calculated for the vertical elements and fare elements, and pedestrian LOS was calculated for the platform area. Analysis for vertical elements and faregate aisles used projected ridership from the peak exiting period at the station – the peak 15 minute weekday time period when the highest total number of passengers would use each element. Table 4-5 summarizes ridership growth during the peak exiting periods at Largo Town Center Metro Station.

Table 4-5: Weekday Peak 15-Minute Exiting Period Ridership Growth

Metro Station	Time	2014		2022 No-build	
		Entries	Exits	Entries	Exits
Largo Town Center	5:00 PM – 5:15 PM	37	356	48	423

Source: WMATA (2014d); MWCOG (2015)

The platform area analysis and fare vending analysis used projected ridership from the peak entering period at the station – the peak 15 minute weekday time period when the most passengers would likely use fare vending machines and the highest number of passengers would be waiting on the platform. Table 4-6 summarizes ridership growth during the peak entering period at Largo Town Center Metro Station.

Table 4-6: Weekday Peak 15-Minute Entering Period Ridership Growth

Metro Station	Time	2014		2022 No-build	
		Entries	Exits	Entries	Exits
Largo Town Center	7:30 AM – 7:45 AM	327	37	**388**	**46**

Source: WMATA (2014d); MWCOG (2015)

Table 4-7 summarizes the results of the Largo Town Center Metro Station capacity analysis, including the vertical elements, fare elements, and platforms. Overall, vertical elements, faregate aisles, and fare vending machines at the station are projected to operate within capacity, or below a v/c of 0.7, which is considered capacity. Additionally, platform peak pedestrian LOS (based on the available spacing between passengers) on the busiest platform sections are projected to be at the acceptable LOS B. Further details on the Metro station capacity analysis are found in Appendix D3.

Table 4-7: 2022 No-build Largo Town Center Metro Station Capacity Analysis Summary

Element		Volume to Capacity (V/C) Ratio
Mezzanine/ Platform	Entry Escalators	0.02
	Exit Escalators	0.14
	Stairs	0.21
Mezzanine/ Street	Entry Escalators	-
	Exit Escalators	0.29
	Stairs	0.09
Faregate Aisles		0.11
Fare Vending		0.09
Platform Peak LOS		B

Source: WMATA (2014d); Largo Town Center Station Site Inventory, December 19, 2014

4.4.2.5 NFPA 130 Emergency Evacuation Analysis

An emergency evacuation analysis was conducted to compare evacuation capacity of Largo Town Center Metro Station to standards set by NFPA 130 code (TRB 2013). NFPA 130 requires that station platforms be fully evacuated within 4 minutes and that all passengers reach a “point of safety” within 6 minutes. WMATA Metrorail stations, however, are not required to meet these criteria. Details on the assumptions and calculations necessitated in NFPA 130 are found in Appendix D4. A summary of the emergency evacuation analyses is included below, with further details on the station analysis included in Appendix D4.

The NFPA 130 analysis used the projected number of passengers waiting to board and alight trains (entries and exits) from the peak 15-minute period (5:00 PM to 5:15 PM) at the Largo Town Center Metro Station. Table 4-5 summarizes volumes of passengers entering and exiting the station during this period.

Using the peak 15-minute ridership period and NFPA 130 assumptions and guidelines, the platform at Largo Town Center Metro Station could be evacuated in 1.5 minutes, and the entire station could be evacuated to a point of safety within 4.4 minutes.

4.4.3 Metrobus Analysis

For this analysis, it was assumed that there would be no major changes in bus service in the study area by 2022. The overall analysis was limited to Metrobus service because no ridership data were available for TheBus. It can be assumed, however, that TheBus would see some minor increases in ridership on routes that serve the site.

To calculate peak hour bus volumes within the study area, the 2014 maximum weekday passenger loads for each route and direction at stops within the study area were averaged by stop, and then this figure was multiplied by the number of peak bus trips per hour to calculate ridership per peak hour by route and direction. These totals were then grown to the year 2022 using the 1.9 percent annual regional growth rate for the bus mode. The 2022 totals were then summed to calculate a total ridership per peak hour for the study area. As noted previously, bus trips for the Largo Park development project were not added to ridership on routes serving the Landover study area in figure 4-1 because none of these routes serve Largo Park or Largo Town Center Metro Station.

To calculate the peak hour capacity of bus services within the study area, the capacity per trip of each bus route during the peak hour was multiplied by the number of trips scheduled in the peak hour. Capacities per trip for each Metrobus route were based on the typical number of seats available on each trip and the WMATA load standard (WMATA 2013c).

Total 2014 peak hour bus ridership and projected 2022 peak hour bus ridership are summarized in table 4-8. Both 2014 and 2022 bus ridership are below the overall calculated capacity of bus services in the study area, meaning the additional passenger trips projected can be adequately handled by current service levels. At the individual route level, however, Route F14 in the northbound direction is projected to be slightly over capacity by 2022 within the study area. Further details on the Metrobus capacity analysis are found in Appendix D6.

Table 4-8: Current and Projected Bus Ridership in the Landover Study Area

Measure	2014		2022 Background Growth		2022 Planned Development Projects		2022 Total No-build	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
Total Volume	210	226	243	262	0	0	243	262
Total Capacity	411	418	411	418	-	-	411	418
Volume to Capacity Ratio (V/C)	0.51	0.54	0.59	0.63	-	-	0.59	0.63

Note: Bus trips associated with the Largo Park development were not added because the site is outside of the study area.
Sources: Masog (2014); WMATA (2014e); MWCOG (2015)

4.4.4 Largo Town Center Metro Station Bus Bays

It is assumed that no new services will serve the station by 2022; therefore, the excess capacity at the bus loop will remain.

4.4.5 Level of Impact

The increase in public transit trips in the No-build Condition would have the following impacts on transit:

- Metrobus Route F14 would have capacity issues that are not present in the Existing Condition. The overall capacity of bus services in the study area, however, would accommodate the projected ridership.

- Metrorail passenger loads through the study area are projected to remain at acceptable levels.
- Metrorail vertical elements are projected to continue to operate below capacity.
- Metrorail faregate aisles and fare vending machines would continue to operate below capacity.
- Metrorail platform peak pedestrian LOS (based on the available spacing between passengers) on the busiest platform sections are projected to continue to be at the acceptable LOS B.
- Platform and station evacuation times would remain the same as existing conditions, continuing to meet NFPA 130 standards. WMATA Metrorail stations, however, are not required to meet NFPA 130 standards.

Therefore, the No-build Condition would have a direct, long-term, adverse impact on public transit capacity. In addition, public transit bus operations (more than three buses) would have direct, long-term, major adverse impacts caused by the potential traffic delays forecasted along Landover Road (see Section 4.7, *Traffic Analysis*).

4.5 Parking

The No-build Condition and improvement projects would not increase public surface parking in the area around the site, nor would the condition decrease existing on-street parking, which is primarily limited to residential neighborhood streets. The private parking lot on the west side of Brightseat Road between Landover Road and Sheriff Road, which is sometimes used for game-day parking would be developed into residential properties with parking intended for the residents and their guests (Brightseat Road Property).

With no other changes in land use or development within the parking 0.5-mile study area anticipated by 2022 except for this Brightseat Road Property project, there would not be a substantial increase in parking demand that would impact the area's parking facilities. Overall, the No-build Condition would have no measurable direct impacts on parking in the study area.

4.6 Truck Access

Truck access routes would not change under the No-build Condition. Therefore, there would be no measurable direct impacts on truck access under the No-build Condition.

4.7 Traffic Analysis

The No-build Condition includes various programmed transportation improvements in the study area, growth in existing traffic volumes through the same horizon year as the Build Condition or 2022, and trips generated by approved and unbuilt development projects. Volumes are then used as an input, along with delay, signal timing, and geometrics, to evaluate traffic operations and queuing at signalized and unsignalized intersections, and on freeways, to determine the impacts of traffic growth and potential mitigation measures.

According to the Landover Site Transportation Agreement, two primary sources were relied on to develop the future No-build traffic volumes, an approved list of planned developments provided by M-NCPPC and background growth rates agreed between all parties (M-NCPPC, Maryland SHA, and EIS project team). The Landover Site Transportation Agreement can be referenced in Appendix D1.

The following section describes the process for analyzing traffic for the No-build Condition and the results of the analysis. Note that the procedures to forecast future traffic volumes throughout the TIA include rounding; therefore, values may not add up to the precise value indicated.

4.7.1 Background Growth

Background growth was added to the Interstate and non-Interstate roadway network to account for vehicle trips traveling through the study area during the AM and PM peak hours. These trips are important to include because they account for vehicle volume growth due to land use changes outside of the study area. Two sources were relied on to develop background growth rates. The MWCOG Travel Demand Model and the AADT volumes maintained by Maryland SHA. The MWCOG travel demand forecasts, in close collaboration with local jurisdictions, provide consolidated, consistent future vehicle volume projections that support air quality modeling, traffic congestion forecasts, and general planning. The models are updated regularly as conditions change, but there is always some degree of lag. The AADT volumes provide a historic reference. M-NCPPC recommends six years of historic data to determine a historical average growth.

According to MWCOG travel demand model comparison between 2010 and 2025 models, there will be an average of 0.56 percent per year growth on I-95, a 0.28 percent per year growth on Landover Road (MD 202), a 1.4 percent per year growth on Arena Drive, and a 2.77 percent per year growth on Brightseat Drive (MWCOG 2014). According to 6 years of historic AADTs between 2008 and 2013 maintained by Maryland SHA, Landover Road had a 0.5 percent annual growth while Arena Drive and Brightseat Road had negative trends (Maryland SHA 2014). Based on these trends and as agreed upon through the Landover Site Transportation Agreement, a 0.5 percent per year growth rate was applied for I-95 through trips, a 0.33 percent per year growth rate was applied for Landover Road and Brightseat Road, and a 1.0 percent per year growth rate was applied for Arena Drive (Appendix D1). Since the traffic counts were obtained between November 2014 and February 2015, the background growth was forecasted out eight years (future horizon year is 2022) by using the compound formula. Table 4-9 summarizes the background growth rates applied to the study area network.

Table 4-9: Background Roadway Growth Rates

Roadway	Annual Growth Rate	Eight-Year Growth
I-95/I-495	0.5%	4.07%
Landover Road/ Brightseat Road	0.33%	2.67%
Arena Drive	1.0%	8.29%

4.7.2 Trip Generation and Modal Split

The process to add each development for the No-build Condition followed the M-NCPPC/Prince George's County guidelines by using the County's prescribed trip generation formulas (M-NCPPC 2012a). Depending on the type of development and size, the trip generation either relied on the Prince George's County trip rates or ITE trip rates. Prince George's County supplies trip rates for a number of typical land uses such as office and residential. Table 4-10 shows the trip generation rates used to cover the planned developments.

After establishing the proper trip rate, the internal capture procedures outlined in National Cooperative Highway Research Program (NCHRP) 684 were followed to account for existing trips that would choose to walk between nearby land uses rather than drive (TRB 2011). The NCHRP process relies on captures rates between specific land uses. It should be noted that this procedure is endorsed as the preferred procedure for handling internal capture by ITE's Proposed Trip Generation Handbook, Third Edition (ITE 2014). Three planned developments required this procedure to reflect the mixed use. Appendix D7 contains the *NCHRP 684* worksheets.

The M-NCPPC/Prince George's County guidelines were also followed in handling pass-by trips. These represent existing trips that choose to stop at a retail use along their route and continue on their way following the stop. For example, a person may stop at the dry cleaners or take-out restaurant on their way home from work. According to the M-NCPPC/Prince George's County guidelines, the smaller the retail space, the higher the percentage of pass-by trips assigned. Three planned developments required this procedure.

M-NCPPC/Prince George's County procedures allow for a transit credit to be applied for developments within close proximity of transit. A maximum of a 20 percent trip credit may be applied. This credit would be applied to the trip generation step, thus reducing the forecasted vehicle trips and assigning them as transit trips. One site is proposed to be located within one-half mile of the Largo Town Center Metro Station; therefore, a 10 percent transit credit was applied to reflect the Metrorail transit access.

Table 4-11 contains a summary of the planned development project's trip generation.

Table 4-10: Prince George's County Trip Generation Rates

Land Use *(Guidance document)*	Trip Generation Rate	Trips Entering	Trips Existing
General Office	AM Trips = 2.00 X units	90% inbound	10% outbound
(Prince George's County Guidance)	PM Trips = 1.85 X units	18.9% inbound	81.1% outbound
General Office	Ln(AM trips) = 0.80 Ln(units) + 1.57	90% inbound [a]	10% outbound [a]
(ITE - 710): Greater than 108,000 SF	PM Trips = 1.12 X units + 78.45	18.9% inbound [a]	81.1% outbound [a]
Warehousing	AM Trips = 0.40 X units	80% inbound	20% outbound
(Prince George's County Guidance)	PM Trips = 0.40 X units	20% inbound	80% outbound
Light Industrial	AM Trips = 0.86 X units	80% inbound	20% outbound
(Prince George's County Guidance)	PM Trips = 0.86 X units	20% inbound	80% outbound
Hotel	AM Trips = 0.53 X units	59% inbound	41% outbound
(ITE - 310)	PM Trips = 0.60 X units	51% inbound	49% outbound
Shopping Center	Ln(AM trips) = 0.61 Ln(units) + 2.24	62% inbound	38% outbound
(ITE - 820)	Ln(AM trips) = 0.67 Ln(units) + 3.31	48% inbound	52% outbound
Quality Restaurant	AM Trips = 0.81 X units	50% inbound	50% outbound
(ITE - 931)	PM Trips = 7.49 X units	67% inbound	33% outbound
Apartments	AM Trips = 0.52 X units	19% inbound	81% outbound
(Prince George's County Guidance)	PM Trips = 0.60 X units	65% inbound	35% outbound
Single Family Residential	AM Trips = 0.75 X units	20% inbound	80% outbound
(Prince George's County Guidance)	PM Trips = 0.90 X units	65% inbound	35% outbound
Townhouses	AM Trips = 0.70 X units	20% inbound	80% outbound
(Prince George's County Guidance)	PM Trips = 0.80 X Units	65% inbound	35% outbound
Condominiums	AM Trips = 0.52 X units	19% inbound	81% outbound
(Prince George's County Guidance)	PM Trips = 0.60 X units	65% inbound	35% outbound
Senior Adult Housing	AM Trips = 0.13 X units	38% inbound	62% outbound
(Prince George's County Guidance)	PM Trips = 0.16 X units	63% inbound	37% outbound

[a] Follows Prince George's County distribution rates.
Note: Ln = Natural Log

Table 4-11: No-build Condition Planned Development Trips

PROJECT	UNITS/SIZE/ CREDITS	AM PEAK HOUR TRIPS			PM PEAK HOUR TRIPS		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Woodmore Towne Centre							
General Office (ITE - 710) [a]	975,000 SF	1,065	118	1,183	221	949	1,170
Internal Capture Trips (following NCHRP 684 Tables)		-54	-20	-74	-15	-33	-48
Net External Trips		1,011	98	1,109	206	916	1,122
Shopping Center (ITE - 820)	50,000 SF	63	39	102	181	196	377
Internal Capture Trips (following NCHRP 684 Tables)		-28	-14	-42	-36	-65	-101
Net External and Pass-by Trips		35	25	60	145	131	276
Pass-by Trips (reduction based on overall retail development)	20% pass-by	-7	-5	-12	-29	-26	-55
Net External Trips		28	20	48	116	105	221
Apartments (M-NCPPC/Prince George's County Guidance)	560 units	55	236	291	218	118	336
Internal Capture Trips (following NCHRP 684 Tables)		-1	-7	-8	-31	-17	-48
Net External Trips		54	229	283	187	101	288
Single Family Residential (M-NCPPC/Prince George's County Guidance)	202 units	30	121	151	118	64	182
Internal Capture Trips (following NCHRP 684 Tables)		-1	-4	-5	-17	-8	-25
Net External Trips		29	117	146	101	56	157
Townhouses (M-NCPPC/Prince George's County Guidance)	301 units	42	169	211	157	84	241
Internal Capture Trips (following NCHRP 684 Tables)		-1	-5	-6	-22	-12	-34
Net External Trips		41	164	205	135	72	207
Hotel (ITE - 310)	360 rooms	113	78	191	110	106	216
Internal Capture Trips (following NCHRP 684 Tables)		0	-34	-34	-18	-4	-22
Net External Trips		113	44	157	92	102	194
TOTAL TRIPS		**1,276**	**672**	**1,948**	**837**	**1,352**	**2,189**

[a] Per M-NCPPC/Prince George's County Guidance ITE followed for developments exceeding 108,000 square feet

NOTE: SF = square feet. M-NCPPC/Prince George's County Guidance is from the Transportation Review Guidelines, 2012.

Table 4-11: No-build Condition Planned Development Trips (continued)

PROJECT	UNITS/SIZE/ CREDITS	AM PEAK HOUR TRIPS			PM PEAK HOUR TRIPS		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Largo Park (Lots 3 and 4 Block D)							
General Office (M-NCPPC/Prince George's County Guidance)	80,000 SF	144	16	160	28	120	148
Internal Capture Trips (following NCHRP 684 Tables)		-8	-5	-13	-5	-8	-13
Net External Trips		136	11	147	23	112	135
1/2 M-NCPPC/Prince George's County Transit Credit [b]	10% credit	-14	-1	-15	-2	-11	-13
Net External Trips		122	10	132	21	101	122
Shopping Center (ITE - 820)	9,000 SF	22	14	36	57	62	119
Internal Capture Trips (following NCHRP 684 Tables)		-6	-7	-13	-21	-32	-53
Net External Trips		16	7	23	36	30	66
1/2 M-NCPPC/Prince George's County Transit Credit [b]	10% credit	-2	-1	-3	-4	-3	-7
Net External Trips		14	6	20	32	27	59
Apartments (M-NCPPC/Prince George's County Guidance)	318 units	31	134	165	124	67	191
Internal Capture Trips (following NCHRP 684 Tables)		-1	-5	-6	-23	-16	-39
Net External Trips		30	129	159	101	51	152
1/2 M-NCPPC/Prince George's County Transit Credit [b]	10% credit	-3	-13	-16	-10	-5	-15
Net External Trips		27	116	143	91	46	137
Quality Restaurant (ITE - 931)	10,000 SF	4	4	8	50	25	75
Internal Capture Trips (following NCHRP 684 Tables)		-4	-2	-6	-23	-16	-39
Net External Trips		0	2	2	27	9	36
1/2 M-NCPPC/Prince George's County Transit Credit [b]	10% credit	0	0	0	-3	-1	-4
Net External Trips		0	2	2	24	8	32
TOTAL TRIPS		**163**	**134**	**297**	**168**	**182**	**350**
[b] M-NCPPC/Prince George's County Guidance offers up to 20% transit credit (1/2 credit applied to reflect approximate 1/3 mile walk to Largo Town Center Metro Station							
NOTE: SF = square feet. M-NCPPC/Prince George's County Guidance is from the Transportation Review Guidelines, 2012.							
King Property							
General Office (ITE - 710) [a]	202,000 SF	302	34	336	58	247	305
Internal Capture Trips (following NCHRP 684 Tables)		-12	-10	-22	-10	-38	-48
Net External Trips		290	24	314	48	209	257
Shopping Center (ITE - 820)	202,000 SF	148	91	239	461	499	960
Internal Capture Trips (following NCHRP 684 Tables)		-10	-12	-22	-42	-20	-62
Net External and Pass-by Trips		138	79	217	419	479	898
Pass-by Trips (M-NCPPC/Prince George's County Guidance)	40% pass-by	-55	-32	-87	-168	-192	-360
Net External Trips		83	47	130	251	287	538
Apartments (M-NCPPC/Prince George's County Guidance)	210 units	10	17	27	21	12	33
Internal Capture Trips (following NCHRP 684 Tables)		0	0	0	-11	-5	-16
Net External Trips		10	17	27	10	7	17
TOTAL TRIPS		**383**	**88**	**471**	**309**	**503**	**812**
[a] Per M-NCPPC/Prince George's County Guidance ITE followed for developments exceeding 108,000 square feet							

Table 4-11: No-build Condition Planned Development Trips (continued)

PROJECT	UNITS/SIZE/ CREDITS	AM PEAK HOUR TRIPS			PM PEAK HOUR TRIPS		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Balk Hill Village							
Single Family Residential (M-NCPPC/Prince George's County Guidance)	156 units	23	94	117	91	49	140
Townhouses (M-NCPPC/Prince George's County Guidance)	82 units	11	46	57	43	23	66
TOTAL TRIPS		**34**	**140**	**174**	**134**	**72**	**206**
Hunters Ridge							
Townhouses (M-NCPPC/Prince George's County Guidance)	284 units	40	159	199	148	80	228
Condominiums (M-NCPPC/Prince George's County Guidance)	39 units	4	16	20	15	8	23
TOTAL TRIPS		**44**	**175**	**219**	**163**	**88**	**251**
Largo Park (Lot 5 Block B)							
General Office (ITE - 710) [a]	144,000 SF	231	25	256	45	195	240
TOTAL TRIPS		**231**	**25**	**256**	**45**	**195**	**240**
[a] Per M-NCPPC/Prince George's County Guidance ITE followed for developments exceeding 108,000 square feet							
Englewood Business Park (Lot 43)							
General Office (M-NCPPC/Prince George's County Guidance)	30,500 SF	55	6	61	11	46	57
Warehousing (M-NCPPC/Prince George's County Guidance)	30,500 SF	10	2	12	2	10	12
TOTAL TRIPS		**65**	**8**	**73**	**13**	**56**	**69**
Englewood Business Park (Lot 27)							
General Office (M-NCPPC/Prince George's County Guidance)	30,500 SF	55	6	61	11	46	57
Warehousing (M-NCPPC/Prince George's County Guidance)	30,500 SF	10	2	12	2	10	12
TOTAL TRIPS		**65**	**8**	**73**	**13**	**56**	**69**
Englewood Business Park (Lots 51 and 52)							
Shopping Center (ITE - 820)	7,000 SF	19	12	31	49	52	101
Pass-by Trips (M-NCPPC/Prince George's County Guidance)	60% pass-by	-11	-7	-18	-29	-31	-60
Net External Trips		8	5	13	20	21	41
TOTAL TRIPS		**8**	**5**	**13**	**20**	**21**	**41**
Englewood Business Park (Lots 31, 32, and 35)							
General Office (ITE - 710) [a]	144,800 SF	231	26	257	46	195	241
TOTAL TRIPS		**231**	**26**	**257**	**46**	**195**	**241**
[a] Per M-NCPPC/Prince George's County Guidance ITE followed for developments exceeding 108,000 square feet							
Corporate Center (Lot 4)							
Light Industrial (M-NCPPC/Prince George's County Guidance)	123,000 SF	85	21	106	21	85	106
TOTAL TRIPS		**85**	**21**	**106**	**21**	**85**	**106**
Brightseat Road Property							
Apartments (M-NCPPC/Prince George's County Guidance)	380 units	38	160	198	148	80	228
TOTAL TRIPS		**38**	**160**	**198**	**148**	**80**	**228**
NOTE: SF = square feet. M-NCPPC/Prince George's County Guidance is from the Transportation Review Guidelines, 2012.							

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4.7.3 Trip Distribution

Once the number of trips was forecasted through trip generation accounting for internal trip capture, pass-by trips, and modal split, the destinations covering the trips were assigned. This process followed two sources, a previous study covering the Woodmore Towne Centre and the MWCOG travel demand model trip tables from the Version 2.3.52 Travel Demand Model for 2020 (M-NCPPC and PGC PD 2012; MWCOG 2014). The Woodmore Towne Centre transportation study provided distributions for office, retail, hotel, and residential uses. Because this development is one of the planned developments included in this study and is in proximity to the other planned developments east of I-95, the distributions were relied on to distribute the trips for all the planned developments east of I-95 and along Arena Drive. Table 4-12 contains the trip distributions by land use prepared through the Woodmore Towne Centre transportation study.

Table 4-12: Trip Distributions by Land Use from Woodmore Towne Centre Transportation Study

Office Distribution

Destination	Road	Distri-bution Percent
East MD (Local)	Landover Road	15.0%
Northeast MD (Local)	Lottsford Road	15.0%
Northeast MD (Local)	Campus Ways North	5.0%
Local points northeast of Woodmore Towne Centre	Varies	5.0%
North MD	I-95 / I-495	15.0%
West MD and DC	Landover Road	10.0%
Southeast (Local)	Lottsford Road	5.0%
Southeast (Local)	McCormick Drive	10.0%
South MD	I-95 / I-495	20.0%
TOTAL		**100.0%**

Retail Distribution

Destination	Road	Distri-bution Percent
Northeast MD (Local)	Lottsford Road	20.0%
Northeast MD (Local)	Campus Ways North	10.0%
Local points northeast of Woodmore Towne Centre	Varies	10.0%
North MD	I-95 / I-495	15.0%
Northwest MD (Local)	Glenarden Parkway	3.0%
West MD and DC	Landover Road	17.0%
Southeast (Local)	Lottsford Road	15.0%
South MD	I-95 / I-495	10.0%
TOTAL		**100.0%**

Residential Distribution

Destination	Road	Distri-bution Percent
Northeast MD (Local)	Lottsford Road	5.0%
Northeast MD (Local)	Campus Ways North	5.0%
North MD	I-95 / I-495	25.0%
Northwest MD (Local)	Glenarden Parkway	5.0%
West MD and DC	Landover Road	10.0%
Southeast (Local)	McCormick Drive	20.0%
South MD	I-95 / I-495	30.0%
TOTAL		**100.0%**

Hotel Distribution

Destination	Road	Distri-bution Percent
East MD (Local)	Landover Road	10.0%
North MD	I-95 / I-495	40.0%
West MD and DC	Landover Road	10.0%
South MD	I-95 / I-495	40.0%
TOTAL		**100.0%**

Source: M-NCPPC and PGC PD (2012)

The two remaining planned developments located west of Brightseat Road relied on the MWCOG travel demand model trip tables (MWCOG 2014). Trip tables from the 2020 model were obtained from MWCOG representing all trips originating at home for all purposes such as work or shopping. A transportation analysis zone or TAZ (the smallest geographical unit within a travel demand model) was selected on the west side of I-95 to capture the travel patterns to and from residential uses. TAZ 1118 represents a 2020 forecasted population of 3,617 and is located north of Landover Road (MD 202), east of Martin Luther King Jr. Highway (MD 704), and west of Brightseat Road. Table 4-13 contains the MWCOG travel demand model-based residential trip distribution. Appendix D8 contains the maps for the Woodmore Towne Centre-based and MWCOG model distributions.

Table 4-13: Residential Trip Distributions from MWCOG Travel Model

Destination	Road	Distri-bution Percent
West MD and DC	Landover Road	35.0%
East MD (Local)	Landover Road / Lottsford Road	2.0%
East MD (Local)	Landover Road	5.0%
Northeast MD (Local)	Brightseat Road	19.0%
South MD (Local)	Brightseat Road	3.0%
North MD	I-95 / I-495	17.0%
North MD	US 50	3.0%
Site	N/A	1.0%
South MD and Virginia West	I-95 / I-495	15.0%
TOTAL		**100.0%**

Source: MWCOG (2014)

4.7.4 Development of No-build Condition

The planned developments, background growth, and planned roadway improvements were summed together to create the total background trip change between the Existing Condition and the No-build Condition. Figure 4-3 shows these combined total background trip AM and PM turning movement volumes, while Appendix D8 contains the individual planned developments and background growth turning movement volumes. The No-build Condition peak turning movement vehicle volumes covering all study area intersections and expressway facilities are then shown in figure 4-4.

The PHF is used to convert 60-minute volumes into peak 15-minute volumes because the HCM traffic operations analysis procedures require a 15-minute peak volume. The PHF is the ratio of the 60-minute volume divided by 4 times the highest 15-minute volume in the peak hour of the day. All transportation facilities in the study area were evaluated based on a peak hour factor (PHF) of 0.92. The study uses the lowest accepted value following the VDOT requirement that all future facility traffic evaluation use a PHF between 0.92 and 1.00 to be consistent for all three sites, and to use the most conservative value for the analysis of future facilities (VDOT 2012). Since the HCM 2000 traffic analysis is based on a 15-minute period, a PHF of 0.92 represents an analyzed vehicle volume based on the highest 15-minute vehicle volume. As a comparison, a PHF of 1.0 represents an analyzed vehicle volume based on a uniform 15-minute vehicle volume or the least conservative.

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Figure 4-3: No-build Condition AM and PM Weekday Peak Total Background Trips

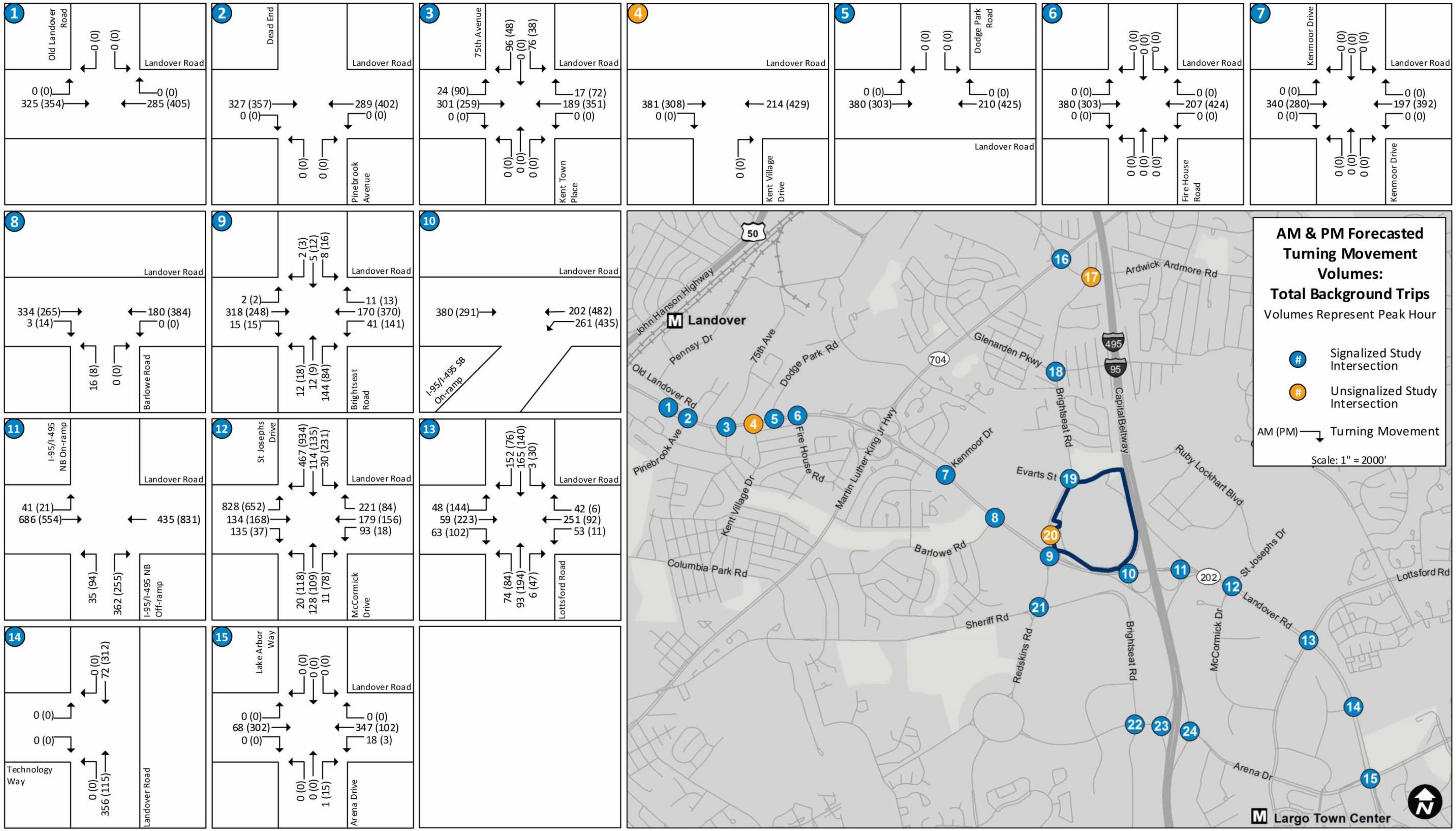

Figure 4-3: No-build Condition AM and PM Weekday Peak Total Background Trips (continued)