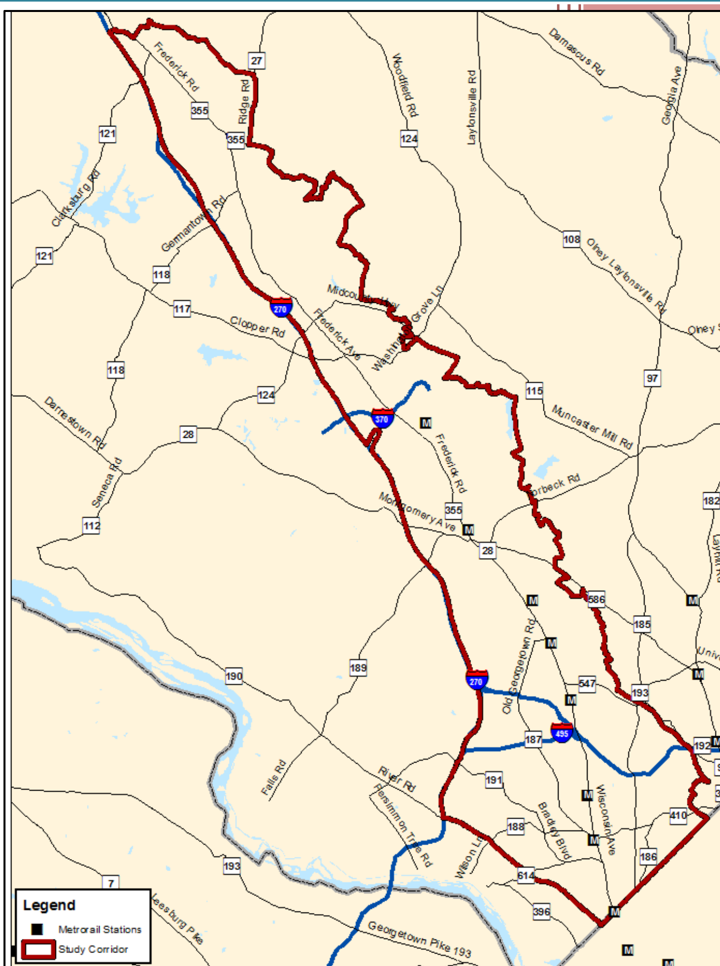
Appendix A – Existing and Forecast Travel Demand Analysis



Maryland State Highway Administration

Maryland Transit Administration

Montgomery County Department of Transportation

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Executive Summary

The 2013 Countywide Transit Corridors Functional Master Plan identified key corridors within Montgomery County that could facilitate premium rapid transit service for the purposes of implementing a Bus Rapid Transit (BRT) network across the County. The focus of this study is a potential BRT service along 21 miles of the MD 355 corridor between Clarksburg in northern Montgomery County and Bethesda in the southern portion of the County. This document analyzes existing and future land use and transportation conditions in the corridor in order to provide a foundation for understanding the overall purpose and need for this type of service.

As of 2014, the Study Corridor is home to over 300,000 residents and over 282,000 jobs (the study corridor was identified based on an assessment of the Transportation Analysis Zones within Montgomery County that would have reasonable access to stations along the proposed BRT service). A substantial amount of growth is forecast for the Study Area between 2015 and 2040, particularly around the proposed White Flint redevelopment. Population in the corridor is expected to increase by 33 percent– an increase of more than 100,000 residents while employment is forecast to grow by 28 percent in the Study Area, for an additional 86,000 jobs in the corridor.

Traffic congestion in the corridor is already a significant issue, with very slow peak period/peak direction travel speeds in portions of the corridor and multiple intersections and intersection-to-intersection links operating at Level of Service (LOS) E or F. The future 2040 No-Build conditions show that the significant growth in population and employment in the Study Corridor will further degrade traffic conditions in the corridor, with even slower peak period traffic speeds and more intersections and links operating at LOS E or F.

Analysis of major travel markets in Montgomery County reveal that most commute trips are relatively long distance trips, with many traveling into the District of Columbia. This market within the MD 355 corridor is currently served primarily by the Red Line Metrorail service which includes eight stations in the Study Area (five of the eight stations have park-and-ride facilities) and provides frequent, high quality transit into DC. In addition, the region's Financially Constrained Long Range Plan (CLRP) includes construction of the Corridor Cities Transitway (CCT), which will help provide high-quality transit services to major employment destinations in the northern half of the corridor, beyond the reach of Metrorail. These commute to work trips present one potential need in the corridor and a BRT service could provide additional connectivity to the Red Line, potentially in the northern section of the Study Area.

Additional projects contained in the CLRP that will impact the study corridor include:

- I-270 interchange with Watkins Mill Road
- I-270/US 15 HOV lanes from Shady Grove to Biggs Ford Road
- MD 27(Ridge Road) widening from MD 355 to County Road A-305
- MD 117 (Clopper Road) widening from I-270 to Great Seneca Parkway

- BRAC intersection improvements on MD 355 near the National Naval Medical Center in Bethesda
- Snowden Farm Parkway from MD 355 to MD 27 (Ridge Road)
- Mid-County Highway from MD 27 (Ridge Road) to Montgomery Village Ave.
- Extend and widen MD 118 (Germantown Road) from MD 355 to Watkins Mill Road/County Road M-83
- Extend and widen Middlebrook Road from MD 355 to County Road M-83
- Montrose Road Parkway extension from MD 355 interchange to Viers Mill Road/ Parkland Road intersection
- Executive Boulevard extension from MD 355 to Nebel Street
- Executive Boulevard extension from MD 187 to Marinelli Road
- Main Street/Market Street from MD 187 (Old Georgetown Road) to MD 355
- MD 187 (Old Georgetown Road) from Nicholson Lane/Tilden Lane to Executive Boulevard
- Hoya Street from Executive Boulevard to Montrose Parkway
- Connection of Little Seneca Parkway with Observation Drive

By far the predominant type of trip made in the corridor is non-work trips, which account for 88 percent of travel within the Study Area. These trips are made frequently, and are usually shorter distance trips than commuter travel. These types of short trips between key trip generators/attractions along MD 355 represent the largest potential market for a BRT service along the corridor, with potential to reduce vehicle travel significantly and help to shape land use changes in the areas that are planned for redevelopment. By reducing vehicle travel and providing more transportation options for these short local trips, enhancements to urban form, the pedestrian environment, parking needs, and safety can be realized.

1. Introduction

In 2013, Montgomery County adopted the Countywide Transit Corridors Functional Master Plan, which identified key corridors within the County that could facilitate premium rapid transit service. The final recommendation of the adopted plan was the implementation of a 102-mile Bus Rapid Transit network within the County, comprising 10 corridors as well as the Corridor Cities Transitway. As the next step in the implementation of the Master Plan recommendations, the Maryland Transit Administration (MTA), in collaboration with the Maryland State Highway Administration (SHA), and MCDOT is conducting a planning analysis of a potential BRT service along MD 355 within Montgomery County between Clarksburg and Bethesda. This corridor-level planning study will analyze a number of possible alternatives in order to develop a preferred Build Alternative that incorporates running way, transit signal priority, station locations, transit routing, service frequency, hours of service, and the structure of the local bus network.

As an early step in this process, an analysis of existing and future 2040 No-Build conditions in the corridor has been conducted to identify transportation issues in the Study Area that could be addressed

by proposed transit improvements, including a potential BRT service. This Purpose and Need Statement highlights major issues and needs in the corridor, in addition to analyzing the existing and future travel markets in the area that could affect the performance of a BRT service. By identifying the transportation needs in the corridor, this document helps shape the potential transit improvement alternatives that will be tested in the next phase of analysis to ensure that they are in line with the needs of the corridor and the overall purpose of the study.

The MD 355 corridor is a vibrant economic spine that runs the entire length of Montgomery County, running the gamut from urban mixed-use centers in the south, through a range of suburban communities of varying densities before entering an almost rural environment in the northernmost reaches of the County. Congestion is a major issue on the corridor, due in part to the amount of economic activity occurring directly along MD 355. Significant growth in the corridor and the County as a whole are likely to cause increases in congestion. Transit usage, both local bus service and regional Metrorail service, is high in the corridor, and BRT has the potential to provide an additional transportation option in this congested corridor while also supporting the corridor's economic vitality and unique identity.

As outlined in the Functional Master Plan, BRT in the MD 355 corridor would combine the most attractive features of light rail with the lower costs of bus technology. Some of the characteristics that could be included in BRT in the MD 355 corridor include:

- All-day service
- Higher frequencies than standard bus service
- Wider stop spacing than standard bus, with approximately ½ to 1-mile spacing
- Provision for exclusive transit lanes
- Transit signal priority and queue jump lanes where appropriate
- Enhanced stations with greater passenger amenities than standard bus stops
- Real-time passenger information
- Potential for off-board fare collection, and
- High quality vehicles that include level boarding from all doors.

Multiple combinations of these features with different operating plans will be tested in the next phase of this study; the focus of this document is to identify current transportation needs that a BRT system could potentially meet.

1.1. Methodology

This analysis relies on a number of data sources and analysis methodologies to quantify travel patterns, land use changes, transit ridership, and accessibility. Existing survey data is used wherever possible to analyze existing (2015) conditions. These sources include:

- 2006 – 2010 Census Transportation Planning Products (CTPP) based on the American Community Survey (ACS) data

- Ride On RideChecks for boardings and alightings (2015), and
- Metrobus RideChecks for boardings and alightings (2015).

Travel patterns were also analyzed for existing conditions and future 2040 conditions using a version of the Metropolitan Washington Council of Governments (MWCOG)/National Capital Region Transportation Planning Board (TPB) version 2.3.57 regional travel demand model that was validated specifically to the MD 355 corridor in Montgomery County. TPB staff refined and validated the model to represent travel conditions in the MD 355 corridor more accurately than the standard model. The model incorporated the MWCOG Round 8.3 Cooperative Land Use Forecasts and the 2014 Financially Constrained Long-Range Plan (CLRP). Results of this model were used and post-processed to forecast the change in travel in the region and corridor by 2040, including changes in transit ridership and traffic levels.

Accessibility within the corridor was also analyzed, as measured by the Multimodal Accessibility measure that was implemented in the MD 355 corridor as a pilot project for the Maryland Department of Transportation (MDOT). This analysis methodology looks at the number of jobs accessible from a given location in a certain amount of time via each travel mode, giving more credit to jobs that can be reached quickly. Therefore, a location with high accessibility means a higher number of jobs and associated economic opportunities can be accessed more quickly and within the given time threshold. This methodology incorporates changes in land use patterns (including the locations of jobs and residents), congestion levels, and travel speeds by all modes to quantify how well connected a location is to the rest of the region. This study incorporated work previously completed by Renaissance Planning Group on existing (2010) accessibility in the corridor, in addition to a new analysis on 2040 conditions based on results from the MWCOG modeling process.

Traffic data was collected utilizing the Maryland State Highway Administration's Traffic Monitoring System (TSM).

Additional reports and analyses were also evaluated as part of this exercise, including the Ride On Title VI Implementation Plan, technical analysis completed in support of the development of the BRT Functional Master Plan and the Montgomery County Service and Integration Study.

2. Regional Context

The Washington metropolitan region is expected to experience substantial demographic growth over the next 25 years according to the MWCOG Round 8.3 Cooperative Land Use Forecasts. As shown in Table 1, by 2040 the regional population is expected to increase by more than 1.8 million people to a total of 8.8 million residents (a 26 percent increase). Similarly, the regional employment totals are projected to increase nearly 1.5 million to a total of 5.5 million (a 36 percent increase).

Table 1: Regional Land Use Growth

	2014	2040	Growth	Percent Growth
Households	2,607,000	3,376,000	769,000	30%
Population	6,974,000	8,805,000	1,831,000	26%
Employment	4,077,000	5,543,000	1,466,000	36%

Source: MWCOG Round 8.3 Cooperative Land Use Forecasts

This regional growth will be driven partly by household, population, and employment growth in Montgomery County, which is expected to experience a 20 percent increase in population and a 40 percent increase in jobs over the same time period. As shown in Table 2, land use forecasts show an additional 200,000 residents and 210,000 jobs in Montgomery County in 2040 compared to today.

Table 2: Montgomery County Demographic Growth

	2014	2040	Growth	Percent Growth
Households	374,000	464,000	90,000	24%
Population	1,011,000	1,213,000	202,000	20%
Employment	528,000	738,000	210,000	40%

Source: MWCOG Round 8.3 Cooperative Land Use Forecasts

2.1. County-to-County Commute-to-Work Flows

Commute-to-work trips account for a large portion of long distance trips in the region, with work trips that begin and end within the same county accounting for 56 percent of regional work trips. Based on the 2006-2010 CTPP, Table 3 shows the regional county-to-county commute-to-work flows. As shown in Table 3, work-related travel in Montgomery County is dominated by intra-county trips, followed by travel between Montgomery County and the District of Columbia (DC). Of the 444,000 commute-to-work trips that begin in Montgomery County, 58 percent also end in Montgomery County and an additional 24 percent end in DC. Many of the work trips coming into Montgomery County originate from Prince George's County, Frederick County, and DC.

Table 3: Regional Commute-to-Work Flows

From/To	District of Columbia	Fairfax, VA	Frederick, MD	Howard, MD	Montgomery, MD	Prince George's, MD	Other	Grand Total
District of Columbia	160,090	12,310	35	570	20,930	15,015	16,020	224,970
	71.2%	5.5%	0.0%	0.2%	9.3%	6.7%	7.1%	100%
Fairfax, VA	88,905	264,060	440	740	16,660	9,830	81,089	461,724
	19.3%	57.2%	0.1%	0.2%	3.6%	2.1%	17.6%	100%
Frederick, MD	4,080	3,104	60,050	2,300	26,045	1,590	5,959	103,128
	4.0%	3.0%	58.2%	2.2%	25.3%	1.5%	5.8%	100%
Howard, MD	9,930	1,695	935	48,684	13,945	13,515	18,004	106,708
	9.3%	1.6%	0.9%	45.6%	13.1%	12.7%	16.9%	100%
Montgomery, MD	105,595	21,705	4,715	6,750	259,395	28,475	17,572	444,207
	23.8%	4.9%	1.1%	1.5%	58.4%	6.4%	4.0%	100%
Prince George's, MD	135,285	17,760	700	8,620	43,530	152,075	36,633	394,603
	34.3%	4.5%	0.2%	2.2%	11.0%	38.5%	9.3%	100%
Other	124,578	156,960	4,250	27,103	25,593	60,399	544,777	943,660
	13.2%	16.6%	0.5%	2.9%	2.7%	6.4%	57.7%	100%
Grand Total	628,463	477,594	71,125	94,767	406,098	280,899	720,054	2,679,000
	23.5%	17.8%	2.7%	3.5%	15.2%	10.5%	26.9%	100%

Source: 2006-2010 CTPP

2.2.Regional Congestion

Congestion is currently a major issue in the region as a whole; the Land Use growth predicted for the region by 2040 will only exacerbate the issue as shown in Table 4. Regional vehicle miles traveled (VMT) provides a good proxy for how congestion levels will change given that regional roadway network capacity will likely expand at a rate slower than the growth in traffic. Current conditions show a total of almost 180 million VMT daily in the region overall with a 25 percent increase expected by 2040 (based on outputs from MWCOG Model). Of this vehicle traffic, 23.5 million VMT occurs in Montgomery County under existing conditions. By 2040, it is forecast that there will be a 20 percent increase in VMT in the County; this additional five million VMT would have to be accommodated either through expansion of the roadway network (i.e. capacity increases on existing roadways or new construction) or increased congestion and slower speeds throughout the County.

Table 4: Vehicle Miles Traveled

	2014	2040	Growth	Percent Growth
Region	179,791,100	225,335,000	45,543,900	25.3%
Montgomery County	23,497,800	28,089,900	4,792,100	20.4%

Source: MWCOG Version 2.3 Regional Travel Demand Forecasting Model

2.3. Regional Transit

Transit plays a major role in the regional transportation system as well as in Montgomery County. Current transit operations within the County include:

- Local Bus Service: Local service consists of Ride On and Metrobus throughout Montgomery County, with Metrobus providing connections into the neighboring jurisdictions of the District of Columbia and Prince George's County.
- Commuter Bus Service: This service is provided by the MTA (primarily during the peak periods) and runs into Montgomery County from Frederick, Baltimore, and Howard Counties.
- Commuter Rail Service: MARC service on the Brunswick Line from Frederick and West Virginia serves stations in Montgomery County.
- Metrorail Service: The Red Line includes 12 stations fully located within Montgomery County (plus Friendship Heights located on the border with the District of Columbia).

2.3.1. Existing Transit Usage

Existing transit usage may be assessed by considering transit mode share, which is the percentage of total trips made by transit. Transit usage in the region is highest for commute-to-work trips. Based on CTPP data[1] the regional transit mode share for commute-to-work trips is 14 percent. The overall transit mode for commute-to-work trips originating in Montgomery County is 17%, generally comparable to the region as a whole (see Table 5). Mode share for commute-to-work trips originating outside the County and coming to the County is 10%. As shown in Table 5, the major transit market in the region is for commute-to-work trips destined for the District of Columbia (DC) with a regional 40 percent transit mode share. Transit mode share for commute-to-work trips originating in Montgomery County and destined for DC is 42% while commute to work trips originating in DC and destined for Montgomery County is 39%. Transit mode share is also fairly high for commute-to-work trips originating in Prince George's County, at 16%.

[1] 2006-2010 CTPP

Table 5: Existing Transit Mode Share – Commute to Work Trips

From/To	District of Columbia	Fairfax, VA	Frederick, MD	Howard, MD	Montgomery, MD	Prince George's, MD	Other	Grand Total
District of Columbia	54%	16%	0%	0%	39%	31%	42%	48%
Fairfax, VA	31%	3%	0%	0%	6%	5%	12%	10%
Frederick, MD	30%	0%	1%	0%	2%	1%	1%	2%
Howard, MD	36%	1%	0%	1%	1%	1%	3%	5%
Montgomery, MD	42%	3%	0%	1%	10%	5%	14%	17%
Prince George's, MD	35%	7%	0%	3%	16%	9%	14%	19%
Other	36%	2%	0%	0%	5%	1%	3%	7%
Grand Total	40%	3%	1%	1%	10%	8%	6%	14%

Source: 2006 – 2010 CTPP

Transit is also used for non-commute trips in Montgomery County, although with a much lower mode share than commute-to-work trips. As shown in Table 6, the results of the validated MWCOG travel demand model estimate that currently approximately three percent of non-commute trips that originate in Montgomery County are made via transit. More detail on transit mode share by district is included in Table 26.

Table 6: Existing Transit Mode Share – Non-Commute Trips

From/To	Montgomery County	Other	Total
Montgomery County	2.9%	4.6%	3.1%
Other	4.6%	2.0%	2.0%
Total	3.1%	2.0%	2.2%

Source: MWCOG v.2.3 travel demand model

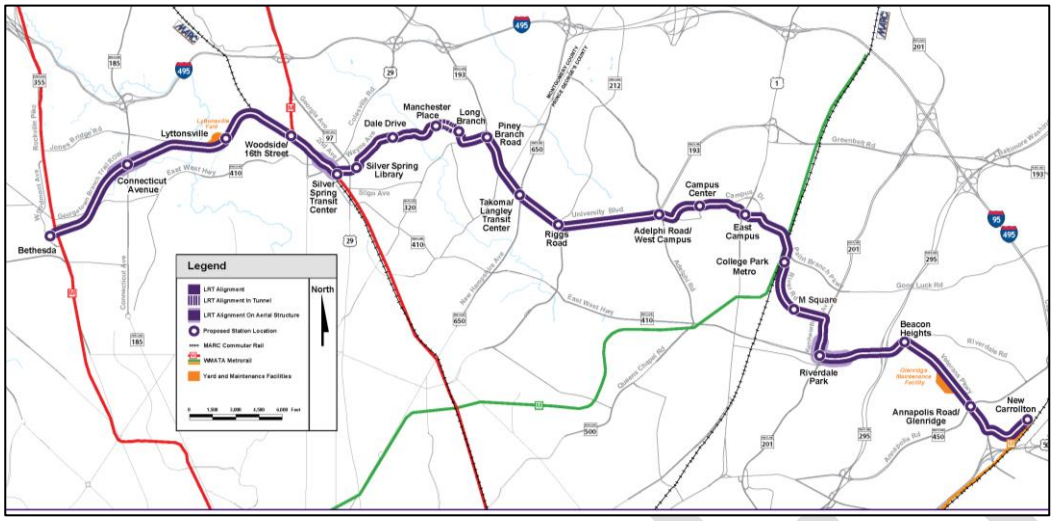
2.3.2. Future Transit Usage

Transit in the region is planned to undergo some significant changes and improvements by 2040, including the construction of a number of new fixed-guideway transit lines by jurisdictions throughout the region in the form of BRT, streetcar, and light rail. The Washington metropolitan region maintains a regional long-range transportation plan that is adopted by TPB and the constituent jurisdictions. The most recent Financially Constrained Long-Range Plan (CLRP) is incorporated into all modeling efforts; the 2014 version of the CLRP was incorporated into the modeling for this study and includes two major transit projects in Montgomery County illustrated in Figure 1.

The CLRP also includes a number of roadway improvements that will impact the study project area. These include:

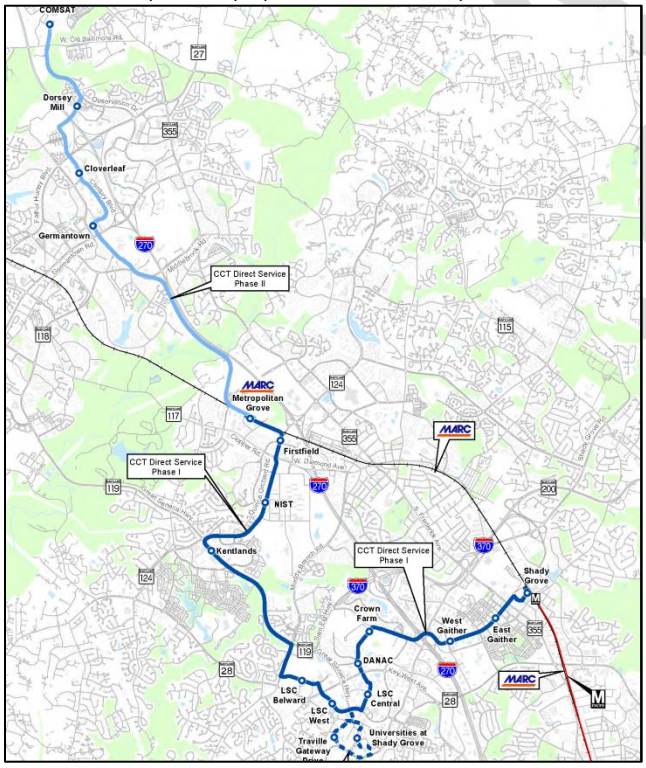
- I-270 interchange with Watkins Mill Road
- I-270/US 15 HOV lanes from Shady Grove to Biggs Ford Road
- MD 27 (Ridge Road) widening from MD 355 to County Road A-305
- MD 117 (Clopper Road) widening from I-270 to Great Seneca Park
- BRAC intersection improvements on MD 355 near the National Naval Medical Center in Bethesda
- Snowden Farm Parkway from MD 355 to MD 27
- Mid-County Highway from MD 27 (Ridge Road) to Montgomery Village Ave.
- Extend and widen MD 118 (Germantown Road) from MD 355 to Watkins Mill Road/County Road M-83
- Extend and widen Middlebrook Road from MD 355 to County Road M-83
- Montrose Road Parkway extension from MD 355 interchange to Viers Mill Road/ Parkland Road intersection
- Executive Boulevard extension from MD 355 to Nebel Street
- Executive Boulevard extension from MD 187 (Old Georgetown Road) to Marinelli Road
- Main Street/Market Street from MD 187(Old Georgetown Road) to MD 355
- MD 187 (Old Georgetown Road) from Nicholson Lane/Tilden Lane to Executive Boulevard
- Hoya Street from Executive Boulevard to Montrose Parkway
- Connection of Little Seneca Parkway with Observation Drive

Figure 1: Future CLRP Transit Projects in Montgomery County



Purple Line: Light Rail between Bethesda in Montgomery County and New Carrollton in Prince George's County with connections to the Red, Green, and Orange Metrorail lines.

Source: MTA, http://www.purplelinemd.com/en/maps



Corridor Cities Transitway (CCT): BRT in Montgomery County from Shady Grove to Comsat Drive in Clarksburg.

Source: MTA (http://www.cctmaryland.com/index.php?option=com_content&view=article&id=47&Itemid=34&lang=en)

The transit improvements noted above as well other major expansions of the regional transit system, in addition to other planned improvements to the transit network (such as headway improvements on bus routes and implementation of 8-car trains throughout the Metrorail system), will increase the range and connectivity of transit in the region as a whole and in Montgomery County in particular. These

improvements, combined with the projected land use growth and resulting increase in congestion are forecast to increase both the number and percentage of regional trips made by transit by 2040. The travel demand model forecasts a one percent increase in the commute-to-work transit mode share for the region and a two percent increase for commute-to-work trips for residents of Montgomery County – for a total mode share of 15 percent regionally and 19 percent in the County by 2040. Transit mode share for non-commute trips in Montgomery County is expected to increase somewhat by 2040, from 3.1 percent to 3.8 percent.

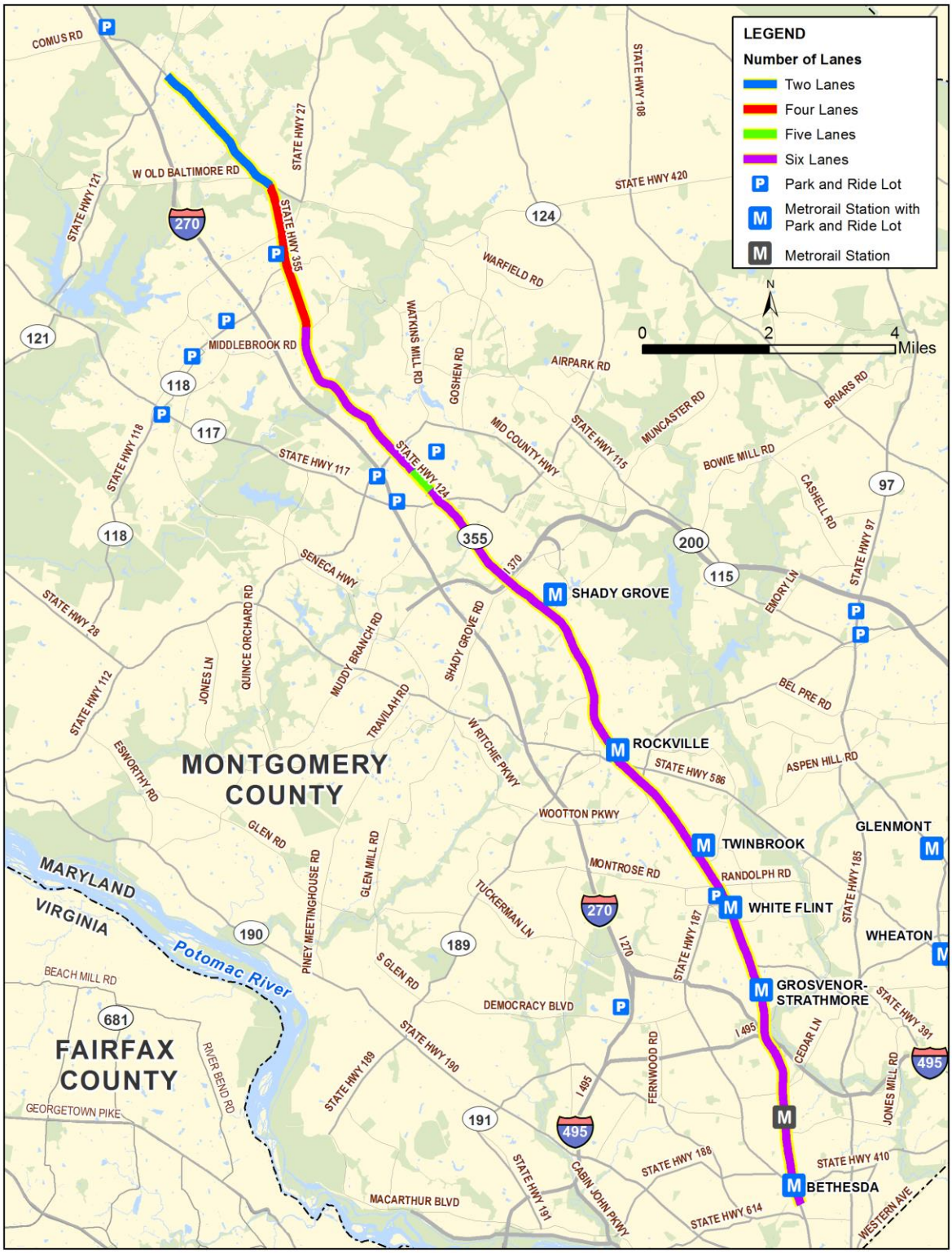
In addition to this overall forecasted growth in transit mode share, it is also important to note that various sector plans guiding the redevelopment of key areas along the MD 355 corridor have aggressive goals for increased transit mode share. This increased mode share would support redevelopments focused on greater residential and employment density as well as more walkable communities (as an example, the White Flint Sector Plan identifies a transit mode share goal of 39% for trips destined for and originating in the White Flint area). Significant transit improvements such as a corridor BRT service will be required to support these aggressive transit mode share goals.

3. Corridor Context

This focus of this study is a potential BRT service along 21 miles of the MD 355 corridor between Clarksburg in northern Montgomery County and Bethesda in the southern portion of the County. MD 355 is a major north-south multilane highway that runs parallel to I-270 and connects several localities including Clarksburg, Germantown, the City of Gaithersburg, the City of Rockville, and Bethesda. As shown in Figure 2, MD 355 transitions from a two-lane road in Clarksburg to a four-lane facility just north of Ridge Road and then to a six-lane facility near Middlebrook Road in Germantown. From Rockville to Bethesda, MD 355 is generally a six-lane roadway, with wider cross sections incorporating multiple turning lanes at many signalized intersections, though there is a short five-lane section through the heart of Gaithersburg.

Metrorail's Red Line operates in this corridor, providing a major north-south connection between Montgomery County and DC. As shown in Figure 2 there are seven Metrorail Red Line stations in the corridor, all of which are served by bus transit services and five of which include park-and-ride facilities. Multiple additional park-and-ride facilities are also located in and near the corridor, as illustrated in Figure 2.

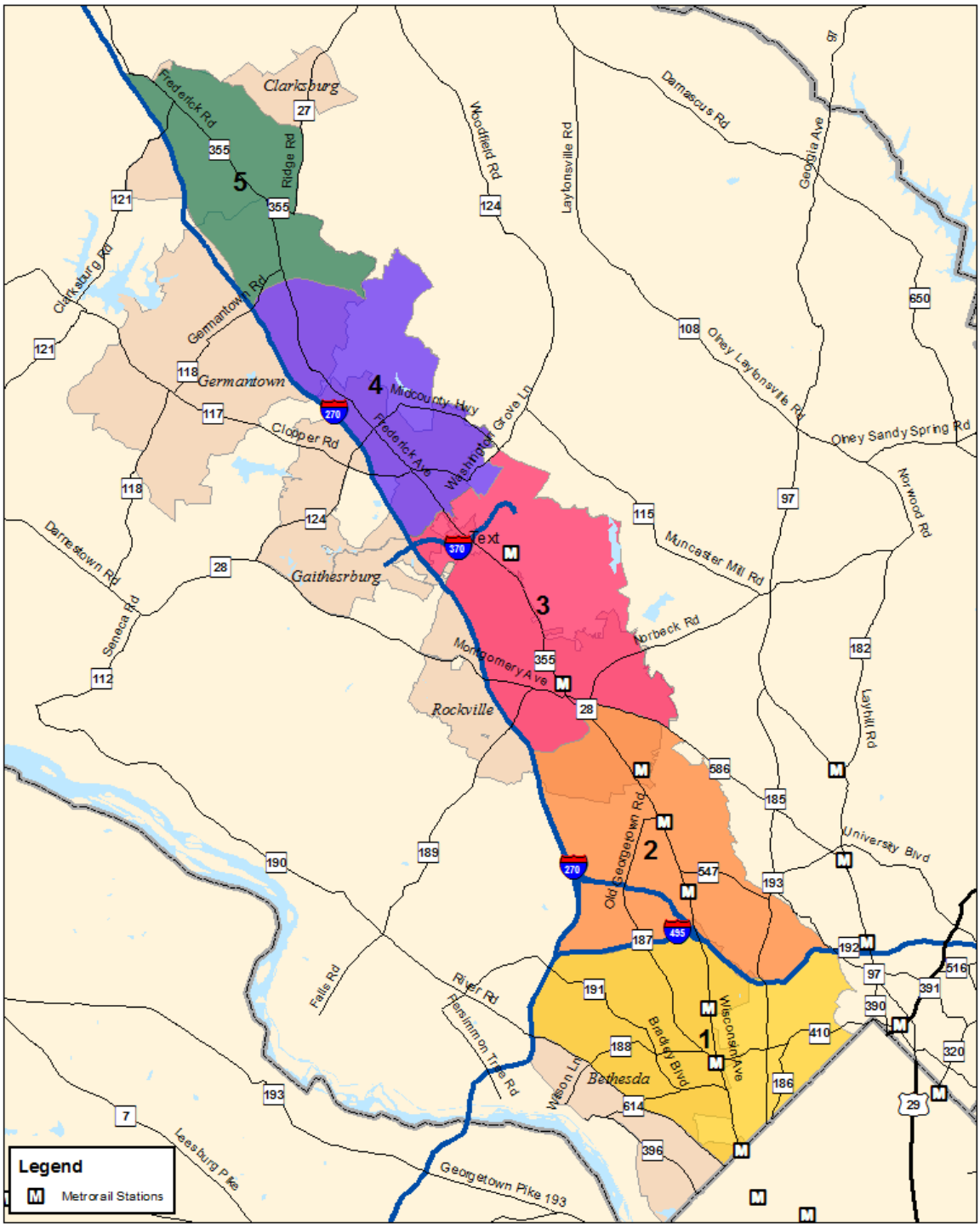
Figure 2: Transportation Assets in MD 355 Study Corridor



While MD 355 does serve as a proxy "Main Street" providing a centralized location for commercial activity for many of the communities along the corridor, the urban form and context of the land uses abutting MD 355 does change significantly along its length. Commercial development of various scales lines most of the length of the corridor, with a more urban feel in the denser activity centers further south (i.e. Bethesda). Dense retail development occurs through the cities of Rockville and Gaithersburg, with commercial densities decreasing farther north toward Germantown and Clarksburg. In addition to the commercial development along much of the corridor, the corridor is also host to major employers including the National Institutes of Health (NIH) and the Walter Reed National Military Medical Center campuses near the Medical Center Metrorail station. Two additional major activity centers are the two Montgomery College campuses in Rockville and Germantown. In the southern portion of the corridor, the eight Red Line Metrorail stations that run underneath/alongside MD 355 are currently the center of dense development, or are the foundation for proposed increased development in areas such as White Flint, Twinbrook, and Shady Grove.

For purposes of this analysis, a Study Area for the corridor was developed that covers the areas that are the most likely to be impacted by the implementation of BRT along the corridor. As shown in Figure 3, the Study Area was subdivided into five districts to help better define existing and future travel patterns and potential ridership markets. Each district is comprised of multiple transportation analysis zones (TAZs).

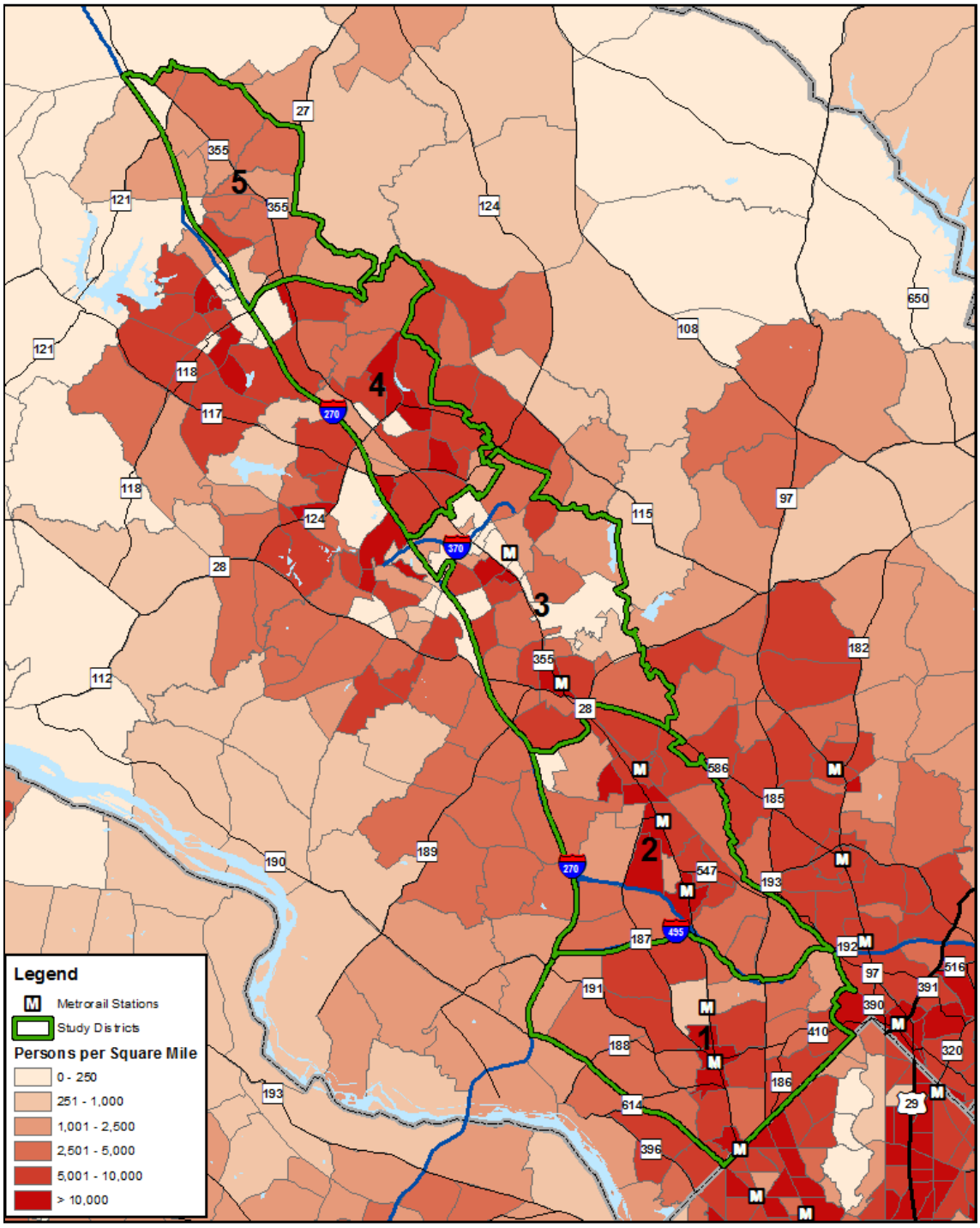
Figure 3: MD 355 Study Corridor and Districts



3.1. Land Use and Demographics

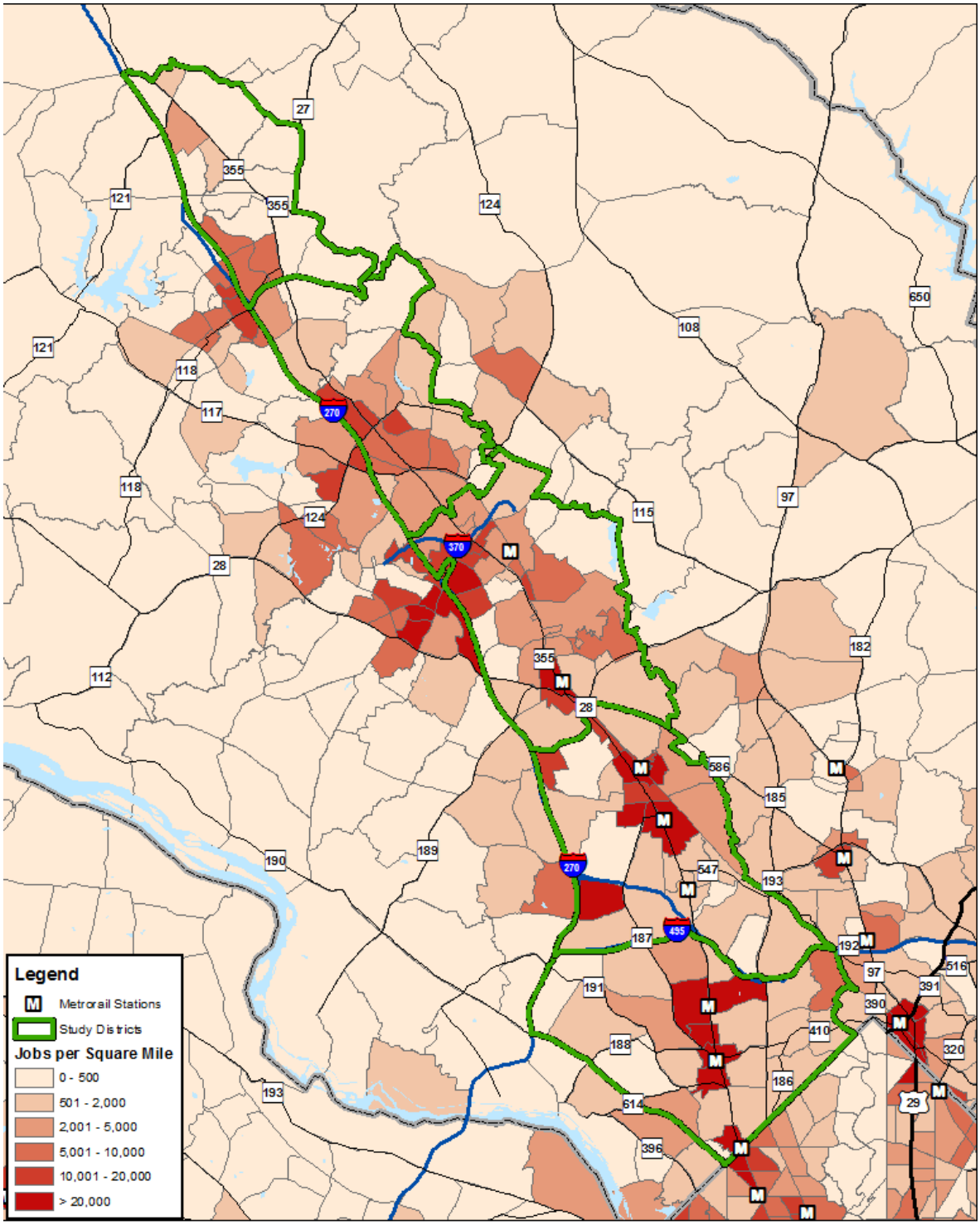
As of 2014, the Study Area is home to over 300,000 residents and over 282,000 jobs (source: MWCOG Population and Employment forecast). Population and employment density in the corridor is shown in Figures 4 and 5, respectively. Population is spread across all five districts, while employment is more heavily concentrated near Metrorail stations (particularly Bethesda, Medical Center, White Flint, Rockville and Twinbrook) and in Gaithersburg west of I-270.

Figure 4: 2014 Population Density



Source: MWCOG Round 8.3 Cooperative Land Use Forecasts

Figure 5: 2014 Employment Density



Source: MWCOG Round 8.3 Cooperative Land Use Forecasts

A substantial amount of growth is forecast for the Study Area between 2014 and 2040, based on the MWCOG Round 8.3 Cooperative Land Use Forecasts. As shown in Table 7, population in the corridor is expected to increase by 33 percent by 2040 – an increase of more than 100,000 residents - with the largest percent increases in District 2 (associated with the White Flint redevelopment) and District 5 in Clarksburg. Household growth follows the same patterns as population. Figure 6 highlights the exact areas of population growth in the corridor. The detailed TAZ-based land use forecasts used for this analysis can be found in Appendix B.

Table 7: Forecasted Population and Household Growth in the MD 355 Corridor – 2014 - 2040

District	2014 Population	2040 Population	Population Growth	Percent Population Growth	2014 Households	2040 Households	Household Growth	Household percent Growth
1	87,900	101,800	13,900	15.9%	34,300	40,000	5,700	16.6%
2	80,200	122,700	42,500	53.0%	31,700	50,300	18,600	58.7%
3	48,000	68,000	20,000	41.5%	19,000	28,000	9,000	47.4%
4	66,000	76,200	10,200	15.5%	25,000	29,300	4,300	17.2%
5	26,000	40,600	14,600	56.2%	8,200	14,700	6,500	79.3%
Study Area Total	308,100	409,300	101,200	32.8%	118,200	162,300	44,100	37.3%
Mont. County	1,010,600	1,212,800	202,200	20.0%	374,200	463,800	89,600	23.9%
TPB Region	6,973,900	8,804,600	1,830,700	26.3%	2,606,700	3,376,300	769,600	29.5%

Source: MWCOG Round 8.3 Cooperative Land Use Forecasts

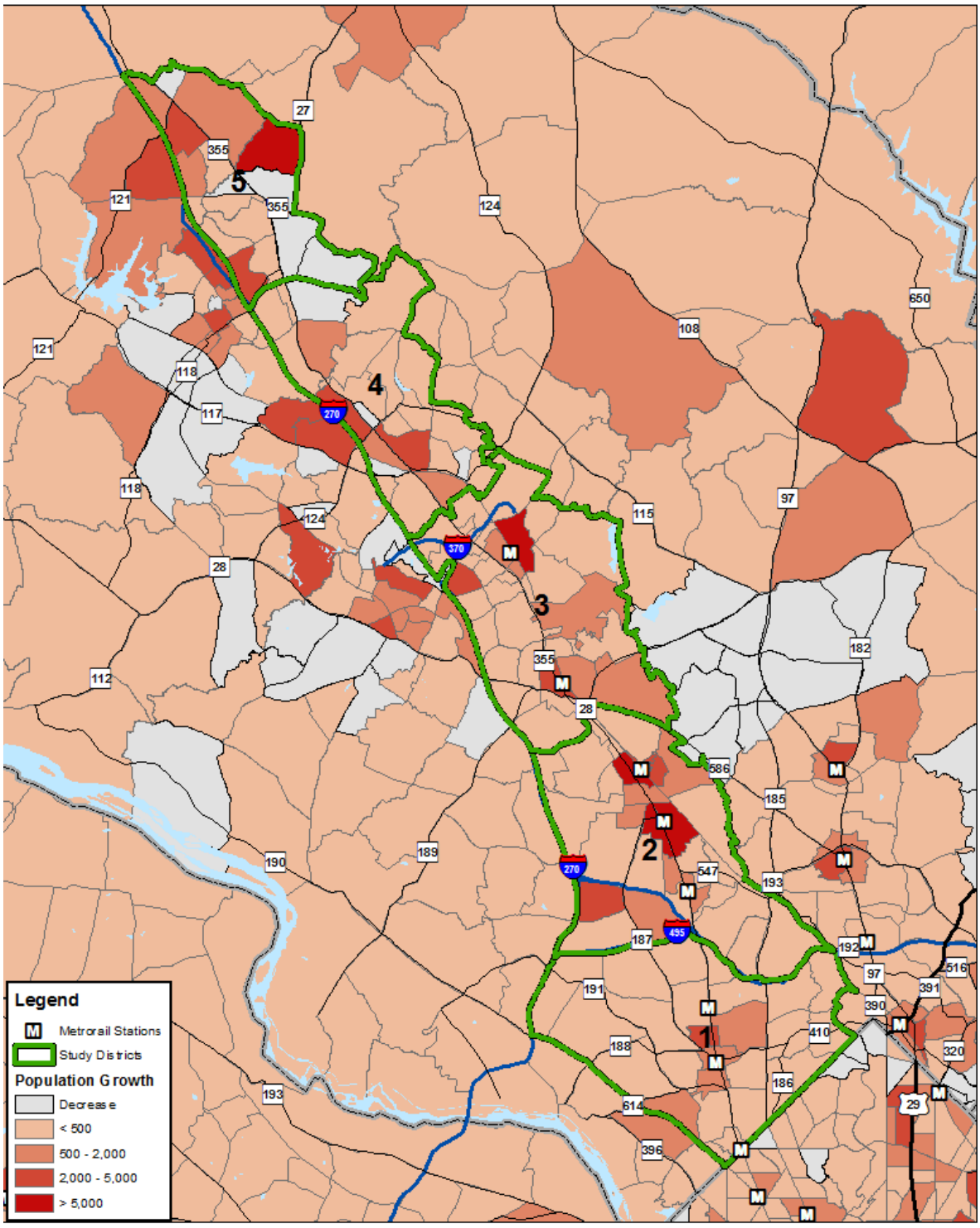
Table 8 highlights the forecasted employment growth of 28 percent in the Study Area, for an additional 86,000 jobs in the corridor. The most growth in employment is forecast for District 2 as an element of the White Flint area redevelopment. As shown in Figure 7, by 2040 District 2 and the White Flint area are forecast to have more jobs and population than the Bethesda area in District 1, with particularly high density development around the Metrorail station. Additional employment growth is expected near the Bethesda and Rockville Metrorail stations, in addition to the Great Seneca Science Corridor development expected in association with the completion of the CCT in Gaithersburg and Germantown. The detailed TAZ-based land use forecasts used for this analysis can be found in Appendix B.

Table 8: Forecasted Employment Growth in the MD 355 Corridor – 2014 - 2040

District	2014	2040	Growth	Percent Growth
1	94,500	114,100	17,600	20.1%
2	84,600	122,100	37,500	46.7%
3	61,300	78,700	17,400	36.3%
4	30,600	39,500	8,900	13.4%
5	9,800	14,800	5,000	19.4%
Study Area Total	282,800	369,200	86,300	30.6%
Montgomery County	527,700	738,000	210,300	39.9%
TPB Region	4,077,500	5,543,000	1,465,500	35.9%

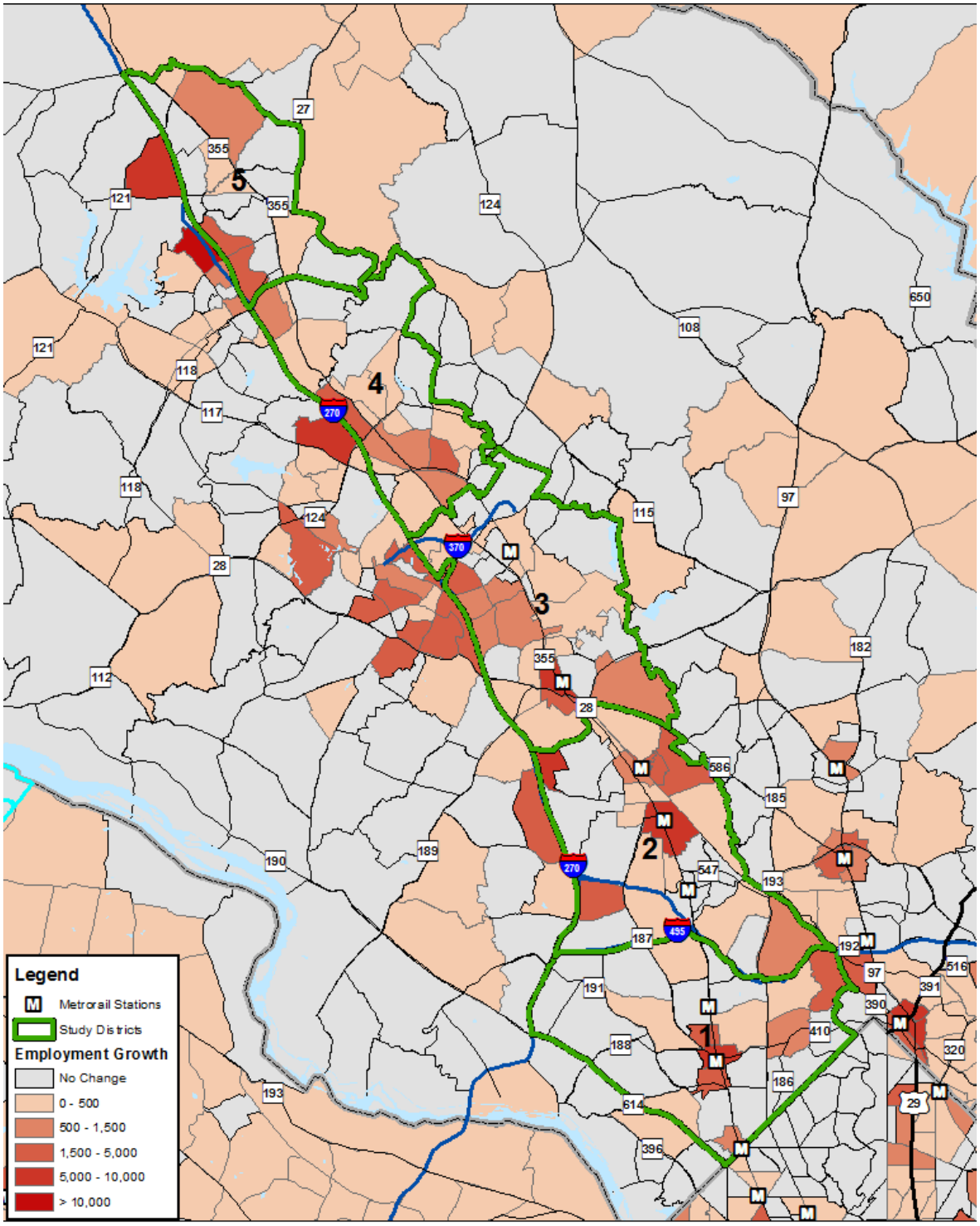
Source: MWCOG Round 8.3 Cooperative Land Use Forecasts

Figure 6: Population Growth – 2014 to 2040



Source: MWCOG Round 8.3 Cooperative Land Use Forecasts

Figure 7: Employment Growth – 2014 to 2040



Source: MWCOG Round 8.3 Cooperative Land Use Forecasts

3.2. Indicators of Transit Need

This section contains an additional demographic analysis focused on study area demographic characteristics that point to potential transit need.

The first characteristic evaluated is areas within the study area that have a high percentage of households with zero cars to support household mobility. Households with no automobile available are more likely to rely on transit for their mobility needs. As the data in Figure 8 show, there are a number of areas within the study area where there is a fairly heavy concentration of households without access to an automobile. These include, from north to south:

- Portions of Gaithersburg/Germantown between the Lake Forest Mall and Germantown Road
- Rockville Town Center
- The southern part of Rockville near the Twinbrook Metrorail Station and north of Montrose Road
- In Bethesda

The second study area demographic characteristic evaluated is low income households (see Figure 9). Low income households are identified as potential transit need communities given that the expense of owning an automobile may be beyond the means of these households. The greatest concentration of low income households in the study area are in Gaithersburg in the general vicinity of the Lake Forest Mall. This area is also one of low auto ownership, though of note is the fact that areas of low auto ownership also occur in areas with minimal low income households.

The final study area demographic characteristic evaluated is areas of the study area with concentrations of people over 65 (see Figure 10). This demographic characteristic is considered an indicator of potential transit need based on the inability of some elderly residents to drive as they become more physically frail as they age. The most significant concentration of residents over 65 is in Gaithersburg in the general vicinity of the Lake Forest Mall.

Overall, the greatest indicator of transit need is zero car households, which to some degree reflect low income households not being able to afford a car, but to a greater degree seem to reflect access to transit, especially Metrorail, and relatively dense walkable land uses.

Figure 8 - Study Area Zero Car Households

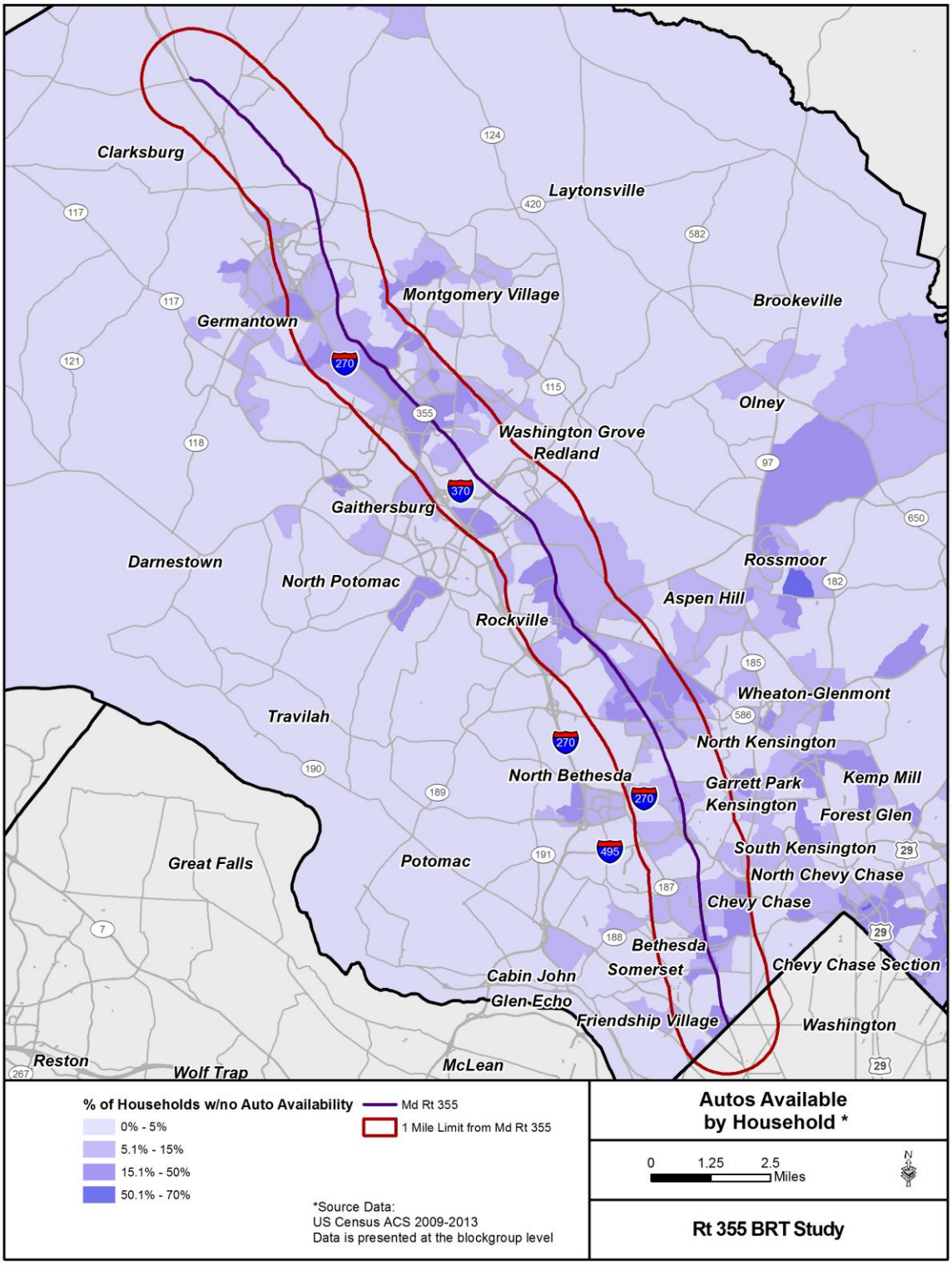


Figure 9 - Study Area Low Income Households

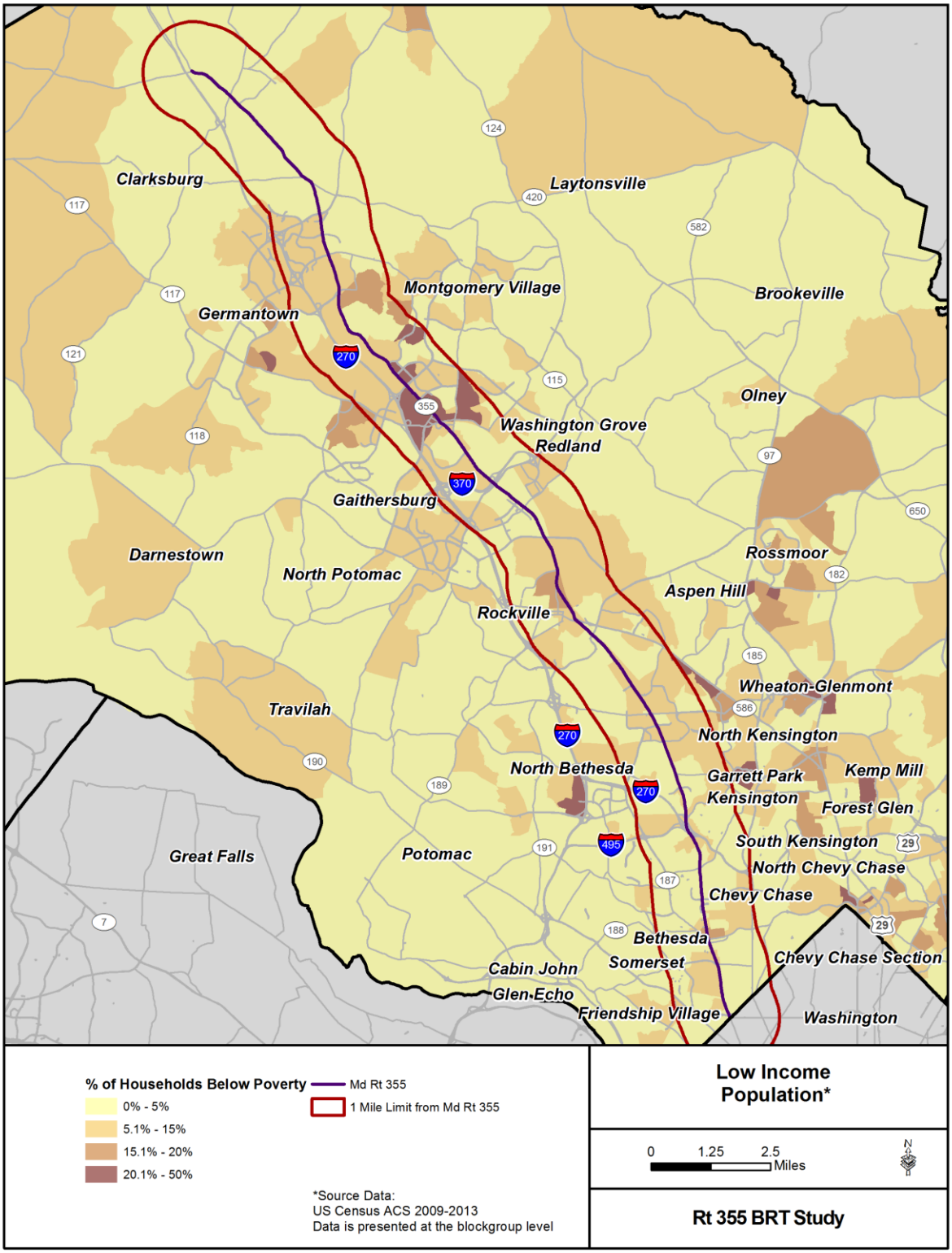
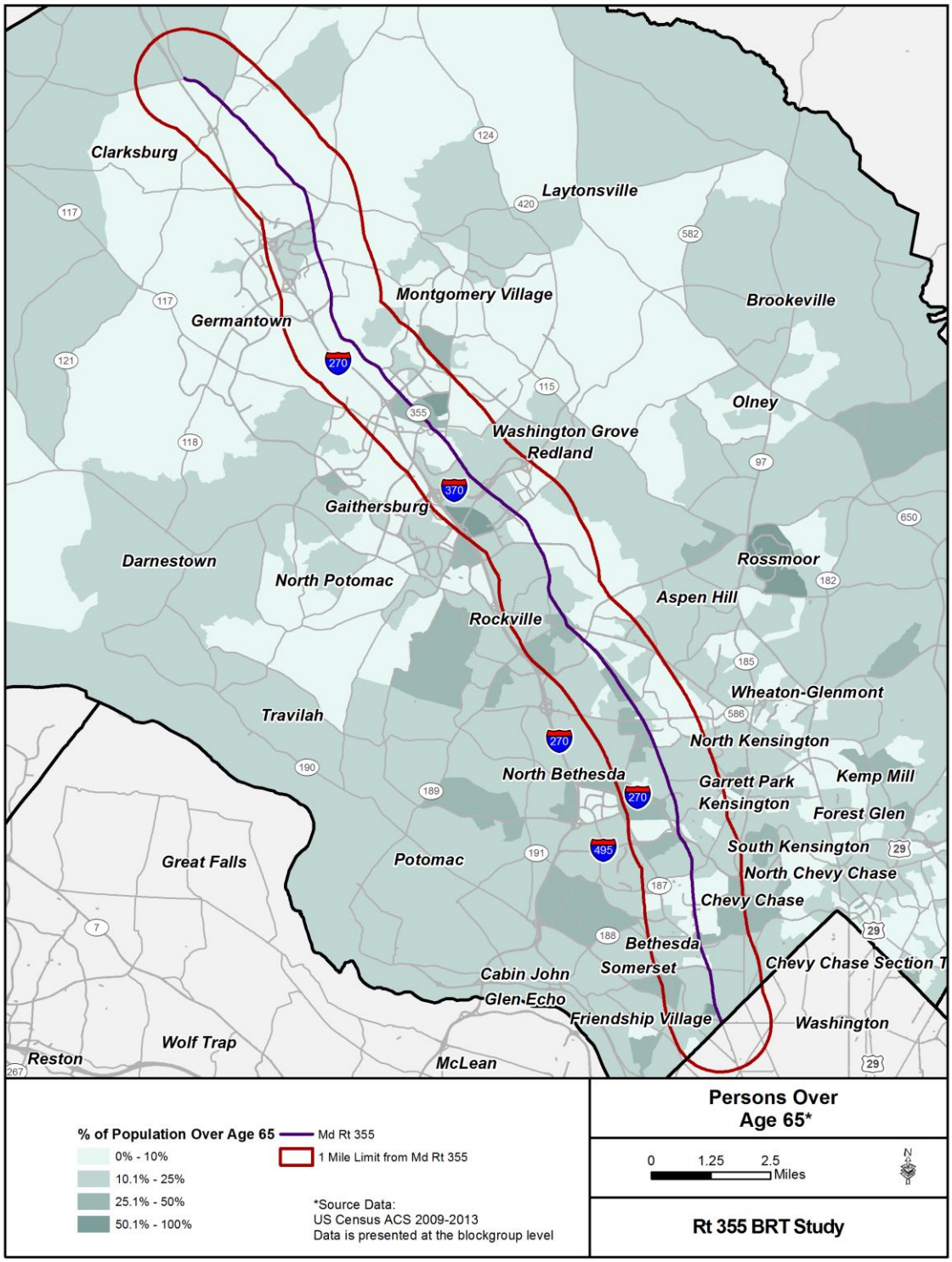


Figure 10: Study Area – Persons Over 65



3.3. Multimodal Accessibility

This section evaluates accessibility to jobs via transit, as measured by the Multimodal Accessibility measure that was implemented in the MD 355 corridor as a pilot project for the Maryland Department of Transportation. This analysis methodology looks at the number of jobs accessible via transit from a given location within the study area in a certain amount of time, giving more credit to jobs that can be reached quickly via transit. Therefore, the higher the accessibility value for a given location within the study area, the higher the number of jobs and associated economic opportunities that can be quickly and efficiently accessed via transit. Figure 11 highlights the existing accessibility to jobs via transit in the study area (this analysis does not include BRT service in the corridor); as shown, areas of current high transit accessibility (shown in yellow and orange) are clustered around the Metrorail stations in the southern half of the corridor, as these stations provide access to a large number of jobs both along the corridor and in DC.

Figure 12 highlights transit accessibility in 2040, incorporating the planned changes in land use and improvements to the transportation network included in the CLRP (this does not include the proposed BRT, since it is not yet in the CLRP). These transit accessibility calculations highlight key areas where transit accessibility remains relatively low in the future (low accessibility shown in blue), and where a proposed BRT service could have a major impact in improving transit accessibility. In the southern portion of the corridor, these opportunities primarily exist in the areas between the Metrorail stations, which are spaced far enough apart to make walking between the stations impractical. In the northern portion of the corridor, transit accessibility remains relatively low, and providing a high quality transit service with direct connections to employment centers and the Metrorail system could be part of a mobility solution for this area. BRT service along MD 355 would provide faster and more direct service to Metrorail stations than alternative local bus routes and thereby has potential to attract Metrorail customers commuting to or from Metrorail.

Figure 11: Multi Modal Accessibility – Existing Transit Access to Employment

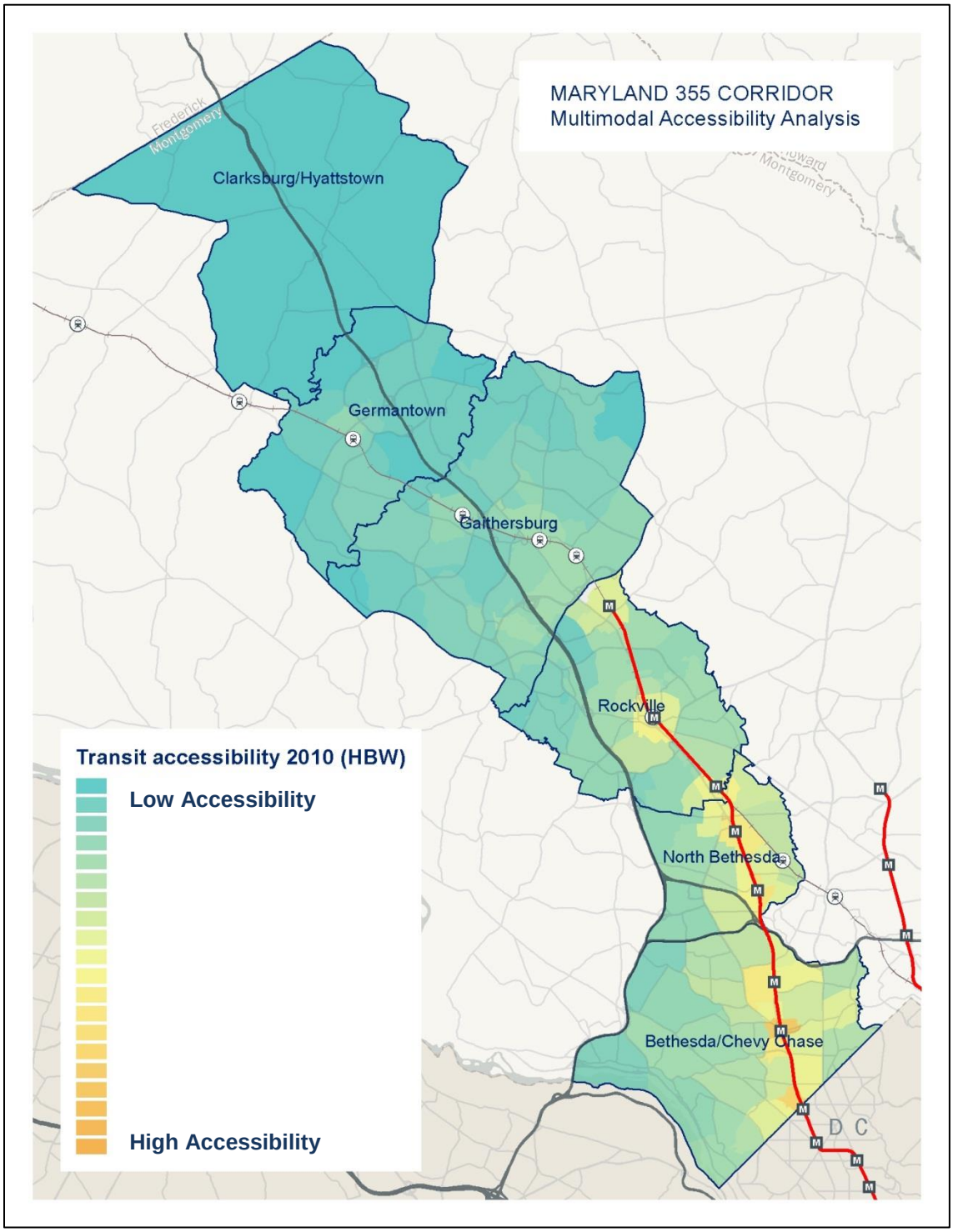
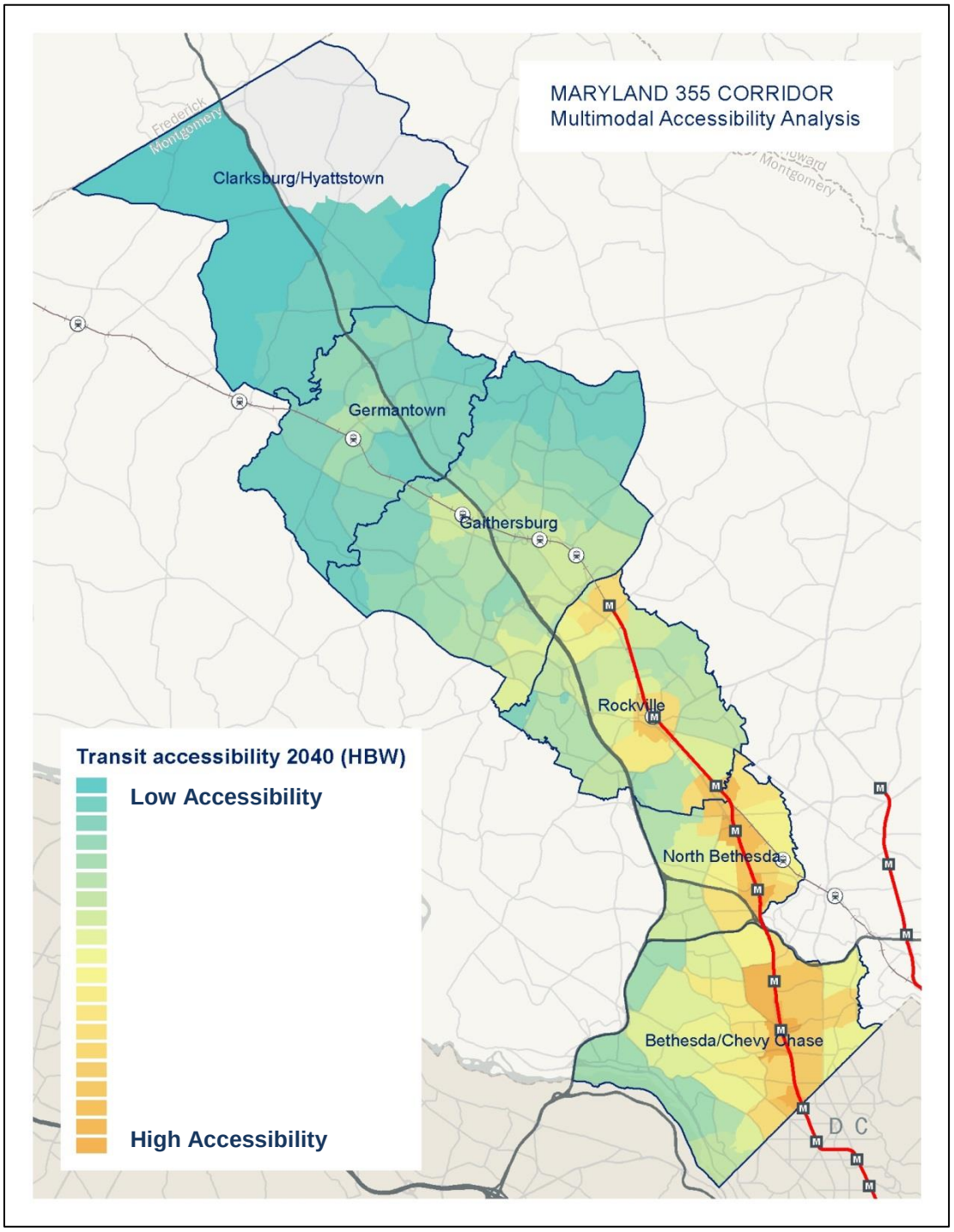


Figure 12: Multi Modal Accessibility – 2040 Transit Access to Employment



3.4.Sector Plans Governing Development/Redevelopment in the Study Area

The framework for much of the growth, development, and redevelopment within the MD 355 corridor that is described in the previous sections is a series of sector plans covering a substantial part of the corridor. These plans are developed and adopted for the purpose of guiding the amount of growth, the type of growth, and the distribution of growth within the areas covered by the plans. A summary of each plan within the MD 355 corridor is provided below.

1. Bethesda Downtown Plan – This plan, which is currently underway, is being undertaken to identify methods for accommodating projected growth in downtown Bethesda. Methods include increased density and incentivizing redevelopment. The transportation element of the plan is multi-modal in nature and is focused on maximizing the productivity of existing right-of-way and transportation infrastructure in order to enhance mobility for all modes.

2. White Flint Sector Plan (2010) – The goal of the White Flint Sector Plan is to support the transformation of the White Flint area from a suburban development pattern into an urban center of residences where people walk to work, shops, and transit. The end result of the development/redevelopment of the White Flint area will be dense urban area with an identifiable urban center containing the tallest buildings. A key foundation for this transformation is transit, with a transit mode share target of 39%. This White Flint redevelopment represents the most aggressive development/redevelopment within the MD 355 corridor.

3. White Flint Sector Plan 2 (2016)– This plan is focused on guiding growth and redevelopment in the portions of the corridor located between the White Flint planning area and the Twinbrook planning area. The plan is currently underway with an anticipated submittal to the County Council in the fall of 2016.

4. Twinbrook Sector Plan (2009) – This plan is focused on using the Twinbrook Metrorail station as the foundation for redevelopment of the area. The plan would guide redevelopment in a way that results in a mix of jobs, homes, and retail at greater densities that currently exist in the planning area, with a specific focus on developing an inviting environment for technology jobs and taking advantage of existing government agencies in the area. There are no specific transit mode share targets identified in the plan.

5. Shady Grove Sector Plan (2006) – This plan is focused on developing higher density mixed uses centered on the Shady Grove Metrorail station. The plan would guide greater support for additional employment, including technology related employment. The plan would also guide new, denser residential areas within the planning area. The plan emphasizes the need for transit to mitigate auto trips, though a specific transit mode share target is not identified in the plan.

6. Great Seneca Science Corridor Master Plan (2010) – The Great Seneca Science Corridor Master Plan is centered on an area adjacent to the MD 355 corridor. The foundation of the recommendations in the plan is the Corridor Cities Transitway (CCT), which would entail a BRT service ultimately running in exclusive guideway between Clarksburg and the Shady Grove Metrorail station. The focus of the Corridor plan is increased density focused on CCT stations. Development, redevelopment, and increased densities are tied to CCT implementation.

7. Germantown Employment Area Sector Plan (2009) – This master plan is focused on creating a more urban, walkable environment within the planning area. The foundation for this increased urbanization is a greater focus on the Germantown town center, higher density in strategic locations, compact walkable communities, increased employment, and the organization of mixed use communities around transit. While no specific transit mode share target is identified in the plan, it is specifically stated that transit would be a key foundation in the redevelopment of the area.

3.5.Roadway Characteristics

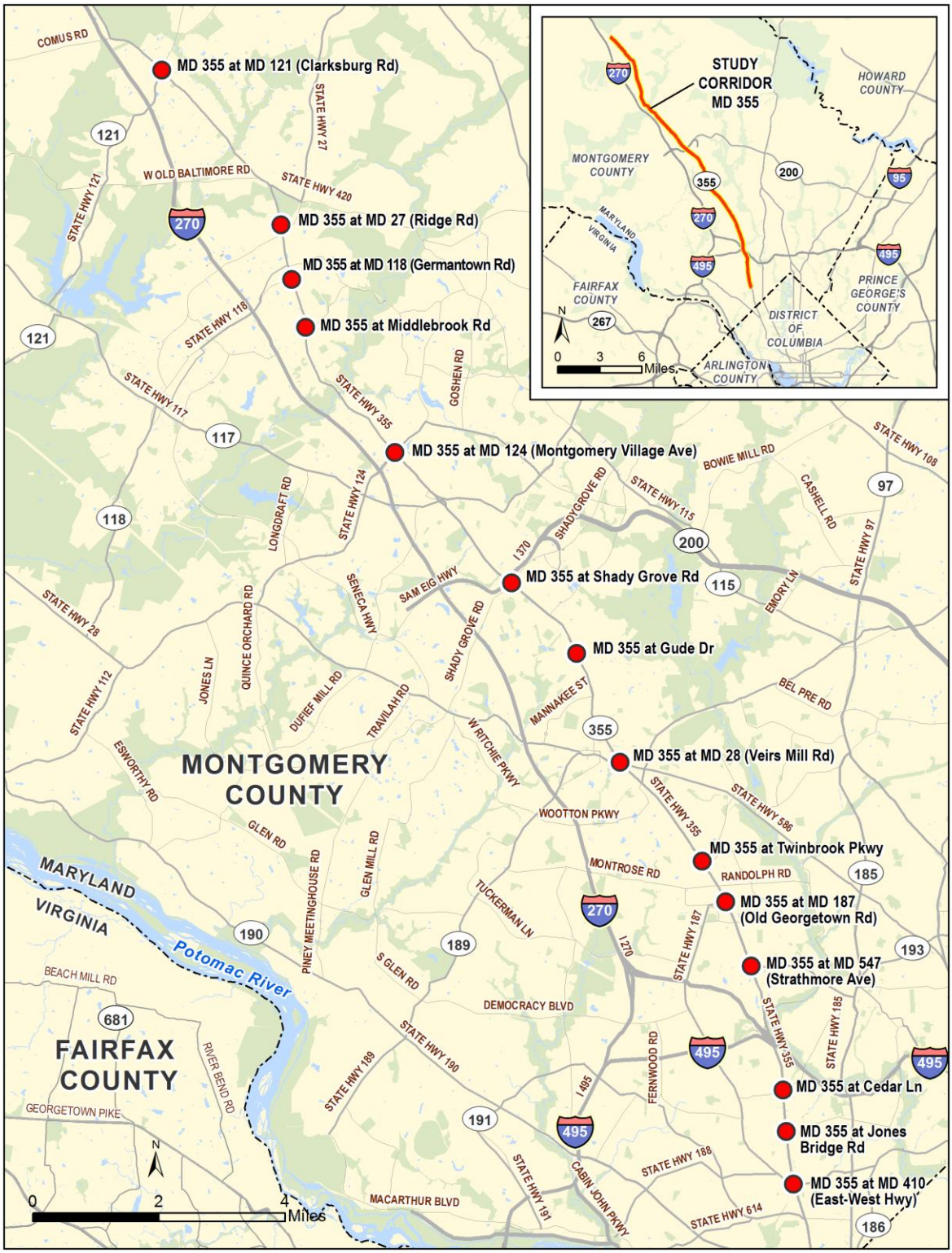
The study area for the MD 355 BRT project extends from the MD 121 (Clarksburg Road) intersection in Clarksburg to the MD 410 (East-West Highway) intersection in Bethesda (See Figure 13 – also shown in Figure 13 are key intersections that were analyzed as part of this study). Within those limits, MD 355's physical characteristics change along with changes in adjacent land use and traffic volumes. In the Clarksburg area at the north end of the project area, the roadway is primarily a two lane roadway that provides access to adjacent homes and residential neighborhoods as well as the rural areas north of the project area. In the vicinity of the MD 27 (Ridge Road) intersection and south through the Germantown area, the roadway becomes divided with a median, and is comprised of two to three through lanes in each direction. In addition to providing access to residential subdivisions, in the Germantown area there are also entrances from MD 355 to retail centers and other commercial properties. Clarksburg Elementary School, Clarksburg Area High School, Rocky Hill Middle School, Ridge Road Recreational Park, Neelsville Middle School and Montgomery County Fire and Rescue Station #34 access MD 355 in this area, with the Montgomery College Germantown campus located just west of the corridor between MD 118 (Germantown Road) and Middlebrook Road.

Within the Gaithersburg area from the Watkins Mill Road intersection vicinity to the MD 124 (Montgomery Village Avenue) intersection to the south, the roadway continues to be divided with a median and has 2 to 3 through lanes in each direction. Several blocks south of MD 124, the roadway becomes an undivided section with a center two-way left-turn lane down to the proximity of the MD 117 (W. Diamond Avenue) bridge crossing. South of MD 117 to the I-370 interchange, the roadway again is divided and is largely three lanes in each direction. Throughout the Gaithersburg area, the roadway provides access to large commercial and employment centers, as well as side streets that access the residential neighborhoods that are located behind the commercial and employment enterprises. Lakeforest Mall, the Montgomery County Fairgrounds, Gaithersburg High School, and Bohrer Park are located near MD 355 in this area.

South of I-370 in the Rockville area, MD 355 parallels the Metrorail Red Line alignment to the west. From I-370 south through the Twinbrook Parkway intersection, MD 355 is comprised of a six lane divided roadway which, similar to the Gaithersburg area, provides access to the adjacent commercial and employment properties, as well as the residential neighborhoods located behind them. The Twinbrook, Rockville, and Shady Grove Metrorail stations are located in this section, with access provided from Chapman Avenue, Park Road, and Redland Road, respectively. The Montgomery College Rockville campus, Richard Montgomery High School, and Woodmont Country Club are located in this section along the west side of MD 355. Development east of MD 355 with access to this road is limited due to the presence of the existing rail lines.

As MD 355 traverses the North Bethesda/White Flint area, the roadway continues to be a predominantly six lane divided section which provides access to the commercial and employment properties located primarily north of the MD 547 (Strathmore Avenue) intersection, as well as the residential neighborhood between this area and the Capital Beltway. The Grosvenor and White Flint Red Line Metrorail stations are located in this section, with access from Tuckerman Lane and Marinelli Road, respectively. The White Flint Mall, Georgetown Prep School and the Strathmore performing arts complex access MD 355 in this section.

Figure 13: MD 355 Roadway Study Corridor and Key Intersections



Where MD 355 crosses the Capital Beltway/I-495, there are ramps to and from the Beltway (except from MD 355 to westbound I-495) as well as ramps to and from I-270. The MD 355 mainline roadway is generally comprised of three lanes in each direction through the interchange area. South of the interchange the roadway is again a divided six lane section providing access to the adjacent neighborhoods. South of Cedar Lane, the National Institute of Health and the Walter Reed National Military Medical Center abut MD 355 down to Jones Bridge Drive, with the roadway continuing as a six lane divided roadway. This area is also the location of the Medical Center Metrorail Crossing project, which is associated with the Base Realignment and Closure (BRAC) initiative. This project includes an underpass between the Medical Center Metrorail Station and the Naval Support Activity Bethesda complex (which includes the Walter Reed National Military Medical Center), deep elevators to the Medical Center Metrorail Station platforms, and at-grade TSM and TDM initiatives to improve pedestrian safety and enhance traffic operations.

The roadway continues primarily as six lanes divided south of Jones Bridge Drive into downtown Bethesda, with the adjacent land uses becoming increasingly dense with commercial and employment uses predominating. The Bethesda Redline Metrorail station is accessed in the southwest corner of the MD 355/MD 410/MD 187 intersection. Bethesda/Chevy Chase High School is located just east of MD 355 along MD 410 (East-West Highway).

3.5.1. Existing Conditions

3.5.1.1 Existing 2015 Traffic Volumes

Existing 2015 traffic volumes were based on recent non-holiday mid-weekday 2011 to 2014 traffic counts available on the State Highway Administration's (SHA) Traffic Monitoring System (TMS) count database. These counts included approximately 70 intersection turning movement and class counts conducted in the fall of 2014 specifically for this project to complement other recent counts already in the SHA count database. The turning movement counts (13 hours each from 6 AM to 7 PM) and 48 hour class counts were converted to Average Daily Traffic Volumes (ADT) using conversion factors found in SHA's Traffic Trends publication.

Average Daily Traffic (ADT) volumes range from a low of approximately 7,700 vehicles south of MD 121 (Clarksburg Road) to a high of 67,700 vehicles just south of I-495 (Capital Beltway). Table 9 shows the range of average daily volumes found between major intersections in the corridor based on the counts taken. For example, for the section between MD 121 (Clarksburg Road) and MD 27 (Ridge Road), the ADTs ranged from 7,700 vehicles between MD 121 and Spire Street to 22,200 vehicles between West Old Baltimore Road to Brink Road. Generally, volumes increase with proximity to the Capital Beltway.

Table 9: Existing ADT Volumes Between Major Intersections

Roadway Sections (North to South)	Range of 2015 Average Daily Volumes (counted)
MD 121 (Clarksburg Road) to MD 27 (Ridge Road)	7,700 – 22,200
MD 27 (Ridge Road) to MD 124 (Montgomery Village Ave.)	21,200 – 39,800
MD 124 (Montgomery Village Ave.) o I-370	26,500 - 43,900
I-370 to MD 28 (Veirs Mill Road)	41,400 - 50,600
MD 28 (Veirs Mill Road) to I-495	40,800 – 60,800
I-495 to MD 410 (East-West Highway)	28,800 – 67,800

Source: SHA Data Services Engineering Division

The morning peak hour for the MD 355 AM commuting period varies between 7:00-8:00 a.m. at the north end in Clarksburg to 8:00-9:00 a.m. at the south end in Bethesda. The peak hour for the PM commuting period is generally between 5:00 and 6:00 p.m. for the entire corridor. The morning and evening peak hour during the typical commute periods were used to develop traffic analysis as these volumes generally represent the highest volumes by direction over the course of the day and are likely to be among the most impacted by changes to the transportation network. However, it should be noted that other hours of the day also have traffic volumes in some locations that may match or exceed the commute peak hours volume (such as late morning during weekdays and mid-day on Saturdays). This will need to be considered in the development and analysis of any Build alternatives, as will other factors in potential time of day volumes, such as the spreading of the peak periods as the corridor becomes more congested.

Intersection volumes from the counts were balanced throughout the entire network to make sure that volumes entering one intersection are the same as those leaving the adjacent intersection per SHA standard practice for both morning and evening peaks, as well as for the ADT volumes. This was done to eliminate the impact of daily fluctuations in counts and to facilitate operational modeling.

In the AM peak hour, the directional distribution of traffic showed a strong southbound trend with 70% to 80% of traffic traveling in the southbound direction between Clarksburg and Rockville, and 60% to 70% traveling southbound south of Rockville down through Bethesda. In the PM peak hour, the opposite is generally true with more traffic heading northbound, though at closer to a 50/50 split. 50% to 60% of traffic travels northbound between Bethesda and Rockville, 60% to 70% in Gaithersburg and Germantown, and 70% to 80% northbound around Clarksburg.

3.5.1.2 Existing 2015 Traffic Operations

Traffic analysis was conducted for the existing and future No-Build 2040 conditions. This analysis used traffic volumes developed as described in section 3.3.1.1 from traffic counts for existing conditions, and post-processed volume results from the MWCOG model for analysis of future conditions. Synchro and SimTraffic, a microsimulation modeling software suite, were used to develop the network based roadway operational analysis for the MD 355 corridor. Synchro/SimTraffic's operational analysis capabilities include volume, roadway geometric, and signal timing inputs; intersection vehicular delay outputs; and corridor-wide operational characteristic measures of effectiveness such as travel times and delays for the network. The microsimulation model covered the entire MD 355 study corridor, with additional intersections included off of MD 355 in areas where the Countywide Transit Corridors Functional Master Plan indicated that a MD 355 BRT system may use adjacent roadways. Inputs were based on field data that was then used to calibrate the models. Appendix D shows the ADT and AM and PM peak hour volumes for the existing conditions for specific roadway segments and intersections.

Calibration of the roadway network focused on vehicular travel times. Calibration was completed using speed and travel time information collected along the MD 355 corridor primarily in the Fall of 2014 using probe vehicles running in mid-week traffic. The validation goals for the SimTraffic simulated travel times were to have the simulated times within ±5 percent of measured travel times for major roadway segments, and ±10 percent for smaller segments. Network attributes such as link speeds, allowable saturation flow rates, and network geometry were adjusted as needed to get the travel times within the validation goals to the extent possible.

Outputs from the Synchro and SimTraffic microsimulation software were obtained for use in reporting the following measures of effectiveness (MOEs):

- Intersection delay per vehicle, which was translated to a Level of Service (LOS) grade using the 2000 Highway Capacity Manual (HCM). Intersection delays, approach delays as well as individual movements delays at the study intersections were obtained.
- Vehicle speeds and travel times for prominent segments along the MD 355 corridor by direction for the AM and PM peak periods.

Table 10 displays the intersection LOS for the morning and evening peak hours for 14 of the major intersections in the corridor. For signalized intersections, the overall LOS for the intersection is displayed, while for un-signalized intersections, the LOS for the worst stop approach is shown. Intersections that are performing at or near capacity (LOS E or F) are shown in orange and red, respectively. Of the 85 total intersections along MD 355 that were analyzed as part of this effort, ten showed a LOS E or F in the morning peak hour, with 17 of those at LOS E or F in the evening peak hour. Appendix C shows the LOS and delays for all of the study area intersections.

Table 10: Existing 2015 Intersection Level of Service

MD 355 Intersections	2015 Morning Peak LOS (Delay)	2015 Evening Peak LOS (Delay)
MD 121 (Clarksburg Rd)	D (52.6)	E (56.6)
MD 27 (Ridge Rd)	D (46.6)	E (70.2)
MD 118 (Germantown Rd)	D (46.7)	E (61.0)
Middlebrook Rd	D (44.6)	E (75.8)
MD 124 (Montgomery Village Ave)	E (58.1)	F (96.6)
Shady Grove Road	F (95.6)	E (76.5)
Gude Drive	F (81.0)	D (53.5)
MD 28 (Veirs Mill Rd)	C (34.2)	D (38.5)
Twinbrook Parkway / Rollins Ave	C (21.3)	C (33.6)
MD 187 (Old Georgetown Rd)	D (45.3)	D (46.6)
MD 547 (Strathmore Ave)	C (34.4)	D (49.8)
Cedar Lane	E (61.5)	F (105.1)
Jones Bridge Rd / Center Drive	D (49.0)	D (54.6)
MD 410 WB (East-West Highway / MD 187 WB (Old Georgetown Rd)	D (53.9)	E (56.3)
Legend		
	LOS C	
	LOS D	
	LOS E	
	LOS F	

Other MD 355 intersections which showed a LOS E or F in either of the two peak periods were Shawnee Lane, Foreman Boulevard/Clarksburg High School, West Old Baltimore Road, Brink Road, Cedar Avenue/Fulks Corner Road, King Farm Boulevard, Redland Road, Wootton Parkway, Nicholson Lane, Tuckerman Lane (north intersection), and Woodmont Avenue/Glenbrook Parkway.

Reported average speeds and travel times along the corridor were taken directly from SimTraffic model outputs, which included the dwell times at signalized intersections. Tables 11 and 12 display the 2015 speeds, travel times, and corresponding travel time index (TTI) for southbound and northbound MD 355 in the morning and evening peak hours. TTI is measured as the ratio of the travel time during the peak

hour to the time required to make the same trip under free-flow conditions. For example, a value of 2.0 indicates a 10-minute free-flow trip would require 20 minute during the peak hour.

Table 11: Existing Southbound MD 355 Average Speeds, Travel Times, and Travel Time Index

Roadway Sections (North to South)	2015 Average Speed (mph) (AM/PM)	2015 Average Travel Time (min) (AM/PM)	2015 Travel Time Index, TTI (AM/PM)
MD 121 (Clarksburg Road) to MD 27 (Ridge Road)	16 / 34	12 / 6	1.81/1.59
MD 27 (Ridge Road) to Professional Dr	27 / 28	7 / 7	1.59/1.83
Professional Dr to I-370	19 / 21	12 / 11	1.81/1.82
I-370 to Edmonston Dr	17 / 19	16 / 14	2.88/2.36
Edmonston Dr to Twinbook Pkwy	26 / 21	3 / 4	1.95/2.42
Twinbrook Parkway to MD 547 (Strathmore Ave)	22 / 15	5 / 7	2.05/2.85
MD 547 (Strathmore Ave) to Pooks Hill Rd	21 / 22	4 / 4	2.14/2.19
Pooks Hill Rd to MD 410 (East-West Highway)	14 / 11	9 / 12	2.90/3.12
Total Corridor	**19 / 20**	**68 / 65**	**2.11/2.20**

Table 12: Existing Northbound MD 355 Average Speeds, Travel Times and Travel Time Index

Roadway Sections (South to North)	2015 Average Speed (mph) (AM/PM)	2015 Average Travel Time (min) (AM/PM)	2015 Travel Time Index, TTI (AM/PM)
MD 27 (Ridge Road) to MD 121 (Clarksburg Road)	32 / 30	6 / 6	1.39/1.48
Professional Dr to MD 27 (Ridge Road)	27 / 23	7 / 8	1.48/2.22
I-370 to Professional Drive	27 / 22	8 / 10	1.37/1.86
Edmonston Dr to I-370	23 / 18	11 / 14	2.08/2.39
Twinbook Pkwy to Edmonston Dr	27 / 16	3 / 5	1.77/2.60
MD 547 (Strathmore Ave) to Twinbrook Parkway	20 / 20	6 / 6	2.27/2.40
Pooks Hill Rd to MD 547 (Strathmore Ave)	18 / 16	5 / 5	2.45/2.55
MD 410 (East-West Highway) to Pooks Hill Rd	24 / 6	5 / 21	1.55/5.48
Total Corridor	**25 / 17**	**51 / 75**	**1.70/2.55**

In the morning peak hour, southbound MD 355 speeds are generally slower than northbound, with the southbound travel time to traverse the entire corridor approximately 17 minutes longer than going in the northbound direction (68 minutes vs. 51 minutes). Conversely, in the evening peak hour the northbound MD 355 speeds are generally slower. As a result, the travel time directional difference for the corridor is 10 minutes longer northbound than southbound (75 minutes versus 65 minutes). These patterns for slower southbound traffic in the morning peak and slower northbound traffic in the evening peak are consistent with peak hour traffic volume flow directions. TTI values indicate that the most congestion is observed in the northbound direction during the evening peak hour with a TTI of 2.55.

The 2014 Maryland State Highway Mobility Report provides congestion, reliability and mobility performance measures for significant arterial corridors in the state at a high level with available data bases and provides an additional data point for understanding traffic operations in the corridor. Figure 14 displays the measures that were recorded for the MD 355 corridor between the Washington, DC Line and MD 27 (Ridge Road).

Figure 14: MD 355 Roadway Study Corridor and Key Intersections

MD 355

Limits:	Washington DC Line to MD 27
Corridor Length:	19.7 miles
Speed Limit:	25 - 45 MPH
Travel Lanes:	(2 - 4) Northbound (2 - 4) Southbound
Signal Controlled Intersections:	80
Grade Separated Interchanges:	3
Major Cross Streets:	MD 191, MD 410, MD 547, MD 187, Montrose Pkwy, MD 28, Shady Grove Rd, I-370, MD 117, MD 124, Middlebrook Rd, MD 118, MD 27

Routes and Ridership

Ride On Routes	Avg. Daily Ridership
Ride On 5	1,918
Ride On 30	710
Ride On 46	3,719
Ride On 55	8,083
Ride On 59	3,924
Ride On 67	147
Ride On 75	444
Ride On 81	181
Ride On 83	491

Red Line Routes	Avg. Daily Ridership
Bethesda	10,808
Grosvenor	5,857
Medical Center	6,221
Rockville	4,900
Shady Grove	13,444
Twinbrook	4,569
White Flint	3,951

2013 AADT	Trucks	Peak Hour Traffic
33,000 - 67,000 vpd	2% - 6%	7.5% - 8.5%

Intersection Operations

Signalized Intersections*:	AM Peak Hour	PM Peak Hour
LOS D or Better	29	27
LOS E	4	4
LOS F	4	6

Segment Operations

Level of Service	Northbound AM / PM (Miles of Roadway)	Southbound AM / PM (Miles of Roadway)
LOS D or Better	9.0 / 5.4	4.5 / 5.1
LOS E	7.4 / 6.3	8.1 / 4.4
LOS F	3.3 / 8.0	7.1 / 10.2

LOS 'E' Intersections
MD 355 at E&W Gude Dr (AM,PM)
MD 355 at MD 124 (AM,PM)
MD 355 at Edmondson Dr (AM)
MD 355 at Tuckerman Ln (North) (AM)
MD 355 at Grosvenor Ln (PM)
MD 355 at MD 191 (PM)

LOS 'F' Intersections
MD 355 at Cedar Ln (AM,PM)
MD 355 at MD 911 (AM,PM)
MD 355 at Shady Grove Rd (AM,PM)
MD 255 at Grosvenor Ln (AM)
MD 355 at Rollins Ave / Twinbrook Pkwy (PM)
MD 355 at North Wood Rd (PM)
MD 355 at Tuckerman Ln (PM)

Color Key

PTI	TTI
1.0-1.5	1.0 - 1.15
1.5-2.5	1.15 - 1.3
>2.5	1.3 - 2.0
	> 2.0
No data	

Functional Class	Roadway Segment North to South	Length (miles)	TTI AM NB	TTI AM SB	TTI PM NB	TTI PM SB	PTI AM NB	PTI AM SB	PTI PM NB	PTI PM SB
Urban Other Principal Arterial	Ridge Rd. (MD-27) -Germantown Rd. (MD-188)	0.9								
	Germantown Rd. (MD-188) - Middlebrook Road	0.8								
	Middlebrook Road - Christopher Ave.	2.3								
	Christopher Ave. - Montgomery Village Ave (MD-124)	0.3						I		
	Montgomery Village Ave. (MD-124) - Odendhal Ave.	0.4			W					
	Odendhal Ave - Summit Ave.	1.0							W	
	Summit Ave. - Shady Grove Rd./ I-370	1.2								
	Shady Grove Rd./ I-370 - Redland Blvd.	1.0								
	Redland Blvd. - Gude Dr.	0.8								
	Gude Dr. - Washington St.	1.0							W	
	Washington St. - Veirs Mill Rd/ Jefferson St (MD-28)	0.9		W		W		W	W	W
	Veirs Mill Rd/ Jefferson St (MD-28) - Wootton Pkwy (MD-911)	0.4				W			W	
	Wootton Pkwy (MD-911) - Montrose Pkwy	2.1				W			W	W
	Montrose Pkwy - Strathmore Ave (MD-547)	1.3								
	Strathmore Ave (MD-547) -Grosvenor Lane	0.9								
	Grosvenor Lane - I-495	0.3								
	I-495 - Cedar Lane	0.9		I				I		
	Cedar Lane - Jones Bridge Rd.	0.6			I					
	Jones Bridge Rd - Montgomery Lane(MD-410)	0.9								
	Montgomery Lane(MD-410) - Bradley Blvd./ Lane (MD 191)	0.5	I	I	I		I	I		
	Bradley Blvd./ Lane (MD 191) - Dorset Ave	0.7								
	Dorset Ave. - DC Line	0.5		I		W		I		

I = Improvement from 2013 W = Worsened from 2013 (blank) = No significant change from 2013

PTI: planning time index (95th percentile travel time / freeflow travel time) TTI: travel time index (50th percentile travel time/ freeflow travel time)

The following intersections were reported in the Mobility Report to have LOS E or F conditions in at least one peak hour based on recent traffic counts: within the BRT project limits:

1. MD 355 at North Wood Road (PM)
2. MD 355 at Cedar Lane (AM/PM)
3. MD 355 at Grosvenor Lane (AM/PM)
4. MD 355 at Tuckerman Lane (AM/PM)
5. MD 355 at Rollins Avenue / Twinbrook Parkway (PM)
6. MD 355 at Edmonston Drive (AM)
7. MD 355 at Wootton Parkway / MD 911 (1st Street) (AM/PM)
8. MD 355 at East and West Gude Drive (AM/PM)
9. MD 355 at Shady Grove Road AM/PM)
10. MD 355 at MD 124 (Montgomery Village Avenue) (AM/PM)

The analyses completed for this project generally track the results of the Mobility Report. The project analysis also found that the majority of these intersections are operating at LOS E or F today in at least one peak period, and also identified an additional seven intersections that operate at a LOS E for at least one peak, and one additional intersection that operates at LOS F (Woodmont Avenue).

Looking at the Mobility Report's Travel Time Index (TTI) results for MD 355, which compares average measured speeds traveled versus free flow speeds during the peak hours, there are many sections of MD 355 that travel significantly slower than free flow in both directions (as noted by the sections shown in yellow and red). This is consistent with the project generated speed results shown in Tables 11and 12, which show that TTI values for many locations indicate congested conditions.

3.5.2. Future 2040 No Build Conditions

3.5.2.1 No-Build 2040 Traffic Volumes

Future No-Build 2040 traffic volumes were developed using the latest version of the MWCOG regional travel demand model (version 2.3.57), validated by MWCOG for the MD 355 corridor for the purposes of this study. Model inputs also included MWCOG's Round 8.3 Cooperative Population and Employment Forecast and the 2014 MWCOG Financially Constrained Long Range Plan (CLRP) regional transportation network. The traffic volumes on the corridor were further refined through SHA's Travel Forecasting and Analysis team to develop intersection level ADT and peak hour traffic.

Within the 2040 CLRP network that was used, there are other transportation improvement projects that are projected to be completed between 2015 and 2040 that were assumed to be part of this project's 2040 No-Build network. These projects include:

1. The Purple Line Transitway from Bethesda to New Carrollton
2. Corridor Cities BRT Transitway (CCT) from Shady Grove to COMSAT
3. I-270 interchange with Watkins Mill Road
4. I-270/US 15 HOV lanes from Shady Grove to Biggs Ford Road
5. MD 27 (Ridge Road) widening from MD 355 to County Road A-305

6. MD 117 (Clopper Road) widening from I-270 to Great Seneca Parkway
7. BRAC intersection improvements on MD 355 near the National Naval Medical Center in Bethesda
8. Snowden Farm Parkway from MD 355 to MD 27 (Ridge Road)
9. Mid-County Highway from MD 27 (Ridge Road) to MD 124 (Montgomery Village Ave.)
10. Extend and widen MD 118 (Germantown Road) from MD 355 to Watkins Mill Road/County Road M-83
11. Extend and widen Middlebrook Road from MD 355 to County Road M-83
12. Montrose Road Parkway extension from MD 355 interchange to Viers Mill Road/ Parkland Road intersection
13. Executive Boulevard extension from MD 355 to Nebel Street
14. Executive Boulevard extension from MD 187 (Old Georgetown Road to Marinelli Road
15. Main Street/Market Street from MD 187 (Old Georgetown Road) to MD 355
16. MD 187 (Old Georgetown Road) from Nicholson Lane/Tilden Lane to Executive Boulevard
17. Hoya Street from Executive Boulevard to Montrose Parkway
18. Connection of Little Seneca Parkway with Observation Drive

The modeled ADT volumes for the study area network were post processed and refined to link and intersection level daily volumes using the NCHRP 765 screenline methodology. This process accounts for differences in forecast base year volumes from the validated MWCOG model versus counted volumes (2015), and applies the resulting factors to future year modeled ADTs (2040). The future No Build 2040 ADT volumes range from a low of approximately 8,600 vehicles south of MD 121 (Clarksburg Road) to a high of 80,200 vehicles just south of the Capital Beltway. Table 13 shows the variation in 2040 daily volumes between major intersections in the corridor, along with the average growth for each. As with existing traffic, volumes generally increase with proximity to the Capital Beltway.

Table 13: 2040 Forecast ADT Volumes and Growth

Roadway Sections (North to South)	Range of 2015 Average Daily Volumes (counted)	Range of 2040 Average Daily Volumes (forecasted)	Total Average Traffic Growth 2015 to 2040
MD 121 (Clarksburg Rd)to MD 27 (Ridge Road)	7,700 – 22,200	8,600 – 25,300	13%
MD 27 (Ridge Road to MD 124 (Mont Village Ave)	21,200 – 39,800	23,500 - 45,900	13%
MD 124 (Montgomery Village Ave) to I-370	26,500 - 43,900	33,000 - 53,700	23%
I-370 to MD 28 (Veirs Mill Road)	41,400 - 50,600	50,100 - 61,000	21%
MD 28 (Veirs Mill Road) to I-495	40,800 – 60,800	51,200 – 73,325	23%
I-495 to MD 410 (East-West Highway)	28,800 – 67,800	33,800 – 80,200	18%

Once the post-processed Future 2040 ADTs were established, the 2040 morning and evening peak hour volumes were developed for the MD 355 corridor using the existing 2015 traffic distributions as well as knowledge of planned development patterns. To account for the congested nature of this corridor, the saturated condition of MD 355 was taken into consideration when applying the growth percentage from the ADT's to the peak hour volumes. A percentage of the future 2040 ADT growth (approximately 75%) was applied to the peak hour volumes at each intersection and interchange within the corridor, resulting in 2040 morning and evening peak hour volumes. Traffic Impact studies for adjacent development projects that have recently been proposed were reviewed for their forecasted traffic growth on MD 355 to check the consistency of these MD 355 forecasts. Appendix D displays the No-Build 2040 ADT and peak hour traffic volumes.

3.5.2.1 No-Build 2040 Traffic Operations

The Synchro and SimTraffic models for this project were updated to 2040 conditions by inputting 2040 AM and PM peak hour volumes, and by updating the roadway network to include planned improvements (particularly the addition of lanes to intersections in the Bethesda area based on ongoing BRAC related improvements). Signal timing plans were optimized at the study intersections by adjusting splits and offsets to accommodate the projected 2040 traffic volumes. Cycle length and phase sequence, however, were kept the same as the existing signal timing plan. Table 14 displays the LOS outputs from the 2040 Synchro models for the morning and evening peaks for the 14 intersection discussed for existing conditions, and compares them to the 2015 results. Appendix C shows the LOS and delays for all of the study area intersections. For signalized intersections, the overall LOS for the intersection is displayed, while for un-signalized intersections, the LOS for the worst approach is shown.

Table 14: Existing 2015 and 2040 No Build Intersection LOS

MD 355 Intersections	2015 Morning Peak LOS (Delay)	2015 Evening Peak LOS (Delay)	2040 Morning Peak LOS (Delay)	2040 Evening Peak LOS (Delay)
MD 121 (Clarksburg Rd)	D (52.6)	E (56.6)	D (48.6)	E (74.0)
MD 27 (Ridge Rd)	D (46.6)	E (70.2)	D (48.6)	E (64.6)
MD 118 (Germantown Rd)	D (46.7)	E (61.0)	E (64.5)	E (55.1)
Middlebrook Rd	D (44.6)	E (75.8)	D (54.0)	F (102.4)
MD 124 (Mont. Village Avenue)	E (58.1)	F (96.6)	D (45.4)	F (86.4)
Shady Grove Road	F (95.6)	E (76.5)	F (120.5)	E (67.4)
Gude Drive	F (81.0)	D (53.7)	F (85.4)	D (50.8)
MD 28 (Veirs Mill Rd)	C (34.2)	D (38.5)	D (37.6)	D (37.6)
Twinbrook Parkway / Rollins Ave	C (21.3)	C (33.6)	C (26.0)	C (27.3)
MD 187 (Old Georgetown Rd)	D (45.3)	D (46.6)	E (78.2)	E (63.7)
MD 547 (Strathmore Ave)	C (34.4)	D (49.8)	D (51.9)	E (64.0)
Cedar Lane	E (61.5)	F (105.1)	C (29.9)	E (61.1)
Jones Bridge Rd / Center Drive	D (49.0)	D (54.6)	D (43.1)	D (42.6)
MD 410 (East West Highway)WB / MD 187 (Old Georgetown Road) WB	D (53.9)	E (56.3)	E (56.4)	D (49.8)

	LOS C
	LOS D
	LOS E
	LOS F

Individual locations in the corridor show an improved LOS in the 2040 No-Build condition versus existing traffic conditions. This is due to the optimization of the traffic signal timings based on the future traffic volumes allowing those locations to operate more efficiently. However, as noted below, overall speeds in the corridor are still forecast to be slower in 2040 under the No-Build than in 2015.

Of the 85 total intersections along MD 355 that were analyzed as part of the 2040 No Build effort, 14 showed a LOS E or F in the morning peak hour, with 19 of those at LOS E or F in the evening peak hour. Other MD 355 intersections which showed a LOS E or F in either of the two peak hours that are not included in Table 14 include Redgrave Place, Shawnee Lane, West Old Baltimore Road, Watkins Mill Road, Cedar Avenue/Fulks Corner Avenue, Redland Road, Mannakee St, Middle Lane/Park Road,

Wootton Parkway/MD 911 (1st Street), Edmonston Drive, Nicholson Lane, Tuckerman Lane (north), and Grosvenor Lane.

Reported average travel times and speeds along the corridor were translated directly from the 2040 SimTraffic outputs, which included the dwell times at signalized intersections. Tables 15 and 16 display the 2015 and 2040 speeds and travel times for southbound and northbound MD 355 in the morning and evening peak hours for both existing conditions and 2040.

Table 15: Existing 2015 and Future 2040 No Build Southbound MD 355 Average Speeds, Travel Times, and Travel Time Index (TTI)

Roadway Sections (North to South)	2015 Average Speed (mph) (AM/PM)	2040 Average Speed (mph) (AM/PM)	2015 Average Travel Time (min) (AM/PM)	2040 Average Travel Time (min) (AM/PM)	2015 Travel Time Index (AM/PM)	2040 Travel Time Index (AM/PM)
MD 121 (Clarksburg Rd) to MD 27 (Ridge Rd)	16 / 34	15 / 29	12 / 6	12 / 7	1.81/1.59	1.80/1.70
MD 27 (Ridge Rd) to Professional Dr	27 / 28	17 / 28	7 / 7	11 / 7	1.59/1.83	2.36/1.79
Professional Dr to I-370	19 / 21	10 / 20	12 / 11	22 / 11	1.81/1.82	3.46/1.93
I-370 to Edmonston Dr	17 / 19	14 / 16	16 / 14	19 / 17	2.88/2.36	3.36/2.61
Edmonston Dr to Twinbook Pkwy	26 / 21	22 /19	3 / 4	3 / 4	1.95/2.42	2.07/2.47
Twinbrook Parkway to MD 547 (Strathmore Ave)	22 / 15	18 / 11	5 / 7	6 / 10	2.05/2.85	2.36/3.42
MD 547 (Strathmore Ave) to Pooks Hill Rd	21 / 22	14 / 23	4 / 4	6 / 4	2.14/2.19	3.04/1.90
Pooks Hill Rd to MD 410 (East-West Highway)	14 / 11	12 / 18	9 / 12	10 / 7	2.90/3.12	3.18/1.82
Total Corridor	**19 / 20**	**14 / 18**	**68 / 65**	**89 / 67**	**2.11/2.20**	**2.74/2.17**

Table 16: Existing 2015 and 2040 No Build Northbound MD 355 Average Speeds, Travel Times, and Travel Time Index (TTI)

Roadway Sections (North to South)	2015 Average Speed (mph) (AM/PM)	2040 Average Speed (mph) (AM/PM)	2015 Average Travel Time (min) (AM/PM)	2040 Average Travel Time (min) (AM/PM)	2015 Travel Time Index, TTI (AM/PM)	2040 Travel Time Index, TTI (AM/PM)
MD 121 (Clarksburg Rd) to MD 27 (Ridge Rd)	32 / 30	32 / 25	6 / 6	6 / 8	1.39/1.48	1.42/1.80
MD 27 (Ridge Rd) to Professional Dr	27 / 23	27 / 20	7 / 8	7 / 9	1.48/2.22	1.47/2.52
Professional Dr to I-370	27 / 22	20 / 15	8 / 10	11 / 15	1.37/1.86	1.76/2.62
I-370 to Edmonston Dr	23 / 18	22 / 14	11 / 14	12 / 19	2.08/2.39	2.09/3.12
Edmonston Dr to Twinbook Pkwy	27 / 16	24 / 12	3 / 5	3 / 6	1.77/2.60	1.81/3.10
Twinbrook Parkway to MD 547 (Strathmore Ave)	20 / 20	14 / 15	6 / 6	7 / 7	2.27/2.40	3.03/2.92
MD 547 (Strathmore Ave) to Pooks Hill Rd	18 / 16	15 / 7	5 / 5	5 / 11	2.45/2.55	2.80/5.64
Pooks Hill Rd to MD 410 (East-West Highway)	24 / 6	21 / 15	5 / 21	6 / 9	1.55/5.48	1.73/2.12
Total Corridor	**25 / 17**	**22 / 15**	**51 / 75**	**57 / 84**	**1.70/2.55**	**1.89/2.77**

With the forecasted growth in traffic volumes for the corridor, roadway speeds are expected to drop between 2015 and 2040. Average speeds for the total corridor are expected to drop by 2 to 5 mph in both directions and peak hours based on the SimTraffic outputs. By 2040 in the morning peak hour, the time to traverse the corridor southbound in the morning peak hour will increase from 68 minutes today to 89 minutes, and the time to travel the entire corridor northbound in the evening peak will increase from 75 minutes to 84 minutes based on the expected speeds and delays. TTI, which indicates the level of congestion along the corridor, also increases in 2040, particularly for the peak direction of traffic as a result of increase in background traffic in 2040. Note that a few segments experience reduced congestion (higher speeds or lower TTI), which can be attributed to the signal timing optimization and roadway improvements described in the CLRP.

With the projected increases in traffic volumes, travel times and delays, and failing intersections forecast between today and 2040, it is expected that not only will traffic travel slower on average, but that there will be larger variations on a daily basis on how well traffic flows along MD 355. With the system operating closer to capacity and saturation, incidents such as crashes, poor weather, construction, etc. will cause wider variability in how long it takes to travel the corridor. These more unpredictable conditions will impact not only the private vehicles using MD 355, but also buses utilizing the roadway. BRT systems by their design provide a mode and facility that is less impacted by the conditions of the roadway traffic and is therefore more reliable for people planning their trips.

3.5.3. Existing Crash Data

Table 17 displays the crashes that occurred between 2011 and 2013 for each of nine segments of the MD 355 corridor. Approximately 1,900 total crashes occurred along MD 355 within the study limits over the three year period, with five of them resulting in fatalities and 65 of them involving pedestrians. The most prevalent crashes were Rear End (41 percent), Angle (19 percent), Left Turn (13 percent), and Sideswipe (13 percent) collisions. The prevalence of these crash types suggests a corridor that has congested conditions with frequent stops and turns from side streets and parking lots.

Table 17: MD 355 BRT Corridor Crash History

Roadway Sections (North to South)	Total Crashes (2011 to 2013)	Crashes Per Mile	Significantly High Crash Types
MD 121 (Clarksburg Road) to MD 27 (Ridge Road)	109	33	Opposite Direction, Rear End, Left Turn
MD 27(Ridge Road) to Game Preserve Road	193	66	Left Turn, Angle
Game Preserve Road to I-370	382	94	Opposite Direction, Left Turn, Pedestrian
I-370 to MD 28 (Veirs Mill Road)	339	97	Left Turn, Pedestrian
MD 28 (Veirs Mille Road) to MD 547 (Strathmore Ave)	444	114	Left Turn, Angle
MD 547 (Strathmore Ave) to I-495	132	101	Opposite Direction
I-495 to Cedar Lane	94	127	Sideswipe
Cedar Lane to Woodmont Ave	112	144	Rear End, Left Turn, Pedestrian
Woodmont Ave to MD 410 (East-West Highway)	112	122	Rear End, Sideswipe, Left Turn, Angle, Pedestrian

Three of the sections shown in Table 17 have total crash rates that are significantly higher than the statewide average rate for similar roadways: MD 410 (East-West Highway) to Woodmont Avenue, Woodmont Avenue to Cedar Lane, and I-370 to Game Preserve Road. Three of the five fatal crashes occurred in the section between MD 547 (Strathmore Avenue) and MD 28 (Veirs Mill Road). Four of the sections had a high number of pedestrian related crashes. These crash locations and safety overall will be addressed as part of the alternatives analysis phase of overall project development.

Vehicle crashes do and will continue to add to the lack of reliability of roadway travel times in the corridor, particularly when combined with forecasted higher levels of congestion in the future. BRT vehicles which operate on separate lanes will not be impacted to the degree of general traffic by crashes.

3.6. Corridor Travel Markets

Tables 18 and 19 summarize the results of the travel demand modeling for existing and future 2040 conditions, detailing the number of trips made within the Study Corridor on an average weekday. Work trips within the study corridor are projected to grow by 40 percent from 2014 to 2040, and non-work travel within the study corridor is projected to grow by 25 percent over the same period. Most trips within the Study Corridor are short, with more than two-thirds of trips occurring within the same district or between adjacent districts (i.e. District 2 to District 3).

Work trips account for only 12 percent of overall existing travel in the study corridor and will account for 13 percent of overall travel in 2040. District 2 around White Flint is expected to experience the most growth in work trips of all five districts: The number of work trips from District 2 and the number of work trips to District 2 are forecasted to increase by 70 percent and 65 percent, respectively, from 2014 to 2040. This is primarily related to the large increase in population and employment planned for this area as part of the White Flint redevelopment.

It should be noted that many additional commute trips are made to the Study Corridor on a daily basis from the portions of Montgomery County outside of the corridor as shown in Table 18. Commute trips from east and west County to jobs in the MD 355 corridor could not access a BRT system on MD 355 by walking, and therefore would need to access a BRT system via transfer from a feeder bus system or by driving to a park-and-ride lot. In the southern portion of the Study Corridor, robust local bus service is already provided to provide access to the Metrorail stations. In the northern portion of the MD 355 corridor, where the local bus network is less robust, park-and-ride facilities may be a more appropriate access option.

Table 18: 2014 and 2040 Daily Commute Travel in Study Corridor

2014 Daily Commute Trips						
From/To District	**1**	**2**	**3**	**4**	**5**	**Corridor Total**
1	9,467	3,438	1,143	358	61	14,466
2	5,048	8,389	2,863	685	118	17,102
3	1,752	3,024	4,718	1,146	168	10,808
4	1,771	2,289	3,466	4,558	841	12,925
5	599	641	751	870	1,220	4,081
Corridor Subtotal	18,638	17,780	12,940	7,617	2,407	59,382
West County*	9,079	9,854	9,610	6,247	1,887	36,677
East County**	14,038	15,328	11,389	5,055	1,216	47,026
Total	41,754	42,961	33,939	18,920	5,510	143,085

2040 Daily Commute Trips						
From/To District	1	2	3	4	5	Corridor Total
1	10,922	4,357	1,276	326	74	16,955
2	6,737	16,563	4,704	858	186	29,049
3	2,148	4,660	7,157	1,520	273	15,757
4	1,757	2,676	3,587	5,460	1,108	14,589
5	892	1,133	1,250	1,546	2,064	6,886
Corridor Subtotal	22,456	29,390	17,974	9,711	3,705	83,236
West County*	9,993	12,095	11,412	8,108	2,866	44,473
East County**	14,321	18,018	11,483	5,153	1,474	50,449
Total	46,770	59,503	40,870	22,972	8,044	178,159

* Incorporates all TAZs within the County located west of the study corridor
** Incorporates all TAZ within the County located east of the study corridor

Non-work trips (highlighted in Table 19) are the dominant trip type within the study corridor, accounting for 88 percent of overall existing travel. These trips are typically frequent and short with less than ten percent occurring between non-adjacent districts. Nearly half of all non-work trips both begin and end in Districts 1 or 2. As with work trips, District 2 is projected to experience the most growth in non-work trips of all five districts: Non-work trips from District 2 and non-work trips to District 2 are both projected to increase by more than 40 percent. In addition, it is important to note that there are a large number of intra-zonal trips in the study corridor (trips that occur within the same traffic analysis zone), and that increased densities and mixed-use developments along the corridor are forecast to increase the demand for this type of highly localized trip as well. The northern portion of the corridor, particularly District 5, has substantially lower levels of travel for all purposes than the southern portion of the corridor due to lower levels of population and employment in this area.

Table 19: 2014 and 2040 Daily Non-Commute and Total Travel in Study Corridor

2014 Daily Non-Commute Trips						
From/To District	**1**	**2**	**3**	**4**	**5**	**Corridor Total**
1	83,374	22,012	4,563	1,833	363	112,147
2	22,426	84,114	15,493	4,044	767	126,844
3	4,899	17,334	46,969	10,010	1,318	80,530
4	2,850	6,253	13,982	57,133	6,541	86,760
5	790	1,531	2,257	8,508	24,961	38,047
Corridor Total	114,338	131,245	83,265	81,529	33,951	444,327

2040 Daily Non-Commute Trips						
From/To District	1	2	3	4	5	Corridor Total
1	91,020	25,437	4,858	1,760	397	123,471
2	27,227	126,628	20,397	4,547	926	179,724
3	5,704	24,183	61,186	11,992	1,590	104,655
4	3,245	7,959	16,421	61,281	6,793	95,698
5	1,189	2,509	3,412	11,454	33,826	52,389
Corridor Total	128,384	186,715	106,274	91,032	43,531	555,937

2014 Total Daily Trips						
From/To District	**1**	**2**	**3**	**4**	**5**	**Corridor Total**
1	92,841	25,450	5,706	2,191	424	126,612
2	27,474	92,503	18,356	4,729	885	143,947
3	6,651	20,358	51,687	11,156	1,486	91,338
4	4,621	8,542	17,448	61,691	7,382	99,684
5	1,389	2,172	3,008	9,378	26,181	42,128
Corridor Total	132,976	149,025	96,205	89,145	36,358	503,709

Table 19 – Continued

2040 Total Daily Trips						
From/To District	1	2	3	4	5	Corridor Total
1	101,942	29,794	6,134	2,086	471	140,427
2	33,964	143,191	25,101	5,405	1,112	208,773
3	7,852	28,843	68,343	13,512	1,863	120,413
4	5,002	10,635	20,008	66,741	7,901	110,287
5	2,081	3,642	4,662	13,000	35,890	59,275
Corridor Total	150,841	216,105	124,248	100,744	47,237	639,175

Percent Increase in Daily Trips, 2014 - 2040						
From/To District	1	2	3	4	5	**Corridor Total**
1	9.8%	17.1%	7.5%	-4.8%	11.1%	10.9%
2	23.6%	54.8%	36.7%	14.3%	25.6%	45.0%
3	18.1%	41.7%	32.2%	21.1%	25.4%	31.8%
4	8.2%	24.5%	14.7%	8.2%	7.0%	10.6%
5	49.8%	67.7%	55.0%	38.6%	37.1%	40.7%
Corridor Total	13.4%	45.0%	29.1%	13.0%	29.9%	26.9%

Source: MWCOG v2.3 Travel Demand Model

These travel patterns within the study corridor present an interesting opportunity for a potential BRT system along MD 355, which would provide high-quality transit service that could accommodate these types of trips. The BRT would provide better transit accessibility to locations between the existing Metrorail stations in the southern portion of the corridor while simultaneously providing higher quality service than the existing local bus routes. Combining these two features of BRT could make this service attractive to the many short, non-work trips in the corridor. Passengers would benefit from both frequent service and quick access to activity centers near BRT stops and quick, direct service from and to locations of interest along the MD 355 corridor. In the northern half of the corridor, a potential BRT service could also provide enhanced access to the Metrorail system.

Table 20 shows the existing and projected future travel patterns of trips with at least one trip end in the study corridor. These trips include trips that begin and end within the study corridor, trips that begin within the corridor and end outside the corridor, and trips that begin outside the corridor and end inside the corridor. Of these trips today, 58 percent begin in the corridor, 73 percent end in the corridor, and 31 percent both begin and end within the corridor. The travel patterns are not projected to change significantly, other than a projected increase in intra-corridor travel. BRT service could accommodate the increase in intra-corridor travel by providing fast, high-capacity service along the MD 355 corridor. BRT service also could serve as an additional transit option for travelers from the District of Columbia or Frederick County, Maryland who end their trip in the corridor.

Table 20: Existing & Future (2040) Travel Patterns In and Out of the Study Corridor

Travel Pattern	Existing Share	Future Share
Intra-Corridor Travel	30.6%	32.5%
From Corridor to Elsewhere in Montgomery County	16.4%	17.1%
From Corridor to Outside of Montgomery County	10.9%	10.5%
To Corridor from Elsewhere in Montgomery County	26.9%	25.1%
To Corridor from Outside of Montgomery County	15.2%	14.7%

Some through travel may also be present on the MD 355 corridor, although I-270 and commuter rail may provide better options for trips traveling between DC and Frederick County. Approximately 18,000 people make this trip each day using all routes; it is expected to increase by 65 percent to 29,700 daily trips by 2040.

3.7. Corridor Transit Travel

3.7.1. Service Attributes

Both Metrobus and Ride On operate local bus service in the study corridor. Metrorail also operates rail service via the Red Line within the southern half of the study corridor. Seven Red Line Metrorail stations are located within the study corridor. The northern terminal station is Shady Grove Metrorail Station in Rockville, and the southernmost station in the study corridor is the Friendship Heights Metrorail Station. Red Line Metrorail hours of operation and headways are shown below in Table 21. Table 22 contains current Metrorail Red Line headways by time of day. WMATA is also planning to run all trips throughout the day to the Shady Grove Metrorail Station, starting in 2019. Currently, during peak periods, ½ of trips terminate at Grosvenor and ½ run the full length of the Red Line to Shady Grove. This change would result in all trips running to Shady Grove during peak periods, with peak period service frequency to Shady Grove changing from the current six minutes to a train every three minutes

Table 21: Red Line Metrorail Service from Shady Grove - Hours of Operation

Day of Week	Start of First Trip	Start of Last Trip
Weekday	5:00 AM	11:37 PM
Friday	5:00 AM	2:37 AM
Saturday	7:00 AM	2:37 AM
Sunday	7:00 AM	11:37 PM

Source: WMATA

Table 22: Red Line Metrorail Service - Headways by Time of Day (in minutes)

Day of Week	Peak Direction Morning Peak Headway	Mid-Day Headway	Peak Direction Evening Peak Headway
Weekday	3 - 6*	12	3 - 6*
Saturday	12	12	12
Sunday	15	15	15

*Currently, additional trains operate between Grosvenor and Silver Spring during the morning and evening rush hours. Starting in 2019, WMATA plans to run all peak period service to Shady Grove, resulting in a 3 minute headway to Shady Grove.

WMATA also operates Metrobus service along relatively short segments of MD 355 near the Medical Center and Shady Grove Metrorail Stations. These Metrobus routes are primarily east-west routes with limited service on MD 355. Ride On offers a number of routes that provide service throughout the study corridor. Table 23 lists the Metrobus and Ride On bus routes that run within the project Study Area.

Table 23: Bus Routes Operating on the MD 355 Corridor

Route	Operator	Metrorail Station Served
J2	WMATA	Medical Center, Bethesda, Silver Spring
J3	WMATA	Medical Center, Bethesda, Silver Spring
J5	WMATA	Silver Spring, Grosvenor-Strathmore, Twinbrook
J7	WMATA	Medical Center, Bethesda
J9	WMATA	Medical Center, Bethesda
Q1	WMATA	Shady Grove, Rockville, Wheaton, Forest Glen, Silver Spring
Q2	WMATA	Shady Grove, Rockville, Wheaton, Forest Glen, Silver Spring
Q5	WMATA	Shady Grove, Rockville, Wheaton
Q6	WMATA	Shady Grove, Rockville, Wheaton
5	Ride On	Twinbrook, White Flint, Silver Spring
6	Ride On	Grosvenor-Strathmore
30	Ride On	Medical Center, Bethesda
34	Ride On	Wheaton, Medical Center, Bethesda, Friendship Heights
45	Ride On	Rockville, Twinbrook
46	Ride On	Shady Grove, Rockville, Twinbrook, White Flint, Grosvenor-Strathmore, Medical Center
55	Ride On	Shady Grove, Rockville
57	Ride On	Shady Grove
59	Ride On	Shady Grove, Rockville
61	Ride On	Shady Grove
63	Ride On	Shady Grove, Rockville
70	Ride On	Medical Center, Bethesda
75	Ride On	None
79	Ride On	Shady Grove*
81	Ride On	Rockville, White Flint

Ride On routes within the corridor are shown in Appendix A. Also included in Appendix A are the service characteristics of each of the corridor Ride-On routes.

Many Ride On routes provide service within the study corridor, though only a small subset of these operates directly on MD 355. There are three Ride On routes providing local north-south service that would mimic BRT service:

- Route 46: Medical Center Metrorail Station to Montgomery College in Rockville.

- Route 55: Rockville Metrorail Station to Germantown Transit Center, serves Shady Grove Metrorail Station and Montgomery College's Rockville and Germantown campuses.
- Route 75: Germantown Transit Center to the Montgomery County Correctional Facility in Clarksburg.

Routes 46 and 55 operate all day service on weekdays and weekends, and Route 75 operates only on weekdays between 5:15 a.m. and 7:15 p.m. Average headways are provided for these three routes in Table 24.

Table 24: Ride On Routes Average Headways

Route	Day of Week	Peak Direction Morning Peak Headway	Mid-Day Headway	Peak Direction Evening Peak Headway
46	Weekday	15	15	15
	Saturday	20-30	20-30	20-30
	Sunday	30	30	30
55	Weekday	12	10-12	12
	Saturday	20	15	15
	Sunday	30	20	20
75	Weekday	30	30	30

Source: Ride On Timetables

Weekday morning peak period travel times in the southbound direction along Routes 46, 55, and 75 are provided in Table 25. The travel times reflect weekday southbound morning peak period travel times between major points on existing Ride On bus routes. BRT service could serve as an attractive alternative to local bus service and auto trips made within the corridor due to the relatively higher bus operating speeds, improved travel time reliability, and a better overall user experience.

Table 25: Travel Times on Current Ride On Bus Service

Route	Origin	Destination	Travel Time (minutes)
46	Montgomery College	Rockville Metrorail	10
	Rockville Metrorail	White Flint Metrorail	17
	White Flint Metrorail	Medical Center Metrorail	19
55	Germantown Transit Center	Lakeforest Mall	31
	Lakeforest Mall	Shady Grove	17
	Shady Grove	Rockville Metrorail	19
75	MC Correctional Facility	Germantown Transit Center	27

Source: Ride On Timetables

Based on the existing bus service in the corridor, a continuous high-quality BRT service could offer several improvements to transit service in the corridor, including:

- More frequent, faster and more direct service to locations along the corridor than any of the existing bus services;
- Increased span of service in the northern portion of the corridor compared to existing Route 75 service; and
- More convenient and continuous service along the MD 355 corridor than any combination of bus services currently operating on the corridor can offer.

3.7.2. Transit Usage

Table 26 shows the 2014 and 2040 transit mode shares for work and non-work travel in the study corridor. Almost one-fourth of work trips within the study corridor are made using transit. Transit mode share is particularly high for commuters to Bethesda from areas to the north. While non-work travel in the corridor is primarily auto-based, transit mode share is highest to the Bethesda area. By 2040, transit is projected to play an even greater role in the study corridor (for reference, a map showing the districts utilized in Table 26 is provided in Figure 3).

Table 26: 2014 and 2040 Transit Mode Share by Work and Non-Work Travel

2014 Daily Commute Transit Mode Share						
From/To District	1	2	3	4	5	Corridor Total
1	27%	24%	18%	15%	14%	25%
2	51%	16%	21%	13%	10%	27%
3	49%	24%	12%	17%	10%	22%
4	46%	22%	25%	14%	13%	23%
5	38%	12%	11%	12%	5%	13%
Corridor Total	38%	20%	18%	14%	8%	24%

2040 Daily Commute Transit Mode Share						
From/To District	1	2	3	4	5	Corridor Total
1	28%	27%	20%	14%	12%	27%
2	57%	17%	25%	13%	10%	28%
3	57%	29%	16%	19%	14%	26%
4	50%	26%	28%	13%	15%	24%
5	41%	15%	16%	14%	6%	16%
Corridor Total	42%	21%	21%	14%	9%	25%

2014 Daily Non-Work Transit Mode Share						
From/To District	1	2	3	4	5	Corridor Total
1	4%	7%	6%	3%	3%	5%
2	11%	3%	7%	3%	1%	5%
3	9%	6%	3%	7%	2%	4%
4	5%	3%	7%	2%	2%	3%
5	2%	1%	2%	2%	0%	1%
Corridor Total	6%	4%	4%	3%	1%	4%

2040 Daily Non-Work Transit Mode Share						
From/To District	1	2	3	4	5	Corridor Total
1	5%	8%	7%	6%	5%	5%
2	14%	3%	8%	5%	2%	5%
3	11%	7%	4%	8%	4%	5%
4	7%	5%	8%	2%	3%	4%
5	4%	2%	4%	2%	1%	1%
Corridor Total	7%	4%	5%	3%	1%	5%

*Source: MWCOG v2.3.57 Travel Demand Model

Average daily ridership for Routes 46, 55, and 75 is provided in Table 27. Route 55 averages nearly 8,000 daily weekday riders (this is the highest ridership route in the Ride On system), and Route 46 averages 3,700 riders each weekday. Route 75 carries about 500 riders per day.

Table 27: Ride On Routes Daily Ridership

Route	Day of Week	Daily Ridership
46	Weekday	3,683
	Saturday	2,084
	Sunday	1,798
55	Weekday	7,920
	Saturday	5,126
	Sunday	2,947
75	Weekday	479

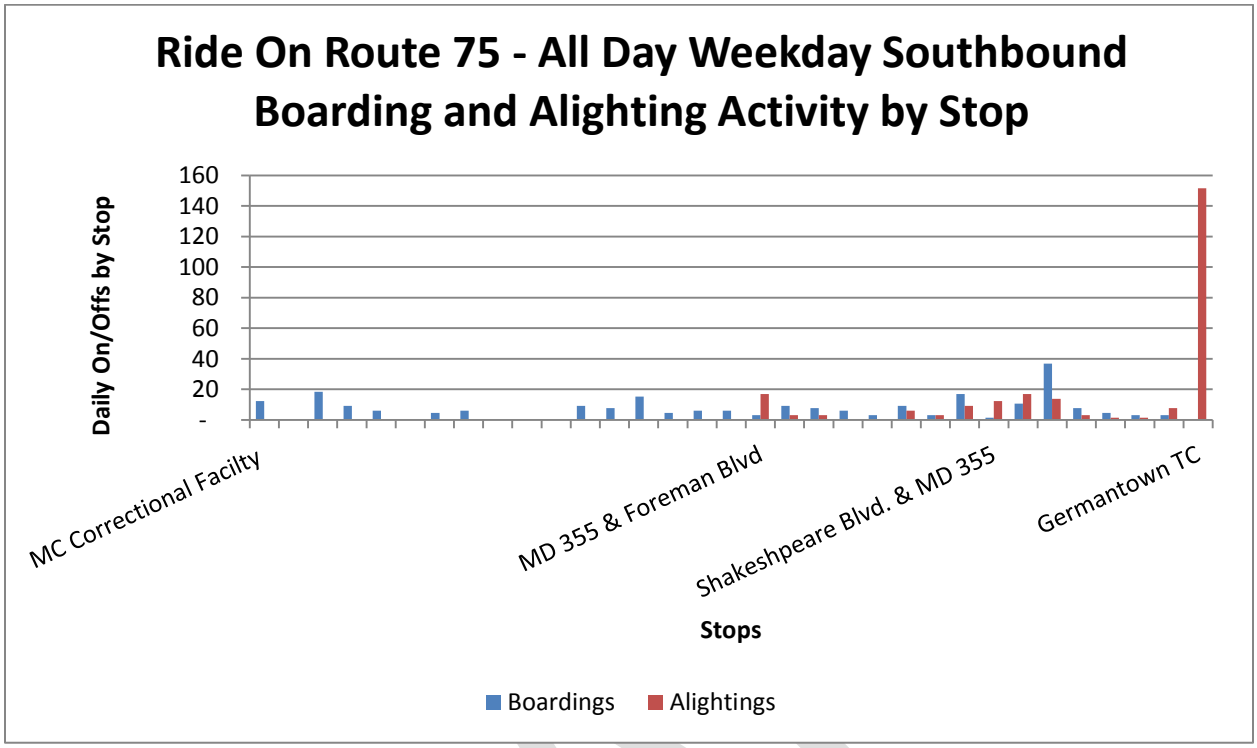
Source: Ride On Boarding –Alighting Counts (2015)

Figures 15, 16, and 17 show weekday boarding and alighting activity by direction for Ride On routes 75, 55, and 46, respectively. These profiles provide a detailed breakdown of boarding and alighting activity along each of these routes. On Route 75, which operates from Germantown Transit Center to the Montgomery County Correctional Facility in Clarksburg, most northbound boardings occur at Germantown Transit Center and alightings are spread evenly along the route (Figure 15). Route 75 southbound boardings are spread evenly along the route, while most alightings occur at the Germantown Transit Center. With essentially one primary pickup and drop-off location for northbound and southbound travel, respectively, Route 75 acts as a "feeder" route to allow riders get to and from the Germantown Transit Center.

Route 55 operates between Rockville Metrorail Station and the Germantown Transit Center. On Route 55 the majority of boardings and alightings occur at the Rockville and Shady Grove Metrorail Stations, Montgomery College, Lakeforest Mall, and the Germantown Transit Center; both of the latter stops serve as hubs for transfers to other Ride On bus routes.

Route 46 operates between the Medical Center Metrorail Station and Montgomery College in Rockville. Most boardings and alightings occur at Montgomery College (Rockville) and at the Medical Center, Twinbrook, and Rockville Metrorail Stations, highlighting the role this route plays in providing access to Montgomery College and as a feeder service to Metrorail.

Figure 15: Ride On Route 75 Weekday Stop Activity by Direction



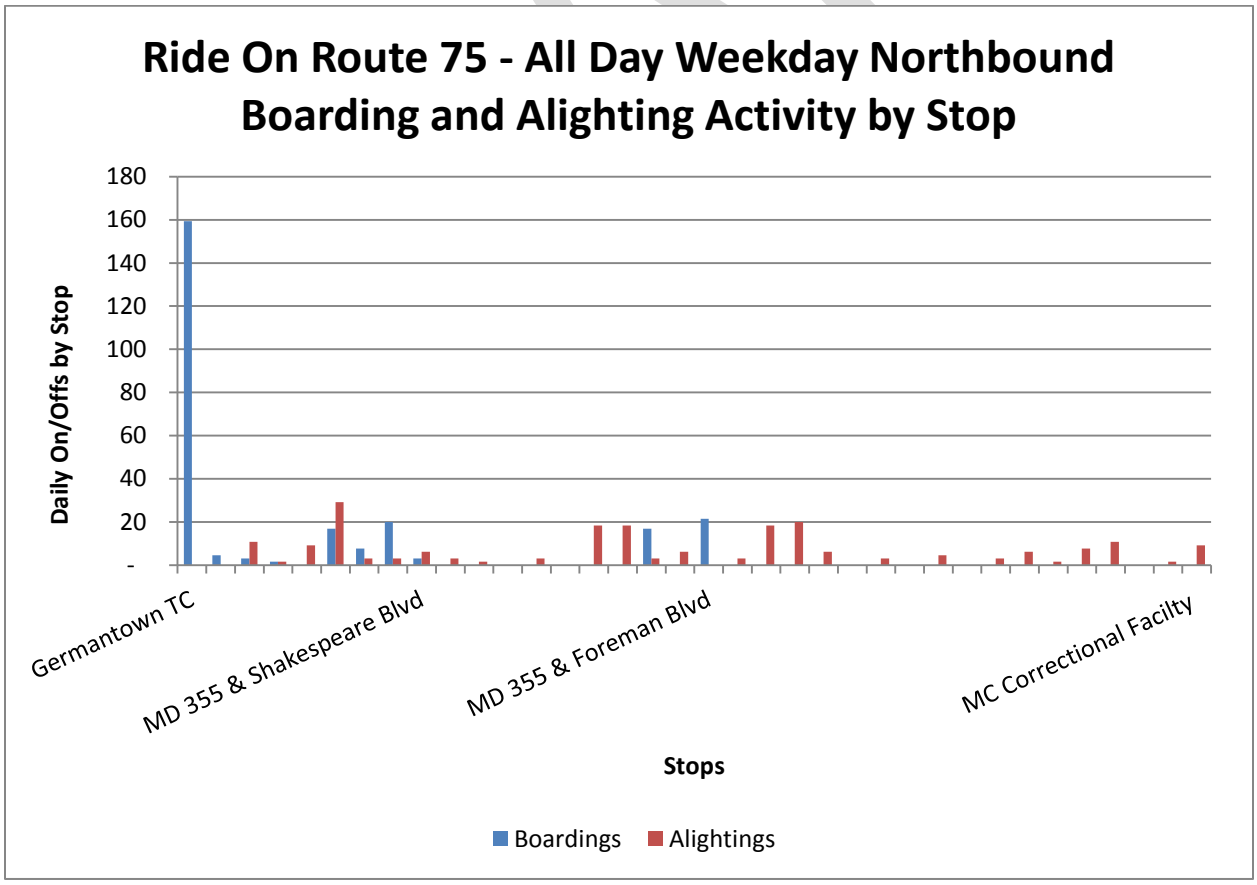
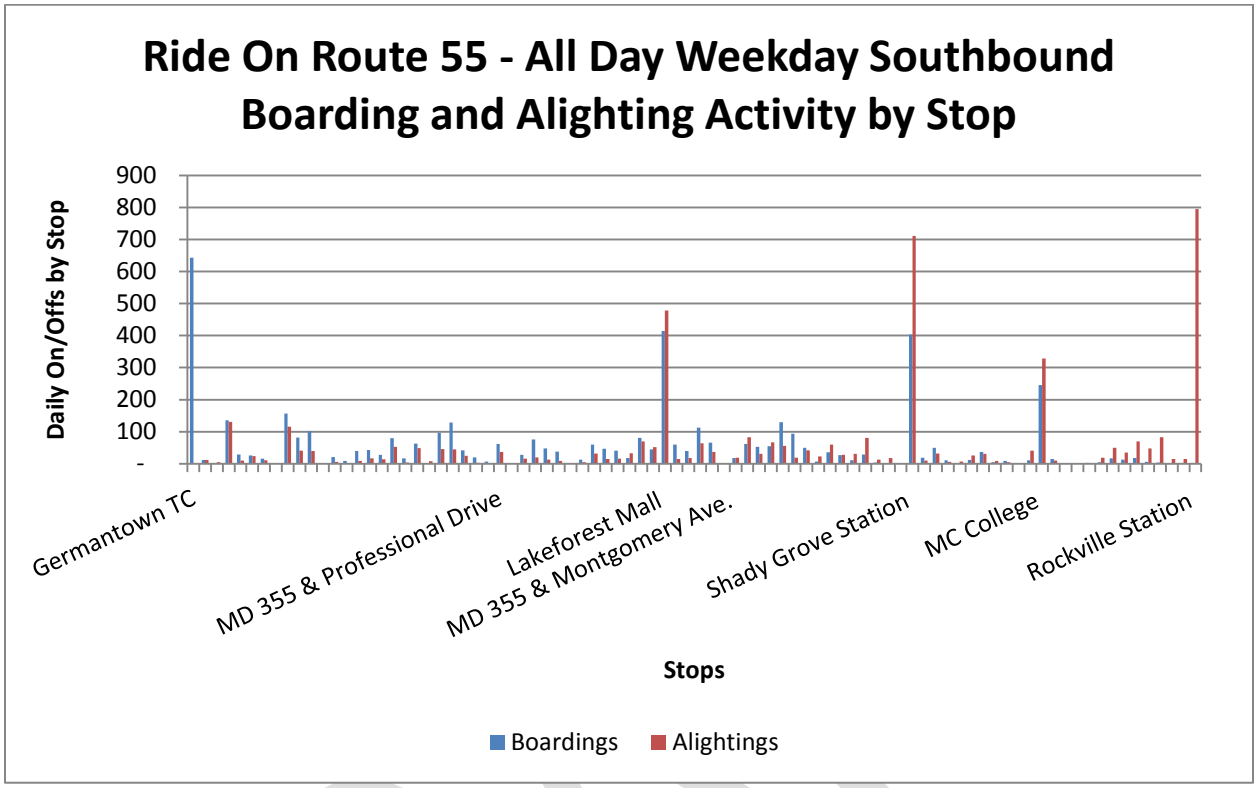


Figure 16: Ride On Route 55 Weekday Activity by Stop and Direction



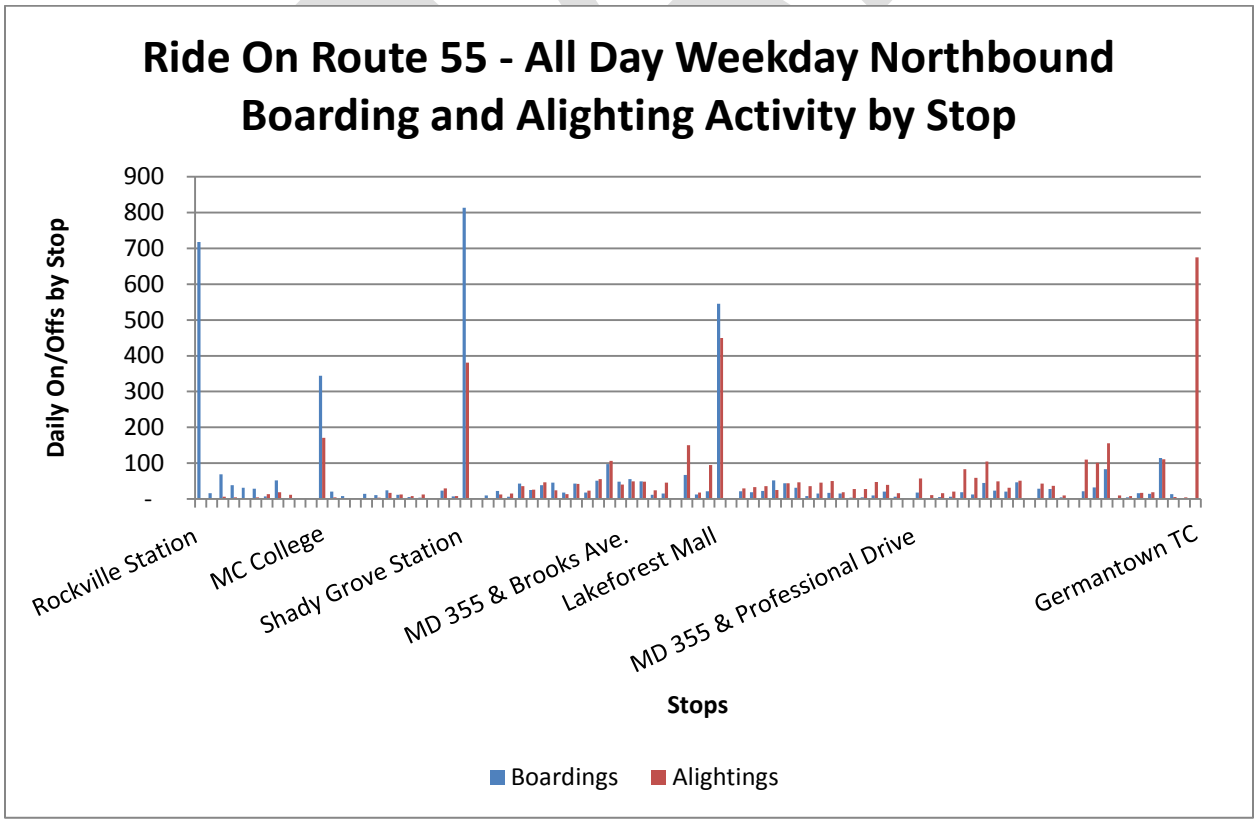
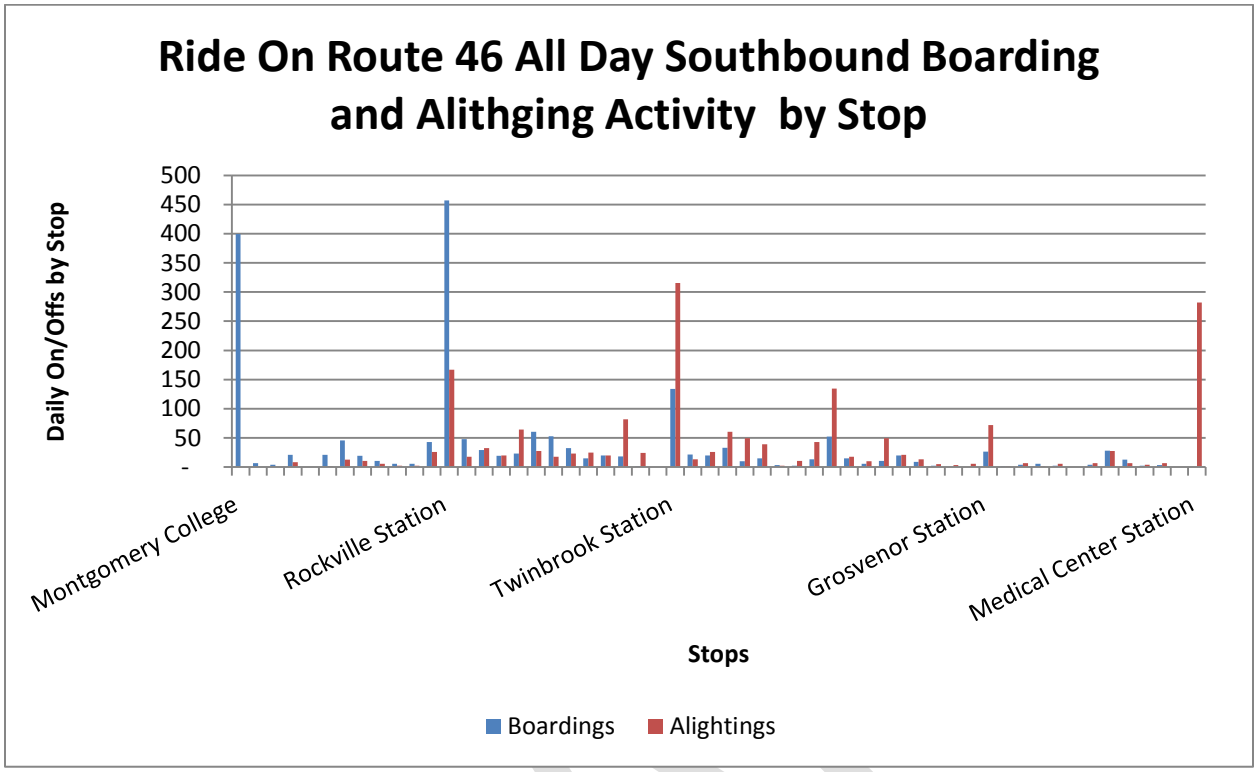


Figure 17: Ride On Route 46 Weekday Activity by Stop and Direction



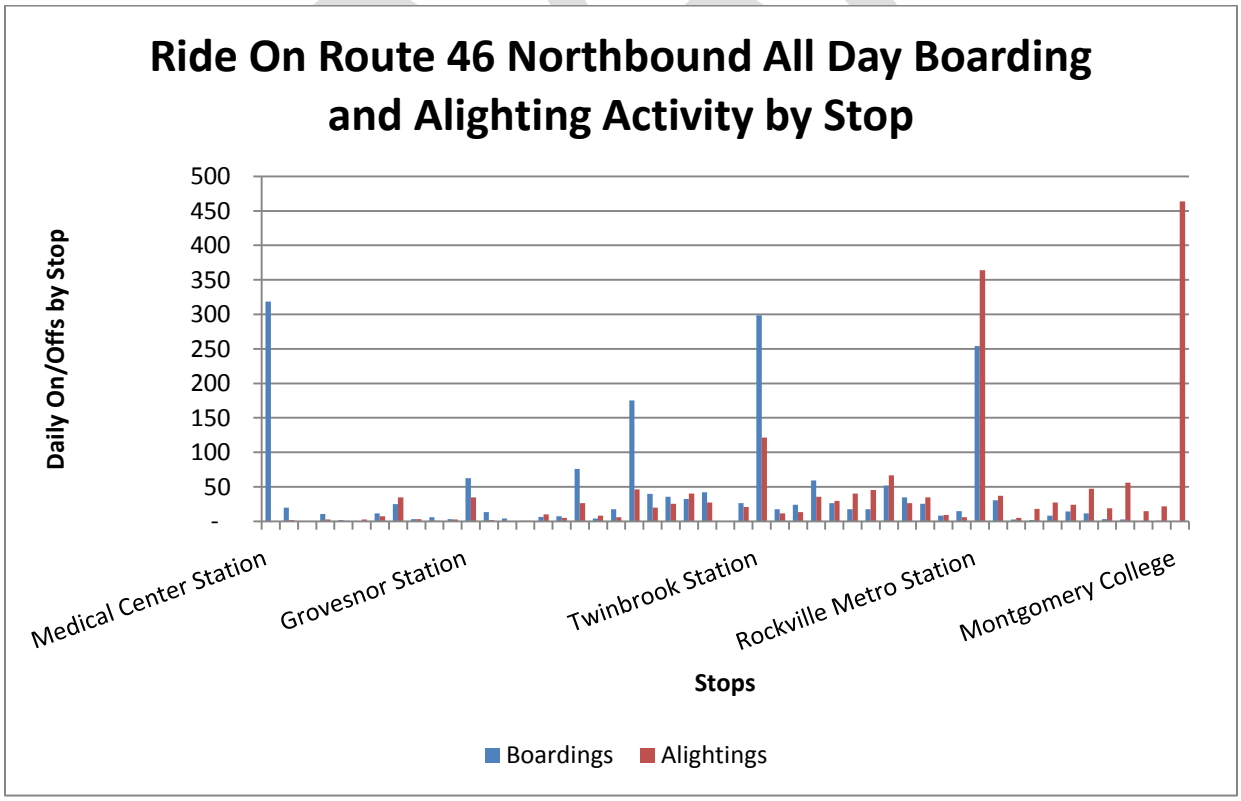


Table 28 presents the average weekday boardings at the eight Red Line stations in the Study Corridor, by station group. As shown, the northern portion of the Red Line experiences approximately 27,000 daily boardings, while the southern group experiences over 32,000 daily boardings.

Table 28: 2013 Observed Red Line Metrorail Boardings

	2013 Observed Boardings
Northern Group	
Shady Grove	13,444
Rockville	4,900
Twinbrook	4,569
White Flint	3,951
Total	26,864
Southern Group	
Grosvenor	5,857
Medical Center	6,221
Bethesda	10,608
Friendship Heights	9,703
Total	32,389

The validated MWCOG Model (Version 2.3.57) was used to forecast growth in transit ridership expected between 2014 and 2040 for the No-Build network. These growth rates are shown in Table 29 and applied to calculate an estimate of 2040 bus ridership in the corridor. Overall, the seven routes in the corridor show a 25 percent increase in daily ridership (an additional 5,000 daily riders). Routes 46 and 55 are the two main local bus routes running along MD 355; together, these two routes averaged 11,600 daily boardings in 2014, and ridership is projected to increase on these two routes by more than 40 percent by 2040. BRT service along MD 355 would help accommodate future transit ridership demands within the corridor by providing an efficient, high-capacity transit option in combination with modified local bus routes.

Table 29: Projected Growth in Daily Bus Ridership from 2014 – 2040

Bus Route	2014 Weekday Daily Ridership	Projected Growth in Ridership, 2014 – 2040	2040 No-Build Daily Ridership Forecast
RO 34	2,700	13.3%	3,100
RO 45	900	11.2%	1,000
RO 46	3,700	40.2%	5,200
RO 55	7,900	44.0%	11,400
RO 59	4,500	-8.9%	4,100
RO 75	500	7.8%	500
RO 79	350	32.8%	500
Total	20,550	25.5%	25,800

A similar analysis was conducted for the Red Line stations in the corridor with one major difference: the same growth rate was used for all stations within a station group consistent with the level of validation

of the MWCOG model. The results are shown in Table 30 and indicate almost 60 percent growth in daily boardings for the northern group of stations, driven primarily by growth at White Flint station. The southern stations show a growth in daily boardings of 27 percent between 2014 and 2040. These ridership levels show the high demand for high quality transit in this market – although Metrorail is particularly focused on accommodating trips into DC. BRT service along the MD 355 corridor would improve connectivity to and from existing transit services, including Metrorail.

Table 30: Forecast Red Line Metrorail Station Boardings

	2013 Observed Boardings	2040 Forecast Boardings
Northern Group		(57.7% Growth)
Shady Grove	13,444	21,201
Rockville	4,900	7,727
Twinbrook	4,569	7,205
White Flint	3,951	6,231
Total	26,864	42,365
Southern Group		(27.2% Growth)
Grosvenor	5,857	7,450
Medical Center	6,221	7,913
Bethesda	10,608	13,493
Friendship Heights	9,703	12,342
Total	32,389	41,199

One other important planned transit improvement affecting the MD 355 BRT is the Corridor Cities Transitway. Based on the latest model runs for the CCT, 2035 (project horizon year) daily ridership is estimated to be approximately 30,000 riders. The CCT will act as a feeder service to the MD 355 BRT at King Farm Boulevard and also crosses a number of local bus routes that would also intersect the MD 355 BRT service.

4. Conclusions

The MD 355 corridor represents a major portion of economic activity in Montgomery County, with over 300,000 residents and 280,000 jobs in the Study Area. Congestion is already a major issue in the corridor, and with 33 percent growth in population and 28 percent growth in employment forecast by 2040, these issues will be exacerbated in the future if transportation system improvements do not keep pace. Limiting this congestion and providing travel mode choices throughout the corridor is one of the major transportation needs on MD 355, and is therefore one of the major purposes that should be addressed by any proposed BRT service.

The MD 355 corridor shows a wide range of urban forms and densities along its 21-mile length and includes both dense, mixed-use urban environments in the southern end and more suburban development patterns in the northern reaches near Clarksburg and Germantown. These differences

result in the potential for different sets of needs in the northern and southern portions, as evidenced by differences in travel patterns and accessibility in these areas.

Analysis of major travel markets in Montgomery County reveal that most commute trips are relatively long distance trips, with many traveling into the District of Columbia. This market is currently served primarily by the Red Line Metrorail service which includes seven stations in the Study Area (including five with significant park-and-ride facilities) and provides frequent, high quality transit into DC. In addition, the CLRP includes construction of the CCT, which will help provide high-quality transit services to major employment destinations in the northern half of the corridor, beyond the reach of Metrorail. These long distance trips are also served by I-270, which parallels MD 355 for most of its length and is the route of choice for many long-distance (and through trips) traveling north-south in this corridor. These commute to work trips, present one potential need in the corridor, and a BRT service could provide additional connectivity to the Red Line, potentially in the northern section of the Study Area.

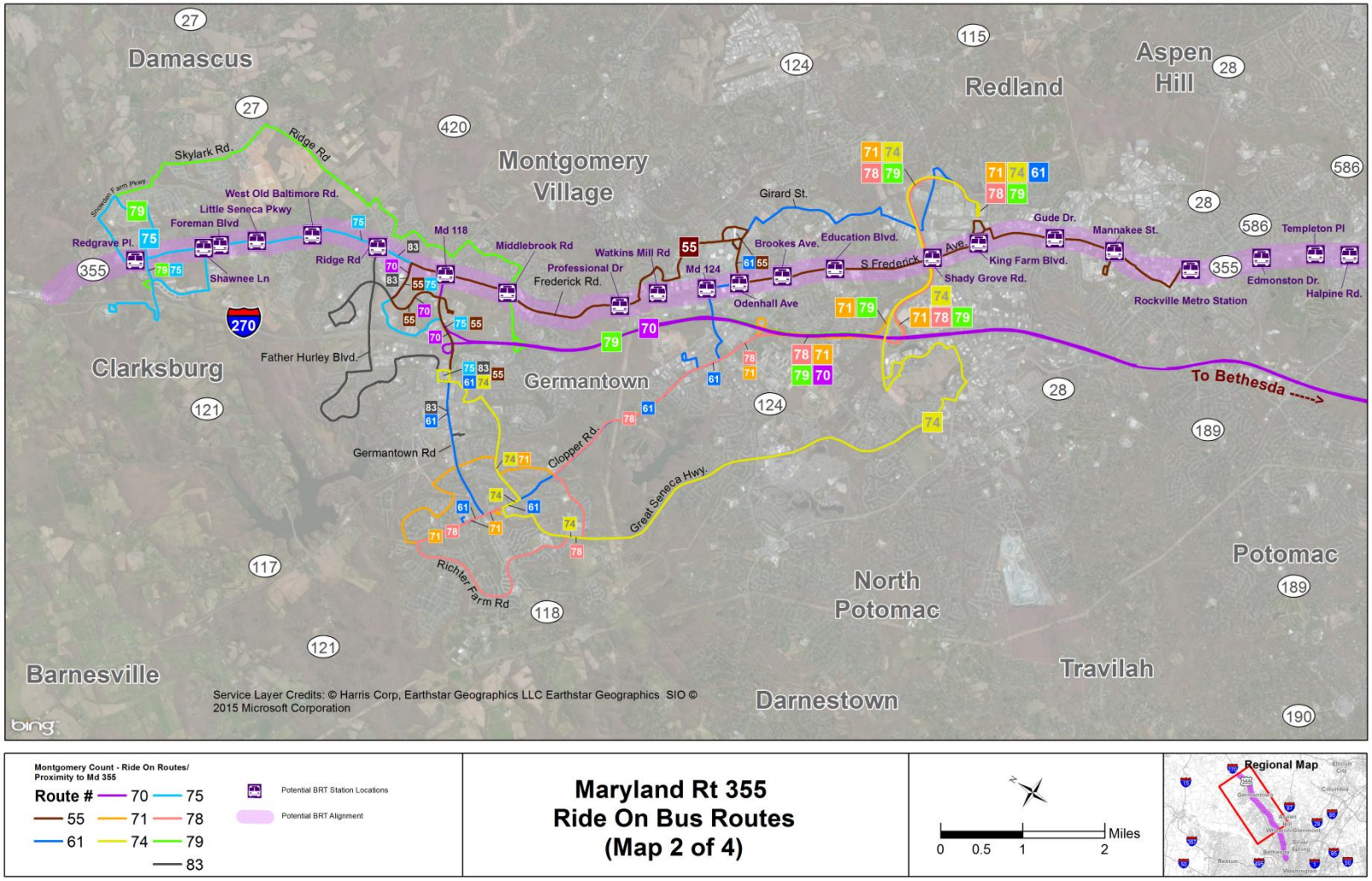
Local transit is provided both by Metrobus and Ride On, with the trunk service along MD 355 operated in three discreet segments by Ride On. These routes, particularly the southern two covering the portion of the corridor between Medical Center and Germantown, are well utilized and show high existing ridership and significant ridership growth potential by 2040. Other bus services in the Study Area would primarily provide connecting service to the BRT from locations in east and west County as well as to Red Line Metrorail stations. This high local bus ridership indicates a continued need for local transit service in the corridor, and the potential to attract additional riders with a well-branded higher-quality BRT service.

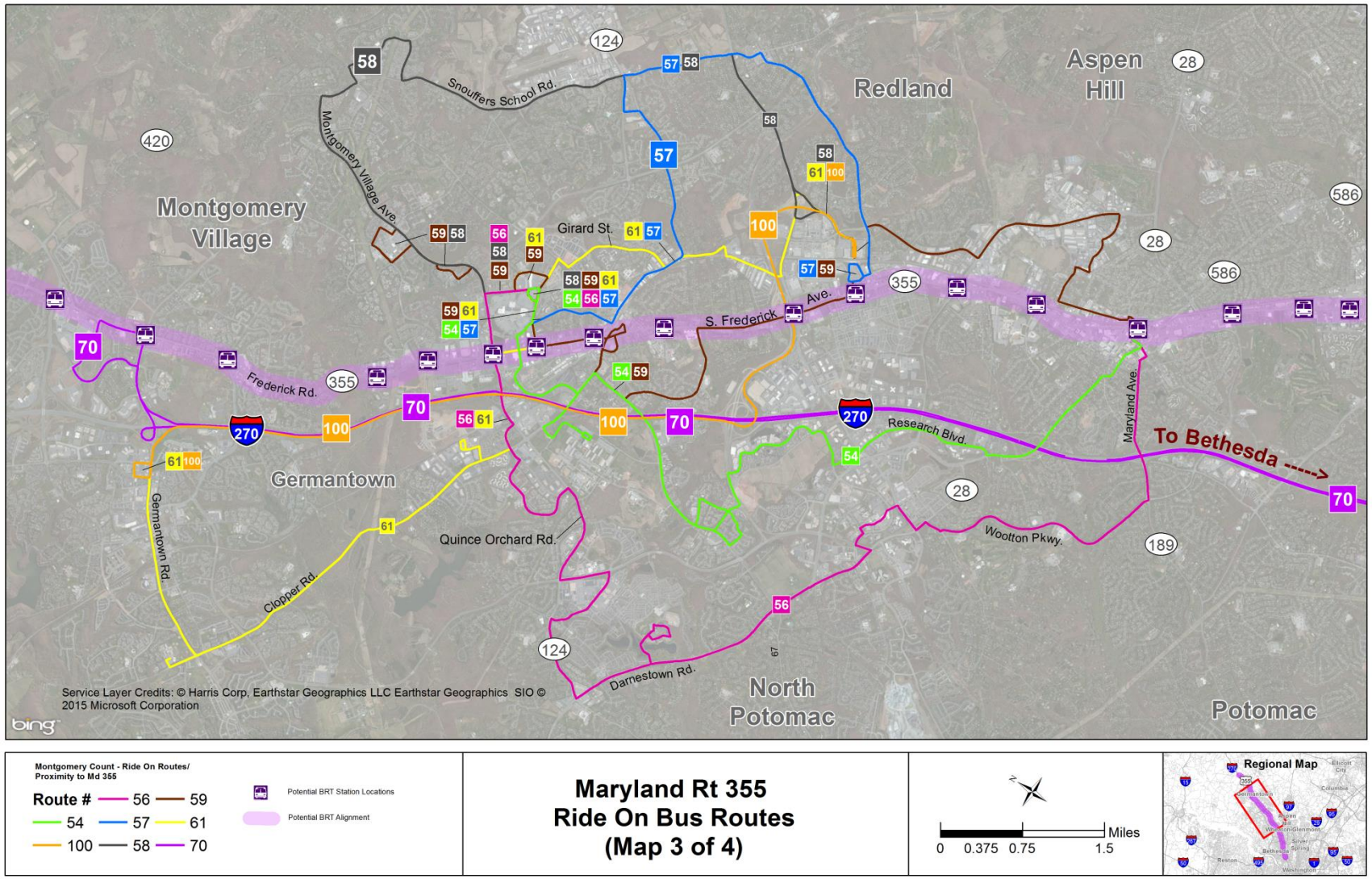
Roadway congestion is currently an issue in the MD 355 corridor, with multiple intersections operating at LOS E or worse during the AM and PM peak periods. Growth in the study area is expected to exacerbate these conditions by 2040, with additional intersections operating at LOS E or F. These traffic conditions will affect travel times and reliability for trips made by automobile and transit trips that must travel on the congested roadways. BRT could help limit the congestion impacts to transit riders by providing various transit priority treatments such as queue jump lanes, transit signal priority, or even dedicated BRT lanes.

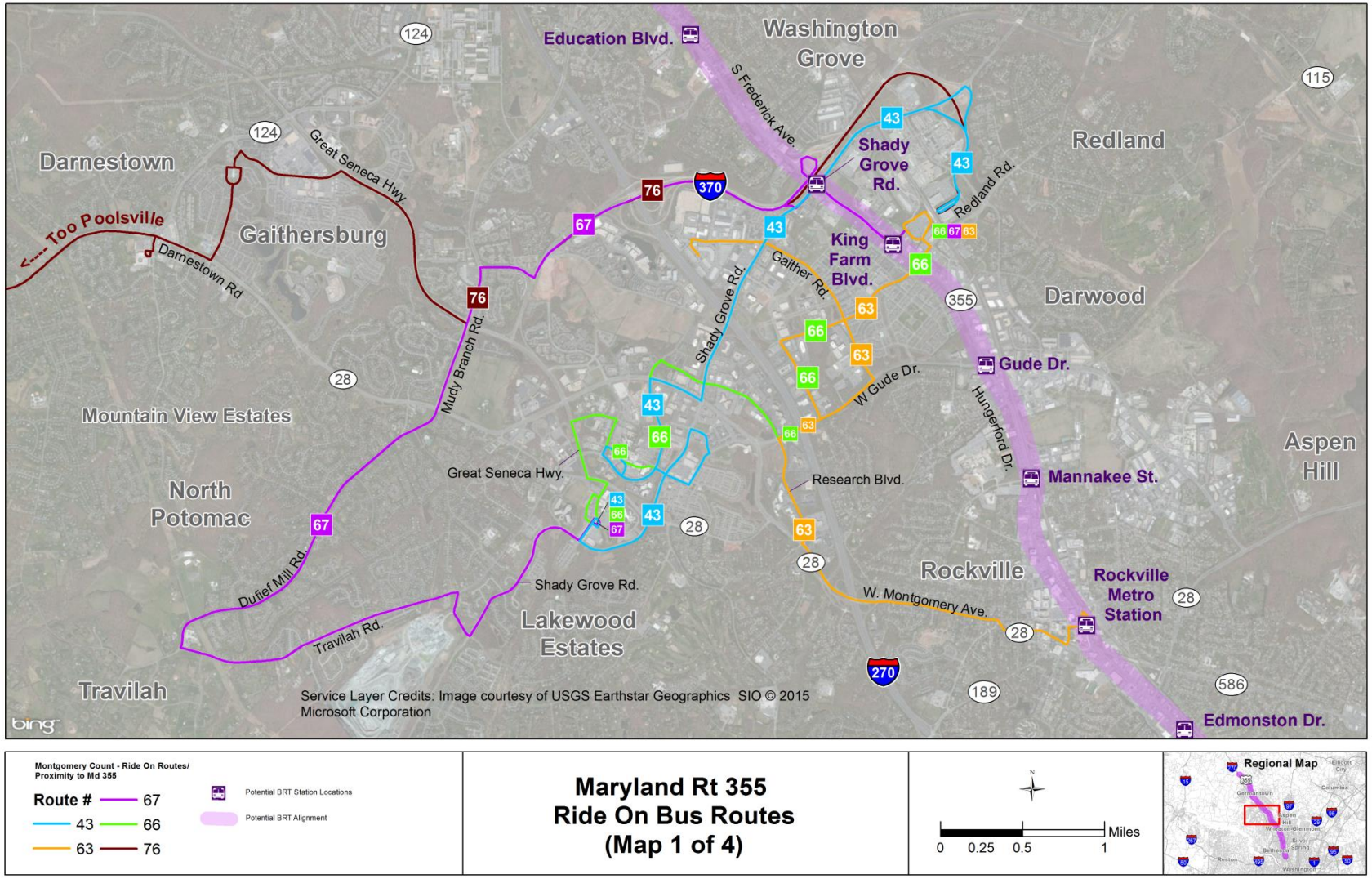
By far the predominant type of trip made in the corridor is non-work trips, which account for 88 percent of travel within the Study Area. These trips are made frequently, and are usually shorter distance trips than commuter travel. These types of short trips between the trip generator/attractors along MD 355 represent the largest potential market for a BRT service along the corridor, with potential to reduce vehicle travel significantly and help to shape land use changes in the areas that are planned for redevelopment. By reducing vehicle travel and providing more transportation options for these short local trips, improvements could be realized in urban form, the pedestrian environment, parking needs, and safety.

Appendix A.1: Corridor Ride On Service Detail

Figure A.1-1: Corridor Ride On Service Maps




Montgomery Village
Redland
Aspen Hill
Germantown
North Potomac
Potomac
Snouffers School Rd.
Montgomery Village Ave.
Girard St.
S. Frederick Ave.
Frederick Rd.
Research Blvd.
Maryland Ave.
To Bethesda ----->
Quince Orchard Rd.
Clopper Rd.
Germantown Rd.
Wootton Pkwy.
Darnestown Rd.
Service Layer Credits: © Harris Corp, Earthstar Geographics LLC Earthstar Geographics SIO © 2015 Microsoft Corporation
bing
Montgomery Count - Ride On Routes/ Proximity to Md 355
Route # 56 59 54 57 61 100 58 70
Potential BRT Station Locations
Potential BRT Alignment
Maryland Rt 355
Ride On Bus Routes
(Map 3 of 4)
N
0 0.375 0.75 1.5 Miles
Regional Map


Education Blvd.
Washington Grove
S Frederick Ave.
Shady Grove Rd.
Redland
Redland Rd.
Darnestown
Great Seneca Hwy.
Too Poolsville
Darnestown Rd
Gaithersburg
King Farm Blvd.
Gaither Rd.
Shady Grove Rd.
Darwood
Gude Dr.
W Gude Dr.
Hungerford Dr.
Mountain View Estates
Mudy Branch Rd.
Aspen Hill
Mannakee St.
Great Seneca Hwy.
Research Blvd.
North Potomac
Rockville
Rockville Metro Station
W. Montgomery Ave.
Dufief Mill Rd.
Shady Grove Rd.
Lakewood Estates
Travilah Rd.
Travilah
Edmonston Dr.
Service Layer Credits: Image courtesy of USGS Earthstar Geographics SIO © 2015 Microsoft Corporation
bing
Montgomery Count - Ride On Routes/ Proximity to Md 355
Route # 67 43 66 63 76
Potential BRT Station Locations
Potential BRT Alignment
Maryland Rt 355
Ride On Bus Routes
(Map 1 of 4)
0 0.25 0.5 1 Miles
Regional Map

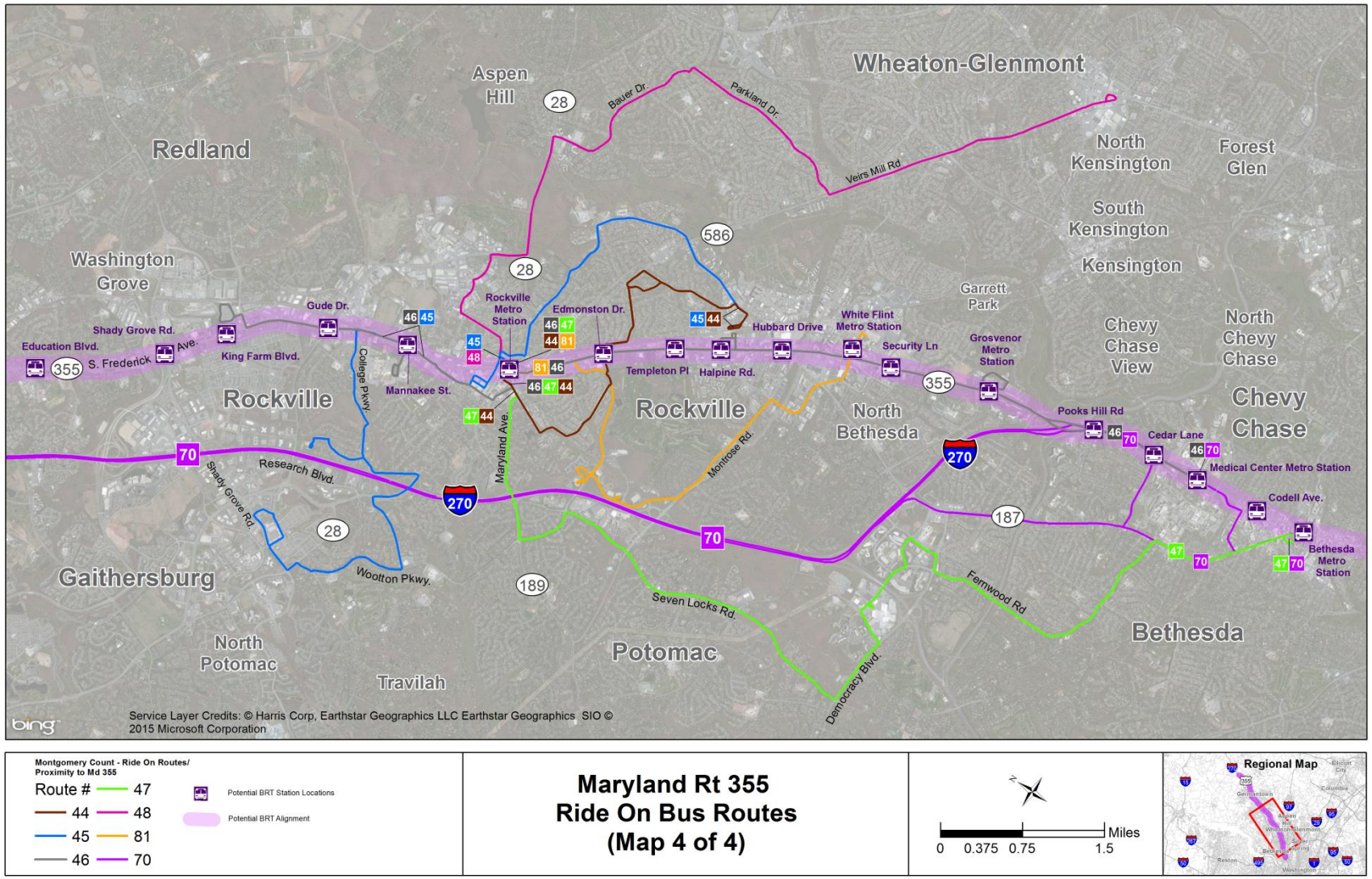

Wheaton-Glenmont
Aspen Hill
Redland
North Kensington
Forest Glen
South Kensington
Kensington
Washington Grove
Garrett Park
Chevy Chase View
North Chevy Chase
Chevy Chase
Rockville
North Bethesda
Gaithersburg
North Potomac
Travilah
Potomac
Bethesda
Bauer Dr.
Parkland Dr.
Veirs Mill Rd
Gude Dr.
Shady Grove Rd.
Education Blvd.
S. Frederick Ave.
King Farm Blvd.
College Pkwy.
Mannakee St.
Rockville Metro Station
Edmonston Dr.
Templeton Pl
Halpine Rd.
Hubbard Drive
White Flint Metro Station
Security Ln
Grosvenor Metro Station
Pooks Hill Rd
Cedar Lane
Medical Center Metro Station
Codell Ave.
Bethesda Metro Station
Maryland Ave.
Montrose Rd.
Research Blvd.
Shady Grove Rd.
Wootton Pkwy.
Seven Locks Rd.
Fernwood Rd
Democracy Blvd.
28
586
355
70
270
187
189
47
Service Layer Credits: © Harris Corp, Earthstar Geographics LLC Earthstar Geographics SIO © 2015 Microsoft Corporation
bing
Montgomery Count - Ride On Routes/ Proximity to Md 355
Route # 47 44 48 45 81 46 70
Potential BRT Station Locations
Potential BRT Alignment
Maryland Rt 355
Ride On Bus Routes
(Map 4 of 4)
N
0 0.375 0.75 1.5 Miles
Regional Map

Table A.1-1: Corridor Ride On Service Characteristics

Route	Direction	Routing	AM Peak Buses/ Hour	Mid-day Buses/ Hour
RO 75	SB	MC Correction Facility to GT Transit Center predominantly on MD 355	4	4
RO 75	NB	GT Transit Center to MC Correctional Facility predominantly on MD 355	3	4
RO 55	SB	Pattern #1 - Germantown Transit Center to Rockville Metro predominantly via MD 355 (serves Lake Forest TC)	5	3
RO 55	SB	Pattern #2 – Lake Forest TC to Rockville Metro predominantly via MD 355	n/a – all trips full length	2
RO 55	NB	Pattern #1 – Rockville Metro to Germantown Transit Center predominantly via MD 355 (serves Lake Forest TC)	4	2
RO 55	NB	Pattern #2 – Rockville Metro to Lake Forest TC via MD 355	n/a – all trips full length	3
RO 46	SB	Montgomery College to Medical Center Metro via MD 355 (early morning trips start at Shady Grove)	4	4
RO 46	NB	Medical Center Metro to Montgomery College via MD 355 (late evening trips run to Shady Grove)	3	4
RO 79	SB	Clarksburg Town Center to Shady Grove Metro via Ridge Road, I-270, I-370	2	No service
RO 79	NB	Shady Grove Metro to Clarksburg Town Center via I-370, I-270, and Ridge Road	No service	No service
RO 61	SB	GT Transit Center to Shady Grove Metro via Germantown Rd, Clopper Rd. (crosses 355)	3	2
RO 61	NB	Shady Grove Metro to GT Transit Center via Germantown Rd, Clopper Road (crosses 355)	2	2
RO 83	SB	Milestone Center to GT MARC Station via GT Transit Center (local circulator)	2	2
RO 83	NB	GT MARC Station to Milestone Center via GT Transit Center (local circulator)	2	2
RO 70	SB	Milestone Center P&R to Bethesda Metro via 270 (express)	4	No Service
RO 70	NB	Bethesda Metro to Milestone Center P&R via 270 (express)	4	No Service

Route	Direction	Routing	AM Peak Buses/ Hour	Mid-day Buses/ Hour
RO 74	SB	Germantown TC to Shady Grove Metro via Great Seneca Highway, I-370	2	2
RO 74	NB	Shady Grove Metro to Germantown TC via I-370, Great Seneca Highway	2	2
RO 71	SB	Kingsview P&R (GT) to Shady Grove Metro via Dawson Farm, Clopper Road, I-270, I-370 (express)	2	No Service
RO 71	NB	Shady Grove Metro to Kingsview P&R via I-370, I-270, Clopper Road, Dawson Farm (express)	No Service	No Service
RO 78	SB	Kingsview P&R (GT) to Shady Grove Metro via Richter Farm, Clopper Road, I-270, I-370 (express)	2	No Service
RO 78	NB	Shady Grove Metro to Kingsview P&R via I-370, I-270, Clopper Road, Richter Farm (express)	No Service	No Service
RO 100	SB	Germantown Transit Center to Shady Grove Metro via I-270 (express)	9	4
RO 100	NB	Shady Grove Metro to Germantown Transit Center via I-270 (express)	9	4
RO 57	SB	Lake Forest TC to Shady Grove Metro via E. Diamond, Muncaster Mill, Redland Rd.	3	3
RO 57	NB	Shady Grove Metro to Lake Forest TC via Redland Rd., Muncaster Mill, E. Diamond	2	3
RO 58	SB	Lake Forest TC to Shady Grove Metro via Montgomery Village, Muncaster Mill, Shady Grove	2	2
RO 58	NB	Shady Grove Metro to Lake Forest TC via Shady Grove, Muncaster Mill, Montgomery Village	2	2
RO 76	EB	Pattern #1 - Poolesville to Shady Grove Metro via Darnestown Road, I-370	2	No Service
RO 76	EB	Pattern #2 – Quince Orchard to Shady Grove Metro via I-370	2	2
RO 76	WB	Pattern #1 – Shady Grove Metro to Poolesville via I-370, Darnestown Road	1	No Service
RO 76	EB	Pattern #2 – Shady Grove Metro to Quince Orchard via I-370	1	2

Route	Direction	Routing	AM Peak Buses/ Hour	Mid-day Buses/ Hour
RO 66	EB	Traville Transit Center to Shady Grove Metro via Research, Redland Blvd. (paired with RO 67)	No Service	No Service
RO 66	WB	Shady Grove Metro to Traville Transit Center via Redland. Research (paired with RO 67)	2	No Service
RO 67	EB	Traville Transit Center to Shady Grove Metro via Travillah, Dufief, Muddy Branch, Sam Eig	2	No Service
RO 67	WB	Shady Grove Metro to Traville Transit Center via Sam Eig, Muddy Branch, Dufief, Travillah	No Service	No Service
RO 43	SB	Shady Grove Metro Station to Traville Transit Center via Shady Grove Road	3	2
RO 43	NB	Traville Transit Center to Shady Grove Metro Station via Shady Grove Road	3	2
RO 54	SB	Lake Forest TC to Rockville Metro via Muddy Branch, Research Blvd., Montgomery Avenue	3	2
RO 54	NB	Rockville Metro to Lake Forest TC via Montgomery Avenue, Research Blvd., Muddy Branch	3	2
RO 56	SB	Lake Forest TC to Rockville Metro via Montgomery Village Ave., Quince Orchard, Darnestown Rd.	2	3
RO 56	NB	Rockville Metro to Lake Forest TC via Darnestown Rd, Quince Orchard, Montgomery Village Ave.	3	2
RO 59	SB	Montgomery Village to Rockville Metro via Lake Forest TC, MD 355, Shady Grove Metro, Gude	4	2
RO 59	NB	Rockville Metro to Montgomery Village via Gude, Shady Grove Metro, MD 355, Lake Forest TC	2	3

Route	Direction	Routing	AM Peak Buses/ Hour	Mid-day Buses/ Hour
RO 63	SB	Shady Grove Metro to Rockville Metro via W. Gude, Research Blvd., W. Montgomery Ave.	2	2
RO 63	NB	Rockville Metro to Shady Grove Metro via W. Montgomery, Research Blvd., W. Gude	2	2
RO 44	SB	Rockville Metro to Twinbrook Metro via Monroe St., Edmonston Dr., Broadwood, Ardennes	2	No Service
RO 44	NB	Twinbrook Metro to Rockville Metro via Ardennes, Broadwood, Edmonston Dr., Monroe St.	2	No Service
RO 45	EB	Pattern #1 - Rockville Regional TC to Twinbrook Metro via Wooton Pkwy, Hurley Ave, College Pkwy, MD 355, Rockville Metro, Balto Rd, Twinbrook	2	2
RO 45	EB	Pattern #2 – Rockville Metro to Twinbrook Metro via Baltimore Road, Twinbrook	2	No Service
RO 45	WB	Pattern #1 – Twinbrook Metro to Rockville Regional TC via Twinbrook, Balto Rd, Rockville Metro, MD 355, College Pkwy, Hurley Ave., Wooton Pkwy.	2	2
RO 45	WB	Pattern #2 – Twinbrook Metro to Rockville Metro via Twinbrook, Baltimore Road	2	No Service
RO 81	SB	Rockville Metro to White Flint Metro via MD 355, Wooton Parkway, Montrose Road	2	No Service
RO 81	NB	White Flint Metro to Rockville Metro via Montrose Road, Wooton Parkway, MD 355	2	No Service
RO 47	SB	Rockville Metro to Bethesda Metro via Seven Locks, Montgomery Mall, Fernwood, Greentree	2	2
RO 47	NB	Bethesda Metro to Rockville Metro via Greentree, Fernwood, Montgomery Mall, Seven Locks	2	2

Appendix A.2: Land Use Forecasts (2014 and 2040)

All land use estimates are based on the MWCOG Round 8.3 Cooperative Land Use Forecasts.

Table A.2-1: 2014 Land Use Estimates

TAZ	District	Households	Population	Total Employment	Industrial Employment	Retail Employment	Office Employment	Other Employment
630	1	358	986	2,946	575	326	1,673	372
631	1	790	2,609	324	5	42	169	108
632	1	814	2,251	508	5	143	248	112
633	1	1,011	2,795	877	15	53	717	92
634	1	1,622	5,165	490	13	105	317	55
635	1	460	1,462	431	29	51	105	246
636	1	1,016	3,146	470	2	63	289	116
637	1	2,174	4,914	9,504	804	2,817	5,340	543
638	1	899	3,036	294	4	30	153	107
639	1	4,312	7,478	8,828	824	1,571	5,782	651
640	1	263	708	30	2	4	21	3
641	1	669	1,546	1,167	96	554	310	207
656	1	702	2,113	498	10	26	264	198
657	1	1,279	4,100	866	17	113	213	523
660	1	1,599	4,629	538	7	53	243	235
661	1	779	2,259	304	9	41	155	99
662	1	3,127	5,753	22,404	1,436	2,048	17,298	1,622
663	1	3,504	6,602	6,370	331	1,074	4,278	687
664	1	202	335	21,899	108	124	9,387	12,280
665	1	1,872	6,845	2,251	44	39	1,545	623
666	1	2,079	6,918	754	35	48	360	311
667	1	2,765	5,954	2,010	74	342	1,052	542
668	1	349	985	240	4	16	39	181
669	1	82	759	11,434	38	131	7,943	3,322
670	1	1,525	4,504	1,021	70	112	627	212
655	2	1,264	4,156	435	11	14	220	190
671	2	596	1,433	89	10	20	44	15
672	2	1,194	3,734	1,392	95	186	954	157
676	2	316	1,255	133	10	40	64	19
677	2	712	2,140	339	19	15	104	201
678	2	642	1,352	16	3	0	12	1
679	2	1,523	4,133	1,769	172	396	776	425
680	2	2,987	5,375	152	1	46	95	10

TAZ	District	Households	Population	Total Employment	Industrial Employment	Retail Employment	Office Employment	Other Employment
681	2	1,119	2,440	335	46	81	51	157
682	2	1,035	3,609	1,337	27	509	660	141
683	2	162	433	215	2	12	31	170
684	2	2,509	6,373	533	7	16	354	156
685	2	97	206	8,633	293	49	6,390	1,901
686	2	1,313	2,631	5,022	235	1,074	3,357	357
687	2	1,830	3,361	9,050	485	2,183	4,122	2,260
688	2	1,712	3,968	2,981	438	770	1,579	194
689	2	1,766	5,302	1,872	449	198	1,126	99
690	2	1,436	3,903	4,728	134	1,673	2,277	644
691	2	830	1,980	6,602	46	2,870	3,305	381
692	2	257	554	1,065	160	346	547	12
693	2	361	822	8,183	607	212	5,716	1,648
694	2	1,787	4,267	784	0	68	512	204
695	2	438	1,045	2,933	0	1,462	1,451	20
696	2	495	1,181	286	0	0	0	286
697	2	2,487	5,928	203	0	9	0	194
698	2	0	0	5,357	0	50	5,307	0
700	2	1,188	4,334	476	4	26	148	298
701	2	882	2,610	434	15	29	214	176
702	2	717	1,657	19,246	579	847	17,121	699
518	3	0	0	1,706	895	217	481	113
519	3	0	15	1,283	206	467	566	44
520	3	0	0	502	33	139	271	59
521	3	232	726	1,375	285	3	840	247
522	3	715	1,890	22	3	2	16	1
523	3	1,262	4,248	622	138	175	208	101
526	3	490	1,513	183	30	4	110	39
527	3	0	0	354	45	219	84	6
528	3	899	2,144	68	0	0	47	21
529	3	0	0	672	13	615	17	27
530	3	768	2,135	5,090	629	168	3,352	941
531	3	0	0	3,081	1,231	425	1,319	106
532	3	65	196	5,649	4,119	61	1,137	332
544	3	2,102	5,043	1,907	0	833	4	1,070
712	3	755	1,892	424	0	0	12	412
713	3	1,818	4,524	1,379	0	71	972	336
714	3	417	976	4,358	0	681	3,088	590

TAZ	District	Households	Population	Total Employment	Industrial Employment	Retail Employment	Office Employment	Other Employment
715	3	1,058	2,508	488	377	11	100	0
716	3	287	754	357	20	306	0	31
717	3	1,583	3,792	9,236	127	1,081	7,116	912
718	3	709	1,713	1,069	0	65	666	338
719	3	1,082	2,588	2,943	175	331	1,950	487
720	3	583	1,391	36	0	0	0	36
721	3	726	1,732	146	38	37	58	13
723	3	630	1,503	81	0	0	25	56
734	3	772	1,716	5,633	0	0	5,317	316
735	3	0	0	4,384	0	399	3,947	38
736	3	1,579	3,766	388	0	331	49	8
737	3	1	10	496	39	155	250	52
738	3	87	220	1,266	0	0	1,244	22
739	3	0	0	3,636	1,024	575	1,786	251
740	3	372	1,021	2,486	1,485	71	351	579
471	4	0	0	1,850	1,241	25	160	424
472	4	746	1,623	30	2	2	25	1
475	4	2,178	6,696	258	11	58	95	94
476	4	826	2,582	458	67	115	199	77
477	4	986	2,638	321	27	118	109	67
478	4	1,047	2,635	229	23	13	113	80
479	4	1,656	4,418	2,182	566	473	757	386
480	4	188	470	5,831	276	44	5,370	140
481	4	8	18	1,396	0	802	441	153
482	4	200	482	2,405	71	1,794	373	166
483	4	0	0	2,714	0	2,714	0	0
484	4	2,002	4,529	547	23	338	97	89
485	4	2,302	5,108	1,560	100	305	861	294
486	4	1,729	4,146	404	7	12	224	161
490	4	1,738	5,801	375	12	38	115	210
512	4	1,628	4,727	449	0	6	31	412
513	4	1,929	5,232	1,634	327	249	258	799
514	4	1,874	3,873	3,228	0	732	2,003	493
515	4	801	2,349	997	123	67	546	261
516	4	283	861	598	482	37	0	79
517	4	194	396	107	16	5	78	8
743	4	1,867	5,409	1,623	29	33	227	1,334
744	4	47	151	1,366	764	12	427	163

TAZ	District	Households	Population	Total Employment	Industrial Employment	Retail Employment	Office Employment	Other Employment
745	4	812	1,830	76	12	2	58	4
446	5	10	30	3	0	3	0	0
450	5	205	563	28	7	0	20	1
451	5	321	806	1,428	601	68	717	42
452	5	2,294	7,424	692	28	442	140	82
453	5	312	1,036	184	58	0	124	2
457	5	144	573	21	1	1	17	2
458	5	660	2,279	4	0	0	3	1
459	5	240	875	401	20	16	97	268
460	5	232	845	29	4	16	8	1
461	5	633	2,318	114	2	7	31	74
462	5	297	923	28	4	0	21	3
463	5	1	3	0	0	0	0	0
465	5	948	2,212	1,805	1,477	28	294	6
466	5	564	1,085	1,975	40	1,606	229	100
467	5	71	159	2,690	252	349	1,939	151
473	5	894	3,440	347	30	89	81	147
474	5	366	1,409	55	9	11	35	0

Table A-2: 2040 Land Use Estimates

TAZ	District	Households	Population	Total Employment	Industrial Employment	Retail Employment	Office Employment	Other Employment
630	1	390	1,080	6,400	4,293	320	1,421	366
631	1	798	2,731	324	5	42	169	108
632	1	990	2,711	639	5	305	225	104
633	1	1,026	2,927	1,461	1	125	1,290	45
634	1	1,718	5,502	490	13	105	317	55
635	1	461	1,511	431	29	51	105	246
636	1	1,107	3,393	470	2	63	289	116
637	1	2,823	6,554	13,485	798	4,179	7,969	539
638	1	1,068	3,399	294	4	30	153	107
639	1	4,412	7,896	10,294	798	1,759	7,092	645
640	1	263	730	30	2	4	21	3
641	1	1,075	2,312	1,199	130	553	310	206
656	1	827	2,401	498	10	26	264	198
657	1	1,495	4,578	866	17	113	213	523
660	1	1,683	4,905	538	7	53	243	235
661	1	939	2,582	304	9	41	155	99

TAZ	District	Households	Population	Total Employment	Industrial Employment	Retail Employment	Office Employment	Other Employment
662	1	4,020	7,559	27,992	1,394	2,281	22,720	1,597
663	1	5,702	10,947	8,063	340	2,368	4,639	716
664	1	202	365	21,899	108	124	9,387	12,280
665	1	1,873	7,067	2,722	44	39	1,545	1,094
666	1	2,080	7,162	754	35	48	360	311
667	1	2,781	6,224	2,046	74	342	1,088	542
668	1	471	1,209	240	4	16	39	181
669	1	82	969	11,434	38	131	7,943	3,322
670	1	1,729	5,113	1,210	61	174	767	208
655	2	1,264	4,396	435	11	14	220	190
671	2	596	1,481	89	10	20	44	15
672	2	1,276	4,200	2,154	147	288	1,477	242
676	2	316	1,316	133	10	40	64	19
677	2	712	2,246	339	19	15	104	201
678	2	642	1,420	16	3	0	12	1
679	2	1,615	4,449	1,829	212	396	796	425
680	2	2,987	5,640	152	1	46	95	10
681	2	1,673	3,850	335	46	81	51	157
682	2	1,315	4,506	1,470	27	509	793	141
683	2	415	1,000	231	2	28	31	170
684	2	2,509	6,686	647	0	0	549	98
685	2	565	1,026	8,773	293	49	6,530	1,901
686	2	5,413	11,200	14,167	274	3,444	9,979	470
687	2	7,099	13,137	17,338	514	3,192	11,375	2,257
688	2	1,712	4,164	3,030	487	770	1,579	194
689	2	2,041	6,441	4,451	718	198	3,436	99
690	2	1,772	5,099	4,983	134	1,830	2,376	643
691	2	3,347	7,368	7,701	46	3,017	3,967	671
692	2	1,489	3,155	2,616	160	568	1,876	12
693	2	2,214	5,266	11,878	851	1,205	7,589	2,233
694	2	1,787	4,267	917	0	68	635	214
695	2	638	1,464	2,961	0	1,490	1,451	20
696	2	695	1,600	286	0	0	0	286
697	2	2,491	5,936	203	0	9	0	194
698	2	100	210	11,090	0	50	10,136	904
700	2	1,193	4,564	476	4	26	148	298
701	2	887	2,758	434	15	29	214	176
702	2	1,576	3,806	22,923	579	1,952	19,693	699

TAZ	District	Households	Population	Total Employment	Industrial Employment	Retail Employment	Office Employment	Other Employment
518	3	0	0	1,706	895	217	481	113
519	3	0	33	1,371	206	555	566	44
520	3	417	874	502	33	139	271	59
521	3	3,790	8,716	1,494	285	108	840	261
522	3	715	1,956	22	3	2	16	1
523	3	1,350	4,698	622	138	175	208	101
526	3	490	1,625	183	30	4	110	39
527	3	500	998	425	42	298	79	6
528	3	899	2,144	68	0	0	47	21
529	3	0	0	672	13	615	17	27
530	3	768	2,338	5,127	633	169	3,377	948
531	3	425	696	3,224	1,350	430	1,337	107
532	3	65	196	5,649	4,119	61	1,137	332
544	3	2,895	6,704	2,733	178	1,166	319	1,070
712	3	762	1,908	434	0	0	12	422
713	3	1,818	4,524	1,559	0	71	972	516
714	3	534	1,222	6,313	0	1,023	4,572	718
715	3	1,471	3,383	488	377	11	100	0
716	3	287	754	821	20	362	408	31
717	3	3,161	7,129	14,516	127	1,441	11,260	1,688
718	3	709	1,713	1,259	0	65	856	338
719	3	1,082	2,588	4,198	175	331	1,950	1,742
720	3	583	1,391	1,201	0	0	895	306
721	3	726	1,732	1,346	38	37	58	1,213
723	3	630	1,503	81	0	0	25	56
734	3	1,784	3,876	8,727	0	45	8,366	316
735	3	100	210	5,587	0	435	5,114	38
736	3	1,579	3,766	388	0	331	49	8
737	3	1	10	596	39	255	250	52
738	3	87	220	1,266	0	0	1,244	22
739	3	0	0	3,662	1,035	578	1,797	252
740	3	372	1,047	2,508	1,498	72	354	584
471	4	0	0	2,804	1,241	25	800	738
472	4	928	2,052	48	2	20	25	1
475	4	2,181	6,566	258	11	58	95	94
476	4	1,520	3,807	680	73	288	230	89
477	4	989	2,716	450	27	247	109	67
478	4	1,048	2,741	229	23	13	113	80

TAZ	District	Households	Population	Total Employment	Industrial Employment	Retail Employment	Office Employment	Other Employment
479	4	1,665	4,480	2,202	571	478	764	389
480	4	1,114	2,553	8,289	404	525	7,017	343
481	4	0	0	1,411	0	812	445	154
482	4	818	2,016	3,490	450	1,658	1,082	300
483	4	0	0	2,738	0	2,738	0	0
484	4	2,003	4,661	547	23	338	97	89
485	4	2,304	5,298	1,580	100	325	861	294
486	4	1,730	4,305	404	7	12	224	161
490	4	1,740	6,035	375	12	38	115	210
512	4	1,689	4,886	459	0	8	32	419
513	4	2,217	5,684	3,140	586	747	895	912
514	4	2,686	5,920	4,495	406	1,233	2,218	638
515	4	1,236	3,442	1,671	277	395	698	301
516	4	286	797	603	486	37	0	80
517	4	194	402	107	16	5	78	8
743	4	2,110	5,869	2,019	90	148	453	1,328
744	4	46	147	1,378	771	12	431	164
745	4	812	1,850	76	12	2	58	4
446	5	560	1,608	3	0	3	0	0
450	5	856	1,629	28	7	0	20	1
451	5	1,248	2,891	1,428	601	68	717	42
452	5	3,000	8,478	1,676	84	918	424	250
453	5	314	1,009	417	56	247	114	0
457	5	144	550	21	1	1	17	2
458	5	2,350	7,583	4	0	0	3	1
459	5	423	1,231	480	24	19	116	321
460	5	232	809	70	4	16	8	42
461	5	707	2,414	114	2	7	31	74
462	5	459	1,364	28	4	0	21	3
463	5	135	211	0	0	0	0	0
465	5	1,173	2,590	3,517	1,477	28	2,006	6
466	5	694	1,223	1,975	40	1,606	229	100
467	5	1,151	2,230	4,649	484	444	3,430	291
473	5	895	3,385	374	32	97	87	158
474	5	366	1,385	55	9	11	35	0

Appendix A.3: MD 355 Level-of-Service (LOS) Summaries

MD 355 LOS Summary Quarter 1 - North

MD 355 LOS Summary by Synchro-HCM - Q1: Professional Dr to MD 121

Intersections	Signal/ Unsignalized	Existing						2040					
		AM			PM			AM			PM		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
MD 355 at MD 121	Signal	D	52.6	0.78	E	56.6	0.86	D	48.6	0.82	E	74.0	0.93
MD 355 at Spire Street	Unsignalized	C	17.9	0.32	C	18.0	0.06	C	20.3	0.37	C	20.0	0.06
MD 355 at Redgrave Place	Unsignalized	C	15.2	0.03	C	21.9	0.15	C	19.2	0.20	**F**	**121.9**	**0.95**
MD 355 at Stringtown Road	Signal	C	32.6	0.63	D	39.2	0.69	D	37.4	0.74	D	44.2	0.86
MD 355 at Shawnee Lane	Unsignalized	E	38.4	0.29	**F**	**55.1**	**0.13**	**F**	**139.0**	**1.11**	**F**	-	-
MD 355 at Clarksburg HS/Foreman Blvd.	Signal	E	77.9	0.73	B	11.7	0.69	C	27.8	0.78	B	10.4	0.77
MD 355 at Little Seneca Parkway	Signal	D	44.1	0.91	C	20.5	0.79	D	53.1	1.05	C	27.9	0.88
MD 355 at W. Old Baltimore Road	Unsignalized	**F**	**348.6**	**1.62**	C	19.7	0.37	**F**	363.1	1.65	C	19.6	0.42
MD 355 at Brink Road*	Unsignalized/Signalized*	B	13.0	0.25	**F**	**287.8**	**1.48**	A	5.6	1.01	D	42.7	1.01
MD 355 at Ridge Road/MD 27	Signal	D	46.6	0.71	E	70.2	0.87	D	48.6	0.78	E	64.6	0.96
MD 355 at Henderson Corner Road	Signal	C	23.3	0.72	D	42.9	0.63	C	23.1	0.77	D	38.2	0.68
MD 355 at Milestone Center	Signal	A	4.4	0.53	A	9.9	0.39	A	6.0	0.57	B	10.1	0.44
MD 355 at Shakespeare Boulevard	Signal	C	22.8	0.64	B	15.9	0.62	C	20.3	0.70	C	25.3	0.69
Shakespeare Blvd at Amber Ridge Dr	Unsignalized	A	8.5	-	C	16.0	-	A	8.7	-	C	18.5	-
Shakespeare Blvd at Observation Dr	Signal	C	23.7	0.16	D	40.0	0.42	C	23.9	0.18	D	36.2	0.42
MD 355 at MD 118	Signal	D	46.7	0.84	E	61.0	0.86	E	64.5	0.94	E	55.1	0.96
MD 118 at Observation Drive	Signal	C	23.1	0.32	D	36.0	0.55	C	22.8	0.38	E	56.9	0.68
MD 118 at Goldenrod Lane	Signal	A	7.5	0.30	C	22.8	0.49	A	9.9	0.50	C	33.4	0.77
MD 355 at Middlebrook Road	Signal	D	44.6	0.89	E	75.8	0.97	D	54.0	0.96	**F**	**102.4**	**1.08**
Middlebrook Rd. at Observation Dr.	Signal	B	13.5	0.45	B	15.5	0.48	B	15.3	0.55	B	17.7	0.58
MD 355 at Blunt Road	Unsignalized	-	-	-	-	-	-	-	-	-	-	-	-
MD 355 at Gunners Br. Rd./Fox Chapel SC	Signal	A	8.4	0.51	C	23.4	0.78	B	11.2	0.55	C	21.5	0.80
MD 355 at Plummer Drive	Signal	A	7.7	0.54	A	7.5	0.49	A	9.6	0.61	A	6.1	0.53

* MD 355 at Brink Road intersection was converted from unsignalized intersection to signalized intersection in the 2040 No Build scenario because unsignalized intersection resulted in significant oversaturation and spillback, which in turn resulted in the failure of the network (vehicles unable to join the network)

MD 355 LOS Summary Quarter 2 – North Central

MD 355 LOS Summary by Synchro-HCM - Q2: Edmonston Dr to Professional Dr

Intersections	Signal/ Unsignalized	Existing						2040					
		AM			PM			AM			PM		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
MD 355 at Professional Drive	Signal	C	21.0	0.76	B	13.2	0.56	B	17.4	0.84	B	13.0	0.63
MD 355 at Spectrum Ave./Travis Ave.	Signal	A	4.1	0.53	B	14.6	0.71	A	7.5	0.70	B	13.8	0.75
MD 355 at Watkins Mill Road	Signal	C	26.2	0.80	C	34.3	0.73	**F**	**120.1**	**1.65**	**F**	**115.7**	**1.39**
MD 355 at IBM/Christopher Avenue	Signal	A	8.0	0.57	C	33.5	0.94	A	9.2	0.63	D	41.0	0.92
MD 355 at Lockheed Martin	Signal	A	4.8	0.57	A	6.7	0.50	A	5.2	0.62	B	12.2	0.58
MD 355 at MD 124	Signal	E	58.1	0.94	**F**	**96.6**	**1.14**	D	45.4	1.01	**F**	**86.4**	**1.22**
MD 355 at Perry Pkwy./Lakeforest Blvd.	Signal	C	28.1	0.60	D	49.8	0.69	C	29.8	0.69	D	43.3	0.81
MD 355 at Odenhal Avenue	Signal	C	21.4	0.74	D	38.1	0.70	C	29.1	0.84	C	33.1	0.80
MD 355 at Chestnut Street	Signal	B	11.9	0.66	B	19.0	0.56	B	15.2	0.76	B	12.8	0.64
MD 355 at Brookes Avenue	Unsignalized	B	10.6	0.06	C	15.8	0.11	B	11.4	0.07	C	18.3	0.14
MD 355 at MD 117 Ramp	Unsignalized	-	-	-	-	-	-	-	-	-	-	-	-
MD 355 at Cedar Ave./Fulks Corner Ave.	Unsignalized	**F**	**331.5**	**1.18**	**F**	**63.5**	**0.53**	**F**	**935.7**	**2.29**	**F**	**163.4**	**1.15**
MD 355 at S. Summit Avenue	Signal	C	20.5	0.51	B	15.2	0.66	C	23.4	0.58	B	13.2	0.77
MD 355 at Education Boulevard	Signal	A	9.7	0.58	A	5.1	0.48	A	9.5	0.66	A	3.7	0.55
MD 355 at Deer Park Road	Signal	C	27.2	0.72	C	34.8	0.71	C	31.4	0.83	C	25.4	0.85
MD 355 at Westland Drive	Signal	C	21.0	0.67	B	16.2	0.57	C	23.7	0.77	B	10.1	0.65
MD 355 at Ramp from WB I-370/Oneill Dr.	Unsignalized	-	-	-	-	-	-	-	-	-	-	-	-
MD 355 at Shady Grove Road	Signal	**F**	**95.6**	**1.21**	E	76.5	0.97	**F**	**120.5**	**1.35**	E	67.4	1.04
MD 355 & Ridgemont Ave/Solid Waste Entr.	Signal	A	10.0	0.75	B	12.9	0.64	A	9.6	0.87	A	9.1	0.74
MD 355 at King Farm Boulevard	Signal	C	20.2	0.79	E	55.4	1.43	D	39.1	1.04	C	24.2	0.95
MD 355 at Redland Road	Signal	E	58.6	0.95	D	41.0	0.90	**F**	**92.8**	**1.14**	E	67.8	1.17
Redland Road at Somerville Dive	Signal	B	14.6	0.43	C	30.3	0.57	B	13.1	0.62	C	28.0	0.79
Redland Road at Redland Extension	Signal	B	18.7	0.69	B	17.0	0.63	E	63.5	1.05	B	16.2	0.63
MD 355 at Watkins Pond Blvd./Indianola Dr.	Signal	D	47.1	0.81	C	22.8	0.65	C	30.1	0.91	C	22.0	0.74
MD 355 at Rockville Corporate Center	Signal	A	1.6	0.68	A	2.7	0.46	A	2.7	0.75	A	2.5	0.53
MD 355 at Gude Drive	Signal	**F**	**81.0**	**1.09**	D	53.5	0.97	**F**	**85.4**	**1.13**	D	50.8	1.00
MD 355 at College Parkway	Signal	A	8.5	0.72	A	9.2	0.55	B	12.7	0.81	A	9.7	0.65
MD 355 at North Campus Drive	Signal	A	7.4	0.76	A	10.0	0.49	B	18.3	0.87	A	7.5	0.58
MD 355 at Mannakee Street	Signal	C	27.6	0.82	B	12.8	0.65	E	56.4	0.96	B	14.4	0.77
MD 355 at Frederick Avenue	Signal	A	2.7	0.54	A	8.9	0.48	A	1.8	0.61	A	6.9	0.56
MD 355 at North Washington Street	Signal	C	20.5	0.65	D	41.5	0.69	B	11.5	0.77	D	37.1	0.80
MD 355 at Hungerford Plaza	Signal	A	3.1	0.46	A	8.9	0.52	A	3.2	0.57	A	6.3	0.60
MD 355 at Beall Avenue	Signal	B	11.5	0.78	B	10.1	0.70	B	10.8	0.94	B	18.9	0.79
MD 355 at Middle Lane/Park Road	Signal	D	36.3	0.82	D	54.8	0.95	D	35.5	0.96	E	64.0	1.13
Metro Station/Parking Lot & Park Road	Unsignalized	A	0.0	-	A	0.0	-	A	0.0	-	A	0.0	-
MD 355 at Monroe Place/Church Street	Signal	B	11.0	0.66	B	12.5	0.67	B	13.8	0.80	B	12.0	0.79
Church Street at Rockville Metro Station	Unsignalized	A	9.3	0.13	B	10.1	0.17	A	9.5	0.15	B	10.3	0.18
MD 355 at MD 28 (E. Jefferson/Veirs Mill)	Signal	C	34.2	0.75	D	38.5	0.77	D	37.6	0.88	D	37.6	0.86
MD 355 at Richard Montgomery Dr./Dodge St.	Signal	B	10.8	0.60	B	10.4	0.54	B	12.1	0.70	B	13.3	0.69
MD 355 at Wootton Parkway/MD 911	Signal	E	70.8	1.03	E	67.1	0.88	**F**	**98.9**	**1.18**	E	78.8	1.00
MD 355 at Edmonston Drive	Signal	C	32.1	1.01	**F**	**83.7**	**1.01**	**F**	**83.0**	**1.24**	**F**	**82.1**	**1.15**

MD 355 LOS Summary Quarter 3 – South Central

MD 355 LOS Summary by Synchro-HCM - Q3: MD 547 to Edmonston Dr

Intersections	Signal/ Unsignalized	Existing						2040					
		AM			PM			AM			PM		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
MD 355 at Country Club Road	Signal	B	12.7	0.70	B	11.5	0.67	B	13.6	0.81	A	5.9	0.79
MD 355 at Templeton Place	Signal	A	10.0	0.74	B	10.4	0.69	B	12.0	0.85	A	7.5	0.81
MD 355 at Congressional Lane	Signal	B	13.2	0.73	C	32.4	0.83	B	14.2	0.85	D	47.3	0.95
MD 355 at Halpine Road	Signal	A	9.9	0.64	B	17.6	0.62	B	19.8	0.81	C	30.6	0.82
Halpine Rd. at Twinbrook Metro Sta.	Unsignalized	B	10.4	-	C	15.2	-	D	25.4	-	**F**	**113.5**	**-**
MD 355 at Bouic Avenue	Unsignalized	B	10.6	0.03	A	9.7	0.05	A	8.9	0.03	B	10.7	0.08
Bouic Ave. at Twinbrook Metro Sta.	Unsignalized	B	11.7	0.07	B	11.6	0.04	C	18.3	0.21	C	17.9	0.12
MD 355 at Rollins Ave./Twinbrook Pkwy.	Signal	C	21.3	0.76	C	33.6	0.87	C	26.0	0.88	C	27.3	0.87
MD 355 at Federal Plaza	Signal	B	12.3	0.55	B	11.9	0.72	B	12.2	0.64	B	13.9	0.74
MD 355 at Bou Avenue	Signal	C	24.5	0.74	B	19.6	0.78	C	32.1	0.86	B	19.4	0.88
MD 355 at Hubbard Drive	Signal	B	13.9	0.73	B	17.2	0.66	B	12.3	0.84	B	19.0	0.75
Montrose Road at Hoya Street	Signal	C	22.8	0.31	C	20.4	0.28	C	23.8	0.34	C	20.7	0.30
Montrose Parkway at MD 355 Ramps	Signal	D	43.6	0.50	D	42.6	0.51	D	41.8	0.58	D	42.7	0.58
MD 355 at Mid-Pike Plaza	Signal	C	28.5	1.09	C	22.5	0.65	C	32.9	1.22	C	20.3	0.82
MD 355 at Old Georgetown Rd./MD 187	Signal	D	45.3	0.85	D	46.6	0.86	E	78.2	1.07	E	63.7	1.05
MD 355 at Marinelli Road	Signal	D	40.9	0.68	C	32.6	0.69	C	26.1	0.87	C	31.3	0.88
MD 355 at Nicholson Lane	Signal	D	39.3	0.70	E	67.7	0.97	D	42.9	0.88	**F**	**93.2**	**1.16**
MD 355 at Security Lane	Signal	A	6.6	0.48	B	10.3	0.62	A	8.2	0.75	B	17.6	0.91
MD 355 at Edson Lane	Signal	C	24.8	0.59	B	15.3	0.68	C	29.1	0.70	B	18.0	0.80
MD 355 at MD 547/Strathmore Road	Signal	C	34.4	0.76	D	49.8	0.97	D	51.9	0.86	E	64.0	1.18

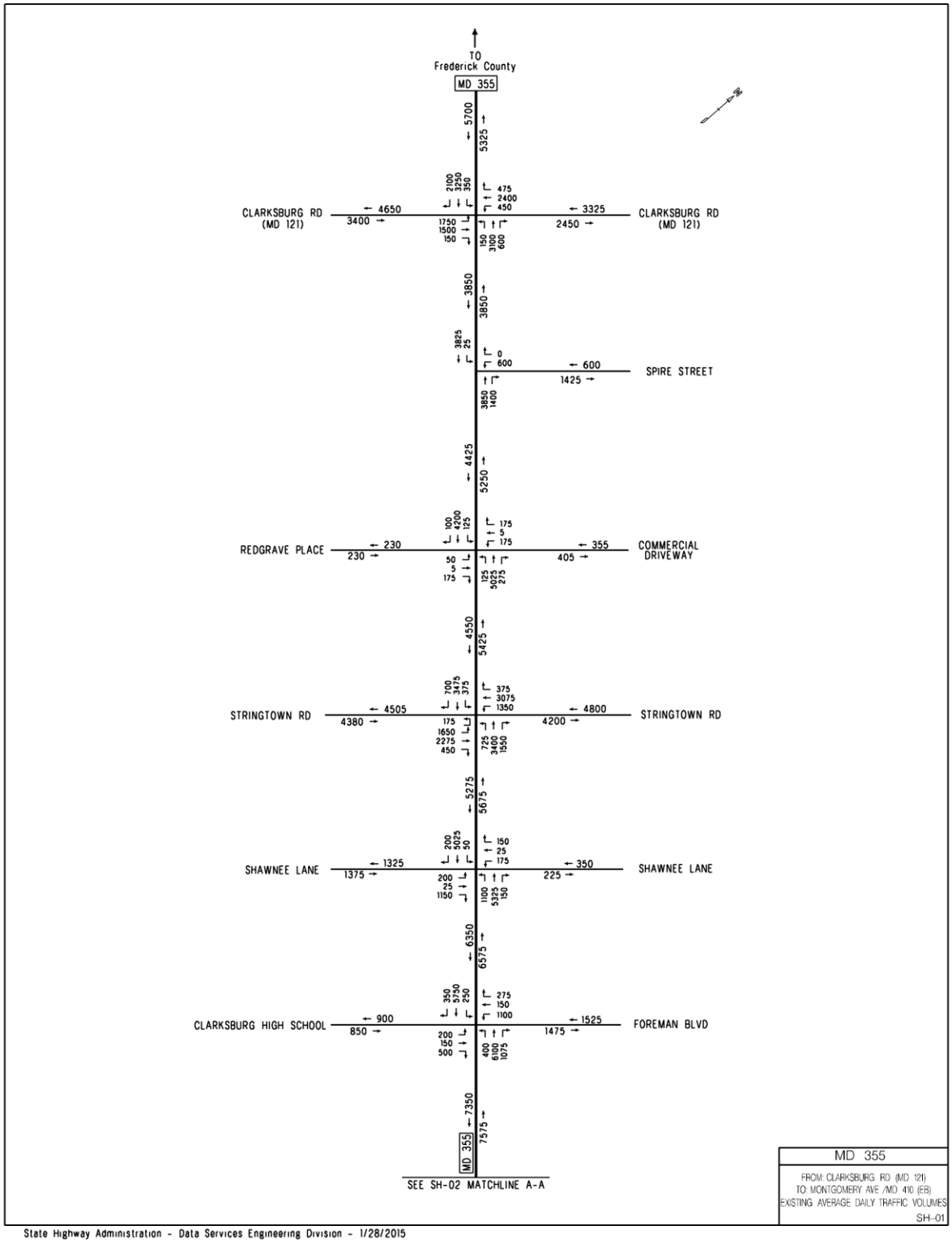
MD 355 LOS Summary Quarter 4 – South

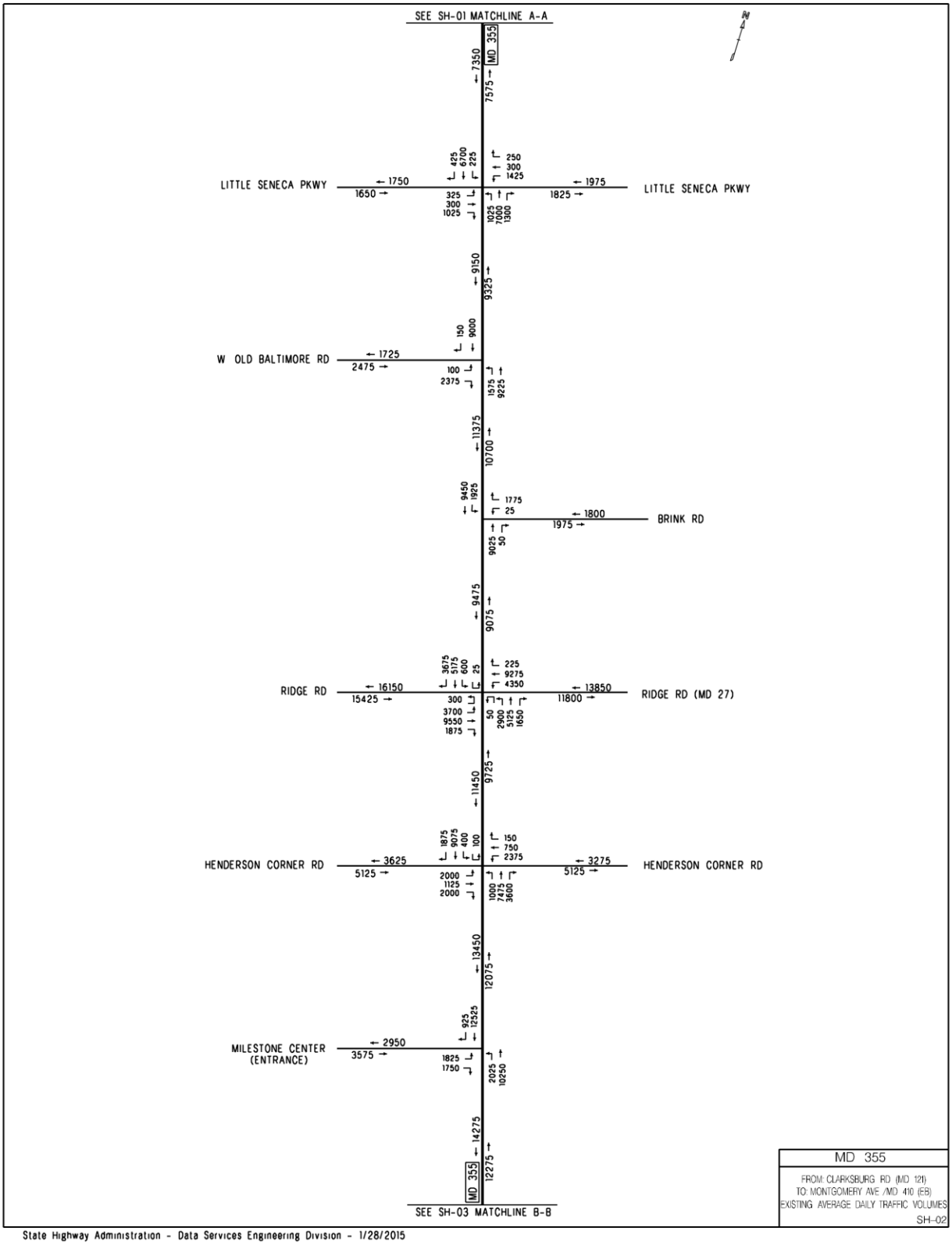
MD 355 LOS Summary by Synchro-HCM - Q4: MD 410 to MD 547

Intersections	Signal/ Unsignalized	Existing						2040					
		AM			PM			AM			PM		
		LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C
MD 355 at Tuckerman Lane (North)	Signal	D	45.1	0.80	E	58.4	0.92	D	43.1	0.85	E	65.7	1.12
Tuckerman Lane at Grosvenor K&R	Unsignalized	A	0.9	0.04	A	0.3	0.26	A	0.9	0.04	A	0.3	0.26
Tuckerman Lane at Grosvenor P&R	Signal	A	3.1	0.24	B	18.0	0.33	A	3.1	0.28	B	18.5	0.35
Tuckerman Lane at Strathmore Hall St.	Unsignalized	B	10.0	-	B	10.5	-	B	10.5	-	B	11.0	-
MD 355 at Tuckerman Lane (South)	Signal	A	8.1	0.57	B	11.7	0.58	A	9.4	0.66	B	12.7	0.68
MD 355 at Grosvenor Lane	Signal	C	29.4	0.85	D	39.3	0.77	E	55.5	1.04	D	43.6	0.92
MD 355 at Ramp from I-495 Inner Loop	Signal	B	14.9	0.63	B	16.1	0.52	B	16.3	0.70	B	18.0	0.59
MD 355 at Pooks Hill Road	Signal	C	24.5	0.72	C	24.6	0.82	C	23.3	0.80	B	11.8	0.93
MD 355 at Alta Vista Road	Signal	B	11.3	0.70	A	8.4	0.79	B	15.7	0.78	B	13.1	0.89
MD 355 at Cedar Lane	Signal	E	61.5	0.90	**F**	**105.1**	**1.11**	C	29.9	0.80	E	61.1	1.03
MD 355 at Wood Road (North)	Signal	A	2.2	0.70	B	19.5	0.71	A	2.3	0.62	B	19.4	0.79
MD 355 at Wilson Drive	Signal	A	3.3	0.68	C	28.6	0.61	A	3.0	0.61	C	26.5	0.68
MD 355 at South Drive/Wood Drive (South)	Signal	B	11.4	0.69	B	19.8	0.71	B	12.3	0.73	C	21.9	0.77
MD 355 at Center Drive/Jones Bridge Road	Signal	D	49.0	0.83	D	54.6	0.80	D	43.1	0.89	D	42.6	0.78
MD 355 at Woodmont Ave./Glenbrook Pkwy.	Signal	A	9.5	0.78	**F**	**98.4**	**0.82**	B	10.4	0.89	D	51.2	0.98
MD 355 at Battery Lane/Rosedale Avenue	Signal	B	19.3	0.63	C	23.9	0.62	C	20.7	0.71	B	13.0	0.74
MD 355 at Cordell Avenue	Signal	A	2.3	0.46	A	3.8	0.38	A	4.0	0.51	A	5.0	0.43
MD 355 at Norfolk Avenue/Cheltenham Drive	Signal	A	7.5	0.51	B	11.5	0.62	A	9.9	0.64	B	13.3	0.78
MD 355 at MD 187/MD 410 (WB)	Signal	D	53.9	0.96	E	56.3	0.95	E	56.4	1.03	D	49.8	1.04
MD 355 at MD 187/MD 410 (EB)	Signal	C	20.1	0.77	C	24.4	0.78	C	32.2	0.85	C	32.2	0.83

Appendix A.4: MD 355 Average Daily Traffic (ADT) and Volume Diagrams

2015 MD 355 ADT Diagrams





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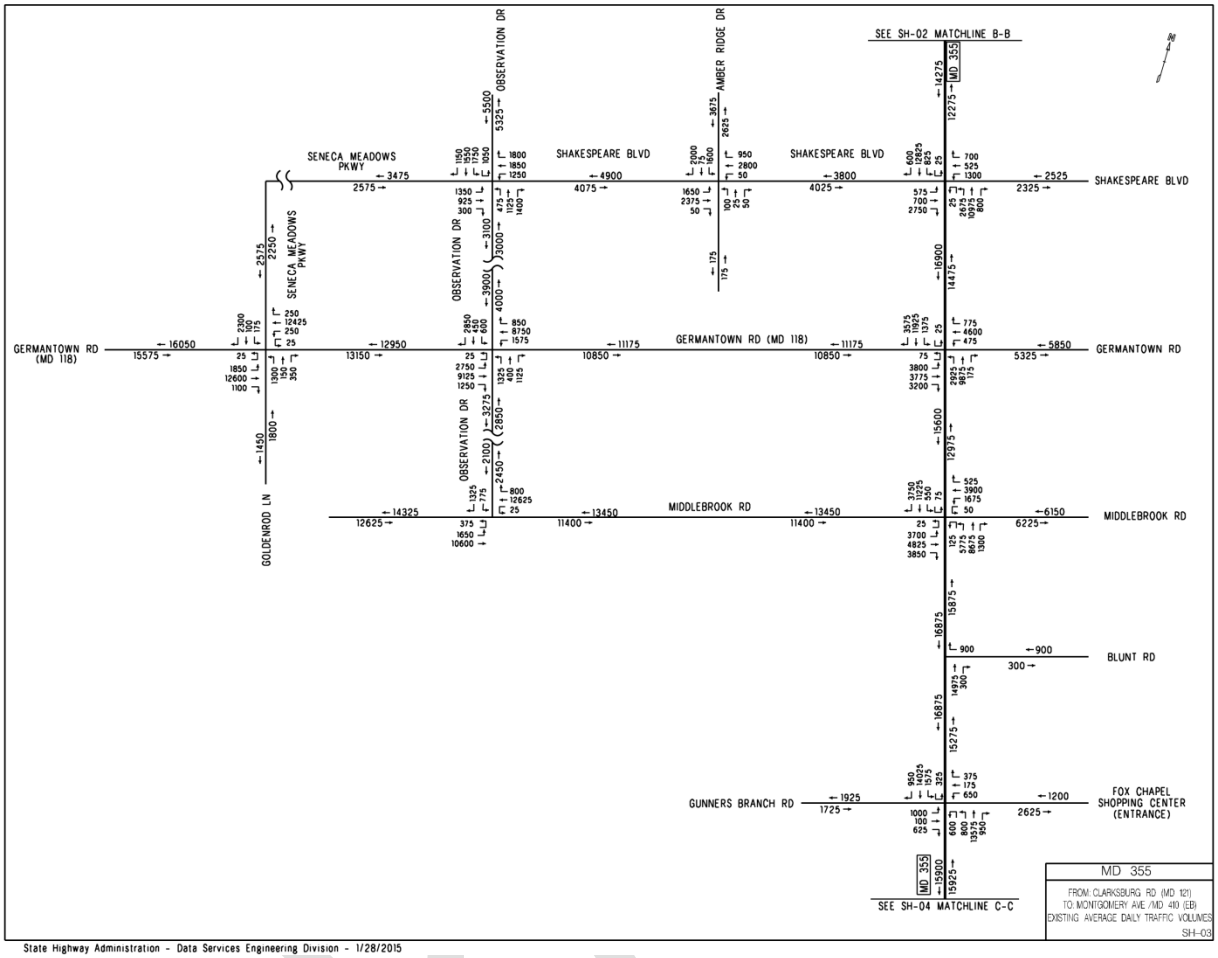
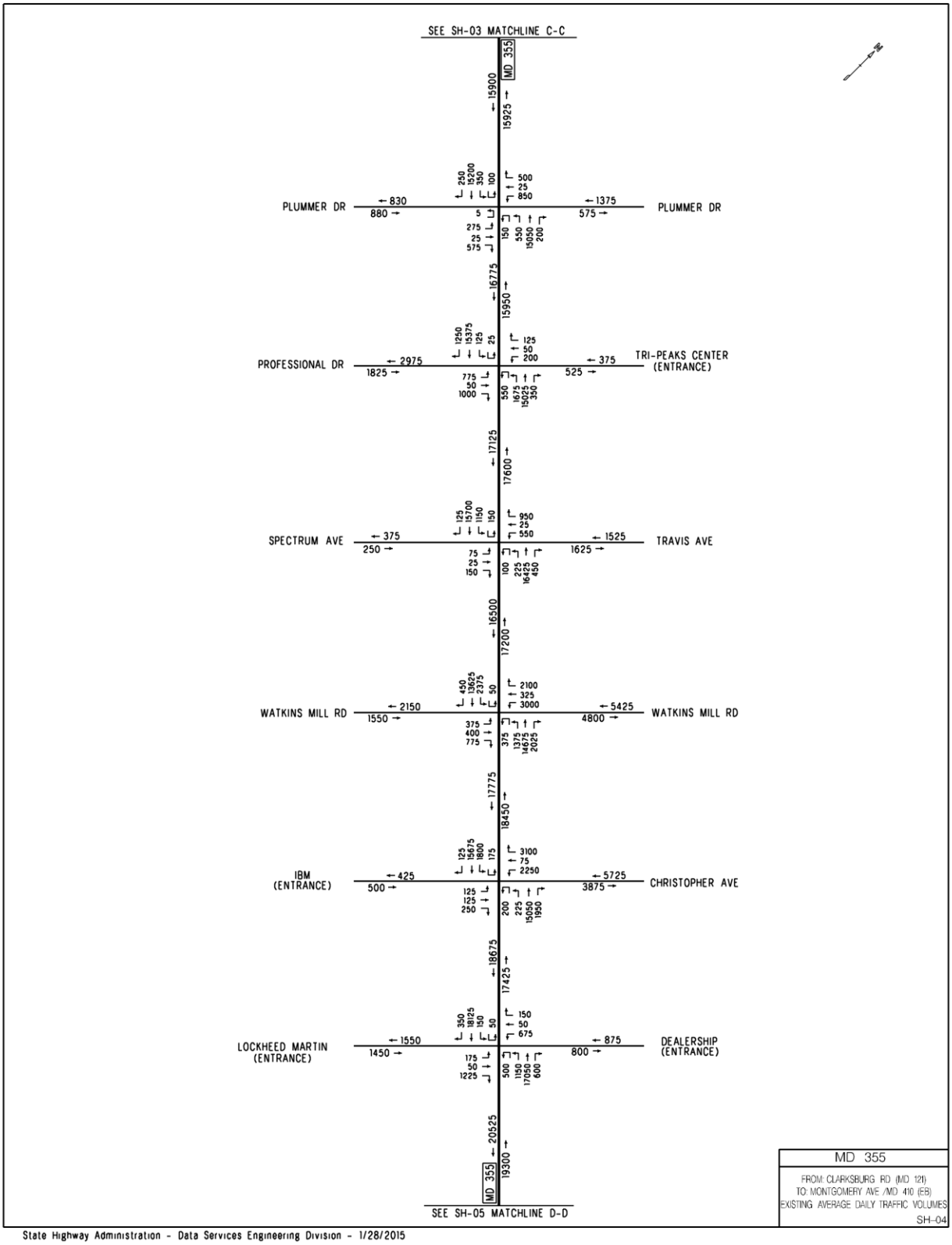

SEE SH-02 MATCHLINE B-B
SENECA MEADOWS PKWY
SHAKESPEARE BLVD
AMBER RIDGE DR
OBSERVATION DR
GERMANTOWN RD (MD 118)
MIDDLEBROOK RD
BLUNT RD
GUNNERS BRANCH RD
FOX CHAPEL SHOPPING CENTER (ENTRANCE)
GOLDENROD LN
MD 355
SEE SH-04 MATCHLINE C-C
MD 355
FROM CLARKSBURG RD (MD 121) TO MONTGOMERY AVE / MD 410 (EB)
EXISTING AVERAGE DAILY TRAFFIC VOLUMES
SH-03
State Highway Administration - Data Services Engineering Division - 1/28/2015



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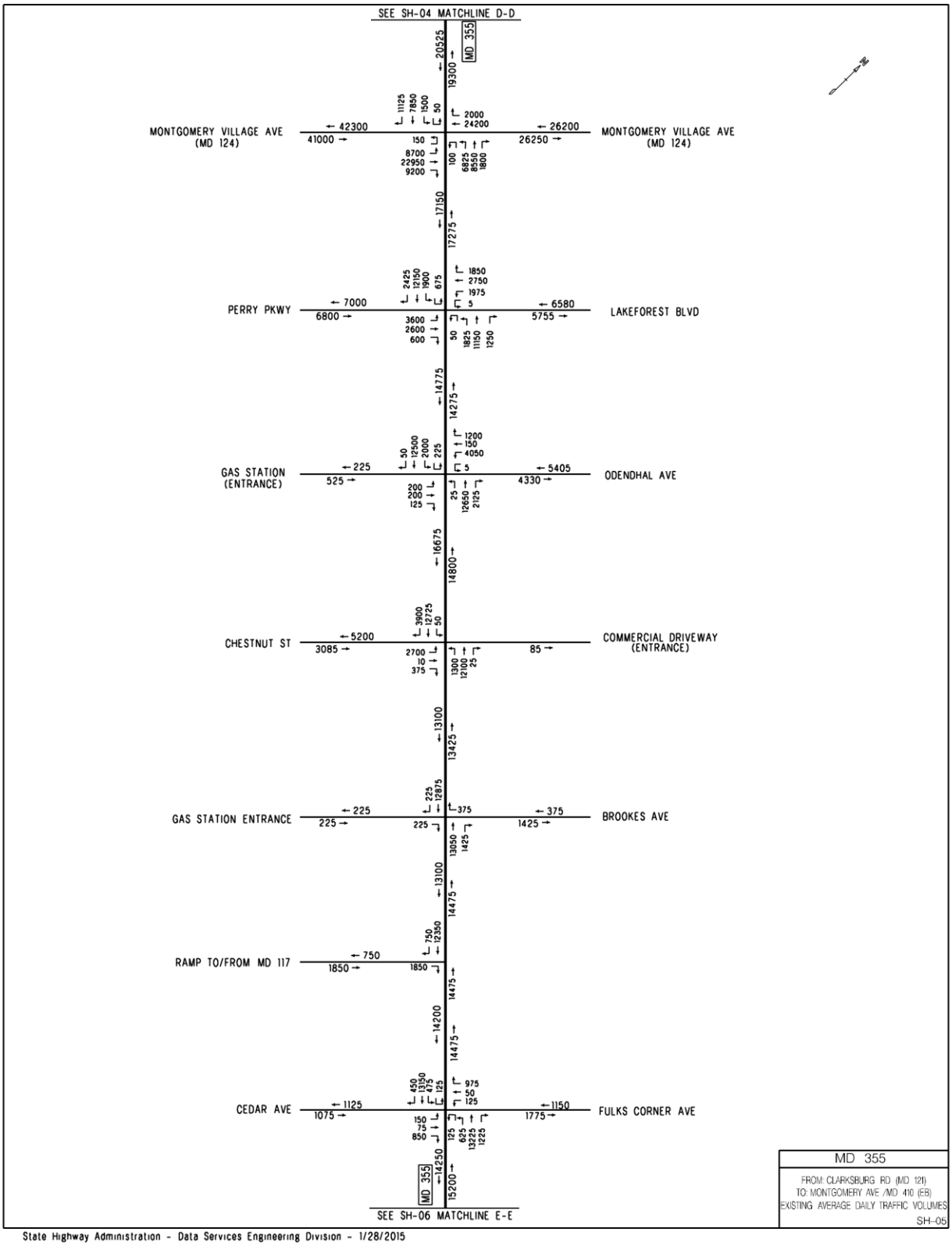

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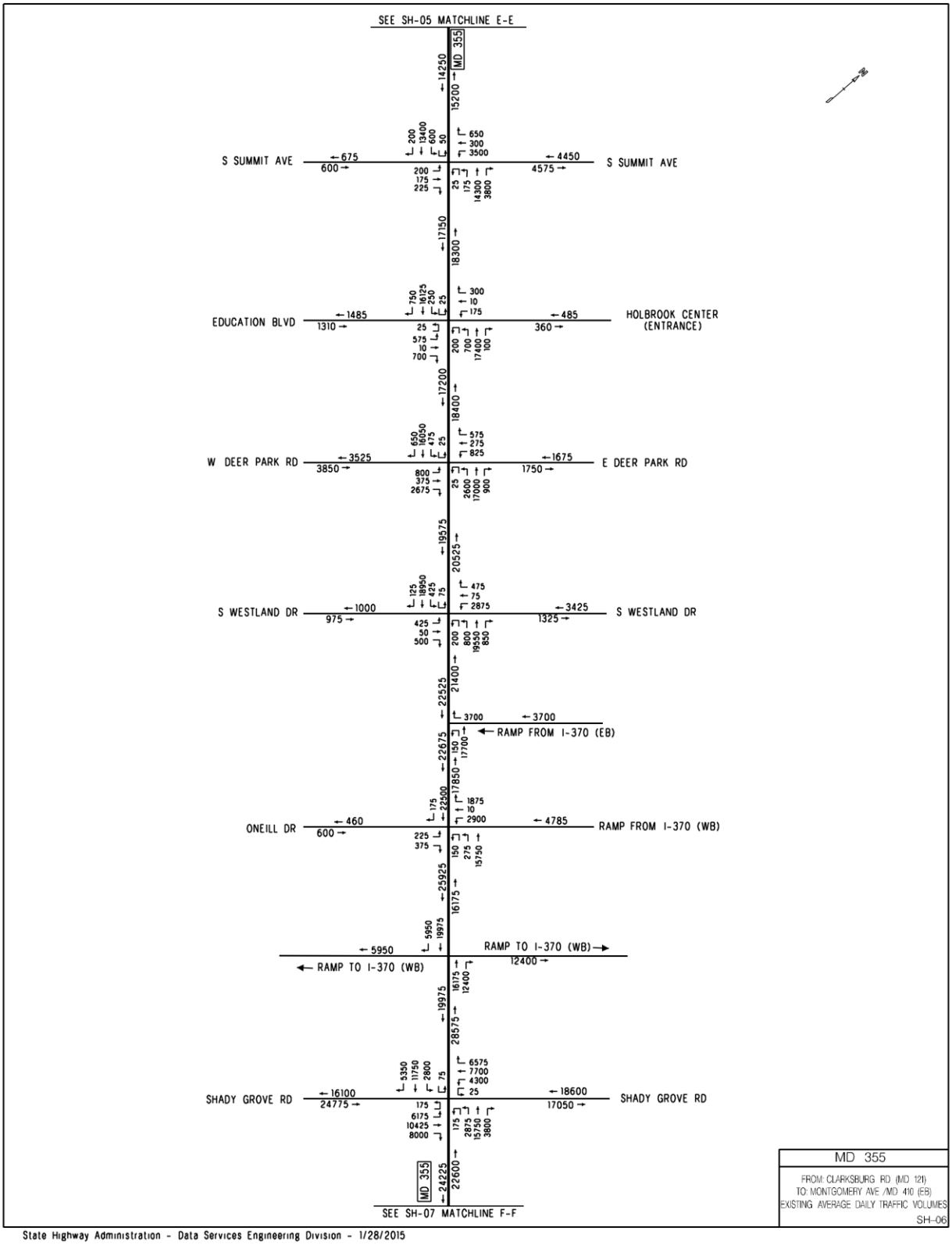

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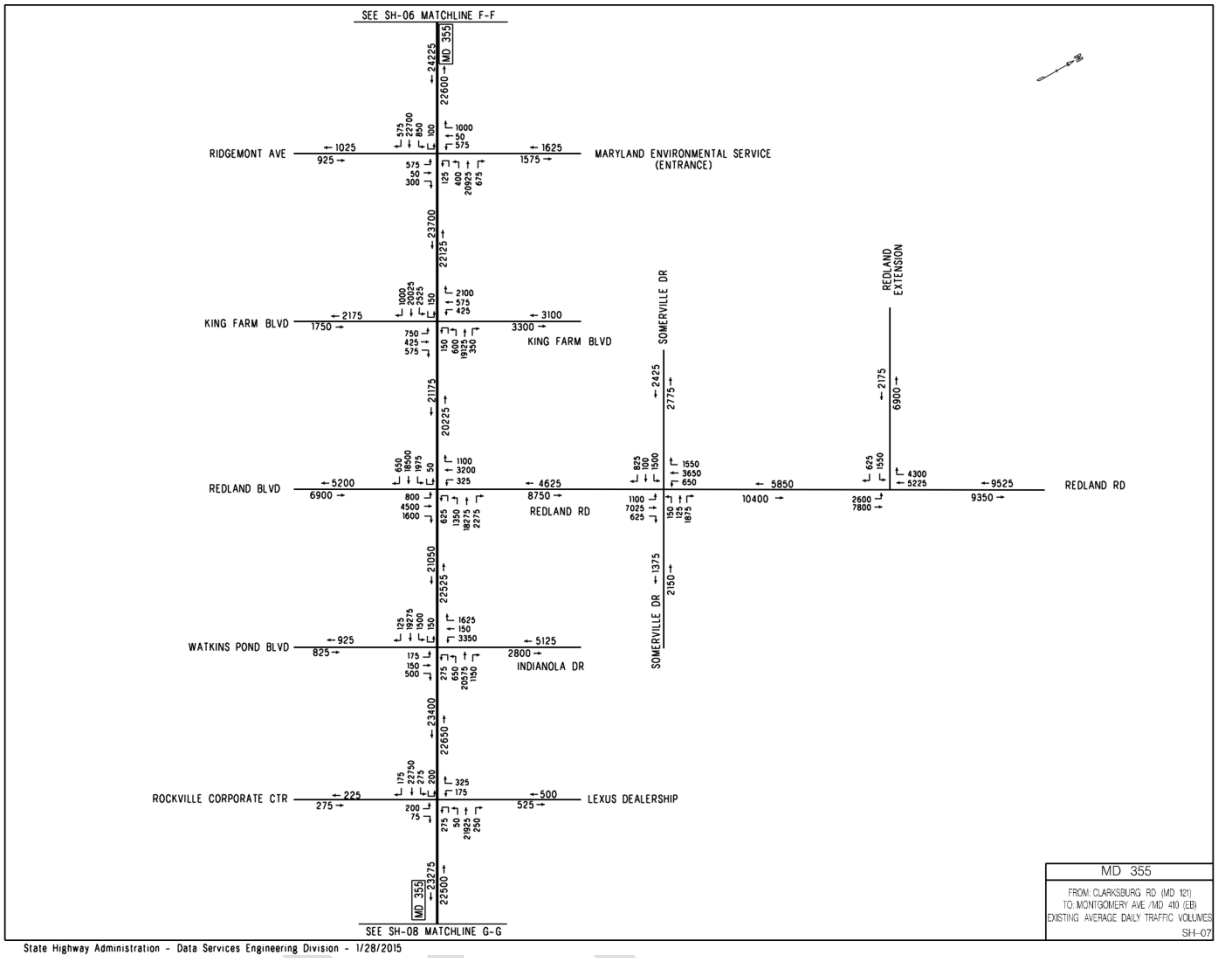

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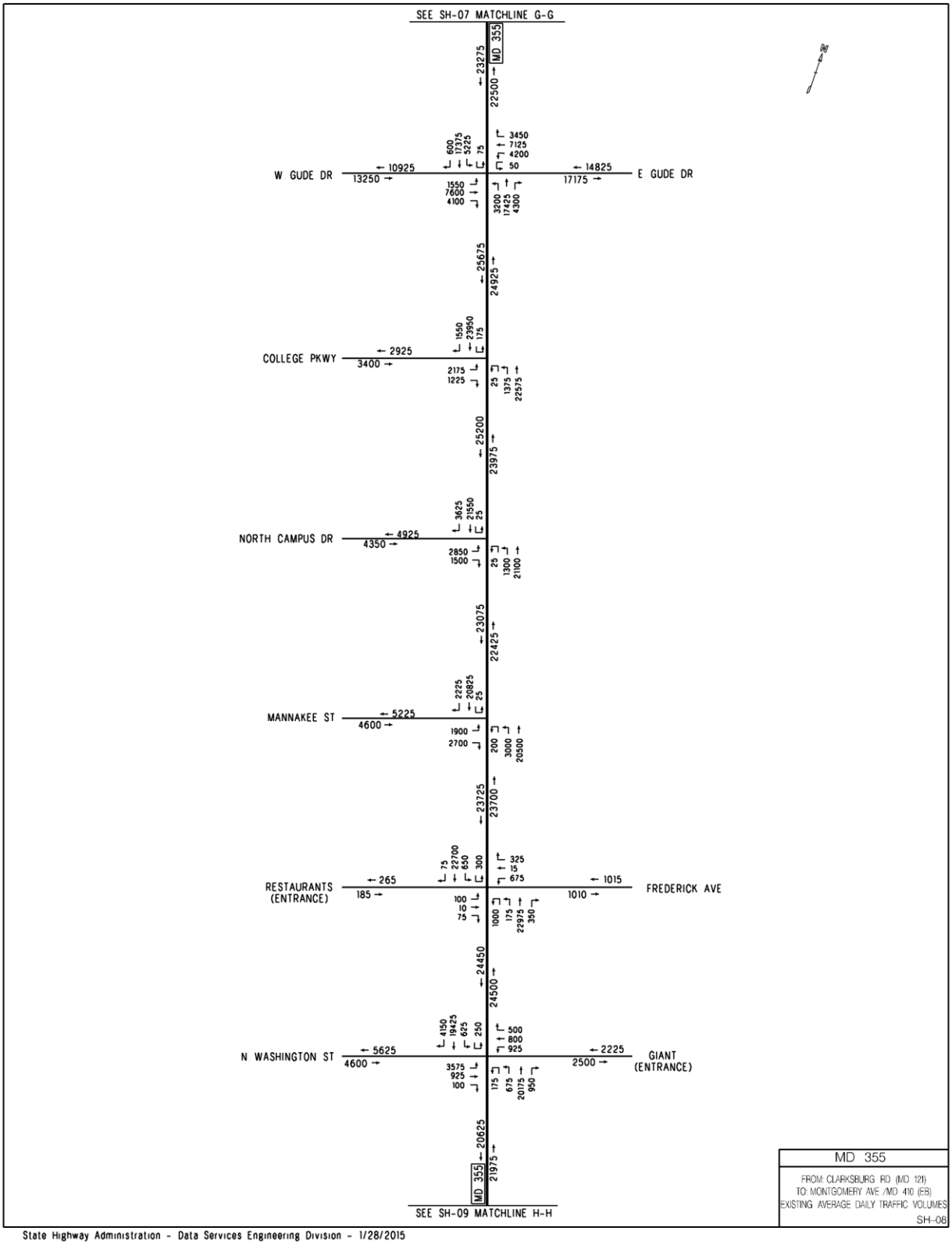
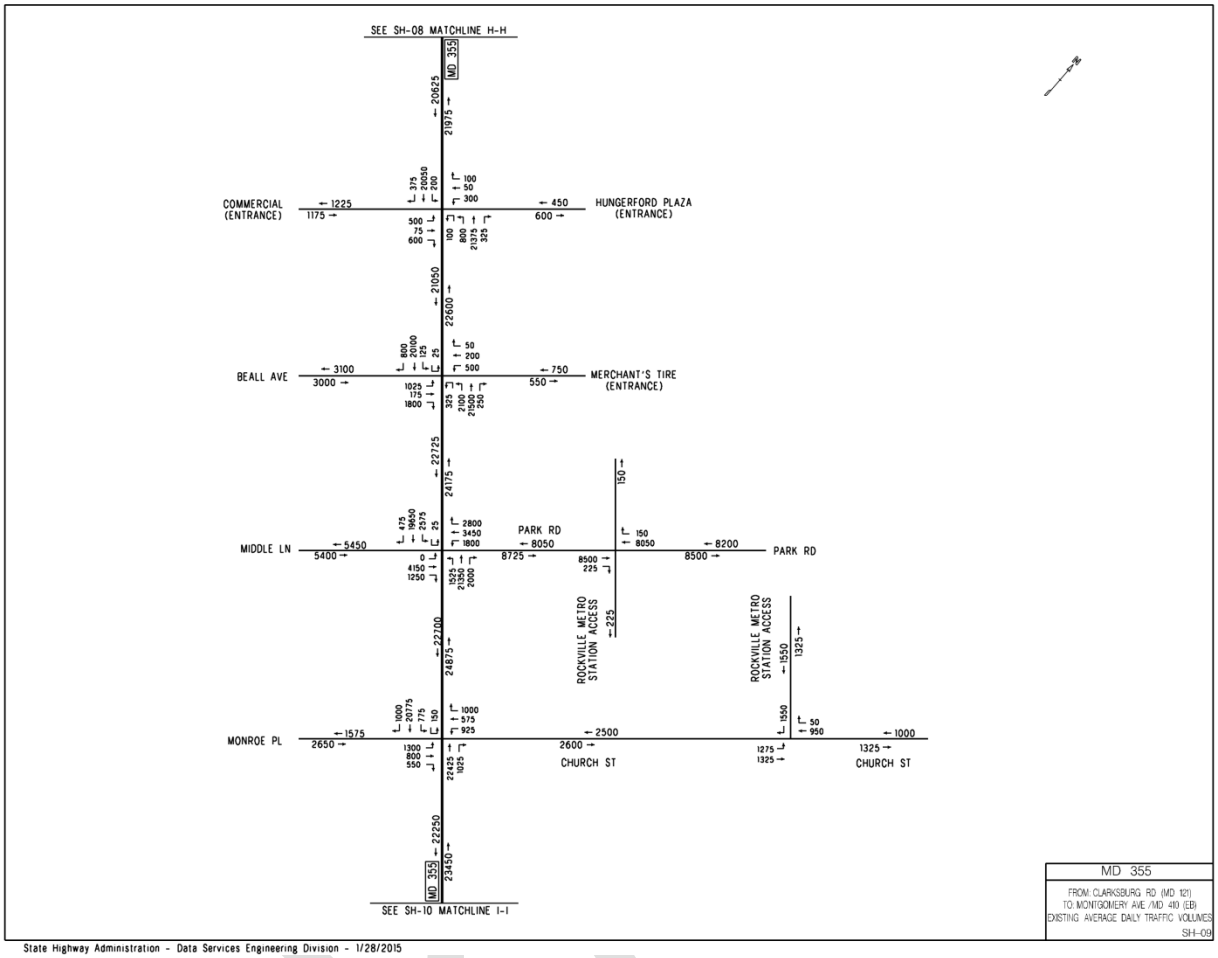
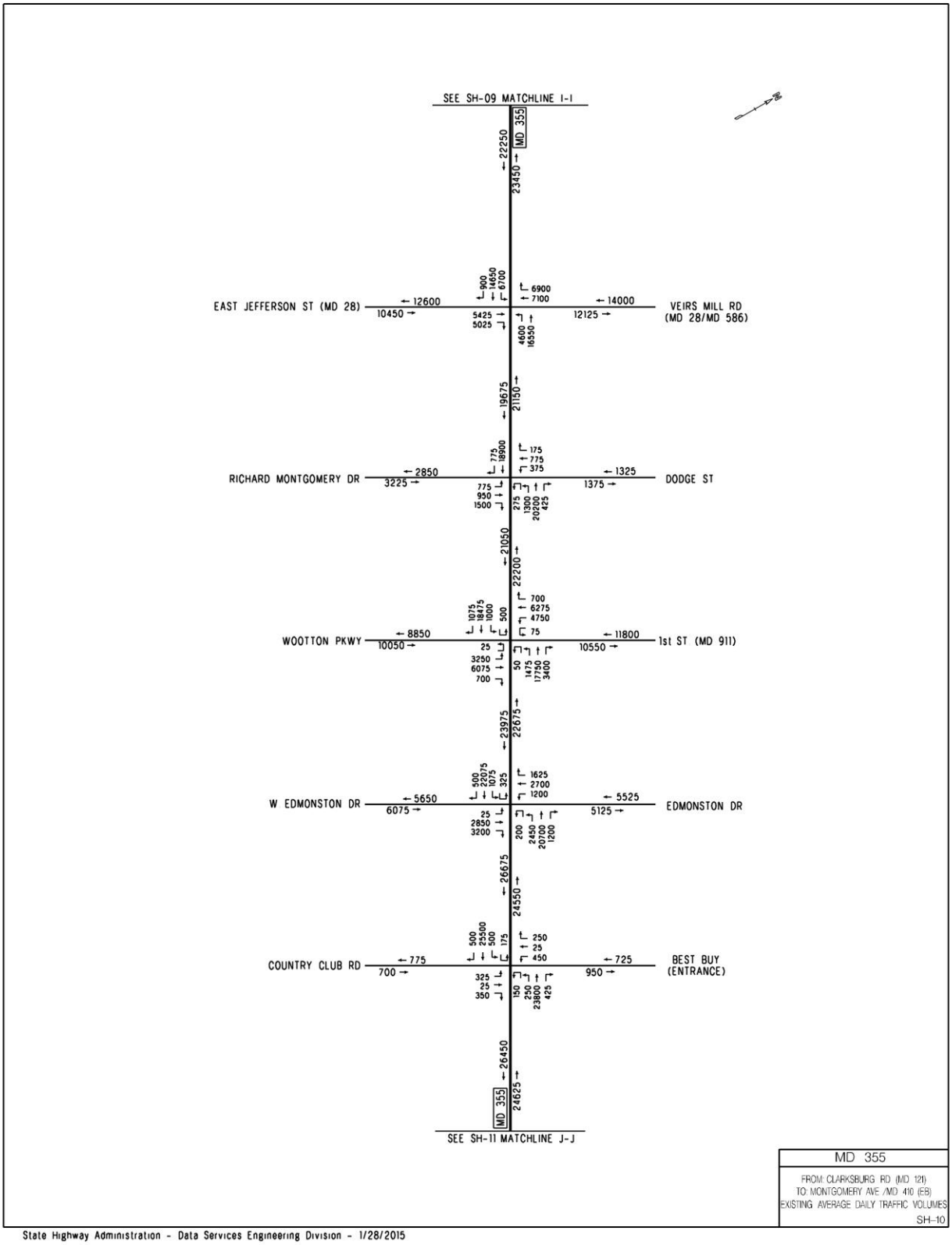
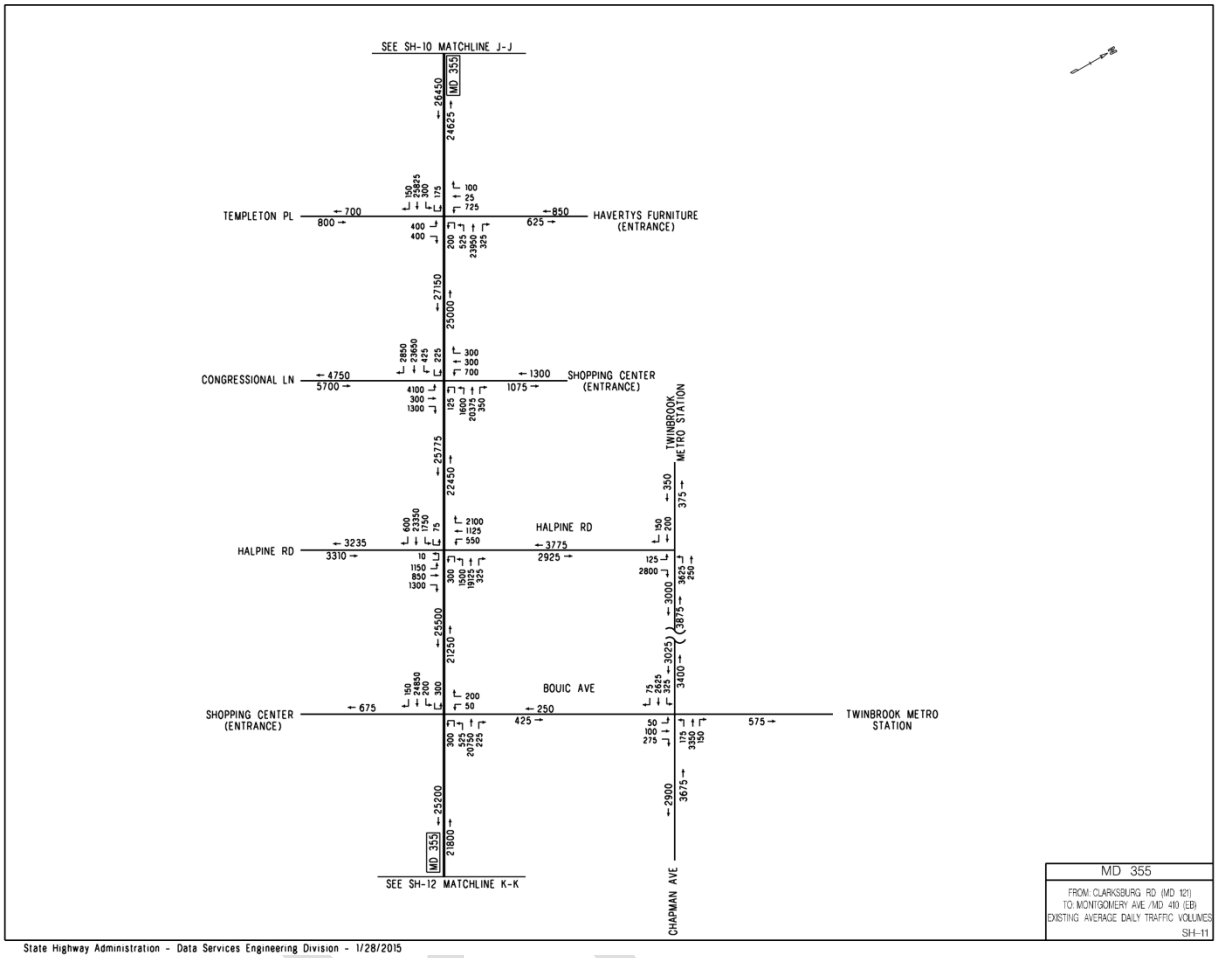
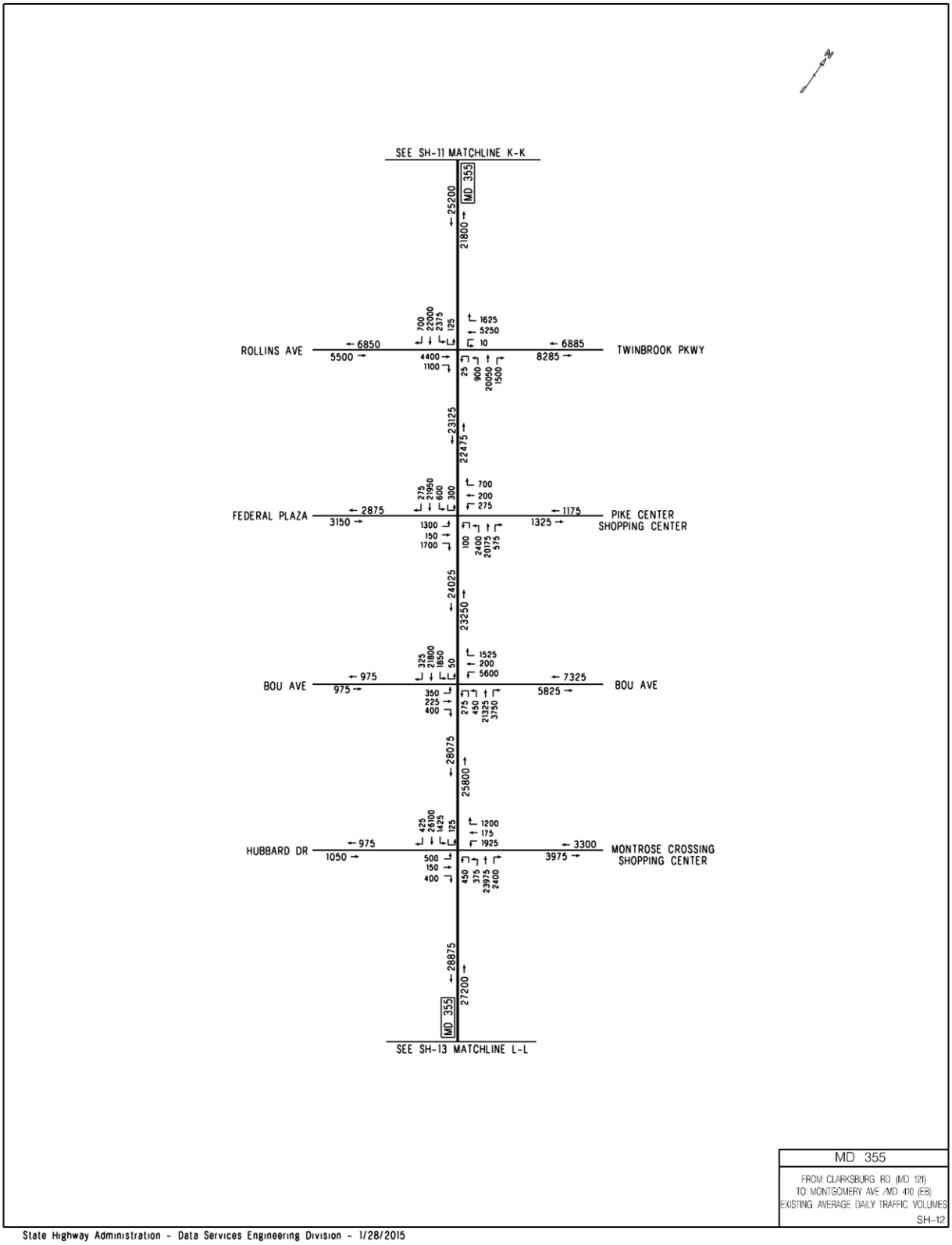
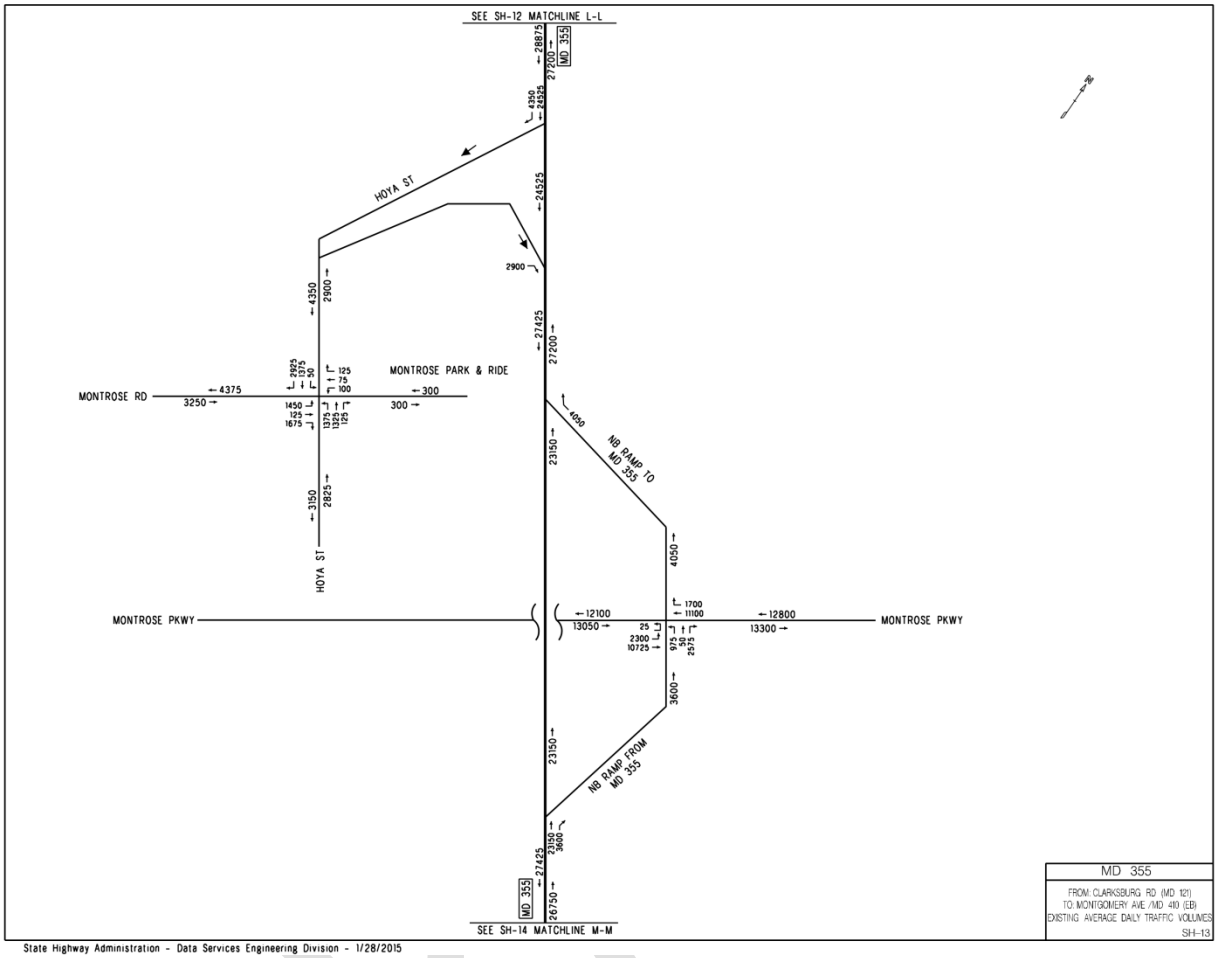

SEE SH-07 MATCHLINE G-G
MD 355
W GUDE DR
E GUDE DR
COLLEGE PKWY
NORTH CAMPUS DR
MANNAKEE ST
RESTAURANTS (ENTRANCE)
FREDERICK AVE
N WASHINGTON ST
GIANT (ENTRANCE)
SEE SH-09 MATCHLINE H-H
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE /MD 410 (EB)
EXISTING AVERAGE DAILY TRAFFIC VOLUMES
SH-08
State Highway Administration - Data Services Engineering Division - 1/28/2015

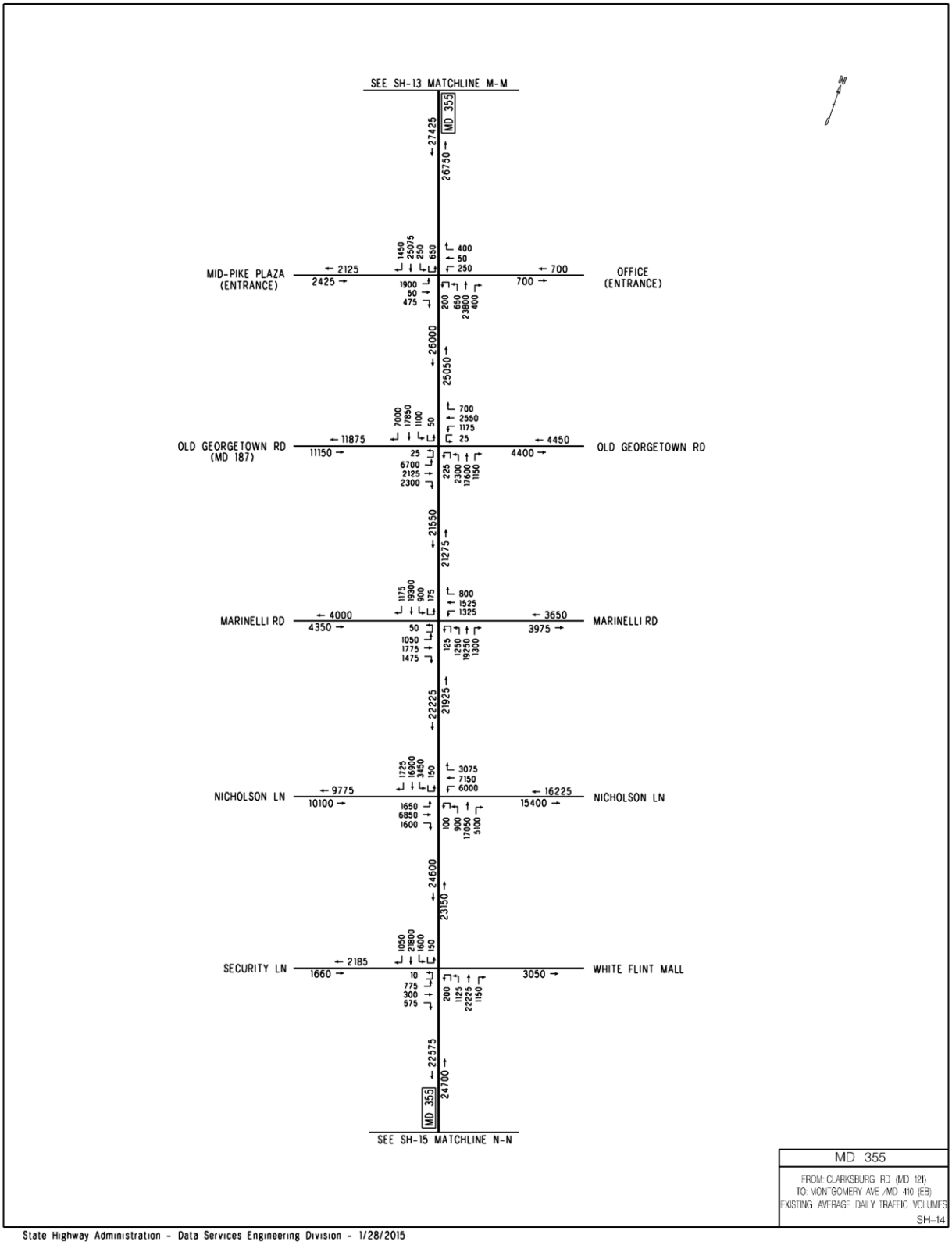

SEE SH-08 MATCHLINE H-H
MD 355
COMMERCIAL (ENTRANCE)
HUNGERFORD PLAZA (ENTRANCE)
BEALL AVE
MERCHANT'S TIRE (ENTRANCE)
MIDDLE LN
PARK RD
PARK RD
ROCKVILLE METRO STATION ACCESS
ROCKVILLE METRO STATION ACCESS
MONROE PL
CHURCH ST
CHURCH ST
MD 355
SEE SH-10 MATCHLINE I-I
MD 355
FROM CLARKSBURG RD (MD 121)
TO MONTGOMERY AVE / MD 410 (EB)
EXISTING AVERAGE DAILY TRAFFIC VOLUMES
SH-09
State Highway Administration - Data Services Engineering Division - 1/28/2015

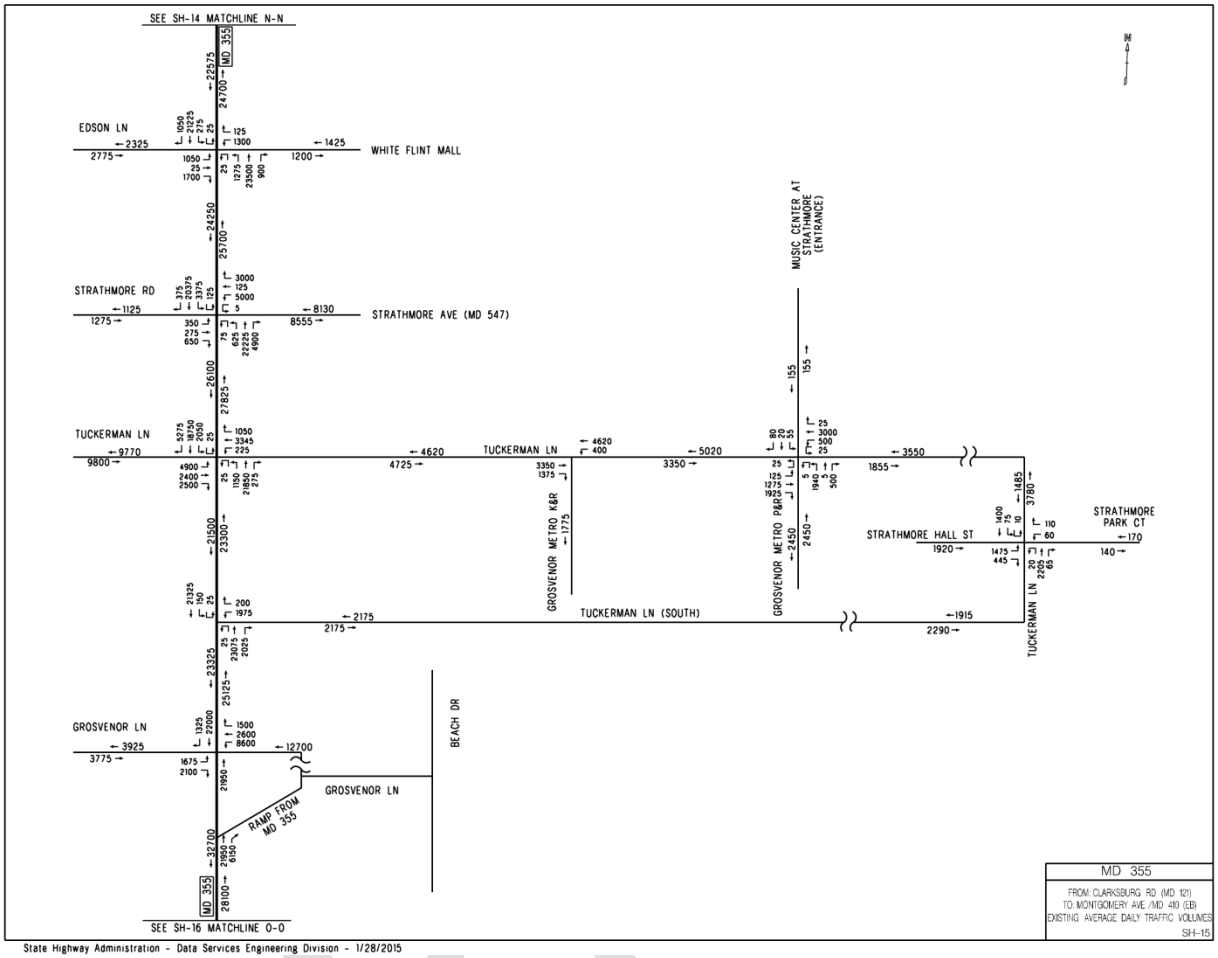

SEE SH-09 MATCHLINE I-I
MD 355
EAST JEFFERSON ST (MD 28)
VEIRS MILL RD (MD 28/MD 586)
RICHARD MONTGOMERY DR
DODGE ST
WOOTTON PKWY
1st ST (MD 911)
W EDMONSTON DR
EDMONSTON DR
COUNTRY CLUB RD
BEST BUY (ENTRANCE)
SEE SH-11 MATCHLINE J-J
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE /MD 410 (EB)
EXISTING AVERAGE DAILY TRAFFIC VOLUMES
SH-10
State Highway Administration - Data Services Engineering Division - 1/28/2015


SEE SH-10 MATCHLINE J-J
MD 355
TEMPLETON PL
HAVERTYS FURNITURE (ENTRANCE)
CONGRESSIONAL LN
SHOPPING CENTER (ENTRANCE)
TWINBROOK METRO STATION
HALPINE RD
BOUIC AVE
SHOPPING CENTER (ENTRANCE)
TWINBROOK METRO STATION
CHAPMAN AVE
MD 355
SEE SH-12 MATCHLINE K-K
MD 355
FROM CLARKSBURG RD (MD 121)
TO MONTGOMERY AVE / MD 410 (EB)
EXISTING AVERAGE DAILY TRAFFIC VOLUMES
SH-11
State Highway Administration - Data Services Engineering Division - 1/28/2015

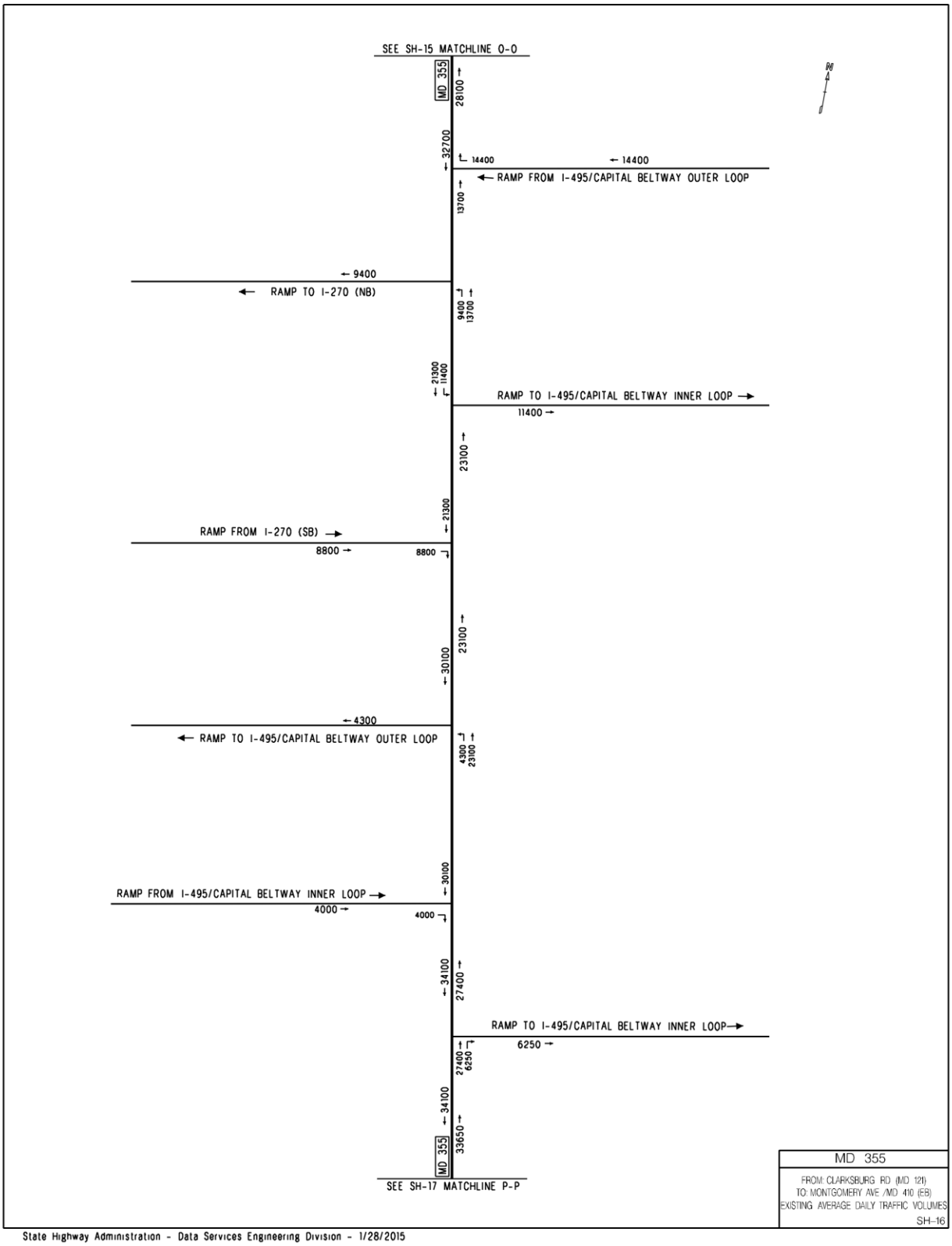

SEE SH-11 MATCHLINE K-K
MD 355
25200
21800
ROLLINS AVE
6850
5500
700
22000
2375
125
4400
1100
1625
5250
10
6885
8285
TWINBROOK PKWY
25
900
20050
1500
23125
22475
FEDERAL PLAZA
2875
3150
275
21950
600
300
1300
150
1700
700
200
275
1175
1325
PIKE CENTER
SHOPPING CENTER
100
2400
20175
575
24025
23250
BOU AVE
975
975
325
21800
1850
50
350
225
400
1525
200
5600
7325
5825
BOU AVE
275
450
21325
3750
28075
25800
HUBBARD DR
975
1050
425
26100
1425
125
500
150
400
1200
175
1925
3300
3975
MONTROSE CROSSING
SHOPPING CENTER
450
375
23975
2400
28875
27200
MD 355
SEE SH-13 MATCHLINE L-L
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE /MD 410 (EB)
EXISTING AVERAGE DAILY TRAFFIC VOLUMES
SH-12
State Highway Administration - Data Services Engineering Division - 1/28/2015

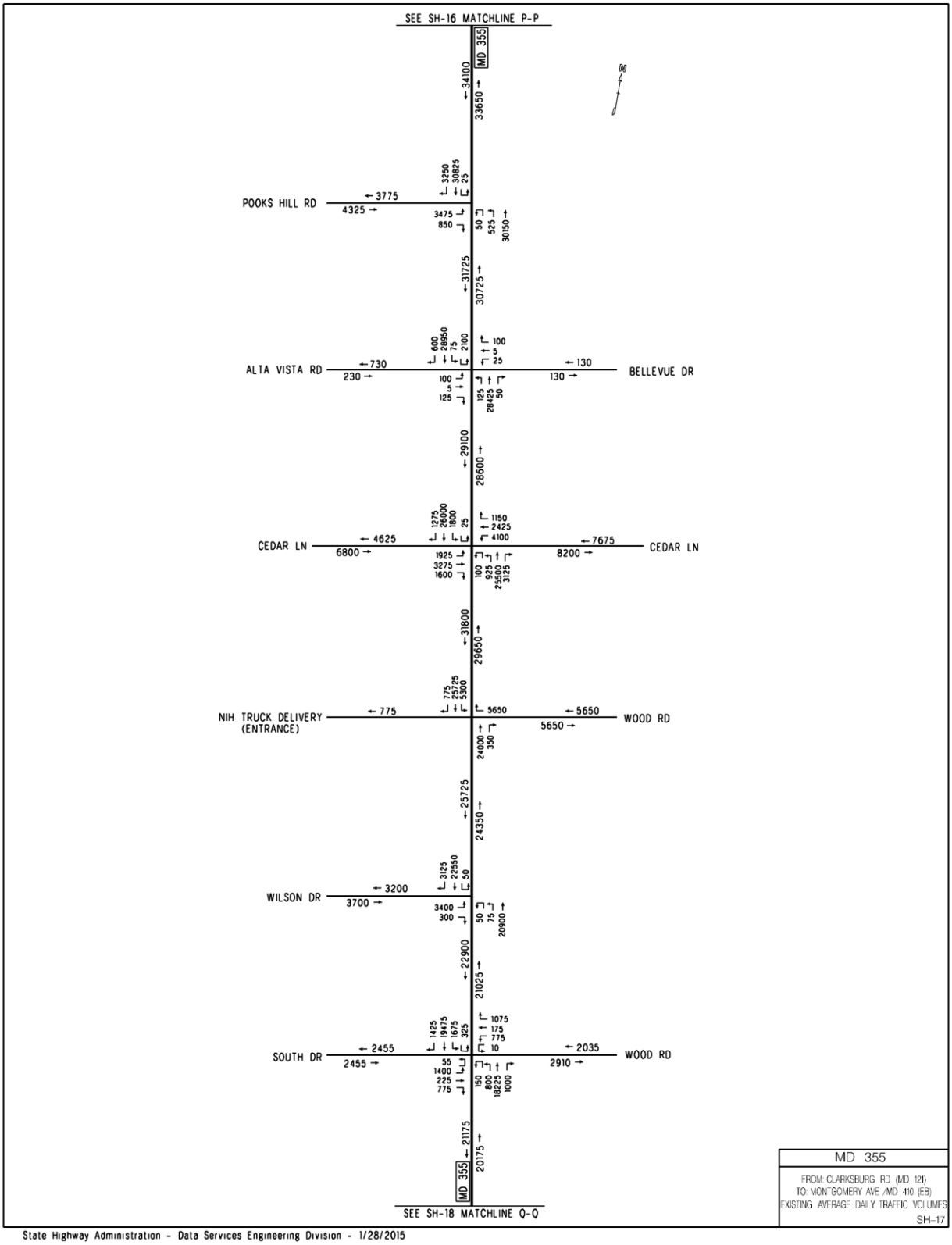

SEE SH-12 MATCHLINE L-L
MD 355
HOYA ST
MONTROSE PARK & RIDE
MONTROSE RD
NB RAMP TO MD 355
NB RAMP FROM MD 355
MONTROSE PKWY
MONTROSE PKWY
MD 355
SEE SH-14 MATCHLINE M-M
MD 355
FROM CLARKSBURG RD (MD 121)
TO MONTGOMERY AVE (MD 410) (EB)
EXISTING AVERAGE DAILY TRAFFIC VOLUMES
SH-13
State Highway Administration - Data Services Engineering Division - 1/28/2015

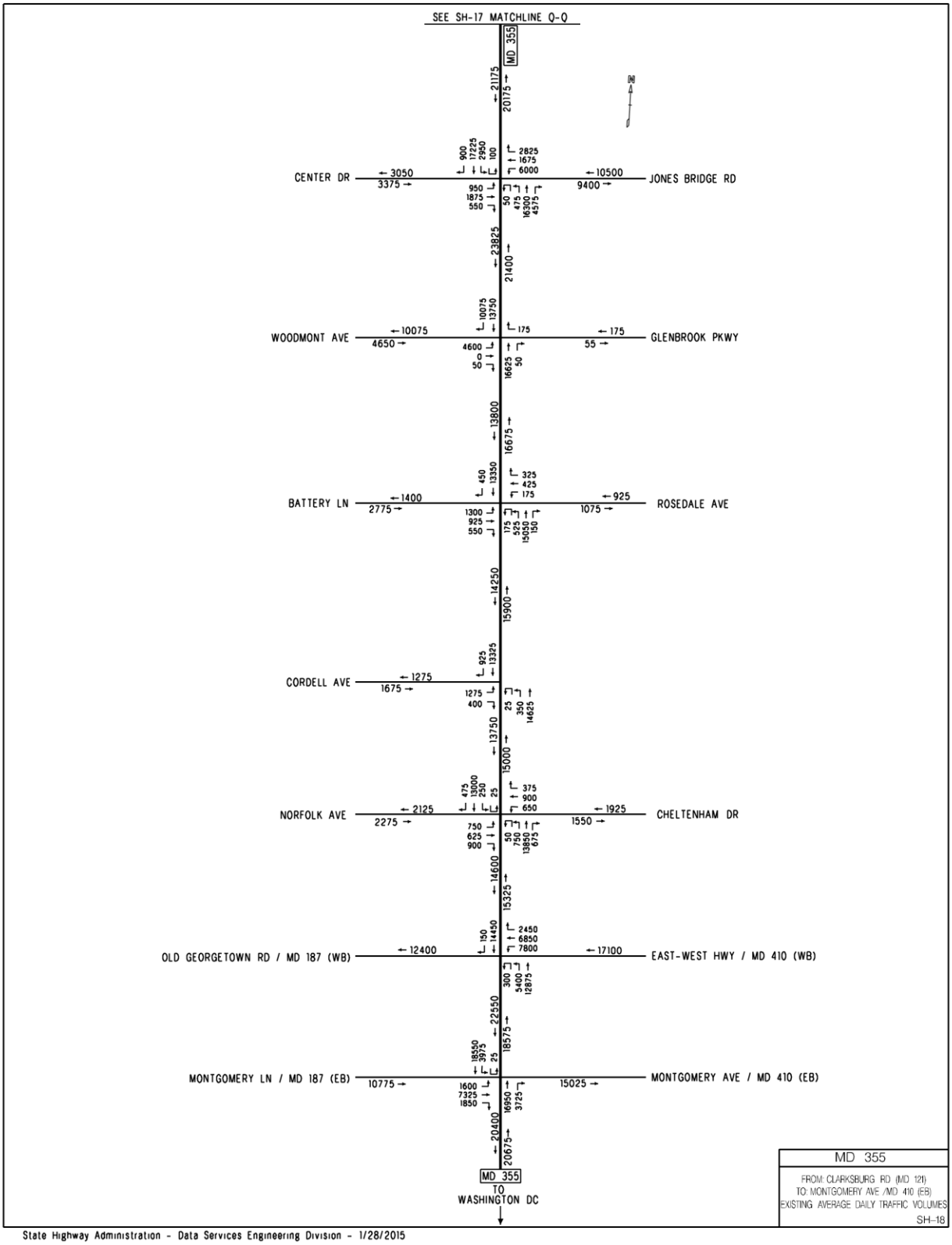

SEE SH-13 MATCHLINE M-M
MD 355
← 27425
26750 →
MID-PIKE PLAZA
(ENTRANCE)
← 2125
2425 →
1450
25075
250
650
1900
50
475
400
50
250
← 700
700 →
OFFICE
(ENTRANCE)
200
650
23800
400
← 26000
25050 →
OLD GEORGETOWN RD
(MD 187)
← 11875
11150 →
7000
17850
1100
50
25
6700
2125
2300
700
2550
1175
25
← 4450
4400 →
OLD GEORGETOWN RD
225
2300
17600
1150
← 21550
21275 →
MARINELLI RD
← 4000
4350 →
1175
19300
900
175
50
1050
1775
1475
800
1525
1325
← 3650
3975 →
MARINELLI RD
125
1250
19250
1300
← 22225
21925 →
NICHOLSON LN
← 9775
10100 →
1725
16900
3450
150
1650
6850
1600
3075
7150
6000
← 16225
15400 →
NICHOLSON LN
100
900
17050
5100
← 24600
23150 →
SECURITY LN
← 2185
1660 →
1050
21800
1600
150
10
775
300
575
3050 →
WHITE FLINT MALL
200
1125
22225
1150
← 22575
24700 →
MD 355
SEE SH-15 MATCHLINE N-N
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE /MD 410 (EB)
EXISTING AVERAGE DAILY TRAFFIC VOLUMES
SH-14
State Highway Administration - Data Services Engineering Division - 1/28/2015



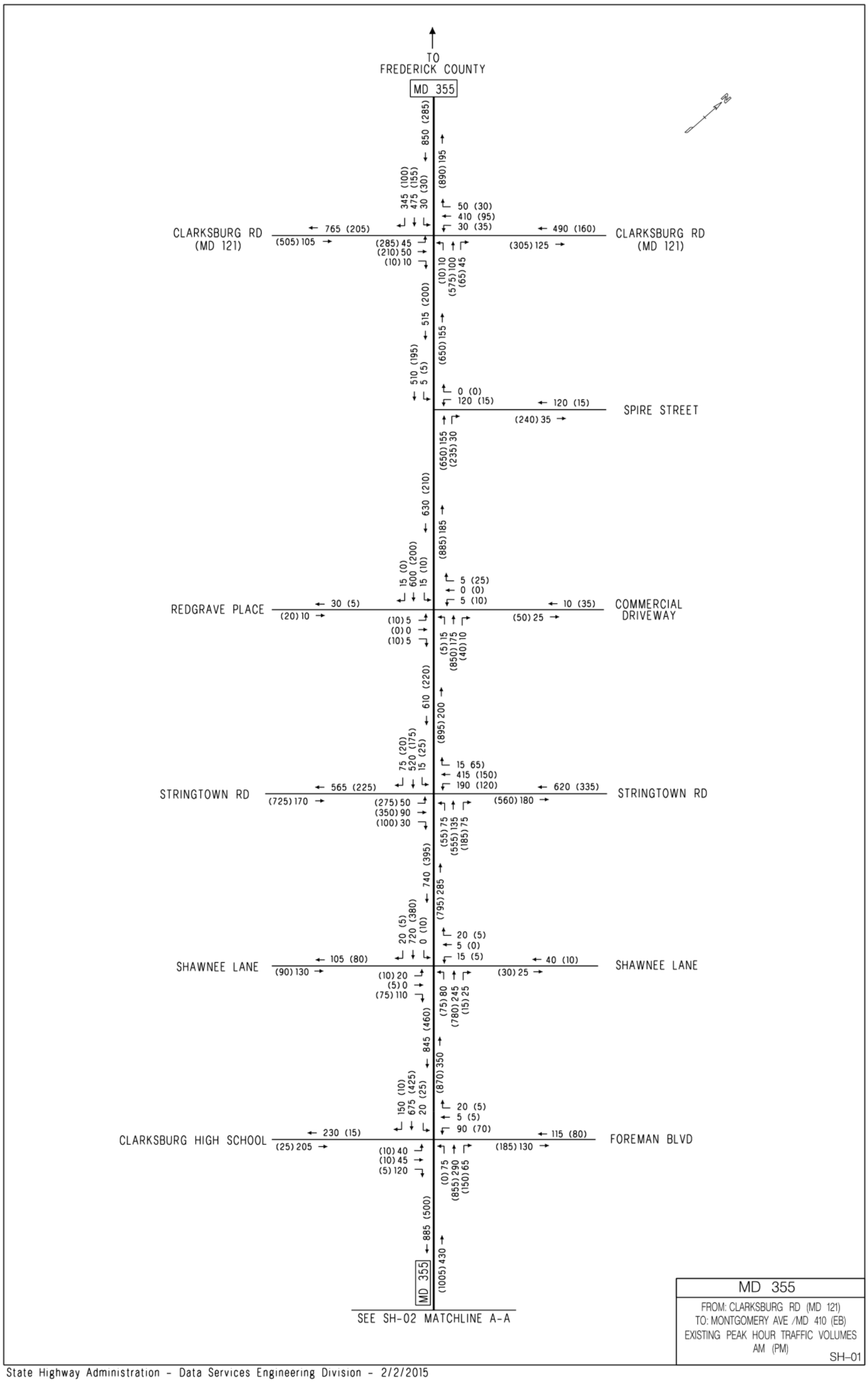
State Highway Administration - Data Services Engineering Division - 1/28/2015


SEE SH-15 MATCHLINE O-O
MD 355
28100
32700
14400
14400
RAMP FROM I-495/CAPITAL BELTWAY OUTER LOOP
13700
9400
RAMP TO I-270 (NB)
9400
13700
21300
11400
RAMP TO I-495/CAPITAL BELTWAY INNER LOOP
11400
23100
21300
RAMP FROM I-270 (SB)
8800
8800
23100
30100
4300
RAMP TO I-495/CAPITAL BELTWAY OUTER LOOP
4300
23100
30100
RAMP FROM I-495/CAPITAL BELTWAY INNER LOOP
4000
4000
34100
27400
RAMP TO I-495/CAPITAL BELTWAY INNER LOOP
6250
27400
6250
34100
33650
MD 355
SEE SH-17 MATCHLINE P-P
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE /MD 410 (EB)
EXISTING AVERAGE DAILY TRAFFIC VOLUMES
SH-16
State Highway Administration - Data Services Engineering Division - 1/28/2015

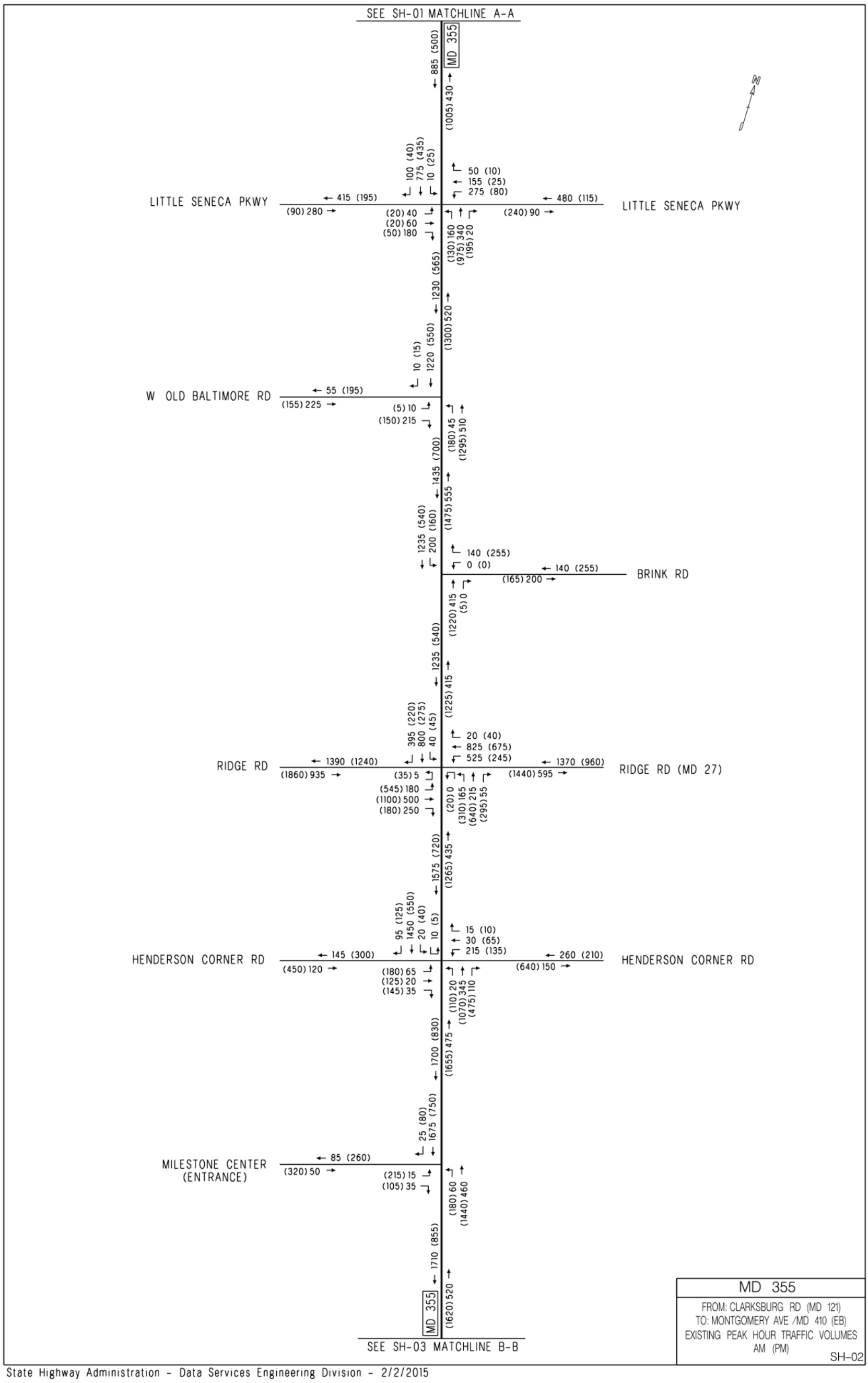

SEE SH-16 MATCHLINE P-P
MD 355
POOKS HILL RD
ALTA VISTA RD
BELLEVUE DR
CEDAR LN
CEDAR LN
NIH TRUCK DELIVERY (ENTRANCE)
WOOD RD
WILSON DR
SOUTH DR
WOOD RD
MD 355
SEE SH-18 MATCHLINE Q-Q
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE /MD 410 (EB)
EXISTING AVERAGE DAILY TRAFFIC VOLUMES
SH-17
State Highway Administration - Data Services Engineering Division - 1/28/2015


SEE SH-17 MATCHLINE Q-Q
MD 355
CENTER DR
JONES BRIDGE RD
WOODMONT AVE
GLENBROOK PKWY
BATTERY LN
ROSEDALE AVE
CORDELL AVE
NORFOLK AVE
CHELTENHAM DR
OLD GEORGETOWN RD / MD 187 (WB)
EAST-WEST HWY / MD 410 (WB)
MONTGOMERY LN / MD 187 (EB)
MONTGOMERY AVE / MD 410 (EB)
MD 355
TO
WASHINGTON DC
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE /MD 410 (EB)
EXISTING AVERAGE DAILY TRAFFIC VOLUMES
SH-18
State Highway Administration - Data Services Engineering Division - 1/28/2015

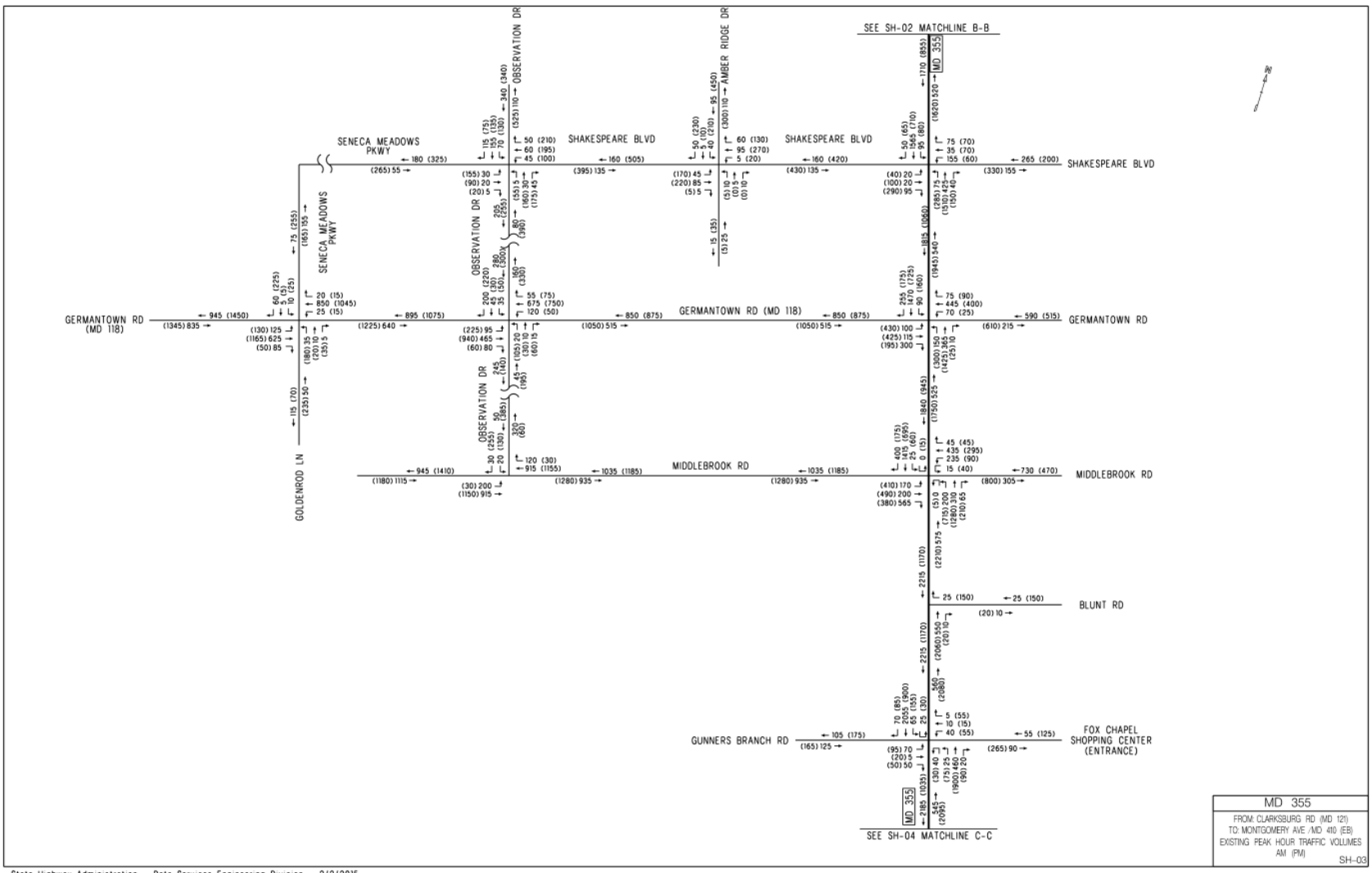
2015 MD 355 AM & PM Volume Diagrams



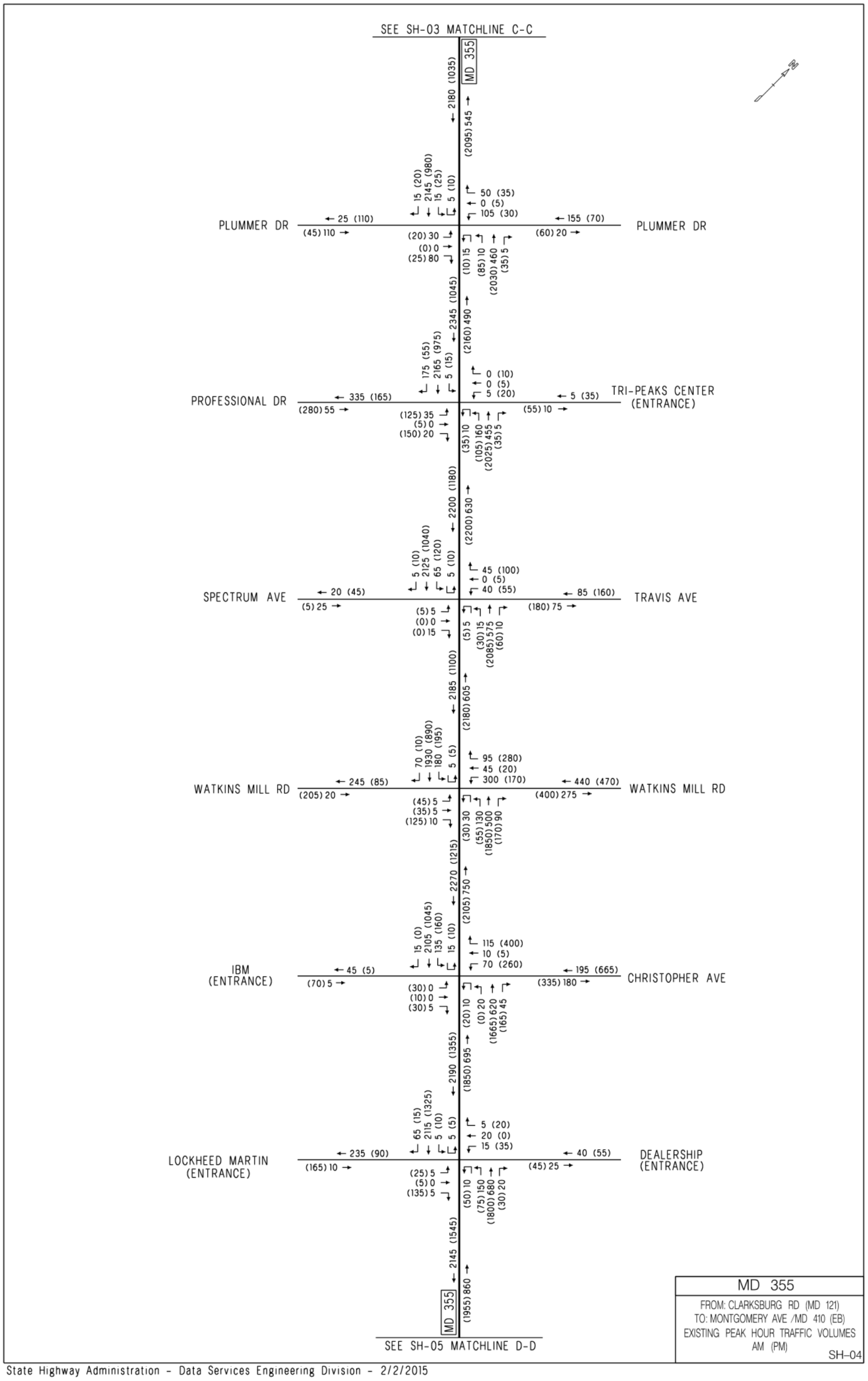
State Highway Administration - Data Services Engineering Division - 2/2/2015



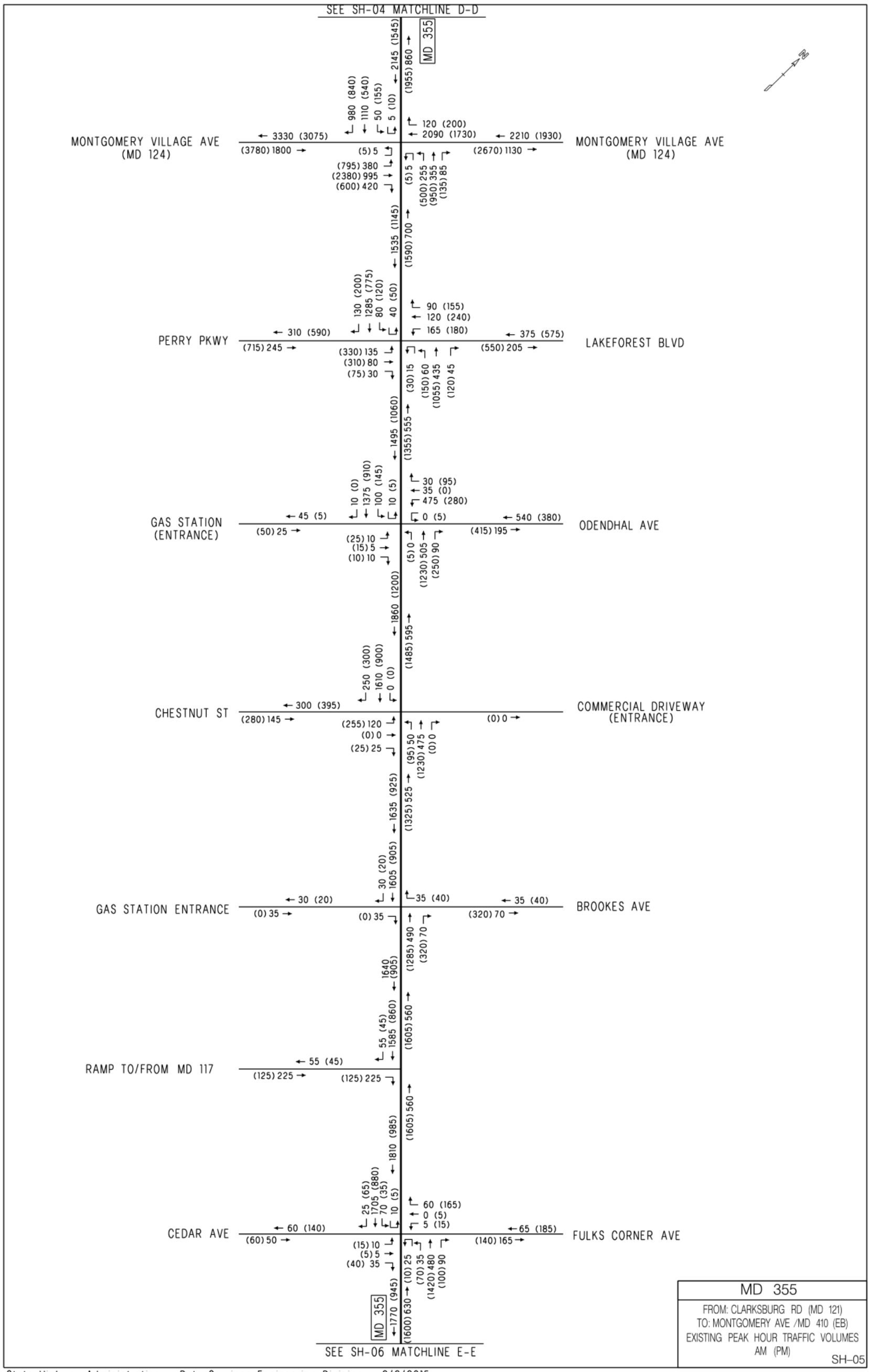
State Highway Administration - Data Services Engineering Division - 2/2/2015

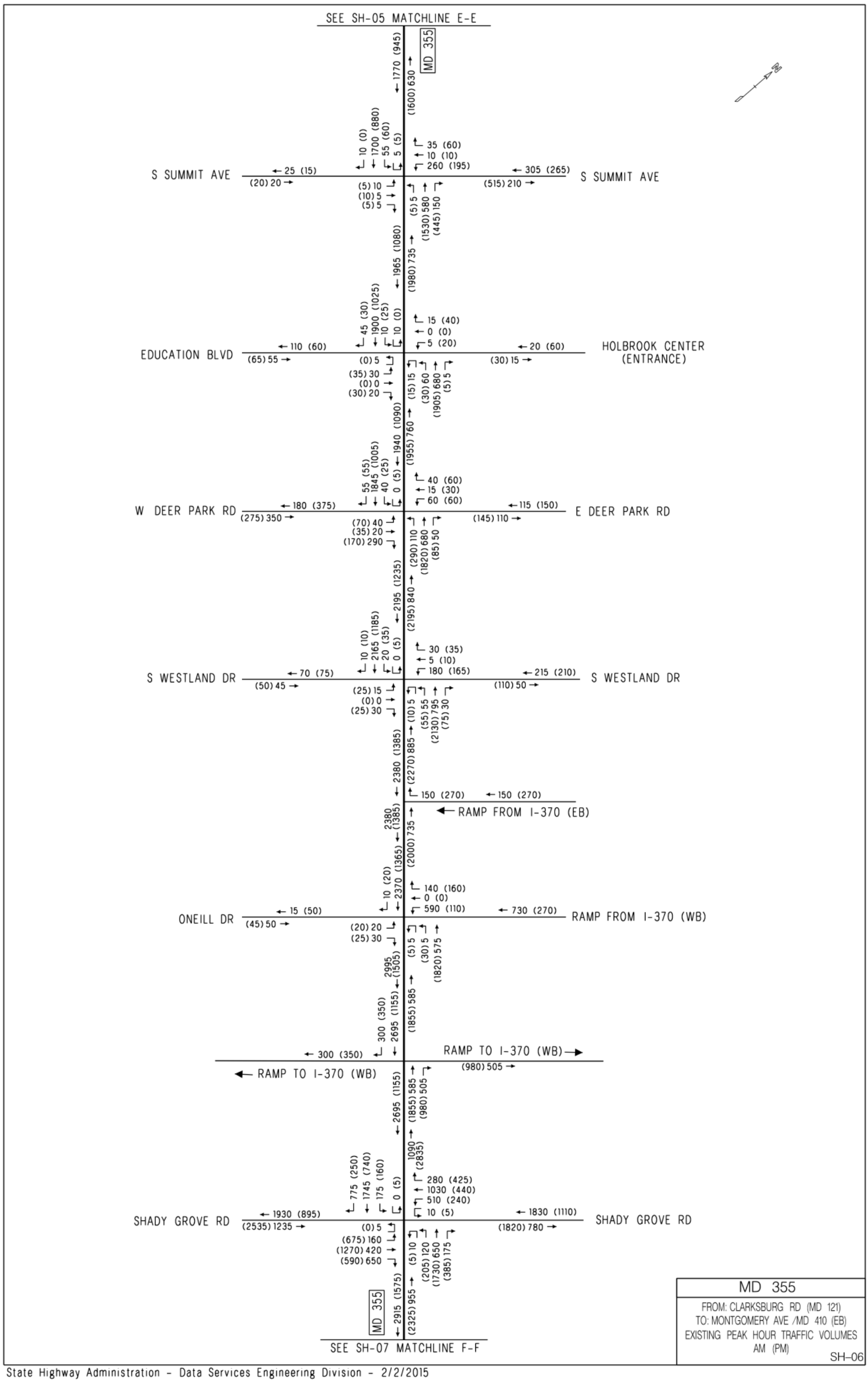


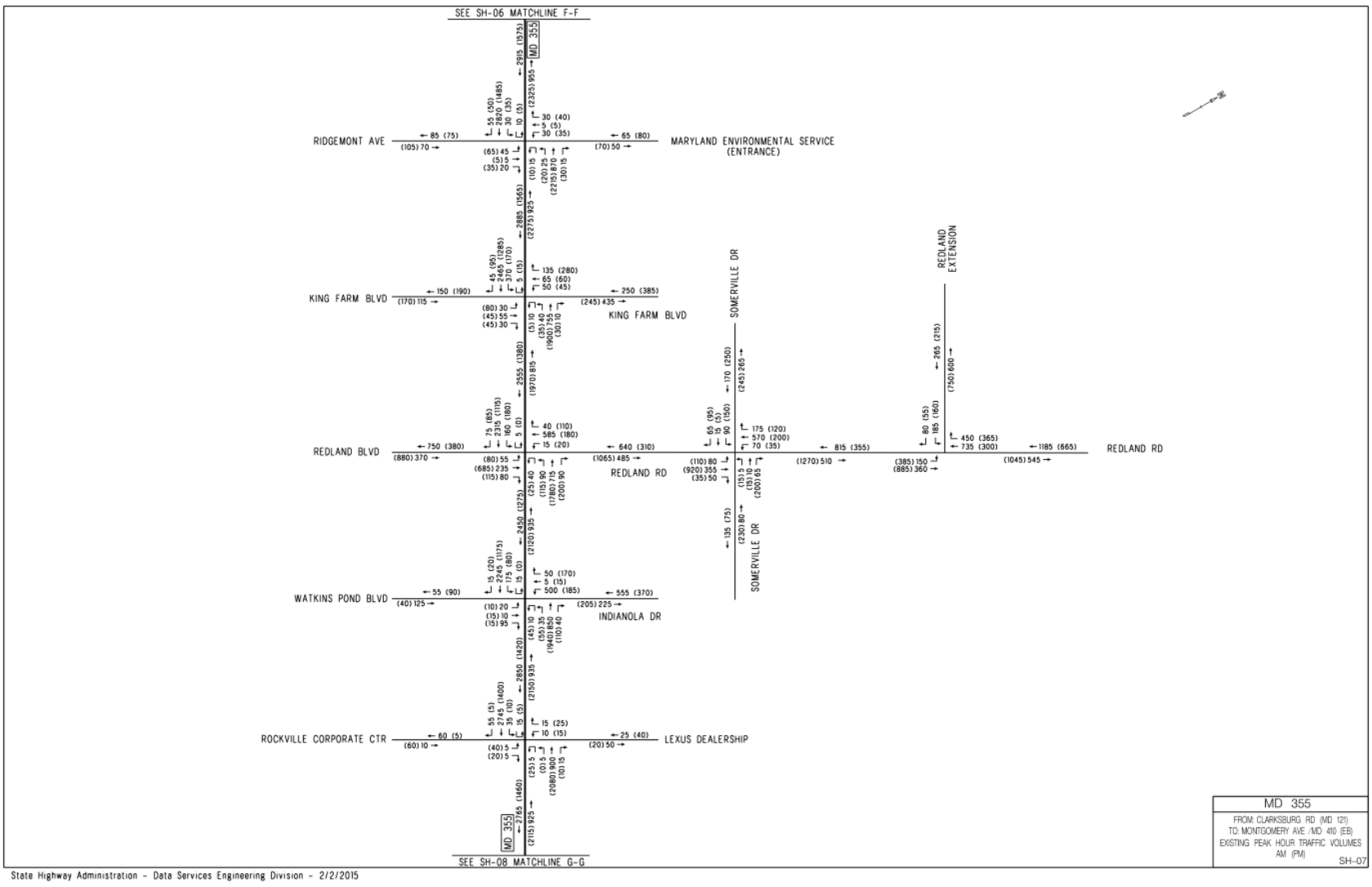
State Highway Administration - Data Services Engineering Division - 2/2/2015



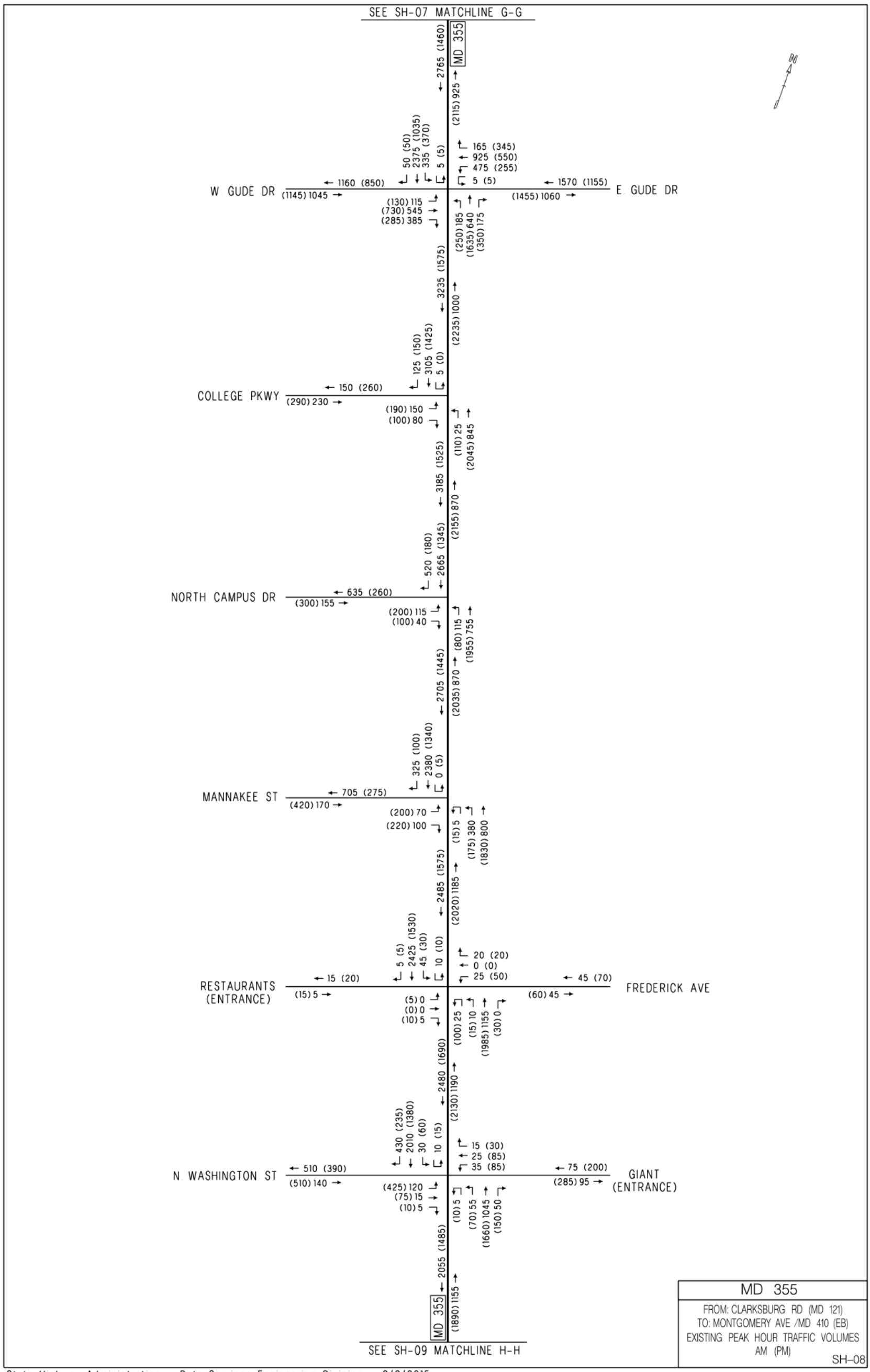
State Highway Administration - Data Services Engineering Division - 2/2/2015


SEE SH-04 MATCHLINE D-D
MD 355
MONTGOMERY VILLAGE AVE (MD 124)
MONTGOMERY VILLAGE AVE (MD 124)
PERRY PKWY
LAKEFOREST BLVD
GAS STATION (ENTRANCE)
ODENDHAL AVE
CHESTNUT ST
COMMERCIAL DRIVEWAY (ENTRANCE)
GAS STATION ENTRANCE
BROOKES AVE
RAMP TO/FROM MD 117
CEDAR AVE
FULKS CORNER AVE
SEE SH-06 MATCHLINE E-E
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE /MD 410 (EB)
EXISTING PEAK HOUR TRAFFIC VOLUMES
AM (PM)
SH-05
State Highway Administration - Data Services Engineering Division - 2/2/2015

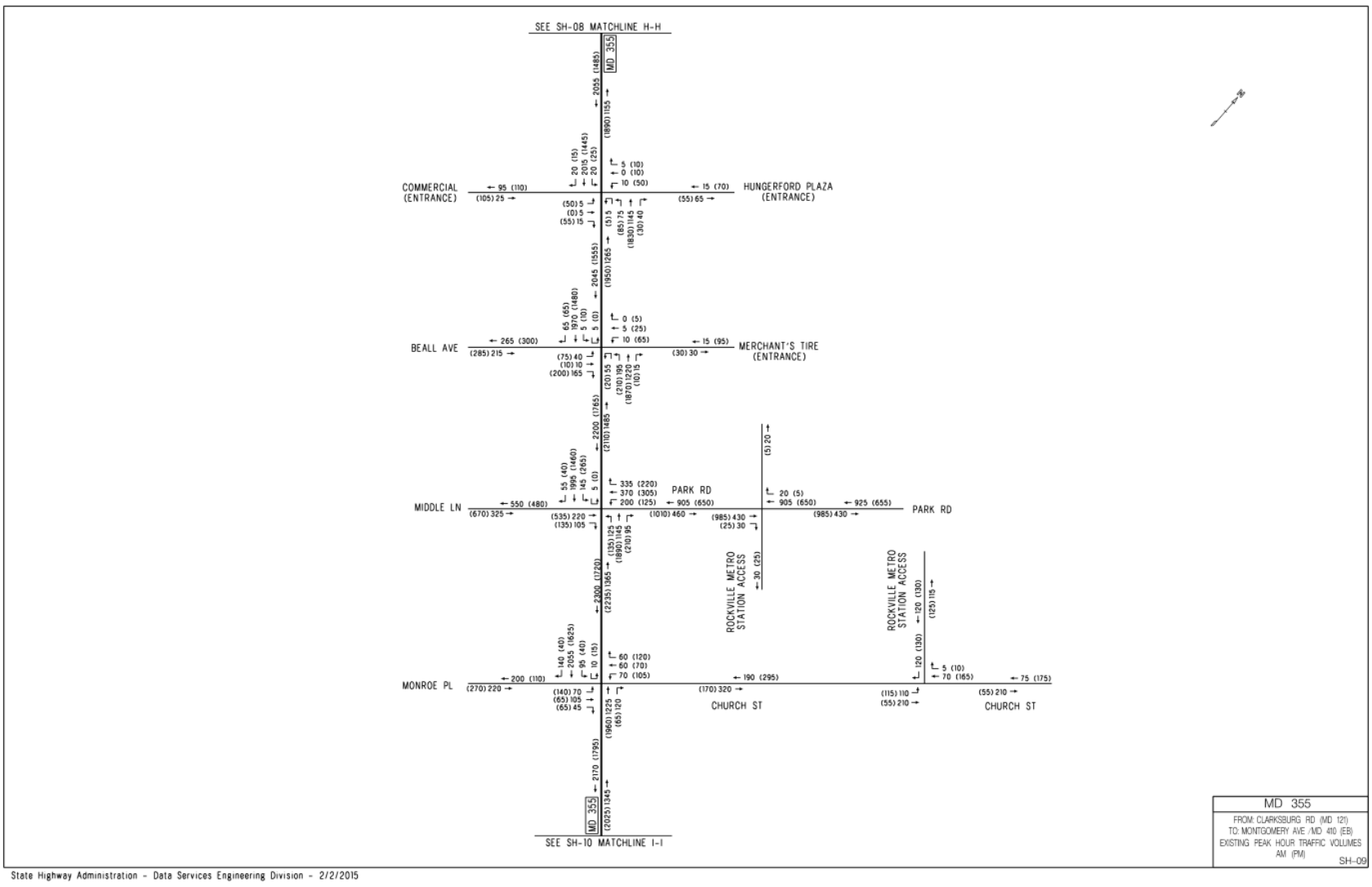

SEE SH-05 MATCHLINE E-E
MD 355
S SUMMIT AVE
S SUMMIT AVE
EDUCATION BLVD
HOLBROOK CENTER (ENTRANCE)
W DEER PARK RD
E DEER PARK RD
S WESTLAND DR
S WESTLAND DR
RAMP FROM I-370 (EB)
ONEILL DR
RAMP FROM I-370 (WB)
RAMP TO I-370 (WB)
RAMP TO I-370 (WB)
SHADY GROVE RD
SHADY GROVE RD
MD 355
SEE SH-07 MATCHLINE F-F
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE /MD 410 (EB)
EXISTING PEAK HOUR TRAFFIC VOLUMES
AM (PM)
SH-06
State Highway Administration - Data Services Engineering Division - 2/2/2015



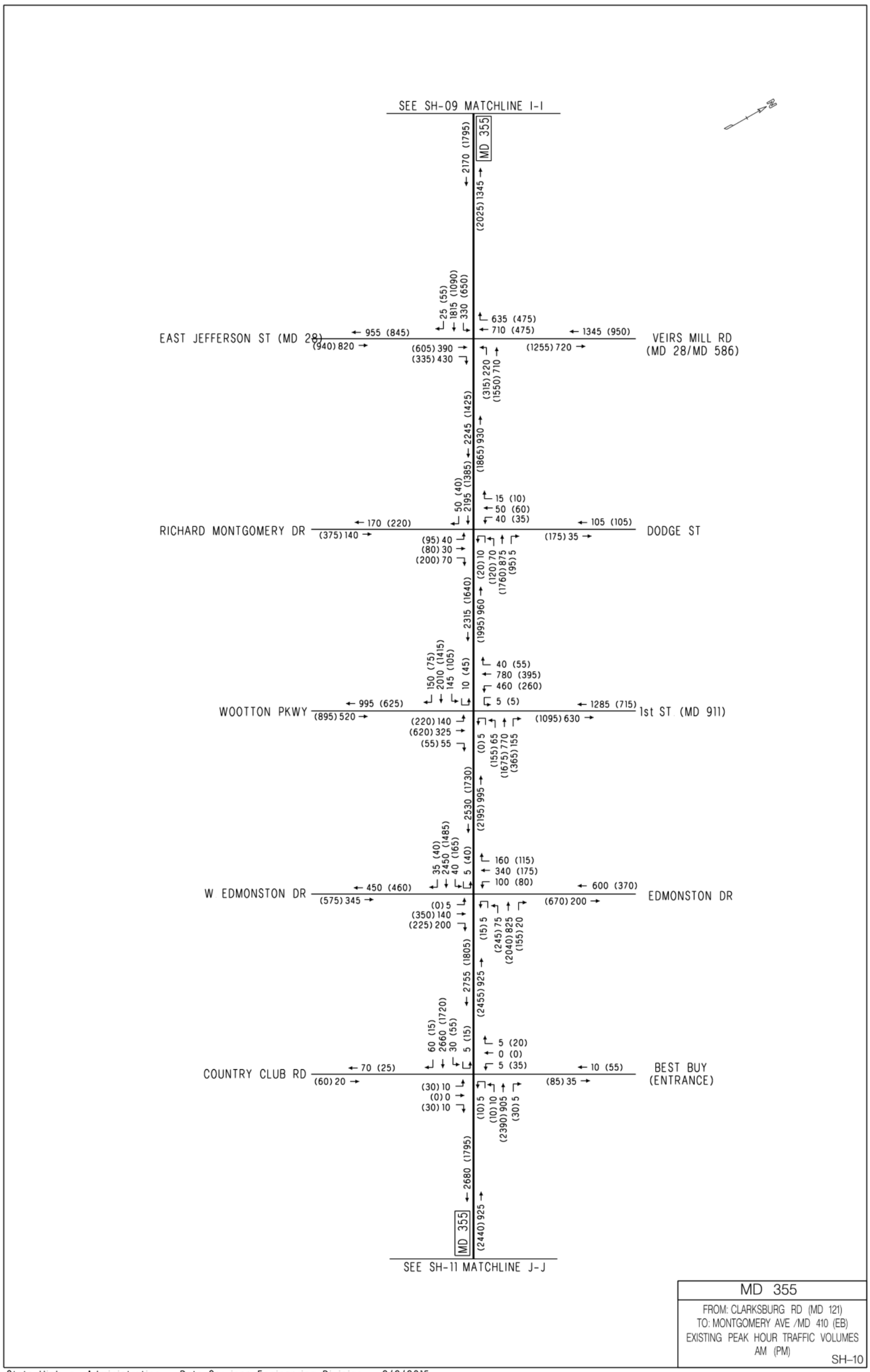
State Highway Administration - Data Services Engineering Division - 2/2/2015

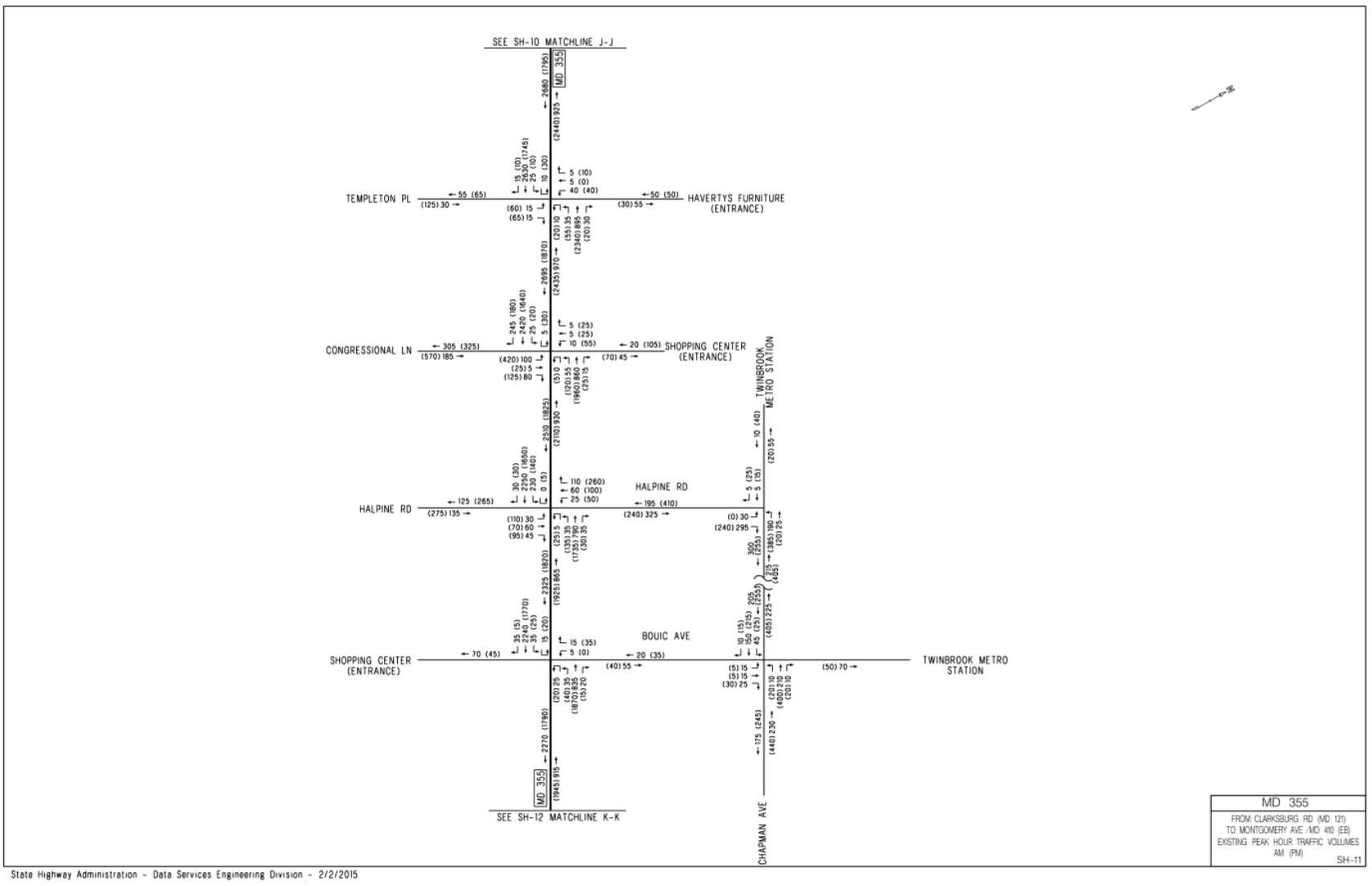


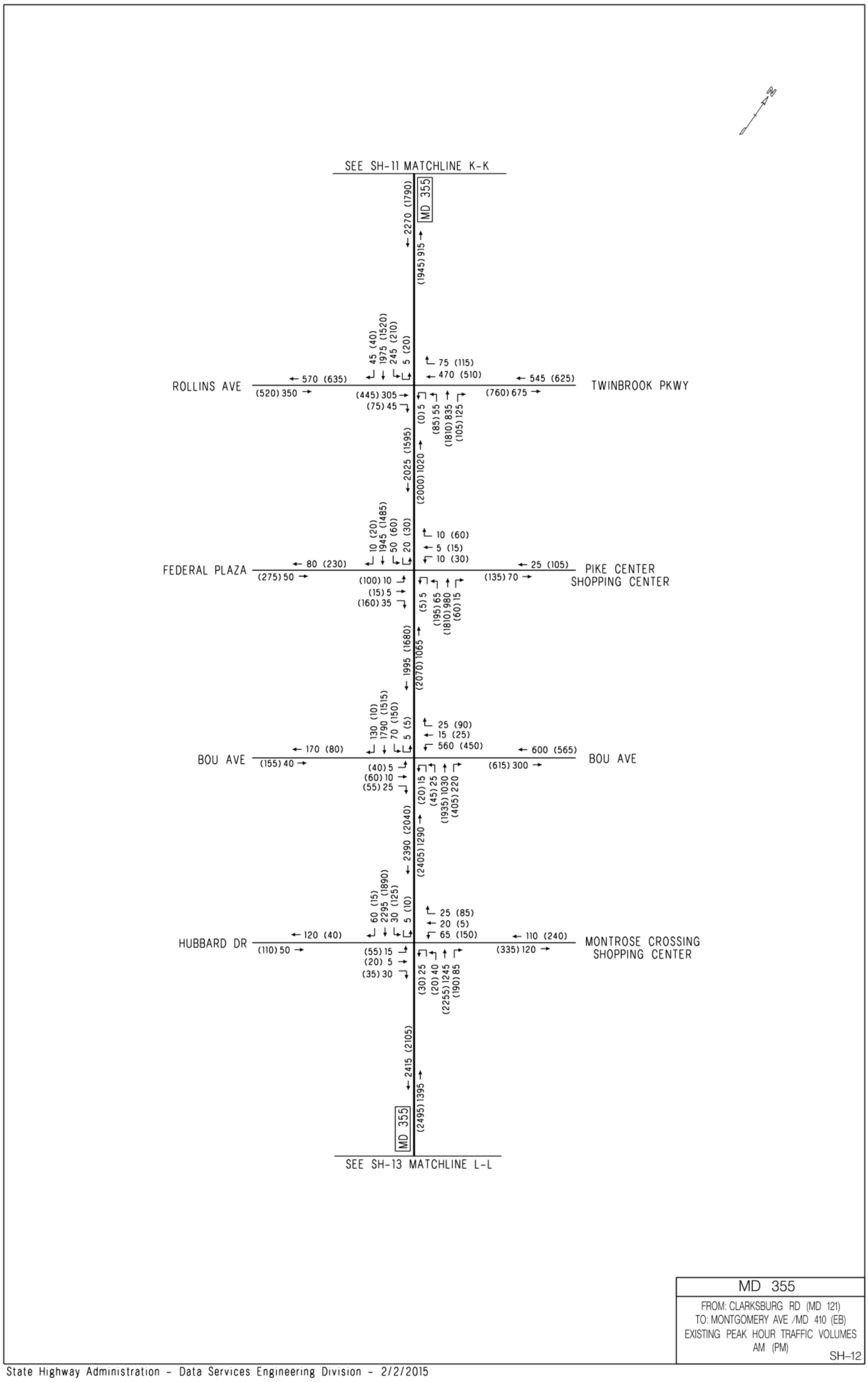
State Highway Administration - Data Services Engineering Division - 2/2/2015

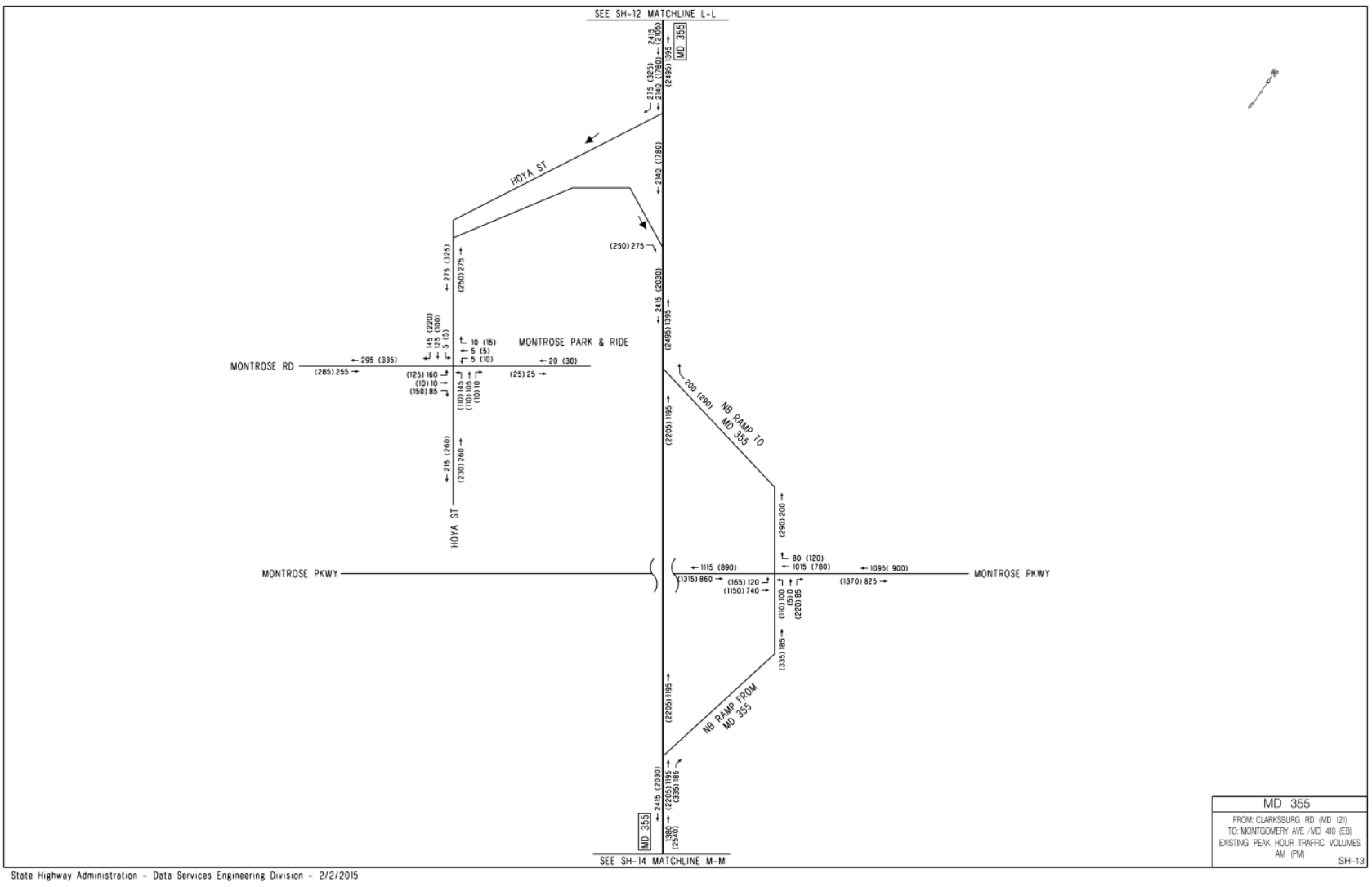


State Highway Administration - Data Services Engineering Division - 2/2/2015

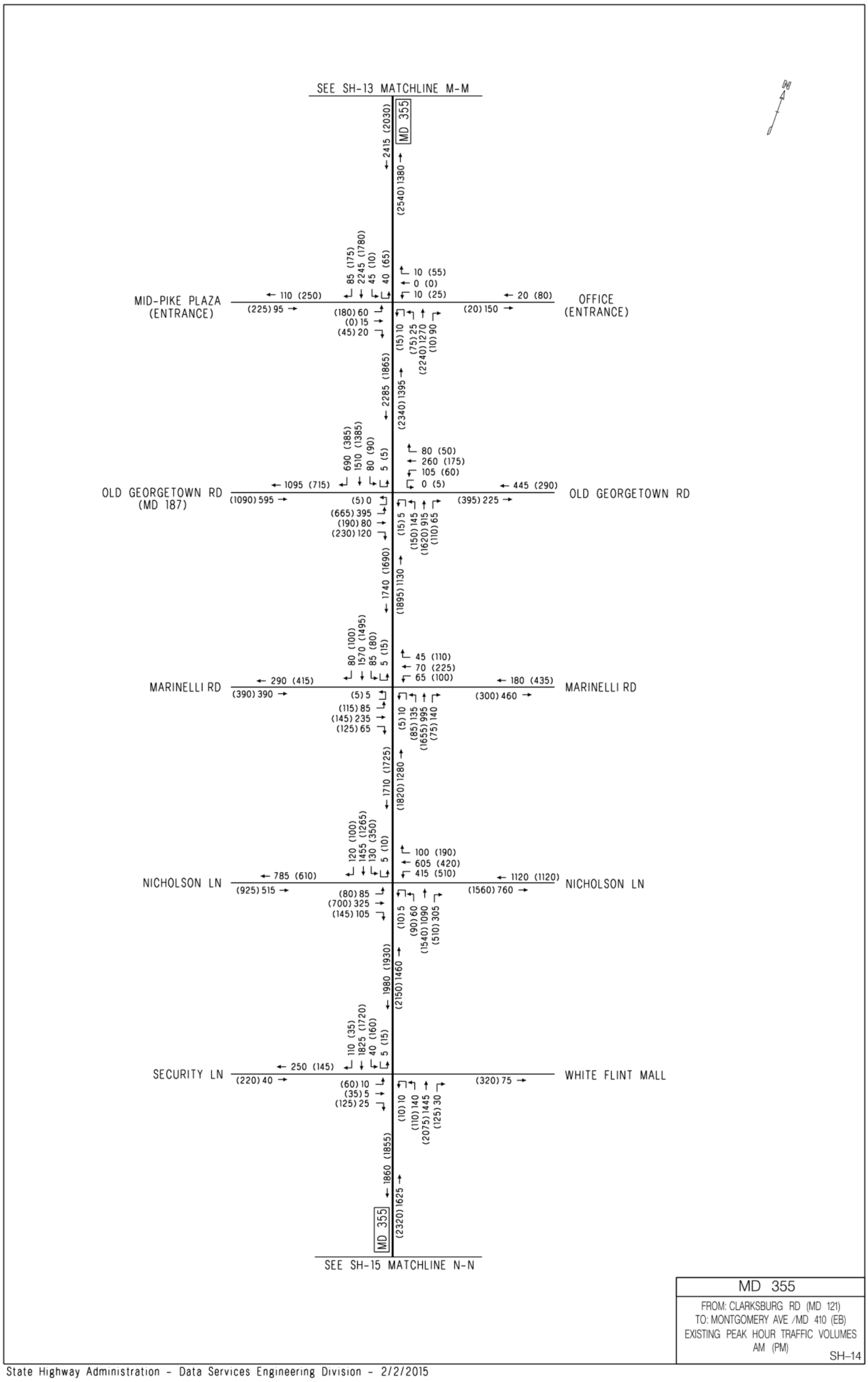

SEE SH-09 MATCHLINE I-I
MD 355
2170 (1795)
(2025) 1345
25 (55)
1815 (1090)
330 (650)
635 (475)
710 (475)
EAST JEFFERSON ST (MD 28)
955 (845)
(940) 820
(605) 390
(335) 430
1345 (950)
(1255) 720
VEIRS MILL RD
(MD 28/MD 586)
(315) 220
(1550) 710
2245 (1425)
(1865) 930
50 (40)
2195 (1385)
15 (10)
50 (60)
40 (35)
RICHARD MONTGOMERY DR
170 (220)
(375) 140
(95) 40
(80) 30
(200) 70
105 (105)
(175) 35
DODGE ST
(20) 10
(120) 70
(1760) 875
(95) 5
2315 (1640)
(1995) 960
150 (75)
2010 (1415)
145 (105)
10 (45)
40 (55)
780 (395)
460 (260)
5 (5)
WOOTTON PKWY
995 (625)
(895) 520
(220) 140
(620) 325
(55) 55
1285 (715)
(1095) 630
1st ST (MD 911)
(0) 5
(155) 65
(1675) 770
(365) 155
2530 (1730)
(2195) 995
35 (40)
2450 (1485)
40 (165)
5 (40)
160 (115)
340 (175)
100 (80)
W EDMONSTON DR
450 (460)
(575) 345
(0) 5
(350) 140
(225) 200
600 (370)
(670) 200
EDMONSTON DR
(15) 5
(245) 75
(2040) 825
(155) 20
2755 (1805)
(2455) 925
60 (15)
2660 (1720)
30 (55)
5 (15)
5 (20)
0 (0)
5 (35)
COUNTRY CLUB RD
70 (25)
(60) 20
(30) 10
(0) 0
(30) 10
10 (55)
(85) 35
BEST BUY
(ENTRANCE)
(10) 5
(10) 10
(2390) 905
(30) 5
2680 (1795)
MD 355
(2440) 925
SEE SH-11 MATCHLINE J-J
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE /MD 410 (EB)
EXISTING PEAK HOUR TRAFFIC VOLUMES
AM (PM)
SH-10
State Highway Administration - Data Services Engineering Division - 2/2/2015


SEE SH-10 MATCHLINE J-J
MD 355
TEMPLETON PL
HAVERTYS FURNITURE (ENTRANCE)
CONGRESSIONAL LN
SHOPPING CENTER (ENTRANCE)
TWINBROOK METRO STATION
HALPINE RD
BOUIC AVE
SHOPPING CENTER (ENTRANCE)
TWINBROOK METRO STATION
CHAPMAN AVE
SEE SH-12 MATCHLINE K-K
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE / MD 410 (EB)
EXISTING PEAK HOUR TRAFFIC VOLUMES
AM (PM)
SH-11
State Highway Administration - Data Services Engineering Division - 2/2/2015

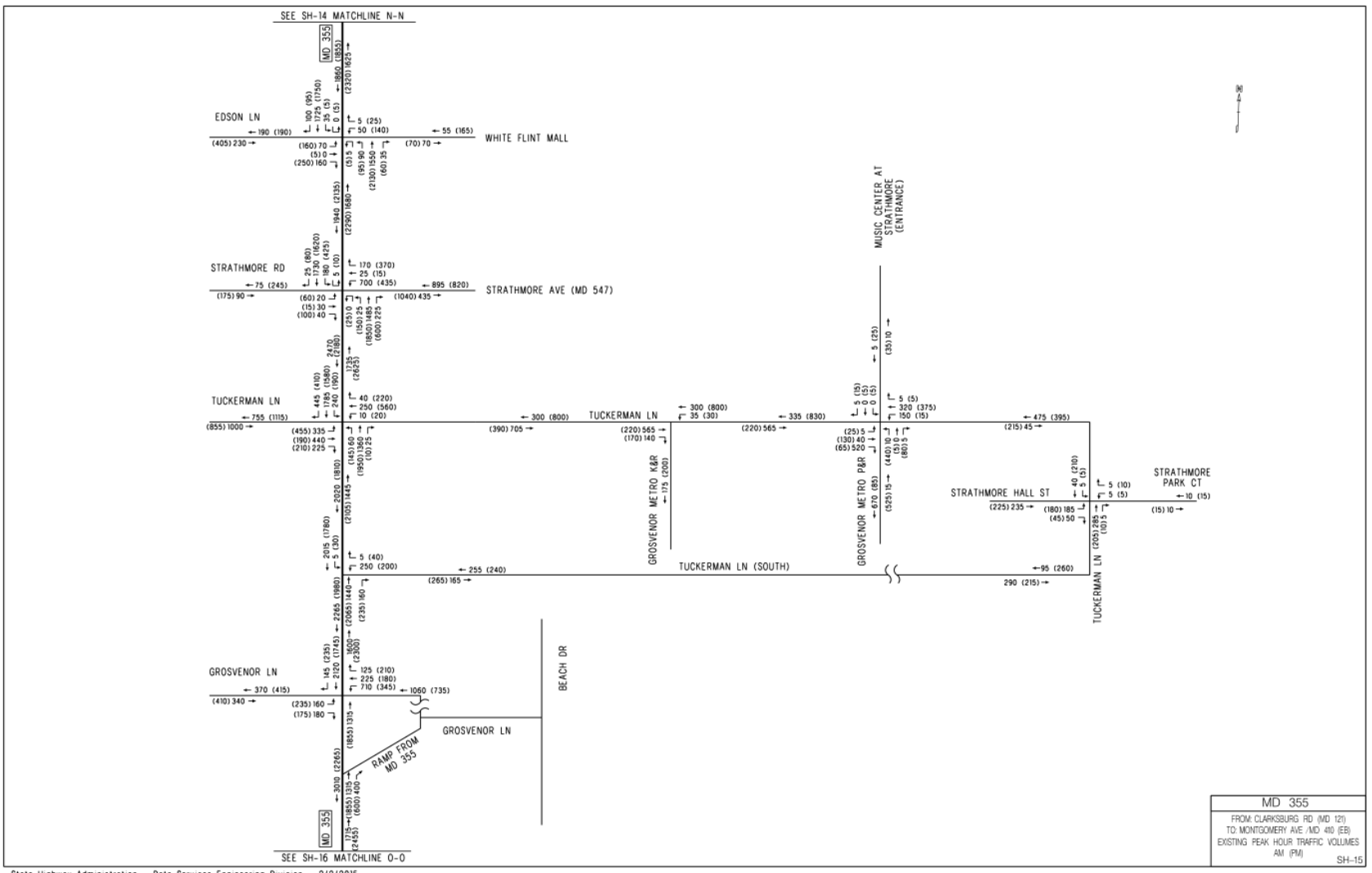

SEE SH-11 MATCHLINE K-K
MD 355
2270 (1790)
(1945) 915
45 (40)
1975 (1520)
245 (210)
5 (20)
75 (115)
470 (510)
ROLLINS AVE
570 (635)
(520) 350
(445) 305
(75) 45
545 (625)
(760) 675
TWINBROOK PKWY
(01) 5
(85) 55
(1810) 835
(105) 125
2025 (1595)
(2000) 1020
10 (20)
1945 (1485)
50 (60)
20 (30)
10 (60)
5 (15)
10 (30)
FEDERAL PLAZA
80 (230)
(275) 50
(100) 10
(15) 5
(160) 35
25 (105)
(135) 70
PIKE CENTER
SHOPPING CENTER
(5) 5
(195) 65
(1810) 980
(60) 15
1995 (1680)
(2070) 1065
130 (10)
1790 (1515)
70 (150)
5 (5)
25 (90)
15 (25)
560 (450)
BOU AVE
170 (80)
(155) 40
(40) 5
(60) 10
(55) 25
600 (565)
(615) 300
BOU AVE
(20) 15
(45) 25
(1935) 1030
(405) 220
2390 (2040)
(2405) 1290
60 (15)
2295 (1890)
30 (125)
5 (10)
25 (85)
20 (5)
65 (150)
HUBBARD DR
120 (40)
(110) 50
(55) 15
(20) 5
(35) 30
110 (240)
(335) 120
MONTROSE CROSSING
SHOPPING CENTER
(30) 25
(20) 40
(2255) 1245
(190) 85
2415 (2105)
(2495) 1395
MD 355
SEE SH-13 MATCHLINE L-L
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE /MD 410 (EB)
EXISTING PEAK HOUR TRAFFIC VOLUMES
AM (PM)
SH-12
State Highway Administration - Data Services Engineering Division - 2/2/2015

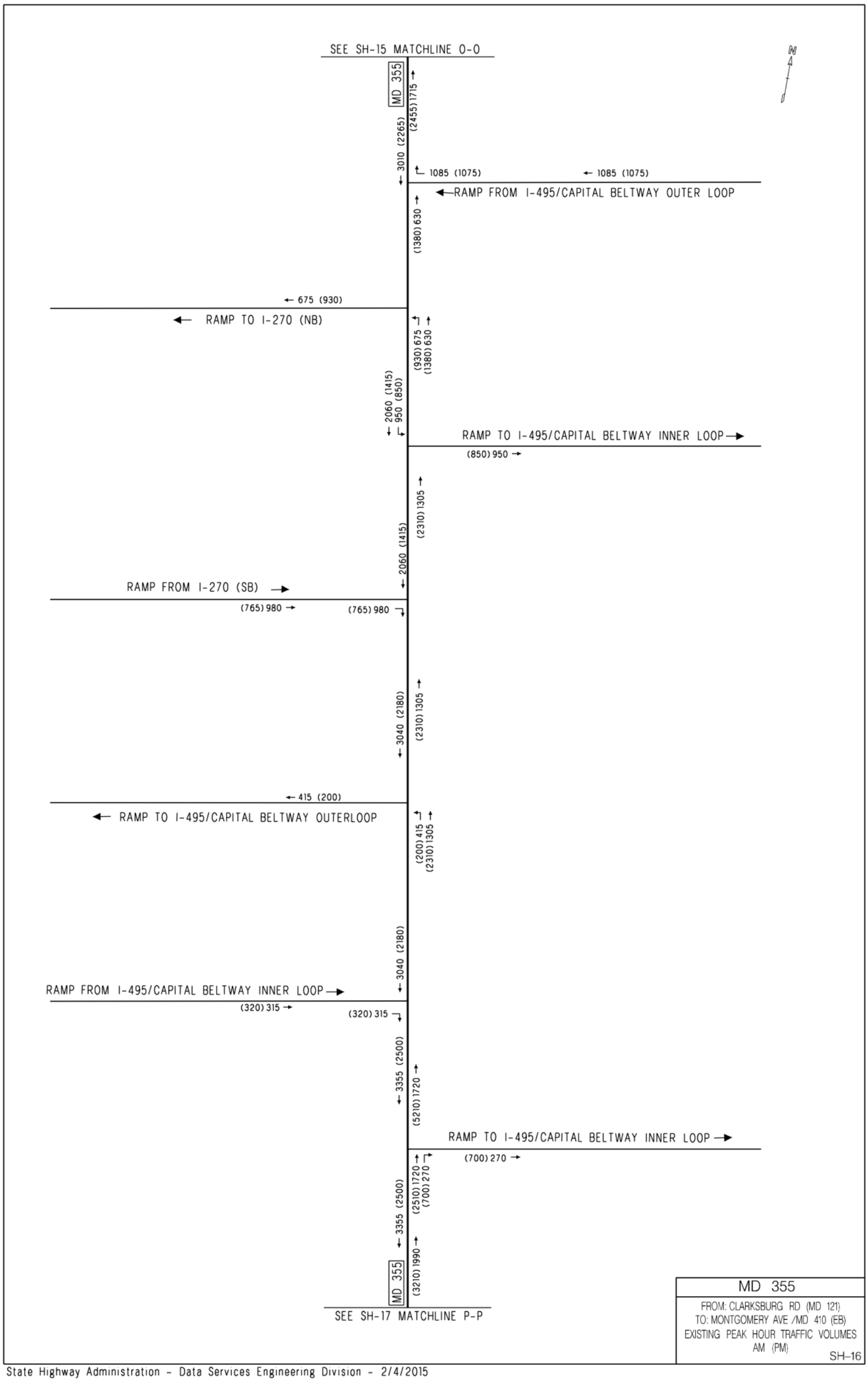


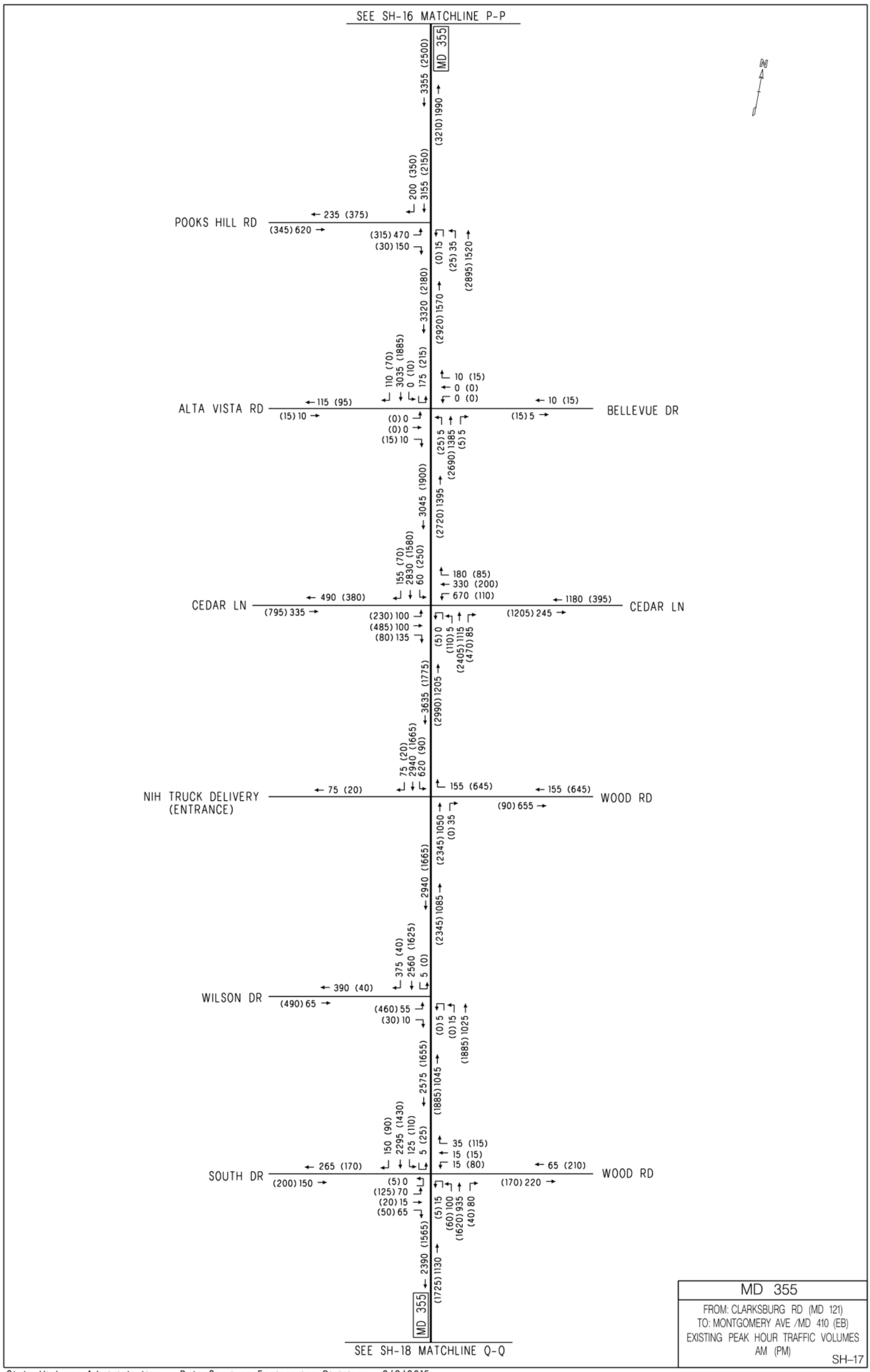
State Highway Administration - Data Services Engineering Division - 2/2/2015



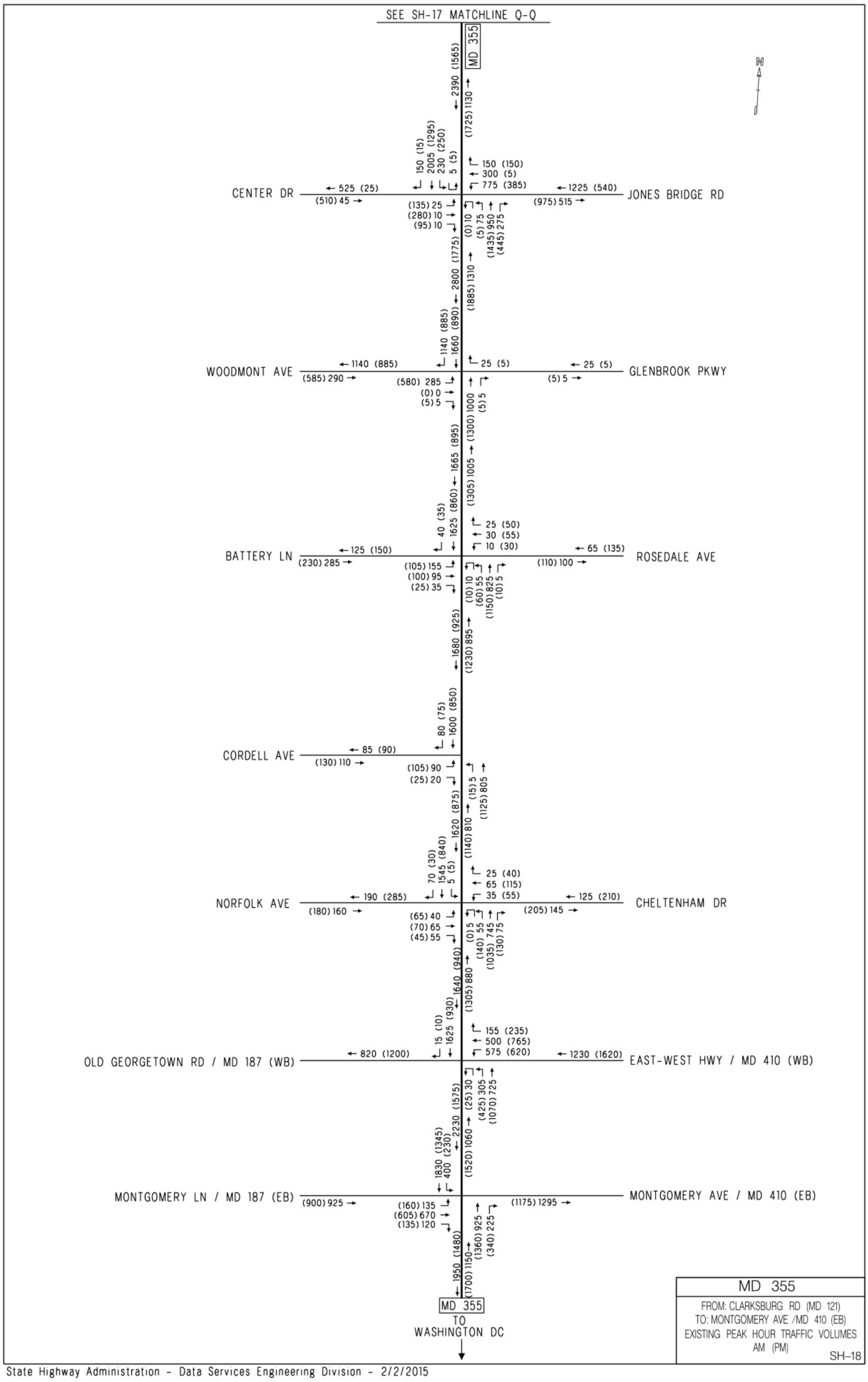
State Highway Administration - Data Services Engineering Division - 2/2/2015


SEE SH-14 MATCHLINE N-N
MD 355
EDSON LN
WHITE FLINT MALL
STRATHMORE RD
STRATHMORE AVE (MD 547)
MUSIC CENTER AT STRATHMORE (ENTRANCE)
TUCKERMAN LN
GROSVENOR METRO K&R
GROSVENOR METRO P&R
STRATHMORE HALL ST
STRATHMORE PARK CT
TUCKERMAN LN (SOUTH)
TUCKERMAN LN
GROSVENOR LN
BEACH DR
RAMP FROM MD 355
SEE SH-16 MATCHLINE O-O
MD 355
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE /MD 410 (EB)
EXISTING PEAK HOUR TRAFFIC VOLUMES
AM (PM)
SH-15
State Highway Administration - Data Services Engineering Division - 2/2/2015

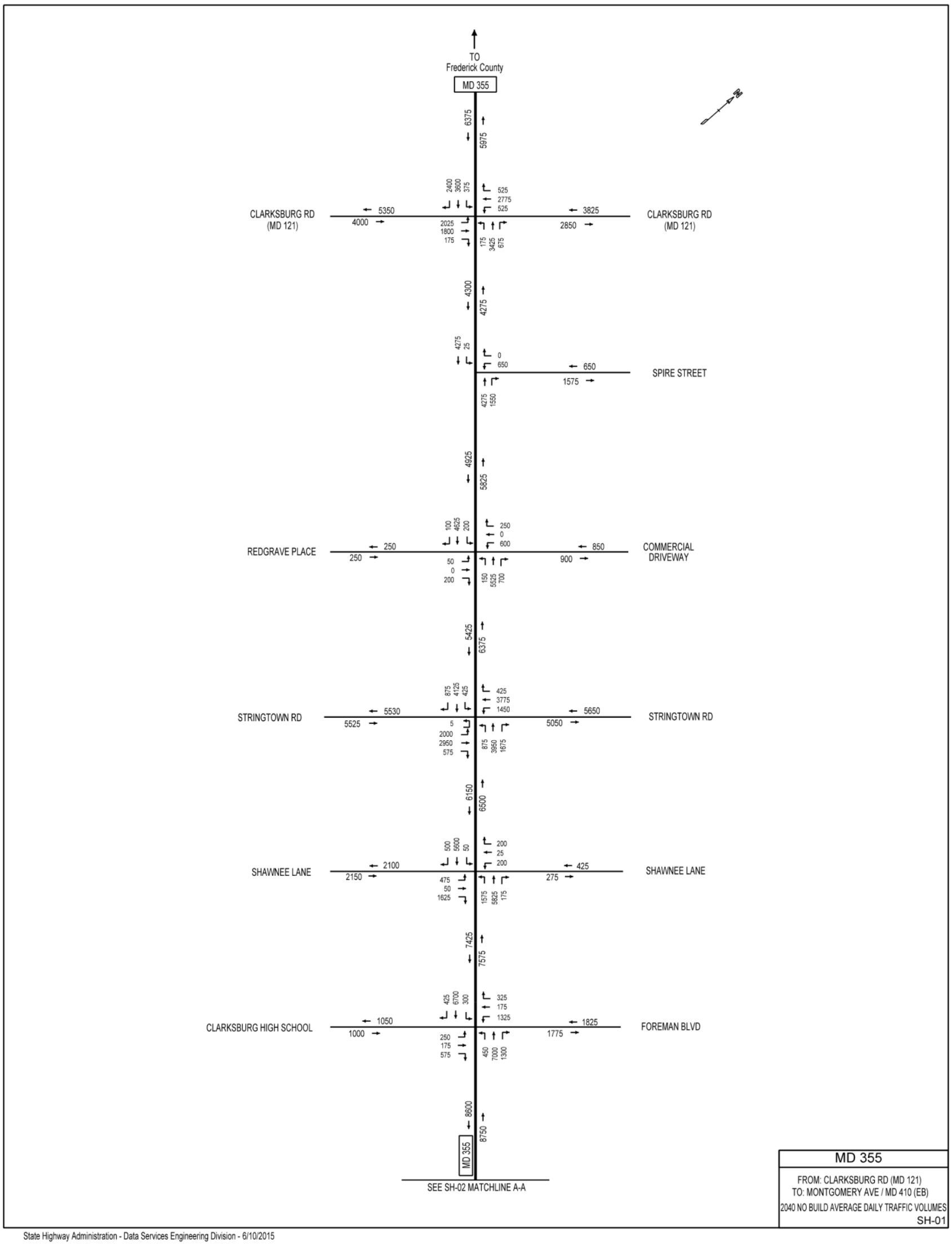

SEE SH-15 MATCHLINE O-O
MD 355
(2455) 1715
3010 (2265)
1085 (1075)
1085 (1075)
RAMP FROM I-495/CAPITAL BELTWAY OUTER LOOP
(1380) 630
675 (930)
RAMP TO I-270 (NB)
(930) 675
(1380) 630
2060 (1415)
950 (850)
RAMP TO I-495/CAPITAL BELTWAY INNER LOOP
(850) 950
(2310) 1305
2060 (1415)
RAMP FROM I-270 (SB)
(765) 980
(765) 980
3040 (2180)
(2310) 1305
415 (200)
RAMP TO I-495/CAPITAL BELTWAY OUTERLOOP
(200) 415
(2310) 1305
3040 (2180)
RAMP FROM I-495/CAPITAL BELTWAY INNER LOOP
(320) 315
(320) 315
3355 (2500)
(5210) 1720
RAMP TO I-495/CAPITAL BELTWAY INNER LOOP
(700) 270
(2510) 1720
(700) 270
3355 (2500)
(3210) 1990
MD 355
SEE SH-17 MATCHLINE P-P
N
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE /MD 410 (EB)
EXISTING PEAK HOUR TRAFFIC VOLUMES
AM (PM)
SH-16
State Highway Administration - Data Services Engineering Division - 2/4/2015

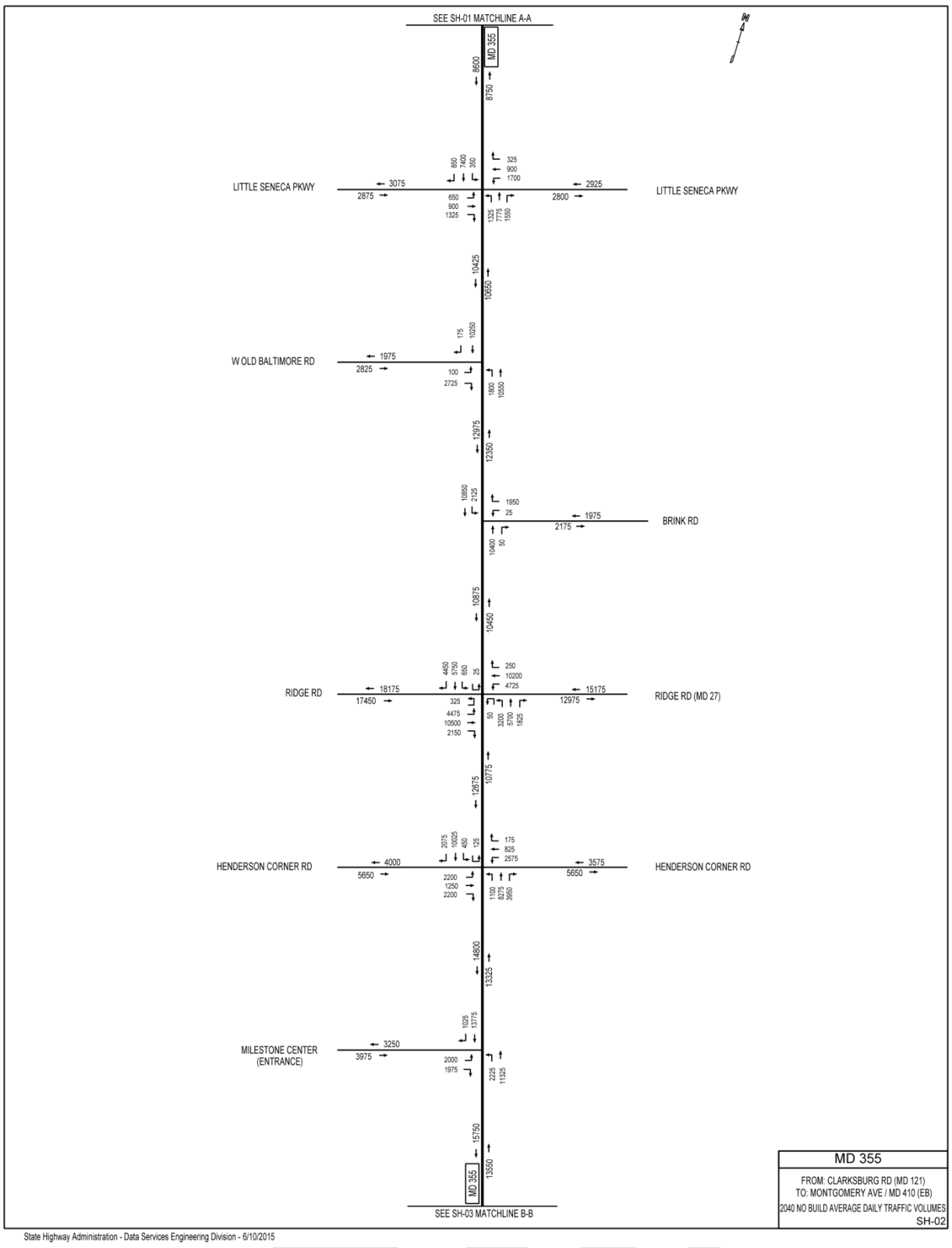


State Highway Administration - Data Services Engineering Division - 2/2/2015

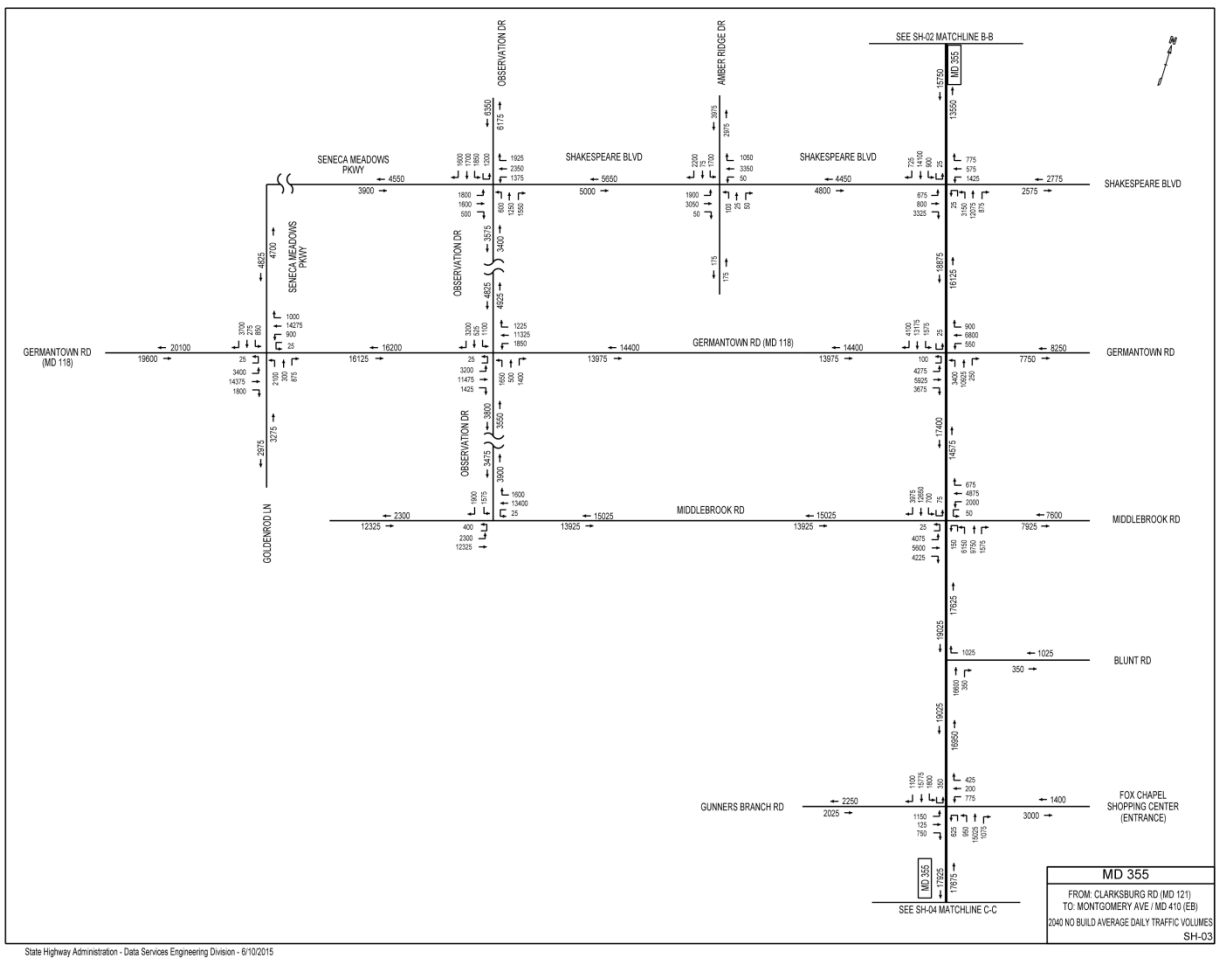

SEE SH-17 MATCHLINE Q-Q
MD 355
N
CENTER DR
JONES BRIDGE RD
WOODMONT AVE
GLENBROOK PKWY
BATTERY LN
ROSEDALE AVE
CORDELL AVE
NORFOLK AVE
CHELTENHAM DR
OLD GEORGETOWN RD / MD 187 (WB)
EAST-WEST HWY / MD 410 (WB)
MONTGOMERY LN / MD 187 (EB)
MONTGOMERY AVE / MD 410 (EB)
MD 355
TO
WASHINGTON DC
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE /MD 410 (EB)
EXISTING PEAK HOUR TRAFFIC VOLUMES
AM (PM)
SH-18
State Highway Administration - Data Services Engineering Division - 2/2/2015

2040 No-Build MD 355 ADT Diagrams

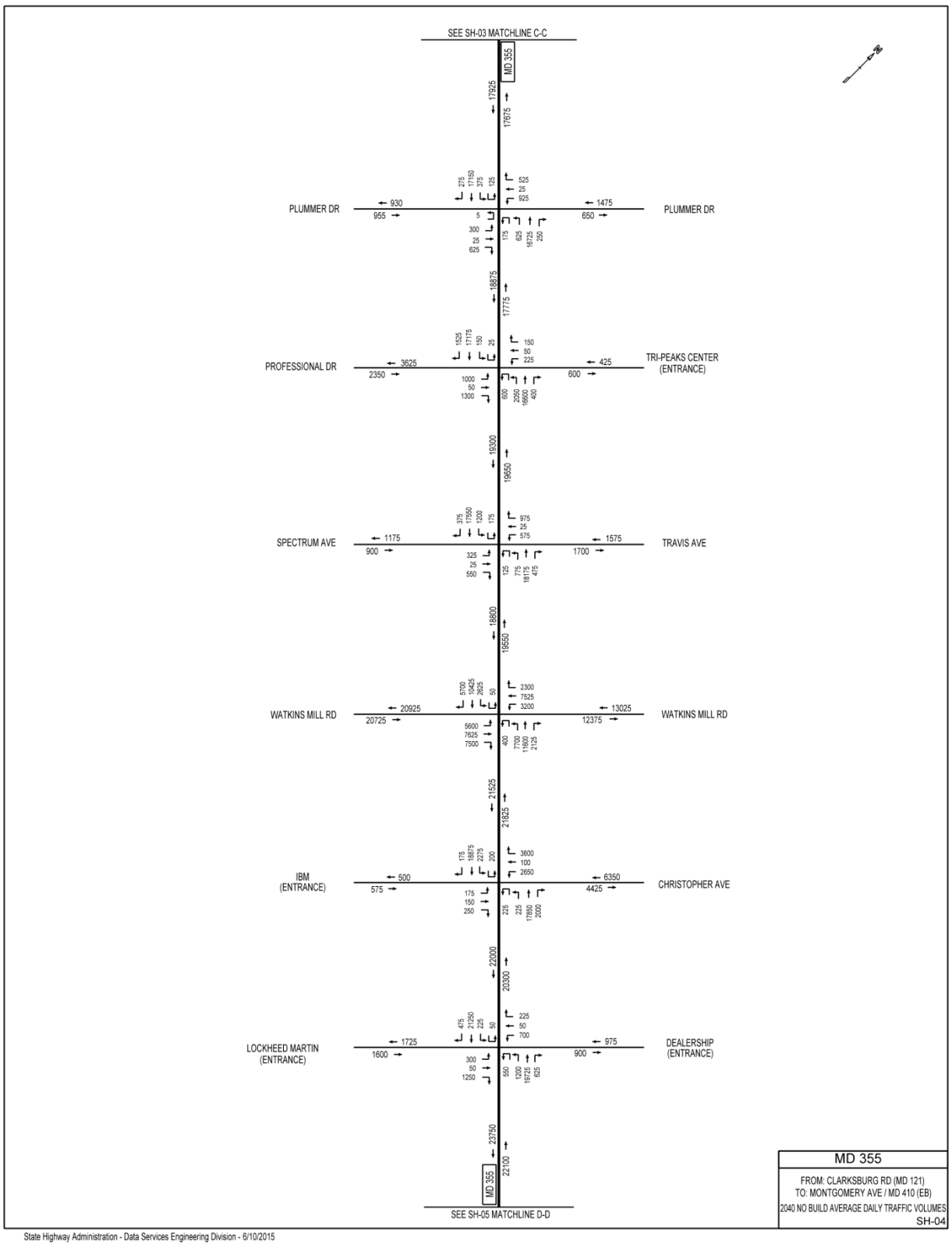


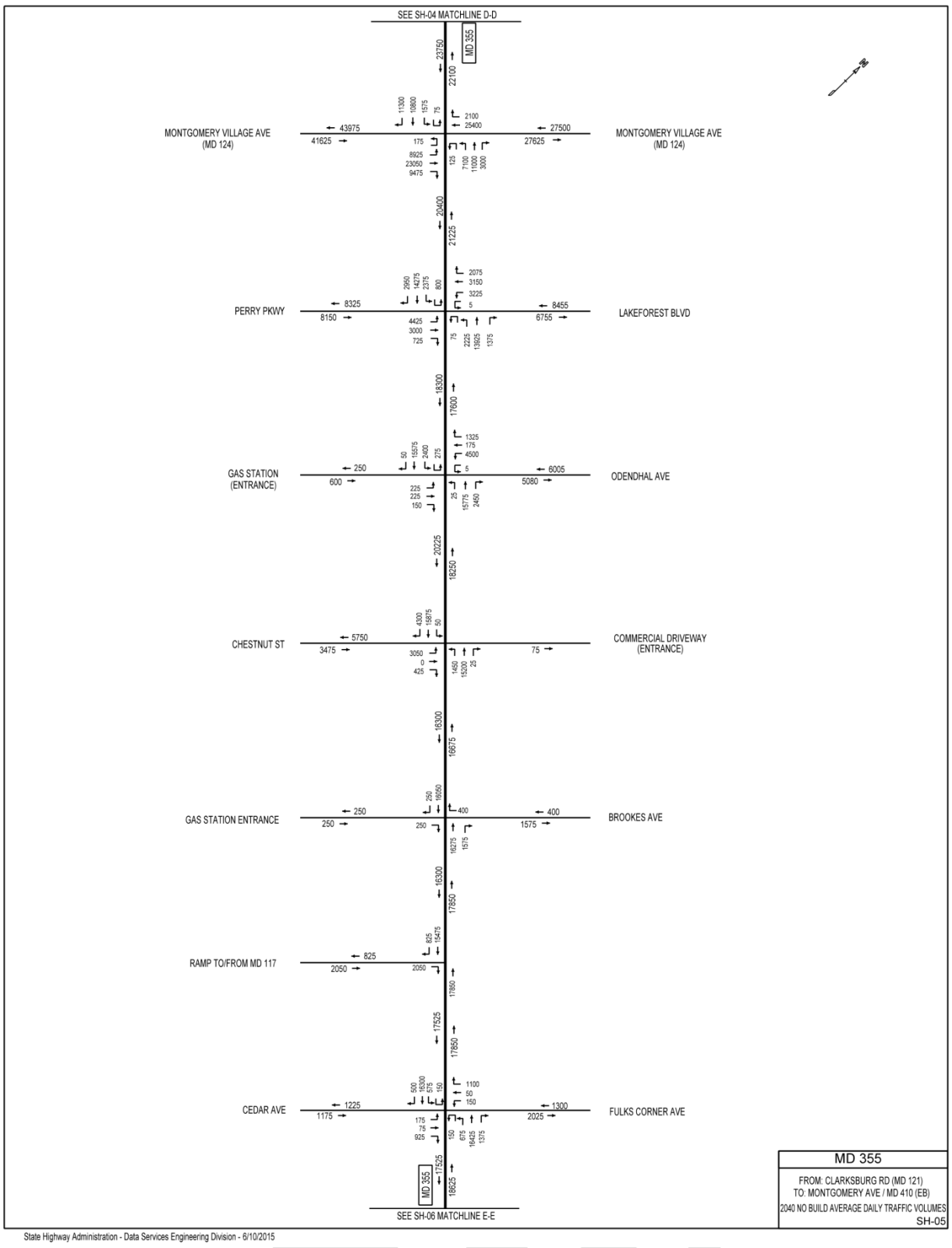


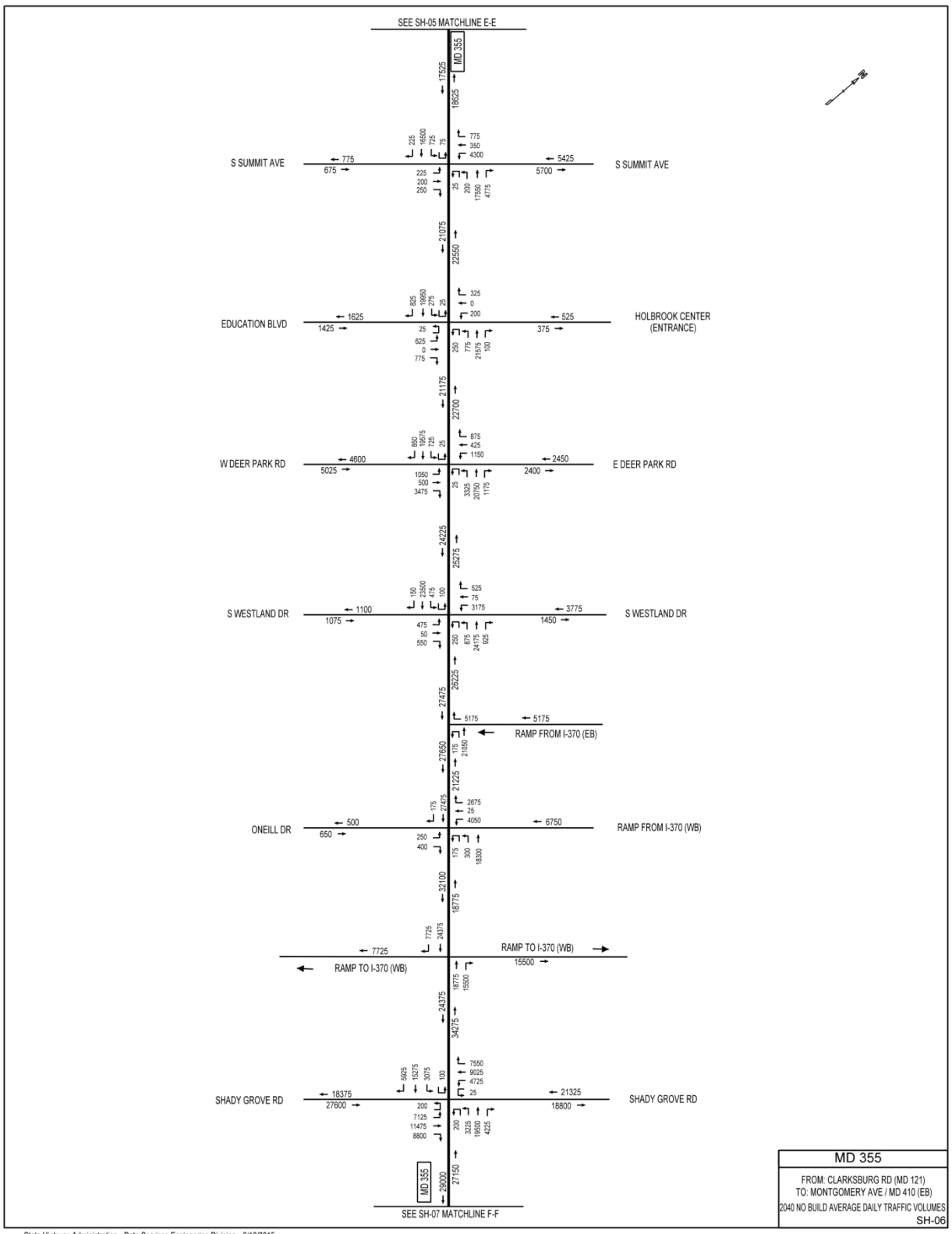
State Highway Administration - Data Services Engineering Division - 6/10/2015



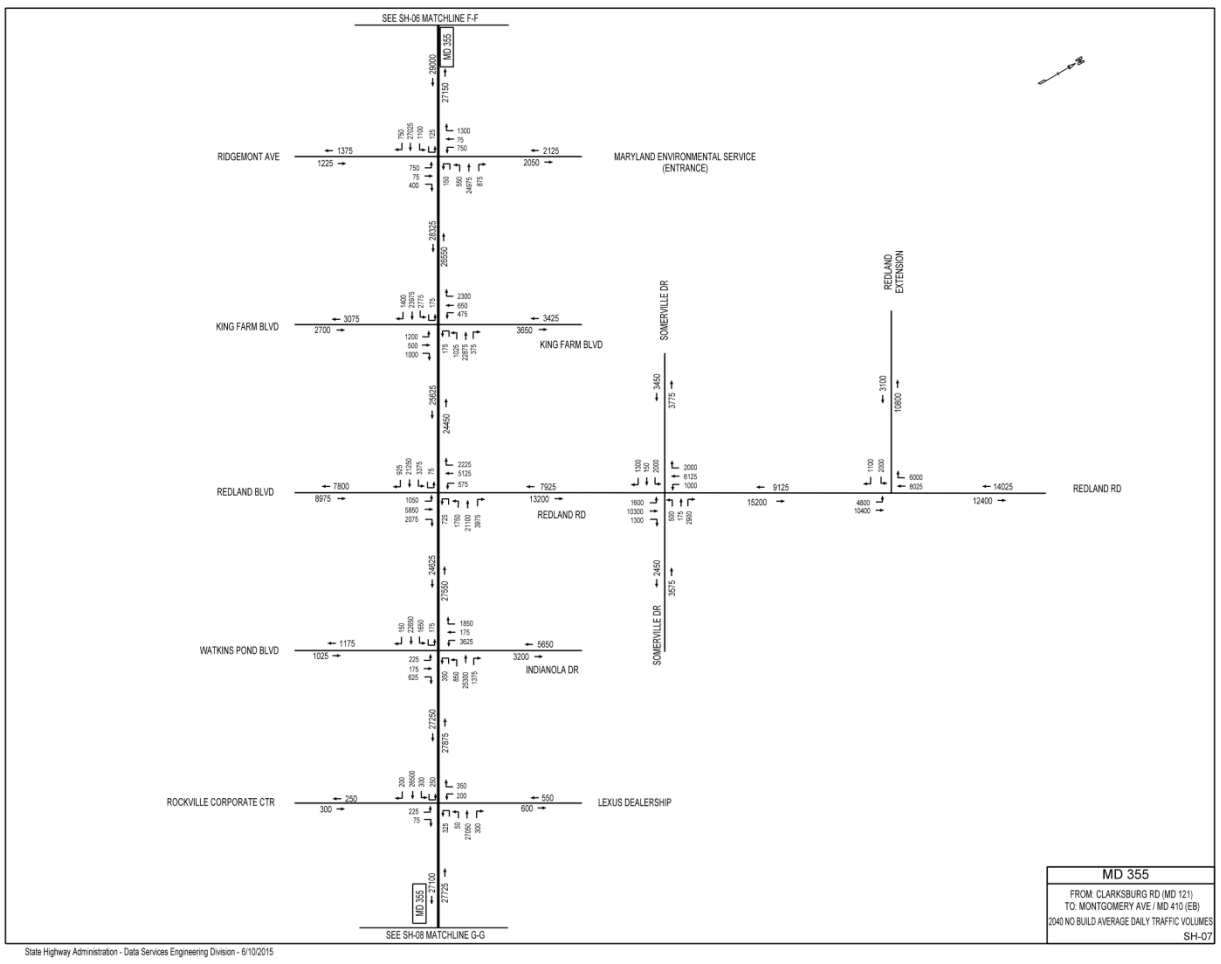
State Highway Administration - Data Services Engineering Division - 6/10/2015


SEE SH-03 MATCHLINE C-C
MD 355
17925
17675
PLUMMER DR
930
955
1475
650
PLUMMER DR
18875
17775
PROFESSIONAL DR
3625
2350
425
600
TRI-PEAKS CENTER (ENTRANCE)
19300
19950
SPECTRUM AVE
1175
900
1575
1700
TRAVIS AVE
18800
19550
WATKINS MILL RD
20925
20725
13025
12375
WATKINS MILL RD
21525
21825
IBM (ENTRANCE)
500
575
6350
4425
CHRISTOPHER AVE
22000
20300
LOCKHEED MARTIN (ENTRANCE)
1725
1600
975
900
DEALERSHIP (ENTRANCE)
23750
22100
MD 355
SEE SH-05 MATCHLINE D-D
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE / MD 410 (EB)
2040 NO BUILD AVERAGE DAILY TRAFFIC VOLUMES
SH-04
State Highway Administration - Data Services Engineering Division - 6/10/2015

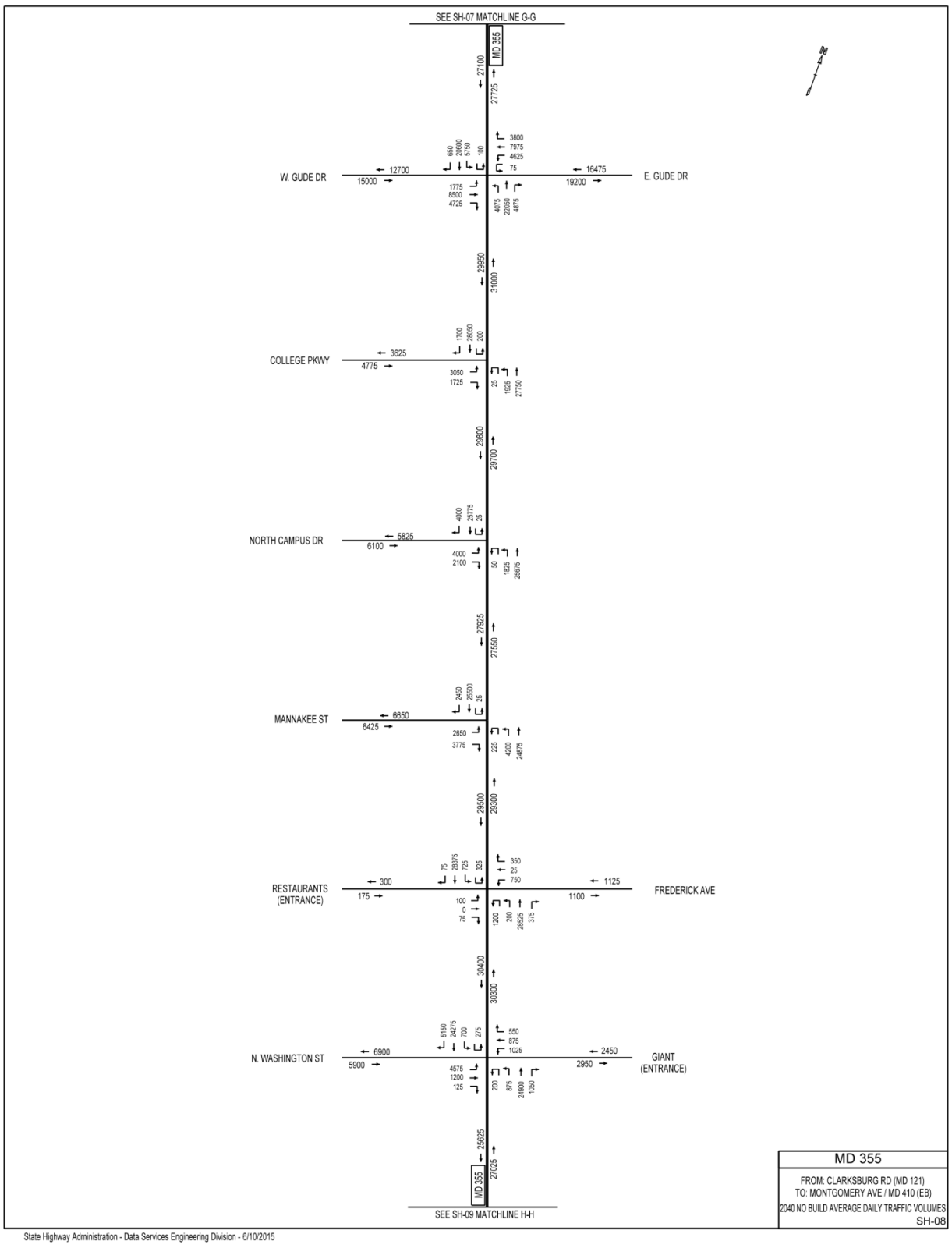

SEE SH-04 MATCHLINE D-D
MD 355
MONTGOMERY VILLAGE AVE (MD 124)
MONTGOMERY VILLAGE AVE (MD 124)
PERRY PKWY
LAKEFOREST BLVD
GAS STATION (ENTRANCE)
ODENDHAL AVE
CHESTNUT ST
COMMERCIAL DRIVEWAY (ENTRANCE)
GAS STATION ENTRANCE
BROOKES AVE
RAMP TO/FROM MD 117
CEDAR AVE
FULKS CORNER AVE
SEE SH-06 MATCHLINE E-E
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE / MD 410 (EB)
2040 NO BUILD AVERAGE DAILY TRAFFIC VOLUMES
SH-05
State Highway Administration - Data Services Engineering Division - 6/10/2015



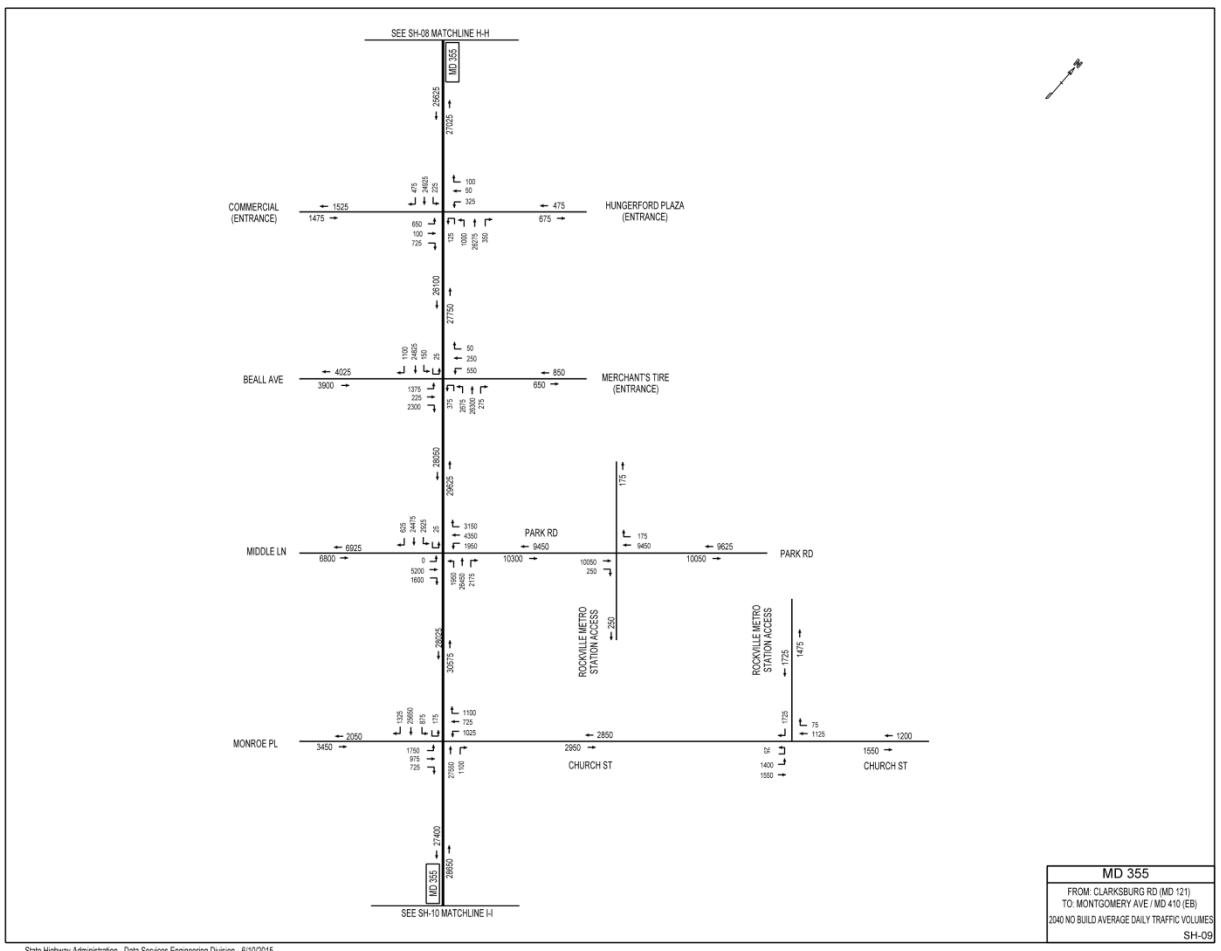
State Highway Administration - Data Services Engineering Division - 6/10/2015



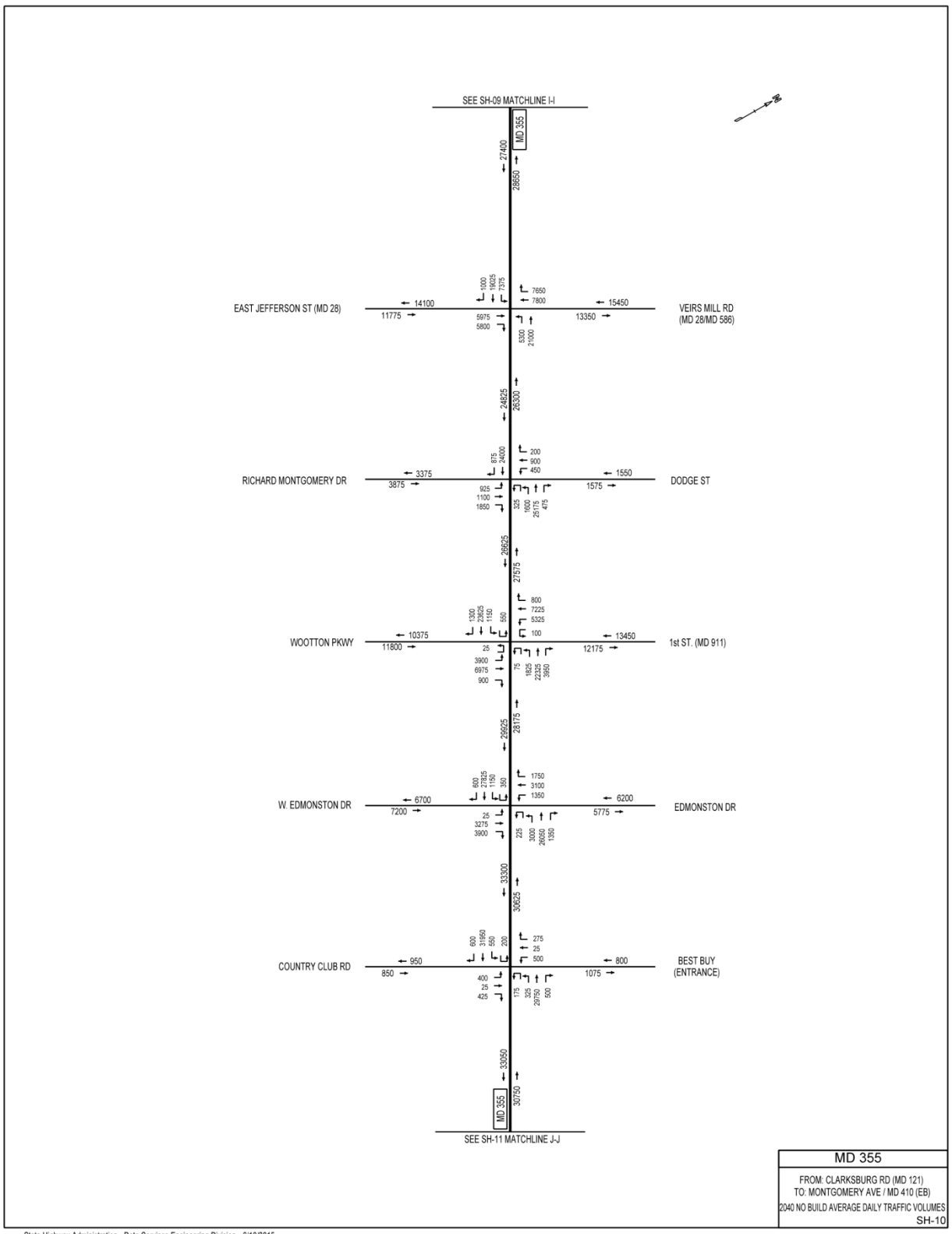
State Highway Administration - Data Services Engineering Division - 6/10/2015



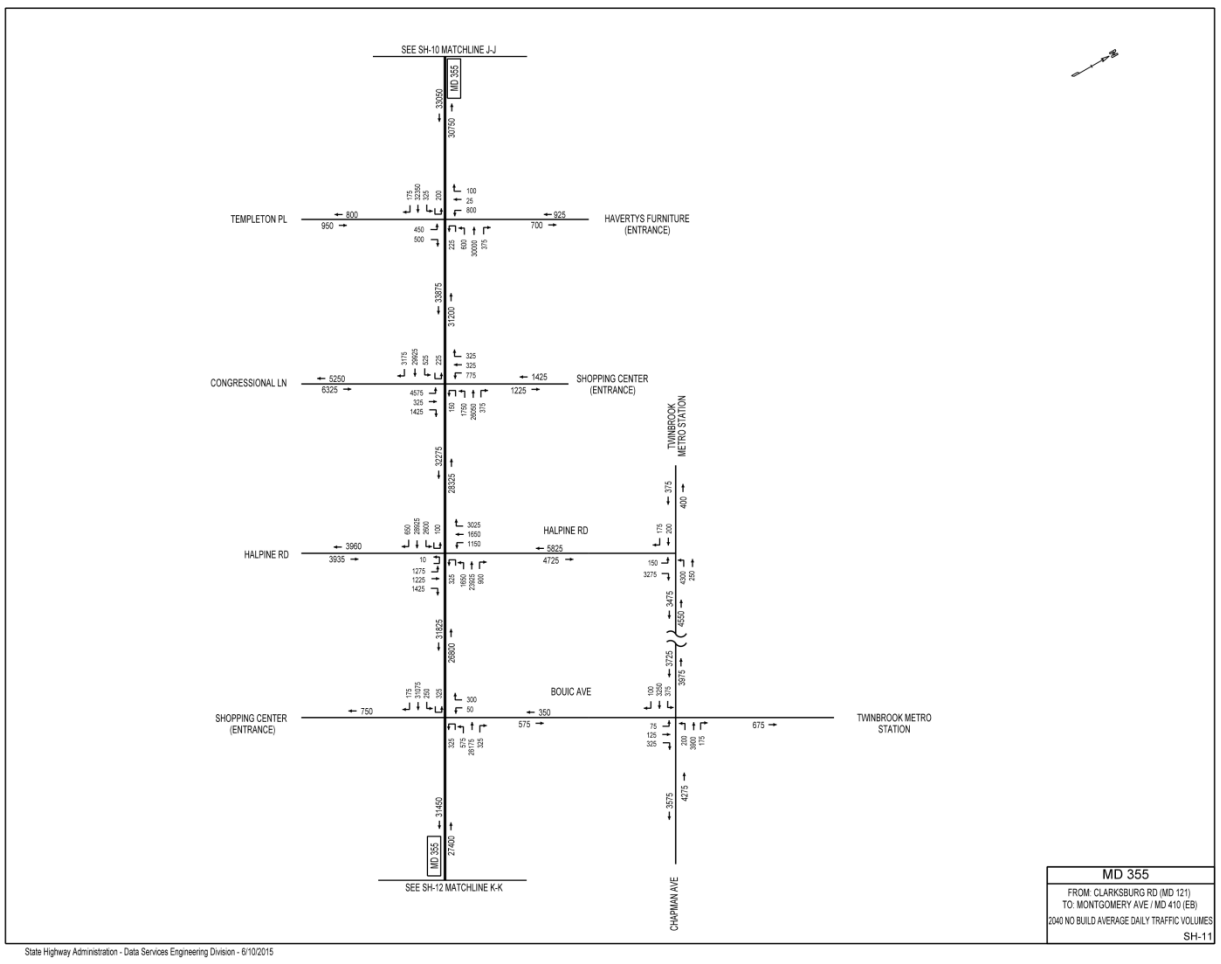
State Highway Administration - Data Services Engineering Division - 6/10/2015



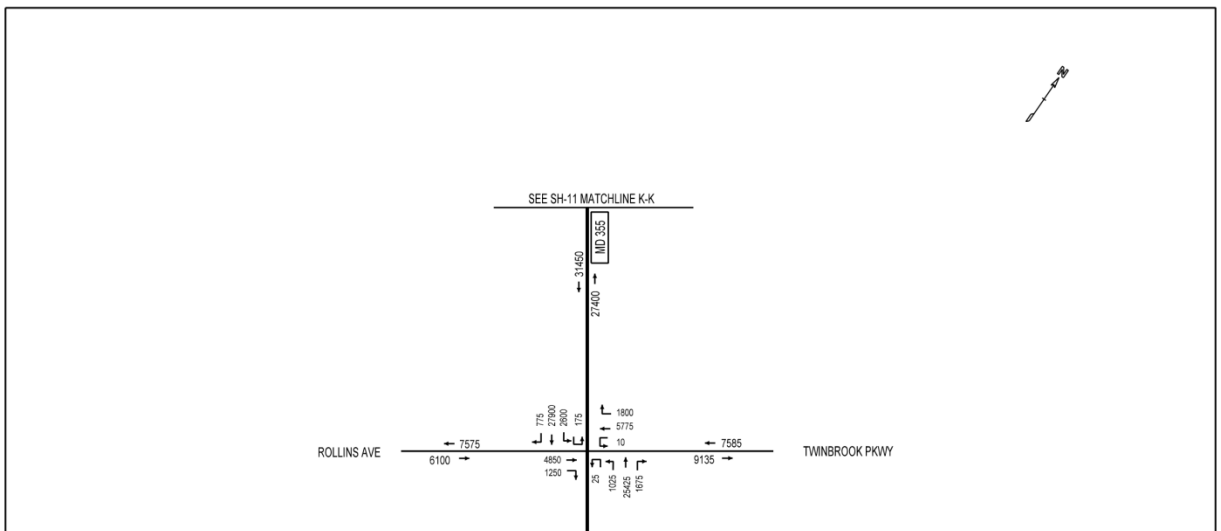
State Highway Administration - Data Services Engineering Division - 6/10/2015



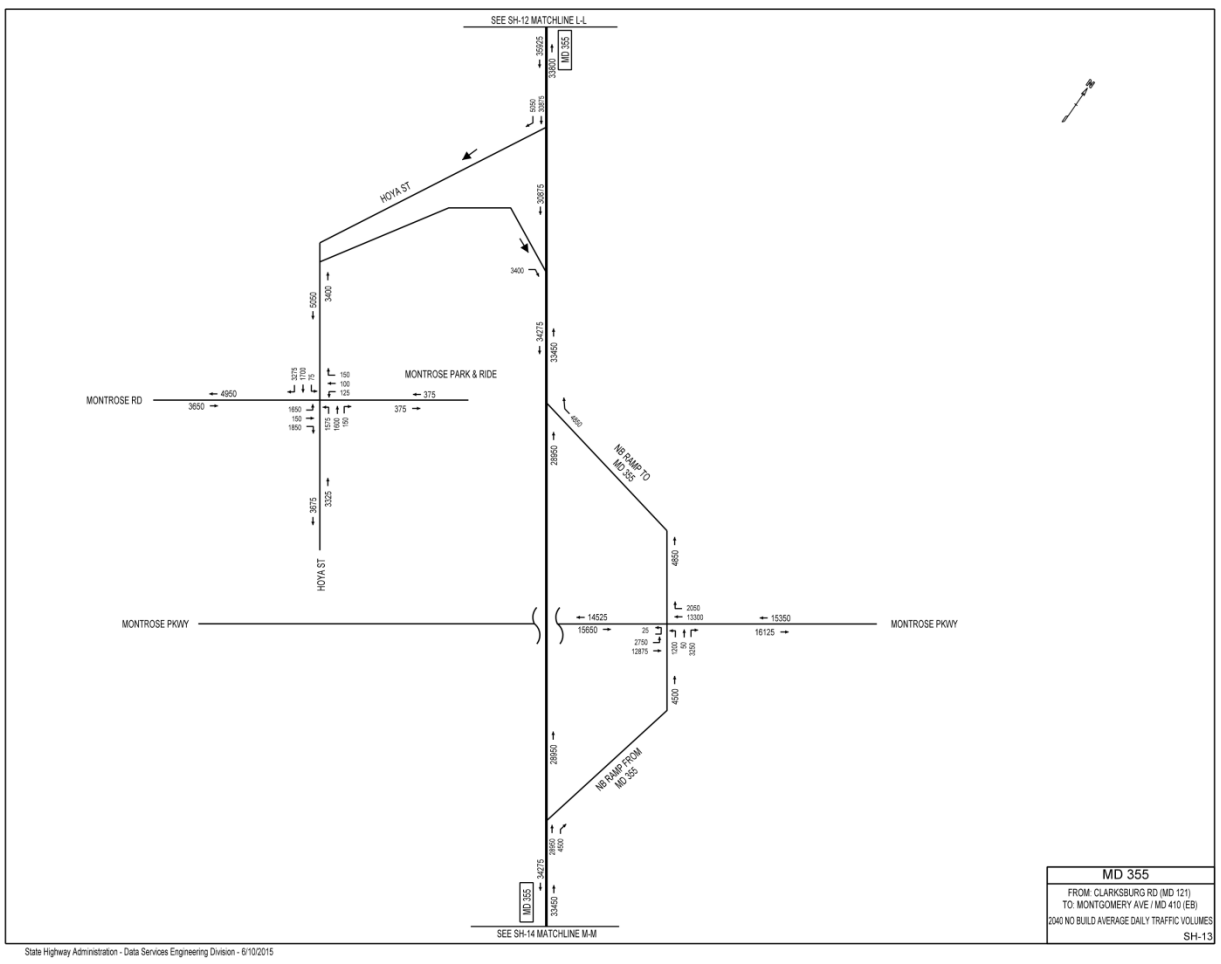
State Highway Administration - Data Services Engineering Division - 6/10/2015



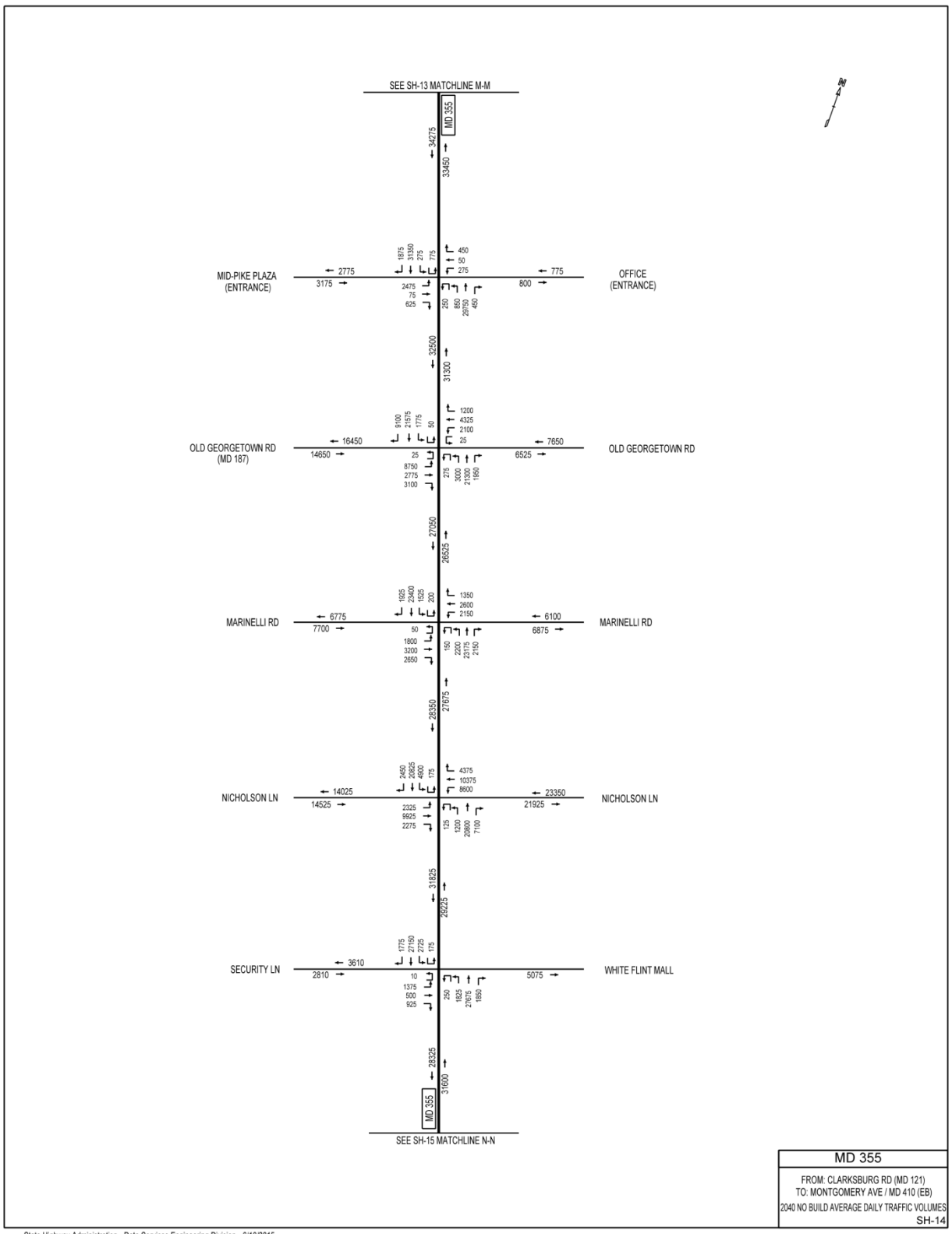
State Highway Administration - Data Services Engineering Division - 6/10/2015



State Highway Administration - Data Services Engineering Division - 6/10/2015



State Highway Administration - Data Services Engineering Division - 6/10/2015

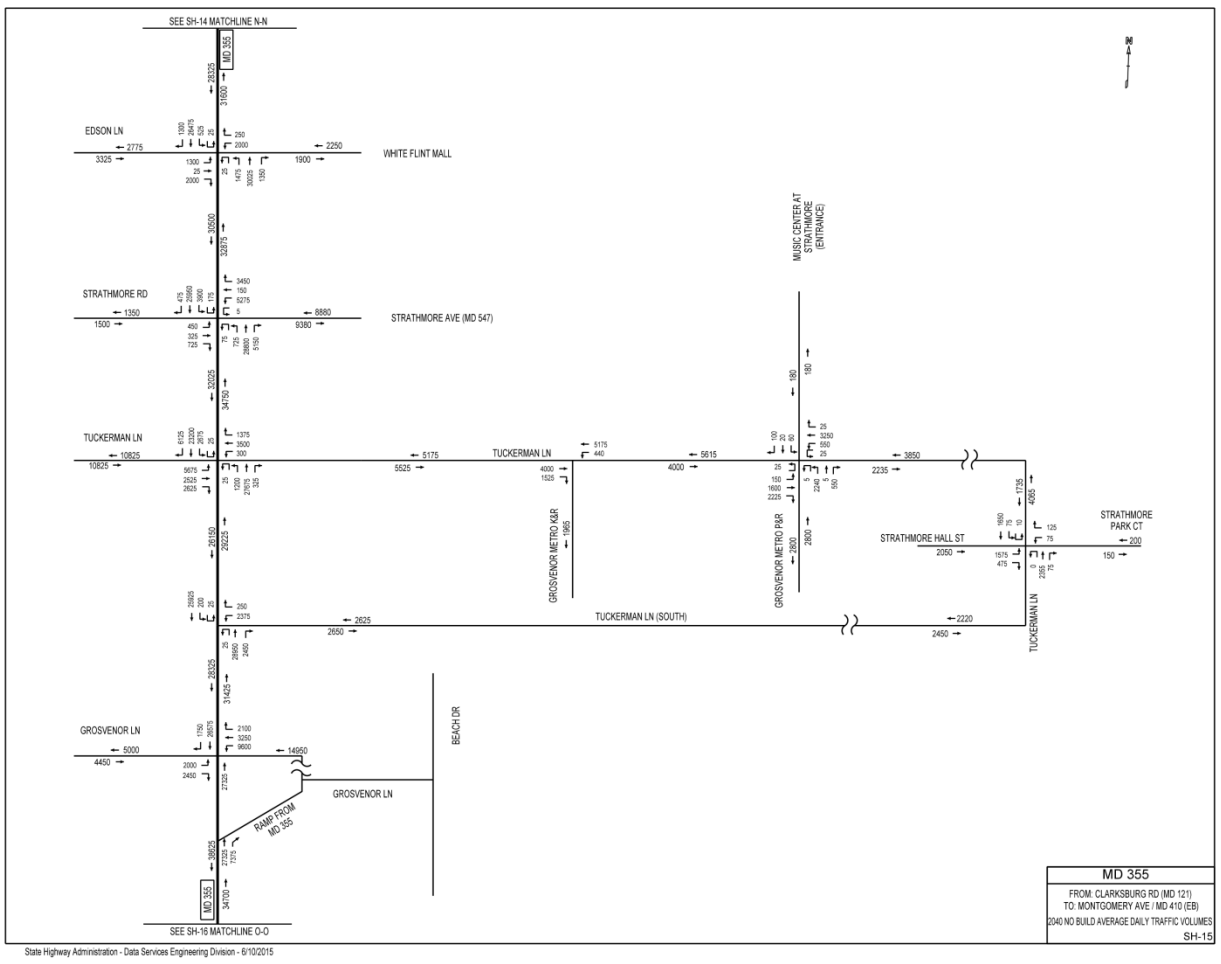


MD 355

FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE / MD 410 (EB)
2040 NO BUILD AVERAGE DAILY TRAFFIC VOLUMES

SH-14

State Highway Administration - Data Services Engineering Division - 6/10/2015

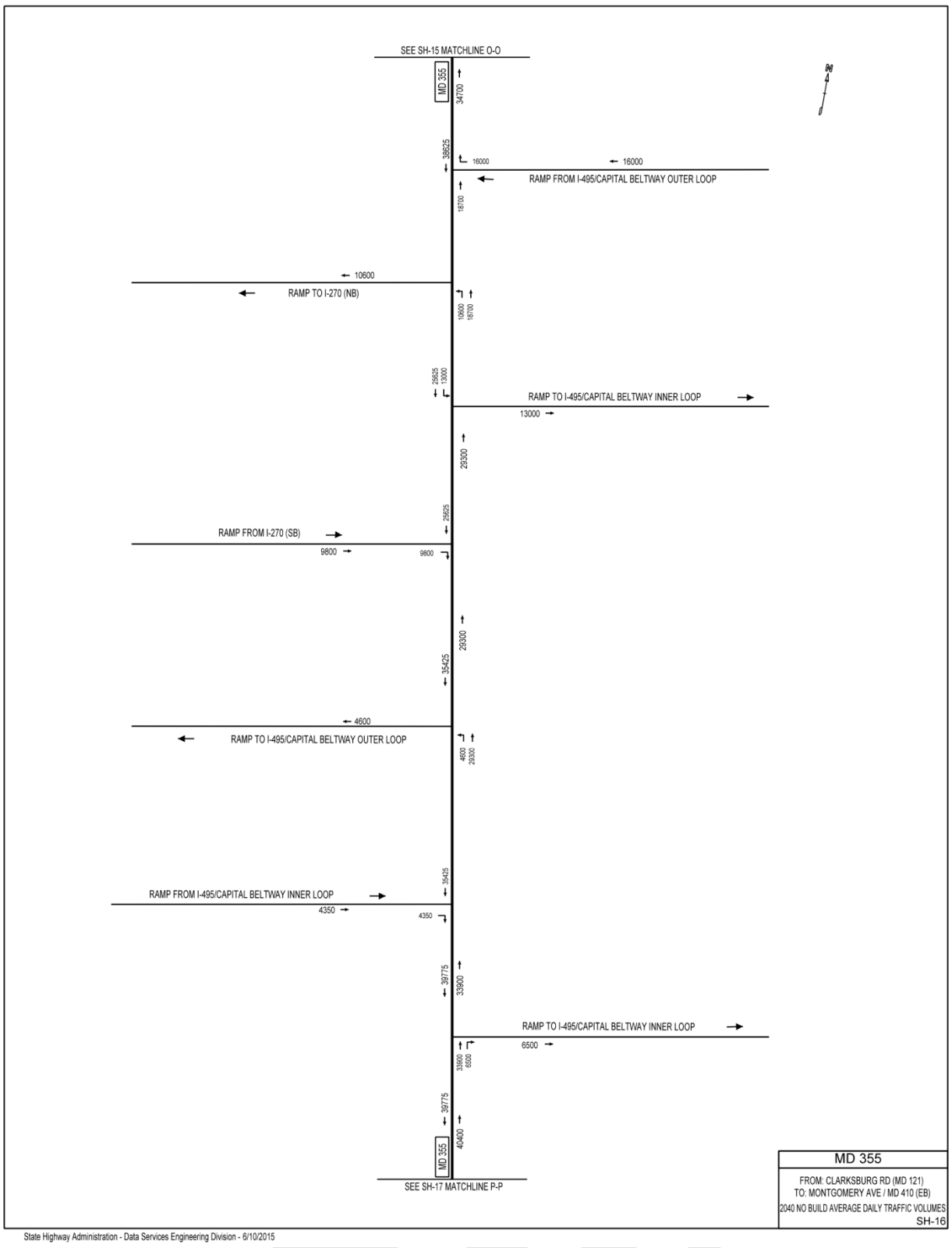


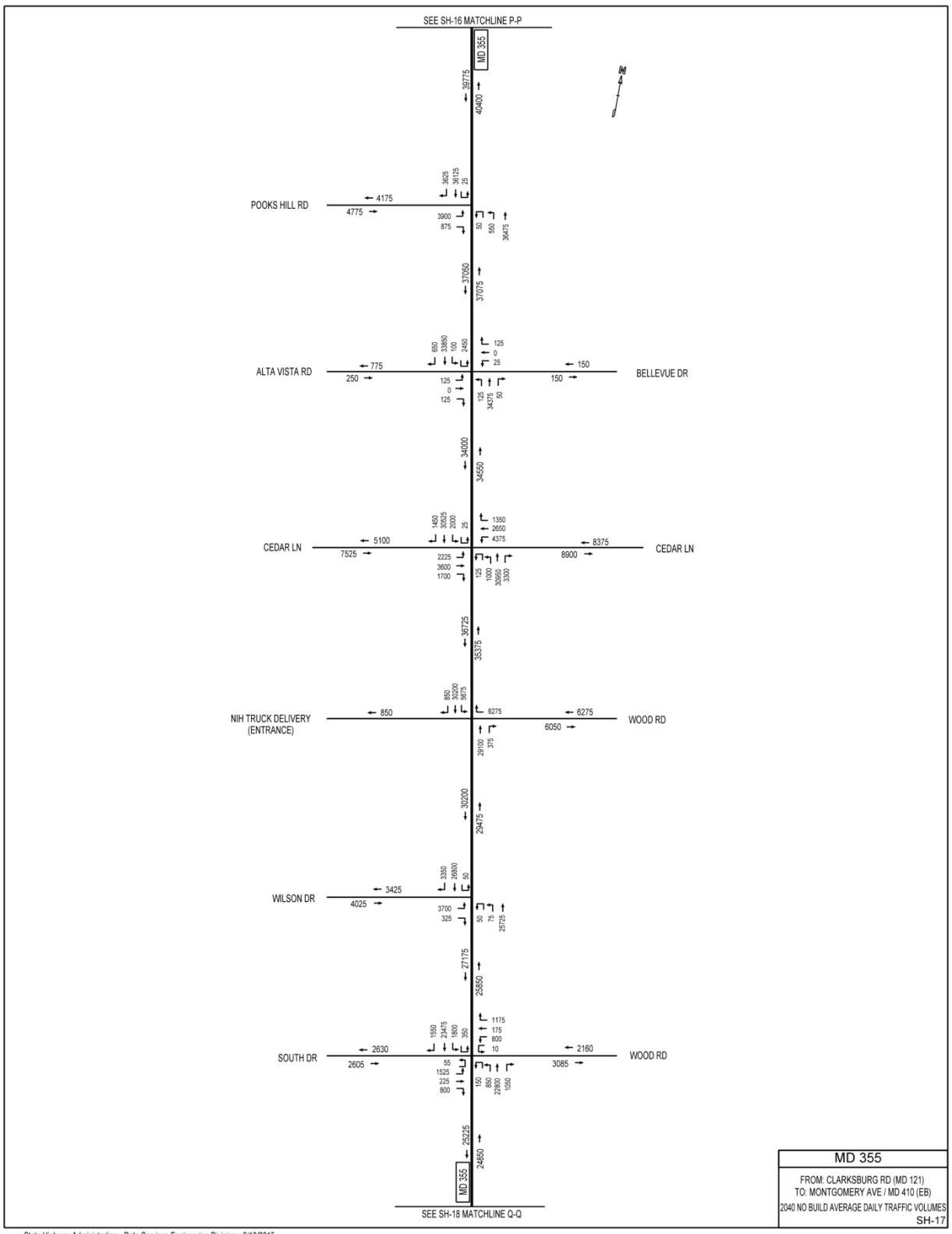
MD 355

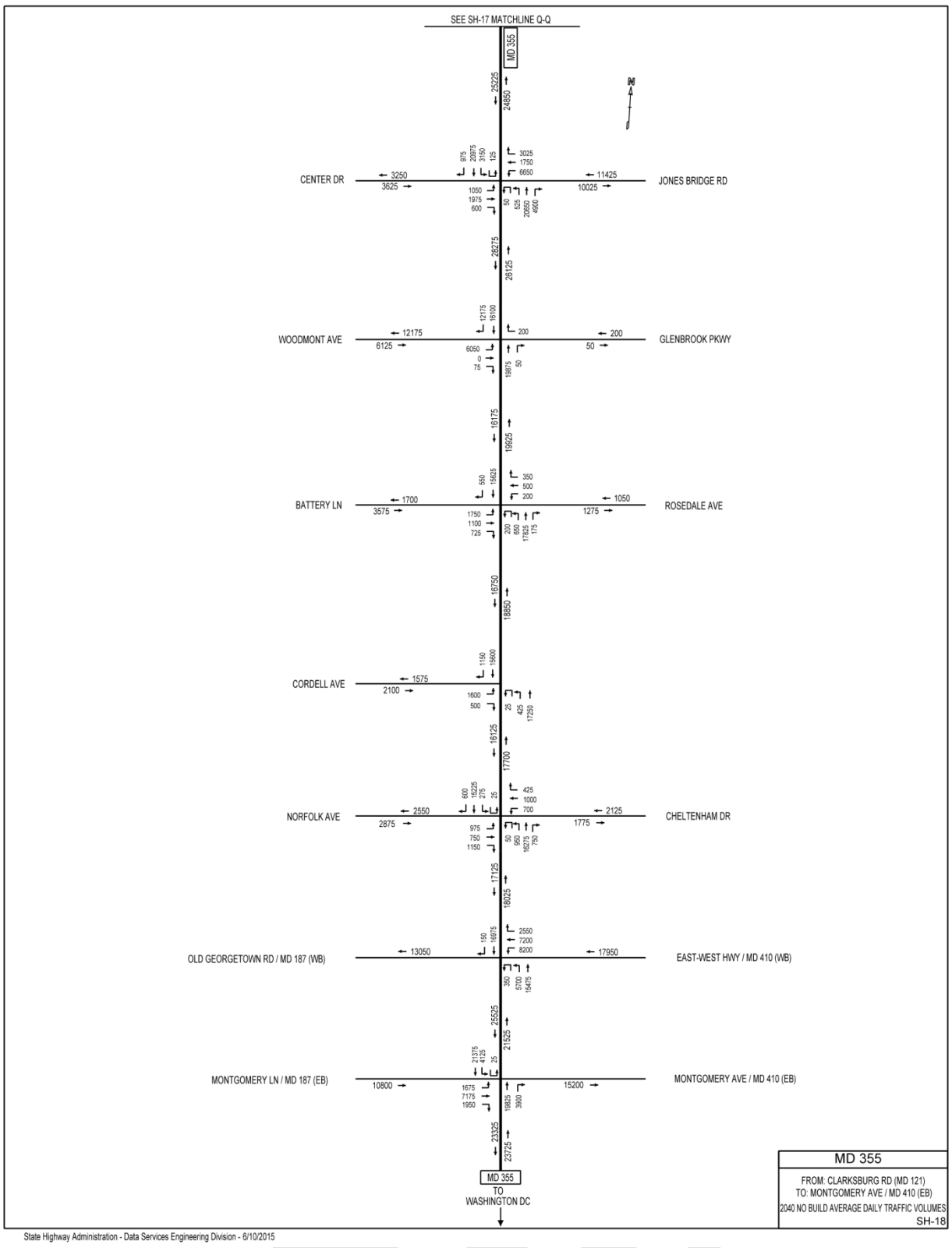
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE / MD 410 (EB)
2040 NO BUILD AVERAGE DAILY TRAFFIC VOLUMES

SH-15

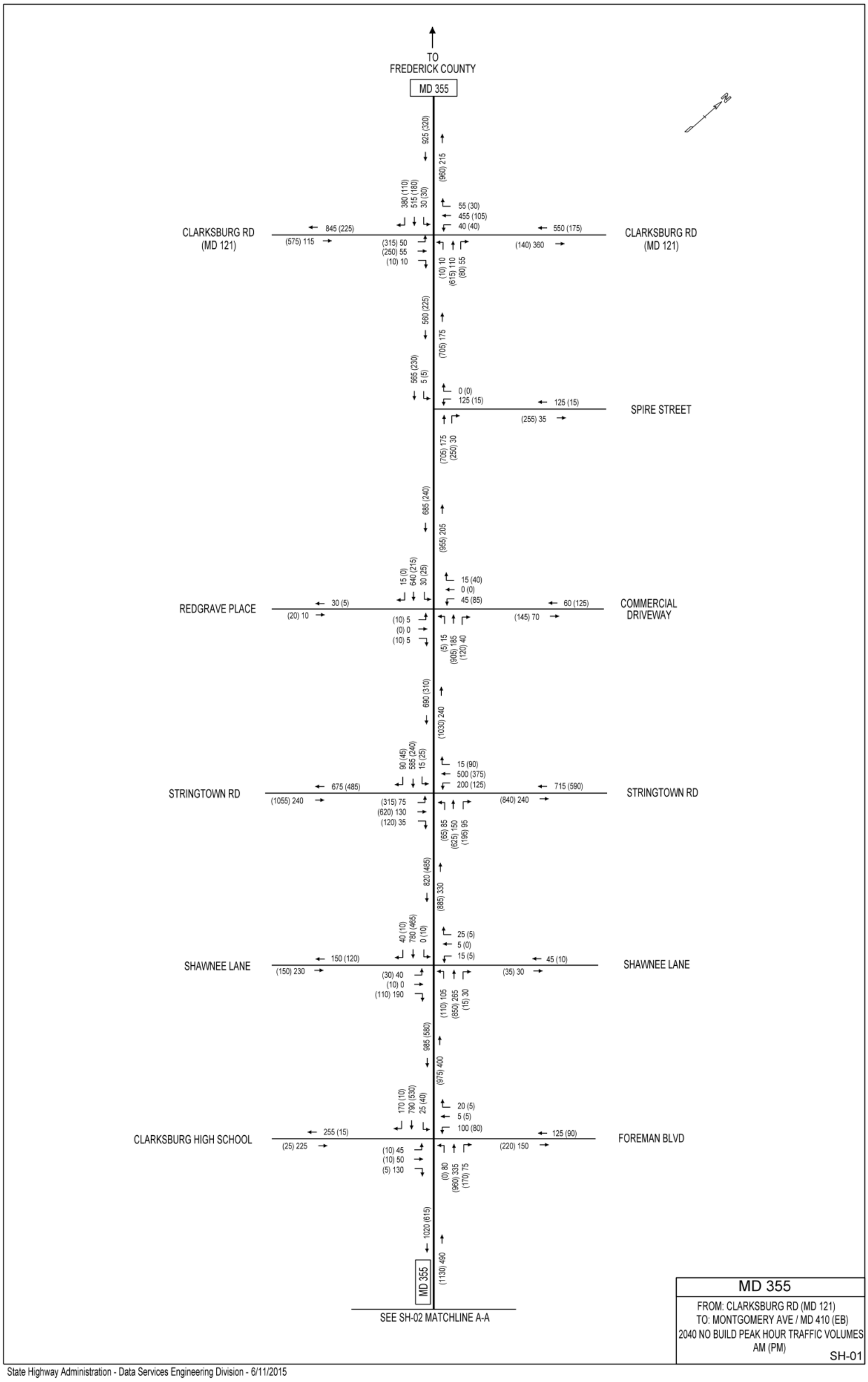
State Highway Administration - Data Services Engineering Division - 6/10/2015

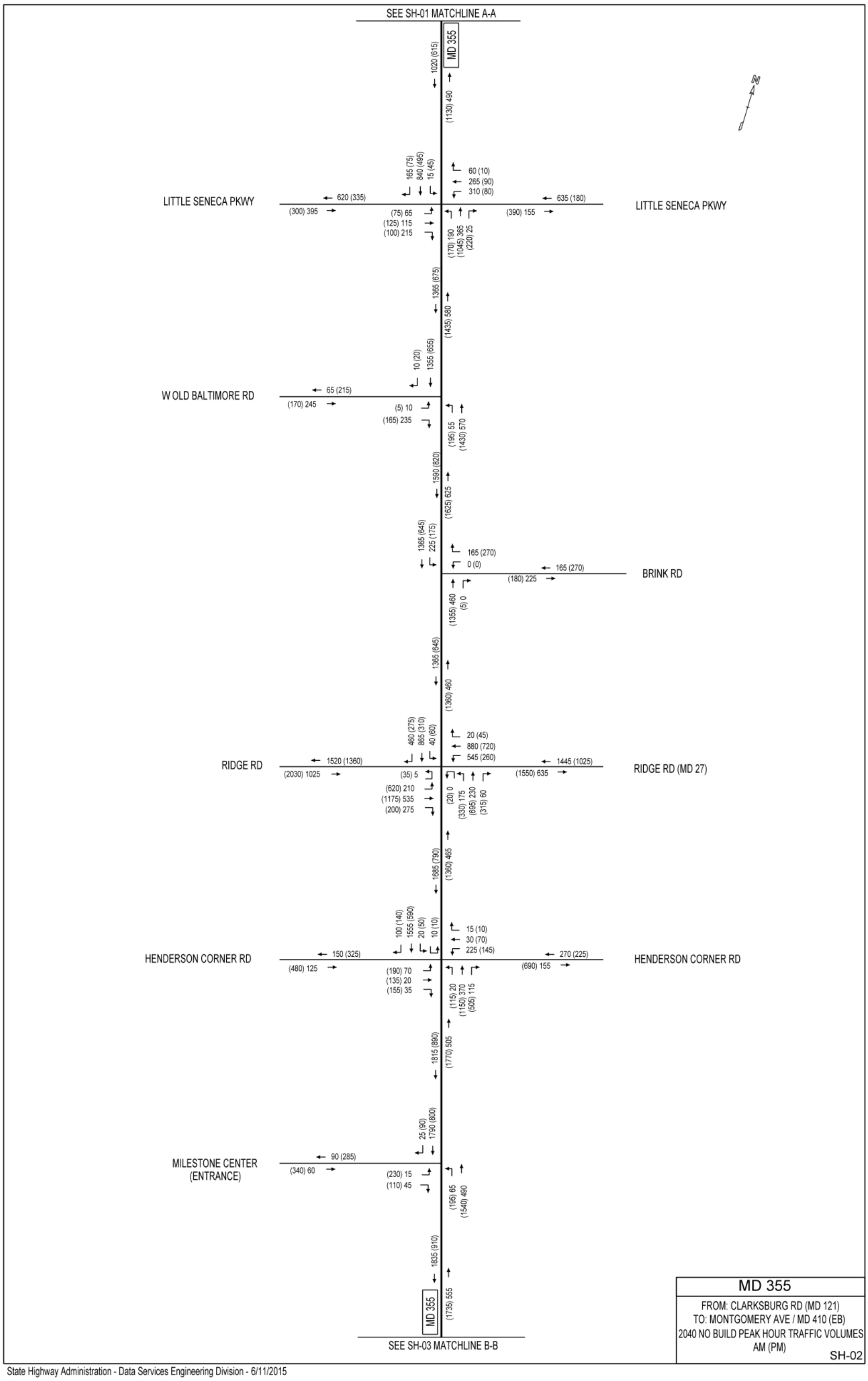

SEE SH-15 MATCHLINE O-O
MD 355
34700
38625
16000
16000
RAMP FROM I-495/CAPITAL BELTWAY OUTER LOOP
18700
10600
RAMP TO I-270 (NB)
10600
18700
25625
13000
RAMP TO I-495/CAPITAL BELTWAY INNER LOOP
13000
29300
25625
RAMP FROM I-270 (SB)
9800
9800
29300
35425
4600
RAMP TO I-495/CAPITAL BELTWAY OUTER LOOP
4600
29300
35425
RAMP FROM I-495/CAPITAL BELTWAY INNER LOOP
4350
4350
39775
33900
RAMP TO I-495/CAPITAL BELTWAY INNER LOOP
6500
33900
6500
39775
40400
MD 355
SEE SH-17 MATCHLINE P-P
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE / MD 410 (EB)
2040 NO BUILD AVERAGE DAILY TRAFFIC VOLUMES
SH-16
State Highway Administration - Data Services Engineering Division - 6/10/2015


SEE SH-16 MATCHLINE P-P
MD 355
39775
40400
3625
36125
25
POOKS HILL RD
4175
4775
3900
875
50
550
36475
37050
37075
650
33850
100
2450
125
0
25
ALTA VISTA RD
775
250
150
150
BELLEVUE DR
125
0
125
125
34375
50
34000
34550
1450
30525
2000
25
1350
2650
4375
CEDAR LN
5100
7525
8375
8900
CEDAR LN
2225
3600
1700
125
1000
30950
3300
36725
35375
850
30200
5675
NIH TRUCK DELIVERY
(ENTRANCE)
850
6275
6275
6050
WOOD RD
29100
375
30200
29475
3350
26800
50
WILSON DR
3425
4025
3700
325
50
75
25725
27175
26550
1550
23475
1800
350
1175
175
800
10
SOUTH DR
2630
2605
2160
3085
WOOD RD
55
1525
225
800
150
850
22800
1050
25225
24850
MD 355
SEE SH-18 MATCHLINE Q-Q
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE / MD 410 (EB)
2040 NO BUILD AVERAGE DAILY TRAFFIC VOLUMES
SH-17
State Highway Administration - Data Services Engineering Division - 6/10/2015

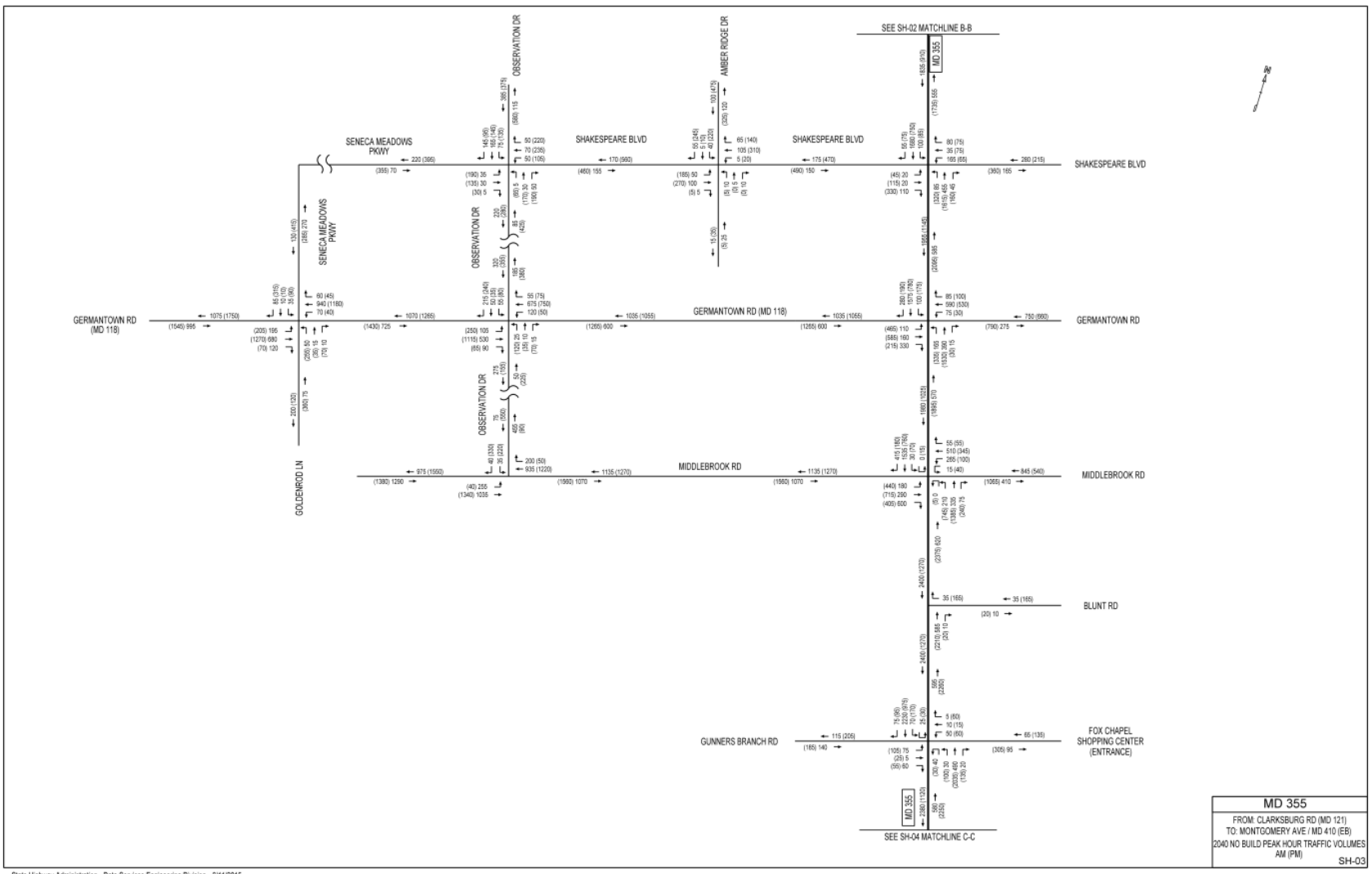

SEE SH-17 MATCHLINE Q-Q
MD 355
N
CENTER DR
JONES BRIDGE RD
WOODMONT AVE
GLENBROOK PKWY
BATTERY LN
ROSEDALE AVE
CORDELL AVE
NORFOLK AVE
CHELTENHAM DR
OLD GEORGETOWN RD / MD 187 (WB)
EAST-WEST HWY / MD 410 (WB)
MONTGOMERY LN / MD 187 (EB)
MONTGOMERY AVE / MD 410 (EB)
MD 355
TO
WASHINGTON DC
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE / MD 410 (EB)
2040 NO BUILD AVERAGE DAILY TRAFFIC VOLUMES
SH-18
State Highway Administration - Data Services Engineering Division - 6/10/2015

2040 No-Build MD 355 AM & PM Volume Diagrams

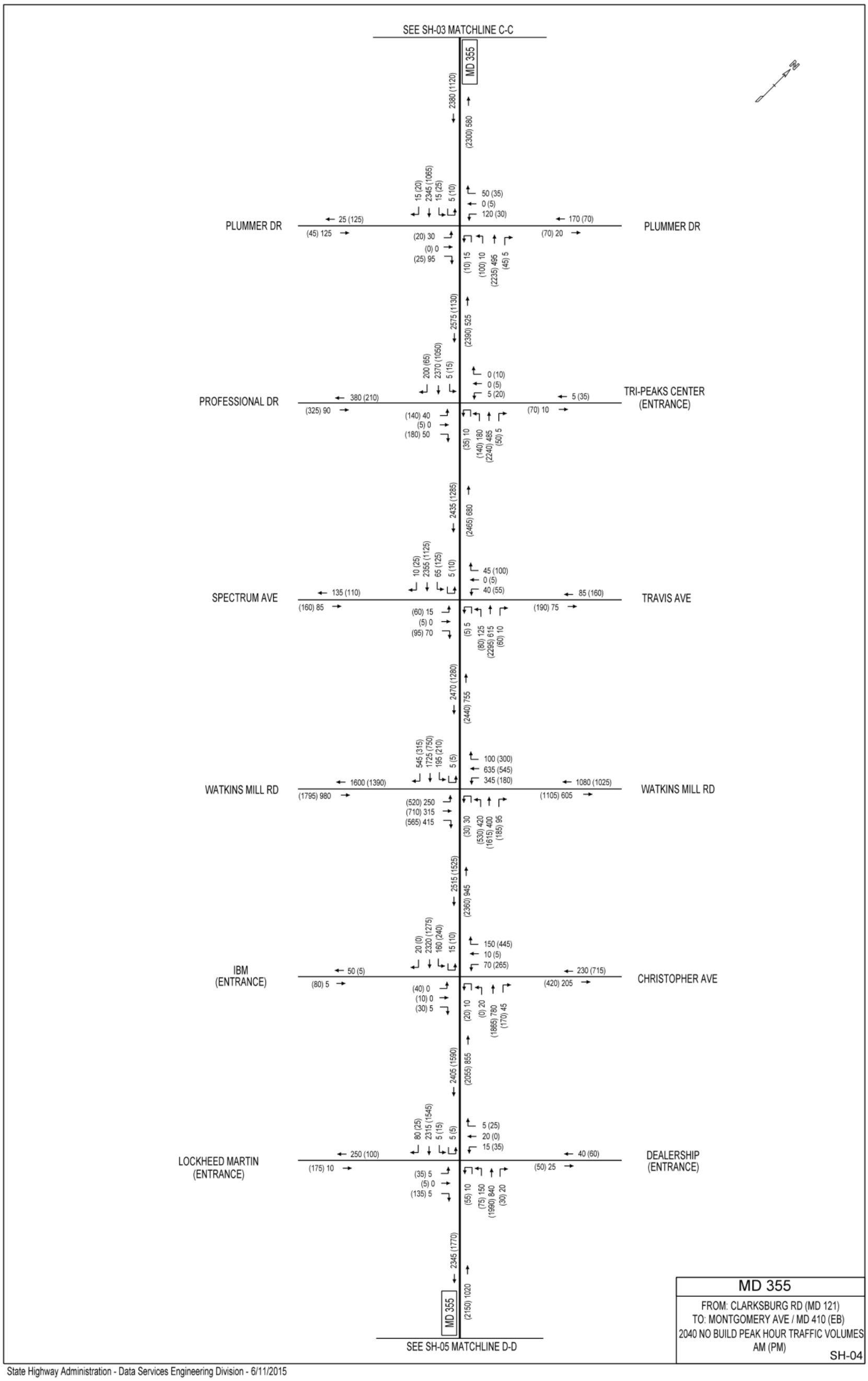


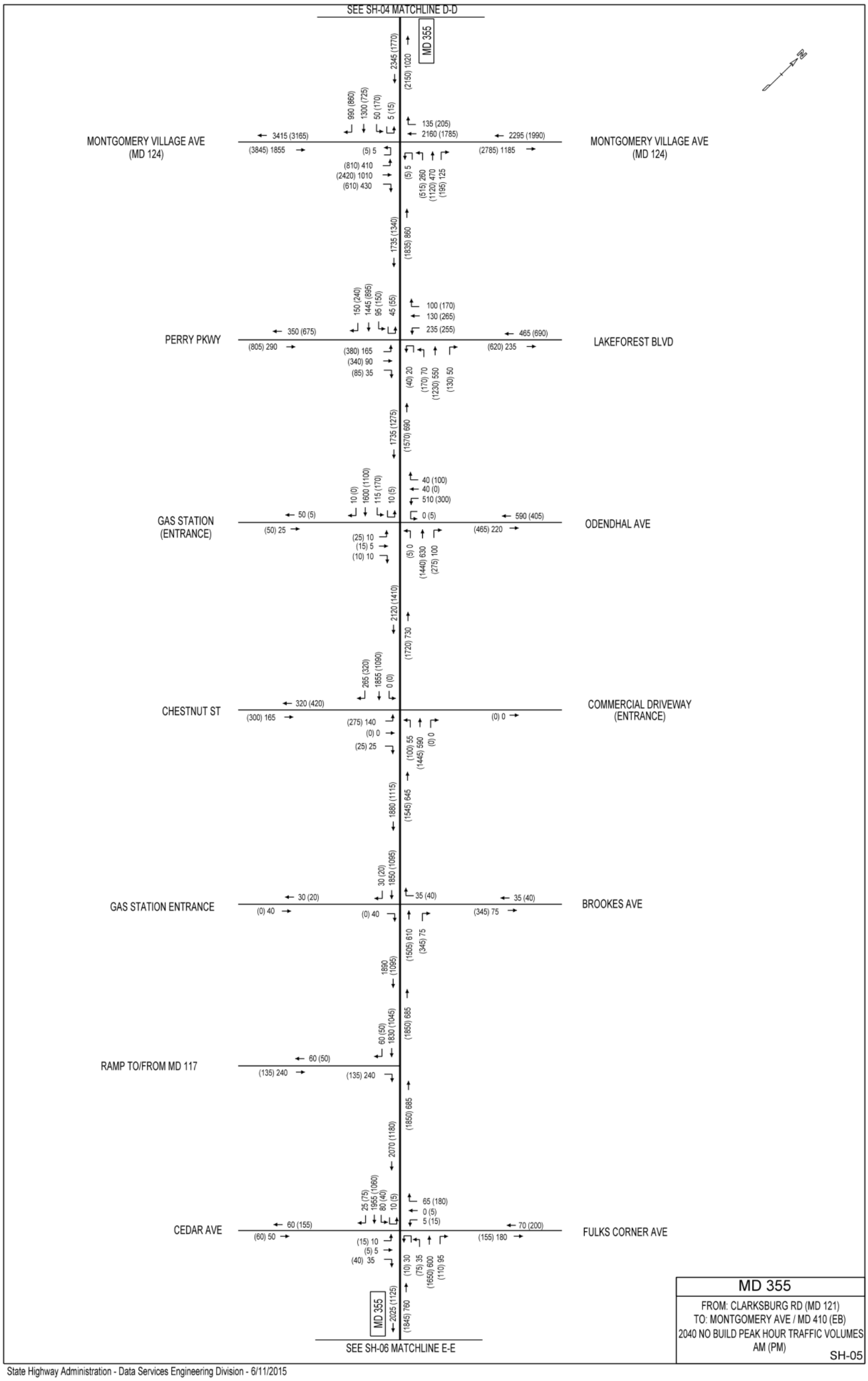


State Highway Administration - Data Services Engineering Division - 6/11/2015

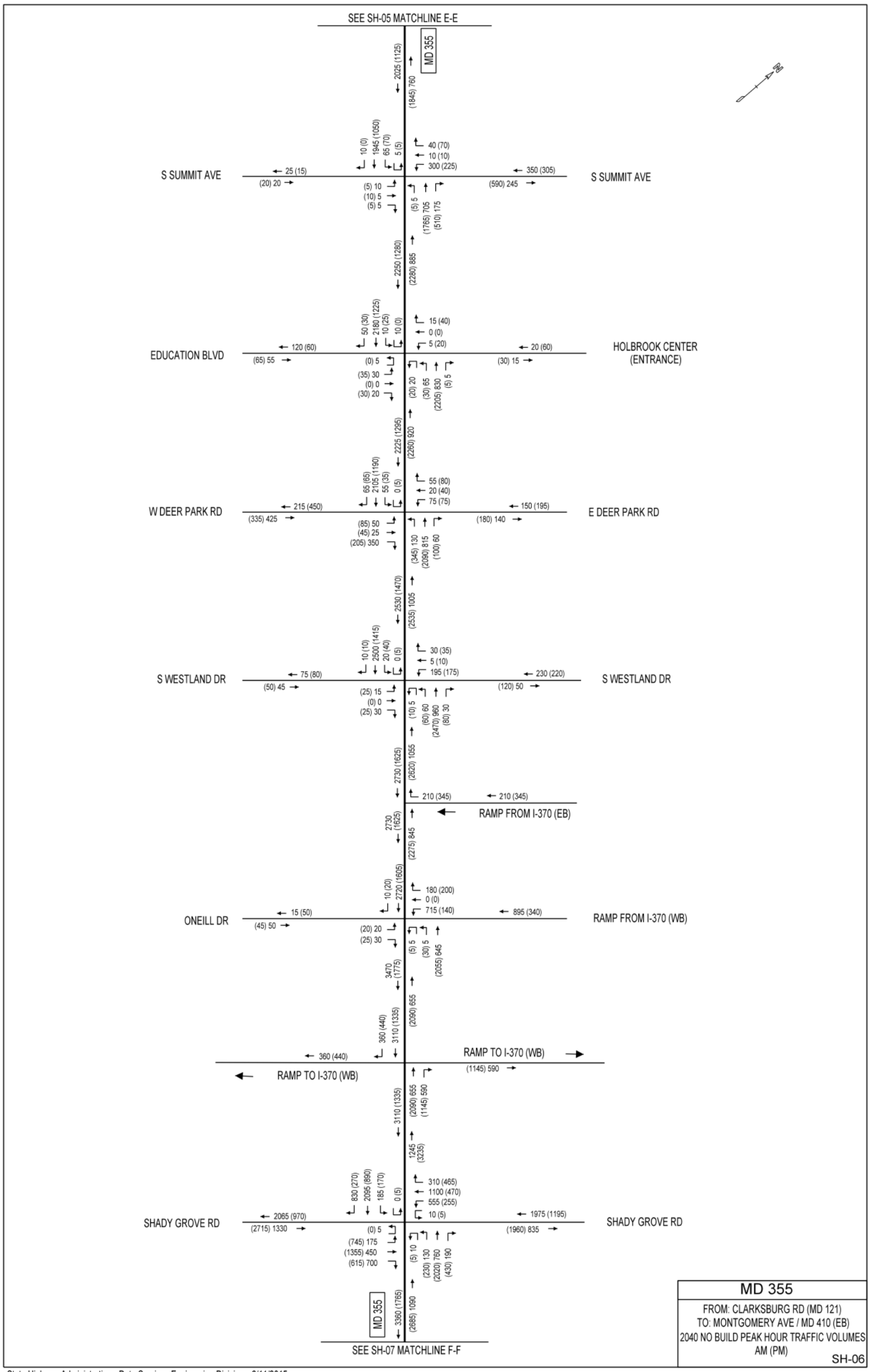


State Highway Administration - Data Services Engineering Division - 5/11/2015

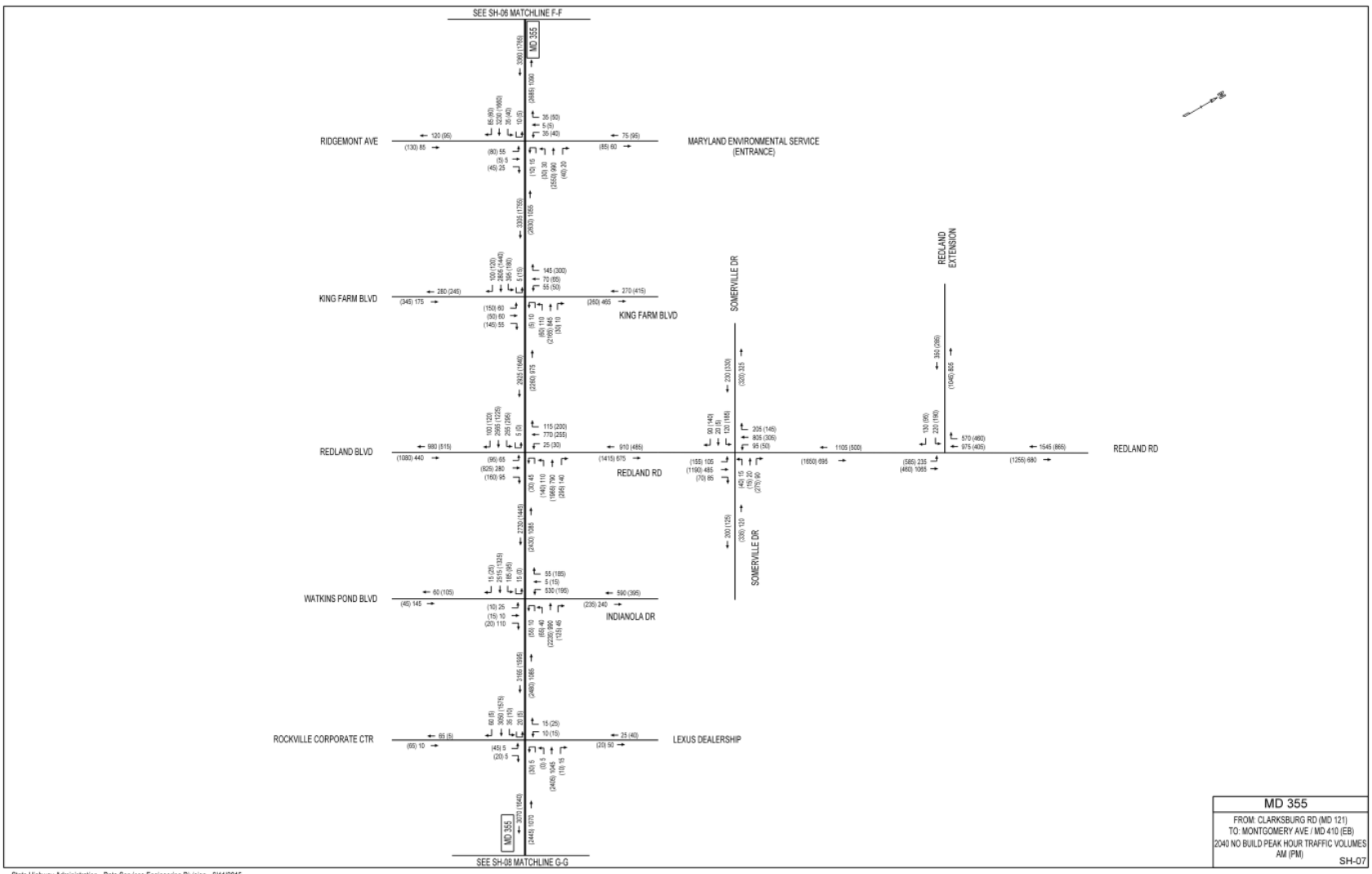

SEE SH-03 MATCHLINE C-C
MD 355
2380 (1120)
(2300) 580
15 (20)
2345 (1065)
15 (25)
5 (10)
50 (35)
0 (5)
120 (30)
PLUMMER DR
25 (125)
(45) 125
(20) 30
(0) 0
(25) 95
170 (70)
(70) 20
PLUMMER DR
(10) 15
(100) 10
(2235) 495
(45) 5
2575 (1130)
(2390) 525
200 (65)
2370 (1050)
5 (15)
0 (10)
0 (5)
5 (20)
PROFESSIONAL DR
380 (210)
(325) 90
(140) 40
(5) 0
(180) 50
5 (35)
(70) 10
TRI-PEAKS CENTER
(ENTRANCE)
(35) 10
(140) 180
(2240) 485
(50) 5
2435 (1285)
(2465) 680
10 (25)
2355 (1125)
65 (125)
5 (10)
45 (100)
0 (5)
40 (55)
SPECTRUM AVE
135 (110)
(160) 85
(60) 15
(5) 0
(95) 70
85 (160)
(190) 75
TRAVIS AVE
(5) 5
(80) 125
(2295) 615
(60) 10
2470 (1280)
(2440) 755
545 (315)
1725 (750)
195 (210)
5 (5)
100 (300)
635 (545)
345 (180)
WATKINS MILL RD
1600 (1390)
(1795) 980
(520) 250
(710) 315
(565) 415
1080 (1025)
(1105) 605
WATKINS MILL RD
(30) 30
(530) 420
(1615) 400
(185) 95
2515 (1525)
(2360) 945
20 (0)
2320 (1275)
160 (240)
15 (10)
150 (445)
10 (5)
70 (265)
IBM
(ENTRANCE)
50 (5)
(80) 5
(40) 0
(10) 0
(30) 5
230 (715)
(420) 205
CHRISTOPHER AVE
(20) 10
(0) 20
(1865) 780
(170) 45
2405 (1590)
(2055) 855
80 (25)
2315 (1545)
5 (15)
5 (5)
5 (25)
20 (0)
15 (35)
LOCKHEED MARTIN
(ENTRANCE)
250 (100)
(175) 10
(35) 5
(5) 0
(135) 5
40 (60)
(50) 25
DEALERSHIP
(ENTRANCE)
(55) 10
(75) 150
(1990) 840
(30) 20
2345 (1770)
MD 355
(2150) 1020
SEE SH-05 MATCHLINE D-D
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE / MD 410 (EB)
2040 NO BUILD PEAK HOUR TRAFFIC VOLUMES
AM (PM)
SH-04
State Highway Administration - Data Services Engineering Division - 6/11/2015

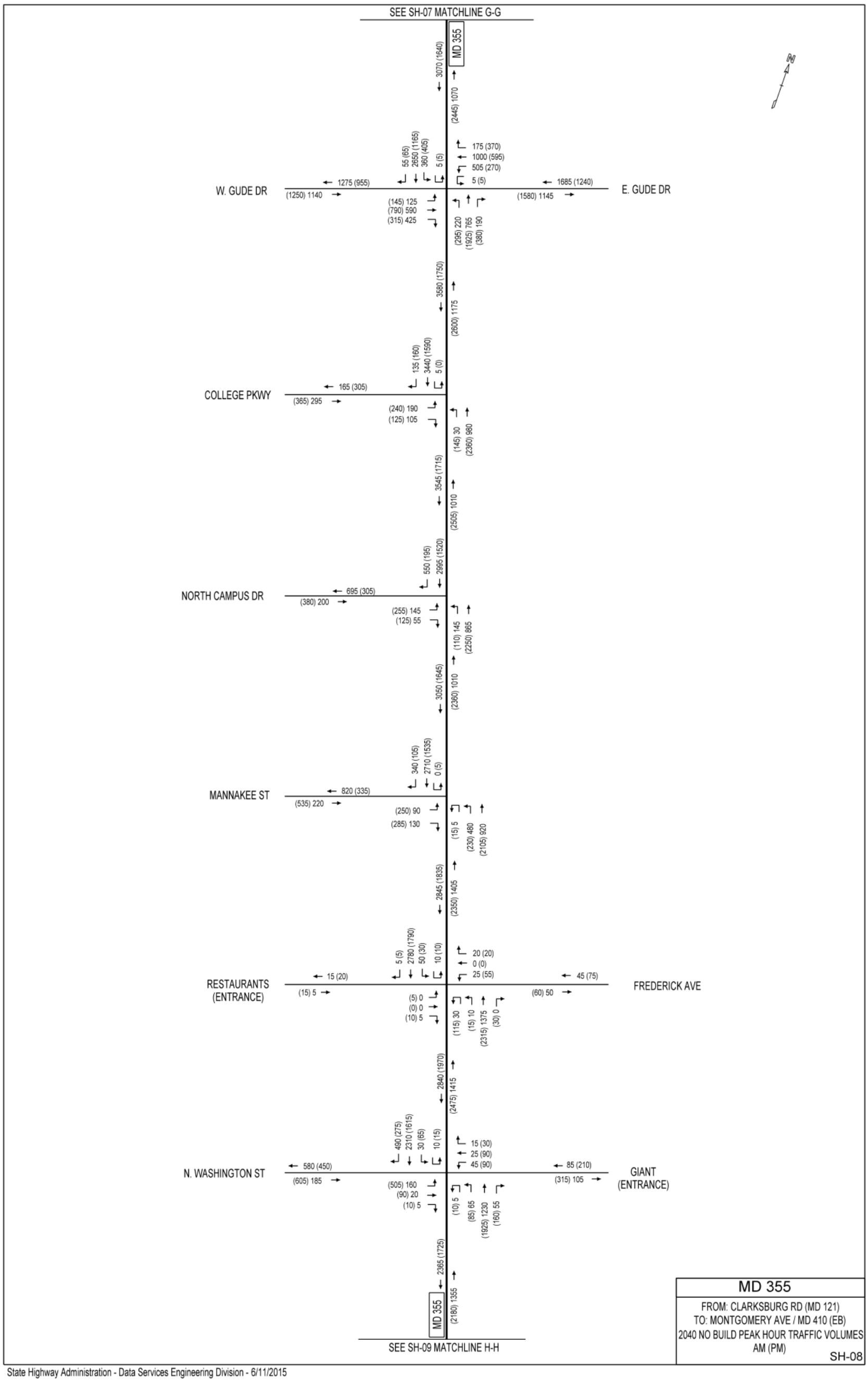


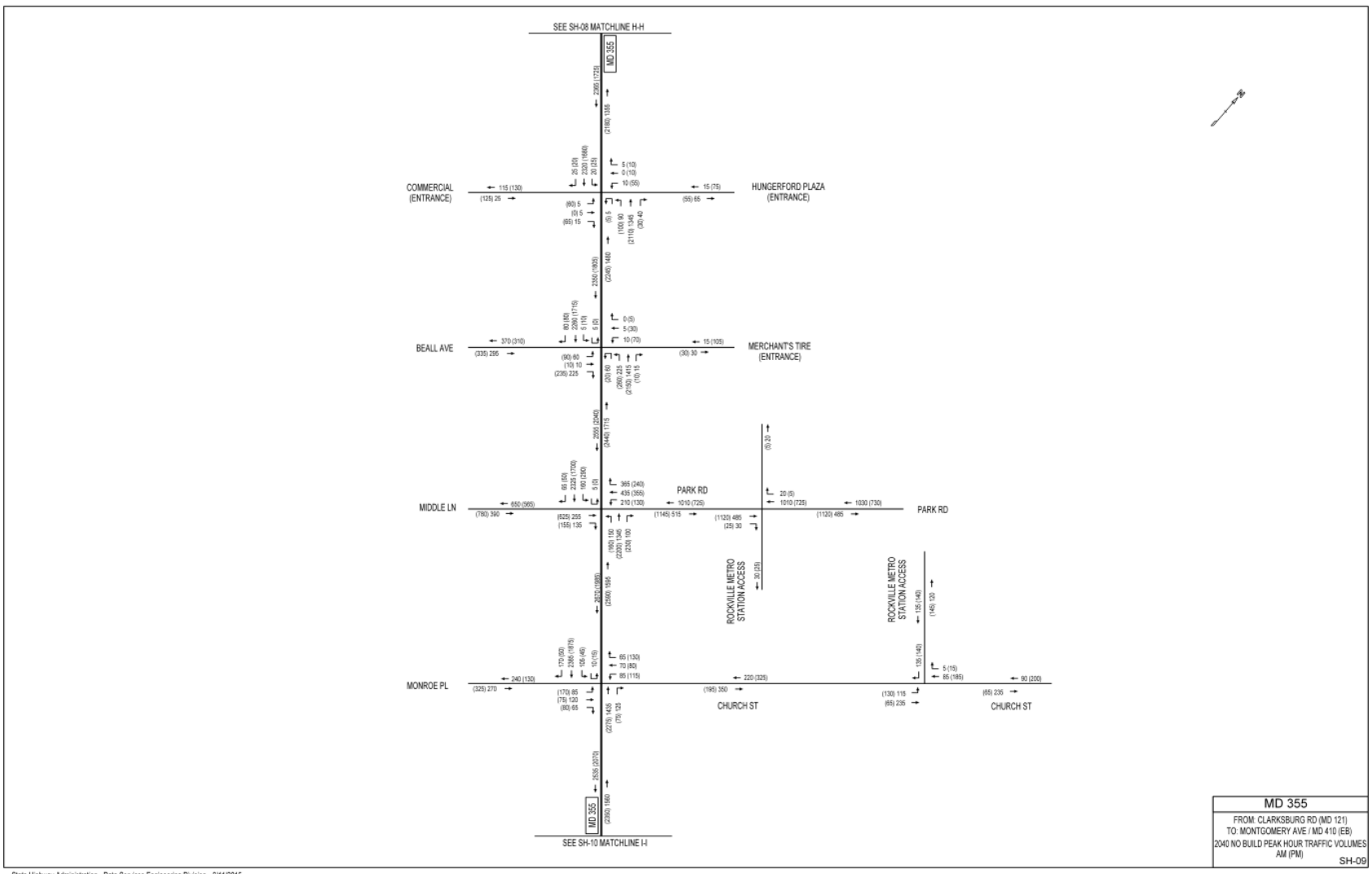
State Highway Administration - Data Services Engineering Division - 6/11/2015



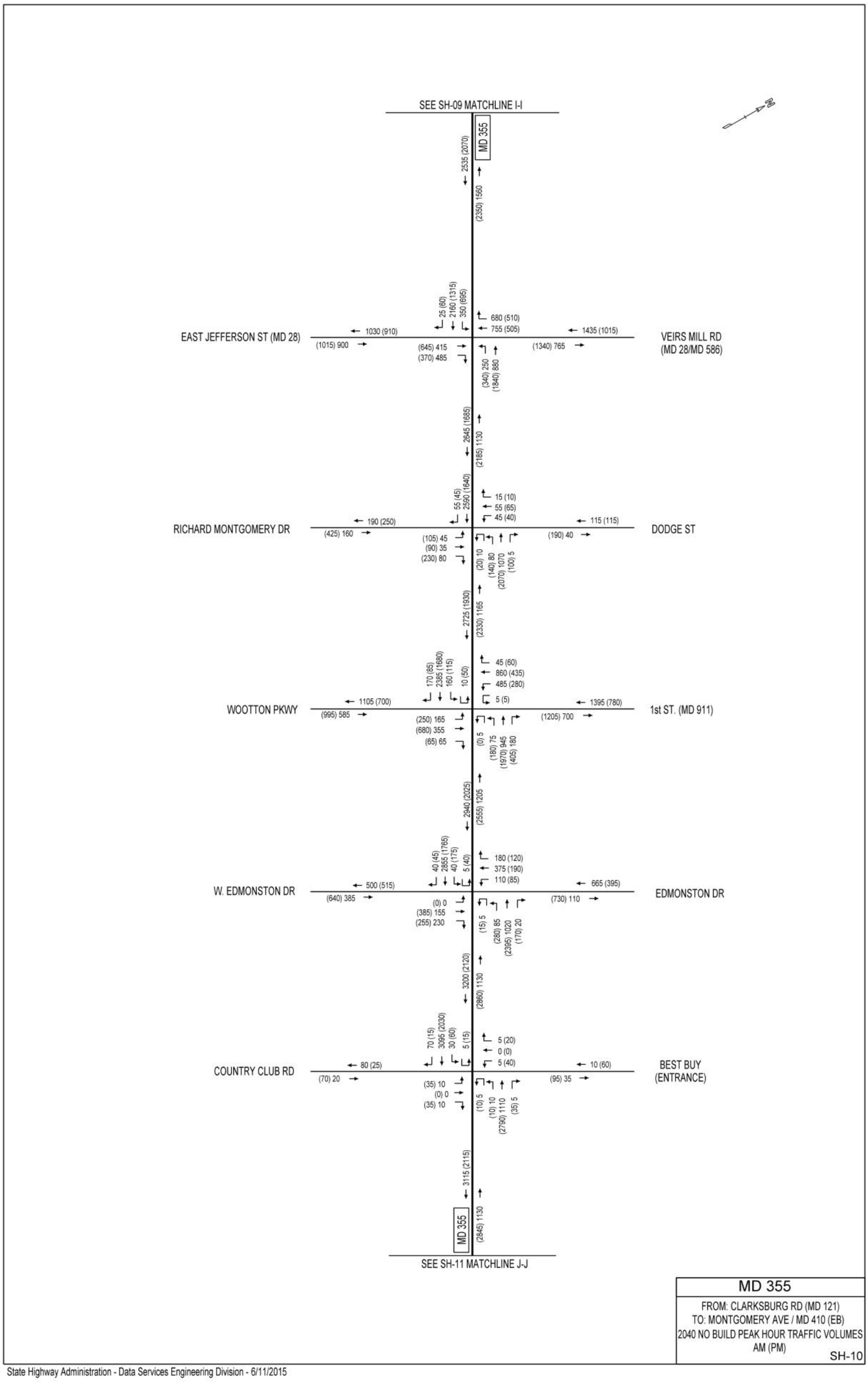
State Highway Administration - Data Services Engineering Division - 6/11/2015

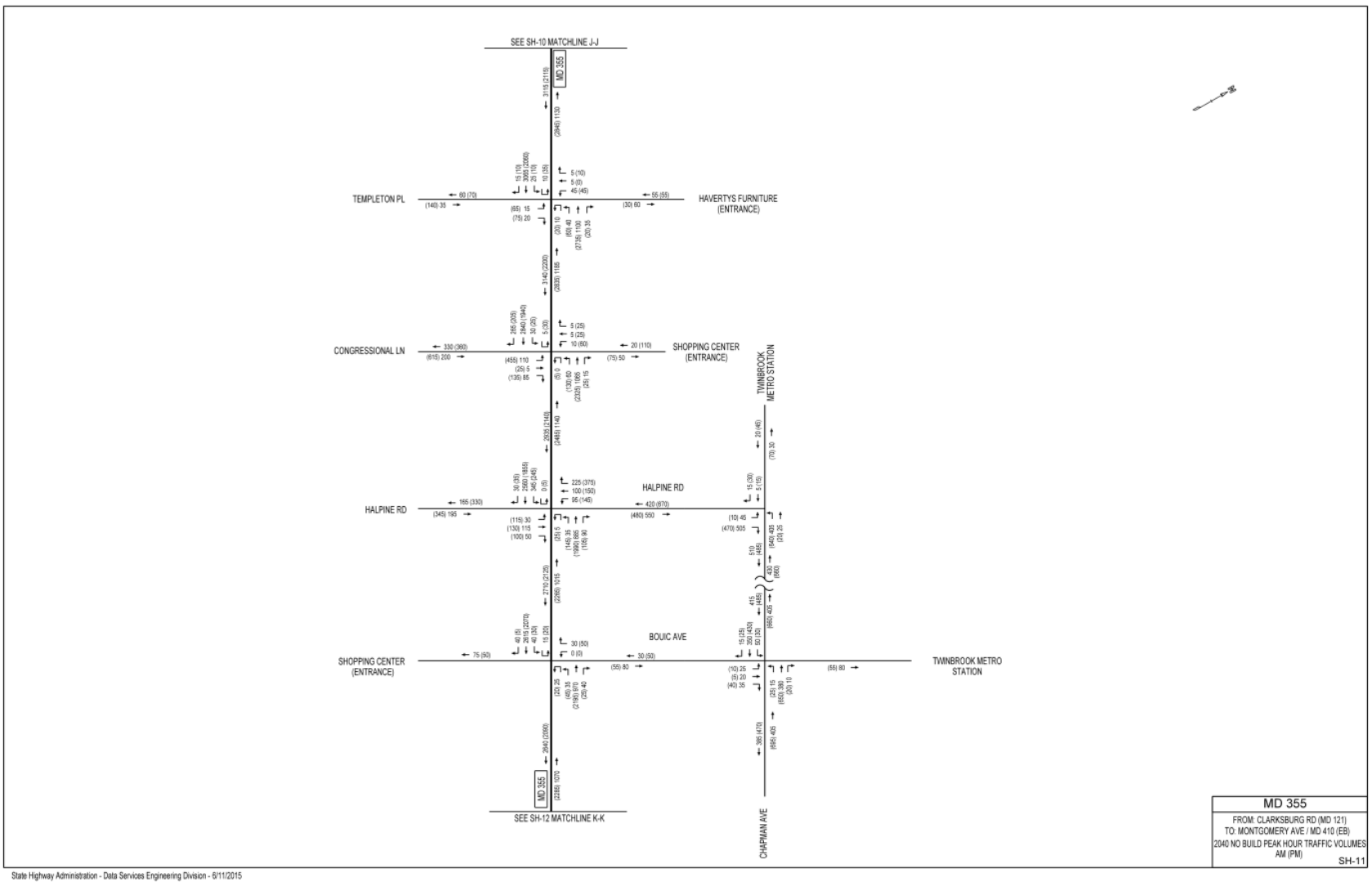

SEE SH-06 MATCHLINE F-F
MD 355
RIDGEMONT AVE
MARYLAND ENVIRONMENTAL SERVICE (ENTRANCE)
KING FARM BLVD
KING FARM BLVD
SOMERVILLE DR
REDLAND EXTENSION
REDLAND BLVD
REDLAND RD
REDLAND RD
WATKINS POND BLVD
INDIANOLA DR
SOMERVILLE DR
ROCKVILLE CORPORATE CTR
LEXUS DEALERSHIP
MD 355
SEE SH-08 MATCHLINE G-G
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE / MD 410 (EB)
2040 NO BUILD PEAK HOUR TRAFFIC VOLUMES
AM (PM)
SH-07
State Highway Administration - Data Services Engineering Division - 6/11/2015

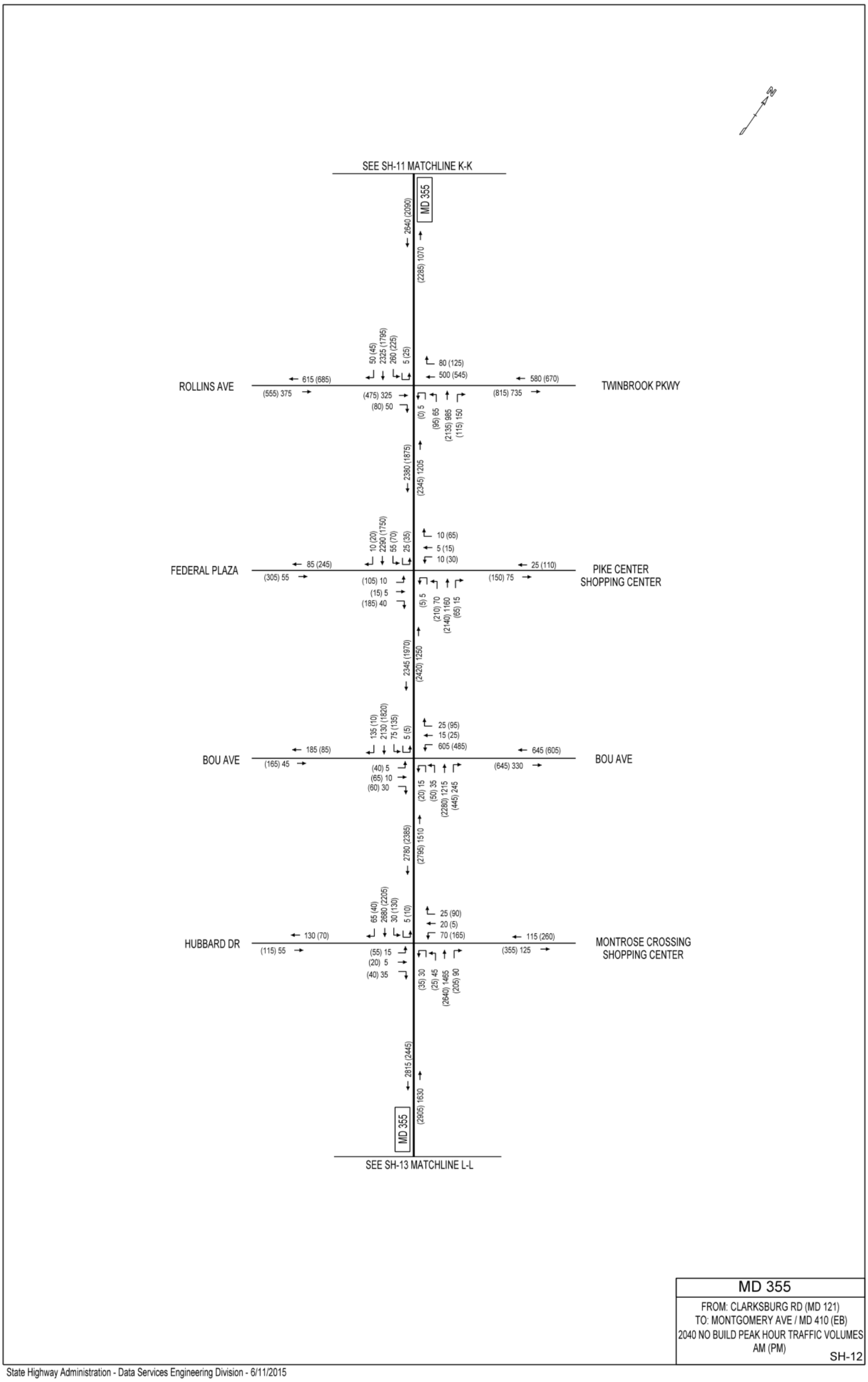

SEE SH-07 MATCHLINE G-G
MD 355
3070 (1640)
(2445) 1070
55 (65)
2650 (1165)
360 (405)
5 (5)
175 (370)
1000 (595)
505 (270)
5 (5)
W. GUDE DR
1275 (955)
(1250) 1140
(145) 125
(790) 590
(315) 425
1685 (1240)
(1580) 1145
E. GUDE DR
(295) 220
(1925) 765
(380) 190
3580 (1750)
(2600) 1175
135 (160)
3440 (1590)
5 (0)
COLLEGE PKWY
165 (305)
(365) 295
(240) 190
(125) 105
(145) 30
(2360) 980
3545 (1715)
(2505) 1010
550 (195)
2995 (1520)
NORTH CAMPUS DR
695 (305)
(380) 200
(255) 145
(125) 55
(110) 145
(2250) 865
3050 (1645)
(2360) 1010
340 (105)
2710 (1535)
0 (5)
MANNAKEE ST
820 (335)
(535) 220
(250) 90
(285) 130
(15) 5
(230) 480
(2105) 920
2845 (1835)
(2350) 1405
5 (5)
2780 (1790)
50 (30)
10 (10)
20 (20)
0 (0)
25 (55)
RESTAURANTS
(ENTRANCE)
15 (20)
(15) 5
45 (75)
(60) 50
FREDERICK AVE
(5) 0
(0) 0
(10) 5
(115) 30
(15) 10
(2315) 1375
(30) 0
2840 (1970)
(2475) 1415
490 (275)
2310 (1615)
30 (65)
10 (15)
15 (30)
25 (90)
45 (90)
N. WASHINGTON ST
580 (450)
(605) 185
85 (210)
(315) 105
GIANT
(ENTRANCE)
(505) 160
(90) 20
(10) 5
(10) 5
(85) 65
(1925) 1230
(160) 55
2365 (1725)
(2180) 1355
MD 355
SEE SH-09 MATCHLINE H-H
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE / MD 410 (EB)
2040 NO BUILD PEAK HOUR TRAFFIC VOLUMES
AM (PM)
SH-08
State Highway Administration - Data Services Engineering Division - 6/11/2015

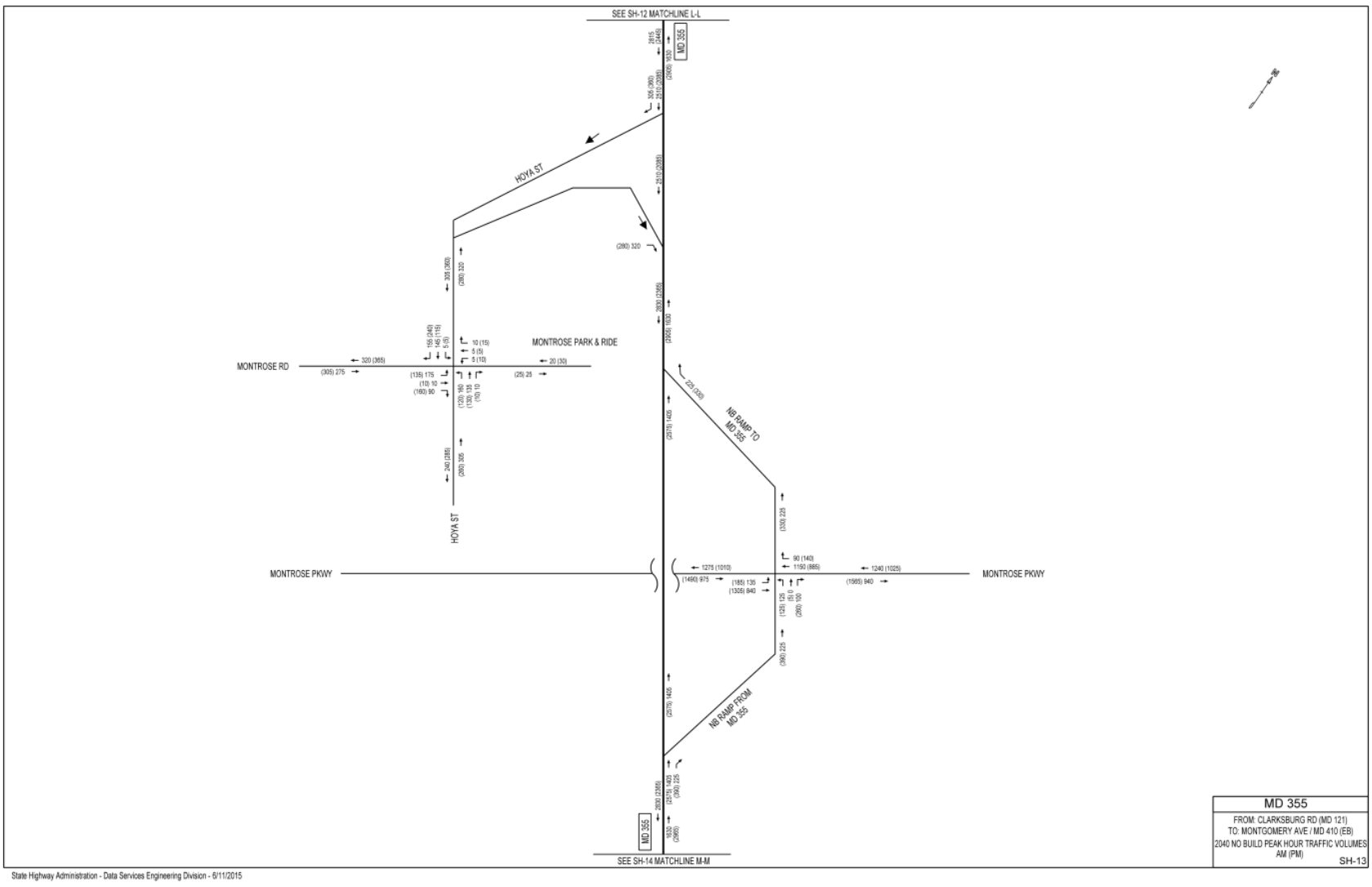


State Highway Administration - Data Services Engineering Division - 6/11/2015

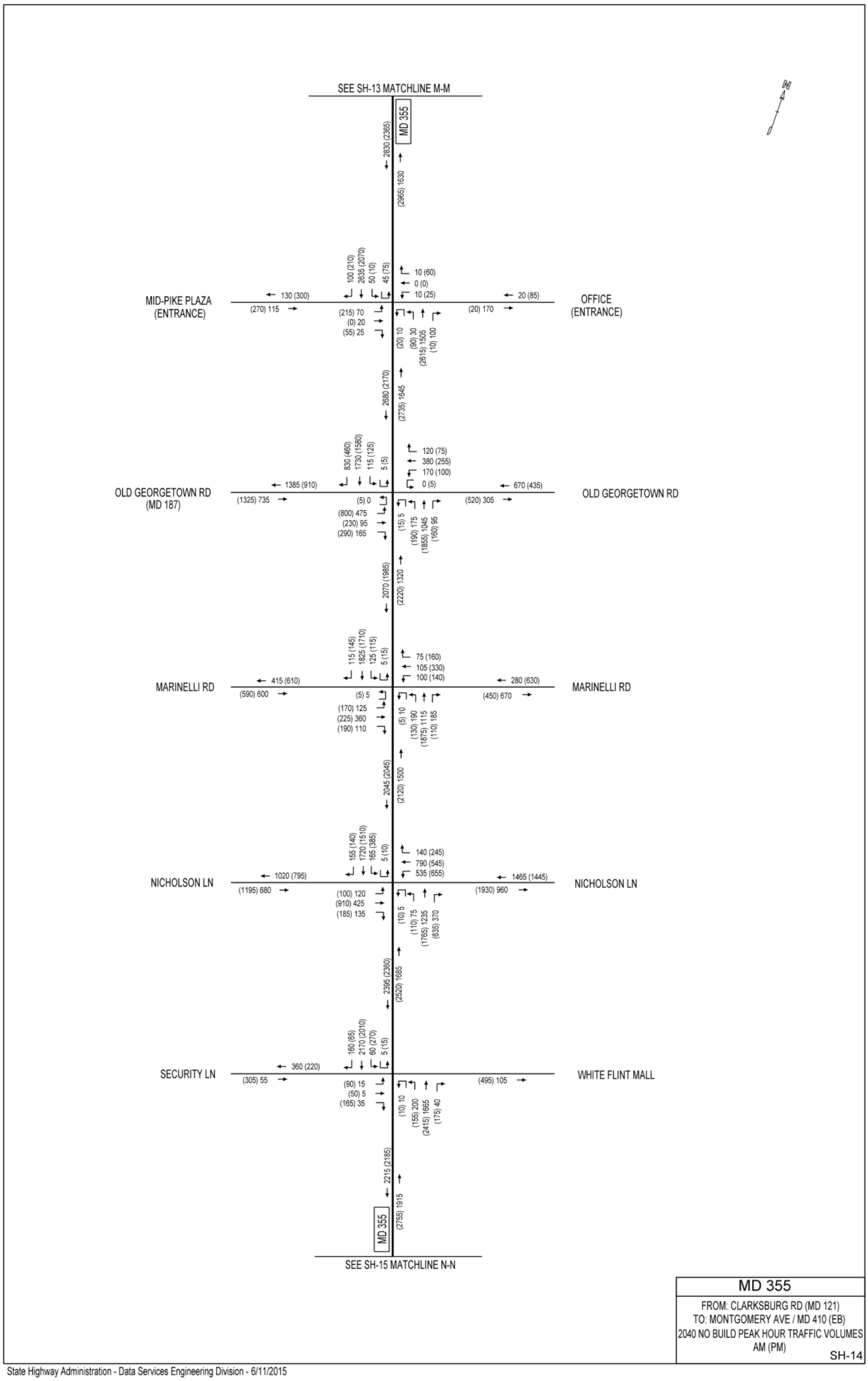

SEE SH-09 MATCHLINE I-I
MD 355
2535 (2070)
(2350) 1560
25 (60)
2160 (1315)
350 (695)
680 (510)
755 (505)
EAST JEFFERSON ST (MD 28)
1030 (910)
(1015) 900
(645) 415
(370) 485
1435 (1015)
(1340) 765
VEIRS MILL RD
(MD 28/MD 586)
(340) 250
(1840) 880
2645 (1685)
(2185) 1130
55 (45)
2590 (1640)
15 (10)
55 (65)
45 (40)
RICHARD MONTGOMERY DR
190 (250)
(425) 160
(105) 45
(90) 35
(230) 80
115 (115)
(190) 40
DODGE ST
(20) 10
(140) 80
(2070) 1070
(100) 5
2725 (1930)
(2330) 1165
170 (85)
2385 (1680)
160 (115)
10 (50)
45 (60)
860 (435)
485 (280)
5 (5)
WOOTTON PKWY
1105 (700)
(995) 585
(250) 165
(680) 355
(65) 65
1395 (780)
(1205) 700
1st ST. (MD 911)
(0) 5
(180) 75
(1970) 945
(405) 180
2940 (2025)
(2555) 1205
40 (45)
2855 (1765)
40 (175)
5 (40)
180 (120)
375 (190)
110 (85)
W. EDMONSTON DR
500 (515)
(640) 385
(0) 0
(385) 155
(255) 230
665 (395)
(730) 110
EDMONSTON DR
(15) 5
(280) 85
(2395) 1020
(170) 20
3200 (2120)
(2860) 1130
70 (15)
3095 (2030)
30 (60)
5 (15)
5 (20)
0 (0)
5 (40)
COUNTRY CLUB RD
80 (25)
(70) 20
(35) 10
(0) 0
(35) 10
10 (60)
(95) 35
BEST BUY
(ENTRANCE)
(10) 5
(10) 10
(2790) 1110
(35) 5
3115 (2115)
MD 355
(2845) 1130
SEE SH-11 MATCHLINE J-J
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE / MD 410 (EB)
2040 NO BUILD PEAK HOUR TRAFFIC VOLUMES
AM (PM)
SH-10
State Highway Administration - Data Services Engineering Division - 6/11/2015

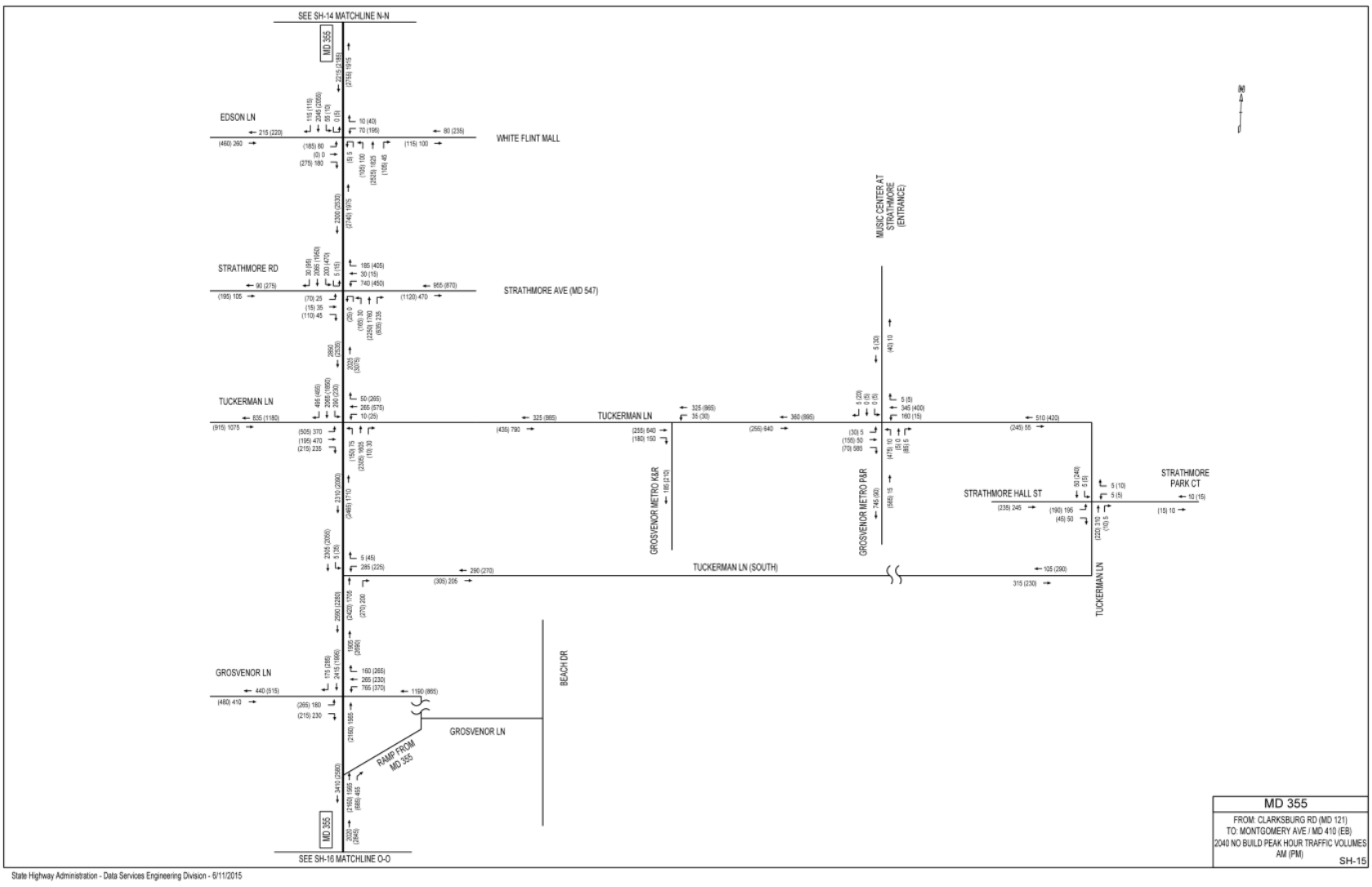

SEE SH-10 MATCHLINE J-J
MD 355
TEMPLETON PL
HAVERTYS FURNITURE (ENTRANCE)
CONGRESSIONAL LN
SHOPPING CENTER (ENTRANCE)
TWINBROOK METRO STATION
HALPINE RD
HALPINE RD
BOUIC AVE
SHOPPING CENTER (ENTRANCE)
TWINBROOK METRO STATION
MD 355
SEE SH-12 MATCHLINE K-K
CHAPMAN AVE
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE / MD 410 (EB)
2040 NO BUILD PEAK HOUR TRAFFIC VOLUMES
AM (PM)
SH-11
State Highway Administration - Data Services Engineering Division - 6/11/2015

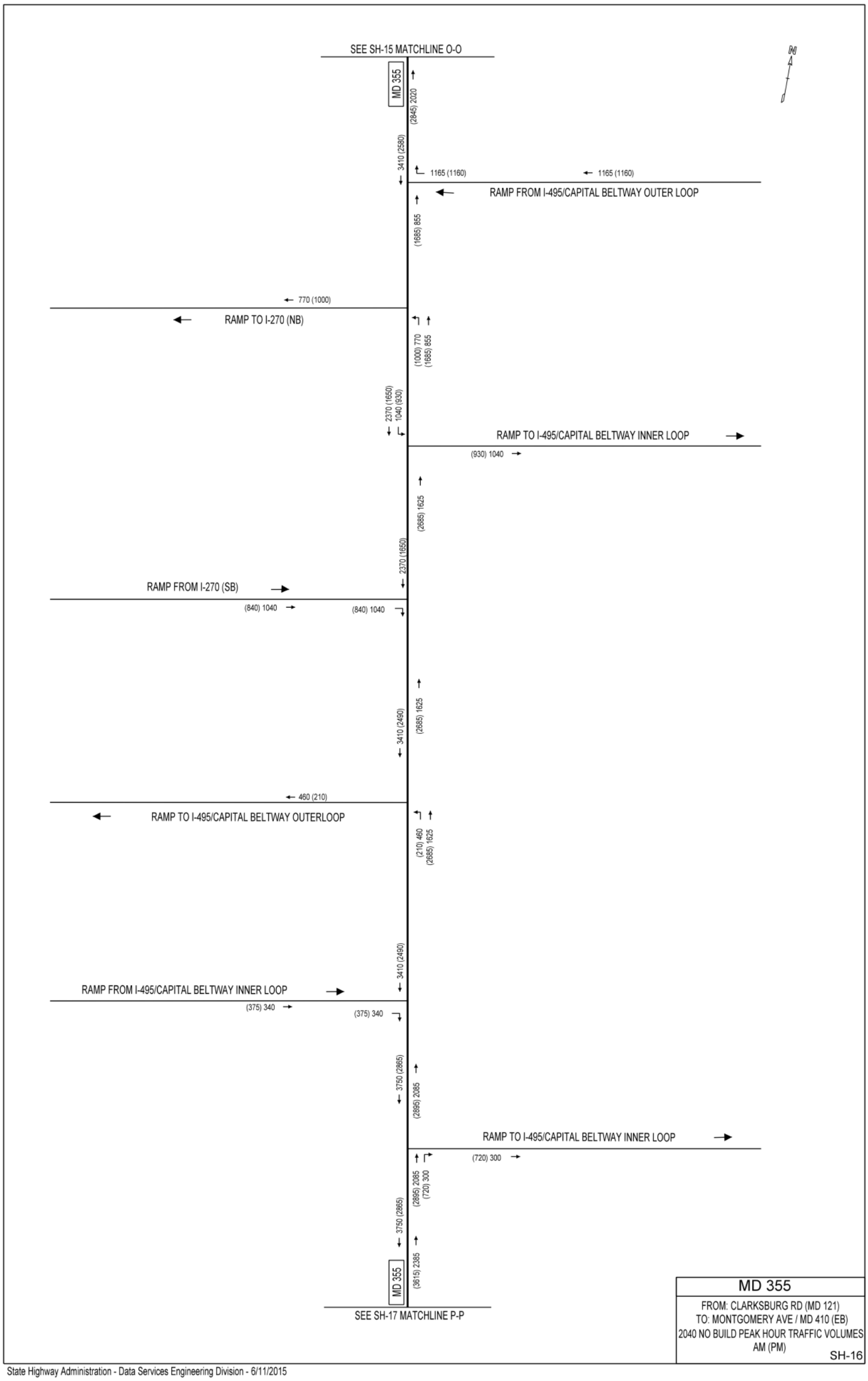

SEE SH-11 MATCHLINE K-K
MD 355
2640 (2090)
(2285) 1070
ROLLINS AVE
615 (685)
(555) 375
50 (45)
2325 (1795)
260 (225)
5 (25)
80 (125)
500 (545)
580 (670)
(815) 735
TWINBROOK PKWY
(475) 325
(80) 50
(0) 5
(95) 65
(2135) 985
(115) 150
2380 (1875)
(2345) 1205
FEDERAL PLAZA
85 (245)
(305) 55
10 (20)
2290 (1750)
55 (70)
25 (35)
10 (65)
5 (15)
10 (30)
25 (110)
(150) 75
PIKE CENTER
SHOPPING CENTER
(105) 10
(15) 5
(185) 40
(5) 5
(210) 70
(2140) 1160
(65) 15
2345 (1970)
(2420) 1250
BOU AVE
185 (85)
(165) 45
135 (10)
2130 (1820)
75 (135)
5 (5)
25 (95)
15 (25)
605 (485)
645 (605)
(645) 330
BOU AVE
(40) 5
(65) 10
(60) 30
(20) 15
(50) 35
(2280) 1215
(445) 245
2780 (2385)
(2795) 1510
HUBBARD DR
130 (70)
(115) 55
65 (40)
2680 (2205)
30 (130)
5 (10)
25 (90)
20 (5)
70 (165)
115 (260)
(355) 125
MONTROSE CROSSING
SHOPPING CENTER
(55) 15
(20) 5
(40) 35
(35) 30
(25) 45
(2640) 1465
(205) 90
2815 (2445)
(2905) 1630
MD 355
SEE SH-13 MATCHLINE L-L
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE / MD 410 (EB)
2040 NO BUILD PEAK HOUR TRAFFIC VOLUMES
AM (PM)
SH-12
State Highway Administration - Data Services Engineering Division - 6/11/2015

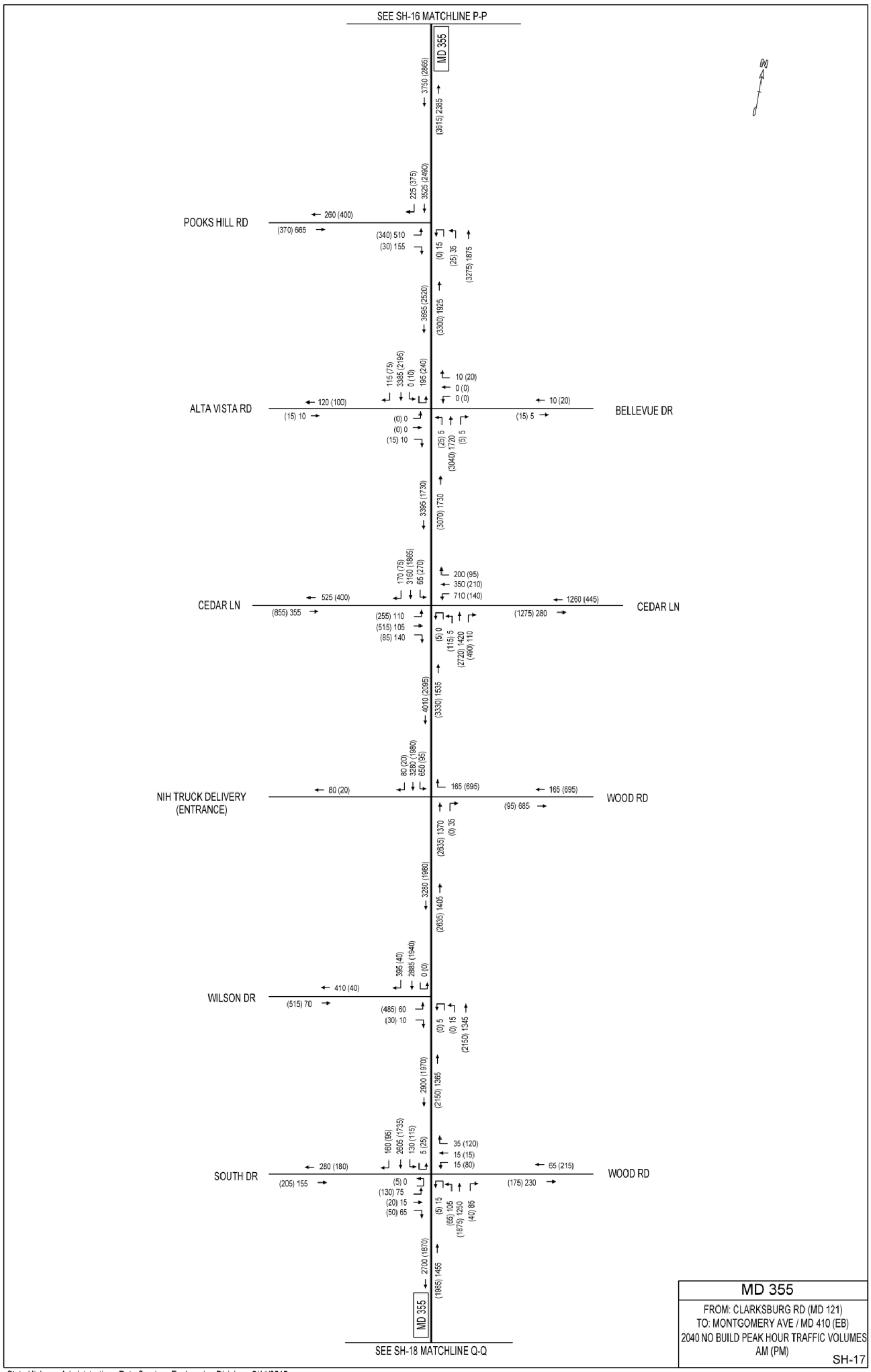


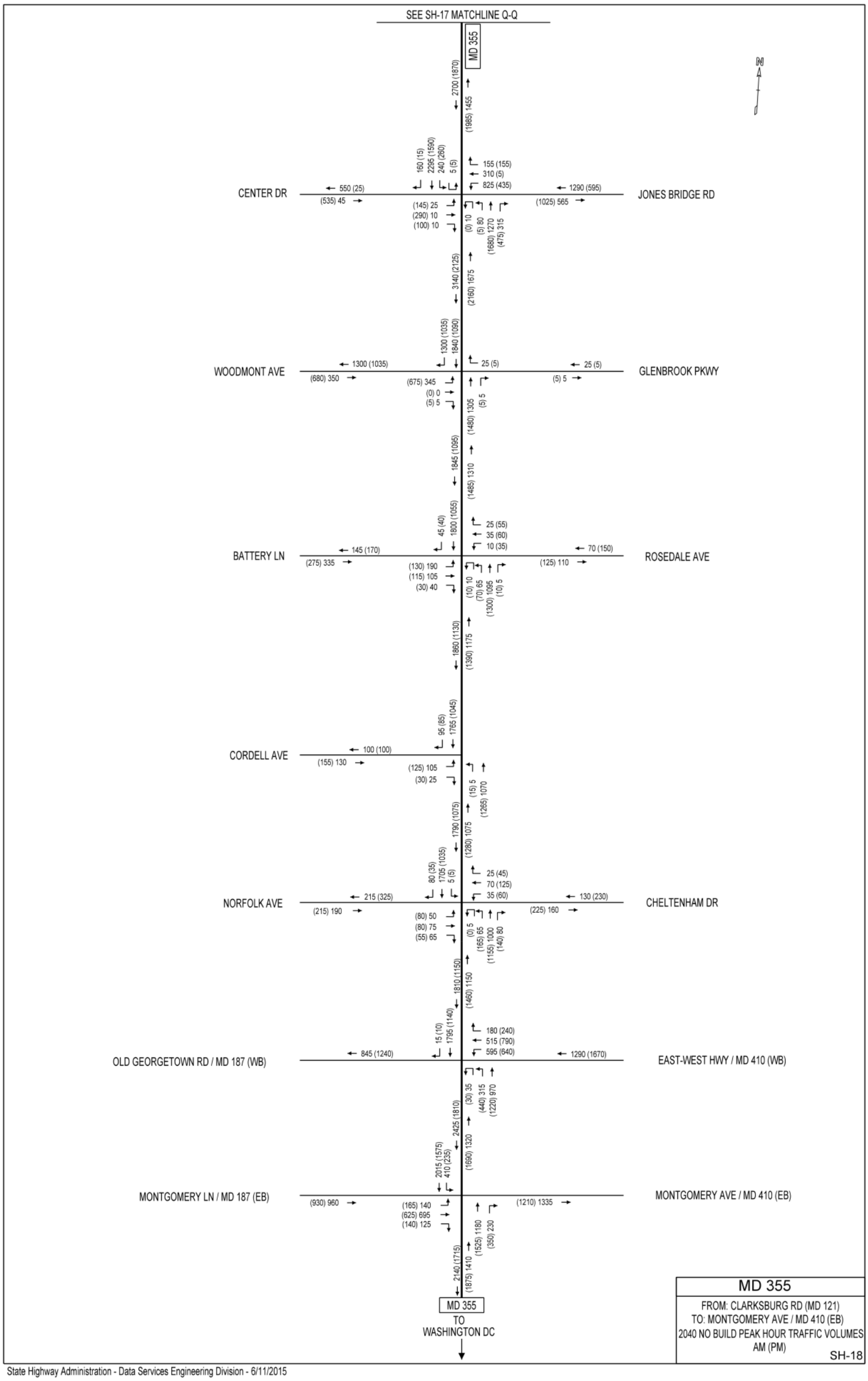
State Highway Administration - Data Services Engineering Division - 6/11/2015


SEE SH-13 MATCHLINE M-M
MD 355
2830 (2365)
(2965) 1630
MID-PIKE PLAZA
(ENTRANCE)
130 (300)
(270) 115
100 (210)
2635 (2070)
50 (10)
45 (75)
10 (60)
0 (0)
10 (25)
20 (85)
(20) 170
OFFICE
(ENTRANCE)
(215) 70
(0) 20
(55) 25
(20) 10
(90) 30
(2615) 1505
(10) 100
2680 (2170)
(2735) 1645
OLD GEORGETOWN RD
(MD 187)
1385 (910)
(1325) 735
830 (460)
1730 (1580)
115 (125)
5 (5)
120 (75)
380 (255)
170 (100)
0 (5)
670 (435)
(520) 305
OLD GEORGETOWN RD
(5) 0
(800) 475
(230) 95
(290) 165
(15) 5
(190) 175
(1855) 1045
(160) 95
2070 (1985)
(2220) 1320
MARINELLI RD
415 (610)
(590) 600
115 (145)
1825 (1710)
125 (115)
5 (15)
75 (160)
105 (330)
100 (140)
280 (630)
(450) 670
MARINELLI RD
(5) 5
(170) 125
(225) 360
(190) 110
(5) 10
(130) 190
(1875) 1115
(110) 185
2045 (2045)
(2120) 1500
NICHOLSON LN
1020 (795)
(1195) 680
155 (140)
1720 (1510)
165 (385)
5 (10)
140 (245)
790 (545)
535 (655)
1465 (1445)
(1930) 960
NICHOLSON LN
(100) 120
(910) 425
(185) 135
(10) 5
(110) 75
(1765) 1235
(635) 370
2395 (2360)
(2520) 1685
SECURITY LN
360 (220)
(305) 55
160 (65)
2170 (2010)
60 (270)
5 (15)
(495) 105
WHITE FLINT MALL
(90) 15
(50) 5
(165) 35
(10) 10
(155) 200
(2415) 1665
(175) 40
2215 (2185)
(2755) 1915
MD 355
SEE SH-15 MATCHLINE N-N
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE / MD 410 (EB)
2040 NO BUILD PEAK HOUR TRAFFIC VOLUMES
AM (PM)
SH-14
State Highway Administration - Data Services Engineering Division - 6/11/2015

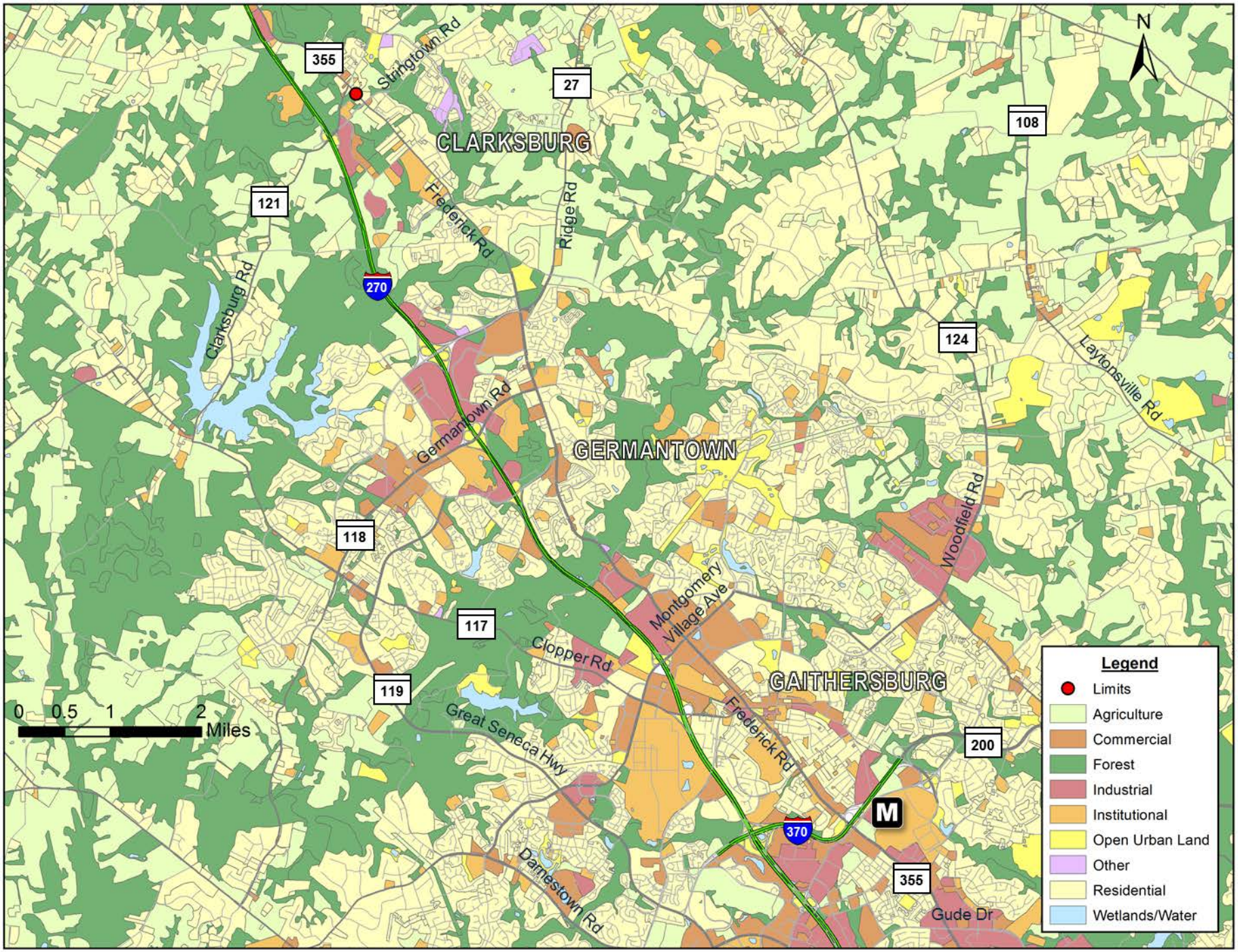

SEE SH-14 MATCHLINE N-N
MD 355
EDSON LN
WHITE FLINT MALL
STRATHMORE RD
STRATHMORE AVE (MD 547)
MUSIC CENTER AT STRATHMORE (ENTRANCE)
TUCKERMAN LN
GROSVENOR METRO K&R
GROSVENOR METRO P&R
STRATHMORE HALL ST
STRATHMORE PARK CT
TUCKERMAN LN (SOUTH)
TUCKERMAN LN
GROSVENOR LN
BEACH DR
RAMP FROM MD 355
SEE SH-16 MATCHLINE O-O
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE / MD 410 (EB)
2040 NO BUILD PEAK HOUR TRAFFIC VOLUMES
AM (PM)
SH-15
State Highway Administration - Data Services Engineering Division - 6/11/2015

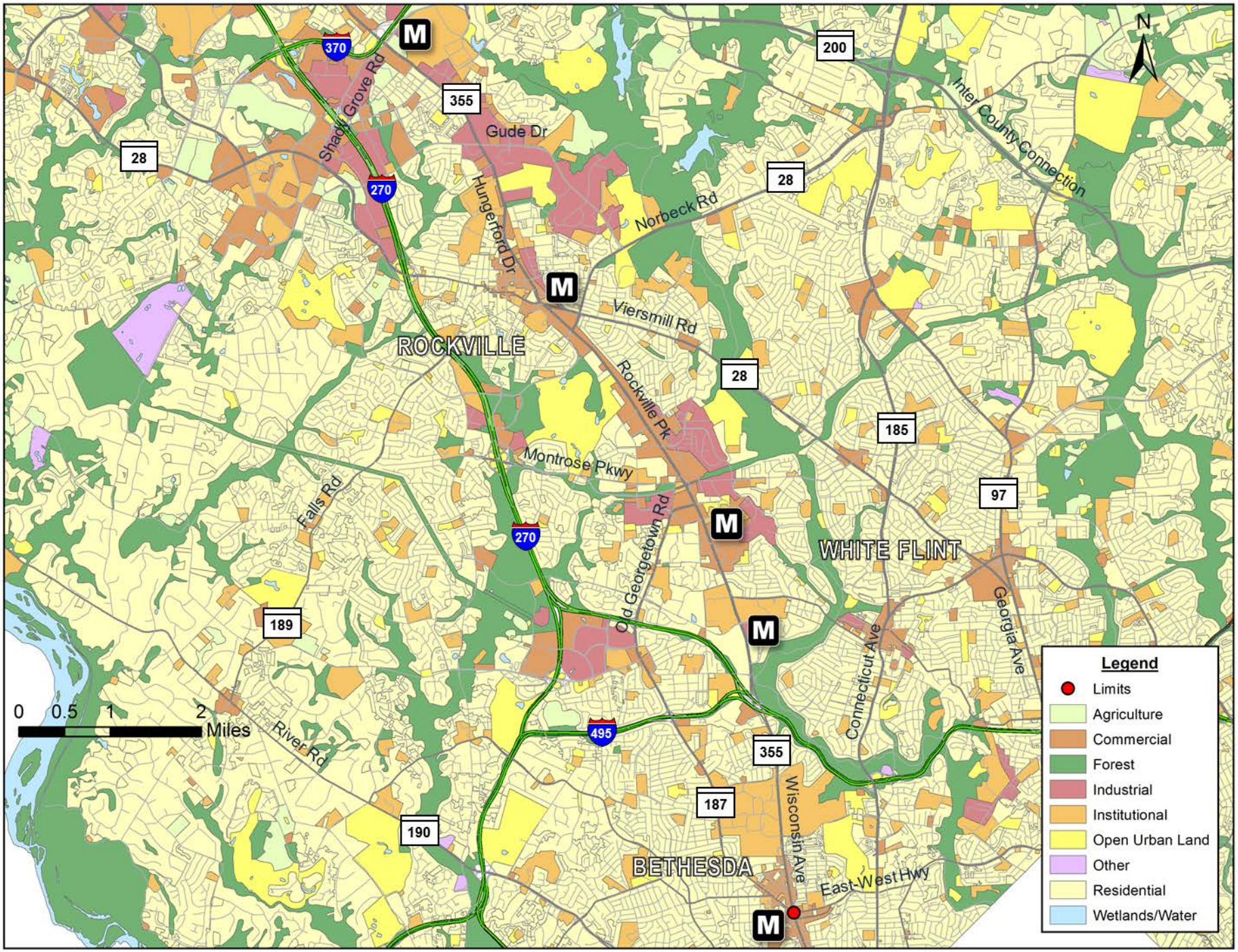

SEE SH-15 MATCHLINE O-O
MD 355
(2845) 2020
3410 (2580)
1165 (1160)
1165 (1160)
RAMP FROM I-495/CAPITAL BELTWAY OUTER LOOP
(1685) 855
770 (1000)
RAMP TO I-270 (NB)
(1000) 770
(1685) 855
2370 (1650)
1040 (930)
RAMP TO I-495/CAPITAL BELTWAY INNER LOOP
(930) 1040
(2685) 1625
2370 (1650)
RAMP FROM I-270 (SB)
(840) 1040
(840) 1040
3410 (2490)
(2685) 1625
460 (210)
RAMP TO I-495/CAPITAL BELTWAY OUTERLOOP
(210) 460
(2685) 1625
3410 (2490)
RAMP FROM I-495/CAPITAL BELTWAY INNER LOOP
(375) 340
(375) 340
3750 (2865)
(2895) 2085
RAMP TO I-495/CAPITAL BELTWAY INNER LOOP
(720) 300
(2895) 2085
(720) 300
3750 (2865)
MD 355
(3615) 2385
SEE SH-17 MATCHLINE P-P
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE / MD 410 (EB)
2040 NO BUILD PEAK HOUR TRAFFIC VOLUMES
AM (PM)
SH-16
State Highway Administration - Data Services Engineering Division - 6/11/2015


SEE SH-16 MATCHLINE P-P
MD 355
N
3750 (2865)
(3615) 2385
225 (375)
3525 (2490)
260 (400)
POOKS HILL RD
(370) 665
(340) 510
(30) 155
(0) 15
(25) 35
(3275) 1875
3695 (2520)
(3300) 1925
115 (75)
3385 (2195)
0 (10)
195 (240)
10 (20)
0 (0)
0 (0)
120 (100)
ALTA VISTA RD
(15) 10
(0) 0
(0) 0
(15) 10
10 (20)
(15) 5
BELLEVUE DR
(25) 5
(3040) 1720
(5) 5
3395 (1730)
(3070) 1730
170 (75)
3160 (1865)
65 (270)
200 (95)
350 (210)
710 (140)
525 (400)
CEDAR LN
(855) 355
(255) 110
(515) 105
(85) 140
1260 (445)
(1275) 280
CEDAR LN
(5) 0
(115) 5
(2720) 1420
(490) 110
4010 (2095)
(3330) 1535
80 (20)
3280 (1980)
650 (95)
165 (695)
80 (20)
NIH TRUCK DELIVERY
(ENTRANCE)
165 (695)
(95) 685
WOOD RD
(2635) 1370
(0) 35
3280 (1980)
(2635) 1405
395 (40)
2885 (1940)
0 (0)
410 (40)
WILSON DR
(515) 70
(485) 60
(30) 10
(0) 5
(0) 15
(2150) 1345
2900 (1970)
(2150) 1365
160 (95)
2605 (1735)
130 (115)
5 (25)
35 (120)
15 (15)
15 (80)
280 (180)
SOUTH DR
(205) 155
(5) 0
(130) 75
(20) 15
(50) 65
65 (215)
(175) 230
WOOD RD
(5) 15
(65) 105
(1875) 1250
(40) 85
2700 (1870)
(1985) 1455
MD 355
SEE SH-18 MATCHLINE Q-Q
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE / MD 410 (EB)
2040 NO BUILD PEAK HOUR TRAFFIC VOLUMES
AM (PM)
SH-17
State Highway Administration - Data Services Engineering Division - 6/11/2015


SEE SH-17 MATCHLINE Q-Q
MD 355
N
2700 (1870)
(1985) 1455
160 (15)
2295 (1590)
240 (260)
5 (5)
155 (155)
310 (5)
825 (435)
CENTER DR
550 (25)
(535) 45
1290 (595)
(1025) 565
JONES BRIDGE RD
(145) 25
(290) 10
(100) 10
(0) 10
(5) 80
(1680) 1270
(475) 315
3140 (2125)
(2160) 1675
1300 (1035)
1840 (1090)
25 (5)
WOODMONT AVE
1300 (1035)
(680) 350
25 (5)
(5) 5
GLENBROOK PKWY
(675) 345
(0) 0
(5) 5
(5) 5
(1480) 1305
1845 (1095)
(1485) 1310
25 (55)
35 (60)
10 (35)
45 (40)
1800 (1055)
BATTERY LN
145 (170)
(275) 335
70 (150)
(125) 110
ROSEDALE AVE
(130) 190
(115) 105
(30) 40
(10) 10
(70) 65
(1300) 1095
(10) 5
1860 (1130)
(1390) 1175
95 (85)
1765 (1045)
CORDELL AVE
100 (100)
(155) 130
(125) 105
(30) 25
(15) 5
(1265) 1070
1790 (1075)
(1280) 1075
80 (35)
1705 (1035)
5 (5)
25 (45)
70 (125)
35 (60)
NORFOLK AVE
215 (325)
(215) 190
130 (230)
(225) 160
CHELTENHAM DR
(80) 50
(80) 75
(55) 65
(0) 5
(165) 65
(1155) 1000
(140) 80
1810 (1150)
(1460) 1150
15 (10)
1795 (1140)
180 (240)
515 (790)
595 (640)
845 (1240)
1290 (1670)
OLD GEORGETOWN RD / MD 187 (WB)
EAST-WEST HWY / MD 410 (WB)
(30) 35
(440) 315
(1220) 970
2425 (1810)
(1690) 1320
2015 (1575)
410 (235)
MONTGOMERY LN / MD 187 (EB)
MONTGOMERY AVE / MD 410 (EB)
(930) 960
(165) 140
(625) 695
(140) 125
(1210) 1335
(1525) 1180
(350) 230
2140 (1715)
(1875) 1410
MD 355
TO
WASHINGTON DC
MD 355
FROM: CLARKSBURG RD (MD 121)
TO: MONTGOMERY AVE / MD 410 (EB)
2040 NO BUILD PEAK HOUR TRAFFIC VOLUMES
AM (PM)
SH-18
State Highway Administration - Data Services Engineering Division - 6/11/2015

Appendix B – Existing Land Use Maps


N
355
Stringtown Rd
27
CLARKSBURG
108
121
Frederick Rd
Ridge Rd
270
Clarksburg Rd
124
Laytonsville Rd
Germantown Rd
GERMANTOWN
Woodfield Rd
118
Montgomery Village Ave
117
Clopper Rd
GAITHERSBURG
119
Frederick Rd
200
Great Seneca Hwy
M
370
355
Gude Dr
Darnestown Rd
0 0.5 1 2 Miles
Legend
Limits
Agriculture
Commercial
Forest
Industrial
Institutional
Open Urban Land
Other
Residential
Wetlands/Water


N
ROCKVILLE
WHITE FLINT
BETHESDA
Shady Grove Rd
Gude Dr
Hungerford Dr
Norbeck Rd
Viersmill Rd
Rockville Pk
Montrose Pkwy
Falls Rd
Old Georgetown Rd
River Rd
Connecticut Ave
Georgia Ave
Wisconsin Ave
East-West Hwy
Inter County Connection
370
355
28
270
200
185
97
189
190
187
495
0 0.5 1 2 Miles
Legend
Limits
Agriculture
Commercial
Forest
Industrial
Institutional
Open Urban Land
Other
Residential
Wetlands/Water

Appendix C – Existing Transit Map

Montgomery County
RAPID TRANSIT
MD 355

SCALE: 1" = 4,000'

PROJECT LIMIT

PROPOSED CCT PHASE I ALIGNMENT

PROPOSED PURPLE LINE ALIGNMENT

BETHESDA

ROCKVILLE

MARYLAND 190
MARYLAND 355
MARYLAND 410
MARYLAND 185
MARYLAND 97
MARYLAND 187
MARYLAND 586
MARYLAND 28
MARYLAND 189
INTERSTATE 495
INTERSTATE 270
INTERSTATE 370

MEDICAL CENTER
GROSVENOR STRATHMORE
TWINBROOK
ROCKVILLE
SHADY GROVE

OLD GEORGETOWN RD
WOODMONT AVE
EAST WEST HWY
JONES BRIDGE RD
CEDAR LN
GROSVENOR LN
TUCKERMAN LN
NICHOLSON LN
STRATHMORE AVE
WHITE FLINT
MONTROSE PKWY
TWINBROOK PKWY
VEIRS MILL RD
WOOTTON PKWY
N WASHINGTON ST
GUDE DR
REDLAND BLVD
KING FARM BLVD
SHADY GROVE RD
MATCH LINE - SEE FIGURE 2
MARC BRUNSWICK LINE

29 30 32 34 47 BC J2 J3 J7
34 70 J2 J3 J9
30
32
29
47
J2 J3 J4
70 J2 J3
26 70 96
6
70 J7 J9
30
34
30 46 70 J7 J9
46 J5
37 96
5 26 38 46 81 C8
5 26 81
38
5 26
38 81
26
38
81
70 J7 J9 505 515
47 56
T2
54 63
44
45 46 55 Q1 Q2 Q5 Q6
46 55
45
43 46 53 55 57 58 59 60 61 63 64 65 66 67 71 74 76 78 79 90 100 201 202 505 515 Q1 Q2 Q5 Q6
29 30 32 34 36 47 70 J2 J3 J4 J7 J9
30 33 34 46 70 J1 J2 J3 J7 J9
33 J1
6 37 46 96 J5
5 46 J5
5 37
34
38 C8 J5
10 C4 J5
93
46
46 81
52 45 49
45
49 52
44 45 46 47 48 49 52 54 55 56 59 63 81 Q1 Q2 Q4 Q5 Q6 T2
5 10 26 44 45 46 93 C4 J5
59
48
63 66
55 59 67
53 57 59
43 58 60 61 64 65 71 74 76 78 79 90 100

LEGEND

- METRO STATION
- MONTGOMERY COUNTY RIDE ON BUS ROUTE
- WMATA METROBUS / MTA COMMUTER ROUTES
- PROPOSED PURPLE LINE ALIGNMENT
- PROPOSED CCT PHASE I ALIGNMENT
- MARC TRAIN BRUNSWICK LINE

MD 355 BUS RAPID TRANSIT CORRIDOR STUDY

EXISTING TRANSIT OPERATIONS ALONG MD 355

SHA · MTA Maryland

BACKGROUND SOURCE
MD SHA 2014

OCTOBER 2015

APPENDIX C

Montgomery County
RAPID TRANSIT
MD 355

SCALE: 1" = 4,000'

PROPOSED CCT PHASE I ALIGNMENT

PROPOSED CCT PHASE II ALIGNMENT

PROJECT LIMIT

GERMANTOWN

GAITHERSBURG

MONTGOMERY VILLAGE

CLARKSBURG

MARC BRUNSWICK LINE

MARYLAND 118

MARYLAND 119

MARYLAND 117

MARYLAND 121

MARYLAND 355

MARYLAND 124

MARYLAND 27

INTERSTATE 370

INTERSTATE 270

SHADY GROVE

MATCH LINE - SEE FIGURE 1

KING FARM BLVD

SHADY GROVE RD

REDLAND BLVD

DEER PARK DR

CEDAR AVE

E DIAMOND AVE

MONTGOMERY VILLAGE AVE

WATKINS MILL RD

GAME PRESERVE RD

SCENERY DR

MIDDLEBROOK RD

GERMANTOWN RD

SHAKESPEARE BLVD

RIDGE RD

W OLD BALTIMORE RD

SHAWNEE LN

REDGRAVE PL

BRINK RD

NEW CUT RD

CLARKSBURG RD

LEGEND

- METRO STATION
- MONTGOMERY COUNTY RIDE ON BUS ROUTE
- WMATA METROBUS / MTA COMMUTER ROUTES
- PROPOSED CCT PHASE I ALIGNMENT
- PROPOSED CCT PHASE II ALIGNMENT
- MARC TRAIN BRUNSWICK LINE

MD 355 BUS RAPID TRANSIT CORRIDOR STUDY

EXISTING TRANSIT OPERATIONS ALONG MD 355

BACKGROUND SOURCE
MD SHA 2014

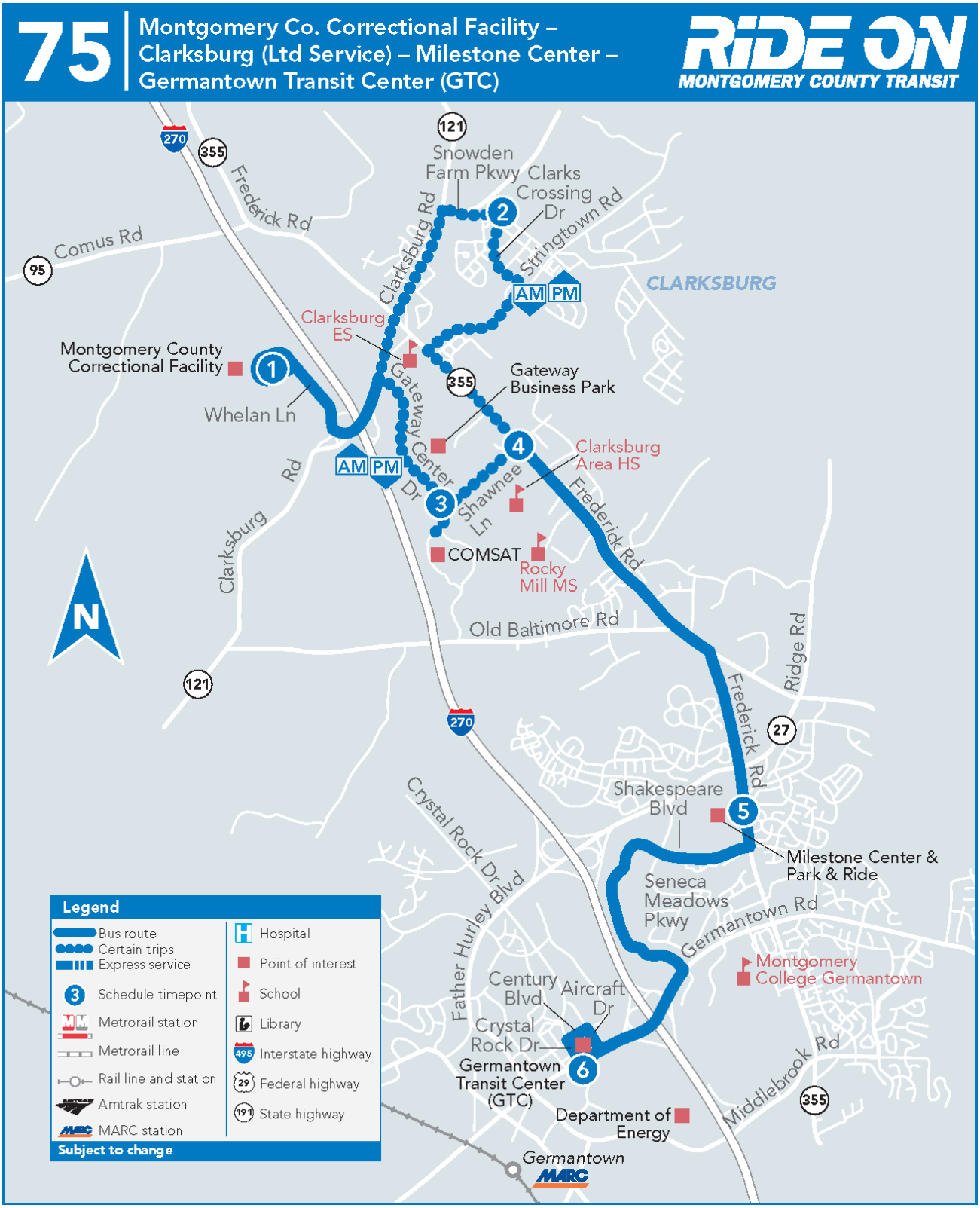
OCTOBER 2015

APPENDIX C

Appendix D – Ride On Bus Routes


46
Shady Grove Metro Station (certain trips) – Montgomery College – Rockville Metro Station – Twinbrook Metro Station – White Flint Metro Station – Grosvenor Metro Station – Medical Center Metro Station
RIDE ON
MONTGOMERY COUNTY TRANSIT
Shady Grove
Redland Rd
Crabbs Branch Wy
Somerville Dr
Indianola Dr
Redland Blvd
Frederick Rd
Montgomery College
ROCKVILLE
Hungerford Dr
Washington St
Montgomery Ave
Norbeck Rd
Rockville
Jefferson St
Saint Mary's
Maryland Ave
Church St
Richard Montgomery HS
Veirs Mill Rd
Edmonston Dr
Rockville Pike
Talbott St
Twinbrook
Halpine Rd
C.E. Smith Jewish Day School
Randolph Rd
Montrose Rd
White Flint
Conference Center
Nicholson Ln
GARRETT PARK
White Flint Mall
Edson Ln
Flanders Ave
Garrett Park
Georgetown Prep
Strathmore Ave
Music Center at Strathmore
Old Georgetown Rd
Tuckerman Ln
Holy Cross Academy
Grosvenor-Strathmore
Kensington
Beach Dr
OAKMONT
Alta Vista Rd
Elsmere Ave
Cedar Ln
Country Day School of the Sacred Heart
National Institutes of Health
National Naval Medical Center
Medical Center
N
Legend
Bus route
Certain trips
Schedule timepoint
Metrorail station
Metrorail line
Rail line and station
Amtrak station
MARC station
Hospital
Point of interest
School
Library
Interstate highway
Federal highway
State highway
Subject to change


55
Germantown Transit Center (GTC) – Montgomery College (Germantown) - Milestone Center – Lakeforest TC – Shady Grove Metro Station – Rockville Metro Station
Ride On
Montgomery County Transit
N
Milestone Center & Park & Ride
Shakespeare Blvd
Neelsville MS
GERMANTOWN
Observation Dr
Germantown Rd
Captain James E. Daly ES
Germantown Transit Center
Montgomery College Germantown
Middlebrook Rd
Germantown MARC
Fox Chapel ES
Frederick Ave
Watkins Mill ES
Montgomery Village Police Station
Montgomery Village Ave
Crown Pointe Corp. Center
Watkins Mill Dr
Gaithersburg Library
GAITHERSBURG
Travis Ave
Odendhal Ave
Gaithersburg Washington Grove Fire Co 8
Lakeforest Transit Center
Washington Grove MARC
Montgomery County Fairgrounds
Diamond Ave
Gaithersburg MARC
Gaithersburg City Hall
Deer Park Dr
Washington Grove
WASHINGTON GROVE
Gaithersburg HS
Washington Grove ES
Summit Hall ES
Rosemont ES
Shady Grove
Shady Grove Rd
Gude Dr
College Gardens ES
Montgomery College Rockville Campus
Mannakee St
ROCKVILLE
Rockville Library
MARC Rockville
Rockville
Veirs Mill Rd
Rockville Pike
Please arrive at your stop several minutes ahead of your bus' scheduled arrival. Since safe service is a priority at Ride On, buses may be delayed due to traffic or weather.
Legend
Bus route
Certain trips
Certain trips
Express service
Schedule timepoint
Metrorail station
Metrorail line
Rail line and station
Amtrak station
MARC station
Hospital
Point of interest
School
Library
Interstate highway
Federal highway
State highway
Subject to change


75
Montgomery Co. Correctional Facility – Clarksburg (Ltd Service) – Milestone Center – Germantown Transit Center (GTC)
RIDE ON
MONTGOMERY COUNTY TRANSIT
Snowden Farm Pkwy
Clarks Crossing Dr
Stringtown Rd
Clarksburg Rd
Frederick Rd
Comus Rd
CLARKSBURG
AM PM
Clarksburg ES
Montgomery County Correctional Facility
Whelan Ln
Gateway Center Dr
Gateway Business Park
Clarksburg Area HS
Shawnee Ln
COMSAT
Rocky Mill MS
Old Baltimore Rd
Ridge Rd
Shakespeare Blvd
Milestone Center & Park & Ride
Seneca Meadows Pkwy
Germantown Rd
Montgomery College Germantown
Crystal Rock Dr
Father Hurley Blvd
Century Blvd
Aircraft Dr
Germantown Transit Center (GTC)
Department of Energy
Middlebrook Rd
Germantown MARC
N
Legend
Bus route
Certain trips
Express service
Schedule timepoint
Metrorail station
Metrorail line
Rail line and station
Amtrak station
MARC station
Hospital
Point of interest
School
Library
Interstate highway
Federal highway
State highway
Subject to change

Appendix E – Environmental and Socioeconomic Inventory and Mapping

MD 355 Bus Rapid Transit (BRT) Corridor Planning Study

Montgomery County, MD

DRAFT

APPENDIX E

ENVIRONMENTAL AND SOCIOECONOMIC INVENTORY AND MAPPING

SOCIOECONOMIC, CULTURAL RESOURCES, AND NATURAL ENVIRONMENTAL INVENTORY SUMMARY REPORT

April 2016

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1. INTRODUCTION

The Maryland Department of Transportation (MDOT), in partnership with Montgomery County, is conducting a study for developing Bus Rapid Transit (BRT) along a portion of the MD 355 corridor from Bethesda to Clarksburg. MD 355 connects several major activity centers, including the Bethesda Central Business District (CBD), the City of Rockville, the City of Gaithersburg, the City of Germantown, and Clarksburg, and has a high level of existing transit ridership. The proposed MD 355 BRT study corridor is 21.2 miles long, extending from the Bethesda Metrorail Station at the southern terminus to Clarksburg at the northern terminus (see **Figure 1 – Study Area Map**). The environmental study area boundary was established 200 feet from the edge of pavement on either side of the road. The study area for environmental resources covers a larger area than the project study area evaluated for engineering purposes. MD 355 is classified as an Urban Other Principal Arterial south of MD 27 and an Urban Minor Arterial north of MD 27. The proposed MD 355 BRT corridor extends almost the entire length of Montgomery County, Maryland. While a majority of the proposed project corridor could be located on existing roadway where possible, roadway widening would be required in several locations to accommodate the proposed project. In addition, some of the proposed stations could extend beyond existing impervious surfaces. MTA is in the process of developing a Preliminary Purpose and Need Statement and preliminary alternative concepts for the project.

This report will identify the following resources in proximity to the MD 355 BRT environmental study area:

- Social characteristics
    - Census tracts, block groups, and population
    - Distribution by age, gender, and disability
    - Racial/ethnic characteristics
    - Income levels
    - Housing
- Environmental justice populations
    - Low-income populations
    - Minority populations
- Community facilities and services, including
    - Educational
    - Emergency services and law enforcement
    - Religious
    - Publicly owned public parks and recreational facilities
    - Public transportation

- Other resources, including libraries, post offices, cemeteries, and community centers/services
- Existing and proposed land use
- Regional and local economic factors

2. SOCIAL CHARACTERISTICS

2.1 Environmental Study Area

The project corridor is located along the MD 355 corridor in western Montgomery County, Maryland (see Figure 1 – Study Area Map). Montgomery County is part of the Washington, D.C., metropolitan area. For most of its 36.7-mile length, MD 355 is a north-south roadway. The northern terminus is within the City of Frederick, just north of the US 40/I-70 overpass. The southern terminus is in Friendship Heights at the Washington, D.C., border, where the road continues south as Wisconsin Avenue. For the majority of the corridor MD 355 is an urban four - to - six - lane divided roadway that serves as a major thoroughfare through Frederick and Montgomery counties and passes through Bethesda, the City of Rockville, the City of Gaithersburg, City of Germantown, Clarksburg, Hyattstown, Urbana, and Frederick.

2.2 Regional Demographics

The following tables provide demographic information for regional population, race/ethnicity, age, gender, disability, and income. 2010 Census data was used to determine the general population and racial/ethnic demographics within the environmental study area, and the American Community Survey five-year estimates to determine the income demographics.

2.2.1. Population and Housing

The *Census of Population and Housing* supplies information that helps the government decide how to distribute funds and assistance to states and local municipalities. In turn, the government provides information to the local municipalities that explains where and how to use these funds for projects as diverse as schools, hospitals, and public transportation.

a. Population and Census Tract –Block Groups

The Washington, D.C., metropolitan area is a major location for employers associated with the federal government and the military and has experienced continued population growth since 2000. According to the 2010 Census, Maryland has a population of 5,773,552. Montgomery County, with a 2010 population of 971,777, is the most populous county within Maryland. Since 2000, growth throughout the state and within Montgomery County has steadily increased by approximately 10 percent. By 2040, growth is expected to increase by 30 percent throughout the

state and by 38 percent within Montgomery County. By 2040, Montgomery County's population is expected to exceed 1.2 million.

Table 1: Regional Population and Population Growth

	2000	2010	2040	2000-2010 % Change	2000-2040 %Change
Maryland	5,296,486	5,773,552	6,889,700*	9%	30%
Montgomery County	873,341	971,777	1,206,800*	11%	38%
*Maryland Department of Planning, Maryland State Data Center, July 2014					

b. Regional Racial and Ethnic Characteristics

According to United States Census Bureau's 2013 American Community Survey data, Maryland's population is 60.5 percent White, 30.1 percent African-American or Black, 6.1 percent Asian, less than 1 percent Native Hawaiian or Other Pacific Islander, less than 1 percent American Indian or Alaska Native, 2.6 percent Two or More Races, and 9 percent Hispanic or Latino. (Hispanic/Latino is an ethnic classification; persons identifying as Hispanic/Latino may be of any race.) Montgomery County's population is 62.6 percent White, 18.6 percent African-American or Black, 14.9 percent Asian, and 3.1 percent Two or More Races. The population percentages of Native Hawaiian or Other Pacific Islander and American Indian or Alaska Native are essentially the same as those of the state. Within the county, 18.3 percent of the population is Hispanic or Latino, which is significantly higher than the Hispanic/Latino population within Maryland (9 percent) (see **Table 2**). The Asian population within the county (14.9 percent) is significantly higher than Maryland's Asian population (6.1 percent). The Asian population has grown significantly in the Washington D.C. area over the past decade. Census data indicates that the Asian population grew over 60 percent since the 2000 census. According to the *Washington Post*, Washington has turned into a hub for Asians on the East Coast. A majority of the Asian population increase is due to immigration. More research is required to determine the reason for the immigration increase to this area. Populations for White and Two or More Races are similar between the state and county statistics. The African-American/Black population within Montgomery County (18.6 percent) is significantly lower than the African-American/Black population within Maryland (30.1 percent). Additional studies are necessary to determine why the Asian and Hispanic/Latino populations are significantly higher in Montgomery County than within Maryland although Montgomery County may be reflecting what is occurring on a state-wide level as shown in the 2010 census. Within Maryland, population growth was due to minority populations, primarily in the Baltimore and Washington (project study area) metropolitan areas as well as in southern and coastal regions. The population of the state's largest racial group, people who are White and not Hispanic, decreased. The non-Hispanic / Black population grew, the Asian population grew by half, and the Hispanic population doubled.

Table 2: Regional Distribution by Race and Ethnicity

	Maryland	Montgomery County
Population	5,938,737	1,016,677
White	60.5%	62.6%
African – American or Black	30.1%	18.6 %
American Indian or Alaska Native	0.6 %	0.7 %
Asian	6.1%	14.9 %
Native Hawaiian or Other Pacific Islander	0.1 %	0.1 %
Two or More Races	2.6 %	3.1 %
Hispanic or Latino	9%	18.3 %
Source: U.S. Census Bureau; State and County Quick Facts, Montgomery County, MD, 2013.		

c. Regional Age, Gender, and Disability Characteristics

The distribution of population by gender, age, and disability within Maryland and Montgomery County are similar and is shown on the following Table 3.

Table 3: Regional Distribution by Gender, Age, and Disability

	Male	Female	19 and under	20-24	25-34	35-49	50-64	65 +	Disabled
Maryland	48.5%	51.5%	25.6%	6.9%	13.6%	20.7%	20.2%	13%	10.3%
Montgomery	48.2%	51.8%	26.1%	5.5%	13.8%	22.1%	20.1%	12.7%	7.5%
Source: U.S. Census Bureau; State and County Quick Facts, Montgomery County, MD, 2013; 2009-2013 American Community Survey 5-Year Estimates									

d. Regional Income Characteristics

Median income denotes the exact mid-point of the income distribution range. According to the 2010 Census and the 2013 American Community Survey, between 2009 to 2013 Maryland had the highest median household income in the country, at approximately $72,583. Montgomery County is the second wealthiest county in Maryland, with a median household income of $98,221. The median household annual income was higher and the percentage of people living below the poverty level was lower in Montgomery County than in the state as a whole. According to the 2009 - 2013 American Community Survey 5 - Year Estimates, approximately 10 percent of Maryland's population and 7 percent of Montgomery County's population live below the poverty level (see **Table 4**).

Table 4: Regional Income

	Median Household Income	% Population Below Poverty
Maryland	$73,538	9.8%
Montgomery County	$98,221	6.7%

Source: U.S. Census Bureau; State and County Quick Facts, Montgomery County, MD, 2009-2013 American Community Survey, 5-Year Estimates.

2.3 Environmental Study Area Demographics

The environmental study area consists of 42 census tracts and 76 block groups, as designated in the 2009-2013 American Community Survey 5-Year Estimates -designated block groups were selected as a unit of measure to provide the most comprehensive and representative demographic data for the environmental study area at the smallest scale. These census tract-block groups are depicted in **Figure 2: Environmental Justice Map** and listed in **Table 5**.

As shown in **Table 5**, 123,988 persons lived within the 2013 environmental study area block groups. According to 2009-2013 American Community Survey 5-Year Estimates, Census Tract 7012.18, Block Group 2 had a total population of 0 residents as of 2013. Within that block group, a new apartment complex was recently constructed. As of the latest estimates, the building was still vacant. The population of this block group is zero residents in all of the environmental study area tables presented, as there were no residents living within the block group when the estimates were made. As such, this block group will not be included in subsequent tables.

Table 5: Environmental Study Area Population

Geography		Population	Geography		Population	Geography		Population
Environmental Study Area		123,988						
Census Tract 7002.05	BG1	2,633	Census Tract 7008.35	BG1	1,336	Census Tract 7012.18	BG1	2,272
Census Tract 7003.04	BG1	1,125	Census Tract 7008.35	BG2	3,280	Census Tract 7012.18	BG2	0
Census Tract 7003.04	BG2	1,790	Census Tract 7009.01	BG1	2,529	Census Tract 7012.18	BG3	465
Census Tract 7003.04	BG3	2,246	Census Tract 7009.01	BG2	1,529	Census Tract 7043.00	BG2	1,482
Census Tract 7003.11	BG1	2,141	Census Tract 7009.02	BG1	2,157	Census Tract 7044.01	BG1	1,552
Census Tract 7003.12	BG1	1,570	Census Tract 7009.04	BG1	1,371	Census Tract 7044.03	BG1	1,510
Census Tract 7003.12	BG2	1,957	Census Tract 7009.04	BG2	1,207	Census Tract 7044.04	BG1	1,560
Census Tract 7003.12	BG3	2,599	Census Tract 7010.01	BG1	2,673	Census Tract 7044.04	BG2	1,177
Census Tract 7007.04	BG2	1,198	Census Tract 7010.04	BG1	1,544	Census Tract 7044.04	BG3	1,213

Table 5: Environmental Study Area Population (continued)

Geography		Population	Geography		Population	Geography		Population
Census Tract 7007.04	BG3	814	Census Tract 7010.04	BG3	1,124	Census Tract 7048.03	BG1	675
Census Tract 7007.13	BG2	1,873	Census Tract 7011.02	BG1	1,397	Census Tract 7048.03	BG2	1,618
Census Tract 7007.17	BG1	1,099	Census Tract 7011.02	BG3	1,215	Census Tract 7048.04	BG1	1,508
Census Tract 7007.17	BG2	1,230	Census Tract 7012.02	BG1	1,438	Census Tract 7048.05	BG1	1,091
Census Tract 7007.17	BG3	2,809	Census Tract 7012.02	BG2	1,288	Census Tract 7048.06	BG1	1,765
Census Tract 7007.17	BG4	739	Census Tract 7012.11	BG1	2,607	Census Tract 7048.06	BG2	1,015
Census Tract 7007.18	BG1	3,755	Census Tract 7012.11	BG2	3,107	Census Tract 7050.00	BG3	825
Census Tract 7007.22	BG1	2,393	Census Tract 7012.13	BG1	1,251	Census Tract 7050.00	BG4	1,403
Census Tract 7007.22	BG2	549	Census Tract 7012.13	BG3	794	Census Tract 7053.00	BG2	1,080
Census Tract 7007.23	BG1	1,423	Census Tract 7012.13	BG5	624	Census Tract 7054.00	BG1	1,227
Census Tract 7007.24	BG1	3,154	Census Tract 7012.14	BG1	1,617	Census Tract 7054.00	BG2	1,597
Census Tract 7008.30	BG1	2,520	Census Tract 7012.14	BG2	1,176	Census Tract 7055.02	BG1	1,764
Census Tract 7008.32	BG1	2,958	Census Tract 7012.15	BG1	783	Census Tract 7055.02	BG3	1,446
Census Tract 7008.33	BG1	1,617	Census Tract 7012.15	BG2	1,195	Census Tract 7056.02	BG1	913
Census Tract 7008.33	BG2	2,634	Census Tract 7012.16	BG2	1,778	Census Tract 7056.02	BG2	3,012
Census Tract 7008.34	BG2	1,998	Census Tract 7012.16	BG3	909			
Census Tract 7008.34	BG3	1,975	Census Tract 7012.16	BG4	1,090			
Source: 2009-2013 American Community Survey 5-Year Estimates								

2.3.1. Environmental Study Area Racial and Ethnic Characteristics

According to the 2010 Census, approximately 50.4 percent of the environmental study area population was White and 13.1 percent was African-American or Black. These environmental study area percentages are lower than the state average of 60.5 percent White and 30.1 percent African American or Black. In addition, the White and African-American or Black population percentages in the environmental study area are lower than the county average of 62.6 percent White and 18.6 percent African-American or Black. Environmental study area population percentages for American Indian and Alaska Native, Native Hawaiian and Other Pacific Islander, and Two or More Races were comparable to the state and county averages for those population groups. The environmental study area population for American Indian and Alaska Native of 0.2 percent is lower than the state average of 0.6 percent and county average of 0.7 percent. The environmental study area population for Native Hawaiian and Other Pacific Islander of 0.1 percent was the same as both the state and county averages. The environmental study area population of residents of Two or More Races of 2.8 percent was comparable to the state average

of 2.6 percent and county average of 3.1 percent. The Asian population within the environmental study area of 15.7 percent was higher than the state average of 6.1 percent and county average of 14.9 percent. The Hispanic and Latino populations of 15.7 percent were higher than the state average of 9 percent and lower than the county average of 18.3 percent. Additional studies are required to determine why the Asian and Hispanic/Latino populations within the county and environmental study area are significantly higher than the state average.

In **Table 6**, Block Groups highlighted in yellow indicate areas that have a higher minority population than the identified average minority population within the environmental study area. The block groups highlighted in green have a significantly higher population of the identified racial group than the other block groups within the study area. Additional research is required to determine why these block groups have a significantly higher population of the identified group than the remainder of the environmental study area. Using the 2010 census data reveals more than half of the census tracts on the table are potential Environmental Justice areas (also see Table 13). Of Asian populations, the largest groups are Asian Indian, followed, by Chinese, followed by Korean. Generally, limited English proficiency (LEP) in the project area is occurring in Asian and Spanish speaking populations (see also Table 15). More research and/or outreach will be required to determine LEP by individual language groups. According to the 2010 census, the American Indian & Alaska Native combination population experienced rapid growth in the far western portion of the U.S., followed by the southern region, of which Maryland is included. Within the state of Maryland, approximately 41 percent of this population resides in the Baltimore Metropolitan area followed by 39 percent in the Washington Capital region (the study area), with 18 percent residing in Montgomery County of which 8 percent are considered LEP.

Table 6: Environmental Study Area Racial and Ethnic Distribution (Percentage)

Geography		Population	White	Black or African American	American Indian & Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Other	Two or More Races	Hispanic or Latino
Environmental study area		123,988	50.4%	13.1%	0.2%	17.4%	0.1%	0.3%	2.8%	15.7%
Census Tract 7002.05	BG1	2,633	57.5%	7.6%	0.0%	22.6%	0.0%	0.1%	3.3%	8.9%
Census Tract 7003.04	BG1	1,125	41.5%	16.5%	0.0%	22.6%	0.0%	0.0%	3.4%	16.0%
	BG2	1,790	23.9%	12.1%	0.0%	50.9%	0.1%	0.2%	3.2%	9.6%
	BG3	2,246	41.9%	12.7%	0.1%	30.2%	0.0%	0.4%	4.1%	10.6%
Census Tract 7003.11	BG1	2,141	33.1%	16.2%	0.1%	37.2%	0.0%	0.4%	2.8%	10.1%
Census Tract 7003.12	BG1	1,570	56.6%	27.7%	0.0%	1.4%	0.0%	0.1%	1.0%	13.2%
	BG2	1,957	54.7%	14.6%	0.1%	19.2%	0.0%	0.1%	3.0%	8.3%
	BG3	2,599	46.3%	16.5%	0.1%	24.0%	0.1%	0.1%	3.4%	9.5%
Census Tract 7007.04	BG2	1,198	48.3%	4.9%	0.0%	27.0%	0.1%	0.0%	2.3%	17.4%
	BG3	814	17.8%	12.2%	0.1%	5.4%	0.0%	0.6%	2.3%	61.5%

Table 6: Environmental Study Area Racial and Ethnic Distribution (Percentage) (continued)

Geography		Population	White	Black or African American	American Indian & Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Other	Two or More Races	Hispanic or Latino
Census Tract 7007.13	BG2	1,873	20.8%	25.9%	0.2%	16.4%	0.0%	0.9%	3.0%	32.8%
Census Tract 7007.17	BG1	1,099	30.8%	24.1%	0.3%	6.7%	0.0%	1.2%	4.5%	32.3%
	BG2	1,230	28.4%	15.5%	0.2%	7.3%	0.0%	0.1%	1.5%	47.0%
	BG3	2,809	18.8%	20.5%	0.4%	11.0%	0.0%	0.5%	2.4%	46.3%
	BG4	739	43.7%	23.4%	0.5%	16.2%	0.0%	1.4%	1.5%	13.3%
Census Tract 7007.18	BG1	3,755	53.4%	11.2%	0.2%	23.0%	0.1%	0.8%	3.0%	8.3%
Census Tract 7007.22	BG1	2,393	17.4%	30.3%	0.1%	21.6%	0.0%	0.6%	3.7%	26.2%
	BG2	549	37.0%	24.6%	0.2%	14.9%	0.0%	0.4%	4.7%	18.2%
Census Tract 7007.23	BG1	1,423	42.3%	23.7%	0.5%	11.1%	0.0%	0.5%	2.5%	19.4%
Census Tract 7007.24	BG1	3,154	15.7%	27.6%	0.1%	12.5%	0.0%	0.3%	2.4%	41.4%
Census Tract 7008.30	BG1	2,520	23.0%	32.4%	0.2%	21.7%	0.2%	0.5%	3.0%	19.0%
Census Tract 7008.32	BG1	2,958	27.0%	23.9%	0.7%	7.8%	0.0%	0.2%	2.4%	37.9%
Census Tract 7008.33	BG1	1,617	30.4%	18.2%	0.4%	28.2%	0.1%	0.2%	3.7%	18.9%
	BG2	2,634	25.4%	21.7%	0.2%	16.6%	0.0%	0.2%	2.2%	33.7%
Census Tract 7008.34	BG2	1,998	26.9%	28.7%	0.2%	14.2%	0.1%	0.4%	3.5%	26.0%
	BG3	1,975	26.4%	36.5%	0.3%	11.0%	0.0%	0.3%	3.8%	21.7%
Census Tract 7008.35	BG1	1,336	52.6%	13.2%	0.1%	21.2%	0.0%	0.1%	2.8%	10.0%
	BG2	3,280	33.2%	17.0%	0.1%	31.8	0.0%	0.2%	3.9%	13.9%
Census Tract 7009.01	BG1	2,529	44.2%	14.0%	0.1%	29.0	0.0%	0.1%	3.6%	8.9%
	BG2	1,529	55.5%	7.3%	0.0%	22.2%	0.1%	0.4%	1.9%	12.6%
Census Tract 7009.02	BG1	2,157	20.2%	27.8%	0.3%	14.9%	0.2%	0.5%	1.3%	34.7%
Census Tract 7009.04	BG1	1,371	45.0%	9.6%	0.3%	32.5%	0.3%	0.1%	3.2%	9.0%
	BG2	1,207	16.2%	7.5%	0.5%	62.1%	0.0%	0.3%	2.0%	11.4%
Census Tract 7010.01	BG1	2,673	46.4%	9.1%	0.1%	25.5%	0.0%	0.4%	3.4%	15.3%
Census Tract 7010.04	BG1	1,544	59.0%	16.8%	0.1%	12.2%	0.1%	0.9%	2.8%	8.2%
	BG3	1,124	53.6%	18.1%	0.2%	12.5%	0.1%	0.2%	3.6%	11.8%
Census Tract 7011.02	BG1	1,397	43.0%	9.9%	0.1%	13.2%	0.0%	0.3%	2.9%	30.7%
	BG3	1,215	35.8%	5.3%	0.0%	16.8%	0.1%	0.1%	1.7%	40.2%
Census Tract 7012.02	BG1	1,438	83.5%	1.2%	0.1%	4.0%	0.0%	0.0%	3.0%	8.3%

Table 6: Environmental Study Area Racial and Ethnic Distribution (Percentage) (continued)

Geography		Population	White	Black or African American	American Indian & Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Other	Two or More Races	Hispanic or Latino
Census Tract 7012.02	BG2	1,288	80.7%	1.8%	0.1%	5.9%	0.0%	0.1%	3.2%	8.3%
Census Tract 7012.11	BG1	2,607	48.0%	11.5%	0.2%	23.7%	0.1%	0.7%	3.2%	12.6%
	BG2	3,107	43.9%	13.3%	0.1%	27.0%	0.0%	0.8%	3.6%	11.2%
Census Tract 7012.13	BG1	1,251	76.9%	2.6%	0.1%	13.3%	0.0%	0.2%	0.7%	6.3%
	BG3	794	80.1%	3.9%	0.0%	8.3%	0.1%	0.0%	1.9%	5.7%
	BG5	624	76.3%	5.1%	0.0%	11.5%	0.0%	0.0%	1.4%	5.6%
Census Tract 7012.14	BG1	1,617	66.1%	7.8%	0.1%	9.5%	0.1%	0.6%	3.7%	12.1%
	BG2	1,176	69.0%	6.3%	0.3%	12.3%	0.0%	0.2%	2.6%	9.4%
Census Tract 7012.15	BG1	783	69.7%	6.3%	0.0%	12.9%	0.0%	0.0%	4.3%	6.8%
	BG2	1,195	68.2%	4.1%	0.2%	15.9%	0.0%	0.2%	2.3%	9.1%
Census Tract 7012.16	BG2	1,778	60.0%	6.4%	0.2%	22.6%	0.0%	0.2%	2.2%	8.5%
	BG3	909	50.6%	20.1%	0.1%	19.0%	0.0%	0.1%	1.9%	8.1%
	BG4	1,090	51.0%	6.3%	0.2%	32.3%	0.0%	0.0%	3.3%	6.9%
Census Tract 7012.18	BG1	2,272	62.9%	11.7%	0.4%	13.6%	0.4%	0.2%	2.9%	8.0%
	BG3	465	50.8%	8.0%	0.2%	26.7%	0.2%	0.0%	6.2%	8.0%
Census Tract 7043.00	BG2	1,482	85.4%	0.9%	0.0%	6.5%	0.0%	0.1%	2.2%	4.9%
Census Tract 7044.01	BG1	1,552	74.9%	4.3%	0.3%	8.2%	0.0%	0.2%	3.0%	9.2%
Census Tract 7044.03	BG1	1,510	78.8%	3.8%	0.1%	9.3%	0.3%	0.1%	1.1%	6.5%
Census Tract 7044.04	BG1	1,560	74.9%	2.2%	0.6%	10.5%	0.3%	0.6%	2.3%	8.5%
	BG2	1,177	73.8%	2.6%	0.0%	11.9%	0.1%	0.1%	3.0%	8.5%
	BG3	1,213	66.3%	6.8%	0.0%	12.8%	0.0%	0.4%	4.0%	9.6%
Census Tract 7048.03	BG1	675	72.7%	4.6%	0.0%	12.6%	0.0%	0.0%	2.2%	7.9%
	BG2	1,618	70.3%	7.3%	0.0%	9.2%	0.0%	0.3%	2.4%	10.5%
Census Tract 7048.04	BG1	1,508	75.1%	2.5%	0.1%	9.4%	0.0%	0.5%	2.8%	9.7%
Census Tract 7048.05	BG1	1,091	68.0%	6.1%	0.0%	16.6%	0.2%	0.6%	3.0%	5.4%
Census Tract 7048.06	BG1	1,765	71.2%	4.1%	0.2%	13.9%	0.0%	0.3%	1.9%	8.3%
	BG2	1,015	72.7%	7.3%	0.0%	12.0%	0.1%	0.3%	2.5%	5.1%
Census Tract 7050.00	BG3	825	80.5%	3.4%	0.2%	5.0%	0.0%	0.5%	3.4%	7.0%
	BG4	1,403	75.2%	7.6%	0.1%	5.6%	0.0%	0.3%	3.0%	8.3%
Census Tract 7053.00	BG2	1,080	91.2%	0.6%	0.2%	2.2%	0.0%	0.7%	1.7%	3.4%
Census Tract 7054.00	BG1	1,227	85.7%	0.4%	0.0%	5.9%	0.0%	0.2%	2.4%	5.5%

Table 6: Environmental Study Area Racial and Ethnic Distribution (Percentage) (continued)

Geography		Population	White	Black or African American	American Indian & Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Other	Two or More Races	Hispanic or Latino
	BG2	1,597	90.0%	1.4%	0.1%	2.3%	0.0%	0.3%	1.8%	4.2%
Census Tract 7055.02	BG1	1,764	85.2%	1.4%	0.0%	6.1%	0.0%	0.4%	2.0%	5.0%
	BG3	1,446	81.7%	1.7%	0.1%	6.2%	0.0%	0.3%	2.6%	7.5%
Census Tract 7056.02	BG1	913	62.4%	8.0%	0.0%	16.5%	0.0%	0.0%	3.1%	10.0%
	BG2	3,012	70.9%	4.8%	0.2%	12.0%	0.1%	0.5%	3.4%	8.1%

Source: 2009-2013 American Community Survey, 5 year estimates 1 Data, Race, Combination of Two Races, & Not Hispanic or Latino;
*Compiled using the 2010 Census racial populations categories (Black or African American, American Indian and Alaska Native, Asian or Other Pacific Islander, Hispanic or Latino) which correspond to the definition of minority (Black, Hispanic, Asian-American, American Indian and Alaska Native) in accordance with EO 12898 on Environmental Justice (See Section II).

2.3.2 Age, Gender and Disability Distribution

According to 2009-2013 American Community Survey 5-Year Estimates, 123,988 people lived within the environmental study area Of that total, 6.2 percent were 20 through 24 years old, 17.9 percent were 25 through 34 years old, 23.3 percent were 35 through 49 years old, 18.2 percent were 50 through 64 years old, and 12 percent were persons of age 65 years and older. In addition, the 2010 Census data indicate that 48 percent of the environmental study area was male and 52 percent was female. **Table 7** summarizes the age and gender distribution of the environmental study area population.

Table 7: Environmental Study Area Age and Gender Distribution

Geography		Population	Male	Female	19 and Under	20-24	25-34	35-49	50-64	65+
Environmental Study Area		123,988	48.1%	52.2%	22.8%	6.2%	17.9%	23.3%	18.2%	12.0%
Census Tract 7002.05	BG1	2,633	49.3%	50.7%	30.5%	5.0%	13.1%	24.7%	19.6%	7.1%
Census Tract 7003.04	BG1	1,125	46.8%	53.2%	25.1%	4.7%	14.3%	26.6%	18.5%	10.8%
	BG2	1,790	49.4%	50.6%	32.7%	4.0%	10.0%	29.4%	16.6%	7.3%
	BG3	2,246	48.1%	51.9%	35.9%	5.2%	7.3%	27.7%	19.1%	4.8%
Census Tract 7003.11	BG1	2,141	49.1%	50.9%	32.5%	4.5%	16.1%	28.0%	13.8%	5.2%
Census Tract 7003.12	BG1	1,570	69.9%	30.1%	16.8%	15.5%	17.5%	23.4%	18.7%	8.1%
	BG2	1,957	49.0%	51.0%	31.1%	4.1%	11.4%	27.1%	17.2%	9.1%
	BG3	2,599	48.0%	52.0%	34.2%	3.3%	13.9%	30.5%	13.4%	4.8%
Census Tract 7007.04	BG2	1,198	49.5%	50.5%	25.1%	6.3%	11.3%	21.0%	24.4%	12.0%
	BG3	814	53.3%	46.7%	27.0%	8.1%	21.1%	26.4%	13.9%	3.4%
Census Tract 7007.13	BG2	1,873	46.9%	53.1%	27.4%	6.4%	17.9%	26.8%	15.5%	6.0%
Census Tract 7007.17	BG1	1,099	47.0%	53.0%	26.2%	8.0%	18.3%	22.0%	17.1%	8.4%
	BG2	1,230	56.2%	43.8%	24.1%	7.5%	21.0%	27.6%	14.5%	5.3%
	BG3	2,809	50.3%	49.7%	28.1%	8.5%	17.5%	21.9%	16.4%	7.5%
	BG4	739	50.9%	49.1%	19.2%	4.9%	12.7%	26.1%	23.8%	13.3%
Census Tract 7007.18	BG1	3,755	46.3%	53.7%	18.1%	5.9%	22.5%	24.4%	17.0%	12.1%
Census Tract 7007.22	BG1	2,393	48.1%	51.9%	26.7%	6.7%	19.6%	22.0%	19.3%	5.6%
	BG2	549	50.5%	49.5%	20.8%	12.2%	33.9%	20.6%	8.7%	3.8%
Census Tract 7007.23	BG1	1,423	44.8%	55.2%	15.8%	3.9%	12.2%	16.0%	19.1%	32.9%
Census Tract 7007.24	BG1	3,154	50.3%	49.7%	26.8%	8.1%	23.9%	21.9%	10.4%	8.9%
Census Tract 7008.30	BG1	2,520	46.0%	54.0%	28.8%	8.9%	25.0%	23.7%	9.9%	3.8%

Table 7: Environmental Study Area Age and Gender Distribution (continued)

Geography		Population	Male	Female	19 and Under	20-24	25-34	35-49	50-64	65+
Census Tract 7008.32	BG1	2,958	49.6%	50.4%	28.9%	6.3%	16.9%	23.7%	16.9%	7.2%
Census Tract 7008.33	BG1	1,617	47.7%	52.3%	31.6%	6.6%	12.5%	25.0%	18.9%	5.4%
	BG2	2,634	49.4%	50.6%	33.1%	6.9%	15.9%	22.7%	17.4%	4.1%
Census Tract 7008.34	BG2	1,998	48.0%	52.0%	31.4%	7.5%	16.3%	25.4%	15.6%	3.9%
	BG3	1,975	45.8%	54.2%	26.7%	6.7%	26.4%	24.8%	11.6%	3.8%
Census Tract 7008.35	BG1	1,336	49.3%	50.7%	27.8%	6.5%	8.6%	23.4%	28.0%	5.6%
	BG2	3,280	49.8%	50.2%	32.0%	7.0%	9.2%	25.8%	20.4%	5.5%
Census Tract 7009.01	BG1	2,529	48.0%	52.0%	13.8%	8.7%	26.2%	21.2%	16.6%	13.4%
	BG2	1,529	44.5%	55.5%	11.6%	4.2%	18.4%	19.4%	18.4%	28.1%
Census Tract 7009.02	BG1	2,157	51.1%	48.9%	26.6%	8.4%	15.5%	23.8%	15.8%	9.8%
Census Tract 7009.04	BG1	1,371	43.0%	57.0%	10.9%	5.2%	26.8%	21.6%	11.2%	24.2%
	BG2	1,207	50.4%	49.6%	21.0%	5.7%	28.0%	25.8%	13.3%	6.1%
Census Tract 7010.01	BG1	2,673	47.7%	52.3%	25.6%	6.4%	13.5%	22.6%	20.1%	11.9%
Census Tract 7010.04	BG1	1,503	47.8%	52.2%	24.5%	5.0%	15.3%	28.7%	27.6%	28.0%
	BG3	1,124	47.7%	52.3%	24.5%	6.7%	15.7%	23.3%	16.8%	13.1%
Census Tract 7011.02	BG1	1,397	48.2%	51.8%	21.8%	9.0%	21.1%	23.5%	17.7%	6.9%
	BG3	1,215	51.8%	48.2%	23.2%	7.7%	17.6%	22.9%	17.9%	10.7%
Census Tract 7012.02	BG1	1,438	48.1%	51.9%	27.3%	3.5%	4.8%	21.0%	24.8%	18.6%
Census Tract 7012.02	BG2	1,288	47.5%	52.5%	25.6%	3.8%	8.5%	20.6%	22.8%	18.7%
Census Tract 7012.11	BG1	2,607	51.3%	48.7%	23.6%	6.0%	9.8%	22.1%	26.7%	11.8%
	BG2	3,107	46.2%	53.8%	25.4%	5.4%	21.2%	27.3%	15.4%	5.3%
Census Tract 7012.13	BG1	1,251	45.0%	55.0%	19.8%	3.9%	9.3%	19.0%	30.7%	17.3%
	BG3	794	46.2%	53.8%	12.7%	2.6%	13.0%	21.8%	30.4%	19.5%
	BG5	624	43.8%	56.3%	11.4%	2.2%	12.7%	19.6%	24.2%	30.0%
Census Tract 7012.14	BG1	1,617	46.2%	53.8%	12.6%	10.8%	32.2%	19.5%	14.4%	10.6%
	BG2	1,176	47.2%	52.8%	11.8%	9.0%	34.3%	21.7%	15.7%	7.5%
Census Tract 7012.15	BG1	783	44.3%	55.7%	7.4%	5.2%	25.5%	21.1%	19.0%	21.7%
	BG2	1,195	45.9%	54.1%	5.6%	5.4%	36.7%	22.1%	14.6%	15.6%
Census Tract 7012.16	BG2	1,778	45.6%	54.4%	13.2%	4.9%	18.5%	22.4%	19.0%	22.0%
	BG3	909	50.7%	49.3%	9.8%	10.2%	39.3%	25.2%	11.6%	4.0%
	BG4	1,090	46.3%	53.7%	8.6%	5.0%	28.0%	26.0%	18.0%	14.5%
Census Tract 7012.18	BG1	2,272	41.3%	58.7%	7.4%	8.1%	24.6%	15.8%	10.3%	33.8%
	BG3	465	47.7%	52.3%	7.3%	6.5%	36.1%	22.2%	15.3%	12.7%
Census Tract 7043.00	BG2	1,482	48.1%	51.9%	31.8%	2.7%	6.6%	27.4%	19.9%	11.6%
Census Tract 7044.01	BG1	1,552	48.3%	51.7%	28.2%	3.3%	12.0%	25.1%	19.1%	12.4%
Census Tract 7044.03	BG1	1,510	41.7%	58.3%	6.2%	3.1%	19.3%	18.3%	20.3%	32.8%
Census Tract 7044.04	BG1	1,560	47.3%	52.7%	24.0%	4.7%	8.6%	21.3%	22.7%	18.7%
	BG2	1,177	47.6%	52.4%	29.7%	3.5%	4.1%	22.9%	26.0%	13.8%
	BG3	1,213	48.5%	51.5%	20.9%	7.7%	20.4%	22.6%	18.9%	9.6%
Census Tract 7048.03	BG1	675	46.8%	53.2%	5.3%	5.9%	41.3%	23.1%	15.7%	8.6%
	BG2	1,618	43.3%	56.7%	12.6%	7.3%	27.7%	22.0%	19.2%	11.2%
Census Tract 7048.04	BG1	1,508	44.9%	55.1%	8.8%	4.4%	28.4%	22.9%	19.3%	16.2%
Census Tract 7048.05	BG1	1,091	45.6%	54.4%	8.4%	5.7%	25.4%	17.4%	17.9%	25.2%
Census Tract 7048.06	BG1	1,765	46.8%	53.2%	7.6%	9.5%	41.4%	20.7%	12.2%	8.6%
	BG2	1,015	50.9%	49.1%	8.2%	9.6%	38.9%	26.8%	12.5%	4.0%
Census Tract 7050.00	BG3	825	49.3%	50.7%	27.3%	4.8%	11.6%	27.9%	20.1%	8.2%
	BG4	1,403	55.6%	44.4%	24.0%	14.6%	14.9%	23.0%	16.7%	6.8%
Census Tract 7053.00	BG2	1,080	48.1%	51.9%	27.8%	1.8%	3.0%	19.1%	27.4%	21.0%
Census Tract 7054.00	BG1	1,227	47.4%	52.6%	27.9%	3.3%	3.8%	22.4%	30.6%	12.1%
	BG2	1,597	48.5%	51.5%	30.6%	2.4%	3.2%	19.9%	27.7%	16.2%
Census Tract 7055.02	BG1	1,764	48.3%	51.7%	32.0%	2.4%	3.9%	20.2%	27.3%	14.2%
	BG3	1,446	45.5%	54.5%	25.4%	2.5%	5.7%	19.8%	22.6%	24.0%
Census Tract 7056.02	BG1	913	40.0%	60.0%	5.6%	11.1%	34.3%	18.9%	14.2%	15.9%
	BG2	3,012	42.7%	57.3%	11.9%	5.9%	20.5%	19.8%	18.1%	23.9%

Source: 2009-2013 American Community Survey, 5 year estimates

Approximately 10.3 percent of Maryland's population is disabled, including 9.9 percent male and 10.6 percent female. The disabled population within Montgomery County is slightly lower than the state average at approximately 7.5 percent, including 6.9 percent of the male population and 8.1 percent of the female population within the County. Data for the disabled population was not available beyond the Census Tract level. Approximately 7.8 percent of the population within the environmental study area is disabled, which is slightly higher than the County average. Census Tract 7007.23 had the highest percentage of disabled populations at 26.1 percent within the environmental study area, which is significantly higher than the environmental study area average of 7.8 percent. This Census Tract also has the highest percentage of disabled males and females within the environmental study area, with 20 percent and 30 percent, respectively. More research is needed to determine why the disabled population is so much higher within this Census Tract than the average. **Table 8** summarizes the disabled population within the environmental study area.

Table 8: Environmental Study Area Disability Distribution

Geography	Population	Population with Disability	Disability %	% Males with Disability	% Females with Disability
Environmental study area	172,869	13,507	7.8%	3.4%	4.4%
Census Tract 7002.05	6,778	564	8.3%	8.9%	7.8%
Census Tract 7003.04	7,744	280	3.6%	4.8%	2.5%
Census Tract 7003.11	7,887	201	2.5%	3.1%	2.1%
Census Tract 7003.12	5,329	328	6.2%	7.9%	4.4%
Census Tract 7007.04	2,866	260	9.1%	5.5%	11.9%
Census Tract 7007.13	5,585	189	3.4%	3.4%	3.4%
Census Tract 7007.17	5,744	410	7.1%	4.2%	10.4%
Census Tract 7007.18	4,207	430	10.2%	9.8%	10.6%
Census Tract 7007.22	4,075	515	12.6%	10.6%	14.5%
Census Tract 7007.23	3,203	835	26.1%	20.0%	30.3%
Census Tract 7007.24	3,253	328	10.1%	5.1%	14.6%
Census Tract 7008.30	2,741	108	3.9%	6.4%	1.8%
Census Tract 7008.32	2,971	292	9.8%	4.9%	14.5%
Census Tract 7008.33	4,414	243	5.5%	7.6%	3.7%
Census Tract 7008.34	4,986	320	6.4%	4.0%	8.3%
Census Tract 7008.35	4,607	246	5.3%	4.9%	5.8%
Census Tract 7009.01	4,016	366	9.1%	8.3%	9.8%
Census Tract 7009.02	3,848	430	11.2%	9.2%	13.3%
Census Tract 7009.04	2,733	193	7.1%	1.8%	12.2%
Census Tract 7010.01	5,638	508	9.0%	8.0%	10.0%
Census Tract 7010.04	5,083	337	6.6%	9.3%	4.4%
Census Tract 7011.02	6,105	487	8.0%	8.4%	7.5%
Census Tract 7012.02	2,717	226	8.3%	9.0%	7.6%
Census Tract 7012.11	6,186	312	5.0%	4.6%	5.5%
Census Tract 7012.13	6,134	389	6.3%	7.7%	5.0%
Census Tract 7012.14	2,993	148	4.9%	3.2%	6.2%
Census Tract 7012.15	4,188	410	9.8%	10.7%	9.2%
Census Tract 7012.16	4,298	524	12.2%	9.8%	14.3%
Census Tract 7012.18	2,302	262	11.4%	6.7%	15.2%
Census Tract 7043	3,700	188	5.1%	4.1%	5.9%
Census Tract 7044.01	3,135	370	11.8%	9.1%	14.8%
Census Tract 7044.03	1,520	290	19.1%	16.3%	20.8%
Census Tract 7044.04	4,764	473	9.9%	10.5%	9.4%
Census Tract 7048.03	3,488	268	7.7%	4.7%	9.5%

Table 8: Environmental Study Area Disability Distribution (continued)

Geography	Population	Population with Disability	Disability %	% Males with Disability	% Females with Disability
Census Tract 7048.04	1,521	66	4.3%	0.8%	7.1%
Census Tract 7048.05	1,656	187	11.3%	13.6%	9.6%
Census Tract 7048.06	3,151	147	4.7%	3.7%	5.5%
Census Tract 7050	3,889	476	12.2%	10.6%	13.8%
Census Tract 7053	1,951	92	4.7%	4.8%	4.7%
Census Tract 7054	2,846	158	5.6%	5.0%	6.0%
Census Tract 7055.02	3,900	281	7.2%	9.6%	4.9%
Census Tract 7056.02	4,717	370	7.8%	7.8%	7.8%
Source: 2009-2013 American Community Survey, 5 year estimates					

2.3.3. Income Levels

The median household annual income of the environmental study area in 2009-2013 was $98,437. An average of 7 percent of environmental study area households lived below the poverty level (see **Table 9**). The percentage of households in the environmental study area below the poverty level of 7 percent was slightly higher than the county average of 6.7 percent, but lower than the state average of 9.8 percent. Forty of the census tracts had poverty levels at or below 5 percent; 18 had poverty levels from 6 to 10 percent; 13 had poverty levels from 11 to 15 percent; two exceeded 15 percent, and three exceeded 20 percent. The average 2013 environmental study area median income was slightly higher than the median income in Montgomery County and approximately 33 percent higher than the median income in Maryland. Twenty-one census tracts had a median household annual income lower than that of the state; 39 block groups had a median household annual income lower than that of the county; and 36 block groups had a median household annual income higher than that of the county. Eight of the 21 census tracts that had a median household annual income lower than that of the state also had a higher percentage of people living below the poverty level than the statewide average. Low-income populations are discussed in **Section 3. Environmental Justice**. Within Census Tract 7007.23, Block Group 1, the percentage of residents below poverty was 32.8 percent, the highest within the environmental study area. This census tract and block group also had the lowest average annual household income at $31,225, and, as previously noted, has the highest number of age 65 plus populations at 32.9 percent.

Table 9: Environmental Study Area Income Demographics

Geography		2013 Estimated Population	2013 Estimated Households	2013 Estimated Household Income (average)	Past 12 Months Below Poverty for Individuals
Environmental study area		125,317	52,223	$98,437	7.0%
Census Tract 7002.05	BG1	2,553	854	$142,130	1.4%
Census Tract 7003.04	BG1	1,403	469	$92,431	15.0%
	BG2	1,691	477	$133,672	0.0%
	BG3	1,973	562	$150,988	0.0%
Census Tract 7003.11	BG1	2,598	841	$136,696	2.4%

Table 9: Environmental Study Area Income Demographics*(continued)

Geography		2013 Estimated Population	2013 Estimated Households	2013 Estimated Household Income (average)	Past 12 Months Below Poverty for Individuals
Census Tract 7003.12	BG1	728	303	$160,096	0.0%
	BG2	2,031	567	$133,717	3.1%
	BG3	2,577	839	$116,914	3.0%
Census Tract 7007.04	BG2	1,323	401	$130,164	6.6%
	BG3	716	302	$42,708	20.0%
Census Tract 7007.13	BG2	2,065	742	$43,500	11.1%
Census Tract 7007.17	BG1	1,180	406	$68,750	1.9%
	BG2	907	317	$76,780	13.1%
	BG3	2,905	917	$59,471	5.7%
	BG4	752	300	$80,875	12.5%
Census Tract 7007.18	BG1	3,699	1,721	$114,856	4.8%
Census Tract 7007.22	BG1	1,793	692	$64,167	10.3%
	BG2	367	193	$49,946	12.3%
Census Tract 7007.23	BG1	1,562	697	$31,225	32.8%
Census Tract 7007.24	BG1	3,238	1,269	$44,784	29.7%
Census Tract 7008.30	BG1	2,694	1,060	$64,621	6.9%
Census Tract 7008.32	BG1	2,971	976	$70,405	7.0%
Census Tract 7008.33	BG1	1,841	505	$109,728	0.5%
	BG2	2,594	814	$74,286	21.4%
Census Tract 7008.34	BG2	1,935	616	$91,848	9.4%
	BG3	2,067	772	$73,182	9.3%
Census Tract 7008.35	BG1	1,334	427	$160,625	1.3%
	BG2	3,298	857	$136,027	2.9%
Census Tract 7009.01	BG1	2,459	1,309	$85,271	13.0%
	BG2	1,557	856	$63,482	14.0%
Census Tract 7009.02	BG1	2,078	627	$70,893	9.0%
Census Tract 7009.04	BG1	1,321	762	$65,488	8.0%
	BG2	1,431	600	$72,315	4.0%
Census Tract 7010.01	BG1	2,754	920	$91,071	6.8%
Census Tract 7010.04	BG1	1,503	506	$131,923	9.4%
	BG3	1,365	575	$59,940	14.3%
Census Tract 7011.02	BG1	1,295	554	$67,005	0.7%
	BG3	1,455	614	$76,646	7.7%
Census Tract 7012.02	BG1	1,453	523	$125,417	5.5%
	BG2	1,256	511	$173,365	1.8%
Census Tract 7012.11	BG1	2,225	666	$104,500	10.6%
	BG2	3,079	1,277	$114,145	4.8%
Census Tract 7012.13	BG1	1,244	556	$131,389	1.5%
	BG3	619	340	$137,059	2.3%
	BG5	856	454	$138,382	1.6%
Census Tract 7012.14	BG1	1,724	903	$130,536	4.6%
	BG2	1,291	712	$78,125	15.6%
Census Tract 7012.15	BG1	803	582	$56,406	8.1%
	BG2	1,224	818	$81,250	1.2%
Census Tract 7012.16	BG2	1,843	1,040	$101,944	7.2%
	BG3	939	526	$96,500	4.5%
	BG4	1,160	759	$64,180	2.2%
Census Tract 7012.18	BG1	1,823	1,052	$75,373	5.4%
	BG3	515	322	$71,750	6.8%
Census Tract 7043.00	BG2	1,219	402	$124,375	0.0%
Census Tract 7044.01	BG1	1,648	209	$141,023	9.0%
Census Tract 7044.03	BG1	1,520	1,069	$71,125	2.9%
Census Tract 7044.04	BG1	1,212	525	$163,309	1.7%
	BG2	1,245	430	$156,974	0.0%
	BG3	958	455	$121,985	10.5%
Census Tract 7048.03	BG1	804	516	$80,536	4.7%
	BG2	1,666	936	$89,423	11.0%

Table 9: Environmental Study Area Income Demographics*(continued)

Geography		2013 Estimated Population	2013 Estimated Households	2013 Estimated Household Income (average)	Past 12 Months Below Poverty for Individuals
Census Tract 7048.04	BG1	1,671	969	$113,346	3.4%
Census Tract 7048.05	BG1	943	635	$97,202	11.6%
Census Tract 7048.06	BG1	1,990	1,111	$81,328	2.9%
	BG2	1,212	689	$120,066	4.0%
Census Tract 7050.00	BG3	865	308	$199,405	5.7%
	BG4	1,044	411	$130,924	2.7%
Census Tract 7053.00	BG2	1,175	391	250,000+	3.1%
Census Tract 7054.00	BG1	1,264	440	$211,100	1.3%
	BG2	1,598	571	250,000+	1.1%
Census Tract 7055.02	BG1	1,707	596	$203,750	4.9%
	BG3	1,482	639	$105,104	2.3%
Census Tract 7056.02	BG1	962	696	$77,891	3.3%
	BG2	3,787	2,143	$90,466	2.1%
Source: 2009-2013 American Community Survey, 5-year estimates					

3. ENVIRONMENTAL JUSTICE

Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. **Fair treatment** means that no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental, and/or commercial operations or policies. **Meaningful involvement** means that: (1) people have an opportunity to participate in decisions about activities that may affect their environment and/or health; (2) the public's contribution can influence the regulatory agency's decision; (3) the public's concerns will be considered in the decision-making process; and (4) the decision makers seek out and facilitate the involvement of those potentially affected.

On Feb 11, 1994, *Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* was signed by President William J. Clinton. The Order directed federal agencies to develop environmental justice strategies to help federal agencies address disproportionately high and/or adverse human health and environmental effects of their programs on minority and/or low-income populations. The Order is also intended to promote nondiscrimination in federal programs that affect human health and the environment. It aims to provide minority and low-income communities' access to public information and public participation in matters relating to human health and the environment.

Minority is defined as a person who is:

• Black (a person having origins in any of the black racial groups of Africa);

• Hispanic (a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race);

• Asian-American (a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands); or

• American Indian and Alaska Native (a person having origins in any of the original peoples of North America and who maintains cultural identification through tribal affiliation or community recognition).

Low-income is defined as a person whose median household income is at or below the Department of Health and Human Services poverty guidelines, which are issued annually and reflect price changes for the previous calendar year.

The 2010 Census data indicate that Montgomery County's population was 50.8 percent minority and that 6 percent of its residents lived below the poverty level.

3.1 Methodology

The identification of low-income and minority populations was based primarily on U.S. Census Bureau 2010 census tract-block group data. The low-income percentage was determined for each census tract, and the minority percentage was determined for each block group. Individual census tract percentages within the study area were averaged to arrive at a study-area low-income percentage of 7 percent. Individual block group percentages within the study area were averaged to arrive at a study-area minority percentage of 49.6 percent. Census tract-block groups with potential low-income and/or minority populations were identified by comparing each census-tract low-income percentage and each block-group minority percentage to the average low-income and minority percentages of the study area. If the individual percentage was meaningfully greater than the average study-area percentage, a potential low-income and/or minority population was identified within that census tract and/or block group. For this analysis, it was determined that study-area block groups that had a minority percentage of five percent greater than the average study area minority percentage was a potential minority population. This was determined by calculating five percent of the average minority percentage (49.6 percent x 5 percent = 2.5 percent) and adding that number to the average minority percentage (49.6 percent + 2.5 percent = 52.1 percent). It was determined that any census block group with a minority percentage of more than 52.1 percent considered a potential minority population. To identify census tracts that contain potential low- income populations, the same formula was used. The study area low-income percentage was 6.9 percent. Using this formula, (6.9 percent x 5 percent = 0.4 percent, then 6.9 percent + 0.4 percent = 7.3 percent), it was determined that 7.3 percent or greater was considered "meaningfully greater." The sources listed below were used to verify environmental justice populations:

3.2 Findings

3.2.1. Minority Populations

Based on the 2010 Census data analysis described above, the following study area census tract/block groups may contain "meaningfully greater" minority/ethnic populations (highlighted in blue on **Table 10**):

- 7003.04-1
- 7003.04-2
- 7003.04-3
- 7003.11-1
- 7003.12-3
- 7007.04-3
- 7007.13-2
- 7007.17-1
- 7007.17-2
- 7007.17-3
- 7007.17-4
- 7007.22-1
- 7007.22-2
- 7007.23-1
- 7007.24-1
- 7008.30-1
- 7008.32-1
- 7008.33-1
- 7008.33-2
- 7008.34-2
- 7008.34-3
- 7008.35-2
- 7009.01-1
- 7009.02-1
- 7009.04-1
- 7009.04-2
- 7010.01-1
- 7011.02-1
- 7011.02-3
- 7012.11-2

3.2.2. Low-Income Populations

The 2010 Census data analysis also identified the following census tract/block groups as containing potential low-income populations (highlighted in green on **Table 13**):

- 7003.04-1
- 7007.04-3
- 7007.13-2
- 7007.17-2
- 7007.17-4
- 7007.22-1
- 7007.22-2
- 7007.23-1
- 7007.24-1
- 7008.33-2
- 7008.34-2
- 7008.34-3
- 7009.01-1
- 7009.01-2
- 7009.02-1
- 7009.04-1
- 7010.04-1
- 7010.04-3
- 7012.11-1
- 7012.14-2
- 7012.15-1
- 7044.01-1
- 7044.04-3
- 7048.03-2
- 7048.05-1

Table 10: Environmental Justice Populations

Census Tract	Block Group	Population	% Minority	% Low Income	Potential Environmental Justice Population
Study Area		123,988	49.6%	6.9%	N/A
Census Tract 7002.05	BG1	2,633	42.5%	1.4%	No
Census Tract 7003.04	BG1	1,125	58.5%	15.0%	**Yes**
	BG2	1,790	76.1%	0.0%	**Yes**
	BG3	2,246	58.1%	0.0%	**Yes**
Census Tract 7003.11	BG1	2,141	66.9%	2.4%	**Yes**
Census Tract 7003.12	BG1	1,570	43.4%	0.0%	No
	BG2	1,957	45.3%	3.1%	No
	BG3	2,599	53.7%	3.0%	No
Census Tract 7007.04	BG2	1,198	51.7%	6.6%	No
	BG3	814	82.2%	20.0%	**Yes**
Census Tract 7007.13	BG2	1,873	79.2%	11.1%	**Yes**
Census Tract 7007.17	BG1	1,099	69.2%	1.9%	**Yes**
	BG2	1,230	71.6%	13.1%	**Yes**
	BG3	2,809	81.2%	5.7%	**Yes**
	BG4	739	56.3%	12.5%	**Yes**
Census Tract 7007.18	BG1	3,755	46.6%	4.8%	No
Census Tract 7007.22	BG1	2,393	82.6%	10.3%	**Yes**
	BG2	549	63.0%	12.3%	**Yes**
Census Tract 7007.23	BG1	1,423	57.7%	32.8%	**Yes**
Census Tract 7007.24	BG1	3,154	84.3%	29.7%	**Yes**
Census Tract 7008.30	BG1	2,520	77.0%	6.9%	**Yes**
Census Tract 7008.32	BG1	2,958	73.0%	7.0%	**Yes**
Census Tract 7008.33	BG1	1,617	69.6%	0.5%	**Yes**
	BG2	2,634	74.6%	21.4%	**Yes**
Census Tract 7008.34	BG2	1,998	73.1%	9.4%	**Yes**
	BG3	1,975	73.6%	9.3%	**Yes**
Census Tract 7008.35	BG1	1,336	47.4%	1.3%	No
	BG2	3,280	66.8%	2.9%	**Yes**
Census Tract 7009.01	BG1	2,529	55.8%	13.0%	**Yes**
	BG2	1,529	44.5%	14.0%	**Yes**
Census Tract 7009.02	BG1	2,157	79.8%	9.0%	**Yes**
Census Tract 7009.04	BG1	1,371	55.0%	8.0%	**Yes**
	BG2	1,207	83.8%	4.0%	**Yes**
Census Tract 7010.01	BG1	2,673	53.6%	6.8%	No
Census Tract 7010.04	BG1	1,503	41.0%	9.4%	No
	BG3	1,124	46.4%	14.3%	**Yes**
Census Tract 7011.02	BG1	1,397	57.0%	0.7%	**Yes**
	BG3	1,215	64.2%	7.7%	**Yes**
Census Tract 7012.02	BG1	1,438	16.5%	5.5%	No
Census Tract 7012.02	BG2	1,288	19.3%	1.8%	No
Census Tract 7012.11	BG1	2,607	52.0%	10.6%	No
	BG2	3,107	56.1%	4.8%	**Yes**
Census Tract 7012.13	BG1	1,251	23.1%	1.5%	No
	BG3	794	19.9%	2.3%	No
	BG5	624	23.7%	1.6%	No

Table 10: Environmental Justice Populations (continued)

Census Tract	Block Group	Population	% Minority	% Low Income	Potential Environmental Justice Population
Census Tract 7012.14	BG1	1,617	33.9%	4.6%	No
	BG2	1,176	31.0%	15.6%	**Yes**
Census Tract 7012.15	BG1	783	30.3%	8.1%	No
	BG2	1,195	31.8%	1.2%	No
Census Tract 7012.16	BG2	1,778	40.0%	7.2%	No
	BG3	909	49.4%	4.5%	No
	BG4	1,090	49.0%	2.2%	No
Census Tract 7012.18	BG1	2,272	37.1%	5.4%	No
	BG2	465	0.0%	0.0%	No
	BG3	1,482	49.2%	6.8%	No
Census Tract 7043.00	BG2	1,552	14.6%	0.0%	No
Census Tract 7044.01	BG1	1,648	25.1%	9.0%	No
Census Tract 7044.03	BG1	1,520	21.2%	2.9%	No
Census Tract 7044.04	BG1	1,212	25.1%	1.7%	No
	BG2	1,245	26.2%	0.0%	No
	BG3	958	33.7%	10.5%	No
Census Tract 7048.03	BG1	804	27.3%	4.7%	No
	BG2	1,666	29.7%	7.2%	No
Census Tract 7048.04	BG1	1,671	24.9%	3.4%	No
Census Tract 7048.05	BG1	943	32.0%	11.6%	No
Census Tract 7048.06	BG1	1,990	28.8%	2.9%	No
	BG2	1,212	27.3%	4.0%	No
Census Tract 7050.00	BG3	865	19.5%	5.7%	No
	BG4	1,044	24.8%	2.7%	No
Census Tract 7053.00	BG2	1,175	8.8%	3.1%	No
Census Tract 7054.00	BG1	1,264	14.3%	1.3%	No
	BG2	1,598	10.0%	1.1%	No
Census Tract 7055.02	BG1	1,707	14.8%	4.9%	No
	BG3	1,482	18.3%	2.3%	No
Census Tract 7056.02	BG1	962	37.6%	3.3%	No
	BG2	3,787	29.1%	2.1%	No
	Source: U.S. Census Bureau; American FactFinder 2013 data				

4. COMMUNITY FACILITIES AND SERVICES

Community facilities and services within the environmental study area are described in the sections 5.1 - 5.6. Facilities abutting MD 355 are printed in **bold** in the included tables. Community facilities within approximately 500 feet of MD 355 are identified in **Figure 3.**

4.1 Educational Facilities and Libraries within the Environmental Study Area

Four high schools are located in block groups within the environmental study area: Clarksburg High School, Gaithersburg High School, Richard Montgomery High School, and Bethesda-Chevy Chase High School. Three middle schools are located in block groups within the

environmental study area: Rocky Hill Middle School, Neelsville Middle School, and Tilden Middle School. Eleven elementary schools are also located within the environmental study area (See **Table 11**).

Montgomery County Public Schools' Office of Special Education and Student Services defines a "special school" as a separate school/center that "provides services for children with special educational needs, the intensity of which cannot be met in comprehensive schools." Rock Terrace School, which lies within an environmental study area block group, is identified as a special school.

Private and parochial schools are *italicized* in Table 14. All educational and library facilities within the environmental study area are listed in **Table 11**. Some of the elementary schools listed below were included in **Figure 3** as part of the supporting research for the identification of potential environmental justice populations.

Table 11: Educational Facilities and Libraries within the Environmental Study Area

Facility	Location	Block Group
Clarksburg Elementary School	13530 Redgrave Pl., Clarksburg, MD 20871	7003.12-1
Little Bennett Elementary School	23930 Burdette Forest Rd., Clarksburg, MD 20871	7003.12-3
Clarksburg High School	22500 Wims Rd. Clarksburg, MD 20871	7003.11-1
Rocky Hill Middle School	22401 Brick Haven Way, Clarksburg, MD 20871	7003.11-1
William B. Gibbs, Jr. Elementary School	12601 Milestone Manor Ln., Clarksburg, MD 20871	7003.01-3
Neelsville Middle School	11700 Neelsville Church Rd., Germantown, MD 20876	7008.35-1
Dr. Sally K. Ride Elementary School	21301 Seneca Crossing Dr., Germantown, MD 20876	7008.35-2
Fox Chapel Elementary School	19315 Archdale Rd., Germantown, MD 20876	7008.32-1
Montgomery College - Germantown Campus	20200 Observation Dr., Germantown, MD 20876	7008.30-1
Gaithersburg Library	18330 Montgomery Village Ave., Gaithersburg, MD 20877	7007.21-1
The Avalon School	200 W. Diamond Ave., Gaithersburg, MD 20877	7007.24-1
St. Martin's School	115 S. Frederick Ave., Gaithersburg, MD 20877	7007.17-2
Gaithersburg High School	314 S. Frederick Ave., Gaithersburg, MD 20877	7007.17-1
Summit Hall Elementary School	101 West Deer Park Rd., Gaithersburg, MD 20877	7007.17-3
Washington Grove Elementary School	8712 Oakmont St., Gaithersburg, MD 20877	7007.04-2
Rosemont Elementary School	16400 Alden Ave., Gaithersburg, MD 20877	7007.17-4
Rockville Memorial Library	21 Maryland Ave., Rockville, MD 20850	7009.01-1
Montgomery College- Rockville Campus	51 Mannakee St., Rockville, MD 20850	7010.04-3
College Gardens Elementary School	1700 Yale Pl., Rockville, MD 20850	7010.04-1

Table 11: Educational Facilities and Libraries within the Environmental Study Area (continued)

Facility	Location	Block Group
Rock Terrace School	390 Martins Ln., Rockville, MD 20850	7009.01-1
Christ Episcopal School	22 W. Jefferson St., Rockville 20850	7009.01-1
Richard Montgomery High School	250 Richard Montgomery Dr., Rockville, MD 20852	7009.01-1
Tilden Middle School	11211 Old Georgetown Rd., Rockville, MD 20852	7012.13-1
Georgetown Preparatory School	10900 Rockville Pike, North Bethesda, MD 20852	7012.13-3
Holy Cross School	4900 Strathmore Ave., Garrett Park, MD 20896	7012.14-1
Garrett Park Elementary School	4810 Oxford St., Kensington, MD 20896	7012.14-1
Academy of the Holy Cross	4920 Strathmore Ave., Kensington, MD 20895	7012.14-1
Kensington Parkwood Elementary School	4710 Saul Rd., Kensington, MD 20895	7043.00-2
Stone Ridge School of the Sacred Heart	9101 Rockville Pike, Bethesda, MD 20814	7044.04-1
Bethesda-Chevy Chase High School	4301 East-West Hwy., Bethesda, MD 20814	7048.05-1
Our Lady of Lourdes Catholic School	7500 Pearl St., Bethesda, MD 20814	7048.05-1
Source: Montgomery County Planning Department GIS mapping, April 2015		

4.2 Health Care Facilities

Two hospitals and eight medical facilities, including urgent-care and specialized offices, are located within the environmental study area (See **Table 12**).

Table 12: Health Care Facilities within the Environmental Study Area

Facility	Location
Bethesda Naval Hospital	8901 Rockville Pike, Bethesda, MD 20889
National Institutes of Health (NIH)	9000 Rockville Pike, Bethesda, MD 20892
Righttime Medical Care	19777 North Frederick Rd., Germantown, MD 20876
All Day Medical Care Clinic	8945 North Westland Dr., Gaithersburg, MD 20877
Casey Health Institute	800 South Frederick Ave., #100, Gaithersburg, MD 20877
Centra Care Adventist	750 Rockville Pike, Rockville, MD 20852
Righttime Medical Care	12220 Rockville Pike, Rockville, MD 20852
Ace Medical Clinic	11520 Rockville Pike, North Bethesda, MD 20852
Women's Health Care Center	8311 Wisconsin Ave., Bethesda, MD 20814
Center for Innovative Gynecological Care	Bethesda Medical Building, 8218 Wisconsin Ave., #414, Bethesda, MD 20814
Source: Montgomery County Planning Department GIS mapping and Maryland iMap, April 2015	

4.3 Religious Facilities

Twenty-one religious facilities are located within the environmental study area (See **Table 13**). The facilities printed in **bold** are located directly adjacent to MD 355; the other facilities are located within or directly adjacent to the environmental study area.

Table 13: Religious Facilities

Facility	Location
John Wesley United Methodist	22420 North Frederick Rd., Clarksburg, MD 80871
Greenridge Baptist Church	21925 Frederick Rd., Boyds, Maryland 20841
Neelsville Presbyterian Church	20701 North Frederick Rd., Germantown, MD 20876
Lakewood Church	22820 North Frederick Rd., Clarksburg, MD 20871
Chinese Bible Church of Maryland, Gaithersburg Campus	18757 North Frederick Rd., Gaithersburg, MD 20879
Grace United Methodist Church	119 North Frederick Rd., Gaithersburg, MD 20877
St. Martin of Tours Catholic Church	201 South Frederick Ave., Gaithersburg, MD 20877
Church of the Ascension	205 South Summit Ave., Gaithersburg, MD 20877
Gaithersburg Presbyterian Church	610 South Frederick Ave., Gaithersburg, MD 20877
Epworth United Methodist Church	9008 Rosemont Dr., Gaithersburg, MD 20877
Good Shepherd Lutheran Church	16420 South Westland Dr., Gaithersburg, MD 20877
Saint Mary's Church	520 Veirs Mill Rd., Rockville, MD 20852
Japanese Christian Community Center	1099 Rockville Pike, Rockville, MD 20850
Temple Hills Church	9400 Rockville Pike, Bethesda, Maryland 20814
Source: Montgomery County Planning Department GIS mapping and Maryland iMap, April 2015	

4.4 Emergency Services and Law Enforcement

Four fire departments are located in the environmental study area: one in the City of Gaithersburg, one in the City of Rockville, and two in Bethesda. A Fire and Rescue Squad is located in Germantown. Four police departments are located along the project corridor, including the District 2 Police Department in Bethesda, the National Institute of Health Police Branch in Bethesda, the City of Gaithersburg Police Department, and the District 6 Police Department, located in Montgomery Village. Two additional law enforcement facilities are located within the environmental study area, including the Montgomery County Sheriff Department in the City of Rockville and the Office of Internal Affairs in the City of Gaithersburg. Emergency Services and Law Enforcement facilities and the location of each facility is summarized in **Table 14**.

Table 14: Emergency Services and Law Enforcement Facilities

Facility	Location
District 2 (Bethesda) Police Department	7359 Wisconsin Ave., Bethesda, MD 20814
NIH Police Branch	31 Center Dr., Bethesda, MD 20892
National Naval Medical Center – Station 50-Federal Fire Station	8901 Rockville Pike, Bethesda, MD 20892
Rockville Fire Station #23	121 Rollins Ave., Rockville, MD 20852
Rockville Volunteer Fire Department (Station 3)	380 Hungerford Dr., Rockville, MD 20850
Gaithersburg-Washington Grove Volunteer Fire Department (Station 8)	801 Russell Ave., Gaithersburg, MD 20877
Gaithersburg City Police	14 Fulks Corner Ave., Gaithersburg, MD ZIP?
Office of Internal Affairs	800 South Frederick Ave., Gaithersburg, MD ZIP
District 6 (Montgomery Village) Police Department	18749 North Frederick Rd., Gaithersburg, MD ZIP
Montgomery County Fire and Rescue Service (Station 34)	20620 Frederick Rd., Germantown, MD 20876
Montgomery County Sheriff Department	51 Monroe St., Rockville, Maryland 20850
Source: Montgomery County Planning Department GIS mapping and Maryland iMap, April 2015	

4.5 Publicly Owned Public Parks and Recreational Facilities

Founded in 1927, the Maryland-National Capital Park and Planning Commission (M-NCPPC) is a bi-county agency serving Prince George's and Montgomery counties. In Montgomery County, the Department of Parks, the Planning Department, and the Planning Board work in cooperation with M-NCPPC to manage parks and recreation areas. The City of Rockville maintains jurisdiction over some recreation areas located within the environmental study area, and the City of Gaithersburg has jurisdiction over others, as listed in **Table 15**.

Several parks are located adjacent to MD 355, as listed below. Based on coordination with M-NCPPC, one new park is planned within the environmental study area. M-NCPPC intends to expand the Little Seneca Greenway Stream Valley Park by adding a parcel in the vicinity of the proposed project area. Parks and recreation areas within the project environmental study area are shown in **Figure 3**.

Table 15: Publicly Owned Public Parks and Recreational Facilities in the Environmental Study Area

Facility	Location	Total Park Acreage	Park Acreage within Study Area	Amenities	Owner
Clarksburg Triangle Urban Park	23365 Frederick Rd., Clarksburg	2.5	1.30	Basketball Court, Outdoor Tennis Court, Playground	M-NCPPC
Dowden's Ordinary Special Park	23169 Stringtown Rd., Clarksburg	2.7	1.36	Playground	M-NCPPC
Little Seneca Greenway Stream Valley Park	I-270 north to Clarksburg, Clarksburg,	230.4	3.19	Trails	M-NCPPC
Little Seneca Greenway Stream Valley Park - ***PROPOSED***	Adjacent to existing Little Seneca Greenway Stream Valley Park.	2.5	2.53	Proposed addition to the existing Little Seneca Greenway SVP. No existing amenities. Potential natural surface trails in the future.	M-NCPPC
Clarksburg Neighborhood Park	22501 Wims Rd.at MD 355, Clarksburg	3.8	1.68	Tennis courts, playground, recreation center, and basketball court	M-NCPPC
North Germantown Greenway Stream Valley Park	I-270 to Blunt Road, Clarksburg	380.81	3.74	Paved trail and significant natural corridors and open spaces	M-NCPPC
Ridge Road Recreational Park	21155 Frederick Rd., Germantown	79.0	11.28	Tennis and volleyball courts, baseball, softball and soccer fields, dog park, inline hockey rink, picnic shelters, playground, and trails	M-NCPPC
Germantown East Local Park	19910 Frederick Rd, Germantown	7.3	2.65	Undeveloped	M-NCPPC
Great Seneca Stream Valley Park- Unit 1	Frederick Rd Rt.355 to Watkins Mill Rd., Germantown, MD	460.6	6.25	Trail and natural areas	M-NCPPC
Seneca Creek State Park	11950 Clopper Rd, Gaithersburg	6,294	6.18	Biking, boat rental, canoeing, comfort station, convenience store, fishing, hiking, hunting, information center, picnic tables, playground, and water fountains	DNR

Table 15: Publicly Owned Public Parks and Recreational Facilities in the Environmental Study Area (continued)

Bohrer Park at Summit Hill Farm and Activity Center	506 S Frederick Ave., Gaithersburg, MD	59	3.79	Paved walking and biking trail, miniature golf course, the Activity Center, skate park and water park, historic Manor House, Wilmot House, historic Log Smokehouse, barn, parking, several open fields, playground area, horseshoe pit, volleyball net, two ponds, covered picnic canopies, picnic tables, lounge chairs, two play areas, bath house, snack bar, and three picnic pavilions.	City of Gaithersburg
Casey Community Center	810 S. Frederick Ave., Gaithersburg, MD	3.8	0.74	Community center used for numerous functions, including wedding receptions, family parties, etc.	City of Gaithersburg
King Farm Homestead Park		7.6	1.89	Garden plots large, rentable picnic shelters, historic buildings	City of Rockville
King Farm Stream Valley Park	W. Gude Dr. and Redland Blvd., Rockville, MD	28.4	1.89	Open space, park shelter, paths	City of Rockville
Promenade Park	Monroe St. and Rockville Pk., Rockville, MD	0.4	0.14	Park benches/sitting area and path	City of Rockville
Veterans Park	Veirs Mill Road and Rockville Pike., Rockville, MD	0.9	0.87	Park benches, artwork, and large illuminated American Flag	City of Rockville
Rock Creek Stream Valley Park	D.C. Line to East West	3,960	13.32	Basketball Court, Community Gardens, Exercise Course, Playground, Trails	M-NCPPC
Elmhirst Parkway Neighborhood Conservation Area	4700 Elmhirst La., Bethesda, MD	7.6	0.79	Undeveloped Open Space	M-NCPPC
Source: Montgomery County M-NCPPC GIS information					

Three parks, Griffith Park at City Hall, Morris Park, and Summerfield Park, are all owned by the City of Gaithersburg. While they were listed in correspondence from the City of Gaithersburg Department of Parks, Recreation, and Culture, these parks are located outside of the project study area and would not be affected by the proposed project.

4.6 OTHER

4.6.1. Cemeteries

Five cemeteries have been identified within the environmental study area and are located directly adjacent to MD 355.

Table 16: Cemeteries

Facility	Location
Bethesda Presbyterian Cemetery	9400 Rockville Pike, Bethesda, MD 20814
John Wesley United Methodist Church Cemetery	22420 Frederick Rd., Clarksburg, MD 20871
Forest Oak Cemetery	300 North Frederick Ave., Gaithersburg, MD 20877
Neelsville Presbyterian Church Cemetery	20701 Frederick Rd., Germantown, MD 20876
St. Mary's Catholic Church Cemetery (old)	520 Veirs Mill Rd., Rockville, MD 20852
Source: Maryland iMap, April 2015 and http://www.montgomeryplanning.org/historic/education/cemeteries_locational.shtm	

4.6.2. Community/Senior Centers

Two community centers are located directly adjacent to MD 355. No senior centers have been identified within or in close proximity to the environmental study area.

Table 17: Community Centers

Facility	Location
Casey Community Center	810 South Frederick Ave., Gaithersburg, MD 20877
Activity Center at Bohrer Park	506 South Frederick Ave., Gaithersburg, MD 20877
Source: Montgomery County Planning Department GIS mapping and Maryland iMap, April 2015	

4.6.3. Post Offices

Two post offices are located directly adjacent to MD 355.

Table 18: Post Offices

Facility	Location
Rockville Post Office	500 North Washington St., Rockville, MD 20850
Bethesda Post Office	7400 Wisconsin Ave., Bethesda, MD 20814
Source: Montgomery County Planning Department GIS mapping and Maryland iMap, April 2015	

5. HISTORIC RESOURCES

The Area of Potential Effects for historic resources (APE) has not been defined due to the preliminary nature of the project scope. Review of SHA cultural resources databases and, the Maryland Historical Trust (MHT) Maryland Inventory of Historic Properties (MIHP) reveals the presence of over 100 standing structures including five historic standing structures National Register listed (NR) and eighteen eligible for listing on the National Register of Historic Places (NRHP: NRE). These significant NR and NRE resources are as follows:

- Bethesda Meeting House NR (M: 35-5)
- Bethesda Naval Hospital Tower NR (M: 35-8)
- Montrose Schoolhouse (NR-722)
- Third Addition to Rockville and Old St. Mary's Church and Cemetery (NR-506)
- Bethesda Theatre NR (M: 35-14-4)
- Bethesda Naval Medical Center NRE (M:35-98)
- Brookes, Russell and Walker Historic District (Gaithersburg) NRE (M:21-165)
- Casey Barn NRE (M:21-183)
- Clarksburg Historic District NRE (M:13-10)
- Convent of the Sisters of Visitation NRE (Building 60/NIH) (M: 35-9-6)
- Corby Estate (Strathmore Hall Arts Center)NRE (M:30-12)
- George Freeland Peter Estate NRE (M:35-9-1)
- Graff/King Property (Billy King Farm) NRE (M: 20-32)
- Locust Hill Estates, center part only NRE (M:35-120)
- National Library of Medicine NRE (NIH) (M:35-9-8)
- NIH Historic Core NRE (M:35-9-2)
- NIH Memorial Laboratory NRE (M:35-9-5)
- NIH Officers' Quarters NRE (M:35-9-7)
- Observatory Heights Historic District (Gaithersburg) NRE (M:21-185)
- Realty Park Historic District (Gaithersburg) NRE (M:21-202)
- Sprigg-Poole House NRE (M:26-21-4)
- Summit Hall NRE (M:21-3)
- Wilson Estate (Tree Tops/NIH) NRE (M:35-9-3)

The following resources were evaluated and were determined to be not eligible for listing in the NRHP:

- Cedarcroft (M:35-6) determined not eligible for NRHP 5-27-2010
- Montouri Estate (M:30-9) determined not eligible for NRHP 3-4-2002
- NIH Animal Building (Building 9) (M:35-9-4) determined not eligible for NRHP 8-23-2000
- Old Gaithersburg Survey District (M:21-2) determined not eligible for NRHP 2-24-2001
- Rebecca Key Offutt Property (Simmons Building), determined not eligible for NRHP 3-2-2000
- SHA Bridge No. 15054 (M:13-57) determined not eligible for NRHP 4-3-2001

The following resources listed in **Table 19** were identified within the environmental study area, but the NRHP eligibility is currently unknown and would require further evaluation.

Table 19: Historic Resources Requiring Further Evaluation within the Environmental Study Area

MIHP No	Resource Name	Address
M: 13-10-2	John Gibson House	23362 Frederick Road
M: 13-10-7	Elizabeth Powers House	23360 Frederick Road
M: 13-10-5	Clark-Waters House	23346 Frederick Road
M: 13-10-6	Leonidas Willson House	23340 Frederick Road
M: 13-10-4	Willson Store	23341 Frederick Road
M: 13-10-3	Horace Willson House	23335 Frederick Road
M: 13-10-11	Hammer Hill	23310 Frederick Road
M: 13-10-9	Columbus Woodward House (John Henry Wims House)	23311 Frederick Road
M: 13-53	Dowden's Ordinary, site	23218 Frederick Road
M: 13-42	Maurice & Sarah Mason House	Frederick Road (MD 355)
M: 13-51	Warner Wims House	Frederick Road (MD 355)
M: 13-34	Clarksburg Negro School, site	Frederick Road (MD 355)
M: 13-38	Lloyd & Sarah Gibbs House, site	Frederick Road (MD 355)
M: 13-48	John Wesley Methodist Church	Frederick Road (MD 355)
M: 13-20	Waters Log House	Frederick Road (MD 355)
M: 19-4	Londonderry	21100 Frederick Road (MD 355)
M: 19-5	Neelsville Presbyterian Church	20701 Frederick Road (MD 355)
M: 19-33	Cider Barrel	20410 Frederick Road (MD 355)
M: 19-38	Seneca State Park	No address available
M: 21-169	Foster & Rosalie Summers House	309 N. Frederick Avenue (MD 124)
M: 21-167	Garrison W. Beall House	307 N. Frederick Avenue (MD 124)
M: 21-155	Henry H. Fraley House	303 N. Frederick Avenue (MD 124)
M: 21-154	Lewis Reed Residence	303 N. Frederick Avenue (MD 124)
M: 21-164	Grace United Methodist Church	
M: 21-132		101 N. Frederick Avenue (MD 124)
M: 21-46		6 Brookes Avenue
M: 21-147	Big A Auto Parts (Lyric Theater)	9 N. Frederick Avenue (MD 124)
M: 21-131	4 N. Frederick Avenue (MD 124)	
M: 37-16	Metropolitan Branch, B&O RR	No address available
M: 21-166	Gaithersburg Wye (The Wood Lot)	Cedar Avenue
M: 21-124	PEPCO Substation	No address available

Table 19: Historic Resources Requiring Further Evaluation within the Environmental Study Area (continued)

MIHP No	Resource Name	Address
M: 21-159	St. Martin's School	115 S. Frederick Avenue (MD 355)
M: 21-120	20 S. Summit Avenue	
M: 21-125	Inns of Court	102 S. Frederick Avenue (MD 355)
M: 21-126	Ballet 106	106 S. Frederick Avenue (MD 355)
M: 21-009	T-shaped Frame House-DeSellum & Francis Aves.	DeSellum Avenue & S. Frederick Avenue
M: 21-129	Thomas Fulks House	208 S. Frederick Avenue (MD 355)
M: 21-150	(No Documentation on File)	212 S. Frederick Avenue (MD 355)
M: 21-158	Salvation Army Community House (Severance House)	202 S. Summit Avenue
M: 21-136	Ascension P.E. Chapel	S. Summit Avenue
M: 21-191	(No Documentation on File)	301 S. Frederick Avenue
M: 21-192	(No Documentation on File)	303 S. Frederick Avenue
M: 21-193	(No Documentation on File)	305 S. Frederick Avenue
M: 21-194	(No Documentation on File)	307 S. Frederick Avenue
M: 21-195	(No Documentation on File)	525 S. Frederick Avenue
M: 21-196	(No Documentation on File)	529 S. Frederick Avenue
M: 21-200	(No Documentation on File)	1 Central Avenue
M: 21-198	(No Documentation on File)	605 S. Frederick Avenue
M: 20-43	Holiday Motel Property	807 S. Frederick Avenue (MD 355)
M: 20-34	Charles & Roberta Ricketts Property	15605 Frederick Road (MD 355)
M: 26-16	Haiti (Martin's Lane Survey District)	No address available
M: 26-12-04	Brewer-Offutt-WINX House	8 Baltimore Road
M: 26-12-06	St. Mary's Church & Cemetery	Baltimore Road
M: 26-21-01	Simmons Building (Rebecca Key Offutt Property)	706 Rockville Pike (MD 355)
M: 26-21-02	Tyson Wheeler Funeral Home	1331 Rockville Pike (MD 355)
M: 26-21-05	Dixie Cream Donut Shop (Montgomery Donuts)	1402 Rockville Pike (MD 355)
M: 26-21-06	Congressional Airport (Congressional Shopping Plaza)	Rockville Pike (MD 355)
M: 26-21-03	Halpine Store (Radio Shack)	1600 Rockville Pike (MD 355)
M: 30-01	Wilkins Estate (Parklawn Cemetery)	12800 Veirs Mill Road (MD 186)

Table 19: Historic Resources Requiring Further Evaluation within the Environmental Study Area (continued)

MIHP No	Resource Name	Address
M: 30-10	Rainbow Motel	11520 Rockville Pike (MD 355)
M: 30-26		5511 Edson Lane
M: 35-007	Stone Ridge (Country Day School of the Sacred Heart)	9101 Rockville Pike (MD 355)
M: 35-014	Old Bethesda Commercial District (Bethesda Commercial District)	No address available
M: 35-014-03	Little Tavern	8100 Wisconsin Avenue (MD 355)
M: 35-014-02	Madonna of the Trails	7400 Wisconsin Avenue (MD 355)
M: 35-014-05	Bethesda Post Office (Darcy's Store)	7400 Wisconsin Avenue (MD 355)
M: 35-014-06	Brooks Photographers	7349 Wisconsin Avenue (MD 355)
M: 35-014-A	One Step Up, Dan Daniels Printing, Games People Play	7327-7335 Wisconsin Avenue (MD 355)

Three historic archeological sites, 18MO562 (Dowden's Ordinary), 18MO599 (Hammerhill Road) and 18MO734 (Neelsville Blacksmith Shop and Residence) have been identified within the environmental study area. Although there is no Determination of Eligibility (DOE) form on file for Dowden's Ordinary, aerial photographs show that the site was excavated prior to the construction of Dowden's Ordinary Park. Previous coordination with MHT reveals that the Hammerhill Road site is ineligible for listing on the NRHP. In addition, coordination with MHT indicates that the Neelsville Blacksmith Shop and Residence is eligible for listing on the NRHP. This archeological site is historic with no standing structure associated with it and it is strictly an underground resource. Only one section of MD 355 within the environmental study area, between West Old Baltimore Road and Cool Brook Lane, has not been included in prior surveys. The majority of the survey area has been included in prior surveys and there are no intact, eligible or potentially eligible resources in the immediate vicinity of the roadway.

Additional architectural investigations and archeological survey would be required to determine the presence of significant resources in the environmental study area. Coordination with the MHT will continue throughout planning to determine project effects to significant cultural resources.

6. LAND USE

The proposed BRT corridor passes through miles of both urban and suburban development with a variety of land uses. Residential land uses are located throughout the environmental study area and the majority of the residential land use is medium density. Multi-family residential uses are found throughout the corridor as well. Commercial, industrial, transportation, retail, office, open

space, and institutional land uses are dispersed throughout the environmental study area. The master plans covering the MD 355 BRT environmental study area are listed below, along with a discussion of land uses found in each area. The proposed MD 355 BRT project is consistent with these master plans.

- The *Clarksburg Master Plan* (1994) describes the existing land use as primarily a residential mixed use, and envisions a major transit stop and traffic oriented development in the vicinity of Redgrave Place. This section also contains the historic district of MD 355.

- Germantown has two Master Plans that cover portions of the MD 355 BRT Corridor, including the *Germantown Master Plan* (1989) and the *Germantown Employment Area Sector Plan* (2009). Land use is described as residential, mixed use, commercial, retail, office, some open space, and highway commercial land uses.

- The *City of Gaithersburg Master Plan* (2010) evaluated the MD 355 corridor in three sections, differentiating their changes in the surrounding land uses. The Southern Residential District, from Shady Grove Rd to Summit Ave, is primarily medium and low density residential, with a mix of commercial, office, and research land uses. The Fairgrounds Commercial District, from Summit Ave to MD 124, is predominantly commercial-office, with some residential pockets. This middle section is the most developed section of the three sections, and the most constrained in terms of available right-of-way for potential roadway widening and improvements. The Northern Employment District, from MD 124 to Ridge Rd, is a mixture of commercial, research, and industrial land uses. The City is currently undergoing their independent BRT study to evaluate potential transit treatments as well as alternate routes to avoid impacts along MD 355.
- *Great Seneca Science Corridor Master Plan* (2010) identified an area within the City of Gaithersburg that is under a separate jurisdiction. This area is an established community of single family residences with little development potential, and is planned to preserve stable residential areas.

- *Shady Grove Sector Plan* (2006) identifies the area between College Parkway and Oneill Drive as primarily industrial, with office/ industrial park and minor commercial land uses on southern section. The east side of MD 355 between Paramount Drive and Kings Farm Boulevard, the Metro station area, has the highest potential for redevelopment. The plan envisions mixed land uses on the south to promote some housing opportunities, and an urban village as a transit oriented development surrounding the Shady Grove Metro Station. Lastly, the plan proposed an industrial/technology corridor to the sections north of Kings Farm Boulevard to the limit to the City of Gaithersburg.

- The *Rockville Comprehensive Plan* (November, 2002) is sub-divided into Planning Areas, as established in the 1970 Master Plan. MD 355 traverses Planning Areas #1, 5, 9, and 17. The

northern most section, Planning Area # 17 includes the already developed King's Farm mixed-used development. Planning Area #5 covers MD 355 between College Parkway and Frederick Ave. The Metro rails abut MD 355 along the east side, and Montgomery College and general commercial to the west. The Master Plan proposes preferred commercial land uses to the east, between Mannakee St and Frederick Ave, and mixed use preferred residential to the west, transitioning to the Town Center.

- The Rockville *Town Center Master Plan* (2001), identified within the *Rockville Comprehensive Plan* as Planning Area 1, cover MD 355 between Frederick Ave and Richard Montgomery Dr. This area is the proposed urban core of the City of Rockville, containing mixed-use and commercial land uses along MD 355, concentrating heavier densities near the Rockville Metro Station. The plan focuses on pedestrian and cyclist access through the Town Center, with convenient access to the Metro Station.

- The southern stretch of MD 355 through the City of Rockville crosses Planning Area #9, from Richard Montgomery Drive to Bou Avenue, just north of Hoya St. Retail makes up over half of existing developed land within the corridor. The commercial development increases in density as one travels south along MD 355. The Plan maintains the commercial corridor with mixed-developments in the surroundings, particularly in the vicinity of the Twinbrook Metro Station, as a potential TOD development area. The Plan also focuses on the development and improvement of the local roadway network to alleviate the congestion along the MD 355 Corridor, envisioning MD 355 as a multi-lane boulevard accommodating a BRT system.

- *White Flint Sector Plan* (2010) encompasses MD 355 between Hillery Way to Hoya Street. Most of this sector is of commercial and office land uses, including the White Flint Mall property, which is in the process of redevelopment into a mixed-used land use pattern. The proposed land use increases the residential units by 9,800 units on top of 2,321 existing plus 2,220 approved, and increase non-residential square footage by 5.69 million on top of the 5.49 and 1.8 million existing and approved land uses. The plan envisions improved pedestrian and cyclist access along MD 355, as well as a BRT system to support the proposed developments.

- The *North Bethesda-Garrett Park Master Plan* (1992) extends from MD 547 (Strathmore Ave) on the north to I-495 in the south. Existing land use is predominantly residential around the Grosvenor Metro station. Residential areas are surrounded by open spaces created by Rock Creek Stream Valley Park, as well as major institutional land uses, including Strathmore Hall, Corby Mansion, and the American Speech, Language, and Hearing Association. Georgetown Prep abuts MD 355 to the west, north of I-495. Commercial and transit areas are also found along this corridor.

- The *Bethesda CBD Sector Plan* (1994) includes the existing center of downtown Bethesda. Land use within this area includes a mix of uses and is intensely developed. This area is a major transportation hub and contains primarily commercial uses, including retail and office uses. This portion of the project corridor contains the highest densities of buildings within the project corridor, as well as the highest concentration of employees.

The environmental study area is highly reliant on transit. Several transit plans have been developed to serve the environmental study area.

- The *Countywide Transit Corridors Functional Master Plan* was approved and adopted in December 2013. Several BRT corridors were recommended within, including MD 355 (north and south), Georgia Avenue, New Hampshire Avenue, North Bethesda, Randolph Road, University Boulevard, US 29, Veirs Mill Road, and Corridor Cities Transitway (CCT). Several additional studies have evolved from this document. The Veirs Mill Road BRT and CCT would both connect to the MD 355 corridor in Rockville.

- Several studies have been completed for the proposed CCT. Studies include the *Corridor Cities Transitway Alternatives Analysis Report for Commercial Property Owners Coalition*, completed in April 2014. The *Corridor Cities Transitway Alternatives Analysis Report for Mission Hills Community*, completed in May 2014, was developed to address concerns that the residents of the community had with the proposed transitway in relation to their homes.

- The *Purple Line Functional Plan* was adopted by the Montgomery County Council in September 2010. The Purple Line is a proposed 16.2-mile light rail system with 21 stations that would run from Bethesda to New Carrollton in Prince George's County. The Purple Line would provide connections to Metrorail, local and inter-city bus, MARC train, and Amtrak. It would provide a direct east-west connection in southern Montgomery and Prince George's Counties. The Purple Line is currently under design and has been studied since 1992. The proposed MD 355 BRT would connect to the Bethesda Metrorail Station at the southern end of the corridor.

- The *MARC: Taking Stock and Rolling Forward Growth and Investment Plan* (Update 2012 to 2050) was established to establish new objectives for MARC service, get feedback and suggestions to improve service, objectives, accomplishments, benefits of investing in MARC, and phased growth and investment plans for the various MARC lines.

The MD 355 Corridor supports both the local and the regional economy. It is highly developed with a heavy presence of commercial, retail, industrial, institution, and office uses. The income characteristics within the project vicinity are on **Table 9**. The entire project corridor is a located within a Maryland Priority Funding Area (see **Figure 4**), which are areas where state and local governments want to target their efforts to encourage and support economic development and

new growth. A more detailed examination and community effects analysis will occur during project development.

7. NATURAL ENVIRONMENTAL INVENTORY

Natural environmental resource data were collected along MD 355 for the entire environmental study area from Redgrave Place in Clarksburg, MD to the Bethesda Metro Station near the MD 355 and Old Georgetown Road intersection in Bethesda, MD (approximate 21.5 miles). The study limits for natural resources are approximately 200 feet from the MD 355 road edge, and approximately 200 feet north and south of the aforementioned end points along MD 355. Geospatial datasets were compiled from published sources, including the Maryland Department of Natural Resources (DNR), and used to identify the natural resources and calculate impact area values. A windshield survey was also completed to confirm the presence of wetland, stream, and forest resources along the project corridor, and, if necessary, to refine the limits and classifications of wetlands mapped using geographic information systems (GIS). Maps of the natural resources can be found in **Figure 5**.

7.2 Surface Water Resources, Water Quality, and Aquatic Habitat

The environmental study area falls within the Cabin John Creek (02140207), the Potomac River Montgomery County (02140202), the Rock Creek (02140206), and the Seneca Creek (02140208) Maryland 8-digit watersheds. There are no Tier II watersheds within the environmental study area.

In compliance with Clean Water Act (CWA) Sections 303(d), 305(b), and 314 and the Safe Drinking Water Act, states develop a prioritized list of waterbodies that currently do not meet water quality standards. The 303(d) prioritized list includes those waterbodies and watersheds that exhibit levels of impairment requiring further investigation or restoration. Waterbodies on this list require the development of a Total Maximum Daily Load (TMDL) calculation, which is the maximum amount of a pollutant that a waterbody can receive while still meeting water quality standards. Table 2 lists the TMDLs for the four watersheds within the environmental study area.

Table 20: TMDLs for Watersheds within the Environmental Study Area

Watershed	Approved TMDLs (Approval Year)
Cabin John Creek	Bacteria - E.coli (2006), Phosphorus (2009), Sediments (2011)
Potomac River Montgomery County	Phosphorus (2012), Sediments (2012)
Rock Creek	Bacteria - Enterococcus (2007), Sediments (2011)
Seneca Creek	Phosphorus (2009), Sediments (2011)

Sixteen streams fall within the environmental study area. The majority are unnamed tributaries; however, larger, named streams crossed by the project area include Little Seneca Creek, Great Seneca Creek, Muddy Branch, and Rock Creek. Stream systems are compiled in Table 3 along

with their use and approximate locations, in order from north to south. All flow through the environmental study area and underneath MD 355, unless otherwise noted. Montgomery County geospatial data included stream lines that were not mapped by other sources, including the USGS National Hydrography Dataset (NHD). The Montgomery County data were used, as they appeared to more accurately follow existing aerial footage. However, the Montgomery County mapping appeared to include areas with storm drainage, at least as could best be confirmed during the windshield survey. These areas were not removed from mapping, as Montgomery County does have instances of underground streams, and these stream resources could be impacted.

Table 21: Stream Resources within the Environmental Study Area

Stream Name	Designated Use	Location
Tributary to Tenmile Creek	I-P	Flows northeast to southwest, just north of Redgrave Place.
Little Seneca Creek	IV-P	Flows northeast to southwest, just north of Newcut Road.
Tributary to Little Seneca Creek	IV-P	Flows east to west, south of Newcut Road, into Little Seneca Creek at MD 355 crossing.
Tributary to Little Seneca Creek	IV-P	Flows northeast to southwest, south of Greenbrook Drive.
Tributary to Little Seneca Creek	IV-P	Flows east to west, north of Stardrift Drive. Could not confirm flow on east side of MD 355, through Ridge Park.
Tributary to Little Seneca Creek	IV-P	Flows east to west, north of Stardrift Drive. Could not confirm flow on east side of MD 355.
Great Seneca Creek	IV-P	Flows east to west, north of Game Preserve Road.
Tributary to Great Seneca Creek	I-P	Flows southeast to northwest, west of MD 355 at Game Preserve Road. Possible underground flow as only portions visible.
Muddy Branch	I-P	Flows northeast to southwest, south of E Deer Park Drive
Tributary to Muddy Branch	I-P	Flows east to west, south of Muddy Branch, flows into Muddy Branch on west side of MD 355.
Tributary to Rock Creek	I	Flows northwest to southeast into Rock Creek, north of Grosvenor Lane.
Rock Creek	I	Flows north to south, east of Beach Drive.
Tributary to Rock Creek	I	Flows west to east, near Pooks Hill Road.
Tributary to Rock Creek	I	Flows southwest to northeast, south of Alta Vista Road.
Tributary to Rock Creek	I	Flows southwest to northeast, along Cedar Lane.
Tributary to Rock Creek	I	Flows southwest to northeast, near Glenbrook Parkway intersection. Unable to confirm visually, likely underground.

The Maryland Department of the Environment (MDE) has classified Rock Creek and its five tributaries as Use I Waters, which are protected for "water contact recreation and protection of nontidal warmwater aquatic life." The Tenmile Creek tributary, the Great Seneca Creek tributary, and Muddy Branch and its tributary are classified as Use I-P Waters, which are protected for "water contact recreation, protection of nontidal warmwater aquatic life, and public water supply." Little Seneca Creek and its four tributaries, along with Great Seneca Creek, are classified as Use IV-P Waters, which are protected for "all uses identified for Class I Waters,

public water supply, and as recreational trout waters" (COMAR 26.08.02.02). There are no Tier II streams within the environmental study area.

Data from the DNR Maryland Biological Stream Survey (MBSS) was gathered to characterize the overall stream condition and aquatic communities of the streams crossed by the project. MBSS has ranked the quality of the habitat and biological communities of many of the environmental study area streams based on detailed field sampling and comparison with "least-impaired" reference stream conditions.

The major streams and their tributaries discussed above provide aquatic habitat to both fish and benthic macroinvertebrates. Benthic macroinvertebrates are organisms without a backbone that live on the bottom of streams and can be seen with the naked eye. They are an important part of stream ecosystems as they are a source of food for other aquatic life, including fish. Both benthic macroinvertebrates and fish are useful indicators of stream health, as they integrate stressors at a site over time. The presence, numbers, and types of organisms convey important information about water quality.

Data from the MBSS is used to calculate a Benthic Index of Biotic Integrity (BIBI) and a Fish Index of Biotic Integrity, which provide a summary of the biotic conditions at a site. Qualitative ratings of stream health are based on IBI scores and range from good (4.0 – 5.0), denoting minimally impacted conditions, to very poor (1.0 – 1.9), indicating severe degradation. The MBSS sampling sites shown in Table 4 fall within the four watersheds that overlap the environmental study area, and are found within an approximate one mile distance from the environmental study area boundary.

Table 22: MBSS Aquatic Biota Data within the Environmental Study Area

Watershed	Year	Stream Name	Site Name	FIBI Score	FIBI Narrative	BIBI Score	BIBI Narrative
Cabin John Creek	1997	Old Farm Creek	MO-P-082-124-97	1.33	Very Poor	1.67	Very Poor
	2003	Cabin John Creek	CABJ-102-R-2003	2.33	Poor	2.67	Poor
Potomac River MO County	1997	Muddy Branch	MO-P-091-204-97	4.00	Good	1.75	Very Poor
	1997	Watts Branch	MO-P-001-214-97	3.00	Fair	1.00	Very Poor
Rock Creek	1997	Mill Creek UT 1	MO-P-308-117-97	1.33	Very Poor	1.67	Very Poor
	1997	Rock Creek	MO-P-310-313-97	2.67	Poor	1.00	Very Poor
	2003	Rock Creek	ROCK-203-R-2003	3.67	Fair	2.33	Poor
	2003	Rock Creek UT 2	ROCK-107-R-2003	1.00	Very Poor	2.00	Poor
	2004	Rock Creek	NCRW-304-N-2004	3.67	Fair	1.67	Very Poor
	2007	Rock Creek	ROCK-203-B-2007	2.67	Poor	1.33	Very Poor
Seneca Creek	1997	Great Seneca Creek	MO-P-445-318-97	5.00	Good	3.25	Fair
	1997	Gunners Branch	MO-P-159-110-97	3.67	Fair	1.50	Very Poor
	1997	Little Seneca Creek	MO-P-024-307-97	5.00	Good	4.00	Good

	1997	Little Seneca Creek	MO-P-024-315-97	2.33	Poor	3.25	Fair
	2001	Gunners Branch	SENE-205-R-2001	4.67	Good	1.75	Very Poor
	2001	Little Seneca Creek	SENE-103-R-2001	3.33	Fair	2.75	Poor
	2001	Whetstone Run	SENE-113-R-2001	2.00	Poor	1.50	Very Poor

The aquatic health of the four watersheds is variable, averaging Fair (3) for the FIBI and Poor (2) for the BIBI. Lower scores for both categories indicate low diversity, often dominated by taxa that are more tolerant of stream impacts; higher scores indicate higher taxa diversity and the presence of more sensitive species. The four sites that scored "Good" in the FIBI category and the one site scoring "Good" in the BIBI are associated with parklands and forested habitats. Parks are generally undisturbed by construction and other modifications, and serve as buffers to these streams. However, all the sites examined in the Rock Creek watershed scored Fair or worse, despite some of these sites being buffered by protected parklands. As all four watersheds are dominated by urban and built landscapes, streams in these watersheds will be subject to higher runoff inputs, contributing to lowered stream health even in spite of protected lands providing buffers. The Seneca Creek watershed, generally the least intensely developed watershed in the environmental study area, had slightly higher aquatic community scores overall.

In addition to MBSS data, Montgomery County DEP conducts county-wide stream monitoring. While general stream characteristics have been discussed here for the purposes of existing conditions, this DEP data will need to be gathered and included in documentation for later phases of this study.

7.3 Groundwater and Hydrogeology

The MD 355 environmental study area lies within the Piedmont and Blue Ridge Crystalline-Rock Aquifer (USGS 2003). The majority of this aquifer is underlain by dense, almost impermeable bedrock that yields water primarily from secondary porosity and fractures.

7.4 Waters of the U.S., Including Wetlands

Surface waters of the U.S., including wetlands within the environmental study area were identified using a combination of the United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) and the DNR wetland mapping. A windshield survey verified the approximate limits of these mapped wetlands and streams within the environmental study area, added any additional potential wetlands that were not accounted for by the NWI and DNR datasets, and removed any wetlands from the NWI and DNR datasets that no longer existed in the environmental study area. Wetland cover types that were found to differ in the field from the mapped cover types were updated to the windshield survey verified cover type in the environmental study area wetland shapefile.

Twenty-eight potential wetlands occur within the environmental study area. Nontidal wetland types include palustrine forested, palustrine scrub-shrub, and palustrine emergent. Nontidal

wetlands include ditches, fields, and forests. These wetlands are scattered throughout the environmental study area along its entire length, and are specifically identified in these areas, moving from north to south:

- PEM1 and PEM/SS1, north of Redgrave Place, associated with the Tenmile Creek tributary
- PEM1 and PFO1A, south of Little Seneca Parkway near Newcut Road, associated with Little Seneca Creek
- PEM5A and PFO1A, south of Greenbrook Drive, associated with a Little Seneca Creek tributary
- PFO1Fh, east of Stardrift Drive, associated with a Little Seneca Creek tributary
- PUBHh, east of MD 355 at Shakespeare Boulevard
- PEM/SS1, west of MD 355 at Middlebrook Road
- PFO1C and PFO1A, north of Game Preserve Road, associated with Great Seneca Creek
- PUBHx, northeast of MD 355 at Montgomery Village Avenue
- PUBHx, southwest of MD 355 at Fairbanks Drive
- PEM1, PFO1, PEM1E, and PEM1C, northwest and southeast of MD 355 at the I-370 interchange
- PFO1, southwest of MD 355, south of Talbot Street
- PFO1A, east of MD 355 at the I-495 interchange, associated with Rock Creek
- PUBHx, east of MD 355, on Wood Road as part of Walter Reed Medical Center

Stormwater ponds that were not associated with natural hydrological features such as streams were not added as wetlands. Based on DNR mapping, there are no Wetlands of Special State Concern (WSSC) within the environmental study area.

While wetland resources are adequately identified for the purposes of this existing resource inventory, field delineations completed in accordance with the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0)* (USACE, November 2010) would be required to confirm the exact limits of all waters of the U.S., including wetlands in the environmental study area at a later stage.

7.5 Floodplains

The 100-year floodplain was identified using Flood Insurance Rate Maps (FIRM) and the corresponding GIS layer produced by the Federal Emergency Management Agency (FEMA). Nontidal floodplains are regulated at the state level by MDE. Any construction in nontidal floodplains would require a Waterway Construction Permit from MDE.

Portions of the environmental study area either cross or border several floodplain areas, including Great Seneca Creek, Muddy Branch, and Rock Creek. These stream areas fall within the 100-year floodplain. None of these floodplains have regulated floodways in the portions that intersect the environmental study area. A floodway is "the channel of a watercourse and the adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height." These floodways were designated though detailed hydrologic studies conducted by FEMA and are regulated by FEMA, MDE, and localities through the permitting process to ensure that development in the floodplain does not raise the base elevation of a designated floodway by more than a maximum of one foot or a smaller increment as determined by MDE.

In January of 2015, Executive Order (EO) 11988 was amended to establish a new Federal Flood Risk Management Standard to provide greater flood "resilience and risk reduction" for federally funded projects (The White House 2015). The standard changes how floodplains are defined for evaluation of compliance under the EO from the 100-year floodplain, as assessed for this project, to the 500-year floodplain (0.2 percent chance of being flooded each year). FEMA is currently in the process of developing guidelines for implementing the amended EO and had directed agencies to delay any implementation of the new standard until the guidelines are fully in effect. The new standard is not anticipated to be ready for full implementation until Mid-May of 2015. In the next phase of design, the project will need to be evaluated for compliance with EO 11988 as amended in accordance with the implementation guidelines once they are finalized.

7.6 Chesapeake Bay Critical Area

The Chesapeake Bay Critical Area does not occur within the environmental study area, as determined using the statewide mapping developed and maintained by the DNR.

7.7 Special Protection Areas

Montgomery County has designated four areas of the county as Special Protection Areas (SPAs). These are defined as a part of the county that has high-quality or unusually sensitive water resources (e.g., high quality streams, sensitive wetlands, or highly-erodible soils) or other environmental features, and where those resources or features are threatened by land use changes unless extraordinary or special protective measures are being taken (Montgomery County DEP 2015). The Clarksburg SPA crosses the northern end of the environmental study area, from Redgrave Place to Henderson Corner Road. The watersheds in this SPA are associated with Great Seneca Creek, Little Seneca Creek and Tenmile Creek. Any development within these areas would be subject to strict requirements throughout the project in coordination with the Montgomery County Department of Permitting Services, Department of Environmental Protection, and the M-NCPPC. Temporary and permanent mitigation structures, such as sediment and erosion control structures, and forested buffers, might need to be implemented in construction areas.

7.8 Vegetation and Wildlife

The majority of forest observed within the environmental study area is upland forest of the Chestnut Oak-Bear Oak Association and Tulip Tree Association (Brush et al. 1977). These forests typically occur on slopes and higher elevation areas throughout the length of the environmental study area. There are some wetland forest habitats of the Sycamore-Green Ash Association, whose locations were described within the "Waters of the U.S., Including Wetlands" section above. Most occur in conjunction with stream valleys that cross the environmental study area. The observed wetland forests range from early successional to mid successional deciduous forests, with common tree species including red maple (*Acer rubrum*), American sycamore (*Platanus occidentalis*), tuliptree (*Liriodendron tulipifera*), green ash (*Fraxinus pennsylvanica*), and American elm (*Ulmus americana*). The upland forest areas include the above species, as well as American beech (*Fagus grandifolia*), oak species (*Quercus* sp.), and mixed deciduous-coniferous forests that also contain white pine (*Pinus strobus*) and eastern red cedar (*Juniperus virginiana*). Japanese honeysuckle (*Lonicera japonica*), wineberry (*Rubus phoenicolasius*), blackberry species (*Rubus* sp.), and Japanese stilt grass (*Microstegium vimineum*) are common throughout the environmental study area as well, all but the blackberry being noxious invasive species.

While not directly observed during the windshield survey, there is the potential for specimen trees to occur within the environmental study area in interior portions of the forests. Specimen trees are trees greater than 30 inches in diameter, or 75 percent of the state champion, when measured at 4.5 feet above the ground. Specimen trees require special protections, and more detailed tree surveys would be required to confirm the exact forest resource limits and specimen tree locations in the environmental study area at a later stage.

The forest resources observed during the windshield survey were generally similar to what was observed on mapped resources. However, one area across from the intersection of Frederick Road and Travis Avenue at Spectrum Avenue has been partially cleared due to construction. If this project requires clearing or cutting forests greater than one acre and utilizes state funds, the Maryland Reforestation Law requires that the area of forest removed must be replanted at a ratio of one acre for every one acre removed on public lands. The law also requires planting must be completed within one year, or two growing seasons of the completion of the project and reforestation or afforestation has to occur within the county or watershed which the project is located. If planting in one of these two areas is not possible, reforestation credits may be purchased from a forest mitigation bank. If the project will require less than one acre of tree clearing, information needs to be provided to the DNR that identifies trees to be impacted and documented under their existing Roadside Tree Blanket Permit.

Based on Maryland DNR GIS information, there are several locations of Forest Interior Dwelling Species (FIDS) habitat located within the environmental study area. Forested areas must meet either of the following conditions to qualify as FIDS habitat:

- The tract is greater than 50 acres in size and contains at least 10 acres of forest interior habitat existing more than 300 feet from the nearest forest edge.
- The tract consists of riparian forests that are, on average, at least 300 feet in total width and greater than 50 acres in total forest area.
- The stream within the riparian forest must be perennial, as indicated on the most recent U.S. Geological Survey 7.5 minute topographic maps or as determined by a site visit.

FIDS habitat within the environmental study area was identified in the following areas, from north to south:

- southwest of Frederick Road, northwest of Cool Brook Lane, between Cool Brook and Shawnee Lane, and southeast of Shawnee Road;
- northeast of Frederick Road across from the intersection with Little Seneca Parkway;
- southwest of Frederick Road and south of West Old Baltimore Road;
- northeast of Frederick Road and east of Wheatfield Drive, part of Great Seneca Park;
- southwest of the intersection of Wheatfield Drive and Frederick Road, part of Great Seneca Park;
- southeast and northwest of Beach Drive, part of Rock Creek Park.

Coordination with DNR supports mapping that indicates that the forested area on or adjacent to the project site contains FIDS habitat. Populations of many FIDS are declining in Maryland and throughout the eastern United States. The conservation of FIDS habitat is strongly encouraged by DNR. The following guidelines will help minimize the project's impacts on FIDS and other native forest plants and wildlife:

1. Avoid placement of new roads or related construction in the forest interior. If forest loss or disturbance is absolutely unavoidable, restrict development to the perimeter of the forest (i.e., within 300 feet of the existing forest edge), and avoid road placement in areas of high quality FIDS habitat (e.g., old-growth forest). Maximize the amount of remaining contiguous forested habitat.

2. Do not remove or disturb forest habitat during April - August, the breeding season for most FIDS. This seasonal restriction may be expanded to February - August if certain early nesting FIDS (e.g., Barred Owl) are present.

3. Maintain forest habitat as close as possible to the road, and maintain canopy closure where possible.

4. Maintain grass height at least 10" during the breeding season (April-August).

Continued coordination with the Maryland DNR Wildlife and Heritage Service is necessary if any impacts to FIDS are proposed. In addition to FIDS and non-FIDS forests, there are forest conservation easements scattered along the entire length of the environmental study area. These easements are put in place to either protect large forest tracts or individual large trees from development impacts. Depending on the easement level, development can be completely prohibited in an area, or require extensive mitigation to offset any forest loss that might occur.

Wildlife resources within the environmental study area are limited, as much of this area is intensively developed. Within the more developed portions of the environmental study area, observed or expected wildlife include gray squirrel (*Sciurus carolinensis*) and common bird species, including American crow (*Corvus brachyrhynchos*), fish crow (*Corvus ossifragus*), blue jay (*Cyanocitta cristata*), Carolina wren (*Thryothorus ludovicianus*), American robin (*Turdus migratorius*), northern mockingbird (*Mimus polyglottos*), European starling (*Sturnus vulgaris*), northern cardinal (*Cardinalis cardinalis*), common grackle (*Quiscalus quiscula*), house finch (*Haemorhous mexicanus*), and house sparrow (*Passer domesticus*). Within larger forest patches or forested stream valleys, a wider diversity of wildlife would be expected, including mammals, such as white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), opossum (*Didelphis virginiana*), beaver (*Castor canadensis*). Bird diversity would also be higher, including various species of hawks, owls, woodpeckers, flycatchers, and numerous songbirds. Amphibian and reptile diversity would also be higher within these more connected natural habitats, including various species of salamanders, frogs, turtles, and snakes. Larger forest tracts could support various FIDS, including red-shouldered hawk (*Buteo lineatus*), barred owl (*Strix varia*), pileated woodpecker (*Dryocopus pileatus*), Acadian flycatcher (*Empidonax virescens*), red-eyed vireo (*Vireo olivaceus*) northern parula (*Setophaga americana*), and scarlet tanager (*Piranga olivacea*).

7.9 Rare, Threatened and Endangered Species

The Department of Natural Resources Wildlife and Heritage Service (DNR-WHS), Maryland Department of Natural Resources Environmental Review Unit (DNR-ERU), and USFWS were contacted to solicit comments on the potential presence of state and federal listed rare, threatened, or endangered (RTE) plant or animal species within the MD 335 environmental study area. A response letter was received from the DNR-WHS dated June 1, 2015 and from the DNR-ERU dated June 18, 2015. Data on the potential presence of federally listed species was obtained through a search of the USFWS online database. A letter was not sent to the National Marine Fisheries Service, as marine environments were not found within the environmental study area.

The search of the USFWS online database shows that no federally listed species or critical habitat were present in the environmental study area. An examination of DNR geospatial data shows a Sensitive Species Project Review Area (SSPRA) on the edge of the environmental study area, to the west of MD 355, between Ridge Road to the north and Germantown Road to the south. Aerial imagery suggests that the area is highly developed, with a wetland and forested area in the center of the SSPRA boundary. The SSPRA is classified as a Group 2 SSPRA, which indicates the presence of state listed species.

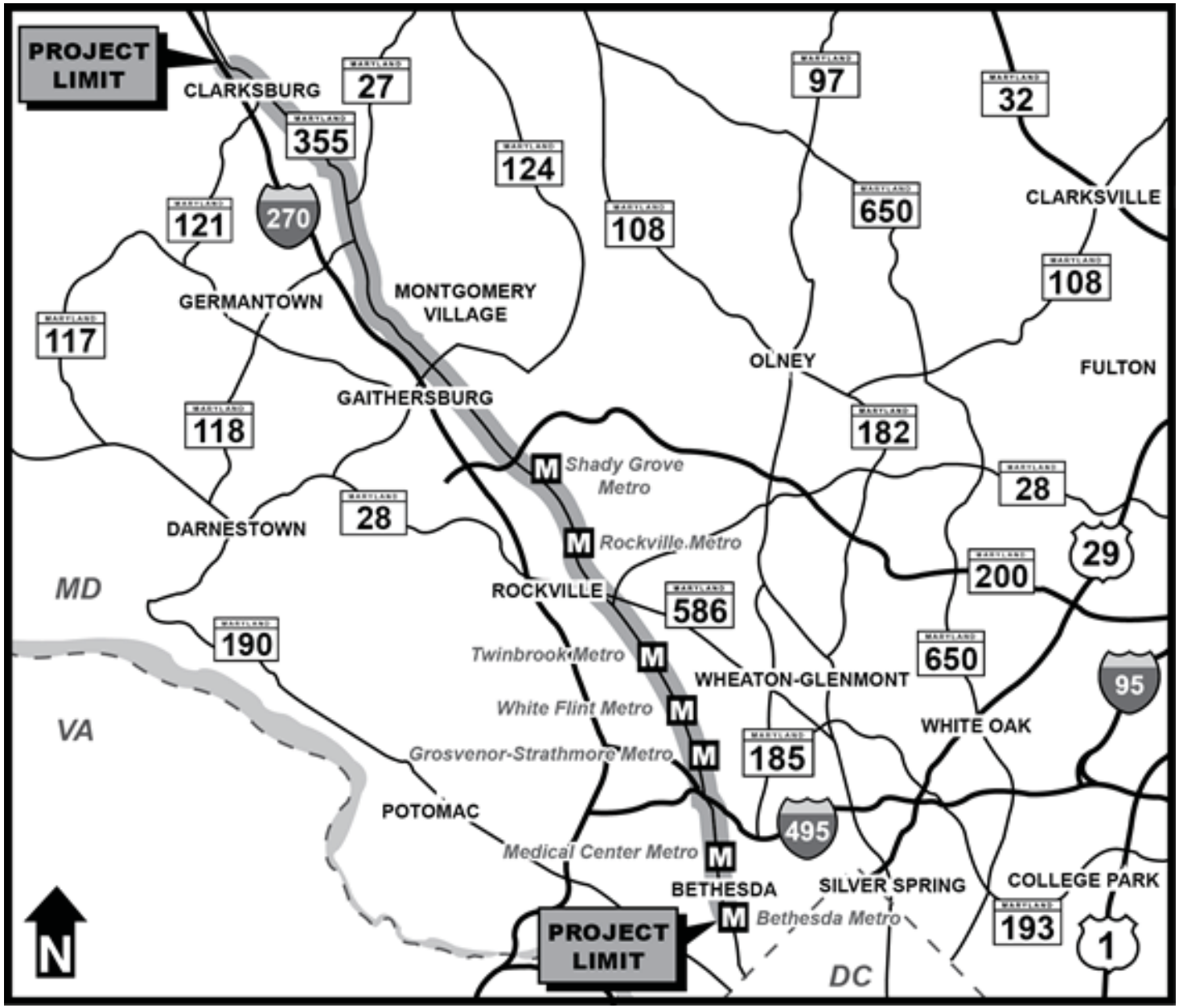
DNR-WHS has determined that there is an area of potential concern along the project environmental study area that may warrant further study for impacts to rare, threatened and endangered species. Between Ridge Road and MD 118, to the west of MD 355, is a site known as Germantown Bog which contains a wetland designated in state regulations as a Nontidal Wetland of Special State Concern (NTWSSC) and records for these species:

Scientific Name	Common Name	State Status
Carex buxbaumii	Buxbaum's Sedge	Threatened
Sanguisorba canadensis	Canada Burnet	Threatened
Spenopholis pensylvanica	Swamp Oats	Threatened

It is possible that any of these three species could occur within the project's limits-of-disturbance in areas of appropriate wetland habitat of seepages, fens or swamp. There is also the concern that this project might alter the hydrology that exists in the rare species habitat, making it less suitable for these state-listed plants. DNR would be interested in coordinating further as this project progresses in order to develop protection measures for avoidance and minimization of adverse impacts to these important species should impacts be anticipated.

7.10 Green Infrastructure

There are several areas designated as Green Infrastructure that overlap the environmental study area, according to DNR geospatial data. Green Infrastructure includes hubs (large, unfragmented habitat areas), corridors (linear remnants of natural land that connect hubs), and gaps (developed areas). While hubs provide important habitat to native plants and animals, corridors allow movement of animals, seeds, and pollen to support long-term survival and diversity. Many of these hubs, and especially corridors, follow stream valleys. Within the environmental study area, both hub and corridor areas are found near Little Seneca Creek, Great Seneca Creek, Muddy Branch, and Rock Creek.



MD 355
Bus Rapid Transit
Corridor Planning Study

Study Area Map

Vicinity Map

MD iMAP, SHA, DoIT, MDP, Esri, HERE, DeLorme, MapmyIndia, ©

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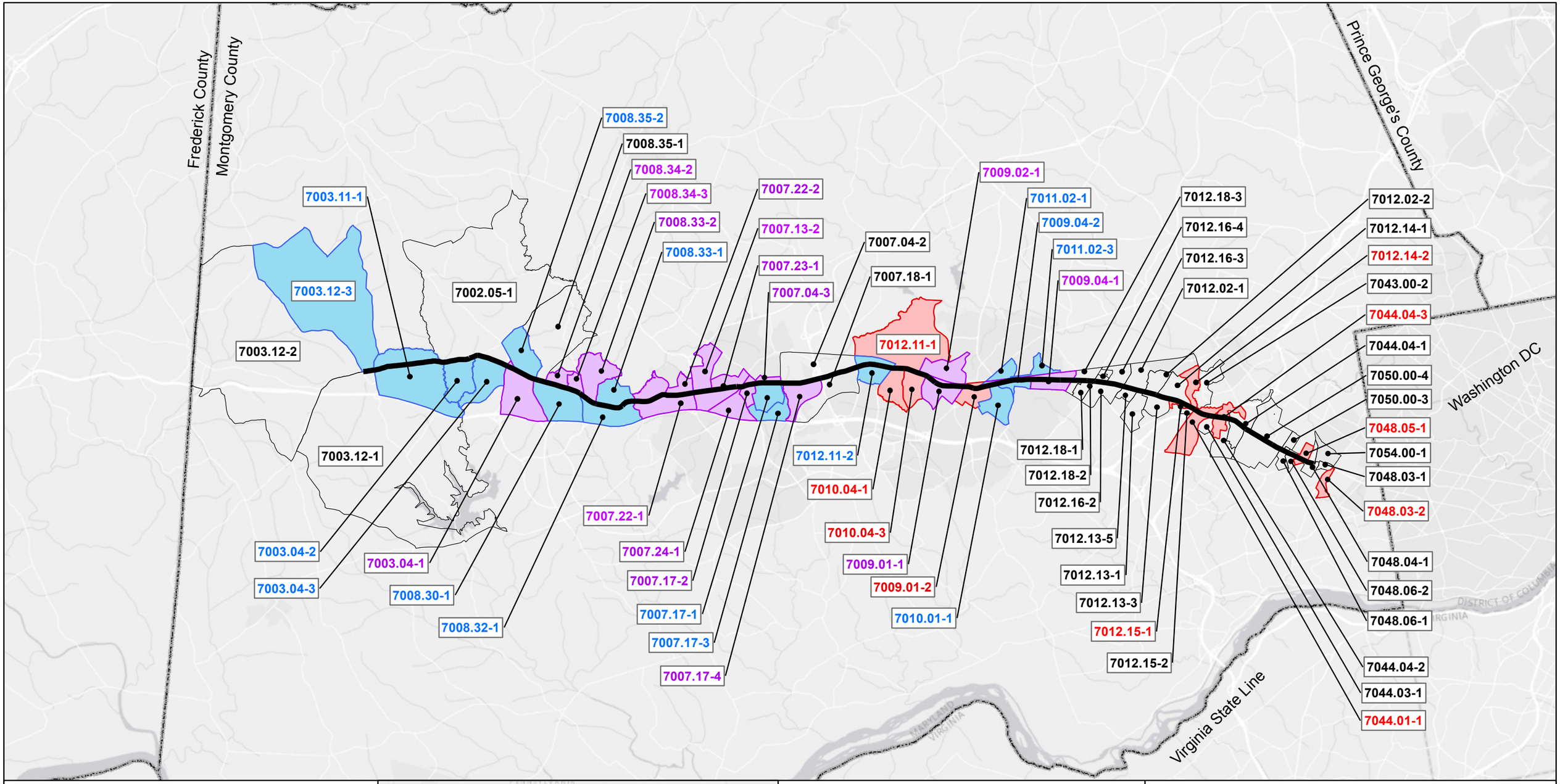
Figure 1



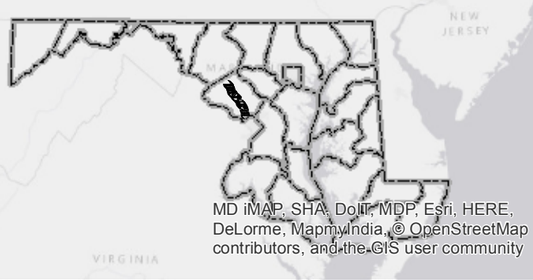
MD 355 Bus Rapid Transit Corridor Planning Study

Figure 2

Environmental Justice Census Block Map

N

Vicinity Map



MD iMAP, SHA, DoIT, MDP, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

Census Blocks

- Minority Population
- Low Income Population
- Low Income and Minority Population
- Other Census Block
- MD 355 Study Area
- County Boundaries

SHA State Highway Administration — Maryland Department of Transportation

Montgomery County Maryland

MTA Maryland

N E S W

1 inch equals 2 miles

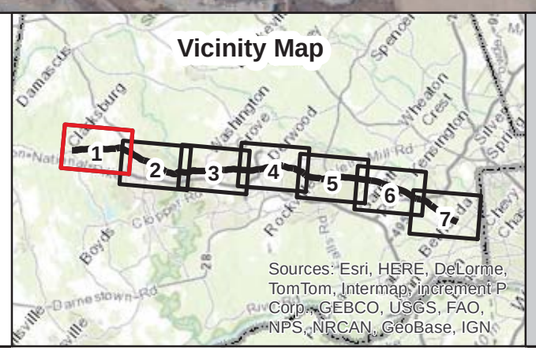
0 2 4 Miles

MD 355 BRT
Corridor Planning Study

Figure 3

Community Resources Map

Sheet 1 of 7



- Police Station
- Fire Station
- Religious Institution
- Cemetery
- Metro Station
- MARC Station
- Park and Ride
- Post Office
- Health Care Facility
- College/University
- High School
- Middle School
- Elementary School
- Private School
- Special School
- Senior Center
- Recreation Center
- Library
- Affordable Housing
- Study Area
- National Register Listed Property
- National Register Eligible Property
- Parkland
- Census Block

1 in = 1,000 feet

0 1,000 2,000

Feet

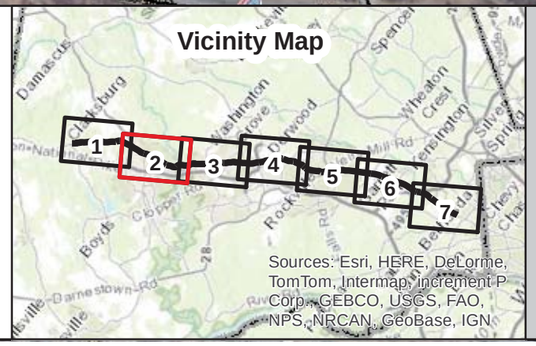
Ridge Road Recreational Park
7008.35-2
SHEET 1 BOUNDARY
Neelsville MS
Neelsville Presbyterian Cemetery
Milestone Park & Ride
Neelsville Presbyterian Church
Station 34 - East Germantown
7008.34-2
7008.34-3
7008.33-2
SHEET 3 BOUNDARY
7003.04-1
Vesta Germantown
Montgomery College Germantown Campus
Germantown East Local Park
7008.30-1
Holy Cross Germantown Hospital
Righttime Medical Care
7008.33-1
Great Seneca Stream Valley Park Unit 1
7008.32-1
Seneca Creek State Park

MD 355 BRT Corridor Planning Study

Community Resources Map

Sheet 2 of 7

Vicinity Map



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN

- Police Station
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SHA State Highway Administration — Maryland Department of Transportation
Montgomery County Maryland
MTA Maryland

1 in = 1,000 feet

0 1,000 2,000

Feet

SHEET 2 BOUNDARY

SHEET 4 BOUNDARY

South Lake ES

Gaithersburg Library

7007,13-2

Forest Oak Towers

Holy Cross Hosptial Health Center

M: 21-202 NRE

M: 21-165 NRE

St. Martin of Tours School

St. Martin of Tours Catholic Church

Gaithersburg City Police

Eastern Healing Center

7007.04-3

7007.22-2

7007.22-1

Forest Oak Cemetery

7007.23-1

Grace United Methodist Church

M: 21-185 NRE

7007,17-2

M: 21-3 NRE

Gaithersburg HS

Montgomery Primary Achievement Center

7007,17-1

Bohrer Park at Summit Hall Farm and Activity Center

Episcopal Church of The Ascension

7007.24-1

Summit Hall ES

7007,17-3

Londonderry Towers

Montgomery Club VI

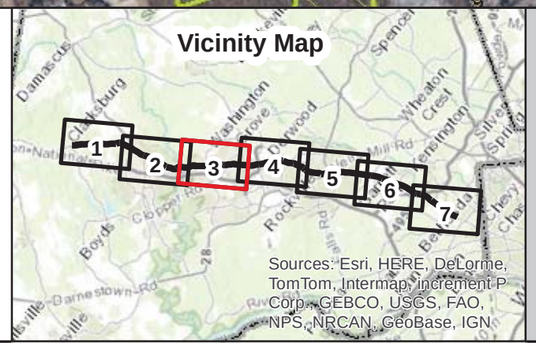
Gaithersburg Upcounty Senior Center

MD 355 BRT Corridor Planning Study

Community Resources Map

Sheet 3 of 7

Vicinity Map



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- National Register Eligible Property
- Parkland
- Census Block

SHA State Highway Administration — Maryland Department of Transportation

Montgomery County Maryland 1776

MTA Maryland

N W E S

1 in = 1,000 feet

0 1,000 2,000

Feet

SHEET 3 BOUNDARY

SHEET 5 BOUNDARY

Shady Grove Apartments

Forbush School at Oakmont

Washington Grove ES

7007.04-2

7012.11-1

King Farm Homestead Park

All Day Medical Care Clinic

Casey Health Institute

7012.11-2

Yang Academy

Office of Internal Affairs

Casey Community Center

M: 20-32 NRE

Gaithersburg Presbyterian

M: 21-183 NRE

Epsworth United Methodist

Good Shepard Lutheran

7007.18-1

King Farm Stream Valley Park

College Gardens ES

Rosemont ES

7007.17-4

Montgomery College Rockville Campus

7010.04-1

Rosemont Stream Valley Park

7010.04-3

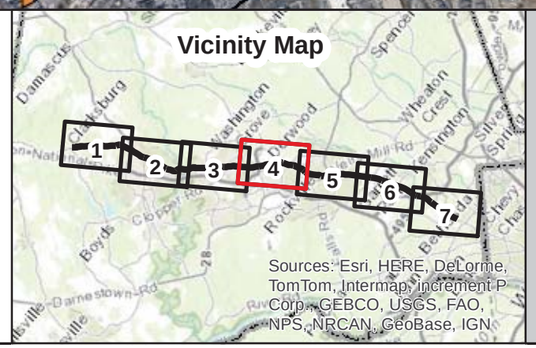
Rock Terrace School

MD 355 BRT Corridor Planning Study

Community Resources Map

Sheet 4 of 7

Vicinity Map



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN

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SHA State Highway Administration — Maryland Department of Transportation

Montgomery County Maryland

MTA Maryland

1 in = 1,000 feet

0 1,000 2,000

Feet

SHEET 4 BOUNDARY

SHEET 6 BOUNDARY

7009.02-1

7009.01-1

7009.01-2

7010.01-1

7011.02-1

7009.04-2

7009.04-1

St. Mary's Catholic Church

St. Mary's Cemetery

Heritage House

Centra Care Adventist Healthcare

Rockville Post Office

Station 3 - Rockville

Rockville Metro Station

NR-506 NR

St Mary School

M: 26-21-4 NRE

Rockville MARC Station

Rockville Library

Town Center Apartments

Veterans Park

Heritage Park

Promenade Park

Richard Montgomery HS

Bethany House

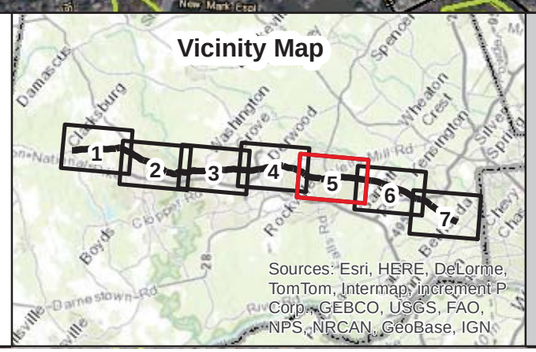
Christ Episcopal Day School

MD 355 BRT
Corridor Planning Study

Community Resources Map

Sheet 5 of 7

Vicinity Map



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN

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SHA State Highway Administration — Maryland Department of Transportation

Montgomery County Maryland 1776

MTA Maryland

1 in = 1,000 feet

0 1,000 2,000

Feet

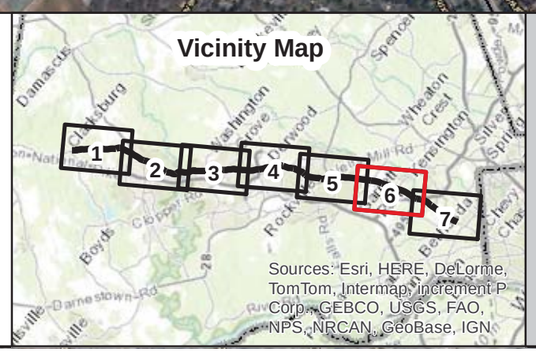
Righttime Medical Care
NR-722
NR
Rockville Optimal School
7012.18-3
7012.16-4
7012.16-3
7012.02-1
Montrose/355
(Mid-Pike Plaza)
Park & Ride
7012.18-2
White Flint Metro Station
Holy Cross School
Garrett Park ES
7012.02-2
Revitz House
Suburban Hospital
Ace Medical Clinic LLC
7012.16-2
7012.14-2
7043.00-2
7012.18-1
7012.14-1
Academy of the Holy Cross
7012.13-5
Rock Creek
Stream Valley Park
Unit 3
Washington
Hospital Center
GYN Oncology
M: 30-12 NRE
Kensington Parkwood ES
SHEET 5 BOUNDARY
Georgetown Preparatory School
Grosvenor-Strathmore Metro Station
7012.15-1
7012.13-3
7012.13-1
7012.15-2
Tilden MS
SHEET 7 BOUNDARY
M: 35-120 NRE
Bethesda P

MD 355 BRT
Corridor Planning Study

Community Resources Map

Sheet 6 of 7

Vicinity Map



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN,

- Police Station
- Fire Station
- Religious Institution
- Cemetery
- Metro Station
- MARC Station
- Park and Ride
- Post Office
- Health Care Facility
- College/University
- High School
- Middle School
- Elementary School
- Private School
- Special School
- Senior Center
- Recreation Center
- Library
- Affordable Housing
- Study Area
- National Register Listed Property
- National Register Eligible Property
- Parkland
- Census Block

SHA State Highway Administration — Maryland Department of Transportation

Montgomery County Maryland 1776

MTA Maryland

1 in = 1,000 feet

0 1,000 2,000

Feet

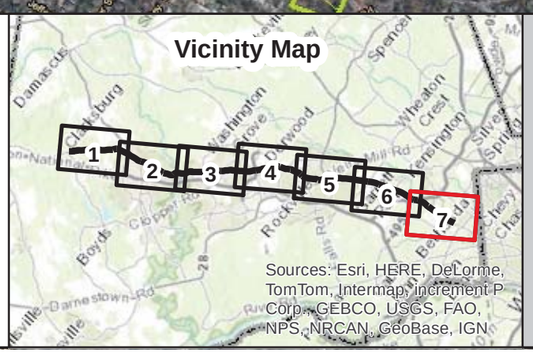
7044.04-3
Elmhirst Parkway NCA
M: 35-120 NRE
Uniformed Services University
7044.04-1
Bethesda Presbyterian Cemetery
M: 35-5 NR
Walter Reed Natl Military Medical Center
7044.03-1
Stone Ridge School of The Sacred Heart
Bethesda Naval Hospital
M: 35-8 NR
M: 35-98 NRE
Fogarty International Center, NIH
National Cancer Institute, NIH
7050.00-4
7044.04-2
SHEET 6 BOUNDARY
M: 35-9-7 NRE
Medical Center Metro Station
M: 35-9-3 NRE
M: 35-9-2 NRE
M: 35-9-1 NRE
7050.00-3
M: 35-9-5 NRE
Women Health Care Center
M: 35-9-8 NRE
Bethesda-Chevy Chase HS
7048.05-1
Our Lady of Lourdes Catholic School
7054.00-1
M: 35-9-6 NRE
Center For Innovative GYN Care
M: 35-14-4 NR
7048.06-2
7048.04-1
District 2 (Bethesda)
Bethesda Metro Station
7048.06-1
Bethesda Post Office

MD 355 BRT Corridor Planning Study

Community Resources Map

Sheet 7 of 7

Vicinity Map



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SHA State Highway Administration — Maryland Department of Transportation

Montgomery County Maryland 1776

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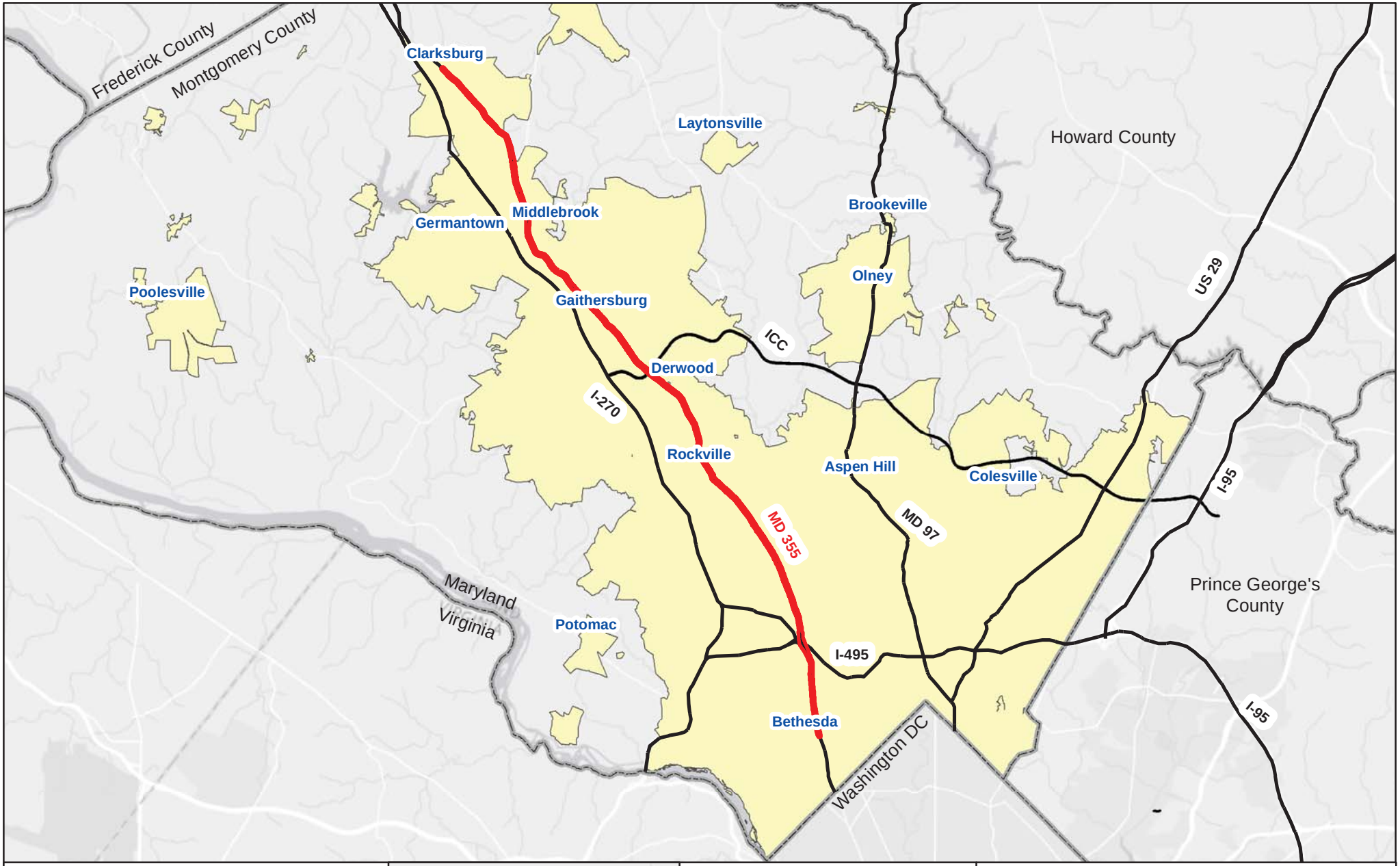
0 1,000 2,000

Feet



MD 355
Bus Rapid Transit Corridor Planning Study

Figure 4

Priority Funding Areas

Vicinity Map

Legend

- MD355 Study Area
- Major Roads
- County Boundaries
- Priority Funding Areas

SHA State Highway Administration

MTA Maryland

N W E S

1 inch equals 3.5 miles

0 3.5 7

Miles

SENECA CREEK WATERSHED

Clarksburg Village North LP

Little Seneca Greenway SVP

Little Seneca Creek

CLARKSBURG SPECIAL PROTECTION AREA

SHEET 2 BOUNDARY

Ridge Road Recreational Park

Kings LP

Dowden's Ordinary SP

Clarksburg Triangle UP

CLARKSBURG, MD

Clarksburg NP

Little Seneca Greenway SVP

Tenmile Creek Tributary

North Germantown Greenway SVP

Waters House SP

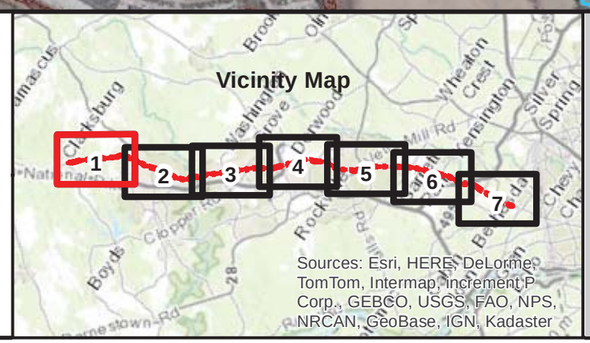
MD 355 Bus Rapid Transit Corridor Feasibility Study

Figure 5

Environmental ResourcesMapping

Sheet 1 of 7

Vicinity Map



Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster

- Study Area
- Observed Wetlands
- Lakes and Streams
- NWI/DNR Wetlands
- Hydric Soils
- 500 Year Flood Zone
- 100 Year Flood Zone
- Parks
- Green Infrastructure
- Forest Conservation Easements
- Potential FIDS Habitat
- Special Protection Areas
- Sensitive Species Project Review Area
- Watershed Boundary

SHA State Highway Administration — Maryland Department of Transportation

Montgomery County Maryland 1776

MTA Maryland

N E S W

1 in = 1,000 ft

0 500 1,000 2,000 Feet

Ridge Road Recreational Park

Great Seneca SV Park

SHEET 3 BOUNDARY

Clearspring LP

Great Seneca Creek

GERMANTOWN, MD

Plumgar LP

Germantown East LP

SHEET 1 BOUNDARY

Gunners Branch

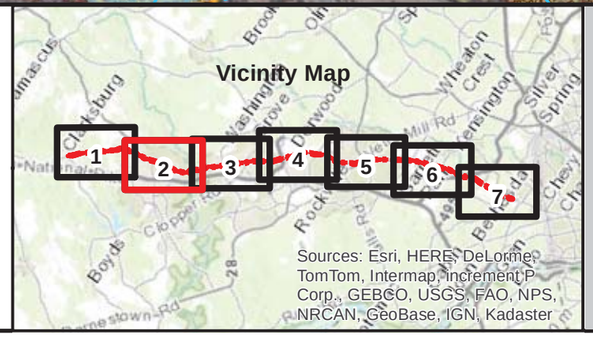
Fox Chapel NP

Great Seneca SV Park

MD 355 Bus Rapid Transit Corridor Feasibility Study

Environmental Resources Mapping

Sheet 2 of 7



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SHA State Highway Administration — Maryland Department of Transportation

Montgomery County Maryland 1776

MTA Maryland

1 in = 1,000 ft

0 500 1,000 2,000 Feet

SHEET 2 BOUNDARY

Victory Farms Park

Kelley Park

West Woods Forest Reserves

Chapel Park

Woodward Park

Railroad Park

SENECA CREEK WATERSHED

POTOMAC RIVER MO COUNTY WATERSHED

Olde Towne Square

Wells-Robertson House

Duvall Park

City Hall and Civic Center Park

Constitution Gardens

Whetstone Run

Blohm Park

Walkers Run

Travis Avenue Park

Great Seneca SVU 1

GAITHERSBURG, MD

International Lattitude Observatory Park

Bohrer Park at Summit Hall Farm and Activity Center

Walder Park

Christman Park

Brown Station Park

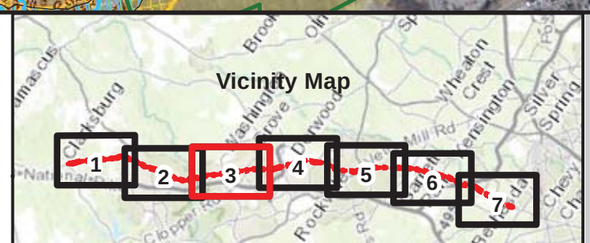
SHEET 4 BOUNDARY

MD 355 Bus Rapid Transit Corridor Feasibility Study

Environmental Resources Mapping

Sheet 3 of 7

Vicinity Map



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SHA State Highway Administration — Maryland Department of Transportation

Montgomery County Maryland 1776

MTA Maryland

N W E S

1 in = 1,000 ft

0 500 1,000 2,000 Feet

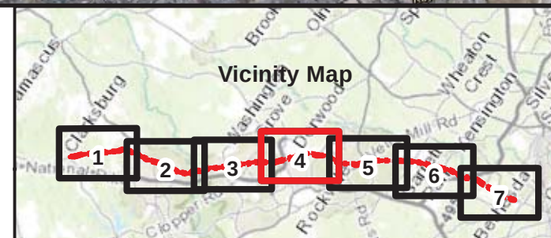
East Woods Forest Reserve
Amity Drive NP
Washington Grove Meadow CP
Piedmont Crossing LP
Blueberry Hill LP
Shady Grove Maintenance Facility
Crabbs Branch SVP
Crabbs Branch
Derwood Station NP
Woodward Park
Morgan Park
SHEET 3 BOUNDARY
SHEET 5 BOUNDARY
Muddy Branch
ROCK CREEK WATERSHED
POTOMAC RIVER MO COUNTY WATERSHED
ROCKVILLE, MD
Summerfield Park
Casey Community Center
Rockville Dog Park
Mattie J.T. Stepanek Park
King Farm Homestead Park
King Farm 12 Acre Park
King Farm Stream Valley Park
Watts Branch
College Gardens Park
Anderson Park

MD 355 Bus Rapid Transit Corridor Feasibility Study

Environmental Resources Mapping

Sheet 4 of 7

Vicinity Map



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SHA State Highway Administration — Maryland Department of Transportation
Montgomery County Maryland 1776
MTA Maryland

1 in = 1,000 ft

0 500 1,000 2,000 Feet

SHEET 4 BOUNDARY

David Scull Park

Northeast Park

Calvin Park

Twinbrook Park

Maryvale Park

Silver Rock Park

Rockcrest Park

Legacy at Lincoln Park

Israel Park

Lone Oak Park

First Street Park

Hillcrest Park

Memory Walk Park

Mary Trumbo Park

Pump House at Croydon Park

Grandin Avenue Park

ROCKVILLE, MD

ROCK CREEK WATERSHED

CABIN JOHN CREEK WATERSHED

Veterans Park

North Street Park

Rockville Town Square

Promenade Park

James Monroe Park

Kinship Park

Swim Center

Courthouse Square Park

SHEET 6 BOUNDARY

Dawson Farm Park

Montrose Park

Welsh Park

POTOMAC RIVER MO COUNTY WATERSHED

Beall-Dawson House & Park

Elwood Smith Park

Cabin John Creek

Jacquilin Trells Williams Park

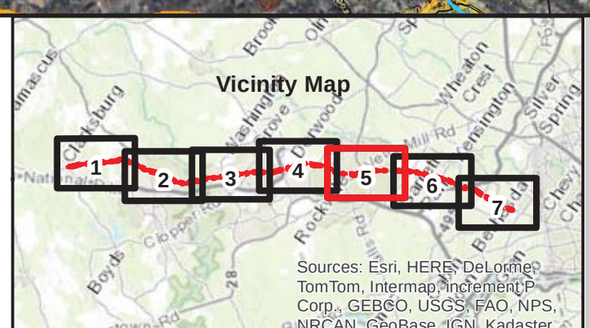
Montrose Woods Park

MD 355 Bus Rapid Transit Corridor Feasibility Study

Environmental Resources Mapping

Sheet 5 of 7

Vicinity Map



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SHA State Highway Administration — Maryland Department of Transportation

Montgomery County Maryland 1776

MTA Maryland

N W E S

1 in = 1,000 ft

0 500 1,000 2,000 Feet

SHEET 5 BOUNDARY

ROCK CREEK WATERSHED

CABIN JOHN CREEK WATERSHED

Waverly-Schuylkill NP

Porcupine Woods Park

Cambria Park

Wells NP

Garrett Park-Waverly NP

Druid Drive NP

White Flint NP

Garrett Park Estates LP

NORTH BETHESDA, MD

Rock Creek

Wall LP

Josiah Henson SP

Luxmanor LP

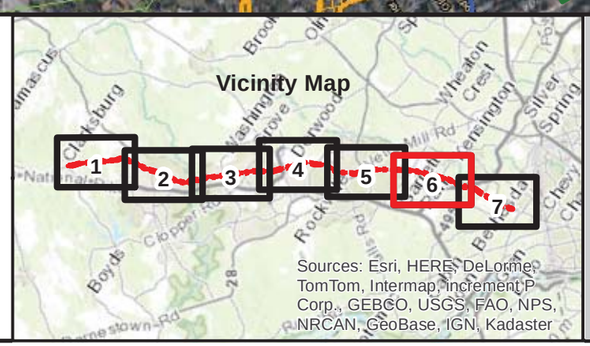
Timberlawn LP

SHEET 6 BOUNDARY

MD 355 Bus Rapid Transit Corridor Feasibility Study

Environmental Resources Mapping

Sheet 6 of 7



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SHA State Highway Administration — Maryland Department of Transportation

Montgomery County Maryland 1776

MTA Maryland

N E S W

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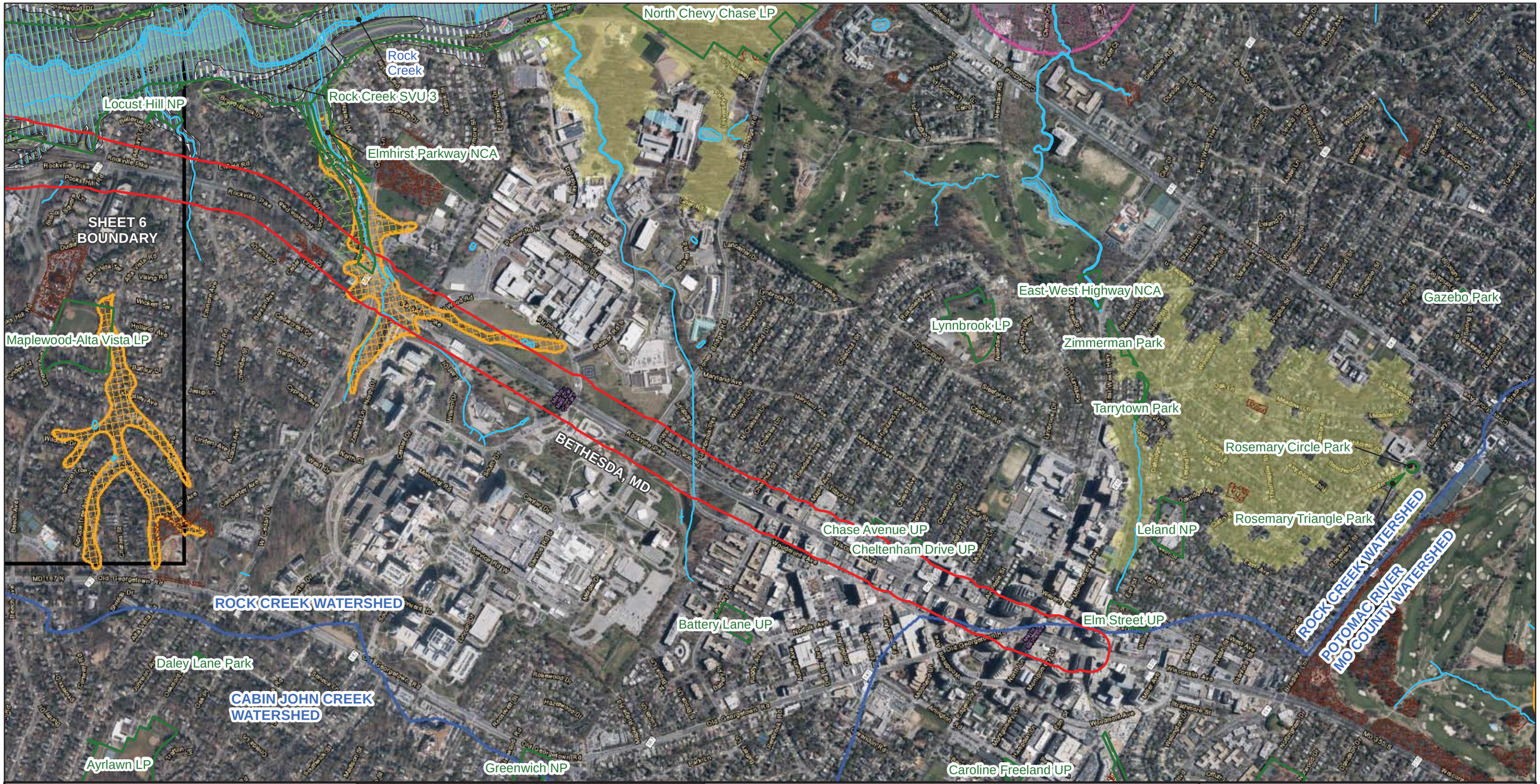
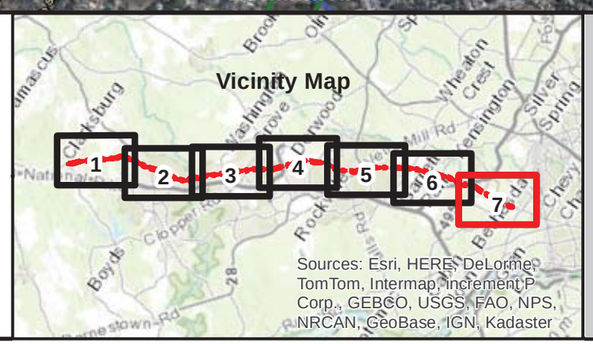
0 500 1,000 2,000 Feet



MD 355 Bus Rapid Transit Corridor Feasibility Study

Environmental Resources Mapping

Sheet 7 of 7



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SHA State Highway Administration — Drive to Excel — Maryland Department of Transportation

Montgomery County Maryland 1776

MTA Maryland

N W E S

1 in = 1,000 ft

0 500 1,000 2,000 Feet