

## Roadway Mobility Metrics

MNCPPC transportation planners aggregated and synthesized vehicle speed data for major corridors in Montgomery County collected from the Regional Integrated Transportation Information System's (RITIS) Vehicle Probe Project Suite. RITIS was developed by the Center for Advanced Transportation Technology Laboratory at the University of Maryland. Vehicle speed data is continuously collected and archived along corridor segments via GPS enabled vehicle "probes" such as mobile phones and GPS devices in various fleet vehicles throughout Montgomery County and beyond. This information is archived and made available to member jurisdictions.

Planners retrieved speed information collected between April 1, 2015 and May 31, 2015 and again between September 1, 2015 and October 31, 2015 for individual roadway segments analyzed as part of this report. MNCPPC staff utilized each roadway segment's measured speed, averaged every 15 minutes, distance, and "free-flow" speed to calculate the travel time index (TTI) for each 15-minute interval. This information is then summarized for peak and non-peak periods for each roadway segment and organized by policy area as defined in the 2012 Subdivision Staging Policy. Due to the fact that several roadway corridors form the boundaries of two or more policy areas, some policy areas were aggregated for the purposes of summarizing results (figure 1). In other instances, bordering roadways may have been arbitrarily assigned to one policy area.

To gain more insight into how congestion has changed in each policy area grouping and throughout the County, MNCPPC transportation planners summarized the Planning Time Index (PTI) and measured speed in 2011 and 2015. The PTI is the ratio of the ninety fifth travel time percentile to the free-flow travel time. The PTI is a measure of travel time reliability and "compares near-worst case travel time to a travel time in light or free-flow traffic" (Center for Advanced Transportation Technology Laboratory, 2016). For example, a PTI of 1.8 indicates for a 20-minute trip in normal conditions, 36 total minutes (1.8 x 20 minutes) should be allocated to guarantee an on-time arrival 95 percent of the time during congested periods.

Finally, for each policy area or grouping, the top two congested roadway corridors' segments are mapped and symbolized according to their level of congestion during the AM and PM peak periods. The morning peak period is defined as seven to nine AM and the evening peak period is defined as four to seven PM. This provides even finer level of granularity to visualize congestion throughout the county.

## TRAVEL TIME INDEX

The travel time index (TTI) compares the average travel time of a trip on a segment of road for a particular time period to the travel time of that same trip during "free flow" conditions. The higher the TTI for a given time period, the more time is lost due to congestion. For example, a TTI of 2.0 indicates that a trip that takes 20 minutes in typical traffic will take twice as long, or 40 minutes, in the measured time period.

TTI, although easy to understand and measure, is a fairly narrow metric that ignores other aspects of the transportation & land use system. Most importantly, the metric does not consider the length of trips needed to accomplish daily tasks such as food shopping or commuting to one's job. The metric is therefore solely concerned with mobility and ignores all aspects of accessibility.

## County Overview

MNCPPC staff analyzed approximately 430 miles of road (bi-directional) across Montgomery County (Figure 1). For the 2015 MAR, several corridors were added to the analysis including stretches of MD-187 (Old Georgetown Rd), MD-547 (Strathmore/Knowles Ave), MD-119 (Great Seneca Hwy), MD-410 (East-West Hwy), and MD 189 (Falls Rd). The report analyzed 58 individual corridors (both travel directions) segmented by groups of policy areas. Of the top 25 congested corridors in the County, eleven occur inside the Capital Beltway in areas that provide good accessibility to jobs and destinations for non-work trips (Table 1). The number one congested roadway, and newcomer to the top 25, is MD-27 in Clarksburg between Brink Road and Davis Mill Road.

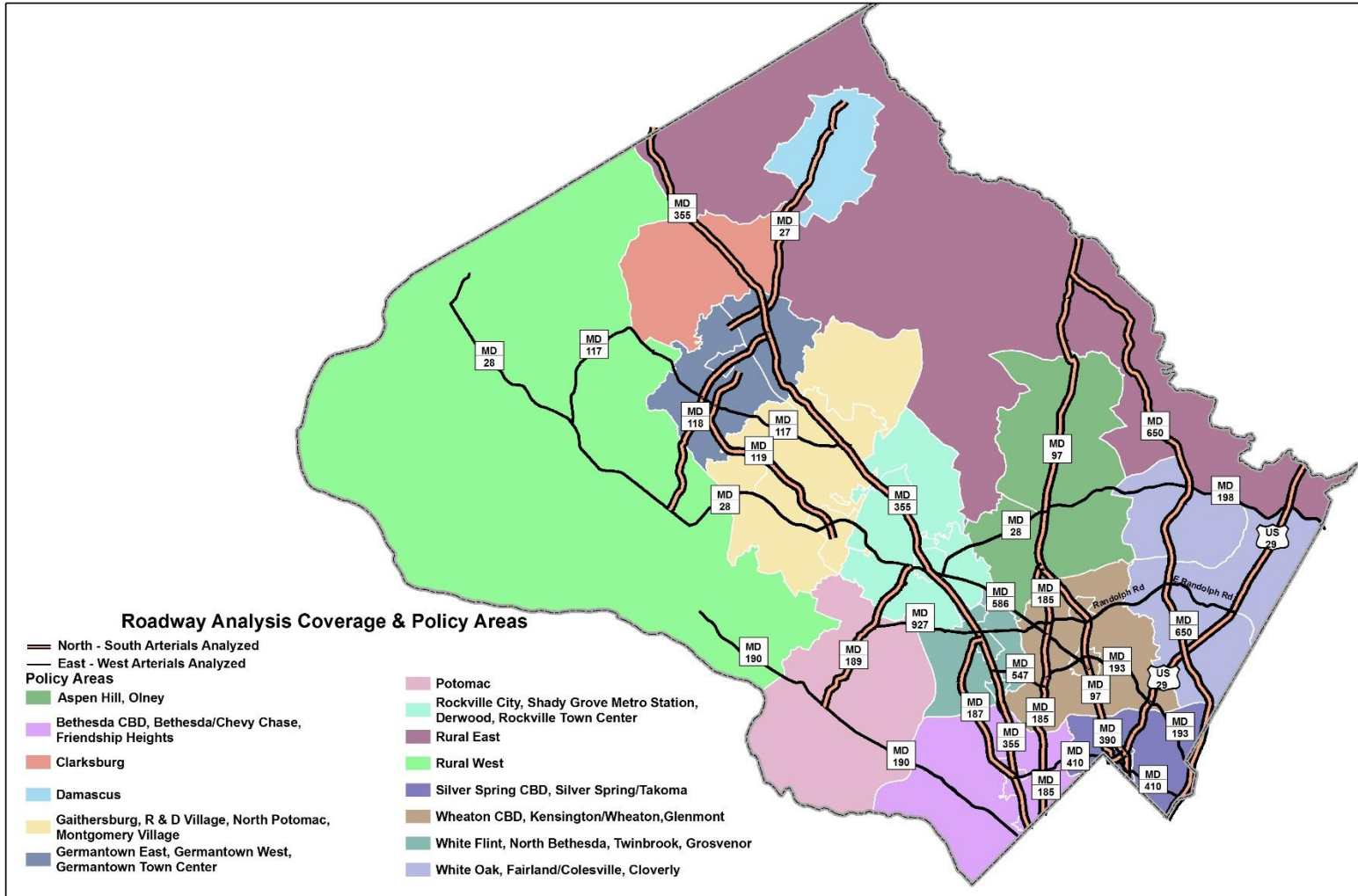


FIGURE 1: ROADWAY ANALYSIS COVERAGE & POLICY AREAS

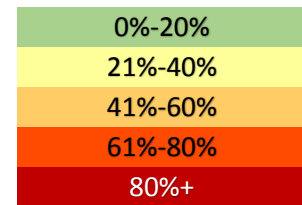
**TABLE 1: TOP 25 CONGESTED ROADWAYS IN MONTGOMERY**

Ranking	Corridor	Direction	Congestion	Policy Areas	Peak	Section
1	MD-27	Southbound	102%	Clarksburg	AM Peak	Brink Rd to Davis Mill Rd
2	Colesville Road	Southbound	87%	Silver Spring CBD, Silver Spring/Takoma	PM Peak	Capital Beltway to DC Line
3	MD-185	Southbound	78%	Bethesda CBD, Bethesda/Chevy Chase, Friendship Heights	AM Peak	Capital Beltway to DC Line
4	US-29	Southbound	73%	Fairland, White Oak & Cloverly	AM Peak	MD-198 to University Blvd
5	MD-650	Northbound	72%	Silver Spring CBD, Silver Spring/Takoma	PM Peak	Capital Beltway to DC Line
6	Georgia Avenue	Northbound	71%	Silver Spring CBD, Silver Spring/Takoma	PM Peak	Capital Beltway to DC Line
7	US-29	Northbound	67%	Wheaton CBD, Wheaton/Kensington, Glenmont	PM Peak	University Blvd to Capital Beltway
8	MD-185	Southbound	66%	Wheaton CBD, Wheaton/Kensington, Glenmont	AM Peak	Aspen Hill Rd to Capital Beltway
9	MD-410	Westbound	66%	Bethesda CBD, Bethesda/Chevy Chase, Friendship Heights	AM Peak	Jones Mill Rd to MD-355
10	MD-355	Northbound	66%	Bethesda CBD, Bethesda/Chevy Chase, Friendship Heights	PM Peak	Capital Beltway to DC Line
11	MD-185	Northbound	64%	Bethesda CBD, Bethesda/Chevy Chase, Friendship Heights	PM Peak	Capital Beltway to DC Line
12	MD-355	Southbound	64%	Bethesda CBD, Bethesda/Chevy Chase, Friendship Heights	PM Peak	Capital Beltway to DC Line
13	MD-187	Southbound	62%	North Bethesda, White Flint, Twinbrook, Grosvenor	PM Peak	MD-355 to Capital Beltway
14	MD-185	Northbound	59%	Aspen Hill & Olney	PM Peak	Aspen Hill Rd to MD-97
15	MD-28	Westbound	59%	Aspen Hill & Olney	AM Peak	Baltimore Rd to MD-97
16	MD-190	Eastbound	57%	Rural West	AM Peak	Piney Meetinghouse Rd to Esworthy Rd
17	MD-190	Eastbound	57%	Potomac	AM Peak	Capital Beltway to Piney Meetinghouse Rd
18	MD-547	Eastbound	56%	Wheaton CBD, Wheaton/Kensington, Glenmont	PM Peak	MD-185 to Beach Drive
19	MD-390/16TH ST	Southbound	55%	Silver Spring CBD, Silver Spring/Takoma	PM Peak	MD-97 to DC Line
20	MD-586	Westbound	55%	Wheaton CBD, Wheaton/Kensington, Glenmont	PM Peak	MD-97 to MD-185
21	MD-355	Southbound	55%	Bethesda CBD, Bethesda/Chevy Chase, Friendship Heights	AM Peak	Capital Beltway to DC Line
22	MD-586	Eastbound	55%	Wheaton CBD, Wheaton/Kensington, Glenmont	PM Peak	MD-97 to MD-185
23	Randolph Road	Eastbound	54%	North Bethesda, White Flint, Twinbrook, Grosvenor	PM Peak	Rocking Horse Rd to MD-355
24	Colesville Road	Northbound	54%	Silver Spring CBD, Silver Spring/Takoma	AM Peak	Capital Beltway to DC Line
25	MD-190	Eastbound	54%	Bethesda CBD, Bethesda/Chevy Chase, Friendship Heights	AM Peak	Capital Beltway to DC Line

Similar to the 2013 MAR, categories that indicate the severity of congestion are identified according to the difference between the measured TTI and free-flow traffic conditions (TTI of 1). For example, MD-27 in Clarksburg experiences an average congestion of 102 percent (TTI of 2.02) indicating the time to travel through this corridor during the AM rush hour takes just over twice as long compared to free-flow conditions.

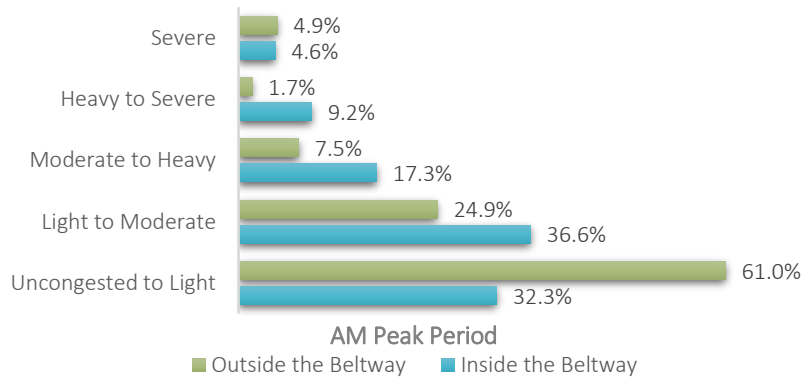
**Congestion Severity Scale Used Throughout This Section**

*Uncongested - Light*  
*Light - Moderate*  
*Moderate - Heavy*  
*Heavy - Severe*  
*Severe*

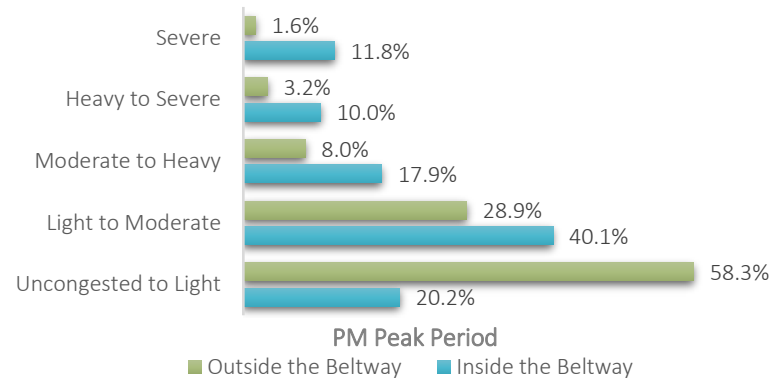


## Summary of Congestion in 2015

Although there are corridors in Montgomery County where severe congestion occurs, a majority of the roadway segments analyzed in the County experience a congestion level of less than 20 percent during peak travel periods. As will be reinforced in the policy area section, a majority of the congested roadway segments (multiple segments can make up one corridor), occur inside the beltway. Below are two bar charts that summarize the percentage of roadway miles that fall into



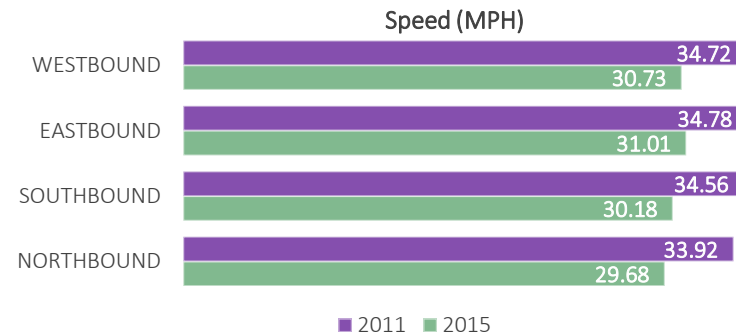
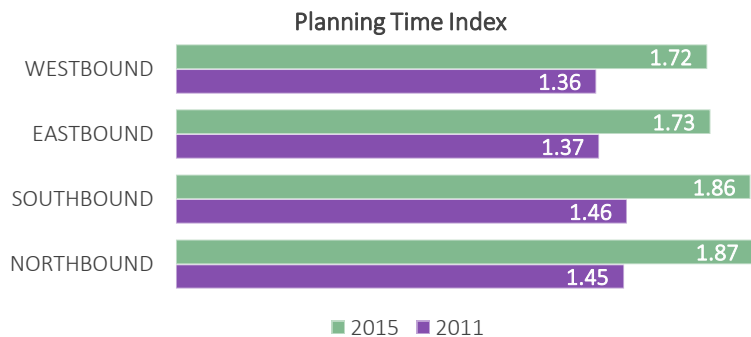
the five levels of congestion severity. The charts are broken down by the location of the corridor segments (inside or outside the beltway). As expected, a greater percentage of roadways inside the Capital Beltway experience moderate to heavy levels of congestion than compared to roadways outside the beltway. During the PM peak period, just under forty percent of roadway mileage inside the beltway experience moderate to heavy levels of congestion or higher compared to just under thirteen percent outside the beltway.



## Congestion Trends

MNCPPC transportation planners analyzed vehicle probe data for all 58 corridors across all time periods in 2011 and 2015. Changes in the average speed and PTI for all time periods is summarized below. The average speed in 2015 has decreased from 2011 by an average of just

over four miles per hour countywide. Also the PTI has increased by an average of four-tenths indicating congestion has become more variable. For example, on average in the southbound direction, a 15-minute trip in 2011 would require an additional seven minutes to arrive on-time 95 percent of the time, increasing to thirteen minutes in 2015.

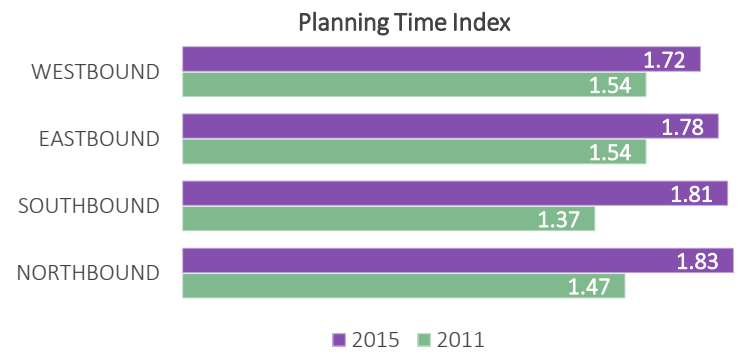
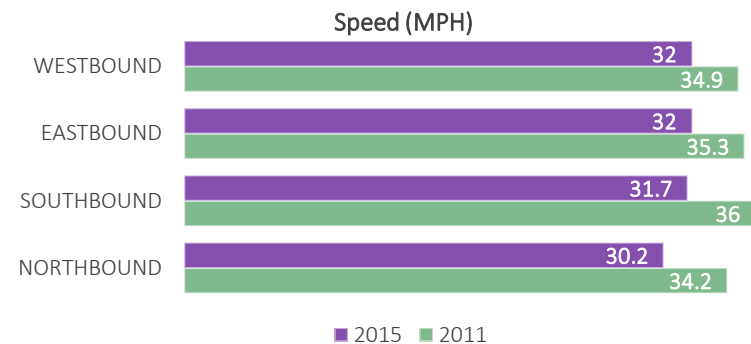
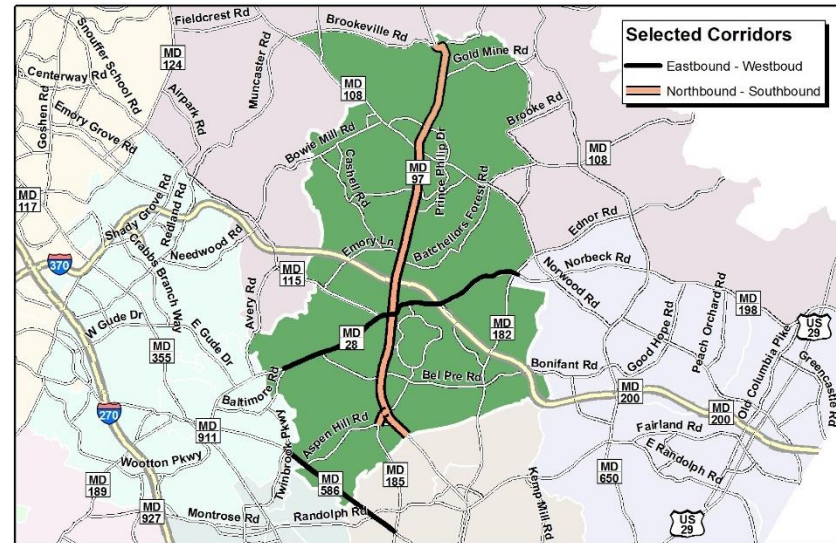


## Aspen Hill and Olney Vicinity

Corridors analyzed in Aspen Hill & Olney include a significant stretch of Georgia Avenue between Randolph Road and Brookeville Road, Norbeck Road between Baltimore Road and Layhill Road, Veirs Mill Road between Twinbrook Parkway and Connecticut Avenue, and a small portion of Connecticut Avenue between Aspen Hill Road and Georgia Ave. The most congested segments are northbound Connecticut Avenue in the evening, and westbound Norbeck Road in the morning both experiencing a severe level of congestion on average throughout the duration of the peak period. Similar to the countywide analysis, since 2011 speed levels have slightly decreased and the Planning Time Index (PTI) has increased. The increase in the PTI may indicate that unexpected delay occurs more often in 2015 than in 2011.

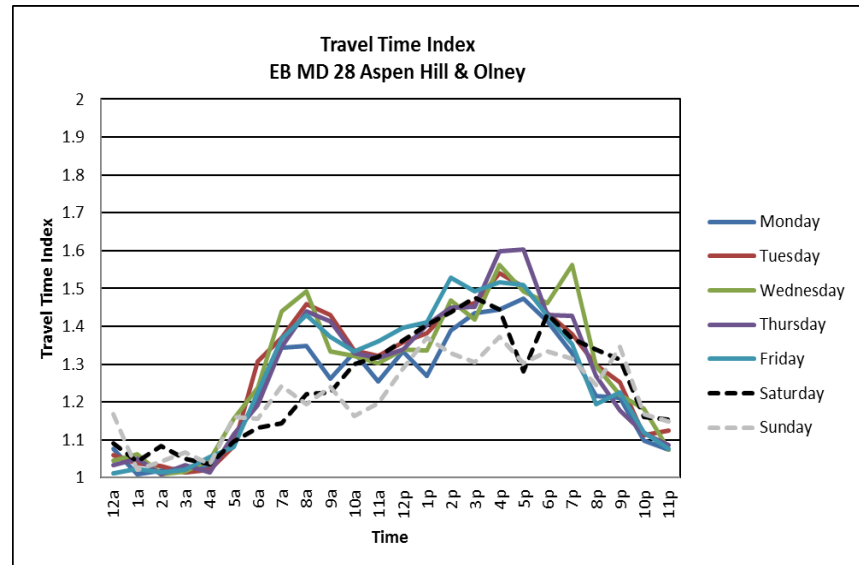
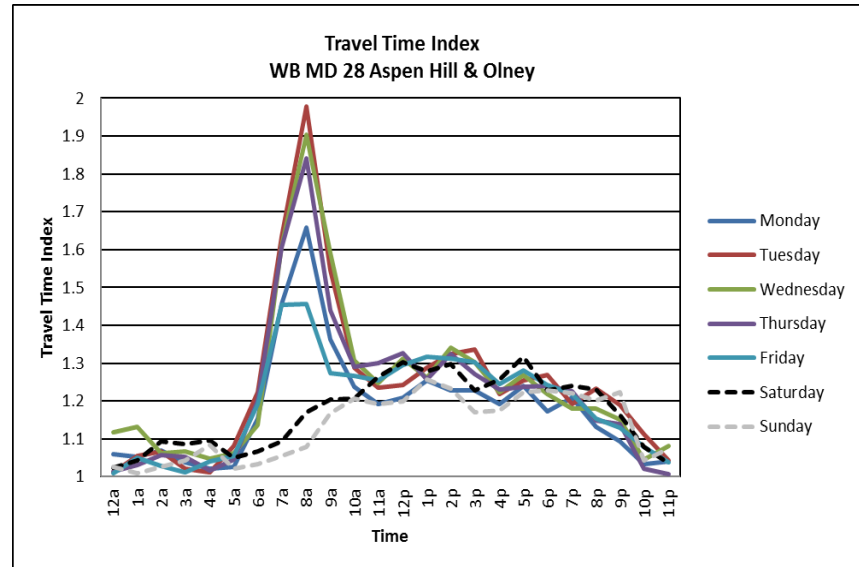
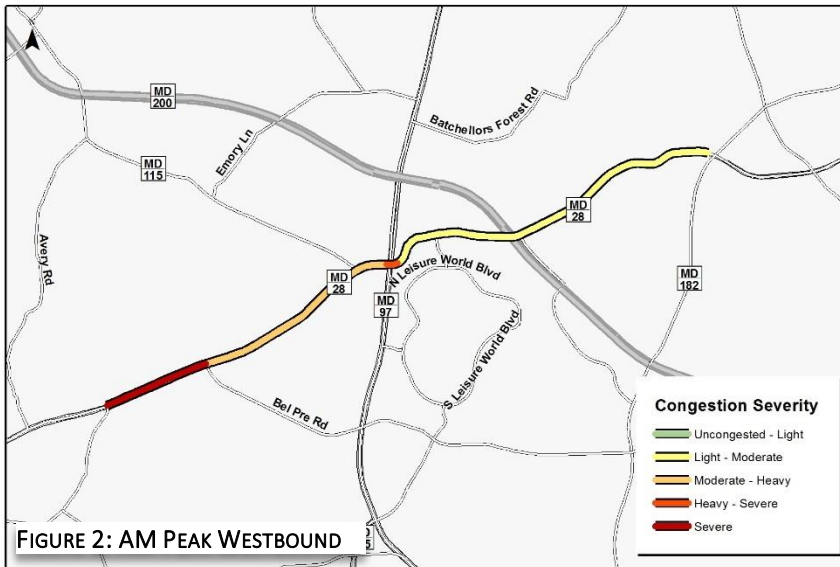
Although the segment of Connecticut Avenue between Aspen Hill Road and Georgia Ave tops the list of congested roadways in Aspen Hill & Olney, Georgia Avenue is analyzed in more detail in lieu of this segment. This is to provide more insight into where congestion occurs along the major north/south corridor in this area. The size of Connecticut Avenue in this vicinity was a result of the reporting segmentation used by the data provider.

Route	Congestion	Direction	Period
MD-185	59%	NORTHBOUND	PM Peak
MD-28	59%	WESTBOUND	AM Peak
MD-28	48%	EASTBOUND	PM Peak
MD-97	44%	NORTHBOUND	PM Peak
MD-185	43%	NORTHBOUND	AM Peak
MD-97	39%	SOUTHBOUND	PM Peak
MD-28	39%	EASTBOUND	AM Peak
MD-185	36%	SOUTHBOUND	PM Peak
MD-97	36%	SOUTHBOUND	AM Peak
MD-185	35%	SOUTHBOUND	AM Peak



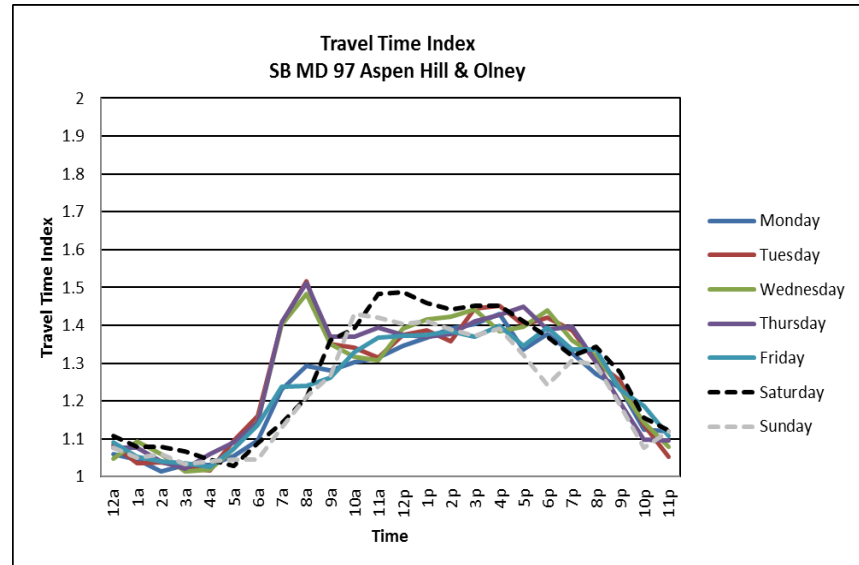
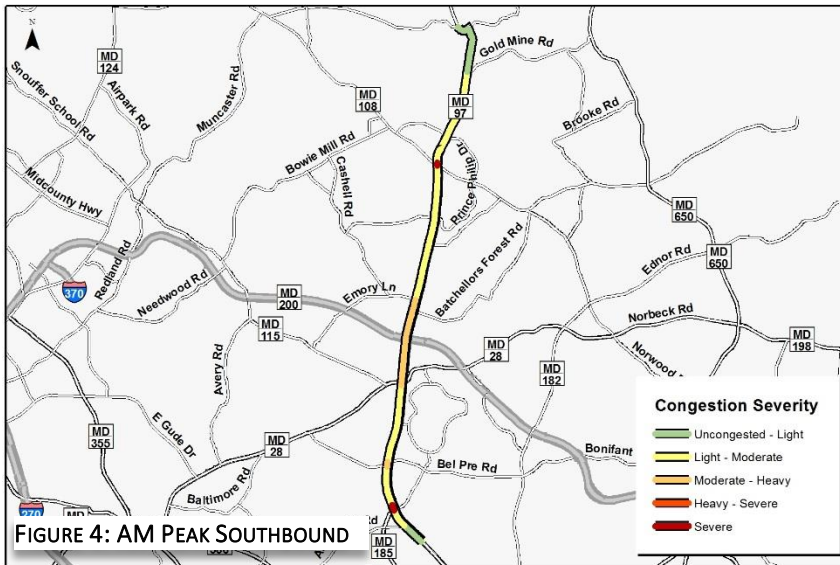
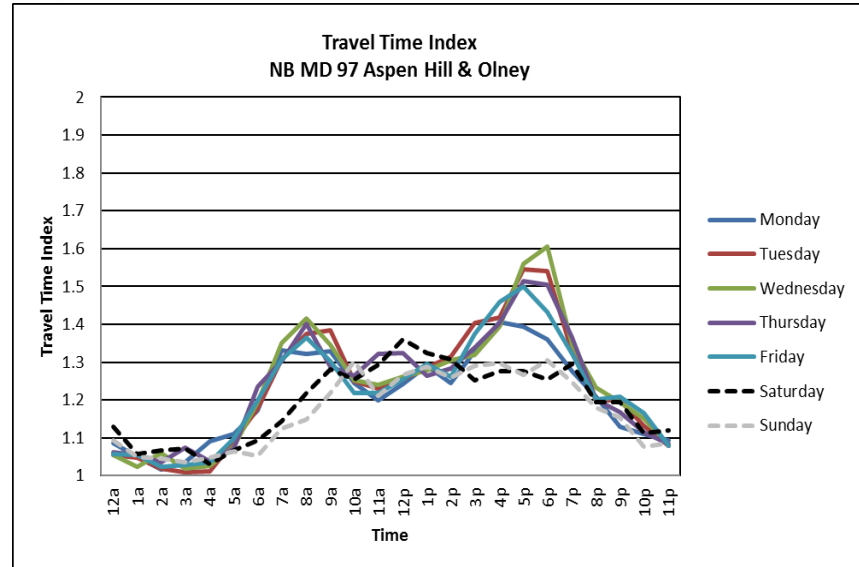
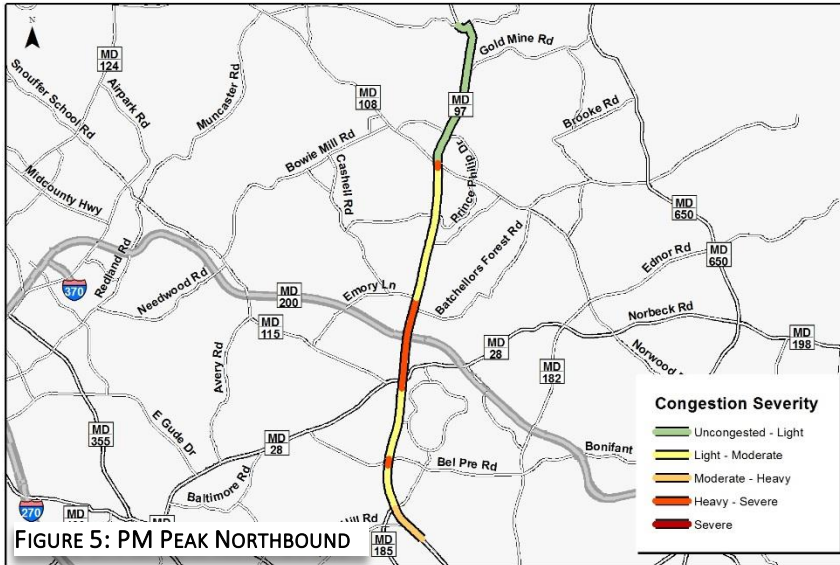
## Norbeck Road (MD 28) from Baltimore Road to MD 182

Norbeck Road experiences very severe congestion particularly in the westbound direction reaching its peak hour at around 8:00 AM. The congestion appears to be at its worst west of Georgia Avenue reaching its maximum congestion between Bel Pre and Baltimore Road. Congestion in the evenings in the eastbound direction is more spread out, and we do not see a sharp peak hour as we do in the morning in the opposite direction.



### Georgia Ave (MD 97) from Aspen Hill Rd to Brookeville Rd

Georgia Avenue experiences its worst congestion during the PM peak period in the northbound direction between five and six in the evening. The stretch between Norbeck Road and Emory Lane experiences heavy to severe congestion levels in the northbound direction in the evenings. The morning commute sees a steady rate of light to moderate congestion reaching periods of heavy congestion around MD-200. The morning commute peaks between seven and eight AM with weekend congestion remaining steady from ten AM to six PM.

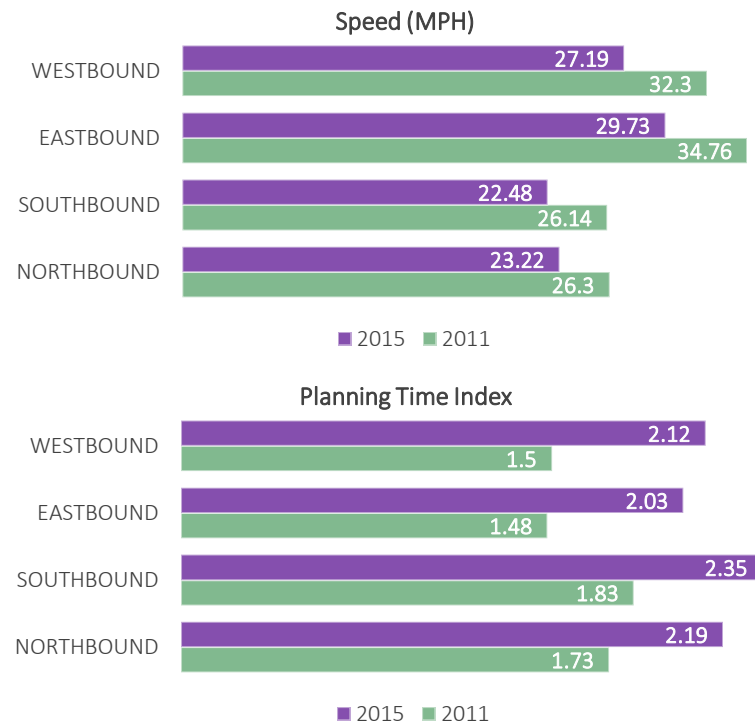
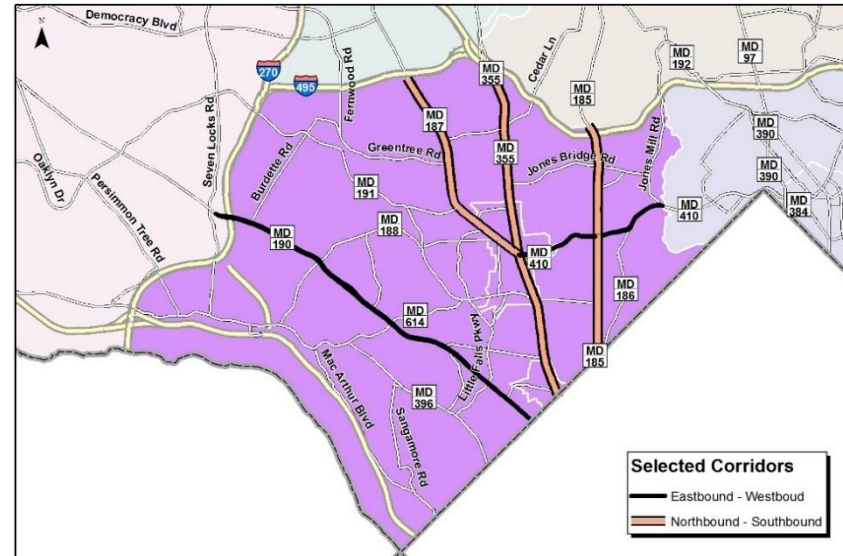


## Bethesda CBD, Bethesda/Chevy Chase, and Friendship Heights

MNCPPC transportation planners analyzed speed data for several corridors in the Bethesda vicinity. These corridors include River Road, MD-355, Connecticut Avenue all between the DC line and the Capital Beltway, Old Georgetown Road between MD-355 and the Capital Beltway, and East-West Highway between Jones Mill Road and MD-355. The most congested section of road is Connecticut Avenue in the southbound direction during the morning rush hour. On average, it takes seventy-eight percent longer to travel through this corridor during the morning rush hour than under normal free-flow conditions. This is followed by East-West Highway in the westbound direction during the morning commute and MD-355 in the northbound direction in the evening commute. The next section will explore Connecticut Avenue and MD-355 in more detail.

An analysis of the historic speed data indicates that the magnitude of the decrease in average speed across all time periods since 2011 is similar to that of the overall County. The PTI, however, has increased in magnitude greater than that of the overall County. For example, the average PTI for westbound traffic in 2015 was 2.12 indicating that twenty-one additional minutes should be allocated for a ten-minute trip to nearly guarantee an on-time arrival. In 2011, five additional minutes was necessary.

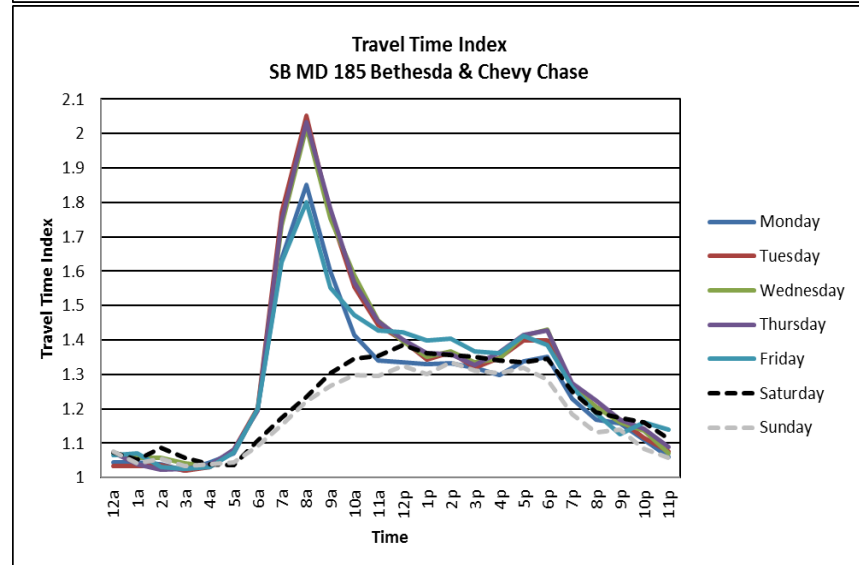
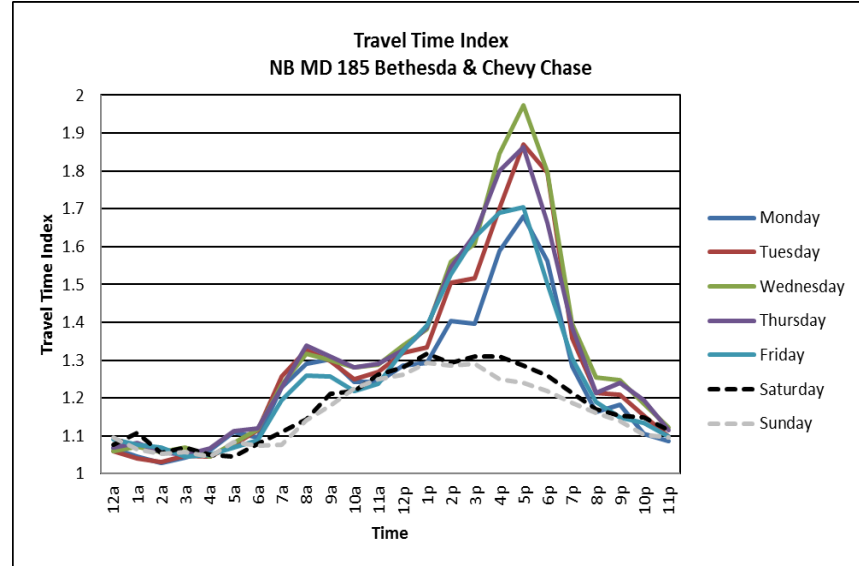
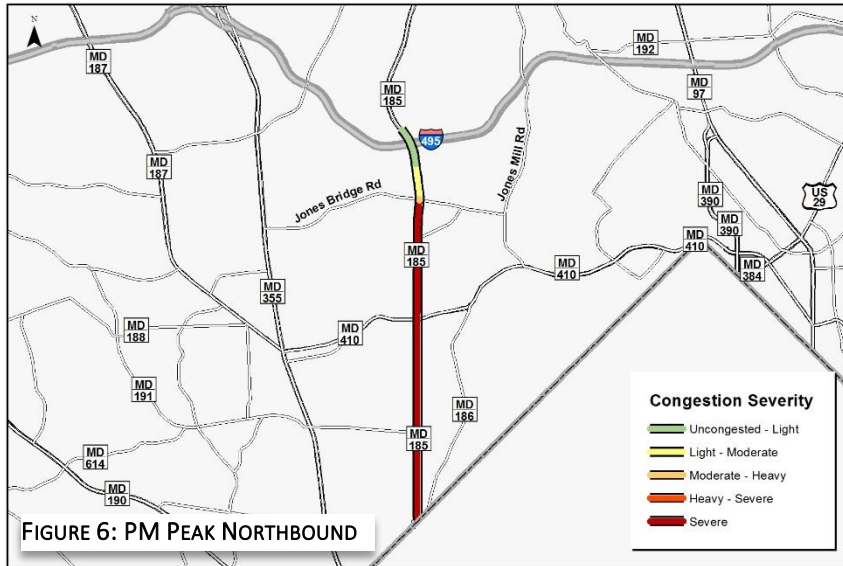
Route	Congestion	Direction	Period
MD-185	78%	SOUTHBOUND	AM Peak
MD-410	66%	WESTBOUND	AM Peak
MD-355	66%	NORTHBOUND	PM Peak
MD-355	64%	SOUTHBOUND	PM Peak
MD-185	64%	NORTHBOUND	PM Peak
MD-355	55%	SOUTHBOUND	AM Peak
MD-190	54%	EASTBOUND	AM Peak
MD-187	50%	NORTHBOUND	PM Peak
MD-410	45%	EASTBOUND	PM Peak
MD-410	41%	WESTBOUND	PM Peak





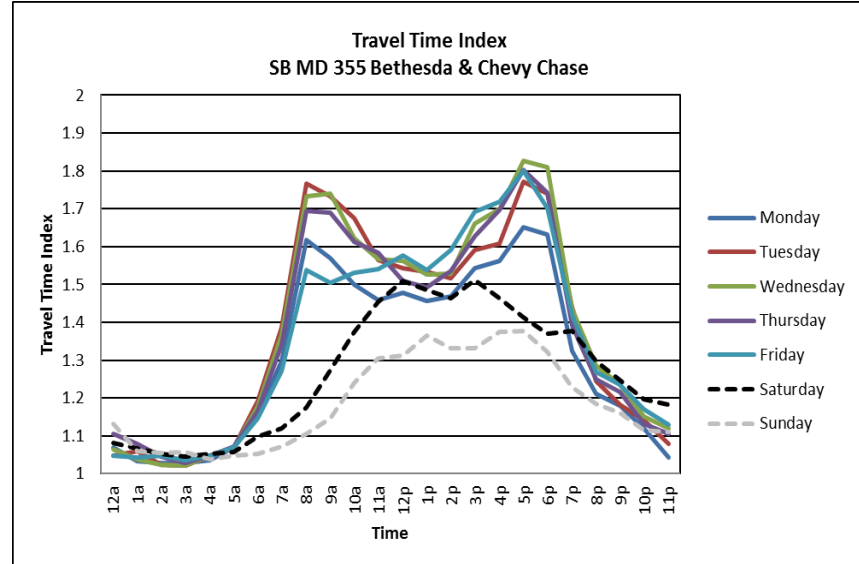
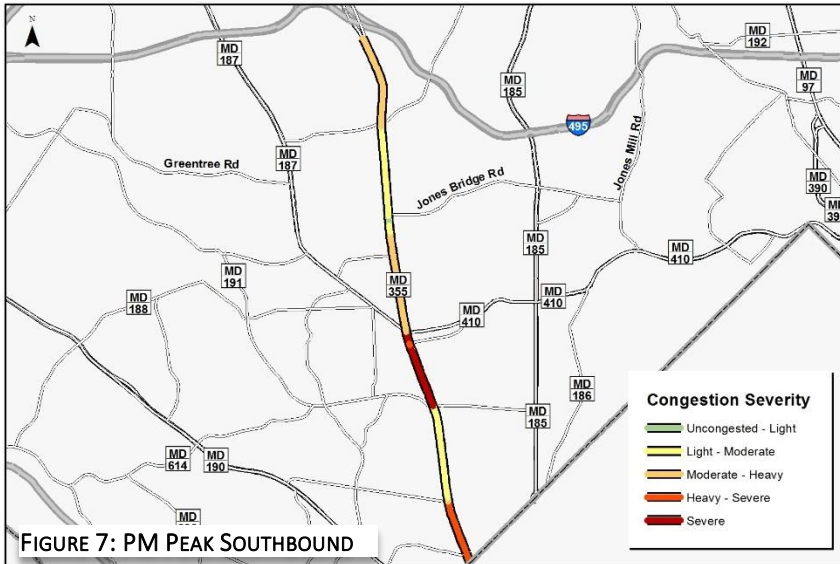
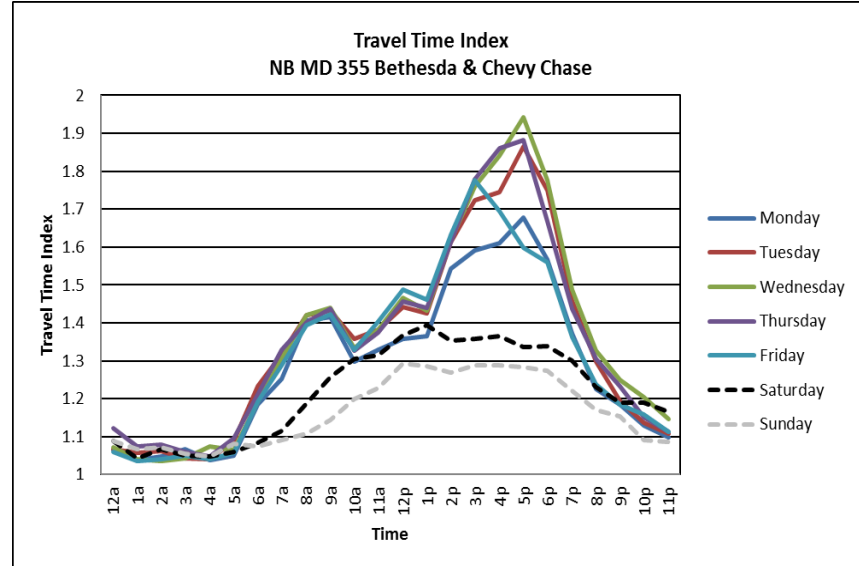
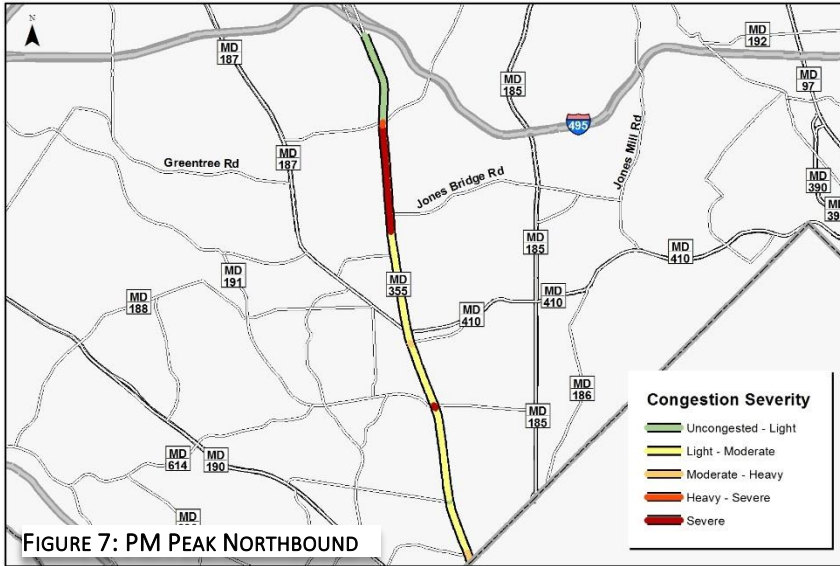
## Connecticut Avenue (MD 185) from DC line to Capital Beltway

Connecticut Avenue experiences two distinct and significant rises in congestion during the morning and evening commutes. In the morning, the TTI peaks at over two (one hundred percent congestion implying it takes twice as long to traverse the section of road) at eight in the morning Tuesday, Wednesday, and Thursday. The worst congestion occurs between the beltway and East-West Highway. In the evening, the TTI approaches two, particularly on Wednesdays, around six PM. Congestion in the evening is concentrated between the DC line and Jones Bridge Road.



### MD-355 from DC line to Capital Beltway

MD-355 is somewhat unusual due to the fact that both directions experience similar congestion during the evening commute. This is likely due to the extraordinary large employment center made up of NIH and the Walter Reed Medical Center. MD-355 southbound congestion is not as unilateral as northbound congestion having two similar peaks during the morning and evening commutes. The evening commute is shown for both directions. Northbound congestion in the evening is severe around NIH and Walter Reed where it is concentrated further south in the southbound direction.

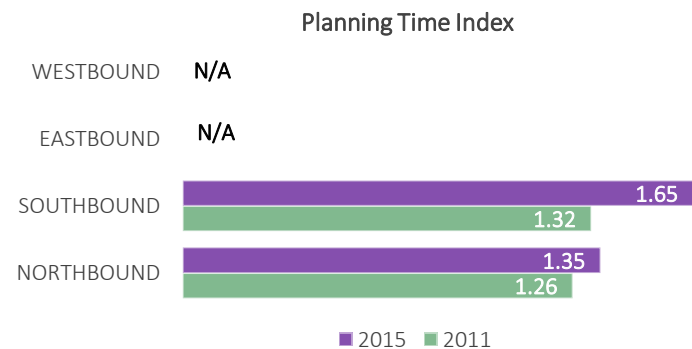
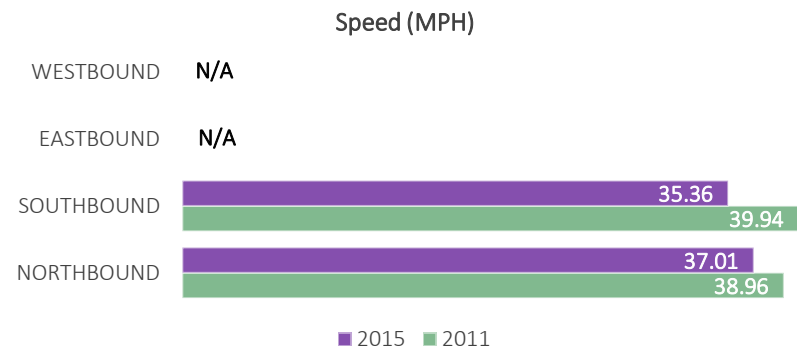


## Clarksburg

Transportation planners analyzed speed data for Frederick Road (MD-355) between Brink Road and Comus Road and Ridge Road (MD-27) between Brink Road and Davis Mill Road in the Clarksburg vicinity. The most congested roadway in Clarksburg is Ridge Road in the southbound direction during the morning commute. According to speed data collected in 2015, commuters can expect travel times to take twice as long as it would under normal conditions. This was likely in part caused by construction activity due to the expansion of Ridge Road from the new intersection at Snowden Farm Parkway to Brink Road. Other corridors in the Clarksburg area experience light to moderate congestion during peak periods.

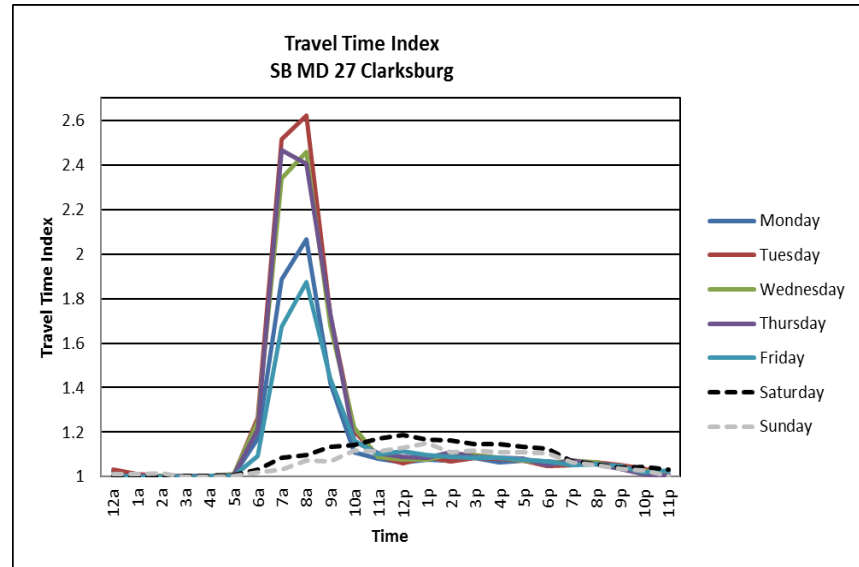
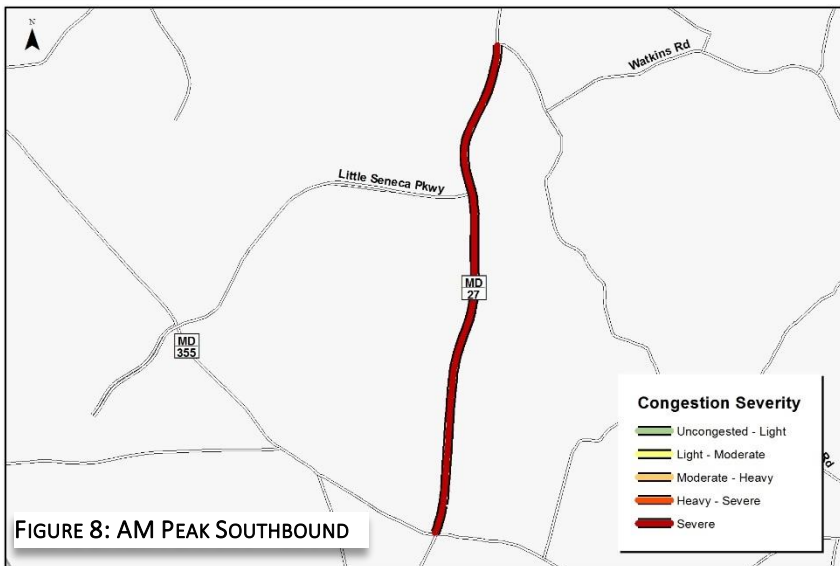
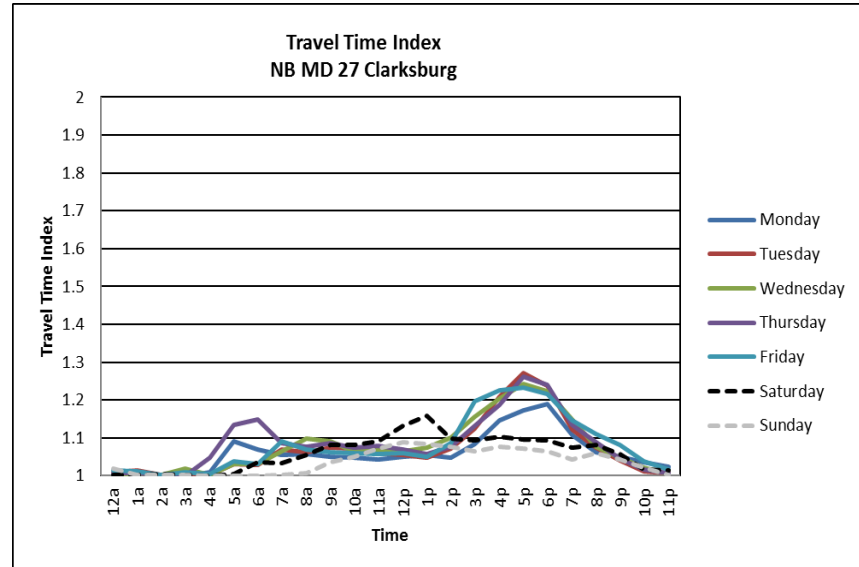
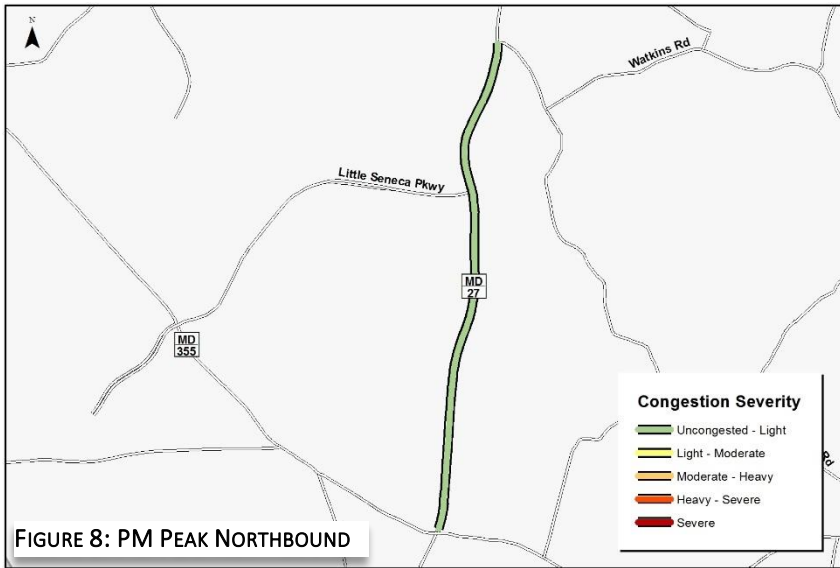
Northbound speed and travel time reliability experienced very little change from 2011 to 2015. Southbound speed and travel time reliability, as indicated by the rise in the PTI, decreased more dramatically than the northbound direction. This was also likely impacted by the construction activity along Ridge Road. For example, travelers in the southbound direction during 2015 on average needed to allocate an additional six and one-half minutes for a typical 10-minute trip to arrive on schedule ninety-five percent of the time.

Route	Congestion	Direction	Period
MD-27	102%	SOUTHBOUND	AM Peak
MD-355	33%	SOUTHBOUND	AM Peak
MD-27	20%	NORTHBOUND	PM Peak
MD-355	10%	NORTHBOUND	PM Peak
MD-27	7%	NORTHBOUND	AM Peak
MD-355	7%	NORTHBOUND	AM Peak
MD-27	7%	SOUTHBOUND	PM Peak
MD-27	6%	SOUTHBOUND	Off Peak
MD-355	6%	SOUTHBOUND	PM Peak
MD-355	5%	SOUTHBOUND	Off Peak



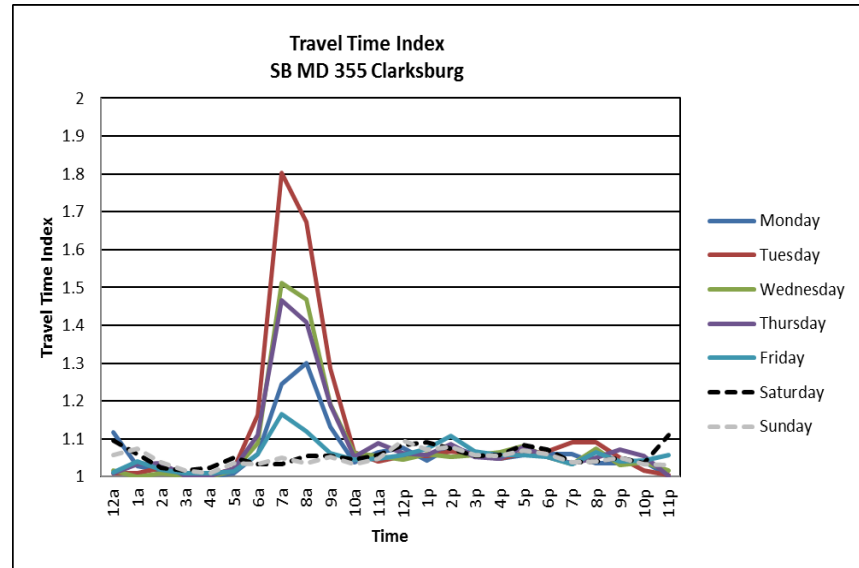
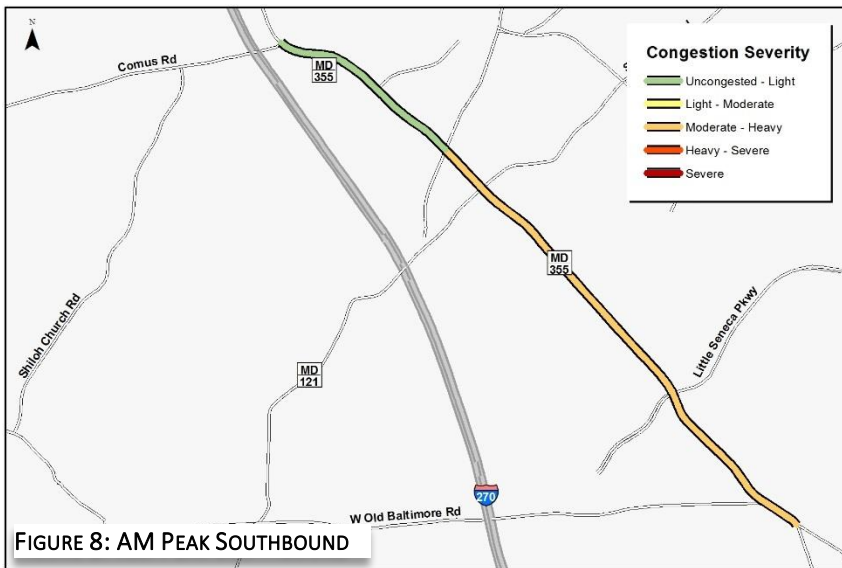
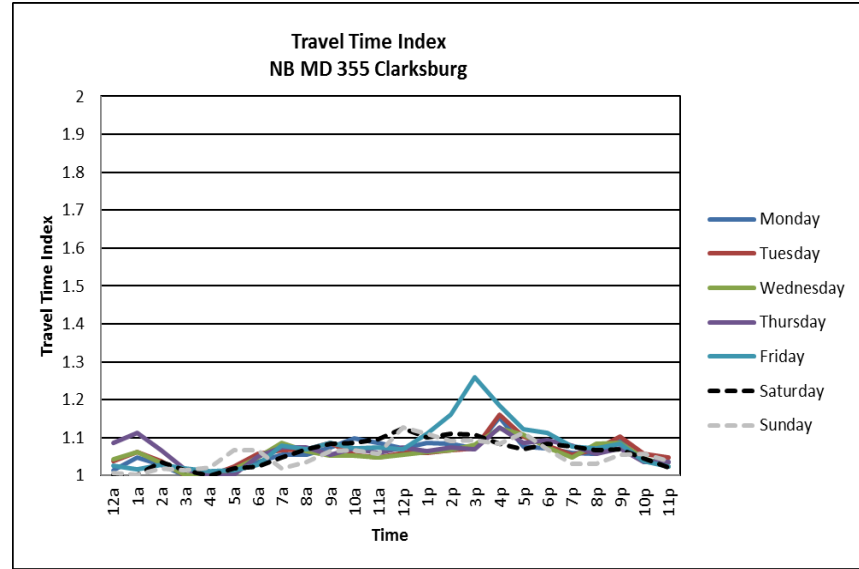
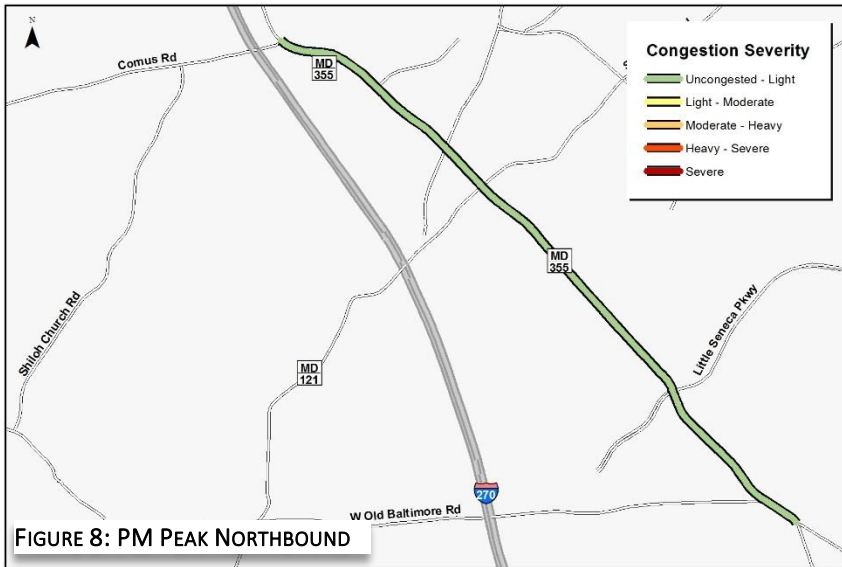
### Ridge Road (MD-27) from Brink Road to Davis Mill Road

Ridge Road from Brink Road to Davis Mill Road experiences a stark peak in congestion during the morning commute at around eight AM in the southbound direction. As mentioned in the previous sections, this may be partly due to the construction related to the widening of Ridge Road from Snowden Farm Parkway to Brink Road. Ridge Road in the northbound direction experiences an increase in congestion during the evening commute but at levels nowhere close to the morning commute heading south.



### Frederick Road (MD-355) from Brink Road to Comus Road

As with Ridge Road, the morning commute is significantly more congested than the evening commute. Southbound congestion becomes moderate to heavy south of Clarksburg Road during the morning commute. Northbound congestion remains uncongested with the exception of Friday afternoon where congestion reaches the low end of the light to moderate range at round three in the afternoon.

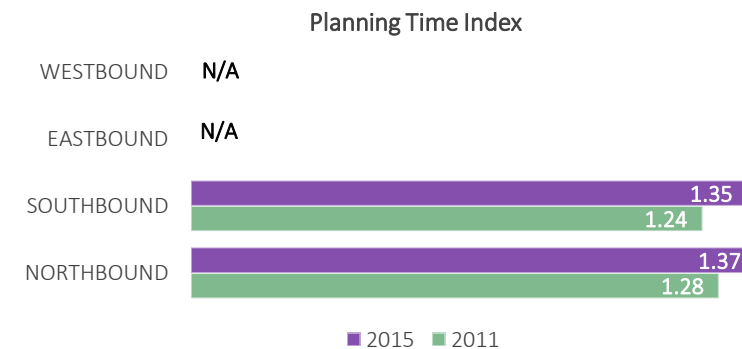
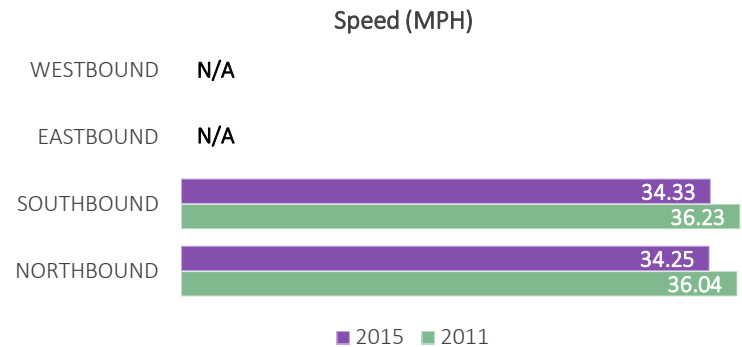
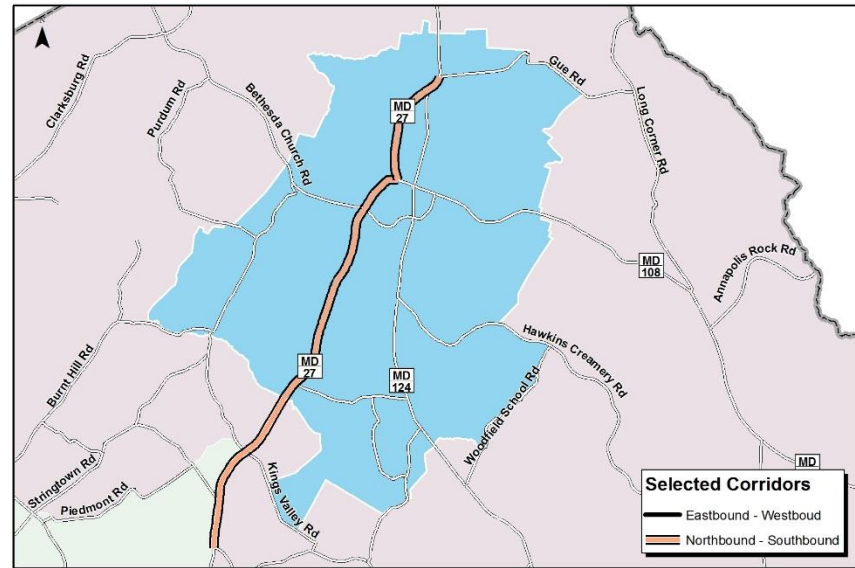


## Damascus

Transportation planners analyzed Ridge Road between Davis Mill Road and Gue Road. The southern section of this corridor, although outside of the Damascus Policy Area, was included in this analysis due to the segmentation used by the data provider. Most of the Damascus Policy Area remains rural with a majority of the non-residential development occurring within a mile radius of the intersection of Ridge Road, Woodfield Road (MD-124), and MD-108. The most congested direction and time for Ridge Road is southbound during the morning commute. Congestion during this time is still relatively light with a 10-minute trip through this corridor during free flow conditions only taking an additional 1.6 minutes during the morning commute. This is closely followed by southbound and northbound travel during the evening commute.

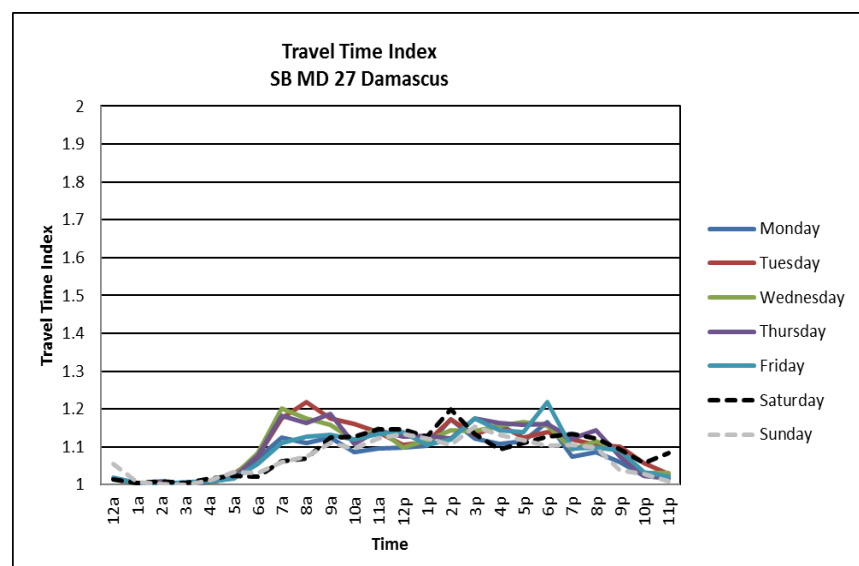
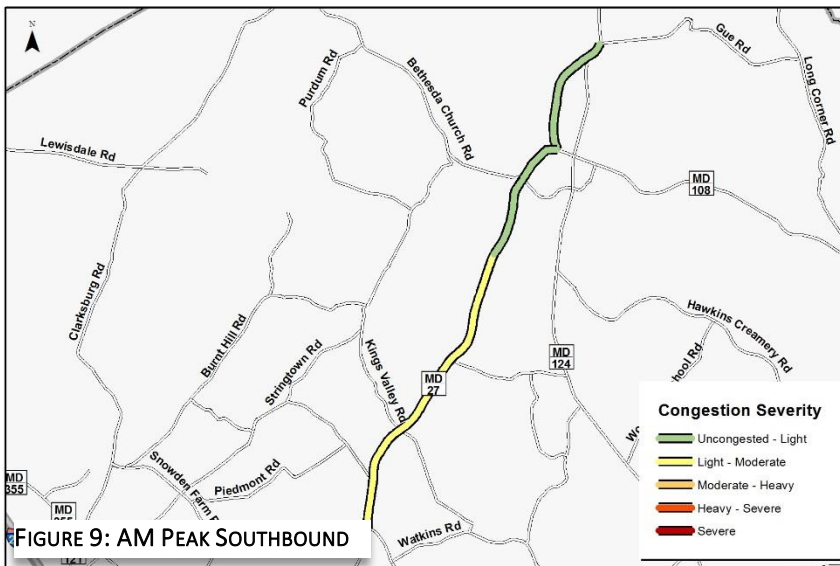
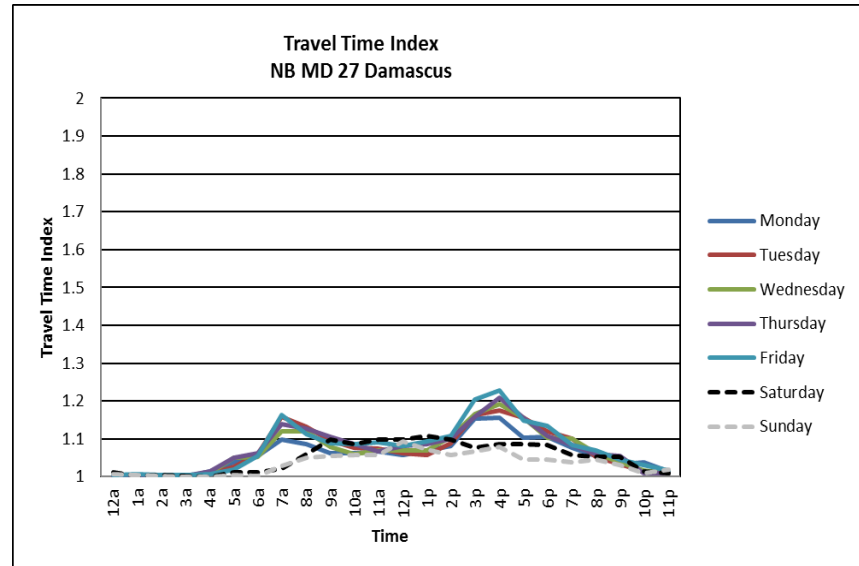
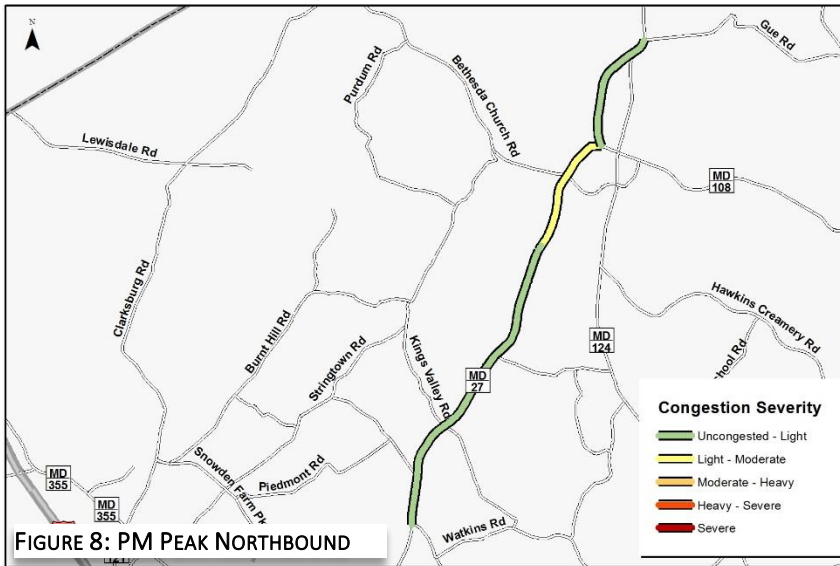
Historical data indicates that speed has decreased slightly, but below the rate countywide. The planning time index has only slightly increased indicating that Ridge Road’s reliability and predictability has remained steady since 2011. In 2015, a ten-minute trip through the corridor heading south would require thirteen and one-half minutes to complete the trip ninety-five percent of the time. In 2011, the same trip required just over twelve minutes to complete the trip ninety-five percent of the time.

Route	Congestion	Direction	Period
MD-27	16%	SOUTHBOUND	AM Peak
MD-27	14%	SOUTHBOUND	PM Peak
MD-27	14%	NORTHBOUND	PM Peak
MD-27	11%	NORTHBOUND	AM Peak
MD-27	7%	SOUTHBOUND	Off Peak
MD-27	5%	NORTHBOUND	Off Peak



## Ridge Road (MD-27) from Davis Mill Road to Gue Road

Congestion along Ridge Road appears to taper off significantly compared to the section analyzed in Clarksburg. Southbound congestion during the morning commute is heaviest south of Oak Drive approaching Davis Mill Road, but remains light to moderate. Commuters during the evening rush in the northbound direction experience light to moderate congestion north of Oak Drive to downtown Damascus.

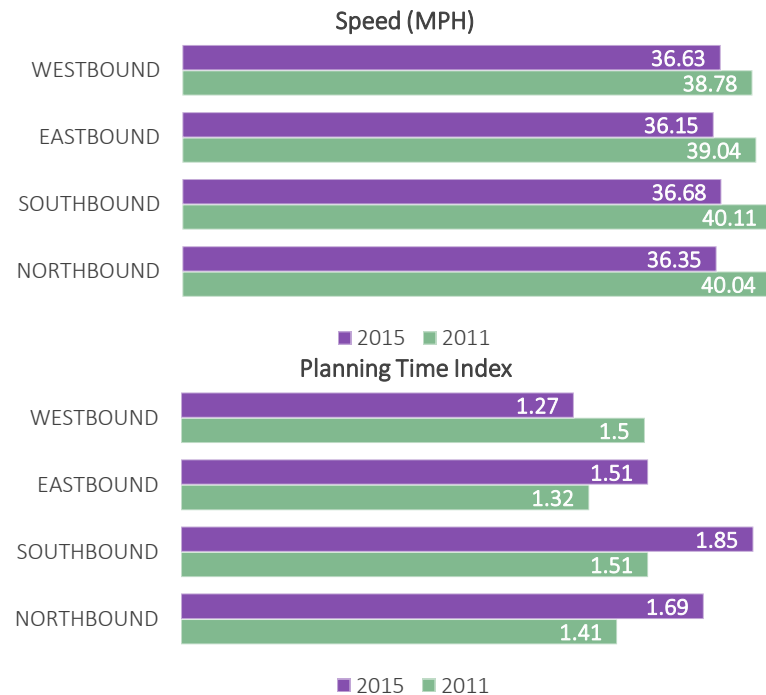
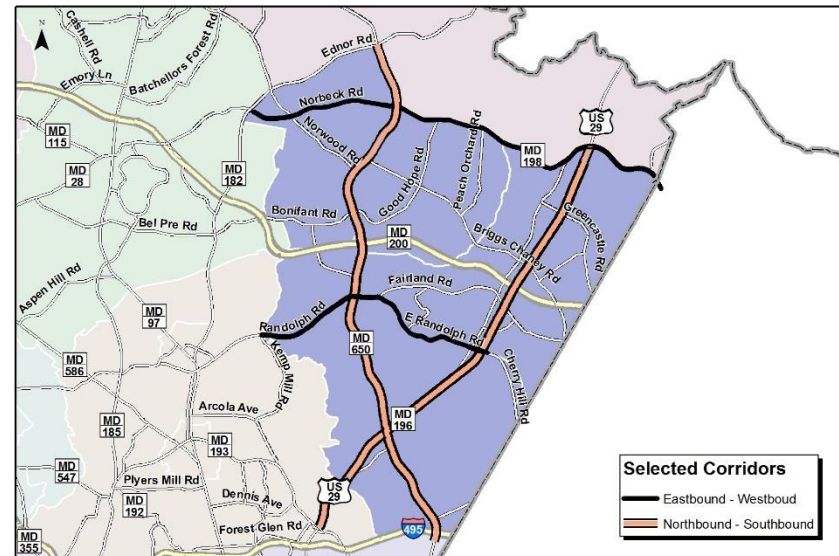


## Cloverly, Fairland/Colesville, White Oak

Transportation planners analyzed two east-west and two north-south corridors in the Cloverly, Fairland/Colesville, and White Oak Policy Areas. The east-west corridors are MD-198/MD-28 between Layhill Road and the Prince George’s County line and Randolph Road between Kemp Mill Road and US-29. The north-south corridors are Columbia Pike (US-29) between University Boulevard and MD-198 and New Hampshire Avenue (MD-650) between the Capital Beltway and Ednor Road. Columbia Pike experiences the greatest amount of congestion in the southbound direction during the morning commute with an average congestion of seventy-three percent. This indicates that it takes, on average, seventy-three percent more time to commute by car through this corridor in the southbound direction during the morning commute than under normal conditions. As will be shown in the next section, a majority of the congestion is concentrated in the southern part of the corridor. New Hampshire Avenue also in the southbound direction during the morning commute is a distant second at forty-eight percent congestion.

Historical data indicates that speeds have decreased and the PTI has increased more for the northbound/southbound corridors than the eastbound/westbound corridors. Travel times appear to be the most unpredictable, as indicated by a larger PTI, in the southbound direction of travel along New Hampshire Avenue and Columbia Pike.

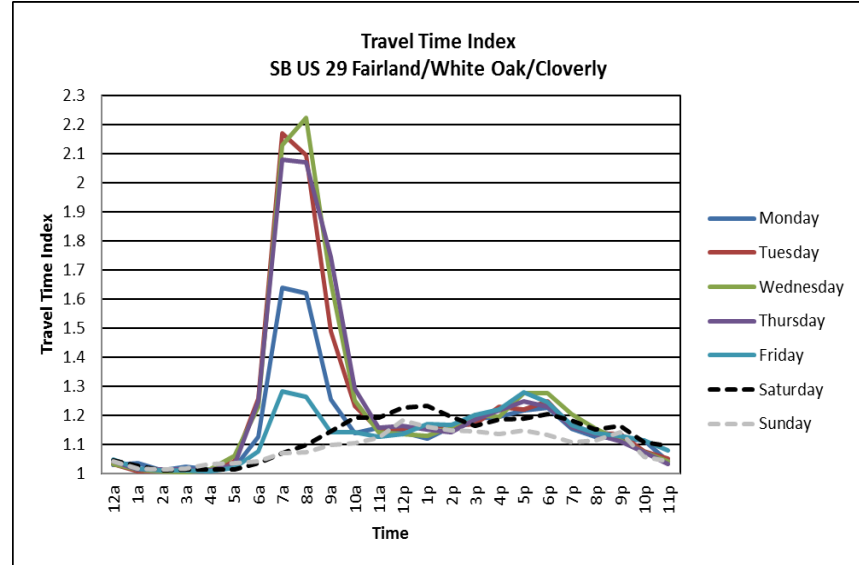
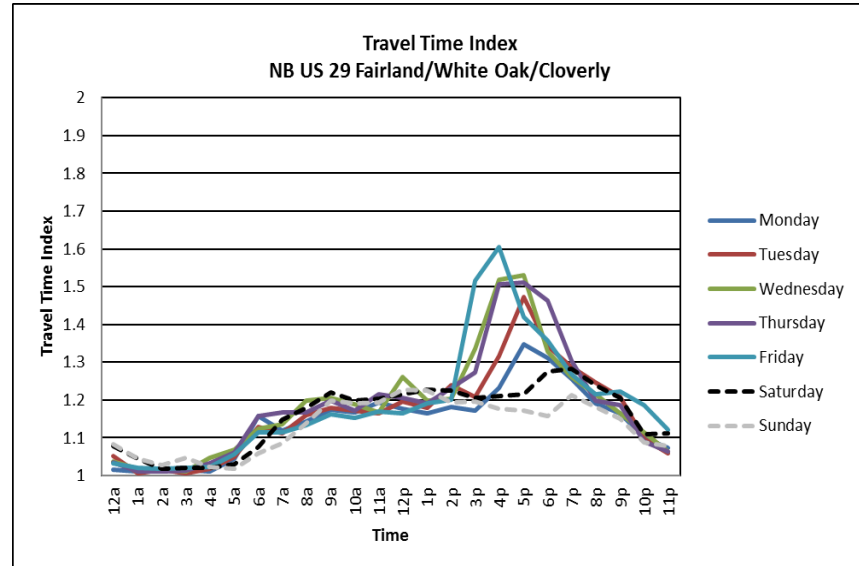
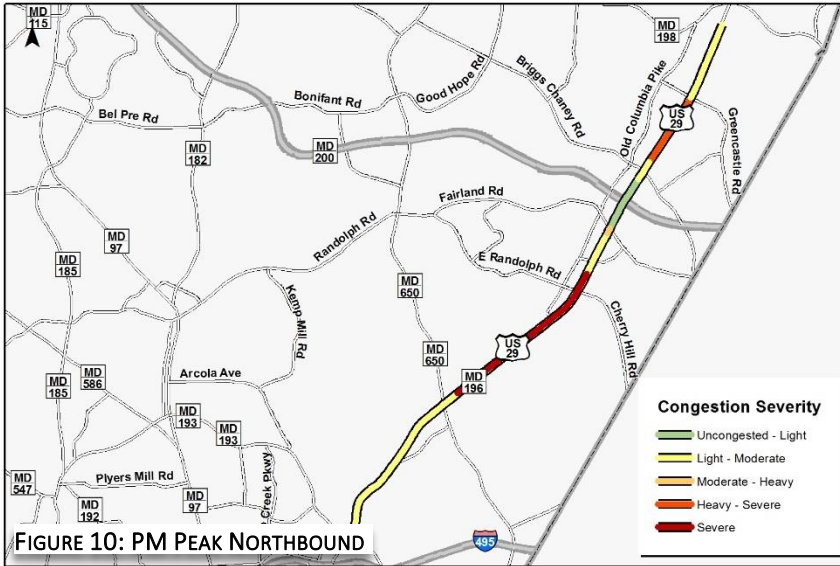
Route	Congestion	Direction	Period
US-29	73%	SOUTHBOUND	AM Peak
MD-650	48%	SOUTHBOUND	AM Peak
RANDOLPH RD	40%	EASTBOUND	AM Peak
US-29	39%	NORTHBOUND	PM Peak
MD-650	35%	SOUTHBOUND	PM Peak
MD-28	33%	WESTBOUND	AM Peak
MD-198	32%	EASTBOUND	PM Peak
MD-650	32%	NORTHBOUND	PM Peak
MD-198	30%	EASTBOUND	AM Peak
RANDOLPH RD	30%	WESTBOUND	PM Peak





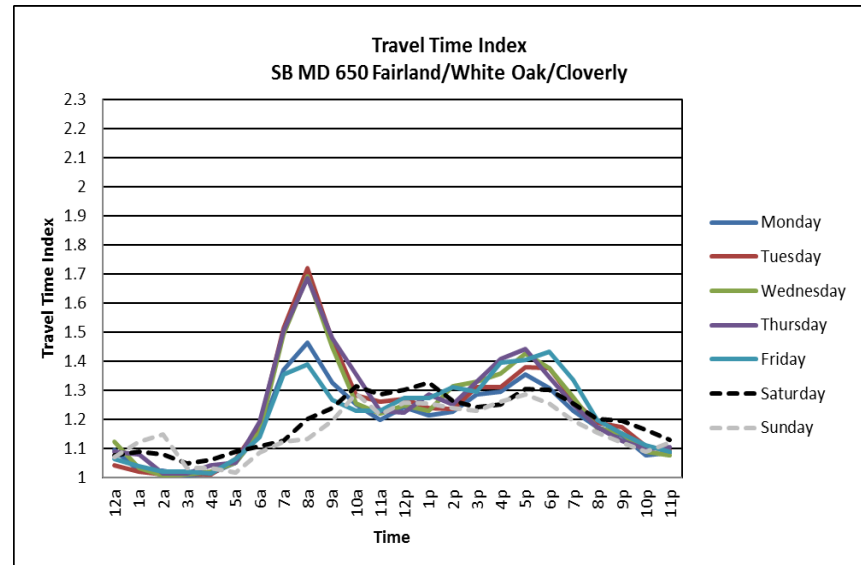
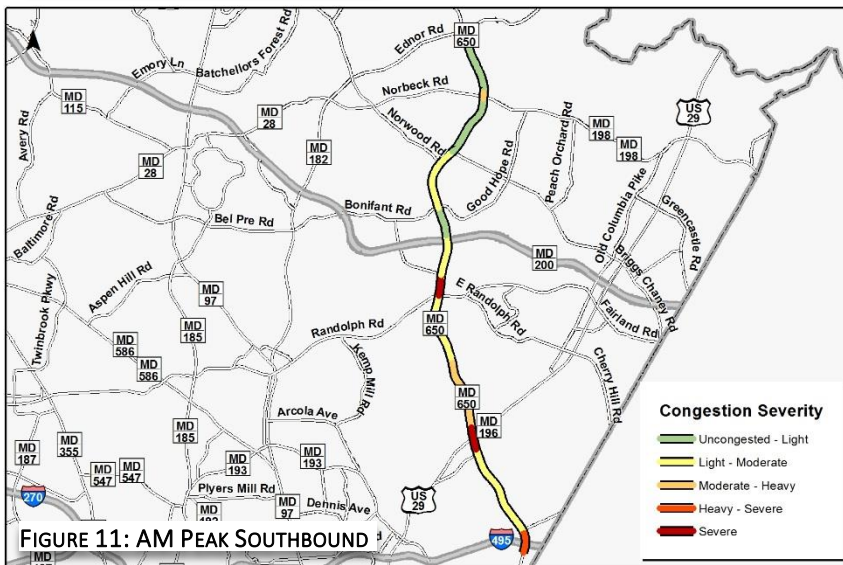
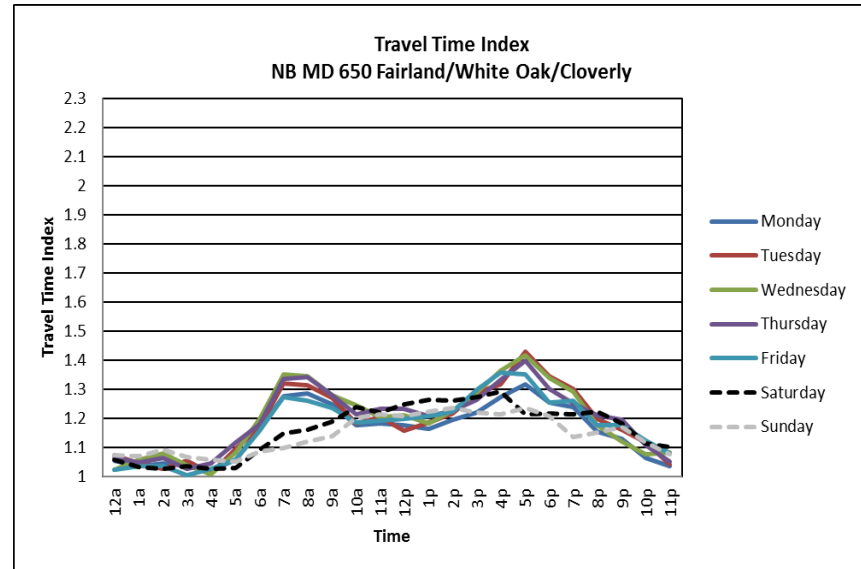
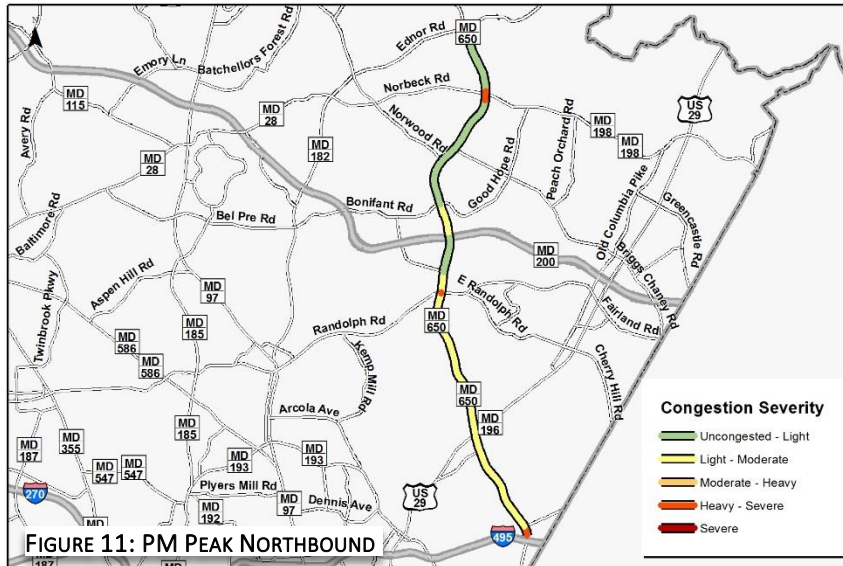
## Columbia Pike (US-29) from University Boulevard to MD-198

Columbia Pike experiences two distinct peak periods. The morning commute sees a swift increase in congestion at seven AM located primarily south of Randolph/Cherry Hill Road. The TTI in this section of the corridor approaches two (one hundred percent congestion) suggesting it requires double the amount of time to travel through during the morning commute than under normal conditions. Car commuters in the northbound direction during the evening commute typically experience the worst congestion between New Hampshire Avenue and Randolph/Cherry Hill Road.



## New Hampshire Avenue (MD-650) from Capital Beltway and Ednor Road

New Hampshire Avenue's heaviest congestion appears to occur during the morning commute in the southbound direction. During the morning commute, congestion shifts from periods of light/moderate to severe congestion from MD-200 south to the Capital Beltway. A moderate to severe level of congestion frequently occurs just to the north of the Food and Drug Administration's (FDA) headquarters. Levels of congestion are actually similar during the evening commute in both directions perhaps influenced by FDA commuters accessing the beltway and points to the south.

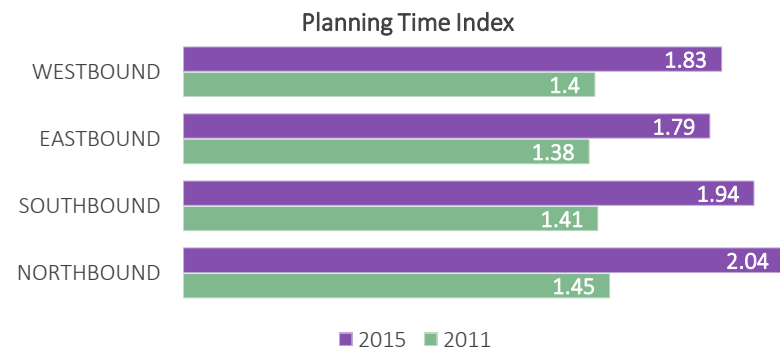
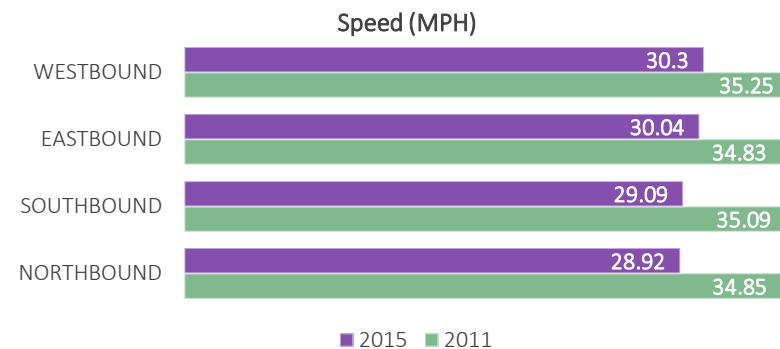
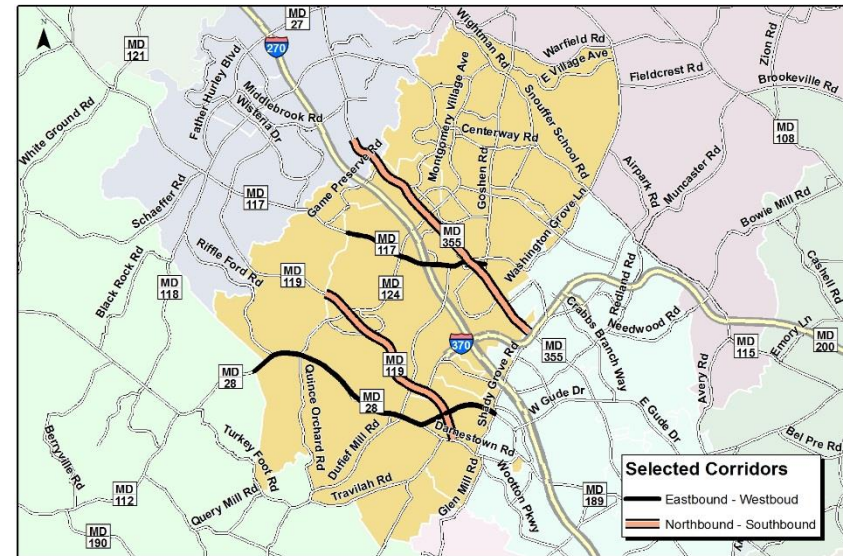


## Gaithersburg, R&D Village, North Potomac, & Montgomery Village

Transportation planners analyzed two east-west and two north-south corridors in the Gaithersburg, R&D Village, North Potomac, and Montgomery Village Areas. The east-west corridors are Clopper Road (MD-117) between Longdraft Road and South Summit Ave, and Darnestown Road/Key West Ave (MD-28) between Jones Lane and Shady Grove Road. The north-south corridors consist of Great Seneca Highway (MD-119) between Longdraft Road and Darnestown Road and Frederick Road (MD-355) between I-370 and Plummer Drive. This section of the county is somewhat unusual in that the top five congested roadways are all during the evening commute. This may indicate that commuters are trip-chaining during the afternoon commute to fulfill other errands.

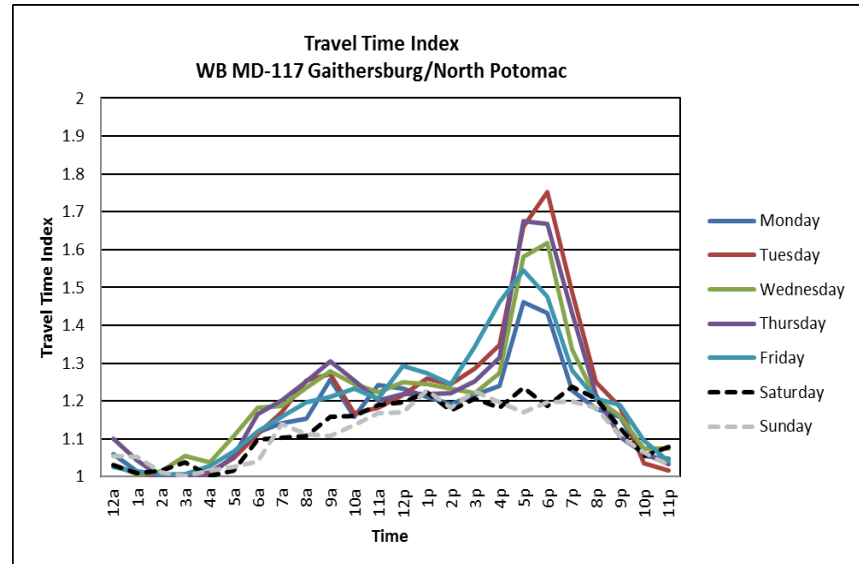
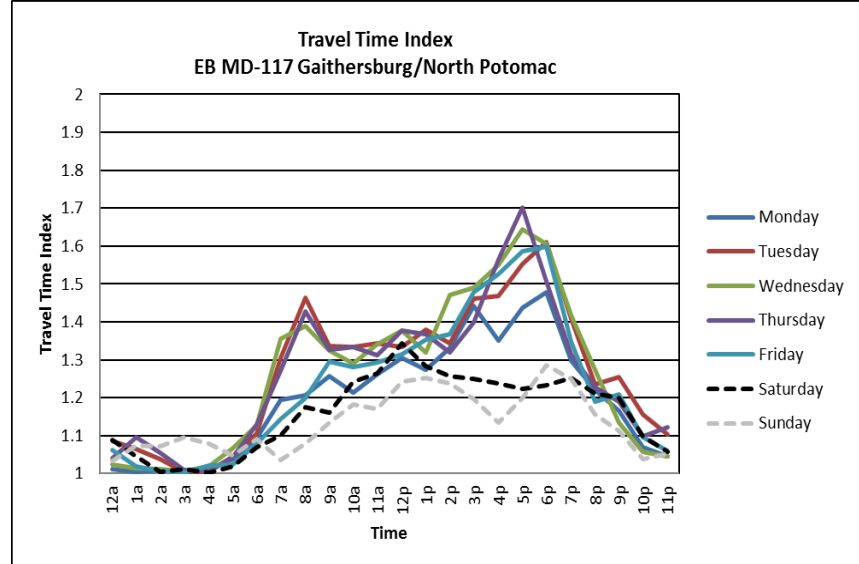
Historical data indicates that this area of the county has seen an increase in congestion since 2011 that is greater than what is found throughout other sections of the county. Speeds have decreased an average of 5.4 MPH across the policy areas with the north and southbound directions experiencing a greater decrease. The PTI has also increased by an average of almost one-half. This indicates that ninety-fifth percentile travel time has increased significantly.

Route	Congestion	Direction	Period
MD-117	50%	EASTBOUND	PM Peak
MD-117	47%	WESTBOUND	PM Peak
MD-355	46%	NORTHBOUND	PM Peak
GREAT SENECA HWY	46%	NORTHBOUND	PM Peak
MD-355	38%	SOUTHBOUND	PM Peak
MD-28	37%	WESTBOUND	AM Peak
MD-28	34%	EASTBOUND	PM Peak
MD-28	34%	WESTBOUND	PM Peak
GREAT SENECA HWY	34%	NORTHBOUND	AM Peak
GREAT SENECA HWY	33%	SOUTHBOUND	PM Peak



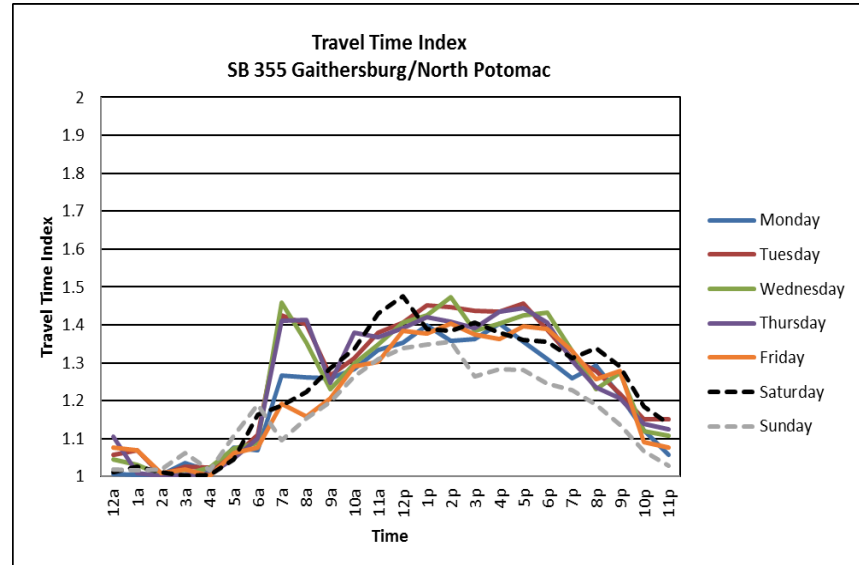
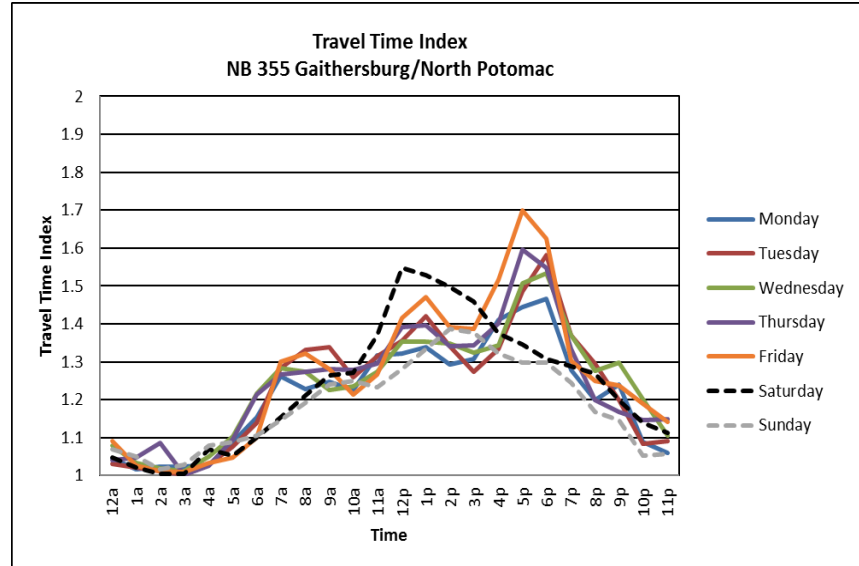
### Clopper Road (MD-117) from Longdraft Road to South Summit Ave

Clopper Road is most congested during the evening commute in both travel directions. Eastbound congestion is centered east of I-270 and westbound congestion is heaviest west of I-270 during the evening commute. The draw of the National Institute of Standards and Technology, a major employer, coupled with commuters exiting northbound I-270 to access Gaithersburg to the east and South Germantown to the west likely contributes to this corridor's bi-direction congestion during the evening commute.



### Frederick Road (MD-355) from I-370 to Plummer Drive

Frederick Road from I-370 to Plummer Drive provides access to many businesses, employment centers, activity centers, apartments, and Gaithersburg High School. Northbound congestion peaks during the evening but remains steady throughout the day including on the weekend which indicates the roadway provides mobility for many non-work trips. Congestion in the southbound direction does see a peak Tuesday through Thursday, but remains consistent throughout the day.

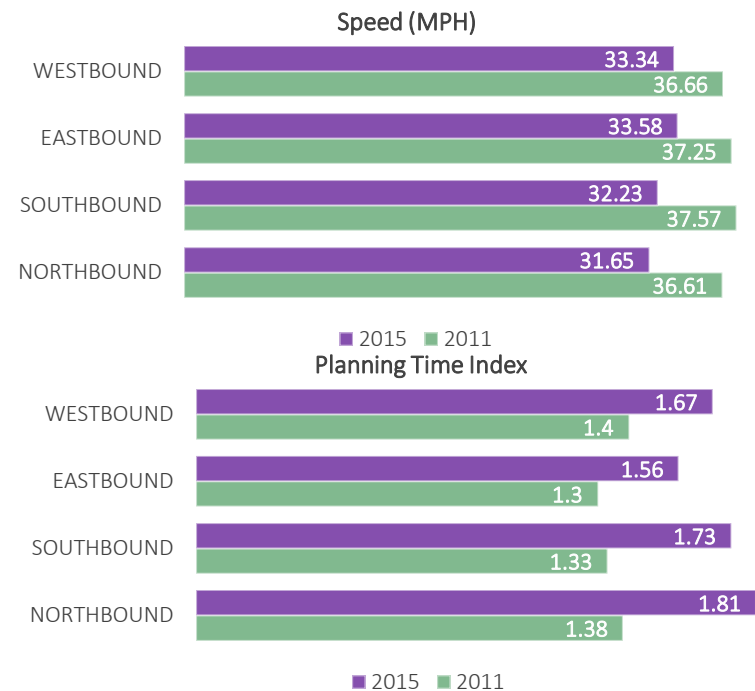
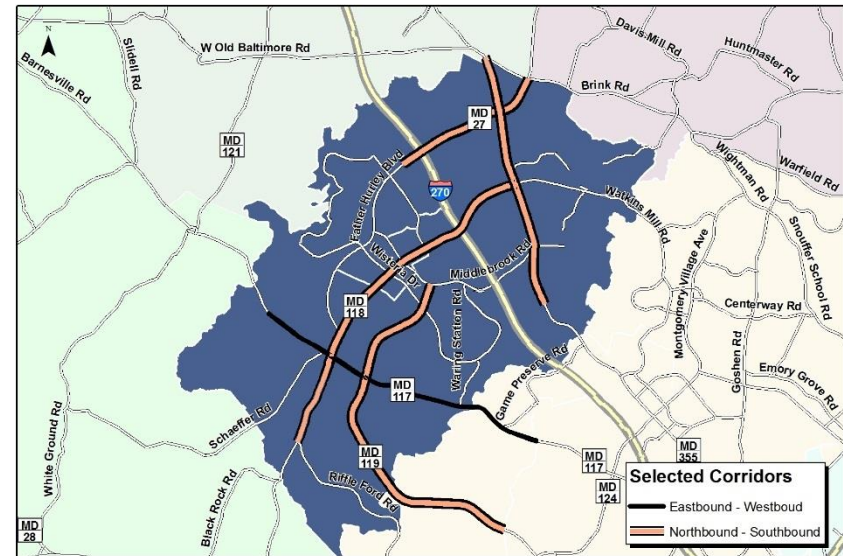


## Germantown Town Center, Germantown East, Germantown West

In the Germantown area, transportation planners analyzed several corridors. The corridors are Frederick Road (MD-355) from Plummer Road to Brink Road, Ridge Road (MD-27) from Brink Road to Century Boulevard, Germantown Road (MD-118) from Frederick Road to Riffle Ford Road, Great Seneca Highway (MD-119) from Middlebrook Road to Longdraft Road, and finally Clopper Road (MD-117) from Longdraft Road to Richter Farm Road. Similar to the Gaithersburg area, the top five congested roads all occur during the evening’s commute indicating the addition of non-work trips play a significant role in the area’s cogestion. Frederick Road has the highest congestion rate of the area taking an average of forty-nine percent longer to travel through the corridor during the evening commute in the northbound direction. Clopper Road in the westbound direction, also during the evening commute, takes an average forty-two percent longer to travel through.

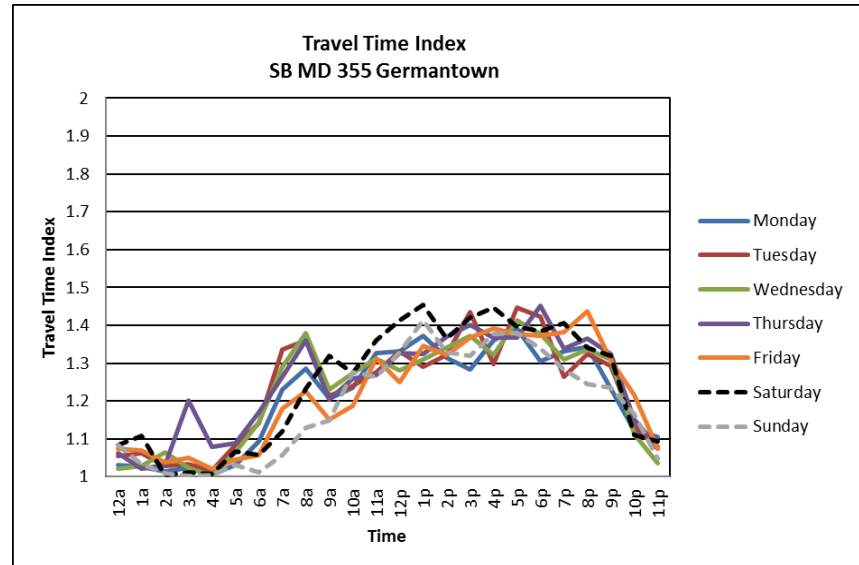
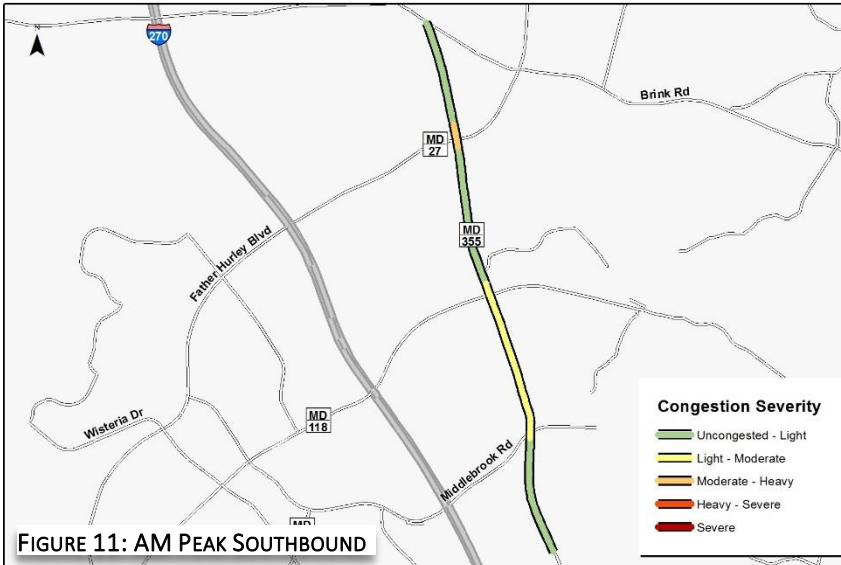
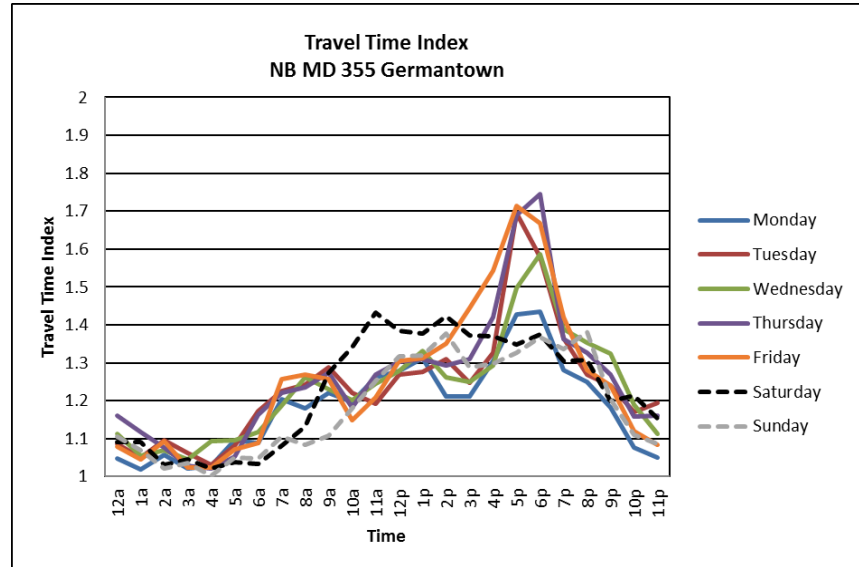
Examining historical speed and travel time reliability data indicates that speeds have decreased on average on par with the overall county. The PTI has increased, on average, slightly less than the overall county. Northbound congestion has experience the greatest increases in the PTI and decreases in speed.

Route	Congestion	Direction	Period
MD-355	49%	NORTHBOUND	PM Peak
MD-117	42%	WESTBOUND	PM Peak
MD-355	37%	SOUTHBOUND	PM Peak
MD-27	35%	NORTHBOUND	PM Peak
MD-118	34%	SOUTHBOUND	PM Peak
MD-118	32%	SOUTHBOUND	AM Peak
GREAT SENECA HWY	30%	NORTHBOUND	AM Peak
MD-117	28%	EASTBOUND	PM Peak
MD-118	28%	NORTHBOUND	PM Peak
MD-355	26%	SOUTHBOUND	AM Peak



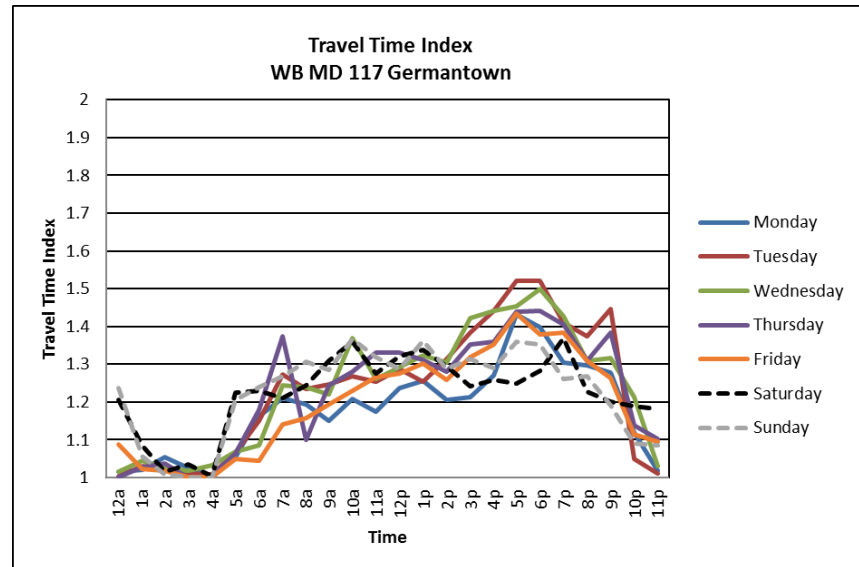
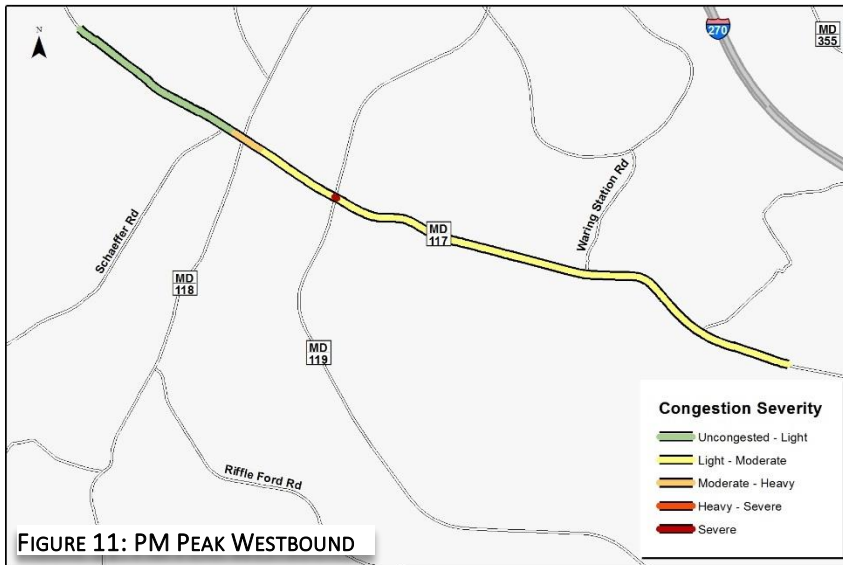
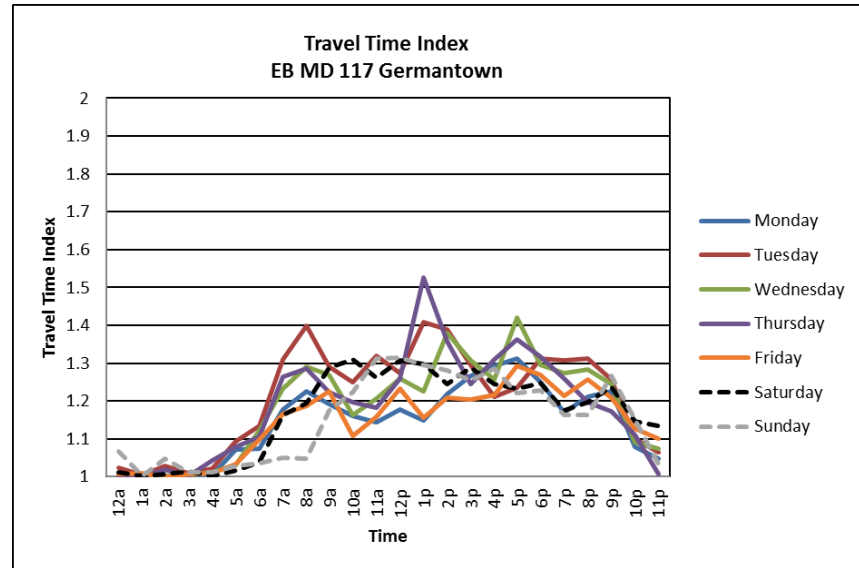
### Frederick Road (MD-355) from Plummer Road to Brink Road

Although northbound Frederick Road in the evening tops the list of congested roadways for the greater Germantown area, a majority of the heaviest congestion occurs between MD-27 and Brink Road. In this segment the congestion rate can reach one hundred twenty percent. There is a sharp peak in the TTI between five and six PM. Southbound congestion does not see a sharp peak as with the northbound direction with the heaviest congestion occurring between Germantown and Middlebrook Road



### Clopper Road (MD-117) Between Longdraft Road and Richter Farm Road

Clopper Road experiences a similar amount of congestion throughout the day in the eastbound direction with subtle peaks in the morning, early afternoon, and evening. The westbound direction sees a more pronounced peak in congestion during the evening commute with significant increases in congestion around the MD-118 and MD-119 intersections.



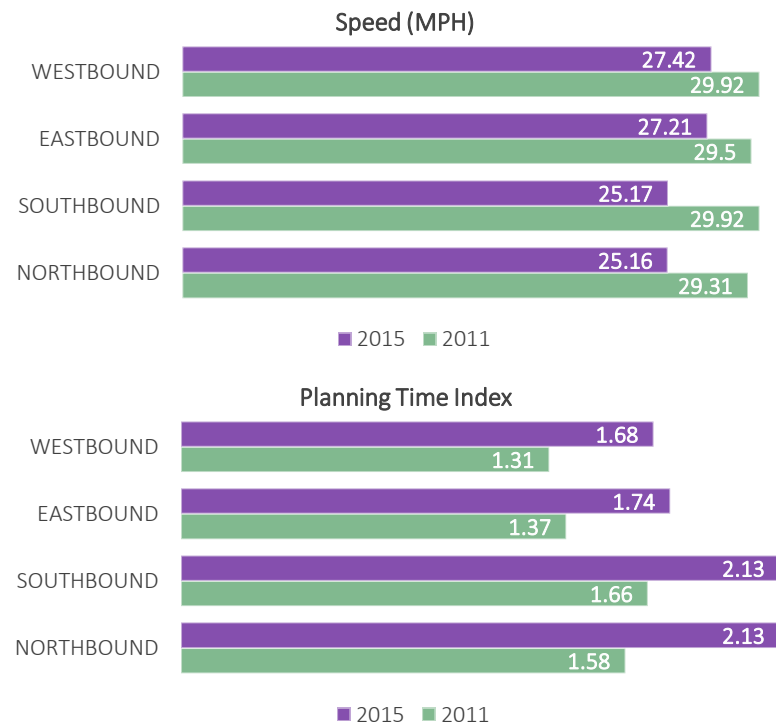
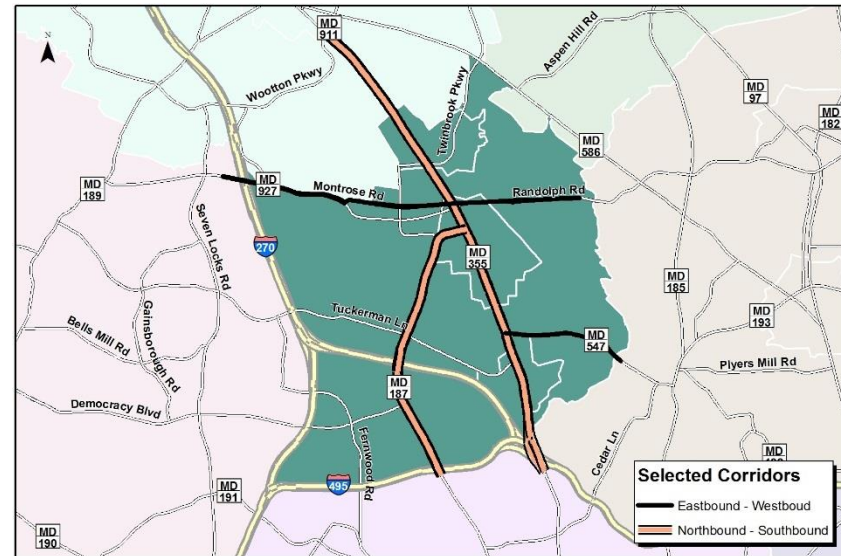


## North Bethesda, White Flint, Twinbrook, Grosvenor

Transportation planners analyzed two north-south and three east-west corridors in the greater North Bethesda area. The two north-south corridors are Old Georgetown Road (MD-187) from the Capital Beltway to Rockville Pike and Rockville Pike (MD-355) from the Capital Beltway to Wootton Parkway. The northern portion of Rockville Parkway is included with this analysis because of the data segmentation used by the data provider. The three east-west corridors are Randolph Road from Gaynor Road to Rockville Pike, Montrose Road from Rockville Pike to I-270, and Knowles/Strathmore Ave (MD-547) from Beach Drive to Rockville Pike. Old Georgetown Road experiences bi-directional moderate to heavy congestion during the evening commute. Randolph Road experiences moderate congestion during the evening commute in the eastbound direction and westbound direction during the morning commute. Montrose Road does not make the top ten list of congested corridors in the North Bethesda area.

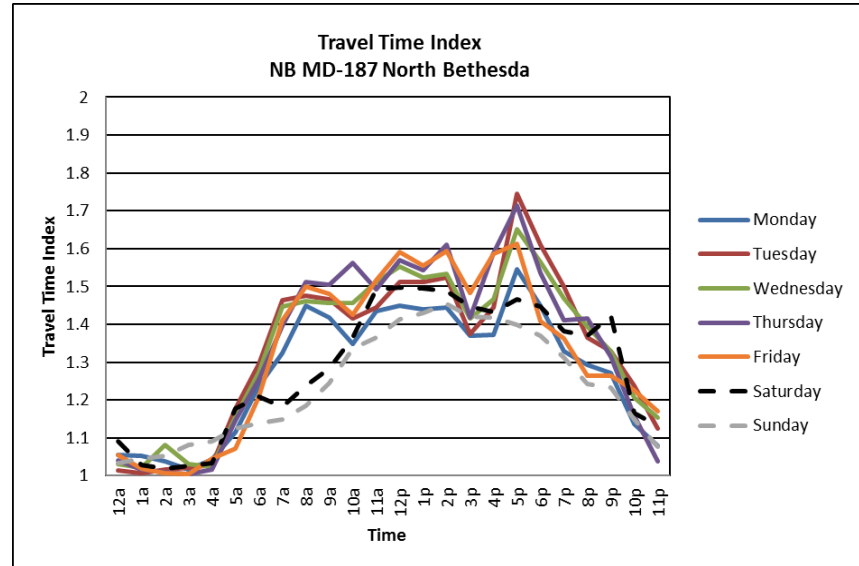
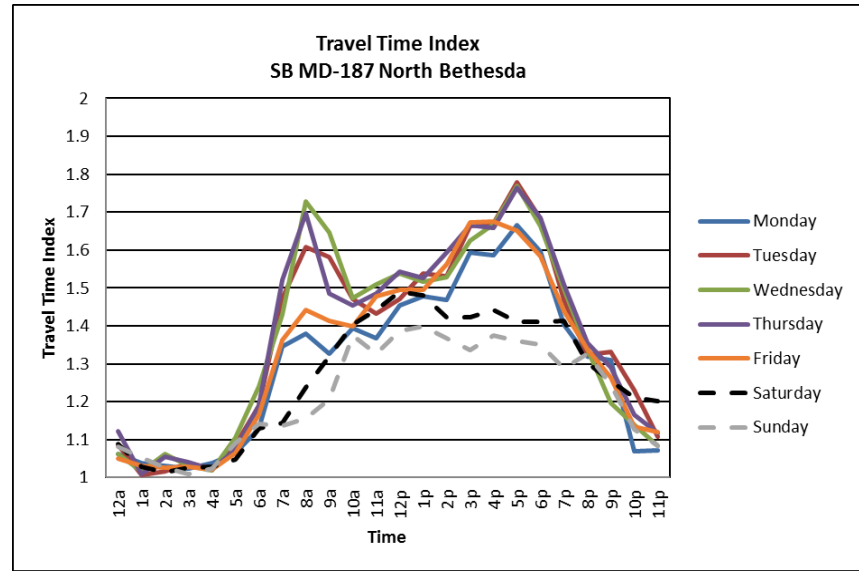
Speed has decreased more in the north and south directions than the east and west directions since 2011. Travel time reliability has also decreased more in the north and south directions. On average, an automobile traveler would need to more than double their normal travel time to arrive on time ninety-five percent of the time when traveling along the north and south corridors in North Bethesda and its vicinity.

Route	Congestion	Direction	Period
MD-187	62%	SOUTHBOUND	PM Peak
RANDOLPH RD	54%	EASTBOUND	PM Peak
MD-187	52%	NORTHBOUND	PM Peak
MD-187	50%	SOUTHBOUND	AM Peak
RANDOLPH RD	47%	WESTBOUND	AM Peak
MD-187	45%	NORTHBOUND	AM Peak
RANDOLPH RD	45%	WESTBOUND	PM Peak
MD-355	42%	NORTHBOUND	AM Peak
MD-547	42%	WESTBOUND	AM Peak
MD-355	38%	SOUTHBOUND	PM Peak



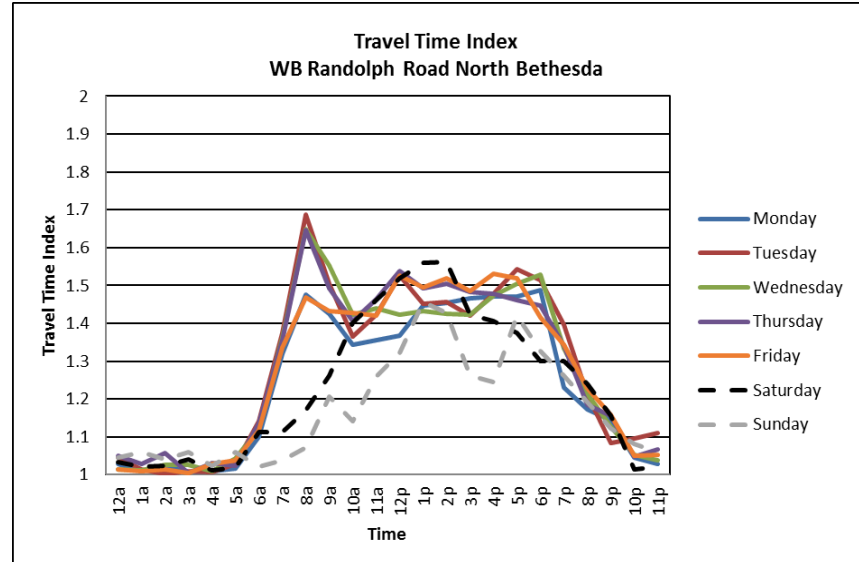
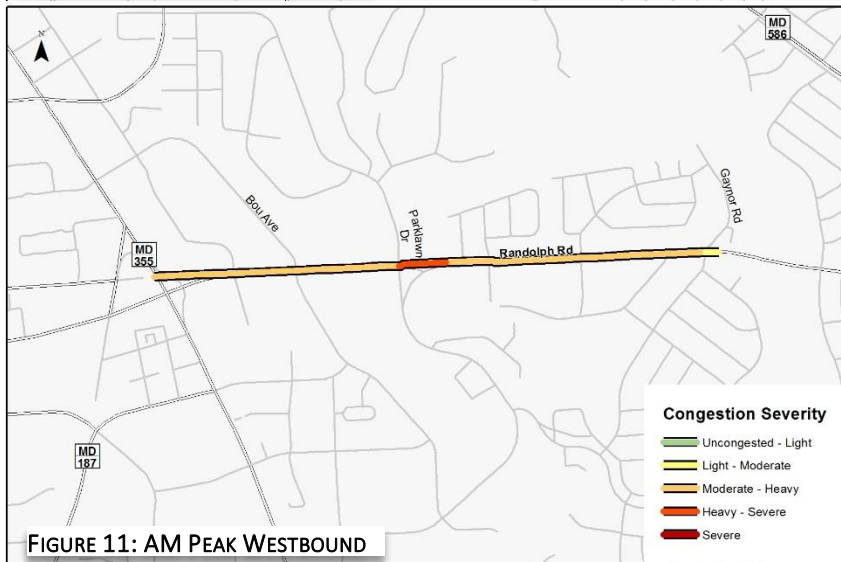
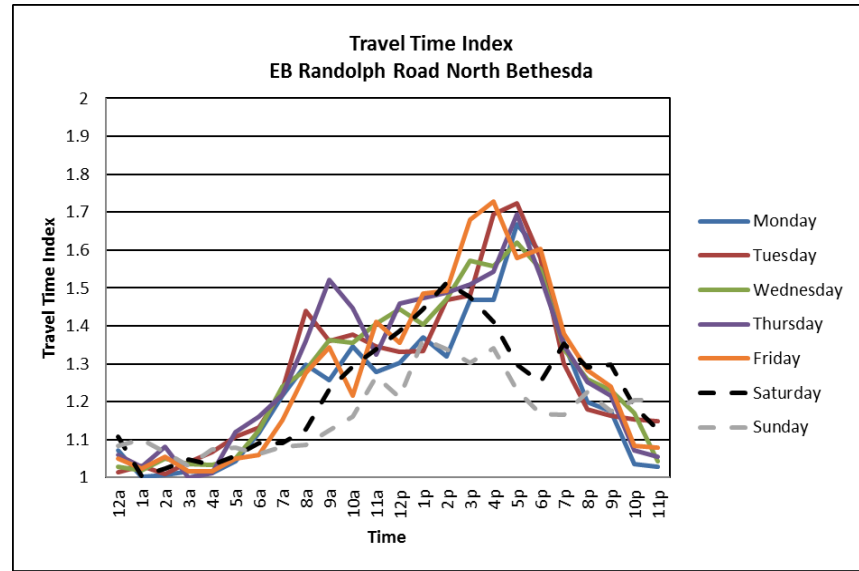
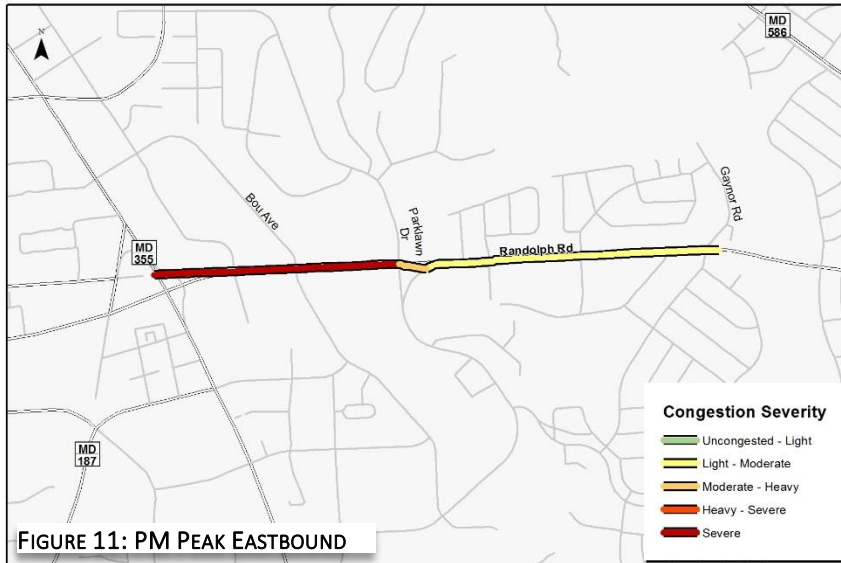
### Old Georgetown Road (MD-187) from the Capital Beltway to Rockville Pike

Old Georgetown Road experiences similar levels of congestion in both directions, particularly during the evening commute. Northbound drivers encounter heavy to severe congestion in the evenings just north of the Capital Beltway interchange and again between Executive Boulevard and Rockville Pike. Southbound drivers during the evening face the heaviest congestion just south of the I-270 interchange. Southbound travelers also experience a significant rise in congestion during the morning commute. Both directions see a steady flow of traffic throughout all days of the week.



## Randolph Road from Gaynor Road to Rockville Pike

The worst congestion along Randolph Road occurs during the evening commute in the eastbound direction between Parklawn Drive and Rockville Pike. On average, congestion along this segment reaches eighty-five percent indicating it takes over two-thirds more time to move through this portion of the roadway during the evening commute. During the morning commute, travelers can expect moderate to heavy congestion throughout the entire corridor with a section of heavy to severe congestion around the intersection of Parklawn Drive.

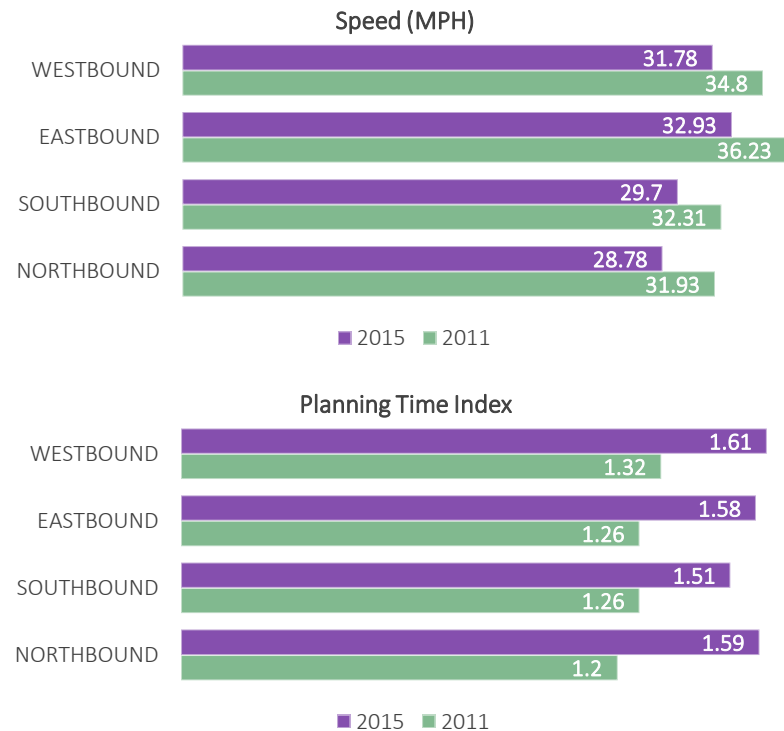
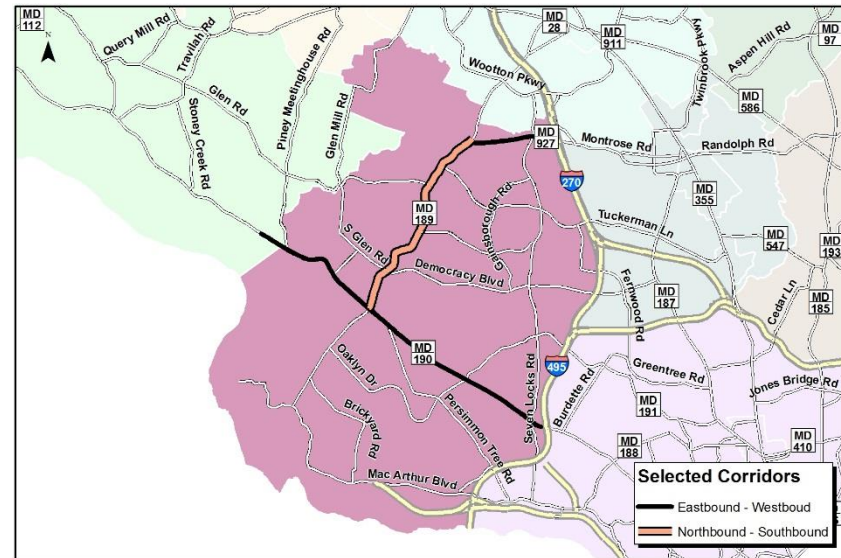


## Potomac

Corridors explored in Potomac include River Road (MD-190) from the Capital Beltway to Piney Branch Toad, Falls Road (MD-189) from River Road to Montrose Road, and Montrose Road from I-270 to Falls Road. The worst congestion of the corridors analyzed in Potomac is River Road during the morning commute in the eastbound direction. Travelers along this segment spend an average fifty-seven percent more time during the morning commute. The fairly short Montrose Road segment within the Potomac Policy area ranks second during the evening commute in the westbound direction. During that time, it takes automobile travelers an average of just over fifty percent more time to travel through the corridor than at free-flow conditions.

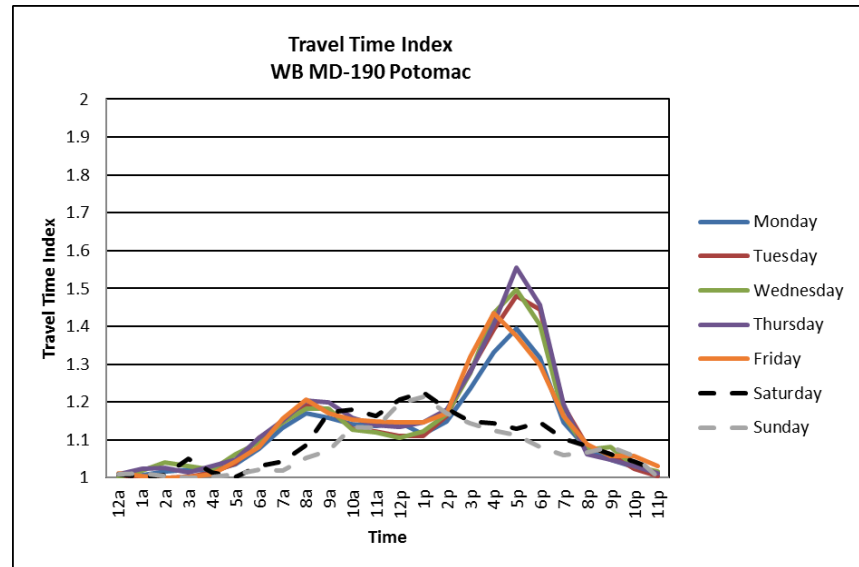
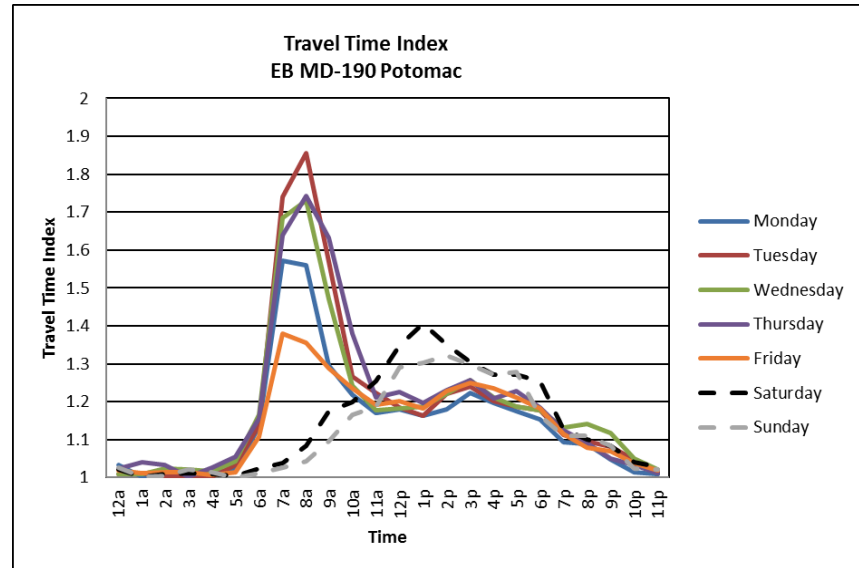
Examination of historical data indicates speed has decreased an average of three miles per hour since 2011 which is less than the county overall. The PTI has slightly increased in all directions indicating congestion is becoming more varied. The PTI in Potomac, however, is significantly below that of the county overall.

Route	Congestion	Direction	Period
MD-190	57%	EASTBOUND	AM Peak
MONTROSE RD	51%	WESTBOUND	PM Peak
MONTROSE RD	38%	WESTBOUND	AM Peak
MD-190	36%	WESTBOUND	PM Peak
MD-189	32%	NORTHBOUND	PM Peak
MD-189	32%	SOUTHBOUND	PM Peak
MD-189	31%	NORTHBOUND	AM Peak
MD-189	24%	SOUTHBOUND	AM Peak
MONTROSE RD	20%	WESTBOUND	Off Peak
MD-190	18%	EASTBOUND	PM Peak



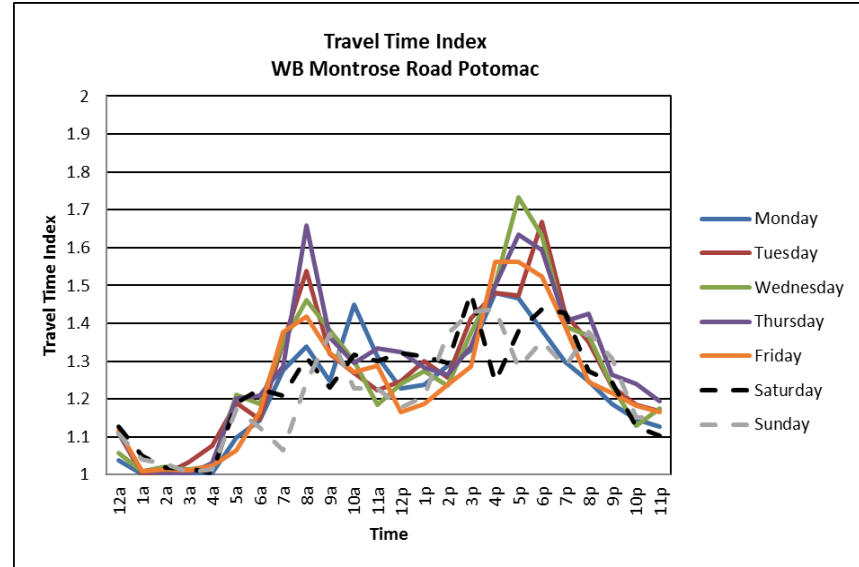
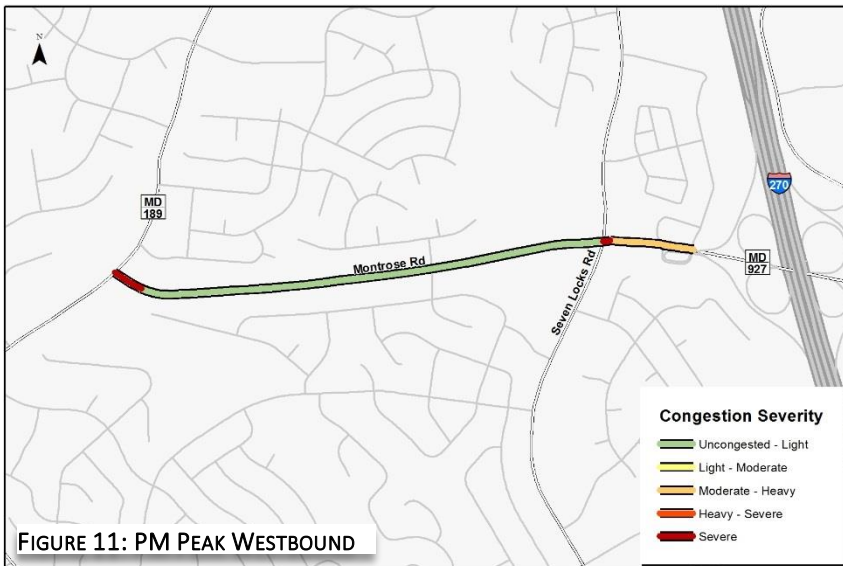
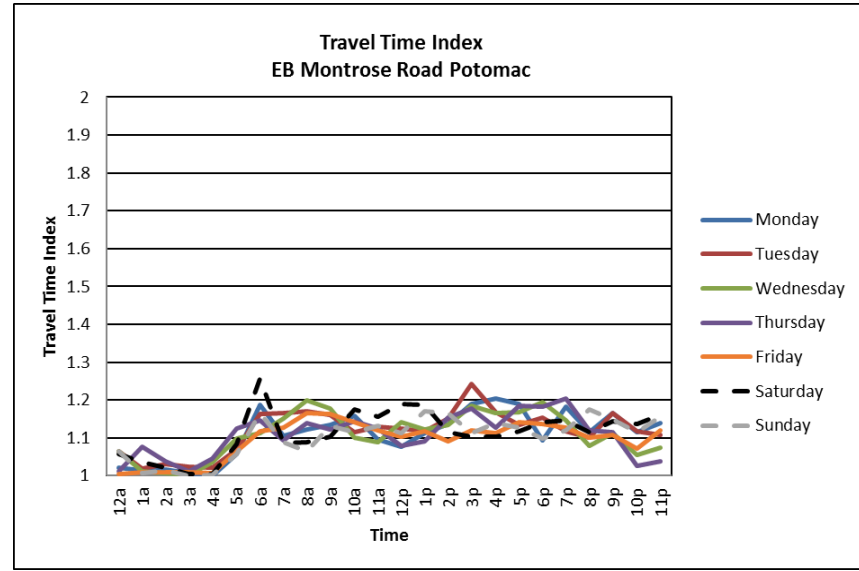
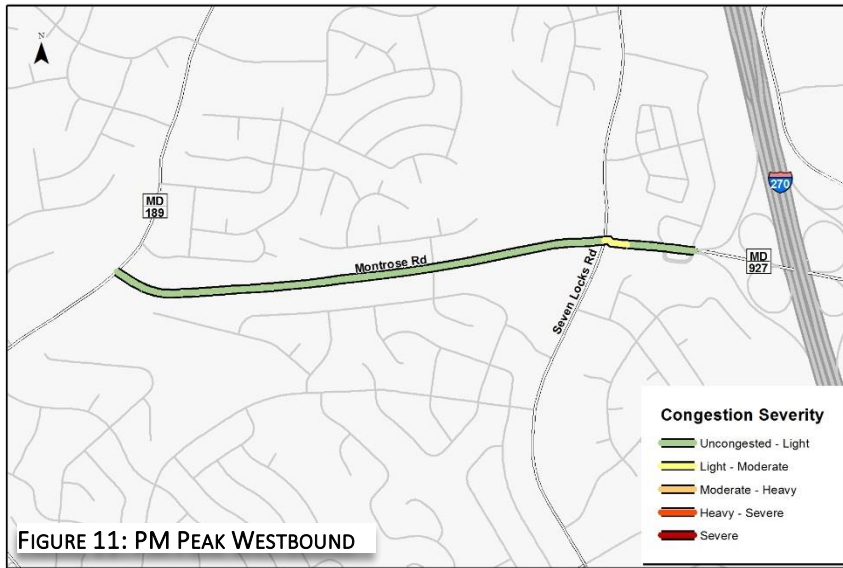
## River Road (MD-190) from the Capital Beltway to Piney Branch Road

River Road is a commuter dominated thoroughfare with two discernible peaks of congestion during the morning and evening commutes. Eastbound travelers in the morning can expect severe congestion for short periods leading up to the intersections at Piney Meetinghouse Road and Bradley Boulevard. During the evening commute, westbound travelers experience more sustained moderate to heavy congestion from the Capital Beltway to Falls Road.



### Montrose Road from I-270 to Falls Road

This section of Montrose Road is just over one mile in length. It appears most of congestion occurs in small sections in the westbound direction during the evening and morning commute at the intersections of Seven Locks Road and River Road perhaps skewing the overall congestion of the corridor higher. Congestion remains light in the eastbound direction throughout the day

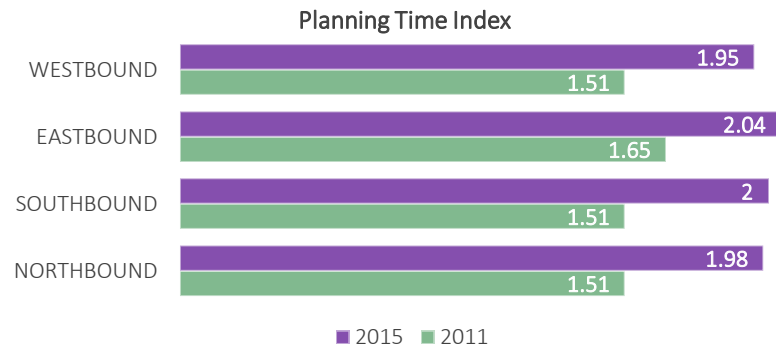
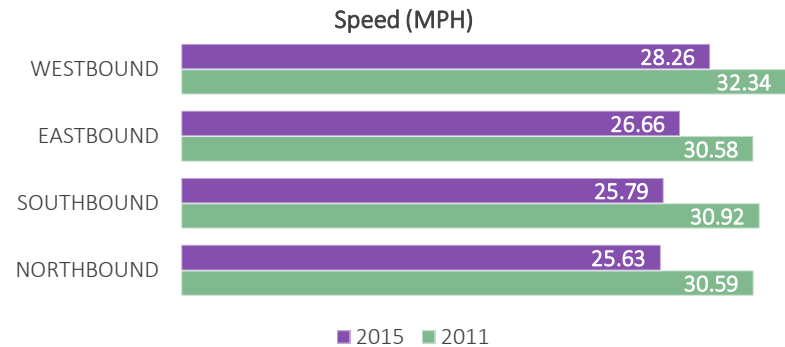
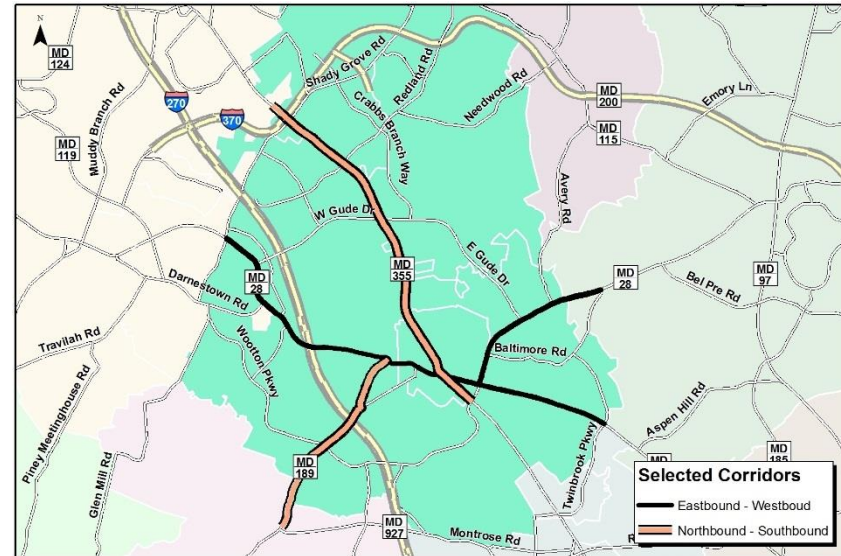


## Rockville City, Rockville Town Center Shady Grove Metro Center, Derwood

Transportation planners collected and analyzed speed data from four main corridors in the Rockville vicinity. These corridors include MD-28 from Baltimore Road to Veirs Mill Road and again from Rockville Pike to Shady Grove Road. For the purposes of this analysis and due to the route assignment of the data provider, the section of Veirs Mill Road from Rockville Pike to Jefferson Street is considered MD-586. The other corridors include Veirs Mill Road (MD-586) from Twinbrook Parkway to Rockville Pike, Great Falls Road (MD-189) from Montrose Road to Montgomery Ave, and Rockville Pike (MD-355) from Wootton Parkway to I-370. The most congested section of roadway in the Rockville vicinity is Veirs Mill Road during the morning commute in the westbound direction. On average, it takes automobile drivers fifty-four percent more time to travel through the corridor compared to free-flow conditions. Overall, the MD-28 corridor sees the second highest congestion rate, just greater than Rockville Pike, but as will be demonstrated in the next section, most of the congestion occurs between Baltimore Road and Veirs Mill Road.

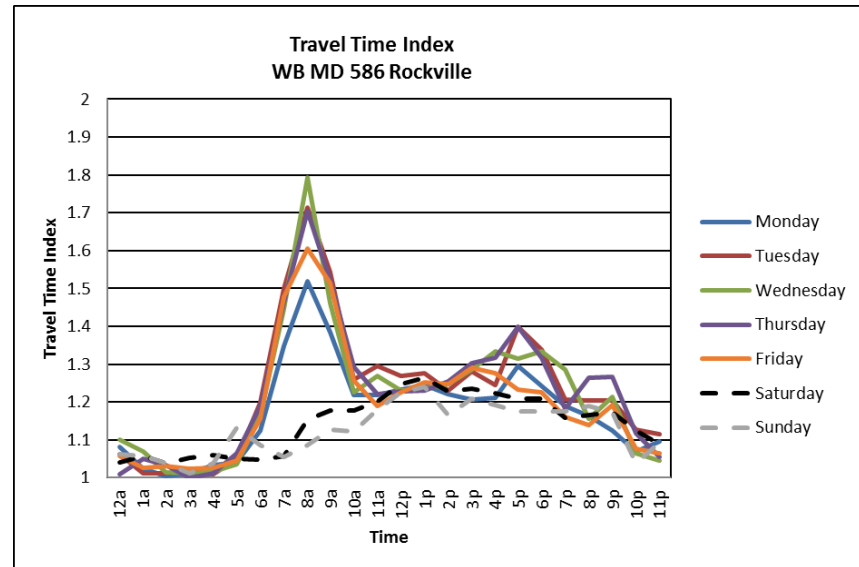
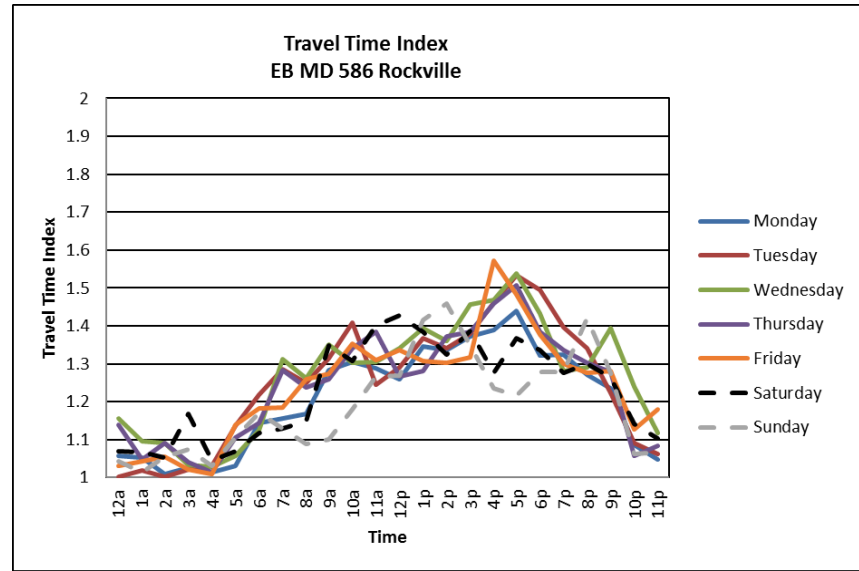
Historical data indicates that speed has decreased an average of four and one-half miles per hour across all directions since 2011. This is slightly more than the county overall. The PTI has also increased slightly more than the county's rate indicating traffic variability has grown.

Route	Congestion	Direction	Period
MD-586	54%	WESTBOUND	AM Peak
MD-28	47%	EASTBOUND	PM Peak
MD-355	46%	SOUTHBOUND	PM Peak
MD-28	43%	EASTBOUND	AM Peak
MD-586	43%	EASTBOUND	PM Peak
MD-355	42%	SOUTHBOUND	AM Peak
MD-28	39%	WESTBOUND	AM Peak
MD-355	37%	NORTHBOUND	PM Peak
MD-189	35%	SOUTHBOUND	AM Peak
MD-28	30%	WESTBOUND	PM Peak



### Veirs Mill Road (MD-586) from Twinbrook Parkway to Jefferson Street

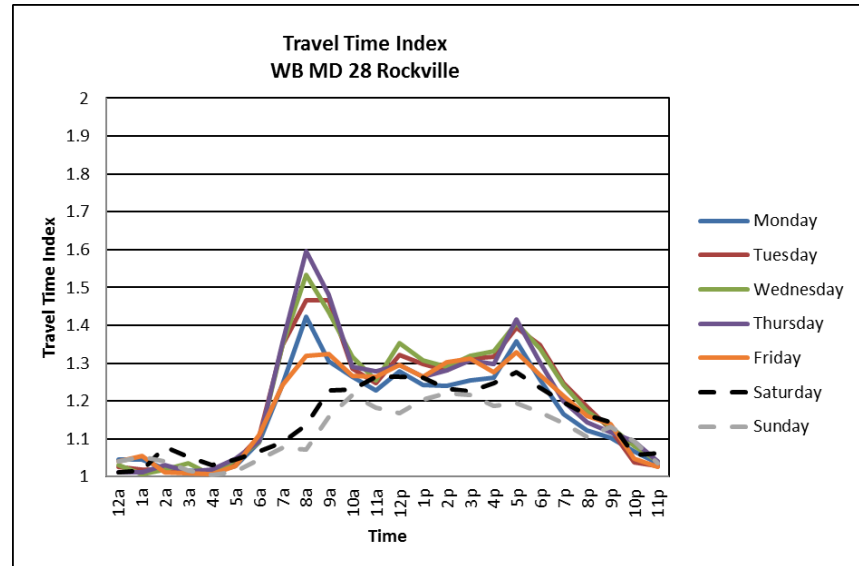
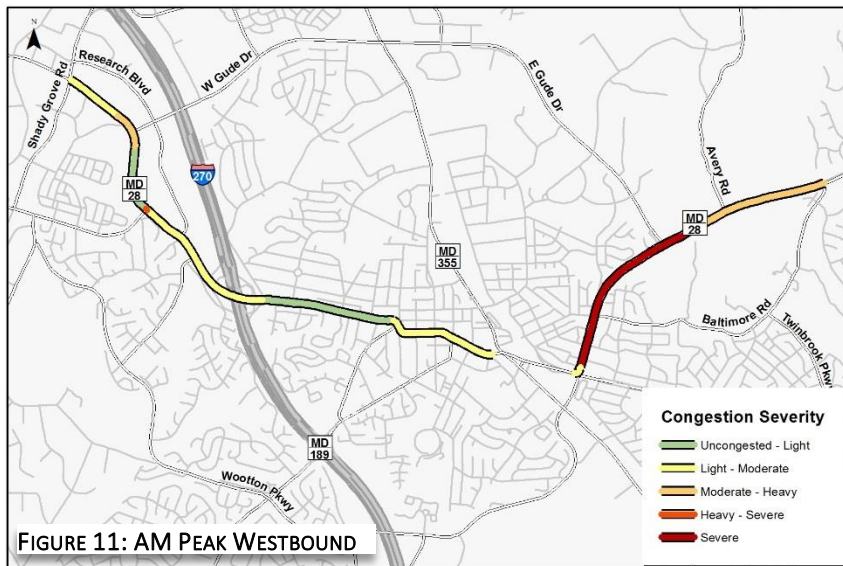
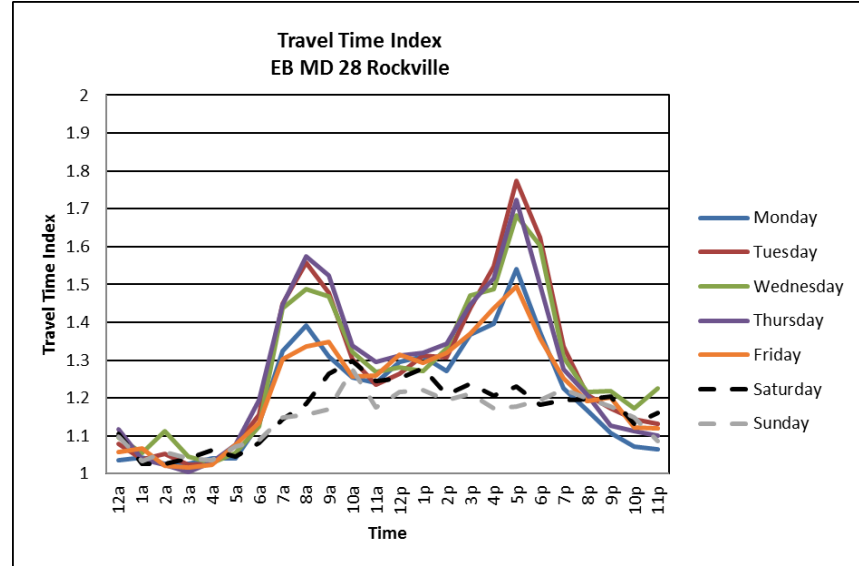
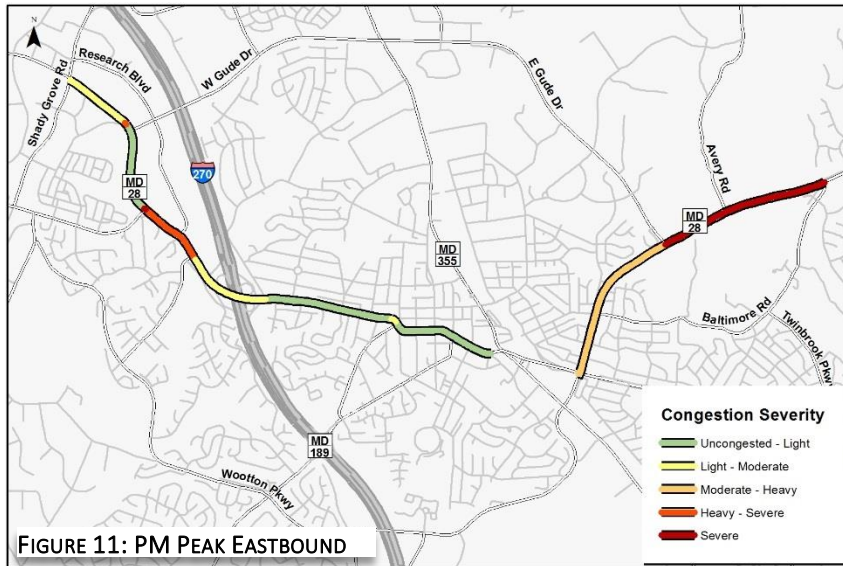
Eastbound Veirs Mill Road gradually increases in congestion from six in the morning before reaching its peak during the evening commute at around five PM. Eastbound traffic remains on the moderate range from Wootton Parkway to Twinbrook Parkway. Westbound Veirs Mill Road behaves more like a traditional commuting corridor with a sharp peak during the morning commute. Congestion is heavy beginning at Twinbrook Parkway reaching a severe level before the intersection at Wootton Parkway.





### MD-28 from Baltimore Road to Veirs Mill Road and from Rockville Pike to Shady Grove Road

MD-28 is bisected by the Rockville Town Center. Eastbound MD-28 has two peaks with the evening commute reaching nearly eighty percent during the majority of the work week. The most significant congestion in the evening occurs on Norkbeck Road indicating people leaving Downtown Rockville. Congestion in the morning is heaviest inbound to Downtown Rockville along Montgomery Avenue. Westbound traffic is heaviest during the morning commute inbound along Norbeck Road and First Street with lighter congestion outbound along Montgomery Avenue.

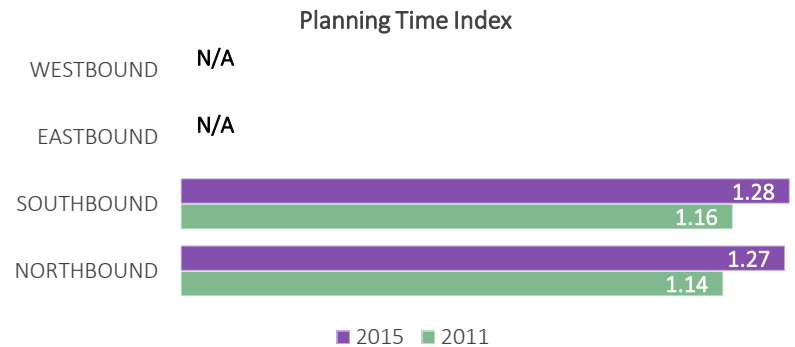
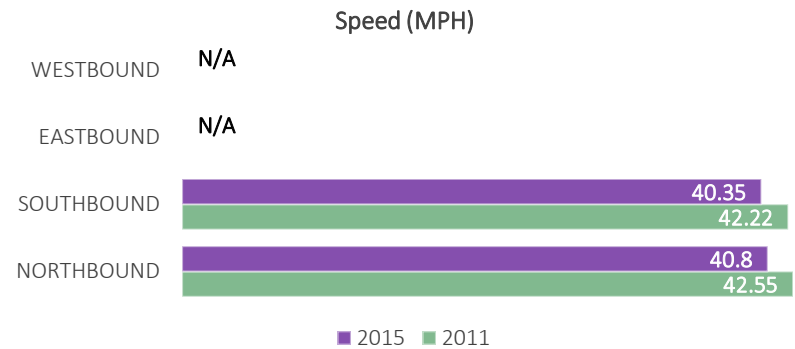
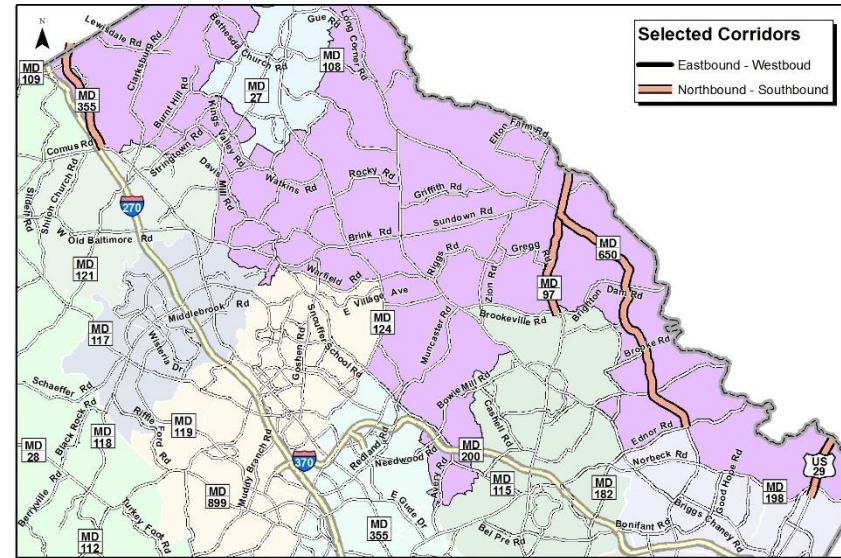


## Rural East

Planners analyzed four north-south corridors in the Rural East Policy Area. The corridors include Columbia Pike (US-29) from Sandy Spring Road to the County border, New Hampshire Avenue (MD-650) from Ednor Road to Georgia Avenue, Georgia Avenue (MD-97) from Brookeville Road to the County border, and Frederick Road (MD-355) from Comus Road to the County border. Congestion in the Rural East Policy Area is mostly limited to sections of Columbia Pike and Georgia Avenue. Columbia Pike experiences moderate to heavy sections of congestion during the evening commute whereas Georgia Avenue is busier during the morning commute. Congestion along the other arterials remains light.

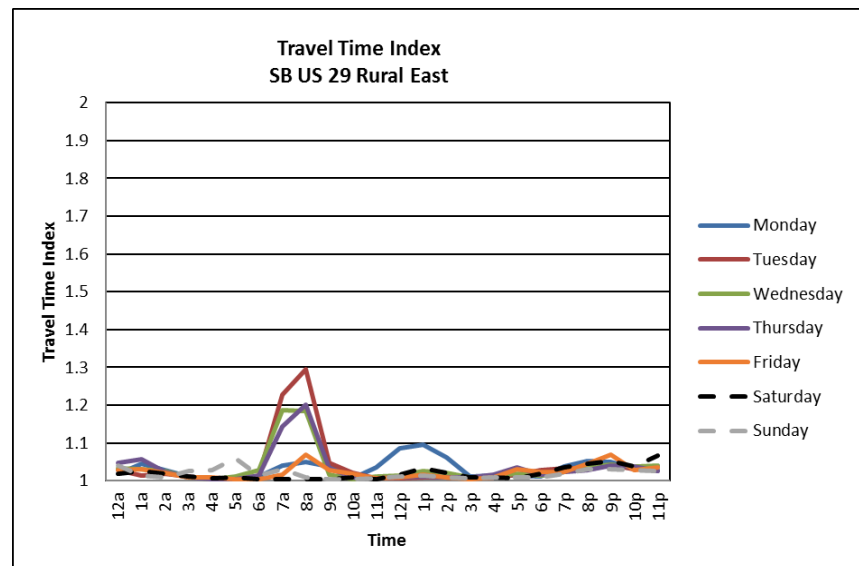
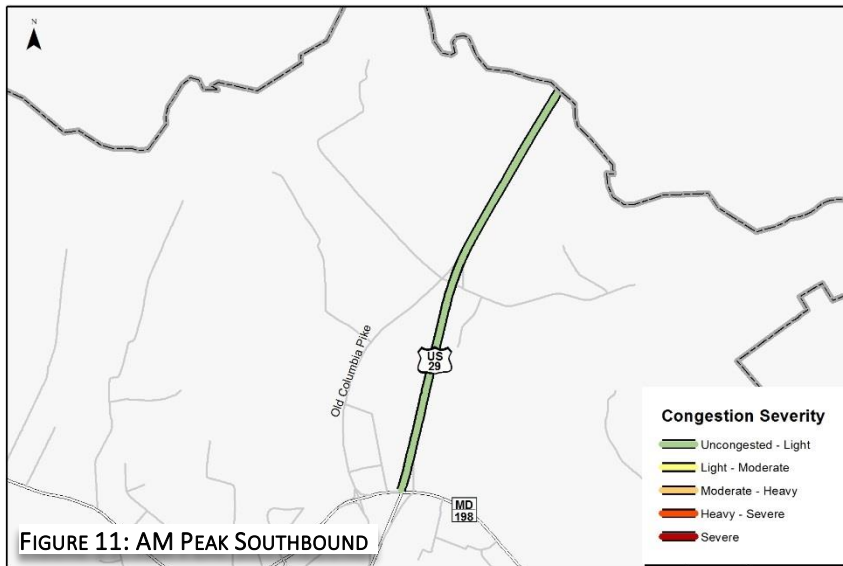
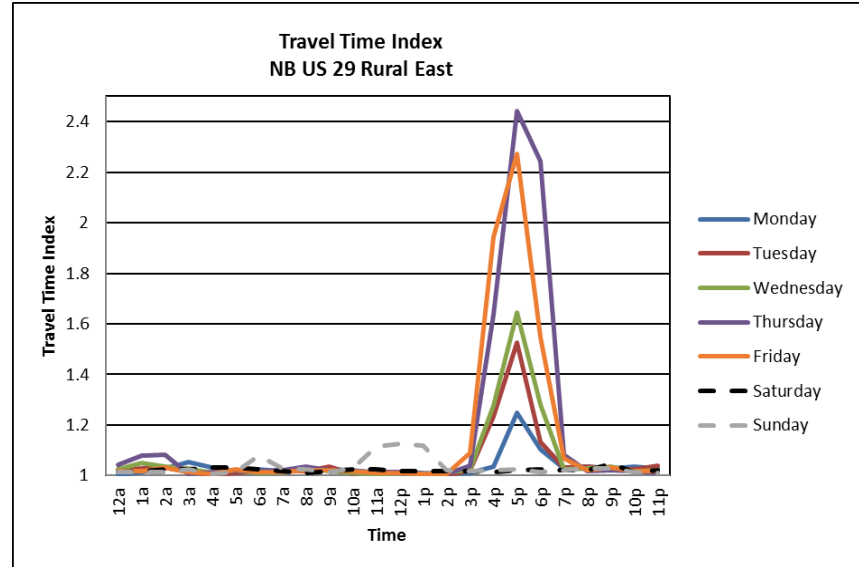
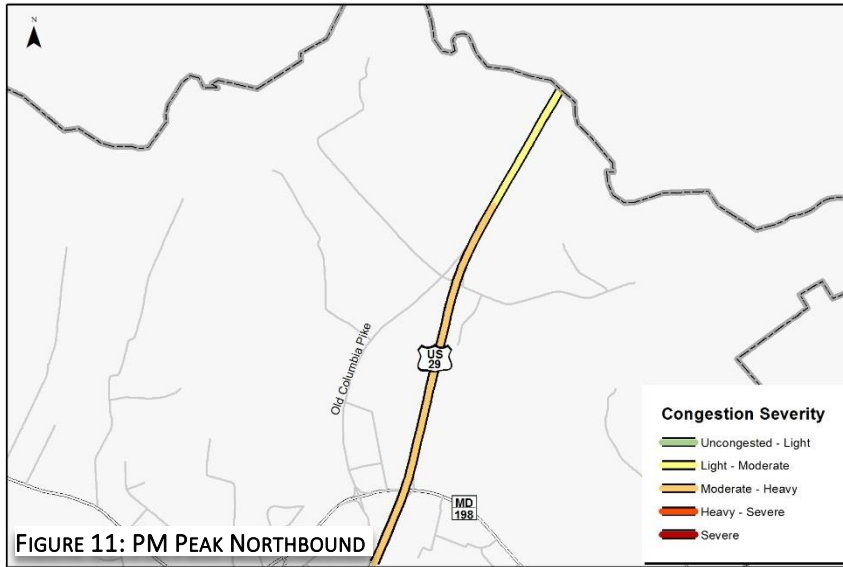
Historical data indicates that speeds have decreased well below that of the overall County. The PTI index has also only slightly increased indicating the variability of congestion has remained consistent.

Route	Congestion	Direction	Period
US-29	45%	NORTHBOUND	PM Peak
MD-97	39%	SOUTHBOUND	AM Peak
MD-355	27%	SOUTHBOUND	AM Peak
MD-650	18%	SOUTHBOUND	AM Peak
MD-650	14%	NORTHBOUND	PM Peak
MD-650	14%	NORTHBOUND	AM Peak
MD-97	14%	NORTHBOUND	PM Peak
MD-650	13%	SOUTHBOUND	PM Peak
MD-355	12%	NORTHBOUND	PM Peak
MD-650	11%	SOUTHBOUND	Off Peak



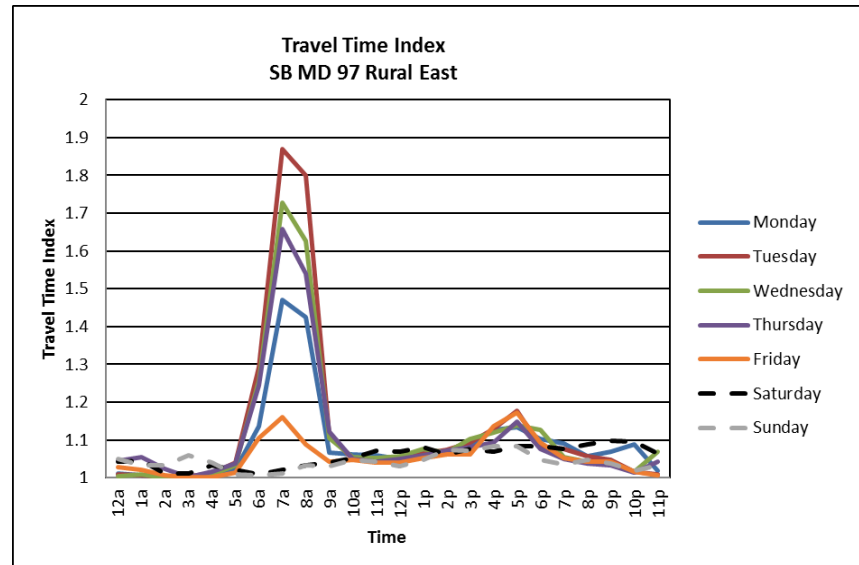
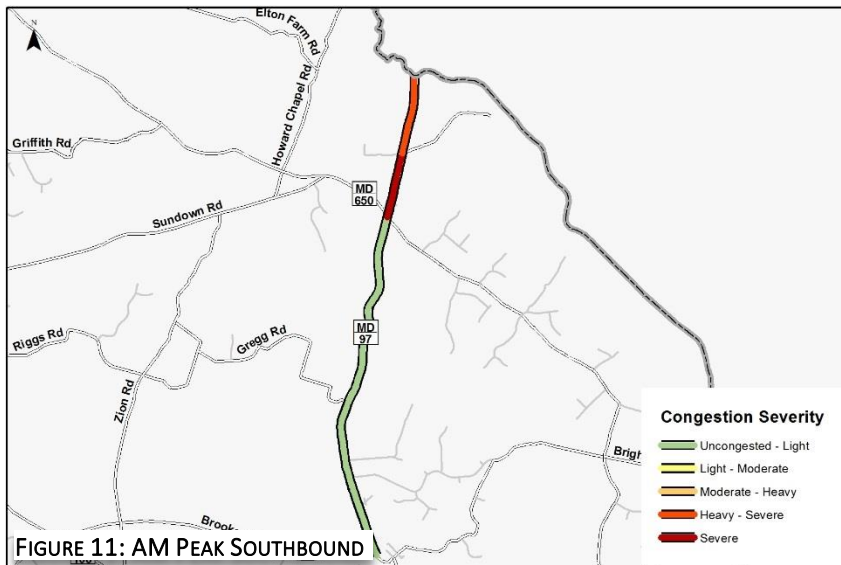
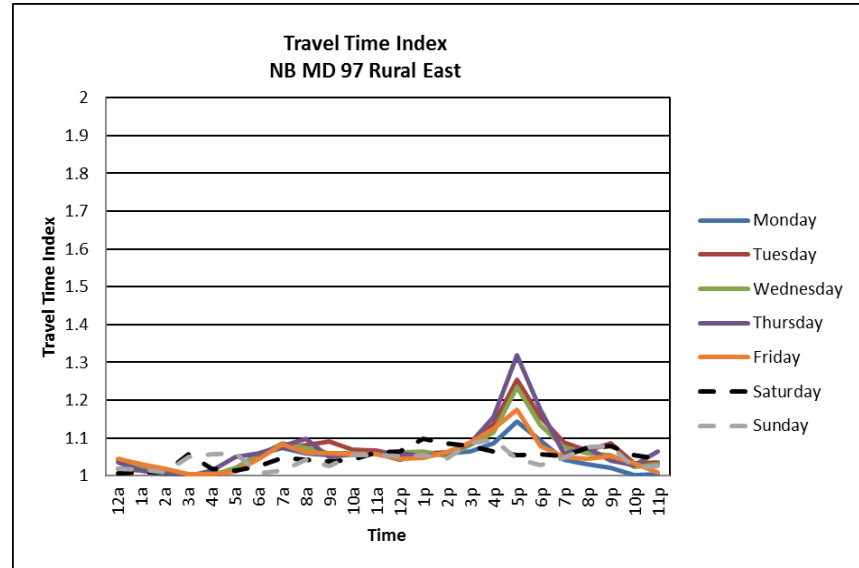
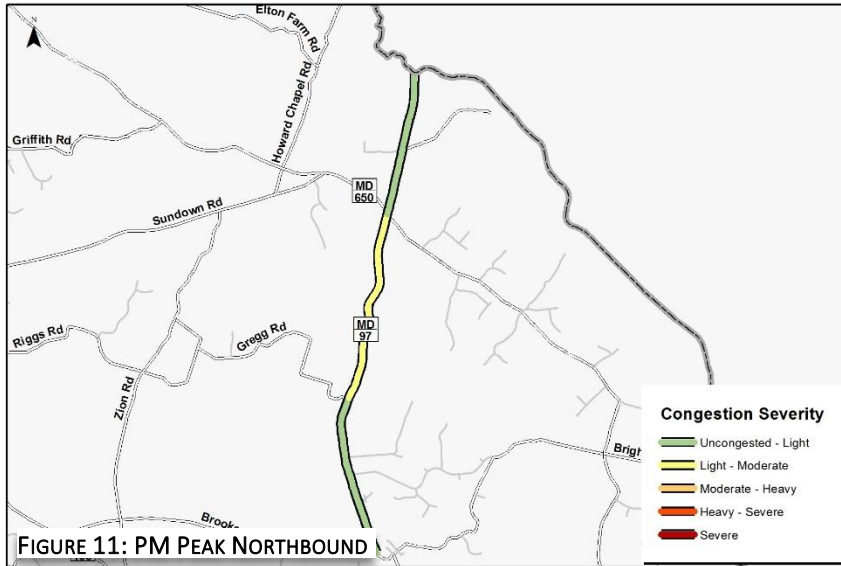
### Columbia Pike (US-29) from Sandy Spring Road to the County border

Columbia Pike experiences an interesting sharp peak in congestion during the evening commute between four and five PM. The congestion appears to be significantly worse on Thursday and Friday evenings. The map below indicates a moderate to heavy level of congestion on average during the evening peak period between Sandy Spring Road and Dustin Road in the northbound direction. Southbound congestion is minimal during the morning commute reaching thirty percent on Tuesday mornings.



### Georgia Avenue (MD-97) from Brookeville Road to the County border

Georgia Avenue, like with Columbia Pike, has the characteristics of a typical commuter route with a sharp peak of congestion in the morning, and to a lesser extent, in the evening. The morning commute inbound to Washington D.C. experiences heavy to severe congestion north of the New Hampshire Avenue Intersection in Brookeville. Northbound congestion in the evening appears to not be as severe with moderate level of congestion appearing between Gregg Road and New Hampshire Avenue.

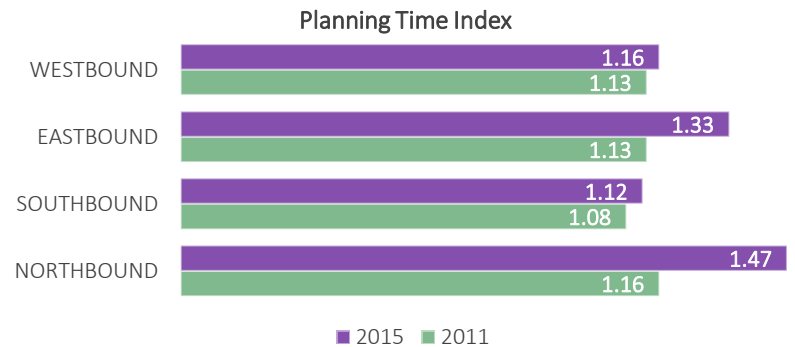
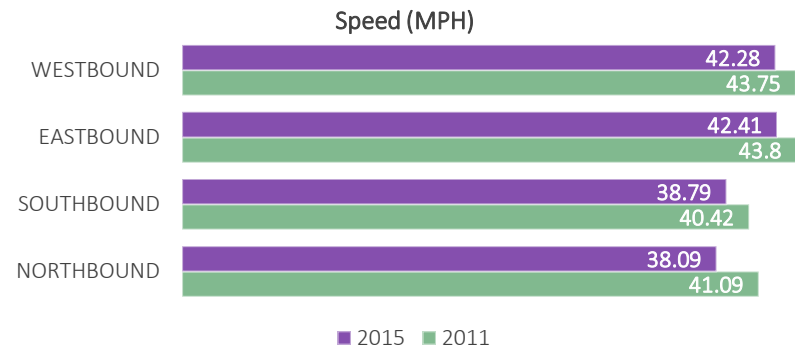
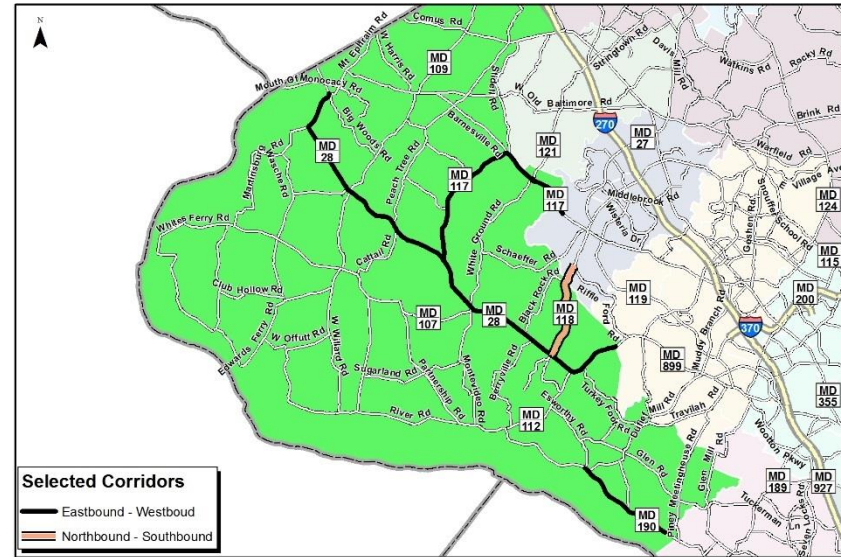


## Rural West

Analyst collected and synthesized speed data for four corridors in the Rural West Policy Area. The corridors are River Road (MD-190) from Piney Meetinghouse Road to Esworthy Road, MD-28 from Jones Lane to Mount Ephraim Road, MD-117 from Darnestown Road to Richter Farm Road, and Germantown Road (MD-118) from Riffle Rod Road to Darnestown Road. Rural East Policy Area serves as a bedroom community for many employees in the greater Washington D.C area. This is evident by the fact that the top two congested roadways occur during the morning commute. Other than the morning commute along River Road and MD-117, there is very little congestion in the Rural West Policy Area.

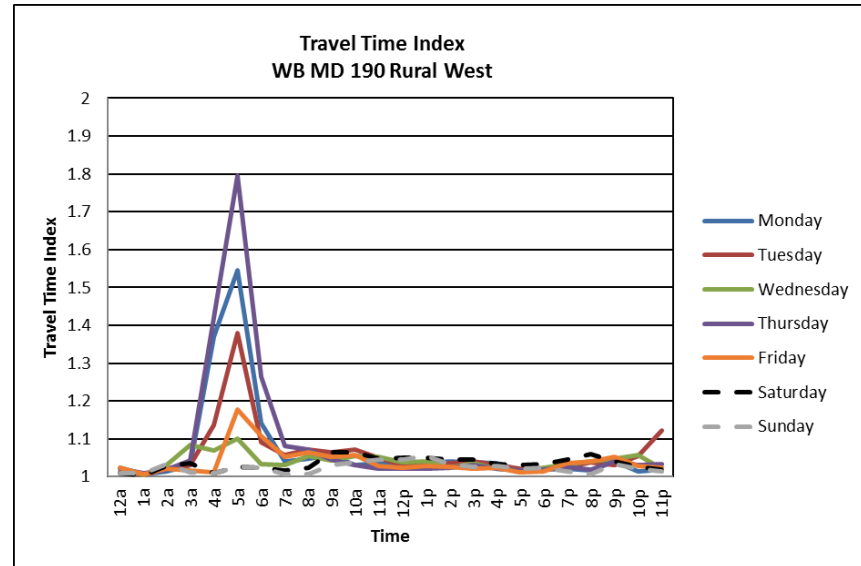
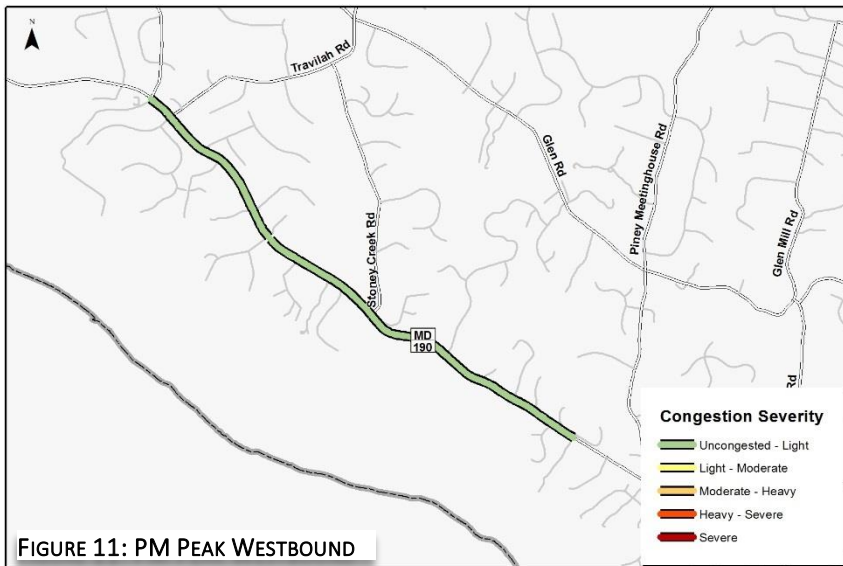
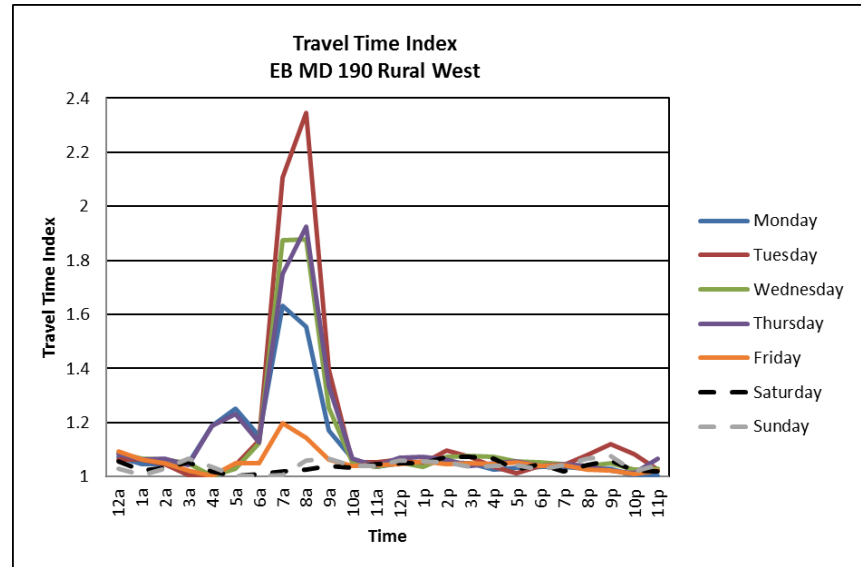
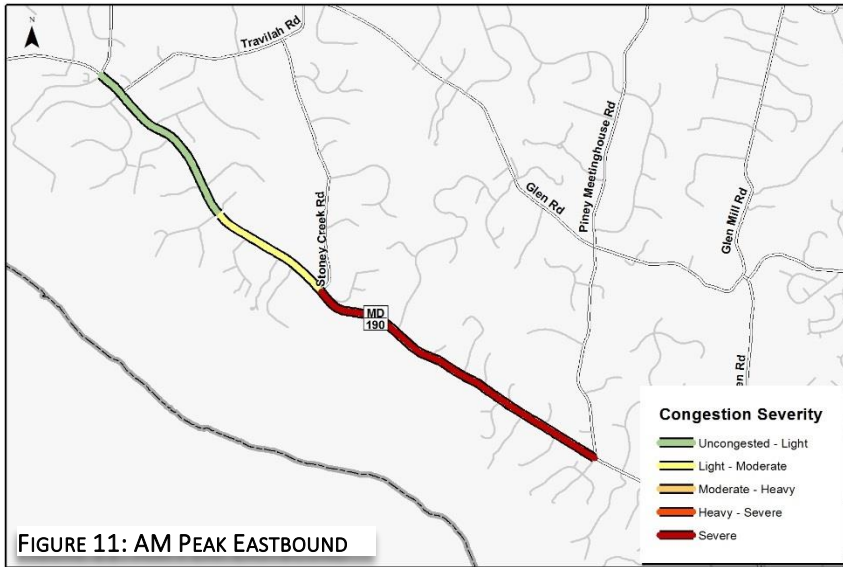
Historical data indicates that speeds have changed very little since 2011. The one exception is Germantown Road (MD-118) which saw a decrease in speed of about three MPH, still below that of the overall County. Travel time reliability has also remained consistent with the biggest changes occurring in the eastbound and northbound directions. As with speed, the biggest change in PTI occurs northbound along Germantown Road.

Route	Congestion	Direction	Period
MD-190	57%	EASTBOUND	AM Peak
MD-117	46%	EASTBOUND	AM Peak
MD-28	12%	EASTBOUND	AM Peak
MD-117	11%	EASTBOUND	Off Peak
MD-118	10%	NORTHBOUND	Off Peak
MD-117	9%	WESTBOUND	AM Peak
MD-117	8%	EASTBOUND	PM Peak
MD-117	7%	WESTBOUND	Off Peak
MD-117	6%	WESTBOUND	PM Peak
MD-118	6%	SOUTHBOUND	AM Peak



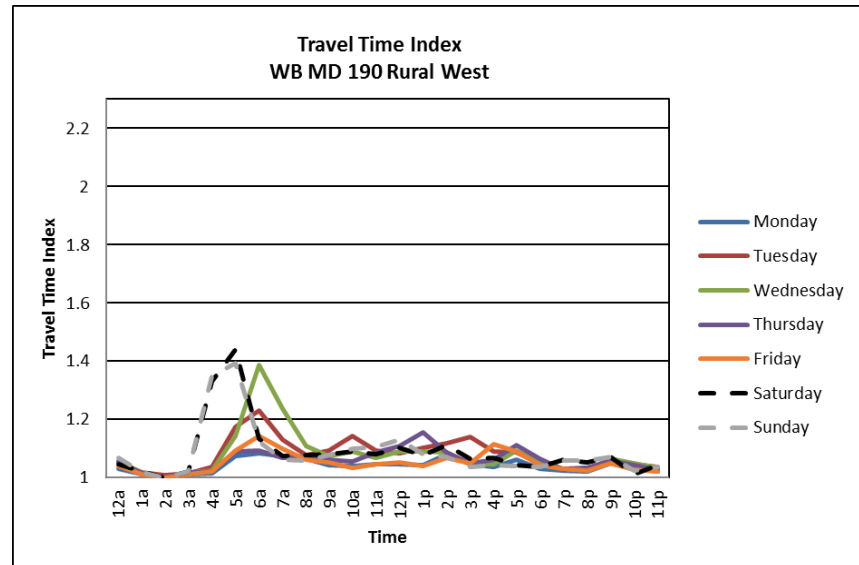
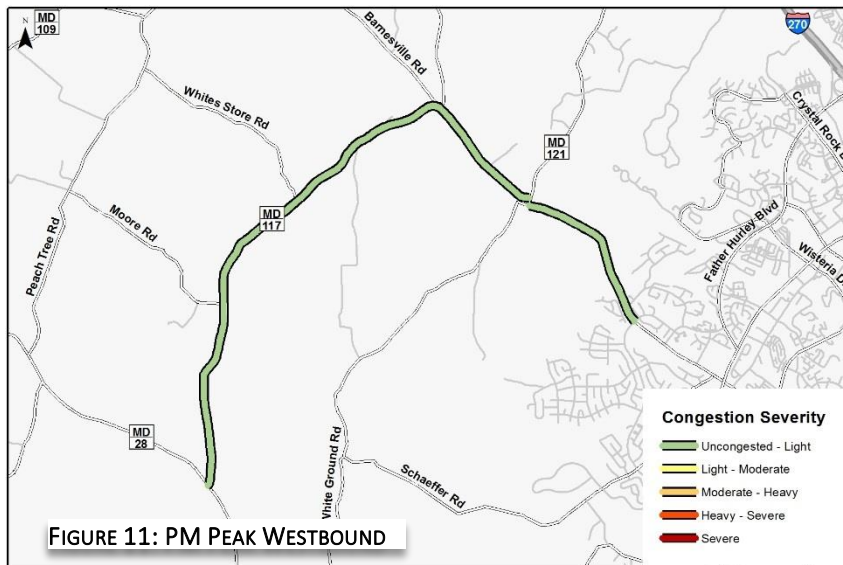
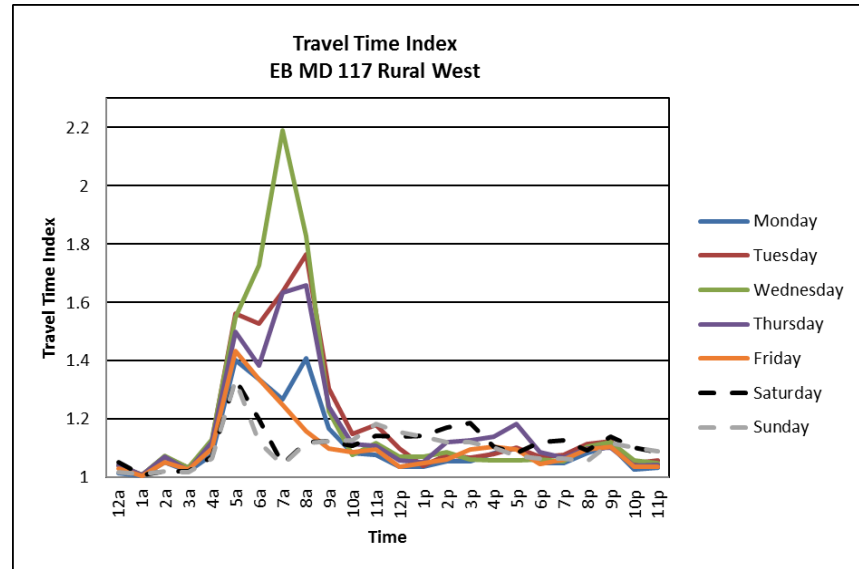
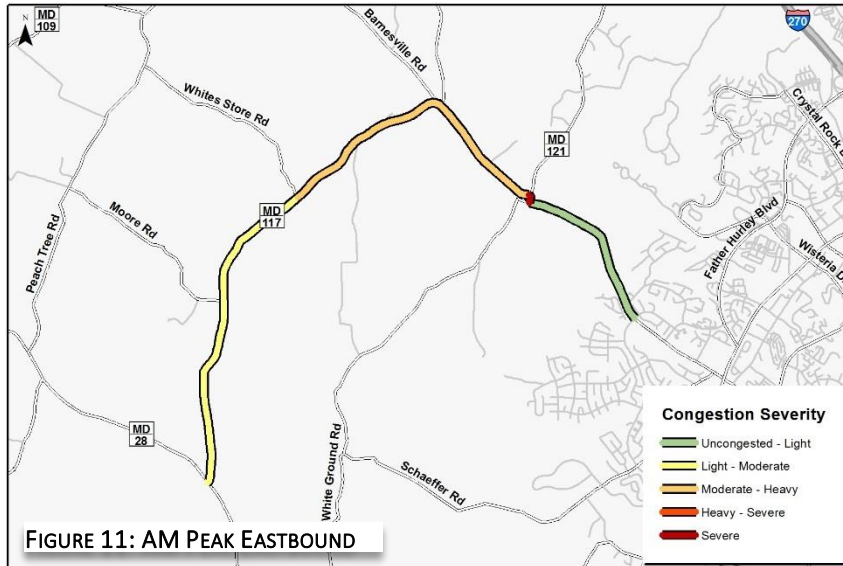
### River Road (MD-190) from Piney Meetinghouse Road to Esworthy Road

Congestion along River Road is heaviest eastbound during the morning commute between Stoney Creek Road and Piney Meetinghouse Road. On average throughout the entire morning commute, travelers can expect for it to take twice the amount of time to move through this section of River Road compared to free-flow conditions. Interestingly and somewhat puzzling is that westbound congestion has a peak at around five in the morning. This could be due to overnight construction activities during the data collection period.



## MD-117 from Darnestown Road to Richter Farm Road

Congestion along MD-117 peaks for both direction during the morning commute. It is heaviest eastbound and is fairly erratic throughout the week. Congestion also begins to build at five in the morning, fairly early compared to other corridors in the County. Eastbound drivers encounter the highest average TTI between Whites Store Road to the intersection of Clarksburg Road where a small segment of heavy to severe congestion can be found. Congestion during the evening is very light in both directions.

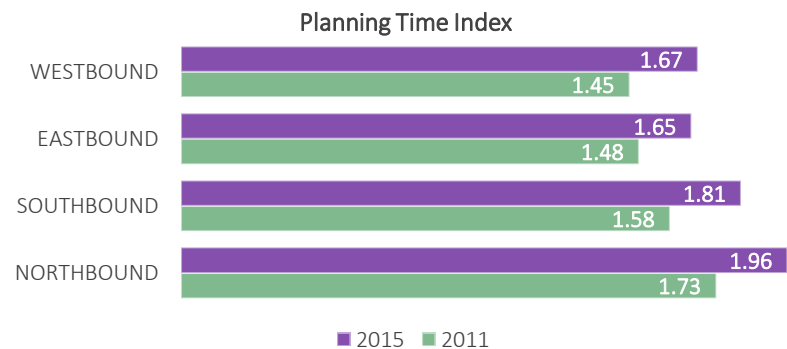
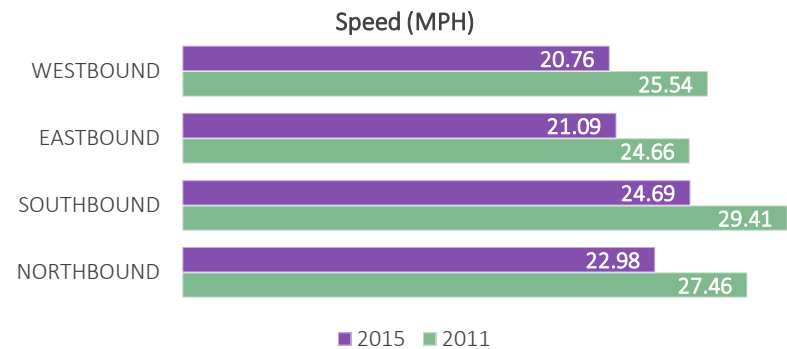
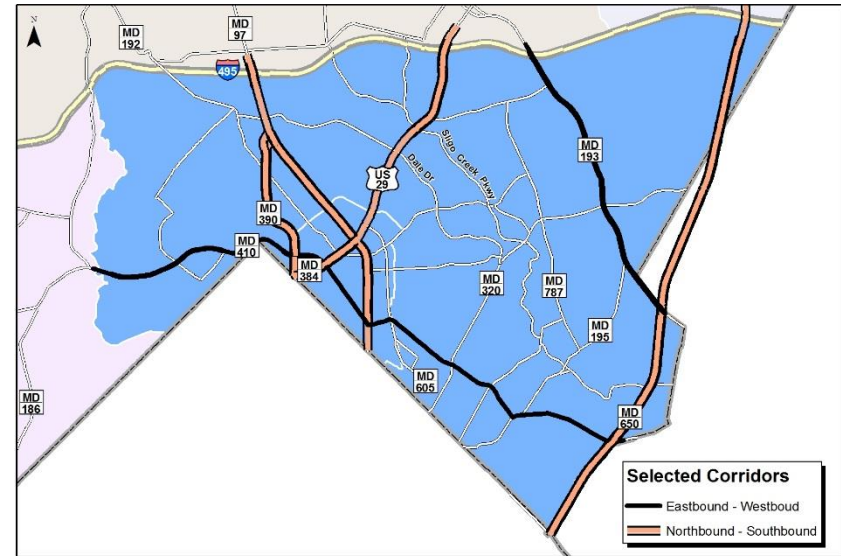


## Silver Spring/Takoma & Silver Spring CBD

MNCPPC staff analyzed several corridors in the Silver Spring and Takoma area. East-west corridors include MD-410 from the County line to Beach Drive and University Boulevard (MD-193) from New Hampshire Avenue to the Capital Beltway. The north-south corridors are Colesville Road from the Capital Beltway to the County line, Georgia Avenue from the Capital Beltway to the County line, Sixteenth Street from Georgia Avenue to the County, and New Hampshire Avenue from the Capital Beltway to the County line. A majority of the top congested corridors in the greater Silver Spring area occur during the evening commute. This is similar to some of the other suburban and urban policy areas that offer a mix of housing, commercial, office, and retail land uses. Northbound travelers on Georgia Avenue during the evening commute can expect a trip to take nearly twice as long to travel through the area on average compared to free-flow conditions. The only morning commute that makes it in the top five congested corridors is Northbound Georgia Avenue.

Historical data indicates that speed has decreased on average across all directions by just under four and a half MPH since 2011. This is slight more than the overall County. The PTI has increased but less than that of the county overall indicating the severity of congestion has remained fairly constant.

Route	Congestion	Direction	Period
Colesville Road	87%	SOUTHBOUND	PM Peak
MD-650	72%	NORTHBOUND	PM Peak
Georgia Avenue	71%	NORTHBOUND	PM Peak
MD-390/16 <sup>th</sup> ST	55%	SOUTHBOUND	PM Peak
Colesville Road	54%	NORTHBOUND	AM Peak
Colesville Road	51%	NORTHBOUND	PM Peak
MD-193	51%	EASTBOUND	PM Peak
MD-390/16 <sup>th</sup> ST	51%	SOUTHBOUND	AM Peak
MD-193	51%	WESTBOUND	PM Peak
MD-650	47%	NORTHBOUND	AM Peak





### Colesville Road from the Capital Beltway to the County line

Southbound Colesville Road during the evening commute is the second most congested corridor analyzed as part of the 2015 MAR. The corridor is congested an average of eight-seven percent throughout the duration of the evening commute with congestion reaching one hundred fort percent during the peak hour of some weekdays. The southbound direction has more of a dichotomous congestion profile than the northbound direction. Congestion along northbound Colesville road reaches similar levels during the morning and evening commutes.

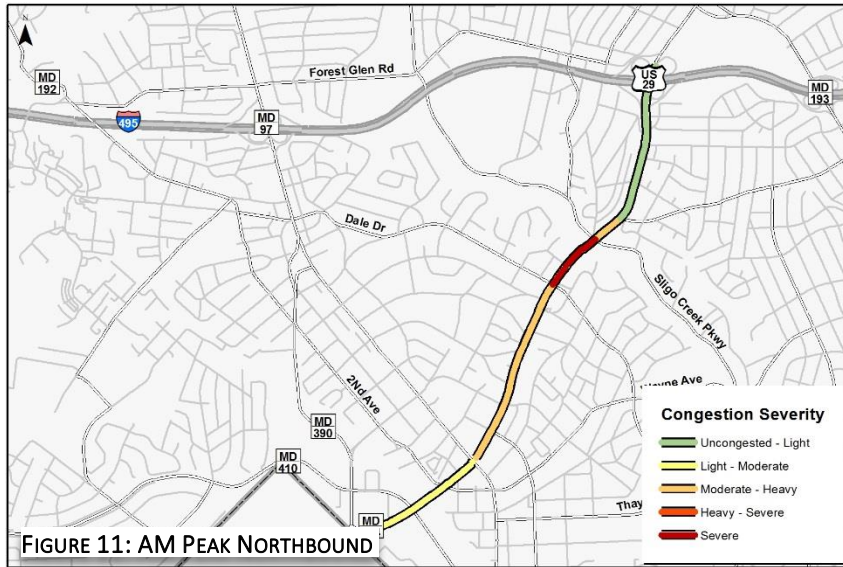
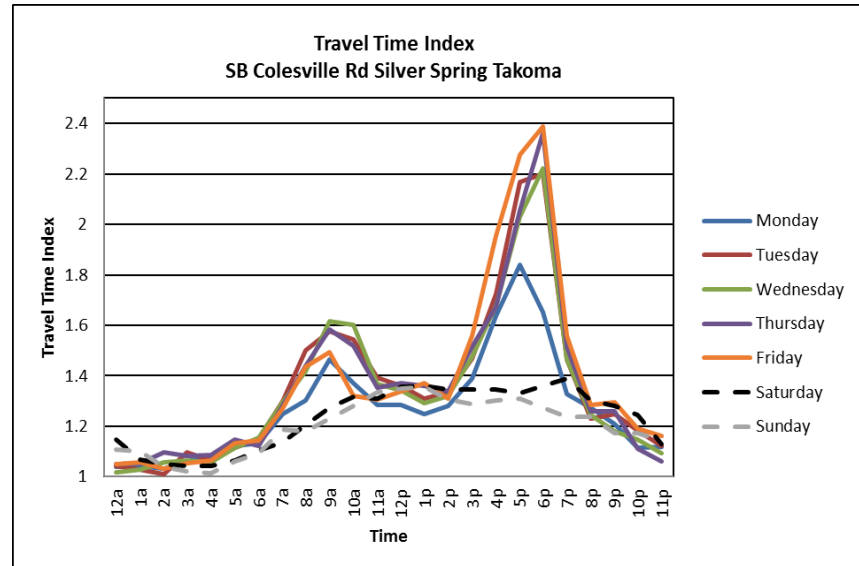
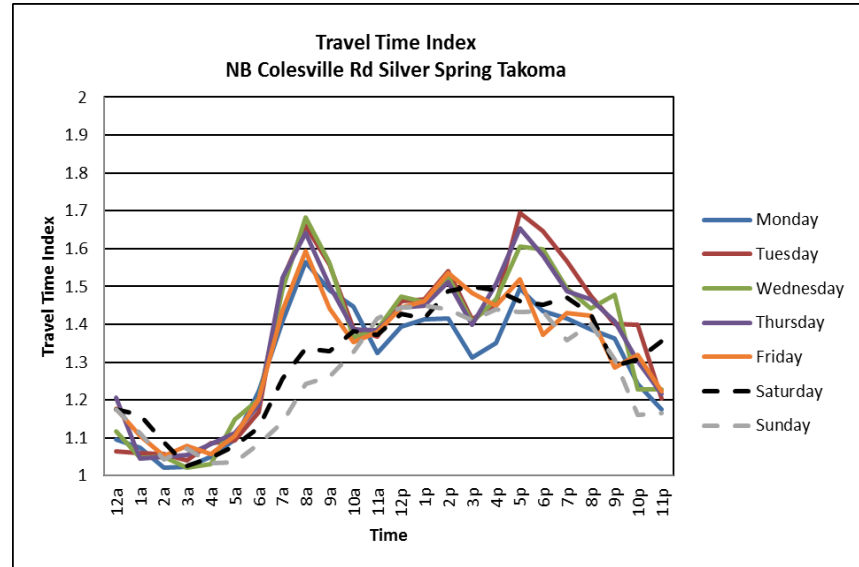


FIGURE 11: AM PEAK NORTHBOUND

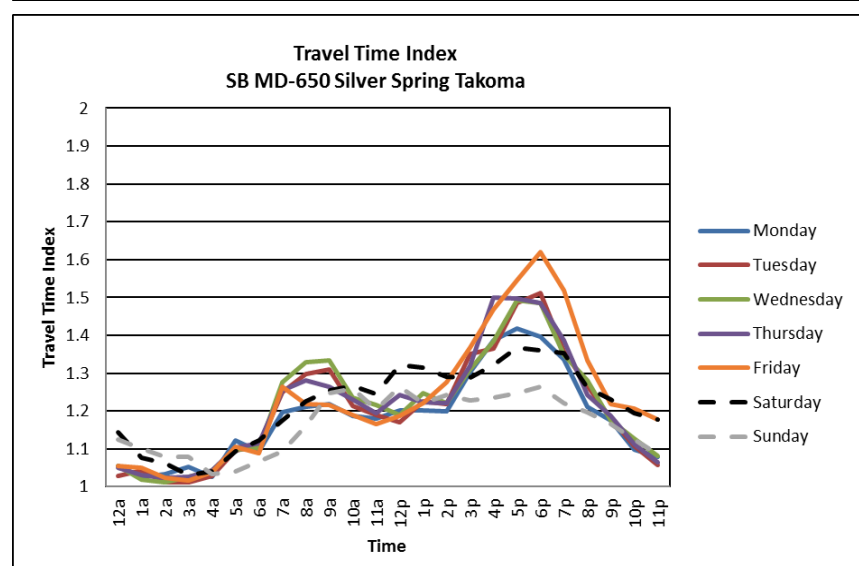
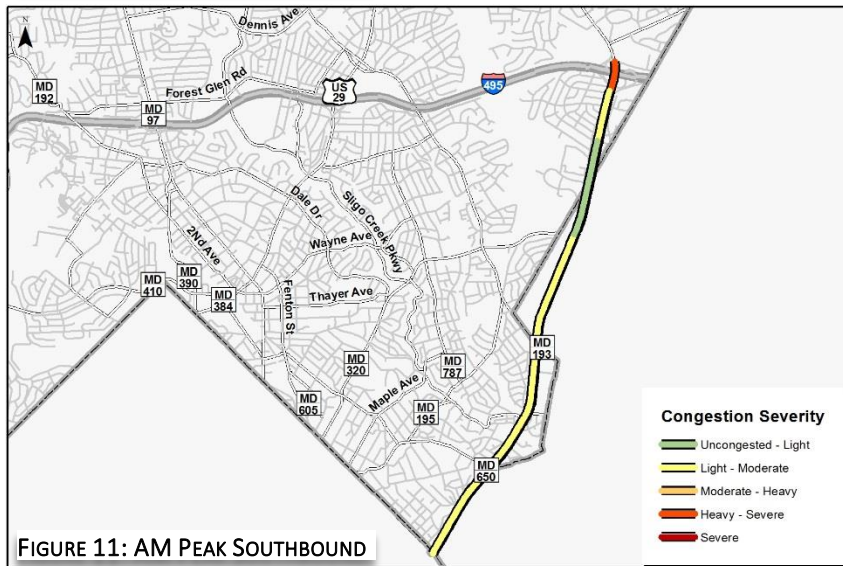
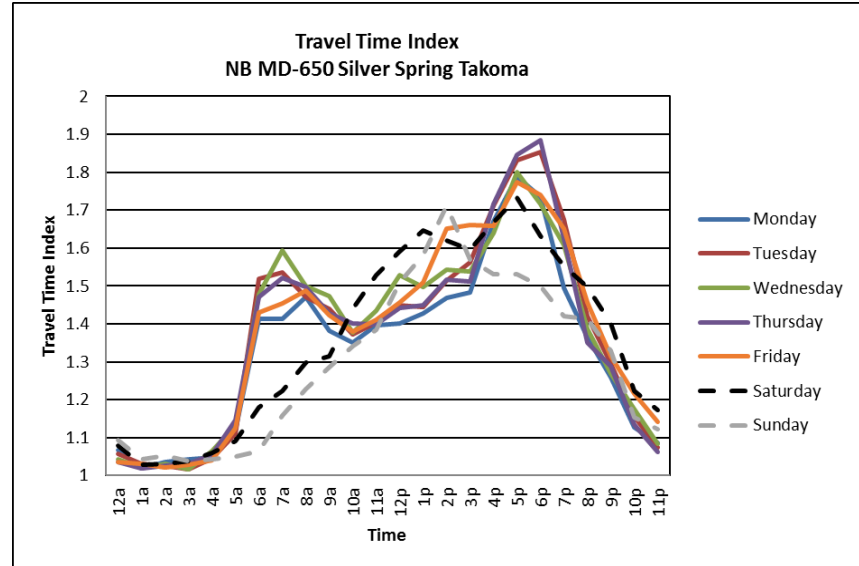
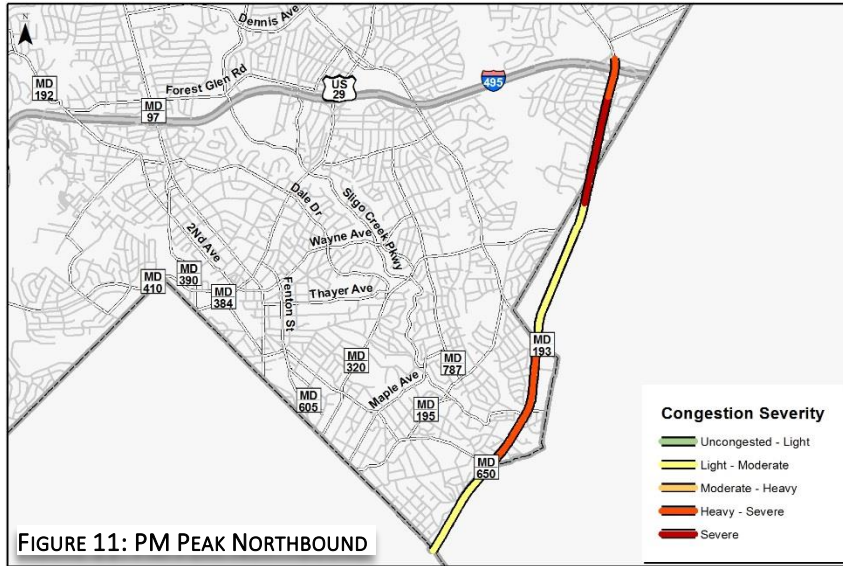


FIGURE 11: PM PEAK SOUTHBOUND



## New Hampshire Avenue (MD-650) from County line to the Capital Beltway

New Hampshire Avenue is most congested during the evening commute in the northbound direction. Travelers during the evening commute heading north experience the worst congestion between Ethan Allen Ave University Avenue and Metzert Road to the Capital Beltway. Overall congestion is heavier in the northbound direction than the southbound direction. Southbound congestion during the morning commute remains light to moderate with the exception of a small segment just south of the Capital Beltway.

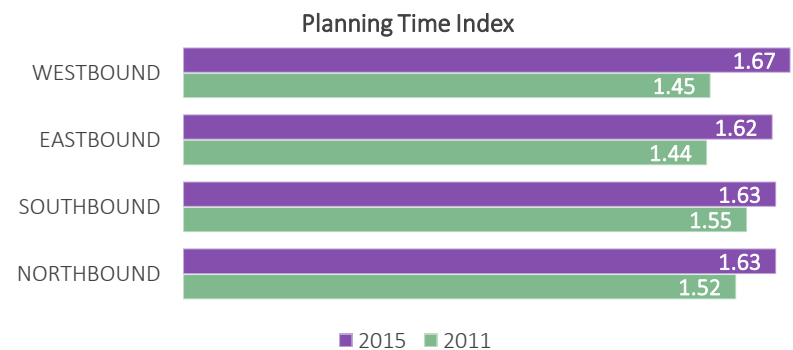
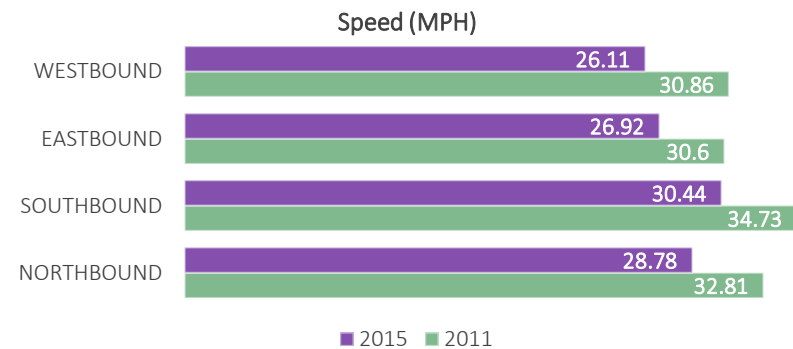
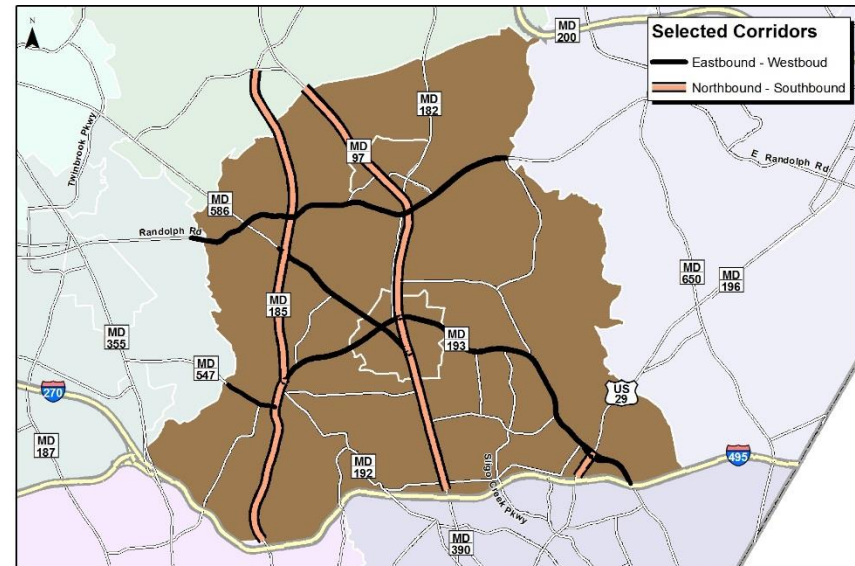


## Wheaton CBD, Wheaton/Kensington, Glenmont

The final vicinity evaluated as part of the 2015 MAR's roadway congestion section is Wheaton CBD, Wheaton/Kensington, and Glenmont policy areas. Due to the segmentation used by the data provider and their spatial relationship with the policy areas, very short segments of Colesville Road (US-29) between the Capital Beltway and University Boulevard and Knowles Ave (MD-547) between Connecticut Avenue and Beach Drive are included with this area analysis. The other corridors analyzed are Connecticut Avenue (MD-185) between the Capital Beltway and Aspen Hill Road, Georgia Avenue (MD-97) between the Capital Beltway and Hewitt Avenue, University Avenue (MD-193) between the Capital Beltway and Connecticut Avenue, Randolph Road between Kemp Mill Road and Rocking Horse Road, and Veirs Mill Road (MD-586) between Georgia Avenue and Connecticut Avenue.

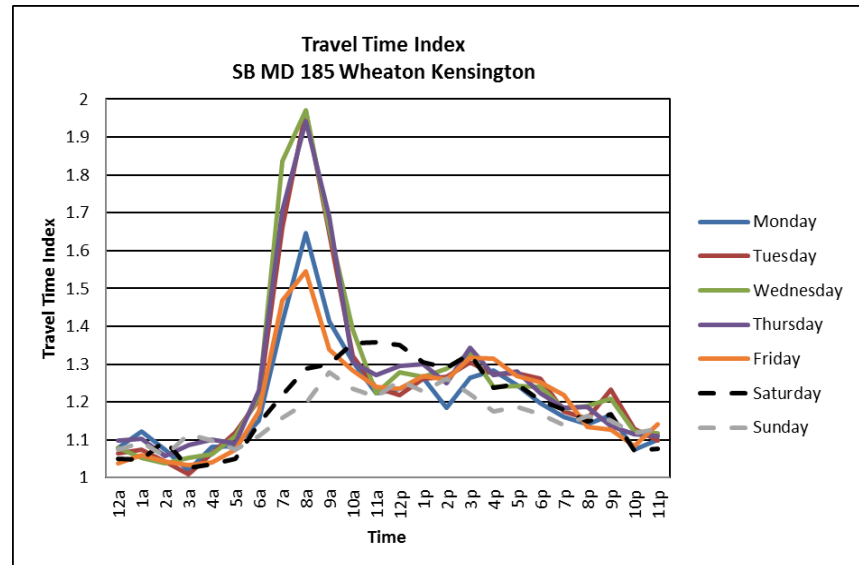
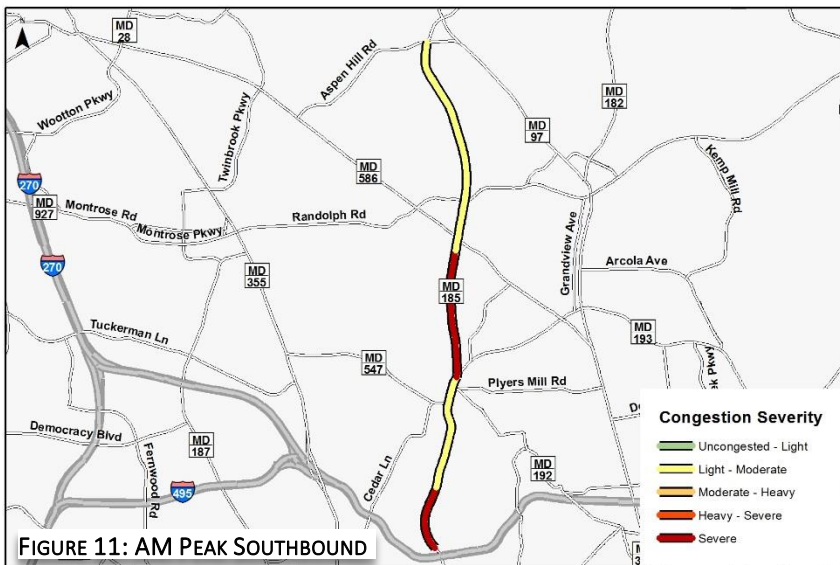
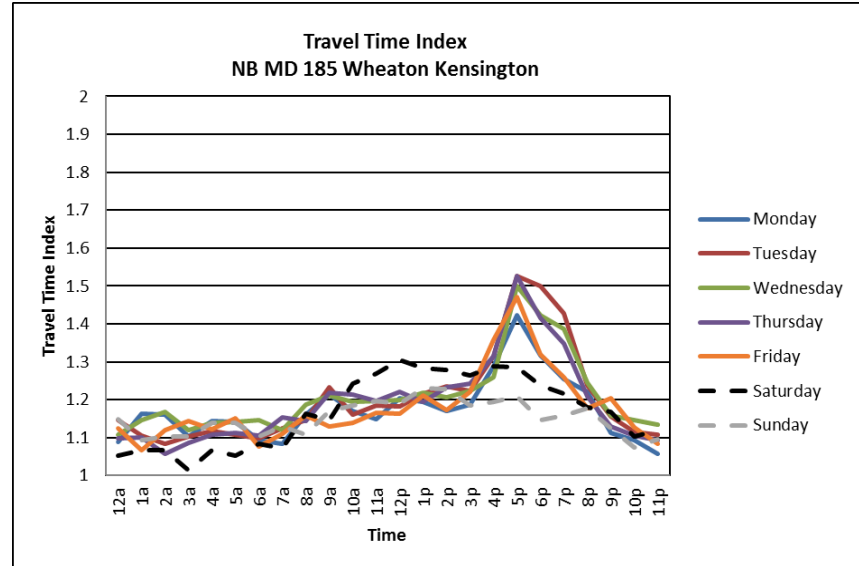
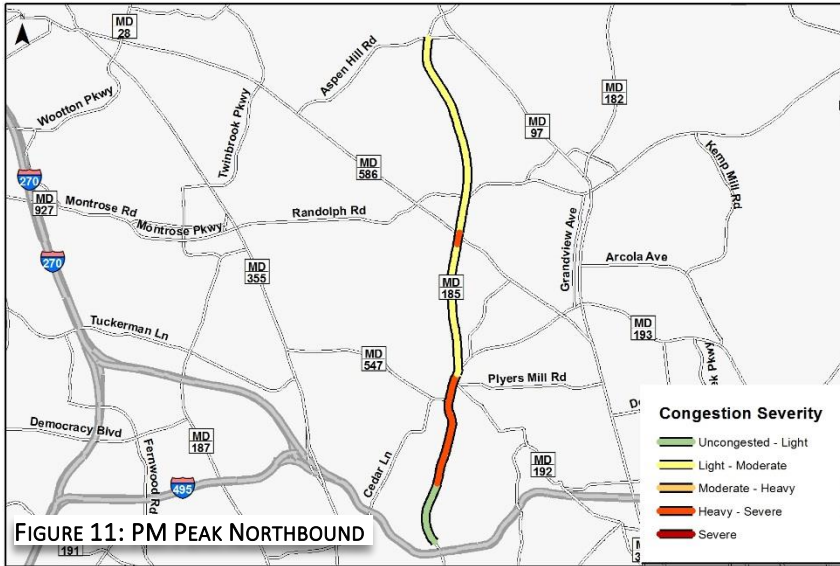
Northbound Colesville Road during the evening commute is the most congested corridor in the greater Wheaton/Kensington/Glenmont area. This finding is certainly impacted by its short distance and location between two major intersections. Connecticut Avenue during the morning commute in the southbound direction is the second most congested corridor. Due to their more substantive lengths, Connecticut Avenue and Veirs Mill Road will be analyzed in more detail in the next section. Historical data indicates that speeds have decreased slightly more than the overall county. Congestion variability, however, has remained fairly constant.

Route	Congestion	Direction	Period
US-29	67%	NORTHBOUND	PM Peak
MD-185	66%	SOUTHBOUND	AM Peak
MD-547	56%	EASTBOUND	PM Peak
MD-586	55%	WESTBOUND	PM Peak
MD-586	55%	EASTBOUND	PM Peak
MD-193	53%	WESTBOUND	AM Peak
MD-586	49%	EASTBOUND	AM Peak
MD-586	49%	WESTBOUND	AM Peak
US-29	48%	SOUTHBOUND	AM Peak
Randolph Rd	47%	WESTBOUND	AM Peak



## Connecticut Avenue (MD-185) between the Capital Beltway and Aspen Hill Road

Connecticut Avenue has a more traditional dichotomous commuting congestion profile. The longest delay occurs during the inbound morning commute when the average congestion can reach almost one hundred percent during Wednesday and Thursday mornings. Travelers tend to experience severe congestion between Veirs Mill Road and University Boulevard in the mornings and again approaching the Capital Beltway. Outbound traffic reaches its peak between five and six PM with the worst congestion occurring between Saul Road and Dupont Ave.



### Veirs Mill Road (MD-586) from Georgia Avenue to Connecticut Avenue

Veirs Mill Road is somewhat unusual in that both directions experience very similar congestion profiles for the evening and morning commutes. Average congestion during the evening and morning commutes are exactly the same for both directions. As indicated by the TTI profiles below, weekend congestion is also fairly significant, an indication that the Viers Mill Corridor is used for many non-work trips serving as a connection between two commercial and retail centers, Wheaton and Rockville. Congestion is often at its worse between MD-193 and MD-97.

