Colesville Road (US 29)
Pedestrian Road Safety Audit
Montgomery County, Maryland

Prepared For:
Department of Transportation
Montgomery County, Maryland

In partnership with the Maryland State Highway Administration

Prepared By:

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Silver Spring, Maryland

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1. Introduction

1.1 Objective

The objective of this study was to complete a pedestrian road safety audit (PRSA) for Colesville Road (US 29) between Fenton Street and North Noyes Drive in Silver Spring, Maryland. As a result of the audit, the PRSA team has identified a variety of issues related to pedestrian and bicycle safety and developed a number of suggestions to improve overall safety in the study area.

1.2 Background

The study area is an approximately 0.3-mile segment of Colesville Road located in a relatively densely developed, urban corridor. The study area includes two signalized intersections at Fenton Street and Spring Street, and three unsignalized intersections at South Noyes Drive, Noyes Court, and North Noyes Drive. Colesville Road is a relatively high-volume major arterial roadway with six lanes. Fenton Street is a two-lane arterial roadway that serves as one of the primary retail corridors in downtown Silver Spring, and connects Colesville Road with Spring Street to the north and MD-410 to the south. Spring Street is a two-lane arterial roadway that connects Colesville Road with Georgia Avenue (MD-97) to the northwest and to portions of the downtown Silver Spring commercial district to the southeast. South Noyes Drive and North Noyes Drive are two-lane residential streets that provide access to the Woodside neighborhood to the west of Colesville Road. Noyes Court is a cul-de-sac.

Colesville Road serves as major commuter route between and within Montgomery County, Maryland, and Washington, D.C. The study area also experiences significant pedestrian activity, generated by the adjacent commercial and residential land use and several transit bus stops.

The Colesville Road study area was identified as one of Montgomery County's High Incidence Areas (HIA) for pedestrian-related collisions, as part of the Montgomery County Executive's Pedestrian Safety Initiative. Based on collision data provided by Montgomery County and the Maryland State Highway Administration, 29 pedestrian collisions occurred in the study area from January 2004 through February 2011. The purpose of this PRSA was to identify safety issues that may be contributing to the observed pedestrian collisions in the study area.

The PRSA was performed on November 16 and November 17, 2011, during daytime and nighttime hours. The PRSA team consisted of seven members, representing:

- Montgomery County Department of Transportation (MCDOT),
- Maryland State Highway Administration (MDSHA),
- Maryland Highway Safety Office,
- Montgomery County Police Department, and
- Vanasse Hangen Brustlin, Inc. (VHB), the PRSA consultant.

1.3 Organization of the Report

This report first presents a description of the existing geometric, operational, and safety conditions for the study area based on field reviews and available data. Next, the report identifies the existing conditions and general issues identified within the corridor by the PRSA team. Finally, the report

presents suggestions to enhance pedestrian safety within the study area. This assessment identifies issues, possible contributing factors, and suggestions for improvement.

This report will be a resource to MDSHA and MCDOT, as well as other stakeholders, for implementing pedestrian safety improvements within the audit area. There will be an ongoing vetting of the suggestions and recommendations in this report with collaboration among agencies and stakeholders to implement short and intermediate-term recommendations and assess the feasibility and constructability of long-term projects. Ultimately, this process will assess the merits of these recommendations and establish a process whereby a range of pedestrian safety recommendations are implemented.

1.4 Existing Conditions

1.4.1 Site Characteristics

In the study area, Colesville Road is a six-lane major arterial that runs in the north-south direction. Figure 1 shows the study area for this PRSA. The posted speed limit on this portion of Colesville Road south of Spring Street is 30 miles per hour (mph). North of Spring Street, the posted speed limit is 35 mph.

Colesville Road is controlled by a time-of-day reversible lane system. The lane control system is comprised of overhead variable signals which display one of three indications (a green arrow, yellow “X”, or red “X”) to identify to drivers traveling in both directions whether each lane is available at any given time of day. The purpose of the lane control system is to provide additional lane capacity for traffic traveling in the direction of heaviest travel during peak periods. The lane control system is currently configured for traffic to usefour southbound lanes and two northbound lanes in the morning peak (7:00-9:30 AM), and two southbound and four northbound lanes in the evening peak (4:00-7:00 PM). During off-peak hours, Colesville Road has three southbound and three northbound lanes.

The study area includes two signalized intersections along Colesville Road:

- Colesville Road (US 29) at Fenton Street
- Colesville Road (US 29) at Spring Street

The study area includes three unsignalized intersections along Colesville Road:

- Colesville Road (US 29) at South Noyes Drive
- Colesville Road (US 29) at Noyes Court
- Colesville Road (US 29) at North Noyes Drive

Colesville Road (US 29) at Fenton Street Intersection

In proximity to the study area, Fenton Street is a two-lane minor arterial roadway that runs in a generally east-west direction. Fenton Street has on-street parking on the north side of the roadway to the west of the intersection of Colesville Road and Fenton Street (on-street parking is allowed on both sides of Fenton Street starting around midblock). During the morning peak, the southbound approach of the Colesville Road and Fenton Street intersection includes one shared

through/right turn lane, two through lanes and one shared left turn/through lane with a protected permissive left turn. During the evening peak, the southbound approach includes one shared through/right turn lane and one shared left turn/through lane with a protected permissive left turn. During non-peak hours, the southbound approach includes one share through/right turn lane, one through lane, and one left turn/through lane with a protected permissive left turn.

During the morning peak, the northbound approach of the Colesville Road and Fenton Street intersection includes one shared through/right turn lane and one shared left turn/through lane. During the evening peak, the northbound approach includes one shared through/right turn lane and three through lanes. Northbound left turns are prohibited during the evening peak. During non-peak hours, the northbound approach includes one share through/right turn lane, one through lane, and one left turn/through lane.

The eastbound approach of the Colesville Road and Fenton Street intersection includes one shared left turn/through lane and one shared through/right turn lane. The westbound approach includes one shared left turn/through lane and one right turn lane.

Colesville Road (US 29) at Spring Street Intersection

In proximity to the study area, Spring Street is a minor arterial roadway that runs in a generally east-west direction. On-street parking is not allowed on Spring Street near Colesville Road. During the morning peak, the southbound approach of the Colesville Road and Spring Street intersection includes one shared through/right turn lane, two through lanes and one shared left turn/through lane with a protected permissive left turn. During the evening peak, the southbound approach includes one shared through/right turn lane and one shared left turn/through lane with a protected permissive left turn. During non-peak hours, the southbound approach includes one share through/right turn lane, one through lane, and one left turn/through lane with a protected permissive left turn.

During the morning peak, the northbound approach of the Colesville Road and Spring Street intersection includes one shared through/right turn lane and one shared left turn/through lane. During the evening peak, the northbound approach includes one shared through/right turn lane and three through lanes. Northbound left turns are prohibited during the evening peak. During non-peak hours, the northbound approach includes one shared through/right turn lane, one through lane, and one left turn/through lane.

The eastbound approach of the Colesville Road and Spring Street intersection includes two left turn lanes and one shared through/right turn lane. The westbound approach includes one shared left turn/through lane, one through lane, and one right turn lane. The eastbound and westbound approaches feature split-phasing. Figure 2 summarizes the peak-hour roadway lane geometry throughout the corridor**.** Figure 3 summarizes the peak-hour roadway lane geometry throughout the corridor.

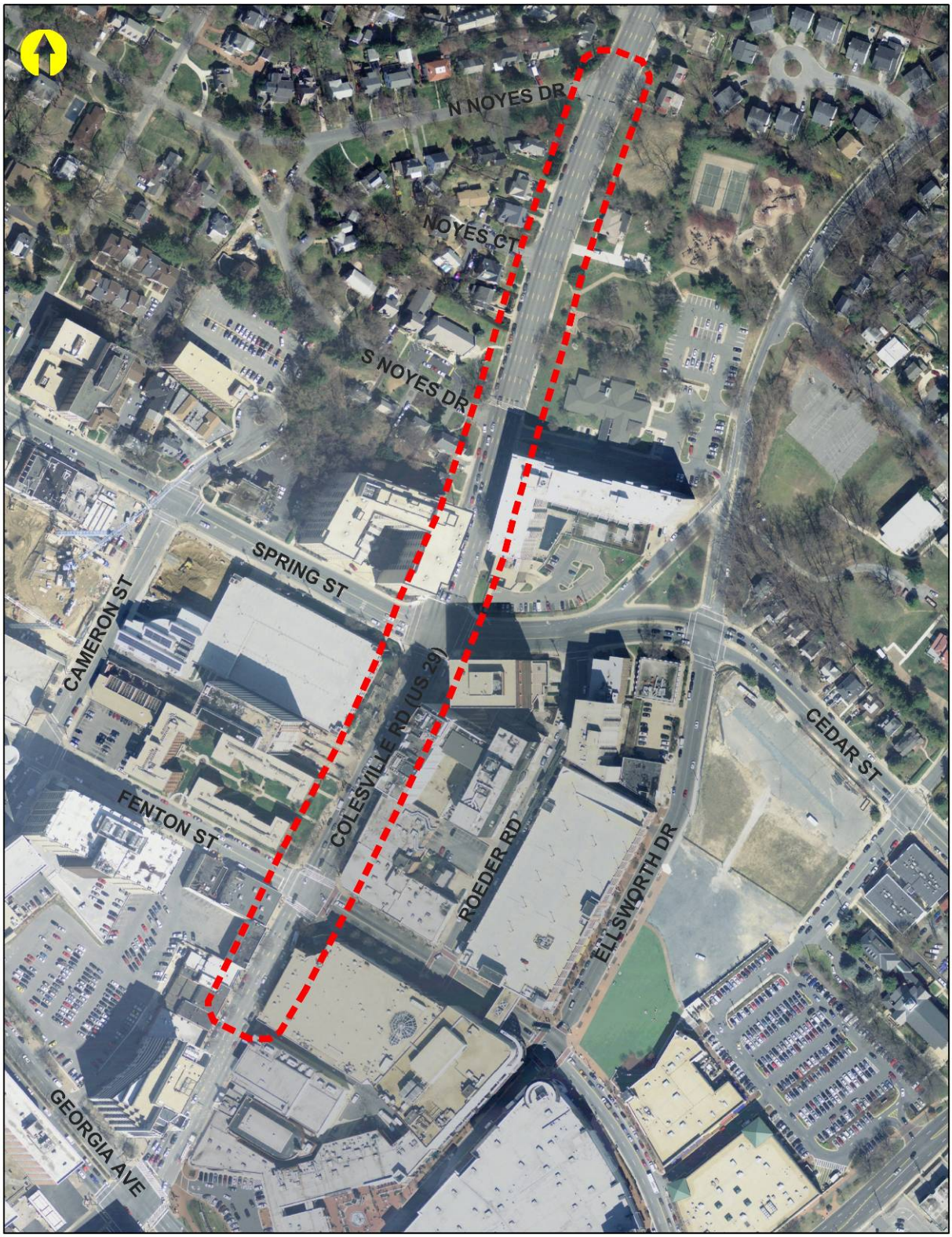


Figure 1: Study Area

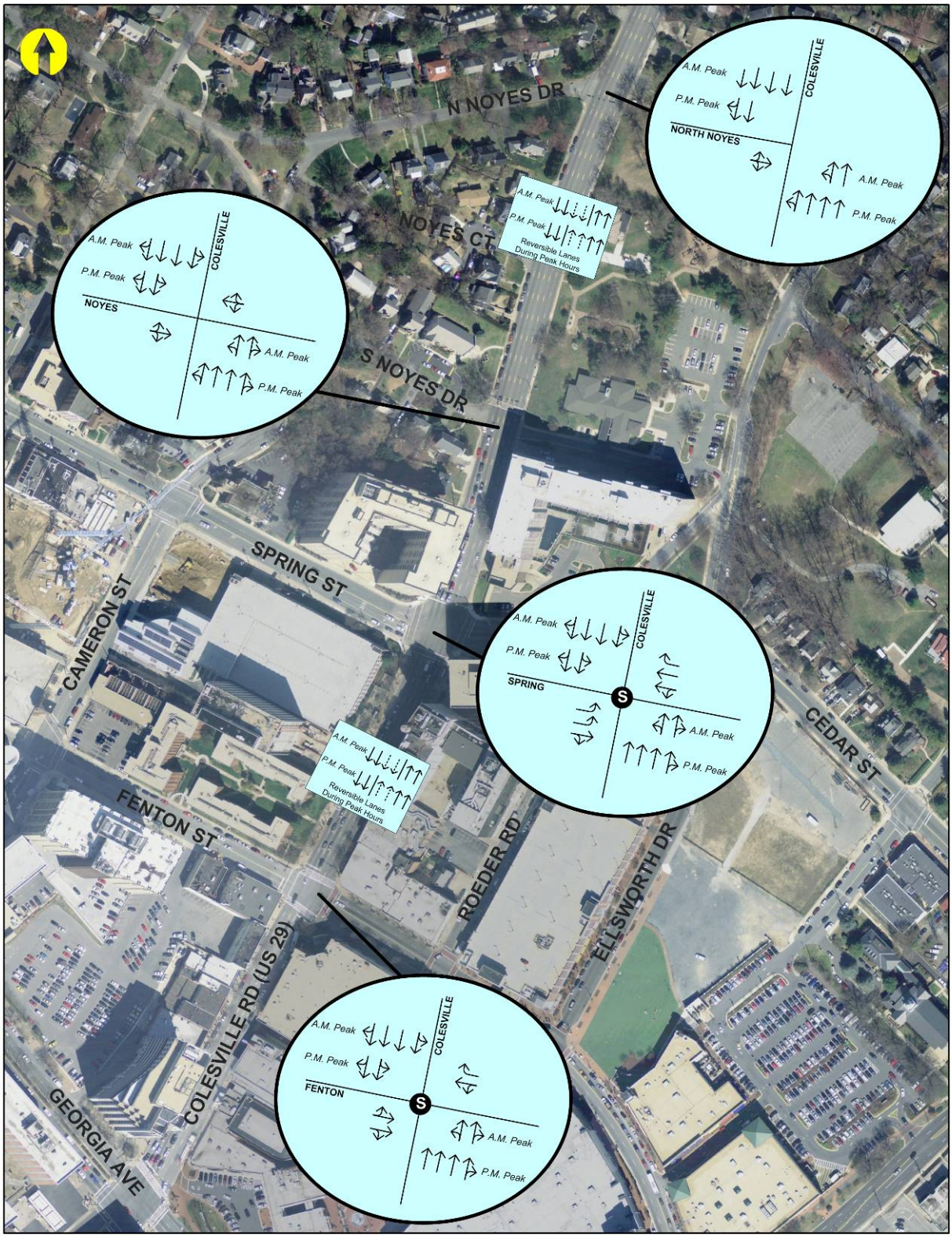


Figure 2: Study Area Corridor and Peak-hour Intersection Lane Geometry

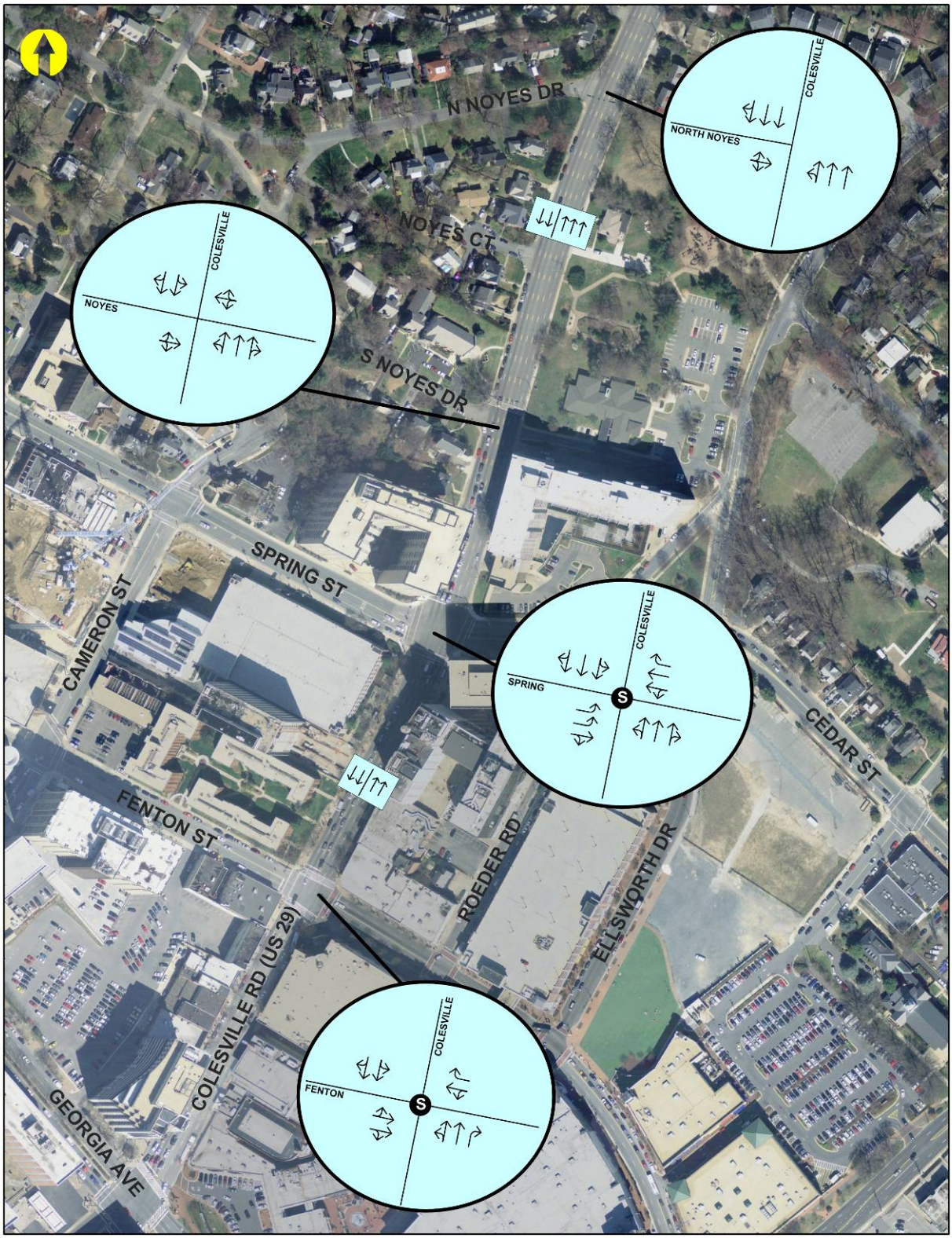


Figure 3: Study Area Corridor and Off-peak Intersection Lane Geometry

Colesville Road (US 29) at South Noyes Drive Intersection

South Noyes Drive is a two-lane residential street that runs in an east-west direction. South Noyes Drive terminates at Colesville Road, and constitutes the eastbound approach to the unsignalized intersection at Colesville Road and South Noyes Drive. The westbound approach to the intersection is a driveway that provides access to the Silver Spring Library. During the morning peak, the southbound approach includes one shared left turn/through lane, two through lanes, and a shared through/right turn lane. During the afternoon peak, the southbound approach includes one shared left turn/through lane and one shared through/right turn lane. During the morning peak, the northbound approach includes one shared left turn/through lane and one shared through/right turn lane. During the afternoon peak, the northbound approach includes one shared left turn/through lane, two through lanes, and one shared through/right turn lane. During the off-peak, the northbound and southbound approaches each include one shared left turn/through lane, one through lane, and a shared through/right turn lane. The westbound and eastbound approaches each include a single lane.

Colesville Road (US 29) at Noyes Court Intersection

Noyes Court is a residential cul-de-sac that runs in an east-west direction. Noyes Court terminates at Colesville Road, and constitutes the eastbound approach to the unsignalized intersection at Colesville Road and Noyes Court. The intersection does not have a westbound approach. During the morning peak, the southbound approach includes one shared left turn/through lane, two through lanes, and a shared through/right turn lane. During the afternoon peak, the southbound approach includes one shared left turn/through lane and one shared through/right turn lane. During the morning peak, the northbound approach includes one shared left turn/through lane and one shared through/right turn lane. During the afternoon peak, the northbound approach includes one shared left turn/through lane, two through lanes, and one shared through/right turn lane. During the off-peak, the northbound and southbound approaches each include one shared left turn/through lane, one through lane, and a shared through/right turn lane. The eastbound approach includes a single lane.

Colesville Road (US 29) at North Noyes Drive Intersection

North Noyes Drive is a residential street that runs in an east-west direction. North Noyes Drive terminates at Colesville Road, and constitutes the eastbound approach to the unsignalized intersection at Colesville Road and North Noyes Drive. The intersection does not have a westbound approach. During the morning peak, the southbound approach includes one shared left turn/through lane, two through lanes, and a shared through/right turn lane. During the afternoon peak, the southbound approach includes one shared left turn/through lane and one shared through/right turn lane. During the morning peak, the northbound approach includes one shared left turn/through lane and one shared through/right turn lane. During the afternoon peak, the northbound approach includes one shared left turn/through lane, two through lanes, and one shared through/right turn lane. During the off-peak, the northbound and southbound approaches each include one shared left turn/through lane, one through lane, and a shared through/right turn lane. The eastbound approach includes a single lane.

Sidewalks are present along both sides of Colesville Road within the study area. Marked crosswalks are provided at both of the signalized intersections within the study area; however, the north leg of

the Colesville Road and Spring Street intersection does not have a marked crosswalk. There is a marked crosswalk on the north leg of the unsignalized intersection of Colesville Road and Noyes Drive.

1.4.2 Traffic Data

Average annual daily traffic (AADT) volume in vehicles per day (vpd) for Colesville Road was obtained from MDSHA traffic count records (Table 1).

Table 1: 2010 AADT

Road	Location	AADT
Colesville Road	0.1 miles north of MD 97	34,930 vpd

Public transportation is heavily utilized in the study area through the eight bus stops located on Colesville Road and Fenton Street. WMATA bus routes F4, F6, Z2, Z6, Z8, Z9, Z11, Z13 and Z29 and Montgomery County Ride On routes 8, 12, 13, 14, 16, 17, 20, 21, 22 and 28 have stops within the study area (see Figure 4). A summary of bus stop locations and ridership is shown in Figure 5.

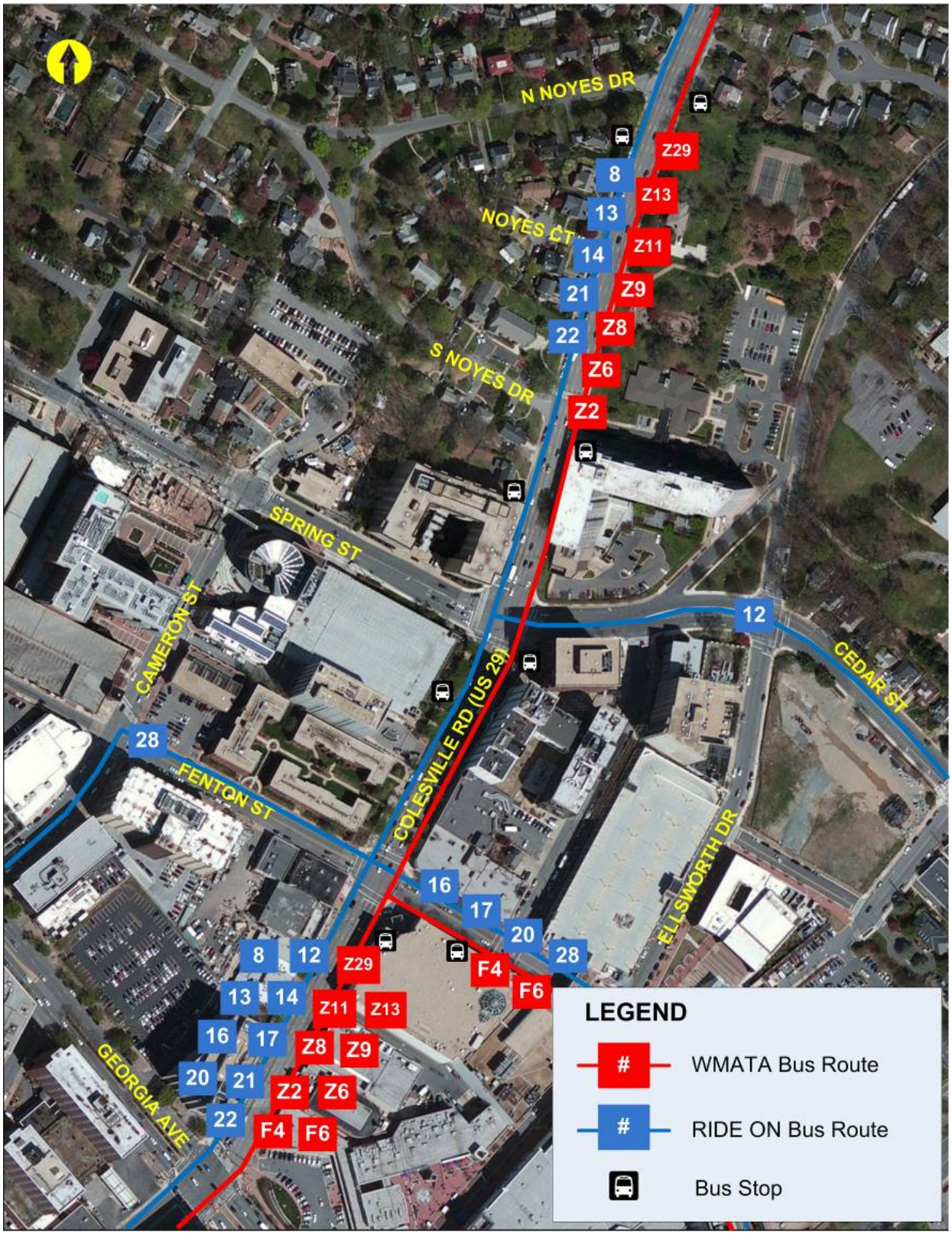


Figure 4: Colesville Road Study Area Bus Routes

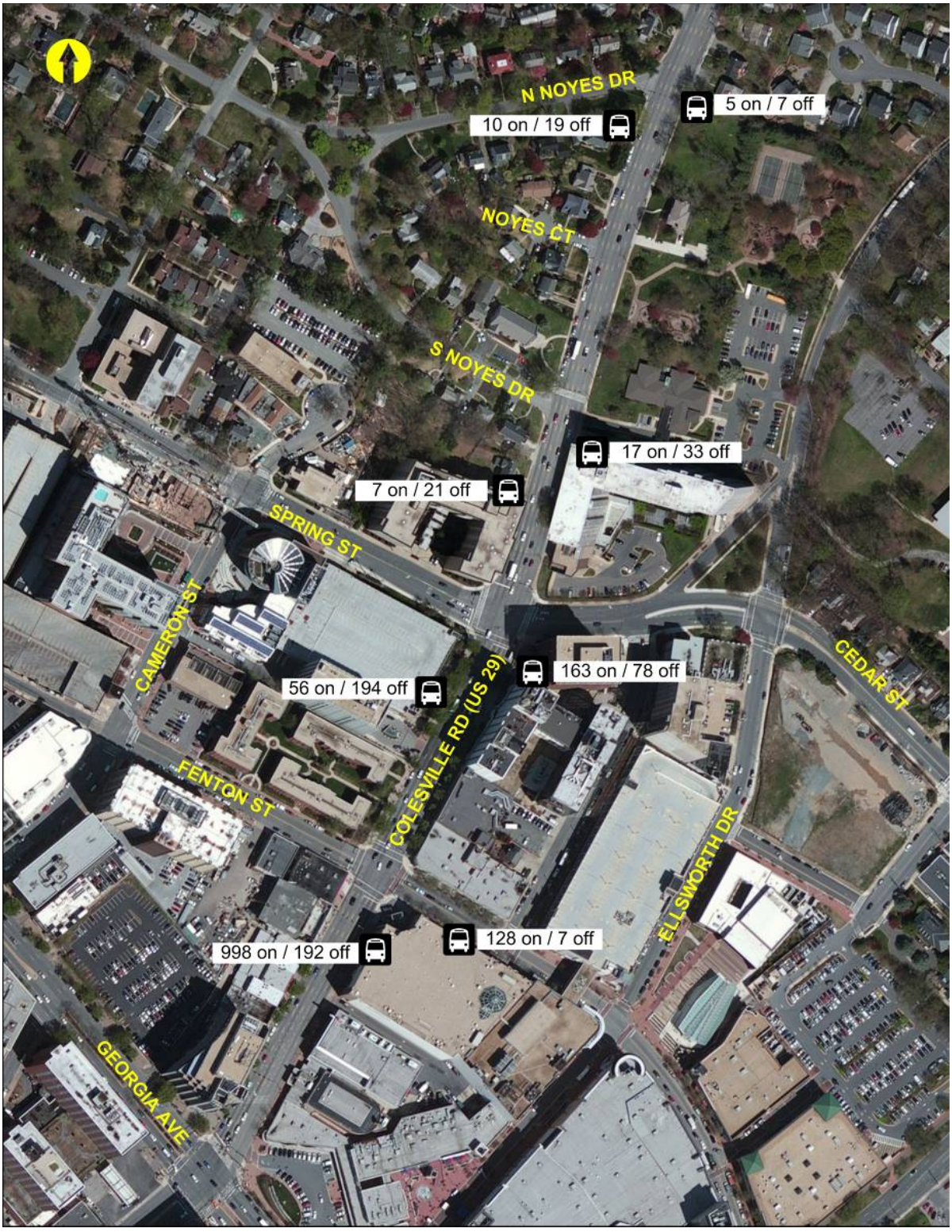


Figure 5: Colesville Road Study Area Daily Bus Stop Ridership

Peak hour vehicular and pedestrian volumes from the most recent MDSHA traffic volume counts for the Connecticut Avenue and Georgia Avenue intersection are shown in Table 2. This data is provided in vehicles per hour (vph) and pedestrians per day (ppd).

Table 2: Traffic Count Data (Entering Volumes)

Year	Location	AM Peak Hour	AM Peak Volume	PM Peak Hour	PM Peak Volume	Daily Ped Volume
2004	Colesville Rd at Fenton St	7:45 - 8:45 AM	3,944 vph	4:00 - 5:00 PM	3,649 vph	4,927 ppd
2011	Colesville Rd at Spring St	8:00 - 9:00 AM	4,249 vph	4:30 - 5:30 PM	4,444 vph	1,304 ppd
2011	Colesville Rd at Noyes Dr	8:15 – 9:15 AM	3,752 vph	4:30 - 5:30 PM	3,948 vph	753 ppd
2011	Colesville Rd at North Noyes Dr	8:15 – 9:15 AM	3,783 vph	4:30 - 5:30 PM	4,025 vph	208 ppd

1.4.3 Crash Data

A review of all collision records collected by Montgomery County Police in the study area during the approximately seven-year period from January 2004 through February 2011 was conducted and crash data identifying the location, date, time, severity, type, and ambient conditions of all reported pedestrian and bicyclist crashes within the corridor was provided to the PRSA team (Figure 6). From January 2004 through February 2011, a total of 264 vehicular crashes and 29 pedestrian crashes were reported in the study area (Figure 7). A detailed crash report for one collision was unavailable from MCPD, so only 28 crashes are depicted in Figure 7.

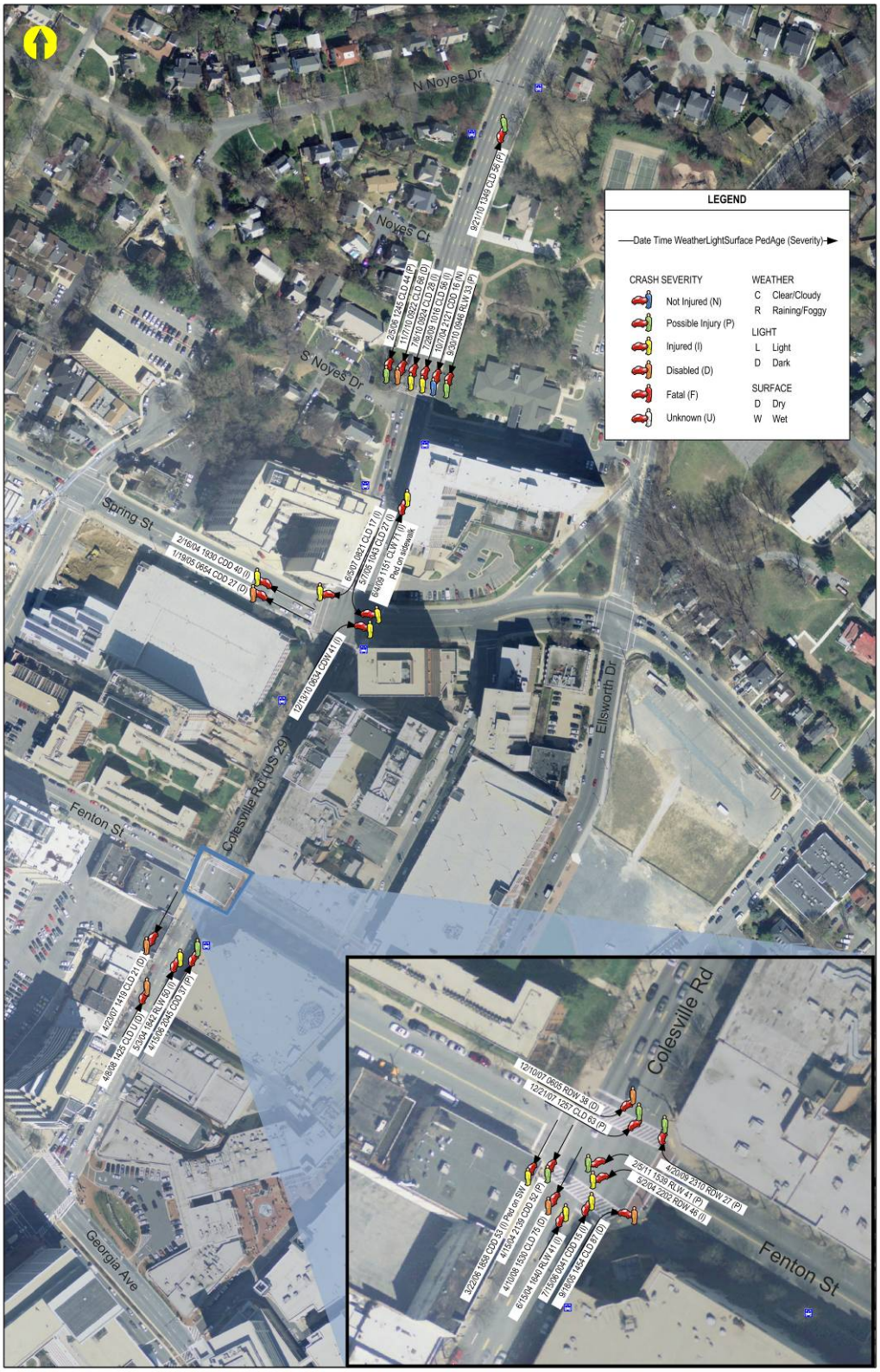


Figure 6: Pedestrian Crashes – Colesville Road (Fenton Street to North Noyes Drive), Jan. 2004 - Feb. 2011

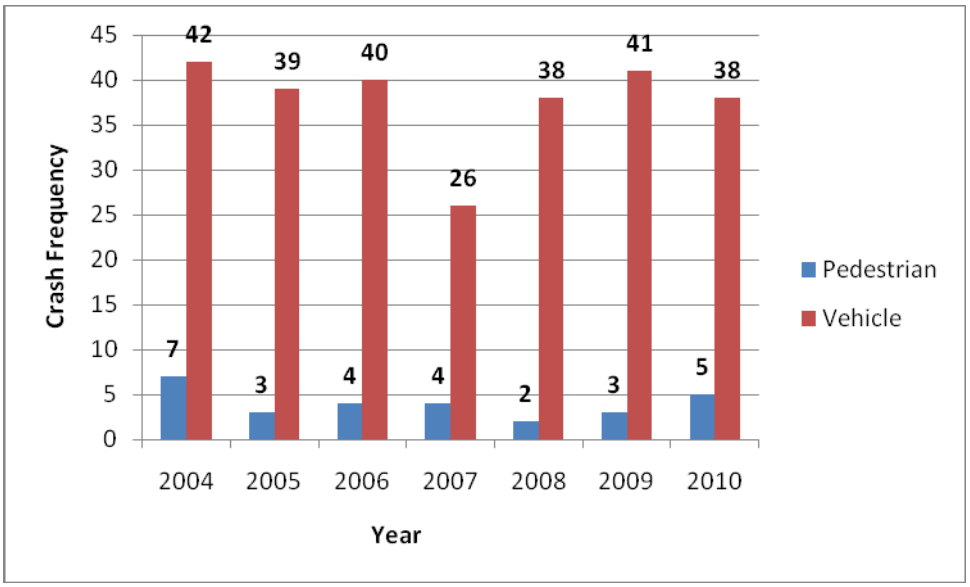


Figure 7: Study Area Crash Frequency, 2004 – 2010

Crash data indicate that 27 of the 29 pedestrian crashes resulted in injuries or possible injuries (Figure 8). Six crashes resulted in disabling injuries, 13 crashes resulted in non-incapacitating injuries, and eight crashes resulted in possible injuries. There were no crashes that resulted in pedestrian fatalities.

Colesville Road is an arterial roadways designed primarily to provide vehicle mobility, using design characteristics like multiple wide lanes, minimized centerline curvature, and – north of the intersection at Spring Street – significant distances between signalized intersections. In particular, the roadway design features north of the intersection of Colesville Road and Spring Street contribute to elevated vehicle speeds on the roadway (posted speed limits of 35 mph or higher), which may contribute to elevated crash severity for pedestrians and bicyclists.

Analysis of national crash trends by Transportation For America indicates that nearly 60 percent of pedestrian fatalities in urban areas occur on arterial roadways. As shown in Figure 9, vehicle speed directly correlates to pedestrian crash severity, with low probabilities for avoiding severe or fatal injuries at speeds of 40 mph or greater.

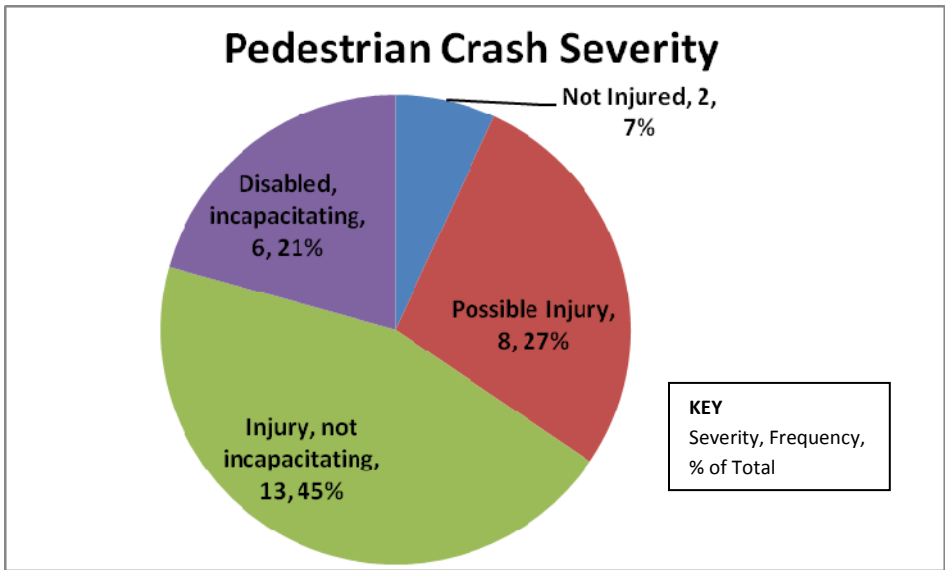


Figure 8: Pedestrian Crashes by Crash Severity, 2005-2009

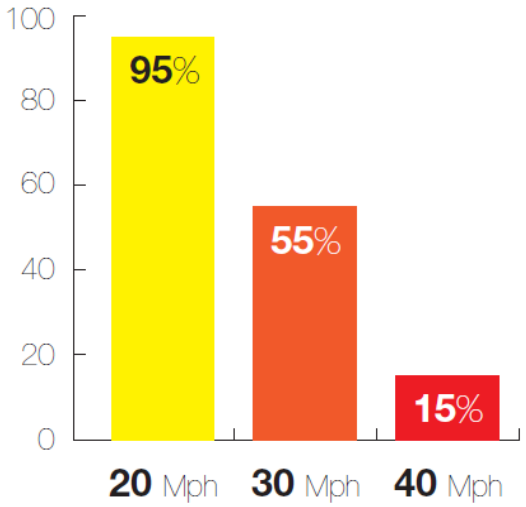


Figure 9: Pedestrian Survival Probability vs. Vehicle Speed

Source: Transportation For America, *Dangerous by Design*

The chart in Figure 10 shows vehicle movements prior to the pedestrian crashes at all study locations. More than half of the 29 crashes involved vehicles moving at constant speed. This finding suggests that drivers typically did not see pedestrians in the roadway or did not expect pedestrian activity at the location of the crash. These circumstances may indicate that low light (a factor in nearly half of all pedestrian crashes), uncontrolled and unexpected midblock crossing activity (a factor in nine of the pedestrian crashes), or multiple-threat situations contributed to many of the crashes. Other vehicle movements prior to the crashes involved making a left turn, making a right turn, accelerating, and skidding.

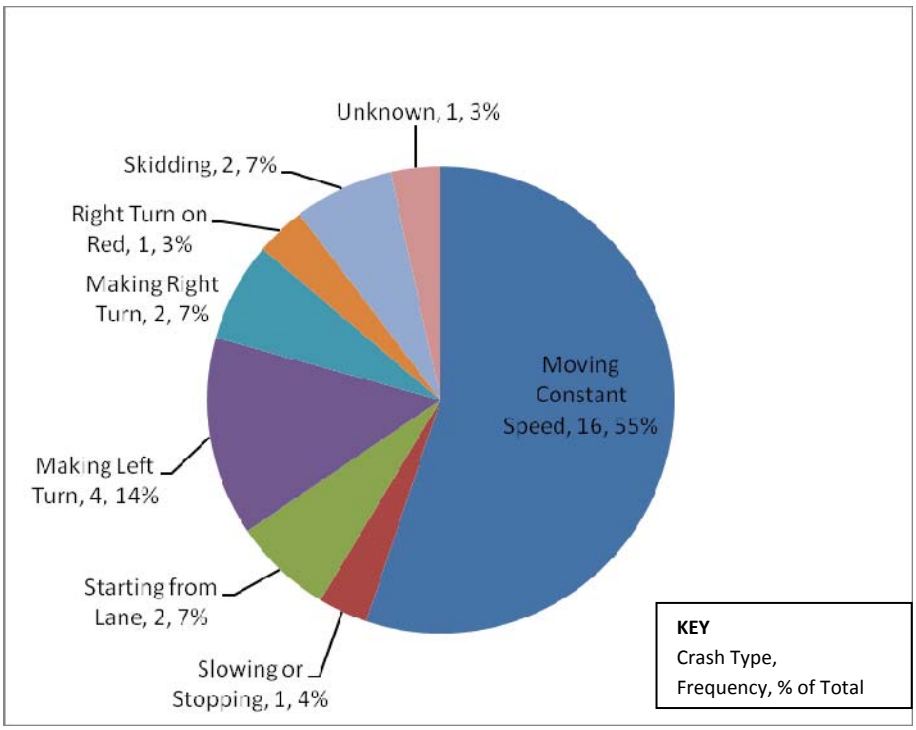


Figure 10: Vehicle Movement Prior to Pedestrian/Bicyclist Crash, Jan. 2004 – Feb. 2011

Figure 11 shows the age distribution of pedestrians involved in crashes. The age distribution is relatively even across age groups. Eleven of the 29 crashes involved pedestrians aged 50 or above, with five of those crashes involving pedestrians aged 60 or above. The latter age group is considered among the most vulnerable pedestrian populations, as elderly pedestrians who are typically the least mobile and most impacted by limited accessibility and limited pedestrian faciilties.

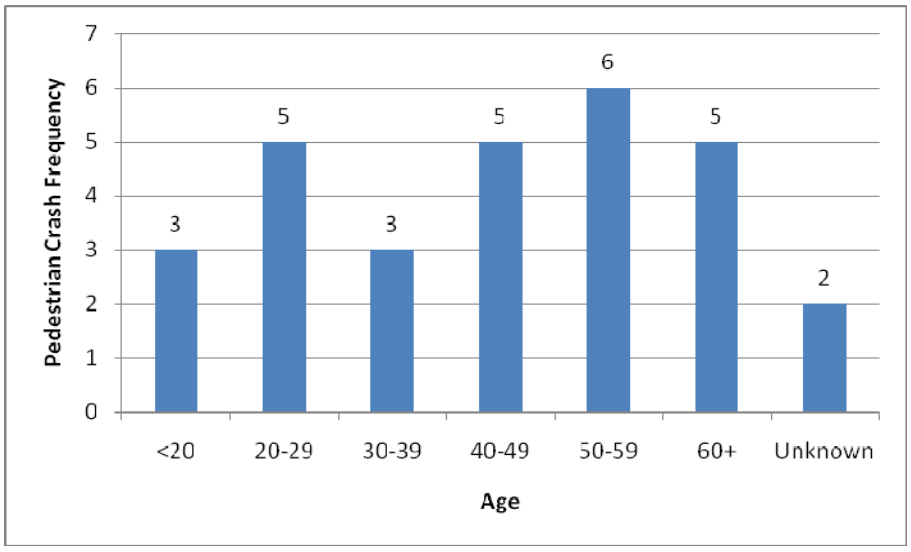


Figure 11: Pedestrian Crashes by Age, Jan. 2004 – Feb. 2011

More than 60 percent (17 crashes) of pedestrian crashes occurred during daylight hours; and over two-thirds (20 crashes) occurred under dry pavement conditions (Figure 12). Eleven of the 29 crashes occurred under dark or dawn/dusk lighting conditions, suggesting that low lighting levels may be a contributing factor to pedestrian and bicyclist crashes in the study area. It is also important to understand that low lighting conditions may exacerbate other contributing factors, such as sight distance limitations.

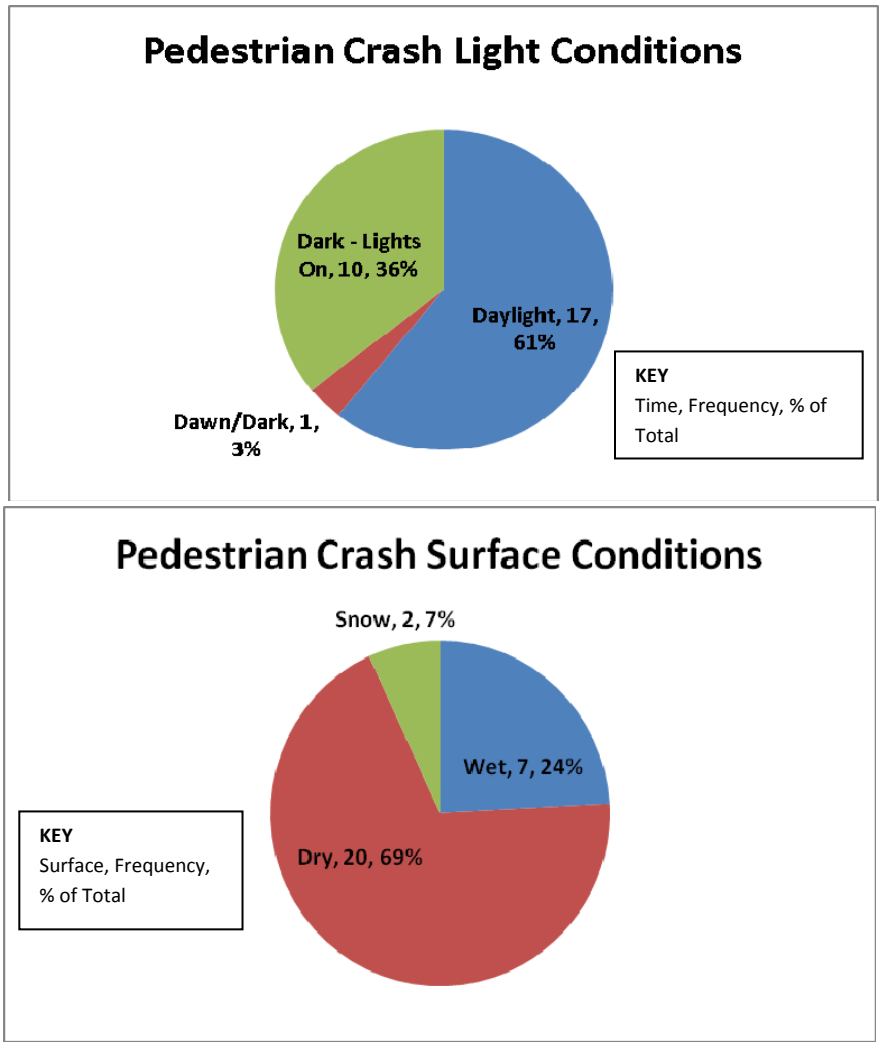


Figure 12: Pedestrian and Bicyclist Crashes by Time of Day and Road Surface Conditions, January 2004 – February 2011

2. Road Safety Audit Findings

2.1 Safety Benefits of Existing Roadway Features

Notable existing roadway features that enhance pedestrian safety in the study area include, but are not limited to:

- *Continuous sidewalks*: Sidewalks along Colesville Road within the study area are continuous and provide a designated space for pedestrians in the corridor. Sidewalks south of the Colesville Road and South Noyes Drive intersection are generally of sufficient width and consistent with appropriate sidewalk width standards for a central business district. Additionally, south of South Noyes Drive, most of the sidewalk is separated from Colesville Road by a planting strip or street furniture. However, significant stretches of the sidewalk along Colesville Road, north of South Noyes Drive, are limited to an effective width of less than five feet, due to encroachment of soil and grass on the sidewalk.
- *Accessible and Countdown Pedestrian Signals (APS/CPS)*: Pedestrian countdown signals with accessible push-buttons are provided at the Colesville Road/Fenton Street and Colesville Road/Spring Street intersections. Countdown pedestrian signal research has shown that pedestrians easily understand how the signal works and that more pedestrians start during the clearance phase, but fewer people initiate walking late in the clearance phase. Studies have also shown that fewer pedestrians remain in crosswalks during the steady "Don't Walk" phase where countdown signals are used. Countdown pedestrian signals have also been found to reduce pedestrian injury crashes and improve pedestrian compliance to traffic controls in several national studies.

Photo of a countdown signal

- *Protected left turn phasing and split phasing*: Both protected and split signal phasing reduce left turn conflicts with pedestrians by prohibiting pedestrian movements during the active vehicle phase. The southbound Colesville Road approach to both Fenton Street and Spring Street operates under protected/permissive phasing for the southbound left turn movements. Protected/permissive phasing provides a protected left turn phase before allowing a permissive left turn where left-turning vehicles must yield to opposing vehicular and concurrent pedestrian movements. The eastbound and westbound approaches to the Colesville Road/Spring Street intersection operate under split-phasing, in which pedestrian crossings on the south leg are prohibited during the westbound left turn phase.
- *Left and right turn restrictions*: Northbound left turns from Colesville Road to both Fenton Street and Spring Street are prohibited during the 4:00-7:00 PM peak period on weekdays. The time-based left turn restrictions limit pedestrian exposure to left turns on the west leg crosswalks on Fenton Street and Spring Street during these periods. Additionally, No Turn on Red restrictions are provided for all right turns approaching the Colesville Road/Fenton Street intersection and on the northbound, eastbound, and westbound right turns at the Colesville Road/Spring Street intersections. The No Turn on Red restrictions limit pedestrian exposure to drivers distracted by focusing on finding gaps in oncoming traffic.

- *Pedestrian safety signage*: A number of signs directly related to pedestrian safety are posted in the study area. These include State Law: Stop for Pedestrians signs and signs indicating vehicles turning right should stop for pedestrians.
- *Silver Spring Central Business District.* The urban character of Colesville Road south of Noyes Drive supports pedestrian activity. The presence of multi-story buildings, relatively closesly spaced traffic signals, on-street parking, wide sidewalks, and street trees and furniture, as well as vehicle speeds limited by traffic congestion and a 30 mile per hour (mph) speed limit, help reinforce the impression of the CBD as a pedestrian friendly area to both pedestrians and drivers. There are few driveways accessing private property on Colesville Road, particularly south of Fenton Street; and there are no crashes associated with driveway access in the study area. The roadway character along this section of Colesville Road is contrasted with the roadway character north of Noyes Drive, which is defined by suburban single-family housing, long distances between traffic signals, narrower sidewalks, and higher vehicle speeds.

These measures help improve driver awareness of pedestrians and compliance with traffic signals. In general, these features can reduce the potential for collisions or limit the severity of pedestrian crashes.

2.2 Observed Issues, Contributing Factors, and Opportunities for Improvements

The Colesville Road PRSA team identified a number of pedestrian safety issues in the study area during the audit. These issues were discussed by the team and prioritized to identify the issues presenting the greatest challenges to pedestrian safety in the study area. This section describes the observed safety issues in order of importance to the PRSA team.

Pedestrian-Vehicle Conflicts

Pedestrian-vehicle conflicts, not including those involving uncontrolled midblock crossings, are comprised of turning movement conflicts at intersections and conflicts at midblock crosswalks. Turning movement conflicts were identified as contributing to nine crashes in the Colesville Road HIA and midblock crosswalk crashes represented six crashes during the study period. They were observed most frequently along Colesville Road at Fenton Street and Spring Street, where bus stops, commercial properties, offices, and hotels all generate significant pedestrian activity. A combination of factors including frequency of turning movements, pedestrian volume, scarcity of vehicle gaps, vehicle speeds, signal phasing/timing settings, and sight line limitations contributed to conflicts. Typical pedestrian-vehicle conflicts were related to the following issues:

- Permissive left turn phasing concurrent with significant pedestrian crossing activity.
- During peak periods in particular, drivers turning left tend to focus on gaps in oncoming traffic rather than pedestrian activity in the crosswalk.
- Vehicles frequently stop beyond stop bars, which may obscure lines of sight for drivers turning left from side streets.
- The reversible lane configuration on Colesville Road provides up to four receiving lanes at intersections; and multiple lanes of turning vehicles were observed turning simultaneously onto Colesville Road.
- Significant queuing and congestion may contribute to impatient driving behaviors.

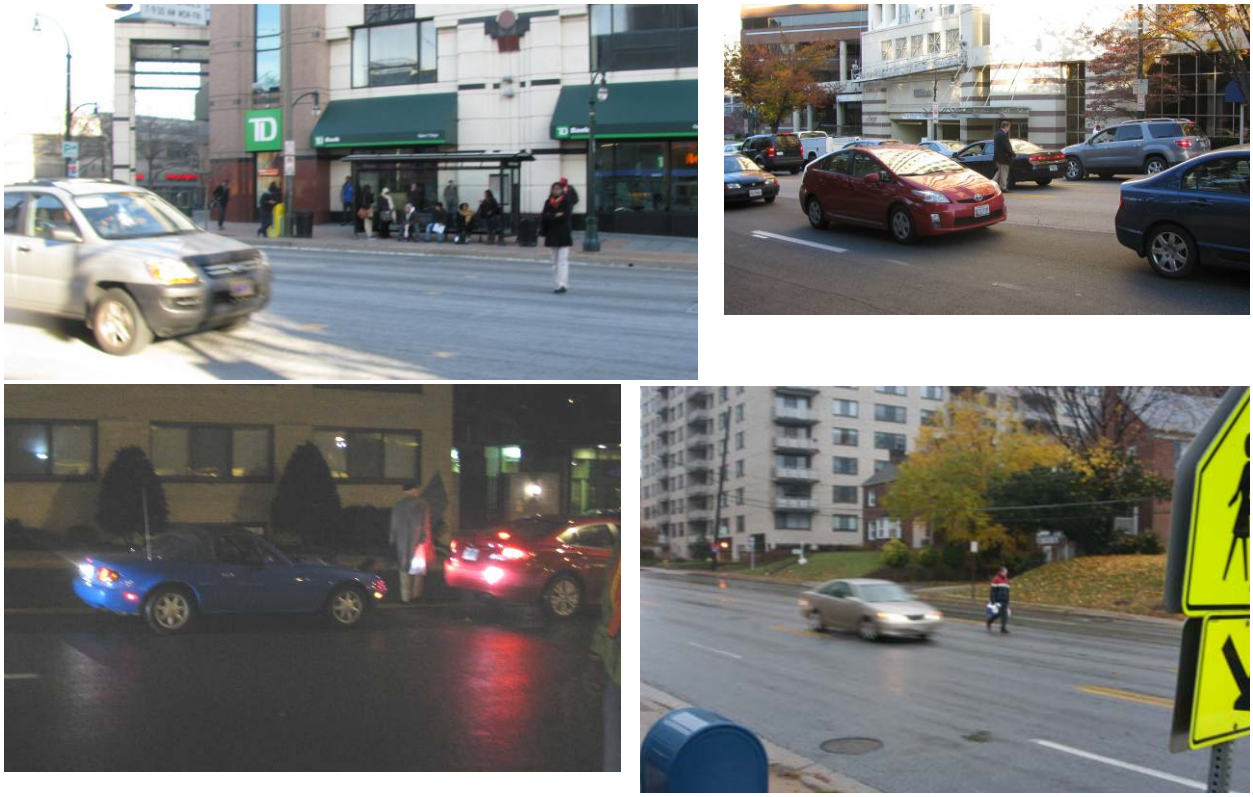
- Roadside objects limit driver lines of sight for drivers turning right at some corners.
- Relatively high traffic volumes and travel speeds, but limited supplementary pedestrian safety treatments, at an unsignalized crosswalk.
- Reversible lane configuration and signals contributing to multiple-threat collision potential, pedestrian confusion, and driver distraction at an unsiganlized crosswalk.
- Vehicles failing to yield to pedestrians in crosswalks.
- Some corner radius designs allow vehicles to turn right at relatively high speeds.

Upper Left: Left turning vehicles approach a pedestrian in a crosswalk. Upper Right: A wide turning radius contributes to longer crossing distance and higher turning speeds than other corners. Lower Left: Pedestrians and bicyclists cross six travel lanes on Colesville Road without protection from a traffic signal as vehicles approach at relatively high speeds. Lower Right: Reversible lane signals, including green arrows that compete for driver attention, hang above the unsignalized crosswalk on Colesville Road.

Figure 13: Pedestrian-Vehicle Conflicts

Uncontrolled Midblock Crossings

Uncontrolled midblock crossing activity was observed at several locations throughout the study area and was identified as contributing to seven crashes during the study period. The presence of various land uses at midblock locations, the location of bus stops offset from intersections, and long signal cycle lengths may influence uncontrolled midblock crossings. Bus stops north of Spring Street are located far from signalized crossings, which may increase pedestrian exposure potential. During peak periods on weekday mornings and evenings, on-street parking on one or both sides of Colesville Road is prohibited and pedestrians cross six active lanes at midblock locations. The reversible lane configurations on Colesville Road contribute to challenging conditions for pedestrians assessing the direction of vehicles in the central lanes. Queuing at intersections also contributes to limited visibility for drivers of pedestrians crossing at some midblock locations.



Upper Left: A pedestrian crosses Colesville Road amid cross traffic after exiting a bus. Upper Right: A pedestrian crosses Colesville Road. Lower Left: A pedestrian crosses between queued vehicles on Spring Street at night. Lower Right: A pedestrian walks down the middle of Colesville Road.

Figure 14: Uncontrolled Midblock Crossings

Aggressive Driver Behaviors

Aggressive driver behaviors were observed at multiple locations in the study area. The most frequently observed behaviors included vehicles failing to yield to pedestrians in crossings, violating red signal indications, violating turn restrictions, turning vehicles accepting short gaps in oncoming traffic, and improperly using reversible lanes during peak periods. Relatively high traffic speeds were observed on Colesville Road, north of Spring Street. Traffic emerging from congested conditions on northbound Colesville Road in the Silver Spring CBD during peak periods tends to accelerate after passing Spring Street. During off-peak periods, drivers were observed traveling at relatively high speeds under uncongested traffic conditions.

Drivers were routinely observed failing to yield to pedestrians waiting to enter the roadway or crossing in an unsignalized crosswalk. Left-turning vehicles were consistently observed waiting until the yellow signal phase to initiate left turn maneuvers or sneaking through all-red signal intervals, particularly during the evening peak period when traffic volumes on Colesville Road are heaviest. Vehicles were also observed disobeying left turn restrictions on Colesville Road and forcing left turn movements to cross up to four lanes of oncoming traffic on Colesville Road during peak periods. Vehicles were observed using the central reversible lanes on Colesville Road as left turn lanes during peak periods. Vehicles were consistently observed stopping well past stop bars, creating conflicts with pedestrians beginning to cross the street in crosswalks.

Upper Left: A vehicle in a central lane blocks the unsignalized crosswalk, forcing pedestrians out of the crosswalk. Upper Right: Vehicles forcing left turns on Colesville Road despite oncoming traffic. Lower Left: Northbound left turn vehicles (oncoming in photo) occupy a center lane designated for southbound traffic during the weekday morning peak period. Lower Right: Vehicles stop past a crosswalk on Colesville Road, forcing a pedestrian into the intersection in front of an opposing vehicle.

Figure 15: Aggressive Driver Maneuvers

Pedestrian Compliance with Signals

Pedestrians were frequently observed violating pedestrian signals. Relatively long pedestrian wait times, long signal cycle lengths, pedestrian impatience, transit activity, and a number of human factors may contribute to the impulse for pedestrians to cross during DON'T WALK indications. Observations during the PRSA and a review of the pedestrian signal timing plans indicated that some existing pedestrian clearance intervals may be shorter than recommended by State standards for pedestrian signal timings. It should be noted that the State and County are currently transitioning to the latest standard recommended in the Federal Highway Administration's (FHWA) Manual on Uniform Traffic Control devices (MUTCD).

Left and Right: Pedestrians cross Colesville Road during the Don't Walk phase.

Figure 16: Limited Pedestrian Compliance with Signals

Pavement Marking and Signage Conditions

The audit team identified several pavement marking and signage conditions that may contribute to pedestrian safety issues. The issues include crosswalk markings that may not ensure visibility or driver expectation of pedestrians for vehicles traveling at relatively high speeds, reversible lane indications that may distract drivers where focusing on pedestrian activity is a priority, speed limits that allow drivers to maintain an elevated speed prior to an unsignalzied crosswalk, undesireable signage placement, and a lack of high visibility pedestrian safety treatments at an unsignalized crosswalk.

Top: South Noyes Drive crosswalk during rainy conditions, which highlights crosswalk visibility limitations and the prominence of the overhead lane indications and signage. Lower Left: Pedestrian safety and posted speed limit signage (increasing limit to 35 mph prior to an unsignalized crosswalk. Lower Right: Pedestrian warning sign along southbound Colesville Road posted outside of Do Not Block Intersection sign.

Figure 17: Pavement Marking and Signage Issues

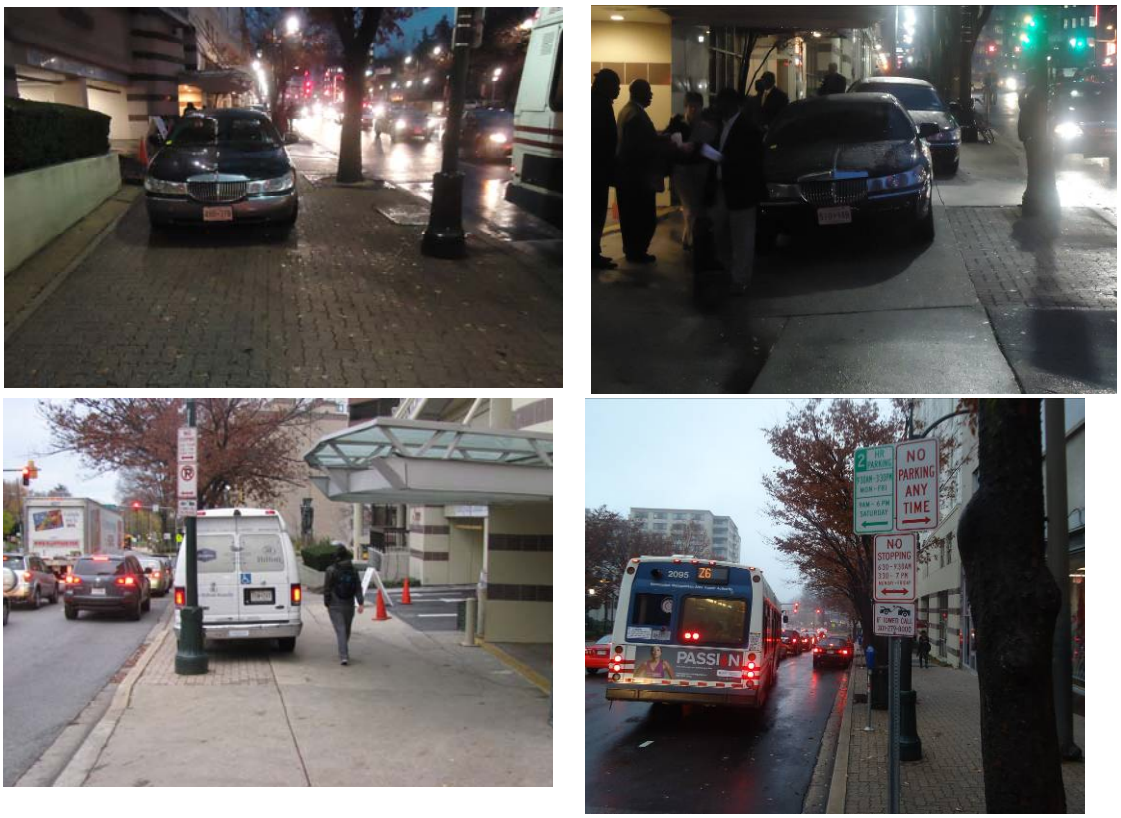
Lighting Conditions

Limited street lighting in multiple locations may reduce visibility near an unsignalized crosswalk, uncontrolled midblock crossing locations, and along sidewalks. The low lighting levels exacerbate the potential for conflicts between pedestrians and vehicles where crossing activity is prevalent.

Improper Vehicle Parking

Vehicles were observed improperly parking on the east sidewalk along Colesville Road, near Spring Street. Multiple vehicles were observed parked on the sidewalk while performing drop-off/pick-up activities. Vehicles parking on the sidewalk diminish pedestrian space and obstruct lines of site for

vehicles entering and exiting the hotel garage. Vehicles were also observed parking illegally during peak periods, when on-street parking is prohibited, along Colesville Road.



Upper Left and Right: Cabs and other passenger vehicles park on the sidewalk, obstructing pedestrian circulation, vehicle access, and lines of sight in front of the Hilton Hotel. Lower Left: A hotel van parked on the sidewalk obstructs pedestrians and lines of sight for drivers entering hotel driveways. Lower Right: Illegal on-street parking on NB Coleville Road.

Figure 18: Improper Vehicle Parking

Pedestrian Facility Limitations

Several issues concerning the sidewalk design, continuity of pedestrian facilities, and pedestrian accessibility were observed. These issues include pedestrian signal timings that appeared to be shorter than concurrent vehicle green phases, long crossing distances, lack of crosswalks along some pedestrian desire lines, superfluous curb cuts, substandard sidewalk width, inconsistent application of pedestrian signal voice commands, substandard crosswalk and wheelchair ramp surfaces, vegetation obstructing sidewalks/wheelchair ramps, missing detectable warning surfaces, narrow effective sidewalk widths, lack of pedestrian buffers, and sidewalk obstructions.

Upper Left: The edge of a wheelchair ramp may present tripping issues for pedestrians. Upper Right: Encroaching grass and a lack of a planting strip along Colesville Road contribute to pedestrians walking in close proximity to relatively high speed traffic. Lower Left: A utility cabinet attached to a pole obstructs a sidewalk. Lower Right: A pedestrian landing at a crosswalk is constricted by a manhole cover, vegetative debris, and the absence of a detectable warning surface.

Figure 19: Pedestrian Facility Limitations

Maintenance

The PRSA team observed a number of conditions that may contribute to pedestrian safety issues and that could be resolved through maintenance actions. These issues include limited conspicuity of variable regulatory signage, non-functional push buttons, outdated and superfluous signage, non-functional street lighting, vegetation obstructing signage, a protruding metal rod in the sidewalk, damaged drainage structures, and faded or deteriorating pavement markings.

Left: Limited conspicuity of the variable No Left Turn indication display on northbound Coleville Road during sunny conditions. Right: A damaged drainage structure along the west sidewalk on Colesville Road.

Figure 20: Maintenance Issues

2.3 Summary of Issues and Suggestions

2.3.1 Study Area Issues and Suggestions

The following section provides a summary of the issues identified during the PRSA process and the suggestions for improvements at each location discussed in this report. The anticipated timeframe for completion [Short Term (ST), Intermediate (I), and Long Term (LT)] is referenced after each suggestion.

Safety Issue	Suggestions
Pedestrian-Vehicle Conflicts	▪ Consider ladder-bar or diagonal crosswalk markings on standard crosswalks, compliant with SHA standards, to improve visibility and consistency among crosswalks. (ST) ▪ Work with the Transportation Management Section (TMS) to pursue implementing lead pedestrian interval (LPI) phasing for pedestrian signals. (ST) ▪ Work with the TMS to confirm signal timing settings and consider modifying the pedestrian signal timings to synchronize pedestrian phases with concurrent vehicle phases and to comply with current State standards, if necessary. (ST) ▪ Consider conducting a pedestrian level-of-service (LOS) evaluation to determine whether pedestrian volumes warrant the dedication of additional WALK or Flashing Don't Walk time to pedestrian phases. (ST) ▪ Work with TMS to evaluate the operational impacts of implementing protected left-turn phasing, where appropriate. (ST) ▪ Consider installing skip markings (puppy tracks) to guide left turns, where appropriate. (ST) ▪ Consider relocating or removing planters, trash cans, and other objects along sidewalks near intersection corners to reduce obstructions for pedestrians and improve driver lines of sight. (ST) ▪ Ensure the appropriate levels of enforcement to deter turning movement violations. (ST) ▪ Consider installing an advance stop bar and "Stop Here for Pedestrians" signage (R1-5b) at crosswalks, compliant with State standards, where appropriate. (ST) ▪ Consider installing overhead "State Law: Stop for Pedestrians" signage (R1-9a) at unsignalized midblock crosswalks. (ST) ▪ Consider installing PED X-ING pavement markings on the roadway in advance of unsignalized midblock crosswalks. (ST) ▪ Consider establishing alternative stop locations for school buses currently stopping on Colesville Road. (ST)

Safety Issue	Suggestions
Pedestrian-Vehicle Conflicts (cont'd)	▪ Consider installing Left Turn or Right Turn "Yield to Pedestrians" signs (R10-15) at some signalized crossings. (I) ▪ Consider the feasibility and constructability of reducing corner radii to reduce right turn vehicle speeds and pedestrian crossing distances, where appropriate. (I) ▪ Evaluate average daily traffic (ADT) volume, vehicle speeds, and projected pedestrian activity to determine whether to retain unsignalized midblock crosswalks and/or the suitability of installing supplemental high-visibility crosswalk treatments, compliant with SHA guidelines. (I) ▪ Work with SHA to explore relocating overhead reversible lane indications to reduce signage clutter and driver distraction near unsignalized midblock crosswalks. (LT) ▪ Work with SHA to evaluate the potential to eliminate reversible lanes on Colesville Road in the Silver Spring CBD or construct a median-divided cross-section. (LT) ▪ Consider evaluating the need for traffic signal control at unsignalized intersections in the study area. (LT)
Aggressive Driver Behaviors	▪ Consider relocating speed limit signage to reduce the posted speed limit on Colesville Road in proximity to unsignalized midblock crossings. (ST) ▪ Work with the Montgomery County Police Department (MCPD) to ensure the appropriate levels of speed enforcement. (ST) ▪ Evaluate the potential for automated speed camera enforcement on Colesville Road, where appropriate. (I) ▪ Work with the TMS to provide "protected left turn only" phasing at signalized intersections. (I) ▪ Consider pedestrian and driver education programs to address aggressive behaviors. (I) ▪ Ensure the appropriate levels of enforcement to reduce red light violations. (I) ▪ Work with SHA to evaluate the potential to eliminate reversible lanes on Colesville Road in the Silver Spring CBD or construct a median-divided cross-section. (LT)

Safety Issue	Suggestions
Uncontrolled Midblock Crossings	▪ Explore options for alternative drop-off locations for commuter buses, including Metro bus stops or off-street locations. (ST) ▪ Consider installing pedestrian warning signs near parking garage driveways to improve driver awareness of pedestrian activity. (ST) ▪ Consider community-based educational efforts to elevate awareness of the risks of crossing at undesignated locations. (ST) ▪ Explore working with adjacent property owners to consider installing street furniture or planters along Colesville Road, similar to treatments used at The Fillmore, to deter midblock crossings. (I) ▪ Consider community-based educational efforts to inform pedestrians and drivers of consequences of pedestrian crashes. (I) ▪ Consider educational campaigns focused on bus passengers, potentially including messages informing riders that crash consequences are significantly worse than waiting for a later bus. (I) ▪ Determine the feasibility and constructability of installing high-visibility midblock crosswalks, where appropriate. (I) ▪ Work with Transit Services to determine whether bus stops can be relocated, consolidated, or eliminated, where appropriate. (I) ▪ Work with property owners to explore limiting commercial entrances and pedestrian accesses at midblock locations, particularly as part of the redevelopment process. (LT) ▪ Work with SHA to evaluate the potential to eliminate reversible lanes on Colesville Road in the Silver Spring CBD and/or construct a median divided cross-section. (LT) ▪ Consider evaluating the need for traffic signal control at unsignalized intersections in the study area. (LT)
Pedestrian Compliance with Signals	▪ Work with the TMS to confirm signal timing settings and consider modifying the pedestrian signal timings to comply with current State standards, if necessary. (ST) ▪ Consider installing signage reminding pedestrians to cross only during the Walk indication (R10-1 and R10-2). (ST) ▪ Consider community-based educational efforts and ensure appropriate levels of enforcement to improve pedestrian compliance with signals.

Safety Issue	Suggestions
Pedestrian Facility Limitations	▪ Work with the TMS to confirm signal timing settings and consider modifying the pedestrian signal timings to synchronize pedestrian phases with concurrent vehicle phases and to comply with current State standards, if necessary. (ST) ▪ Consider conducting a pedestrian level-of-service (LOS) evaluation to determine whether pedestrian volumes warrant the dedication of additional signal time to pedestrian phases, where appropriate. (ST) ▪ Continue working with entertainment venues in the area to improve queue management prior to events. (ST) ▪ Consider removing or relocating planters, newspaper dispensers, and other impermanent objects from the sidewalk to improve conditions for pedestrians, where appropriate. (ST) ▪ Consider removing or trimming soil, grass, and vegetation encroaching on the sidewalk in the study area. (ST) ▪ Consider installing detectable warning surface(s) on wheelchair ramp(s) in the study area, where appropriate. (ST) ▪ Work with SHA/TMS to upgrade APS/CPS equipment to include voice commands, where appropriate. (I) ▪ Determine the constructability and feasibility of enhanced traction treatments for metal grates in crosswalks and redesigning wheelchair ramps, where appropriate. (I) ▪ Work with SHA, MCDOT, and utility providers to determine the constructability and feasibility of relocating utility boxes that obstruct sidewalks in the study area. (I) ▪ Work with SHA and utility providers to determine the constructability and feasibility of relocating traffic controller cabinets and/or widening sidewalks at intersections, where appropriate. (LT) ▪ Consider installing high visibility crosswalks at signalized intersections in the study area, where appropriate. (I) ▪ Determine the feasibility and constructability of reducing corner radii to reduce right turn vehicle speeds and pedestrian crossing distances, where appropriate. (I) ▪ Determine the feasibility of eliminating unnecessary curb cuts, where appropriate. (I) ▪ Determine the feasibility and constructability of widening sidewalks, constructing a grass buffer and moving utilities outside of the sidewalk, where appropriate. (LT)

Safety Issue	Suggestions
Maintenance	▪ Consider replacing variable/changeable turn indication(s) with new device(s) displaying greater conspicuity during bright conditions. (ST) ▪ Consider refreshing crosswalk striping, where appropriate. (ST) ▪ Consider installing high visibility crosswalk markings at signalized intersections in the study area, where appropriate. (ST) ▪ Consider removing superfluous signage contributing to sign clutter at intersections in the study area. (ST) ▪ Consider replacing/repairing non-functioning street lights. (ST) ▪ Work with SHA/MCDOT to repair/replace unresponsive pedestrian signal push buttons. (ST) ▪ Remove hardware protruding from sidewalks that may have the potential to trip pedestrians. (ST) ▪ Trim vegetation obstructing signage. (ST) ▪ Repair curbside drainage structures, where appropriate. (I)
Lighting Conditions	▪ Trim vegetation obscuring street lighting. (ST) ▪ Determine feasibility and constructability of installing additional street lighting to address visibility issues during dark conditions. (I) ▪ Determine feasibility and constructability of extending pedestrian-scale lighting, where appropriate. (I)
Improper Vehicle Parking	▪ Work in coordination with the Department of Permitting Services (DPS), commercial tenants, and hotels along Colesville Road to ensure that service, hotel guest, and visitor vehicles do not park or idle on sidewalks. (ST) ▪ Work with MCPD to ensure appropriate levels of on-street parking enforcement. (ST) ▪ Consider working with commercial tenants to eliminate access to lay-by curb cuts and potentially provide a curbside short-term parking/standing zone during off-peak periods. (I)

Safety Issue	Suggestions
Pavement Marking and Signage Conditions	▪ Consider relocating speed limit signage to reduce the posted speed limit on Colesville Road in proximity to unsignalized midblock crossings. (ST) ▪ Consider installing crosswalks exceeding the standard 10-foot width to enhance visibility to drivers at a longer distance and elevated speeds, at unsignalized midblock crosswalks. (ST) ▪ Evaluate and consider restriping crosswalks with high-visibility markings and materials. (ST) ▪ Consider installing an advance stop bar and "Stop Here for Pedestrians" signage (R1-5b) at crosswalks, compliant with State standards, where appropriate. (ST) ▪ Consider installing overhead "State Law: Stop for Pedestrians" signage (R1-9a) at unsignalized midblock crosswalks. (ST) ▪ Consider moving pedestrian warning signage closer to the roadway, where appropriate. (ST) ▪ Work with SHA to explore relocating overhead reversible lane indications to reduce signage clutter and driver distraction near unsignalized midblock crosswalks. (LT)

Other Possible Issues

The Coleville Road PRSA team observed several other issues during the field observations that are not unique to the study area, but represented potential concerns for the Montgomery County Department of Transportation and the Maryland State Highway Administration. The audit team is providing these observations and offering some suggestions for MCDOT and MDSHA to consider or discuss with other parties. Below is a summary of the other observations and suggestions made by the PRSA team.

Driver Cell Phone Use and Texting

Drivers in the study area were observed using cell phones and/or texting while driving. This behavior is prohibited by Maryland law and has been demonstrated to contribute to elevated potential for crashes. MCDOT and MDSHA may want to consider educational and enforcement measures to promote safe driving behaviors and deter use of cell phones in the study area or commercial districts with elevated pedestrian activity.

Bicycle Activity

The audit team did not observe high levels of bicycle activity in the study area, but a few key observations related to bicycle activity were made. The relatively high vehicle volumes and speeds on Colesville Road likely deter significant bicycle travel on the corridor, and a number of bicyclists that were observed in the study area appeared to be experienced and comfortable riding in traffic despite potential conflicts. However, several bicyclists were observed using sidewalks to avoid vehicle traffic along the corridor, which contributes to bicyclist conflicts with pedestrians or fixed objects. Alternative bicycle accommodations and improved bicycle wayfinding in the area should be explored.

Some bicycles were observed locked on parking meters or other streetscape fixtures on Colesville Road. Bicycle parking at parking meters is disruptive to on-street vehicle parking and may require bicyclists to stand very close to the edge of the roadway during peak periods. Dedicated bicycle parking locations in the Silver Spring CBD, including in public parking garages, and wayfinding bicycle signage should be considered to address bicycle parking needs along the Colesville Road corridor.

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Gan, A., Shen, J., and Rodriguez, A., "Update of Florida Crash Reduction Factors and Countermeasures to improve the Development of District Safety Improvement Projects." Florida Department of Transportation (2005).

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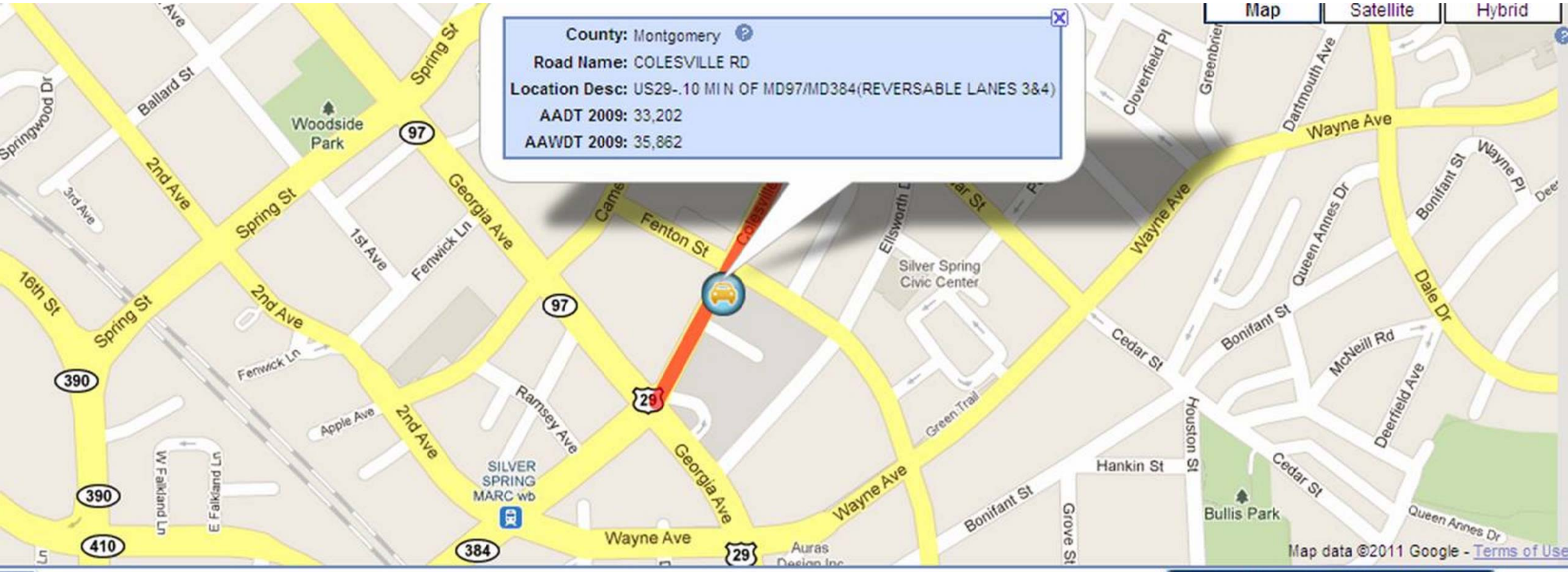
Appendix A: Traffic Count Data



Display Locations within Map View

LOCATION DESCRIPTION	ROAD NAME	AADT 2010	AADT 2009	AADT 2008	AAWDT 2010	AAWDT 2009	AAWDT 2008
US29-.10 MI N OF MD97/MD384(REVERSABLE LANES 3&4)	COLESVILLE RD	34,930	33,202	33,201	37,380	35,862	36,191

Maryland State Highway Administration
Highway Information Services Division
Turning Movement Count Study - Field Sheet

Station ID: S2000150278
Date: Wednesday 11/10/2004
Location: US 29 at Fenton St

County: Montgomery
Town: none
Weather:

Comments: LOS AM:C PM:B HEAVY QUEING OCCURRED DURING AM & PM PEAKS. PEDS CAUSED DELAYS FOR TURNING VEHICLES THROUGH OUT THE DAY.

Interval (dd): 15 min

PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Begin 07:45	End 08:45	Volume 3944	PM PERIOD 12:00PM-19:00PM	Begin 16:00	End 17:00	Volume 3649

Hour	US 29 From North				US 29 From South				FENTON STREET From East				FENTON STREET From West				Grand Total
Begin	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	
6:00	25	382	2	409	1	54	9	64	5	10	6	21	1	3	0	4	498
6:15	18	518	4	540	2	54	7	63	7	9	10	26	0	5	1	6	635
6:30	26	601	10	637	1	79	4	84	13	13	6	32	3	8	2	13	766
6:45	14	506	4	524	2	80	9	91	15	19	14	48	5	4	5	14	677
7:00	22	684	1	707	3	132	5	140	9	23	13	45	1	3	2	6	898
7:15	33	538	9	580	2	102	15	119	16	29	12	57	6	15	1	22	778
7:30	59	655	11	725	2	136	10	148	9	22	14	45	0	10	0	10	928
7:45	**34**	**617**	**21**	**672**	**1**	**143**	**13**	**157**	**18**	**37**	**11**	**66**	**2**	**19**	**4**	**25**	**920**
8:00	**36**	**677**	**22**	**735**	**2**	**167**	**14**	**183**	**12**	**33**	**19**	**64**	**6**	**11**	**0**	**17**	**999**
8:15	**45**	**672**	**27**	**744**	**4**	**154**	**21**	**179**	**22**	**52**	**31**	**105**	**2**	**15**	**3**	**20**	**1048**
8:30	**37**	**624**	**31**	**692**	**2**	**166**	**15**	**183**	**14**	**52**	**20**	**86**	**6**	**8**	**2**	**16**	**977**
8:45	56	540	19	615	3	152	15	170	17	44	21	82	8	12	6	26	893
9:00	34	515	24	573	7	148	20	175	23	51	30	104	5	15	3	23	875
9:15	35	424	20	479	3	129	22	154	14	42	24	80	8	22	2	32	745
9:30	28	345	25	398	7	118	18	143	15	41	30	86	9	20	3	32	659
9:45	35	352	23	410	12	107	21	140	13	27	22	62	10	23	5	38	650
10:00	38	312	19	369	5	129	16	150	20	49	28	97	10	14	6	30	646
10:15	36	316	17	369	3	134	15	152	25	29	18	72	4	19	15	38	631
10:30	33	304	7	344	10	151	17	178	10	28	30	68	17	21	14	52	642
10:45	40	255	10	305	6	111	14	131	21	33	23	77	6	23	8	37	550
11:00	38	226	13	277	8	148	13	169	15	40	26	81	5	25	15	45	572
11:15	32	211	8	251	9	181	19	209	15	36	36	87	19	27	10	56	603
11:30	31	192	5	228	7	158	9	174	23	16	35	74	10	23	1	34	510
11:45	50	193	15	258	12	182	10	204	18	30	47	95	10	25	7	42	599
12:00	29	203	14	246	7	195	10	212	31	22	58	111	20	20	4	44	613
12:15	38	226	13	277	7	168	31	206	19	39	31	89	10	15	17	42	614
12:30	27	171	10	208	3	158	19	180	7	37	34	78	10	12	2	24	490
12:45	40	201	14	255	9	217	37	263	28	28	49	105	14	29	9	52	675
13:00	30	227	12	269	6	201	33	240	19	44	30	93	16	29	6	51	653
13:15	34	203	11	248	8	240	26	274	35	47	45	127	10	31	4	45	694
13:30	43	217	7	267	8	205	37	250	27	60	35	122	22	32	15	69	708
13:45	35	172	9	216	10	177	22	209	23	57	30	110	13	23	3	39	574
14:00	34	169	12	215	12	213	22	247	19	49	44	112	7	20	15	42	616
14:15	22	173	9	204	17	274	17	308	28	39	46	113	12	39	11	62	687
14:30	31	185	18	234	5	269	20	294	14	41	38	93	11	24	8	43	664
14:45	29	139	4	172	5	261	25	291	18	37	38	93	14	16	7	37	593
15:00	31	147	8	186	10	307	26	343	17	32	52	101	12	31	7	50	680
15:15	29	154	10	193	8	309	25	342	18	42	42	102	19	27	3	49	686
15:30	17	166	6	189	5	396	24	425	19	61	48	128	20	22	9	51	793
15:45	28	163	6	197	7	343	19	369	21	43	50	114	9	15	6	30	710
16:00	**21**	**139**	**6**	**166**	**1**	**486**	**19**	**506**	**23**	**42**	**70**	**135**	**27**	**32**	**6**	**65**	**872**
16:15	**21**	**217**	**10**	**248**	**1**	**541**	**40**	**582**	**18**	**31**	**44**	**93**	**16**	**29**	**6**	**51**	**974**
16:30	**31**	**164**	**15**	**210**	**0**	**484**	**36**	**520**	**20**	**35**	**68**	**123**	**21**	**33**	**11**	**65**	**918**
16:45	**32**	**193**	**6**	**231**	**0**	**476**	**38**	**514**	**14**	**28**	**50**	**92**	**11**	**34**	**3**	**48**	**885**
17:00	31	163	6	200	0	429	36	465	22	33	51	106	19	32	5	56	827
17:15	28	183	10	221	0	546	36	582	20	41	51	112	18	32	9	59	974
17:30	23	148	9	180	0	431	27	458	30	39	60	129	23	48	6	77	844
17:45	28	162	12	202	0	469	34	503	16	28	33	77	16	33	1	50	832
18:00	27	192	8	227	0	448	38	486	21	36	68	125	23	15	8	46	884
18:15	27	228	8	263	0	491	37	528	15	28	49	92	15	23	2	40	923
18:30	42	221	6	269	0	414	48	462	28	31	47	106	12	24	3	39	876
18:45	44	196	9	249	1	386	43	430	17	39	38	94	6	21	3	30	803
TOTAL	**1687**	**15781**	**615**	**18083**	**244**	**12649**	**1156**	**14049**	**956**	**1854**	**1825**	**4635**	**579**	**1111**	**304**	**1994**	**38761**
AM Peak	**152**	**2590**	**101**	**2843**	**9**	**630**	**63**	**702**	**66**	**174**	**81**	**321**	**16**	**53**	**9**	**78**	**3944**
PM Peak	**105**	**713**	**37**	**855**	**2**	**1987**	**133**	**2122**	**75**	**136**	**232**	**443**	**75**	**128**	**26**	**229**	**3649**

Station ID: S2000150278
Date: Wednesday 11/10/2004
Location: US 29 at Fenton St

County: Montgomery
Town: none
Weather:

Comments: LOS AM:C PM:B HEAVY QUEING OCCURRED DURING AM & PM PEAKS. PEDS CAUSED DELAYS FOR TURNING VEHICLES THROUGH OUT THE DAY.

Interval (dd): 15 min

PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Begin 07:45	End 08:45	Volume 3944	PM PERIOD 12:00PM-19:00PM	Begin 16:00	End 17:00	Volume 3649

Hour	US 29 North Leg			US 29 South Leg			FENTON STREET East Leg			FENTON STREET West Leg		
Ending	S.C.	PED.	U.T.	S.C.	PED.	U.T.	S.C.	PED.	U.T.	S.C.	PED.	U.T.
6:00	0	2	0	0	0	0	0	7	1	0	5	1
6:15	0	7	0	0	8	0	0	1	0	0	6	0
6:30	0	2	0	0	15	0	0	1	0	0	3	0
6:45	0	5	0	0	11	0	0	13	0	0	3	0
7:00	0	2	0	0	11	0	0	5	1	0	9	0
7:15	0	2	0	0	19	0	0	8	0	0	6	0
7:30	0	4	0	0	24	0	0	15	0	0	13	0
7:45	**0**	**4**	**0**	**0**	**33**	**0**	**0**	**8**	**0**	**0**	**11**	**0**
8:00	**0**	**5**	**0**	**0**	**30**	**0**	**2**	**26**	**0**	**0**	**13**	**0**
8:15	**1**	**13**	**0**	**0**	**41**	**0**	**0**	**14**	**0**	**0**	**17**	**0**
8:30	**0**	**13**	**0**	**0**	**29**	**0**	**0**	**29**	**0**	**0**	**12**	**0**
8:45	0	4	0	0	29	0	0	40	0	0	7	0
9:00	0	13	0	0	28	0	0	33	0	0	8	0
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9:45	0	9	0	0	29	0	0	18	0	0	10	0
10:00	0	5	0	0	12	0	0	14	0	2	10	0
10:15	0	3	0	0	6	0	0	8	0	0	12	0
10:30	0	5	0	0	10	0	0	16	0	1	5	0
10:45	0	13	0	0	27	0	0	10	0	0	10	1
11:00	0	4	1	0	28	0	0	12	0	0	7	0
11:15	0	9	0	0	36	0	0	7	0	0	3	0
11:30	0	2	0	0	18	0	0	5	0	0	7	0
11:45	0	8	0	0	28	0	0	48	0	0	6	0
12:00	0	13	1	0	22	2	0	41	1	0	9	1
12:15	0	21	4	0	35	0	0	33	0	0	11	0
12:30	0	18	0	0	17	0	0	10	1	0	12	0
12:45	0	19	0	0	38	0	0	25	0	0	17	1
13:00	0	27	0	0	53	0	0	19	1	0	28	0
13:15	0	11	0	0	76	1	0	18	1	0	5	0
13:30	0	2	0	0	40	0	0	21	1	0	2	0
13:45	0	24	0	4	59	0	0	36	0	0	7	0
14:00	1	22	0	0	68	0	1	54	0	0	17	0
14:15	1	20	0	4	95	0	0	23	1	0	27	0
14:30	0	12	0	3	85	0	0	37	1	0	20	0
14:45	0	6	0	16	84	1	20	44	0	0	18	0
15:00	0	5	0	9	95	0	3	42	0	0	16	0
15:15	0	16	0	13	68	0	0	31	0	0	11	0
15:30	0	26	0	10	83	0	0	15	0	0	18	0
15:45	0	23	0	3	68	0	0	20	0	0	20	0
16:00	**1**	**20**	**0**	**4**	**61**	**1**	**1**	**37**	**5**	**0**	**14**	**3**
16:15	**0**	**6**	**0**	**22**	**84**	**0**	**7**	**23**	**0**	**7**	**25**	**0**
16:30	**0**	**22**	**0**	**2**	**99**	**0**	**2**	**46**	**0**	**0**	**18**	**0**
16:45	**0**	**15**	**0**	**4**	**58**	**0**	**5**	**53**	**2**	**6**	**17**	**1**
17:00	0	19	0	0	74	0	0	16	0	0	14	0
17:15	0	12	0	0	89	0	0	38	0	3	28	0
17:30	0	20	0	5	49	0	0	27	0	0	29	0
17:45	3	39	0	0	76	0	0	67	1	3	40	0
18:00	3	35	0	0	109	0	0	35	0	0	30	0
18:15	0	10	0	2	65	0	2	51	1	0	22	0
18:30	0	6	0	0	35	0	0	21	0	0	5	0
18:45	7	13	0	16	21	0	18	18	1	8	12	0
Total	**17**	**624**	**6**	**117**	**2329**	**5**	**61**	**1271**	**19**	**30**	**703**	**8**
AM Peak	**1**	**35**	**0**	**0**	**133**	**0**	**2**	**77**	**0**	**0**	**53**	**0**
PM Peak	**1**	**63**	**0**	**32**	**302**	**1**	**15**	**159**	**7**	**13**	**74**	**4**

Station ID: S2000150278
Date: Wednesday 11/10/2004
Location: US 29 at Fenton St

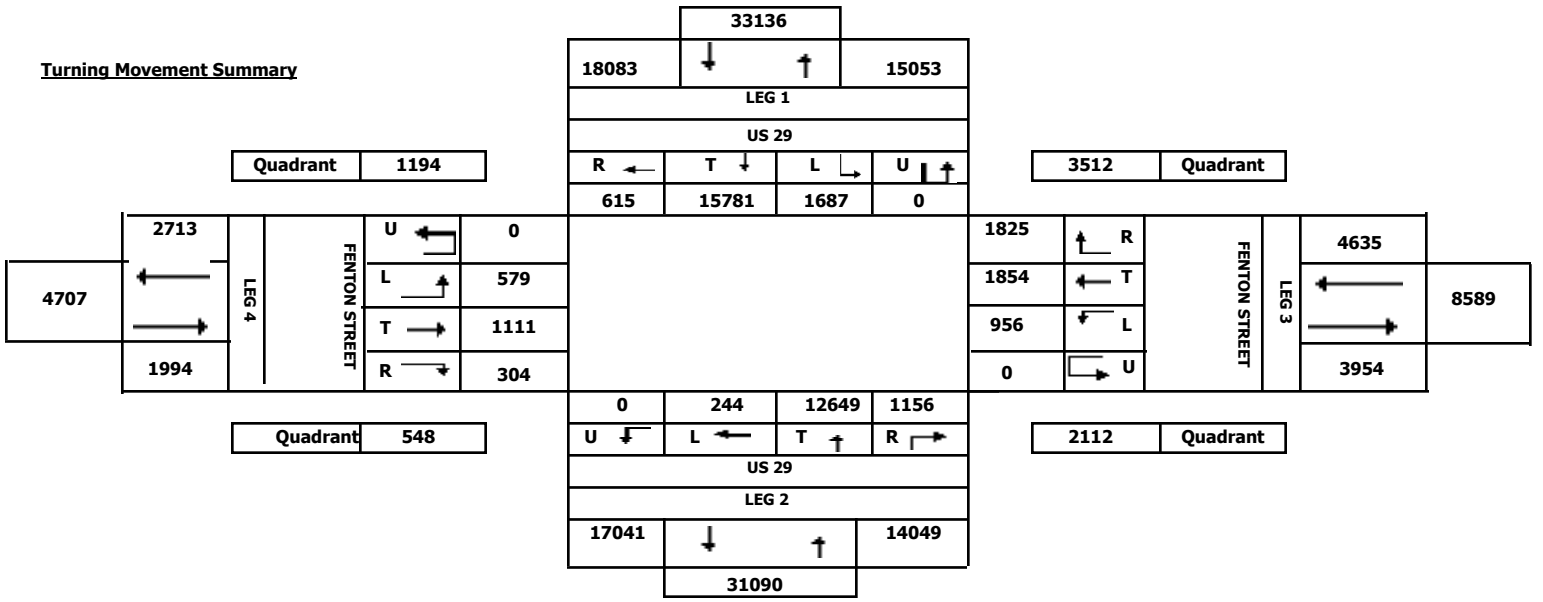
County: Montgomery
Town: none
Weather:

Comments: LOS AM:C PM:B HEAVY QUEING OCCURRED DURING AM & PM PEAKS. PEDS CAUSED DELAYS FOR TURNING VEHICLES THROUGH OUT THE DAY.

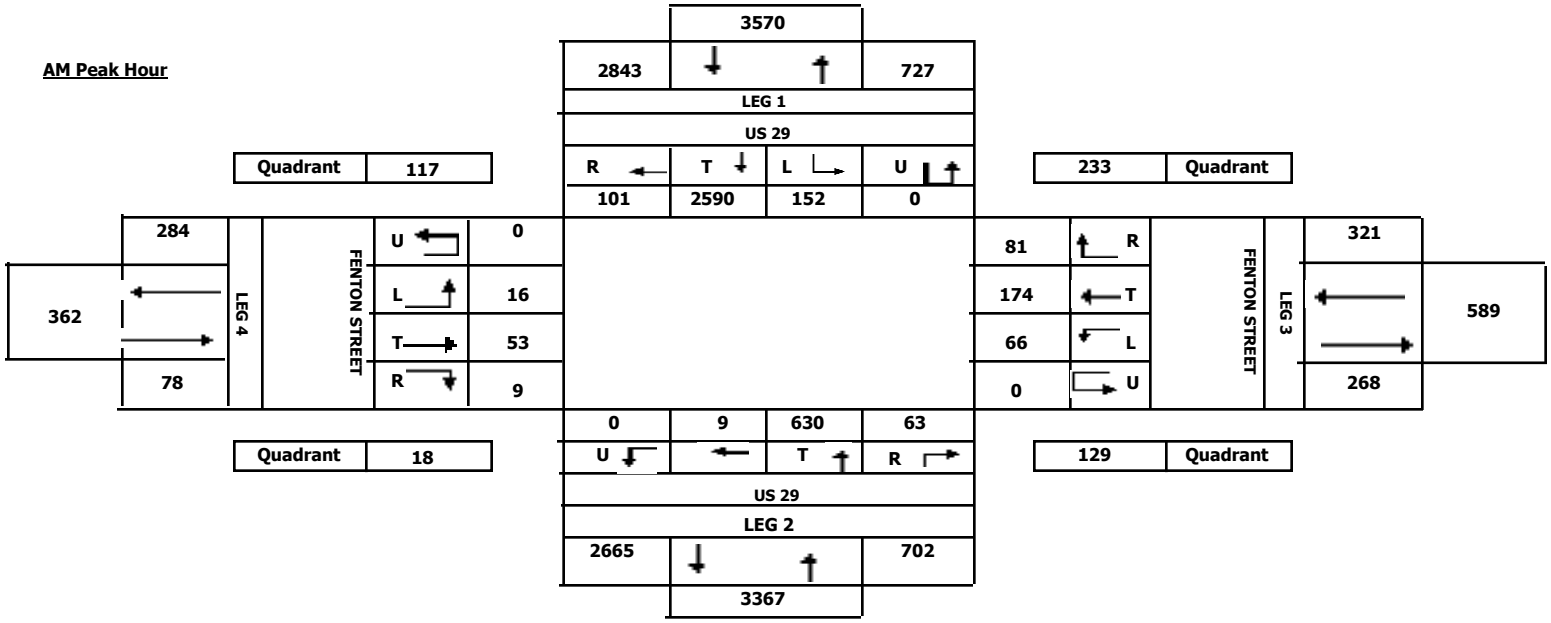
Interval (dd): 15 min

PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Begin	End	Volume	PM PERIOD 12:00PM-19:00PM	Begin	End	Volume
		07:45	08:45	3944		16:00	17:00	3649

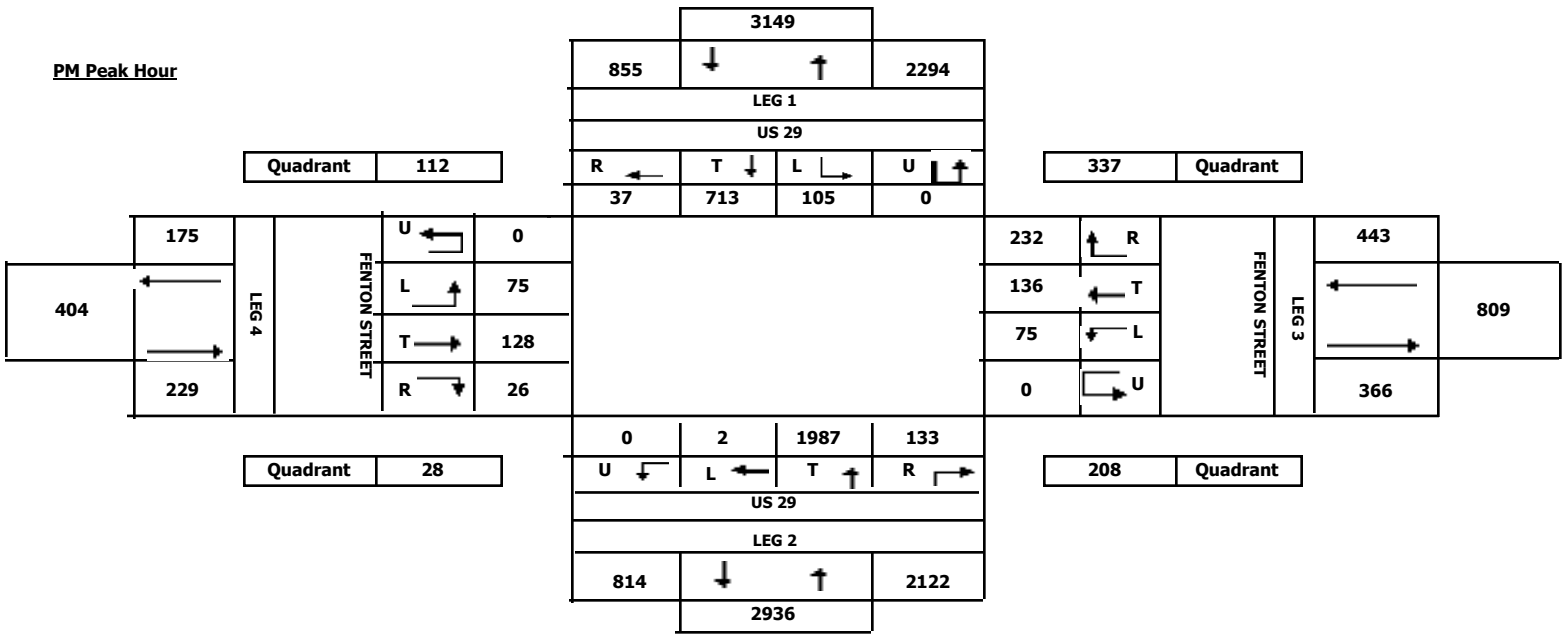
Turning Movement Summary



AM Peak Hour



PM Peak Hour



Maryland State Highway Administration
Highway Information Services Division
Turning Movement Count Study - Field Sheet

Station ID: S2002150077 **County:** Montgomery **Comments:** LOS AM:C PM:C

Date: Tuesday 01/25/2011 **Town:** none

Location: US 29 at SPRING ST **Weather:**

Interval (dd): 15 min

PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Begin	End	Volume	PM PERIOD 12:00PM-19:00PM	Begin	End	Volume
		08:00	09:00	4249		16:30	17:30	4444

Hour	US 29 From North				US 29 From South				SPRING STREET From East				SPRING STREET From West				Grand Total
Begin	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	
6:00	20	347	26	393	1	54	3	58	1	3	3	7	13	4	2	19	477
6:15	11	400	41	452	0	64	0	64	6	2	3	11	28	2	2	32	559
6:30	17	478	74	569	2	83	6	91	1	11	2	14	23	3	2	28	702
6:45	24	424	82	530	0	97	2	99	7	9	5	21	29	6	4	39	689
7:00	27	571	94	692	0	128	6	134	3	13	10	26	31	14	3	48	900
7:15	26	519	87	632	0	135	4	139	1	9	6	16	58	24	6	88	875
7:30	48	600	89	737	0	141	6	147	5	19	8	32	34	14	9	57	973
7:45	51	479	122	652	1	158	2	161	7	35	15	57	43	22	9	74	944
8:00	**57**	**618**	**105**	**780**	**0**	**184**	**9**	**193**	**12**	**22**	**11**	**45**	**44**	**23**	**6**	**73**	**1091**
8:15	**57**	**500**	**116**	**673**	**1**	**159**	**7**	**167**	**13**	**31**	**10**	**54**	**70**	**24**	**6**	**100**	**994**
8:30	**55**	**586**	**168**	**809**	**0**	**165**	**11**	**176**	**7**	**40**	**14**	**61**	**70**	**27**	**3**	**100**	**1146**
8:45	**60**	**500**	**127**	**687**	**2**	**150**	**9**	**161**	**12**	**51**	**13**	**76**	**53**	**37**	**4**	**94**	**1018**
9:00	66	504	112	682	2	151	10	163	4	38	14	56	52	38	3	93	994
9:15	62	466	139	667	0	137	11	148	3	30	14	47	58	46	14	118	980
9:30	41	389	69	499	0	124	3	127	7	28	17	52	48	27	8	83	761
9:45	36	353	52	441	1	122	9	132	7	11	8	26	48	28	5	81	680
10:00	45	263	65	373	1	134	6	141	6	20	11	37	37	35	10	82	633
10:15	33	260	50	343	1	140	3	144	8	8	2	18	39	31	8	78	583
10:30	28	256	35	319	2	126	6	134	4	15	15	34	41	25	9	75	562
10:45	27	230	44	301	0	157	5	162	2	14	17	33	48	33	7	88	584
11:00	37	203	48	288	5	146	8	159	6	23	24	53	51	28	2	81	581
11:15	28	218	31	277	4	153	6	163	0	15	22	37	69	33	12	114	591
11:30	29	184	40	253	2	140	7	149	7	16	18	41	49	27	8	84	527
11:45	28	203	39	270	2	154	8	164	9	30	8	47	54	34	15	103	584
12:00	34	183	26	243	1	103	8	112	3	23	15	41	61	53	1	115	511
12:15	35	181	23	239	0	156	10	166	11	11	21	43	64	73	13	150	598
12:30	33	193	35	261	3	214	13	230	13	24	53	90	48	27	11	86	667
12:45	29	176	45	250	5	201	2	208	12	26	47	85	49	30	12	91	634
13:00	30	214	40	284	4	176	6	186	14	36	50	100	48	23	9	80	650
13:15	24	188	42	254	7	196	8	211	14	26	36	76	61	31	8	100	641
13:30	25	200	52	277	3	192	5	200	10	32	44	86	60	19	5	84	647
13:45	28	193	29	250	3	241	5	249	20	39	41	100	57	27	11	95	694
14:00	26	180	30	236	1	226	7	234	11	32	64	107	64	31	6	101	678
14:15	27	194	41	262	3	280	15	298	9	29	51	89	64	34	9	107	756
14:30	19	238	32	289	1	238	8	247	15	31	60	106	88	31	3	122	764
14:45	34	234	40	308	1	297	5	303	10	33	58	101	105	33	5	143	855
15:00	31	196	34	261	3	281	5	289	14	44	64	122	103	46	9	158	830
15:15	25	184	39	248	3	350	8	361	7	41	74	122	159	44	6	209	940
15:30	28	196	44	268	1	346	7	354	13	35	78	126	161	38	5	204	952
15:45	32	213	51	296	1	406	11	418	15	33	66	114	155	32	6	193	1021
16:00	21	172	30	223	0	462	17	479	12	27	58	97	174	44	5	223	1022
16:15	18	200	37	255	0	486	11	497	15	25	88	128	177	42	7	226	1106
16:30	**13**	**206**	**39**	**258**	**0**	**452**	**16**	**468**	**13**	**40**	**81**	**134**	**172**	**47**	**9**	**228**	**1088**
16:45	**17**	**196**	**46**	**259**	**0**	**485**	**17**	**502**	**13**	**42**	**86**	**141**	**172**	**50**	**4**	**226**	**1128**
17:00	**19**	**186**	**37**	**242**	**1**	**453**	**11**	**465**	**13**	**37**	**74**	**124**	**208**	**50**	**7**	**265**	**1096**
17:15	**23**	**160**	**51**	**234**	**0**	**478**	**21**	**499**	**9**	**59**	**96**	**164**	**171**	**56**	**8**	**235**	**1132**
17:30	28	154	34	216	1	420	26	447	12	57	72	141	177	65	8	250	1054
17:45	13	189	36	238	0	433	25	458	11	66	86	163	149	62	3	214	1073
18:00	23	174	33	230	1	414	14	429	11	49	61	121	159	48	11	218	998
18:15	23	181	28	232	0	442	22	464	15	46	89	150	170	47	12	229	1075
18:30	35	163	33	231	0	428	16	444	8	38	76	122	130	49	5	184	981
18:45	27	184	29	240	0	431	16	447	11	46	63	120	106	58	7	171	978
TOTAL	**1633**	**14879**	**2891**	**19403**	**70**	**12489**	**482**	**13041**	**472**	**1520**	**2022**	**4014**	**4402**	**1775**	**362**	**6539**	**42997**
AM Peak	**229**	**2204**	**516**	**2949**	**3**	**658**	**36**	**697**	**44**	**144**	**48**	**236**	**237**	**111**	**19**	**367**	**4249**
PM Peak	**72**	**748**	**173**	**993**	**1**	**1868**	**65**	**1934**	**48**	**178**	**337**	**563**	**723**	**203**	**28**	**954**	**4444**

Station ID: S2002150077 **County:** Montgomery **Comments:** LOS AM:C PM:C

Date: Tuesday 01/25/2011 **Town:** none

Location: US 29 at SPRING ST **Weather:**

Interval (dd): 15 min

PEAK HOURS	AM PERIOD	Begin	End	Volume	PM PERIOD	Begin	End	Volume
	6:00AM-12:00PM	08:00	09:00	4249	12:00PM-19:00PM	16:30	17:30	4444

Hour	US 29 North Leg			US 29 South Leg			SPRING STREET East Leg			SPRING STREET West Leg		
Ending	S.C.	PED.	U.T.	S.C.	PED.	U.T.	S.C.	PED.	U.T.	S.C.	PED.	U.T.
6:00	0	0	0	0	1	0	0	4	0	0	2	0
6:15	0	0	0	0	5	0	0	5	0	1	1	0
6:30	0	0	0	0	5	0	0	6	0	0	4	0
6:45	0	0	0	1	7	0	0	5	0	0	3	0
7:00	0	0	0	0	1	0	0	4	0	0	4	0
7:15	0	2	0	3	8	0	2	5	0	0	3	0
7:30	0	0	0	6	4	0	8	6	0	0	6	0
7:45	0	0	0	4	7	0	4	11	0	3	3	0
8:00	**0**	**2**	**0**	**4**	**5**	**0**	**4**	**5**	**0**	**1**	**13**	**0**
8:15	**0**	**1**	**0**	**2**	**5**	**0**	**4**	**4**	**0**	**2**	**14**	**0**
8:30	**0**	**1**	**0**	**0**	**5**	**0**	**2**	**2**	**0**	**0**	**13**	**0**
8:45	**0**	**1**	**0**	**1**	**3**	**0**	**1**	**6**	**0**	**0**	**5**	**0**
9:00	0	1	0	1	3	0	0	5	0	0	3	0
9:15	0	0	0	1	5	0	0	3	0	0	1	0
9:30	0	1	0	0	8	0	1	3	0	0	4	0
9:45	0	1	0	1	14	0	0	13	0	0	6	0
10:00	0	0	0	0	5	0	0	2	0	0	1	0
10:15	0	1	0	0	6	0	0	10	0	0	3	0
10:30	0	2	0	0	7	0	1	5	0	0	7	0
10:45	0	2	0	0	6	0	0	16	0	0	7	0
11:00	0	0	0	0	6	0	0	11	0	0	5	0
11:15	0	1	0	0	6	0	0	7	0	0	8	0
11:30	0	0	0	0	3	0	0	3	0	0	6	0
11:45	0	0	0	0	6	0	0	5	0	0	4	0
12:00	0	0	0	0	6	0	0	1	0	0	14	0
12:15	0	0	0	0	0	0	0	2	0	0	7	0
12:30	0	0	0	0	8	0	0	11	0	0	10	0
12:45	0	1	0	2	5	0	0	17	0	0	4	0
13:00	0	1	0	0	9	0	0	12	0	0	12	0
13:15	0	0	0	0	7	0	0	7	0	1	6	0
13:30	0	0	0	0	2	0	0	6	0	0	1	0
13:45	0	1	0	0	14	0	0	19	0	0	12	0
14:00	0	0	0	0	7	0	0	17	0	0	5	0
14:15	0	0	0	0	7	0	0	15	0	0	3	0
14:30	2	1	0	0	9	0	0	15	0	2	11	0
14:45	0	1	0	3	4	0	5	12	0	3	6	0
15:00	0	2	0	3	9	0	1	12	0	1	11	0
15:15	0	0	0	0	11	0	0	19	0	1	3	0
15:30	0	0	0	1	4	0	3	18	0	2	2	0
15:45	0	0	0	1	3	0	2	16	0	1	1	0
16:00	0	0	0	0	7	0	1	18	0	0	6	0
16:15	0	0	0	2	9	0	0	10	0	4	5	0
16:30	**0**	**0**	**0**	**0**	**16**	**0**	**0**	**11**	**0**	**1**	**8**	**0**
16:45	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**17**	**0**	**0**	**10**	**0**
17:00	**0**	**0**	**0**	**0**	**15**	**0**	**0**	**13**	**0**	**0**	**13**	**0**
17:15	**0**	**0**	**0**	**0**	**11**	**0**	**0**	**13**	**0**	**0**	**7**	**0**
17:30	0	0	0	0	11	0	0	12	0	0	14	0
17:45	0	1	0	0	20	0	0	35	0	0	11	0
18:00	0	0	0	0	23	0	0	20	0	0	16	0
18:15	0	0	0	0	8	0	0	11	0	0	13	0
18:30	0	1	0	0	5	0	0	16	0	0	14	0
18:45	0	0	0	0	10	0	0	18	0	0	13	0
Total	**2**	**25**	**0**	**36**	**376**	**0**	**39**	**539**	**0**	**23**	**364**	**0**
AM Peak	**0**	**5**	**0**	**7**	**18**	**0**	**11**	**17**	**0**	**3**	**45**	**0**
PM Peak	**0**	**0**	**0**	**0**	**47**	**0**	**0**	**54**	**0**	**1**	**38**	**0**

Station ID: S2002150077 **County:** Montgomery **Comments:** LOS AM:C PM:C

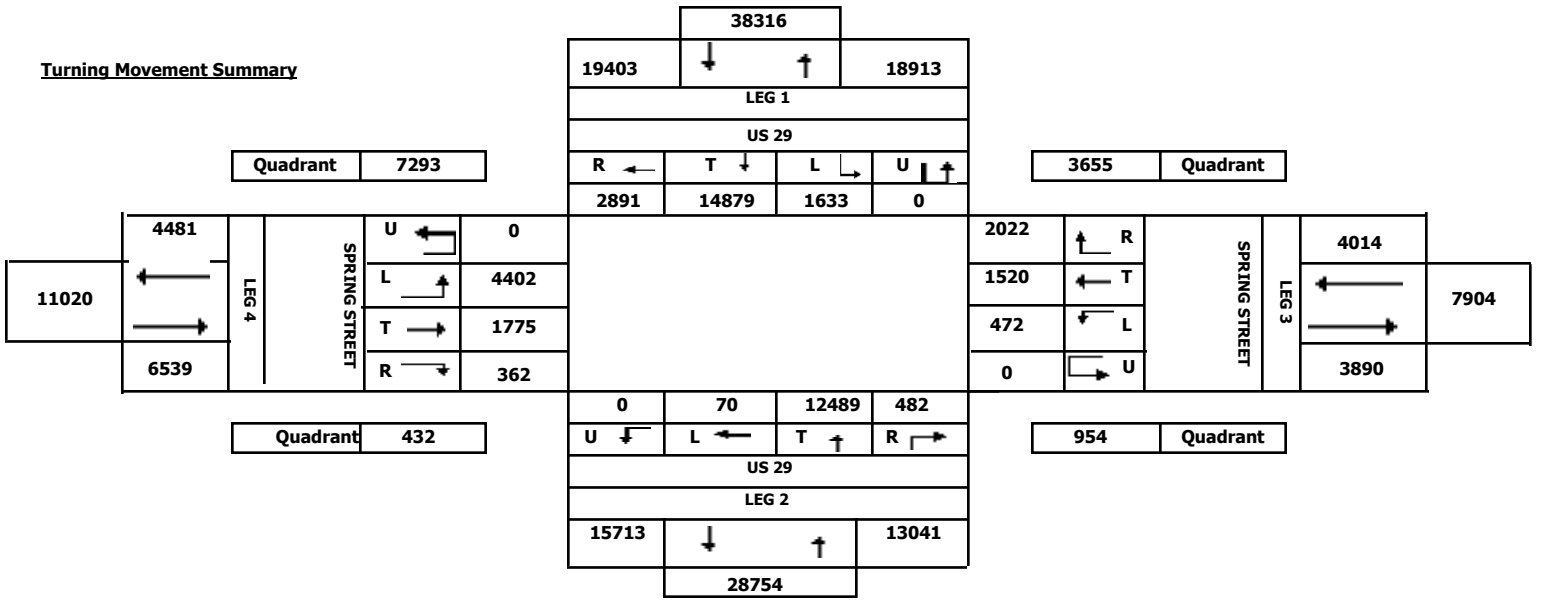
Date: Tuesday 01/25/2011 **Town:** none

Location: US 29 at SPRING ST **Weather:**

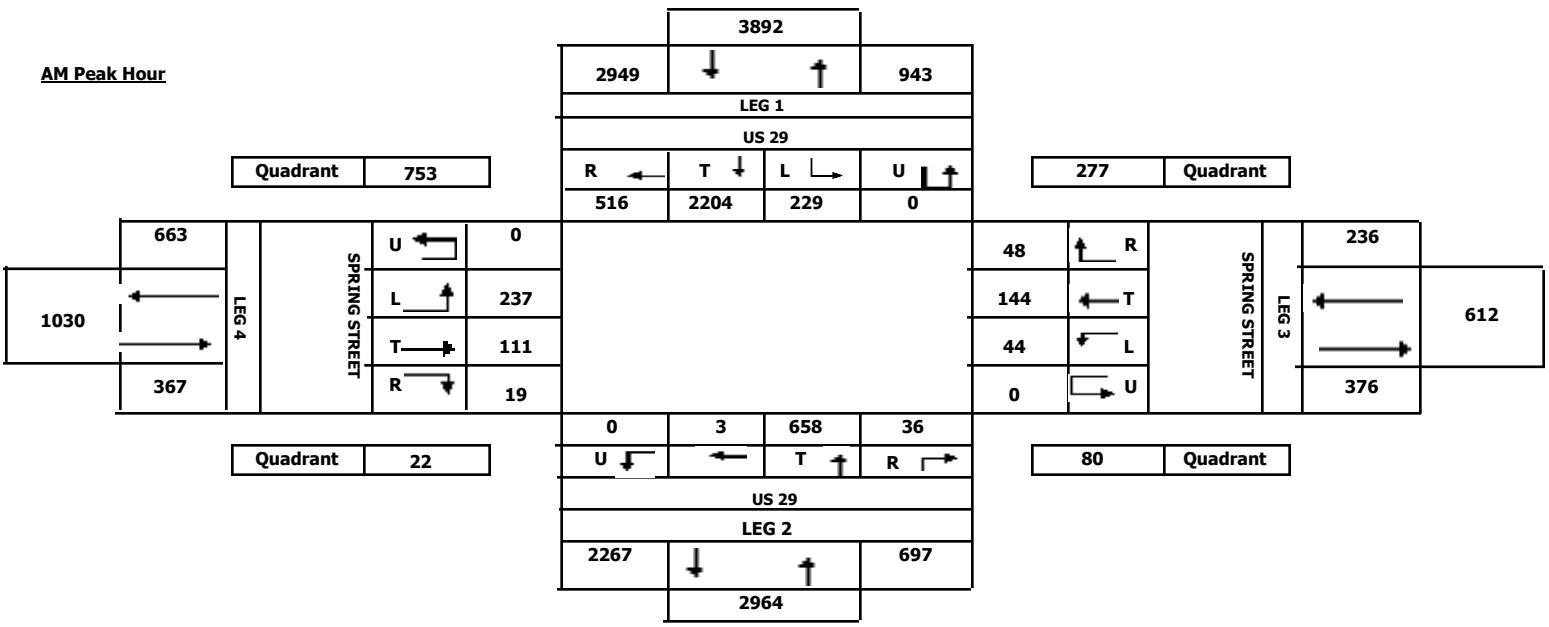
Interval (dd): 15 min

PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Begin	End	Volume	PM PERIOD 12:00PM-19:00PM	Begin	End	Volume
		08:00	09:00	4249		16:30	17:30	4444

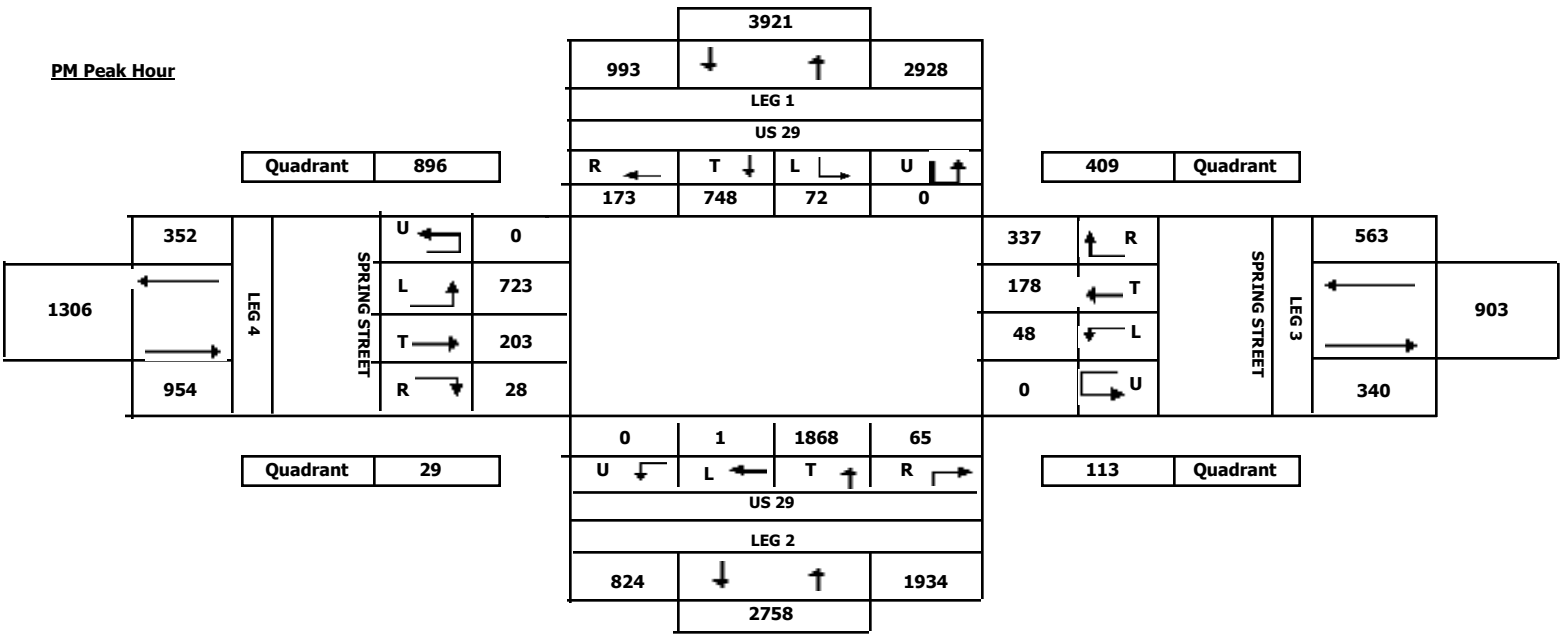
Turning Movement Summary



AM Peak Hour



PM Peak Hour



Maryland State Highway Administration
Highway Information Services Division
Turning Movement Count Study - Field Sheet

Station ID: S2002150078 **County:** Montgomery **Comments:** LOS AM = A; LOS PM = A

Date: Tuesday 06/07/2011 **Town:** none

Location: US 29 at NOYES DR **Weather:** Sunny/Hot

Interval (dd): 15 min

PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Begin	End	Volume	PM PERIOD 12:00PM-19:00PM	Begin	End	Volume
		08:15	09:15	3752		16:30	17:30	3948

Hour	US 29 From North				US 29 From South				Library Access From East				S Noyes Dr From West				Grand Total
Begin	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	
6:00	3	380	0	383	1	75	1	77	0	0	0	0	0	0	0	0	460
6:15	0	409	0	409	0	102	2	104	0	0	1	1	0	0	0	0	514
6:30	0	486	0	486	0	113	0	113	0	0	0	0	0	0	0	0	599
6:45	0	511	3	514	0	142	0	142	0	0	0	0	0	0	2	2	658
7:00	1	621	2	624	0	191	2	193	0	0	1	1	0	0	0	0	818
7:15	2	588	6	596	0	215	4	219	0	0	1	1	0	0	2	2	818
7:30	3	605	5	613	0	247	3	250	0	0	2	2	0	0	0	0	865
7:45	4	642	5	651	1	201	0	202	0	0	0	0	0	0	0	0	853
8:00	9	665	8	682	0	205	3	208	0	0	0	0	0	0	2	2	892
8:15	**3**	**733**	**13**	**749**	**0**	**236**	**3**	**239**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**988**
8:30	**4**	**660**	**9**	**673**	**0**	**246**	**3**	**249**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**922**
8:45	**4**	**624**	**14**	**642**	**0**	**271**	**5**	**276**	**0**	**0**	**0**	**0**	**2**	**0**	**2**	**4**	**922**
9:00	**5**	**677**	**4**	**686**	**0**	**229**	**5**	**234**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**920**
9:15	3	637	3	643	1	190	4	195	0	0	0	0	1	0	2	3	841
9:30	3	462	5	470	0	221	2	223	0	0	0	0	0	0	1	1	694
9:45	11	466	1	478	0	190	1	191	0	0	0	0	0	0	1	1	670
10:00	6	434	4	444	3	182	1	186	0	0	0	0	0	0	5	5	635
10:15	6	426	0	432	0	191	3	194	0	0	0	0	0	0	0	0	626
10:30	6	389	4	399	0	216	3	219	0	0	0	0	0	0	2	2	620
10:45	10	384	10	404	1	262	2	265	0	0	0	0	0	0	3	3	672
11:00	2	321	3	326	5	222	3	230	0	0	1	1	0	0	2	2	559
11:15	6	269	3	278	2	273	1	276	0	0	1	1	0	0	1	1	556
11:30	5	279	2	286	2	276	2	280	0	0	0	0	0	2	2	4	570
11:45	2	269	1	272	2	279	1	282	0	0	0	0	0	0	6	6	560
12:00	7	290	0	297	1	254	3	258	0	0	1	1	0	0	1	1	557
12:15	5	268	1	274	3	282	0	285	0	0	0	0	0	0	2	2	561
12:30	1	303	4	308	2	239	3	244	0	0	0	0	2	0	5	7	559
12:45	3	296	2	301	1	341	2	344	0	0	0	0	1	0	4	5	650
13:00	5	262	0	267	0	327	4	331	0	0	1	1	0	0	0	0	599
13:15	6	283	1	290	1	365	4	370	1	0	0	1	0	0	5	5	666
13:30	3	288	1	292	2	328	3	333	0	0	0	0	0	0	0	0	625
13:45	4	278	1	283	2	369	4	375	0	0	0	0	0	0	1	1	659
14:00	4	258	1	263	1	392	2	395	0	0	0	0	1	0	0	1	659
14:15	2	276	0	278	1	412	2	415	0	0	1	1	0	0	2	2	696
14:30	3	270	0	273	2	389	3	394	0	0	0	0	0	0	0	0	667
14:45	4	253	0	257	2	413	5	420	0	0	0	0	0	0	1	1	678
15:00	1	261	1	263	1	468	2	471	0	0	0	0	1	0	1	2	736
15:15	3	279	1	283	0	517	2	519	0	0	0	0	0	0	2	2	804
15:30	5	259	2	266	1	530	4	535	0	0	0	0	0	0	0	0	801
15:45	2	259	0	261	0	551	6	557	0	0	0	0	0	0	2	2	820
16:00	1	207	6	214	2	681	5	688	2	0	0	2	1	0	2	3	907
16:15	2	281	2	285	0	699	3	702	0	0	0	0	1	0	3	4	991
16:30	**2**	**261**	**1**	**264**	**0**	**686**	**8**	**694**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**3**	**961**
16:45	**6**	**266**	**1**	**273**	**3**	**716**	**6**	**725**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**2**	**1000**
17:00	**3**	**274**	**1**	**278**	**2**	**658**	**4**	**664**	**0**	**0**	**0**	**0**	**1**	**0**	**4**	**5**	**947**
17:15	**4**	**259**	**1**	**264**	**3**	**767**	**4**	**774**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**2**	**1040**
17:30	3	245	1	249	1	638	9	648	0	0	0	0	0	0	4	4	901
17:45	3	245	1	249	1	657	3	661	0	0	0	0	1	0	6	7	917
18:00	3	249	0	252	0	641	0	641	0	0	0	0	1	1	1	3	896
18:15	5	262	2	269	0	671	3	674	0	0	0	0	0	0	0	0	943
18:30	0	246	0	246	4	602	1	607	0	0	0	0	0	0	7	7	860
18:45	6	279	2	287	4	592	2	598	0	0	1	1	0	1	5	6	892
TOTAL	**194**	**19394**	**138**	**19726**	**58**	**19160**	**151**	**19369**	**3**	**0**	**11**	**14**	**13**	**4**	**98**	**115**	**39224**
AM Peak	**16**	**2694**	**40**	**2750**	**0**	**982**	**16**	**998**	**0**	**0**	**0**	**0**	**2**	**0**	**2**	**4**	**3752**
PM Peak	**15**	**1060**	**4**	**1079**	**8**	**2827**	**22**	**2857**	**0**	**0**	**0**	**0**	**1**	**0**	**11**	**12**	**3948**

Station ID: S2002150078 **County:** Montgomery **Comments:** LOS AM = A; LOS PM = A

Date: Tuesday 06/07/2011 **Town:** none

Location: US 29 at NOYES DR **Weather:** Sunny/Hot

Interval (dd): 15 min

PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Begin	End	Volume	PM PERIOD 12:00PM-19:00PM	Begin	End	Volume
		08:15	09:15	3752		16:30	17:30	3948

Hour	US 29 North Leg			US 29 South Leg			Library Access East Leg			S Noyes Dr West Leg		
Ending	S.C.	PED.	U.T.	S.C.	PED.	U.T.	S.C.	PED.	U.T.	S.C.	PED.	U.T.
6:00	0	0	0	0	0	0	0	2	1	0	3	0
6:15	0	0	0	0	0	0	0	3	0	0	0	0
6:30	0	0	0	0	0	0	0	2	0	0	1	0
6:45	0	0	0	0	0	0	0	3	0	0	0	0
7:00	0	0	0	0	0	0	0	1	0	0	3	0
7:15	0	0	0	0	0	0	0	6	0	0	1	0
7:30	0	0	0	0	0	0	0	10	0	0	1	0
7:45	0	0	0	0	0	1	0	7	0	0	0	0
8:00	0	0	0	0	0	0	0	5	0	0	2	0
8:15	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**5**	**0**
8:30	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**3**	**0**
8:45	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**8**	**0**	**0**	**2**	**0**
9:00	**0**	**7**	**0**	**0**	**0**	**0**	**0**	**6**	**0**	**0**	**6**	**0**
9:15	0	1	0	0	0	1	0	4	0	0	0	0
9:30	0	1	0	0	0	0	0	4	0	0	0	0
9:45	0	2	0	0	0	0	0	13	0	0	1	0
10:00	0	3	0	0	0	0	0	4	0	0	5	0
10:15	0	1	0	0	0	1	0	24	0	0	1	0
10:30	0	3	0	0	0	0	0	4	0	0	2	0
10:45	0	1	0	0	0	0	0	3	0	0	4	0
11:00	0	2	0	0	0	1	0	6	1	0	7	0
11:15	0	4	0	0	0	0	0	9	0	0	5	0
11:30	0	3	1	0	1	0	0	23	0	0	2	0
11:45	0	3	0	0	0	2	0	6	1	0	2	0
12:00	0	1	0	0	2	0	0	0	0	0	5	0
12:15	0	3	0	0	0	0	0	7	0	0	1	0
12:30	0	8	0	0	0	0	0	10	0	0	4	0
12:45	0	6	0	0	0	0	0	15	0	0	11	0
13:00	0	5	0	0	0	0	0	10	0	0	11	0
13:15	0	4	0	0	0	1	0	7	0	0	13	0
13:30	0	2	0	0	0	2	0	11	0	0	7	0
13:45	0	1	0	0	1	0	0	13	0	0	3	0
14:00	0	2	1	0	1	0	0	18	0	0	0	0
14:15	0	0	0	0	0	0	0	5	0	0	1	0
14:30	0	7	0	0	0	0	0	4	0	0	5	0
14:45	0	2	0	0	0	0	0	10	0	0	2	0
15:00	0	1	0	0	0	0	0	14	0	0	1	0
15:15	0	0	0	0	0	0	0	15	0	0	1	0
15:30	0	0	0	0	0	0	0	8	0	0	1	0
15:45	0	3	0	0	6	0	0	7	0	0	1	0
16:00	0	4	0	0	0	0	0	16	0	0	6	0
16:15	0	3	0	0	0	1	0	11	0	0	11	0
16:30	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**0**	**0**	**2**	**0**
16:45	**0**	**0**	**0**	**0**	**1**	**2**	**0**	**10**	**0**	**0**	**0**	**0**
17:00	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**18**	**0**	**0**	**7**	**0**
17:15	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**18**	**0**	**0**	**1**	**0**
17:30	0	1	0	0	1	0	0	12	0	0	11	0
17:45	0	3	0	0	1	0	0	23	0	0	4	0
18:00	0	1	0	0	0	0	0	11	0	0	3	0
18:15	0	0	1	0	0	0	0	4	0	0	1	0
18:30	0	2	0	0	0	1	0	2	0	0	2	0
18:45	0	2	0	0	0	0	0	12	1	0	5	0
Total	**0**	**95**	**3**	**0**	**14**	**13**	**0**	**468**	**4**	**0**	**176**	**0**
AM Peak	**0**	**8**	**0**	**0**	**0**	**0**	**0**	**27**	**0**	**0**	**16**	**0**
PM Peak	**0**	**2**	**0**	**0**	**1**	**2**	**0**	**57**	**0**	**0**	**10**	**0**

Station ID: S2002150078 **County:** Montgomery **Comments:** LOS AM = A; LOS PM = A

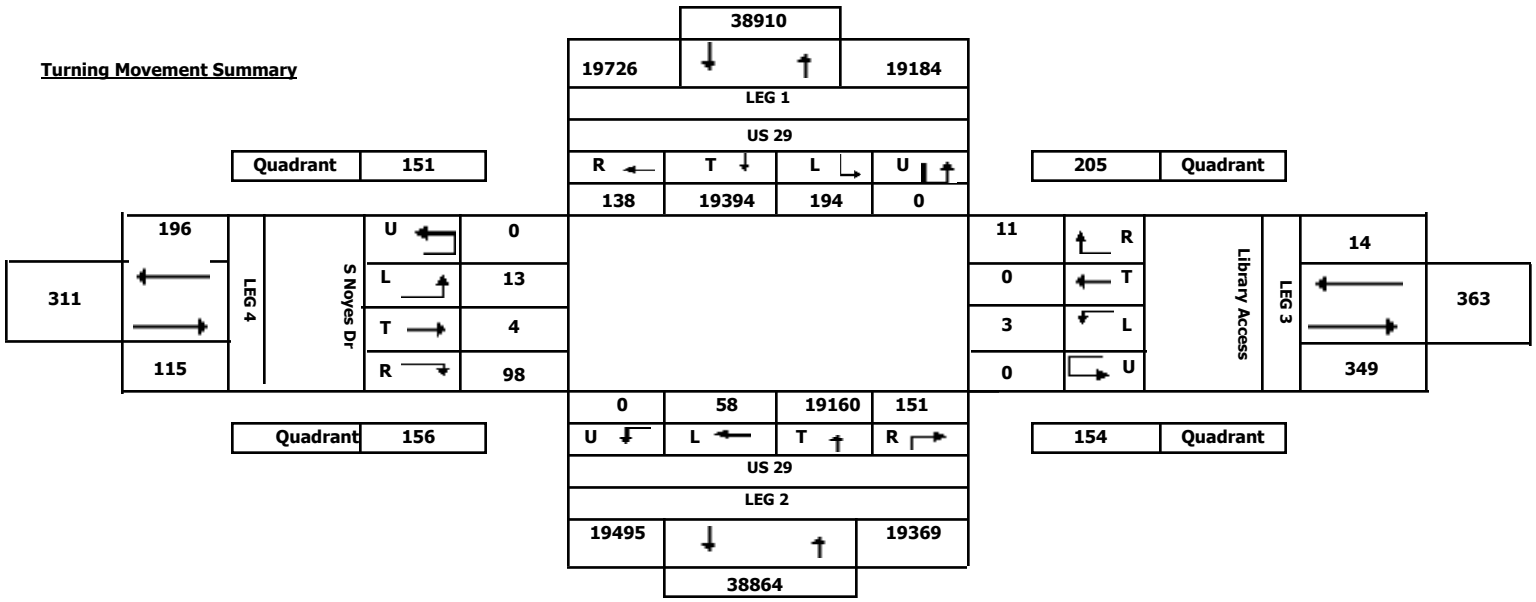
Date: Tuesday 06/07/2011 **Town:** none

Location: US 29 at NOYES DR **Weather:** Sunny/Hot

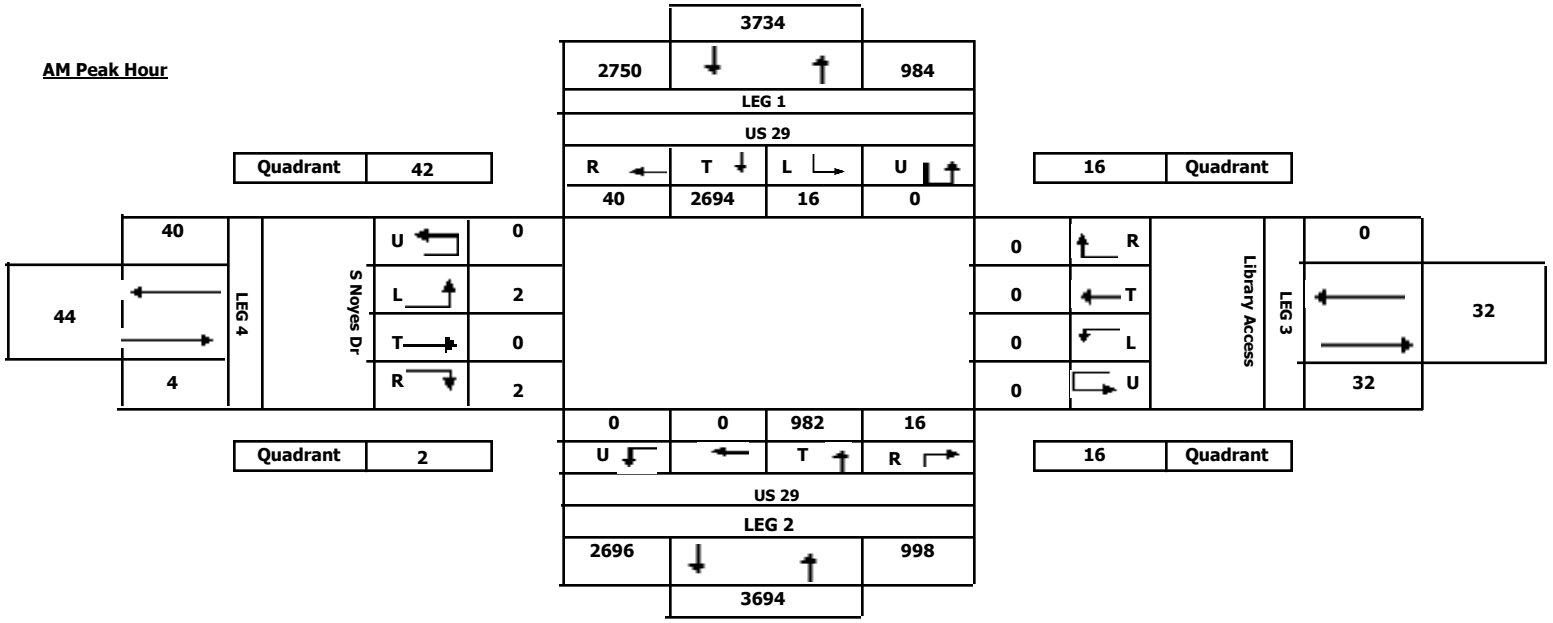
Interval (dd): 15 min

PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Begin	End	Volume	PM PERIOD 12:00PM-19:00PM	Begin	End	Volume
		08:15	09:15	3752		16:30	17:30	3948

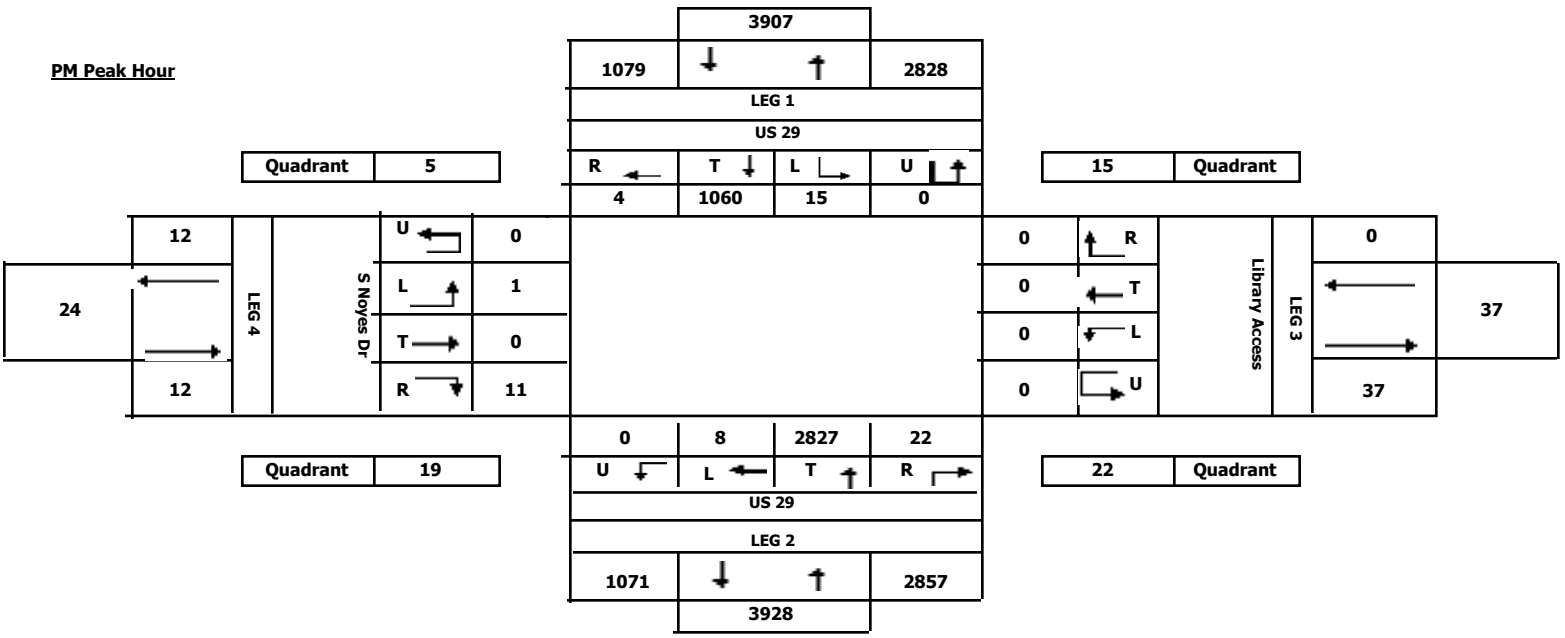
Turning Movement Summary



AM Peak Hour



PM Peak Hour



Maryland State Highway Administration
Highway Information Services Division
Turning Movement Count Study - Field Sheet

Station ID: S2011150232 **County:** Montgomery **Comments:** LOS AM = A; LOS PM = A

Date: Tuesday 06/07/2011 **Town:** none

Location: US 29 at N. Noyes Dr **Weather:** Sunny/Hot

Interval (dd): 15 min

PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Begin	End	Volume	PM PERIOD 12:00PM-19:00PM	Begin	End	Volume
		08:15	09:15	3783		16:30	17:30	4025

Hour	US 29 From North				US 29 From South				Private Driveway From East				N Noyes Dr From West				Grand Total
Begin	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	L	T	R	TOT	
6:00	0	387	1	388	0	71	0	71	0	0	0	0	0	0	0	0	459
6:15	0	428	2	430	0	104	0	104	0	0	0	0	0	0	0	0	534
6:30	0	481	8	489	0	107	0	107	0	0	0	0	0	0	0	0	596
6:45	0	544	5	549	0	141	0	141	0	0	0	0	1	0	1	2	692
7:00	0	598	2	600	0	180	1	181	0	0	0	0	0	0	0	0	781
7:15	0	609	2	611	0	221	0	221	0	1	0	1	0	0	0	0	833
7:30	0	594	2	596	0	242	0	242	0	0	0	0	1	0	0	1	839
7:45	0	640	1	641	0	198	0	198	0	0	0	0	0	0	0	0	839
8:00	0	675	0	675	0	198	0	198	0	0	0	0	0	0	0	0	873
8:15	**0**	**737**	**0**	**737**	**0**	**232**	**0**	**232**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**970**
8:30	**0**	**705**	**1**	**706**	**0**	**239**	**0**	**239**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**945**
8:45	**0**	**703**	**8**	**711**	**0**	**276**	**0**	**276**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**987**
9:00	**0**	**631**	**18**	**649**	**0**	**229**	**1**	**230**	**1**	**0**	**0**	**1**	**1**	**0**	**0**	**1**	**881**
9:15	1	650	25	676	0	203	0	203	10	0	0	10	1	0	0	1	890
9:30	0	476	18	494	2	224	0	226	0	0	0	0	0	0	0	0	720
9:45	0	470	11	481	0	188	0	188	0	0	0	0	2	0	0	2	671
10:00	0	432	18	450	2	179	0	181	0	0	0	0	2	0	2	4	635
10:15	0	446	21	467	1	177	0	178	0	0	0	0	0	0	0	0	645
10:30	0	412	15	427	0	229	0	229	0	0	0	0	1	0	0	1	657
10:45	0	379	14	393	1	244	0	245	0	0	0	0	0	0	2	2	640
11:00	0	304	6	310	0	235	0	235	0	0	0	0	2	0	1	3	548
11:15	0	293	4	297	4	261	0	265	0	0	0	0	2	0	4	6	568
11:30	0	287	6	293	2	289	0	291	0	0	0	0	0	0	3	3	587
11:45	0	275	4	279	1	276	0	277	0	0	0	0	1	0	0	1	557
12:00	0	301	4	305	0	271	0	271	0	0	0	0	2	0	0	2	578
12:15	0	267	5	272	0	288	0	288	0	0	0	0	0	0	0	0	560
12:30	0	287	4	291	1	256	0	257	0	0	0	0	2	0	1	3	551
12:45	0	286	8	294	1	339	0	340	0	0	0	0	1	0	0	1	635
13:00	0	266	9	275	1	340	0	341	0	0	0	0	1	0	0	1	617
13:15	0	285	4	289	1	349	0	350	0	0	0	0	0	0	0	0	639
13:30	0	288	4	292	2	331	0	333	0	0	0	0	2	0	3	5	630
13:45	0	283	3	286	0	364	0	364	0	0	0	0	1	0	0	1	651
14:00	0	266	9	275	0	407	0	407	0	0	0	0	0	0	0	0	682
14:15	0	281	7	288	2	402	0	404	0	0	0	0	0	0	1	1	693
14:30	1	271	4	276	1	391	0	392	0	0	1	1	1	0	1	2	671
14:45	0	261	6	267	1	409	0	410	0	0	0	0	1	0	2	3	680
15:00	0	264	2	266	1	468	0	469	0	0	0	0	1	0	1	2	737
15:15	0	287	5	292	0	496	0	496	0	0	0	0	0	0	0	0	788
15:30	0	273	5	278	0	544	0	544	0	0	0	0	4	0	0	4	826
15:45	0	249	5	254	3	515	0	518	0	0	0	0	0	0	2	2	774
16:00	0	226	5	231	0	700	0	700	0	0	0	0	2	0	1	3	934
16:15	0	283	7	290	0	658	0	658	0	0	0	0	0	0	0	0	948
16:30	**0**	**266**	**13**	**279**	**1**	**728**	**0**	**729**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**1009**
16:45	**0**	**265**	**11**	**276**	**2**	**743**	**0**	**745**	**0**	**0**	**0**	**0**	**1**	**0**	**1**	**2**	**1023**
17:00	**0**	**280**	**12**	**292**	**0**	**685**	**0**	**685**	**0**	**0**	**1**	**1**	**2**	**0**	**0**	**2**	**980**
17:15	**0**	**261**	**12**	**273**	**2**	**734**	**0**	**736**	**0**	**0**	**0**	**0**	**3**	**0**	**1**	**4**	**1013**
17:30	0	261	15	276	5	684	0	689	0	0	0	0	0	0	1	1	966
17:45	0	235	13	248	4	647	1	652	0	0	1	1	2	0	1	3	904
18:00	0	273	20	293	0	687	2	689	0	0	0	0	0	0	1	1	983
18:15	0	262	16	278	4	648	0	652	1	0	0	1	1	0	3	4	935
18:30	0	239	7	246	1	604	0	605	0	0	0	0	1	0	0	1	852
18:45	0	285	8	293	1	540	0	541	0	0	0	0	1	0	0	1	835
TOTAL	**2**	**19707**	**415**	**20124**	**47**	**19171**	**5**	**19223**	**12**	**1**	**3**	**16**	**43**	**0**	**35**	**78**	**39441**
AM Peak	**0**	**2776**	**27**	**2803**	**0**	**976**	**1**	**977**	**1**	**0**	**0**	**1**	**1**	**0**	**1**	**2**	**3783**
PM Peak	**0**	**1072**	**48**	**1120**	**5**	**2890**	**0**	**2895**	**0**	**0**	**1**	**1**	**6**	**0**	**3**	**9**	**4025**

Station ID: S2011150232
Date: Tuesday 06/07/2011
Location: US 29 at N. Noyes Dr

County: Montgomery
Town: none
Weather: Sunny/Hot

Comments: LOS AM = A; LOS PM = A

Interval (dd): 15 min

PEAK HOURS	AM PERIOD	Begin	End	Volume	PM PERIOD	Begin	End	Volume
	6:00AM-12:00PM	08:15	09:15	3783	12:00PM-19:00PM	16:30	17:30	4025

Hour	US 29 North Leg			US 29 South Leg			Private Driveway East Leg			N Noyes Dr West Leg		
Ending	S.C.	PED.	U.T.	S.C.	PED.	U.T.	S.C.	PED.	U.T.	S.C.	PED.	U.T.
6:00	0	0	0	0	0	0	0	1	0	0	3	0
6:15	0	0	0	0	0	0	0	4	0	0	0	0
6:30	0	0	0	0	0	0	0	2	0	0	0	0
6:45	0	0	0	0	0	1	0	2	0	0	1	0
7:00	0	0	0	0	0	2	0	0	0	0	0	0
7:15	0	0	0	0	0	1	0	2	0	0	0	0
7:30	0	0	0	0	0	0	0	4	0	0	0	0
7:45	0	0	0	0	0	1	0	3	0	0	2	0
8:00	0	0	0	0	0	0	0	1	0	0	1	0
8:15	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**1**	**0**
8:30	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**0**	**0**	**0**	**0**
8:45	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**4**	**0**
9:00	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
9:15	0	0	0	0	0	0	0	1	0	0	0	0
9:30	0	0	0	0	0	0	0	4	0	0	0	0
9:45	0	1	0	0	0	0	0	6	0	0	1	0
10:00	0	0	0	0	0	0	0	2	0	0	0	0
10:15	0	0	0	0	0	0	0	2	0	0	0	0
10:30	0	0	0	0	0	0	0	2	0	0	0	0
10:45	0	0	1	0	0	0	0	1	0	0	0	0
11:00	0	0	0	0	0	2	0	0	0	0	0	0
11:15	0	0	0	0	0	1	0	4	0	0	2	0
11:30	0	1	0	0	0	0	0	2	0	0	1	0
11:45	0	0	0	0	0	0	0	0	0	0	3	0
12:00	0	0	0	0	0	0	0	2	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	1	0	4	0	0	0	0
12:45	0	0	1	0	0	0	0	9	0	0	0	0
13:00	0	0	0	0	0	0	0	2	0	0	12	0
13:15	0	0	0	0	0	1	0	1	0	0	5	0
13:30	0	0	0	0	0	1	0	1	0	0	7	0
13:45	0	0	0	0	0	0	0	2	0	0	2	0
14:00	0	0	0	0	0	0	0	1	0	0	0	0
14:15	0	0	0	0	0	0	0	2	0	0	1	0
14:30	0	0	0	0	0	0	0	1	0	0	1	0
14:45	0	0	0	0	0	0	0	1	0	0	0	0
15:00	0	0	0	0	0	0	0	1	0	0	1	0
15:15	0	0	0	0	0	0	0	4	0	0	0	0
15:30	0	0	0	0	0	0	0	5	0	0	0	0
15:45	0	0	0	0	0	1	0	0	0	0	1	0
16:00	0	0	0	0	0	0	0	1	0	0	0	0
16:15	0	1	0	0	0	1	0	4	0	0	0	0
16:30	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**
16:45	**0**	**1**	**0**	**0**	**0**	**3**	**0**	**3**	**0**	**0**	**1**	**0**
17:00	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**4**	**0**	**0**	**2**	**0**
17:15	**0**	**0**	**0**	**0**	**1**	**0**	**0**	**6**	**0**	**0**	**11**	**0**
17:30	0	0	0	0	0	0	0	3	0	0	5	0
17:45	0	0	0	0	0	1	0	2	0	0	3	0
18:00	0	0	0	0	0	0	0	2	0	0	2	0
18:15	0	0	0	0	0	0	0	0	0	0	1	0
18:30	0	0	1	0	0	1	0	3	0	0	2	0
18:45	0	0	0	0	0	0	0	5	0	0	3	0
Total	**0**	**4**	**3**	**0**	**1**	**18**	**0**	**124**	**0**	**0**	**79**	**0**
AM Peak	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**11**	**0**	**0**	**5**	**0**
PM Peak	**0**	**1**	**0**	**0**	**1**	**3**	**0**	**14**	**0**	**0**	**14**	**0**

Station ID: S2011150232 **County:** Montgomery **Comments:** LOS AM = A; LOS PM = A

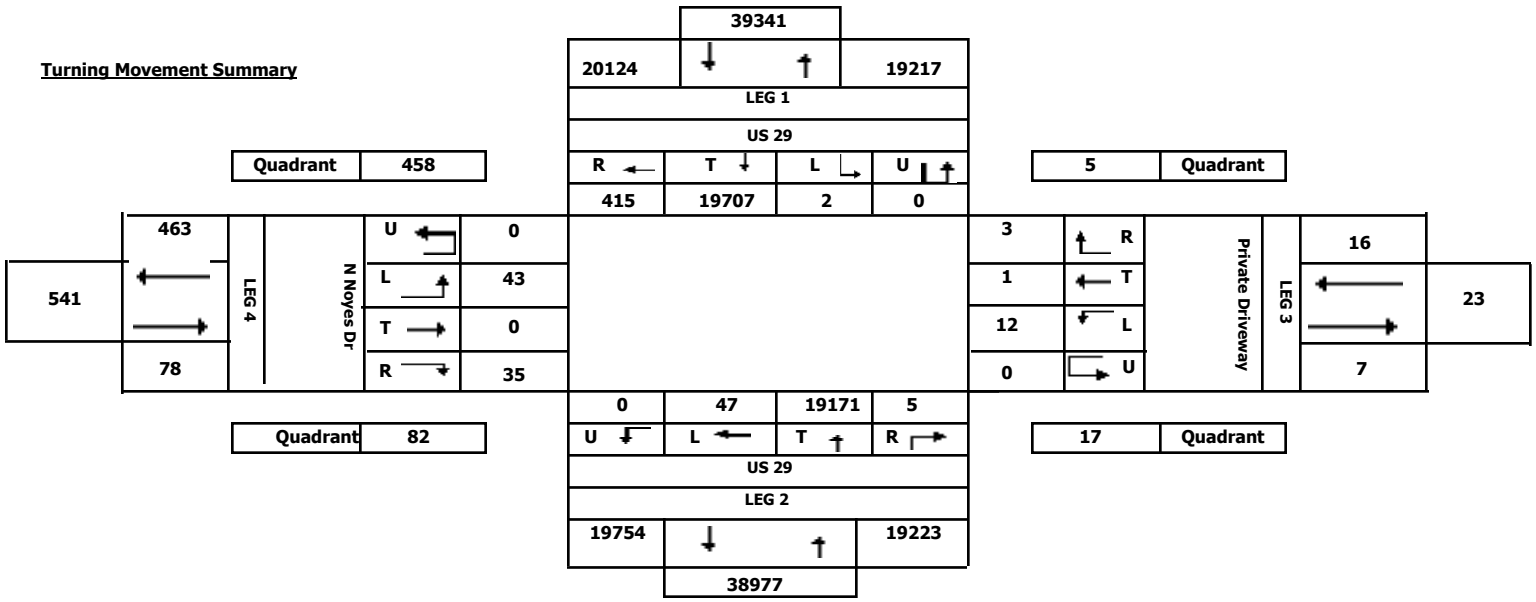
Date: Tuesday 06/07/2011 **Town:** none

Location: US 29 at N. Noyes Dr **Weather:** Sunny/Hot

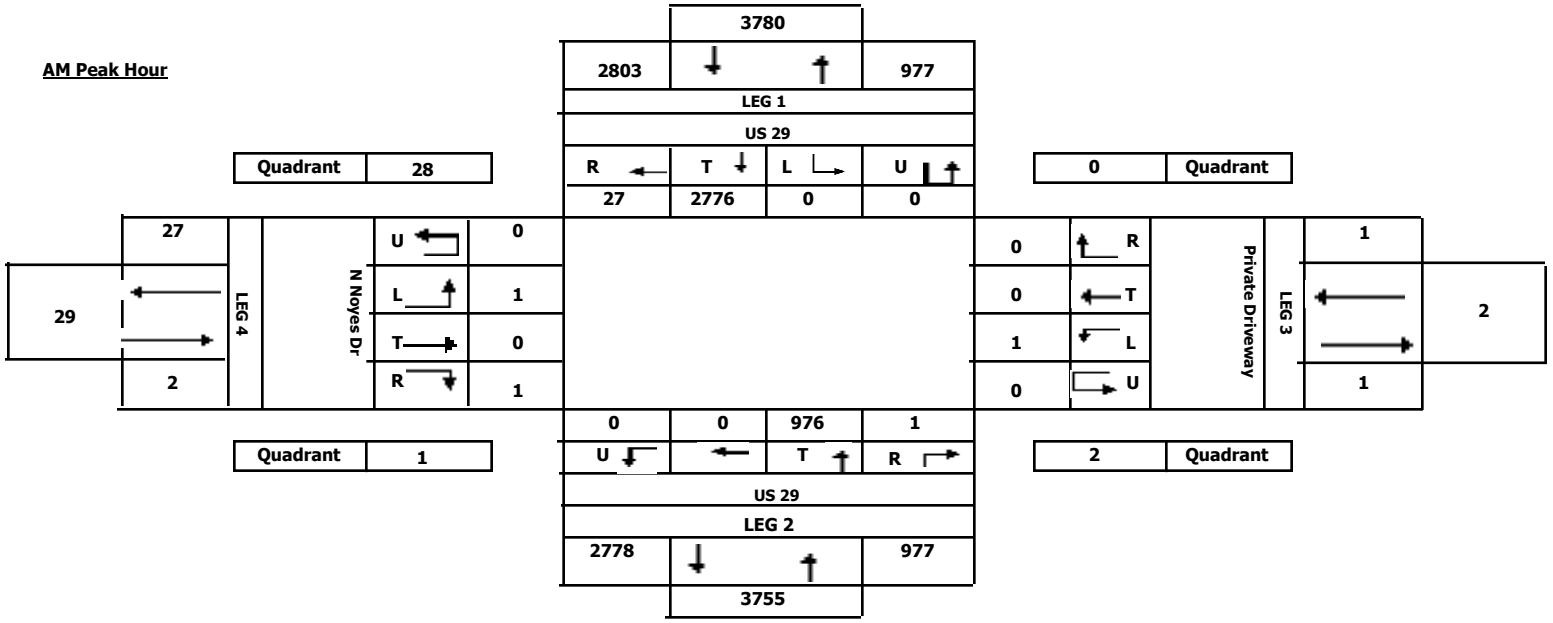
Interval (dd): 15 min

PEAK HOURS	AM PERIOD 6:00AM-12:00PM	Begin	End	Volume	PM PERIOD 12:00PM-19:00PM	Begin	End	Volume
		08:15	09:15	3783		16:30	17:30	4025

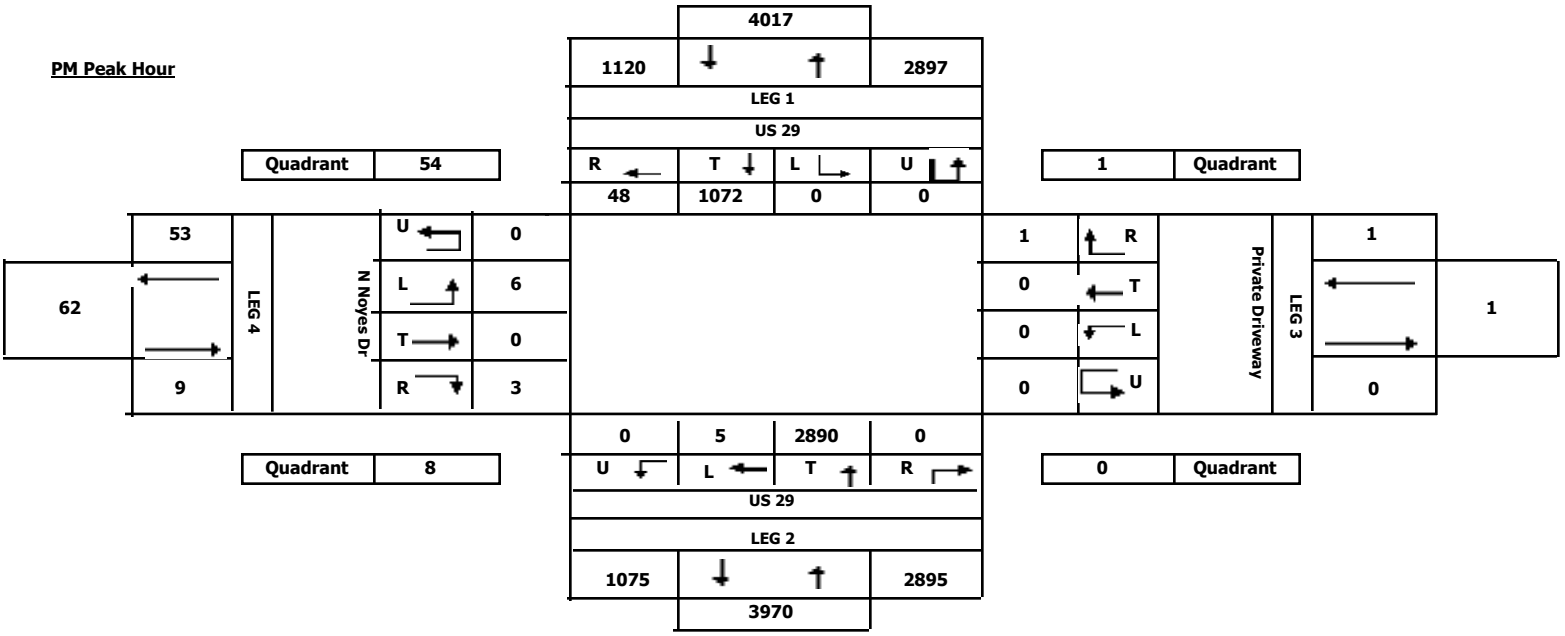
Turning Movement Summary



AM Peak Hour



PM Peak Hour



Appendix B: Signal Timing/Phasing Plans

SIG#0304 Hub-FE

PLAN 1

PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MIN GRN	0	10	0	5	5	10	0	5	0	0	0	0	0	0	0	0
BK MGRN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS MGRN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DLY GRN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WALK	0	7	0	10	0	7	0	10	0	0	0	0	0	0	0	0
WALK2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WLK MAX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PED CLR	0	12	0	16	0	12	0	16	0	0	0	0	0	0	0	0
PD CLR2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PC MAX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PED CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VEH EXT	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VH EXT2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAX1	0	60	0	30	15	60	0	30	0	0	0	0	0	0	0	0
MAX2	0	50	0	50	30	50	0	50	0	0	0	0	0	0	0	0
MAX3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM MAX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM STP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YELLOW	3.0	4.0	3.0	3.5	3.5	4.0	3.0	3.5	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
RED CLR	0.0	2.5	0.0	3.0	4.0	2.5	0.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RED MAX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RED RVT	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
ACT B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SEC/ACT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAX INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TIME B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CARS WT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDUC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTREDUC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MIN GAP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

COORDINATOR PATTERN 1

USE SPLIT PATTERN	1	TIMING PLAN	1
CYCLE	120	SEQUENCE	1
OFFSET VAL	1	ACTION PLAN	0
ACTUATED COORD		VEH PERM 1	0
ACT WALK REST		VEH PERM 2	0
PHASE RESERVICE		VEH PERM 2 - DISP	0
STD (COS)	111	XART PTRN.	0

RING CONFIG

RING	1	2	3	4
SPLT EXT	0	0	0	0

RING	1	2	3	4
SPLIT DEMAND PTRN.	0	0		

RING	1	2	3	4
RING DISP		0	0	0

SIG#0304 Hub-FE

SPLIT PREF PHASES

PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PREF 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PREF 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PHASE MODES

Phase	1	2	3	4	5	6	7	8
COORD		X				X		
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

PHASE MODES

Phase	9	10	11	12	13	14	15	16
COORD								
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

SF OUT

PHASE	1	2	3	4	5	6	7	8
SF OUT								

COORDINATOR PATTERN 2

USE SPLIT PATTERN	2	TIMING PLAN	1
CYCLE	120	SEQUENCE	1
OFFSET VAL	38	ACTION PLAN	0
ACTUATED COORD		VEH PERM 1	0
ACT WALK REST		VEH PERM 2	0
PHASE RESERVICE		VEH PERM 2 - DISP	0
STD (COS)	121	XART PTRN.	0

RING CONFIG

RING	1	2	3	4
SPLT EXT	0	0	0	0

RING	1	2	3	4
SPLIT DEMAND PTRN.	0	0		

RING	1	2	3	4
RING DISP		0	0	0

SPLIT PREF PHASES

PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PREF 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PREF 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PHASE MODES

Phase	1	2	3	4	5	6	7	8
COORD		X				X		
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

PHASE MODES

Phase	9	10	11	12	13	14	15	16
COORD								
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

SF OUT

PHASE	1	2	3	4	5	6	7	8
SF OUT								

COORDINATOR PATTERN 3

USE SPLIT PATTERN	3	OFFSET VAL	52
CYCLE	120	ACTUATED COORD	

NextEdit

SIG#0304 Hub-FE

COORDINATOR PATTERN 3

ACT WALK REST		ACTION PLAN	0
PHASE RESERVICE		VEH PERM 1	0
STD (COS)	131	VEH PERM 2	0
TIMING PLAN	1	VEH PERM 2 - DISP	0
SEQUENCE	1	XART PTRN.	0

RING CONFIG

RING	1	2	3	4
SPLT EXT	0	0	0	0

RING	1	2	3	4
SPLIT DEMAND PTRN.	0	0		

RING	1	2	3	4
RING DISP		0	0	0

SPLIT PREF PHASES

PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PREF 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PREF 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PHASE MODES

Phase	1	2	3	4	5	6	7	8
COORD		X				X		
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

PHASE MODES

Phase	9	10	11	12	13	14	15	16
COORD								
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

SF OUT

PHASE	1	2	3	4	5	6	7	8
SF OUT								

COORDINATOR PATTERN 4

USE SPLIT PATTERN	4	TIMING PLAN	1
CYCLE	120	SEQUENCE	1
OFFSET VAL	38	ACTION PLAN	0
ACTUATED COORD		VEH PERM 1	0
ACT WALK REST		VEH PERM 2	0
PHASE RESERVICE		VEH PERM 2 - DISP	0
STD (COS)	141	XART PTRN.	0

RING CONFIG

RING	1	2	3	4
SPLT EXT	0	0	0	0

RING	1	2	3	4
SPLIT DEMAND PTRN.	0	0		

RING	1	2	3	4
RING DISP		0	0	0

SPLIT PREF PHASES

PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PREF 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PREF 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

SIG#0304 Hub-FE

PHASE MODES

Phase	1	2	3	4	5	6	7	8
COORD		X				X		
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

PHASE MODES

Phase	9	10	11	12	13	14	15	16
COORD								
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

SF OUT

PHASE	1	2	3	4	5	6	7	8
SF OUT								

COORDINATOR PATTERN 5

USE SPLIT PATTERN	5
CYCLE	0
OFFSET VAL	0
ACTUATED COORD	
ACT WALK REST	
PHASE RESERVICE	
STD (COS)	151

TIMING PLAN	1
SEQUENCE	1
ACTION PLAN	0
VEH PERM 1	0
VEH PERM 2	0
VEH PERM 2 - DISP	0
XART PTRN.	0

RING CONFIG

RING	1	2	3	4
SPLT EXT	0	0	0	0

RING	1	2	3	4
SPLIT DEMAND PTRN.	0	0		

RING	1	2	3	4
RING DISP		0	0	0

SPLIT PREF PHASES

PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PREF 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PREF 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PHASE MODES

Phase	1	2	3	4	5	6	7	8
COORD		X				X		
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

PHASE MODES

Phase	9	10	11	12	13	14	15	16
COORD								
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

SF OUT

PHASE	1	2	3	4	5	6	7	8
SF OUT								

COORDINATOR PATTERN 6

USE SPLIT PATTERN	6
CYCLE	0
OFFSET VAL	0
ACTUATED COORD	
ACT WALK REST	
PHASE RESERVICE	
STD (COS)	112

TIMING PLAN	1
SEQUENCE	1
ACTION PLAN	0
VEH PERM 1	0
VEH PERM 2	0
VEH PERM 2 - DISP	0
XART PTRN.	0

SIG#0304 Hub-FE

RING CONFIG

RING	1	2	3	4
SPLT EXT	0	27	0	0

RING	1	2	3	4
SPLIT DEMAND PTRN.	0	0		

RING	1	2	3	4
RING DISP		0	0	0

SPLIT PREF PHASES

PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PREF 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PREF 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PHASE MODES

Phase	1	2	3	4	5	6	7	8
COORD		X				X		
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

PHASE MODES

Phase	9	10	11	12	13	14	15	16
COORD								
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

SF OUT

PHASE	1	2	3	4	5	6	7	8
SF OUT								

Split 1

PHASE	1	2	3	4	5	6	7	8
SPLIT	0	86	0	34	20	66	0	34
COORD		X				X		
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

Split 1

PHASE	9	10	11	12	13	14	15	16
SPLIT	0	0	0	0	0	0	0	0
COORD								
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

Split 2

PHASE	1	2	3	4	5	6	7	8
SPLIT	0	76	0	44	22	54	0	44
COORD		X				X		
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

Split 2

PHASE	9	10	11	12	13	14	15	16
SPLIT	0	0	0	0	0	0	0	0
COORD								
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

Split 3

PHASE	1	2	3	4	5	6	7	8
SPLIT	0	86	0	34	13	73	0	34

PHASE	1	2	3	4	5	6	7	8
COORD		X				X		

Split 3

PHASE	1	2	3	4	5	6	7	8
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

Split 3

PHASE	9	10	11	12	13	14	15	16
SPLIT	0	0	0	0	0	0	0	0
COORD								
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

Split 4

PHASE	1	2	3	4	5	6	7	8
SPLIT	0	76	0	44	22	54	0	44
COORD		X				X		
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

Split 4

PHASE	9	10	11	12	13	14	15	16
SPLIT	0	0	0	0	0	0	0	0
COORD								
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

Split 5

PHASE	1	2	3	4	5	6	7	8
SPLIT	0	0	0	0	0	0	0	0
COORD		X				X		
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

Split 5

PHASE	9	10	11	12	13	14	15	16
SPLIT	0	0	0	0	0	0	0	0
COORD								
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

Split 6

PHASE	1	2	3	4	5	6	7	8
SPLIT	0	0	0	0	0	0	0	0
COORD		X				X		
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

Split 6

PHASE	9	10	11	12	13	14	15	16
SPLIT	0	0	0	0	0	0	0	0
COORD								
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

SIG#0303 Hub-FE

PLAN 1

PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MIN GRN	0	10	10	10	5	10	0	0	0	0	0	0	0	0	0	0
BK MGRN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CS MGRN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DLY GRN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WALK	0	7	7	0	0	7	0	0	0	0	0	0	0	0	0	0
WALK2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
WLK MAX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PED CLR	0	18	15	0	0	18	0	0	0	0	0	0	0	0	0	0
PD CLR2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PC MAX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PED CO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VEH EXT	0.0	0.0	3.0	3.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VH EXT2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAX1	0	60	30	30	30	60	0	0	0	0	0	0	0	0	0	0
MAX2	0	60	45	45	45	60	0	0	0	0	0	0	0	0	0	0
MAX3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM MAX	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DYM STP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
YELLOW	3.0	4.0	3.0	3.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
RED CLR	0.0	2.5	3.5	3.0	2.0	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RED MAX	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
RED RVT	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
ACT B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SEC/ACT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MAX INT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TIME B4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CARS WT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
STPTDUC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TTREDUC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MIN GAP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

COORDINATOR PATTERN 1

USE SPLIT PATTERN	1	TIMING PLAN	1
CYCLE	120	SEQUENCE	1
OFFSET VAL	119	ACTION PLAN	0
ACTUATED COORD		VEH PERM 1	0
ACT WALK REST		VEH PERM 2	0
PHASE RESERVICE		VEH PERM 2 - DISP	0
STD (COS)	111	XART PTRN.	0

RING CONFIG

RING	1	2	3	4
SPLT EXT	0	0	0	0

RING	1	2	3	4
SPLIT DEMAND PTRN.	0	0		

RING	1	2	3	4
RING DISP		0	0	0

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SPLIT PREF PHASES

PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PREF 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PREF 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PHASE MODES

Phase	1	2	3	4	5	6	7	8
COORD		X				X		
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

PHASE MODES

Phase	9	10	11	12	13	14	15	16
COORD								
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

SF OUT

PHASE	1	2	3	4	5	6	7	8
SF OUT								

COORDINATOR PATTERN 2

USE SPLIT PATTERN	2
CYCLE	120
OFFSET VAL	50
ACTUATED COORD	
ACT WALK REST	
PHASE RESERVICE	
STD (COS)	121

TIMING PLAN	1
SEQUENCE	1
ACTION PLAN	0
VEH PERM 1	0
VEH PERM 2	0
VEH PERM 2 - DISP	0
XART PTRN.	0

RING CONFIG

RING	1	2	3	4
SPLT EXT	0	0	0	0

RING	1	2	3	4
SPLIT DEMAND PTRN.	0	0		

RING	1	2	3	4
RING DISP		0	0	0

SPLIT PREF PHASES

PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PREF 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PREF 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PHASE MODES

Phase	1	2	3	4	5	6	7	8
COORD		X				X		
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

PHASE MODES

Phase	9	10	11	12	13	14	15	16
COORD								
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

SF OUT

PHASE	1	2	3	4	5	6	7	8
SF OUT								

COORDINATOR PATTERN 3

USE SPLIT PATTERN	3
CYCLE	120

OFFSET VAL	65
ACTUATED COORD	

NextEdit

COORDINATOR PATTERN 3

ACT WALK REST		ACTION PLAN	0
PHASE RESERVICE		VEH PERM 1	0
STD (COS)	131	VEH PERM 2	0
TIMING PLAN	1	VEH PERM 2 - DISP	0
SEQUENCE	1	XART PTRN.	0

RING CONFIG

RING	1	2	3	4
SPLT EXT	0	0	0	0

RING	1	2	3	4
SPLIT DEMAND PTRN.	0	0		

RING	1	2	3	4
RING DISP		0	0	0

SPLIT PREF PHASES

PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PREF 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PREF 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PHASE MODES

Phase	1	2	3	4	5	6	7	8
COORD		X				X		
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

PHASE MODES

Phase	9	10	11	12	13	14	15	16
COORD								
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

SF OUT

PHASE	1	2	3	4	5	6	7	8
SF OUT								

COORDINATOR PATTERN 4

USE SPLIT PATTERN	4	TIMING PLAN	1
CYCLE	120	SEQUENCE	1
OFFSET VAL	50	ACTION PLAN	0
ACTUATED COORD		VEH PERM 1	0
ACT WALK REST		VEH PERM 2	0
PHASE RESERVICE		VEH PERM 2 - DISP	0
STD (COS)	141	XART PTRN.	0

RING CONFIG

RING	1	2	3	4
SPLT EXT	0	0	0	0

RING	1	2	3	4
SPLIT DEMAND PTRN.	0	0		

RING	1	2	3	4
RING DISP		0	0	0

SPLIT PREF PHASES

PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PREF 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PREF 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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PHASE MODES

Phase	1	2	3	4	5	6	7	8
COORD		X				X		
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

PHASE MODES

Phase	9	10	11	12	13	14	15	16
COORD								
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

SF OUT

PHASE	1	2	3	4	5	6	7	8
SF OUT								

COORDINATOR PATTERN 5

USE SPLIT PATTERN	5
CYCLE	0
OFFSET VAL	0
ACTUATED COORD	
ACT WALK REST	
PHASE RESERVICE	
STD (COS)	151

TIMING PLAN	1
SEQUENCE	1
ACTION PLAN	0
VEH PERM 1	0
VEH PERM 2	0
VEH PERM 2 - DISP	0
XART PTRN.	0

RING CONFIG

RING	1	2	3	4
SPLT EXT	0	0	0	0

RING	1	2	3	4
SPLIT DEMAND PTRN.	0	0		

RING	1	2	3	4
RING DISP		0	0	0

SPLIT PREF PHASES

PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PREF 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PREF 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PHASE MODES

Phase	1	2	3	4	5	6	7	8
COORD		X				X		
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

PHASE MODES

Phase	9	10	11	12	13	14	15	16
COORD								
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

SF OUT

PHASE	1	2	3	4	5	6	7	8
SF OUT								

COORDINATOR PATTERN 6

USE SPLIT PATTERN	6
CYCLE	0
OFFSET VAL	0
ACTUATED COORD	
ACT WALK REST	
PHASE RESERVICE	
STD (COS)	112

TIMING PLAN	1
SEQUENCE	1
ACTION PLAN	0
VEH PERM 1	0
VEH PERM 2	0
VEH PERM 2 - DISP	0
XART PTRN.	0

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RING CONFIG

RING	1	2	3	4
SPLT EXT	0	27	0	0

RING	1	2	3	4
SPLIT DEMAND PTRN.	0	0		

RING	1	2	3	4
RING DISP		0	0	0

SPLIT PREF PHASES

PHASE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PREF 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PREF 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PHASE MODES

Phase	1	2	3	4	5	6	7	8
COORD		X				X		
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

PHASE MODES

Phase	9	10	11	12	13	14	15	16
COORD								
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

SF OUT

PHASE	1	2	3	4	5	6	7	8
SF OUT								

Split 1

PHASE	1	2	3	4	5	6	7	8
SPLIT	0	73	29	18	15	58	0	0
COORD		X				X		
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

Split 1

PHASE	9	10	11	12	13	14	15	16
SPLIT	0	0	0	0	0	0	0	0
COORD								
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

Split 2

PHASE	1	2	3	4	5	6	7	8
SPLIT	0	66	32	22	17	49	0	0
COORD		X				X		
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

Split 2

PHASE	9	10	11	12	13	14	15	16
SPLIT	0	0	0	0	0	0	0	0
COORD								
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

Split 3

PHASE	1	2	3	4	5	6	7	8
SPLIT	0	59	41	20	12	47	0	0

PHASE	1	2	3	4	5	6	7	8
COORD		X				X		

Split 3

PHASE	1	2	3	4	5	6	7	8
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

Split 3

PHASE	9	10	11	12	13	14	15	16
SPLIT	0	0	0	0	0	0	0	0
COORD								
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

Split 4

PHASE	1	2	3	4	5	6	7	8
SPLIT	0	66	32	22	17	49	0	0
COORD		X				X		
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

Split 4

PHASE	9	10	11	12	13	14	15	16
SPLIT	0	0	0	0	0	0	0	0
COORD								
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

Split 5

PHASE	1	2	3	4	5	6	7	8
SPLIT	0	0	0	0	0	0	0	0
COORD		X				X		
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

Split 5

PHASE	9	10	11	12	13	14	15	16
SPLIT	0	0	0	0	0	0	0	0
COORD								
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

Split 6

PHASE	1	2	3	4	5	6	7	8
SPLIT	0	0	0	0	0	0	0	0
COORD		X				X		
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE

Split 6

PHASE	9	10	11	12	13	14	15	16
SPLIT	0	0	0	0	0	0	0	0
COORD								
PHASE MODE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE