DelDOT
Delaware Department of Transportation

SR 2 KIRKWOOD HIGHWAY

PEDESTRIAN SAFETY STUDY

FINAL REPORT

JANUARY 2015

WHITMAN, REQUARDT & ASSOCIATES, LLP
ENGINEERS · ARCHITECTS · PLANNERS
EST. 1915

EXECUTIVE SUMMARY

During 2012, an unusually high number of fatal and incapacitating injury pedestrian crashes occurred in the State of Delaware. In 2012, 30 pedestrian fatalities were reported compared to a previous 5-year average (2007 to 2011) of 19 pedestrian fatalities per year. Additionally, 25 pedestrian fatalities were reported on Delaware roadways in 2013. In response to this increase in serious pedestrian crashes, the Delaware Department of Transportation (DelDOT) formed the Pedestrian/Bicycle Safety Working Group comprised of various highway safety stakeholders with the goal of identifying, evaluating, and implementing pedestrian/bicycle related safety improvements throughout the state and along several corridors exhibiting higher than average pedestrian crash rates. Additionally, the goal of *Delaware's 2010 Strategic Highway Safety Plan* and the Pedestrian/Bicycle Safety Working Group for the emphasis area focused on pedestrian safety is to reduce the number of fatal crashes involving pedestrians by five percent every three years.

One of the corridors identified as exhibiting a higher than average pedestrian crash rate is SR 2 (Kirkwood Highway) from St. James Church Road/Griffin Drive to SR 141 in New Castle County (see **Figure 1**). The purpose of this study is to conduct a pedestrian safety audit along this corridor. This report provides a description of historical crash trends, existing physical conditions, pedestrian activity, vehicular traffic trends, and traffic control devices. It assesses the need and impacts associated with pedestrian safety improvements within the study corridor.

Pedestrian and bicycle crashes that occurred within the study limits during an 8-year study period from 2005 to 2012 were reviewed. A total of 28 pedestrian crashes and 8 bicycle crashes were reported during the study period, including two fatal pedestrian crashes, 22 injury pedestrian crashes, and 7 injury bicycle crashes (no fatal bicycle crashes were reported). Additionally, two fatal pedestrian crashes occurred in 2013, following the study period. Pedestrian and bicycle crash trends are summarized in the report.

Pedestrian observations and counts were performed in September/October 2013. Following the pedestrian counts, members of Delaware's Pedestrian/Bicycle Safety Working Group participated in a bus/walking tour of the study corridor to discuss key areas in need of improvements and/or further study. The key discussion points were presented and discussed at a follow-up meeting of the Pedestrian/Bicycle Safety Working Group in January 2014. The results of these discussions focused further evaluation and assessment of pedestrian and bicycle accommodations throughout the study corridor that are summarized in the report.

Recommendations are presented as short-term, mid-term, and long-term improvements and are prioritized based on pedestrian crash history, pedestrian frequency, and transit ridership. Recommendations include installing additional signalized crosswalks, installing pedestrian warning signs, performing public outreach, repairing and/or installing sidewalk, replacing pushbutton signs, and installing lighting. In addition, consolidating access points along the corridor and installing ADA-compliant curb ramps should be considered as part of future projects.

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INTRODUCTION

During 2012, an unusually high number of fatal and incapacitating injury pedestrian crashes occurred in the State of Delaware. In 2012, 30 pedestrian fatalities were reported compared to a previous 5-year average (2007 to 2011) of 19 pedestrian fatalities per year. Additionally, 25 pedestrian fatalities were reported on Delaware roadways in 2013. In response to this increase in serious pedestrian crashes, the Delaware Department of Transportation (DelDOT) formed the Pedestrian/Bicycle Safety Working Group comprised of various highway safety stakeholders (i.e., DelDOT, WILMAPCO, Delaware Office of Highway Safety, Dover/Kent MPO, Delaware State Police (DSP), University of Delaware, City of Wilmington, Bike Delaware, FHWA, City of Newark, Division of Alcohol and Tobacco Enforcement, Beebee Medical Center, and DART/DTC) with the goal of identifying, evaluating, and implementing pedestrian/bicycle related safety improvements throughout the state and along several corridors exhibiting higher than average pedestrian crash rates. Additionally, the goal of *Delaware's 2010 Strategic Highway Safety Plan* and the Pedestrian/Bicycle Safety Working Group for the emphasis area focused on pedestrian safety is to reduce the number of fatal crashes involving pedestrians by five percent every three years.

One of the corridors identified as exhibiting a higher than average pedestrian crash rate is SR 2 (Kirkwood Highway) from St. James Church Road/Griffin Drive to SR 141 in New Castle County (see **Figure 1**). The purpose of this study is to conduct a pedestrian safety audit along this corridor. The SR 2 corridor serves as a major east/west route extending from the Maryland State Line into the City of Wilmington. In addition to serving a high volume of vehicular traffic, numerous pedestrian generators, including primarily commercial properties, are located along the corridor. This report provides a description of historical crash trends, existing physical conditions, pedestrian activity, vehicular traffic trends, and traffic control devices. It assesses the need and impacts associated with pedestrian safety improvements within the study corridor.

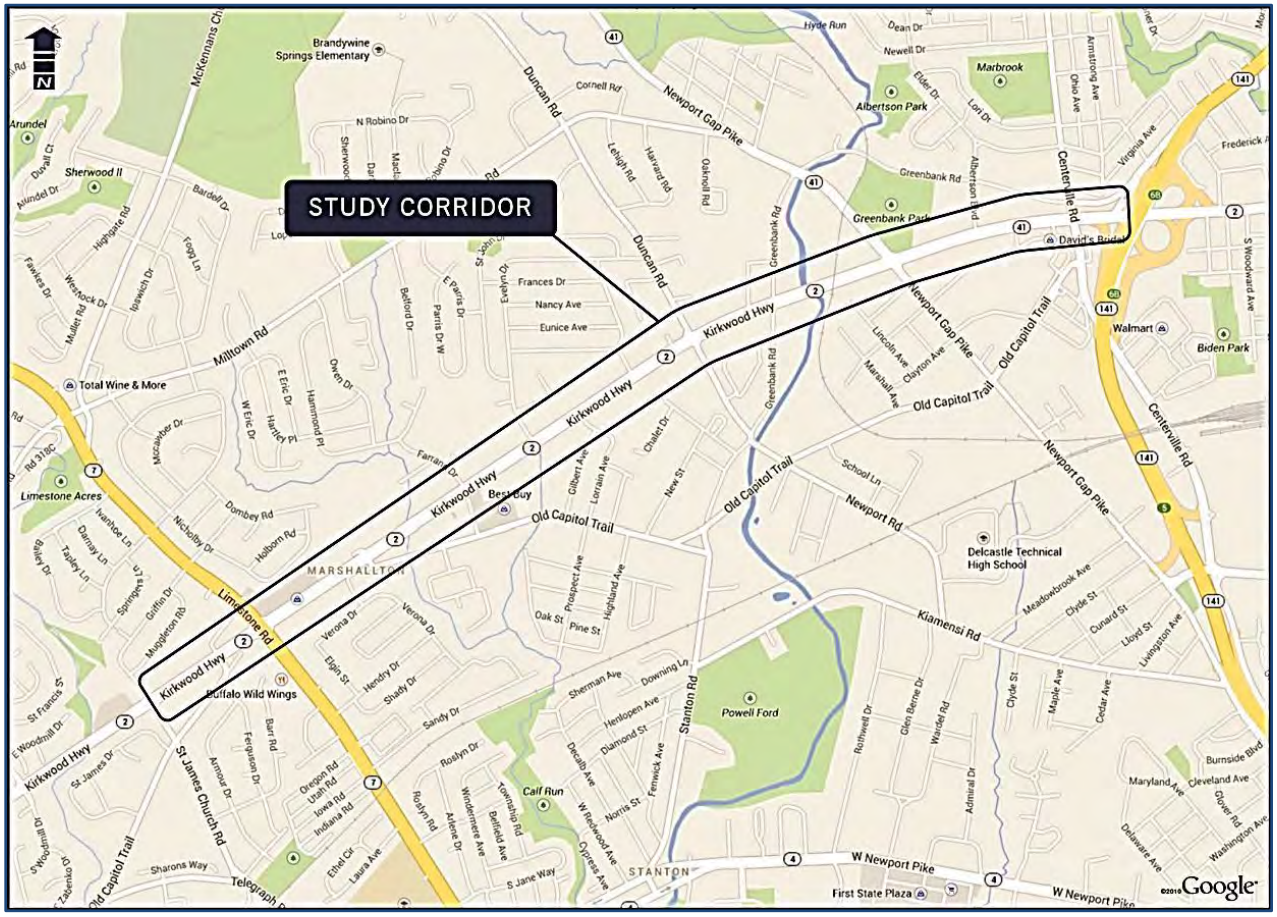
Relevant Projects

SR 2 from Greenbank Road to SR 41 was identified as a "Top Priority Pedestrian Segment" (based on measures such as surrounding population and employment density, pedestrian crash rate, and proximity to shops, libraries, and community centers) in WILMAPCO's *Top Pedestrian Priority Segments (January 2012)* report. The study used WILMAPCO's Prioritized Pedestrian Network (PPN) indexing system which includes the following 13 criteria: bus stop, commercial property, community center, greenway, hometown overlay zone, library, municipality, park, safety improvement target, school, significant "Environmental Justice" neighborhood, significant "Transportation Justice" neighborhood, and traffic analysis zone density. SR 2 from Greenbank Road to SR 41 received a PPN score of 11 and ranked tenth of 20 top priority segments. The report recommended installing ADA improvements and marked crosswalks at the SR 2 at Greenbank Road and SR 2 at SR 41 intersections and installing a landscaped refuge area and sidewalk buffers along SR 2 between Greenbank Road and SR 41.

As part of DelDOT's Hazard Elimination Program, several intersections within the study area have been identified and studied including SR 2 at SR 7 (2007 Site R), SR 2 at Farrand Drive (2013 Site F), SR 2 at Duncan Road (2009 Site G), and SR 2 at SR 41 (2010 Site H).

In addition, left-turn phasing was evaluated along the SR 2 corridor in 2007/2008. As a result, protected-only left-turn phasing was installed on the eastbound and westbound SR 2 approaches to Duncan Road and Albertson Boulevard in January and March 2009, respectively. Furthermore, installing protected-only left-turn phasing on the eastbound SR 2 approach to Kirkwood Plaza has been recommended as part of DelDOT's Flashing Red Arrow (FRA) program.

Figure 1 – Study Location Map



Signal timing improvements, including adjustments to cycle lengths, splits, and offsets, were implemented in spring 2014 along SR 2 within the study corridor to reduce congestion and delays.

In response to numerous requests, bicycle warning signs were installed in winter 2014 along eastbound and westbound SR 2 in the vicinity of the SR 141 interchange.

SR 2 from SR 7 to Elsmere was resurfaced as part of the Pavement and Rehabilitation program in 2012. Additionally, resurfacing SR 2 from Cleveland Avenue to SR 7 is scheduled for construction in fall 2014 (NTP issued August 26, 2014). As part of the resurfacing project, ADA improvements will be installed at SR 2 at St. James Church Road/Griffin Drive and a crosswalk will be provided on the south leg of the intersection. Countdown pedestrian signals will also be installed.

A Royal Farms was constructed on the northwest corner of SR 2 at Duncan Road (the store opened in May 2014). As part of the development, sidewalk was installed along the west side of Duncan Road from SR 2 to approximately 350 feet north of SR 2 and along the north side of SR 2 from Duncan Road to approximately 220 feet west of Duncan Road. Driveways for the Royal Farms are provided along Duncan Road approximately 350 feet north of SR 2 (full access; a northbound left-turn lane is provided) and along westbound SR 2 approximately 200 feet west of Duncan Road (right-in/right-out access only).

Construction of the Mill Creek Fire Company Number 1, Station 21 fire station located along the south side of SR 2 east of Woodhaven Drive was completed in 2013/2014.

Portable changeable message signs (PCMS) were placed along SR 2 in March/April 2014 along the study corridor with messages to warn motorists and pedestrians of the historically high pedestrian crash locations. Furthermore, Delaware State Police conducted a two-week pedestrian safety enforcement campaign along the study corridor in early April 2014 as part of their "Drive to Save Lives" campaign. The enforcement and education campaign discouraged pedestrian crossings at areas other than marked crosswalks, walking within the roadway when a sidewalk is available, and walking along a roadway at night without a light or reflective device. During the campaign, DSP issued warnings for not crossing at a crosswalk to 59 pedestrians, arrested 6 persons for dangerous moving violations, arrested 4 persons related to cell phone usage violations, arrested 5 persons for seatbelt violations, and arrested 24 persons for various traffic violations.

Additionally, Delaware OHS in conjunction with DelDOT and DSP conducted a pedestrian crash demonstration on April 29, 2014 showing the "life or death" need for slowing down on Old Capital Trail west of Farrand Drive. The demonstration showed how a pedestrian in the path of a vehicle may be unharmed (i.e., a vehicle is able to stop before striking the pedestrian) by a vehicle traveling at 25 mph, but may sustain life-threatening injuries when struck by a vehicle traveling at 35 mph. Reverse 911 calls and press releases were issued to residents adjacent to SR 2 and Old Capital Trail.

EXISTING CONDITIONS

Site Description

SR 2 is classified as an urban principal arterial, serving as a major east/west route extending from the City of Newark into the City of Wilmington and is included as part of the National Highway System. SR 2 from St. James Church Road/Griffin Drive to SR 141 is a six-lane, divided roadway with variable shoulder widths. Typically, the travel lanes along SR 2 are 12 feet wide. Sidewalk is generally provided along both sides of SR 2 within the study limits. Within the study limits, the posted speed limit is 45 miles per hour west of Albertson Boulevard and 40 miles per hour east of Albertson Boulevard. According to *DelDOT's 2012 Traffic Summary*, the ADT along SR 2 ranges from approximately 20,000 west of SR 7 to approximately 48,000 east of SR 7. The corridor is approximately 2.75 miles long and includes 8 signalized intersections, 7 unsignalized intersections, and numerous business driveways within the study limits. Median openings are provided at all signalized intersections and at Woodhaven Drive and Greenbank Road. Additionally, emergency-use only median openings are provided at the Cranston Heights Fire Company and Mill Creek Fire Company. Adjacent land uses along the corridor are predominately commercial except in the vicinity of the SR 141 interchange and the bridge over Red Clay Creek located between Greenbank Road and SR 41. Additionally, many residential properties are located within walking distance along the side street approaches to SR 2 within the study limits. Anna P. Mote Elementary School (2110 Edwards Avenue) is located along Edwards Avenue (north of SR 2).

Existing condition figures for the SR 2 corridor from St. James Church Road/Griffin Drive to SR 141 are shown in **Figures 2-1 to 2-12.** The following information is included in the existing condition figures. In addition, further discussion of existing conditions is provided below. It is important to note that the lighting locations shown in the figures include only roadway lighting provided along SR 2 (i.e., ambient lighting due to adjacent properties is not shown on the figures).

- Existing signalized intersections
- Existing bus stops and shelter locations with available ridership information from DTC
- Existing luminaire locations
- Existing sidewalk

- Pedestrian and bicycle crash locations and characteristics
- September/October 2013 pedestrian count data
- Adjacent land uses

Signalized Intersections

The eight signalized intersections along SR 2 within the study corridor operate as part of coordinated signal system along SR 2. The system operates with a 150-second cycle length during both the AM and PM peak hours. At least one push-button activated pedestrian crossing is provided across SR 2 at each fully signalized intersection at SR 2 at St. James Church Road/Griffin Drive, SR 7, Farrand Drive, Duncan Road, SR 41, and Albertson Boulevard (pedestrian crossings across SR 2 are not provided at the two half-signals at Prices Corner and Kirkwood Plaza). Additionally, countdown pedestrian signals are provided at all intersections except for SR 2 at St. James Church Road/Griffin Drive.

SR 2 at St. James Church Road/Griffin Drive: SR 2 at St. James Church Road/Griffin Drive operates with protected-only left-turn phasing on the eastbound and westbound SR 2 approaches and split phasing on the northbound St. James Church Road and southbound Griffin Drive approaches. The eastbound and westbound approaches include a left-turn lane, two through lanes, and a shared through/right-turn lane. The northbound and southbound approaches include a left-turn lane, shared left-turn/through lane, and a channelized right-turn lane. YIELD (R1-2) signs and acceleration lanes are provided for the northbound St. James Church Road and southbound Griffin Drive right-turning movements onto SR 2 (both acceleration lanes are non-compliant based AASHTO acceleration lane length criteria; however, both acceleration lanes are planned to be removed as part of the SR 2 Pavement and Rehabilitation project (T201206110)). Westbound SR 2 is reduced from three to two lanes west of St. James Church Road/Griffin Drive. Pedestrian signals and crosswalks are provided across the east and north legs of the intersection.

SR 2 at SR 7: SR 2 at SR 7 operates with protected-only left-turn phasing on all four approaches. The eastbound and westbound SR 2 approaches include two left-turn lanes, three through lanes, and a channelized right-turn lane. The northbound and southbound SR 7 approaches include two left-turn lanes, two through lanes, and channelized right-turn lanes. YIELD (R1-2) signs are posted for the northbound, southbound, and eastbound right-turning movements at SR 2 at SR 7. An acceleration/deceleration auxiliary lane is provided along northbound SR 7 between SR 2 and the Mill Creek Shopping Center driveway located approximately 325 feet north of SR 2. Red light enforcement cameras were installed in May 2005 to monitor northbound through, southbound through, and westbound left turns at the intersection. Pedestrian signals and crosswalks are provided across all four legs of the intersection.

SR 2 at Kirkwood Plaza: SR 2 at Kirkwood Plaza operates as a "half signal", providing protected-permissive phasing (with flashing red arrow indications) for eastbound SR 2 left turns into Kirkwood Plaza. Eastbound through traffic does not stop; however, 3-section signal heads are provided for this movement (green through arrow indications are displayed continuously). The northbound and southbound approaches operate under stop control. Right-in/right-out operations are accommodated on the south leg of the intersection and right-in/left-in/right-out operations are accommodated on the north leg of the intersection. The eastbound approach includes a left-turn lane, three through lanes, and a channelized right-turn lane. The westbound approach includes three through lanes and a channelized right-turn lane. The northbound Old Capitol Trail and southbound Kirkwood Plaza approaches include a channelized right-turn lane. A STOP (R1-1) sign is posted for northbound and southbound right turns. An acceleration lane is provided for southbound Kirkwood Plaza right turns onto westbound SR 2 (the acceleration lane length does not meet AASHTO acceleration lane length criteria). Pedestrian signals and crosswalk are provided across the north leg of the intersection and an unsignalized crosswalk is provided across the south leg of the intersection.

SR 2 at Farrand Drive: SR 2 at Farrand Drive operates with protected-only left-turn phasing on the eastbound and westbound SR 2 approaches and split phasing on the northbound and southbound Farrand Drive approaches. The eastbound and westbound approaches include a left-turn lane, three through lanes, and a channelized right-turn lane. The northbound and southbound approaches include a left-turn lane, shared left-turn/through lane, and a channelized right-turn lane. Acceleration lanes are provided for northbound and southbound right turns onto SR 2 (both acceleration lane lengths do not meet AASHTO acceleration lane length criteria). YIELD (R1-2) signs are posted for all four right-turning movements at the intersection. Pedestrian signals and crosswalks are provided across the east, south, and north legs of the intersection.

SR 2 at Duncan Road: SR 2 at Duncan Road operates with protected-only left-turn phasing on the eastbound and westbound SR 2 approaches and split phasing on the northbound and southbound Duncan Road approaches. The eastbound and westbound approaches include a left-turn lane, two through lanes, and a shared through/right-turn lane. The northbound and southbound approaches include a shared left-turn/through lane and a channelized right-turn lane. Short acceleration lanes (both acceleration lane lengths do not meet AASHTO acceleration lane length criteria) and YIELD (R1-2) signs are provided for northbound and southbound right turns onto SR 2. Pedestrian signals and crosswalks are provided across the east and south legs of the intersection.

SR 2 at SR 41: SR 2 at SR 41 operates with protected-only left-turn phasing on the eastbound and westbound SR 2 approaches and split phasing on the northbound and southbound SR 41 approaches. The eastbound and westbound approaches include a left-turn lane, three through lanes, and a channelized right-turn lane. The northbound approach includes a left-turn lane, shared left-turn/through lane, and a channelized right-turn lane. The southbound approach includes two left-turn lanes, a through lane, and a channelized right-turn lane. An acceleration lane is provided for westbound SR 2 right turns onto northbound SR 41 and an acceleration/deceleration auxiliary lane is provided along southbound SR 41 between SR 2 and Roselawn Avenue (both acceleration lanes meet AASHTO acceleration lane length criteria). Red light cameras were installed in June 2005 to monitor the eastbound, northbound, and southbound through movements and the northbound and southbound left-turning movements at the intersection. YIELD (R1-2) signs are posted for all four right-turning movements at the intersection. Pedestrian signals and crosswalks are provided across the west, south, and north legs of the intersection.

SR 2 at Albertson Boulevard/Prices Corner driveway (west): SR 2 at Albertson Boulevard operates with protected-only left-turn phasing on the eastbound SR 2 approach (the south leg of the intersection serves outbound/northbound movements only). The northbound through and left-turn movements operate as a lead phase followed by concurrent protected-only left-turn phasing on the northbound and southbound approaches. The eastbound approach includes a left-turn lane and three through lanes. The westbound approach includes three through lanes and a right-turn lane. The northbound approach includes two left-turn lanes, a through lane, and a channelized right-turn lane. The southbound approach includes a left-turn lane and a left-turn/channelized right-turn lane. YIELD (R1-2) signs are posted for northbound and southbound right turns. Pedestrian signals and crosswalks are provided across the east and north legs of the intersection.

SR 2 at Prices Corner driveway (east): SR 2 at the Prices Corner entrance operates as a "half-signal" with protected-only left-turn phasing on the westbound SR 2 approach. Westbound through traffic does not stop; however, single signal heads are provided for this movement (green through arrow indications are displayed continuously). The eastbound SR 2 approach includes three through lanes and a channelized right-turn lane. The westbound SR 2 approach includes a left-turn lane and three through lanes. The south leg of the intersection includes a receiving lane for eastbound right-turning vehicles, two receiving lanes for westbound left-turning vehicles, and a channelized northbound right-turn lane. Pedestrian signals and a crosswalk are provided across the south leg of the intersection.

October 2014

Existing Conditions
SR 2

St. James Church Rd
to
SR 141

- Traffic Signal
- Existing Bus Stop
- Bus Board/Alight
- Existing Luminaire
- Existing Sidewalk
- Pedestrian Non-Injury Crash
- Bicycle Non-Injury Crash
- Pedestrian Injury Crash
- Bicycle Injury Crash
- Pedestrian Fatal Crash
- Bicycle Fatal Crash
- Dark Nighttime Crash
- Average Hourly Ped Volume (highest of 3 peaks)

Crash study period - January 2005 through December 2012

0 50 100 150 200 Feet

Figure 2-1

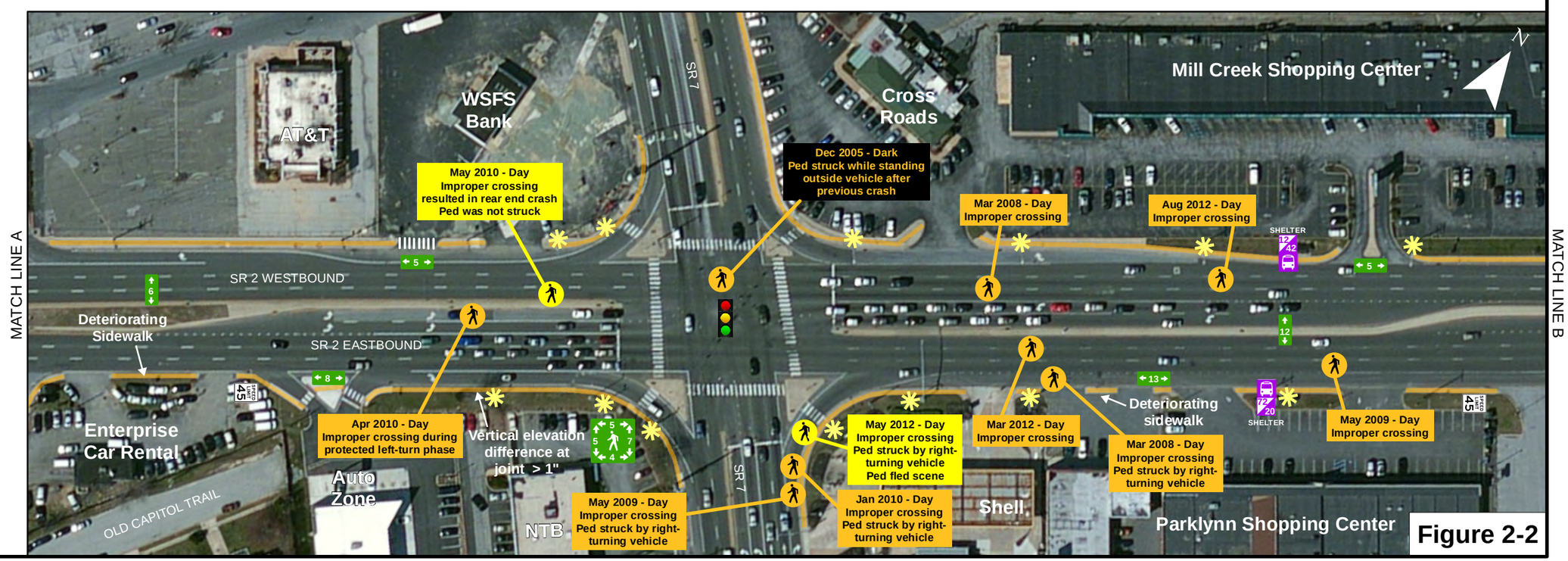


Figure 2-2

October 2014

Existing Conditions
SR 2

St. James Church Rd
to
SR 141

- Traffic Signal
- Existing Bus Stop
- Bus Board/Alight
- Existing Luminaire
- Existing Sidewalk
- Pedestrian Non-Injury Crash
- Bicycle Non-Injury Crash
- Pedestrian Injury Crash
- Bicycle Injury Crash
- Pedestrian Fatal Crash
- Bicycle Fatal Crash
- Dark — Nighttime Crash
- Average Hourly Ped Volume (highest of 3 peaks)

Crash study period - January 2005 through December 2012

0 50 100 150 200 Feet

Figure 2-3

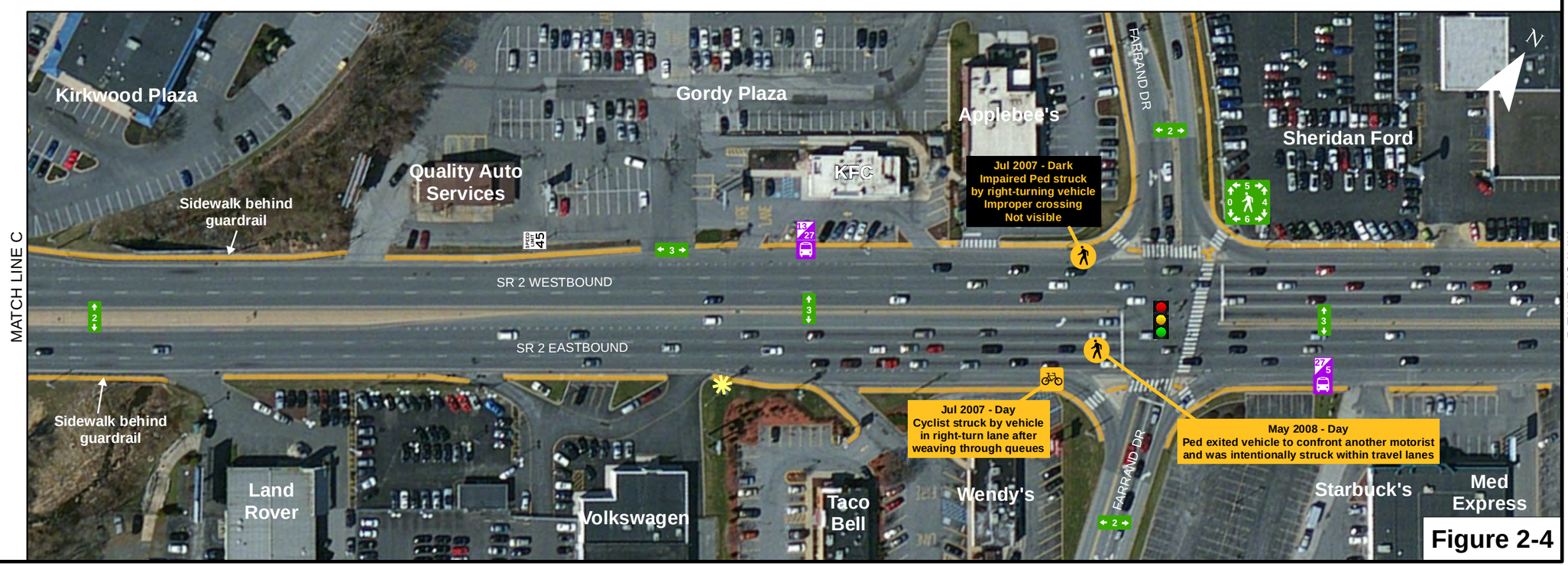


Figure 2-4

October 2014

Existing Conditions
SR 2

St. James Church Rd
to
SR 141

- Traffic Signal
- Existing Bus Stop
- Bus Board/Alight
- Existing Luminaire
- Existing Sidewalk
- Pedestrian Non-Injury Crash
- Bicycle Non-Injury Crash
- Pedestrian Injury Crash
- Bicycle Injury Crash
- Pedestrian Fatal Crash
- Bicycle Fatal Crash
- Dark — Nighttime Crash
- Average Hourly Ped Volume (highest of 3 peaks)

Crash study period - January 2005 through December 2012

0 50 100 150 200 Feet

Figure 2-5

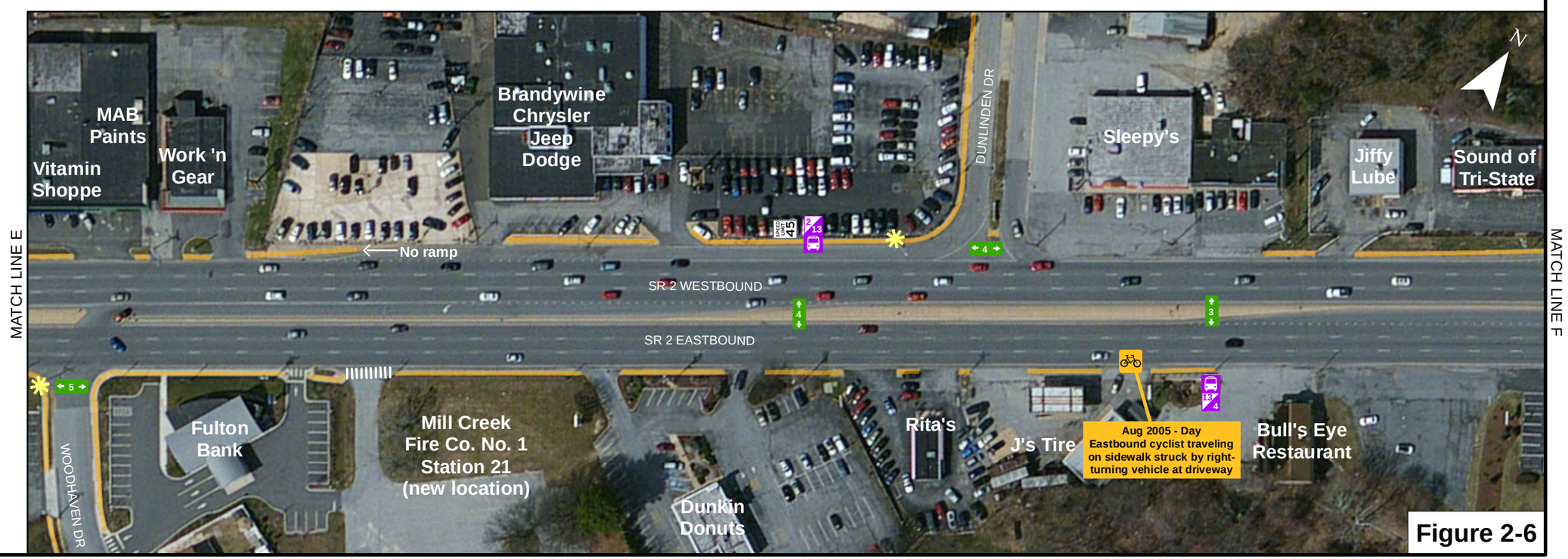


Figure 2-6

October 2014

Existing Conditions
SR 2

St. James Church Rd
to
SR 141

- Traffic Signal
- Existing Bus Stop
- Bus Board/Alight
- Existing Luminaire
- Existing Sidewalk
- Pedestrian Non-Injury Crash
- Bicycle Non-Injury Crash
- Pedestrian Injury Crash
- Bicycle Injury Crash
- Pedestrian Fatal Crash
- Bicycle Fatal Crash
- Dark — Nighttime Crash
- Average Hourly Ped Volume (highest of 3 peaks)

Crash study period - January 2005 through December 2012

0 50 100 150 200 Feet

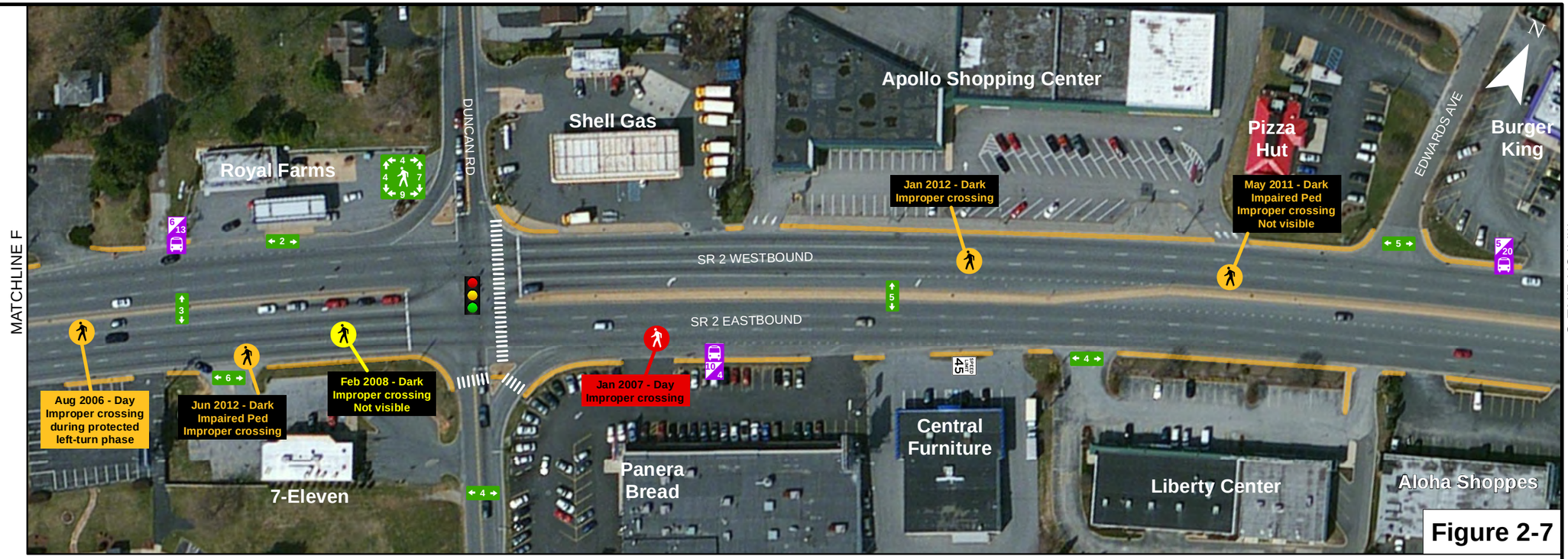


Figure 2-7

Figure 2-8

October 2014

Existing Conditions
SR 2

St. James Church Rd
to
SR 141

- Traffic Signal
- Existing Bus Stop
- Bus Board/Alight
- Existing Luminaire
- Existing Sidewalk
- Pedestrian Non-Injury Crash
- Bicycle Non-Injury Crash
- Pedestrian Injury Crash
- Bicycle Injury Crash
- Pedestrian Fatal Crash
- Bicycle Fatal Crash
- Dark — Nighttime Crash
- Average Hourly Ped Volume (highest of 3 peaks)

Crash study period - January 2005 through December 2012

0 50 100 150 200 Feet

Figure 2-9

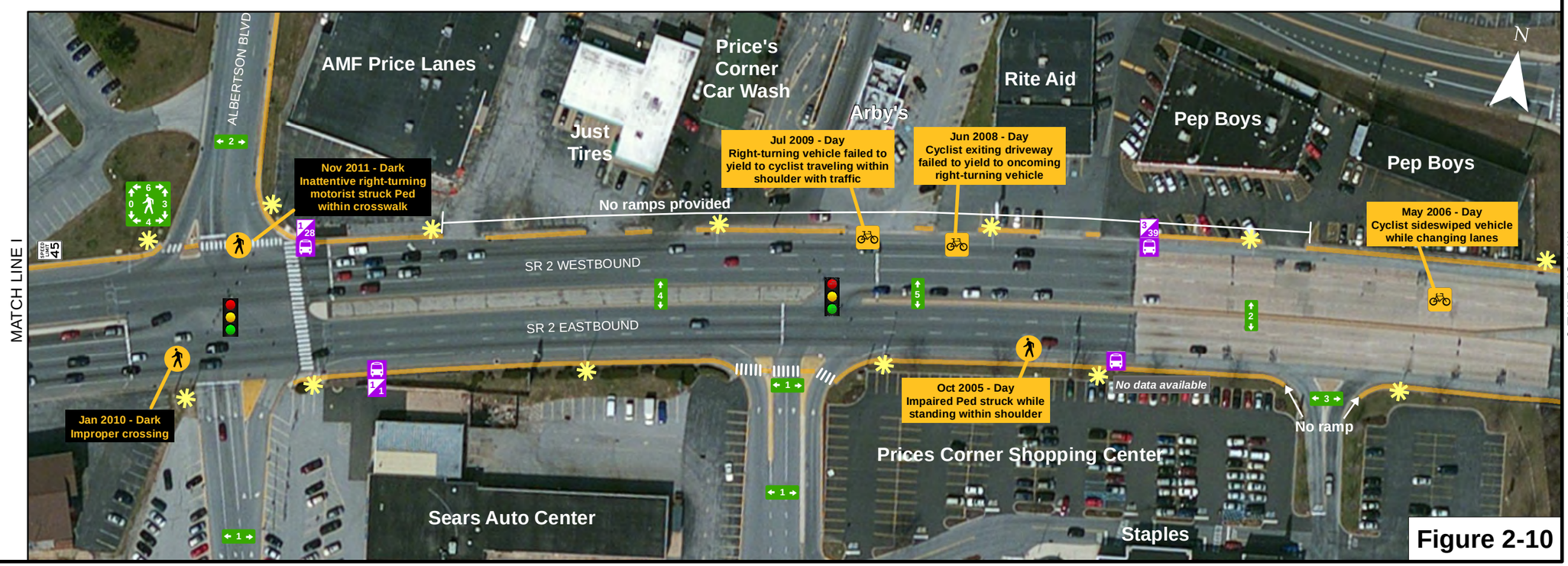


Figure 2-10

October 2014

Existing Conditions
SR 2
St. James Church Rd
to
SR 141

Traffic Signal

Existing Bus Stop

Existing Luminaire

Existing Sidewalk

Pedestrian Non-Injury Crash

Bicycle Non-Injury Crash

Pedestrian Injury Crash

Bicycle Injury Crash

Pedestrian Fatal Crash

Bicycle Fatal Crash

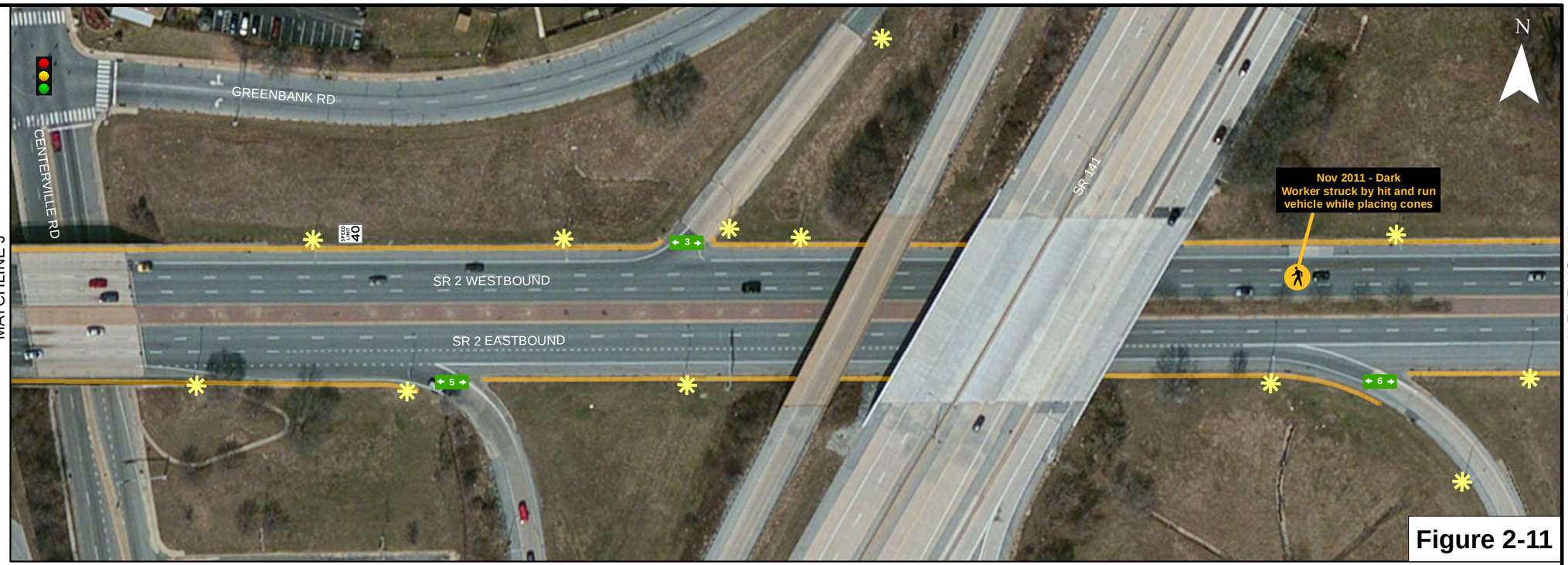
Dark Nighttime Crash

Average Hourly Ped Volume (highest of 3 peaks)

Crash study period - January 2005 through December 2012

0 50 100 150 200 Feet

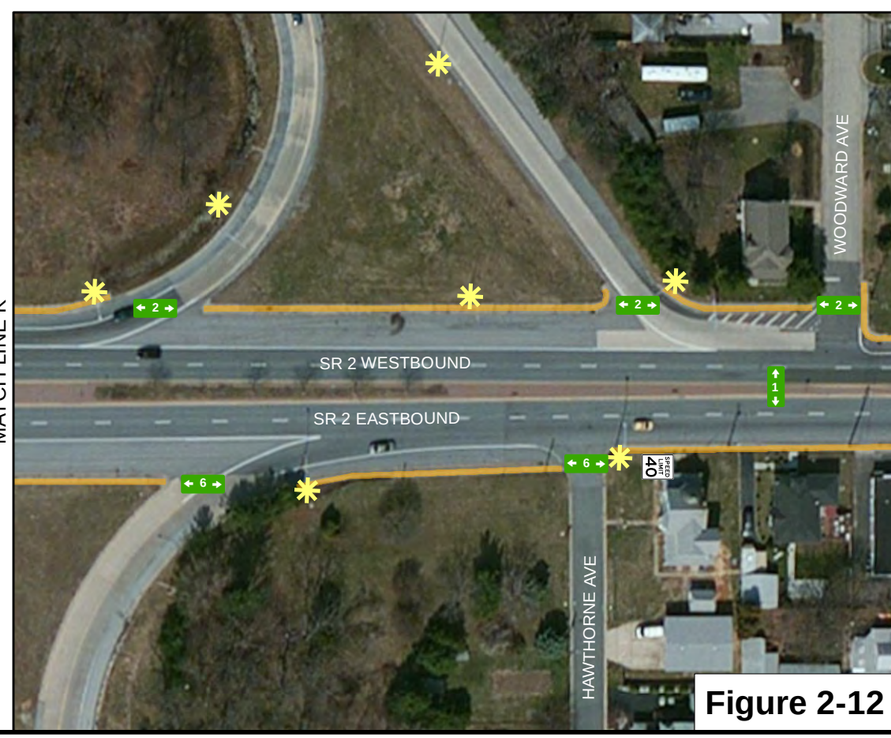
MATCHLINE J



MATCH LINE K

Figure 2-11

MATCH LINE K



STUDY LIMIT

Figure 2-12

Crash Data

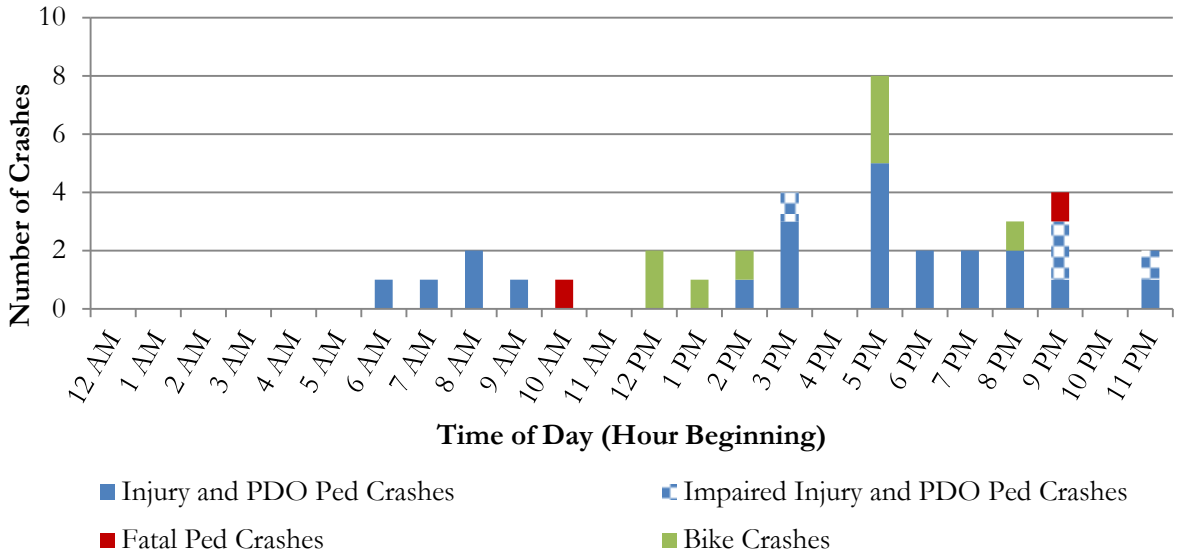
Pedestrian/Bicycle Crashes: A total of 28 pedestrian crashes and 8 bicycle crashes were reported during the eight-year study period from January 2005 through December 2012, including 2 fatal pedestrian crashes, 22 injury pedestrian crashes, and 7 injury bicycle crashes. All pedestrian and bicycle crashes during the study period were reviewed in detail and are summarized by location, lighting condition, and crash circumstances in **Figures 2-1 to 2-12**. Thirteen (46 percent) pedestrian crashes occurred at nighttime and one (13 percent) bicycle crash occurred at nighttime. Pedestrian and bicycle crash characteristics are summarized by time of day and impairment in **Figure 3-1**. As shown, 19 (53 percent) of the 36 total pedestrian and bicycle crashes occurred between 5 PM and 10 PM and 4 (11 percent) pedestrian and bicycle crashes involved an impaired pedestrian. **Figures 3-2 to 3-4** summarize pedestrian and bicycle crashes during the study period by the age of the pedestrian or bicyclist involved, year of the crash, and day of week, respectively. As shown, 7 (19 percent) crashes involved pedestrians/bicyclists between the ages of 46 and 55, pedestrian/bicycle crashes increased in 2008, and 11 (31 percent) pedestrian/bicycle crashes occurred on a Monday. Additionally, improper crossings resulted in 23 (82 percent) of the 28 total pedestrian crashes. Specifically, improper crossings between 6 PM and 7 AM resulted in 9 (32 percent) of the 28 total pedestrian crashes. **Table 1** summarizes pedestrian and bicycle crashes compared to the distance to signalized crosswalks across SR 2. As shown, the highest number of crashes per mile occurred along SR 2 between SR 7 and Farrand Drive; however, several of the crashes in this section occurred on the east leg of the SR 2 at SR 7 intersection. The next highest number of crashes per mile occurred along SR 2 between SR 41 and Albertson Boulevard, which is the shortest segment between signalized crosswalks. In addition, total crashes and total crashes per mile along SR 2 are shown by segment in **Table 1** for comparison purposes. As shown, the highest total number of crashes per mile coincides with the segments with the highest number of pedestrian and bicycle crashes per mile. Furthermore, 18 (64 percent) of the total 28 pedestrian crashes during the study period occurred within 200 feet of a signalized crosswalk and one (3.6 percent) crash occurred within a signalized crosswalk (crash occurred within the crosswalk on the north leg of SR 2 at Albertson Boulevard).

In addition to the pedestrian crashes reported during the study period, two fatal pedestrian crashes occurred in 2013 (following the study period):

- Saturday, March 30, 2013 – The crash occurred just east of the SR 2 at Farrand Drive intersection. The pedestrian attempted to cross the westbound lanes of SR 2 in a southerly direction and was struck by a westbound vehicle. The crash occurred at 4:05 AM and alcohol was a factor on behalf of the pedestrian.

- Friday, November 8, 2013 – The crash occurred approximately 250 feet west of the SR 2 at Duncan Road intersection. The pedestrian attempted to cross the eastbound lanes of SR 2 in a northerly direction outside of a marked crosswalk and was struck by an eastbound vehicle. The crash occurred at 6:02 PM during dry, clear conditions.

Figure 3-1 – SR 2, St. James Church Road to SR 141
Pedestrian and Bicycle Crashes by Time of Day (Jan 2005 – Dec 2012)



* No reported pedestrian crashes that involved an impaired pedestrian resulted in a fatality
** No reported bicycle crashes involved an impaired bicyclist or resulted in a fatality

Figure 3-2 – SR 2, St. James Church Road to SR 141
Pedestrian and Bicycle Crashes by Age of Pedestrian/Bicyclist (Jan 2005 – Dec 2012)

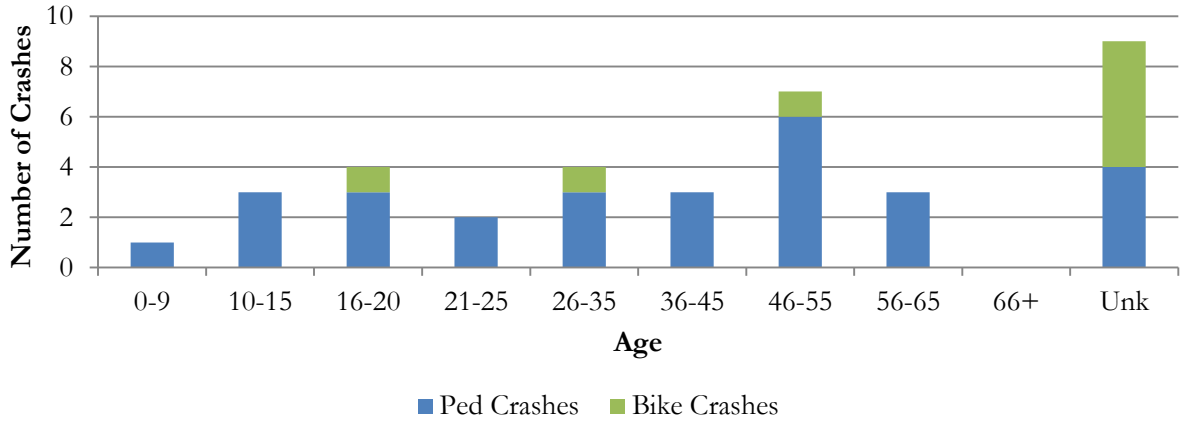


Figure 3-3 – SR 2, St. James Church Road to SR 141
Pedestrian and Bicycle Crashes by Year

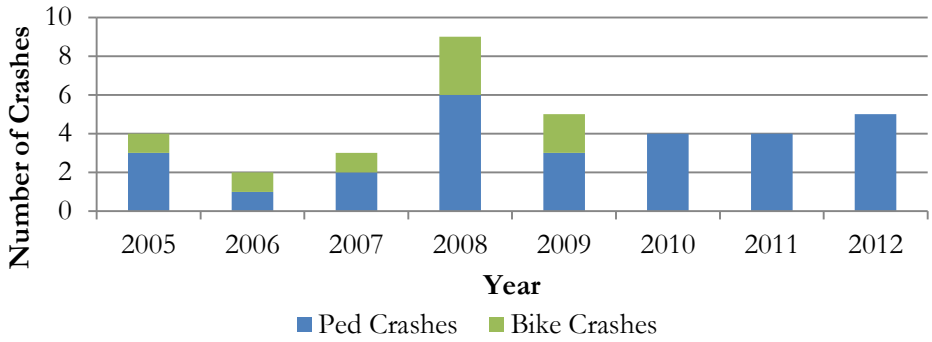


Figure 3-4 – SR 2, St. James Church Road to SR 141
Pedestrian and Bicycle Crashes by Day of Week

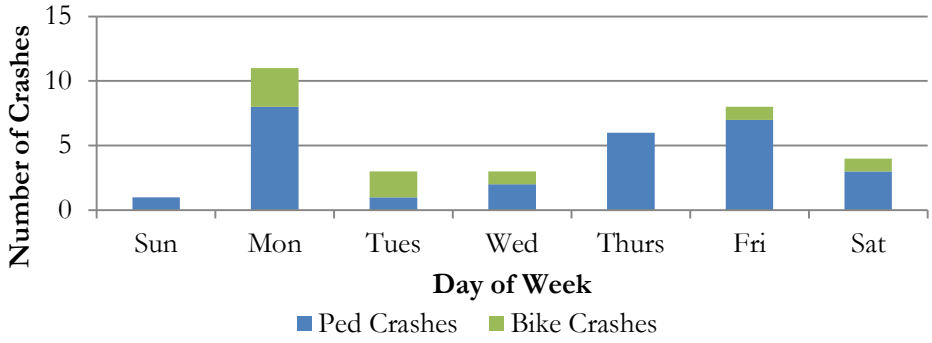


Table 1 – SR 2, St. James Church Road to SR 141
Pedestrian and Bicycle Crashes by Distance between Signalized Crossings of SR 2

Segment		Length (mile)	Total Access Points	Access Points Per Mile	Total Crashes	Ped & Bike Crashes	Total Crashes Per Mile	Ped & Bike Crashes Per Mile
From	To							
St. James Church Road	SR 7	0.3	16	52	63	5	**203**	**16.1**
SR 7	Farrand Drive	**0.6**	25	44	158	12	**276**	**21.0**[1]
Farrand Drive	Duncan Road	**0.6**	43	68	71	5	112	7.9
Duncan Road	SR 41	0.5	22	44	72	4	145	8.0
SR 41	Albertson Boulevard	0.2	8	38	68	4	**325**	**19.1**
Albertson Boulevard	Eastern study limit	**0.6**	17	30	83	6	149	10.8

[1] Eight of the twelve pedestrian and bicycle crashes occurred within approximately 550 feet of SR 7

Vehicular Crashes: A total of 638 crashes (including pedestrian and bicycle crashes) were reported during the three-year study period from January 2010 to December 2012. Of the 638 crashes reported throughout the corridor, 169 (26 percent) crashes occurred during night/dawn/dusk conditions and 112 (18 percent) crashes occurred on wet/snow/ice-covered roadways. **Table 2** includes a summary of the total crashes, percent nighttime crashes, and percent wet roadway crashes at the eight signalized intersections within the study limits.

Table 2 – Crash Data Summary

Intersection	# of Crashes	% Nighttime Crashes	% Wet Crashes
SR 2 at St. James Church Road/Griffin Drive	32	16%	25%
SR 2 at SR 7	146	26%	14%
SR 2 at Kirkwood Plaza	34	29%	18%
SR 2 at Farrand Drive	47	32%	21%
SR 2 at Duncan Road	50	32%	16%
SR 2 at SR 41	68	31%	16%
SR 2 at Albertson Boulevard	48	27%	17%
SR 2 at Prices Corner Entrance	24	33%	33%
Corridor-Wide	**638**	**26%**	**18%**

Transit Inventory

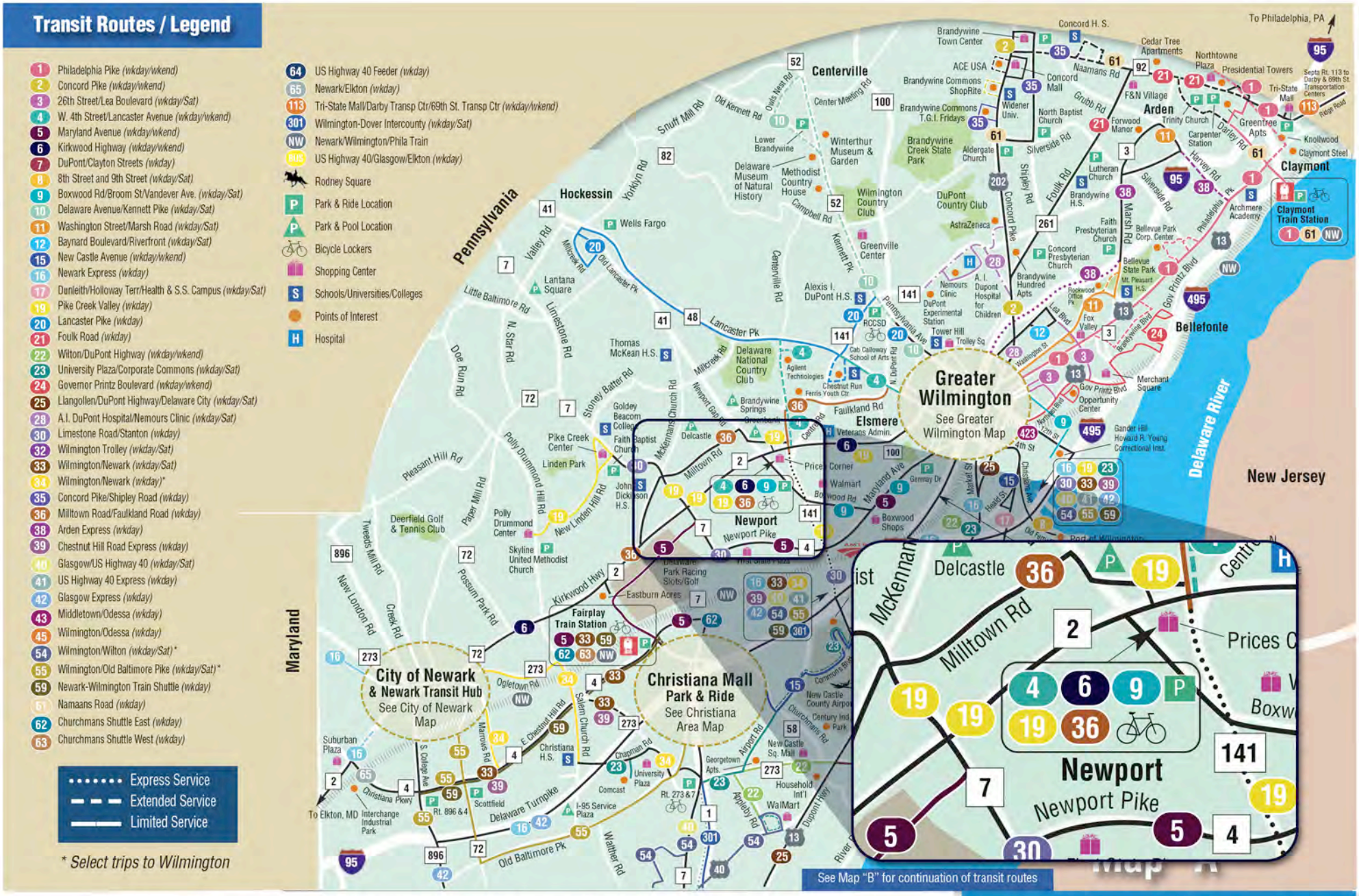
Within any transportation system, all transit riders begin and end their trip as pedestrians; therefore, evaluating bus stop locations and ridership behavior is important in evaluating overall pedestrian safety along a corridor. Bus stops along SR 2 within the study limits serve DART Bus Routes 6, 19, and 36. Route 6 serves the Newark Transit Hub, Kirkwood Highway, Little Italy, Prices Corner Park & Ride, Elsmere, Pennsylvania Avenue, Downtown Wilmington, and the Amtrak Station. Route 19 serves Pike Creek Valley, Skyline Drive, Limestone Road, Stanton, Prices Corner Park & Ride, and Downtown Wilmington. Route 36 serves Kirkwood Highway Library, Eastburn Acres, Milltown Road, Prices Corner Park & Ride, Faulkland Road, and Downtown Wilmington (see **Figure 4**). A summary of existing bus stop locations, amenities (e.g., bench, shelter), and ridership is provided in **Table 3**. As shown, of the 23 total bus stops within the study corridor, 17 (74 percent) stops are located on the far side of an intersection. Of the 14 total bus stops provided at signalized intersections, 12 (86 percent) are located on the far side of the intersection. Additionally, bus stop locations and ridership data are provided graphically in **Figures 2-1 to 2-12**. **Photos 1 and 2** show examples of existing bus stops provided along westbound SR 2 east of SR 7 in front of the Mill Creek Shopping Center (S.C.) and eastbound SR 2 west of Evelyn Drive, respectively.

Table 3 – Transit Inventory Summary

Dir.	Location	Routes	Stop Location	Shelter/ Bench?[1]	Lit?[2]	Stop ID	Stop Abbrev	Daily Weekday Ridership[3]	
								On	Off
Eastbound SR 2	SR 2 at St. James Church Road	6	Far side	Shelter	No	1218	KESJ	15	3
	SR 2 at Midway S.C.	6	Near side	Shelter	Yes	1219	KEWL	23	10
	SR 2 at Mill Creek S.C.	6,19,36	Far side	Shelter	Yes	112	KELI	72	20
	SR 2 at Kirkwood Plaza	6,19	Far side	Bench	No	1221	K1OL	24	10
	SR 2 at Farrand Drive	6,19	Far side	None	No	1222	KEFA	27	5
	SR 2 at Evelyn Drive	6,19	Near side	None	No	1223	KEEV	8	5
	SR 2 at Dunlinden Road	6,19	Far side	None	No	1225	KEDU	13	4
	SR 2 at Duncan Road	6,19	Far side	None	No	1226	K1DU	10	4
	SR 2 at Greenbank Road	6,19	Near side	None	Yes	1227	KIGR	14	4
	SR 2 at Albertson Boulevard	6,19	Far side	None	Yes	1233	KEAL	1	1
	SR 2 at Prices Corner S.C.[4]	6,19	Far side	None	Yes	-	-	-	-
Westbound SR 2	SR 2 at Prices Corner S.C.	6,19	Near side	None	Yes	1122	KWPE	3	39
	SR 2 at Albertson Boulevard	6,19	Near side	None	Yes	1123	KWAL	1	28
	SR 2 at SR 41	6,19	Far side	None	No	1131	K0NE	5	3
	SR 2 at Greenbank Road	6,19	Far side	None	No	1132	K0GB	5	20
	SR 2 at Duncan Road	6,19	Far side	None	No	1133	K0DU	6	13
	SR 2 at Dunlinden Road	6,19	Far side	None	Yes	1134	K0DN	2	13
	SR 2 at Evelyn Drive	6,19	Near side	None	Yes	1930	KWEV	0	11
	SR 2 at Farrand Drive	6,19	Far side	None	No	1137	KWFA	13	27
	SR 2 at Kirkwood Plaza	6,19	Far side	None	No	1138	KWOL	6	25
	SR 2 at Mill Creek S.C.	6,19	Far side	Shelter	Yes	106	KWLI	12	42
	SR 2 at Midway S.C.	6	Far side	Shelter	Yes	1139	K0MI	25	26
	SR 2 at Griffin Drive	6	Far side	None	Yes	1140	KWGR	4	4

[1] Within the study corridor, all bus stops with shelters also have benches
[2] For the purposes of the report, a bus stop was considered lit when lighting along SR 2 is provided within approximately 100 feet of the bus stop location
[3] February/March 2013 manual count ridership data provided by Delaware Transit Corporation (DTC). Counts reflect weekday daily average ridership.
[4] Stop is served on limited trips; no activity recorded by February/March 2013 Manual Counts

Figure 4 - Existing Transit Service along SR 2



Routing is subject to change based on rerouting due to construction or other circumstances that can only be addressed by altering the route temporarily or permanently.

*For assistance with trip planning, call **1.800.652.DART** or use the Google Trip Planner on DART's Home Page.*

DART
A Division of DelDOT
Getting There Starts Here

New Castle County
DART Transit Routes
Effective February 9, 2014

Photo 1 – Existing Bus Stop with Shelter along Westbound SR 2 east of SR 7 (at Mill Creek Shopping Center)

Photo 2 – Existing Bus Stop without Shelter along Eastbound SR 2 west of Evelyn Drive

The existing transit routes and bus stops located along SR 2 contribute a significant amount of pedestrian activity along the corridor, especially during peak hours when users are arriving and departing from their work places. Crash data was reviewed to determine whether there was any direct correlation between pedestrian crashes and the location of bus stops along the corridor. Sixteen (57 percent) pedestrian crashes were reported within approximately 200 feet of a bus stop. Based on an individual review of the crash report narratives, there was no mention of a pedestrian involved in a crash being destined for or leaving a bus stop; however, it is possible that due to the circumstances of the crashes, this information may not have been available. Coordinating with DSP to create a "cheat sheet" for the type of information to include in a pedestrian crash report (and incorporating this information into DELJIS E-Crash training) is recommended to provide additional information on the circumstances of pedestrian crashes.

DelDOT Traffic representatives met with DTC on March 25, 2014 to discuss the potential for upgrades and modifications to transit amenities to improve safety for transit users along the SR 2 corridor. Specifically, the following items were discussed with DTC:

- As noted in DTC's *Bus Stop and Passenger Facilities Policy*, DTC prefers farside bus stop locations to facilitate bus re-entry into the traffic flow and minimize conflicts with right-turning vehicles and pedestrians crossing the intersection. Nearside bus stops may be considered on a case-by-case basis and it is very desirable to get bus operators' input into the decision-making process. Delaware does not have any current laws requiring vehicles to yield to buses, thus DTC is generally reluctant to put bus stops on the near side of intersections unless there are compelling safety and/or operational advantages of a nearside location.
- DTC uses land use patterns to make decisions about bus stop placement. Per Federal Highway Administration's (FHWA) *Pedestrian Safety Guide for Transit Agencies* (February 2008), pedestrians are typically willing to walk for five to ten minutes, or approximately 0.25-mile to 0.5-mile to a transit stop. DTC prefers to provide a bus stop spacing of 750 to 1300 feet.
- Prerecorded audio messages directing pedestrians to cross at designated crosswalks could be played on buses; however, DTC sometimes has concerns regarding too many announcements on buses. More critical locations and/or major intersections could potentially be prioritized.

DTC and DelDOT both agreed that closer coordination between the two agencies is desirable as decisions about placement of new or relocated bus stops are made. The following initiatives are recommended:

- Establish a working group (including a DelDOT Traffic Safety Engineer) to coordinate aspects of both new and old bus stop locations
- Enhance the current *Bus Stop and Passenger Facilities Policy* (DTC-05) to incorporate and improve pedestrian safety
- Develop pedestrian safety advertisements to install at bus stop shelters, specifically at high ridership locations
- Develop and distribute questionnaires to transit riders along the SR 2 study corridor to gather feedback about pedestrian safety and facilities to better identify the topics needing further public outreach

In addition, a pedestrian safety-related questionnaire should be prepared to distribute to customers at Delaware DMV sites regarding pedestrian safety and pedestrian signal operations. The questionnaire should be designed with the goal of determining what Delaware residents know about pedestrian safety and signals.

Pedestrian Observations

Pedestrian observations and counts were performed along the SR 2 study corridor during morning, midday, and evening peak hours (i.e., 7 AM to 9 AM, 11 AM to 1 PM, 3 PM to 6 PM) on a Tuesday, Wednesday, or Thursday in September/October 2013 when weather conditions were generally clear and dry with fair temperatures. Pedestrian observations and counts were also performed in June 2014 at SR 2 at Duncan Road after the Royal Farms opened. The average hourly pedestrian volume (highest of three peaks) is depicted in **Figures 2-1 to 2-12**. Pedestrian behaviors observed throughout the SR 2 corridor are discussed below.

Mid-block Crossings: Pedestrians were frequently observed crossing SR 2 at mid-block locations throughout the study corridor (see **Photo 3**). Pedestrians that cross at mid-block locations create a dangerous situation for both pedestrians and drivers – pedestrians may put themselves in danger if they misjudge the speed of approaching vehicles and the time it takes to safely cross the road; drivers may be startled and confused by an unexpected pedestrian crossing the road, causing the driver to slam on their brakes. According to the National Highway Traffic Safety Administration's (NHTSA) *National Pedestrian Crash Report* (June 2008), 78 percent of pedestrians killed were at non-intersection (i.e., mid-block) locations over the past decade. Based on field observations, pedestrians were frequently observed crossing SR 2 at mid-block locations within 200-feet of a marked, signalized crosswalk. During the September/October 2013 pedestrian observations, a relatively high volume (i.e., 5 or more pedestrians per hour) of mid-block crossings across SR 2 occurred at the following locations:

- Old Capitol Trail/Midway Plaza driveway (i.e., approximately 650 feet east of SR 7)
- West of Greenbank Road
- East of Duncan Road
- West of Albertson Boulevard
- Prices Corner

Waiting/Walking within the Median: Due to the relatively heavy traffic volumes along SR 2, pedestrians crossing at midblock locations may experience significant delays waiting for acceptable gaps in traffic; therefore, pedestrians frequently perform two-stage crossings and wait within the median to minimize crossing delay (see **Photo 4**). Additionally, pedestrians waiting within the median were observed walking along the median while waiting to cross to the other side of the roadway, effectively treating the SR 2 median as a sidewalk. A wide median (i.e., approximately 10 feet or greater) is provided along SR 2 from east of St. James Church Road/Griffin Drive to west of SR 7, from Kirkwood Plaza to west of Farrand Drive, from west of Evelyn Drive to Woodhaven Drive, from the bridge west of SR 41 to the beginning of the eastbound left-turn lane at SR 41, from Albertson Boulevard to the Prices Corner entrance, and east of Centerville Road. In other areas, the raised concrete median is typically between 4 and 8 feet. Furthermore, the section of SR 2 from Greenbank Road to just west of SR 41 includes the bridge over Red Clay Creek – concrete barrier is provided within the median through this section, which prohibits pedestrians from crossing SR 2. Otherwise, there are no barriers provided within the median along SR 2 within the study limits. Currently, vegetation barriers (i.e., trees, grass, and small shrubbery) are provided along the SR 2 median in Elsmere (east of the study area).

Photo 3 – Pedestrian Crossing SR 2 at Mid-Block Location west of Farrand Drive

Photo 4 – Pedestrian Walking along SR 2 Median east of SR 7

Young Children/Students: According to the Centers for Disease Control and Prevention (CDC), children are among the three high-risk pedestrian populations (older adults and impaired pedestrians are the other two high-risk pedestrian populations). Per the CDC, nearly one in every five children between the ages of 5 and 9 who was killed in a traffic crash was a pedestrian. It can be difficult for children under the age of 10 to judge the speed and distance of approaching vehicles.

Young children/students were observed (see **Photo 5**) walking along and crossing SR 2 from approximately Greenbank Road to Duncan Road to access the Anna P. Mote Elementary School (2110 Edwards Avenue). The nearest marked crosswalks across SR 2 are at Duncan Road and SR 41, which are located approximately 1,050 feet and 1,600 feet west of and east of Greenbank Road, respectively.

Photo 5 – Student Crossing SR 2 near Greenbank Road

Vehicular Travel Speeds

Vehicular travel speeds were measured at four locations along eastbound and westbound SR 2 between St. James Church Road/Griffin Drive and SR 141. Vehicular speeds were measured using radar during off-peak periods between 9 and 11 AM and 1 and 3 PM on Tuesday, September 24, 2013 and Wednesday, September 25, 2013. Within the study limits, the posted speed limit is 45 miles per hour west of Albertson Boulevard and 40 miles per hour east of Albertson Boulevard. As shown in **Table 4**, 85th-percentile speeds on eastbound and westbound SR 2 do not exceed 5 miles per hour above the posted speed limit at locations west of SR 7, in the vicinity of Evelyn Drive, and west of SR 141. However, the 85th-percentile speeds on eastbound and westbound SR 2 east of Greenbank Road are 7 miles per hour above the 45-mph posted speed limit. It should be noted that the section of SR 2 from Greenbank Road to just west of SR 41 includes the bridge over Red Clay Creek (i.e., a change in character from the primarily commercial areas along the rest of the study corridor as shown in **Photo 6**), which may be contributing to higher speeds. However, pedestrians cannot cross SR 2 over the barrier in this section (two separate bridges are provided – one for each direction; concrete barrier is provided within the median).

Table 4 – Speed Data Summary

Criteria	West of SR 7		Evelyn Drive		East of Greenbank Road		West of SR 141	
	EB	WB	EB	WB	EB	WB	EB	WB
Posted Speed Limit	45	45	45	45	45	45	40	40
85th-Percentile Speed	46	46	49	48	52	52	45	44
Mean Speed	41	41	43	42	47	48	39	39
% > 5 mph over Posted Speed Limit	5%	2%	7%	8%	22%	28%	11%	10%

Photo 6 – SR 2 over Red Clay Creek (west of SR 41)

ADA Inventory and Assessment

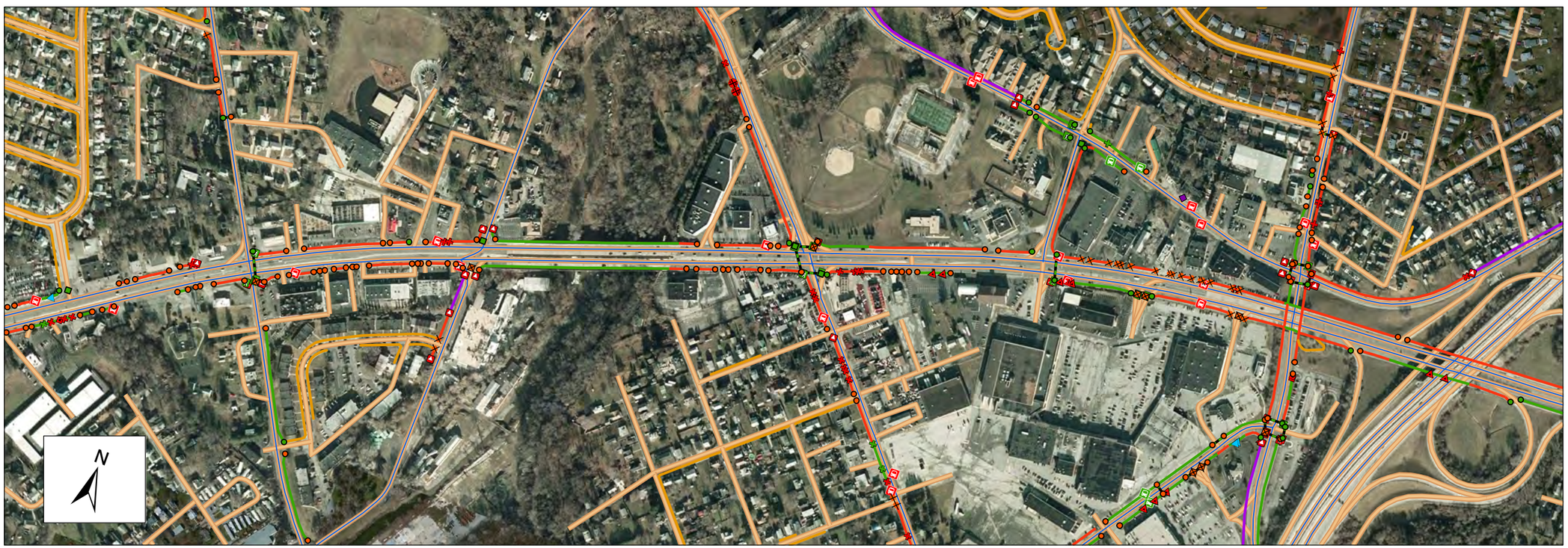
In November and December 2011, DelDOT conducted an ADA inventory and assessment of pedestrian accommodations along SR 2 from St. James Church Road/Griffin Drive to SR 141; therefore, a full evaluation of ADA compliance was not performed as part of the SR 2 Pedestrian Safety Study. A summary of the features collected by DelDOT's study are shown in **Table 5** and are shown graphically in **Figure 5**. As shown, 84 percent of curb ramps and 43 percent of sidewalk within the study limits are non-compliant.

Table 5 – SR 2, St. James Church Road/Griffin Drive to SR 141
ADA Features (November and December 2011)

Category	Total Assessed	Total Compliant	Total Non-Compliant	% Compliant	% Non-Compliant
Sidewalk (miles)	4.2	2.4	1.8	57%	43%
Sidewalks (feet)	22,364	12,733	9,631	57%	43%
Missing Links (miles)	0.0	-	-	-	-
Missing Links (feet)	0	-	-	-	-
Marked Crosswalks	39	39	0	100%	0%
Curb Ramps	179	28	151	16%	84%
Curb Barriers	34	-	-	-	-
Bus Stop Patron Pads	23	6	17	26%	74%
Pedestrian Signals	28	18	10	64%	36%
Medians or Channelized Islands	26	10	16	38%	62%
Stub Ends	22	-	-	-	-
Driveway Crossings on Non-Compliant Sidewalk	13	-	-	-	-
Features Collected Along Compliant Sidewalks Only					
Driveway Crossings on Compliant Sidewalk	23	10	13	43%	57%
Pinch Points	10	6	4	60%	40%
Horizontal Gaps > 1/2 inch	5	-	-	-	-
Vertical Elevations > 1/2 inch	25	-	-	-	-
Non-Compliant Sidewalk 20 Feet or Less	1	-	-	-	-

In April 2014, DelDOT received a complaint from a member of the community regarding ADA violations traveling north along SR 7 and traveling westward along the south side of SR 2 to the Dunkin Donuts located along the southwest corner of the SR 2 at St. James Church Road/Griffin Drive intersection. Based on a field review and the July 2012 DelDOT ADA Pedestrian Inventory, DelDOT identified a number of noncompliant pedestrian features in the area. DelDOT is currently investigating ways to implement remedial actions including the current Pavement and Rehabilitation contract scheduled for summer/fall 2014.

Figure 5 - SR 2, St. James Church Road/Griffin Drive to SR 141
ADA Inventory (November/December 2011)



Legend

Bus Stop Patron Pad
- Compliant
- Non-Compliant
- Not Assessed

Sidewalk
- Compliant
- Non-Compliant
- Not Assessed

Curb Ramp
- Compliant
- Non-Compliant

Driveway Crossing
- Compliant
- Non-Compliant

Median or Channelized Island
- Compliant
- Non-Compliant

Pinch Point
- Compliant
- Non-Compliant

Railroad / PAR Crossing
- Compliant
- Non-Compliant

Pedestrian Signal
- Compliant
- Non-Compliant

Marked Crosswalk
- Compliant
- Non-Compliant

Path Berm Run Slope
- Compliant
- Non-Compliant
- Curb Barrier
- Stub End
- Non-Compliant Sidewalk 20 Feet or Less
- Horizontal Gap
- Vertical Elevation Difference
- Sidewalk Passing Area
- Missing Sidewalk Link
- Area Under Construction
- Further Investigation Required or Other Discrepancy Point
- Parking Lot Barrier
- Marked or Metered On-Street Parking

- State Maintained Roads
- Other Roads

PEDESTRIAN SAFETY EVALUATION/ANALYSES

FHWA's Pedestrian Intersection Safety Indices

FHWA's Pedestrian Intersection Safety Indices (Ped ISI) were used to evaluate pedestrian safety at critical intersections along SR 2 from St. James Church Road to SR 141. The intended use of Pedestrian ISI analysis is to prioritize proposed pedestrian safety improvements within a given area. According to FHWA's *Pedestrian and Bicycle Safety Indices User Guide*, "many States and municipalities have pedestrian and bicycle safety programs to identify and address high crash locations. Although these safety programs can treat pedestrian or bicyclist hazards as they are identified, it would be preferable to use a proactive method of prioritizing which intersections should be examined first to ensure that potentially risky locations are addressed before they become crash problems." Furthermore, "PED ISI proactively prioritizes pedestrian crossings with respect to safety." Safety index scores range from 1 to 6 with a higher score indicating a greater priority for further safety assessment.

The methodology of the Pedestrian ISI analysis was developed using data at urban and suburban intersections with the following characteristics; therefore, the Pedestrian ISI is most appropriately used at intersections with similar characteristics. The Pedestrian ISI user guide urges caution when using the Pedestrian ISI at intersections with characteristics that differ from those listed below.

- Three and four-legged intersections
- Signalized, two-way stop, and four-way stop intersections
- Average daily traffic (ADT) on the main street (i.e. street with the crossing of interest) between 600 and 50,000 vehicles per day
- One-way and two-way roads
- Roadways with one to four through lanes (total of both directions)
- Speed limits between 15 and 45 miles per hour (on the street with the crossing of interest)

According to *DelDOT's 2012 Traffic Summary*, the ADT along SR 2 ranges from approximately 20,000 west of SR 7 to approximately 48,000 east of SR 7, which falls within the ADT range discussed above. The posted speed limit along SR 2 ranges from 40 to 45 miles per hour, which falls within the speed limit range discussed above; however, measured 85th-percentile speeds range from 44 to 52 miles per hour. Six through lanes are provided along SR 2 within the study limits; however, the Pedestrian ISI analysis is intended to be used for roadways with one to four through lanes (total of both directions). Therefore, pedestrian crossings across SR 2 are outside the roadway characteristics appropriate for FHWA's Pedestrian ISI based on the number of travel lanes. However, the Pedestrian ISI analysis was still performed for informational purposes.

A summary of Pedestrian ISI analysis for each of the critical intersections along the study corridor is shown in **Tables 6-1 and 6-2** for crossings across SR 2 and side streets, respectively. Calculations are based on existing conditions (e.g., traffic control, number of through lanes, 85th-percentile speed, and ADT of the crossing of interest, and the predominant land use of the surrounding area). It is important to note that all intersections are assumed to have "predominately commercial" adjacent land uses; therefore, this variable is not shown in the summary tables. As shown, the calculated pedestrian ISI values for crossings across SR 2 range from 3.71 to 5.56 and pedestrian ISI values for crossings across side streets range from 2.00 to 3.18. As can be expected, crossings across SR 2 at signalized intersections score lower (i.e., a better safety index) than crossings at unsignalized intersections.

Table 6-1 – Pedestrian Intersection Safety Index Summary (SR 2 Crossings)

Intersection	West Leg					East Leg				
	Signal/ Stop?	# Thru Lanes[1]	Speed[2]	ADT[3] (1,000s)	Ped ISI[4]	Signal/ Stop?	# Thru Lanes[1]	Speed[2]	ADT[3] (1,000s)	Ped ISI[4]
SR 2 at St. James Church Road	Signal	6	46	21	**3.71**	Signal	6	46	21	**3.71**
SR 2 at Old Capitol Trail	-	6	46	21	**5.45**	-	6	46	21	**5.45**
SR 2 at SR 7	Signal	6	46	21	**3.71**	Signal	6	46	42	**3.83**
SR 2 at Kirkwood Plaza	-	6	49	42	**5.50**	-	6	49	42	**5.50**
SR 2 at Farrand Drive	Signal	6	49	42	**3.89**	Signal	6	49	42	**3.89**
SR 2 at Evelyn Drive	-	6	49	42	**5.50**	-	6	49	42	**5.50**
SR 2 at Woodhaven Drive	-	6	49	42	**5.50**	-	6	49	42	**5.50**
SR 2 at Dunlinden Drive	-	6	49	42	**5.50**	-	6	49	42	**5.50**
SR 2 at Duncan Road	Signal	6	52	42	**3.94**	Signal	6	52	42	**3.94**
SR 2 at Edwards Avenue	-	6	52	42	**5.56**	-	6	52	42	**5.56**
SR 2 at Greenbank Road	-	6	52	42	**5.56**	-	6	52	42	**5.56**
SR 2 at SR 41	Signal	6	52	42	**3.94**	Signal	6	52	48	**3.98**
SR 2 at Albertson Boulevard	Signal	6	45	48	**3.85**	Signal	6	45	48	**3.85**
SR 2 at Prices Corner Entrance	-	6	45	48	**5.43**	-	6	45	48	**5.43**

[1] Number of through lanes on the street with the crossing of interest, not including exclusive turn lanes. If the crossing of interest is crossing the side street of a three-legged intersection, turning lanes are included.
[2] Travel speeds along SR 2 based on measured 85th-percentile speeds from September 2013
[3] Average Daily Traffic of the street with the crossing of interest per *2012 DelDOT Traffic Summary*
[4] Pedestrian Intersection Safety Index

Table 6-2 – Pedestrian Intersection Safety Index Summary (Side Street Crossings)

Intersection	North Leg					South Leg				
	Signal/ Stop?	# Thru Lanes[1]	Speed[2]	ADT[3] (1,000s)	Ped ISI[4]	Signal/ Stop?	# Thru Lanes[1]	Speed[2]	ADT[3] (1,000s)	Ped ISI[4]
SR 2 at St. James Church Road	Signal	2	30	7	**2.00**	Signal	2	30	7	**2.00**
SR 2 at Old Capitol Trail	Stop	2	30	4	**2.01**	Stop	2	30	1	**2.01**
SR 2 at SR 7	Signal	4	45	32	**3.09**	Signal	4	45	47	**3.18**
SR 2 at Kirkwood Plaza	Stop	2	30	4	**2.01**	Stop	2	30	1	**2.01**
SR 2 at Farrand Drive	Signal	2	30	9	**2.01**	Signal	2	30	9	**2.01**
SR 2 at Evelyn Drive	Stop	2	30	1	**2.01**	*Three-Legged Intersection*				
SR 2 at Woodhaven Drive	*Three-Legged Intersection*					Stop	2	30	1	**2.01**
SR 2 at Dunlinden Drive	Stop	2	30	1	**2.01**	*Three-Legged Intersection*				
SR 2 at Duncan Road	Signal	2	40	7	**2.18**	Signal	2	40	5	**2.16**
SR 2 at Edwards Avenue	Stop	2	30	1	**2.01**	*Three-Legged Intersection*				
SR 2 at Greenbank Road	Stop	2	30	1	**2.01**	Stop	2	30	13	**2.01**
SR 2 at SR 41	Signal	2	40	16	**2.23**	Signal	2	40	19	**2.25**
SR 2 at Albertson Boulevard	Signal	4	30	3	**2.64**	Signal	3	30	4	**2.31**
SR 2 at Prices Corner Entrance	*Three-Legged Intersection*					Signal	2	30	4	**1.98**

[1] Number of through lanes on the street with the crossing of interest, not including exclusive turn lanes. If the crossing of interest is crossing the side street of a three-legged intersection, turning lanes are included.
[2] Travel speeds along side street approaches based on posted speed limit plus 5-mph
[3] Average Daily Traffic of the street with the crossing of interest per *2012 DelDOT Traffic Summary*
[4] Pedestrian Intersection Safety Index

Lighting Evaluation

According to *NHTSA's Fatality Analysis Reporting Systems* (FARS), 34 percent of fatal pedestrian crashes reported nationwide in 2011 occurred during nighttime unlit conditions. Of the two fatal pedestrian crashes reported along SR 2 during the eight-year study period, one (50 percent) crash occurred at nighttime during unlit conditions. Section 14.6.2.8 of the *Highway Safety Manual* (HSM) indicates "intersection illumination appears to have the greatest effect on fatal pedestrian nighttime crashes."

The location of existing luminaires along SR 2 within the study limits is shown in **Figures 2-1 to 2-12**. In addition to the roadway and intersection lighting provided along the corridor, varying levels of ambient lighting is provided by adjacent businesses. Pedestrian and vehicular crash data was reviewed to identify locations which may warrant the installation of roadway lighting and locations potentially requiring additional lighting. Lighting evaluations for SR 2 at Kirkwood Plaza, SR 2 at Duncan Road, and SR 2 at SR 41 are included in the **Improvement Alternative Evaluation/Analyses** section of this report. Additionally, performing a lighting evaluation along the entire corridor to identify the need for and feasibility of providing additional lighting is recommended.

According to the *DelDOT Lighting Design Guidelines*, all public transit stops should be lit. Additionally, DTC's current bus stop policy (P.I. Number DTC-05) states "it is highly desirable to place all bus stop signs, shelters, and benches in areas where lighting is or can be provided". According to DTC's policy, lighting provides safety and security, both real and perceived, to waiting transit passengers and helps to provide bus drivers the ability to clearly see the bus stop area and passengers. The presence of illumination at all DART bus stops along SR 2 within the study limits is shown in **Table 3**. As shown, lighting is provided at 12 (52 percent) of the 23 bus stops provided along eastbound and westbound SR 2 within the study limits.

Improvement Alternative Evaluation/Analyses

On Tuesday, October 15, 2013, members of the Pedestrian/Bicycle Safety Working Group participated in a bus/walking tour along the SR 2 corridor from St. James Church Road/Griffin Drive to SR 141 to bring together multiple stakeholders for the pedestrian safety audit and to identify and discuss key areas in need of improvements and/or further study. Existing condition figures (**Figures 2-1 to 2-12**) were provided to the Pedestrian/Bicycle Safety Working Group to facilitate discussions. Critical locations based on crash history and/or pedestrian observations were reviewed and preliminary improvements were identified during the bus/walking tour. A review of critical data and preliminary results from the bus/walking tour were presented to the Pedestrian/Bicycle Safety Working Group at the January 16, 2014 meeting and improvements requiring additional analyses are summarized by location below. A summary of all the proposed improvements is included in **Table 15**.

Current *Synchro* models and signal timings were provided by DelDOT and verified for analyses purposes. Signal timings, cycle lengths, and offsets were maintained for the purposes of the analysis. Existing pedestrian signal timings were confirmed to meet DelDOT's current best practices. Available turning movement count data was provided by DelDOT (count data for each intersection is included in the Appendix).

Currently, at the majority of intersections along the corridor, a maximum of one signalized crossing of SR 2 is provided (with the exception of SR 7). Providing a second signalized crossing of SR 2 (i.e., crossing both the east and west legs) was considered at several intersections to improve pedestrian accommodations; however, providing a second crossing of SR 2 typically results in negative impacts to vehicular traffic operations along the corridor. This is due to the additional time required to serve pedestrians that exceeds vehicular demand, especially with side street split phasing which is provided at the majority of the intersections along the

corridor. Where additional pedestrian crossings are considered, the incremental green time required to serve pedestrians is discussed in addition to the corridor impacts in terms of delay and level of service.

Installing a signalized crosswalk across a side street approach (i.e., north or south leg) to SR 2 was considered at several signalized intersections along the study corridor (i.e., SR 2 at St. James Church Road/Griffin Drive, SR 2 at Duncan Road, and SR 2 at Albertson Boulevard). The required split time for the mainline (i.e., eastbound and westbound SR 2) phases is greater than the required pedestrian clearance time to cross the side street at each of these locations. As such, minimal to no impacts to capacity are anticipated due to the installation of signalized crosswalks across these side street approaches. Therefore, these improvements were not analyzed.

SR 2 at St. James Church Road/Griffin Drive

The SR 2 at St. James Church Road/Griffin Drive intersection is included as part of the Pavement and Rehabilitation Project along SR 2 from Cleveland Avenue to SR 7 that is scheduled for construction in summer/fall 2014. Currently, signalized crosswalks are provided across the north and east legs of the intersection and both the eastbound and westbound SR 2 bus stops are located on the far side of the intersection (see **Figure 2-1**). ADA and pedestrian upgrades including installing a crosswalk across the south leg of the intersection (minimal to no impacts to capacity are anticipated due to this improvement) and upgrading pedestrian push buttons and curb ramps are included as part of the resurfacing project.

During the study period, one nighttime pedestrian crash occurred on the east leg of the intersection (outside the marked crosswalk). Potential improvements discussed during the bus/walking tour included installing crosswalks across the south and west legs of the intersection and relocating the existing westbound bus stop from the west leg to the east leg of the intersection (including potentially relocating the westbound lane reduction and/or providing a bus pull-off area along westbound SR 2). The crosswalk across the south leg of the intersection will be installed by the planned resurfacing project. The westbound SR 2 bus stop at St. James Church Road/Griffin Drive is located on the west leg of the intersection approximately 185 feet west of the existing crosswalk provided across the east leg of the intersection. Therefore, westbound transit passengers destined for locations along the south side of SR 2 theoretically must cross a minimum of two (north and east) legs of the intersection to access locations to the south. The Pedestrian/Bicycle Safety Working Group suggested performing capacity and alternative analysis to install a crosswalk on the west leg or relocate the westbound bus stop from the west leg to the east leg of the intersection.

Bus Stop Relocation Evaluation: Relocating the westbound SR 2 bus stop from the west leg (i.e., far side) to the east leg (i.e., near side) was considered to potentially improve pedestrian accommodations and connectivity at the bus stop. Westbound SR 2 is reduced to two lanes approximately 450 feet west of the St. James Church Road/Griffin Drive intersection. Relocating the lane reduction to east of the intersection and providing a short right-turn lane could accommodate a nearside bus stop while providing a westbound right-turn lane (instead of a shared through/right-turn lane). The westbound right-turn volume is relatively low, so conflicts with right-turning vehicles would be minimal; however, a short storage lane would be necessary.

According to DTC's *Bus Stop and Passenger Facilities Policy,* DTC prefers farside bus stop locations to facilitate bus re-entry into the traffic flow and minimize conflicts with right-turning vehicles and pedestrians crossing the intersection. Nearside bus stops may be used when the nearside stop location provides greater safety for transit passengers and does not expose the bus to an increased risk, when there is considerably more traffic on the far side of the intersection, when the stop does not conflict with right-turning vehicles, and when there are land uses on the far side which adversely impact passenger safety and/or safe bus operations. Additionally, according to DTC's bus stop spacing guidelines, bus stops should be placed approximately 1,000 feet apart for local bus service in areas with moderate transit density.

The existing eastbound SR 2 bus stop located at St. James Church Road/Griffin Drive is located approximately 180 feet east of the existing pedestrian crossing across the east leg of SR 2. Relocating the westbound bus stop to the east leg of the SR 2 at St. James Church Road/Griffin Drive intersection, across from the eastbound bus stop, would reduce the bus stop interval spacing to the existing westbound SR 2 bus stop located at the Midway Shopping Center to approximately 750 feet, and would increase the bus stop interval spacing to the westbound SR 2 bus stop located at Woodmill Drive to 2,400 feet, which do not meet the desired spacing for DTC bus stops. Furthermore, ridership at the existing bus stop along westbound SR 2 west of St. James Church Road/Griffin Drive is relatively low, no pedestrian crashes were reported during the study period at the bus stop, and nearside bus stops may be considered unexpected along this corridor. For these reasons, relocating the westbound bus stop at SR 2 at St. James Church Road/Griffin Drive from the west leg to the east leg of the intersection is not recommended at this time.

West Leg Crosswalk Evaluation: A proposed crosswalk and pedestrian signal across the west leg of the intersection can operate with the southbound Griffin Drive phase to avoid conflicts with northbound left turns during the split phase. Turning movement volumes at the intersection from November 2012 indicate traffic volumes are consistently higher in the PM peak hour as compared to the AM peak hour; therefore, capacity analysis was performed for the PM peak hour to assess the impacts associated with the worst-case scenario. PM peak hour vehicular and pedestrian volumes at the SR 2 at St. James Church Road/Griffin Drive intersection were modeled using *Synchro* (HCM methodologies) software. Overall intersection level of service and delay, SR 2 mainline delays, and SR 2 mainline actuated green times were reviewed to determine the effects of the proposed crossing on the west leg of the intersection. Per existing signal timing data provided by DelDOT, a total split (i.e., sum of green, yellow, and red times) of 18 seconds is provided for the southbound approach. The required total split to accommodate a signalized crosswalk on the west leg of the intersection is 37 seconds, an increase of 19 seconds. Therefore, the split for the southbound Griffin Drive phase was increased to 37 seconds for the purposes of the *Synchro* analyses. To maintain the existing 150-second cycle length, the split times for the SR 2 left-turn and through phases were reduced proportionally. Despite the longer available green time provided on the side street phases that correspond with proposed pedestrian crossings of SR 2, the signal will routinely "gap out" when there is no pedestrian actuation and return the unused portion of the green time to the mainline SR 2 phases. As shown in **Table 7**, eastbound and westbound SR 2 delays increase by approximately 24 and 20 seconds (20 and 85 percent), respectively, during the PM peak hour. The actuated green time for eastbound and westbound SR 2 decreases by approximately 3 and 6 seconds, respectively, during the PM peak hour.

Table 7 – SR 2 at St. James Church Road/Griffin Drive Capacity Analyses

Scenario		Measures of Effectiveness					
		Overall Intersection		SR 2 Mainline Delays (seconds)		Actuated Green Time (seconds)	
		LOS[1]	Delay	EBT	WBT	EBT	WBT
Base Conditions	PM	F	140.7	119.8	23.4	57.6	65.5
With West Leg Ped Crossing (Existing Ped Demand)	PM	F	151.6	144.1	43.2	54.5	60.0
Net Difference	PM	-	+10.9	+24.3	+19.8	-3.1	-5.5

[1] Level of Service

During September/October 2013 pedestrian counts, no pedestrians were observed crossing the west leg of the SR 2 at St. James Church Road/Griffin Drive intersection; however, a maximum of four pedestrians in an hour were observed crossing SR 2 near the existing westbound bus stop. Although existing pedestrian demand does not indicate a desire to cross on the west leg of the SR 2 at St. James Church Road/Griffin Drive intersection, there may be latent demand for pedestrian crossings. No existing sidewalk is provided along the south side of SR 2 west of St. James Church Road/Griffin Drive or along the west side of St. James Church Road south of SR 2. However, with the installation of a crosswalk on the west leg of the intersection, increases in eastbound and westbound SR 2 approach delays are projected to be relatively low compared to existing conditions. For these reasons, installing a crosswalk across the west leg of the intersection is recommended.

Although the analysis assumes, that the side street split will be increased to accommodate the pedestrian phase during all cycles, this represents a worst-case scenario in terms of impacts to SR 2 corridor operations. During implementation of the signal timings, consideration should be given to allowing the pedestrian phases to exceed the maximum split. This will result in taking time from subsequent signal phases and/or throwing the signal out of coordination temporarily, but is appropriate when pedestrian actuations are infrequent.

SR 2 at Old Capitol Trail/Midway Plaza Shopping Center

During September/October 2013 pedestrian counts, a relatively high volume of pedestrians were observed crossing mid-block between St. James Church Road and SR 7 in the vicinity of Old Capitol Trail and the Midway Plaza Shopping Center driveway. Eastbound and westbound SR 2 bus stops with moderate ridership are located just west of Old Capitol Trail/Midway Plaza Shopping Center driveway. During the study period, no pedestrian crashes were reported at this location; however, one bicycle crash was reported nearby. As such, the Pedestrian/Bicycle Safety Working Group suggested performing analysis and evaluating the feasibility and impacts of installing a midblock pedestrian hybrid beacon near the existing bus stops in front of the McDonald's (4625 Kirkwood Highway). Currently, no marked crosswalk is provided across SR 2 and the median width varies along SR 2 between St. James Church Road and SR 7; however, the median width is approximately 16 feet at Midway Plaza. The nearest signalized crosswalks are located approximately 575 feet east (at SR 7) and approximately 950 feet west (at St. James Church Road).

Pedestrian Hybrid Beacon Evaluation: A pedestrian hybrid beacon is a special type of traffic control signal used to warn and control traffic at an unsignalized location to assist pedestrians in crossing a street or highway at a marked crosswalk. Vehicular traffic is stopped only when a pedestrian activates the signal. According to Chapter 4F of the *2011 DE MUTCD*, "if a traffic control signal is not justified per the signal warrants of Chapter 4C and if gaps in vehicular traffic are not adequate to permit pedestrians to cross, or if the speed of vehicles approaching on the major street is too high to permit pedestrians to cross, or if pedestrian delay is excessive, the need for a pedestrian hybrid beacon should be considered on the basis of an engineering study that considers major-street volumes, speeds, widths, and gaps in conjunction with pedestrian volumes, walking speeds, and delay." Furthermore, a pedestrian hybrid beacon may be considered to facilitate pedestrian crossings at a location that does not meet traffic signal warrants, or at a location that meets the pedestrian volume and/or school crossing traffic signal warrants but a decision is made to not install a traffic control signal. The pedestrian volume warrant and the school crossing traffic signal warrants are not met at SR 2 between St. James Church Road and SR 7; therefore, a pedestrian hybrid beacon was considered. Based on the *2011 DE MUTCD*, the following guidelines should be considered when evaluating the need for a pedestrian hybrid beacon:

- "For a major street where the posted or statutory speed limit or the 85th-percentile speed exceeds 35 mph, the need for a pedestrian hybrid beacon should be considered if the engineering study finds that the plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding total of all pedestrians crossing the major street for 1 hour (any four consecutive 15-miute periods) of an average day falls above the applicable curve in Figure 4F-2 for the length of the crosswalk." **Peak hour traffic volumes on eastbound and westbound SR 2 exceed 2,000 vehicles (total of both directions), a maximum of 20 pedestrians per hour were observed crossing SR 2 during September/October 2013 counts, and the theoretical crosswalk length is approximately 100 feet to cross both directions of SR 2 and the median; therefore, this criteria is marginally met (i.e., the threshold is 20 pedestrians per hour).**

- **Are Adequate Gaps in Traffic Available?** According to *NCHRP Report 562*, pedestrians become anxious to begin walking again within 30 seconds of waiting for a gap. If waiting periods are longer, high school, college, and middle-aged adults, in particular, tend to look for a shorter gap. A gap study was performed on Wednesday, July 9, 2014 along SR 2 at the potential location for a pedestrian hybrid beacon (i.e., approximately 650 feet west of SR 7). At the proposed crosswalk location, the pavement width (i.e., face-of-curb to face-of-curb) of SR 2 is approximately 100 feet, including an approximately 16-foot median. The width to cross only eastbound or westbound SR 2 is approximately 40 to 42 feet. Based on a walking pace of 3.5 feet per second, 28 seconds are required to cross all of SR 2. If a two-stage crossing is considered, 12 seconds are required to cross only the eastbound or westbound travel lanes. Acceptable gaps are created by the upstream traffic signals at St. James Church Road/Griffin Drive (in the eastbound direction) and SR 7 (in the westbound direction). As shown in **Table 8**, an acceptable gap in eastbound and westbound traffic was observed, on average, every 67 and 52 seconds, respectively, during the midday peak period. Similarly, an acceptable gap in eastbound and westbound traffic was observed, on average, every 64 and 66 seconds, respectively, during the evening peak period. However, acceptable gaps to complete a full crossing of SR 2 (i.e., crossing both eastbound and westbound travel lanes) was observed very infrequently, on average, every 30 minutes during both the midday and evening peak periods. **Therefore, gaps in vehicular traffic are available to accommodate pedestrian crossings; however, pedestrians may be delayed for approximately 60 seconds and will typically need to perform a two-stage crossing.**

Table 8 – SR 2 at Old Capitol Trail/Midway Plaza Shopping Center
Gap Study Summary

Direction	Acceptable Gap Criteria[1]	Time Period			
		12:00 – 12:30 PM (i.e., 30 minutes)		4:30 – 5:30 PM (i.e., 60 minutes)	
		Number of Gaps	Gap Frequency	Number of Gaps	Gap Frequency
EB SR 2	12 seconds	27 gaps	67 seconds	57 gaps	64 seconds
WB SR 2	12 seconds	35 gaps	52 seconds	55 gaps	66 seconds
EB and WB SR 2	28 seconds	1 gap	30 minutes	2 gaps	30 minutes

[1] Acceptable gaps equal the crossing distance (in feet) divided by 3.5 feet/second (i.e., assumed pedestrian walking speed), rounded up to nearest whole number

- **Pedestrian Delay:** As previously noted, pedestrians become anxious to begin walking after approximately 30 seconds of delay. Observed delays for pedestrians crossing SR 2 in the vicinity of the proposed pedestrian hybrid beacon were typically between 15 and 30 seconds (similar delays were noted at both the nearside crossing and within the SR 2 median for pedestrians traveling both northbound and southbound). At a typical signalized intersection with crosswalks, a pedestrian may be delayed up to the

full cycle length. The cycle length along the SR 2 corridor in the vicinity of the proposed pedestrian hybrid beacon is 150 seconds during the AM and PM peak hours. If installed, the pedestrian hybrid beacon would likely be coordinated with adjacent traffic signals; therefore, delays could be up to 150 seconds with the proposed pedestrian hybrid beacon.

- **Spacing to Adjacent Intersections/Driveways:** According to *Implementing Hybrid (HAWK) Pedestrian Signals* by Diahn L. Swartz, P.E., P.T.O.E., the City of Tucson (Arizona) requires pedestrian hybrid beacons be installed no closer than 600 feet from an existing traffic signal or STOP sign. In addition, the City's general practice is to keep crossings no closer than a quarter mile from existing traffic signals. **The proposed location for of a pedestrian hybrid beacon along SR 2 at Old Capitol Trail is approximately 675 feet west of the SR 2 at SR 7 traffic signal and approximately 950 feet east of the SR 2 at St. James Church Road/Griffin Drive traffic signal.** The *2011 DE MUTCD* indicates that the "pedestrian hybrid beacon should be installed at least 100 feet from side streets or driveways that are controlled by STOP or YIELD signs." **Therefore, the proposed hybrid beacon should be located at least 100 feet west of the Midway Plaza driveway and Old Capitol Trail. Driveways are located along the south side of SR 2 in this area; however, no STOP or YIELD signs are provided.**

Federal Highway Administration's (FHWA) *Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations* provides guidelines for installing marked crosswalks alone (i.e., without traffic-calming treatments, traffic signals and pedestrian signals, etc.). Marked crosswalks alone are insufficient at locations where the speed limit exceeds 40 mph and on roadways with four or more lanes with a raised median or crossing island with an ADT of 15,000 or greater. The posted speed limit along eastbound and westbound SR 2 at Old Capitol Trail/Midway Plaza driveway is 45 mph, there are six lanes with a grass median, and the ADT is approximately 20,000. Furthermore, a marked crosswalk alone may create a false sense of safety to pedestrians crossing at this location and encourage at-risk pedestrians (i.e., children and older adults) to cross at this location, increasing the potential for pedestrian crashes at this location. For these reasons, installing a marked crosswalk across SR 2 at Old Capital Trail/Midway Plaza driveway without additional traffic control devices is not recommended.

Installing a pedestrian hybrid beacon will create an additional stop condition along SR 2, creating the potential for eastbound and westbound rear end crashes and eastbound through queues approaching SR 7 will occasionally extend beyond the proposed pedestrian hybrid beacon similar to existing conditions. However, using a walking pace of 3.5 feet per second, 28 seconds are required to cross SR 2 at the proposed pedestrian hybrid beacon location; therefore, a total "split" time of 35 seconds (including a 7-second WALK interval) would be required to accommodate the proposed crosswalk. At the nearby SR 2 at SR 7 intersection, the existing northbound and southbound SR 7 through phases (i.e., phases 4 and 8) are 41 and 58 seconds during the AM and PM peak hours, respectively, which exceeds the required time for the proposed pedestrian crossing. As such, the pedestrian phase could potentially be coordinated to operate concurrently with the northbound and southbound SR 7 through phases at the SR 2 at SR 7 intersection to minimize impacts to vehicular traffic along SR 2. Additionally, sight distance to the potential location for a pedestrian hybrid beacon is unobstructed.

A relatively high volume of pedestrians were observed crossing mid-block between St. James Church Road and SR 7 in the vicinity of Old Capitol Trail and the Midway Plaza Shopping Center driveway (i.e., 20 pedestrians in one hour). Eastbound and westbound SR 2 bus stops with moderate ridership are located just west of Old Capitol Trail/Midway Plaza Shopping Center driveway. During the study period, no pedestrian crashes were reported at this location; however, one bicycle crash was reported nearby. Several pedestrians were observed crossing SR 2 to travel between the eastbound bus stop and the McDonalds. Generally, acceptable gaps for pedestrians to cross are created by the existing traffic signals at SR 2 at St. James Church Road/Griffin Drive and SR 7 which meter eastbound and westbound SR 2 traffic. Acceptable gaps to cross one direction of SR 2 are available approximately every 60 seconds. The pedestrian crossing at SR 2 at Old Capitol Trail/Midway Plaza driveway can likely operate concurrently with the northbound and southbound

SR 7 through phases, minimizing impacts to the overall vehicular traffic conditions along SR 2. For these reasons and because the installation of a marked crosswalk across SR 2 without additional traffic control devices is not recommended, pursing the installation of a pedestrian hybrid beacon along SR 2 at Old Capitol Trail/Midway Plaza driveway (with coordination at the adjacent traffic signals) is recommended, as pedestrian demand is relatively high in this area compared to other locations along the corridor.

DelDOT has installed pedestrian hybrid beacons at two locations within the state; however, there have been issues associated with motorist compliance at these locations. Compliance rates for the new pedestrian hybrid beacon at SR 8 at Dover High School and the proposed pedestrian hybrid beacons along the SR 1 corridor in the beach area should be investigated once the information is available.

SR 2 at SR 7

During the study period, the highest concentration of pedestrian crashes occurred in the vicinity of the SR 2 at SR 7 intersection (11 pedestrian crashes were reported in the area, including 5 crashes on the east leg of the intersection, 3 crashes involving northbound right-turning vehicles, 2 crashes on the west leg of the intersection, and 1 crash within the intersection). Bus stops along eastbound and westbound SR 2 with high ridership are located approximately 450 feet east of the intersection, and pedestrian volumes in the area are relatively high. Signalized crosswalks are provided across all four legs of the SR 2 at SR 7 intersection. During the bus/walking tour, the Pedestrian/Bicycle Safety Working Group identified several short-term improvements to improve pedestrian safety associated with the northbound right-turn movement, including:

- Installing Pedestrian (W11-1) warning signs with Downward Diagonal Arrow (W16-7P) plaques at the pedestrian crossing across the channelized northbound SR 7 right-turn lane
- Removing the private business signs located near the southeast corner of the intersection that obstruct sight lines to a pedestrian crossing the northbound right-turn lane

In addition, evaluating the impacts of signalizing the northbound SR 7 right turn, tightening the right-turn radius, and/or relocating the bus stops located on the east leg of the intersection closer to the crosswalk (requiring coordination with DTC) was recommended.

Northbound Right-Turn Evaluation: The existing yield condition and channelizing island provided for the northbound SR 7 right-turning movement at SR 2 allows northbound right-turning vehicles to continue moving through their turn without stopping at the intersection, reducing acceptable gaps for pedestrians to cross the channelized northbound right-turn lane and increasing the potential for pedestrian crashes. Additionally, no acceleration lane is provided along eastbound SR 2 to accommodate accelerating northbound right-turning movements from SR 7, increasing the potential for northbound right-turn rear end crashes. During the three-year study period from January 2010 to December 2012, 146 crashes were reported at SR 2 at SR 7, including 21 northbound right-turn rear end crashes. Signalizing the northbound SR 7 right-turning movement at SR 2 (and providing a right-turn overlap with the westbound left-turn phase) would create a stop condition for northbound right turns in advance of the crosswalk and potentially create a more desirable crossing environment for pedestrians on the southeast corner of the intersection. Signalizing the movement would require tightening the turning radius on the southeast corner of the intersection, removing the channelizing island, and realigning the crosswalks on the south and east legs of the intersection. This option would also reduce the potential for northbound rear end crashes by providing positive guidance to these motorists when they have the right-of-way and reducing the need for right-turning vehicles to yield to opposing traffic.

Right turns from northbound SR 7 to eastbound SR 2 were observed during the PM peak hour on Tuesday, July 22, 2014 to determine the number of vehicles that complete their turn during various signal phases (i.e., the northbound through phase, the westbound left-turn phase, the eastbound through phase, or the southbound left-turn phase). **Table 9** summarizes the results. As shown, 55 percent of northbound right-turning vehicles complete their movement during the northbound through phase, 24 percent of northbound right-turning vehicles complete their movement during the westbound left-turn phase, 11 percent of northbound right-turning vehicles complete their movement during the eastbound through phase, and 10 percent of northbound right-turning vehicles complete their movement during the southbound left-turn phase. Northbound right-turning vehicles were observed turning directly in front of eastbound through and southbound left-turn platoons, increasing the potential for crashes. Furthermore, multiple near-miss crashes involving northbound right-turning and westbound U-turning vehicles were observed.

Table 9 – SR 2 at SR 7 Right-Turn Peak Hour Study Summary

Condition		PM Peak	
		# of Vehicles	% of Right Turns
NB Right-Turn	Longest Queue	12	-
	Cleared During the NB Through Phase	278	55 %
	Cleared During the WB Left-Turn Phase	121	24 %
	Cleared During the EB Through Phase	57	11 %
	Cleared During the SB Left-Turn Phase	52	10 %
	Total NB Right-Turns	**508**	**100 %**

Capacity analyses were performed using *Synchro* (HCM methodologies) software to assess the impacts of signalizing the northbound SR 7 right-turning movement at SR 2 and providing an overlap phase with the westbound SR 2 left-turning movement using turning movement count data from April 2013. Installing a second northbound right-turn lane to increase capacity was considered; however, it was determined to be infeasible due to existing right-of-way constraints from adjacent land uses. As such, the analysis assumes a single northbound right-turn lane would be maintained similar to existing conditions. As shown in **Table 10**, northbound SR 7 right-turn delays at SR 2 decrease approximately 41 and 37 seconds during the AM and PM peak hours, respectively, when the movement is signalized with an overlap, as compared to existing conditions. Projected 95th-percentile queue lengths increase approximately 105 feet and 120 feet during the AM and PM peak hours, respectively; however, projected queues can be accommodated within the existing turn lane. Overall intersection delays remain relatively the same as existing conditions. Signalizing the northbound SR 7 right-turning movement at SR 2 without providing an overlap phase was also considered; however, due to limitations in the software, the *Synchro* (HCM methodologies) results do not provide different results for a channelized right-turning movement with yield control as compared to a signal-controlled movement (i.e., the *Synchro* results for signalizing the right-turning movement without providing an overlap phase are the same as existing conditions in Table 10).

Under proposed conditions, it was assumed that right-turn-on-red movements would be permitted similar to the existing yield condition; however, prohibiting the westbound U-turning movement should be considered to avoid conflicts between westbound U-turning vehicles and northbound right-turning vehicles. Westbound U-turns represent approximately 5 and 14 percent (or approximately 15 to 85 vehicles) of westbound left-turn/U-turn vehicles during the AM and PM peak hour, respectively, according to a November 12, 2014 count. The nearest downstream median opening that accommodates westbound U-turning movements along SR 2 is at St. James Church Road/Griffin Drive which is located approximately 1,650 feet west of SR 7.

As an alternative to signalizing the northbound SR 7 right-turning movement, retaining the existing yield control and tightening the turning radius for northbound SR 7 right turns onto eastbound SR 2 was considered to reduce travel speeds of northbound right-turning vehicles and potentially improve pedestrian safety on the southeast corner of the intersection. As shown in **Figure 6**, tightening the turning radius for northbound right turns can be accomplished while maintaining a refuge area for pedestrians. The turning radius may be reduced from approximately 80 feet to approximately 60 feet and can accommodate a WB-40 design vehicle according to AUTO-TURN. Additionally, northbound right-turning vehicles enter the yield point at a lesser angle, reducing the need for drivers to look over their left shoulder, which may potentially reduce northbound right-turn rear end crashes.

Signalizing northbound SR 7 right turns at SR 2 and providing an overlap with the westbound left-turning movement will likely provide the greatest safety improvement for both pedestrians crossing the right-turn lane and northbound right-turning vehicles, without significantly impacting capacity. However, providing an overlap phase would present a conflict between westbound U turns and northbound right turns. While this conflict exists today, providing concurrent green arrow indications for both turning movements could increase the potential for safety concerns and crashes. Although tightening the turning radius independently is likely to improve pedestrian safety, the benefits are less quantifiable due to the relatively minimal reduction in turning radius. For these reasons, signalizing the northbound SR 7 right-turning movement and tightening the turning radius on the southeast corner of the SR 2 at SR 7 intersection is recommended. Providing an overlap with westbound SR 2 left turns and prohibiting the westbound U-turning movement should be considered as part of the design phase to avoid conflicts between westbound U-turning vehicles and northbound right-turning vehicles.

Table 10 – SR 2 at SR 7 Capacity Analyses

Scenario	Peak Hour	Intersection		Northbound Right Turn		
		Delay (sec)	LOS[1]	Delay (sec)	LOS[1]	95th-Percentile Queue (775 ft available)
Existing	AM	248.6	F	136.8	F	473 ft[2]
	PM	254.4	F	82.3	F	523 ft[2]
Proposed – Signalize NB SR 7 Right Turns and Provide an Overlap Phase	AM	246.0	F	95.6	F	578 ft[2]
	PM	252.0	F	45.5	D	641 ft[2]

[1] LOS – Level of Service
[2] Volume exceeds capacity; queue length may exceed calculated 95th-percentile queue length

Bus Stop Relocation Evaluation: Relocating the existing bus stops located along eastbound and westbound SR 2 east of SR 7 closer to the existing crosswalk on the east leg of the SR 2 at SR 7 intersection was considered to better serve transit passengers at both bus stops and reduce the distance pedestrians must travel between the bus stops and crosswalk. Currently, the eastbound and westbound bus stops are located approximately 425 and 450 feet east of the signalized crosswalk, respectively. Bus shelters are provided at each stop to accommodate the high ridership; therefore, it was assumed that any relocation of these bus stops would require relocating the bus shelters. Observed pedestrian activity on the east leg of SR 2 at SR 7 in the vicinity of the existing bus stops indicates 12 pedestrians crossed SR 2, with approximately an even distribution between northbound and southbound pedestrians.

According to DTC's *Bus Stop and Passenger Facilities Policy,* in areas that have high traffic volumes, turning movements, and pedestrian crossings through intersections, the bus stop should be placed where it presents the least conflict with vehicular traffic and pedestrians. As previously discussed, signalizing the northbound SR 7 right-turning movement at SR 2 is recommended, which will eliminate the channelizing island located on the southeast corner of the intersection and relocate the curb along eastbound SR 2 closer to the

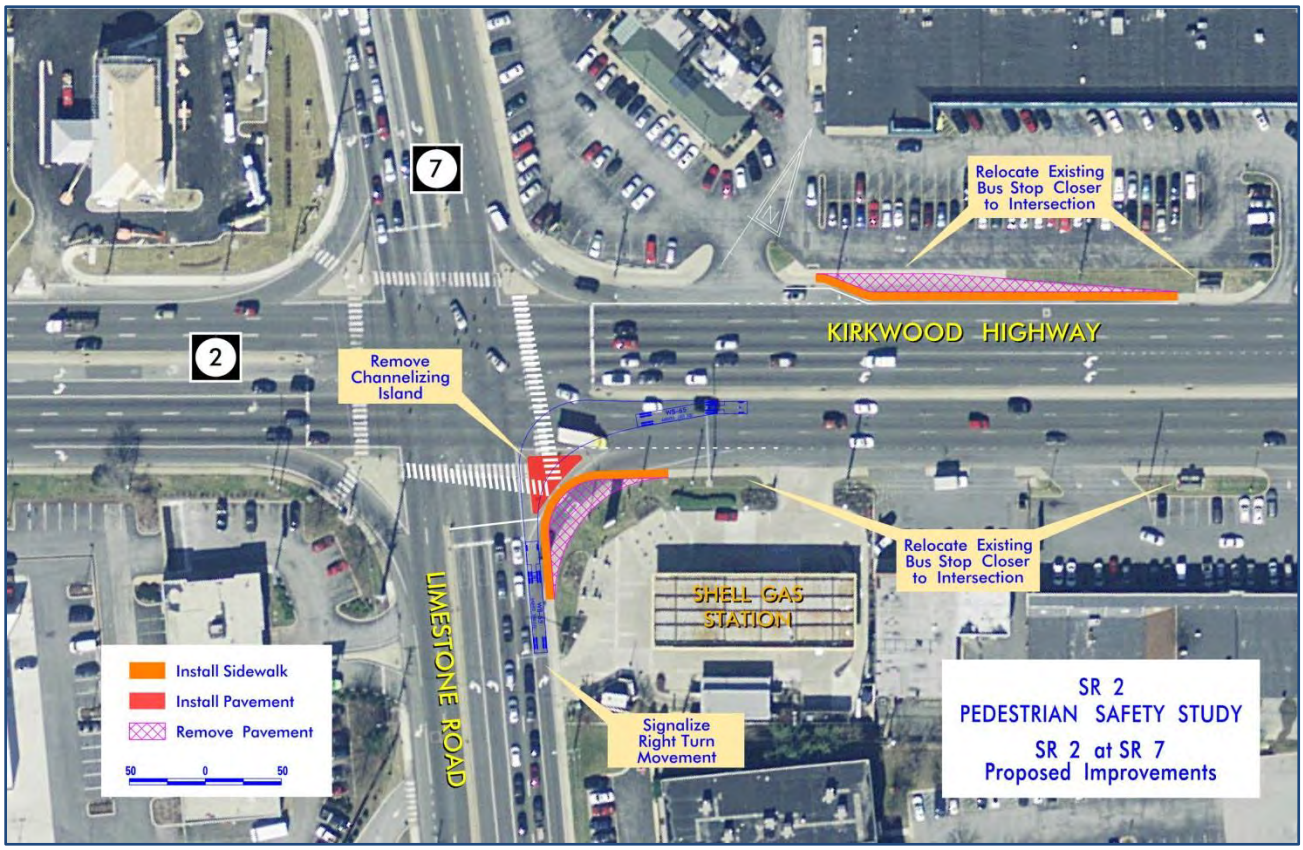
eastbound travel lanes. These improvements will create an opportunity to provide a bus pull-off area and relocate the eastbound SR 2 bus stop and shelter closer to SR 7 (in front of the Shell gas station). Relocating the bus stop to this location will reduce the distance to the nearest signalized crossing of SR 2 by approximately 275 feet. For these reasons, relocating the eastbound SR 2 bus stop at SR 7 closer to the intersection is recommended (in conjunction with signalizing the northbound SR 7 right-turning movement at SR 2). Installing additional signage at the bus stop to encourage transit riders and pedestrians to cross at the intersection is recommended as a short-term improvement.

Figure 6 – SR 2 at SR 7 Reduced Northbound Right-Turn Radius

Similarly, relocating the westbound SR 2 bus stop at SR 7 was considered. Farside bus stop locations are generally preferred by DTC; however, relocating the bus stop from the near side of the intersection to the far side would provide three bus stops along westbound SR 2 from SR 7 to St. James Church Road/Griffin Drive, creating less than desired bus stop spacing. Additionally, the existing near side stop serves the Mill Creek Shopping Center, with a high ridership. A preliminary review of the existing private driveways and land uses along the north side of SR 2 east of SR 7 indicates the westbound SR 2 bus stop could be relocated closer to the existing crosswalk at SR 7 by reducing the westbound SR 2 right-turn storage length approaching SR 7 and extending the curb line closer to the westbound travel lanes. Based on peak hour field observations, westbound SR 2 through queues frequently extend beyond the existing right-turn lane and block right-turning vehicles from entering the turn lane. Although reducing the length of the right-turn lane will increase the frequency of blockages, reducing the length of the right-turn lane slightly is not anticipated to significantly impact operations. This improvement will require modifications and impacts to the retaining wall located on the northeast corner of the SR 2 at SR 7 intersection. For these reasons, relocating the westbound SR 2 bus stop at SR 7 closer to the intersection is recommended. Installing additional signage at the bus stop to encourage transit riders and pedestrians to cross at the intersection is recommended as a short-term improvement.

A conceptual sketch of the east leg of the SR 2 at SR 7 intersection showing the relocation of bus stops, signalization of northbound SR 7 right turns at SR 2, and the tightening of the turning radius on the southwest corner of the intersection is shown in **Figure 7**.

FIGURE 7 - SR 2 at SR 7 Proposed Improvements



SR 2 at Kirkwood Plaza

Currently, SR 2 at Kirkwood Plaza operates as a "half signal", westbound SR 2 traffic is stopped to allow eastbound SR 2 left turns into Kirkwood Plaza. Protected-permissive phasing (with flashing red arrow indications) is currently provided for eastbound SR 2 left turns. However, as part of an FRA study, protected-only left-turn phasing was recommended on the eastbound SR 2 approach to Kirkwood Plaza to reduce the potential for eastbound left-turn crashes (13 eastbound left-turn crashes were reported during the 3-year study period from 2010 to 2012). During the study period, one fatal pedestrian crash occurred at nighttime on the east leg of the intersection. Farside bus stops with moderate ridership are provided along eastbound and westbound SR 2 and no pedestrian crosswalk is provided across SR 2. Five pedestrians were observed crossing SR 2 in the vicinity of Kirkwood Plaza during pedestrian observations. The nearest signalized crosswalks are located approximately 1,500 feet west and east of SR 2 at Kirkwood Plaza at the SR 2 at SR 7 and SR 2 at Farrand Drive intersections, respectively. To improve pedestrian safety at the intersection, evaluating the impacts of converting the intersection to a full signal, installing a signalized crosswalk across SR 2, evaluating the need for intersection lighting, and considering options to improve sidewalk connectivity along the south side of SR 2 west of Kirkwood Plaza was recommended by the Pedestrian/Bicycle Safety Working Group.

Crosswalk Evaluation: Capacity analyses were performed to assess the impacts of converting the SR 2 at Kirkwood Plaza intersection into a full signal (i.e., providing eastbound left-turn, eastbound through, and westbound through signal indications; the northbound and southbound side street approaches are stop-controlled; northbound and southbound left-turning movements are prohibited) and providing a signalized crosswalk across SR 2. Analyses were performed to demonstrate the traffic impacts associated with providing a pedestrian phase that operates concurrently with the eastbound left-turn phase (Option 2), or an exclusive pedestrian phase (Option 3). For the purposes of the analyses, it was assumed that protected-only eastbound left-turn phasing will be installed (Option 1) with both Options 2 and 3. AM and PM peak hour vehicular and pedestrian volumes at the SR 2 at Kirkwood Plaza intersection were modeled using *Synchro* (HCM methodologies) software. Overall intersection level of service and delay, SR 2 mainline delays, and SR 2 mainline actuated green times were reviewed to determine the effects of the proposed crossing. The required total split for the pedestrian phase is 37 seconds. Under Option 2, the pedestrian timings can be accommodated during the eastbound SR 2 left-turn phase (currently, 62 seconds are provided during both AM and PM peak hours). Under Option 3 conditions, the eastbound SR 2 left-turn and westbound SR 2 through phases were reduced proportionally to accommodate an exclusive pedestrian phase while maintaining the existing 150-second cycle length. Despite the longer available green time provided for the phase that corresponds with the proposed pedestrian crossing of SR 2, the signal will routinely "gap out" when there is no pedestrian actuation and return the unused portion of the green time to the mainline SR 2 phases. As shown in **Table 11**, westbound SR 2 delays increase approximately 5 and 27 seconds during the AM and PM peak hours, respectively, and the average modeled green time for westbound SR 2 decreases by approximately 8 to 10 seconds with a pedestrian phase overlap and protected-only eastbound left-turn phasing (i.e., Option 2), as compared to existing conditions with protected-only eastbound left-turn phasing. Eastbound SR 2 delays increase less than 2 seconds during the AM and PM peak hours under Option 2 conditions. Similarly, westbound SR 2 delays increased approximately 9 and 38 seconds during the AM and PM peak hours, respectively, and the average modeled green time for westbound SR 2 decreased approximately 37 seconds with an exclusive pedestrian phase and protected-only eastbound left-turn phasing (i.e., Option 3), as compared to existing conditions with protected-only eastbound left-turn phasing. Eastbound SR 2 delays increase approximately 5 and 10 seconds during the AM and PM peak hours, respectively, under Option 3 conditions.

To improve pedestrian safety and to better accommodate pedestrians accessing the bus stops along eastbound and westbound SR 2, installing a signalized pedestrian crosswalk across SR 2 at Kirkwood Plaza is recommended. Installing the crosswalk across the east leg of the intersection is recommended to allow the pedestrian phase to operate concurrently with the eastbound left-turn phase (i.e., Option 2), reducing the impacts to eastbound and westbound SR 2 vehicular traffic.

Table 11 – SR 2 at Kirkwood Plaza Capacity Analyses

Scenario		Measures of Effectiveness							
		Overall Intersection		SR 2 Mainline Delays (seconds)			Actuated Green Time (seconds)		
		LOS[1]	Delay	EBT	WBT	EBL	EBT	WBT	EBL
Existing – Flashing Red Arrow indications for EB SR 2 Left Turns	AM	A	1.2	-	0.7	36.0	-	129.7	73.3
	PM	B	15.2	-	25.9	29.9	-	110.9	92.1
Option 1 – Protected-Only Left-Turn Phasing on EB SR 2	AM	A	2.3	-	0.7	77.6	-	123.1	13.9
	PM	B	17.1	-	25.9	59.4	-	106.7	30.3
Option 2 – Protected-Only Left-Turn Phasing on EB SR 2 with Overlap Pedestrian Phase	AM	A	4.5	1.2	5.5	63.7	130.8	113.3	23.7
	PM	B	18.7	1.9	29.4	47.7	130.8	98.7	38.3
Option 3 – Protected-Only Left-Turn Phasing on EB SR 2 with Exclusive Pedestrian Phase	AM	A	8.6	5.4	9.6	77.5	106.0	86.1	13.9
	PM	C	28.6	10.4	42.1	59.7	106.0	70.4	29.6
Net Difference (Option 2 – Option 1)	AM	-	+2.2	-	+4.8	-13.9	-	-9.8	+9.8
	PM	-	+1.6	-	+3.5	-11.7	-	-8	+8
Net Difference (Option 3 – Option 1)	AM	-	+6.3	-	+8.9	-0.1	-	-37	0
	PM	-	+11.5	-	+16.2	+0.3	-	-36.3	-0.7

[1] LOS – Level of Service

Lighting Evaluation: According to the *DelDOT Lighting Design Guidelines*, "locations where crash patterns indicate that lighting may reduce crashes and where the percentage of nighttime accidents is 35 percent or greater" may be lit. During the three-year study period, 10 (29 percent) of the 34 crashes reported at the SR 2 at Kirkwood Plaza intersection occurred during darkness or dawn/dusk conditions. According to the *Highway Safety Manual*, Section 14.6.2.8., "Non-injury crashes may also be reduced by installing illumination. Intersection illumination appears to have the greatest effect on fatal pedestrian nighttime crashes. However, the crash impact is unknown at this time." One fatal nighttime pedestrian crash near the SR 2 at Kirkwood Plaza intersection involved improper crossing and a non-visible pedestrian. Additionally, the *DelDOT Lighting Design Guidelines* indicate lighting may be installed "at locations where a combination of favorable factors exists and engineering judgment indicates that lighting would be useful." Farside bus stops are located along eastbound and westbound SR 2 at Kirkwood Plaza, indicating a potentially desirable location for lighting.

Nighttime lighting levels were measured to evaluate the existing lighting levels (specifically, the ambient lighting levels provided by adjacent businesses) at SR 2 at Kirkwood Plaza. Light levels were collected from 10 PM to 11 PM on Wednesday, July 16, 2014 during clear and dry weather conditions. Nighttime lighting levels indicate that the ambient lighting provided by adjacent businesses at SR 2 at Kirkwood Plaza provides sufficient lighting to adequately light the roadway. Therefore, installing intersection lighting at SR 2 at Kirkwood Plaza is not recommended at this time.

Evaluation of Elevated Landscaping Bed: Along the south side of SR 2, approximately 200 feet west of the Kirkwood Plaza signal, an elevated landscaping bed obstructs the path of a pedestrian traveling along the roadway (see **Photo 7**). The landscaping bed is surrounded by stacked wood posts, which are supported with steel beams driven into the ground. The elevated landscaping bed, which provides physical separation between the eastbound SR 2 travel lanes and Old Capitol Trail/Monica Boulevard, is approximately 31 inches wide at its narrowest point and about 30 inches tall. A sidewalk with two crossings of Old Capitol Trail/Monica Boulevard is provided on the south side of the landscaping bed. Based on field observations, the majority of pedestrians are walking along the south side of the landscaping bed and not within the eastbound SR 2 travel lanes. Additionally, there is evidence of vehicles traveling along Old Capitol Trail striking the landscaping bed.

The elevated landscaping bed is not crashworthy, is located within the clear zone, and creates a diversion for pedestrians traveling along the SR 2 corridor. As such, removing the landscaping bed and providing a crashworthy treatment and sidewalk along SR 2 is recommended. This will likely involve installing guardrail along SR 2 and/or Old Capitol Trail/Monica Boulevard and potentially narrowing the eastbound SR 2 right-turn lane approaching Old Capitol Trail to provide additional width for the guardrail and sidewalk (the existing right-turn lane is approximately 14 feet). Consideration should also be given to eliminating one of the travel lanes along Old Capitol Trail/Monica Boulevard (i.e., provide a one-way roadway segment) to provide additional width for the guardrail and sidewalk. Additional investigations are required to determine the most appropriate treatment to address the deficiency.

Photo 7 – Elevated Landscaping Bed along South Side of SR 2 west of Kirkwood Plaza (Looking West)

SR 2 at Farrand Drive

Two pedestrian and one bicycle crashes were reported on the west leg of SR 2 at Farrand Drive during the study period. In addition, one nighttime pedestrian fatal crash on the east leg of the intersection was reported after the study period, in March 2013. Signalized crossings are currently provided across the north, south, and east legs of the intersection. Farside bus stops with moderate ridership are located along eastbound and westbound SR 2 at Farrand Drive, approximately 125 feet and 380 feet, east and west of the crosswalk on the east and west legs of the intersection, respectively. Therefore, westbound transit passengers destined for locations along the south side of SR 2 theoretically must cross a minimum of two (north and east) legs of the intersection to access locations to the south. The Pedestrian/Bicycle Safety Working Group recommended performing capacity and alternative analysis to evaluate the feasibility of and impacts associated with installing a crosswalk across the west leg of SR 2 at Farrand Drive and/or relocating the westbound bus stop from the west leg to the east leg so that it is closer to the existing pedestrian crossing provided on the east leg.

Bus Stop Relocation Evaluation: Relocating the westbound SR 2 bus stop from the west leg (i.e., far side) to the east leg (i.e., near side) was considered to potentially improve pedestrian accommodations and connectivity at the bus stop. If the westbound bus stop is relocated to a location across from the eastbound bus stop, the proposed bus stop would be located within the existing westbound SR 2 right-turn lane. According to DTC's *Bus Stop and Passenger Facilities Policy,* DTC prefers farside bus stop locations to facilitate bus re-entry into the traffic flow and minimize conflicts with right-turning vehicles and pedestrians crossing the intersection. Nearside bus stops may be used when the nearside stop location provides greater safety for transit passengers and does not expose the bus to an increased risk, when there is considerably more traffic on the far side of the intersection, when the stop does not conflict with right-turning vehicles, and when there are land uses on the far side which adversely impact passenger safety and/or safe bus operations. Per an October 2010 turning movement count, there are approximately 175 westbound right-turning vehicles during the PM peak hour. Furthermore, nearside bus stops may be considered unexpected along this corridor. Consideration was also given to maintaining the farside bus stop but relocating it as close as possible to the intersection. The existing stop is located within the acceleration lane provided for southbound Farrand Drive right-turning vehicles onto westbound SR 2. Relocating the stop farther east may potentially increase conflicts with merging vehicles and stopped busses. Removing the southbound right-turn acceleration lane (the acceleration lane length is less than the AASHTO desired length) provided for southbound right turns would allow for the relocation of the westbound bus stop closer to the intersection. Per an October 2010 turning movement count there are approximately 70 southbound right-turning vehicles during both the AM and PM peak hours. For these reasons, removing the acceleration lane provided for southbound Farrand Drive right turns onto westbound SR 2 and relocating the westbound bus stop at SR 2 at Farrand Drive closer to the intersection is recommended.

West Leg Crosswalk Evaluation: A proposed crosswalk and pedestrian signal across the west leg of the intersection could operate with the southbound Farrand Drive phase to avoid conflicts with northbound left turns during the split phase. A review of turning movement volumes at the intersection from October 2010 indicate traffic volumes are higher in the PM peak hour as compared to the AM peak hour; therefore, capacity analysis was performed for the PM peak hour to assess the impacts associated with the worst-case scenario. PM peak hour vehicular and pedestrian volumes at the SR 2 at Farrand Drive intersection were modeled using *Synchro* (HCM methodologies) software. Overall intersection level of service and delay, SR 2 mainline delays, and SR 2 mainline actuated green times were reviewed to determine the effects of the proposed crossing on the west leg of the intersection. Per existing timing data provided by DelDOT, a total split (i.e., sum of green, yellow, and red times) of 20 seconds is provided for the southbound approach. The required total split with the installation of a crosswalk on the west leg of the intersection is 36 seconds, an increase of 16 seconds. Therefore, the split for the southbound Farrand Drive approach was increased to 36 seconds for the purposes of the *Synchro* analyses. To maintain the existing 150-second cycle length, the split

times for the SR 2 left-turn and through phases were reduced proportionally. Despite the longer available green time provided on the side street phases that correspond with proposed pedestrian crossings of SR 2, the signal will routinely "gap out" when there is no pedestrian actuation and return the unused portion of the green time to the mainline SR 2 phases. As shown in **Table 12**, eastbound and westbound SR 2 delays increase by approximately 9 and 114 seconds (31 and 473 percent), respectively, and the average modeled green time decreased by approximately 13 to 14 seconds (20 to 21 percent).

Table 12 – SR 2 at Farrand Drive Capacity Analyses

Scenario		Measures of Effectiveness					
		Overall Intersection		SR 2 Mainline Delays (seconds)		Actuated Green Time (seconds)	
		LOS[1]	Delay	EBT	WBT	EBT	WBT
Base Conditions	PM	F	122.2	29.3	24.2	66.4	66.8
With West Leg Ped Crossing (Existing Ped Demand)	PM	F	174.1	38.5	138.6	53.0	53.0
Net Difference	PM	-	+51.9	+9.2	+114.4	-13.4	-13.8

[1] LOS – Level of Service

During September/October 2013 pedestrian counts, 3 pedestrians in an hour were observed crossing SR 2 near the existing westbound bus stop. Although existing pedestrian demand does not indicate a desire to cross on the west leg of the SR 2 at Farrand Drive intersection, there may be latent demand for pedestrian crossings. No pedestrian and bicycle-related crashes were reported during the study period after June 2008 and the two pedestrian crashes and one bicycle crash that occurred prior to June 2008 involved unique behaviors (e.g., impaired pedestrian, road rage, etc.) on the part of the pedestrian or bicyclist (see **Figures 2-4** for additional details). Due to the potential for significant impacts to traffic along eastbound and westbound SR 2, installation of a crosswalk on the west leg of SR 2 at Farrand Drive is not recommended at this time. Installing additional signage at the eastbound and westbound bus stops to encourage transit riders and pedestrians to cross at the intersection is recommended.

SR 2 at Duncan Road

During the study period, there were five pedestrian crashes in the vicinity of SR 2 at Duncan Road, including one fatal pedestrian crash, which occurred on the east leg of the intersection. In addition, one fatal pedestrian crash occurred after the study period, in November 2013. Signalized crossings are currently provided along the east and south legs of the intersection. Farside bus stops with relatively low ridership are provided along eastbound and westbound SR 2 at Duncan Road, approximately 180 feet and 265 feet, east and west of the crosswalk on the east leg of the intersection, respectively. Therefore, westbound transit passengers destined for locations along the south side of SR 2 theoretically must cross a minimum of two (north and east) legs of the intersection to access locations to the south. A Royal Farms gas station and convenience store opened in May 2014 was anticipated to generate pedestrian traffic. Therefore, additional turning movement and pedestrian counts were performed in June 2014. The Pedestrian/Bicycle Safety Working Group suggested performing capacity and alternative analysis to install a crosswalk on the west leg or relocate the westbound bus stop from the west leg to the east leg of the intersection. Installing a crosswalk across the north leg of the intersection was also recommended (traffic impacts associated with this improvement are anticipated to be minimal and therefore were not analyzed). In addition, evaluating the need for intersection lighting was recommended.

Bus Stop Relocation Evaluation: Relocating the westbound SR 2 bus stop from the west leg (i.e., far side) to the east leg (i.e., near side) was considered to potentially improve pedestrian accommodations and connectivity to the bus stop. Currently, the existing westbound bus stop is located on the far side of the intersection near the end of a short acceleration lane provided for southbound Duncan Road right turns onto westbound SR 2. If the westbound bus stop is relocated to a location across from the eastbound bus stop, the proposed bus stop would be located within the existing westbound SR 2 shared through/right-turn lane, which may increase the potential for conflicts. During the June 3, 2014 turning movement count, 38 and 138 westbound right-turning vehicles were observed during the AM and PM peak hours, respectively. According to DTC's *Bus Stop and Passenger Facilities Policy,* DTC prefers farside bus stop locations to facilitate bus re-entry into the traffic flow and minimize conflicts with right-turning vehicles and pedestrians crossing the intersection. Nearside bus stops may be used when the nearside stop location provides greater safety for transit passengers and does not expose the bus to an increased risk, when there is considerably more traffic on the far side of the intersection, when the stop does not conflict with right-turning vehicles, and when there are land uses on the far side which adversely impact passenger safety and/or safe bus operations. Additionally, the existing westbound bus stop is located in front of the recently opened Royal Farms, which is likely to generate significant pedestrian traffic in the area. Furthermore, nearside bus stops may be considered unexpected along this corridor.

Relocating the bus stop farther east toward the existing crosswalk and the yield point for southbound right-turning vehicles may create an undesirable conflict between stopped buses and southbound right-turning vehicles in the acceleration lane. During the June 3, 2014 turning movement count, 86 and 99 southbound right-turning vehicles were observed during the AM and PM peak hours, respectively. Removing the southbound right-turn acceleration lane (the acceleration lane length is less than the AASHTO desired length) would allow for the relocation of the westbound bus stop closer to the intersection. For these reasons, removing the acceleration lane provided for southbound Duncan Road right turns onto westbound SR 2 and relocating the westbound bus stop at SR 2 at Duncan Road closer to the intersection is recommended.

West Leg Crosswalk Evaluation: Traffic volumes for the capacity analyses were obtained from a turning movement count completed at SR 2 at Duncan Road on Tuesday, June 3, 2014 (i.e., following the opening of the Royal Farms and prior to the end of the school year). The proposed crosswalk across the west leg of the intersection would operate concurrently with the southbound Duncan Road phase. Peak hour vehicular and pedestrian volumes at the SR 2 at Duncan Road intersection were modeled using *Synchro* (HCM methodologies) software. Overall intersection level of service and delay, SR 2 mainline delays, and SR 2 mainline actuated green times were reviewed to determine the effects of the proposed crossing on the west leg of the intersection. Per existing timing data provided by DelDOT, a total split (i.e., sum of green, yellow, and red times) of 29 seconds is provided for the southbound approach. The required total split with the installation of a crosswalk on the west leg of the intersection is 38 seconds, an increase of 9 seconds. Therefore, the split for the southbound Duncan Road approach was increased to 38 seconds for the purposes of the *Synchro* analyses. To maintain the existing 150-second cycle length, eastbound and westbound SR 2 phases were reduced by 9 seconds. Despite the longer available green time provided on the side street phases that correspond with proposed pedestrian crossings of SR 2, the signal will routinely "gap out" when there is no pedestrian actuation and return the unused portion of the green time to the mainline SR 2 phases. As shown in **Table 13,** eastbound SR 2 delays increase by approximately 59 and 3 seconds (175 and 9 percent) during the AM and PM peak hours, respectively. Similarly, westbound SR 2 approach delays increase by approximately 4 and 141 seconds (8 and 77 percent) during the AM and PM peak hours, respectively. The actuated green time for eastbound and westbound SR 2 decreases approximately 9 to 10 seconds during both peak hours.

Installing concurrent phasing on the northbound and southbound Duncan Road approaches to SR 2 to potentially minimize the impacts to vehicular traffic along SR 2 with the installation of a signalized crosswalk across the west leg of the intersection was considered. Existing traffic volumes at SR 2 at Duncan Road were reviewed and indicate very minor improvements in Critical Movement Summation volumes associated with concurrent phasing as compared to split phasing (assuming existing lane configurations). Concurrent phasing with permissive left-turning movements may create the potential for left-turn crashes (and providing left-turn lanes is not feasible within the existing right-of-way). Projected left-turn/through 95th-percentile queue lengths with concurrent phasing on the northbound and southbound Duncan Road approaches are approximately 415 and 400 feet, respectively (i.e., projected queues would extend beyond the existing turn lanes and the Panera Bread driveway located approximately 225 feet south of the intersection and the Royal Farms driveway located approximately 350 feet north of the intersection). For these reasons, installing concurrent phasing on the northbound and southbound Duncan Road approaches to SR 2 is not recommended at this time.

Due to the significant impacts to traffic along eastbound and westbound SR 2, installing a crosswalk across the west leg of SR 2 at Duncan Road is not recommended at this time. Additionally, while westbound transit passengers destined for locations along the south side of SR 2 theoretically must cross a minimum of two (north and east) legs of the intersection to access locations to the south, the north leg of the intersection consists of a relatively short crossing distance. As previously noted, the addition of a crosswalk on the north leg of the intersection is recommended and will not impact operations at the intersection.

Table 13 – SR 2 at Duncan Road Capacity Analyses

Scenario		Measures of Effectiveness					
		Overall Intersection		SR 2 Mainline Delays (seconds)		Actuated Green Time (seconds)	
		LOS[1]	Delay	EBT	WBT	EBT	WBT
Base Conditions	AM	F	240.0	33.8	44.5	66.3	61.1
	PM	F	204.6	36.3	184.7	60.4	55.4
With West Leg Ped Crossing (Existing Ped Demand)	AM	F	269.8	92.8	48.1	57.3	52.1
	PM	F	275.9	39.5	326.1	50.9	45.9
Net Difference	AM	-	+29.8	+59	+3.6	-9	-9
	PM	-	+71.3	+3.2	+141.4	-9.5	-9.5

[1] Level of Service

Lighting Evaluation: According to the *DelDOT Lighting Design Guidelines*, "locations where crash patterns indicate that lighting may reduce crashes and where the percentage of nighttime accidents is 35 percent or greater" may be lit. During the three-year study period, 16 (32 percent) of the 50 crashes at SR 7 at Duncan Road occurred during darkness/dawn/dusk conditions. According to the *Highway Safety Manual*, Section 14.6.2.8., "Non-injury crashes may also be reduced by installing illumination. Intersection illumination appears to have the greatest effect on fatal pedestrian nighttime crashes. However, the crash impact is unknown at this time." Three nighttime pedestrian crashes occurred in the vicinity of the intersection; however, none were fatal. Additionally, the *DelDOT Lighting Design Guidelines* indicate lighting may be installed "at locations where a combination of favorable factors exists and engineering judgment indicates that lighting would be useful." Farside bus stops are located along eastbound and westbound SR 2 at Duncan Road, indicating a potentially desirable location for lighting.

Nighttime lighting levels were measured to evaluate the existing lighting levels (specifically, ambient lighting from adjacent businesses) at SR 2 at Duncan Road. Light levels were collected from 10 PM to 11 PM on Wednesday, July 16, 2014 during clear and dry weather conditions. Nighttime lighting levels confirm that the existing ambient lighting provided by adjacent businesses at SR 2 at Duncan Road provides some lighting on the roadway, with the exception of the southbound right turn acceleration lane. Leased lighting could be installed on utility poles to supplement the existing lighting at the intersection. For these reasons, installing intersection lighting at SR 2 at Duncan Road is recommended.

SR 2 at Greenbank Road

Eastbound and westbound SR 2 bus stops with moderate ridership are provided west of Greenbank Road. During the study period, no pedestrian or bicycle crashes were reported in the vicinity of SR 2 at Greenbank Road; however, school-aged children were observed crossing SR 2 in the area (a maximum of eight pedestrians per hour were observed crossing SR 2 near Greenbank Road). As such, the group recommended performing educational outreach to the nearby Anna P. Mote Elementary School regarding pedestrian safety to and from school. In addition, the group discussed the potential for installing a pedestrian hybrid beacon in the vicinity of the intersection. A preliminary evaluation indicated that existing pedestrian volumes do not meet the warrants outlined in the *2011 DE MUTCD* and there is poor sight distance along eastbound SR 2 approaching the potential crossing location due to a crest vertical curve located west of Greenbank Road. For these reasons, pursing a pedestrian hybrid beacon was not considered further.

SR 2 at SR 41

Pedestrian improvements, including signalized pedestrian crosswalks were installed in May 2011 at SR 2 at SR 41 across the north, south, and west legs of the intersection. The two pedestrian crashes and two bicycle crashes reported during the study period occurred prior to these improvements; however, three of the four crashes occurred during darkness. A farside bus stop with relatively low ridership is provided along westbound SR 2 at SR 41. Minimal pedestrian activity was observed and no bus stops are located on the east leg of the intersection. The Pedestrian/Bicycle Safety Working Group recommended that a lighting evaluation for the intersection be performed.

Lighting Evaluation: According to the *DelDOT Lighting Design Guidelines*, intersections of two Delaware Routes should be lit. Additionally, "locations where crash patterns indicate that lighting may reduce crashes and where the percentage of nighttime accidents is 35 percent or greater" may be lit. During the three-year study period, 21 (31 percent) of the 68 total crashes at the SR 2 and SR 41 intersection occurred during darkness/dawn/dusk conditions. Due to the requirement that two Delaware Routes should be lit, and in response to the two nighttime pedestrian/bicycle crashes at the intersection, installing lighting at SR 2 at SR 41 is recommended.

SR 2 at Albertson Boulevard

During the study period, two nighttime pedestrian crashes were reported at the intersection, including one crash involving a pedestrian that was struck while walking within the crosswalk on the north leg. Eastbound and westbound SR 2 bus stops are provided on the east leg of the intersection and ridership is relatively low except for moderate alighting volumes at the westbound bus stop. Currently, signalized crosswalks are provided across the east and north legs of the intersection and lighting is provided on all four corners of the intersection. During the bus/walking tour, the Pedestrian/Bicycle Safety Working Group recommended that several improvements in the vicinity of SR 2 at Albertson Boulevard be evaluated, including:

- Installing a crosswalk on the south leg of the intersection and extending the curb and sidewalk on the southwest corner of the intersection adjacent to the fire station
- Channelizing the westbound SR 2 right-turn movement (to reduce the crossing distance for pedestrians across the north and east legs of the intersection)

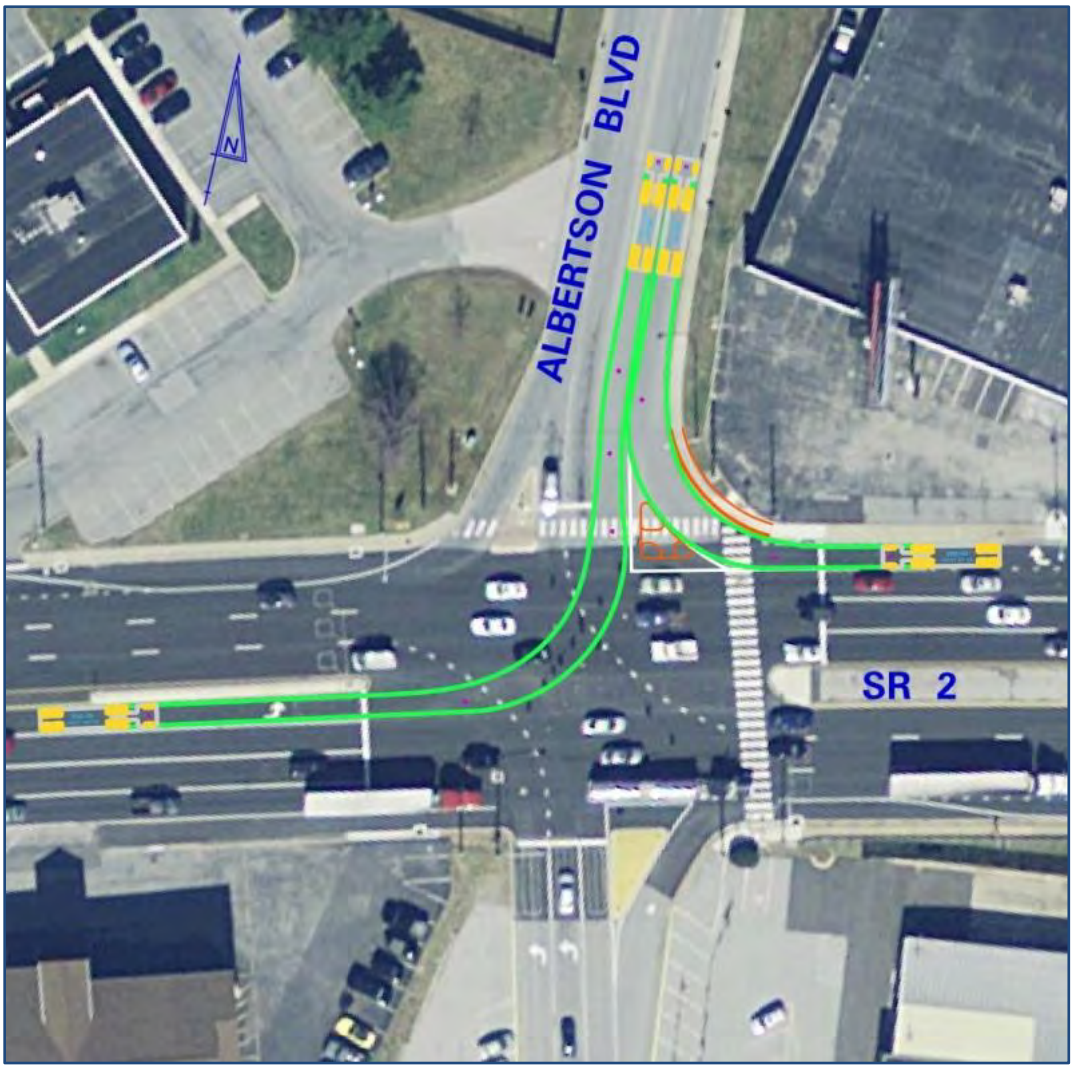
Additionally, consideration was given to installing a signalized crosswalk across the west leg of SR 2 at Albertson Boulevard. However, there are no bus stops near the west leg and minimal pedestrian activity was observed crossing SR 2 in the vicinity of this location that would be served by a crosswalk. With the installation of a signalized crosswalk on the south leg of the intersection, connectivity to the east leg crosswalk will be provided on both the north and south sides of SR 2. No southbound through movements are accommodated at the intersection; therefore, northbound left turns do not conflict with an opposing through movement during the side street portion of the signal. As such, installing a pedestrian crossing across the west leg of the intersection will require providing an exclusive pedestrian phase, which would significantly impact capacity along SR 2 when the west leg pedestrian crossing would be actuated as compared to existing conditions. For these reasons, pursuing the installation of a crosswalk on the west leg of SR 2 at Albertson Boulevard was not evaluated further.

South Leg Crosswalk Evaluation: Currently, sidewalk is generally provided along the south side of SR 2 from SR 41 to SR 141 except for an approximately 400-foot section west of Albertson Boulevard in front of the Cranston Heights Fire Company No. 1 building and across the south leg of SR 2 at Albertson Boulevard. Therefore, evaluating the impacts of installing sidewalk in front of the fire station building and installing a crosswalk across the south leg of SR 2 at Albertson Boulevard was recommended to improve sidewalk connectivity in the area. Currently, a continuous asphalt pavement surface is provided in front of the fire station which provides a walking path; however, the path is not delineated from the parking lot. It is necessary to maintain a flush driving surface for fire department vehicles; therefore, installing a traditional raised concrete sidewalk is not feasible. As such, installing a sidewalk using flush concrete, colored pavement, stamped asphalt, or high-friction overlay is recommended. Coordination with Cranston Heights Fire Company is required prior to implementing these improvements.

The proposed signalized crosswalk across the south leg of SR 2 at Albertson Boulevard would operate during the eastbound SR 2 phase (i.e., mainline phase) and minimal to no impacts to capacity are anticipated due to the proposed crosswalk and pedestrian signal across the south leg of SR 2 at Albertson Boulevard. Additionally, the south leg of the intersection is one-way northbound; therefore, there would be no pedestrian-vehicle conflict points with eastbound SR 2 right-turning vehicles, westbound left-turning vehicles, and southbound through vehicles. For these reasons, installing a signalized crosswalk across the south leg of SR 2 at Albertson Boulevard is recommended (the channelizing island provided on the southeast corner of the intersection needs to be reconstructed to provide an ADA-compliant pathway).

Westbound SR 2 Right-Turn Channelization Evaluation: Channelizing the westbound SR 2 right-turning movement at Albertson Boulevard was considered to reduce the distance required for a pedestrian to cross the north and east legs of the SR 2 at Albertson Boulevard intersection. As shown in **Figure 8**, channelizing the westbound right-turning movement will require relocating the east leg crosswalk. As previously noted, installing a signalized crosswalk across the south leg of the intersection is recommended, so this corner of the intersection, in theory, will be modified to accommodate this improvement. Two northbound receiving lanes are not required on the north leg of the intersection based on existing lane configurations at the intersection (i.e., one northbound through lane and one eastbound left-turn lane). For these reasons, installing a channelizing island on the northeast corner of SR 2 at Albertson Boulevard is recommended.

Figure 8 – SR 2 at Albertson Boulevard Concept



SR 2 at Prices Corner

Currently, SR 2 at Prices Corner operates as a "half signal"; eastbound SR 2 traffic is stopped to allow westbound SR 2 left turns into Prices Corner shopping center; however, westbound through traffic does not stop. During the study period, three bicycle and one pedestrian crash were reported in the vicinity of the SR 2 at Prices Corner entrance (all four crashes occurred prior to August 2009). Bus stops are provided along eastbound and westbound SR 2 approximately 300 feet east of the SR 2 at Prices Corner traffic signal. Currently, no signalized crossing is provided across SR 2 at the intersection. Eleven pedestrians were observed crossing SR 2 in the vicinity of Prices Corner during pedestrian observations. The nearest signalized crosswalks are located approximately 450 feet west of Prices Corner at Albertson Boulevard (no SR 2 crossing is located east of Prices Corner). The Pedestrian/Bicycle Safety Working Group recommended that the following improvements be evaluated:

- Converting the existing "half signal" to a full signal at SR 2 at Prices Corner and install a signalized crosswalk across SR 2 (includes relocating bus stops closer to the proposed crossing)
- Relocating the eastbound SR 2 right-turning movement into Prices Corner Shopping Center upstream to Albertson Boulevard
- Consolidating driveways along the north side of SR 2 to reduce access points

Crosswalk Evaluation: Capacity analyses were performed to assess the impacts of converting the SR 2 at Prices Corner intersection to a full signal (i.e., providing westbound left-turn, eastbound through, and westbound through signal indications) and providing a signalized crosswalk across SR 2. Analyses were performed to demonstrate the impacts associated with installing a pedestrian phase that overlaps with the westbound left-turn phase (Option 1) and an exclusive pedestrian phase (Option 2). AM and PM peak hour vehicular and pedestrian volumes at the SR 2 at Prices Corner intersection were modeled using *Synchro* (HCM methodologies) software. Overall intersection level of service and delay, SR 2 mainline delays, and SR 2 mainline actuated green times were review to determine the effects of the proposed crossing on the west leg of the intersection. The required total split for the pedestrian phase is 37 seconds. Under Option 1, the pedestrian timings can be accommodated under the westbound SR 2 left-turn phase (currently, 50 seconds are provided during both the AM and PM peak hours). Under Option 2, the split times for the westbound SR 2 left-turn and eastbound SR 2 through phases were reduced proportionally to maintain the existing 150-second cycle length. Despite the longer available green time provided for the phases that correspond with proposed pedestrian crossing of SR 2, the signal will routinely "gap out" when there is no pedestrian actuation and return the unused portion of the green time to the mainline SR 2 phases. As shown in **Table 14**, eastbound SR 2 delays increased approximately 47 and 3 seconds during the AM and PM peak hours, respectively, and the average modeled green time for eastbound SR 2 decreased approximately 14 and 9 seconds, respectively, with a pedestrian overlap phase (i.e., Option 1), as compared to existing conditions. Westbound left-turn delays decreased by approximately 29 to 30 seconds during the AM and PM peak hours and the average modeled green time for westbound left turns increased by approximately 14 and 9 seconds during the AM and PM peak hours, respectively. Projected westbound through delays (currently there is no delay for this movement) are approximately 5 and 13 seconds during the AM and PM peak hours, respectively, with a pedestrian overlap phase (i.e., Option 1). Similarly, eastbound SR 2 delays increased approximately 182 and 52 seconds during the AM and PM peak hours, respectively, and the average modeled green time for eastbound SR 2 decreased approximately 37 and 34 seconds, respectively with an exclusive pedestrian phase (i.e., Option 2), as compared to existing conditions. Westbound left-turn delays increased approximately 0 and 21 seconds during the AM and PM peak hours, respectively, and the average modeled green time for westbound left turns was relatively unchanged. Projected westbound through delays (currently there is no delay for this movement) are approximately 14 and 53 seconds during the AM and PM peak hours, respectively, with an exclusive pedestrian phase (i.e., Option 2).

Installing an exclusive pedestrian phase at SR 2 at Prices Corner intersection has significant impacts to capacity on eastbound and westbound SR 2 vehicular traffic. However, installing a pedestrian phase that operates concurrently with the westbound left-turn phase reduces the magnitude of impacts to SR 2 mainline traffic. For these reasons, converting the SR 2 at Prices Corner traffic signal from a "half" signal to a "full" signal and providing a pedestrian overlap phase is recommended.

Additionally, relocating the existing eastbound and westbound SR 2 bus stops closer to the proposed signalized crosswalk is recommended. Relocating the SR 2 bus stops at Prices Corner to the west will create closely spaced bus stops at Albertson Boulevard and Prices Corner. As such, pending discussions with DTC, consolidating the two eastbound bus stops and the two westbound bus stops in the vicinity of SR 2 at Albertson Boulevard and Prices Corner should be considered in conjunction with the installation of a signalized crosswalk at SR 2 at Prices Corner.

Table 14 – SR 2 at Prices Corner Capacity Analyses

Scenario		Measures of Effectiveness							
		Overall Intersection		SR 2 Mainline Delays (seconds)			Actuated Green Time (seconds)		
		LOS[1]	Delay	EBT	WBT	WBL	EBT	WBT	WBL
Base Conditions	AM	B	17.3	26.0	-	84.2	126.1	-	11.9
	PM	B	13.2	23.3	-	80.2	103.7	-	34.3
Option 1 – Overlap Pedestrian Phase	AM	D	47.1	72.6	5.0	55.3	112.3	125.6	25.7
	PM	B	16.4	19.9	12.6	52.8	95.1	125.6	42.9
Option 2 – Exclusive Pedestrian Phase	AM	F	133.4	207.5	14.1	84.2	89.1	107.0	11.9
	PM	E	59.9	75.6	52.5	101.1	70.2	107.0	30.8
Net Difference (Option 1 - Base)	AM	-	+29.8	+46.6	-	-28.9	-13.8	-	+13.8
	PM	-	+3.2	-3.4	-	-27.4	-8.6	-	+8.6
Net Difference (Option 2 - Base)	AM	-	+116.1	+181.5	-	0	-37	-	0
	PM	-	+46.7	+52.3	-	+20.9	-33.5	-	-3.5

[1] LOS – Level of Service

Eastbound SR 2 Ingress Movement into Prices Corner Shopping Center Assessment: Relocating the eastbound SR 2 right-turning movement into Prices Corner Shopping Center upstream to opposite Albertson Boulevard was considered to eliminate a conflict between "free" right-turning vehicles and pedestrians crossing the south leg of the SR 2 at Prices Corner intersection. Currently, the south leg of the SR 2 at Albertson Boulevard intersection serves northbound (i.e., egress) movements only. Therefore, installing a receiving lane for eastbound right turns would require modifying the one-way northbound operation opposite Albertson Boulevard to a two-way operation and potentially impacting a light pole and signal pole on the southeast corner of the intersection to provide an appropriate turning radius. Any changes would require coordination with Prices Corner Shopping Center due to changes to circulation within the parking lot. For these reasons, relocating the eastbound right-turning movement into Prices Corner to Albertson Boulevard is not recommended at this time; however, this improvement should be considered as part of a future redevelopment or capital improvement project.

Access Management Assessment: Currently, there are eight driveways located along the north side of SR 2 within an approximately 1,000-foot area from Albertson Boulevard to the Centerville Road overpass. These driveway serve a bowling alley, tire store, car wash, Arby's restaurant, Rite Aid, and Pep Boys. In addition to access along westbound SR 2, access to these businesses is provided in the rear of the parking lot, along Greenbank Road. Consolidating the SR 2 driveways to improve pedestrian and bicycle facilities and connectivity along the north side of SR 2 was considered. Reducing the number of driveways will reduce the number of conflict points between right-turning vehicles and pedestrians. During the study period, two crashes were reported involving bicyclists and right-turning vehicles in this area. Developing a final plan for consolidating these driveways will require coordination with multiple property and business owners. However, the following should be considered as part of a long-term redevelopment for these properties:

- Consolidate the two Rite Aid driveways and two Pep Boys driveways into a single right-in/right-out driveway located east of the Prices Corner traffic signal
- Consolidate the Arby's and Prices Corner Car Wash driveways into a single right-in/right-out driveway on the north leg of the SR 2 at Prices Corner traffic signal
- Consolidate the AMF Price Lanes and Just Tires driveways into a right-in only access point along westbound SR 2 (egress movements can be provided along Greenbank Road)

SUMMARY OF RECOMMENDATIONS

A summary of recommended improvements along SR 2 from St. James Church Road to SR 141 are shown in **Table 15**. It should be noted that pushbuttons at the eight signalized intersections along the study corridor were inventoried and tested in October 2013 to identify any issues with functionality, placement, and operations. DelDOT Traffic was notified of any immediate deficiencies (e.g., a push button being stuck in the depressed position, push buttons actuating the wrong pedestrian crossing, etc.).

Recommendations are categorized as short-term, mid-term, and long-term improvements. Generally, mid-term and long-term recommendations require design efforts and coordination between multiple stakeholders. Therefore, these improvements have been prioritized based on a review of pedestrian crash history, pedestrian frequency, and transit ridership to prioritize resources (mid-term and long-term improvements were prioritized separately). Short-term improvements have not been prioritized, as it is assumed these can be accomplished relatively quickly without significant design efforts).

Table 15 – Summary of Recommendations

Priority	Recommendation
	General
Short-Term	• Coordinate with Delaware State Police to create a "cheat sheet" for the types of information to include in a pedestrian crash report and incorporate this information into DELJIS E-Crash training • Establish a working group (including a DelDOT Traffic Safety Engineer) to coordinate aspects of both new and old bus stop locations (*requires coordination with DTC*) • Enhance the current *Bus Stop and Passenger Facilities Policy* (DTC-05) to incorporate and improve pedestrian safety (*requires coordination with DTC*) • Develop pedestrian safety advertisements to install at bus stop shelters, specifically at high ridership locations (*requires coordination with DTC*) • Develop and distribute questionnaires to transit riders along the SR 2 study corridor to gather feedback about pedestrian safety and facilities to better identify the topics needing further public outreach (*requires coordination with DTC*) • Develop a pedestrian safety-related questionnaire to distribute to customers at Delaware DMV sites regarding pedestrian safety and pedestrian signal operations (the questionnaire should be designed with the goal of determining what Delaware residents know about pedestrian safety and signals) • Investigate the feasibility of providing prerecorded audio messages on buses directing pedestrians to cross at designated crosswalks *(requires further discussion with DTC)*.
	Corridor-Wide
Short-Term	• Replace/install directional arrows on pedestrian pushbuttons where missing. • Consider utilizing audible messages on DART buses along the corridor to emphasize safe crossing (*requires coordination with DTC*) • Repair/replace guardrail end treatment along eastbound SR 2 at Evelyn Drive • Perform a full lighting evaluation along the corridor to identify the need for additional lighting
Mid-Term (Priority 9)	• Install lighting along SR 2 from St. James Church Road/Griffin Drive to the SR 141 interchange, as identified in the proposed lighting evaluation
Long-Term (Priority 2)	• As part of future projects such as pavement and rehabilitation, install ADA-compliant curb ramps and sidewalks throughout the corridor (see ADA Inventory, **Figure 5**)
Long-Term (Priority 3)	• As part of future projects, install lighting at all bus stop locations along the corridor (*requires coordination with DTC*)
Long-Term (Priority 5)	• Consider reducing the number and frequency of access points along the study corridor as part of any future redevelopment
	SR 2 at St. James Church Road/Griffin Drive
Short-Term	• Install a signalized crosswalk across the south leg of SR 2 at St. James Church Road/Griffin Drive *(to be included as part of Contract T201206110)*
Mid-Term (Priority 10)	• Install a signalized crosswalk across the west leg of SR 2 at St. James Church Road/Griffin Drive (potentially includes removal of the channelizing island located on the northwest corner of the intersection and realigning the crossing on the north leg)

Priority	Recommendation
SR 2 at Old Capitol Trail/Midway Plaza Shopping Center driveway	
Short-Term	• Install ADA-compliant curb ramps along the south side of SR 2 at Old Capitol Trail *(to be included as part of Contract T201206110)* • Replace the faded crosswalks on the north and south legs of SR 2 at Old Capitol Trail/Midway Plaza Shopping Center driveway *(to be included as part of Contract T201206110)*
Mid-Term (Priority 5)	• Pursue installing a pedestrian hybrid beacon on SR 2 at Old Capitol Trail/Midway Plaza driveway (requires coordinating the beacon with adjacent traffic signals)
SR 2 at SR 7	
Short-Term	• Install 36-inch Pedestrian (W11-1) warning signs with Downward Diagonal (W16-7P) plaques on the northbound SR 7 approach to SR 2 across the right-turn lane *(to be included as part of Contract T201206110)* • Repair the deteriorating sidewalk along the south side of SR 2 east and west of SR 7*(to be included as part of Contract T201206110)* • Reduce the 1-inch vertical elevation difference at the sidewalk joint located along the south side of SR 2 west of SR 7 *(to be included as part of Contract T201206110)* • Install Keep Right (R4-7) signs at SR 2 at SR 7 in accordance with *2011 DE MUTCD* Figure 2B-16 *(to be included as part of Contract T201206110)* • Remove the SHARE THE ROAD plaque posted on westbound SR 2 west of SR 7 *(to be included as part of Contract T201206110)* • Install No Pedestrian Crossing (R9-3a) and Use Crosswalk (R9-3bP) signs at the eastbound and westbound SR 2 bus stops located east of SR 7 to emphasize use of marked crosswalks at the SR 2 at SR 7 intersection • Remove the business signs located on the southeast corner that obstruct sight lines to the pedestrian crosswalk on the southeast corner of the SR 2 at SR 7 intersection (*requires coordination with businesses*)
Mid-Term (Priority 1)	• Signalize the northbound SR 7 right-turning movement at SR 2and tighten the turning radius on the southeast corner of the SR 2 at SR 7 intersection (as part of the design phase, providing an overlap with westbound SR 2 left turns and prohibiting the westbound U-turning movement to avoid conflicts between westbound U-turning vehicles and northbound right-turning vehicles should be considered). In addition, relocate the existing eastbound and westbound SR 2 bus stops closer to the SR 7 intersection (relocating the bus stops will require constructing/relocating the curb and sidewalk along both sides of the roadway and impacts the retaining wall along the north side of the roadway).
SR 2 at Kirkwood Plaza	
Mid-Term (Priority 6)	• Install protected-only left-turn phasing on the eastbound SR 2 approach to Kirkwood Plaza *(as recommended as part of DelDOT's FRA program)*
	• Install a signalized crosswalk across SR 2 at the SR 2 at Kirkwood Plaza intersection (operating the pedestrian phase concurrently with the eastbound left-turn phase is recommended to reduce the impacts to westbound SR 2 vehicular traffic)

Priority	Recommendation
Mid-Term (Priority 11)	• Investigate alternatives to remove the landscaping bed along the south side of SR 2, approximately 200 feet west of the Kirkwood Plaza signal to provide sidewalk and a crashworthy treatment to separate eastbound SR 2 traffic from Old Capitol Trail/Monica Boulevard traffic
SR 2 at Farrand Drive	
Short-Term	• Install No Pedestrian Crossing (R9-3a) and Use Crosswalk (R9-3bP) signs at the eastbound and westbound SR 2 bus stops located on the far side of Farrand Drive to encourage transit riders and pedestrian to cross at the intersection
Mid-Term (Priority 8)	• Remove the acceleration lane provided for southbound Farrand Drive right turns onto westbound SR 2 and relocate the existing westbound SR 2 bus stop closer to the SR 2 at Farrand Drive intersection
SR 2 at Duncan Road	
Short-Term	• Install a signalized crosswalk across the north leg of SR 2 at Duncan Road • Install intersection lighting at the SR 2 at Duncan Road intersection • Install No Pedestrian Crossing (R9-3a) and Use Crosswalk (R9-3bP) signs at the eastbound and westbound SR 2 bus stops located on the far side of Duncan Road to encourage transit riders and pedestrian to cross at the intersection
Mid-Term (Priority 2)	• Remove the acceleration lane provided for southbound Duncan Road right turns onto westbound SR 2 and relocate the existing westbound SR 2 bus stop closer to the SR 2 at Duncan Road intersection
Long-Term (Priority 1)	• Replace the concrete along the north side of SR 2 adjacent to the Shell gas station located on the northeast corner of SR 2 at Duncan Road with ADA-compliant sidewalk • Install sidewalk along both sides of Duncan Road from SR 2 to the Anna P. Mote Elementary School driveway located approximately 650 feet north of SR 2. • Install sidewalk connections along the east side of Duncan Road south of SR 2 to tie into the existing sidewalk located approximately 325 feet south of SR 2
SR 2 at Greenbank Road	
Short-Term	• As part of the Safe Routes to School program, perform educational outreach to Anna P. Mote Elementary School regarding pedestrian safety to and from school • Install school warning signs adjacent to Anna P. Mote Elementary School
SR 2 at SR 41	
Mid-Term (Priority 3)	• Install intersection lighting at SR 2 at SR 41
SR 2 at Albertson Boulevard	
Short-Term	• Remove the shrubbery located on the southeast corner of SR 2 at Albertson Boulevard obstructing sight lines between northbound right-turning vehicles and pedestrians crossing the east leg of the intersection

Priority	Recommendation
Mid-Term (Priority 7)	• Install a flush sidewalk along the south side of SR 2 in front of the Cranston Heights Fire Company No. 1 building located on the southwest corner of SR 2 at Albertson Boulevard • Install a signalized crosswalk on the south leg of SR 2 at Albertson Boulevard (the channelizing island provided on the southeast corner of the intersection needs to be reconstructed to provide an ADA-compliant pathway) • Install a channelizing island on the northeast corner of SR 2 at Albertson Boulevard for westbound right turns (requires modifying the existing signalized crosswalks on the north and east legs of the intersection)
SR 2 at Prices Corner	
Short-Term	• Install ADA-compliant curb ramps along eastbound and westbound SR 2 in the vicinity of Prices Corner
Mid-Term (Priority 4)	• Install a signalized crosswalk across the west leg of the SR 2 at Prices Corner intersection (operate the pedestrian phase concurrently with the westbound left-turn phase to reduce the impacts to SR 2 vehicular traffic) and consider consolidating the two eastbound bus stops and the two westbound bus stops along SR 2 at Albertson Boulevard and Prices Corner (*requires coordination with DTC*)
Long-Term (Priority 4)	• As part of future redevelopment, consolidate access points and driveways along the north side of SR 2 from Albertson Boulevard to the SR 141 interchange
Long-Term (Priority 6)	• Relocating the eastbound right-turning movement into Prices Corner to Albertson Boulevard should be considered as part of future redevelopment or capital improvement project

Appendix
Traffic Counts

PASSENGER CAR TURNING MOVEMENT COUNT - SUMMARY

Intersection of: SR 2
and: St James Church Rd
Location: New Castle Co., DE

Counted by: VCU
Date: November 8, 2012
Weather: Cloudy/Warm
Entered by: RB

Day: Thursday

TIME	TRAFFIC FROM NORTH on: St James Church Rd					TRAFFIC FROM SOUTH on: St James Church Rd					TRAFFIC FROM EAST on: SR 2					TRAFFIC FROM WEST on: SR 2					TOTAL N + S + E + W
	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	
AM																					
6:00-6:15	3	0	4	0	7	6	1	2	0	9	0	53	7	0	60	8	92	3	2	105	181
6:15-6:30	2	3	4	0	9	6	2	0	0	8	2	58	5	1	66	15	178	6	2	201	284
6:30-6:45	5	0	5	0	10	12	1	10	0	23	0	92	9	1	102	25	230	5	5	265	400
6:45-7:00	3	6	6	0	15	18	6	9	0	33	1	104	7	1	113	21	262	6	3	292	453
7:00-7:15	5	7	8	0	20	21	5	17	0	43	0	124	20	4	148	29	286	7	11	333	544
7:15-7:30	6	4	12	0	22	15	6	22	0	43	2	157	22	4	185	41	370	8	11	430	680
7:30-7:45	17	11	7	0	35	23	7	10	0	40	4	205	19	4	232	39	291	12	6	348	655
7:45-8:00	6	7	13	0	26	25	3	13	0	41	3	191	18	4	216	34	277	14	3	328	611
8:00-8:15	6	10	8	0	24	15	5	12	0	32	3	180	18	9	210	26	269	9	2	306	572
8:15-8:30	7	6	10	0	23	14	7	19	0	40	2	188	21	15	226	25	257	8	5	295	584
8:30-8:45	7	3	5	0	15	25	3	22	0	50	4	227	23	7	261	24	308	8	6	346	672
8:45-9:00	19	4	6	0	29	19	4	14	0	37	3	171	17	10	201	35	251	23	5	314	581
3 Hr Totals	86	61	88	0	235	199	50	150	0	399	24	1750	186	60	2020	322	3071	109	61	3563	6217
1 Hr Totals																					
6:00-7:00	13	9	19	0	41	42	10	21	0	73	3	307	28	3	341	69	762	20	12	863	1318
6:15-7:15	15	16	23	0	54	57	14	36	0	107	3	378	41	7	429	90	956	24	21	1091	1681
6:30-7:30	19	17	31	0	67	66	18	58	0	142	3	477	58	10	548	116	1148	26	30	1320	2077
6:45-7:45	31	28	33	0	92	77	24	58	0	159	7	590	68	13	678	130	1209	33	31	1403	2332
7:00-8:00	34	29	40	0	103	84	21	62	0	167	9	677	79	16	781	143	1224	41	31	1439	2490
7:15-8:15	35	32	40	0	107	78	21	57	0	156	12	733	77	21	843	140	1207	43	22	1412	2518
7:30-8:30	36	34	38	0	108	77	22	54	0	153	12	764	76	32	884	124	1094	43	16	1277	2422
7:45-8:45	26	26	36	0	88	79	18	66	0	163	12	786	80	35	913	109	1111	39	16	1275	2439
8:00-9:00	39	23	29	0	91	73	19	67	0	159	12	766	79	41	898	110	1085	48	18	1261	2409
PEAK HOUR																					
7:15-8:15	35	32	40	0	107	78	21	57	0	156	12	733	77	21	843	140	1207	43	22	1412	2518
PM																					
4:00-4:15	27	10	23	0	60	33	7	39	0	79	9	281	30	12	332	31	267	13	8	319	790
4:15-4:30	30	12	16	0	58	22	6	34	0	62	6	294	34	11	345	23	228	15	2	268	733
4:30-4:45	15	11	24	0	50	23	9	39	0	71	9	300	38	12	359	16	237	16	5	274	754
4:45-5:00	21	18	15	0	54	32	7	27	0	66	11	349	35	4	399	20	253	24	7	304	823
5:00-5:15	30	14	27	0	71	23	20	34	0	77	11	330	37	14	392	22	290	21	2	335	875
5:15-5:30	26	14	23	0	63	27	8	43	0	78	9	308	36	11	364	22	297	13	2	334	839
5:30-5:45	29	22	15	0	66	33	13	27	0	73	6	339	24	8	377	23	321	16	3	363	879
5:45-6:00	27	16	20	0	63	33	9	31	0	73	3	362	27	17	409	9	263	20	4	296	841
2 Hr Totals	205	117	163	0	485	226	79	274	0	579	64	2563	261	89	2977	166	2156	138	33	2493	6534
1 Hr Totals																					
4:00-5:00	93	51	78	0	222	110	29	139	0	278	35	1224	137	39	1435	90	985	68	22	1165	3100
4:15-5:15	96	55	82	0	233	100	42	134	0	276	37	1273	144	41	1495	81	1008	76	16	1181	3185
4:30-5:30	92	57	89	0	238	105	44	143	0	292	40	1287	146	41	1514	80	1077	74	16	1247	3291
4:45-5:45	106	68	80	0	254	115	48	131	0	294	37	1326	132	37	1532	87	1161	74	14	1336	3416
5:00-6:00	112	66	85	0	263	116	50	135	0	301	29	1339	124	50	1542	76	1171	70	11	1328	3434
PEAK HOUR																					
5:00-6:00	112	66	85	0	263	116	50	135	0	301	29	1339	124	50	1542	76	1171	70	11	1328	3434

HEAVY TRUCK TURNING MOVEMENT COUNT - SUMMARY

Intersection of: SR 2
and: St James Church Rd
Location: New Castle Co., DE

Counted by: VCU
Date: November 8, 2012
Weather: Cloudy/Warm
Entered by: RB

Day: Thursday

TIME	TRAFFIC FROM NORTH on: St James Church Rd					TRAFFIC FROM SOUTH on: St James Church Rd					TRAFFIC FROM EAST on: SR 2					TRAFFIC FROM WEST on: SR 2					TOTAL N + S + E + W
	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	
AM																					
6:00-6:15	1	0	0	0	1	0	0	0	0	0	0	9	2	0	11	1	3	1	0	5	17
6:15-6:30	0	0	0	0	0	2	0	0	0	2	0	9	0	0	9	1	10	0	0	11	22
6:30-6:45	2	0	0	0	2	1	0	0	0	1	0	7	1	0	8	0	8	0	0	8	19
6:45-7:00	0	0	0	0	0	4	0	0	0	4	0	6	0	0	6	1	10	0	0	11	21
7:00-7:15	2	0	1	0	3	4	1	0	0	5	0	7	0	0	7	1	10	0	0	11	26
7:15-7:30	1	0	0	0	1	1	0	2	0	3	1	6	0	0	7	1	11	0	0	12	23
7:30-7:45	1	0	0	0	1	0	0	1	0	1	0	6	1	0	7	1	7	0	0	8	17
7:45-8:00	0	0	1	0	1	1	0	0	0	1	0	12	1	0	13	0	5	1	0	6	21
8:00-8:15	0	1	2	0	3	0	2	0	0	2	0	11	0	0	11	0	6	0	0	6	22
8:15-8:30	1	0	2	0	3	0	1	2	0	3	0	19	1	0	20	2	3	1	0	6	32
8:30-8:45	1	1	2	0	4	0	0	1	0	1	2	11	0	0	13	2	12	0	0	14	32
8:45-9:00	0	0	0	0	0	0	0	0	0	0	0	5	8	0	13	2	9	0	0	11	24
3 Hr Totals	9	2	8	0	19	13	4	6	0	23	3	108	14	0	125	12	94	3	0	109	276
1 Hr Totals																					
6:00-7:00	3	0	0	0	3	7	0	0	0	7	0	31	3	0	34	3	31	1	0	35	79
6:15-7:15	4	0	1	0	5	11	1	0	0	12	0	29	1	0	30	3	38	0	0	41	88
6:30-7:30	5	0	1	0	6	10	1	2	0	13	1	26	1	0	28	3	39	0	0	42	89
6:45-7:45	4	0	1	0	5	9	1	3	0	13	1	25	1	0	27	4	38	0	0	42	87
7:00-8:00	4	0	2	0	6	6	1	3	0	10	1	31	2	0	34	3	33	1	0	37	87
7:15-8:15	2	1	3	0	6	2	2	3	0	7	1	35	2	0	38	2	29	1	0	32	83
7:30-8:30	2	1	5	0	8	1	3	3	0	7	0	48	3	0	51	3	21	2	0	26	92
7:45-8:45	2	2	7	0	11	1	3	3	0	7	2	53	2	0	57	4	26	2	0	32	107
8:00-9:00	2	2	6	0	10	0	3	3	0	6	2	46	9	0	57	6	30	1	0	37	110
PEAK HOUR																					
7:15-8:15	2	1	3	0	6	2	2	3	0	7	1	35	2	0	38	2	29	1	0	32	83
PM																					
4:00-4:15	2	1	1	0	4	2	0	0	0	2	0	6	1	0	7	2	3	0	0	5	18
4:15-4:30	0	1	0	0	1	1	0	0	0	1	0	8	3	0	11	0	4	0	0	4	17
4:30-4:45	0	0	0	0	0	0	0	0	0	0	0	5	1	0	6	0	11	0	0	11	17
4:45-5:00	0	0	1	0	1	0	0	0	0	0	1	6	0	1	8	1	6	0	0	7	16
5:00-5:15	0	0	0	0	0	1	0	0	0	1	0	4	0	0	4	1	3	0	0	4	9
5:15-5:30	0	0	0	0	0	0	0	0	0	0	0	4	1	0	5	0	1	0	0	1	6
5:30-5:45	0	0	0	0	0	0	0	0	0	0	0	2	1	0	3	1	2	0	0	3	6
5:45-6:00	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	0	2	0	0	2	6
2 Hr Totals	2	2	2	0	6	4	0	0	0	4	1	39	7	1	48	5	32	0	0	37	95
1 Hr Totals																					
4:00-5:00	2	2	2	0	6	3	0	0	0	3	1	25	5	1	32	3	24	0	0	27	68
4:15-5:15	0	1	1	0	2	2	0	0	0	2	1	23	4	1	29	2	24	0	0	26	59
4:30-5:30	0	0	1	0	1	1	0	0	0	1	1	19	2	1	23	2	21	0	0	23	48
4:45-5:45	0	0	1	0	1	1	0	0	0	1	1	16	2	1	20	3	12	0	0	15	37
5:00-6:00	0	0	0	0	0	1	0	0	0	1	0	14	2	0	16	2	8	0	0	10	27
PEAK HOUR																					
5:00-6:00	0	0	0	0	0	1	0	0	0	1	0	14	2	0	16	2	8	0	0	10	27

RIGHT TURN ON RED TURNING MOVEMENT COUNT - SUMMARY

Counted by: VCU

Intersection of: SR 2 | Date: November 8, 2012 | Day: Thursday

and: St James Church Rd | Weather: Cloudy/Warm

Location: New Castle Co., DE | Entered by: RB

TIME	TRAFFIC FROM NORTH on: St James Church Rd					TRAFFIC FROM SOUTH on: St James Church Rd					TRAFFIC FROM EAST on: SR 2					TRAFFIC FROM WEST on: SR 2					TOTAL N + S + E + W
	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	
AM																					
6:00-6:15					0					0	0				0	0				0	0
6:15-6:30					0					0	0				0	4				4	4
6:30-6:45					0					0	0				0	3				3	3
6:45-7:00					0					0	0				0	6				6	6
7:00-7:15					0					0	0				0	8				8	8
7:15-7:30					0					0	1				1	4				4	5
7:30-7:45					0					0	0				0	18				18	18
7:45-8:00					0					0	0				0	9				9	9
8:00-8:15					0					0	0				0	0				0	0
8:15-8:30					0					0	0				0	0				0	0
8:30-8:45					0					0	0				0	7				7	7
8:45-9:00					0					0	0				0	9				9	9
3 Hr Totals	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	68	0	0	0	68	69
1 Hr Totals																					
6:00-7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	0	0	0	13	13
6:15-7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	0	0	0	21	21
6:30-7:30	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	21	0	0	0	21	22
6:45-7:45	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	36	0	0	0	36	37
7:00-8:00	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	39	0	0	0	39	40
7:15-8:15	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	31	0	0	0	31	32
7:30-8:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	0	0	0	27	27
7:45-8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0	16	16
8:00-9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0	16	16
PEAK HOUR																					
7:15-8:15	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	31	0	0	0	31	32
PM																					
4:00-4:15					0					0	0				0	2				2	2
4:15-4:30					0					0	2				2	0				0	2
4:30-4:45					0					0	0				0	0				0	0
4:45-5:00					0					0	1				1	3				3	4
5:00-5:15					0					0	0				0	1				1	1
5:15-5:30					0					0	0				0	3				3	3
5:30-5:45					0					0	0				0	1				1	1
5:45-6:00					0					0	0				0	0				0	0
2 Hr Totals	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	10	0	0	0	10	13
1 Hr Totals																					
4:00-5:00	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	5	0	0	0	5	8
4:15-5:15	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	4	0	0	0	4	7
4:30-5:30	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	7	0	0	0	7	8
4:45-5:45	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	8	0	0	0	8	9
5:00-6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	5
PEAK HOUR																					
5:00-6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	5	5

TOTAL VEHICLE TURNING MOVEMENT COUNT - SUMMARY

Intersection of: SR 2
and: St James Church Rd
Location: New Castle Co., DE

Counted by: VCU
Date: November 8, 2012
Weather: Cloudy/Warm
Entered by: RB

Day: Thursday

TIME	TRAFFIC FROM NORTH on: St James Church Rd					TRAFFIC FROM SOUTH on: St James Church Rd					TRAFFIC FROM EAST on: SR 2					TRAFFIC FROM WEST on: SR 2					TOTAL N + S + E + W
	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	RIGHT	THRU	LEFT	U-TN	TOTAL	
AM																					
6:00-6:15	4	0	4	0	8	6	1	2	0	9	0	62	9	0	71	9	95	4	2	110	198
6:15-6:30	2	3	4	0	9	8	2	0	0	10	2	67	5	1	75	20	188	6	2	216	310
6:30-6:45	7	0	5	0	12	13	1	10	0	24	0	99	10	1	110	28	238	5	5	276	422
6:45-7:00	3	6	6	0	15	22	6	9	0	37	1	110	7	1	119	28	272	6	3	309	480
7:00-7:15	7	7	9	0	23	25	6	17	0	48	0	131	20	4	155	38	296	7	11	352	578
7:15-7:30	7	4	12	0	23	16	6	24	0	46	4	163	22	4	193	46	381	8	11	446	708
7:30-7:45	18	11	7	0	36	23	7	11	0	41	4	211	20	4	239	58	298	12	6	374	690
7:45-8:00	6	7	14	0	27	26	3	13	0	42	3	203	19	4	229	43	282	15	3	343	641
8:00-8:15	6	11	10	0	27	15	7	12	0	34	3	191	18	9	221	26	275	9	2	312	594
8:15-8:30	8	6	12	0	26	14	8	21	0	43	2	207	22	15	246	27	260	9	5	301	616
8:30-8:45	8	4	7	0	19	25	3	23	0	51	6	238	23	7	274	33	320	8	6	367	711
8:45-9:00	19	4	6	0	29	19	4	14	0	37	3	176	25	10	214	46	260	23	5	334	614
3 Hr Totals	95	63	96	0	254	212	54	156	0	422	28	1858	200	60	2146	402	3165	112	61	3740	6562
1 Hr Totals																					
6:00-7:00	16	9	19	0	44	49	10	21	0	80	3	338	31	3	375	85	793	21	12	911	1410
6:15-7:15	19	16	24	0	59	68	15	36	0	119	3	407	42	7	459	114	994	24	21	1153	1790
6:30-7:30	24	17	32	0	73	76	19	60	0	155	5	503	59	10	577	140	1187	26	30	1383	2188
6:45-7:45	35	28	34	0	97	86	25	61	0	172	9	615	69	13	706	170	1247	33	31	1481	2456
7:00-8:00	38	29	42	0	109	90	22	65	0	177	11	708	81	16	816	185	1257	42	31	1515	2617
7:15-8:15	37	33	43	0	113	80	23	60	0	163	14	768	79	21	882	173	1236	44	22	1475	2633
7:30-8:30	38	35	43	0	116	78	25	57	0	160	12	812	79	32	935	154	1115	45	16	1330	2541
7:45-8:45	28	28	43	0	99	80	21	69	0	170	14	839	82	35	970	129	1137	41	16	1323	2562
8:00-9:00	41	25	35	0	101	73	22	70	0	165	14	812	88	41	955	132	1115	49	18	1314	2535
PEAK HOUR																					
7:15-8:15	37	33	43	0	113	80	23	60	0	163	14	768	79	21	882	173	1236	44	22	1475	2633
PM																					
4:00-4:15	29	11	24	0	64	35	7	39	0	81	9	287	31	12	339	35	270	13	8	326	810
4:15-4:30	30	13	16	0	59	23	6	34	0	63	8	302	37	11	358	23	232	15	2	272	752
4:30-4:45	15	11	24	0	50	23	9	39	0	71	9	305	39	12	365	16	248	16	5	285	771
4:45-5:00	21	18	16	0	55	32	7	27	0	66	13	355	35	5	408	24	259	24	7	314	843
5:00-5:15	30	14	27	0	71	24	20	34	0	78	11	334	37	14	396	24	293	21	2	340	885
5:15-5:30	26	14	23	0	63	27	8	43	0	78	9	312	37	11	369	25	298	13	2	338	848
5:30-5:45	29	22	15	0	66	33	13	27	0	73	6	341	25	8	380	25	323	16	3	367	886
5:45-6:00	27	16	20	0	63	33	9	31	0	73	3	366	27	17	413	9	265	20	4	298	847
2 Hr Totals	207	119	165	0	491	230	79	274	0	583	68	2602	268	90	3028	181	2188	138	33	2540	6642
1 Hr Totals																					
4:00-5:00	95	53	80	0	228	113	29	139	0	281	39	1249	142	40	1470	98	1009	68	22	1197	3176
4:15-5:15	96	56	83	0	235	102	42	134	0	278	41	1296	148	42	1527	87	1032	76	16	1211	3251
4:30-5:30	92	57	90	0	239	106	44	143	0	293	42	1306	148	42	1538	89	1098	74	16	1277	3347
4:45-5:45	106	68	81	0	255	116	48	131	0	295	39	1342	134	38	1553	98	1173	74	14	1359	3462
5:00-6:00	112	66	85	0	263	117	50	135	0	302	29	1353	126	50	1558	83	1179	70	11	1343	3466
PEAK HOUR																					
5:00-6:00	112	66	85	0	263	117	50	135	0	302	29	1353	126	50	1558	83	1179	70	11	1343	3466

PEDESTRIAN OBSERVATIONS

Intersection of: SR 2
and: St James Church Rd
Location: New Castle Co., DE

Counted by: VCU
Date: November 8, 2012
Weather: Cloudy/Warm
Entered by: RB

Day: Thursday

TIME	St James Church Rd NORTH LEG PEDESTRIANS	St James Church Rd NORTH LEG BICYCLES	St James Church Rd SOUTH LEG PEDESTRIANS	St James Church Rd SOUTH LEG BICYCLES
AM				
6:00-6:15	0		0	
6:15-6:30	0		0	
6:30-6:45	0		0	
6:45-7:00	0		0	
7:00-7:15	1		0	
7:15-7:30	0		0	
7:30-7:45	0		0	
7:45-8:00	0		0	
8:00-8:15	0		0	
8:15-8:30	0		0	
8:30-8:45	0		0	
8:45-9:00	0		0	
TOTALS	1	0	0	0
PM				
4:00-4:15	0		0	
4:15-4:30	3		0	
4:30-4:45	0		0	
4:45-5:00	0		0	
5:00-5:15	2		0	
5:15-5:30	0		0	
5:30-5:45	0		0	
5:45-5:00	0		0	
TOTALS	5	0	0	0

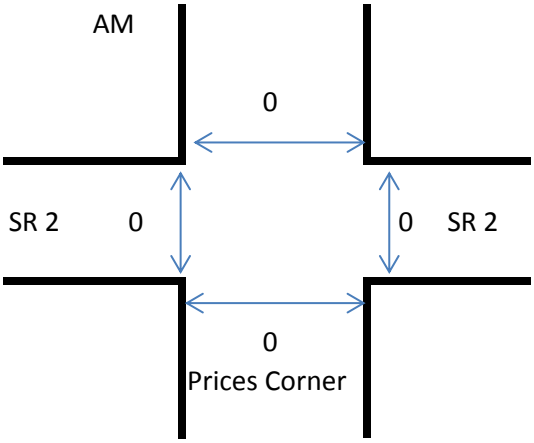
TIME	SR 2 EAST LEG PEDESTRIANS	SR 2 EAST LEG BICYCLES	SR 2 WEST LEG PEDESTRIANS	SR 2 WEST LEG BICYCLES
AM				
6:00-6:15	0		0	
6:15-6:30	0		0	
6:30-6:45	0		0	
6:45-7:00	0		0	
7:00-7:15	0		0	
7:15-7:30	0		0	
7:30-7:45	0		0	
7:45-8:00	0		0	
8:00-8:15	0		0	
8:15-8:30	0		0	
8:30-8:45	0		0	
8:45-9:00	0		0	
TOTALS	0	0	0	0
PM				
4:00-4:15	0		0	
4:15-4:30	0		0	
4:30-4:45	3		0	
4:45-5:00	0		0	
5:00-5:15	0		0	
5:15-5:30	3		0	
5:30-5:45	0		0	
5:45-5:00	0		0	
TOTALS	6	0	0	0

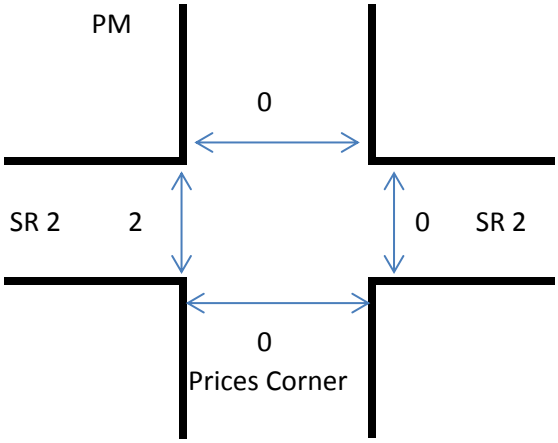
TRAFFIC COUNT SUMMARY

Intersection: DE 2 and DE 7
Intersection #: 13
Weather Conditions: AM Cloudy, PM Clear

NOTES:

INTERSECTION SKETCHES WITH PED MOVEMENTS:





Count performed by: Hubschmitt, Eta, Erony, Lavenburg

Date: 4/23/13

CARS

	SB SR 7				EB SR 2				NB SR 7				WB EB 2				15 Minute
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Time																	
7:00-7:15	74	144	51	269	35	295	32	362	64	135	31	230	7	267	143	417	1278
7:15-7:30	85	146	57	288	42	298	26	366	78	150	37	265	11	290	156	457	1376
7:30-7:45	133	226	49	408	58	298	15	371	100	156	33	289	14	350	138	502	1570
7:45-8:00	108	194	84	386	57	289	26	372	103	168	29	300	14	285	102	401	1459
8:00-8:15	88	149	57	294	48	248	23	319	85	148	47	280	12	299	95	406	1299
8:15-8:30	97	206	44	347	47	237	32	316	81	123	42	246	15	239	104	358	1267
8:30-8:45	97	169	66	332	61	262	39	362	94	144	35	273	10	228	67	305	1272
8:45-9:00	86	150	50	286	64	164	34	262	72	147	63	282	15	220	99	334	1164
TOTAL	768	1384	458	2610	412	2091	227	2730	677	1171	317	2165	98	2178	904	3180	10685

TRUCKS

	SB SR 7				EB SR 2				NB SR 7				WB EB 2				15 Minute
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Time																	
7:00-7:15	2	0	0	2	0	1	0	1	1	5	0	6	0	4	1	5	14
7:15-7:30	0	2	0	2	1	1	0	2	0	5	7	12	0	11	0	11	27
7:30-7:45	2	2	1	5	0	1	1	2	0	6	1	7	0	7	2	9	23
7:45-8:00	3	6	2	11	0	3	1	4	0	8	0	8	1	9	0	10	33
8:00-8:15	3	5	4	12	2	1	1	4	2	8	2	12	0	10	0	10	38
8:15-8:30	1	3	0	4	1	0	0	1	2	11	2	15	2	3	2	7	27
8:30-8:45	1	3	0	4	0	4	0	4	0	9	3	12	0	6	1	7	27
8:45-9:00	2	5	3	10	1	3	1	5	2	12	0	14	0	3	2	5	34
TOTAL	14	26	10	50	5	14	4	23	7	64	15	86	3	53	8	64	223

PEDS

	Across EB SR 2	Across NB SR 7	Across WB SR 2	Across SB SR 7	15 Minute
Time	Total	Total	Total	Total	Total
7:00-7:15	0	0			0
7:15-7:30	0	1			1
7:30-7:45	1	1			2
7:45-8:00	0	1			1
8:00-8:15	0	0			0
8:15-8:30	0	0			0
8:30-8:45	2	0			2
8:45-9:00	0	0			0
TOTAL	3	3	0	0	6

Intersection Peak Hour

	SB SR 7				EB SR 2				NB SR 7				WB EB 2				Peak Hour
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Car and Truck Totals																	
7:15-7:30	85	148	57	**290**	43	299	26	**368**	78	155	44	**277**	11	301	156	**468**	1403
7:30-7:45	135	228	50	**413**	58	299	16	**373**	100	162	34	**296**	14	357	140	**511**	1593
7:45-8:00	111	200	86	**397**	57	292	27	**376**	103	176	29	**308**	15	294	102	**411**	1492
8:00-8:15	91	154	61	**306**	50	249	24	**323**	87	156	49	**292**	12	309	95	**416**	1337
Total Volume	**422**	**730**	**254**	**1406**	**208**	**1139**	**93**	**1440**	**368**	**649**	**156**	**1173**	**52**	**1261**	**493**	**1806**	**5825**
Trucks	9	16	7	32	3	5	3	11	4	33	5	42	3	29	4	36	121
Peds				1				2				0				0	3
Tk %	2.1%	2.2%	2.8%	2.3%	1.4%	0.4%	3.2%	0.8%	1.1%	5.1%	3.2%	3.6%	5.8%	2.3%	0.8%	2.0%	
PHF	0.78	0.80	0.74	0.85	0.90	0.95	0.86	0.96	0.89	0.92	0.80	0.95	0.87	0.88	0.79	0.88	0.91

Count performed by: Fisher, Becker, Binning, Knabe

Date: 4/16/13

CARS

	SB SR 7				EB SR 2				NB SR 7				WB EB 2				15 Minute
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Time																	
4:00-4:15	18	205	86	309	45	249	53	347	126	246	60	432	89	277	106	472	1560
4:15-4:30	27	180	86	293	56	222	55	333	129	228	73	430	99	283	125	507	1563
4:30-4:45	19	193	87	299	46	227	48	321	127	282	58	467	88	237	121	446	1533
4:45-5:00	27	211	73	311	62	225	67	354	123	258	59	440	115	279	157	551	1656
5:00-5:15	20	234	101	355	51	260	58	369	131	267	64	462	129	280	161	570	1756
5:15-5:30	29	198	104	331	53	252	68	373	106	270	54	430	121	294	133	548	1682
5:30-5:45	28	199	90	317	48	269	58	375	103	286	50	439	100	302	138	540	1671
5:45-6:00	31	222	95	348	57	220	57	334	98	254	60	412	104	295	124	523	1617
TOTAL	199	1642	722	2563	418	1924	464	2806	943	2091	478	3512	845	2247	1065	4157	13038

TRUCKS

	SB SR 7				EB SR 2				NB SR 7				WB EB 2				15 Minute
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Time																	
4:00-4:15	0	4	0	4	0	2	0	2	0	3	0	3	0	0	4	4	13
4:15-4:30	1	4	2	7	0	1	0	1	0	12	0	12	0	1	0	1	21
4:30-4:45	0	8	2	10	0	0	0	0	1	3	0	4	2	1	2	5	19
4:45-5:00	0	4	3	7	0	3	1	4	2	6	0	8	1	1	1	3	22
5:00-5:15	0	15	2	17	0	0	0	0	0	7	0	7	0	4	0	4	28
5:15-5:30	1	6	1	8	0	2	0	2	0	5	0	5	0	1	1	2	17
5:30-5:45	0	8	3	11	0	4	0	4	0	5	1	6	0	3	0	3	24
5:45-6:00	0	5	0	5	4	2	1	7	0	1	0	1	0	1	1	2	15
TOTAL	2	54	13	69	4	14	2	20	3	42	1	46	3	12	9	24	159

PEDS

Time	Across EB SR 2 Total	Across NB SR 7 Total	Across WB SR 2 Total	Across SB SR 7 Total	15 Minute Total
4:00-4:15	1	1	0	0	2
4:15-4:30	0	6	1	6	13
4:30-4:45	2	1	2	0	5
4:45-5:00	3	3	0	1	7
5:00-5:15	0	1	2	3	6
5:15-5:30	0	2	0	0	2
5:30-5:45	2	4	2	2	10
5:45-6:00	1	2	2	2	7
TOTAL	9	20	9	14	52

Intersection Peak Hour

	SB SR 7				EB SR 2				NB SR 7				WB EB 2				Peak Hour
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Car and Truck Totals																	
4:45-5:00	27	215	76	318	62	228	68	358	125	264	59	448	116	280	158	554	1678
5:00-5:15	20	249	103	372	51	260	58	369	131	274	64	469	129	284	161	574	1784
5:15-5:30	30	204	105	339	53	254	68	375	106	275	54	435	121	295	134	550	1699
5:30-5:45	28	207	93	328	48	273	58	379	103	291	51	445	100	305	138	543	1695
Total Volume	**105**	**875**	**377**	**1357**	**214**	**1015**	**252**	**1481**	**465**	**1104**	**228**	**1797**	**466**	**1164**	**591**	**2221**	**6856**
Trucks	1	33	9	43	0	9	1	10	2	23	1	26	1	9	2	12	91
Peds				5				10				4				6	25
Tk %	1.0%	3.8%	2.4%	3.2%	0.0%	0.9%	0.4%	0.7%	0.4%	2.1%	0.4%	1.4%	0.2%	0.8%	0.3%	0.5%	
PHF	0.88	0.88	0.90	0.91	0.86	0.93	0.93	0.98	0.89	0.95	0.89	0.96	0.90	0.95	0.92	0.97	0.96

Whitman, Requardt & Associates LLP

3 Mill Rd Suite 309
Wilmington, DE 19806

Location: New Castle County
Intersection: SR 2 @ SR 7
Date: Wednesday, November 12, 2014
Counters: DCG and BMW

File Name : sr 2 @ sr 7 total
Site Code : 11121411
Start Date : 11/12/2014
Page No : 1

Groups Printed- Unshifted - Turns - Heavy Vehicles

	SR 2 Eastbound					SR 2 Westbound					SR 7 Northbound					SR 7 Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:15 AM	0	0	0	0	0	76	0	0	0	76	0	0	0	0	0	0	0	0	0	0	76
07:30 AM	0	0	0	0	0	78	0	0	0	78	0	0	0	0	0	0	0	0	0	0	78
07:45 AM	0	0	0	0	0	80	0	0	0	80	0	0	0	0	0	0	0	0	0	0	80
Total	0	0	0	0	0	234	0	0	0	234	0	0	0	0	0	0	0	0	0	0	234
08:00 AM	0	0	0	0	0	77	0	0	0	77	0	0	0	0	0	0	0	0	0	0	77
*** BREAK ***																					
Total	0	0	0	0	0	77	0	0	0	77	0	0	0	0	0	0	0	0	0	0	77
*** BREAK ***																					
04:45 PM	0	0	0	0	0	121	0	0	0	121	0	0	0	0	0	0	0	0	0	0	121
Total	0	0	0	0	0	121	0	0	0	121	0	0	0	0	0	0	0	0	0	0	121
05:00 PM	0	0	0	0	0	120	0	0	0	120	0	0	0	0	0	0	0	0	0	0	120
05:15 PM	0	0	0	0	0	114	0	0	0	114	0	0	0	0	0	0	0	0	0	0	114
05:30 PM	0	0	0	0	0	133	0	0	0	133	0	0	0	0	0	0	0	0	0	0	133
Grand Total	0	0	0	0	0	799	0	0	0	799	0	0	0	0	0	0	0	0	0	0	799
Apprch %	0	0	0	0		100	0	0	0		0	0	0	0		0	0	0	0		
Total %	0	0	0	0	0	100	0	0	0	100	0	0	0	0	0	0	0	0	0	0	
Unshifted	0	0	0	0	0	690	0	0	0	690	0	0	0	0	0	0	0	0	0	0	690
% Unshifted	0	0	0	0	0	86.4	0	0	0	86.4	0	0	0	0	0	0	0	0	0	0	86.4
U-Turns	0	0	0	0	0	87	0	0	0	87	0	0	0	0	0	0	0	0	0	0	87
% U-Turns	0	0	0	0	0	10.9	0	0	0	10.9	0	0	0	0	0	0	0	0	0	0	10.9
Heavy Vehicles																					
% Heavy Vehicles	0	0	0	0	0	2.8	0	0	0	2.8	0	0	0	0	0	0	0	0	0	0	2.8

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3 Mill Rd Suite 309
Wilmington, DE 19806

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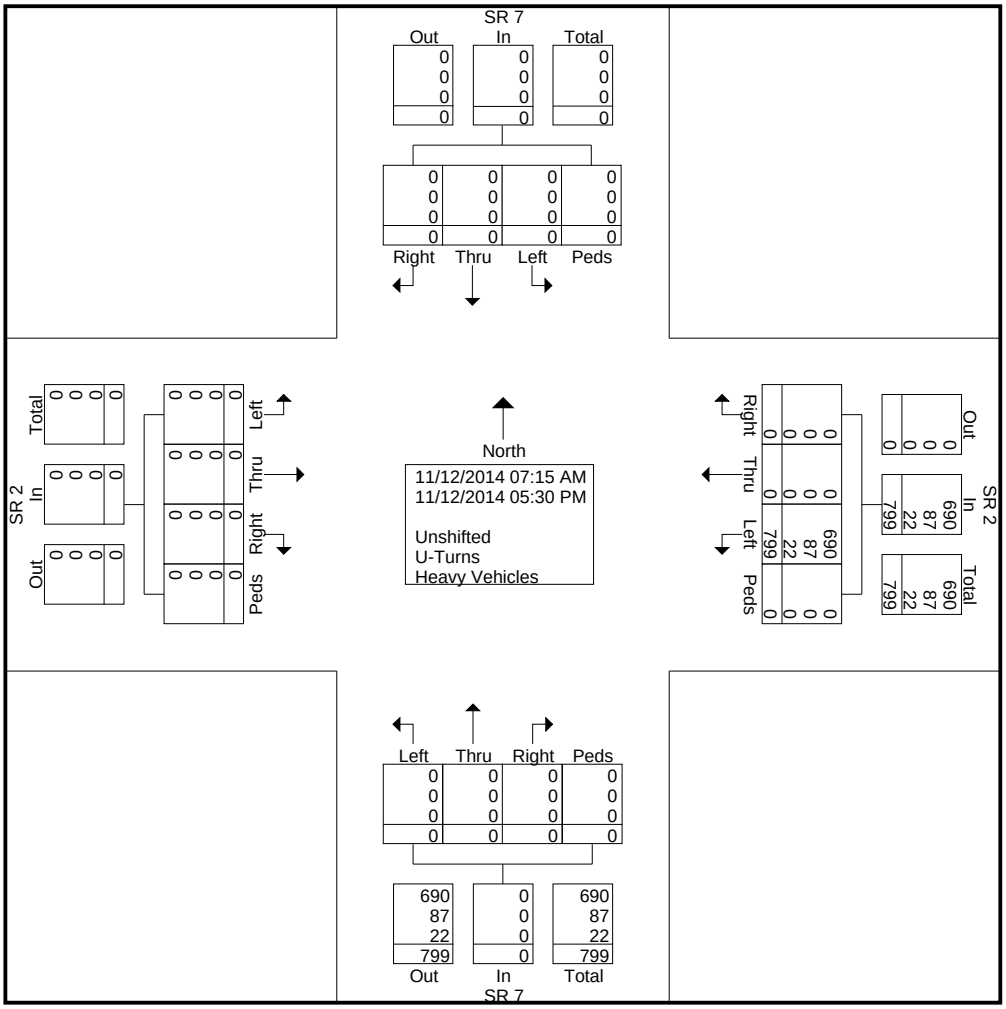
File Name : sr 2 @ sr 7 total
Site Code : 11121411
Start Date : 11/12/2014
Page No : 2



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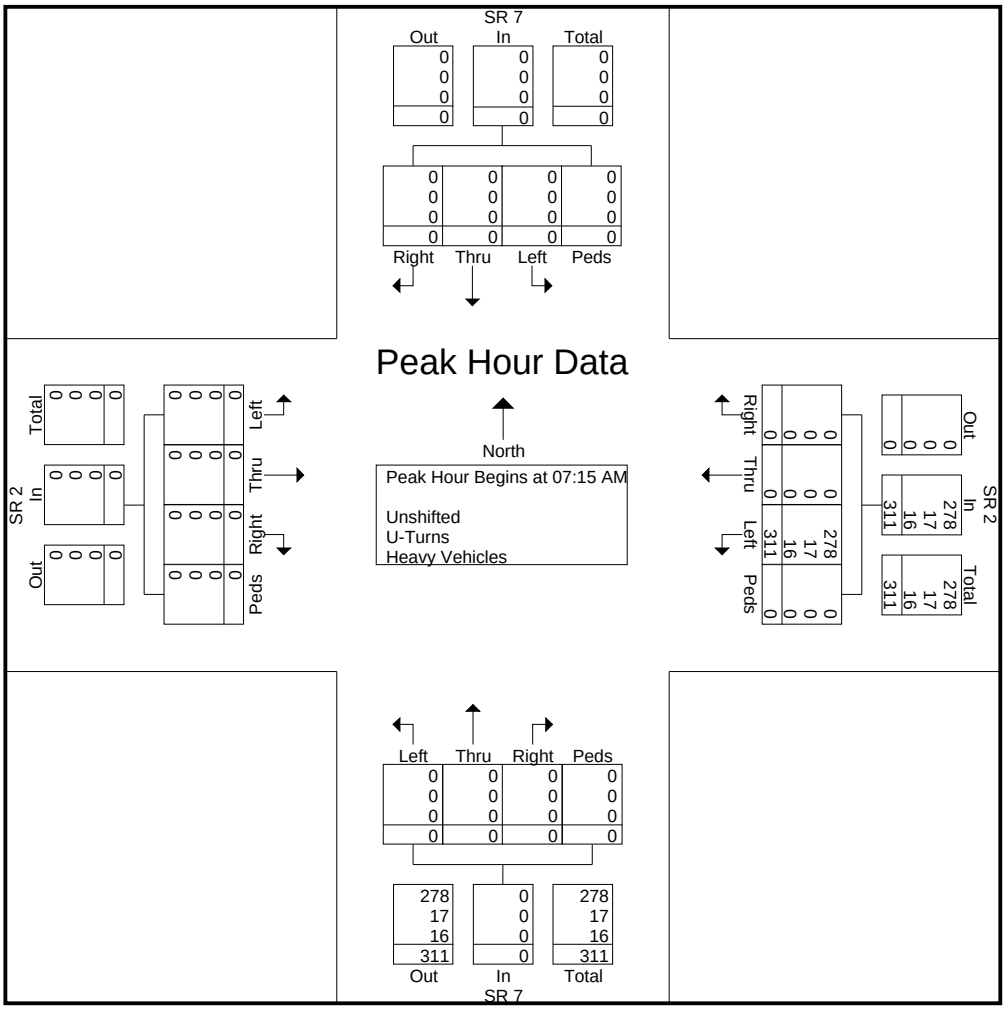
Location: New Castle County
Intersection: SR 2 @ SR 7
Date: Wednesday, November 12, 2014
Counters: DCG and BMW

File Name : sr 2 @ sr 7 total
Site Code : 11121411
Start Date : 11/12/2014
Page No : 3

	SR 2 Eastbound					SR 2 Westbound					SR 7 Northbound					SR 7 Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:15 AM to 08:00 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	0	0	0	0	76	0	0	0	76	0	0	0	0	0	0	0	0	0	0	76
07:30 AM	0	0	0	0	0	78	0	0	0	78	0	0	0	0	0	0	0	0	0	0	78
07:45 AM	0	0	0	0	0	**80**	0	0	0	**80**	0	0	0	0	0	0	0	0	0	0	**80**
08:00 AM	0	0	0	0	0	77	0	0	0	77	0	0	0	0	0	0	0	0	0	0	77
Total Volume	0	0	0	0	0	311	0	0	0	311	0	0	0	0	0	0	0	0	0	0	311
% App. Total	0	0	0	0		100	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.972	.000	.000	.000	.972	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.972
Unshifted	0	0	0	0	0	278	0	0	0	278	0	0	0	0	0	0	0	0	0	0	278
% Unshifted						89.4	0	0	0	89.4	0	0	0	0	0	0	0	0	0	0	89.4
U-Turns	0	0	0	0	0	17	0	0	0	17	0	0	0	0	0	0	0	0	0	0	17
% U-Turns																					
Heavy Vehicles	0	0	0	0	0	16	0	0	0	16	0	0	0	0	0	0	0	0	0	0	16
% Heavy Vehicles	0	0	0	0	0	5.1	0	0	0	5.1	0	0	0	0	0	0	0	0	0	0	5.1



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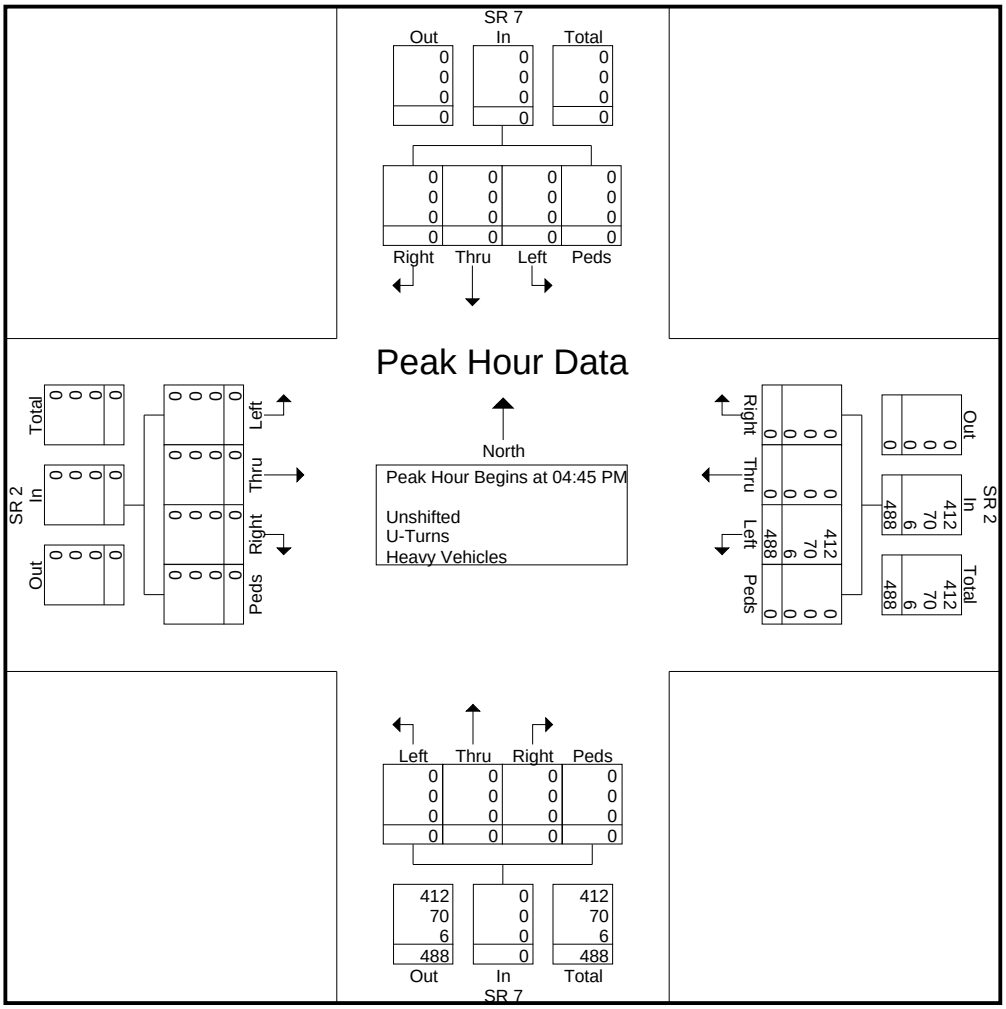
3 Mill Rd Suite 309
Wilmington, DE 19806

Location: New Castle County
Intersection: SR 2 @ SR 7
Date: Wednesday, November 12, 2014
Counters: DCG and BMW

File Name : sr 2 @ sr 7 total
Site Code : 11121411
Start Date : 11/12/2014
Page No : 4

	SR 2 Eastbound					SR 2 Westbound					SR 7 Northbound					SR 7 Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 04:45 PM to 05:30 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	0	0	0	0	121	0	0	0	121	0	0	0	0	0	0	0	0	0	0	121
05:00 PM	0	0	0	0	0	120	0	0	0	120	0	0	0	0	0	0	0	0	0	0	120
05:15 PM	0	0	0	0	0	114	0	0	0	114	0	0	0	0	0	0	0	0	0	0	114
05:30 PM	0	0	0	0	0	**133**	0	0	0	**133**	0	0	0	0	0	0	0	0	0	0	**133**
Total Volume	0	0	0	0	0	488	0	0	0	488	0	0	0	0	0	0	0	0	0	0	488
% App. Total	0	0	0	0		100	0	0	0		0	0	0	0		0	0	0	0		
PHF	.000	.000	.000	.000	.000	.917	.000	.000	.000	.917	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.917
Unshifted	0	0	0	0	0	412	0	0	0	412	0	0	0	0	0	0	0	0	0	0	412
% Unshifted						84.4	0	0	0	84.4	0	0	0	0	0	0	0	0	0	0	84.4
U-Turns	0	0	0	0	0	70	0	0	0	70	0	0	0	0	0	0	0	0	0	0	70
% U-Turns						14.3	0	0	0	14.3	0	0	0	0	0	0	0	0	0	0	14.3
Heavy Vehicles																					
% Heavy Vehicles	0	0	0	0	0	1.2	0	0	0	1.2	0	0	0	0	0	0	0	0	0	0	1.2



Whitman, Requardt & Associates

801 S. Caroline Street
Baltimore, MD 21231

Location: New Castle
Intersection: SR2 at Kirkwood S.C.
Date: Wednesday, Nov 16, 2011

File Name : SR2-KirkwoodShoppingCenter(11-16-2011)
Site Code :
Start Date : 11/16/2011
Page No : 1

Groups Printed- CARS & PEDS - U TURNS & BIKES - TRUCKS

	Kirkwood Shopping Center Southbound					Monica Blvd Northbound					SR 2 Westbound					SR 2 Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	0	0	0	0	0	0	0	0	0	0	1	236	0	0	237	46	463	7	0	516	753
07:15 AM	2	0	0	0	2	1	0	0	0	1	1	285	0	0	286	52	517	13	0	582	871
07:30 AM	3	0	0	0	3	0	0	0	0	0	1	360	0	0	361	38	477	18	0	533	897
07:45 AM	2	0	0	1	3	1	0	0	0	1	3	322	0	0	325	31	441	15	4	491	820
Total	7	0	0	1	8	2	0	0	0	2	6	1203	0	0	1209	167	1898	53	4	2122	3341
08:00 AM	3	0	0	0	3	1	0	0	0	1	7	289	0	0	296	27	395	27	0	449	749
08:15 AM	6	0	0	1	7	0	0	0	0	0	1	304	0	0	305	28	387	17	1	433	745
08:30 AM	9	0	0	0	9	1	0	0	1	2	4	349	0	0	353	40	376	26	0	442	806
08:45 AM	11	0	0	0	11	4	0	0	0	4	8	287	0	0	295	28	347	55	0	430	740
Total	29	0	0	1	30	6	0	0	1	7	20	1229	0	0	1249	123	1505	125	1	1754	3040
11:00 AM	34	0	0	1	35	1	0	0	0	1	5	314	0	0	319	39	320	78	1	438	793
11:15 AM	38	0	0	1	39	0	0	0	0	0	5	339	0	1	345	25	275	62	1	363	747
11:30 AM	38	0	0	0	38	2	0	0	0	2	12	321	1	0	334	32	291	95	0	418	792
11:45 AM	37	0	0	0	37	2	0	0	0	2	5	348	0	0	353	30	303	76	0	409	801
Total	147	0	0	2	149	5	0	0	0	5	27	1322	1	1	1351	126	1189	311	2	1628	3133
12:00 PM	51	0	0	1	52	0	0	0	0	0	11	351	0	0	362	30	308	88	0	426	840
12:15 PM	49	0	0	0	49	1	0	0	0	1	5	337	0	0	342	28	321	85	0	434	826
12:30 PM	44	0	0	2	46	1	0	0	0	1	9	368	0	0	377	32	361	87	1	481	905
12:45 PM	51	0	0	0	51	2	0	0	1	3	7	380	0	0	387	30	290	79	0	399	840
Total	195	0	0	3	198	4	0	0	1	5	32	1436	0	0	1468	120	1280	339	1	1740	3411
03:00 PM	54	0	0	0	54	1	0	0	0	1	6	415	0	0	421	27	323	86	0	436	912
03:15 PM	40	0	0	0	40	2	0	0	0	2	1	394	0	0	395	30	341	84	0	455	892
03:30 PM	60	0	0	0	60	5	0	0	0	5	2	426	0	0	428	48	319	73	0	440	933
03:45 PM	59	0	0	0	59	0	0	0	0	0	8	464	1	0	473	41	330	85	0	456	988
Total	213	0	0	0	213	8	0	0	0	8	17	1699	1	0	1717	146	1313	328	0	1787	3725
04:00 PM	47	0	0	0	47	1	0	0	0	1	8	461	0	0	469	51	335	81	0	467	984
04:15 PM	48	0	0	2	50	2	0	0	0	2	11	475	1	3	490	49	326	104	5	484	1026
04:30 PM	37	0	0	0	37	1	0	0	0	1	8	514	0	0	522	47	334	83	0	464	1024
04:45 PM	47	0	0	1	48	2	0	0	0	2	6	506	0	0	512	56	329	68	0	453	1015
Total	179	0	0	3	182	6	0	0	0	6	33	1956	1	3	1993	203	1324	336	5	1868	4049
05:00 PM	48	0	0	1	49	1	0	0	0	1	6	508	0	1	515	42	371	83	0	496	1061
05:15 PM	49	0	0	1	50	0	0	0	0	0	5	510	0	3	518	43	340	71	0	454	1022
05:30 PM	41	0	0	27	68	1	0	0	0	1	4	534	0	0	538	40	288	98	37	463	1070
05:45 PM	49	1	0	0	50	0	0	0	0	0	5	534	0	1	540	46	293	76	0	415	1005
Total	187	1	0	29	217	2	0	0	0	2	20	2086	0	5	2111	171	1292	328	37	1828	4158
Grand Total	957	1	0	39	997	33	0	0	2	35	155	10931	3	9	11098	1056	9801	1820	50	12727	24857
Apprch %	96	0.1	0	3.9		94.3	0	0	5.7		1.4	98.5	0	0.1		8.3	77	14.3	0.4		
Total %	3.9	0	0	0.2	4	0.1	0	0	0	0.1	0.6	44	0	0	44.6	4.2	39.4	7.3	0.2	51.2	
CARS & PEDS	862	1	0	37	900	26	0	0	2	28	136	9649	3	7	9795	785	8186	1307	49	10327	21050
% CARS & PEDS	90.1	100	0	94.9	90.3	78.8	0	0	100	80	87.7	88.3	100	77.8	88.3	74.3	83.5	71.8	98	81.1	84.7
U TURNS & BIKES	0	0	0	2	2	0	0	0	0	0	0	0	0	2	2	0	0	306	1	307	311
% U TURNS & BIKES	0	0	0	5.1	0.2	0	0	0	0	0	0	0	0	22.2	0	0	0	16.8	2	2.4	1.3
TRUCKS	95	0	0	0	95	7	0	0	0	7	19	1282	0	0	1301	271	1615	207	0	2093	3496
% TRUCKS	9.9	0	0	0	9.5	21.2	0	0	0	20	12.3	11.7	0	0	11.7	25.7	16.5	11.4	0	16.4	14.1

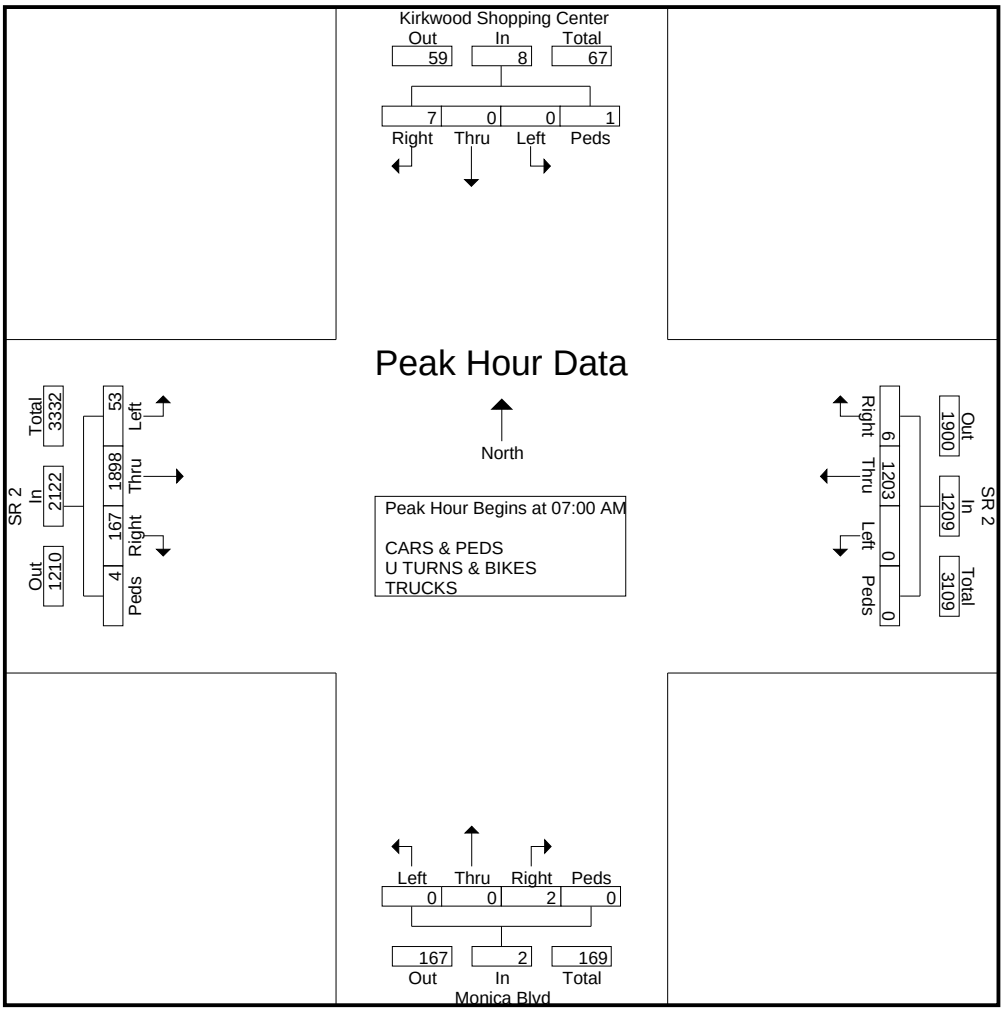
Whitman, Requardt & Associates

801 S. Caroline Street
Baltimore, MD 21231

Location: New Castle
Intersection: SR2 at Kirkwood S.C.
Date: Wednesday, Nov 16, 2011

File Name : SR2-KirkwoodShoppingCenter(11-16-2011)
Site Code :
Start Date : 11/16/2011
Page No : 2

	Kirkwood Shopping Center Southbound					Monica Blvd Northbound					SR 2 Westbound					SR 2 Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:00 AM																					
07:00 AM	0	0	0	0	0	0	0	0	0	0	1	236	0	0	237	46	463	7	0	516	753
07:15 AM	2	0	0	0	2	**1**	0	0	0	**1**	1	285	0	0	286	**52**	**517**	13	0	**582**	871
07:30 AM	**3**	0	0	0	**3**	0	0	0	0	0	1	**360**	0	0	**361**	38	477	**18**	0	533	**897**
07:45 AM	2	0	0	**1**	3	1	0	0	0	1	**3**	322	0	0	325	31	441	15	**4**	491	820
Total Volume	7	0	0	1	8	2	0	0	0	2	6	1203	0	0	1209	167	1898	53	4	2122	3341
% App. Total	87.5	0	0	12.5		100	0	0	0		0.5	99.5	0	0		7.9	89.4	2.5	0.2		
PHF	.583	.000	.000	.250	.667	.500	.000	.000	.000	.500	.500	.835	.000	.000	.837	.803	.918	.736	.250	.912	.931



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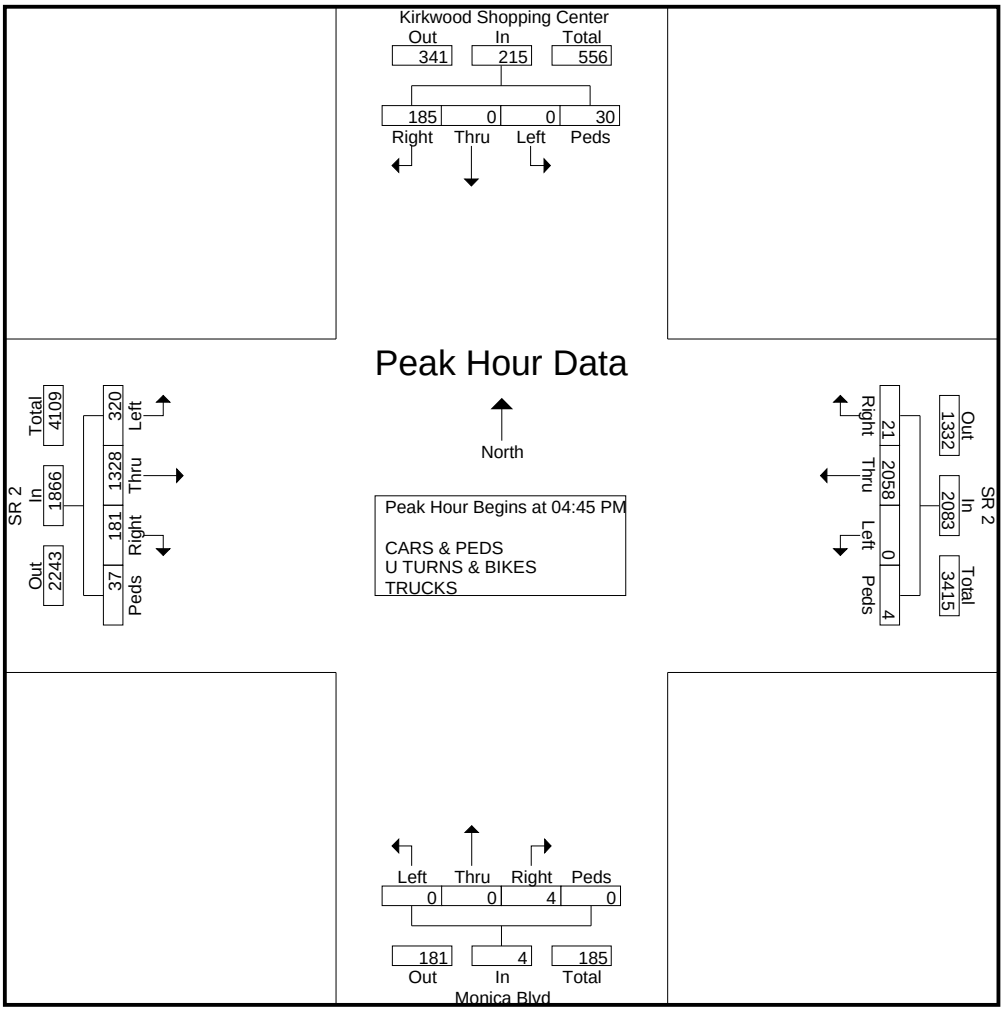
Page No : 3

	Kirkwood Shopping Center Southbound					Monica Blvd Northbound					SR 2 Westbound					SR 2 Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	47	0	0	1	48	**2**	0	0	0	**2**	**6**	506	0	0	512	**56**	329	68	0	453	1015
05:00 PM	48	0	0	1	49	1	0	0	0	1	6	508	0	1	515	42	**371**	83	0	**496**	1061
05:15 PM	**49**	0	0	1	50	0	0	0	0	0	5	510	0	**3**	518	43	340	71	0	454	1022
05:30 PM	41	0	0	**27**	**68**	1	0	0	0	1	4	**534**	0	0	**538**	40	288	**98**	**37**	463	**1070**
Total Volume	185	0	0	30	215	4	0	0	0	4	21	2058	0	4	2083	181	1328	320	37	1866	4168
% App. Total	86	0	0	14		100	0	0	0		1	98.8	0	0.2		9.7	71.2	17.1	2		
PHF	.944	.000	.000	.278	.790	.500	.000	.000	.000	.500	.875	.963	.000	.333	.968	.808	.895	.816	.250	.941	.974

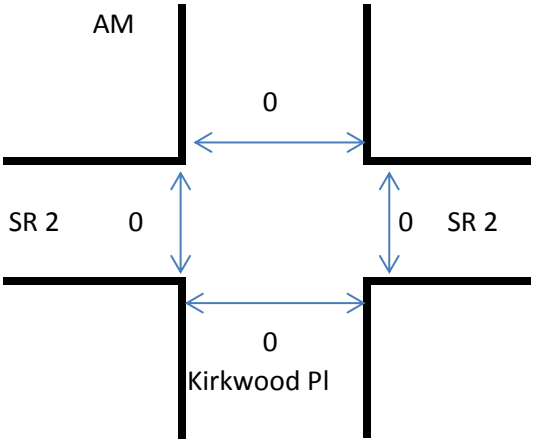


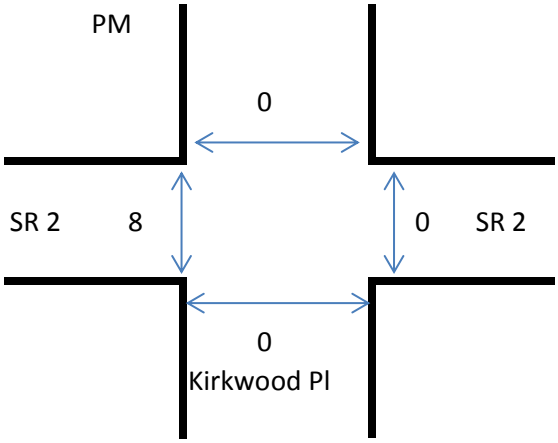
TRAFFIC COUNT SUMMARY

Intersection: DE 2 and Kirkwood Pl
Intersection #: 14
Weather Conditions: PM Rainy

NOTES:
AM EB trucks not counted

INTERSECTION SKETCHES WITH PED MOVEMENTS:





Count performed by: Erony, Lavenburg

Date: 5/2/13

CARS

	SB				EB SR 2				NB Shopping Center				WB EB 2				15 Minute
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Time																	
7:00-7:15				0	62	449	16	527	1	0	0	1	0	329	0	329	857
7:15-7:30				0	44	473	17	534	1	0	0	1	0	401	0	401	936
7:30-7:45				0	51	454	25	530	1	0	0	1	5	366	0	371	902
7:45-8:00				0	26	350	17	393	7	0	0	7	6	309	0	315	715
8:00-8:15				0	36	378	17	431	7	0	0	7	2	315	0	317	755
8:15-8:30				0	36	373	39	448	4	0	0	4	0	347	0	347	799
8:30-8:45				0	34	338	42	414	6	0	0	6	3	320	0	323	743
8:45-9:00				0	25	288	66	379	10	0	0	10	3	258	0	261	650
TOTAL	0	0	0	0	314	3103	239	3656	37	0	0	37	19	2645	0	2664	6357

TRUCKS

	SB				EB SR 2				NB Shopping Center				WB EB 2				15 Minute
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Time																	
7:00-7:15				0				0				0	0	3	0	3	3
7:15-7:30				0				0				0	0	2	0	2	2
7:30-7:45				0				0				0	0	10	0	10	10
7:45-8:00				0				0				0	0	9	0	9	9
8:00-8:15				0				0				0	0	8	0	8	8
8:15-8:30				0				0				0	0	4	0	4	4
8:30-8:45				0				0				0	0	4	0	4	4
8:45-9:00				0				0				0	0	5	0	5	5
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	45	0	45	45

PEDS

	Across EB SR 2	Across NB Shopping Center	Across WB SR 2	Across SB	15 Minute
	Total	Total	Total	Total	Total
Time					
7:00-7:15	0				0
7:15-7:30	0				0
7:30-7:45	0				0
7:45-8:00	0				0
8:00-8:15	0				0
8:15-8:30	0				0
8:30-8:45	0				0
8:45-9:00	0				0
TOTAL	0	0	0	0	0

Intersection Peak Hour

	SB				EB SR 2				NB Shopping Center				WB EB 2				Peak Hour
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Car and Truck Totals																	
7:00-7:15	0	0	0	0	62	449	16	527	1	0	0	1	0	332	0	332	860
7:15-7:30	0	0	0	0	44	473	17	534	1	0	0	1	0	403	0	403	938
7:30-7:45	0	0	0	0	51	454	25	530	1	0	0	1	5	376	0	381	912
7:45-8:00	0	0	0	0	26	350	17	393	7	0	0	7	6	318	0	324	724
Total Volume	**0**	**0**	**0**	**0**	**183**	**1726**	**75**	**1984**	**10**	**0**	**0**	**10**	**11**	**1429**	**0**	**1440**	**3434**
Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	24	0	24	24
Peds				0				0				0				0	0
Tk %	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.0%	0.0%	0.0%	0.0%	0.0%	#DIV/0!	#DIV/0!	0.0%	0.0%	1.7%	#DIV/0!	1.7%	
PHF	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.74	0.91	0.75	0.93	0.36	#DIV/0!	#DIV/0!	0.36	0.46	0.89	#DIV/0!	0.89	0.92

Count performed by: Binning, Kerezsi

Date: 4/22/13

CARS

	SB				EB SR 2				NB Shopping Center				WB EB 2				15 Minute
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Time																	
4:00-4:15				0	62	370	70	502	1	0	0	1	7	494	0	501	1004
4:15-4:30				0	51	407	59	517	3	0	0	3	9	527	0	536	1056
4:30-4:45				0	48	301	75	424	1	0	0	1	7	502	0	509	934
4:45-5:00				0	58	328	58	444	1	0	0	1	11	487	0	498	943
5:00-5:15				0	55	332	72	459	2	0	0	2	6	566	0	572	1033
5:15-5:30				0	68	336	65	469	1	0	0	1	7	568	0	575	1045
5:30-5:45				0	47	322	66	435	1	0	0	1	5	553	0	558	994
5:45-6:00				0	45	340	61	446	2	0	0	2	9	543	0	552	1000
TOTAL	0	0	0	0	434	2736	526	3696	12	0	0	12	61	4240	0	4301	8009

TRUCKS

	SB				EB SR 2				NB Shopping Center				WB EB 2				15 Minute
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Time																	
4:00-4:15				0	0	3	0	3	0	0	0	0	0	8	0	8	11
4:15-4:30				0	0	1	0	1	0	0	0	0	0	2	0	2	3
4:30-4:45				0	2	2	0	4	0	0	0	0	0	5	0	5	9
4:45-5:00				0	0	3	0	3	0	0	0	0	0	4	0	4	7
5:00-5:15				0	0	2	0	2	0	0	0	0	0	3	0	3	5
5:15-5:30				0	0	4	0	4	0	0	0	0	0	2	0	2	6
5:30-5:45				0	0	3	0	3	0	0	0	0	0	1	0	1	4
5:45-6:00				0	1	1	0	2	0	0	0	0	0	2	0	2	4
TOTAL	0	0	0	0	3	19	0	22	0	0	0	0	0	27	0	27	49

PEDS

Time	Across EB SR 2 Total	Across NB Shopping Center Total	Across WB SR 2 Total	Across SB Total	15 Minute Total
4:00-4:15	3	0	0	0	3
4:15-4:30	0	0	0	0	0
4:30-4:45	2	0	0	0	2
4:45-5:00	1	0	0	0	1
5:00-5:15	0	0	0	0	0
5:15-5:30	0	0	0	0	0
5:30-5:45	2	0	0	0	2
5:45-6:00	0	0	0	0	0
TOTAL	8	0	0	0	8

Intersection Peak Hour

	SB				EB SR 2				NB Shopping Center				WB EB 2				Peak Hour
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Car and Truck Totals																	
5:00-5:15	0	0	0	**0**	55	334	72	**461**	2	0	0	**2**	6	569	0	**575**	1038
5:15-5:30	0	0	0	**0**	68	340	65	**473**	1	0	0	**1**	7	570	0	**577**	1051
5:30-5:45	0	0	0	**0**	47	325	66	**438**	1	0	0	**1**	5	554	0	**559**	998
5:45-6:00	0	0	0	**0**	46	341	61	**448**	2	0	0	**2**	9	545	0	**554**	1004
Total Volume	**0**	**0**	**0**	**0**	**216**	**1340**	**264**	**1820**	**6**	**0**	**0**	**6**	**27**	**2238**	**0**	**2265**	**4091**
Trucks	0	0	0	0	2	11	0	13	0	0	0	0	0	14	0	14	27
Peds				3				0				0				0	3
Tk %	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.9%	0.8%	0.0%	0.7%	0.0%	#DIV/0!	#DIV/0!	0.0%	0.0%	0.6%	#DIV/0!	0.6%	
PHF	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.79	0.98	0.92	0.96	0.75	#DIV/0!	#DIV/0!	0.75	0.75	0.98	#DIV/0!	0.98	0.97

Tri-State Traffic Data, Inc.

610-466-1469
www.TSTData.com

Location:New Castle County, DE
Intersection:DE 2/Farrand Drive
Date:October 26, 2010
Counter:pb/ji

File Name : YJ1026-5
Site Code : 00000000
Start Date : 10/26/2010
Page No : 1

Groups Printed- Cars - Heavy Vehicles - turns

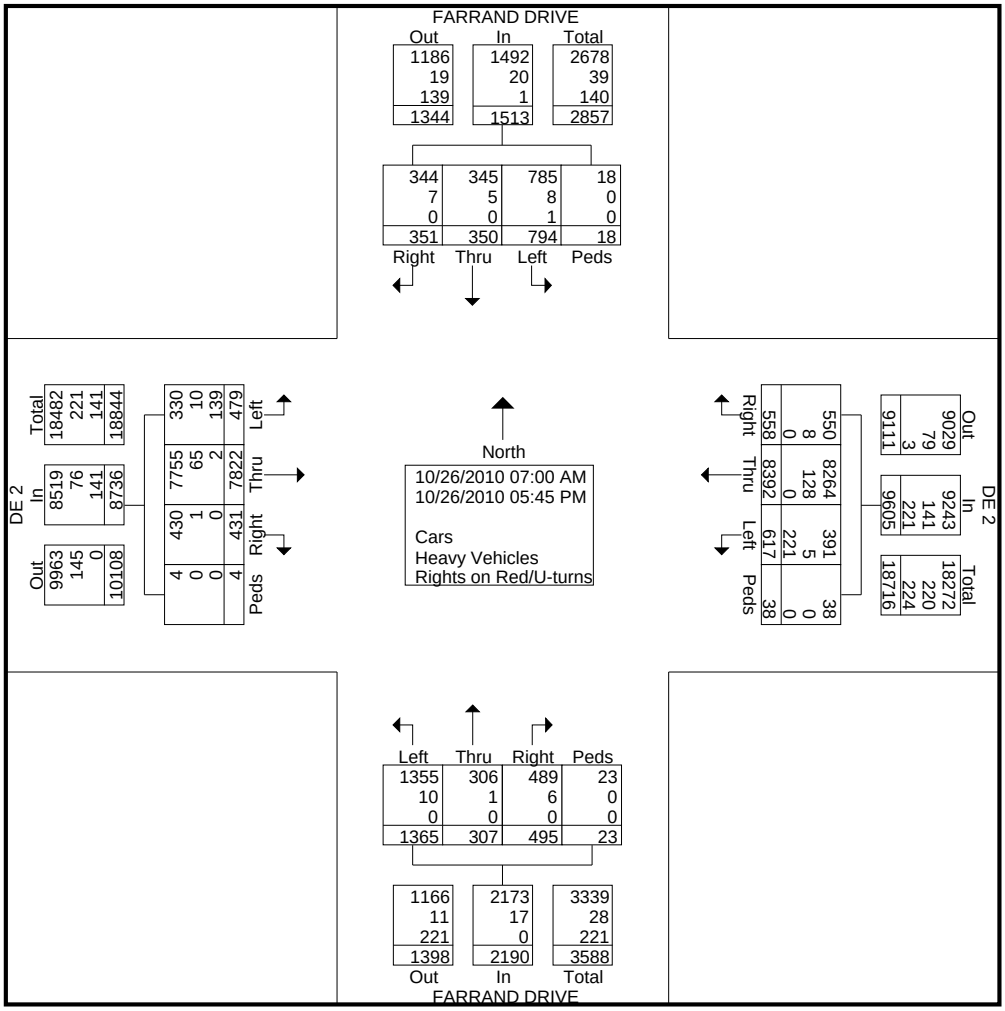
	FARRAND DRIVE Southbound					DE 2 Westbound					FARRAND DRIVE Northbound					DE 2 Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	19	3	18	0	40	8	173	5	1	187	9	2	24	0	35	10	400	8	0	418	680
07:15 AM	14	6	23	0	43	4	229	14	0	247	13	3	25	0	41	9	509	5	0	523	854
07:30 AM	20	10	25	0	55	13	305	12	2	332	12	4	24	0	40	10	456	4	0	470	897
07:45 AM	24	8	11	0	43	9	343	16	1	369	11	3	39	0	53	7	352	9	1	369	834
Total	77	27	77	0	181	34	1050	47	4	1135	45	12	112	0	169	36	1717	26	1	1780	3265
08:00 AM	12	5	24	1	42	10	289	18	2	319	11	9	30	0	50	5	345	6	0	356	767
08:15 AM	17	9	27	0	53	6	253	11	0	270	9	6	49	1	65	10	341	3	0	354	742
08:30 AM	7	8	18	1	34	11	294	14	3	322	14	7	31	0	52	11	349	6	0	366	774
08:45 AM	11	4	13	2	30	18	241	12	0	271	11	5	27	0	43	7	330	14	0	351	695
Total	47	26	82	4	159	45	1077	55	5	1182	45	27	137	1	210	33	1365	29	0	1427	2978
*** BREAK ***																					
11:00 AM	10	7	24	0	41	17	279	21	1	318	15	8	35	0	58	14	282	16	0	312	729
11:15 AM	8	16	44	0	68	23	254	24	2	303	12	12	58	0	82	18	273	20	0	311	764
11:30 AM	11	10	32	0	53	27	249	30	2	308	18	13	62	1	94	18	261	26	0	305	760
11:45 AM	7	21	39	4	71	22	321	39	0	382	29	12	45	1	87	20	282	26	1	329	869
Total	36	54	139	4	233	89	1103	114	5	1311	74	45	200	2	321	70	1098	88	1	1257	3122
12:00 PM	16	21	40	1	78	20	289	31	3	343	24	16	66	1	107	14	251	17	0	282	810
12:15 PM	16	19	28	4	67	17	322	42	1	382	31	10	52	6	99	24	246	24	0	294	842
12:30 PM	12	19	52	1	84	24	312	41	2	379	45	32	68	0	145	23	242	25	0	290	898
12:45 PM	12	25	38	1	76	24	316	36	0	376	37	14	66	2	119	20	357	36	0	413	984
Total	56	84	158	7	305	85	1239	150	6	1480	137	72	252	9	470	81	1096	102	0	1279	3534
*** BREAK ***																					
04:00 PM	20	25	58	1	104	35	380	36	5	456	30	19	74	0	123	30	309	29	1	369	1052
04:15 PM	17	15	39	1	72	30	485	42	4	561	19	17	75	1	112	26	304	30	0	360	1105
04:30 PM	18	28	43	0	89	28	429	29	3	489	20	21	88	1	130	24	340	44	0	408	1116
04:45 PM	22	10	48	0	80	65	469	34	3	571	24	18	73	1	116	27	341	29	0	397	1164
Total	77	78	188	2	345	158	1763	141	15	2077	93	75	310	3	481	107	1294	132	1	1534	4437
05:00 PM	13	21	57	0	91	27	544	20	1	592	22	16	77	6	121	30	295	24	0	349	1153
05:15 PM	16	10	27	0	53	43	555	31	1	630	29	21	114	1	165	27	367	30	0	424	1272
05:30 PM	19	22	38	1	80	46	574	34	1	655	23	21	78	0	122	21	276	24	0	321	1178
05:45 PM	10	28	28	0	66	31	487	25	0	543	27	18	85	1	131	26	314	24	1	365	1105
Total	58	81	150	1	290	147	2160	110	3	2420	101	76	354	8	539	104	1252	102	1	1459	4708
Grand Total	351	350	794	18	1513	558	8392	617	38	9605	495	307	1365	23	2190	431	7822	479	4	8736	22044
Apprch %	23.2	23.1	52.5	1.2		5.8	87.4	6.4	0.4		22.6	14	62.3	1.1		4.9	89.5	5.5	0		
Total %	1.6	1.6	3.6	0.1	6.9	2.5	38.1	2.8	0.2	43.6	2.2	1.4	6.2	0.1	9.9	2	35.5	2.2	0	39.6	
Cars	344	345	785	18	1492	550	8264	391	38	9243	489	306	1355	23	2173	430	7755	330	4	8519	21427
% Cars	98	98.6	98.9	100	98.6	98.6	98.5	63.4	100	96.2	98.8	99.7	99.3	100	99.2	99.8	99.1	68.9	100	97.5	97.2
Heavy Vehicles	7	5	8	0	20	8	128	5	0	141	6	1	10	0	17	1	65	10	0	76	254
% Heavy Vehicles	2	1.4	1	0	1.3	1.4	1.5	0.8	0	1.5	1.2	0.3	0.7	0	0.8	0.2	0.8	2.1	0	0.9	1.2
Rights on Red/U-turns	0	0	1	0	1	0	0	221	0	221	0	0	0	0	0	0	2	139	0	141	363
% Rights on Red/U-turns	0	0	0.1	0	0.1	0	0	35.8	0	2.3	0	0	0	0	0	0	0	29	0	1.6	1.6

Tri-State Traffic Data, Inc.

610-466-1469
www.TSTData.com

Location:New Castle County, DE
Intersection:DE 2/Farrand Drive
Date:October 26, 2010
Counter:pb/ji

File Name : YJ1026-5
Site Code : 00000000
Start Date : 10/26/2010
Page No : 2



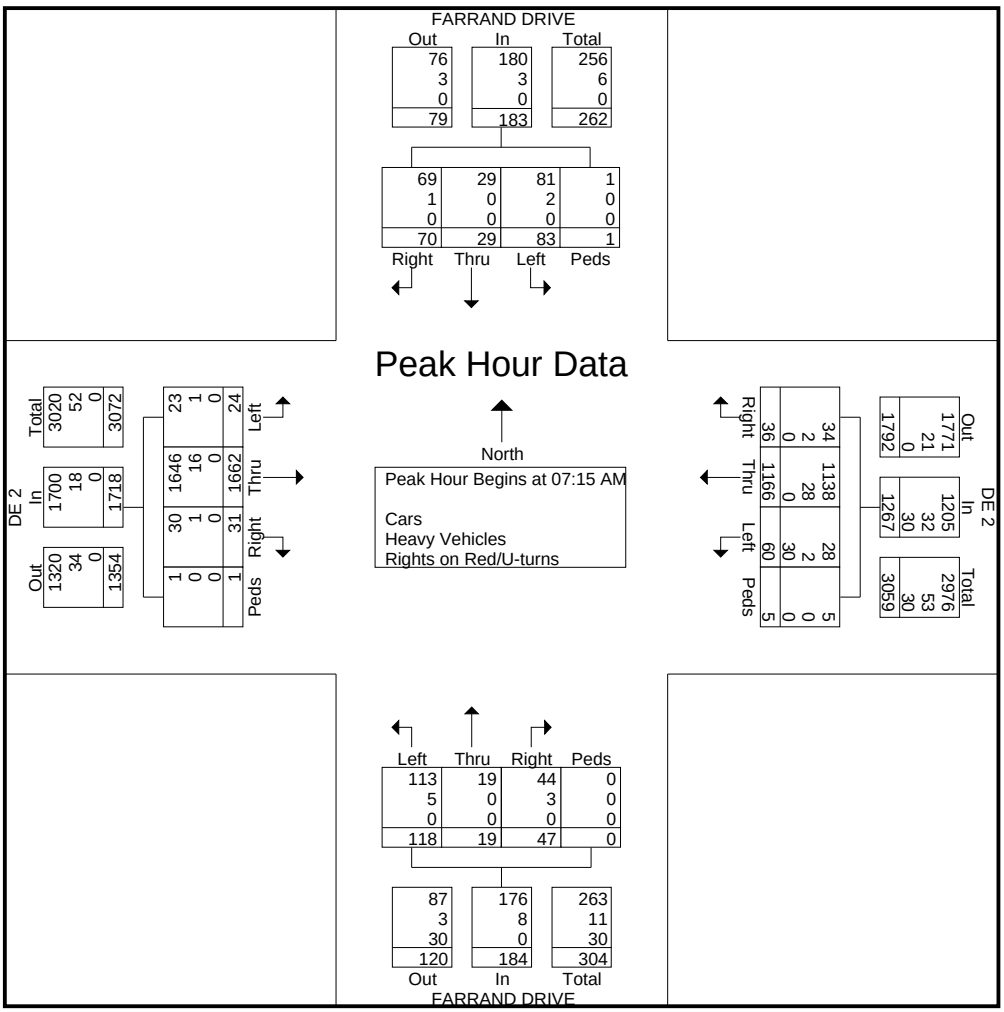
Tri-State Traffic Data, Inc.

610-466-1469
www.TSTData.com

Location:New Castle County, DE
Intersection:DE 2/Farrand Drive
Date:October 26, 2010
Counter:pb/ji

File Name : YJ1026-5
Site Code : 00000000
Start Date : 10/26/2010
Page No : 3

	FARRAND DRIVE Southbound					DE 2 Westbound					FARRAND DRIVE Northbound					DE 2 Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	14	6	23	0	43	4	229	14	0	247	**13**	3	25	0	41	9	**509**	5	0	**523**	854
07:30 AM	20	**10**	**25**	0	**55**	**13**	305	12	**2**	332	12	4	24	0	40	**10**	456	4	0	470	**897**
07:45 AM	**24**	8	11	0	43	9	**343**	16	1	**369**	11	3	**39**	0	**53**	7	352	**9**	**1**	369	834
08:00 AM	12	5	24	**1**	42	10	289	**18**	2	319	11	**9**	30	0	50	5	345	6	0	356	767
Total Volume	70	29	83	1	183	36	1166	60	5	1267	47	19	118	0	184	31	1662	24	1	1718	3352
% App. Total	38.3	15.8	45.4	0.5		2.8	92	4.7	0.4		25.5	10.3	64.1	0		1.8	96.7	1.4	0.1		
PHF	.729	.725	.830	.250	.832	.692	.850	.833	.625	.858	.904	.528	.756	.000	.868	.775	.816	.667	.250	.821	.934
Cars	69	29	81	1	180	34	1138										1646				
% Cars	98.6	100	97.6	100	98.4	94.4	97.6	46.7	100	95.1	93.6	100	95.8	0	95.7	96.8	99.0	95.8	100	99.0	97.3
Heavy Vehicles	1	0	2	0	3	2	28	2	0	32	3	0	5	0	8	1	16	1	0	18	61
% Heavy Vehicles	1.4	0	2.4	0	1.6	5.6	2.4	3.3	0	2.5	6.4	0	4.2	0	4.3	3.2	1.0	4.2	0	1.0	1.8
Rights on Red/U-turns	0	0	0	0	0	0	0	30	0	30	0	0	0	0	0	0	0	0	0	0	30
% Rights on Red/U-turns	0	0	0	0	0	0	0	50.0	0	2.4	0	0	0	0	0	0	0	0	0	0	0.9



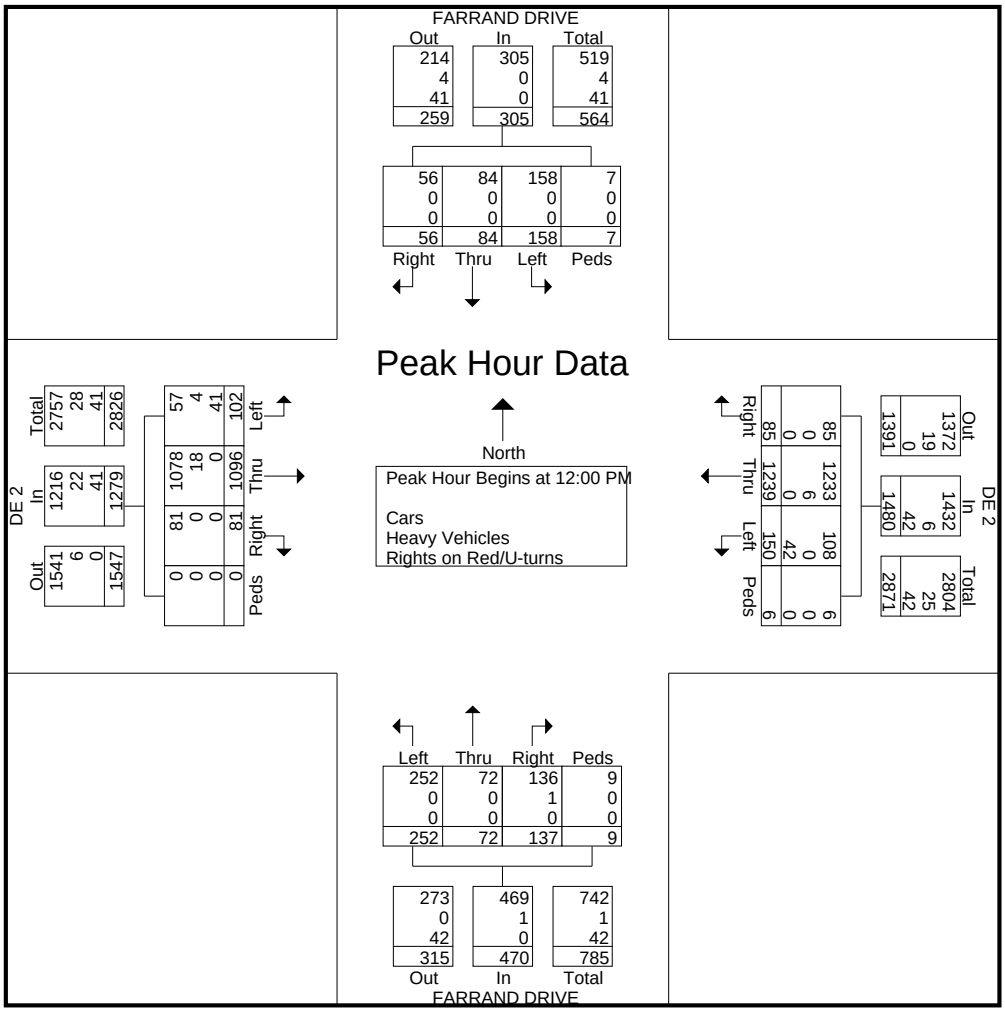
Tri-State Traffic Data, Inc.

610-466-1469
www.TSTData.com

Location:New Castle County, DE
Intersection:DE 2/Farrand Drive
Date:October 26, 2010
Counter:pb/ji

File Name : YJ1026-5
Site Code : 00000000
Start Date : 10/26/2010
Page No : 4

	FARRAND DRIVE Southbound					DE 2 Westbound					FARRAND DRIVE Northbound					DE 2 Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 12:00 PM																					
12:00 PM	**16**	21	40	1	78	20	289	31	**3**	343	24	16	66	1	107	14	251	17	0	282	810
12:15 PM	16	19	28	**4**	67	17	**322**	**42**	1	**382**	31	10	52	**6**	99	**24**	246	24	0	294	842
12:30 PM	12	19	**52**	1	**84**	**24**	312	41	2	379	**45**	**32**	**68**	0	**145**	23	242	25	0	290	898
12:45 PM	12	**25**	38	1	76	24	316	36	0	376	37	14	66	2	119	20	**357**	**36**	0	**413**	**984**
Total Volume	56	84	158	7	305	85	1239	150	6	1480	137	72	252	9	470	81	1096	102	0	1279	3534
% App. Total	18.4	27.5	51.8	2.3		5.7	83.7	10.1	0.4		29.1	15.3	53.6	1.9		6.3	85.7	8	0		
PHF	.875	.840	.760	.438	.908	.885	.962	.893	.500	.969	.761	.563	.926	.375	.810	.844	.768	.708	.000	.774	.898
Cars	56	84	158	7	305	85	1233										1078				
% Cars	100	100	100	100	100	100	99.5	72.0	100	96.8	99.3	100	100	100	99.8	100	98.4	55.9	0	95.1	96.8
Heavy Vehicles	0	0	0	0	0	0	6	0	0	6	1	0	0	0	1	0	18	4	0	22	29
% Heavy Vehicles	0	0	0	0	0	0	0.5	0	0	0.4	0.7	0	0	0	0.2	0	1.6	3.9	0	1.7	0.8
Rights on Red/U-turns	0	0	0	0	0	0	0	42	0	42	0	0	0	0	0	0	0	41	0	41	83
% Rights on Red/U-turns	0	0	0	0	0	0	0	28.0	0	2.8	0	0	0	0	0	0	0	40.2	0	3.2	2.3



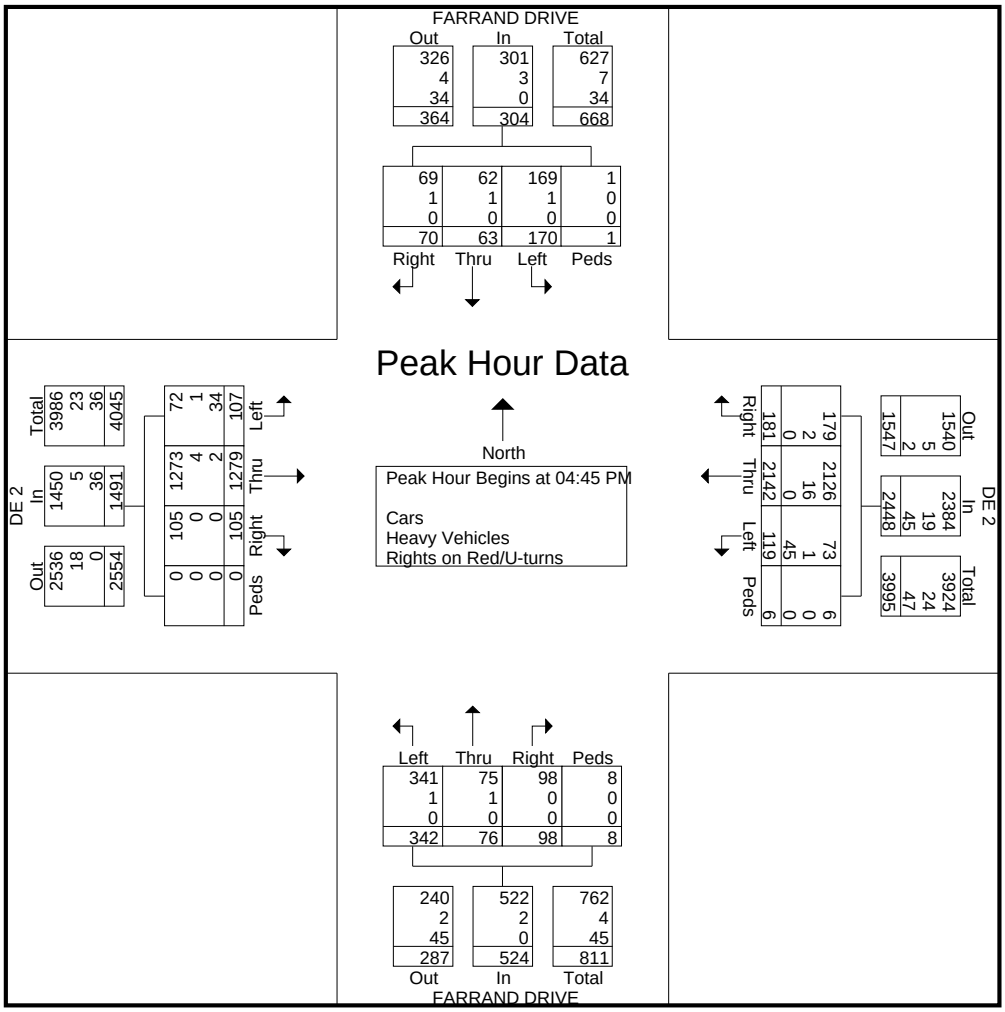
Tri-State Traffic Data, Inc.

610-466-1469
www.TSTData.com

Location:New Castle County, DE
Intersection:DE 2/Farrand Drive
Date:October 26, 2010
Counter:pb/ji

File Name : YJ1026-5
Site Code : 00000000
Start Date : 10/26/2010
Page No : 5

	FARRAND DRIVE Southbound					DE 2 Westbound					FARRAND DRIVE Northbound					DE 2 Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	**22**	10	48	0	80	**65**	469	**34**	**3**	571	24	18	73	1	116	27	341	29	0	397	1164
05:00 PM	13	21	**57**	0	**91**	27	544	20	1	592	22	16	77	**6**	121	**30**	295	24	0	349	1153
05:15 PM	16	10	27	0	53	43	555	31	1	630	**29**	**21**	**114**	1	**165**	27	**367**	**30**	0	**424**	**1272**
05:30 PM	19	**22**	38	**1**	80	46	**574**	34	1	**655**	23	21	78	0	122	21	276	24	0	321	1178
Total Volume	70	63	170	1	304	181	2142	119	6	2448	98	76	342	8	524	105	1279	107	0	1491	4767
% App. Total	23	20.7	55.9	0.3		7.4	87.5	4.9	0.2		18.7	14.5	65.3	1.5		7	85.8	7.2	0		
PHF	.795	.716	.746	.250	.835	.696	.933	.875	.500	.934	.845	.905	.750	.333	.794	.875	.871	.892	.000	.879	.937
Cars	69	62	169	1	301	179	2126										1273				
% Cars	98.6	98.4	99.4	100	99.0	98.9	99.3	61.3	100	97.4	100	98.7	99.7	100	99.6	100	99.5	67.3	0	97.3	97.7
Heavy Vehicles	1	1	1	0	3	2	16	1	0	19	0	1	1	0	2	0	4	1	0	5	29
% Heavy Vehicles	1.4	1.6	0.6	0	1.0	1.1	0.7	0.8	0	0.8	0	1.3	0.3	0	0.4	0	0.3	0.9	0	0.3	0.6
Rights on Red/U-turns	0	0	0	0	0	0	0	45	0	45	0	0	0	0	0	0	2	34	0	36	81
% Rights on Red/U-turns	0	0	0	0	0	0	0	37.8	0	1.8	0	0	0	0	0	0	0.2	31.8	0	2.4	1.7



RJM Engineering, Inc.
6031 University Blvd, Suite 209
Ellicott City, MD 21043

Location: New Castle County, DE
Intersection: SR 2 at Duncan Road
Date: Tuesday, June 3, 2014

File Name : SR 2 at Duncan Road
Site Code : 00001044
Start Date : 6/3/2014
Page No : 1

Groups Printed- Cars and Peds - Turns and Bikes - Walkers

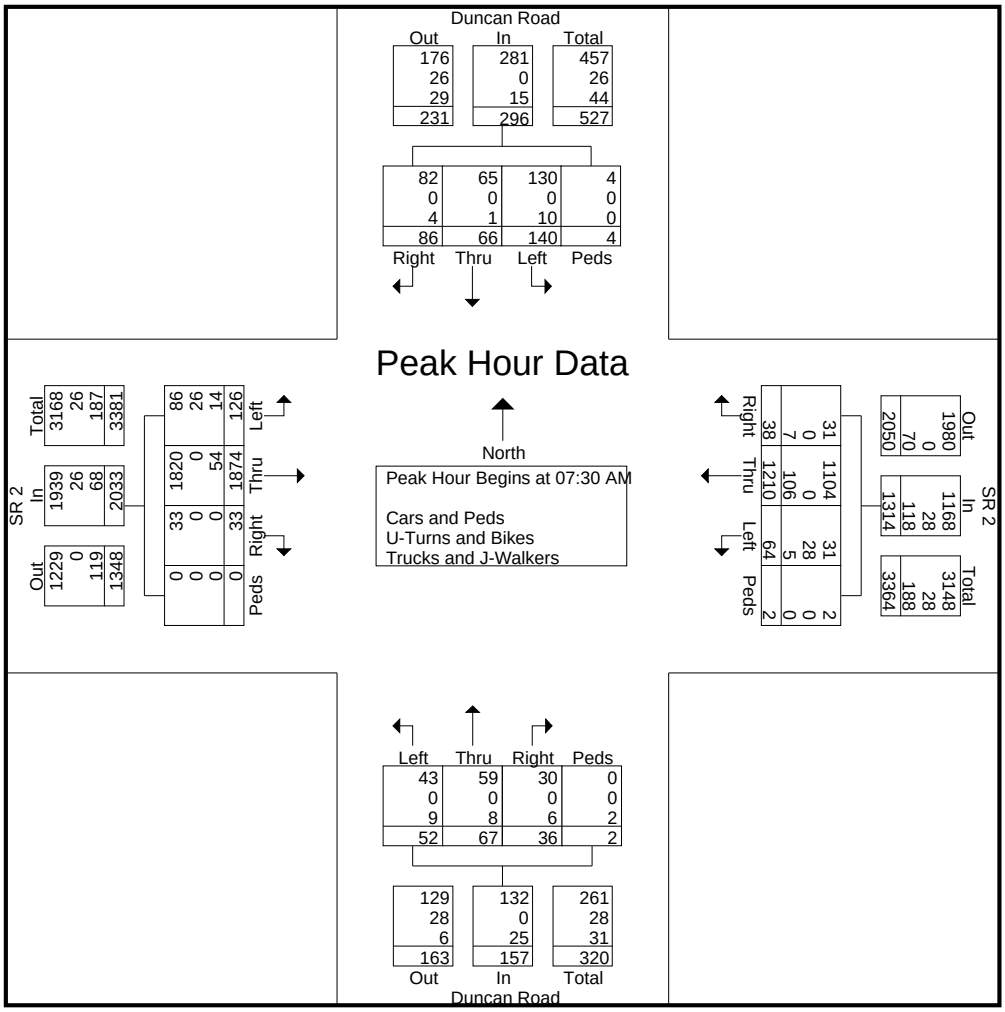
	SR 2 Eastbound					SR 2 Westbound					Duncan Road Northbound					Duncan Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
07:00 AM	10	443	8	1	462	13	241	11	0	265	12	6	5	0	23	38	19	18	0	75	825
07:15 AM	27	483	13	0	523	16	230	5	2	253	10	13	7	1	31	36	24	24	0	84	891
07:30 AM	31	531	8	0	570	12	312	10	1	335	6	14	13	0	33	52	15	29	1	97	1035
07:45 AM	35	470	12	0	517	17	289	12	0	318	13	14	7	2	36	20	22	17	0	59	930
Total	103	1927	41	1	2072	58	1072	38	3	1171	41	47	32	3	123	146	80	88	1	315	3681
08:00 AM	26	407	6	0	439	19	270	8	1	298	12	19	5	0	36	19	18	14	3	54	827
08:15 AM	34	466	7	0	507	16	339	8	0	363	21	20	11	0	52	49	11	26	0	86	1008
08:30 AM	41	411	15	1	468	33	324	13	0	370	14	15	10	0	39	29	22	36	0	87	964
08:45 AM	32	371	10	2	415	34	294	12	0	340	9	15	20	0	44	27	19	25	1	72	871
Total	133	1655	38	3	1829	102	1227	41	1	1371	56	69	46	0	171	124	70	101	4	299	3670
11:00 AM	29	253	12	0	294	37	313	18	3	371	15	5	3	0	23	16	14	5	1	36	724
11:15 AM	31	293	12	1	337	31	310	16	0	357	21	15	10	1	47	12	19	8	0	39	780
11:30 AM	42	278	7	0	327	30	317	9	2	358	11	12	8	3	34	15	15	18	0	48	767
11:45 AM	36	292	11	1	340	36	312	18	3	369	12	13	9	3	37	18	14	17	1	50	796
Total	138	1116	42	2	1298	134	1252	61	8	1455	59	45	30	7	141	61	62	48	2	173	3067
12:00 PM	48	263	6	3	320	33	305	53	1	392	15	13	6	3	37	30	14	18	1	63	812
12:15 PM	47	365	10	2	424	39	313	11	1	364	16	21	5	0	42	24	12	13	1	50	880
12:30 PM	49	296	9	0	354	37	297	18	3	355	17	11	6	3	37	35	13	16	2	66	812
12:45 PM	38	215	12	0	265	27	331	24	0	382	17	15	7	0	39	17	8	16	2	43	729
Total	182	1139	37	5	1363	136	1246	106	5	1493	65	60	24	6	155	106	47	63	6	222	3233
01:00 PM	42	305	10	0	357	26	359	20	0	405	17	17	7	1	42	20	11	14	1	46	850
01:15 PM	44	268	4	0	316	26	336	14	0	376	23	21	13	1	58	25	17	16	2	60	810
01:30 PM	39	278	6	0	323	38	303	10	1	352	21	14	11	1	47	12	9	16	2	39	761
01:45 PM	39	274	6	0	319	28	318	19	0	365	24	17	12	0	53	13	14	20	1	48	785
Total	164	1125	26	0	1315	118	1316	63	1	1498	85	69	43	3	200	70	51	66	6	193	3206
03:00 PM	39	309	5	0	353	24	359	14	0	397	15	23	9	0	47	21	12	27	0	60	857
03:15 PM	39	316	9	0	364	12	414	22	1	449	21	20	4	1	46	25	17	18	2	62	921
03:30 PM	41	266	2	0	309	32	428	21	2	483	16	17	3	1	37	15	20	26	0	61	890
03:45 PM	43	272	7	0	322	22	410	25	0	457	19	16	14	0	49	29	16	39	0	84	912
Total	162	1163	23	0	1348	90	1611	82	3	1786	71	76	30	2	179	90	65	110	2	267	3580
04:00 PM	35	339	4	0	378	25	482	19	0	526	25	26	5	1	57	20	17	26	1	64	1025
04:15 PM	46	323	9	0	378	27	447	29	0	503	21	38	19	0	78	26	11	10	0	47	1006
04:30 PM	31	260	15	3	309	24	435	17	2	478	20	27	5	0	52	32	20	33	0	85	924
04:45 PM	50	393	10	0	453	22	517	25	1	565	12	38	3	1	54	24	15	21	0	60	1132
Total	162	1315	38	3	1518	98	1881	90	3	2072	78	129	32	2	241	102	63	90	1	256	4087
05:00 PM	34	354	9	1	398	20	513	42	1	576	17	35	6	2	60	29	15	26	2	72	1106
05:15 PM	51	380	3	0	434	25	497	30	0	552	20	54	12	0	86	22	24	30	0	76	1148
05:30 PM	41	299	5	0	345	20	555	41	0	616	16	27	11	1	55	21	19	22	1	63	1079
05:45 PM	47	331	6	0	384	25	473	45	1	544	10	27	7	0	44	19	15	25	1	60	1032
Total	173	1364	23	1	1561	90	2038	158	2	2288	63	143	36	3	245	91	73	103	4	271	4365
Grand Total	1217	10804	268	15	12304	826	11643	639	26	13134	518	638	273	26	1455	790	511	669	26	1996	28889
Apprch %	9.9	87.8	2.2	0.1		6.3	88.6	4.9	0.2		35.6	43.8	18.8	1.8		39.6	25.6	33.5	1.3		
Total %	4.2	37.4	0.9	0.1	42.6	2.9	40.3	2.2	0.1	45.5	1.8	2.2	0.9	0.1	5	2.7	1.8	2.3	0.1	6.9	
Cars and Peds	725	10447	263	4	11439	324	10648	582	25	11579	490	597	252	15	1354	752	494	645	21	1912	26284
% Cars and Peds	59.6	96.7	98.1	26.7	93	39.2	91.5	91.1	96.2	88.2	94.6	93.6	92.3	57.7	93.1	95.2	96.7	96.4	80.8	95.8	91
U-Turns and Bikes	455	0	0	7	462	462	0	0	0	462	0	0	0	8	8	0	0	0	4	4	936
% U-Turns and Bikes	37.4	0	0	46.7	3.8	55.9	0	0	0	3.5	0	0	0	30.8	0.5	0	0	0	15.4	0.2	3.2
Trucks and J-Walkers	37	357	5	4	403	40	995	57	1	1093	28	41	21	3	93	38	17	24	1	80	1669
% Trucks and J-Walkers	3	3.3	1.9	26.7	3.3	4.8	8.5	8.9	3.8	8.3	5.4	6.4	7.7	11.5	6.4	4.8	3.3	3.6	3.8	4	5.8

RJM Engineering, Inc.
6031 University Blvd, Suite 209
Ellicott City, MD 21043

Location: New Castle County, DE
Intersection: SR 2 at Duncan Road
Date: Tuesday, June 3, 2014

File Name : SR 2 at Duncan Road
Site Code : 00001044
Start Date : 6/3/2014
Page No : 2

	SR 2 Eastbound					SR 2 Westbound					Duncan Road Northbound					Duncan Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	31	**531**	8	0	**570**	12	312	10	**1**	335	6	14	**13**	0	33	**52**	15	**29**	1	**97**	**1035**
07:45 AM	**35**	470	**12**	0	517	17	289	**12**	0	318	13	14	7	**2**	36	20	**22**	17	0	59	930
08:00 AM	26	407	6	0	439	**19**	270	8	1	298	12	19	5	0	36	19	18	14	**3**	54	827
08:15 AM	34	466	7	0	507	16	**339**	8	0	**363**	**21**	**20**	11	0	**52**	49	11	26	0	86	1008
Total Volume	126	1874	33	0	2033	64	1210	38	2	1314	52	67	36	2	157	140	66	86	4	296	3800
% App. Total	6.2	92.2	1.6	0		4.9	92.1	2.9	0.2		33.1	42.7	22.9	1.3		47.3	22.3	29.1	1.4		
PHF	.900	.882	.688	.000	.892	.842	.892	.792	.500	.905	.619	.838	.692	.250	.755	.673	.750	.741	.333	.763	.918
Cars and Peds	86	1820					1104														
% Cars and Peds	68.3	97.1	100	0	95.4	48.4	91.2	81.6	100	88.9	82.7	88.1	83.3	0	84.1	92.9	98.5	95.3	100	94.9	92.6
U-Turns and Bikes	26	0	0	0	26	28	0	0	0	28	0	0	0	0	0	0	0	0	0	0	54
% U-Turns and Bikes	20.6	0	0	0	1.3	43.8	0	0	0	2.1	0	0	0	0	0	0	0	0	0	0	1.4
Trucks and J-Walkers	14	54	0	0	68	5	106	7	0	118	9	8	6	2	25	10	1	4	0	15	226
% Trucks and J-Walkers	11.1	2.9	0	0	3.3	7.8	8.8	18.4	0	9.0	17.3	11.9	16.7	100	15.9	7.1	1.5	4.7	0	5.1	5.9

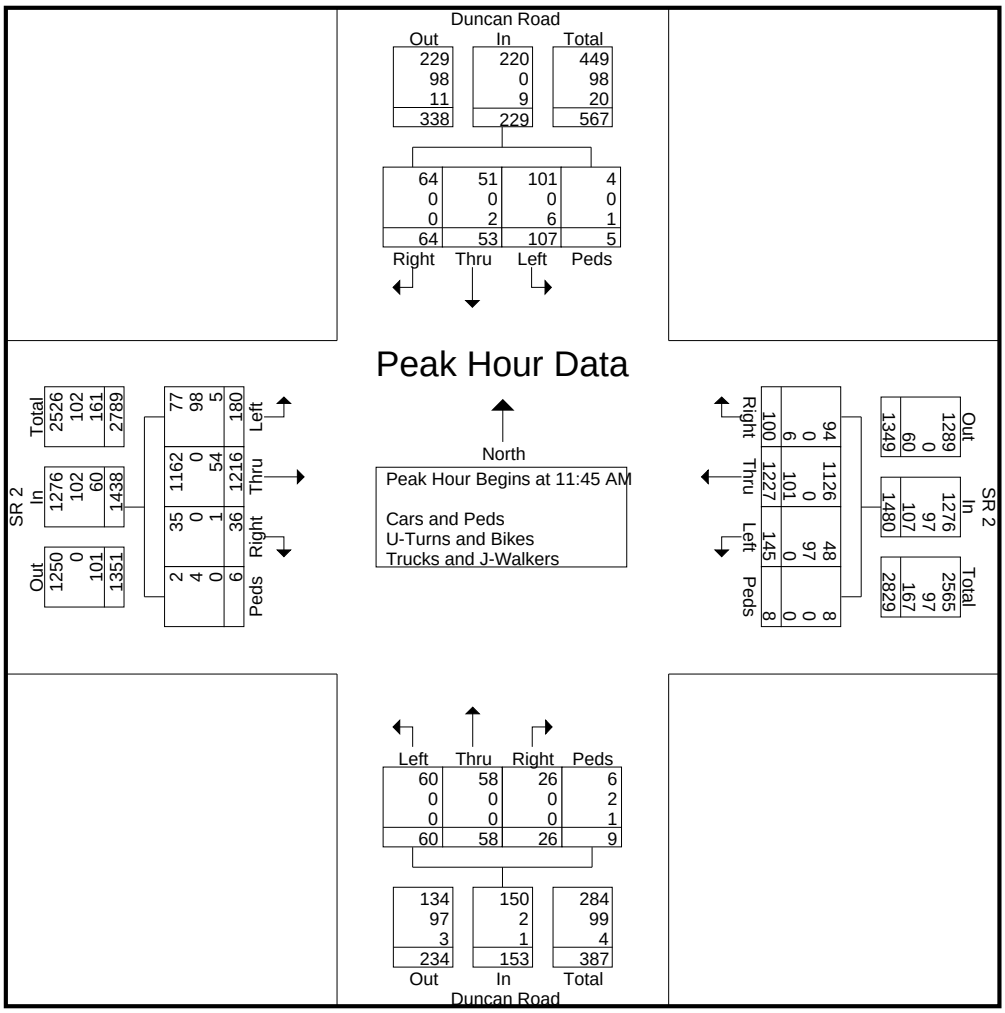


RJM Engineering, Inc.
6031 University Blvd, Suite 209
Ellicott City, MD 21043

Location: New Castle County, DE
Intersection: SR 2 at Duncan Road
Date: Tuesday, June 3, 2014

File Name : SR 2 at Duncan Road
Site Code : 00001044
Start Date : 6/3/2014
Page No : 3

	SR 2 Eastbound					SR 2 Westbound					Duncan Road Northbound					Duncan Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 10:00 AM to 01:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 11:45 AM																					
11:45 AM	36	292	**11**	1	340	36	312	18	**3**	369	12	13	**9**	**3**	37	18	**14**	17	1	50	796
12:00 PM	48	263	6	**3**	320	33	305	**53**	1	**392**	15	13	6	3	37	30	14	**18**	1	63	812
12:15 PM	47	**365**	10	2	**424**	**39**	**313**	11	1	364	16	**21**	5	0	**42**	24	12	13	1	50	**880**
12:30 PM	**49**	296	9	0	354	37	297	18	3	355	**17**	11	6	3	37	**35**	13	16	**2**	**66**	812
Total Volume	180	1216	36	6	1438	145	1227	100	8	1480	60	58	26	9	153	107	53	64	5	229	3300
% App. Total	12.5	84.6	2.5	0.4		9.8	82.9	6.8	0.5		39.2	37.9	17	5.9		46.7	23.1	27.9	2.2		
PHF	.918	.833	.818	.500	.848	.929	.980	.472	.667	.944	.882	.690	.722	.750	.911	.764	.946	.889	.625	.867	.938
Cars and Peds	77	1162					1126														
% Cars and Peds	42.8	95.6	97.2	33.3	88.7	33.1	91.8	94.0	100	86.2	100	100	100	66.7	98.0	94.4	96.2	100	80.0	96.1	88.5
U-Turns and Bikes	98	0	0	4	102	97	0	0	0	97	0	0	0	2	2	0	0	0	0	0	201
% U-Turns and Bikes	54.4	0	0	66.7	7.1	66.9	0	0	0	6.6	0	0	0	22.2	1.3	0	0	0	0	0	6.1
Trucks and J-Walkers	5	54	1	0	60	0	101	6	0	107	0	0	0	1	1	6	2	0	1	9	177
% Trucks and J-Walkers	2.8	4.4	2.8	0	4.2	0	8.2	6.0	0	7.2	0	0	0	11.1	0.7	5.6	3.8	0	20.0	3.9	5.4

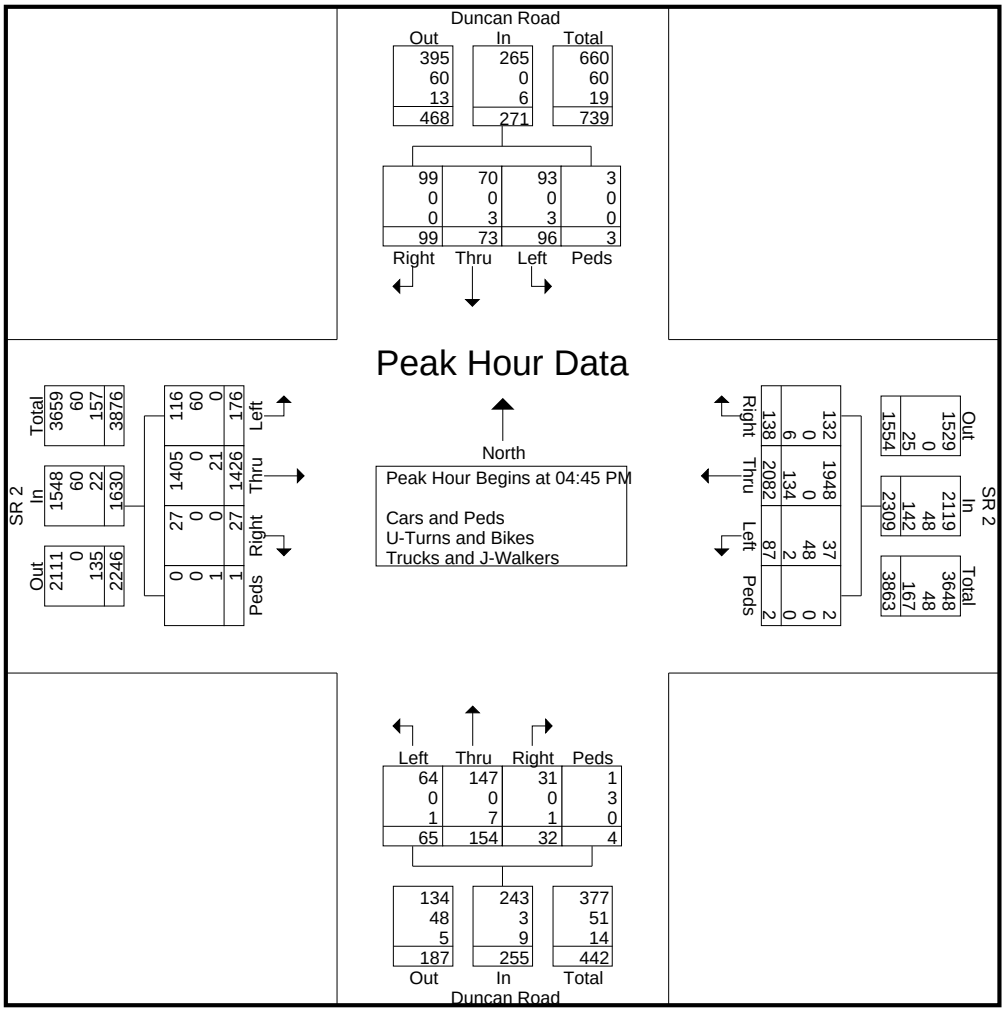


RJM Engineering, Inc.
6031 University Blvd, Suite 209
Ellicott City, MD 21043

Location: New Castle County, DE
Intersection: SR 2 at Duncan Road
Date: Tuesday, June 3, 2014

File Name : SR 2 at Duncan Road
Site Code : 00001044
Start Date : 6/3/2014
Page No : 4

	SR 2 Eastbound					SR 2 Westbound					Duncan Road Northbound					Duncan Road Southbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	50	**393**	**10**	0	**453**	22	517	25	**1**	565	12	38	3	1	54	24	15	21	0	60	1132
05:00 PM	34	354	9	**1**	398	20	513	**42**	1	576	17	35	6	**2**	60	**29**	15	26	**2**	72	1106
05:15 PM	**51**	380	3	0	434	**25**	497	30	0	552	**20**	**54**	**12**	0	**86**	22	**24**	**30**	0	**76**	**1148**
05:30 PM	41	299	5	0	345	20	**555**	41	0	**616**	16	27	11	1	55	21	19	22	1	63	1079
Total Volume	176	1426	27	1	1630	87	2082	138	2	2309	65	154	32	4	255	96	73	99	3	271	4465
% App. Total	10.8	87.5	1.7	0.1		3.8	90.2	6	0.1		25.5	60.4	12.5	1.6		35.4	26.9	36.5	1.1		
PHF	.863	.907	.675	.250	.900	.870	.938	.821	.500	.937	.813	.713	.667	.500	.741	.828	.760	.825	.375	.891	.972
Cars and Peds	116	1405					1948														
% Cars and Peds	65.9	98.5	100	0	95.0	42.5	93.6	95.7	100	91.8	98.5	95.5	96.9	25.0	95.3	96.9	95.9	100	100	97.8	93.5
U-Turns and Bikes	60	0	0	0	60	48	0	0	0	48	0	0	0	3	3	0	0	0	0	0	111
% U-Turns and Bikes	34.1	0	0	0	3.7	55.2	0	0	0	2.1	0	0	0	75.0	1.2	0	0	0	0	0	2.5
Trucks and J-Walkers	0	21	0	1	22	2	134	6	0	142	1	7	1	0	9	3	3	0	0	6	179
% Trucks and J-Walkers	0	1.5	0	100	1.3	2.3	6.4	4.3	0	6.1	1.5	4.5	3.1	0	3.5	3.1	4.1	0	0	2.2	4.0

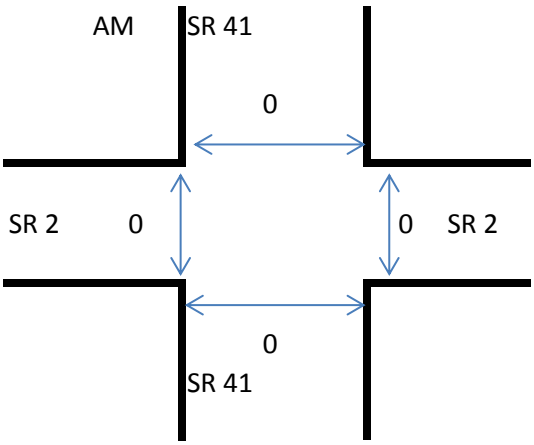


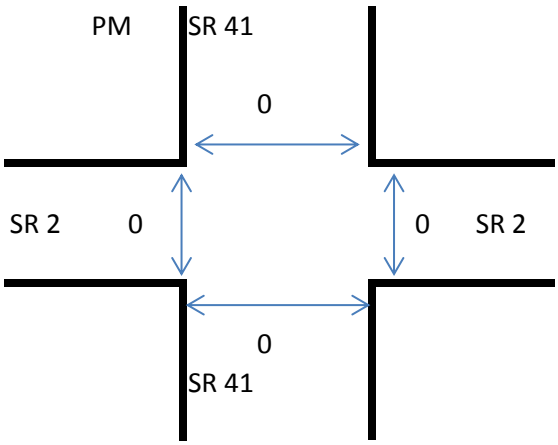
TRAFFIC COUNT SUMMARY

Intersection: DE 2 and Newport Gap Pike (SR 41)
Intersection #: 17
Weather Conditions:

NOTES:
4/30 AM count no WB trucks
PM SB data inaccurate

INTERSECTION SKETCHES WITH PED MOVEMENTS:





Count performed by: Eta, DeBenedictis, Parenty, Hubschmitt

Date: 4/30/13

CARS

	SB Newport Gap Pike				EB SR 2				NB Newport Gap Pike				WB EB 2				15 Minute
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Time																	
7:00-7:15	2	48	135	185	44	449	4	497	10	18	18	46	84	183	12	279	1007
7:15-7:30	5	55	189	249	35	444	6	485	24	26	26	76	94	240	11	345	1155
7:30-7:45	12	66	191	269	112	366	14	492	28	28	28	84	90	308	13	411	1256
7:45-8:00	8	65	164	237	61	340	8	409	15	21	24	60	81	275	31	387	1093
8:00-8:15	9	43	178	230	31	396	15	442	11	22	21	54	90	276	22	388	1114
8:15-8:30	10	36	149	195	47	291	18	356	15	19	21	55	73	262	10	345	951
8:30-8:45	7	54	156	217	49	411	8	468	20	15	42	77	88	294	27	409	1171
8:45-9:00	4	40	122	166	36	273	10	319	18	21	30	69	77	239	24	340	894
TOTAL	57	407	1284	1748	415	2970	83	3468	141	170	210	521	677	2077	150	2904	8641

TRUCKS

	SB Newport Gap Pike				EB SR 2				NB Newport Gap Pike				WB EB 2				15 Minute
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Time																	
7:00-7:15	0	1	4	5	0	0	0	0	1	0	1	2				0	7
7:15-7:30	0	0	1	1	0	4	0	4	0	0	0	0				0	5
7:30-7:45	0	1	3	4	1	3	0	4	1	0	0	1				0	9
7:45-8:00	0	0	10	10	0	3	0	3	0	0	0	0				0	13
8:00-8:15	0	2	7	9	1	4	2	7	0	2	1	3				0	19
8:15-8:30	0	5	11	16	3	5	2	10	1	2	0	3				0	29
8:30-8:45	1	1	5	7	1	4	0	5	1	0	0	1				0	13
8:45-9:00	1	1	9	11	0	3	1	4	1	0	0	1				0	16
TOTAL	2	11	50	63	6	26	5	37	5	4	2	11	0	0	0	0	111

PEDS

	Across EB SR 2	Across NB Newport Gap Pike	Across WB SR 2	Across SB Newport Gap Pike	15 Minute
	Total	Total	Total	Total	Total
Time					
7:00-7:15	2			0	2
7:15-7:30	1			0	1
7:30-7:45	3			0	3
7:45-8:00	2			1	3
8:00-8:15	0			1	1
8:15-8:30	3			0	3
8:30-8:45	2			0	2
8:45-9:00	0			0	0
TOTAL	13	0	0	2	15

Intersection Peak Hour

	SB Newport Gap Pike				EB SR 2				NB Newport Gap Pike				WB EB 2				Peak Hour
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Car and Truck Totals																	
7:15-7:30	5	55	190	**250**	35	448	6	**489**	24	26	26	**76**	94	240	11	**345**	1160
7:30-7:45	12	67	194	**273**	113	369	14	**496**	29	28	28	**85**	90	308	13	**411**	1265
7:45-8:00	8	65	174	**247**	61	343	8	**412**	15	21	24	**60**	81	275	31	**387**	1106
8:00-8:15	9	45	185	**239**	32	400	17	**449**	11	24	22	**57**	90	276	22	**388**	1133
Total Volume	**34**	**232**	**743**	**1009**	**241**	**1560**	**45**	**1846**	**79**	**99**	**100**	**278**	**355**	**1099**	**77**	**1531**	**4664**
Trucks	0	8	31	39	5	15	4	24	2	4	1	7	0	0	0	0	70
Peds				8				0				0				2	10
Tk %	0.0%	3.4%	4.2%	3.9%	2.1%	1.0%	8.9%	1.3%	2.5%	4.0%	1.0%	2.5%	0.0%	0.0%	0.0%	0.0%	
PHF	0.71	0.87	0.96	0.92	0.53	0.87	0.66	0.93	0.68	0.88	0.89	0.82	0.94	0.89	0.62	0.93	0.92

Count performed by: Viloria, Hollingshead, Ewell, Hubschmitt

Date: 5/7/13

CARS

	SB Newport Gap Pike				EB SR 2				NB Newport Gap Pike				WB EB 2				15 Minute
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Time																	
7:00-7:15	9	58	131	198	34	369	10	413	12	13	20	45	80	147	10	237	893
7:15-7:30	2	61	164	227	41	411	6	458	13	12	21	46	94	230	13	337	1068
7:30-7:45	7	71	190	268	29	483	18	530	27	24	28	79	76	273	20	369	1246
7:45-8:00	7	55	170	232	27	405	6	438	22	23	25	70	93	349	17	459	1199
8:00-8:15	10	50	148	208	29	389	14	432	13	29	29	71	64	239	13	316	1027
8:15-8:30	9	51	135	195	32	345	13	390	18	22	24	64	66	250	17	333	982
8:30-8:45	11	29	166	206	30	301	10	341	12	23	31	66	62	249	13	324	937
8:45-9:00	7	37	122	166	28	402	13	443	14	12	30	56	68	224	13	305	970
TOTAL	62	412	1226	1700	250	3105	90	3445	131	158	208	497	603	1961	116	2680	8322

TRUCKS

	SB Newport Gap Pike				EB SR 2				NB Newport Gap Pike				WB EB 2				15 Minute
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Time																	
7:00-7:15	0	0	4	4	0	0	0	0	0	1	1	2	8	2	0	10	16
7:15-7:30	0	7	3	10	2	2	1	5	0	3	1	4	9	4	0	13	32
7:30-7:45	1	8	4	13	2	3	0	5	0	4	1	5	15	4	0	19	42
7:45-8:00	0	2	7	9	1	1	0	2	0	0	0	0	8	4	0	12	23
8:00-8:15	2	2	4	8	3	4	0	7	0	2	0	2	3	6	0	9	26
8:15-8:30	1	2	12	15	0	6	1	7	0	1	0	1	7	4	0	11	34
8:30-8:45	0	1	2	3	0	1	1	2	0	0	0	0	7	5	0	12	17
8:45-9:00	0	3	13	16	0	2	2	4	0	0	0	0	7	3	0	10	30
TOTAL	4	25	49	78	8	19	5	32	0	11	3	14	64	32	0	96	220

PEDS

Time	Across EB SR 2 Total	Across NB Newport Gap Pike Total	Across WB SR 2 Total	Across SB Newport Gap Pike Total	15 Minute Total
7:00-7:15	0			0	0
7:15-7:30	0			2	2
7:30-7:45	0			0	0
7:45-8:00	0			0	0
8:00-8:15	0			1	1
8:15-8:30	0			1	1
8:30-8:45	0			0	0
8:45-9:00	0			0	0
TOTAL	0	0	0	4	4

Intersection Peak Hour

	SB Newport Gap Pike				EB SR 2				NB Newport Gap Pike				WB EB 2				Peak Hour
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Car and Truck Totals																	
7:15-7:30	2	68	167	**237**	43	413	7	**463**	13	15	22	**50**	103	234	13	**350**	1100
7:30-7:45	8	79	194	**281**	31	486	18	**535**	27	28	29	**84**	91	277	20	**388**	1288
7:45-8:00	7	57	177	**241**	28	406	6	**440**	22	23	25	**70**	101	353	17	**471**	1222
8:00-8:15	12	52	152	**216**	32	393	14	**439**	13	31	29	**73**	67	245	13	**325**	1053
Total Volume	**29**	**256**	**690**	**975**	**134**	**1698**	**45**	**1877**	**75**	**97**	**105**	**277**	**362**	**1109**	**63**	**1534**	**4663**
Trucks	4	14	27	45	6	14	1	21	0	7	1	8	33	18	0	51	125
Peds				0				0				0				2	2
Tk %	13.8%	5.5%	3.9%	4.6%	4.5%	0.8%	2.2%	1.1%	0.0%	7.2%	1.0%	2.9%	9.1%	1.6%	0.0%	3.3%	
PHF	0.60	0.81	0.89	0.87	0.78	0.87	0.63	0.88	0.69	0.78	0.91	0.82	0.88	0.79	0.79	0.81	0.91

Count performed by: Winder, Durkin, Dolgos, King

Date: 4/18/13

CARS

	SB Newport Gap Pike				EB SR 2				NB Newport Gap Pike				WB EB 2				15 Minute
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Time																	
4:00-4:15	37	47	17	101	41	331	16	388	19	40	46	105	144	405	18	567	1161
4:15-4:30	44	43	22	109	55	343	12	410	16	40	48	104	140	413	29	582	1205
4:30-4:45	27	38	16	81	41	287	22	350	15	33	61	109	178	479	38	695	1235
4:45-5:00	33	39	17	89	31	332	18	381	23	54	49	126	192	435	28	655	1251
5:00-5:15	36	49	13	98	43	346	16	405	14	42	63	119	178	574	25	777	1399
5:15-5:30	31	49	13	93	32	324	19	375	12	42	56	110	168	467	21	656	1234
5:30-5:45	22	17	22	61	33	313	14	360	19	33	46	98	159	427	29	615	1134
5:45-6:00	34	10	12	56	37	292	16	345	14	38	65	117	144	356	23	523	1041
TOTAL	264	292	132	688	313	2568	133	3014	132	322	434	888	1303	3556	211	5070	9660

TRUCKS

	SB Newport Gap Pike				EB SR 2				NB Newport Gap Pike				WB EB 2				15 Minute
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Time																	
4:00-4:15				0	0	0	0	0	3	1	0	4	17	3	0	20	24
4:15-4:30				0	0	2	0	2	0	0	0	0	8	4	0	12	14
4:30-4:45				0	2	2	1	5	0	0	0	0	11	5	0	16	21
4:45-5:00				0	0	2	0	2	0	0	0	0	7	2	1	10	12
5:00-5:15				0	0	1	0	1	0	0	0	0	7	0	0	7	8
5:15-5:30				0	0	2	0	2	0	0	0	0	5	1	0	6	8
5:30-5:45				0	0	0	0	0	0	0	0	0	2	0	0	2	2
5:45-6:00				0	0	1	0	1	0	0	0	0	5	2	0	7	8
TOTAL	0	0	0	0	2	10	1	13	3	1	0	4	62	17	1	80	97

PEDS

Time	Across EB SR 2 Total	Across NB Newport Gap Pike Total	Across WB SR 2 Total	Across SB Newport Gap Pike Total	15 Minute Total
4:00-4:15	0	1	1	0	2
4:15-4:30	0	0	0	0	0
4:30-4:45	2	2	1	0	5
4:45-5:00	1	0	1	0	2
5:00-5:15	0	2	1	0	3
5:15-5:30	3	0	0	0	3
5:30-5:45	0	1	3	0	4
5:45-6:00	5	1	0	0	6
TOTAL	11	7	7	0	25

Intersection Peak Hour

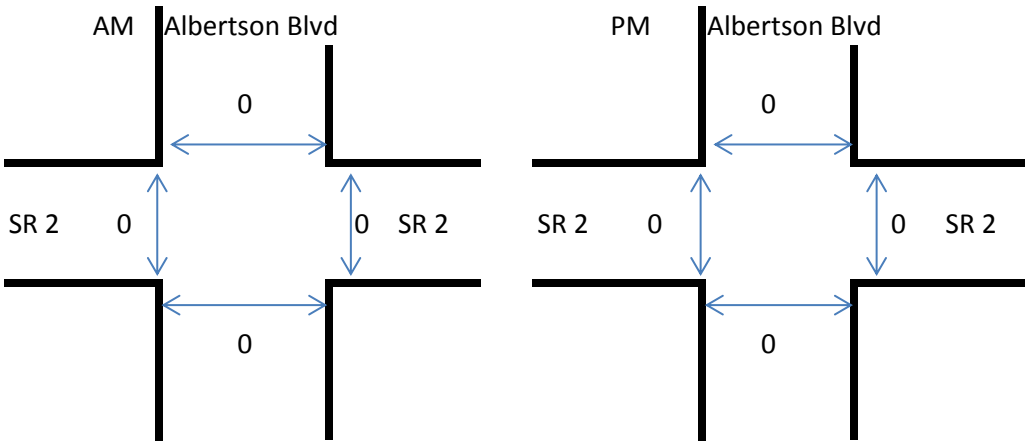
	SB Newport Gap Pike				EB SR 2				NB Newport Gap Pike				WB EB 2				Peak Hour
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Car and Truck Totals																	
4:30-4:45	27	38	16	81	43	289	23	355	15	33	61	109	189	484	38	711	1256
4:45-5:00	33	39	17	89	31	334	18	383	23	54	49	126	199	437	29	665	1263
5:00-5:15	36	49	13	98	43	347	16	406	14	42	63	119	185	574	25	784	1407
5:15-5:30	31	49	13	93	32	326	19	377	12	42	56	110	173	468	21	662	1242
Total Volume	**127**	**175**	**59**	**361**	**149**	**1296**	**76**	**1521**	**64**	**171**	**229**	**464**	**746**	**1963**	**113**	**2822**	**5168**
Trucks	0	0	0	0	2	7	1	10	0	0	0	0	30	8	1	39	49
Peds				6				4				3				0	13
Tk %	0.0%	0.0%	0.0%	0.0%	1.3%	0.5%	1.3%	0.7%	0.0%	0.0%	0.0%	0.0%	4.0%	0.4%	0.9%	1.4%	
PHF	0.88	0.89	0.87	0.92	0.87	0.93	0.83	0.94	0.70	0.79	0.91	0.92	0.94	0.85	0.74	0.90	0.92

TRAFFIC COUNT SUMMARY

Intersection: DE 2 and Albertson
Intersection #: 18
Weather Conditions:

NOTES:

INTERSECTION SKETCHES WITH PED MOVEMENTS:



Count performed by: Viloria, Sarrett

Date: 4/30/13

CARS

	SB Albertson Blvd				EB SR 2				NB Shopping Center				WB EB 2				15 Minute
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Time																	
7:00-7:15	20	0	43	63	0	559	30	589	1	0	2	3	19	243	0	262	917
7:15-7:30	23	0	39	62	0	643	36	679	0	0	2	2	10	298	0	308	1051
7:30-7:45	40	0	57	97	0	626	40	666	0	1	1	2	13	308	0	321	1086
7:45-8:00	51	0	59	110	0	535	54	589	0	1	3	4	16	367	0	383	1086
8:00-8:15	44	0	29	73	0	562	46	608	0	1	5	6	9	301	0	310	997
8:15-8:30	45	0	27	72	0	461	48	509	0	0	4	4	9	295	0	304	889
8:30-8:45	46	0	23	69	0	497	42	539	0	2	3	5	15	301	0	316	929
8:45-9:00	44	0	34	78	0	435	35	470	0	3	4	7	8	289	0	297	852
TOTAL	313	0	311	624	0	4318	331	4649	1	8	24	33	99	2402	0	2501	7807

TRUCKS

	SB Albertson Blvd				EB SR 2				NB Shopping Center				WB EB 2				15 Minute
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Time																	
7:00-7:15	0	0	0	0	0	6	0	6	0	0	0	0	0	10	0	10	16
7:15-7:30	0	0	0	0	0	4	0	4	0	0	0	0	0	11	0	11	15
7:30-7:45	2	0	0	2	0	4	2	6	0	0	0	0	0	14	0	14	22
7:45-8:00	1	0	1	2	0	9	0	9	0	0	0	0	0	16	0	16	27
8:00-8:15	0	0	1	1	0	14	0	14	0	0	0	0	0	13	0	13	28
8:15-8:30	0	0	0	0	0	13	1	14	0	0	0	0	0	13	0	13	27
8:30-8:45	0	0	0	0	0	12	1	13	0	0	0	0	0	14	0	14	27
8:45-9:00	1	0	2	3	0	11	0	11	0	0	0	0	0	11	0	11	25
TOTAL	4	0	4	8	0	73	4	77	0	0	0	0	0	102	0	102	187

PEDS

	Across EB SR 2	Across NB Shopping Center	Across WB SR 2	Across SB Albertson Blvd	15 Minute
	Total	Total	Total	Total	Total
Time					
7:00-7:15	0				0
7:15-7:30	0				0
7:30-7:45	0				0
7:45-8:00	0				0
8:00-8:15	0				0
8:15-8:30	0				0
8:30-8:45	0				0
8:45-9:00	0				0
TOTAL	0	0	0	0	0

Intersection Peak Hour

	SB Albertson Blvd				EB SR 2				NB Shopping Center				WB EB 2				Peak Hour
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Car and Truck Totals																	
7:15-7:30	23	0	39	**62**	0	647	36	**683**	0	0	2	**2**	10	309	0	**319**	1066
7:30-7:45	42	0	57	**99**	0	630	42	**672**	0	1	1	**2**	13	322	0	**335**	1108
7:45-8:00	52	0	60	**112**	0	544	54	**598**	0	1	3	**4**	16	383	0	**399**	1113
8:00-8:15	44	0	30	**74**	0	576	46	**622**	0	1	5	**6**	9	314	0	**323**	1025
Total Volume	**161**	**0**	**186**	**347**	**0**	**2397**	**178**	**2575**	**0**	**3**	**11**	**14**	**48**	**1328**	**0**	**1376**	**4312**
Trucks	3	0	2	5	0	40	3	43	0	0	0	0	0	56	0	56	104
Peds				0				0				0				0	0
Tk %	1.9%	#DIV/0!	1.1%	1.4%	#DIV/0!	1.7%	1.7%	1.7%	#DIV/0!	0.0%	0.0%	0.0%	0.0%	4.2%	#DIV/0!	4.1%	
PHF	0.77	#DIV/0!	0.78	0.77	#DIV/0!	0.93	0.82	0.94	#DIV/0!	0.75	0.55	0.58	0.75	0.87	#DIV/0!	0.86	0.97

Count performed by: Cory, Malkin

Date: 4/25/13

CARS

	SB Albertson Blvd				EB SR 2				NB Shopping Center				WB EB 2				15 Minute
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Time																	
4:00-4:15	91	0	31	122	0	460	46	506	1	5	28	34	10	550	0	560	1222
4:15-4:30	93	0	36	129	0	448	38	486	2	3	39	44	12	520	0	532	1191
4:30-4:45	109	0	33	142	0	379	55	434	0	6	42	48	25	571	0	596	1220
4:45-5:00	87	0	30	117	0	421	28	449	2	8	31	41	18	558	0	576	1183
5:00-5:15	126	0	21	147	0	373	44	417	1	3	29	33	19	565	0	584	1181
5:15-5:30	101	0	32	133	0	415	41	456	2	5	31	38	18	559	0	577	1204
5:30-5:45	79	0	44	123	0	419	47	466	5	1	19	25	19	512	0	531	1145
5:45-6:00	92	0	15	107	0	369	39	408	7	2	39	48	19	478	0	497	1060
TOTAL	778	0	242	1020	0	3284	338	3622	20	33	258	311	140	4313	0	4453	9406

TRUCKS

	SB Albertson Blvd				EB SR 2				NB Shopping Center				WB EB 2				15 Minute
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Time																	
4:00-4:15	0	0	0	0	0	9	0	9	0	0	0	0	0	15	0	15	24
4:15-4:30	1	0	0	1	0	10	0	10	0	0	0	0	0	11	0	11	22
4:30-4:45	1	0	0	1	0	6	0	6	0	0	0	0	1	9	0	10	17
4:45-5:00	3	0	0	3	0	9	0	9	0	1	0	1	0	7	0	7	20
5:00-5:15	0	0	0	0	0	6	0	6	0	0	0	0	1	7	0	8	14
5:15-5:30	0	0	8	8	0	9	0	9	0	0	0	0	1	8	0	9	26
5:30-5:45	1	0	0	1	1	9	0	10	0	0	0	0	0	8	0	8	19
5:45-6:00	1	0	0	1	0	5	0	5	0	0	0	0	0	11	0	11	17
TOTAL	7	0	8	15	1	63	0	64	0	1	0	1	3	76	0	79	159

PEDS

	Across EB SR 2	Across NB Shopping Center	Across WB SR 2	Across SB Albertson Blvd	15 Minute
	Total	Total	Total	Total	Total
Time					
4:00-4:15	0	0	0	0	0
4:15-4:30	0	0	0	0	0
4:30-4:45	0	0	0	0	0
4:45-5:00	0	0	0	0	0
5:00-5:15	0	0	0	0	0
5:15-5:30	0	0	0	0	0
5:30-5:45	0	0	0	0	0
5:45-6:00	0	0	0	0	0
TOTAL	0	0	0	0	0

Intersection Peak Hour

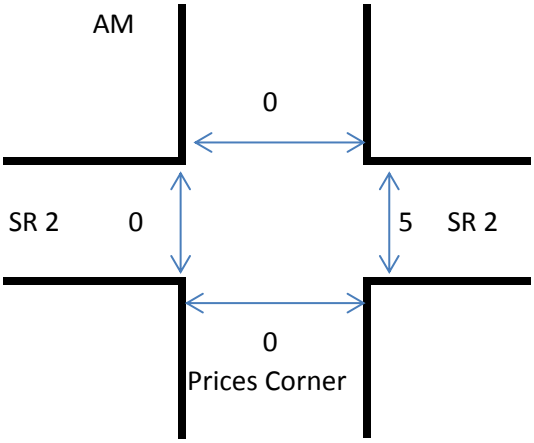
	SB Albertson Blvd				EB SR 2				NB Shopping Center				WB EB 2				Peak Hour
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Car and Truck Totals																	
4:00-4:15	91	0	31	122	0	469	46	515	1	5	28	34	10	565	0	575	1246
4:15-4:30	94	0	36	130	0	458	38	496	2	3	39	44	12	531	0	543	1213
4:30-4:45	110	0	33	143	0	385	55	440	0	6	42	48	26	580	0	606	1237
4:45-5:00	90	0	30	120	0	430	28	458	2	9	31	42	18	565	0	583	1203
Total Volume	**385**	**0**	**130**	**515**	**0**	**1742**	**167**	**1909**	**5**	**23**	**140**	**168**	**66**	**2241**	**0**	**2307**	**4899**
Trucks	5	0	0	5	0	34	0	34	0	1	0	1	1	42	0	43	83
Peds				0				0				0				0	0
Tk %	1.3%	#DIV/0!	0.0%	1.0%	#DIV/0!	2.0%	0.0%	1.8%	0.0%	4.3%	0.0%	0.6%	1.5%	1.9%	#DIV/0!	1.9%	
PHF	0.88	#DIV/0!	0.90	0.90	#DIV/0!	0.93	0.76	0.93	0.63	0.64	0.83	0.88	0.63	0.97	#DIV/0!	0.95	0.98

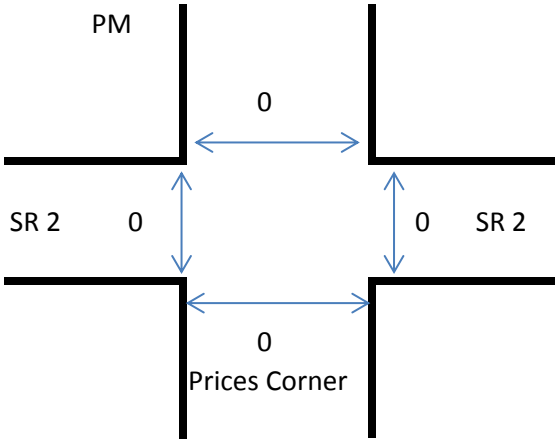
TRAFFIC COUNT SUMMARY

Intersection: DE 2 and Prices Corner
Intersection #: 19
Weather Conditions: Rainy PM

NOTES:
4/25 PM count - fender bender during 4:45-5

INTERSECTION SKETCHES WITH PED MOVEMENTS:





Count performed by: Lavenburg, Beer

Date: 5/7/13

CARS

	SB				EB SR 2				NB Prices Corner				WB EB 2				15 Minute
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Time																	
7:00-7:15				0	3	563	0	566	1	0	0	1	0	223	8	231	798
7:15-7:30				0	6	643	0	649	0	0	0	0	0	315	7	322	971
7:30-7:45				0	6	666	0	672	2	0	0	2	0	340	9	349	1023
7:45-8:00				0	10	633	0	643	2	0	0	2	0	357	10	367	1012
8:00-8:15				0	7	471	0	478	6	0	0	6	0	383	15	398	882
8:15-8:30				0	12	519	0	531	2	0	0	2	0	383	18	401	934
8:30-8:45				0	16	443	0	459	3	0	0	3	0	456	31	487	949
8:45-9:00				0	26	504	0	530	1	0	0	1	0	165	15	180	711
TOTAL	0	0	0	0	86	4442	0	4528	17	0	0	17	0	2622	113	2735	7280

TRUCKS

	SB				EB SR 2				NB Prices Corner				WB EB 2				15 Minute
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Time																	
7:00-7:15				0	0	5	0	5	0	0	0	0	0	9	0	9	14
7:15-7:30				0	0	8	0	8	0	0	0	0	0	11	0	11	19
7:30-7:45				0	0	7	0	7	0	0	0	0	0	21	0	21	28
7:45-8:00				0	0	6	0	6	0	0	0	0	0	9	0	9	15
8:00-8:15				0	0	8	0	8	0	0	0	0	0	10	0	10	18
8:15-8:30				0	0	16	0	16	0	0	0	0	0	12	0	12	28
8:30-8:45				0	0	5	0	5	0	0	0	0	0	21	0	21	26
8:45-9:00				0	0	11	0	11	0	0	0	0	0	6	0	6	17
TOTAL	0	0	0	0	0	66	0	66	0	0	0	0	0	99	0	99	165

PEDS

Time	Across EB SR 2 Total	Across NB Prices Corner Total	Across WB SR 2 Total	Across SB Total	15 Minute Total
7:00-7:15	0		1		1
7:15-7:30	0		4		4
7:30-7:45	0		0		0
7:45-8:00	0		0		0
8:00-8:15	0		0		0
8:15-8:30	0		0		0
8:30-8:45	0		0		0
8:45-9:00	0		0		0
TOTAL	0	0	5	0	5

Intersection Peak Hour

	SB				EB SR 2				NB Prices Corner				WB EB 2				Peak Hour
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Car and Truck Totals																	
7:15-7:30	0	0	0	**0**	6	651	0	**657**	0	0	0	**0**	0	326	7	**333**	990
7:30-7:45	0	0	0	**0**	6	673	0	**679**	2	0	0	**2**	0	361	9	**370**	1051
7:45-8:00	0	0	0	**0**	10	639	0	**649**	2	0	0	**2**	0	366	10	**376**	1027
8:00-8:15	0	0	0	**0**	7	479	0	**486**	6	0	0	**6**	0	393	15	**408**	900
Total Volume	**0**	**0**	**0**	**0**	**29**	**2442**	**0**	**2471**	**10**	**0**	**0**	**10**	**0**	**1446**	**41**	**1487**	**3968**
Trucks	0	0	0	0	0	37	0	37	0	0	0	0	0	52	0	52	89
Peds				0				0				0				0	0
Tk %	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.0%	1.5%	#DIV/0!	1.5%	0.0%	#DIV/0!	#DIV/0!	0.0%	#DIV/0!	3.6%	0.0%	3.5%	
PHF	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.73	0.91	#DIV/0!	0.91	0.42	#DIV/0!	#DIV/0!	0.42	#DIV/0!	0.92	0.68	0.91	0.94

Count performed by: Knabe, Holloway

Date: 5/7/13

CARS

	SB				EB SR 2				NB Prices Corner				WB EB 2				15 Minute
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Time																	
4:00-4:15				0	51	383	0	434	16	0	0	16	2	508	59	569	1019
4:15-4:30				0	46	410	0	456	18	0	0	18	2	471	48	521	995
4:30-4:45				0	43	374	0	417	19	0	0	19	1	508	58	567	1003
4:45-5:00				0	49	330	0	379	22	0	0	22	3	560	48	611	1012
5:00-5:15				0	42	402	0	444	18	0	0	18	4	544	49	597	1059
5:15-5:30				0	36	388	0	424	18	0	0	18	4	590	50	644	1086
5:30-5:45				0	44	397	0	441	22	0	0	22	0	599	55	654	1117
5:45-6:00				0	44	380	0	424	27	0	0	27	1	532	44	577	1028
TOTAL	0	0	0	0	355	3064	0	3419	160	0	0	160	17	4312	411	4740	8319

TRUCKS

	SB				EB SR 2				NB Prices Corner				WB EB 2				15 Minute
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Time																	
4:00-4:15				0	0	10	0	10	0	0	0	0	0	12	0	12	22
4:15-4:30				0	0	5	0	5	0	0	0	0	0	9	0	9	14
4:30-4:45				0	0	4	0	4	0	0	0	0	0	9	1	10	14
4:45-5:00				0	0	5	0	5	0	0	0	0	0	5	0	5	10
5:00-5:15				0	0	8	0	8	0	0	0	0	0	8	0	8	16
5:15-5:30				0	0	7	0	7	0	0	0	0	0	7	0	7	14
5:30-5:45				0	0	3	0	3	0	0	0	0	0	6	0	6	9
5:45-6:00				0	0	4	0	4	0	0	0	0	0	6	0	6	10
TOTAL	0	0	0	0	0	46	0	46	0	0	0	0	0	62	1	63	109

PEDS

	Across EB SR 2	Across NB Prices Corner	Across WB SR 2	Across SB	15 Minute
	Total	Total	Total	Total	Total
Time					
4:00-4:15	0	2	0	0	2
4:15-4:30	2	1	0	0	3
4:30-4:45	1	1	0	0	2
4:45-5:00	0	0	0	0	0
5:00-5:15	2	0	0	0	2
5:15-5:30	1	0	0	0	1
5:30-5:45	2	0	0	0	2
5:45-6:00	0	0	0	0	0
TOTAL	8	4	0	0	12

Intersection Peak Hour

	SB				EB SR 2				NB Prices Corner				WB EB 2				Peak Hour
	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Right	Thru	Left	Total	Total
Car and Truck Totals																	
5:00-5:15	0	0	0	**0**	42	410	0	**452**	18	0	0	**18**	4	552	49	**605**	1075
5:15-5:30	0	0	0	**0**	36	395	0	**431**	18	0	0	**18**	4	597	50	**651**	1100
5:30-5:45	0	0	0	**0**	44	400	0	**444**	22	0	0	**22**	0	605	55	**660**	1126
5:45-6:00	0	0	0	**0**	44	384	0	**428**	27	0	0	**27**	1	538	44	**583**	1038
Total Volume	**0**	**0**	**0**	**0**	**166**	**1589**	**0**	**1755**	**85**	**0**	**0**	**85**	**9**	**2292**	**198**	**2499**	**4339**
Trucks	0	0	0	0	0	24	0	24	0	0	0	0	0	29	1	30	54
Peds				4				1				0				0	5
Tk %	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.0%	1.5%	#DIV/0!	1.4%	0.0%	#DIV/0!	#DIV/0!	0.0%	0.0%	1.3%	0.5%	1.2%	
PHF	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	0.94	0.97	#DIV/0!	0.97	0.79	#DIV/0!	#DIV/0!	0.79	0.56	0.95	0.90	0.95	0.96

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