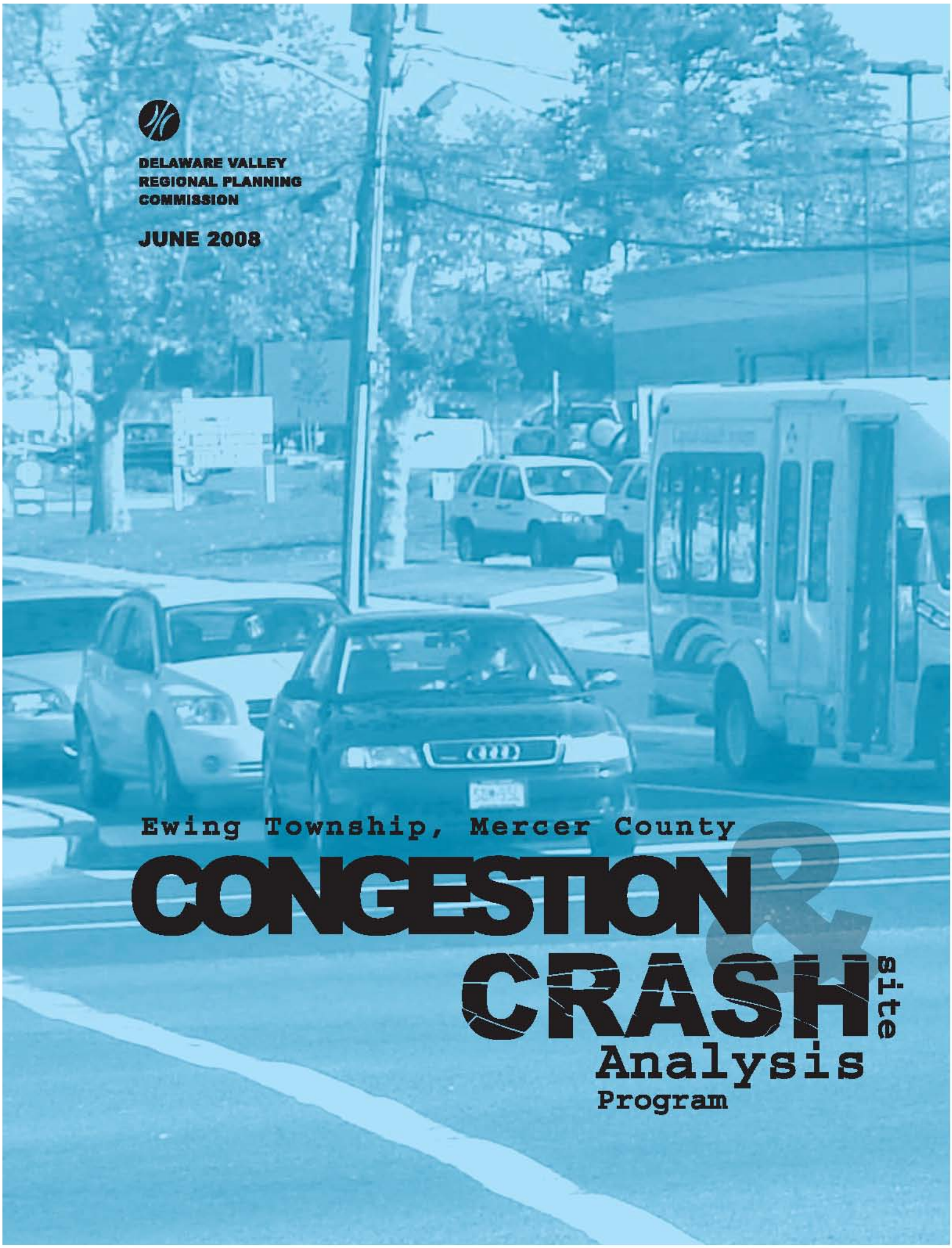

DELAWARE VALLEY
REGIONAL PLANNING
COMMISSION

JUNE 2008

Ewing Township, Mercer County

CONGESTION & CRASH site Analysis Program

Created in 1965, the Delaware Valley Regional Planning Commission (DVRPC) is an interstate, intercounty and intercity agency that provides continuing, comprehensive and coordinated planning to shape a vision for the future growth of the Delaware Valley region. The region includes Bucks, Chester, Delaware, and Montgomery counties, as well as the City of Philadelphia, in Pennsylvania; and Burlington, Camden, Gloucester and Mercer counties in New Jersey. DVRPC provides technical assistance and services; conducts high-priority studies that respond to the requests and demands of member state and local governments; fosters cooperation among various constituents to forge a consensus on diverse regional issues; determines and meets the needs of the private sector; and practices public outreach efforts to promote two-way communication and public awareness of regional issues and the Commission.

Our logo is adapted from the official DVRPC seal, and is designed as a stylized image of the Delaware Valley. The outer ring symbolizes the region as a whole, while the diagonal bar signifies the Delaware River. The two adjoining crescents represent the Commonwealth of Pennsylvania and the State of New Jersey.

DVRPC is funded by a variety of funding sources including federal grants from the U.S. Department of Transportation's Federal Highway Administration (FHWA) and Federal Transit Administration (FTA), the Pennsylvania and New Jersey departments of transportation, as well as by DVRPC's state and local member governments. The authors, however, are solely responsible for its findings and conclusions, which may not represent the official views or policies of the funding agencies.

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INTRODUCTION

The goals of the Congestion and Crash Site Analysis Program are improving access to and efficiency of the region's transportation system, improving safety and air quality, and reducing congestion through analyses for specific highway locations with demonstrated problems in both New Jersey and Pennsylvania. Unlike a typical corridor study that examines a larger geographic area, the intent of this program is to examine individual intersections or specific problem sites. Although this program preceded the DVRPC's Regional Safety Action Plan, it also addresses one of our established emphasis areas: "improving the design and operations of intersections."

Due to their many conflict points, intersections experience more crashes than mid-block locations. In addition, the geometry of an intersection can present many issues for the road user. Assuring the efficient operation of intersections is an increasingly important issue as municipalities attempt to maximize vehicle roadway capacity to serve the growing demand for travel. The objective is to identify cost-effective improvements that will reduce crashes and congestion created by limited capacity and design deficiencies.

These selected locations may experience high levels of congestion and/or have a high number of crashes. Crashes not only result in fatalities, injuries, and property damage, but also add to the congestion and deficiency in the operation of the intersection. This report examines the intersection of North Olden Avenue and Parkside Avenue and its surroundings in Ewing Township and identifies potential improvement strategies that would improve the safety and mobility of all road users.

There are three other locations currently being evaluated in this program and include one location in Pennsylvania—Delaware County; and two others in New Jersey—one each in Camden and Burlington counties. Their results will be presented in separate documents.

DVRPC solicited input from each of the counties in the region to identify potential problem locations. Working with the counties, DVRPC selected the four locations to study. Each of the locations is distinct and has its own particular set of issues and problems. With each location being unique, there is no one cure-all solution. In fact, each location may need to implement a combination of strategies in order to have an impact on improving safety and reducing congestion.

Methodology

The Mercer County Planning Department was asked to submit two locations for further study. To assist in the selection process, the county was given a number of locations that were identified through analysis using the DVRPC developed *Cluster Finder Tool,* which focused on locations with a high number of crashes. The county could select the locations from this list or select another based on other criteria. Mercer County selected only one location (the intersection of North Olden Avenue and Parkside Avenue) to be analyzed. This selection was based on the location demonstrating high levels of congestion and/or crashes and because it was not already programmed for

improvement. Selections for the program were also determined by whether the locations provide a regional function and, in the case of New Jersey, are on the county or local network.

The study team conducted field views for the location to observe the issues. Data was then compiled and analyzed. This included crash records data, Average Annual Daily Traffic (AADT), turning movement counts, and traffic signal timings. Stakeholder meetings were held with the appropriate state, county, and municipal officials, and others as deemed necessary. These meetings assisted in the identification of problems, with discussion of the study team observations and local stakeholder feedback.

The study team conducted follow-up field views to better define the existing conditions, observe the operating conditions, and refine the identification of problems. Subsequently, a technical analysis was performed to quantify the identified transportation problem areas. This included the preparation of collision diagrams displaying crash patterns and conducting level of service (LOS) analyses for existing conditions.

Based on these analyses, a set of improvements was developed that addresses the identified problems. LOS analyses were conducted for the recommended improvements.

Findings and preliminary recommendations were presented to stakeholders at a follow-up meeting. The purpose of the meeting was also to discuss and get a sense from the local officials of how practical the recommendations were from their perspective.

Report Structure

The report is organized into separate sections that consist of: Location Description, Existing Conditions, Opportunities and Constraints, Potential Improvement Scenarios, and Recommendations.

The *location description* section provides an account of the location and examines the study area in terms of regional setting. This includes a general depiction of the local area surroundings, lane configurations, and adjacent land uses.

The *existing conditions* section presents additional background information for the site. Turning movement counts were collected during the peak periods in 15-minute increments to determine the peak hour traffic volumes. Traffic signal timing and operation plans for the intersection were collected from the county. A crash analysis and a LOS analysis were conducted for the intersection and adjacent area for current conditions.

The crash analysis was performed to substantiate problems presented during the municipal field views and to identify any probable causes and potential improvements. Reportable and non-reportable crash records for a three-year period were collected from the Ewing Township Police Department. Reportable crashes typically involve an

injury, fatality, and/or significant property damage of $500 or more. Although a non-reportable crash is one where there is no injury to the occupant(s) of the vehicle(s) and the vehicles involved do not have considerable damage, the crash may have negative effects on the operation of the intersection.

The *opportunities and constraints* section discusses specific issues or problems that may effect any potential improvements that have been identified. A typical constraint may be the restriction of right-of-way expansion to increase capacity. Expansion may be cost prohibitive due to encroaching land uses or nearby bridge widths.

The *potential improvement scenarios* section addresses operational and safety problems. Typical improvement scenarios range from optimizing signal timing and signal coordination to adding turning lanes and intersection redesign/reconstruction. A LOS analysis was conducted for each scenario and compared to the existing LOS analysis. This process helps to determine the level of improvement to the efficiency and operation of the intersection if the scenario is implemented.

The recommendations in the final section are based on the ability to correct existing or potential problems or deficiencies. The potential improvement scenario concepts presented in this document have been categorized as short-term, mid-range or long-term. Short-term improvement recommendations typically considered a lower cost operational/safety improvement that can be completed with little lead time and no additional major studies. Long-range improvement concepts should only be pursued if the implemented set of short-term and mid-range improvements are evaluated and determined to be ineffective. These improvements, such as additional signing and resurfacing or enhancing pavement markings, may be completed primarily through maintenance activities. A mid-range improvement may require additional costs with regard to signal coordination and pedestrian enhancements. A long-term improvement may have a higher capital cost and require the acquisition of right-of-way and construction of new infrastructure.

There is a corresponding Appendix that contains the detailed technical data documentation for turning movement counts and LOS analysis.

Level of Service Analysis

The level of service analysis (LOS) is a common tool for assessment of transportation facilities and is used extensively in this report. The LOS for existing conditions and potential improvement scenarios is evaluated for the study intersection. When applied as a measure of performance for an entire intersection or a particular component of it, LOS has a precise meaning: the average delay experienced by a vehicle traveling through the intersection or a specific component of it. In other words, LOS is a reflection of the average delay experienced by vehicles traversing an intersection. The exact parameters of delay that determine the various LOS categories for a signalized and an unsignalized intersection are displayed in ***Table 1***.

A review of the existing conditions and of the various improvement scenarios was conducted using SYNCHRO traffic signal software for the project intersection. Necessary information for determining delay and LOS measures include turning movement counts, roadway geometry, signal timing, and actuation plans. The turning movement counts were mostly gathered by DVRPC staff; the signal timing, actuation data, and roadway geometrics were supplied by the county.

Table 1 **Level of Service (LOS) Designations and Associated Delays**

Level of Service	Signalized Intersection	Unsignalized Intersection
	Total Delay per Vehicle (seconds/vehicle)	Control Delay per Vehicle (seconds/vehicle)
A (Desirable)	≤ 10	≤ 10
B (Desirable)	> 10 and ≤ 20	> 10 and ≤ 15
C (Desirable)	> 20 and ≤ 35	> 15 and ≤ 25
D (Acceptable)	> 35 and ≤ 55	> 25 and ≤ 35
E (Undesirable)	> 55 and ≤ 80	> 35 and ≤ 55
F (Unsatisfactory)	> 80	> 50

For signalized intersections, SYNCHRO calculates a control delay and a queue delay. The control delay is calculated by a percentile delay method; this approach uses formulas from the Highway Capacity Manual (HCM) to calculate delay; however, the final delay measure is taken from an average of the 10^{th}, 30^{th}, 50^{th}, 70^{th}, and 90^{th} percentile volume levels. As a result, the calculated delay is a product of the various operating conditions that a signal may actually encounter. The queue delay is utilized whenever two signalized intersections are located within a critical distance of one another. If the intersections are within that distance, then calculations are made to determine the extent to which queue interactions (such as queue spillback and queue blocking) reduce capacity and consequently increase delay.

For an unsignalized intersection, SYNCHRO only utilizes control delay, for which it relies exclusively upon HCM methods.

For the revision of timing plans, SYNCHRO is capable of optimizing intersection splits, cycle lengths, and offsets. These efforts seek to establish a timing plan that provides the most efficient performance that serves a critical volume of vehicles.

NORTH OLDEN AVENUE AND PARKSIDE AVENUE, EWING TOWNSHIP

LOCATION DESCRIPTION

The study location is the signalized intersection of North Olden Avenue (CR 622) and Parkside Avenue (CR 636) in Ewing Township, Mercer County. Parkside Avenue, which is functionally classified as an Urban Minor Arterial, runs in a south-north direction in the study area. Parkside Avenue runs north from Scotch Road (CR 611) southward to Riverside Avenue (NJ 29), as shown in ***Figure 1***. Other major roadways Parkside Avenue connects with include Pennington Road (NJ 31), Parkway Avenue and Federal City Road. North Olden Avenue, which is functionally classified as an urban minor arterial, runs in an east-west direction from Whitehorse Avenue (CR 533) to the east to Parkway Avenue (CR 634) to the west. Other major roadways North Olden Avenue connects with include NJ 31 (Pennington Road), Prospect Street (CR 627), Brunswick Pike (US 206), Greenwood Avenue (NJ 33), and I-295.

North Olden Avenue has five lanes, two lanes in each direction and a center two-way left-turn lane, as shown in ***Figure 2***. Both North Olden Avenue approaches at the study intersection have three lanes, one dedicated left-turn lane, one dedicated through lane and one shared through/right-turn lane. A raised median separates directional traffic at the intersection. North Olden Avenue has no shoulders and varying width of sidewalk. The speed limit on North Olden Avenue varies but at the study location it is 40 MPH.

Parkside Avenue has four lanes- two lanes in each direction. There are no shoulders and sidewalk with varying width. Both approaches of Parkside Avenue have two shared movement lanes; one shared left/through lane and one shared through/right. The speed limit on Parkside Avenue is 35 MPH.

The NJ Transit Route 601 bus serves the study intersection. The Route 601 bus provides service between College of New Jersey and Hamilton Marketplace. The bus travels along North Olden Avenue between Prospect Avenue and Parkside Avenue and travels along Parkside Avenue between North Olden Avenue and Ewingville Road. In addition to College of New Jersey and Hamilton Marketplace, the Route 601 bus provides access to the Trenton Rail Station, Roebling Market, and Briarwood Shopping Center. This bus serves the study area with 21 eastbound and 21 westbound trips per weekday; 12 eastbound and 13 westbound trips on Saturday, and 8 trips in each direction on Sundays. The average weekday ridership on this bus route in 2007 was 1,104 passengers.

The land use in the study area is predominantly residential. Residential development consists of mainly single family dwellings but there are also a number of multi-family dwelling units in the area. The multi-family dwellings are located on Parkside Avenue north of the study intersection. Commercial uses are mainly concentrated along North Olden Avenue, as depicted in ***Figure 3.*** These range from small retail establishment to big box retail. At the study intersection on the northwest corner is a PNC Bank; the northeast corner is occupied by a liquor store; a diner is on the southeast corner and on the southwest corner is a strip mall. Other commercial uses in close proximity to the

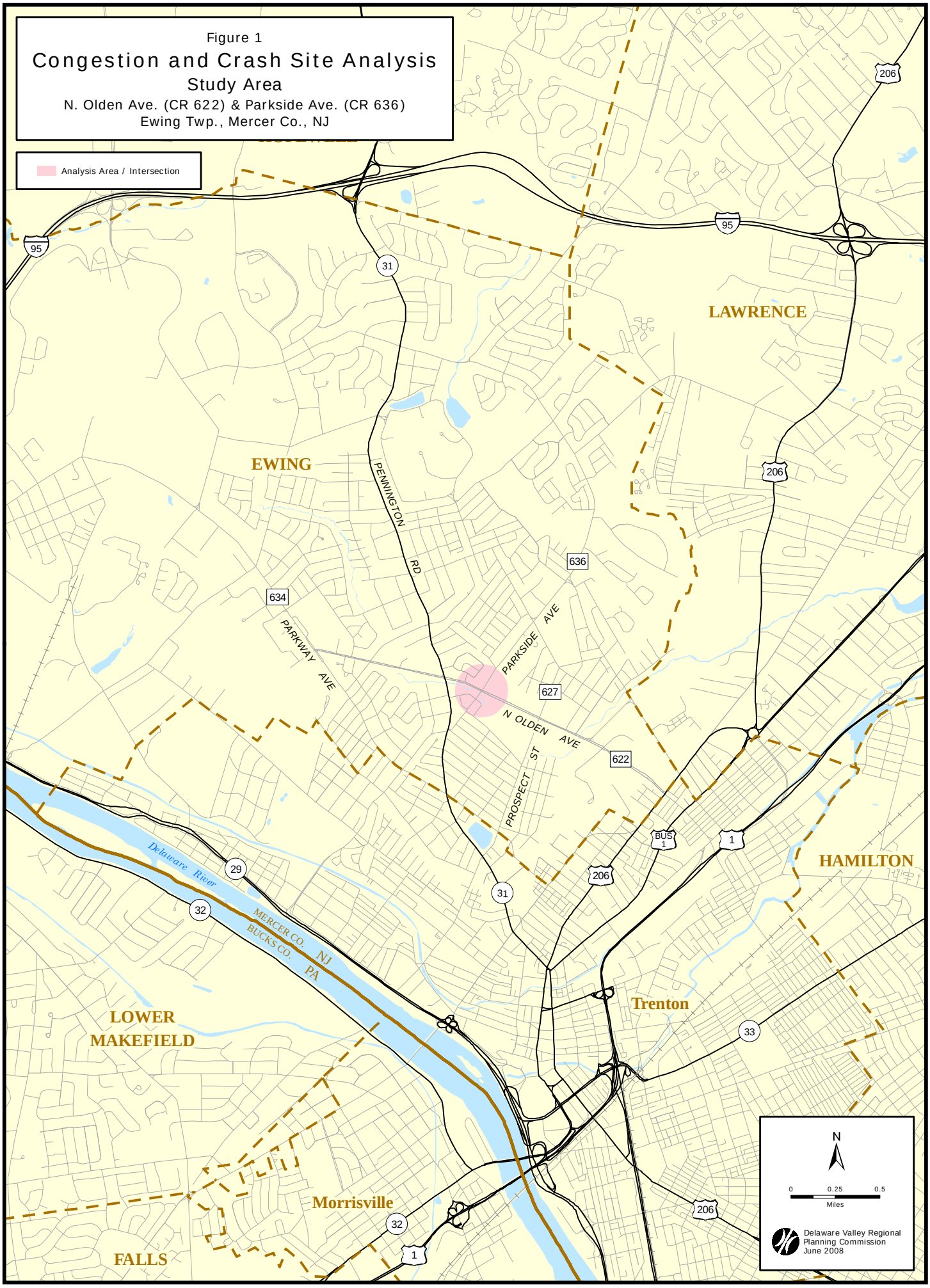


Figure 1
Congestion and Crash Site Analysis
Study Area
N. Olden Ave. (CR 622) & Parkside Ave. (CR 636)
Ewing Twp., Mercer Co., NJ
Analysis Area / Intersection
LAWRENCE
EWING
HAMILTON
Trenton
LOWER MAKEFIELD
Morrisville
FALLS
PENNINGTON RD
PARKWAY AVE
PARKSIDE AVE
N OLDEN AVE
PROSPECT ST
Delaware River
MERCER CO., NJ
BUCKS CO., PA
95
31
206
634
636
627
622
29
32
BUS 1
1
33
N
0 0.25 0.5
Miles
Delaware Valley Regional Planning Commission
June 2008


Figure 2
Congestion and Crash Site Analysis
Existing Lane Configuration
N. Olden Ave. (CR 622) & Parkside Ave. (CR 636)
Ewing Twp., Mercer Co., NJ
CR 636 PARKSIDE AVE
CR 622 N OLDEN AVE
BRUCE LN
CROSS ST
N
0
50
100
Feet
DVRPC Aerial Imagery: Spring, 2005
Delaware Valley Regional Planning Commission
June 2008

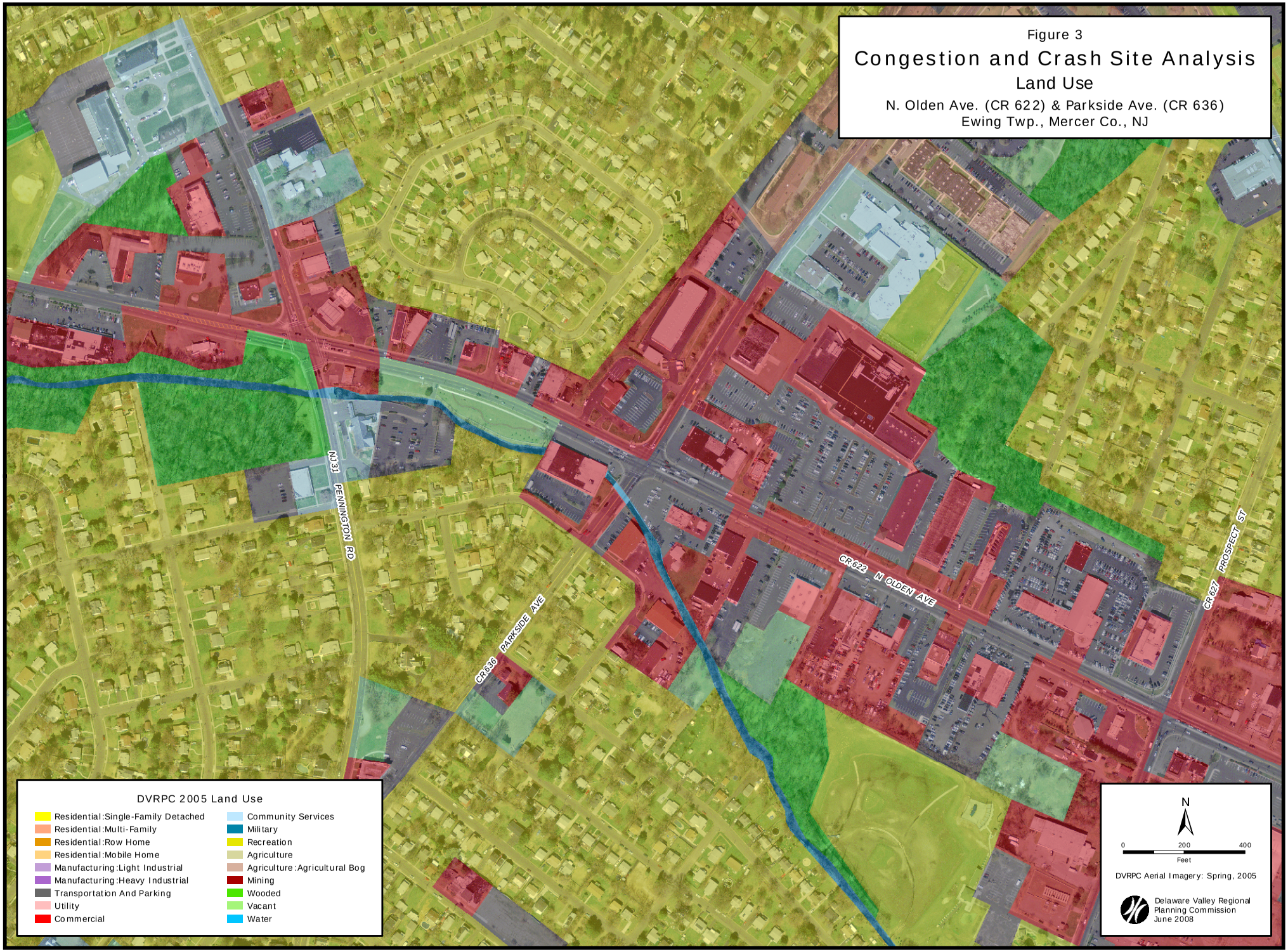


Figure 3
Congestion and Crash Site Analysis
Land Use
N. Olden Ave. (CR 622) & Parkside Ave. (CR 636)
Ewing Twp., Mercer Co., NJ
NJ 31
PENNINGTON RD
CR 622
N OLDEN AVE
CR 627
PROSPECT ST
CR 636
PARKSIDE AVE
DVRPC 2005 Land Use
Residential:Single-Family Detached
Residential:Multi-Family
Residential:Row Home
Residential:Mobile Home
Manufacturing:Light Industrial
Manufacturing:Heavy Industrial
Transportation And Parking
Utility
Commercial
Community Services
Military
Recreation
Agriculture
Agriculture:Agricultural Bog
Mining
Wooded
Vacant
Water
N
0
200
400
Feet
DVRPC Aerial Imagery: Spring, 2005
Delaware Valley Regional Planning Commission
June 2008

intersection consist of a larger shopping area with ShopRite as its anchor; a car dealership; a storage facility and a 7-11. Other land uses of note are the wooded areas and community services which are sprinkled throughout ***Figure 3***. A stream crosses Parkside Avenue close to the study intersection.

EXISTING CONDITIONS

The intersection of North Olden Avenue and Parkside Avenue is located approximately one mile northeast of NJ 29 which runs along the Delaware River connecting I-295 and I-95 within Mercer County. This important intersection, comprised of two urban minor arterials, is a nexus for residential and shopping traffic. From stakeholder accounts and subsequent field visits to the intersection, it is congested specifically in the afternoon peak period. Additionally, the crash data indicates a safety issue and the interplay of the roadway geometry, land uses and their access and vehicular movements in the study area have the potential for further safety issues.

Congestion

Daily Traffic Counts

Traffic counts taken in 2005 on Parkside Avenue showed an average annual daily traffic (AADT) volume of 6,340 vehicles northbound between North Olden Avenue and Buttonwood Drive. The average daily volumes for the southbound direction taken in 2006 were slightly lower at 6,096 vehicles. As depicted in ***Figure 4***, North Olden Avenue experiences much higher daily volumes than Parkside Avenue. Average annual daily traffic volumes recorded on North Olden Avenue west of the study area, between Pennington Road and Sutherland Avenue in 2007 was 12,347 vehicles in the eastbound direction and 10,475 vehicles in the westbound direction. East of the study area on North Olden Avenue, east of Arctic Parkway AADT of 18,145 vehicles were recorded eastbound in 2006 and in 2005, 16,308 vehicles were recorded westbound.

Turning Movement Counts

Manual turning movement counts were taken at the intersection of North Olden Avenue and Parkside Avenue on Wednesday, December 5, 2007 between the hours of 6:00 AM and 9:00 AM and between 3:00 PM and 6:00 PM. A peak hour turning movement diagram is shown in ***Figure 5***. The morning peak hour is 7:45 AM to 8:45 AM and the afternoon peak hour is 4:45 PM to 5:45 PM.

During the morning peak hour, 2,140 vehicles traveled through the intersection. The dominant movements are the through-movements on North Olden Avenue. The eastbound through-movement on North Olden Avenue had the highest volume of 586 vehicles during the peak hour. Westbound North Olden Avenue had comparable high through-movements with 527 vehicles. The protected left-turns were 106 vehicles westbound and 91 vehicles eastbound during the morning peak hour.

Although the dominant movements for the Parkside Avenue approaches were the through-movements, there were relatively high right-turn volumes at each approach and high left-turn movements from the southbound approach for the morning peak period. Morning peak hour through-movements were 206 vehicles northbound and 196 vehicles southbound. Right-turns from both approaches were 137 vehicles each. Northbound left-turn volumes were only 6 percent of that approach morning peak hour volume while left-turns for the southbound approach is approximately 18 percent of that approach morning peak hour volume.

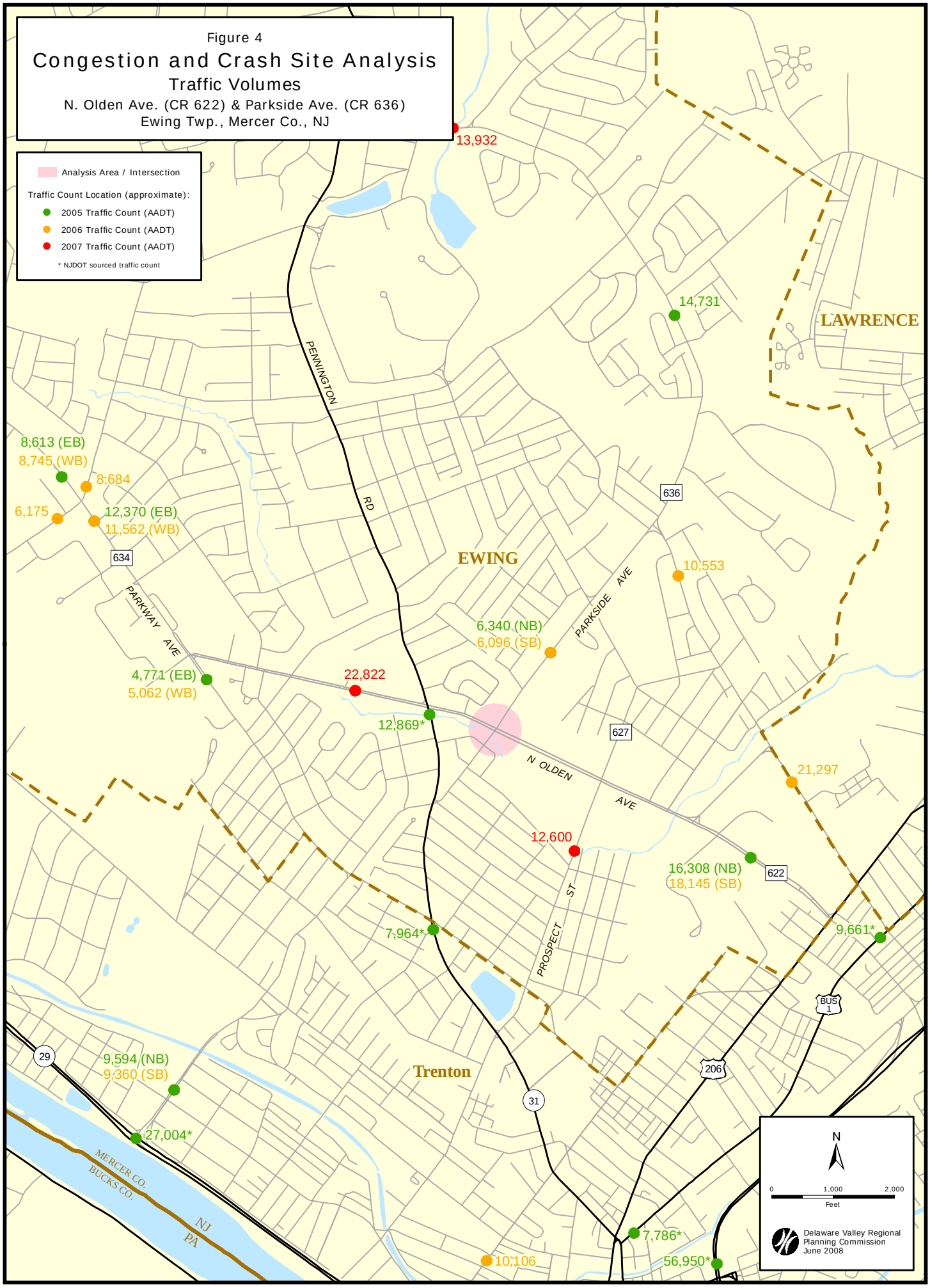
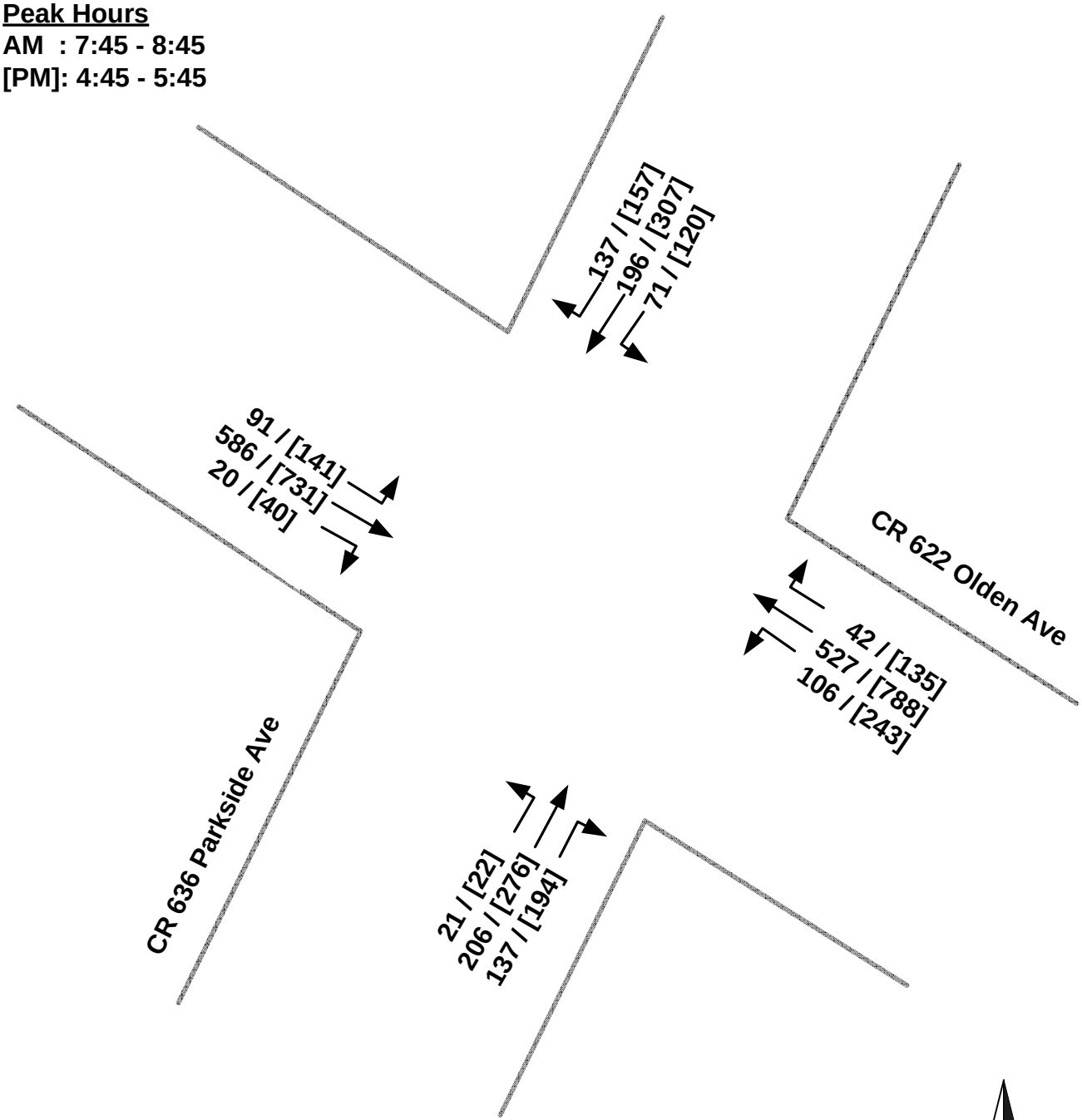


Figure 4
Congestion and Crash Site Analysis
Traffic Volumes
N. Olden Ave. (CR 622) & Parkside Ave. (CR 636)
Ewing Twp., Mercer Co., NJ
Analysis Area / Intersection
Traffic Count Location (approximate):
2005 Traffic Count (AADT)
2006 Traffic Count (AADT)
2007 Traffic Count (AADT)
* NJDOT sourced traffic count
13,932
14,731
LAWRENCE
PENNINGTON RD
8,613 (EB)
8,745 (WB)
8,684
6,175
12,370 (EB)
11,562 (WB)
634
636
EWING
PARKWAY AVE
PARKSIDE AVE
10,553
6,340 (NB)
6,096 (SB)
4,771 (EB)
5,062 (WB)
22,822
12,869*
627
N OLDEN AVE
21,297
12,600
16,308 (NB)
18,145 (SB)
622
PROSPECT ST
7,964*
9,661*
BUS 1
29
9,594 (NB)
9,360 (SB)
Trenton
206
31
27,004*
MERCER CO.
BUCKS CO.
NJ
PA
7,786*
10,106
56,950*
N
0
1,000
2,000
Feet
Delaware Valley Regional Planning Commission
June 2008

Figure 5
Existing Peak Hour Turning Movement Counts

Peak Hours
AM : 7:45 - 8:45
[PM]: 4:45 - 5:45



SCHEMATIC NOT TO SCALE

Delaware Valley Regional Planning Commission
June 2008

The afternoon peak hour volumes were 47 percent higher than the morning peak hour volumes. 3,154 vehicles traveled through the intersection during the afternoon peak hour with the dominant movement being the westbound through-movement which is 25 percent of the intersection volumes. The eastbound through-movement is a close second in peak hour volumes at 731 vehicles, approximately 23 percent of the total intersection volume. Heavy protected left-turn volumes during this period are experienced from the westbound approach on to southbound Parkside Avenue. The 243 vehicles making the left-turn represents 8 percent of the intersection total or 21 percent of the westbound approach total volume for the peak hour. Eastbound left-turns are relatively lighter than the westbound left-turns by a difference of 102 vehicles and the westbound approach experiences 135 right-turn movements during the afternoon peak hour.

The Parkside Avenue approaches also experience higher volumes in the afternoon compared to the morning peak hour. All movements at the approaches experienced significantly higher volumes except the northbound left-turn movement; this volume increased by only one vehicle in the afternoon peak hour. Increase in volumes between the morning and afternoon peak ranged from 15 percent for the southbound right-turns to 69 percent for the southbound left-turns. The southbound approach had high through volumes and relatively high right and left-turn volumes while the northbound approach experiences high through volumes with relatively high right-turn volumes. The northbound approach has the highest right-turn movement for the intersection of 194 vehicles during the afternoon peak hour and the southbound right-turns are a close second with 157 vehicles.

Level of Service

SYNCHRO Traffic Analysis Software was utilized to evaluate the intersection's current performance levels and then to compare the effectiveness of potential improvements. In its evaluations of intersection performance, SYNCHRO considers several factors, including but not limited to vehicular volume, intersection geometry, and signal timing. From this data, SYNCHRO is capable of providing a Level of Service (LOS) and the average delay-per-vehicle, as well as other measures of effectiveness. These measures are detailed for each movement and approach for the entire intersection.

Table 2 shows the existing LOS. During the morning peak hour, the intersection operates at an overall LOS of C, with an average delay of 29 seconds. The poorest performing approach during this period is the southbound Parkside Avenue with LOS of D and 51 seconds of delay. This is in part due to the high number of left-turn movements without a protected phase and the conflicting northbound through-movement. All other approaches operate at LOS C with delays ranging from 21 seconds for the Olden Avenue eastbound approach to 33 seconds for the Parkside Avenue northbound approach. The cycle length is 93 seconds.

During the afternoon peak hour, the intersection operates at an overall LOS of D, with an average delay of 45 seconds. The westbound approach of Olden Avenue operates at an inefficient LOS of E with 61 seconds of delay. This is partly due to the long queue

of left-turning vehicles during the afternoon peak hour. For southbound Parkside Avenue as in the morning peak hour it operates at LOS D with longer delay of 55 seconds. There are heavy through, left and right-turn movements and these are in conflict with heavy-through and right-turn movements from the northbound approach. The cycle length is currently 103 seconds

TABLE 2

Existing Peak hour Level of Service (LOS) Analysis

North Olden Avenue and Parkside Avenue

Scenario	Direction of Travel	2007 Peak AM Hour and Peak PM Hour LOS with Average Delay / Vehicle			
Existing Conditions		AM Peak (93 sec)		PM Peak (103 sec)	
		LOS	Delay (sec)	LOS	Delay (sec)
	N. Olden Avenue eastbound	C	21	C	30
	N. Olden Avenue westbound	C	23	E	61
	Parkside Avenue northbound	C	33	C	24
	Parkside Avenue southbound	D	51	D	55
	Intersection	C	29	D	45

Source: DVRPC, 2007

Safety

The analysis for this location focuses on crashes occurring on Parkside and Olden Avenues both in the intersection box, and within approximately 200 feet of the intersection along the four intersection approaches.

Crash Analysis

The crash data used in this analysis was assembled from Police Crash Investigation Reports for years 2005 – 2007, provided by the Ewing Township Police Department. For this study both reportable and non-reportable police records were utilized. A crash is considered reportable when it results in at least $500 of property damage, an injury, or fatality.

The intersection analysis identifies specific problematic locations, highlights crash trends, and compares and contrasts crash data with 2006 New Jersey Statewide crash averages for the county road system. Comparison with statewide numbers provides context for determining the extent of the crash problem according to various criteria.

The collision diagrams, graphic representations of the location, collision type, and frequency of vehicular crashes within the study area; and crash summary, the analytical synopsis of various crash conditions obtained from the police reports are used to assist in identifying crash trends which may be addressed through any combination of

engineering improvements, increased enforcement, and/or educational campaigns as appropriate.

A total of ninety-two crashes occurred within the study limits between 2005 and 2007. There were 40 crashes in 2005, 25 crashes in 2006, and 27 crashes in 2007; with crashes for 2007 representing only partial year numbers. There were no obvious reasons for the significant decline in total crashes between 2005 and 2006.

As shown in ***Table 3***, there were no recorded fatalities; there were 23 injury crashes, and 69 property damage only crashes. Compared to New Jersey county road statewide averages, property damage only crashes, at 75% of the area's total crashes exceeded the statewide average of 70.57%.

Over the study period only two of the identified collision types did not exceed the 2006 statewide crash averages, they are hit-fixed object and hit parked vehicle crashes. The largest percentage of crashes were rear-end crashes at 37% (34) and angle crashes at 34% (31), together accounting for over 70% of the total. Both exceeded statewide percentages, but the angle crashes stand out the most which were almost double state numbers. The NJ Department of Transportation describes angle crashes as involving vehicles moving in angular directions, for instance collisions involving vehicles traveling northbound and eastbound. Angle crashes are common at intersections and often result when drivers proceed into the intersection without proper clearance, as in red-light running.

There were 14 sideswipe crashes which account for 15% of the total, exceeding the statewide percentage of 11.45%. Both Olden and Parkside Avenues carry two through lanes in each direction. This four-lane configuration is prone to sideswipe collisions due to frequent weaving and lane changing. This is especially possible on Parkside Avenue where a dedicated left-turn lane is not provided and left and through-movements can be made from the left lane. Vehicles intending to move through the intersection frequently weave out of the left lane to avoid getting stuck behind a left-turning vehicle.

There were nine left-turn crashes accounting for approximately 10% of the total. By definition, left-turn crashes involve vehicles moving in opposite directions as one vehicle turns in front of the other without proper clearance. There is increased potential for this type of crash at multi-lane approach intersections with opposing left-turning vehicles as does Parkside Avenue. The opposing lefts tend to obstruct the view of oncoming through traffic in the right lane – known as a "shadowing effect."

The number of crashes occurring during daylight hours was seventy, representing 76% of the total crashes, and 21 crashes occurred at the night time representing 22.5%. The daytime/nighttime split is fairly typical according to the statewide averages. Seventy four percent of the total (68 crashes) occurred when the road surface was dry. Wet road surface conditions accounted for 21 crashes, or 22.5% slightly higher than the statewide percentage of 19.67%.

Table 3 Intersection Crash Summary

CR 636 & CR 622	2005		2006		*2007		Total		2006 NJ Statewide County
Police Report Summary	**Crash**	**%**	**Crash**	**%**	**Crash**	**%**	**Crash**	**%**	**Road Average**
*Reportable	39	97.50%	23	92.00%	27	100.00%	89	96.74%	~
Non-Reportable	1	2.50%	2	8.00%	~	~	3	3.26%	~
Collision Type									
Rear-End	21	52.50%	5	20.00%	8	29.63%	34	**36.96%**	30.32%
Angle	11	27.50%	11	44.00%	9	33.33%	31	**33.70%**	18.09%
Sideswipe	5	12.50%	1	4.00%	8	29.63%	14	**15.22%**	11.45%
Left Turn	3	7.50%	5	20.00%	1	3.70%	9	**9.78%**	7.89%
Hit Fixed Object	~	~	1	4.00%	1	3.70%	2	2.17%	11.89%
Encroachment	~	~	1	4.00%	~	~	1	**1.09%**	0.46%
Hit Parked Vehicle	~	~	1	4.00%	~	~	1	**1.09%**	5.67%
Intersection Type									
Intersection	6	15.00%	2	8.00%	7	25.93%	15	17.20%	39.52%
Not at Intersection	34	85.00%	23	92.00%	20	74.07%	77	**82.80%**	60.45%
Severity Type									
Fatality	~	~	~	~	~	~	~	~	0.27%
Injured	9	22.50%	9	36.00%	5	18.52%	23	25.00%	29.16%
Property	31	77.50%	16	64.00%	22	81.48%	69	**75.00%**	70.57%
Lighting Condition									
Day	29	73.17%	21	84.00%	20	74.07%	70	**76.34%**	70.25%
Dusk/Dawn	~	~	1	4.00%	~	~	1	1.08%	3.84%
Night	11	26.83%	3	12.00%	7	25.93%	21	22.58%	25.49%
Road Surface Condition									
Dry	30	75.61%	16	64.00%	22	81.48%	68	74.19%	77.54%
Wet	8	19.51%	8	32.00%	5	18.52%	21	**22.58%**	19.67%
Ice/Snow	2	4.88%	1	4.00%	~	~	3	**3.23%**	2.13%

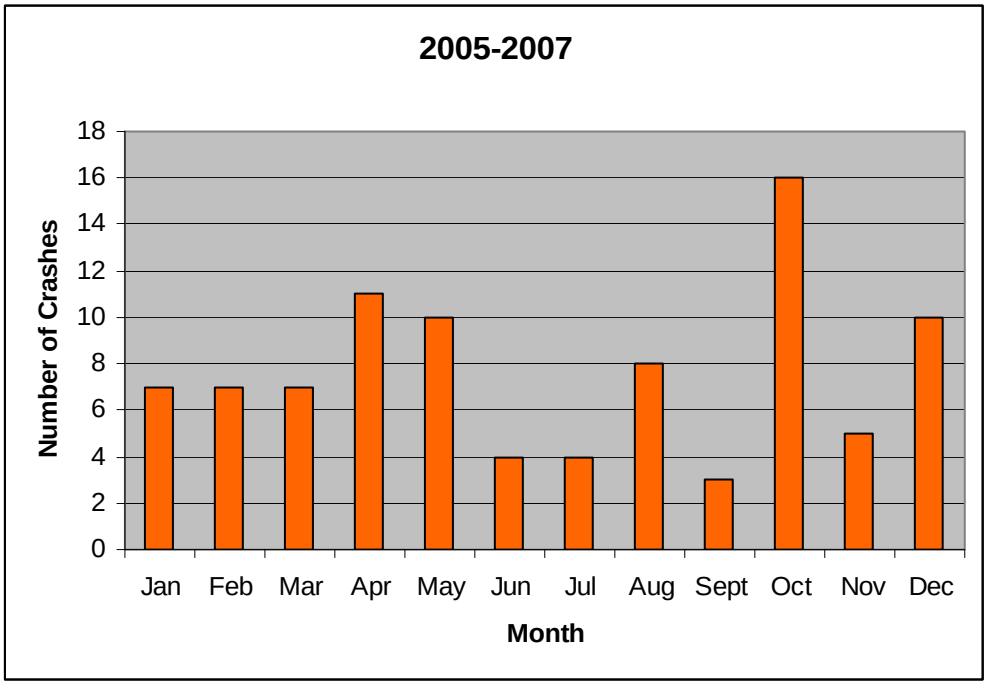
* 2007 Does not represent the full year of crash data.

Source: Ewing Township Police Department

Figures 6 and 7 depict crashes by month and by day of the week, respectively. There were 16 crashes in October (17%) making it the month of the year with the highest number of crashes. September showed the lowest number of crashes by month with only three. April, May, and December all had 10 or more crashes. Seven crashes occurred in January, February, and March. The remaining months each had five or fewer crashes.

As shown in figure 6, every day but Sunday experienced between 12 and 17 crashes. Only seven crashes occurred on Sundays during the study period.

FIGURE 6: Crashes by Month



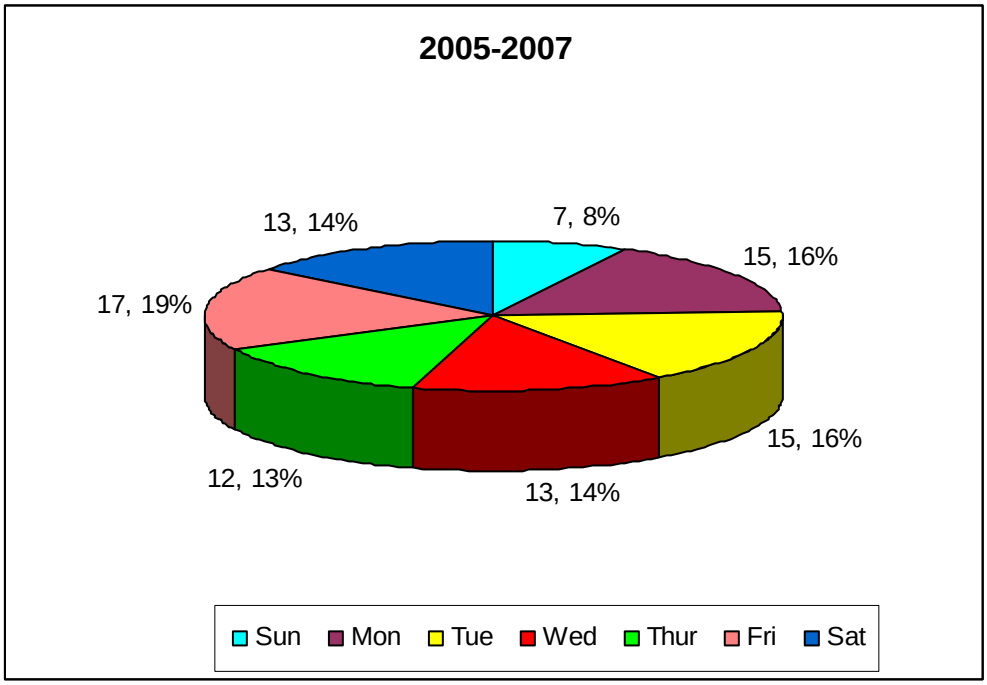
Source: Ewing Township Police Department, 2008

In examining ***Figures 8, 9, and 10,*** the following crash concentrations were revealed:

- 10% of the crashes occurred on the south side intersection leg
- 13% of the crashes occurred on the north side intersection leg
- 16% of the crashes occurred within the intersection box (within the crosswalks)
- 22% of the crashes occurred on the west side intersection leg
- 39% of the crashes occurred on the east side intersection leg

The east side intersection leg (39%) is the section of the study area with multiple driveways accessing the ShopRite shopping center and many other retail establishments as well as a New Jersey Transit bus stop. The high volume of traffic entering and exiting Olden Avenue may contribute to the number of crashes. An analysis of collision types regarding these crashes revealed that 47% were rear-end crashes, which are typically related to congestion.

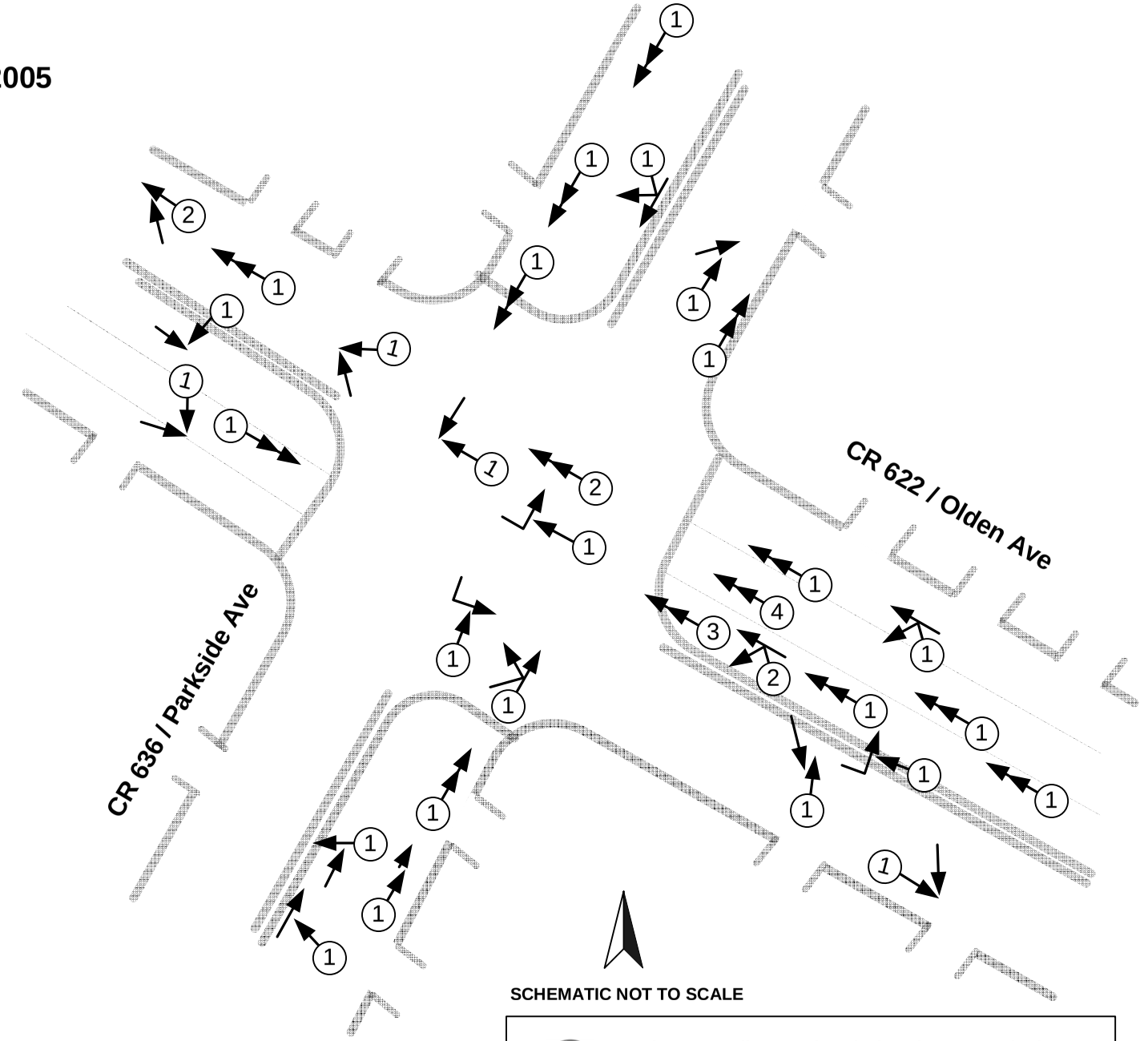
FIGURE 7: Crashes by Day of Week



Source: Ewing Township Police Department, 2008

Figure 8
Collision Diagram – 2005

Total Crashes = 40
Pedestrian Crashes = 0



Crash Type Legend

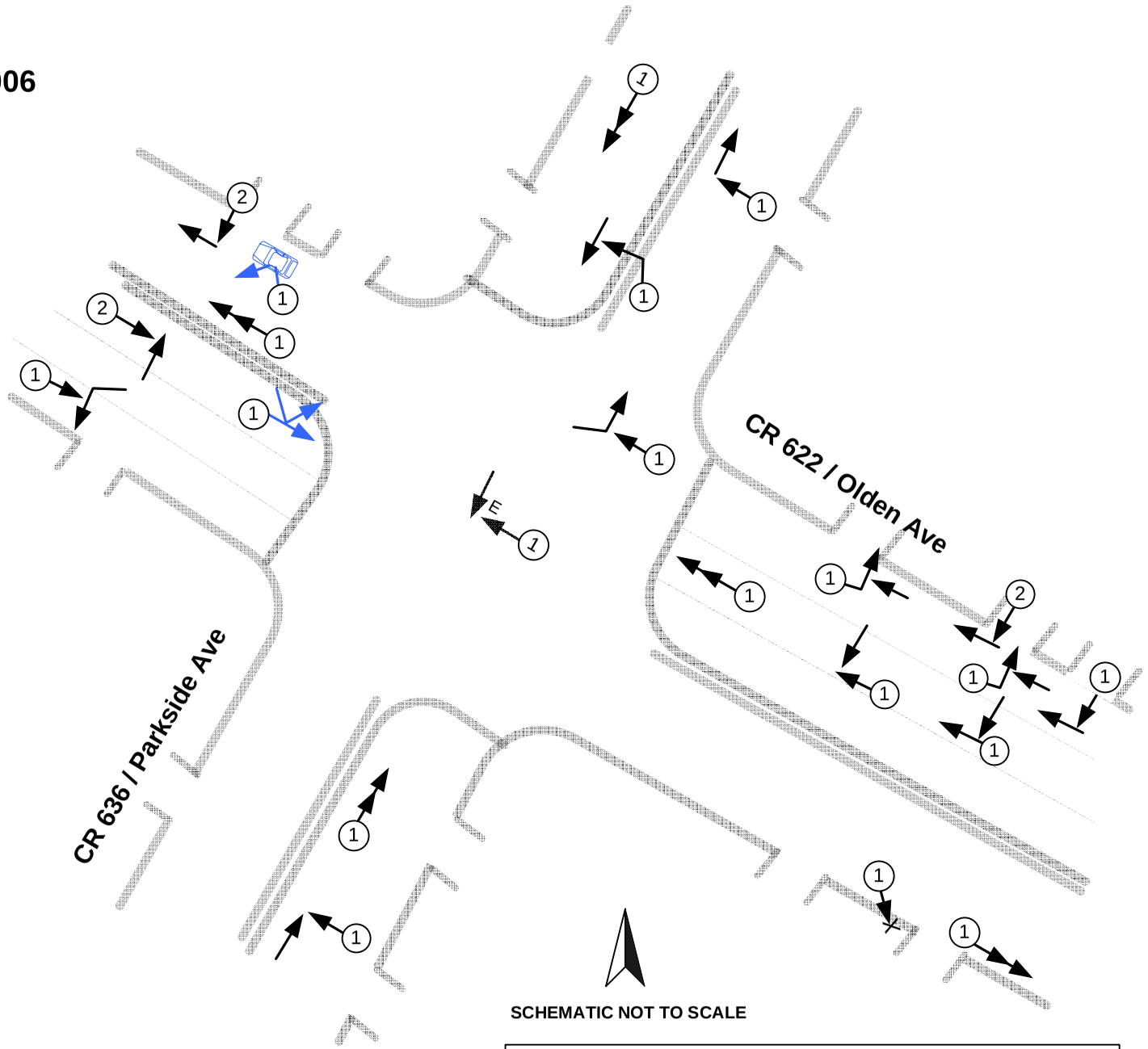
- (1) = # crashes
- Rear End
- Angle
- Angle
- Sideswipe
- Left Turn

Delaware Valley Regional Planning Commission
June 2008

Source: Ewing Township Police Department

Figure 9
Collision Diagram – 2006

Total Crashes = 25
Pedestrian Crashes = 0



Crash Type Legend

- (1) = # crashes
- Rear End
- Angle
- Sideswipe
- Left Turn
- E — Encroachment
- X — Hit Fixed Object

Possible Miscoding

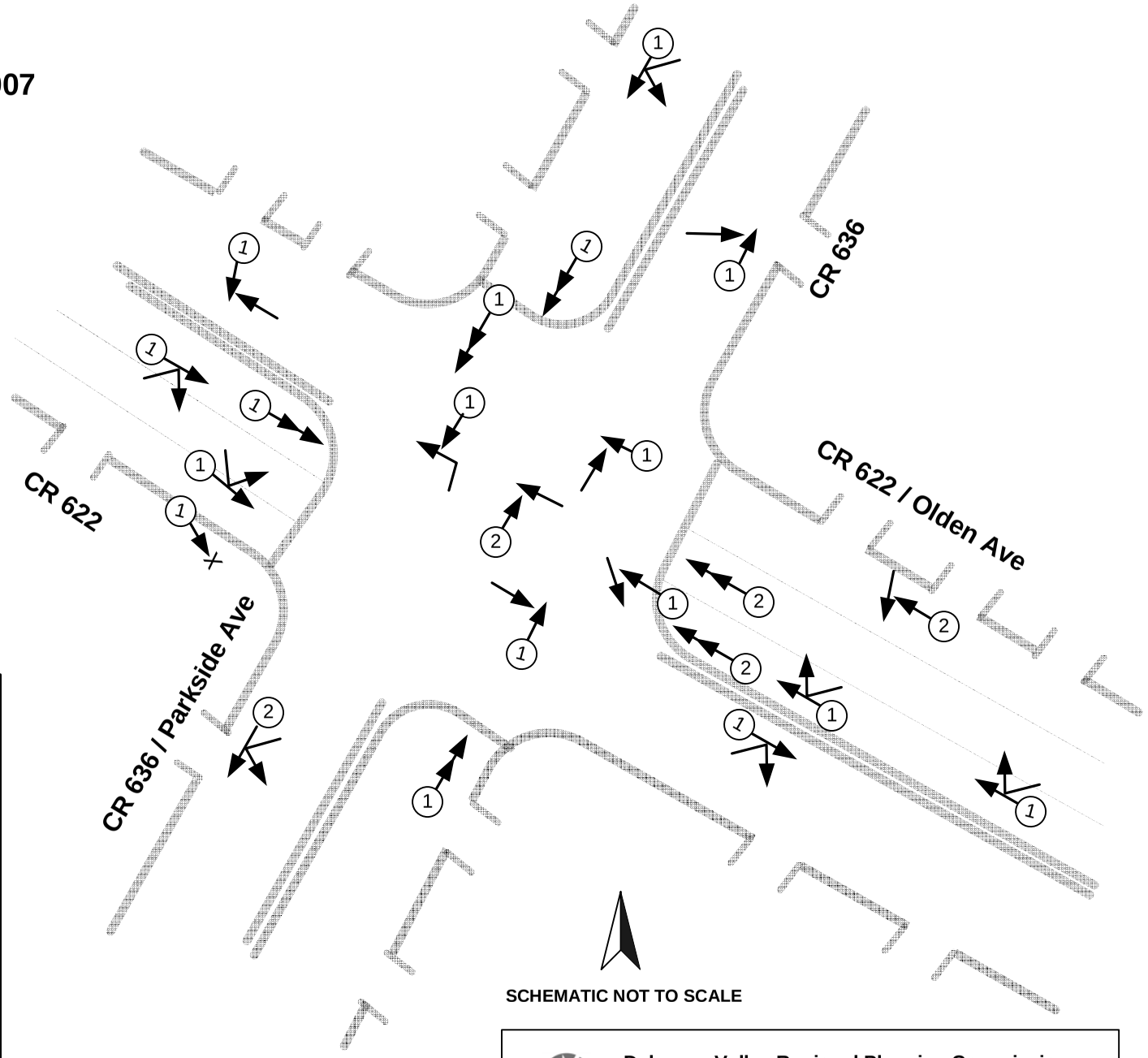
- Hit Parked Vehicle "Angle"
- Sideswipe "Hit Fixed Object"

Delaware Valley Regional Planning Commission
June 2008

Source: Ewing Township Police Department

Figure 10
Collision Diagram – 2007

Total Crashes = 27
Pedestrian Crashes = 0



Crash Type Legend

(1)	= # crashes
→	Rear End
↓←	Angle
↘	Sideswipe
→↓	Left Turn
→X	Hit Fixed Object

Delaware Valley Regional Planning Commission
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Source: Ewing Township Police Department

Pedestrian and Bicycle Amenities

Currently, there are no bicycle amenities in the study area. North Olden Avenue and Parkside Avenue do not have a shoulder therefore bicyclists are forced to share the travel lanes or in some cases utilize the sidewalks. There are no “share the road” signs to alert motorists of these road users.

Sidewalks in the area are substandard. Around the study intersection they are narrow, with pavement in poor condition consisting of tripping hazards. In these areas the sidewalk is more of a potential hazard to pedestrians than a refuge. Traffic signal and utility poles are located in the middle of narrow sidewalks making it difficult for people with disabilities to travel safely.

There are no curb ramps at the intersection and the traffic signal has no pedestrian indication though there are pedestrian push buttons.

Access Management

North Olden Avenue boasts many access points for businesses which front the roadway. Many businesses have undefined driveways which can result in confusion for all road users. Movements from driveways in the area are unrestricted in most cases and motorists are allowed to cross several lanes of active traffic to enter or exit these facilities. Both land uses on the southeast and southwest corners of the intersection have open access/egress for North Olden Avenue. The diner on the southeast corner and the liquor store on the northeast corner of the intersection both have access/egress points on Parkside Avenue which are too close to the intersection for safe movement.

Pavement Markings

Pavement markings on North Olden Avenue and Parkside Avenue were faded in some areas. Crosswalks are the minimum required by MUTCD guidelines and are fading.

OPPORTUNITIES AND CONSTRAINTS

North Olden Avenue is an important commuter route in Mercer County as well as an important commercial destination. Parkside Avenue serves both through traffic but also destination traffic for residential developments located in and around the area. As a result there are heavy traffic movements within the study area.

High or increasing traffic volumes in the past usually lead to widening of the right-of-way to accommodate additional lanes. The intersection of North Olden Avenue and Parkside Avenue vehicular capacity is limited. The intersection currently occupies all the existing right-of-way and all quadrants of the intersection are developed. Additionally, any required increase in the right-of-way on Parkside Avenue may be restricted by the bridge south of the intersection.

Signal upgrade and retiming to provide for improved safety, efficiency, and operation of the intersection will have to consider any coordination with the existing traffic signal at the North Olden Avenue and Pennington Road intersection, located a ¼ mile west of the study intersection. The signal at the North Olden Avenue and Pennington Road intersection currently operates on a 90 second cycle length. This constraint could possibly affect the level of improvement given that the two signals are operated by different agencies.

Given the high number of angle crashes at the intersection improvement strategies will examine the addition of an “all-red” phase to follow the protected left-turn phase of the North Olden Avenue approaches. Modification of the “all-red” phase may also be beneficial to the overall operation of the intersection. Although, the addition of the “all-red” phase will not necessarily reduce red-light running, it will provide additional clearance time that can help to prevent crashes if red-light running occurs in the first few seconds of the red intervals.

At the initial stakeholders meeting, the study team was asked to examine the operations of Parkside Avenue between Pennington Road and Buttonwood Drive; consider pedestrian movement to/from the NJ Transit bus stop on North Olden Avenue and traffic circulation for the ShopRite shopping center. Of note, the entrance from the shopping center on to North Olden Avenue restricts exiting left-turn movements but motorists often executes that turn even though it is illegal.

Parkside Avenue is currently a four lane roadway with two lanes in each direction. Average annual daily traffic volumes are approximately 12,500. A road-diet application was considered for Parkside Avenue given that it satisfied the preliminary criteria.
As discussed earlier, at the approaches to the study intersection, Parkside Avenue is a four-lane road, with two lanes in both directions. This cross-section extends along Parkside Avenue in both directions, until its intersection with Pennington Road (NJ 31) to the south of the study intersection, and its intersection with Buttonwood Drive to the north. These sections are approximately 0.3 miles and 0.5 miles in length, respectively. Parkside Avenue south of the Pennington Road intersection is a two-lane road. North of

the Buttonwood Drive intersection, Parkside Avenue is a three-lane road then shortly thereafter it transitions into a two-lane cross-section.

Road-diet – A typical road-diet technique is to reduce the number of lanes on a roadway cross-section. One of the most common applications of a road-diet is to convert a 4-lane roadway, into 3 lanes with one travel lane in each direction and a two-way turn lane in the middle. The remaining pavement width can be converted to bicycle lanes, sidewalks, on-street parking or some combination of these design elements.
Road-diets can be used as a safety tool, or as a design objective. Road-diets have been applied to roadways all across the United States and Canada. As information about the safety benefits of these conversions have become more widespread, the projects have gained popularity with communities looking to improve safety and access on large roads.

While there does not seem to be a consensus on exactly how much safer road-diet projects are, there is convincing evidence to support the claim that roads put on a diet are safer. The reduction in crash rate is primarily the result of the reduction in conflict points. In addition to reduced conflict points at intersections, there is typically a reduction of mid block conflicts related to lane changes prevalent with four lane roadways. With the 3-lane configuration of the road-diet, sight distance for turning and crossing traffic is also improved making these maneuvers safer.

Typically, the difference in level of service remains adequate for the converted roadways. In general, only when average daily traffic (ADT) has reached over 20,000 vehicles that congestion may increase and the potential for diversion to other routes is realized.

Pedestrian – On Saturday, February 16, 2008 a pedestrian survey was taken in from of the ShopRite shopping center. ***Table 4*** depicts the movements between 11:00 AM and 4:00 PM.

Table 4: Pedestrian Movements

TIME	Bus Stop EB	Bus Arrival	Bus Stop WB	Bus Arrival	Others Crossing Olden Avenue/Walking in the Vicinity	TOTAL
11:00 - 11:30	3	11:10			2	5
11:30 - 12:00			2	11:55	1	3
12:00 - 12:30	2	12:25				2
12:30 - 1:00					2	2
1:00 - 1:30			3	1:12	4	7
1:30 - 2:00	2	1:40			3	5
2:00 - 2:30			1	2:26	1	2
2:30 - 3:00	4	3:00				4
3:00 - 3:30					1	1
3:30 - 4:00			1	3:37		1
Total	11		7		14	32

Source: DVRPC, 2008

Circulation – Given that ShopRite shopping center is private property, implementation of any recommended improvement in the circulation of this facility would be at the discretion of and in cooperation with the property owners. Therefore, owner buy-in is crucial.

POTENTIAL IMPROVEMENT SCENARIOS

Intersection of North Olden Avenue and Parkside Avenue

Two short-term and three medium-term scenarios were analyzed for their impact upon the performance of the study intersection. The former two scenarios involve revisions to the signal timing only, whereas the latter three incorporate changes to the geometry of the intersection in addition to signal timing revisions. The three medium-term scenarios evaluate the impact of reconfiguring the type and number of lanes at the Parkside Avenue approaches, with various timing provisions for left-turn movements. All five scenarios consider extending the green time for the North Olden Avenue's signal protected left-turn phase as well as the influence of a two second all-red phase to follow. In addition, the effect of a 90 second cycle length is evaluated in order to coordinate with the cycle length of the adjacent Olden Avenue intersection at Pennington Road.

Short-Term Scenarios

Scenario 1

Characteristics

- Optimize the existing signal timing splits and cycle length.
- Retain the existing signal protection for Olden Avenue left-turns.

In addition:

- Add a two second all-red phase to follow the protected Olden Avenue left-turn phase.
- Optimize the signal timing at a 90 second cycle length like the signal at the Olden Avenue/Pennington Road intersection.

Advantages

- Timing revisions may be implemented with little cost and in the short-term.
- Optimization provides splits and cycle lengths that are more appropriate for current peak hour traffic patterns.
- The two second all-red phase will provide an increased buffer of clearance for Olden Avenue vehicles.
- A 90 second cycle length will allow cycle length coordination with the adjacent Olden Avenue signalized intersection.

Disadvantages

- Parkside Avenue left-turns remain unprotected and must be completed against two lanes of opposing traffic.
- The two second all-red phase adds additional delay.
- A 90 second cycle length is longer than the optimized timing plans with cycle lengths of 55 seconds during the morning peak and 60 seconds in the afternoon.

Level of Service Analysis

As shown in **Table 5**, for the morning peak hour operates at a LOS of B with 17 seconds of delay, a 12 second improvement from existing conditions. This is mainly a

result of a shorter split for the Olden Avenue approaches and shorter overall cycle length. The afternoon peak hour experiences an overall 28 seconds of delay, for a LOS of C; this represents a 17 second reduction from existing delay measures, due primarily to the shorter overall cycle length. The inclusion of a two second all-red phase induces a slight increase in delay for both Olden Avenue approaches and for the overall intersection.

When optimized at a 90 second cycle length, overall delay was also reduced from existing conditions but comparable alternatives had lower delays.

TABLE 5

Proposed Scenario 1 Peak Hour Level of Service (LOS) Analysis

Olden Avenue and Parkside Avenue Existing Geometry

2007 Peak AM Hour and Peak PM Hour LOS with Average Delay/Vehicle

Existing Timing	Permitted Only			
	93 sec CL		**103 sec CL**	
	AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)
Olden Avenue- Eastbound	C	21	C	30
Olden Avenue - Westbound	C	23	E	61
Parkside Avenue- Northbound	C	33	C	24
Parkside Avenue- Southbound	D	51	D	55
Intersection	C	29	D	45

Optimized Signal Plan	Permitted Only							
	55 sec CL		**60 sec CL**		**90 sec CL**			
	AM Peak		PM Peak		AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Olden Avenue- Eastbound	B	19	D	36	C	22	C	33
Olden Avenue - Westbound	B	18	C	30	C	21	C	30
Parkside Avenue- Northbound	B	13	B	12	C	23	B	18
Parkside Avenue- Southbound	B	16	C	27	C	33	D	43
Intersection	B	17	C	28	C	24	C	32

TABLE 5 cont'd

Proposed Scenario 1 Peak Hour Level of Service (LOS) Analysis

Olden Avenue and Parkside Avenue Existing Geometry

Optimized Signal Plan with 2 sec all-red for Olden LTs	Permitted Only							
	60 sec				**90 sec**			
	AM Peak		AM Peak		AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Olden Avenue- Eastbound	B	20	D	50	C	23	C	35
Olden Avenue - Westbound	C	20	D	37	C	23	C	32
Parkside Avenue- Northbound	B	14	B	12	C	24	B	19
Parkside Avenue- Southbound	B	19	C	27	C	34	D	48
Intersection	B	19	C	35	C	25	C	34

Source: DVRPC, 2008

Scenario 2

Characteristics

- Optimize the existing timing splits and cycle length while implementing a split phase for the Parkside Avenue approaches.
- Retain the existing signal protection for Olden Avenue left-turns.

In addition:

- Add a two second all-red phase to follow the protected Olden Avenue left-turn phase.
- Optimize the signal timing at a 90 second cycle length like the signal at the Olden Avenue/Pennington Road intersection.

Advantages

- Parkside Avenue left-turn movements will have signal protection.
- Timing revisions may be implemented with little cost and in the short-term.
- Optimization provides splits and cycle lengths that are more appropriate for current peak hour traffic patterns.
- The two second all-red phase will provide an increased buffer of clearance for Olden Avenue vehicles.
- A 90 second cycle length will allow cycle length coordination with the adjacent Olden Avenue signalized intersection.

Disadvantages

- In general, split phasing can create additional delay though level of delay will vary.
- The two second all-red phase adds additional delay.
- A 90 second cycle length is longer than the optimized signal timing of 60 seconds in the morning peak hour and 80 seconds in the afternoon peak hour.

Level of Service Analysis

As shown in **Table 6**, overall delay during the morning peak hour will remain at its current level of 29 seconds and LOS of C. Delay at the Parkside Avenue approaches are reduced, though it increases for the Olden Avenue approaches. Compared to existing conditions, the afternoon peak hour's overall LOS remains a D though with a slight increase in delay, with only one approach experiencing a delay reduction. The addition of a two second all-red phase accounts for a minor increase in overall delay for both peak hours, which is mainly borne by the Olden Avenue approaches.

Optimization at a 90 second cycle length induces an additional one to five seconds of overall delay, to the extent that neither peak hour scenarios improve over the existing conditions.

TABLE 6

Proposed Scenario 2 Peak Hour Level of Service (LOS) Analysis

Olden Avenue and Parkside Avenue Existing Geometry

	Protected Only							
	60 sec CL		**80 sec CL**		**90 sec**			
	AM Peak		PM Peak		AM Peak		PM Peak	
Parkside Spilt Phased	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Olden Avenue- Eastbound	C	21	C	30	C	21	C	30
Olden Avenue - Westbound	C	23	E	61	C	23	E	61
Parkside Avenue- Northbound	C	33	C	24	C	33	C	24
Parkside Avenue- Southbound	D	51	D	55	D	51	D	55
Intersection	C	29	D	45	C	29	D	45

	Protected Only							
	60 sec CL		**80 sec CL**		**90 sec**			
	AM Peak		PM Peak		AM Peak		PM Peak	
Parkside Split Phased with 2 sec all-red for Olden LTs	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Olden Avenue- Eastbound	C	28	D	50	C	32	D	45
Olden Avenue - Westbound	C	29	D	45	C	31	D	41
Parkside Avenue- Northbound	C	31	D	50	D	40	D	52
Parkside Avenue- Southbound	D	36	E	68	D	43	F	86
Intersection	C	30	D	51	D	35	D	52

Source: DVRPC, 2008

Medium-Term Scenarios

Scenario 3

Characteristics

- Convert the left lane for both Parkside Avenue approaches into an exclusive left-turn lane.
- Reduce the Parkside Avenue receiving lanes at both approaches to one.
- Evaluate various types of signal protection for Parkside Avenue left-turns
    - Left-turns from the Parkside Avenue approaches as permissive only;
    - Left-turns from the Parkside Avenue approaches as permissive only with 2 second “all-red” phase following the Olden Avenue left-turns;
    - Left-turns from the Parkside Avenue approaches as protected only;
    - Left-turns from the Parkside Avenue approaches as protected only with 2 second “all-red” phase following the Olden Avenue left-turns;
    - Left-turns from the Parkside Avenue approaches as protected and permissive; and
    - Left-turns from the Parkside Avenue approaches as protected and permissive with 2 second “all-red” phase following the Olden Avenue left-turns.
- Optimize the existing signal’s splits and cycle length.
- Retain the existing signal protection for Olden Avenue left-turns.

In addition:

- Add a two second all-red phase to follow the protected Olden Avenue left-turn phase.
- Optimize the signal timing at a 90 second cycle length as the signal at the Olden Avenue/Pennington Road intersection.

This scenario is illustrated in ***Figure 11.***

Advantages

- Parkside Avenue through-movements will not be combined with left-turning vehicles.
- A single lane of opposing through-movements provides improved sight line and distance for Parkside Avenue left-turns.
- Reconfiguration of the approach lanes will occur within the existing curb-to-curb right-of-way.
- Signal protection may be provided for Parkside Avenue left-turns.
- Optimization provides splits and cycle lengths that are more appropriate for current peak hour traffic patterns.
- The two second “all-red” phase will provide an increased buffer of clearance for Olden Avenue vehicles.
- A 90 second cycle length will allow cycle length coordination with the adjacent Olden Avenue signalized intersection.

Disadvantages

- Reduced throughput capacity for Parkside Avenue through and right-turn movements.

Figure 11

Congestion and Crash Site Analysis

Proposed Intersection Improvements - Scenario 3

N. Olden Ave. (CR 622) & Parkside Ave. (CR 636)
Ewing Twp., Mercer Co., NJ

CR 636 PARKSIDE AVE

CR 622 N OLDEN AVE

BRUCE LN

CROSS ST

ONLY

N

0 50 100
Feet

DVRPC Aerial Imagery: Spring, 2005

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- The two second all-red phase adds additional delay.
- A 90 second cycle length is often longer than the optimized timing plans.

Level of Service Analysis

As shown in **Table 7**, *Scenario 3* was evaluated with various timing provisions for Parkside Avenue left-turns. Starting with the "permitted only" provision, which is similar to the existing signal timing, the morning peak hour overall delay is reduced by eight seconds from current conditions, though with a similar LOS of C. However, compared to *Scenario 1* and its similar timing plan, delays at the Parkside Avenue approaches are higher. Compared to existing conditions, the afternoon peak hour 38 seconds of overall delay is a seven second reduction, though its LOS remains at D. When compared to *Scenario 1*, delay increases for the Parkside Avenue approaches while remaining comparable for Olden Avenue. The introduction of signal protection for Parkside Avenue left-turns, via "protected and permitted" and "protected only" timing provisions contributes an additional four and eleven seconds to overall delay, respectively. The addition of a two second all-red phase also impacts overall delay, from three to seven seconds.

Consideration of these alternatives at a 90 second cycle length will create further overall delay of up to seven seconds. This additional delay influences the morning peak hour alternatives more than the afternoon, since the latter cycle lengths are at or near 90 seconds.

TABLE 7

Proposed Scenario 3 Peak Hour Level of Service (LOS) Analysis

Olden Avenue and Parkside Avenue New Timing and Geometry

2007 Peak AM Hour and Peak PM Hour LOS with Average Delay/Vehicle

Optimized Signal Plan	Protected only							
	60 sec CL		**90 sec CL**		**90 sec CL**			
	AM Peak		PM Peak		AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Olden Avenue- Eastbound	C	34	D	48	C	31	D	48
Olden Avenue - Westbound	C	30	D	43	C	29	D	43
Parkside Avenue- Northbound	C	29	E	68	D	45	E	68
Parkside Avenue- Southbound	C	29	D	47	C	37	D	47
Intersection	C	31	D	49	C	34	D	49

TABLE 7 continued

Proposed Scenario 3 Peak Hour Level of Service (LOS) Analysis

Olden Avenue and Parkside Avenue New Timing and Geometry

Optimized Signal Plan with 2 sec all-red for Olden LTs	Protected only							
	60 sec		**90 sec**		**90 sec**			
	AM Peak		AM Peak		AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Olden Avenue- Eastbound	D	46	D	51	C	32	D	51
Olden Avenue - Westbound	D	36	D	45	C	30	D	45
Parkside Avenue- Northbound	C	29	E	79	D	47	E	79
Parkside Avenue- Southbound	C	29	D	49	D	39	D	49
Intersection	D	37	D	53	D	35	D	53

Optimized Signal Plan	Protected and Permitted							
	60 sec		**80 sec**		**90 sec**			
	AM Peak		AM Peak		AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Olden Avenue- Eastbound	C	26	D	44	C	28	D	45
Olden Avenue - Westbound	C	27	D	37	C	27	D	39
Parkside Avenue- Northbound	C	23	E	56	D	38	E	56
Parkside Avenue- Southbound	C	22	D	38	C	32	D	37
Intersection	C	25	D	42	C	30	D	43

Optimized Signal Plan with 2 sec all-red for Olden LTs	Protected and Permitted							
	60 sec CL		**80 sec CL**		**90 sec**			
	AM Peak		PM Peak		AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Olden Avenue- Eastbound	D	39	D	48	C	30	D	48
Olden Avenue - Westbound	C	32	D	43	C	29	D	43
Parkside Avenue-Northbound	C	25	E	77	D	41	E	77
Parkside Avenue- Southbound	C	20	D	40	C	31	D	40
Intersection	C	31	D	49	C	32	D	49

TABLE 7 continued

Proposed Scenario 3 Peak Hour Level of Service (LOS) Analysis

Olden Avenue and Parkside Avenue New Timing and Geometry

Optimized Signal Plan	Permitted Only							
	55 sec CL		**75 sec CL**		**90 sec**			
	AM Peak		PM Peak		AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Olden Avenue- Eastbound	C	22	D	37	C	24	D	39
Olden Avenue - Westbound	C	20	C	34	C	24	C	34
Parkside Avenue- Northbound	C	21	C	35	C	34	D	28
Parkside Avenue- Southbound	C	23	D	51	D	38	E	59
Intersection	C	21	D	38	C	28	D	41

Optimized Signal Plan with 2 sec all-red for Olden LTs	Permitted Only							
	60 sec CL		**75 sec CL**		**90 sec**			
	AM Peak		PM Peak		AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Olden Avenue- Eastbound	C	23	D	44	C	25	D	42
Olden Avenue - Westbound	C	23	D	39	C	25	D	37
Parkside Avenue- Northbound	C	23	C	34	D	36	D	38
Parkside Avenue- Southbound	C	26	D	47	D	42	E	58
Intersection	C	24	D	41	C	30	D	43

Source: DVRPC, 2008

Scenario 4

Characteristics

- Convert the left lane of the northbound Parkside Avenue approach into an exclusive left-turn lane.
- Convert the southbound Parkside Avenue approach into exclusive left-turn, through, and right-turn departure lanes.
- Reduce the number of receiving lanes for Parkside Avenue into one lane.
- Utilize various types of signal protection for Parkside Avenue left-turns.
    - Left-turns from the Parkside Avenue approaches as permissive only;
    - Left-turns from the Parkside Avenue approaches as permissive only with 2 second “all-red” phase following the Olden Avenue left-turns;
    - Left-turns from the Parkside Avenue approaches as protected only;
    - Left-turns from the Parkside Avenue approaches as protected only with 2 second “all-red” phase following the Olden Avenue left-turns;
    - Left-turns from the Parkside Avenue approaches are protected and permissive; and

  - Left-turns from the Parkside Avenue approaches as protected and permissive with 2 second “all-red” phase following the Olden Avenue left-turns.
- Optimize the existing signal timing splits and cycle length.
- Retain the existing signal protection for Olden Avenue left-turns.

In addition:

- Add a two second all-red phase to follow the protected Olden Avenue left-turn phase.
- Optimize the signal timing at a 90 second cycle length as the signal at the Olden Avenue/Pennington Road intersection.

Advantages

- Northbound Parkside Avenue through-movements will not be combined with left-turning vehicles.
- All southbound Parkside Avenue movements will have an exclusive departure lane.
- A single lane of opposing through-movements provides improved sight line and distance for Parkside Avenue left-turns.
- Reconfiguration of the approach lanes will occur within the existing curb-to-curb right-of-way.
- Signal protection may be provided for Parkside Avenue left-turns.
- Optimization provides splits and cycle lengths that are more appropriate for current peak hour traffic patterns.
- The two second all-red phase will provide an increased buffer of clearance for Olden Avenue vehicles.
- A 90 second cycle length will allow cycle length coordination with the adjacent Olden Avenue signalized intersection.

Disadvantages

- Reduced throughput capacity for northbound Parkside Avenue through and right-turn movements.
- The exclusive southbound through departure lane may require realignment with its receiving lane.
- The two second all-red phase adds additional delay.
- A 90 second cycle length is often longer than the optimized timing plans depending on the alternative.

This scenario is illustrated in ***Figure 12.***

Level of Service Analysis

As shown in ***Table 8***, *Scenario 4* was evaluated with various timing provisions. For the optimization of the “permitted only” alternative for Parkside Avenue left-turns, the morning peak hour overall delay is 19 seconds with LOS B; all approaches are LOS B except northbound Parkside Avenue with LOS C. Overall this is a 10 second improvement from existing conditions, but only a two second improvement compared to *Scenario 3*. In comparison to *Scenario 1*, only the northbound Parkside Avenue

Figure 12

Congestion and Crash Site Analysis

Proposed Intersection Improvements - Scenario 4

N. Olden Ave. (CR 622) & Parkside Ave. (CR 636)
Ewing Twp., Mercer Co., NJ

CR 636 PARKSIDE AVE

CR 622 N OLDEN AVE

BRUCE LN

CROSS ST

ONLY ONLY ONLY

ONLY ONLY ONLY

ONLY

N

0 50 100
Feet

DVRPC Aerial Imagery: Spring, 2005

Delaware Valley Regional
Planning Commission
June 2008

TABLE 8

Proposed Scenario 4 Peak Hour Level of Service (LOS) Analysis

Olden Avenue and Parkside Avenue New Timing and Geometry

2007 Peak AM Hour and Peak PM Hour LOS with Average Delay/Vehicle

Optimized Signal Plan	Protected only							
	60 sec CL		**90 sec CL**		**90 sec CL**			
	AM Peak		PM Peak		AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Olden Avenue- Eastbound	C	26	D	47	C	31	D	47
Olden Avenue - Westbound	C	27	D	43	C	29	D	43
Parkside Avenue- Northbound	D	37	E	62	D	43	E	62
Parkside Avenue- Southbound	B	19	D	37	C	25	D	37
Intersection	C	27	D	46	C	31	D	46

Optimized Signal Plan with 2 sec all-red for Olden LTs	Protected only							
	55 sec		**90 sec**		**90 sec**			
	AM Peak		AM Peak		AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Olden Avenue- Eastbound	C	29	D	48	C	32	D	48
Olden Avenue - Westbound	C	30	D	43	C	30	D	43
Parkside Avenue- Northbound	D	44	F	80	D	45	F	80
Parkside Avenue- Southbound	C	23	D	38	C	25	D	38
Intersection	C	31	D	49	C	32	D	49

Optimized Signal Plan	Protected and Permitted							
	60 sec		**75 sec**		**90 sec**			
	AM Peak		AM Peak		AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Olden Avenue- Eastbound	C	23	D	43	C	27	D	43
Olden Avenue - Westbound	C	24	D	38	C	27	D	38
Parkside Avenue- Northbound	C	33	D	53	C	38	E	56
Parkside Avenue- Southbound	B	16	C	24	B	20	C	27
Intersection	C	24	D	39	C	28	D	40

TABLE 8 continued

Proposed Scenario 4 Peak Hour Level of Service (LOS) Analysis

Olden Avenue and Parkside Avenue New Timing and Geometry

Optimized Signal Plan with 2 sec all-red for Olden LTs	Protected and Permitted							
	60 sec CL		**80 sec CL**		**90 sec**			
	AM Peak		PM Peak		AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Olden Avenue- Eastbound	C	24	D	45	C	28	D	48
Olden Avenue - Westbound	C	25	D	42	C	28	D	41
Parkside Avenue- Northbound	D	35	E	57	D	40	E	56
Parkside Avenue- Southbound	B	17	C	27	C	22	C	27
Intersection	C	25	D	42	C	29	D	43

Optimized Signal Plan	Permitted Only							
	45 sec CL		**50 sec CL**		**90 sec**			
	AM Peak		PM Peak		AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Olden Avenue- Eastbound	B	18	C	35	C	23	D	39
Olden Avenue - Westbound	B	19	C	33	C	23	C	34
Parkside Avenue- Northbound	C	27	D	46	D	35	D	35
Parkside Avenue- Southbound	B	16	C	28	C	26	D	46
Intersection	B	19	C	35	C	26	D	38

Optimized Signal Plan with 2 sec all-red for Olden LTs	Permitted Only							
	50 sec CL		**55 sec CL**		**90 sec**			
	AM Peak		PM Peak		AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Olden Avenue- Eastbound	C	21	D	36	C	25	D	42
Olden Avenue - Westbound	B	20	D	36	C	24	D	37
Parkside Avenue- Northbound	C	27	D	55	D	36	D	35
Parkside Avenue- Southbound	B	18	C	34	C	28	D	44
Intersection	C	21	D	38	C	27	D	40

Source: DVRPC, 2008

approach deviates considerably in delay measures. During the afternoon peak hour with the "permitted only" alternative, the overall intersection operates with 35 seconds of delay with LOS C. This is a 10 second improvement from existing conditions, but only a three second improvement from *Scenario 3*, and a deterioration of seven seconds from *Scenario 1*. The addition of signal protection for Parkside Avenue left-turns only showed marginal changes in the overall delay when compared to *Scenario 1*. All alternatives showed a decrease in intersection delay over *Scenario 3* for both the morning and afternoon peak hours.

As shown in ***Table 8***, these alternatives at a 90 seconds cycle length either showed no effect in overall delay at the intersection or increased between one and seven seconds.

Scenario 5
Characteristics

- Convert the both Parkside Avenue approaches into exclusive left-turn, through, and right-turn departure lanes.
- Reduce the number of receiving lanes for Parkside Avenue to one lane.
- Utilize various types of signal protection for Parkside Avenue left-turns:
    - Left-turns from the Parkside Avenue approaches as permissive only;
    - Left-turns from the Parkside Avenue approaches as permissive only with 2 second "all-red" phase following the Olden Avenue left-turns;
    - Left-turns from the Parkside Avenue approaches as protected only;
    - Left-turns from the Parkside Avenue approaches as protected only with 2 second "all-red" phase following the Olden Avenue left-turns;
    - Left-turns from the Parkside Avenue approaches as protected and permissive; and
    - Left-turns from the Parkside Avenue approaches as protected and permissive with 2 second "all-red" phase following the Olden Avenue left-turns.
- Optimize the existing signal timing splits and cycle length.
- Retain the existing signal protection for Olden Avenue left-turns.

In addition:

- Add a two second "all-red" phase to follow the protected Olden Avenue left-turn phase.
- Optimize the signal timing at a 90 second cycle length as the signal at the Olden Avenue/Pennington Road intersection.

This scenario is illustrated in ***Figure 13.***

Advantages

- All Parkside Avenue movements will have an exclusive departure lane.
- A single lane of opposing through-movements provides improved sight line and distance for Parkside Avenue left-turns.
- Reconfiguration of the lanes will occur within the existing curb-to-curb right-of-way.
- Signal protection may be provided for Parkside Avenue left-turns.

- Optimization provides splits and cycle lengths that are more appropriate for current peak hour traffic patterns.
- The two second "all-red" phase will provide an increased buffer of clearance for Olden Avenue vehicles.
- A 90 second cycle length will allow cycle length coordination with the adjacent Olden Avenue signalized intersection.

Disadvantages

- The reconfigured Parkside Avenue through-movement departure lanes may require realignment with their respective receiving lane.
- The two second all-red phase adds additional delay.
- A 90 second cycle length is often longer than the optimized timing plans.

Level of Service Analysis

As shown in ***Table 9***, for the optimization with "permitted only" timing provision, the morning peak hour operates at LOS B with 17 seconds of overall delay, a 12 second improvement over current conditions. It is also an overall improvement from all other proposed scenarios, except *Scenario 1*, which has the same 17 seconds of overall delay. The afternoon peak hour experiences 25 seconds of overall delay for a LOS of C. This represents a 20 second reduction in delay over the existing conditions and an upgrade from LOS D. This represents an improvement over all other scenarios. The addition of signal protection for Parkside Avenue left-turns increases the overall delay.

As shown in ***Table 9***, these alternatives at a 90 seconds cycle length either showed no effect in overall delay at the intersection or increased between one and six seconds.

TABLE 9

Proposed Scenario 5 Peak Hour Level of Service (LOS) Analysis

Olden Avenue and Parkside Avenue New Timing and Geometry

2007 Peak AM Hour and Peak PM Hour LOS with Average Delay/Vehicle

Optimized Signal Plan	Protected only							
	60 sec CL		**80 sec CL**		**90 sec CL**			
	AM Peak		PM Peak		AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Olden Avenue- Eastbound	C	29	D	39	C	26	D	37
Olden Avenue - Westbound	C	25	C	34	C	26	C	34
Parkside Avenue- Northbound	B	18	C	29	C	32	D	35
Parkside Avenue- Southbound	C	21	C	31	C	27	C	31
Intersection	C	24	C	34	C	27	C	35

TABLE 9 continued

Proposed Scenario 5 Peak Hour Level of Service (LOS) Analysis

Olden Avenue and Parkside Avenue New Timing and Geometry

Optimized Signal Plan with 2 sec all-red for Olden LTs	Protected only							
	60 sec		**80 sec**		**90 sec**			
	AM Peak		AM Peak		AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Olden Avenue- Eastbound	D	37	D	43	C	28	D	41
Olden Avenue - Westbound	C	30	D	39	C	27	D	37
Parkside Avenue- Northbound	B	20	C	29	C	32	D	35
Parkside Avenue- Southbound	C	21	C	31	C	27	C	31
Intersection	C	29	D	37	C	28	D	37

Optimized Signal Plan	Protected and Permitted							
	60 sec		**70 sec**		**90 sec**			
	AM Peak		AM Peak		AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Olden Avenue- Eastbound	C	22	C	32	C	24	C	32
Olden Avenue - Westbound	C	23	C	28	C	23	C	29
Parkside Avenue- Northbound	B	16	C	22	C	28	C	33
Parkside Avenue- Southbound	B	14	C	23	C	24	C	28
Intersection	B	20	C	27	C	24	C	30

Optimized Signal Plan with 2 sec all-red for Olden LTs	Protected and Permitted							
	60 sec CL		**75 sec CL**		**90 sec**			
	AM Peak		PM Peak		AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Olden Avenue- Eastbound	C	25	C	34	C	25	C	34
Olden Avenue - Westbound	C	24	C	31	C	25	C	31
Parkside Avenue- Northbound	B	17	C	25	C	30	C	33
Parkside Avenue- Southbound	B	15	C	25	C	25	C	28
Intersection	C	21	C	30	C	26	C	32

TABLE 9 continued

Proposed Scenario 5 Peak Hour Level of Service (LOS) Analysis

Olden Avenue and Parkside Avenue New Timing and Geometry

Optimized Signal Plan	Permitted Only							
	55 sec CL		**60 sec CL**		**90 sec**			
	AM Peak		PM Peak		AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Olden Avenue- Eastbound	B	19	C	31	B	19	C	27
Olden Avenue - Westbound	B	18	C	26	B	19	C	26
Parkside Avenue- Northbound	B	14	B	17	C	26	C	26
Parkside Avenue- Southbound	B	15	C	21	C	29	D	39
Intersection	B	17	C	25	C	23	C	29

Optimized Signal Plan with 2 sec all-red for Olden LTs	Permitted Only							
	60 sec CL		**60 sec CL**		**90 sec**			
	AM Peak		PM Peak		AM Peak		PM Peak	
	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)	LOS	Delay (sec)
Olden Avenue- Eastbound	B	19	D	41	C	21	C	29
Olden Avenue - Westbound	B	20	C	31	C	20	C	28
Parkside Avenue- Northbound	B	16	B	17	C	27	C	26
Parkside Avenue- Southbound	B	18	C	21	C	30	D	41
Intersection	B	19	C	30	C	24	C	30

Source: DVRPC, 2008

Figure 13

Congestion and Crash Site Analysis

Proposed Intersection Improvements - Scenario 5

N. Olden Ave. (CR 622) & Parkside Ave. (CR 636)
Ewing Twp., Mercer Co., NJ

CR 636 PARKSIDE AVE

CR 622 N OLDEN AVE

BRUCE LN

CROSS ST

ONLY ONLY ONLY

N

0 50 100
Feet

DVRPC Aerial Imagery: Spring, 2005

Delaware Valley Regional
Planning Commission
June 2008

Parkside Avenue Road-diet Analysis

The research literature regarding road-diets indicate that a three-lane cross-section can accommodate an AADT of approximately 20,000 vehicles before significant impacts occur. A capacity analysis of the roadway suggests an hourly capacity of approximately 1650 vehicles per lane. The detailed capacity analysis and AADT counts are shown in the **Appendix**. According to the AADT volumes for Parkside Avenue, the highest hourly volume recorded per direction was 546 vehicles; a volume-capacity ratio of 0.33. Thus, both a review of the relevant literature and the volume-capacity analysis considers a three-lane configuration as plausible along this section of Parkside Avenue.

A SimTraffic micro-simulation of the relevant section of Parkside Avenue provides a methodology to compare the effects of a road-diet. According to the SimTraffic outputs, it is calculated to take an average of 2 minutes and 15 seconds to travel along Parkside Avenue between Pennington Road and Buttonwood Drive. The simulation output is available in the **Appendix**. Without any changes to the geometry or signal timing at the intersection with Olden Avenue, a road-diet along Parkside Avenue would increase travel time by only four seconds for an average of 2 minutes and 19 seconds. The road-diet application for Parkside Avenue is shown in ***Figures 14 and 15***.

Figure 14

Congestion and Crash Site Analysis

Parkside Ave. (CR 636)

Road-diet Application - North

Ewing Twp., Mercer Co., NJ

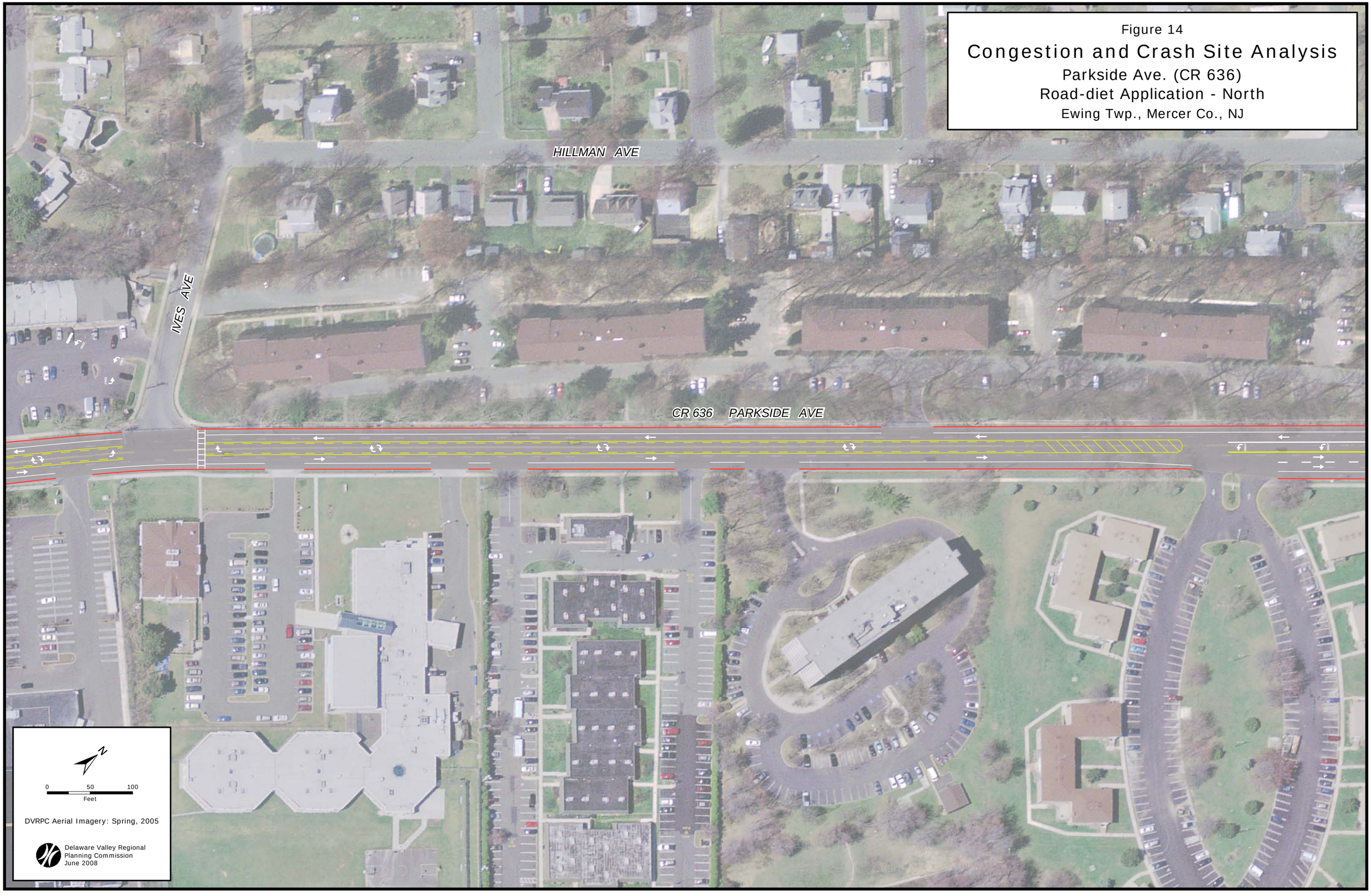


Figure 15

Congestion and Crash Site Analysis

Parkside Ave. (CR 636)
Road-diet Application - South

Ewing Twp., Mercer Co., NJ

PICKFORD AVE

NJ 31 PENNINGTON RD

GWENDOLYN DR

BRUCE LN

CR 636 PARKSIDE AVE

NEW HILLCREST AVE

HAZELHURST AVE

ALBEMARLE AVE

ROSEDALE AVE

MORSE AVE

CROSS ST

N

0 50 100
Feet

DVRPC Aerial Imagery: Spring, 2005

Delaware Valley Regional
Planning Commission
June 2008

RECOMMENDATIONS

Intersection of Olden Avenue and Parkside Avenue

The intersection currently operates at LOS C and D during the morning and afternoon peak hours, respectively. The majority of the traffic signal green time is devoted to the Olden Avenue approaches, but is insufficient for its left-turn volume especially the westbound approach in the afternoon peak. Up to twenty percent of southbound and forty percent of northbound Parkside Avenue movements are comprised of left-turn and right-turn movements, respectively. However, these approaches do not currently have exclusive turn lanes.

All *scenarios,* except for *Scenario 2* provide delay and level of service improvements to the intersection. These improvements included the addition of a two second "all-red" phase, optimization at a 90 second cycle length, and the various signal provisions for Parkside Avenue left-turns. Although the inclusion of these variables often contributes to overall intersection delay, these variables have the potential to provide safety or operational benefits to the intersection that are difficult to quantify in this analysis.

This study recommends in the short-term *Scenario 1* be implemented which includes the optimization of the signal plan and with a two second "all-red" phase following the signal-protected Olden Avenue left-turns. The 90 second cycle length should only be included if it is determined that the optimization at the shorter cycle length would adversely affect the adjacent intersection at Pennington Road/North Olden Avenue. This alternative will provide improvement to overall intersection level of service and delay with some safety enhancements.

For the medium-term, this study recommends *Scenario 5* for implementation; the reconfiguration of the Parkside Avenue approaches to include exclusive left, through, and right-turn lanes accompanied by signal optimization. The form of this alternative should include the two second "all-red" phase following Olden Avenue left-turn phase, and "protected and permitted" timing provisions for Parkside Avenue left-turns. The 90 second cycle length should only be included if it is determined that the optimization at the shorter cycle length would adversely affect the adjacent intersection at Pennington Road/North Olden Avenue. This alternative will provide improvement to the intersection overall operation and safety as well as better continuity with the road-diet application for Parkside Avenue. Pavement markings to delineate the path for the Parkside Avenue through-movements should be installed to address potential misalignment caused by the reconfiguration.

Parkside Avenue Road-diet Application

With respect to the limits associated with the applicable literature and hourly lane capacity, the AADT and hourly volumes along Parkside Avenue are within an acceptable range for the successful application of a "road-diet." The SimTraffic micro-simulation of the "road-diet" scenario indicates a marginal three percent increase in delay. The lane configuration of Parkside Avenue in the vicinity of the study intersection does not conform to the configuration of adjacent sections. Additionally, the

recommended medium-term alternative for the study intersection entails a single through lane for both approach legs of Parkside Avenue making a road-diet application along Parkside Avenue, from Pennington Road to Buttonwood Drive transition seamlessly through the study intersection as well as with adjacent sections. This will reduce the number of conflict points and improve the operational efficiency of the roadway.

Pedestrian and Bicycle Amenities

Install "share the road" signs on North Olden Avenue and Parkside Avenue to alert motorists of bicyclists. These roadways do not have shoulders therefore bicyclists are forced to share the travel lanes or in some cases utilize the sidewalks. With the proposed road-diet application on Parkside Avenue, the excess pavement width can be converted to bike lanes.

Conduct a sidewalk inventory to establish substandard areas and upgrade as appropriate. As mentioned earlier in this study, sidewalks in the study area are narrow with pavement in poor condition consisting of tripping hazards. Also several traffic signal and utility poles are located in the middle of narrow sidewalks making it difficult for people with disabilities to travel safely.

Construct curb ramps at the intersection and adjacent driveways in compliance with American Disabilities Act (ADA) requirements. Upgrade the pedestrian traffic signal heads with pedestrian indication – man/hand with countdown timers.

As shown in ***Figure 16***, provide a mid-block crosswalk on North Olden Avenue at the ShopRite shopping center in accordance with pedestrian desire line. Sign as appropriate and construct a curbed pedestrian refuge in the center turn lane.

Construct a bus pull-out for westbound transit stop on North Olden Avenue. Move the eastbound Olden Avenue bus stop east of the current location to provide easy access to the crosswalk for passengers crossing North Olden Avenue.

Shopping Center Circulation

Left-turns from the shopping center driveway on to eastbound Olden Avenue are currently prohibited; however, motorists do make that illegal movement creating conflicts with through-movement on the roadway. In addition, to increased enforcement, construct a channelized curb island to physically restrict these left-turns as shown in ***Figure 16***.

To facilitate eastbound traffic from the shopping center modify the Parkside Avenue driveway as shown in ***Figure 16****.* This will entail modifying the existing parking spaces and shifting the driveway north for ease of circulation. Motorists destined for eastbound Olden Avenue can to do via this driveway and making a left-turn at the signal controlled intersection.

Figure 16

Congestion and Crash Site Analysis

Pedestrian Improvements and Circulation

N. Olden Ave. (CR 622) & Parkside Ave. (CR 636)
Ewing Twp., Mercer Co., NJ

CR 636 PARKSIDE AVE

STOP

CR 622 N OLDEN AVE

OVERHEAD PEDESTRIAN BEACON

BUS STOP

BRUCE LN

CROSS ST

N

0 50 100
Feet

DVRPC Aerial Imagery: Spring, 2005

Delaware Valley Regional Planning Commission
June 2008

DELAWARE VALLEY REGIONAL PLANNING COMMISSION
OFFICE OF TRAVEL MAM INTERVAL COUNTS

COUNTY: MERCER
MUNICIPALITY: EWING

INTERSECTION: North-South Street & East-West Street
STREETS: CR 636 PARKSIDE AVE CR 622 OLDEN AVE

DATE: 12/5/07
DAY: WEDNESDAY
WEATHER: FAIR

FILE NUMBER: 10AM

AM INTERVAL COUNTS

STARTING	CR 636 PARKSIDE AVE 1-NORTHBOUND				2-SOUTHBOUND				CR 622 OLDEN AVE 3-EASTBOUND				4-WESTBOUND				N-S	E-W	
TIME	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	TOTAL	TOTAL	TOTAL
6:00 6:15	1	7	8	16	5	7	1	13	4	22	0	26	4	17	2	23	29	49	78
6:15 6:30	0	9	12	21	8	12	3	23	6	38	1	45	9	29	4	42	44	87	131
6:30 6:45	1	16	21	38	4	10	6	20	7	52	0	59	2	60	2	64	58	123	181
6:45 7:00	2	32	10	44	14	21	12	47	11	58	2	71	7	71	5	83	91	154	245
7:00 7:15	0	41	23	64	9	27	16	52	19	92	3	114	16	75	5	96	116	210	326
7:15 7:30	0	39	25	64	15	27	28	70	17	90	1	108	17	97	8	122	134	230	364
7:30 7:45	4	55	30	89	17	37	31	85	10	97	5	112	21	108	8	137	174	249	423
7:45 8:00	12	55	37	104	17	33	41	91	14	143	9	166	14	109	9	132	195	298	493
8:00 8:15	4	60	28	92	16	65	40	121	24	149	5	178	29	153	12	194	213	372	585
8:15 8:30	2	50	34	86	24	55	26	105	31	160	1	192	36	152	8	196	191	388	579
8:30 8:45	3	41	38	82	14	43	30	87	22	134	5	161	27	113	13	153	169	314	483
8:45 9:00	1	63	20	84	21	64	22	107	22	131	2	155	17	103	9	129	191	284	475
TOTALS	30	468	286	784	164	401	256	821	187	1166	34	1387	199	1087	85	1371	1605	2758	4363
P.H. am																			
P.H. pm																			

HOURLY VOLUMES

STARTING	CR 636 PARKSIDE AVE 1-NORTHBOUND				2-SOUTHBOUND				CR 622 OLDEN AVE 3-EASTBOUND				4-WESTBOUND				N-S	E-W	
TIME	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	TOTAL	TOTAL	TOTAL
6:00 7:00	4	64	51	119	31	50	22	103	28	170	3	201	22	177	13	212	222	413	635
7:00 8:00	16	190	115	321	58	124	116	298	60	422	18	500	68	389	30	487	619	987	1606
8:00 9:00	10	214	120	344	75	227	118	420	99	574	13	686	109	521	42	672	764	1358	2122
TOTALS	30	468	286	784	164	401	256	821	187	1166	34	1387	199	1087	85	1371	1605	2758	4363

DELAWARE VALLEY REGIONAL PLANNING COMMISSION
OFFICE OF TRAVEL M AM INTERVAL COUNTS

COUNTY: MERCER
MUNICIPALITY: EWING

INTERSECTION: North-South Street & East-West Street
STREETS: CR 636 PARKSIDE AVE CR 622 OLDEN AVE

DATE: 12/5/07
DAY: WEDNESDAY
WEATHER: FAIR

FILE NUMBER: 10PM

PM INTERVAL COUNTS

	CR 636 PARKSIDE AVE								CR 622 OLDEN AVE										
STARTING	1-NORTHBOUND				2-SOUTHBOUND				3-EASTBOUND				4-WESTBOUND				N-S	E-W	
TIME	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	TOTAL	TOTAL	TOTAL
3:00 3:15	2	31	30	63	17	41	22	80	14	114	9	137	25	122	21	168	143	305	448
3:15 3:30	2	35	36	73	22	52	29	103	25	136	2	163	33	141	15	189	176	352	528
3:30 3:45	5	41	42	88	29	55	35	119	30	148	8	186	42	169	23	234	207	420	627
3:45 4:00	7	45	39	91	30	57	32	119	28	163	6	197	48	163	17	228	210	425	635
4:00 4:15	6	58	44	108	27	42	45	114	29	178	7	214	48	161	32	241	222	455	677
4:15 4:30	14	64	47	125	19	58	40	117	30	203	11	244	37	161	34	232	242	476	718
4:30 4:45	7	65	48	120	36	52	31	119	33	186	7	226	58	191	26	275	239	501	740
4:45 5:00	9	49	53	111	44	70	39	153	35	191	9	235	54	164	25	243	264	478	742
5:00 5:15	3	80	51	134	30	76	41	147	41	172	10	223	51	185	45	281	281	504	785
5:15 5:30	5	77	52	134	20	81	31	132	35	204	7	246	69	225	31	325	266	571	837
5:30 5:45	5	70	38	113	26	80	46	152	30	164	14	208	69	214	34	317	265	525	790
5:45 6:00	13	66	37	116	19	68	21	108	35	195	2	232	54	201	25	280	224	512	736
TOTALS	78	681	517	1276	319	732	412	1463	365	2054	92	2511	588	2097	328	3013	2739	5524	8263
P.H. am																			
P.H. pm																			

HOURLY VOLUMES

	CR 636 PARKSIDE AVE								CR 622 OLDEN AVE										
STARTING	1-NORTHBOUND				2-SOUTHBOUND				3-EASTBOUND				4-WESTBOUND				N-S	E-W	
TIME	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	L	S	R	TOTAL	TOTAL	TOTAL	TOTAL
4:00 5:00	16	152	147	315	98	205	118	421	97	561	25	683	148	595	76	819	736	1502	2238
5:00 6:00	36	236	192	464	126	222	155	503	127	758	34	919	197	677	117	991	967	1910	2877
6:00 7:00	26	293	178	497	95	305	139	539	141	735	33	909	243	825	135	1203	1036	2112	3148
TOTALS	78	681	517	1276	319	732	412	1463	365	2054	92	2511	588	2097	328	3013	2739	5524	8263

DVRPC - Travel Monitoring

TAKEN BY: JD **DATE:** 2/23/2005

ROAD: CR 636 NB PARKSIDE AVE **FROM:** CR 622 S OLDEN AVE **TO:** CR 627 BUTTONWOOD DR

COUNTY: MERCER **MCD:** 342 - EWING TOWNSHIP **SR/SEG/OFF:** 11000636/1.87597 **FC:** 16

PROJECT 06-MERC-076 **COUNT DIR:** NORTH **TRAFFIC DIR:** BOTH **SPEED LIMIT:** 35 **STATE:** NJ

STATION ID: 2-0-205 **DVRPC FILE #:** 41413 **COUNTER #:** 9990 **WEATHER:** F **LOOP OR CLASS:**

ROAD DESCRIPTION:

HOUR ENDING	Wednesday 02/23/05	Thursday 02/24/05	Friday 02/25/05	Saturday 02/26/05	Sunday 02/27/05
1AM		43	39		
2 AM		24	26		
3 AM		29	23		
4 AM		30	26		
5 AM		19	30		
6 AM		74	73		
7 AM		200	206		
8 AM		299	338		
9 AM		382	378		
10 AM		316	288		
11 AM		314	295		
12 PM		385	350		
1 PM	441	419			
2 PM	388	432			
3 PM	395	384			
4 PM	439	421			
5 PM	546	474			
6 PM	530	541			
7 PM	428	429			
8 PM	401	380			
9 PM	288	335			
10 PM	211	240			
11 PM	147	162			
12 AM	68	93			
		6,425			

DATA SOURCE: INTERNAL

COMMENTS:

PRIORITY 4

SEASONAL FACTOR:	1.011	**AADT:**	**6,340**	AM Peak %	6.0	Hour Ending	12:00 PM
AXLE CORR. FACTOR:	0.976			PM Peak %	8.4	Hour Ending	6:00 PM

DVRPC - Travel Monitoring

TAKEN BY: JD **DATE:** 3/6/2006

ROAD: CR 636 SB PARKSIDE AVE **FROM:** CR 622 S OLDEN AVE **TO:** CR 627 BUTTONWOOD DR

COUNTY: MERCER **MCD:** 342 - EWING TOWNSHIP **SR/SEG/OFF:** 11000636/1.87597 **FC:** 16

PROJECT 06-MERC-076 **COUNT DIR:** SOUTH **TRAFFIC DIR:** BOTH **SPEED LIMIT:** 35 **STATE:** NJ

STATION ID: 2-0-207 **DVRPC FILE #:** 41447 **COUNTER #:** 9991 **WEATHER:** F **LOOP OR CLASS:**

ROAD DESCRIPTION:

HOUR ENDING	Monday 03/06/06	Tuesday 03/07/06	Wednesday 03/08/06	Thursday 03/09/06	Friday 03/10/06
1AM		31	28		
2 AM		22	18		
3 AM		27	25		
4 AM		31	35		
5 AM		23	30		
6 AM		61	50		
7 AM		172	199		
8 AM		384	402		
9 AM		426	384		
10 AM		341	316		
11 AM		309	271		
12 PM		314	319		
1 PM	384	429			
2 PM	358	387			
3 PM	415	371			
4 PM	441	410			
5 PM	505	433			
6 PM	491	528			
7 PM	393	361			
8 PM	331	384			
9 PM	296	330			
10 PM	279	296			
11 PM	118	175			
12 AM	78	96			
		6,341			

DATA SOURCE: INTERNAL

COMMENTS:

PRIORITY 4

SEASONAL FACTOR:	0.985	**AADT:**	**6,096**	AM Peak %	6.7	Hour Ending	9:00 AM
AXLE CORR. FACTOR:	0.976			PM Peak %	8.3	Hour Ending	6:00 PM

Olden Avenue and Parkside Avenue Intersection Crash Data
EWING TOWNSHIP - MERCER COUNTY

Reportable and Non Reportable crashes (2005-2007)

Reportable or Non-reportable	DATE	TIME	TOTAL KILLED	TOTAL INJURED	ROAD SYSTEM	AT INTERSECTION OR NOT AT INTERSECTION	WEATHER COND.	LIGHT COND.	ROAD COND.	CRASH TYPE	VEHICLE 1 CONTRIBUTING FACTORS	VEHICLE 2 CONTRIBUTING FACTORS
Reportable	1/23/05	12:34 PM	0	~	County	Not at Intersection	Clear	Daylight	Snowy	Rear End	Unsafe Speed	Unsafe Speed
Reportable	1/19/05	1:20 AM	0	~	County	Not at Intersection	Snow	Dark	~	Rear End	Driver Inattention	Unsafe Speed
Reportable	1/26/05	2:12 PM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Angle	Driver Inattention	~
Reportable	2/14/05	3:40 PM	0	~	County	Not at Intersection	Rain	~	Wet	Rear End	Driver Inattention	~
Reportable	3/12/05	10:00 PM	0	1	County	Not at Intersection	Clear	Dark	Dry	Angle	~	~
Reportable	3/29/05	3:32 PM	0	1	County	Not at Intersection	Clear	Daylight	Dry	Rear End	Driver Inattention	~
Reportable	5/1/05	12:35 AM	0	1	County	Not at Intersection	Rain	Dark	Wet	Rear End	~	None
Reportable	5/3/05	2:23 PM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Angle	Driver Inattention	~
Reportable	5/20/05	3:13 PM	0	1	County	Not at Intersection	Rain	Daylight	Wet	Rear End	Driver Inattention	~
Reportable	5/29/05	11:02 AM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Rear End	Driver Inattention	~
Reportable	7/12/05	3:07 PM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Angle	Driver InattentionUnsafe Speed	Unsafe Speed
Reportable	7/15/05	2:35 AM	0	~	County	At Intersection	Clear	Dark	Dry	Rear End	~	~
Reportable	7/29/05	7:18 PM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Angle	~	~
Non-reportable	8/23/05	4:39 PM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Rear End	~	~
Reportable	10/22/05	5:02 PM	0	1	County	Not at Intersection	Rain	Daylight	Wet	Rear End	Unsafe Speed	Driver InattentionUnsafe Speed
Reportable	10/26/05	3:08 PM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Angle	Unsafe Speed	Driver Inattention
Reportable	10/31/05	5:47 PM	0	~	County	Not at Intersection	Clear	Dark	Dry	Angle	Unsafe Speed	Unsafe Speed
Reportable	11/1/05	6:00 PM	0	~	County	Not at Intersection	Clear	Dark	Dry	Rear End	~	Driver Inattention
Reportable	12/3/05	2:37 PM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Same Direction Sideswipe	Driver Inattention	~
Reportable	11/9/05	7:29 AM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Same Direction Sideswipe	Unsafe Speed	Driver Inattention
Reportable	12/15/05	9:57 PM	0	~	County	Not at Intersection	Rain	Daylight	Wet	Left Turn	Driver Inattention	~
Reportable	12/17/05	9:22 AM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Rear End	Driver Inattention	~
Reportable	12/21/05	9:17 AM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Rear End	~	Driver Inattention
Reportable	12/31/05	10:49 AM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Same Direction Sideswipe	Driver Inattention	~
Reportable	4/4/05	12:17 PM	0	~	County	At Intersection	Clear	Daylight	Dry	Rear End	Driver Inattention	~
Reportable	5/16/05	11:35 PM	0	~	County	At Intersection	Clear	Dark	Dry	Left Turn	Driver Inattention	~
Reportable	5/23/05	2:37 PM	0	~	County	At Intersection	Clear	Daylight	Dry	Same Direction Sideswipe	Driver Inattention	~
Reportable	8/14/05	8:05 AM	0	~	County	At Intersection	Clear	Daylight	Dry	Angle	Driver Inattention	~
Reportable	10/8/05	7:16 PM	0	~	County	At Intersection	Rain	Dark	Wet	Left Turn	~	~
Reportable	12/8/05	8:32 PM	0	1	County	Not at Intersection	Clear	Dark	Dry	Head On	Driver Inattention	~
Reportable	2/24/05	6:22 PM	0	1	County	Not at Intersection	Snow	Dark	Snowy	Rear End	Driver Inattention	~
Reportable	3/7/05	1:09 PM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Angle	~	Driver Inattention
Reportable	4/21/05	2:02 PM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Rear End	Driver Inattention	~
Reportable	5/27/05	3:09 PM	0	1	County	Not at Intersection	Clear	Daylight	Dry	Rear End	Driver Inattention	Driver Inattention

Reportable or Non-reportable	DATE	TIME	TOTAL KILLED	TOTAL INJURED	ROAD SYSTEM	AT INTERSECTION OR NOT AT INTERSECTION	WEATHER COND.	LIGHT COND.	ROAD COND.	CRASH TYPE	VEHICLE 1 CONTRIBUTING FACTORS	VEHICLE 2 CONTRIBUTING FACTORS
Reportable	6/29/05	3:47 PM	0	~	County	Not at Intersection	Clear	Daylight	Wet	Angle	Driver Inattention	~
Reportable	6/30/05	7:32 PM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Angle	Driver Inattention	~
Reportable	9/7/05	5:38 PM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Same Direction Sideswipe	Driver Inattention	~
Reportable	10/21/05	8:57 AM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Rear End	Driver Inattention	~
Reportable	10/28/05	12:41 PM	0	1	County	Not at Intersection	Clear	Daylight	Dry	Rear End	Driver Inattention	Driver Inattention
Reportable	11/15/05	5:03 PM	0	~	County	Not at Intersection	Rain	Dark	Wet	Rear End	Driver Inattention	Driver Inattention
Reportable	1/6/06	8:45 PM	0	~	County	Not at Intersection	Clear	Dark	Dry	Encroachment	~	~
Reportable	3/12/06	1:13 PM	0	~	County	Not at Intersection	Clear	Daylight	Wet	Angle	None	Failed To Yield ROW to Vehicle/Pedes.
Reportable	3/12/06	5:34 PM	0	1	County	Not at Intersection	Overcast	Dusk	Wet	Angle	None	Failed To Obey Traffic Device
Reportable	4/4/06	1:56 PM	0	1	County	Not at Intersection	Clear	Daylight	Dry	Left Turn	None	Failed To Yield ROW to Vehicle/Pedes.
Reportable	4/15/06	10:22 AM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Angle	None	Failed To Yield ROW to Vehicle/Pedes.
Reportable	4/27/06	3:37 PM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Left Turn	None	Failed To Yield ROW to Vehicle/Pedes.
Reportable	5/5/06	8:02 AM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Rear End	None	Unsafe Speed
Non-reportable	4/29/06	8:00 AM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Struck Parked Vehicle	Unsafe Speed~	Unsafe SpeedFailed To Obey Traffic Device
Reportable	6/16/06	8:54 PM	0	1	County	Not at Intersection	Clear	Dark	Dry	Angle	Failed To Yield ROW to Vehicle/Pedes.	None
Reportable	8/8/06	7:58 AM	0	1	County	Not at Intersection	Clear	Daylight	Dry	Rear End	None	Following Too Closely
Reportable	10/12/06	3:22 PM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Angle	Failed To Yield ROW to Vehicle/Pedes.	Unsafe Speed
Reportable	10/4/06	7:33 AM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Angle	Improper use/Failed to Use Turn Signal	Failed To Yield ROW to Vehicle/Pedes.
Reportable	10/6/06	8:08 AM	0	1	County	Not at Intersection	Rain	Daylight	Wet	Rear End	Unsafe SpeedFailed To Yield ROW to Vehicle/Pedes.	Following Too CloselyFollowing Too Closely
Reportable	10/17/06	12:32 PM	0	~	County	Not at Intersection	Rain	Daylight	Wet	Rear End	Following Too Closely	Following Too Closely
Reportable	10/31/06	1:41 PM	0	1	County	Not at Intersection	Clear	Daylight	Dry	Angle	Failed To Yield ROW to Vehicle/Pedes.	None
Reportable	11/16/06	11:47 AM	0	1	County	Not at Intersection	Overcast	Daylight	Dry	Left Turn	None	Failed To Yield ROW to Vehicle/Pedes.

Reportable or Non-reportable	DATE	TIME	TOTAL KILLED	TOTAL INJURED	ROAD SYSTEM	AT INTERSECTION OR NOT AT INTERSECTION	WEATHER COND.	LIGHT COND.	ROAD COND.	CRASH TYPE	VEHICLE 1 CONTRIBUTING FACTORS	VEHICLE 2 CONTRIBUTING FACTORS
Reportable	12/8/06	12:32 PM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Angle	None	Failed To Yield ROW to Vehicle/Pedes.
Reportable	12/14/06	1:30 PM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Angle	Failed To Yield ROW to Vehicle/Pedes.	None
Reportable	3/29/06	1:00 PM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Angle	Failed To Yield ROW to Vehicle/Pedes.	None
Reportable	4/22/06	2:09 PM	0	~	County	Not at Intersection	Rain	Daylight	Wet	Angle	Failed To Yield ROW to Vehicle/Pedes.	None
Reportable	8/26/06	10:07 PM	0	1	County	Not at Intersection	Rain	Dark	Wet	Rear End	None	None
Reportable	10/6/06	7:20 AM	0	~	County	Not at Intersection	Rain	Daylight	Wet	Left Turn	None	Improper Turning
Reportable	10/11/06	4:48 PM	0	1	County	Not at Intersection	Rain	Daylight	Wet	Rear End	None	Unsafe Speed
Reportable	1/17/06	12:33 PM	0	~	County	At Intersection	Clear	Daylight	Icy	Same Direction Sideswipe	Unsafe Speed	~
Non-reportable	9/11/06	6:55 PM	0	~	County	At Intersection	Clear	Daylight	Dry	Left Turn	None	Failed To Obey Traffic Device
Reportable	2/23/07	9:19 AM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Same Direction Sideswipe	None	Improper Lane Change
Reportable	5/24/07	5:49 PM	0	1	County	Not at Intersection	Clear	Daylight	Dry	Angle	None	Failed To Yield ROW to Vehicle/Pedes.
Reportable	6/18/07	3:42 PM	0	1	County	Not at Intersection	Clear	Daylight	Dry	Rear End	None	Driver Inattention
Reportable	9/12/07	8:03 PM	0	~	County	Not at Intersection	Clear	Dark	Dry	Angle	Failed To Yield ROW to Vehicle/Pedes.	None
Reportable	1/11/07	7:59 PM	0	~	County	Not at Intersection	Clear	Dark	Dry	Left Turn	None	Failed To Yield ROW to Vehicle/Pedes.
Reportable	4/10/07	6:17 AM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Same Direction Sideswipe	Improper Lane Change	Improper Lane Change
Reportable	4/24/07	9:16 PM	0	1	County	Not at Intersection	Clear	Dark	Dry	Angle	None	Failed To Yield ROW to Vehicle/Pedes.
Reportable	4/30/07	6:06 PM	0	1	County	Not at Intersection	Clear	Daylight	Dry	Angle	Failed To Obey Traffic Device	None
Reportable	8/2/07	11:54 AM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Rear End	None	Following Too Closely
Reportable	10/14/07	11:03 AM	0	1	County	Not at Intersection	Clear	Daylight	Dry	Angle	None	Failed To Obey Traffic Device
Reportable	2/10/07	1:23 PM	0	1	County	Not at Intersection	Clear	Daylight	Dry	Angle	None	Failed To Obey Traffic Device
Reportable	2/16/07	8:07 PM	0	~	County	Not at Intersection	Clear	Dark	Dry	Angle	None	Failed To Obey Traffic Device
Reportable	2/27/07	12:59 PM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Same Direction Sideswipe	None	Improper Lane Change
Reportable	3/7/07	3:38 PM	0	~	County	Not at Intersection	Snow	Daylight	Wet	Rear End	Driver Inattention	Following Too Closely

Reportable or Non-reportable	DATE	TIME	TOTAL KILLED	TOTAL INJURED	ROAD SYSTEM	AT INTERSECTION OR NOT AT INTERSECTION	WEATHER COND.	LIGHT COND.	ROAD COND.	CRASH TYPE	VEHICLE 1 CONTRIBUTING FACTORS	VEHICLE 2 CONTRIBUTING FACTORS
Reportable	4/9/07	8:02 PM	0	~	County	Not at Intersection	Clear	Dark	Dry	Angle	None	Failed To Yield ROW to Vehicle/Pedes.
Reportable	5/11/07	11:55 AM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Same Direction Sideswipe	Driver Inattention	Driver Inattention
Reportable	7/2/07	3:09 PM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Rear End	Unsafe Speed	~
Reportable	8/8/07	11:11 AM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Angle	None	Failed To Yield ROW to Vehicle/Pedes.
Reportable	8/6/07	2:56 PM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Rear End	Failed To Obey Traffic Device	None
Reportable	8/31/07	2:31 AM	0	~	County	Not at Intersection	Clear	Dark	Dry	Same Direction Sideswipe	None	Driver Inattention
Reportable	10/1/07	10:15 AM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Rear End	None	Following Too Closely
Reportable	10/27/07	10:23 AM	0	~	County	Not at Intersection	Rain	Daylight	Wet	Rear End	None	Unsafe Speed
Reportable	12/10/07	7:04 AM	0	~	County	Not at Intersection	Rain	Daylight	Wet	Rear End	None	Following Too Closely
Reportable	11/6/07	6:56 PM	0	~	County	Not at Intersection	Clear	Dark	Dry	Same Direction Sideswipe	None	Unsafe Speed
Reportable	12/10/07	12:23 PM	0	~	County	Not at Intersection	Overcast	Daylight	Wet	Rear End	Improper Lane Change	Driver Inattention
Reportable	1/5/07	1:52 PM	0	~	County	Not at Intersection	Rain	Daylight	Wet	Same Direction Sideswipe	None	Driver Inattention
Reportable	2/17/07	11:56 AM	0	~	County	Not at Intersection	Clear	Daylight	Dry	Same Direction Sideswipe	None	Improper Lane Change

Source: Ewing Township Police Department

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	0	3227	0	0	3343	0
Flt Permitted	0.950			0.950				0.737			0.680	
Satd. Flow (perm)	1711	3511	0	1711	3497	0	0	2390	0	0	2294	0
Satd. Flow (RTOR)		8			13			96			74	
Lane Group Flow (vph)	125	673	0	143	665	0	0	440	0	0	520	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		
Total Split (s)	15.0	51.0	0.0	15.0	51.0	0.0	27.0	27.0	0.0	27.0	27.0	0.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	10.6	45.2		10.5	45.2			20.2			20.2	
Actuated g/C Ratio	0.12	0.50		0.12	0.50			0.22			0.22	
v/c Ratio	0.62	0.38		0.71	0.38			0.72			0.91	
Control Delay	52.4	15.0		58.9	14.8			32.5			50.7	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	52.4	15.0		58.9	14.8			32.5			50.7	
LOS	D	B		E	B			C			D	
Approach Delay		20.8			22.6			32.5			50.7	
Approach LOS		C			C			C			D	

Intersection Summary

Cycle Length: 93
Actuated Cycle Length: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 29.4 — Intersection LOS: C
Intersection Capacity Utilization 82.6% — ICU Level of Service E
Analysis Period (min) 15

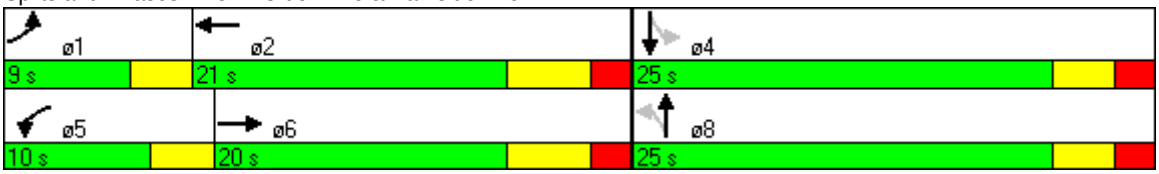
Splits and Phases: 3: N Olden Ave & Parkside Ave

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	0	3227	0	0	3343	0
Flt Permitted	0.950			0.950				0.834			0.789	
Satd. Flow (perm)	1711	3511	0	1711	3497	0	0	2705	0	0	2661	0
Satd. Flow (RTOR)		10			16			152			151	
Lane Group Flow (vph)	125	673	0	143	665	0	0	440	0	0	520	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		
Total Split (s)	9.0	20.0	0.0	10.0	21.0	0.0	25.0	25.0	0.0	25.0	25.0	0.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	6.2	14.7		6.7	15.4			10.9			10.9	
Actuated g/C Ratio	0.14	0.33		0.15	0.35			0.25			0.25	
v/c Ratio	0.53	0.58		0.55	0.54			0.56			0.68	
Control Delay	31.5	16.2		30.2	15.0			12.6			15.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	31.5	16.2		30.2	15.0			12.6			15.6	
LOS	C	B		C	B			B			B	
Approach Delay		18.6			17.7			12.6			15.6	
Approach LOS		B			B			B			B	

Intersection Summary

Cycle Length: 55
Actuated Cycle Length: 44.4
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.68
Intersection Signal Delay: 16.7 — Intersection LOS: B
Intersection Capacity Utilization 61.9% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave

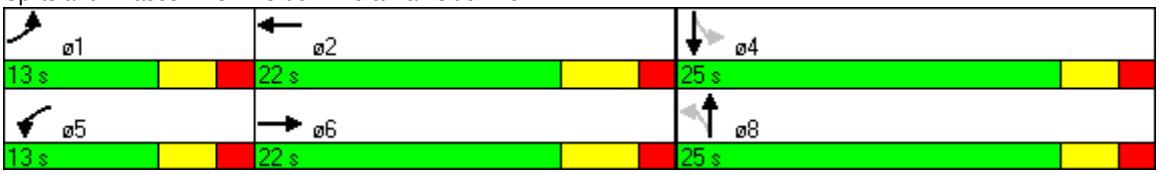


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	0	3227	0	0	3343	0
Flt Permitted	0.950			0.950				0.819			0.767	
Satd. Flow (perm)	1711	3511	0	1711	3497	0	0	2656	0	0	2587	0
Satd. Flow (RTOR)		9			14			152			132	
Lane Group Flow (vph)	125	673	0	143	665	0	0	440	0	0	520	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		
Total Split (s)	13.0	22.0	0.0	13.0	22.0	0.0	25.0	25.0	0.0	25.0	25.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	7.7	16.7		7.4	16.6			12.1			12.1	
Actuated g/C Ratio	0.15	0.34		0.15	0.33			0.24			0.24	
v/c Ratio	0.48	0.57		0.56	0.56			0.58			0.71	
Control Delay	28.7	17.8		32.7	17.7			14.2			19.0	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	28.7	17.8		32.7	17.7			14.2			19.0	
LOS	C	B		C	B			B			B	
Approach Delay		19.5			20.3			14.2			19.0	
Approach LOS		B			C			B			B	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 49.8
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.71
Intersection Signal Delay: 18.8 — Intersection LOS: B
Intersection Capacity Utilization 62.8% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave

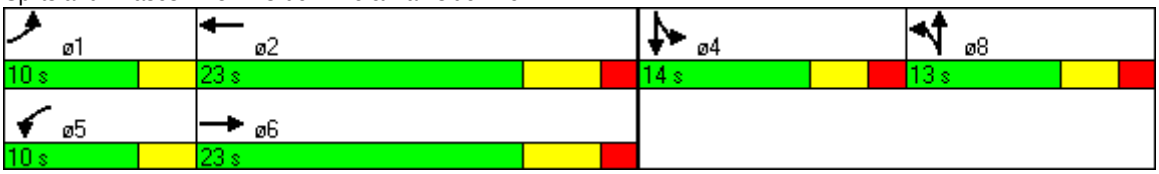


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	0	3227	0	0	3343	0
Flt Permitted	0.950			0.950				0.995			0.991	
Satd. Flow (perm)	1711	3511	0	1711	3497	0	0	3227	0	0	3343	0
Satd. Flow (RTOR)		9			15			132			104	
Lane Group Flow (vph)	125	673	0	143	665	0	0	440	0	0	520	0
Turn Type	Prot			Prot			Split			Split		
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases												
Total Split (s)	10.0	23.0	0.0	10.0	23.0	0.0	13.0	13.0	0.0	14.0	14.0	0.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	6.9	17.1		6.8	17.1			7.7			8.9	
Actuated g/C Ratio	0.12	0.30		0.12	0.30			0.13			0.15	
v/c Ratio	0.61	0.64		0.71	0.63			0.80			0.86	
Control Delay	40.7	21.4		48.0	21.1			31.0			36.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	40.7	21.4		48.0	21.1			31.0			36.5	
LOS	D	C		D	C			C			D	
Approach Delay		24.5			25.9			31.0			36.5	
Approach LOS		C			C			C			D	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 57.6
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 28.5 — Intersection LOS: C
Intersection Capacity Utilization 61.9% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave

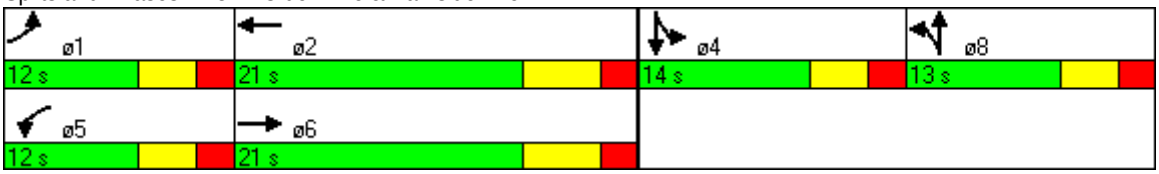


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	0	3227	0	0	3343	0
Flt Permitted	0.950			0.950				0.995			0.991	
Satd. Flow (perm)	1711	3511	0	1711	3497	0	0	3227	0	0	3343	0
Satd. Flow (RTOR)		9			14			132			104	
Lane Group Flow (vph)	125	673	0	143	665	0	0	440	0	0	520	0
Turn Type	Prot			Prot			Split			Split		
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases												
Total Split (s)	12.0	21.0	0.0	12.0	21.0	0.0	13.0	13.0	0.0	14.0	14.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	6.9	15.2		6.8	15.2			7.7			8.9	
Actuated g/C Ratio	0.12	0.27		0.12	0.27			0.13			0.16	
v/c Ratio	0.61	0.72		0.70	0.71			0.80			0.85	
Control Delay	40.3	25.2		47.3	24.7			30.6			36.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	40.3	25.2		47.3	24.7			30.6			36.1	
LOS	D	C		D	C			C			D	
Approach Delay		27.6			28.7			30.6			36.1	
Approach LOS		C			C			C			D	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 57.1
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 30.2 — Intersection LOS: C
Intersection Capacity Utilization 62.8% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave

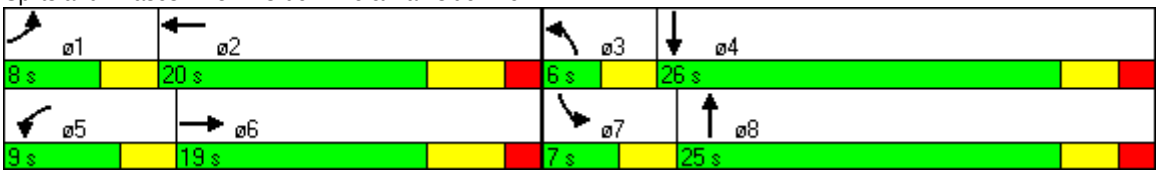


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1755	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1755	0
Satd. Flow (RTOR)		9			14			57			58	
Lane Group Flow (vph)	125	673	0	143	665	0	48	392	0	96	424	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												
Total Split (s)	8.0	19.0	0.0	9.0	20.0	0.0	6.0	25.0	0.0	7.0	26.0	0.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	4.0
Act Effct Green (s)	5.1	13.2		6.1	14.3		3.1	14.7		4.1	16.7	
Actuated g/C Ratio	0.10	0.25		0.11	0.27		0.06	0.27		0.08	0.31	
v/c Ratio	0.77	0.77		0.73	0.71		0.48	0.77		0.72	0.72	
Control Delay	61.4	28.3		52.3	24.6		45.9	26.7		60.4	22.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	61.4	28.3		52.3	24.6		45.9	26.7		60.4	22.2	
LOS	E	C		D	C		D	C		E	C	
Approach Delay		33.5			29.5			28.8			29.2	
Approach LOS		C			C			C			C	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 53.6
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 30.6 — Intersection LOS: C
Intersection Capacity Utilization 61.7% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave



Olden Avenue and Parkside Avenue

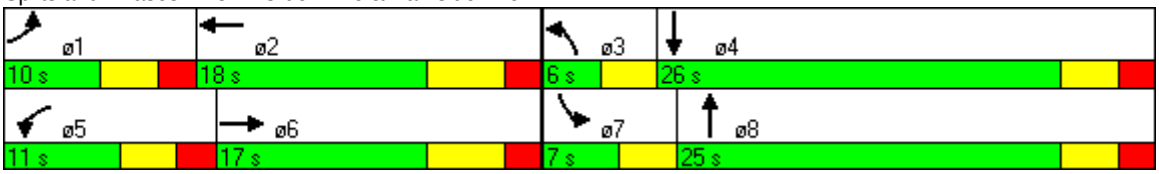
AM Peak Hour - Scenario 3 with Parkside LTs Prot ONLY and Two Second All Red

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1755	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1755	0
Satd. Flow (RTOR)		8			13			57			58	
Lane Group Flow (vph)	125	673	0	143	665	0	48	392	0	96	424	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												
Total Split (s)	10.0	17.0	0.0	11.0	18.0	0.0	6.0	25.0	0.0	7.0	26.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	4.0
Act Effct Green (s)	5.1	11.2		6.1	12.2		3.1	14.7		4.1	16.7	
Actuated g/C Ratio	0.10	0.21		0.11	0.23		0.06	0.27		0.08	0.31	
v/c Ratio	0.77	0.91		0.73	0.82		0.48	0.77		0.72	0.72	
Control Delay	61.4	42.9		52.3	32.8		45.9	26.7		60.4	22.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	61.4	42.9		52.3	32.8		45.9	26.7		60.4	22.2	
LOS	E	D		D	C		D	C		E	C	
Approach Delay		45.8			36.2			28.8			29.2	
Approach LOS		D			D			C			C	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 53.6
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 36.5 — Intersection LOS: D
Intersection Capacity Utilization 62.5% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave

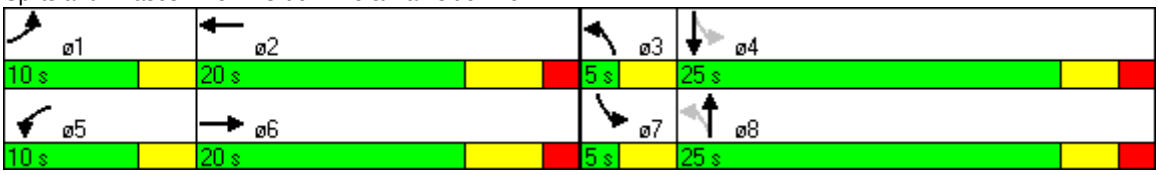


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1755	0
Flt Permitted	0.950			0.950			0.305			0.327		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	568	1696	0	609	1755	0
Satd. Flow (RTOR)		9			14			57			56	
Lane Group Flow (vph)	125	673	0	143	665	0	48	392	0	96	424	0
Turn Type	Prot			Prot			pm+pt			pm+pt		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases							8			4		
Total Split (s)	10.0	20.0	0.0	10.0	20.0	0.0	5.0	25.0	0.0	5.0	25.0	0.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	4.0
Act Effct Green (s)	7.1	14.8		6.9	14.8		18.4	14.9		19.0	15.9	
Actuated g/C Ratio	0.14	0.28		0.13	0.28		0.35	0.29		0.36	0.30	
v/c Ratio	0.54	0.67		0.63	0.67		0.19	0.75		0.36	0.74	
Control Delay	35.6	23.8		40.6	23.4		11.7	24.8		14.9	23.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	35.6	23.8		40.6	23.4		11.7	24.8		14.9	23.7	
LOS	D	C		D	C		B	C		B	C	
Approach Delay		25.7			26.5			23.4			22.1	
Approach LOS		C			C			C			C	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 52.2
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 24.8 — Intersection LOS: C
Intersection Capacity Utilization 61.7% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave

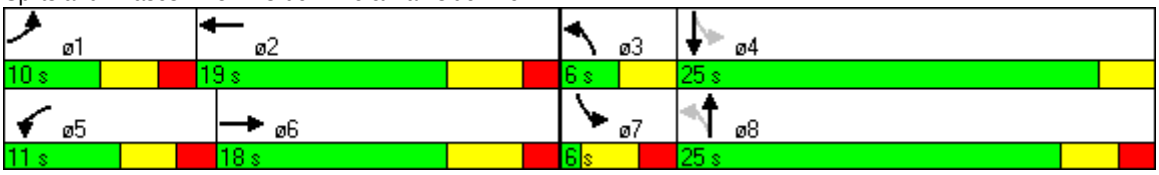


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1755	0
Flt Permitted	0.950			0.950			0.270			0.315		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	503	1696	0	587	1755	0
Satd. Flow (RTOR)		8			13			57			59	
Lane Group Flow (vph)	125	673	0	143	665	0	48	392	0	96	424	0
Turn Type	Prot			Prot			pm+pt			pm+pt		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases							8			4		
Total Split (s)	10.0	18.0	0.0	11.0	19.0	0.0	6.0	25.0	0.0	6.0	25.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	3.0	5.0	4.0	5.0	3.0	4.0
Act Effct Green (s)	5.1	12.2		6.1	13.2		18.9	14.6		16.4	17.9	
Actuated g/C Ratio	0.09	0.23		0.11	0.25		0.35	0.27		0.31	0.33	
v/c Ratio	0.77	0.84		0.74	0.76		0.19	0.78		0.48	0.68	
Control Delay	61.8	34.0		52.6	27.9		11.0	27.1		22.5	19.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	61.8	34.0		52.6	27.9		11.0	27.1		22.5	19.7	
LOS	E	C		D	C		B	C		C	B	
Approach Delay		38.3			32.3			25.4			20.2	
Approach LOS		D			C			C			C	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 53.7
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 30.5 — Intersection LOS: C
Intersection Capacity Utilization 63.3% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave



Olden Avenue and Parkside Avenue

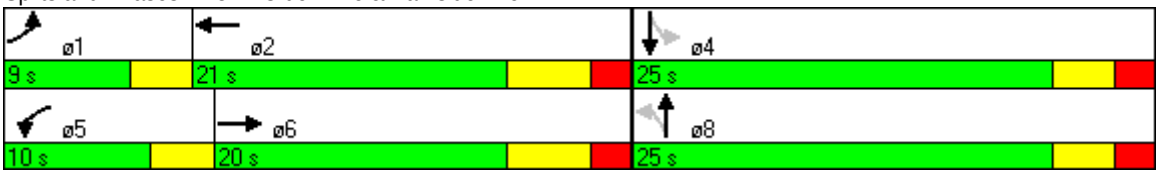
AM Peak Hour - Scenario 3 with Parkside LTs Perm ONLY and Two Second All Red

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1755	0
Flt Permitted	0.950			0.950			0.314			0.361		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	585	1696	0	672	1755	0
Satd. Flow (RTOR)		10			16			65			64	
Lane Group Flow (vph)	125	673	0	143	665	0	48	392	0	96	424	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		
Total Split (s)	9.0	20.0	0.0	10.0	21.0	0.0	25.0	25.0	0.0	25.0	25.0	0.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	6.2	14.7		6.7	15.5		13.9	13.9		13.9	13.9	
Actuated g/C Ratio	0.13	0.31		0.14	0.33		0.29	0.29		0.29	0.29	
v/c Ratio	0.56	0.61		0.59	0.58		0.28	0.72		0.49	0.76	
Control Delay	35.5	19.1		34.6	17.3		17.7	20.9		23.3	22.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	35.5	19.1		34.6	17.3		17.7	20.9		23.3	22.5	
LOS	D	B		C	B		B	C		C	C	
Approach Delay		21.7			20.3			20.6			22.7	
Approach LOS		C			C			C			C	

Intersection Summary

Cycle Length: 55
Actuated Cycle Length: 47.5
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 21.3 — Intersection LOS: C
Intersection Capacity Utilization 62.5% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave



Olden Avenue and Parkside Avenue

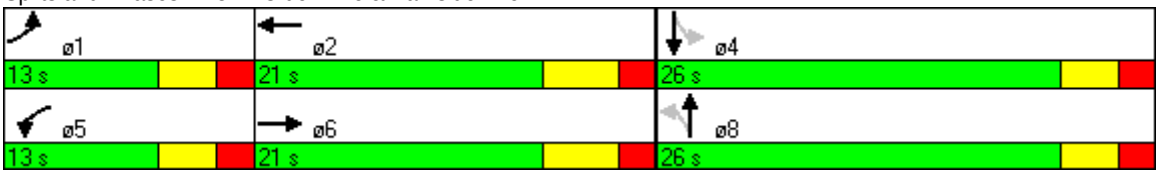
AM Peak Hour - Scenario 3 with Parkside LTs Perm ONLY and Two Second All Red

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1755	0
Flt Permitted	0.950			0.950			0.289			0.337		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	538	1696	0	628	1755	0
Satd. Flow (RTOR)		9			14			58			58	
Lane Group Flow (vph)	125	673	0	143	665	0	48	392	0	96	424	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		
Total Split (s)	13.0	21.0	0.0	13.0	21.0	0.0	26.0	26.0	0.0	26.0	26.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	7.7	15.8		7.5	15.7		15.0	15.0		15.0	15.0	
Actuated g/C Ratio	0.15	0.31		0.14	0.30		0.29	0.29		0.29	0.29	
v/c Ratio	0.49	0.63		0.58	0.62		0.31	0.74		0.53	0.77	
Control Delay	30.9	21.1		35.2	20.9		20.7	23.5		27.7	25.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	30.9	21.1		35.2	20.9		20.7	23.5		27.7	25.2	
LOS	C	C		D	C		C	C		C	C	
Approach Delay		22.7			23.4			23.2			25.7	
Approach LOS		C			C			C			C	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 51.8
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.77
Intersection Signal Delay: 23.6 — Intersection LOS: C
Intersection Capacity Utilization 63.3% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave

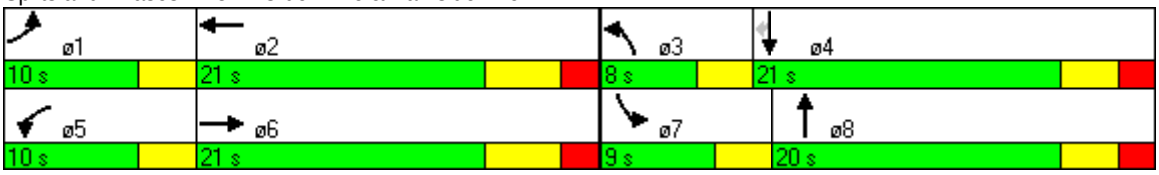


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1863	1636
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1863	1636
Satd. Flow (RTOR)		9			14			51				163
Lane Group Flow (vph)	125	673	0	143	665	0	48	392	0	96	261	163
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												4
Total Split (s)	10.0	21.0	0.0	10.0	21.0	0.0	8.0	20.0	0.0	9.0	21.0	21.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	5.0
Act Effct Green (s)	7.0	15.7		6.9	15.7		5.2	13.9		6.2	16.1	16.1
Actuated g/C Ratio	0.13	0.29		0.13	0.29		0.09	0.25		0.11	0.29	0.29
v/c Ratio	0.57	0.67		0.66	0.66		0.28	0.84		0.48	0.48	0.27
Control Delay	38.1	23.5		44.0	23.2		30.6	37.8		35.5	21.2	5.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	38.1	23.5		44.0	23.2		30.6	37.8		35.5	21.2	5.1
LOS	D	C		D	C		C	D		D	C	A
Approach Delay		25.8			26.8			37.0			18.8	
Approach LOS		C			C			D			B	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 55
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 26.6 — Intersection LOS: C
Intersection Capacity Utilization 61.7% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave



Olden Avenue and Parkside Avenue

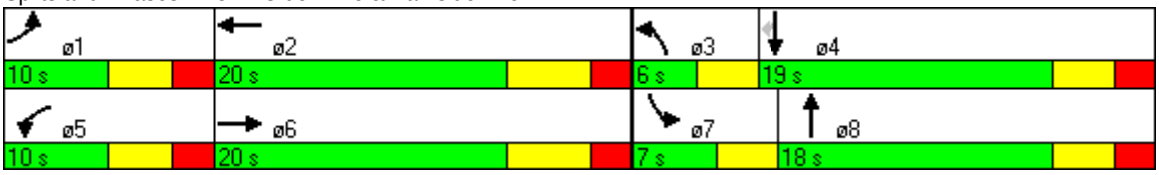
AM Peak Hour - Scenario 4 with Parkside LTs Prot ONLY and Two Second All Red

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1863	1636
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1863	1636
Satd. Flow (RTOR)		10			15			54				163
Lane Group Flow (vph)	125	673	0	143	665	0	48	392	0	96	261	163
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												4
Total Split (s)	10.0	20.0	0.0	10.0	20.0	0.0	6.0	18.0	0.0	7.0	19.0	19.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	5.0
Act Effct Green (s)	5.0	14.1		5.0	16.4		3.0	12.5		4.0	14.4	14.4
Actuated g/C Ratio	0.09	0.27		0.09	0.31		0.06	0.24		0.08	0.27	0.27
v/c Ratio	0.77	0.72		0.88	0.61		0.48	0.89		0.72	0.52	0.29
Control Delay	59.4	23.5		76.8	20.4		43.8	44.0		58.4	21.4	5.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	59.4	23.5		76.8	20.4		43.8	44.0		58.4	21.4	5.1
LOS	E	C		E	C		D	D		E	C	A
Approach Delay		29.1			30.4			44.0			23.1	
Approach LOS		C			C			D			C	

Intersection Summary

Cycle Length: 55
Actuated Cycle Length: 53.1
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.89
Intersection Signal Delay: 30.8 — Intersection LOS: C
Intersection Capacity Utilization 62.5% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave

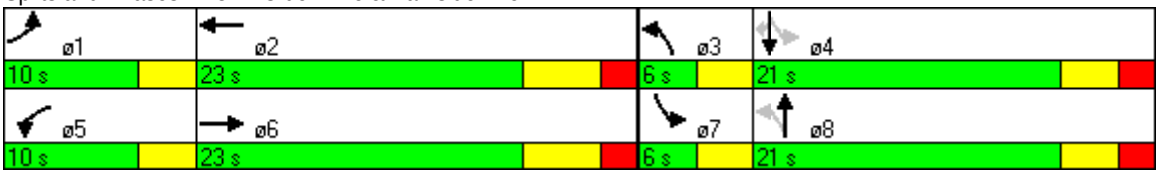


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1863	1636
Flt Permitted	0.950			0.950			0.539			0.275		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	1004	1696	0	512	1863	1636
Satd. Flow (RTOR)		9			15			52				163
Lane Group Flow (vph)	125	673	0	143	665	0	48	392	0	96	261	163
Turn Type	Prot			Prot			pm+pt			pm+pt		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases							8			4		4
Total Split (s)	10.0	23.0	0.0	10.0	23.0	0.0	6.0	21.0	0.0	6.0	21.0	21.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	5.0
Act Effct Green (s)	7.0	17.7		6.9	17.7		18.4	14.1		18.9	15.2	15.2
Actuated g/C Ratio	0.13	0.32		0.13	0.32		0.33	0.26		0.34	0.28	0.28
v/c Ratio	0.57	0.59		0.67	0.59		0.13	0.83		0.39	0.51	0.29
Control Delay	38.0	20.1		44.2	19.8		12.1	35.2		17.0	22.0	5.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	38.0	20.1		44.2	19.8		12.1	35.2		17.0	22.0	5.2
LOS	D	C		D	B		B	D		B	C	A
Approach Delay		22.9			24.1			32.7			15.8	
Approach LOS		C			C			C			B	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 55
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 23.5 — Intersection LOS: C
Intersection Capacity Utilization 61.7% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave



Olden Avenue and Parkside Avenue

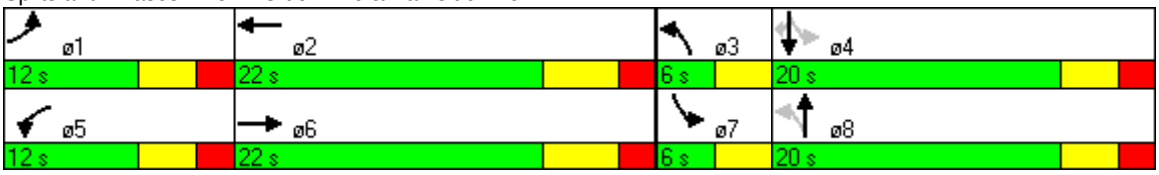
AM Peak Hour - Scenario 4 with Parkside LTs Prot+Perm and Two Second All Red

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1863	1636
Flt Permitted	0.950			0.950			0.527			0.267		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	982	1696	0	497	1863	1636
Satd. Flow (RTOR)		9			14			51				163
Lane Group Flow (vph)	125	673	0	143	665	0	48	392	0	96	261	163
Turn Type	Prot			Prot			pm+pt			pm+pt		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases							8			4		4
Total Split (s)	12.0	22.0	0.0	12.0	22.0	0.0	6.0	20.0	0.0	6.0	20.0	20.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	5.0
Act Effct Green (s)	7.0	16.7		6.9	16.7		18.1	13.8		18.7	14.9	14.9
Actuated g/C Ratio	0.13	0.30		0.12	0.30		0.33	0.25		0.34	0.27	0.27
v/c Ratio	0.57	0.63		0.67	0.62		0.13	0.85		0.40	0.52	0.29
Control Delay	38.4	21.6		44.4	21.4		12.8	38.1		18.1	23.0	5.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	38.4	21.6		44.4	21.4		12.8	38.1		18.1	23.0	5.4
LOS	D	C		D	C		B	D		B	C	A
Approach Delay		24.3			25.4			35.4			16.6	
Approach LOS		C			C			D			B	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 55.2
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 25.0 — Intersection LOS: C
Intersection Capacity Utilization 62.5% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave



Olden Avenue and Parkside Avenue

AM Peak Hour - Scenario 4 with Parkside LTs Perm ONLY and Two Second All Red

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1863	1636
Flt Permitted	0.950			0.950			0.576			0.370		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	1073	1696	0	689	1863	1636
Satd. Flow (RTOR)		13			20			69				163
Lane Group Flow (vph)	125	673	0	143	665	0	48	392	0	96	261	163
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		4
Total Split (s)	9.0	19.0	0.0	9.0	19.0	0.0	17.0	17.0	0.0	17.0	17.0	17.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Act Effct Green (s)	6.0	13.3		5.9	13.3		10.8	10.8		10.8	10.8	10.8
Actuated g/C Ratio	0.14	0.32		0.14	0.32		0.26	0.26		0.26	0.26	0.26
v/c Ratio	0.51	0.60		0.60	0.60		0.17	0.80		0.54	0.54	0.30
Control Delay	27.8	15.8		32.7	15.5		14.6	28.4		28.7	18.9	4.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	27.8	15.8		32.7	15.5		14.6	28.4		28.7	18.9	4.8
LOS	C	B		C	B		B	C		C	B	A
Approach Delay		17.7			18.6			26.9			16.3	
Approach LOS		B			B			C			B	

Intersection Summary

Cycle Length: 45
Actuated Cycle Length: 42.1
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 19.3 — Intersection LOS: B
Intersection Capacity Utilization 62.5% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave

Olden Avenue and Parkside Avenue

AM Peak Hour - Scenario 4 with Parkside LTs Perm ONLY and Two Second All Red

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1863	1636
Flt Permitted	0.950			0.950			0.553			0.331		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	1030	1696	0	617	1863	1636
Satd. Flow (RTOR)		11			17			63				163
Lane Group Flow (vph)	125	673	0	143	665	0	48	392	0	96	261	163
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		4
Total Split (s)	11.0	19.0	0.0	12.0	20.0	0.0	19.0	19.0	0.0	19.0	19.0	19.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Act Effct Green (s)	6.2	13.7		6.6	14.4		12.1	12.1		12.1	12.1	12.1
Actuated g/C Ratio	0.13	0.30		0.14	0.31		0.26	0.26		0.26	0.26	0.26
v/c Ratio	0.55	0.64		0.58	0.60		0.18	0.80		0.59	0.53	0.30
Control Delay	33.0	19.2		32.0	17.3		15.7	28.4		34.2	19.7	4.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	33.0	19.2		32.0	17.3		15.7	28.4		34.2	19.7	4.8
LOS	C	B		C	B		B	C		C	B	A
Approach Delay		21.4			19.9			27.0			17.7	
Approach LOS		C			B			C			B	

Intersection Summary

Cycle Length: 50
Actuated Cycle Length: 46.1
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 21.1 — Intersection LOS: C
Intersection Capacity Utilization 63.3% — ICU Level of Service B
Analysis Period (min) 15

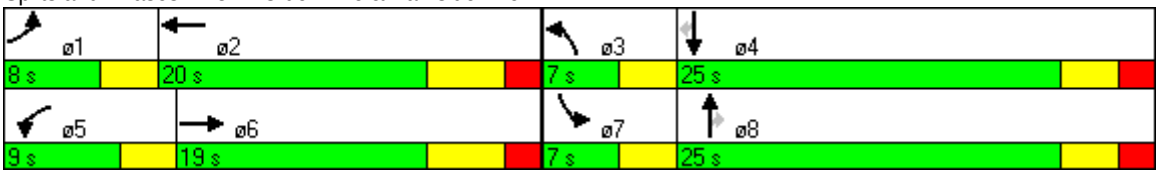
Splits and Phases: 3: N Olden Ave & Parkside Ave

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1801	1583	1770	1863	1636
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	1770	1801	1583	1770	1863	1636
Satd. Flow (RTOR)		9			14				152			163
Lane Group Flow (vph)	125	673	0	143	665	0	48	240	152	96	261	163
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases									8			4
Total Split (s)	8.0	19.0	0.0	9.0	20.0	0.0	7.0	25.0	25.0	7.0	25.0	25.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Act Effct Green (s)	5.1	13.2		6.1	14.2		4.1	11.3	11.3	4.1	14.0	14.0
Actuated g/C Ratio	0.10	0.26		0.12	0.28		0.08	0.23	0.23	0.08	0.28	0.28
v/c Ratio	0.72	0.72		0.69	0.66		0.33	0.59	0.32	0.67	0.50	0.28
Control Delay	52.5	24.3		44.8	21.2		30.8	24.1	5.5	52.2	19.3	4.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.5	24.3		44.8	21.2		30.8	24.1	5.5	52.2	19.3	4.8
LOS	D	C		D	C		C	C	A	D	B	A
Approach Delay		28.7			25.4			18.4			20.8	
Approach LOS		C			C			B			C	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 50.1
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 24.3 — Intersection LOS: C
Intersection Capacity Utilization 53.3% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave



Olden Avenue and Parkside Avenue

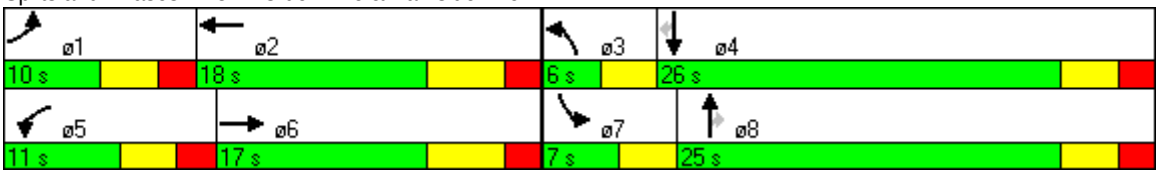
AM Peak Hour - Scenario 5 with Parkside LTs Prot ONLY with Two Second All Red

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1801	1583	1770	1863	1636
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	1770	1801	1583	1770	1863	1636
Satd. Flow (RTOR)		8			13				152			163
Lane Group Flow (vph)	125	673	0	143	665	0	48	240	152	96	261	163
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases									8			4
Total Split (s)	10.0	17.0	0.0	11.0	18.0	0.0	6.0	25.0	25.0	7.0	26.0	26.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Act Effct Green (s)	5.1	11.2		6.1	12.2		3.0	11.1	11.1	4.1	13.1	13.1
Actuated g/C Ratio	0.10	0.22		0.12	0.24		0.06	0.22	0.22	0.08	0.26	0.26
v/c Ratio	0.72	0.85		0.68	0.77		0.44	0.60	0.32	0.67	0.54	0.30
Control Delay	52.1	33.8		44.4	27.1		41.0	24.5	5.6	51.7	20.6	4.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.1	33.8		44.4	27.1		41.0	24.5	5.6	51.7	20.6	4.9
LOS	D	C		D	C		D	C	A	D	C	A
Approach Delay		36.7			30.1			19.8			21.4	
Approach LOS		D			C			B			C	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 49.9
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 28.6 — Intersection LOS: C
Intersection Capacity Utilization 54.1% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave

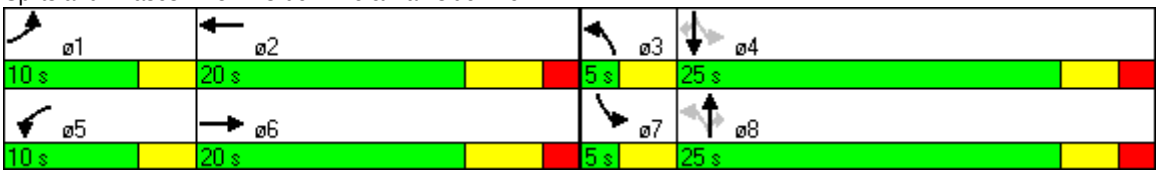


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1801	1583	1770	1863	1636
Flt Permitted	0.950			0.950			0.570			0.530		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	1062	1801	1583	987	1863	1636
Satd. Flow (RTOR)		9			14				152			163
Lane Group Flow (vph)	125	673	0	143	665	0	48	240	152	96	261	163
Turn Type	Prot			Prot			pm+pt		Perm	pm+pt		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases							8		8	4		4
Total Split (s)	10.0	20.0	0.0	10.0	20.0	0.0	5.0	25.0	25.0	5.0	25.0	25.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Act Effct Green (s)	7.1	14.7		6.9	14.7		14.7	11.2	11.2	15.9	13.1	13.1
Actuated g/C Ratio	0.15	0.30		0.14	0.30		0.30	0.23	0.23	0.33	0.27	0.27
v/c Ratio	0.50	0.63		0.59	0.62		0.14	0.58	0.32	0.27	0.52	0.29
Control Delay	31.3	20.4		35.5	20.0		11.6	23.4	5.5	13.7	20.0	4.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.3	20.4		35.5	20.0		11.6	23.4	5.5	13.7	20.0	4.9
LOS	C	C		D	C		B	C	A	B	C	A
Approach Delay		22.1			22.8			15.9			14.1	
Approach LOS		C			C			B			B	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 48.4
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.63
Intersection Signal Delay: 19.6 — Intersection LOS: B
Intersection Capacity Utilization 53.3% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave



Olden Avenue and Parkside Avenue

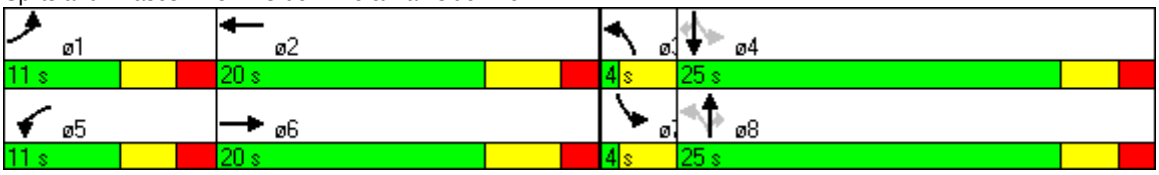
AM Peak Hour - Scenario 5 with Parkside LTs Prot+Perm and Two Second All Red

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1801	1583	1770	1863	1636
Flt Permitted	0.950			0.950			0.526			0.528		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	980	1801	1583	984	1863	1636
Satd. Flow (RTOR)		9			14				152			163
Lane Group Flow (vph)	125	673	0	143	665	0	48	240	152	96	261	163
Turn Type	Prot			Prot			pm+pt		Perm	pm+pt		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases							8		8	4		4
Total Split (s)	11.0	20.0	0.0	11.0	20.0	0.0	4.0	25.0	25.0	4.0	25.0	25.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Act Effct Green (s)	6.1	14.1		6.1	16.7		14.1	11.3	11.3	15.3	12.9	12.9
Actuated g/C Ratio	0.12	0.28		0.12	0.33		0.28	0.22	0.22	0.30	0.25	0.25
v/c Ratio	0.61	0.68		0.70	0.57		0.17	0.60	0.32	0.31	0.55	0.30
Control Delay	39.6	22.0		45.9	19.2		13.4	24.3	5.5	15.8	21.3	5.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.6	22.0		45.9	19.2		13.4	24.3	5.5	15.8	21.3	5.0
LOS	D	C		D	B		B	C	A	B	C	A
Approach Delay		24.7			23.9			16.6			15.2	
Approach LOS		C			C			B			B	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 50.7
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 21.2 — Intersection LOS: C
Intersection Capacity Utilization 54.1% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave



Olden Avenue and Parkside Avenue

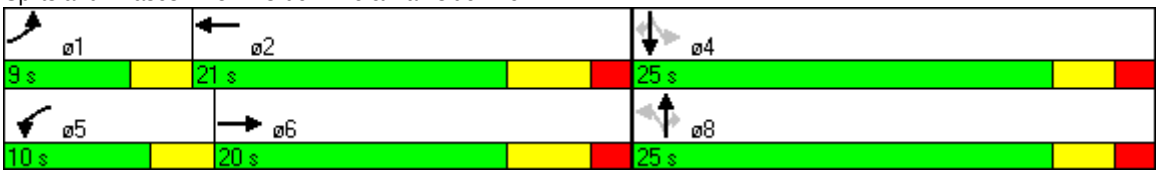
AM Peak Hour - Scenario 5 with Parkside LTs Perm ONLY and Two Second All Red

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1801	1583	1770	1863	1636
Flt Permitted	0.950			0.950			0.555			0.596		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	1034	1801	1583	1110	1863	1636
Satd. Flow (RTOR)		10			16				152			163
Lane Group Flow (vph)	125	673	0	143	665	0	48	240	152	96	261	163
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8		8	4		4
Total Split (s)	9.0	20.0	0.0	10.0	21.0	0.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)	6.2	14.7		6.7	15.4		10.7	10.7	10.7	10.7	10.7	10.7
Actuated g/C Ratio	0.14	0.33		0.15	0.35		0.24	0.24	0.24	0.24	0.24	0.24
v/c Ratio	0.52	0.57		0.55	0.54		0.19	0.55	0.30	0.36	0.58	0.31
Control Delay	31.3	16.2		30.2	14.9		15.4	20.1	4.9	18.2	20.6	4.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.3	16.2		30.2	14.9		15.4	20.1	4.9	18.2	20.6	4.8
LOS	C	B		C	B		B	C	A	B	C	A
Approach Delay		18.5			17.6			14.3			15.2	
Approach LOS		B			B			B			B	

Intersection Summary

Cycle Length: 55
Actuated Cycle Length: 44.2
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.58
Intersection Signal Delay: 16.8 — Intersection LOS: B
Intersection Capacity Utilization 54.1% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave

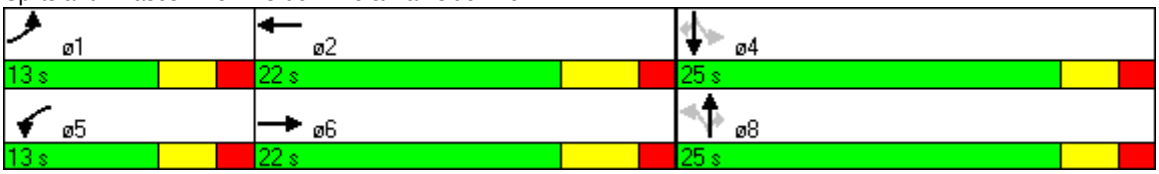


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1801	1583	1770	1863	1636
Flt Permitted	0.950			0.950			0.518			0.561		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	965	1801	1583	1045	1863	1636
Satd. Flow (RTOR)		9			14				152			163
Lane Group Flow (vph)	125	673	0	143	665	0	48	240	152	96	261	163
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8		8	4		4
Total Split (s)	13.0	22.0	0.0	13.0	22.0	0.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)	7.6	16.7		7.4	16.6		11.5	11.5	11.5	11.5	11.5	11.5
Actuated g/C Ratio	0.15	0.34		0.15	0.34		0.23	0.23	0.23	0.23	0.23	0.23
v/c Ratio	0.47	0.56		0.56	0.56		0.21	0.57	0.31	0.39	0.60	0.32
Control Delay	28.1	17.4		32.1	17.2		18.1	23.1	5.4	21.7	23.6	5.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.1	17.4		32.1	17.2		18.1	23.1	5.4	21.7	23.6	5.2
LOS	C	B		C	B		B	C	A	C	C	A
Approach Delay		19.0			19.9			16.4			17.5	
Approach LOS		B			B			B			B	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 49.1
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.60
Intersection Signal Delay: 18.5 — Intersection LOS: B
Intersection Capacity Utilization 55.0% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	0	3227	0	0	3343	0
Flt Permitted	0.950			0.950				0.778			0.707	
Satd. Flow (perm)	1711	3511	0	1711	3497	0	0	2523	0	0	2385	0
Satd. Flow (RTOR)		7			11			112			87	
Lane Group Flow (vph)	125	673	0	143	665	0	0	440	0	0	520	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		
Total Split (s)	17.0	36.0	0.0	20.0	39.0	0.0	34.0	34.0	0.0	34.0	34.0	0.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	10.6	32.4		10.8	35.0			18.3			18.3	
Actuated g/C Ratio	0.14	0.43		0.14	0.46			0.24			0.24	
v/c Ratio	0.52	0.45		0.58	0.41			0.63			0.81	
Control Delay	40.1	18.0		41.5	16.6			23.4			33.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	40.1	18.0		41.5	16.6			23.4			33.4	
LOS	D	B		D	B			C			C	
Approach Delay		21.5			21.0			23.4			33.4	
Approach LOS		C			C			C			C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 75.7
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 24.1 — Intersection LOS: C
Intersection Capacity Utilization 61.9% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave

Olden Avenue and Parkside Avenue

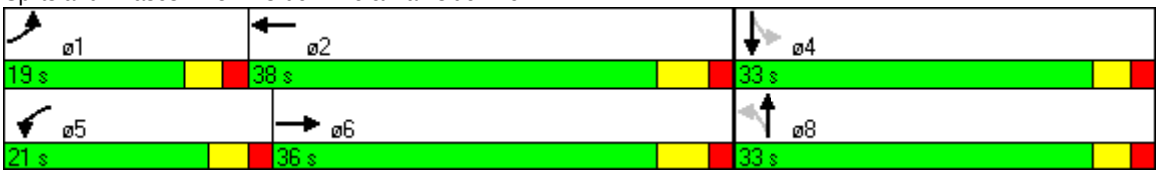
AM Peak Hour - Scenario 1 with Two Second All Red (90s CL)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	0	3227	0	0	3343	0
Flt Permitted	0.950			0.950				0.772			0.702	
Satd. Flow (perm)	1711	3511	0	1711	3497	0	0	2504	0	0	2368	0
Satd. Flow (RTOR)		7			11			110			85	
Lane Group Flow (vph)	125	673	0	143	665	0	0	440	0	0	520	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		
Total Split (s)	19.0	36.0	0.0	21.0	38.0	0.0	33.0	33.0	0.0	33.0	33.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	10.7	31.7		10.8	34.7			18.7			18.7	
Actuated g/C Ratio	0.14	0.41		0.14	0.45			0.24			0.24	
v/c Ratio	0.53	0.47		0.60	0.42			0.64			0.82	
Control Delay	41.3	19.6		43.4	18.0			24.0			34.3	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	41.3	19.6		43.4	18.0			24.0			34.3	
LOS	D	B		D	B			C			C	
Approach Delay		23.0			22.5			24.0			34.3	
Approach LOS		C			C			C			C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 77.5
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 25.3 — Intersection LOS: C
Intersection Capacity Utilization 62.8% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave

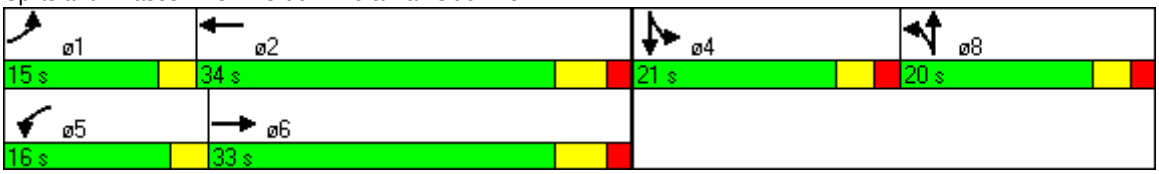


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	0	3227	0	0	3343	0
Flt Permitted	0.950			0.950				0.995			0.991	
Satd. Flow (perm)	1711	3511	0	1711	3497	0	0	3227	0	0	3343	0
Satd. Flow (RTOR)		6			10			91			71	
Lane Group Flow (vph)	125	673	0	143	665	0	0	440	0	0	520	0
Turn Type	Prot			Prot			Split			Split		
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases												
Total Split (s)	15.0	33.0	0.0	16.0	34.0	0.0	20.0	20.0	0.0	21.0	21.0	0.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	10.4	27.6		10.6	30.2			12.8			14.5	
Actuated g/C Ratio	0.12	0.33		0.13	0.36			0.15			0.17	
v/c Ratio	0.60	0.59		0.67	0.53			0.78			0.82	
Control Delay	48.6	27.2		51.8	25.2			38.0			41.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	48.6	27.2		51.8	25.2			38.0			41.9	
LOS	D	C		D	C			D			D	
Approach Delay		30.5			29.9			38.0			41.9	
Approach LOS		C			C			D			D	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 84.7
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 33.9 — Intersection LOS: C
Intersection Capacity Utilization 61.9% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave



Olden Avenue and Parkside Avenue

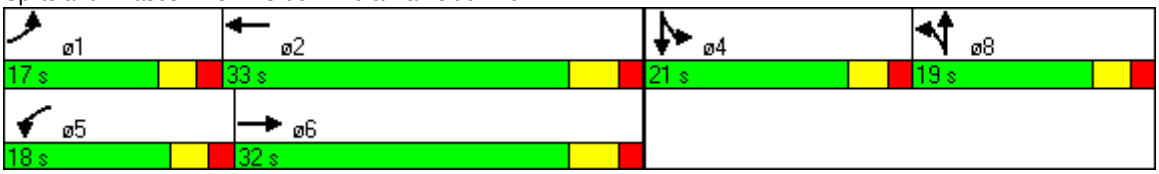
AM Peak Hour - Scenario 2 with Two Second All Red (90s CL)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	0	3227	0	0	3343	0
Flt Permitted	0.950			0.950				0.995			0.991	
Satd. Flow (perm)	1711	3511	0	1711	3497	0	0	3227	0	0	3343	0
Satd. Flow (RTOR)		6			10			90			71	
Lane Group Flow (vph)	125	673	0	143	665	0	0	440	0	0	520	0
Turn Type	Prot			Prot			Split			Split		
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases												
Total Split (s)	17.0	32.0	0.0	18.0	33.0	0.0	19.0	19.0	0.0	21.0	21.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	10.4	26.6		10.7	29.6			12.6			14.5	
Actuated g/C Ratio	0.12	0.31		0.13	0.35			0.15			0.17	
v/c Ratio	0.60	0.61		0.67	0.55			0.80			0.83	
Control Delay	49.0	28.8		52.3	26.4			40.3			42.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	49.0	28.8		52.3	26.4			40.3			42.5	
LOS	D	C		D	C			D			D	
Approach Delay		31.9			31.0			40.3			42.5	
Approach LOS		C			C			D			D	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 85.5
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 35.2 — Intersection LOS: D
Intersection Capacity Utilization 62.8% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave

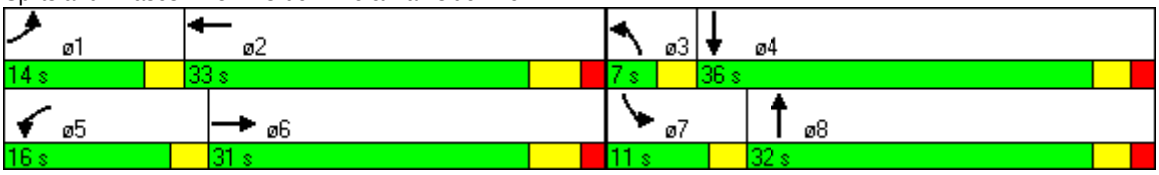


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1755	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1755	0
Satd. Flow (RTOR)		6			10			36			38	
Lane Group Flow (vph)	125	673	0	143	665	0	48	392	0	96	424	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												
Total Split (s)	14.0	31.0	0.0	16.0	33.0	0.0	7.0	32.0	0.0	11.0	36.0	0.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	4.0
Act Effct Green (s)	9.9	26.5		10.4	29.8		4.1	21.1		7.7	24.1	
Actuated g/C Ratio	0.12	0.33		0.13	0.37		0.05	0.26		0.10	0.30	
v/c Ratio	0.60	0.58		0.65	0.51		0.53	0.83		0.56	0.77	
Control Delay	49.2	27.2		49.8	24.8		63.9	42.5		52.7	33.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	49.2	27.2		49.8	24.8		63.9	42.5		52.7	33.8	
LOS	D	C		D	C		E	D		D	C	
Approach Delay		30.6			29.2			44.8			37.3	
Approach LOS		C			C			D			D	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 80.6
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 34.0 — Intersection LOS: C
Intersection Capacity Utilization 61.7% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave



Olden Avenue and Parkside Avenue

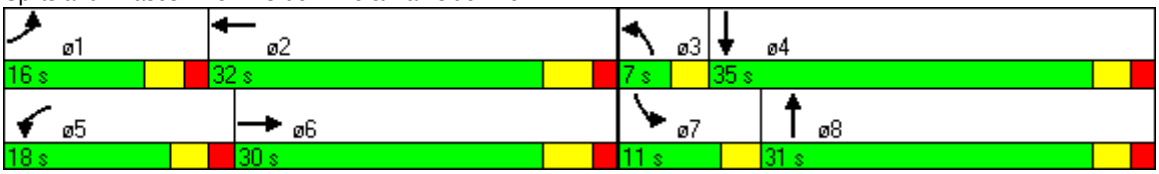
AM Peak Hour - Scenario 3 with Parkside LTs Prot ONLY and Two Second All Red (90s CL)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1755	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1755	0
Satd. Flow (RTOR)		6			10			36			37	
Lane Group Flow (vph)	125	673	0	143	665	0	48	392	0	96	424	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												
Total Split (s)	16.0	30.0	0.0	18.0	32.0	0.0	7.0	31.0	0.0	11.0	35.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	4.0
Act Effct Green (s)	9.9	25.4		10.5	29.3		4.1	21.0		7.7	24.0	
Actuated g/C Ratio	0.12	0.31		0.13	0.36		0.05	0.26		0.09	0.29	
v/c Ratio	0.60	0.61		0.65	0.53		0.54	0.85		0.57	0.78	
Control Delay	49.8	28.9		50.1	25.9		64.9	44.6		53.4	35.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	49.8	28.9		50.1	25.9		64.9	44.6		53.4	35.2	
LOS	D	C		D	C		E	D		D	D	
Approach Delay		32.2			30.2			46.8			38.6	
Approach LOS		C			C			D			D	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 81.5
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 35.4 — Intersection LOS: D
Intersection Capacity Utilization 62.5% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave

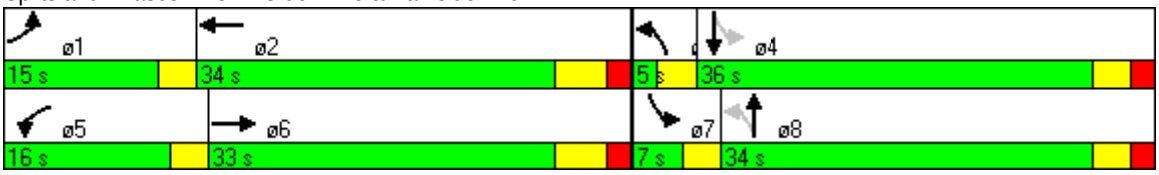


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1755	0
Flt Permitted	0.950			0.950			0.257			0.227		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	479	1696	0	423	1755	0
Satd. Flow (RTOR)		6			10			37			38	
Lane Group Flow (vph)	125	673	0	143	665	0	48	392	0	96	424	0
Turn Type	Prot			Prot			pm+pt			pm+pt		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases							8			4		
Total Split (s)	15.0	33.0	0.0	16.0	34.0	0.0	5.0	34.0	0.0	7.0	36.0	0.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	4.0
Act Effct Green (s)	10.2	28.1		10.3	30.8		24.4	20.9		27.7	23.4	
Actuated g/C Ratio	0.13	0.36		0.13	0.39		0.31	0.26		0.35	0.30	
v/c Ratio	0.57	0.54		0.64	0.48		0.26	0.82		0.44	0.77	
Control Delay	45.4	24.2		48.2	22.6		20.7	40.1		23.5	33.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	45.4	24.2		48.2	22.6		20.7	40.1		23.5	33.8	
LOS	D	C		D	C		C	D		C	C	
Approach Delay		27.5			27.1			38.0			31.9	
Approach LOS		C			C			D			C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 78.9
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 30.1 — Intersection LOS: C
Intersection Capacity Utilization 61.7% — ICU Level of Service B
Analysis Period (min) 15

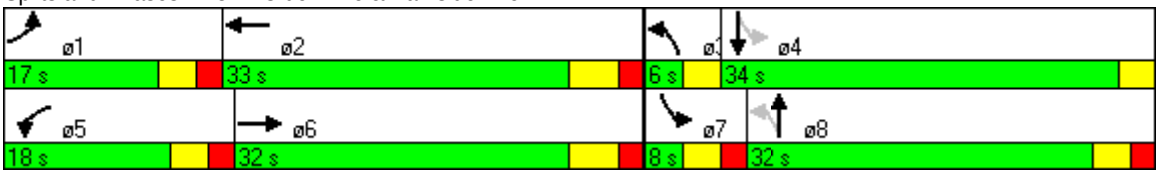
Splits and Phases: 3: N Olden Ave & Parkside Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1755	0
Flt Permitted	0.950			0.950			0.220			0.220		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	410	1696	0	410	1755	0
Satd. Flow (RTOR)		6			10			36			38	
Lane Group Flow (vph)	125	673	0	143	665	0	48	392	0	96	424	0
Turn Type	Prot			Prot			pm+pt			pm+pt		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases							8			4		
Total Split (s)	17.0	32.0	0.0	18.0	33.0	0.0	6.0	32.0	0.0	8.0	34.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	3.0	5.0	4.0	5.0	3.0	4.0
Act Effct Green (s)	10.3	27.1		10.4	30.4		25.3	20.9		25.3	25.7	
Actuated g/C Ratio	0.13	0.34		0.13	0.38		0.31	0.26		0.31	0.32	
v/c Ratio	0.58	0.57		0.65	0.50		0.27	0.84		0.53	0.72	
Control Delay	46.8	26.4		49.8	24.4		20.4	43.1		31.3	30.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	46.8	26.4		49.8	24.4		20.4	43.1		31.3	30.5	
LOS	D	C		D	C		C	D		C	C	
Approach Delay		29.6			28.9			40.6			30.7	
Approach LOS		C			C			D			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 80.8	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 31.5	Intersection LOS: C
Intersection Capacity Utilization 63.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: N Olden Ave & Parkside Ave

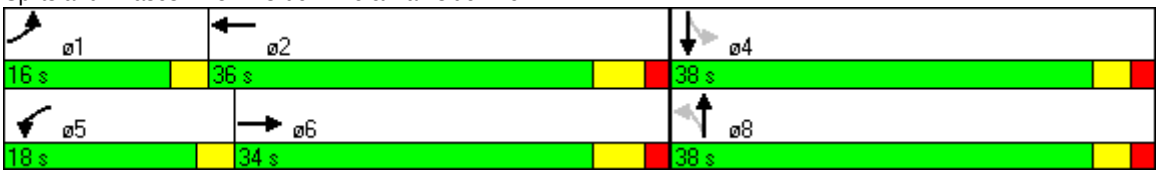


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1755	0
Flt Permitted	0.950			0.950			0.227			0.274		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	423	1696	0	510	1755	0
Satd. Flow (RTOR)		7			10			40			39	
Lane Group Flow (vph)	125	673	0	143	665	0	48	392	0	96	424	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		
Total Split (s)	16.0	34.0	0.0	18.0	36.0	0.0	38.0	38.0	0.0	38.0	38.0	0.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	10.4	29.8		10.5	32.4		21.4	21.4		21.4	21.4	
Actuated g/C Ratio	0.14	0.39		0.14	0.43		0.28	0.28		0.28	0.28	
v/c Ratio	0.53	0.49		0.60	0.44		0.40	0.77		0.67	0.81	
Control Delay	41.5	20.7		43.6	19.2		33.0	33.5		47.9	36.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	41.5	20.7		43.6	19.2		33.0	33.5		47.9	36.0	
LOS	D	C		D	B		C	C		D	D	
Approach Delay		24.0			23.6			33.5			38.2	
Approach LOS		C			C			C			D	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 76
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 28.3 — Intersection LOS: C
Intersection Capacity Utilization 62.5% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1755	0
Flt Permitted	0.950			0.950			0.211			0.259		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	393	1696	0	482	1755	0
Satd. Flow (RTOR)		7			10			39			38	
Lane Group Flow (vph)	125	673	0	143	665	0	48	392	0	96	424	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		
Total Split (s)	18.0	34.0	0.0	20.0	36.0	0.0	36.0	36.0	0.0	36.0	36.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	10.5	29.6		10.7	32.8		21.6	21.6		21.6	21.6	
Actuated g/C Ratio	0.13	0.38		0.14	0.42		0.28	0.28		0.28	0.28	
v/c Ratio	0.54	0.50		0.61	0.45		0.44	0.79		0.72	0.83	
Control Delay	42.9	21.9		44.8	20.2		37.6	35.8		56.6	38.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	42.9	21.9		44.8	20.2		37.6	35.8		56.6	38.7	
LOS	D	C		D	C		D	D		E	D	
Approach Delay		25.2			24.5			36.0			42.0	
Approach LOS		C			C			D			D	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 78.2
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 30.2 — Intersection LOS: C
Intersection Capacity Utilization 63.3% — ICU Level of Service B
Analysis Period (min) 15

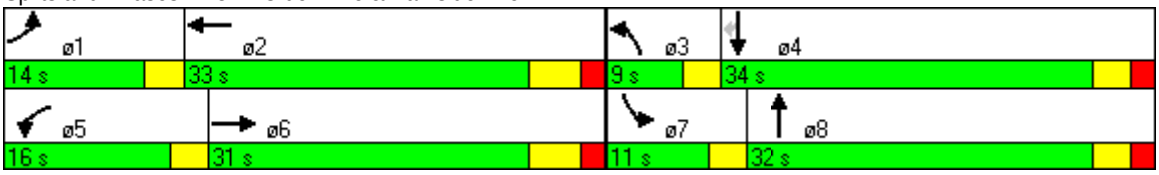
Splits and Phases: 3: N Olden Ave & Parkside Ave

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1863	1636
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1863	1636
Satd. Flow (RTOR)		6			10			36				163
Lane Group Flow (vph)	125	673	0	143	665	0	48	392	0	96	261	163
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												4
Total Split (s)	14.0	31.0	0.0	16.0	33.0	0.0	9.0	32.0	0.0	11.0	34.0	34.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	5.0
Act Effct Green (s)	9.9	26.5		10.4	29.8		6.0	21.0		7.8	24.3	24.3
Actuated g/C Ratio	0.12	0.33		0.13	0.37		0.07	0.26		0.10	0.30	0.30
v/c Ratio	0.60	0.58		0.65	0.51		0.36	0.84		0.56	0.47	0.27
Control Delay	49.1	27.2		49.7	24.7		47.5	42.9		52.5	26.5	5.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	49.1	27.2		49.7	24.7		47.5	42.9		52.5	26.5	5.2
LOS	D	C		D	C		D	D		D	C	A
Approach Delay		30.6			29.2			43.4			24.6	
Approach LOS		C			C			D			C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 80.5
Control Type: Semi Act-Uncoord
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 31.1 — Intersection LOS: C
Intersection Capacity Utilization 61.7% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave



Olden Avenue and Parkside Avenue

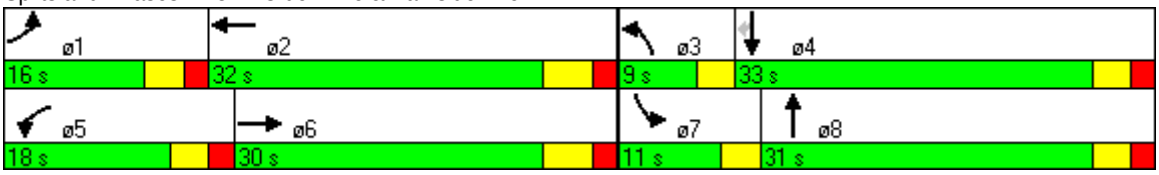
AM Peak Hour - Scenario 4 with Parkside LTs Prot ONLY and Two Second All Red (90s CL)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1863	1636
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1863	1636
Satd. Flow (RTOR)		6			10			36				163
Lane Group Flow (vph)	125	673	0	143	665	0	48	392	0	96	261	163
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												4
Total Split (s)	16.0	30.0	0.0	18.0	32.0	0.0	9.0	31.0	0.0	11.0	33.0	33.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	5.0
Act Effct Green (s)	9.9	25.4		10.5	29.3		6.0	20.9		7.8	24.2	24.2
Actuated g/C Ratio	0.12	0.31		0.13	0.36		0.07	0.26		0.10	0.30	0.30
v/c Ratio	0.60	0.61		0.65	0.53		0.37	0.85		0.57	0.47	0.27
Control Delay	49.8	28.9		50.1	25.9		48.0	44.8		53.2	27.3	5.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	49.8	28.9		50.1	25.9		48.0	44.8		53.2	27.3	5.3
LOS	D	C		D	C		D	D		D	C	A
Approach Delay		32.2			30.2			45.1			25.2	
Approach LOS		C			C			D			C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 81.4
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 32.4 — Intersection LOS: C
Intersection Capacity Utilization 62.5% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave

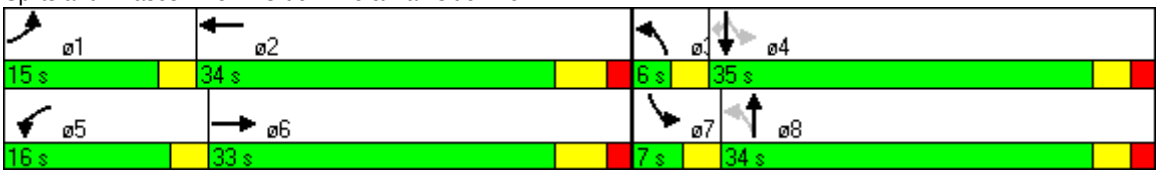


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1863	1636
Flt Permitted	0.950			0.950			0.502			0.229		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	935	1696	0	427	1863	1636
Satd. Flow (RTOR)		6			10			37				163
Lane Group Flow (vph)	125	673	0	143	665	0	48	392	0	96	261	163
Turn Type	Prot			Prot			pm+pt			pm+pt		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases							8			4		4
Total Split (s)	15.0	33.0	0.0	16.0	34.0	0.0	6.0	34.0	0.0	7.0	35.0	35.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	5.0
Act Effct Green (s)	10.2	28.1		10.3	30.9		25.0	20.7		26.9	22.7	22.7
Actuated g/C Ratio	0.13	0.36		0.13	0.39		0.32	0.26		0.34	0.29	0.29
v/c Ratio	0.57	0.53		0.64	0.48		0.15	0.83		0.44	0.49	0.28
Control Delay	45.3	24.1		48.1	22.6		17.2	40.7		23.8	26.9	5.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	45.3	24.1		48.1	22.6		17.2	40.7		23.8	26.9	5.2
LOS	D	C		D	C		B	D		C	C	A
Approach Delay		27.4			27.1			38.1			19.5	
Approach LOS		C			C			D			B	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 78.7
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 27.6 — Intersection LOS: C
Intersection Capacity Utilization 61.7% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave

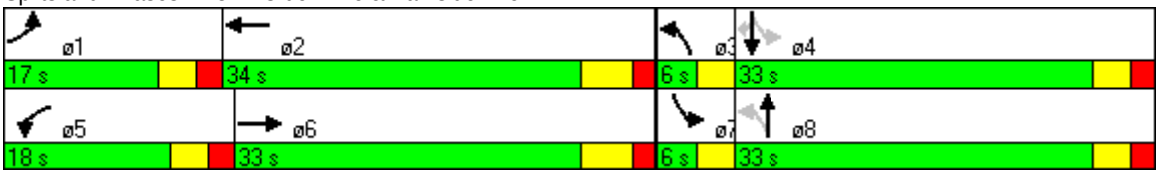


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1863	1636
Flt Permitted	0.950			0.950			0.468			0.227		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	872	1696	0	423	1863	1636
Satd. Flow (RTOR)		6			10			37				163
Lane Group Flow (vph)	125	673	0	143	665	0	48	392	0	96	261	163
Turn Type	Prot			Prot			pm+pt			pm+pt		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases							8			4		4
Total Split (s)	17.0	33.0	0.0	18.0	34.0	0.0	6.0	33.0	0.0	6.0	33.0	33.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	5.0
Act Effct Green (s)	10.2	28.0		10.4	31.3		25.1	20.8		25.7	22.0	22.0
Actuated g/C Ratio	0.13	0.35		0.13	0.39		0.31	0.26		0.32	0.28	0.28
v/c Ratio	0.57	0.55		0.64	0.48		0.16	0.84		0.51	0.51	0.29
Control Delay	46.0	24.8		49.0	23.0		18.5	42.2		29.5	28.8	5.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	46.0	24.8		49.0	23.0		18.5	42.2		29.5	28.8	5.5
LOS	D	C		D	C		B	D		C	C	A
Approach Delay		28.1			27.6			39.7			21.6	
Approach LOS		C			C			D			C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 28.6 — Intersection LOS: C
Intersection Capacity Utilization 62.5% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave

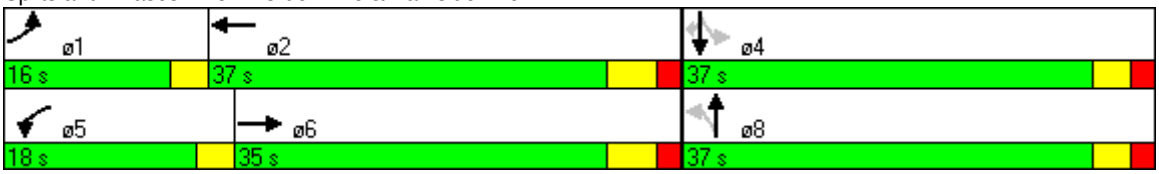


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1863	1636
Flt Permitted	0.950			0.950			0.467			0.257		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	870	1696	0	479	1863	1636
Satd. Flow (RTOR)		7			11			39				163
Lane Group Flow (vph)	125	673	0	143	665	0	48	392	0	96	261	163
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		4
Total Split (s)	16.0	35.0	0.0	18.0	37.0	0.0	37.0	37.0	0.0	37.0	37.0	37.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Act Effct Green (s)	10.4	30.8		10.5	33.4		20.6	20.6		20.6	20.6	20.6
Actuated g/C Ratio	0.14	0.40		0.14	0.44		0.27	0.27		0.27	0.27	0.27
v/c Ratio	0.53	0.47		0.60	0.43		0.20	0.80		0.74	0.52	0.29
Control Delay	41.5	19.9		43.7	18.5		23.5	36.7		59.1	27.4	5.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	41.5	19.9		43.7	18.5		23.5	36.7		59.1	27.4	5.1
LOS	D	B		D	B		C	D		E	C	A
Approach Delay		23.3			23.0			35.2			26.3	
Approach LOS		C			C			D			C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 76.2
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.80
Intersection Signal Delay: 25.8 — Intersection LOS: C
Intersection Capacity Utilization 62.5% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1696	0	1770	1863	1636
Flt Permitted	0.950			0.950			0.461			0.248		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	859	1696	0	462	1863	1636
Satd. Flow (RTOR)		7			10			39				163
Lane Group Flow (vph)	125	673	0	143	665	0	48	392	0	96	261	163
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		4
Total Split (s)	18.0	34.0	0.0	20.0	36.0	0.0	36.0	36.0	0.0	36.0	36.0	36.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Act Effct Green (s)	10.4	29.7		10.6	32.8		20.7	20.7		20.7	20.7	20.7
Actuated g/C Ratio	0.13	0.38		0.14	0.42		0.27	0.27		0.27	0.27	0.27
v/c Ratio	0.54	0.50		0.61	0.45		0.21	0.81		0.77	0.52	0.29
Control Delay	42.3	21.4		44.3	19.7		24.2	37.9		66.0	28.0	5.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	42.3	21.4		44.3	19.7		24.2	37.9		66.0	28.0	5.2
LOS	D	C		D	B		C	D		E	C	A
Approach Delay		24.7			24.1			36.4			27.9	
Approach LOS		C			C			D			C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 77.3
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.81
Intersection Signal Delay: 27.1 — Intersection LOS: C
Intersection Capacity Utilization 63.3% — ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave

Olden Avenue and Parkside Avenue

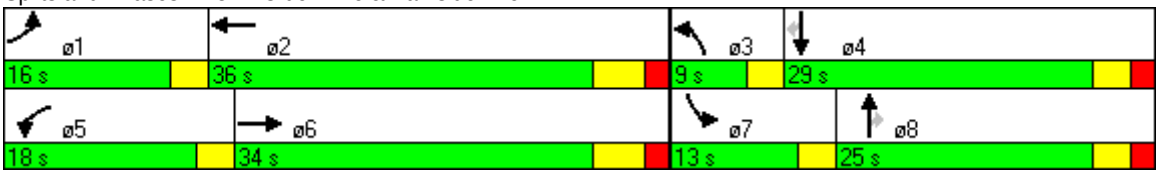
AM Peak Hour - Scenario 5 with Parkside LTs Prot ONLY (90s CL)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1801	1583	1770	1863	1636
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	1770	1801	1583	1770	1863	1636
Satd. Flow (RTOR)		7			10				152			163
Lane Group Flow (vph)	125	673	0	143	665	0	48	240	152	96	261	163
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases									8			4
Total Split (s)	16.0	34.0	0.0	18.0	36.0	0.0	9.0	25.0	25.0	13.0	29.0	29.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Act Effct Green (s)	10.6	29.9		10.8	32.8		6.0	14.7	14.7	8.8	19.2	19.2
Actuated g/C Ratio	0.13	0.38		0.14	0.41		0.08	0.19	0.19	0.11	0.24	0.24
v/c Ratio	0.55	0.51		0.61	0.46		0.36	0.72	0.36	0.49	0.58	0.31
Control Delay	44.1	22.9		45.9	21.3		46.7	44.3	8.0	45.4	33.1	6.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.1	22.9		45.9	21.3		46.7	44.3	8.0	45.4	33.1	6.4
LOS	D	C		D	C		D	D	A	D	C	A
Approach Delay		26.2			25.7			32.0			27.0	
Approach LOS		C			C			C			C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 79.2
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 27.2 — Intersection LOS: C
Intersection Capacity Utilization 53.3% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave

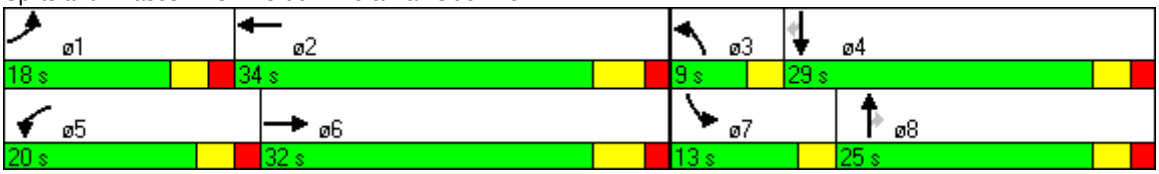


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1801	1583	1770	1863	1636
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	1770	1801	1583	1770	1863	1636
Satd. Flow (RTOR)		6			10				152			163
Lane Group Flow (vph)	125	673	0	143	665	0	48	240	152	96	261	163
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases									8			4
Total Split (s)	18.0	32.0	0.0	20.0	34.0	0.0	9.0	25.0	25.0	13.0	29.0	29.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Act Effct Green (s)	10.6	27.8		10.8	31.4		6.0	14.7	14.7	8.8	19.2	19.2
Actuated g/C Ratio	0.13	0.35		0.14	0.40		0.08	0.19	0.19	0.11	0.24	0.24
v/c Ratio	0.55	0.54		0.61	0.48		0.36	0.72	0.36	0.49	0.58	0.31
Control Delay	44.1	24.9		45.9	22.9		46.7	44.3	8.0	45.4	33.1	6.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.1	24.9		45.9	22.9		46.7	44.3	8.0	45.4	33.1	6.4
LOS	D	C		D	C		D	D	A	D	C	A
Approach Delay		27.9			27.0			32.0			27.0	
Approach LOS		C			C			C			C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 79.2
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 28.1 — Intersection LOS: C
Intersection Capacity Utilization 54.1% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1801	1583	1770	1863	1636
Flt Permitted	0.950			0.950			0.464			0.367		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	864	1801	1583	684	1863	1636
Satd. Flow (RTOR)		7			11				152			163
Lane Group Flow (vph)	125	673	0	143	665	0	48	240	152	96	261	163
Turn Type	Prot			Prot			pm+pt		Perm	pm+pt		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases							8		8	4		4
Total Split (s)	17.0	36.0	0.0	19.0	38.0	0.0	6.0	27.0	27.0	8.0	29.0	29.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Act Effct Green (s)	10.7	31.9		10.9	34.6		19.2	14.9	14.9	22.4	17.6	17.6
Actuated g/C Ratio	0.14	0.41		0.14	0.44		0.25	0.19	0.19	0.29	0.23	0.23
v/c Ratio	0.53	0.47		0.60	0.43		0.19	0.70	0.36	0.36	0.62	0.33
Control Delay	42.0	20.1		44.0	18.8		22.0	41.8	7.7	24.3	35.0	6.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.0	20.1		44.0	18.8		22.0	41.8	7.7	24.3	35.0	6.6
LOS	D	C		D	B		C	D	A	C	C	A
Approach Delay		23.6			23.3			27.9			24.1	
Approach LOS		C			C			C			C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 78
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 24.3 — Intersection LOS: C
Intersection Capacity Utilization 53.3% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1801	1583	1770	1863	1636
Flt Permitted	0.950			0.950			0.476			0.337		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	887	1801	1583	628	1863	1636
Satd. Flow (RTOR)		7			11				152			163
Lane Group Flow (vph)	125	673	0	143	665	0	48	240	152	96	261	163
Turn Type	Prot			Prot			pm+pt		Perm	pm+pt		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases							8		8	4		4
Total Split (s)	18.0	36.0	0.0	20.0	38.0	0.0	6.0	25.0	25.0	9.0	28.0	28.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Act Effct Green (s)	10.6	31.7		10.9	35.1		19.2	14.9	14.9	23.7	18.4	18.4
Actuated g/C Ratio	0.13	0.39		0.14	0.44		0.24	0.18	0.18	0.29	0.23	0.23
v/c Ratio	0.56	0.49		0.62	0.44		0.20	0.72	0.37	0.35	0.62	0.33
Control Delay	44.7	21.6		46.5	19.9		22.8	45.0	8.0	24.7	35.5	6.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.7	21.6		46.5	19.9		22.8	45.0	8.0	24.7	35.5	6.7
LOS	D	C		D	B		C	D	A	C	D	A
Approach Delay		25.2			24.6			29.8			24.5	
Approach LOS		C			C			C			C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 80.6
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.72
Intersection Signal Delay: 25.7 — Intersection LOS: C
Intersection Capacity Utilization 54.1% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave

Olden Avenue and Parkside Avenue

AM Peak Hour - Scenario 5 with Parkside LTs Perm ONLY (90s CL)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1801	1583	1770	1863	1636
Flt Permitted	0.950			0.950			0.392			0.438		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	730	1801	1583	816	1863	1636
Satd. Flow (RTOR)		7			11				152			163
Lane Group Flow (vph)	125	673	0	143	665	0	48	240	152	96	261	163
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8		8	4		4
Total Split (s)	18.0	38.0	0.0	21.0	41.0	0.0	31.0	31.0	31.0	31.0	31.0	31.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)	10.7	34.6		10.7	37.0		15.0	15.0	15.0	15.0	15.0	15.0
Actuated g/C Ratio	0.14	0.46		0.14	0.50		0.20	0.20	0.20	0.20	0.20	0.20
v/c Ratio	0.51	0.41		0.58	0.38		0.33	0.66	0.34	0.58	0.69	0.35
Control Delay	38.7	15.6		40.8	14.6		32.4	37.1	7.1	42.7	38.3	6.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.7	15.6		40.8	14.6		32.4	37.1	7.1	42.7	38.3	6.9
LOS	D	B		D	B		C	D	A	D	D	A
Approach Delay		19.2			19.2			26.2			29.3	
Approach LOS		B			B			C			C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 74.6
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 22.5 — Intersection LOS: C
Intersection Capacity Utilization 54.1% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	91	586	20	106	527	42	21	206	137	71	196	137
Satd. Flow (prot)	1711	3511	0	1711	3497	0	1770	1801	1583	1770	1863	1636
Flt Permitted	0.950			0.950			0.382			0.429		
Satd. Flow (perm)	1711	3511	0	1711	3497	0	712	1801	1583	799	1863	1636
Satd. Flow (RTOR)		7			11				152			163
Lane Group Flow (vph)	125	673	0	143	665	0	48	240	152	96	261	163
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8		8	4		4
Total Split (s)	20.0	38.0	0.0	22.0	40.0	0.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)	10.8	33.8		10.8	36.7		15.2	15.2	15.2	15.2	15.2	15.2
Actuated g/C Ratio	0.14	0.44		0.14	0.48		0.20	0.20	0.20	0.20	0.20	0.20
v/c Ratio	0.51	0.43		0.59	0.39		0.34	0.67	0.35	0.60	0.70	0.36
Control Delay	39.5	17.0		41.6	15.7		33.5	38.0	7.1	44.6	39.3	7.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.5	17.0		41.6	15.7		33.5	38.0	7.1	44.6	39.3	7.0
LOS	D	B		D	B		C	D	A	D	D	A
Approach Delay		20.5			20.3			26.8			30.1	
Approach LOS		C			C			C			C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 76
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.70
Intersection Signal Delay: 23.5 — Intersection LOS: C
Intersection Capacity Utilization 55.0% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 3: N Olden Ave & Parkside Ave

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	0	3213	0	0	3364	0
Flt Permitted	0.950			0.950				0.891			0.639	
Satd. Flow (perm)	1711	3511	0	1711	3461	0	0	2868	0	0	2171	0
Satd. Flow (RTOR)		7			24			151			53	
Lane Group Flow (vph)	153	838	0	264	1004	0	0	535	0	0	635	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		
Total Split (s)	15.0	51.0	0.0	15.0	51.0	0.0	37.0	37.0	0.0	37.0	37.0	0.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	11.5	45.0		12.0	45.6			29.6			29.6	
Actuated g/C Ratio	0.11	0.45		0.12	0.45			0.29			0.29	
v/c Ratio	0.78	0.53		1.29	0.64			0.56			0.94	
Control Delay	71.6	21.9		201.9	23.5			23.5			54.9	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	71.6	21.9		201.9	23.5			23.5			54.9	
LOS	E	C		F	C			C			D	
Approach Delay		29.6			60.6			23.5			54.9	
Approach LOS		C			E			C			D	

Intersection Summary

Cycle Length: 103
Actuated Cycle Length: 100.7
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.29
Intersection Signal Delay: 44.8 — Intersection LOS: D
Intersection Capacity Utilization 99.1% — ICU Level of Service F
Analysis Period (min) 15

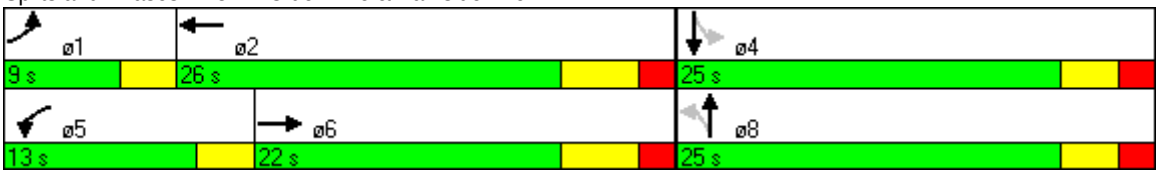
Splits and Phases: 3: N. Olden Ave & Parkside Ave

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	0	3213	0	0	3364	0
Flt Permitted	0.950			0.950				0.908			0.694	
Satd. Flow (perm)	1711	3511	0	1711	3461	0	0	2923	0	0	2358	0
Satd. Flow (RTOR)		9			35			211			94	
Lane Group Flow (vph)	153	838	0	264	1004	0	0	535	0	0	635	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		
Total Split (s)	9.0	22.0	0.0	13.0	26.0	0.0	25.0	25.0	0.0	25.0	25.0	0.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	6.0	16.1		10.0	20.1			16.7			16.7	
Actuated g/C Ratio	0.11	0.28		0.18	0.35			0.29			0.29	
v/c Ratio	0.85	0.84		0.87	0.81			0.53			0.84	
Control Delay	67.6	29.8		56.3	23.5			11.7			27.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	67.6	29.8		56.3	23.5			11.7			27.1	
LOS	E	C		E	C			B			C	
Approach Delay		35.6			30.3			11.7			27.1	
Approach LOS		D			C			B			C	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 56.8
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 28.3 — Intersection LOS: C
Intersection Capacity Utilization 83.1% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave

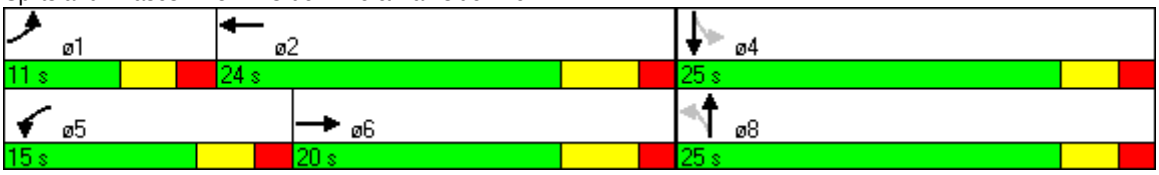


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	0	3213	0	0	3364	0
Flt Permitted	0.950			0.950				0.908			0.694	
Satd. Flow (perm)	1711	3511	0	1711	3461	0	0	2923	0	0	2358	0
Satd. Flow (RTOR)		8			33			211			94	
Lane Group Flow (vph)	153	838	0	264	1004	0	0	535	0	0	635	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		
Total Split (s)	11.0	20.0	0.0	15.0	24.0	0.0	25.0	25.0	0.0	25.0	25.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	6.0	14.0		10.0	18.1			16.7			16.7	
Actuated g/C Ratio	0.11	0.25		0.18	0.32			0.29			0.29	
v/c Ratio	0.85	0.96		0.87	0.89			0.53			0.84	
Control Delay	67.6	46.7		56.3	31.8			11.7			27.1	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	67.6	46.7		56.3	31.8			11.7			27.1	
LOS	E	D		E	C			B			C	
Approach Delay		49.9			36.9			11.7			27.1	
Approach LOS		D			D			B			C	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 56.8
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 34.9 — Intersection LOS: C
Intersection Capacity Utilization 83.9% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	0	3213	0	0	3364	0
Flt Permitted	0.950			0.950				0.998			0.990	
Satd. Flow (perm)	1711	3511	0	1711	3461	0	0	3213	0	0	3364	0
Satd. Flow (RTOR)		7			27			155			57	
Lane Group Flow (vph)	153	838	0	264	1004	0	0	535	0	0	635	0
Turn Type	Prot			Prot			Split			Split		
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases												
Total Split (s)	11.0	29.0	0.0	16.0	34.0	0.0	16.0	16.0	0.0	19.0	19.0	0.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	8.0	23.0		13.0	28.0			11.0			14.0	
Actuated g/C Ratio	0.10	0.29		0.16	0.35			0.14			0.18	
v/c Ratio	0.89	0.83		0.95	0.82			0.93			1.00	
Control Delay	84.7	34.9		78.7	29.7			49.7			67.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	84.7	34.9		78.7	29.7			49.7			67.5	
LOS	F	C		E	C			D			E	
Approach Delay		42.5			39.9			49.7			67.5	
Approach LOS		D			D			D			E	

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 47.3 — Intersection LOS: D
Intersection Capacity Utilization 83.1% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	0	3213	0	0	3364	0
Flt Permitted	0.950			0.950				0.998			0.990	
Satd. Flow (perm)	1711	3511	0	1711	3461	0	0	3213	0	0	3364	0
Satd. Flow (RTOR)		7			26			155			57	
Lane Group Flow (vph)	153	838	0	264	1004	0	0	535	0	0	635	0
Turn Type	Prot			Prot			Split			Split		
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases												
Total Split (s)	13.0	27.0	0.0	18.0	32.0	0.0	16.0	16.0	0.0	19.0	19.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	8.0	21.0		13.0	26.0			11.0			14.0	
Actuated g/C Ratio	0.10	0.26		0.16	0.32			0.14			0.18	
v/c Ratio	0.89	0.90		0.95	0.88			0.93			1.00	
Control Delay	84.7	43.3		78.7	35.5			49.7			67.5	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	84.7	43.3		78.7	35.5			49.7			67.5	
LOS	F	D		E	D			D			E	
Approach Delay		49.7			44.5			49.7			67.5	
Approach LOS		D			D			D			E	

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 80
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.00
Intersection Signal Delay: 51.1 — Intersection LOS: D
Intersection Capacity Utilization 83.9% — ICU Level of Service E
Analysis Period (min) 15

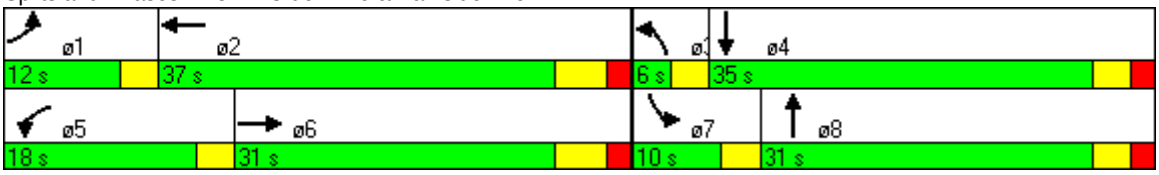
Splits and Phases: 3: N. Olden Ave & Parkside Ave

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1689	0	1770	1768	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	1770	1689	0	1770	1768	0
Satd. Flow (RTOR)		6			24			40			31	
Lane Group Flow (vph)	153	838	0	264	1004	0	24	511	0	130	505	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												
Total Split (s)	12.0	31.0	0.0	18.0	37.0	0.0	6.0	31.0	0.0	10.0	35.0	0.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	4.0
Act Effct Green (s)	9.0	25.1		14.9	31.0		3.0	26.0		7.0	33.6	
Actuated g/C Ratio	0.10	0.28		0.17	0.34		0.03	0.29		0.08	0.37	
v/c Ratio	0.89	0.85		0.93	0.83		0.41	0.99		0.94	0.74	
Control Delay	88.2	40.5		77.5	33.8		63.2	68.7		106.8	32.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	88.2	40.5		77.5	33.8		63.2	68.7		106.8	32.0	
LOS	F	D		E	C		E	E		F	C	
Approach Delay		47.9			42.9			68.4			47.3	
Approach LOS		D			D			E			D	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 49.1 — Intersection LOS: D
Intersection Capacity Utilization 83.8% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave



Olden Avenue and Parkside Avenue

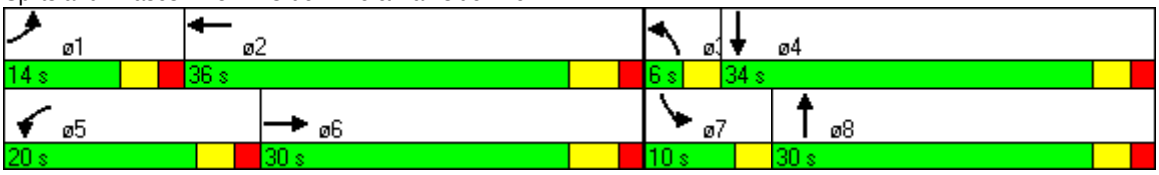
PM Peak Hour - Scenario 3 with Parkside LTs Prot ONLY and Two Second All Red

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1689	0	1770	1768	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	1770	1689	0	1770	1768	0
Satd. Flow (RTOR)		6			23			39			30	
Lane Group Flow (vph)	153	838	0	264	1004	0	24	511	0	130	505	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												
Total Split (s)	14.0	30.0	0.0	20.0	36.0	0.0	6.0	30.0	0.0	10.0	34.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	4.0
Act Effct Green (s)	9.0	24.1		14.9	30.0		3.0	25.0		7.0	32.6	
Actuated g/C Ratio	0.10	0.27		0.17	0.33		0.03	0.28		0.08	0.36	
v/c Ratio	0.89	0.89		0.93	0.86		0.41	1.03		0.94	0.77	
Control Delay	88.2	44.5		77.5	36.4		63.2	79.4		106.8	34.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	88.2	44.5		77.5	36.4		63.2	79.4		106.8	34.1	
LOS	F	D		E	D		E	E		F	C	
Approach Delay		51.2			44.9			78.7			49.0	
Approach LOS		D			D			E			D	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.03
Intersection Signal Delay: 52.8 — Intersection LOS: D
Intersection Capacity Utilization 84.6% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave

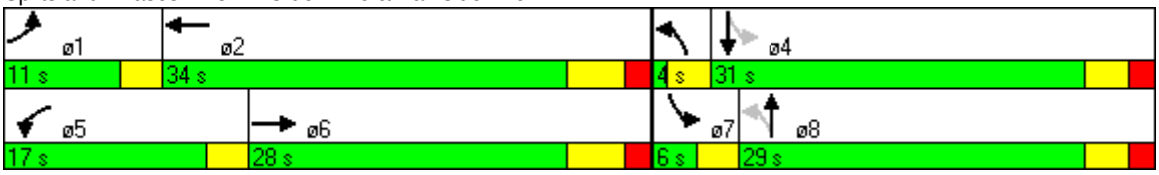


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1689	0	1770	1768	0
Flt Permitted	0.950			0.950			0.229			0.143		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	427	1689	0	266	1768	0
Satd. Flow (RTOR)		7			27			45			34	
Lane Group Flow (vph)	153	838	0	264	1004	0	24	511	0	130	505	0
Turn Type	Prot			Prot			pm+pt			pm+pt		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases							8			4		
Total Split (s)	11.0	28.0	0.0	17.0	34.0	0.0	4.0	29.0	0.0	6.0	31.0	0.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	4.0
Act Effct Green (s)	8.0	22.4		13.6	28.0		26.6	23.6		31.2	28.0	
Actuated g/C Ratio	0.10	0.28		0.17	0.35		0.33	0.30		0.39	0.35	
v/c Ratio	0.89	0.84		0.90	0.81		0.15	0.96		0.81	0.78	
Control Delay	83.5	36.6		67.3	29.3		18.1	57.9		56.7	32.8	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	83.5	36.6		67.3	29.3		18.1	57.9		56.7	32.8	
LOS	F	D		E	C		B	E		E	C	
Approach Delay		43.9			37.2			56.1			37.7	
Approach LOS		D			D			E			D	

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 79.6
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 42.2 — Intersection LOS: D
Intersection Capacity Utilization 83.8% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave



Olden Avenue and Parkside Avenue

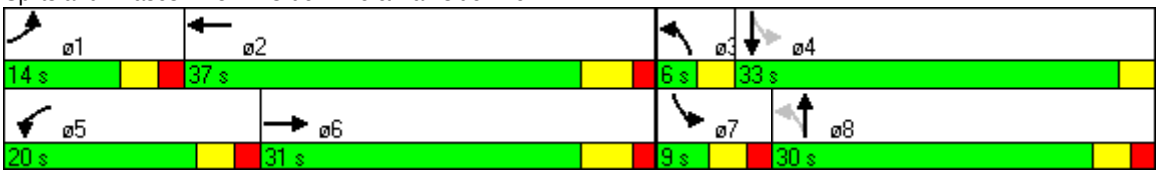
PM Peak Hour - Scenario 3 with Parkside LTs Prot+Perm and Two Second All Red

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1689	0	1770	1768	0
Flt Permitted	0.950			0.950			0.212			0.119		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	395	1689	0	222	1768	0
Satd. Flow (RTOR)		6			24			39			31	
Lane Group Flow (vph)	153	838	0	264	1004	0	24	511	0	130	505	0
Turn Type	Prot			Prot			pm+pt			pm+pt		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases							8			4		
Total Split (s)	14.0	31.0	0.0	20.0	37.0	0.0	6.0	30.0	0.0	9.0	33.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	3.0	5.0	4.0	5.0	3.0	4.0
Act Effct Green (s)	9.0	25.1		14.9	31.0		30.0	25.0		33.2	33.6	
Actuated g/C Ratio	0.10	0.28		0.17	0.34		0.33	0.28		0.37	0.37	
v/c Ratio	0.89	0.85		0.93	0.83		0.13	1.03		0.86	0.74	
Control Delay	88.2	40.5		77.5	33.8		18.4	79.4		69.4	32.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	88.2	40.5		77.5	33.8		18.4	79.4		69.4	32.0	
LOS	F	D		E	C		B	E		E	C	
Approach Delay		47.9			42.9			76.7			39.7	
Approach LOS		D			D			E			D	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.03
Intersection Signal Delay: 49.0 — Intersection LOS: D
Intersection Capacity Utilization 85.5% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave



Olden Avenue and Parkside Avenue

PM Peak Hour - Scenario 3 with Parkside LTs Perm ONLY

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1689	0	1770	1768	0
Flt Permitted	0.950			0.950			0.206			0.199		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	384	1689	0	371	1768	0
Satd. Flow (RTOR)		7			28			53			38	
Lane Group Flow (vph)	153	838	0	264	1004	0	24	511	0	130	505	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		
Total Split (s)	11.0	27.0	0.0	16.0	32.0	0.0	32.0	32.0	0.0	32.0	32.0	0.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	8.0	21.5		12.6	26.1		24.3	24.3		24.3	24.3	
Actuated g/C Ratio	0.11	0.30		0.17	0.36		0.34	0.34		0.34	0.34	
v/c Ratio	0.81	0.80		0.89	0.79		0.19	0.85		1.05	0.82	
Control Delay	65.2	31.5		62.4	26.7		20.9	35.1		122.7	32.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	65.2	31.5		62.4	26.7		20.9	35.1		122.7	32.6	
LOS	E	C		E	C		C	D		F	C	
Approach Delay		36.7			34.1			34.5			51.0	
Approach LOS		D			C			C			D	

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 72.5
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.05
Intersection Signal Delay: 38.1 — Intersection LOS: D
Intersection Capacity Utilization 84.6% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave

Olden Avenue and Parkside Avenue

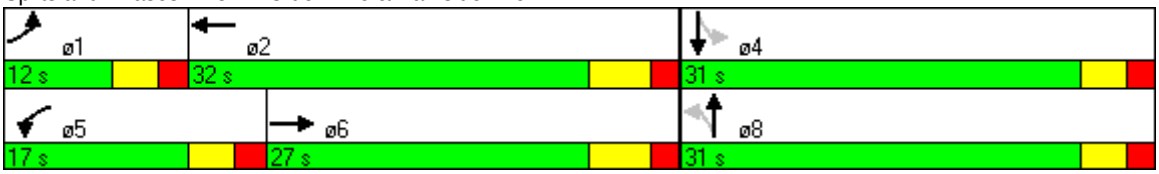
PM Peak Hour - Scenario 3 with Parkside LTs Perm ONLY and Two Second All Red

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1689	0	1770	1768	0
Flt Permitted	0.950			0.950			0.214			0.206		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	399	1689	0	384	1768	0
Satd. Flow (RTOR)		7			28			52			38	
Lane Group Flow (vph)	153	838	0	264	1004	0	24	511	0	130	505	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		
Total Split (s)	12.0	27.0	0.0	17.0	32.0	0.0	31.0	31.0	0.0	31.0	31.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	7.0	21.0		12.0	26.0		25.5	25.5		25.5	25.5	
Actuated g/C Ratio	0.09	0.28		0.16	0.35		0.34	0.34		0.34	0.34	
v/c Ratio	0.95	0.84		0.96	0.82		0.18	0.83		0.99	0.80	
Control Delay	97.3	34.7		79.1	28.5		21.1	34.4		106.8	32.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	97.3	34.7		79.1	28.5		21.1	34.4		106.8	32.1	
LOS	F	C		E	C		C	C		F	C	
Approach Delay		44.4			39.0			33.8			47.4	
Approach LOS		D			D			C			D	

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 74.5
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 41.3 — Intersection LOS: D
Intersection Capacity Utilization 85.5% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave

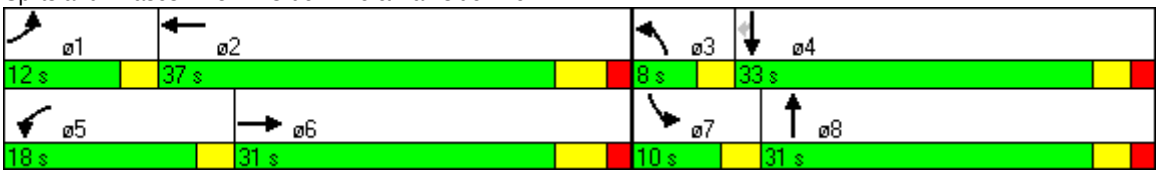


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1747	0	1770	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	1770	1747	0	1770	1863	1583
Satd. Flow (RTOR)		6			24			40				171
Lane Group Flow (vph)	153	838	0	264	1004	0	24	511	0	130	334	171
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												4
Total Split (s)	12.0	31.0	0.0	18.0	37.0	0.0	8.0	31.0	0.0	10.0	33.0	33.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	5.0
Act Effct Green (s)	9.0	25.1		14.9	31.0		5.0	25.6		7.0	32.4	32.4
Actuated g/C Ratio	0.10	0.28		0.17	0.35		0.06	0.29		0.08	0.36	0.36
v/c Ratio	0.89	0.85		0.93	0.83		0.24	0.97		0.94	0.50	0.25
Control Delay	87.3	40.0		77.1	33.4		47.0	62.9		105.7	26.4	4.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	87.3	40.0		77.1	33.4		47.0	62.9		105.7	26.4	4.9
LOS	F	D		E	C		D	E		F	C	A
Approach Delay		47.3			42.5			62.2			36.8	
Approach LOS		D			D			E			D	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 89.6
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 45.9 — Intersection LOS: D
Intersection Capacity Utilization 83.8% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave



Olden Avenue and Parkside Avenue

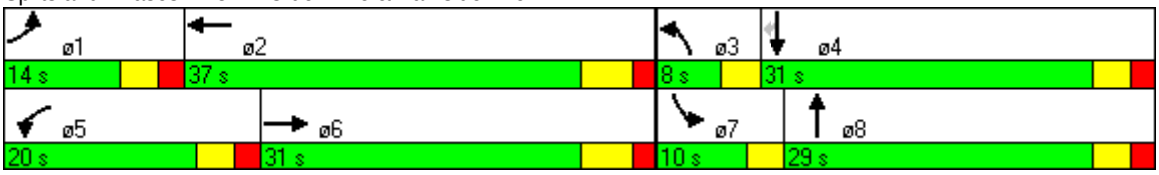
PM Peak Hour - Scenario 4 with Parkside LTs Prot ONLY and Two Second All Red

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1747	0	1770	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	1770	1747	0	1770	1863	1583
Satd. Flow (RTOR)		6			24			38				171
Lane Group Flow (vph)	153	838	0	264	1004	0	24	511	0	130	334	171
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												4
Total Split (s)	14.0	31.0	0.0	20.0	37.0	0.0	8.0	29.0	0.0	10.0	31.0	31.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	5.0
Act Effct Green (s)	9.0	25.1		14.9	31.0		5.0	24.0		7.0	30.8	30.8
Actuated g/C Ratio	0.10	0.28		0.17	0.34		0.06	0.27		0.08	0.34	0.34
v/c Ratio	0.89	0.85		0.93	0.83		0.24	1.03		0.94	0.52	0.26
Control Delay	88.2	40.5		77.5	33.8		47.0	81.7		106.8	28.5	5.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	88.2	40.5		77.5	33.8		47.0	81.7		106.8	28.5	5.2
LOS	F	D		E	C		D	F		F	C	A
Approach Delay		47.9			42.9			80.1			38.3	
Approach LOS		D			D			F			D	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.03
Intersection Signal Delay: 49.3 — Intersection LOS: D
Intersection Capacity Utilization 84.6% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave

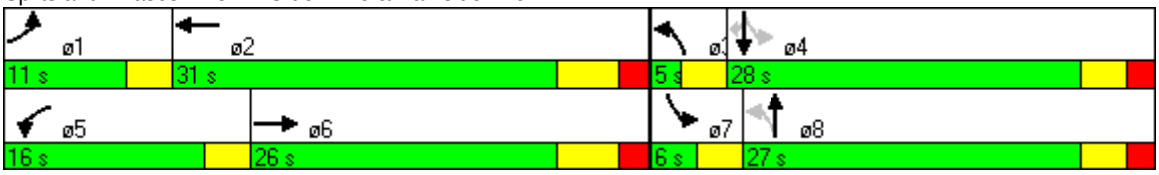


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1747	0	1770	1863	1583
Flt Permitted	0.950			0.950			0.454			0.157		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	846	1747	0	292	1863	1583
Satd. Flow (RTOR)		7			28			48				171
Lane Group Flow (vph)	153	838	0	264	1004	0	24	511	0	130	334	171
Turn Type	Prot			Prot			pm+pt			pm+pt		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases							8			4		4
Total Split (s)	11.0	26.0	0.0	16.0	31.0	0.0	5.0	27.0	0.0	6.0	28.0	28.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	5.0
Act Effct Green (s)	8.0	20.3		12.7	25.0		25.5	21.5		28.7	25.5	25.5
Actuated g/C Ratio	0.11	0.27		0.17	0.34		0.34	0.29		0.39	0.34	0.34
v/c Ratio	0.83	0.87		0.90	0.85		0.08	0.95		0.76	0.52	0.26
Control Delay	69.6	37.8		65.6	31.1		14.5	54.4		47.2	23.9	4.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	69.6	37.8		65.6	31.1		14.5	54.4		47.2	23.9	4.7
LOS	E	D		E	C		B	D		D	C	A
Approach Delay		42.7			38.3			52.6			23.5	
Approach LOS		D			D			D			C	

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 74.5
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 39.1 — Intersection LOS: D
Intersection Capacity Utilization 83.8% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave



Olden Avenue and Parkside Avenue

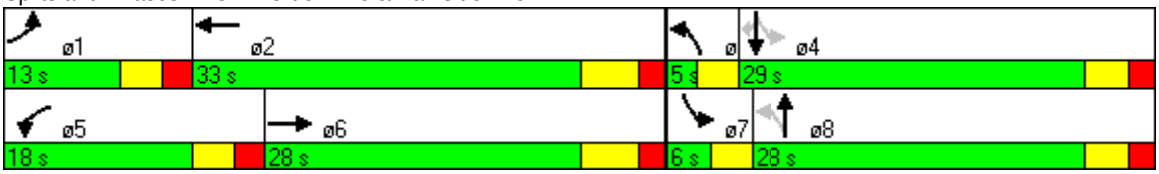
PM Peak Hour - Scenario 4 with Parkside LTs Prot+Perm and Two Second All Red

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1747	0	1770	1863	1583
Flt Permitted	0.950			0.950			0.439			0.150		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	818	1747	0	279	1863	1583
Satd. Flow (RTOR)		7			26			44				171
Lane Group Flow (vph)	153	838	0	264	1004	0	24	511	0	130	334	171
Turn Type	Prot			Prot			pm+pt			pm+pt		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases							8			4		4
Total Split (s)	13.0	28.0	0.0	18.0	33.0	0.0	5.0	28.0	0.0	6.0	29.0	29.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	5.0
Act Effct Green (s)	8.0	22.0		13.0	27.0		26.7	22.7		29.9	26.7	26.7
Actuated g/C Ratio	0.10	0.28		0.16	0.34		0.34	0.28		0.38	0.34	0.34
v/c Ratio	0.89	0.86		0.95	0.84		0.08	0.96		0.81	0.54	0.27
Control Delay	84.0	38.0		77.9	32.0		16.0	59.3		57.7	26.0	4.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	84.0	38.0		77.9	32.0		16.0	59.3		57.7	26.0	4.9
LOS	F	D		E	C		B	E		E	C	A
Approach Delay		45.1			41.6			57.4			26.8	
Approach LOS		D			D			E			C	

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 79.7
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 42.3 — Intersection LOS: D
Intersection Capacity Utilization 84.6% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1747	0	1770	1863	1583
Flt Permitted	0.950			0.950			0.431			0.286		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	803	1747	0	533	1863	1583
Satd. Flow (RTOR)		11			42			70				171
Lane Group Flow (vph)	153	838	0	264	1004	0	24	511	0	130	334	171
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		4
Total Split (s)	8.0	20.0	0.0	11.0	23.0	0.0	19.0	19.0	0.0	19.0	19.0	19.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Act Effct Green (s)	5.0	14.0		8.0	17.0		14.0	14.0		14.0	14.0	14.0
Actuated g/C Ratio	0.10	0.28		0.16	0.34		0.28	0.28		0.28	0.28	0.28
v/c Ratio	0.89	0.85		0.96	0.83		0.11	0.95		0.87	0.64	0.30
Control Delay	75.4	27.3		73.2	22.8		14.9	47.2		72.2	22.6	4.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	75.4	27.3		73.2	22.8		14.9	47.2		72.2	22.6	4.7
LOS	E	C		E	C		B	D		E	C	A
Approach Delay		34.7			33.3			45.8			27.9	
Approach LOS		C			C			D			C	

Intersection Summary

Cycle Length: 50
Actuated Cycle Length: 50
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 34.7 — Intersection LOS: C
Intersection Capacity Utilization 84.6% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave

Olden Avenue and Parkside Avenue

PM Peak Hour - Scenario 4 with Parkside LTs Perm ONLY and Two Second All Red

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1747	0	1770	1863	1583
Flt Permitted	0.950			0.950			0.406			0.267		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	756	1747	0	497	1863	1583
Satd. Flow (RTOR)		10			38			63				171
Lane Group Flow (vph)	153	838	0	264	1004	0	24	511	0	130	334	171
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		4
Total Split (s)	11.0	21.0	0.0	14.0	24.0	0.0	20.0	20.0	0.0	20.0	20.0	20.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Act Effct Green (s)	6.0	15.0		9.0	18.0		15.0	15.0		15.0	15.0	15.0
Actuated g/C Ratio	0.11	0.27		0.16	0.33		0.27	0.27		0.27	0.27	0.27
v/c Ratio	0.82	0.87		0.94	0.87		0.12	0.98		0.96	0.66	0.31
Control Delay	60.7	31.0		69.3	27.1		16.9	56.3		95.2	25.3	5.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	60.7	31.0		69.3	27.1		16.9	56.3		95.2	25.3	5.0
LOS	E	C		E	C		B	E		F	C	A
Approach Delay		35.6			35.8			54.5			34.1	
Approach LOS		D			D			D			C	

Intersection Summary

Cycle Length: 55
Actuated Cycle Length: 55
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.98
Intersection Signal Delay: 38.4 — Intersection LOS: D
Intersection Capacity Utilization 85.5% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1801	1583	1770	1863	1636
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	1770	1801	1583	1770	1863	1636
Satd. Flow (RTOR)		7			27				211			171
Lane Group Flow (vph)	153	838	0	264	1004	0	24	300	211	130	334	171
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases									8			4
Total Split (s)	11.0	28.0	0.0	17.0	34.0	0.0	7.0	25.0	25.0	10.0	28.0	28.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Act Effct Green (s)	8.0	22.6		13.5	28.1		4.0	16.1	16.1	7.0	23.5	23.5
Actuated g/C Ratio	0.10	0.30		0.18	0.37		0.05	0.21	0.21	0.09	0.31	0.31
v/c Ratio	0.85	0.80		0.87	0.78		0.26	0.79	0.42	0.80	0.58	0.27
Control Delay	74.8	32.9		61.1	26.6		43.3	43.7	6.7	70.7	27.7	5.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.8	32.9		61.1	26.6		43.3	43.7	6.7	70.7	27.7	5.1
LOS	E	C		E	C		D	D	A	E	C	A
Approach Delay		39.3			33.8			29.1			30.5	
Approach LOS		D			C			C			C	

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 76.3
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.87
Intersection Signal Delay: 34.0 — Intersection LOS: C
Intersection Capacity Utilization 72.0% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1801	1583	1770	1863	1636
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	1770	1801	1583	1770	1863	1636
Satd. Flow (RTOR)		7			26				211			171
Lane Group Flow (vph)	153	838	0	264	1004	0	24	300	211	130	334	171
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases									8			4
Total Split (s)	13.0	27.0	0.0	18.0	32.0	0.0	7.0	25.0	25.0	10.0	28.0	28.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Act Effct Green (s)	8.0	21.1		13.0	26.1		4.0	16.1	16.1	7.0	23.5	23.5
Actuated g/C Ratio	0.10	0.28		0.17	0.34		0.05	0.21	0.21	0.09	0.31	0.31
v/c Ratio	0.85	0.86		0.90	0.84		0.26	0.79	0.42	0.80	0.58	0.27
Control Delay	74.8	37.6		67.8	31.1		43.3	43.7	6.7	70.7	27.7	5.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.8	37.6		67.8	31.1		43.3	43.7	6.7	70.7	27.7	5.1
LOS	E	D		E	C		D	D	A	E	C	A
Approach Delay		43.4			38.7			29.1			30.5	
Approach LOS		D			D			C			C	

Intersection Summary

Cycle Length: 80
Actuated Cycle Length: 76.3
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 37.0 — Intersection LOS: D
Intersection Capacity Utilization 72.8% — ICU Level of Service C
Analysis Period (min) 15

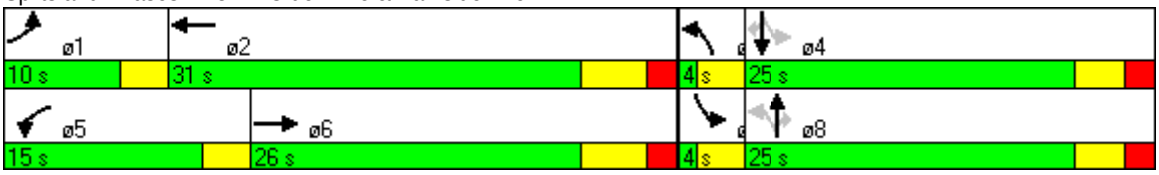
Splits and Phases: 3: N. Olden Ave & Parkside Ave

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1801	1583	1770	1863	1636
Flt Permitted	0.950			0.950			0.354			0.387		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	659	1801	1583	721	1863	1636
Satd. Flow (RTOR)		8			31				211			171
Lane Group Flow (vph)	153	838	0	264	1004	0	24	300	211	130	334	171
Turn Type	Prot			Prot			pm+pt		Perm	pm+pt		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases							8		8	4		4
Total Split (s)	10.0	26.0	0.0	15.0	31.0	0.0	4.0	25.0	25.0	4.0	25.0	25.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Act Effct Green (s)	7.0	20.5		11.8	25.2		17.7	14.9	14.9	18.9	16.5	16.5
Actuated g/C Ratio	0.11	0.32		0.18	0.39		0.28	0.23	0.23	0.29	0.26	0.26
v/c Ratio	0.81	0.75		0.84	0.73		0.12	0.72	0.40	0.57	0.70	0.31
Control Delay	65.2	26.1		53.4	21.2		16.5	33.2	5.8	29.3	30.3	5.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	65.2	26.1		53.4	21.2		16.5	33.2	5.8	29.3	30.3	5.4
LOS	E	C		D	C		B	C	A	C	C	A
Approach Delay		32.1			27.9			21.6			23.4	
Approach LOS		C			C			C			C	

Intersection Summary

Cycle Length: 70
Actuated Cycle Length: 64.3
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 27.3 — Intersection LOS: C
Intersection Capacity Utilization 72.0% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave

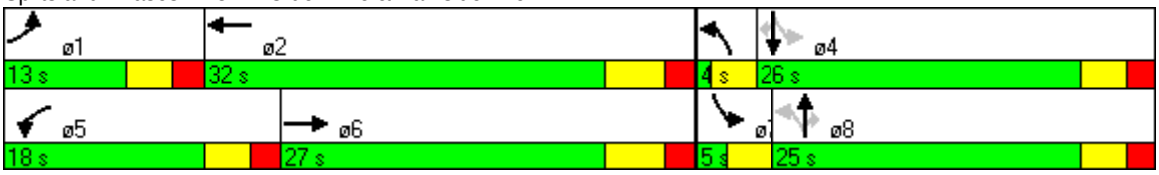


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1801	1583	1770	1863	1636
Flt Permitted	0.950			0.950			0.354			0.348		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	659	1801	1583	648	1863	1636
Satd. Flow (RTOR)		7			28				211			171
Lane Group Flow (vph)	153	838	0	264	1004	0	24	300	211	130	334	171
Turn Type	Prot			Prot			pm+pt		Perm	pm+pt		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases							8		8	4		4
Total Split (s)	13.0	27.0	0.0	18.0	32.0	0.0	4.0	25.0	25.0	5.0	26.0	26.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Act Effct Green (s)	8.1	21.7		12.6	26.2		18.3	15.5	15.5	20.6	17.8	17.8
Actuated g/C Ratio	0.12	0.31		0.18	0.38		0.26	0.22	0.22	0.30	0.26	0.26
v/c Ratio	0.77	0.76		0.85	0.76		0.13	0.75	0.41	0.58	0.70	0.31
Control Delay	59.8	28.8		56.5	24.3		18.5	37.9	6.2	30.6	32.2	5.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.8	28.8		56.5	24.3		18.5	37.9	6.2	30.6	32.2	5.6
LOS	E	C		E	C		B	D	A	C	C	A
Approach Delay		33.6			31.0			24.5			24.7	
Approach LOS		C			C			C			C	

Intersection Summary

Cycle Length: 75
Actuated Cycle Length: 69.7
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 29.6 — Intersection LOS: C
Intersection Capacity Utilization 72.8% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave



Olden Avenue and Parkside Avenue

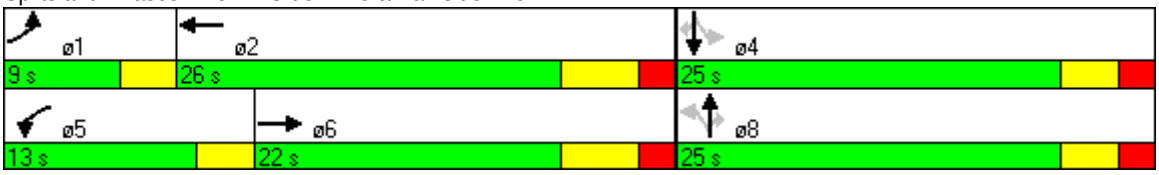
PM Peak Hour - Scenario 5 with Parkside LTs Perm ONLY

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1801	1583	1770	1863	1636
Flt Permitted	0.950			0.950			0.391			0.450		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	728	1801	1583	838	1863	1636
Satd. Flow (RTOR)		9			35				211			171
Lane Group Flow (vph)	153	838	0	264	1004	0	24	300	211	130	334	171
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8		8	4		4
Total Split (s)	9.0	22.0	0.0	13.0	26.0	0.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)	6.0	16.1		10.1	20.1		13.8	13.8	13.8	13.8	13.8	13.8
Actuated g/C Ratio	0.11	0.30		0.19	0.37		0.26	0.26	0.26	0.26	0.26	0.26
v/c Ratio	0.80	0.80		0.83	0.77		0.13	0.65	0.38	0.61	0.70	0.31
Control Delay	59.1	26.0		48.2	20.7		16.4	24.9	4.9	30.3	26.6	4.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.1	26.0		48.2	20.7		16.4	24.9	4.9	30.3	26.6	4.7
LOS	E	C		D	C		B	C	A	C	C	A
Approach Delay		31.1			26.4			16.6			21.4	
Approach LOS		C			C			B			C	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 54
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 25.3 — Intersection LOS: C
Intersection Capacity Utilization 72.8% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave



Olden Avenue and Parkside Avenue

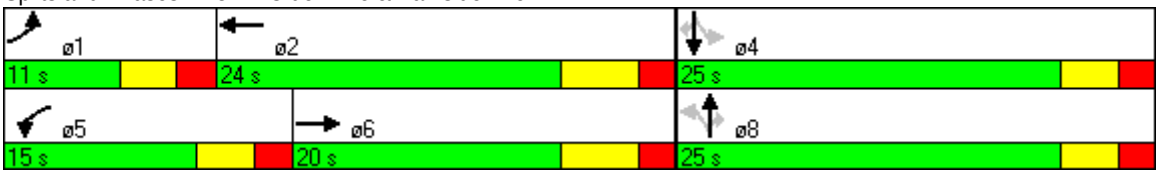
PM Peak Hour - Scenario 5 with Parkside LTs Perm ONLY and Two Second All Red

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1801	1583	1770	1863	1636
Flt Permitted	0.950			0.950			0.391			0.450		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	728	1801	1583	838	1863	1636
Satd. Flow (RTOR)		8			33				211			171
Lane Group Flow (vph)	153	838	0	264	1004	0	24	300	211	130	334	171
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8		8	4		4
Total Split (s)	11.0	20.0	0.0	15.0	24.0	0.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)	6.0	14.1		10.1	18.1		13.8	13.8	13.8	13.8	13.8	13.8
Actuated g/C Ratio	0.11	0.26		0.19	0.34		0.26	0.26	0.26	0.26	0.26	0.26
v/c Ratio	0.80	0.91		0.83	0.85		0.13	0.65	0.38	0.61	0.70	0.31
Control Delay	59.1	37.5		48.2	26.6		16.4	24.9	4.9	30.3	26.6	4.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.1	37.5		48.2	26.6		16.4	24.9	4.9	30.3	26.6	4.7
LOS	E	D		D	C		B	C	A	C	C	A
Approach Delay		40.9			31.1			16.6			21.4	
Approach LOS		D			C			B			C	

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 54
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 29.9 — Intersection LOS: C
Intersection Capacity Utilization 73.6% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	0	3213	0	0	3364	0
Flt Permitted	0.950			0.950				0.907			0.654	
Satd. Flow (perm)	1711	3511	0	1711	3461	0	0	2920	0	0	2222	0
Satd. Flow (RTOR)		6			25			178			63	
Lane Group Flow (vph)	153	838	0	264	1004	0	0	535	0	0	635	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		
Total Split (s)	14.0	33.0	0.0	22.0	41.0	0.0	35.0	35.0	0.0	35.0	35.0	0.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	10.5	29.5		16.2	35.2			25.4			25.4	
Actuated g/C Ratio	0.12	0.35		0.19	0.41			0.30			0.30	
v/c Ratio	0.73	0.69		0.81	0.69			0.54			0.90	
Control Delay	58.3	28.9		53.7	24.0			18.1			42.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	58.3	28.9		53.7	24.0			18.1			42.6	
LOS	E	C		D	C			B			D	
Approach Delay		33.4			30.2			18.1			42.6	
Approach LOS		C			C			B			D	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 85.1
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.90
Intersection Signal Delay: 31.5 — Intersection LOS: C
Intersection Capacity Utilization 83.1% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave

Olden Avenue and Parkside Avenue

PM Peak Hour - Scenario 1 with Two Second All Red (90s CL)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	0	3213	0	0	3364	0
Flt Permitted	0.950			0.950				0.906			0.649	
Satd. Flow (perm)	1711	3511	0	1711	3461	0	0	2917	0	0	2205	0
Satd. Flow (RTOR)		6			25			173			61	
Lane Group Flow (vph)	153	838	0	264	1004	0	0	535	0	0	635	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		
Total Split (s)	16.0	34.0	0.0	23.0	41.0	0.0	33.0	33.0	0.0	33.0	33.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	10.5	29.5		16.1	35.1			25.5			25.5	
Actuated g/C Ratio	0.12	0.34		0.18	0.40			0.29			0.29	
v/c Ratio	0.74	0.70		0.84	0.71			0.55			0.92	
Control Delay	60.7	29.8		57.9	25.3			19.3			47.6	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	60.7	29.8		57.9	25.3			19.3			47.6	
LOS	E	C		E	C			B			D	
Approach Delay		34.5			32.1			19.3			47.6	
Approach LOS		C			C			B			D	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 87.1
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.92
Intersection Signal Delay: 33.7 — Intersection LOS: C
Intersection Capacity Utilization 83.9% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	0	3213	0	0	3364	0
Flt Permitted	0.950			0.950				0.998			0.990	
Satd. Flow (perm)	1711	3511	0	1711	3461	0	0	3213	0	0	3364	0
Satd. Flow (RTOR)		6			24			139			51	
Lane Group Flow (vph)	153	838	0	264	1004	0	0	535	0	0	635	0
Turn Type	Prot			Prot			Split			Split		
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases												
Total Split (s)	12.0	32.0	0.0	19.0	39.0	0.0	18.0	18.0	0.0	21.0	21.0	0.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	9.0	26.6		15.4	33.0			12.8			16.0	
Actuated g/C Ratio	0.10	0.30		0.17	0.37			0.14			0.18	
v/c Ratio	0.89	0.80		0.90	0.78			0.93			0.99	
Control Delay	87.8	36.4		70.2	29.8			52.2			68.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	87.8	36.4		70.2	29.8			52.2			68.8	
LOS	F	D		E	C			D			E	
Approach Delay		44.3			38.2			52.2			68.8	
Approach LOS		D			D			D			E	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 89.8	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 47.8	Intersection LOS: D
Intersection Capacity Utilization 83.1%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: N. Olden Ave & Parkside Ave

Olden Avenue and Parkside Avenue

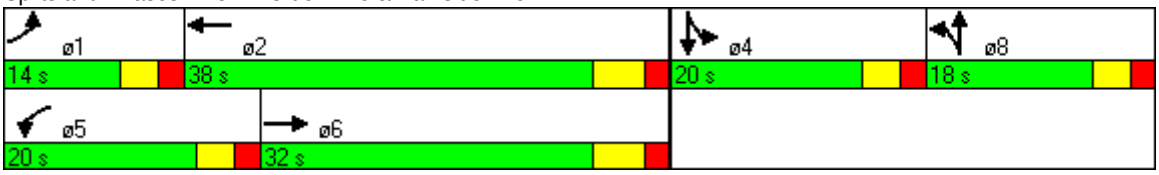
PM Peak Hour - Scenario 2 with Two Second All Red (90s CL)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	0	3213	0	0	3364	0
Flt Permitted	0.950			0.950				0.998			0.990	
Satd. Flow (perm)	1711	3511	0	1711	3461	0	0	3213	0	0	3364	0
Satd. Flow (RTOR)		6			24			139			50	
Lane Group Flow (vph)	153	838	0	264	1004	0	0	535	0	0	635	0
Turn Type	Prot			Prot			Split			Split		
Protected Phases	1	6		5	2		8	8		4	4	
Permitted Phases												
Total Split (s)	14.0	32.0	0.0	20.0	38.0	0.0	18.0	18.0	0.0	20.0	20.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	9.0	26.1		14.9	32.0			12.8			15.0	
Actuated g/C Ratio	0.10	0.29		0.17	0.36			0.14			0.17	
v/c Ratio	0.89	0.82		0.93	0.80			0.93			1.05	
Control Delay	87.8	37.4		77.5	31.5			52.2			86.4	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	87.8	37.4		77.5	31.5			52.2			86.4	
LOS	F	D		E	C			D			F	
Approach Delay		45.2			41.1			52.2			86.4	
Approach LOS		D			D			D			F	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 89.8
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.05
Intersection Signal Delay: 52.4 — Intersection LOS: D
Intersection Capacity Utilization 83.9% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave



Olden Avenue and Parkside Avenue

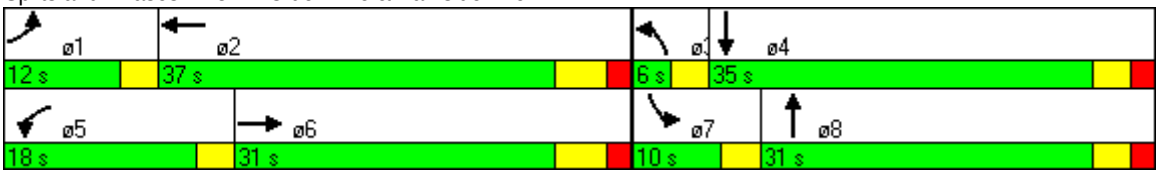
PM Peak Hour - Scenario 3 with Parkside LTs Prot ONLY (90s CL)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1689	0	1770	1768	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	1770	1689	0	1770	1768	0
Satd. Flow (RTOR)		6			24			40			31	
Lane Group Flow (vph)	153	838	0	264	1004	0	24	511	0	130	505	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												
Total Split (s)	12.0	31.0	0.0	18.0	37.0	0.0	6.0	31.0	0.0	10.0	35.0	0.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	4.0
Act Effct Green (s)	9.0	25.1		14.9	31.0		3.0	26.0		7.0	33.6	
Actuated g/C Ratio	0.10	0.28		0.17	0.34		0.03	0.29		0.08	0.37	
v/c Ratio	0.89	0.85		0.93	0.83		0.41	0.99		0.94	0.74	
Control Delay	88.2	40.5		77.5	33.8		63.2	68.7		106.8	32.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	88.2	40.5		77.5	33.8		63.2	68.7		106.8	32.0	
LOS	F	D		E	C		E	E		F	C	
Approach Delay		47.9			42.9			68.4			47.3	
Approach LOS		D			D			E			D	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.99
Intersection Signal Delay: 49.1 — Intersection LOS: D
Intersection Capacity Utilization 83.8% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave

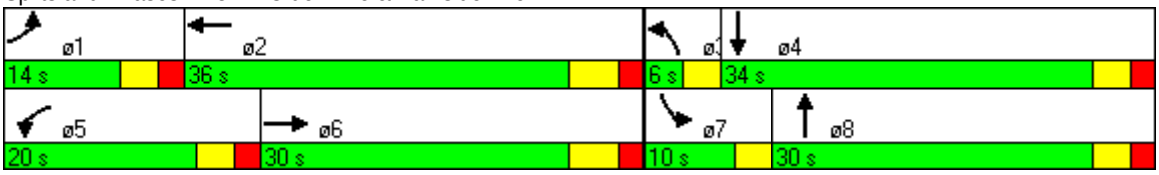


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1689	0	1770	1768	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	1770	1689	0	1770	1768	0
Satd. Flow (RTOR)		6			23			39			30	
Lane Group Flow (vph)	153	838	0	264	1004	0	24	511	0	130	505	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												
Total Split (s)	14.0	30.0	0.0	20.0	36.0	0.0	6.0	30.0	0.0	10.0	34.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	4.0
Act Effct Green (s)	9.0	24.1		14.9	30.0		3.0	25.0		7.0	32.6	
Actuated g/C Ratio	0.10	0.27		0.17	0.33		0.03	0.28		0.08	0.36	
v/c Ratio	0.89	0.89		0.93	0.86		0.41	1.03		0.94	0.77	
Control Delay	88.2	44.5		77.5	36.4		63.2	79.4		106.8	34.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	88.2	44.5		77.5	36.4		63.2	79.4		106.8	34.1	
LOS	F	D		E	D		E	E		F	C	
Approach Delay		51.2			44.9			78.7			49.0	
Approach LOS		D			D			E			D	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.03
Intersection Signal Delay: 52.8 — Intersection LOS: D
Intersection Capacity Utilization 84.6% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave

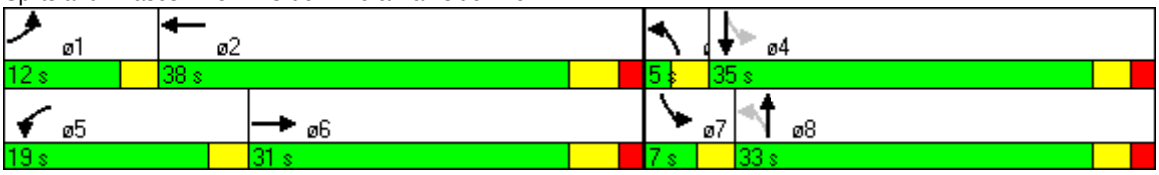


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1689	0	1770	1768	0
Flt Permitted	0.950			0.950			0.233			0.137		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	434	1689	0	255	1768	0
Satd. Flow (RTOR)		6			24			41			31	
Lane Group Flow (vph)	153	838	0	264	1004	0	24	511	0	130	505	0
Turn Type	Prot			Prot			pm+pt			pm+pt		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases							8			4		
Total Split (s)	12.0	31.0	0.0	19.0	38.0	0.0	5.0	33.0	0.0	7.0	35.0	0.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	4.0
Act Effct Green (s)	9.0	25.7		15.3	32.0		30.8	26.8		35.5	31.9	
Actuated g/C Ratio	0.10	0.29		0.17	0.36		0.35	0.30		0.40	0.36	
v/c Ratio	0.88	0.82		0.89	0.80		0.13	0.95		0.76	0.77	
Control Delay	85.7	37.9		69.3	30.8		17.7	57.3		49.5	33.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	85.7	37.9		69.3	30.8		17.7	57.3		49.5	33.9	
LOS	F	D		E	C		B	E		D	C	
Approach Delay		45.3			38.8			55.5			37.1	
Approach LOS		D			D			E			D	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 88.9
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 43.0 — Intersection LOS: D
Intersection Capacity Utilization 83.8% — ICU Level of Service E
Analysis Period (min) 15

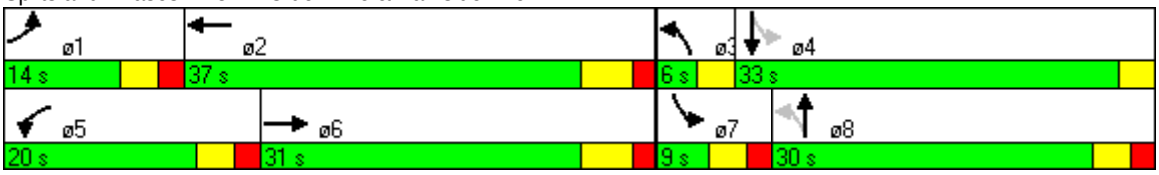
Splits and Phases: 3: N. Olden Ave & Parkside Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1689	0	1770	1768	0
Flt Permitted	0.950			0.950			0.212			0.119		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	395	1689	0	222	1768	0
Satd. Flow (RTOR)		6			24			39			31	
Lane Group Flow (vph)	153	838	0	264	1004	0	24	511	0	130	505	0
Turn Type	Prot			Prot			pm+pt			pm+pt		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases							8			4		
Total Split (s)	14.0	31.0	0.0	20.0	37.0	0.0	6.0	30.0	0.0	9.0	33.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	3.0	5.0	4.0	5.0	3.0	4.0
Act Effct Green (s)	9.0	25.1		14.9	31.0		30.0	25.0		33.2	33.6	
Actuated g/C Ratio	0.10	0.28		0.17	0.34		0.33	0.28		0.37	0.37	
v/c Ratio	0.89	0.85		0.93	0.83		0.13	1.03		0.86	0.74	
Control Delay	88.2	40.5		77.5	33.8		18.4	79.4		69.4	32.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	88.2	40.5		77.5	33.8		18.4	79.4		69.4	32.0	
LOS	F	D		E	C		B	E		E	C	
Approach Delay		47.9			42.9			76.7			39.7	
Approach LOS		D			D			E			D	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.03	
Intersection Signal Delay: 49.0	Intersection LOS: D
Intersection Capacity Utilization 85.5%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: N. Olden Ave & Parkside Ave

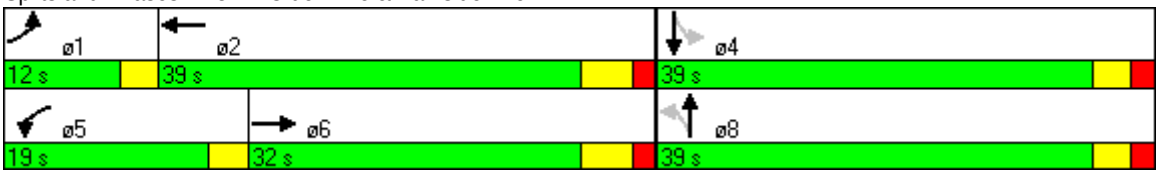


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1689	0	1770	1768	0
Flt Permitted	0.950			0.950			0.194			0.186		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	361	1689	0	346	1768	0
Satd. Flow (RTOR)		6			24			45			33	
Lane Group Flow (vph)	153	838	0	264	1004	0	24	511	0	130	505	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		
Total Split (s)	12.0	32.0	0.0	19.0	39.0	0.0	39.0	39.0	0.0	39.0	39.0	0.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	9.1	27.2		15.1	33.2		28.5	28.5		28.5	28.5	
Actuated g/C Ratio	0.11	0.32		0.18	0.39		0.34	0.34		0.34	0.34	
v/c Ratio	0.84	0.74		0.87	0.73		0.20	0.86		1.12	0.82	
Control Delay	76.3	32.1		63.1	26.5		23.8	38.6		148.7	35.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	76.3	32.1		63.1	26.5		23.8	38.6		148.7	35.7	
LOS	E	C		E	C		C	D		F	D	
Approach Delay		39.0			34.1			38.0			58.8	
Approach LOS		D			C			D			E	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 84.9
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.12
Intersection Signal Delay: 40.7 — Intersection LOS: D
Intersection Capacity Utilization 84.6% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave

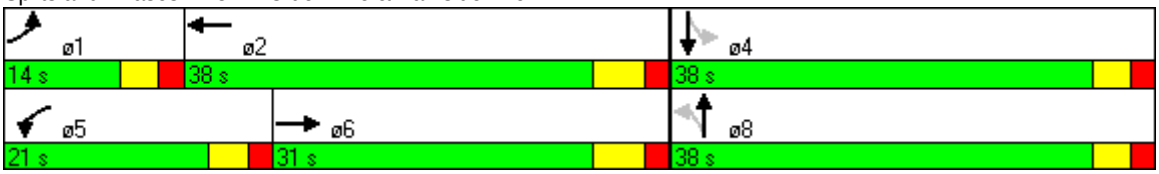


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1689	0	1770	1768	0
Flt Permitted	0.950			0.950			0.196			0.189		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	365	1689	0	352	1768	0
Satd. Flow (RTOR)		6			24			44			32	
Lane Group Flow (vph)	153	838	0	264	1004	0	24	511	0	130	505	0
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		
Total Split (s)	14.0	31.0	0.0	21.0	38.0	0.0	38.0	38.0	0.0	38.0	38.0	0.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	4.0
Act Effct Green (s)	9.0	26.0		15.2	32.1		29.2	29.2		29.2	29.2	
Actuated g/C Ratio	0.10	0.30		0.18	0.37		0.34	0.34		0.34	0.34	
v/c Ratio	0.85	0.79		0.88	0.77		0.20	0.85		1.09	0.82	
Control Delay	79.8	35.5		66.2	29.1		24.3	38.9		140.9	36.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	79.8	35.5		66.2	29.1		24.3	38.9		140.9	36.0	
LOS	E	D		E	C		C	D		F	D	
Approach Delay		42.3			36.8			38.3			57.5	
Approach LOS		D			D			D			E	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 86.5
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.09
Intersection Signal Delay: 42.5 — Intersection LOS: D
Intersection Capacity Utilization 85.5% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave



Olden Avenue and Parkside Avenue

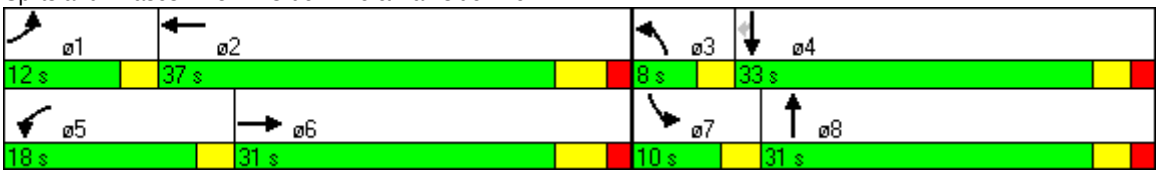
PM Peak Hour - Scenario 4 with Parkside LTs Prot ONLY (90s CL)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1747	0	1770	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	1770	1747	0	1770	1863	1583
Satd. Flow (RTOR)		6			24			40				171
Lane Group Flow (vph)	153	838	0	264	1004	0	24	511	0	130	334	171
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												4
Total Split (s)	12.0	31.0	0.0	18.0	37.0	0.0	8.0	31.0	0.0	10.0	33.0	33.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	5.0
Act Effct Green (s)	9.0	25.1		14.9	31.0		5.0	25.6		7.0	32.4	32.4
Actuated g/C Ratio	0.10	0.28		0.17	0.35		0.06	0.29		0.08	0.36	0.36
v/c Ratio	0.89	0.85		0.93	0.83		0.24	0.97		0.94	0.50	0.25
Control Delay	87.3	40.0		77.1	33.4		47.0	62.9		105.7	26.4	4.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	87.3	40.0		77.1	33.4		47.0	62.9		105.7	26.4	4.9
LOS	F	D		E	C		D	E		F	C	A
Approach Delay		47.3			42.5			62.2			36.8	
Approach LOS		D			D			E			D	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 89.6
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.97
Intersection Signal Delay: 45.9 — Intersection LOS: D
Intersection Capacity Utilization 83.8% — ICU Level of Service E
Analysis Period (min) 15

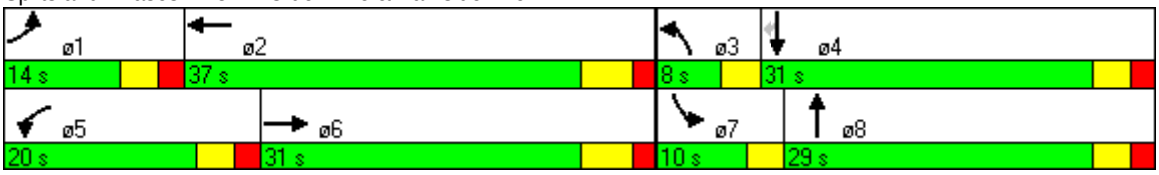
Splits and Phases: 3: N. Olden Ave & Parkside Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1747	0	1770	1863	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	1770	1747	0	1770	1863	1583
Satd. Flow (RTOR)		6			24			38				171
Lane Group Flow (vph)	153	838	0	264	1004	0	24	511	0	130	334	171
Turn Type	Prot			Prot			Prot			Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases												4
Total Split (s)	14.0	31.0	0.0	20.0	37.0	0.0	8.0	29.0	0.0	10.0	31.0	31.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	5.0
Act Effct Green (s)	9.0	25.1		14.9	31.0		5.0	24.0		7.0	30.8	30.8
Actuated g/C Ratio	0.10	0.28		0.17	0.34		0.06	0.27		0.08	0.34	0.34
v/c Ratio	0.89	0.85		0.93	0.83		0.24	1.03		0.94	0.52	0.26
Control Delay	88.2	40.5		77.5	33.8		47.0	81.7		106.8	28.5	5.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	88.2	40.5		77.5	33.8		47.0	81.7		106.8	28.5	5.2
LOS	F	D		E	C		D	F		F	C	A
Approach Delay		47.9			42.9			80.1			38.3	
Approach LOS		D			D			F			D	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.03	
Intersection Signal Delay: 49.3	Intersection LOS: D
Intersection Capacity Utilization 84.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 3: N. Olden Ave & Parkside Ave

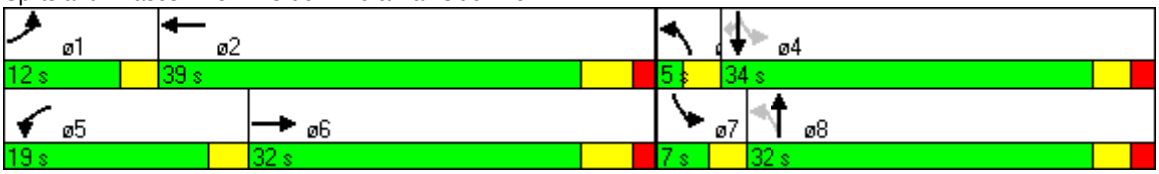


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1747	0	1770	1863	1583
Flt Permitted	0.950			0.950			0.450			0.130		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	838	1747	0	242	1863	1583
Satd. Flow (RTOR)		6			24			40				171
Lane Group Flow (vph)	153	838	0	264	1004	0	24	511	0	130	334	171
Turn Type	Prot			Prot			pm+pt			pm+pt		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases							8			4		4
Total Split (s)	12.0	32.0	0.0	19.0	39.0	0.0	5.0	32.0	0.0	7.0	34.0	34.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	5.0
Act Effct Green (s)	9.0	26.7		15.3	33.0		30.0	26.0		34.6	31.0	31.0
Actuated g/C Ratio	0.10	0.30		0.17	0.37		0.34	0.29		0.39	0.35	0.35
v/c Ratio	0.88	0.79		0.89	0.77		0.08	0.95		0.80	0.51	0.26
Control Delay	85.9	35.6		69.4	29.2		17.3	58.1		55.6	27.0	4.8
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	85.9	35.6		69.4	29.2		17.3	58.1		55.6	27.0	4.8
LOS	F	D		E	C		B	E		E	C	A
Approach Delay		43.4			37.6			56.2			26.9	
Approach LOS		D			D			E			C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 89
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 40.2 — Intersection LOS: D
Intersection Capacity Utilization 83.8% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave



Olden Avenue and Parkside Avenue

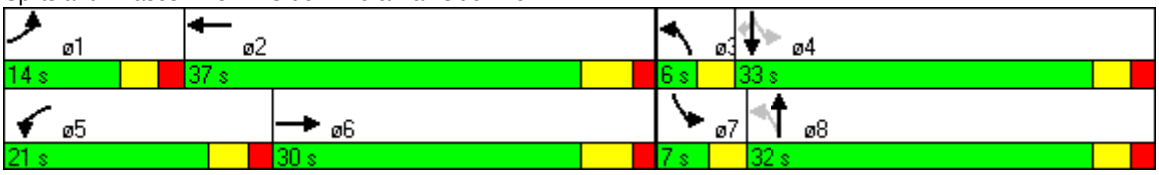
PM Peak Hour - Scenario 4 with Parkside LTs Prot+Perm and Two Second All Red (90s CL)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1747	0	1770	1863	1583
Flt Permitted	0.950			0.950			0.440			0.131		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	820	1747	0	244	1863	1583
Satd. Flow (RTOR)		6			24			40				171
Lane Group Flow (vph)	153	838	0	264	1004	0	24	511	0	130	334	171
Turn Type	Prot			Prot			pm+pt			pm+pt		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases							8			4		4
Total Split (s)	14.0	30.0	0.0	21.0	37.0	0.0	6.0	32.0	0.0	7.0	33.0	33.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	3.0	5.0	4.0	3.0	5.0	5.0
Act Effct Green (s)	9.0	24.7		15.3	31.0		31.0	26.0		34.2	30.6	30.6
Actuated g/C Ratio	0.10	0.28		0.17	0.35		0.35	0.29		0.38	0.34	0.34
v/c Ratio	0.88	0.86		0.89	0.82		0.08	0.95		0.80	0.52	0.26
Control Delay	85.9	41.2		69.4	32.9		17.2	58.1		56.4	27.6	4.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	85.9	41.2		69.4	32.9		17.2	58.1		56.4	27.6	4.9
LOS	F	D		E	C		B	E		E	C	A
Approach Delay		48.1			40.5			56.2			27.4	
Approach LOS		D			D			E			C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 89
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.95
Intersection Signal Delay: 42.7 — Intersection LOS: D
Intersection Capacity Utilization 84.6% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave



Olden Avenue and Parkside Avenue

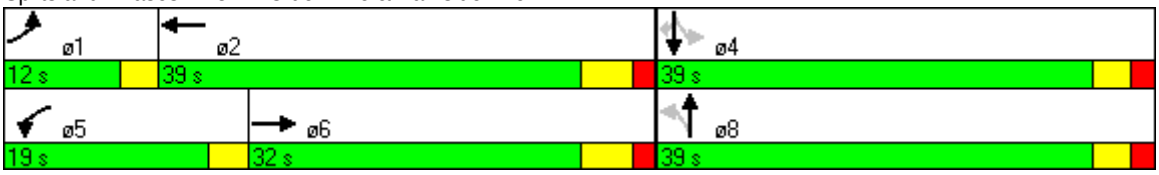
PM Peak Hour - Scenario 4 with Parkside LTs Perm ONLY (90s CL)

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1747	0	1770	1863	1583
Flt Permitted	0.950			0.950			0.405			0.184		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	754	1747	0	343	1863	1583
Satd. Flow (RTOR)		6			24			45				171
Lane Group Flow (vph)	153	838	0	264	1004	0	24	511	0	130	334	171
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		4
Total Split (s)	12.0	32.0	0.0	19.0	39.0	0.0	39.0	39.0	0.0	39.0	39.0	39.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Act Effct Green (s)	9.1	27.2		15.1	33.2		28.3	28.3		28.3	28.3	28.3
Actuated g/C Ratio	0.11	0.32		0.18	0.39		0.33	0.33		0.33	0.33	0.33
v/c Ratio	0.84	0.74		0.87	0.73		0.10	0.83		1.13	0.54	0.27
Control Delay	75.8	32.0		63.0	26.4		19.4	36.1		154.1	25.9	4.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	75.8	32.0		63.0	26.4		19.4	36.1		154.1	25.9	4.3
LOS	E	C		E	C		B	D		F	C	A
Approach Delay		38.8			34.0			35.4			46.3	
Approach LOS		D			C			D			D	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 84.7
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.13
Intersection Signal Delay: 37.9 — Intersection LOS: D
Intersection Capacity Utilization 84.6% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave

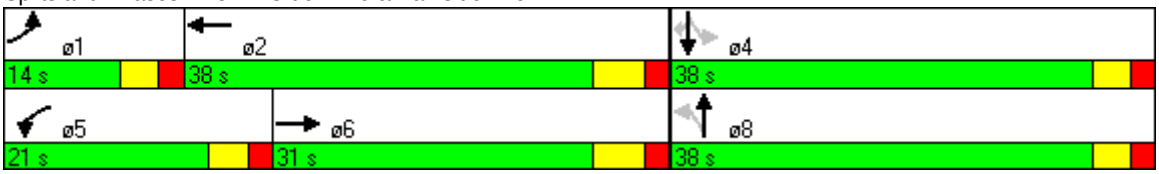


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1747	0	1770	1863	1583
Flt Permitted	0.950			0.950			0.406			0.189		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	756	1747	0	352	1863	1583
Satd. Flow (RTOR)		6			24			44				171
Lane Group Flow (vph)	153	838	0	264	1004	0	24	511	0	130	334	171
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8			4		4
Total Split (s)	14.0	31.0	0.0	21.0	38.0	0.0	38.0	38.0	0.0	38.0	38.0	38.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	5.0	5.0	4.0	5.0	5.0	5.0
Act Effct Green (s)	9.0	26.0		15.2	32.1		29.2	29.2		29.2	29.2	29.2
Actuated g/C Ratio	0.10	0.30		0.18	0.37		0.34	0.34		0.34	0.34	0.34
v/c Ratio	0.85	0.79		0.88	0.77		0.09	0.82		1.09	0.53	0.26
Control Delay	79.8	35.5		66.2	29.1		20.0	36.1		140.9	26.2	4.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	79.8	35.5		66.2	29.1		20.0	36.1		140.9	26.2	4.4
LOS	E	D		E	C		B	D		F	C	A
Approach Delay		42.3			36.8			35.4			43.8	
Approach LOS		D			D			D			D	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 86.5
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.09
Intersection Signal Delay: 39.5 — Intersection LOS: D
Intersection Capacity Utilization 85.5% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave

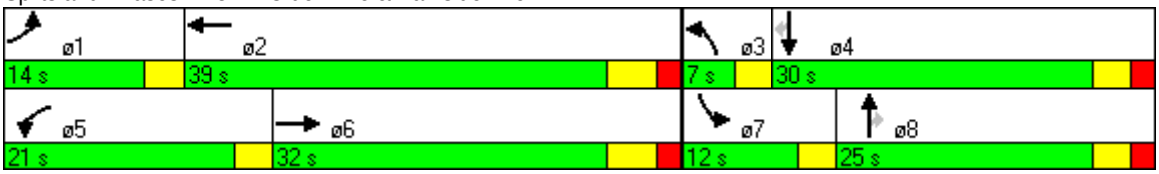


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1801	1583	1770	1863	1636
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	1770	1801	1583	1770	1863	1636
Satd. Flow (RTOR)		6			24				211			171
Lane Group Flow (vph)	153	838	0	264	1004	0	24	300	211	130	334	171
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases									8			4
Total Split (s)	14.0	32.0	0.0	21.0	39.0	0.0	7.0	25.0	25.0	12.0	30.0	30.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Act Effct Green (s)	10.5	27.5		16.1	33.1		4.0	17.4	17.4	8.8	26.5	26.5
Actuated g/C Ratio	0.12	0.32		0.19	0.38		0.05	0.20	0.20	0.10	0.31	0.31
v/c Ratio	0.74	0.75		0.84	0.75		0.29	0.83	0.43	0.73	0.59	0.28
Control Delay	60.3	32.8		57.5	27.7		50.9	53.4	7.4	63.3	31.3	5.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.3	32.8		57.5	27.7		50.9	53.4	7.4	63.3	31.3	5.5
LOS	E	C		E	C		D	D	A	E	C	A
Approach Delay		37.0			33.9			35.2			30.9	
Approach LOS		D			C			D			C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 86.8
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 34.5 — Intersection LOS: C
Intersection Capacity Utilization 72.0% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave

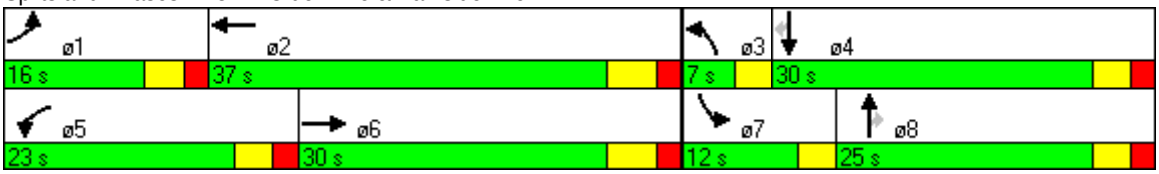


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1801	1583	1770	1863	1636
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	1770	1801	1583	1770	1863	1636
Satd. Flow (RTOR)		6			24				211			171
Lane Group Flow (vph)	153	838	0	264	1004	0	24	300	211	130	334	171
Turn Type	Prot			Prot			Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases									8			4
Total Split (s)	16.0	30.0	0.0	23.0	37.0	0.0	7.0	25.0	25.0	12.0	30.0	30.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Act Effct Green (s)	10.5	25.5		16.1	31.1		4.0	17.4	17.4	8.8	26.5	26.5
Actuated g/C Ratio	0.12	0.29		0.19	0.36		0.05	0.20	0.20	0.10	0.31	0.31
v/c Ratio	0.74	0.81		0.84	0.80		0.29	0.83	0.43	0.73	0.59	0.28
Control Delay	60.3	37.0		57.5	31.1		50.9	53.4	7.4	63.3	31.3	5.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.3	37.0		57.5	31.1		50.9	53.4	7.4	63.3	31.3	5.5
LOS	E	D		E	C		D	D	A	E	C	A
Approach Delay		40.6			36.6			35.2			30.9	
Approach LOS		D			D			D			C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 86.8
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 36.5 — Intersection LOS: D
Intersection Capacity Utilization 72.8% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1801	1583	1770	1863	1636
Flt Permitted	0.950			0.950			0.381			0.276		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	710	1801	1583	514	1863	1636
Satd. Flow (RTOR)		6			26				211			171
Lane Group Flow (vph)	153	838	0	264	1004	0	24	300	211	130	334	171
Turn Type	Prot			Prot			pm+pt		Perm	pm+pt		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases							8		8	4		4
Total Split (s)	14.0	35.0	0.0	22.0	43.0	0.0	4.0	26.0	26.0	7.0	29.0	29.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Act Effct Green (s)	10.5	31.3		16.3	37.1		20.6	17.6	17.6	26.6	23.1	23.1
Actuated g/C Ratio	0.12	0.36		0.19	0.43		0.24	0.20	0.20	0.31	0.27	0.27
v/c Ratio	0.74	0.66		0.81	0.67		0.13	0.82	0.43	0.60	0.67	0.30
Control Delay	59.4	27.1		54.3	22.4		24.1	51.4	7.3	35.5	36.1	5.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.4	27.1		54.3	22.4		24.1	51.4	7.3	35.5	36.1	5.9
LOS	E	C		D	C		C	D	A	D	D	A
Approach Delay		32.1			29.1			32.8			27.9	
Approach LOS		C			C			C			C	

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 86.2	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 30.3	Intersection LOS: C
Intersection Capacity Utilization 72.0%	ICU Level of Service C
Analysis Period (min) 15	

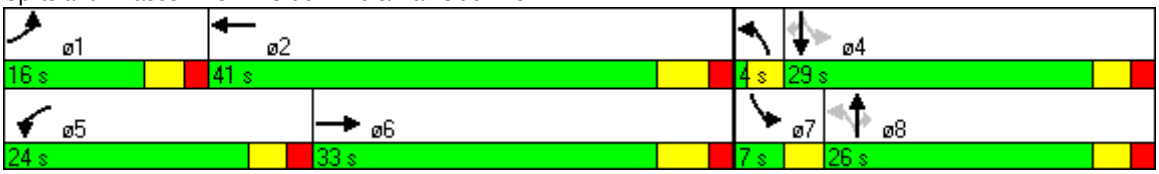
Splits and Phases: 3: N. Olden Ave & Parkside Ave

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1801	1583	1770	1863	1636
Flt Permitted	0.950			0.950			0.381			0.276		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	710	1801	1583	514	1863	1636
Satd. Flow (RTOR)		6			25				211			171
Lane Group Flow (vph)	153	838	0	264	1004	0	24	300	211	130	334	171
Turn Type	Prot			Prot			pm+pt		Perm	pm+pt		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases							8		8	4		4
Total Split (s)	16.0	33.0	0.0	24.0	41.0	0.0	4.0	26.0	26.0	7.0	29.0	29.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	3.0	5.0	5.0	3.0	5.0	5.0
Act Effct Green (s)	10.5	29.3		16.3	35.1		20.6	17.6	17.6	26.6	23.1	23.1
Actuated g/C Ratio	0.12	0.34		0.19	0.41		0.24	0.20	0.20	0.31	0.27	0.27
v/c Ratio	0.74	0.70		0.81	0.71		0.13	0.82	0.43	0.60	0.67	0.30
Control Delay	59.4	29.7		54.3	24.7		24.1	51.4	7.3	35.5	36.1	5.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.4	29.7		54.3	24.7		24.1	51.4	7.3	35.5	36.1	5.9
LOS	E	C		D	C		C	D	A	D	D	A
Approach Delay		34.3			30.8			32.8			27.9	
Approach LOS		C			C			C			C	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 86.2
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 31.6 — Intersection LOS: C
Intersection Capacity Utilization 72.8% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1801	1583	1770	1863	1636
Flt Permitted	0.950			0.950			0.289			0.351		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	538	1801	1583	654	1863	1636
Satd. Flow (RTOR)		6			26				211			171
Lane Group Flow (vph)	153	838	0	264	1004	0	24	300	211	130	334	171
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8		8	4		4
Total Split (s)	17.0	35.0	0.0	24.0	42.0	0.0	31.0	31.0	31.0	31.0	31.0	31.0
Total Lost Time (s)	3.0	6.0	4.0	3.0	6.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)	11.6	31.9		16.0	36.3		18.8	18.8	18.8	18.8	18.8	18.8
Actuated g/C Ratio	0.14	0.39		0.20	0.45		0.23	0.23	0.23	0.23	0.23	0.23
v/c Ratio	0.62	0.60		0.78	0.64		0.19	0.72	0.40	0.86	0.77	0.33
Control Delay	45.6	23.6		47.4	20.4		28.8	39.0	6.2	74.6	41.8	6.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.6	23.6		47.4	20.4		28.8	39.0	6.2	74.6	41.8	6.1
LOS	D	C		D	C		C	D	A	E	D	A
Approach Delay		27.0			26.0			25.6			38.9	
Approach LOS		C			C			C			D	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 80.8
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 28.6 — Intersection LOS: C
Intersection Capacity Utilization 72.8% — ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	731	40	243	788	135	22	276	194	120	307	157
Satd. Flow (prot)	1711	3511	0	1711	3461	0	1770	1801	1583	1770	1863	1636
Flt Permitted	0.950			0.950			0.281			0.343		
Satd. Flow (perm)	1711	3511	0	1711	3461	0	523	1801	1583	639	1863	1636
Satd. Flow (RTOR)		6			26				211			171
Lane Group Flow (vph)	153	838	0	264	1004	0	24	300	211	130	334	171
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	1	6		5	2			8			4	
Permitted Phases							8		8	4		4
Total Split (s)	18.0	35.0	0.0	25.0	42.0	0.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Lost Time (s)	5.0	6.0	4.0	5.0	6.0	4.0	5.0	5.0	5.0	5.0	5.0	5.0
Act Effct Green (s)	11.4	31.5		16.1	36.3		19.1	19.1	19.1	19.1	19.1	19.1
Actuated g/C Ratio	0.14	0.38		0.19	0.44		0.23	0.23	0.23	0.23	0.23	0.23
v/c Ratio	0.65	0.63		0.79	0.66		0.20	0.72	0.40	0.88	0.78	0.34
Control Delay	49.0	25.1		50.3	21.7		29.8	40.1	6.3	80.9	43.0	6.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.0	25.1		50.3	21.7		29.8	40.1	6.3	80.9	43.0	6.2
LOS	D	C		D	C		C	D	A	F	D	A
Approach Delay		28.8			27.6			26.3			40.9	
Approach LOS		C			C			C			D	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 82.9
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.88
Intersection Signal Delay: 30.2 — Intersection LOS: C
Intersection Capacity Utilization 73.6% — ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 3: N. Olden Ave & Parkside Ave

Intersection of Olden Avenue and Parkside Avenue: Delay & LOS Analysis

AM PEAK HOUR

	Existing		Short-Term							
	Existing Timing and Geometry		New Timing with Existing Geometry							
	Existing (93 sec. CL)		Optimized Signal Plan (55 sec. CL)		Optimized Signal Plan (60 sec. CL.) with 2 sec. All-Red for Olden LTs		Parkside Split Phased (60 sec. CL)		Parkside Split Phased (60 sec. CL) with 2 sec. All-Red for Olden LTs	
Parkside LT Type	Perm ONLY		Perm ONLY		Perm ONLY		Prot ONLY		Prot ONLY	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
Olden Ave (EB)	21	C	19	B	20	B	25	C	28	C
Olden Ave (WB)	23	C	18	B	20	C	26	C	29	C
Parkside Ave (NB)	33	C	13	B	14	B	31	C	31	C
Parkside Ave (SB)	51	D	16	B	19	B	37	D	36	D
Total Intersection	29	C	17	B	19	B	29	C	30	C

	Medium-Term											
	New Timing and Geometry. *Scenario 3:* Left & Through/Right-Turn Lanes, One Receiving Lane for Parkside Avenue											
	Optimized Signal Plan (60 sec. CL)		Optimized Signal Plan (60 sec. CL) with 2 sec. All-Red for Olden LTs		Optimized Signal Plan (60 sec. CL)		Optimized Signal Plan (60 sec. CL) with 2 sec. All-Red for Olden LTs		Optimized Signal Plan (55 sec. CL)		Optimized Signal Plan (60 sec. CL) with 2 sec. All-Red for Olden LTs	
Parkside LT Type	Prot ONLY		Prot ONLY		Prot + Perm		Prot + Perm		Perm ONLY		Perm ONLY	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
Olden Ave (EB)	34	C	46	D	26	C	39	D	22	C	23	C
Olden Ave (WB)	30	C	36	D	27	C	32	C	20	C	23	C
Parkside Ave (NB)	29	C	29	C	23	C	25	C	21	C	23	C
Parkside Ave (SB)	29	C	29	C	22	C	20	C	23	C	26	C
Total Intersection	31	C	37	D	25	C	31	C	21	C	24	C

	Medium-Term											
	New Timing and Geometry. *Scenario 4:* Southbound Parkside Avenue Left, Through, & Right-Turn Lanes; Northbound Parkside Avenue Left & Through/Right-Turn Lanes; One Receiving Lane for Parkside Avenue											
	Optimized Signal Plan (60 sec. CL)		Optimized Signal Plan (55 sec. CL) with 2 sec. All-Red for Olden LTs		Optimized Signal Plan (60 sec. CL)		Optimized Signal Plan (60 sec. CL) with 2 sec. All-Red for Olden LTs		Optimized Signal Plan (45 sec. CL)		Optimized Signal Plan (50 sec. CL) with 2 sec. All-Red for Olden LTs	
Parkside LT Type	Prot ONLY		Prot ONLY		Prot + Perm		Prot + Perm		Perm ONLY		Perm ONLY	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
Olden Ave (EB)	26	C	29	C	23	C	24	C	18	B	21	C
Olden Ave (WB)	27	C	30	C	24	C	25	C	19	B	20	B
Parkside Ave (NB)	37	D	44	D	33	C	35	D	27	C	27	C
Parkside Ave (SB)	19	B	23	C	16	B	17	B	16	B	18	B
Total Intersection	27	C	31	C	24	C	25	C	19	B	21	C

	Medium-Term											
	New Timing and Geometry: *Scenario 5:* Left and Right-Turn Lanes for Parkside Avenue; One Receiving Lane for Parkside Avenue											
	Optimized Signal Plan (60 sec. CL)		Optimized Signal Plan (60 sec. CL) with 2 sec. All-Red for Olden LTs		Optimized Signal Plan (60 sec. CL)		Optimized Signal Plan (60 sec. CL) with 2 sec. All-Red for Olden LTs		Optimized Signal Plan (55 sec. CL)		Optimized Signal Plan (60 sec. CL) with 2 sec. All-Red for Olden LTs	
Parkside LT Type	Prot ONLY		Prot ONLY		Prot + Perm		Prot + Perm		Perm ONLY		Perm ONLY	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
Olden Ave (EB)	29	C	37	D	22	C	25	C	19	B	19	B
Olden Ave (WB)	25	C	30	C	23	C	24	C	18	B	20	B
Parkside Ave (NB)	18	B	20	B	16	B	17	B	14	B	16	B
Parkside Ave (SB)	21	C	21	C	16	B	15	B	15	B	18	B
Total Intersection	24	C	29	C	20	B	21	C	17	B	19	B

PM PEAK HOUR

	Existing (103 sec. CL)		Optimized Signal Plan (60 sec. CL)		Optimized Signal Plan (60 sec. CL.) with 2 sec. All-Red for Olden LTs		Parkside Split Phased (80 sec. CL)		Parkside Split Phased (80 sec. CL) with 2 sec. All-Red for Olden LTs	
Parkside LT Type	Perm ONLY		Perm ONLY		Perm ONLY		Prot ONLY		Prot ONLY	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
Olden Ave (EB)	30	C	36	D	50	D	43	D	50	D
Olden Ave (WB)	61	E	30	C	37	D	40	D	45	D
Parkside Ave (NB)	24	C	12	B	12	B	50	D	50	D
Parkside Ave (SB)	55	D	27	C	27	C	68	E	68	E
Total Intersection	45	D	28	C	35	C	47	D	51	D

	Optimized Signal Plan (90 sec. CL)		Optimized Signal Plan (90 sec. CL) with 2 sec. All-Red for Olden LTs		Optimized Signal Plan (80 sec. CL)		Optimized Signal Plan (90 sec. CL) with 2 sec. All-Red for Olden LTs		Optimized Signal Plan (75 sec. CL)		Optimized Signal Plan (75 sec. CL) with 2 sec. All-Red for Olden LTs	
Parkside LT Type	Prot ONLY		Prot ONLY		Prot + Perm		Prot + Perm		Perm ONLY		Perm ONLY	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
Olden Ave (EB)	48	D	51	D	44	D	48	D	37	D	44	D
Olden Ave (WB)	43	D	45	D	37	D	43	D	34	C	39	D
Parkside Ave (NB)	68	E	79	E	56	E	77	E	35	C	34	C
Parkside Ave (SB)	47	D	49	D	38	D	40	D	51	D	47	D
Total Intersection	49	D	53	D	42	D	49	D	38	D	41	D

	Optimized Signal Plan (90 sec. CL)		Optimized Signal Plan (90 sec. CL) with 2 sec. All-Red for Olden LTs		Optimized Signal Plan (75 sec. CL)		Optimized Signal Plan (80 sec. CL) with 2 sec. All-Red for Olden LTs		Optimized Signal Plan (50 sec. CL)		Optimized Signal Plan (55 sec. CL) with 2 sec. All-Red for Olden LTs	
Parkside LT Type	Prot ONLY		Prot ONLY		Prot + Perm		Prot + Perm		Perm ONLY		Perm ONLY	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
Olden Ave (EB)	47	D	48	D	43	D	45	D	35	C	36	D
Olden Ave (WB)	43	D	43	D	38	D	42	D	33	C	36	D
Parkside Ave (NB)	62	E	80	F	53	D	57	E	46	D	55	D
Parkside Ave (SB)	37	D	38	D	24	C	27	C	28	C	34	C
Total Intersection	46	D	49	D	39	D	42	D	35	C	38	D

	Optimized Signal Plan (80 sec. CL)		Optimized Signal Plan (80 sec. CL) with 2 sec. All-Red for Olden LTs		Optimized Signal Plan (70 sec. CL)		Optimized Signal Plan (75 sec. CL) with 2 sec. All-Red for Olden LTs		Optimized Signal Plan (60 sec. CL)		Optimized Signal Plan (60 sec. CL) with 2 sec. All-Red for Olden LTs	
Parkside LT Type	Prot ONLY		Prot ONLY		Prot + Perm		Prot + Perm		Perm ONLY		Perm ONLY	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
Olden Ave (EB)	39	D	43	D	32	C	34	C	31	C	41	D
Olden Ave (WB)	34	C	39	D	28	C	31	C	26	C	31	C
Parkside Ave (NB)	29	C	29	C	22	C	25	C	17	B	17	B
Parkside Ave (SB)	31	C	31	C	23	C	25	C	21	C	21	C
Total Intersection	34	C	37	D	27	C	30	C	25	C	30	C

All Alternatives Evaluated at a 90 Second Cycle Length

AM PEAK HOUR

	Existing		Short-Term							
	Existing Timing and Geometry		New Timing with Existing Geometry							
	Existing (93 sec. CL)		Optimized Signal Plan (90 sec. CL)		Optimized Signal Plan (90 sec. CL.) with 2 sec. All-Red for Olden LTs		Parkside Split Phased (90 sec. CL)		Parkside Split Phased (90 sec. CL) with 2 sec. All-Red for Olden LTs	
Parkside LT Type	Perm ONLY		Perm ONLY		Perm ONLY		Prot ONLY		Prot ONLY	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
Olden Ave (EB)	21	C	22	C	23	C	31	C	32	C
Olden Ave (WB)	23	C	21	C	23	C	30	C	31	C
Parkside Ave (NB)	33	C	23	C	24	C	38	D	40	D
Parkside Ave (SB)	51	D	33	C	34	C	42	D	43	D
Total Intersection	29	C	24	C	25	C	34	C	35	D

	Medium-Term											
	New Timing and Geometry. *Scenario 3:* Left & Through/Right-Turn Lanes for Parkside Avenue, One Receiving Lane for Parkside Avenue											
	Optimized Signal Plan (90 sec. CL)		Optimized Signal Plan (90 sec. CL) with 2 sec. All-Red for Olden LTs		Optimized Signal Plan (90 sec. CL)		Optimized Signal Plan (90 sec. CL) with 2 sec. All-Red for Olden LTs		Optimized Signal Plan (90 sec. CL)		Optimized Signal Plan (90 sec. CL) with 2 sec. All-Red for Olden LTs	
Parkside LT Type	Prot ONLY		Prot ONLY		Prot + Perm		Prot + Perm		Perm ONLY		Perm ONLY	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
Olden Ave (EB)	31	C	32	C	28	C	30	C	24	C	25	C
Olden Ave (WB)	29	C	30	C	27	C	29	C	24	C	25	C
Parkside Ave (NB)	45	D	47	D	38	D	41	D	34	C	36	D
Parkside Ave (SB)	37	D	39	D	32	C	31	C	38	D	42	D
Total Intersection	34	C	35	D	30	C	32	C	28	C	30	C

	Medium-Term											
	New Timing and Geometry. *Scenario 4:* Southbound Parkside Avenue Left, Through, & Right-Turn Lanes; Northbound Parkside Avenue Left & Through/Right-Turn Lanes; One Receiving Lane for Parkside Avenue											
	Optimized Signal Plan (90 sec. CL)		Optimized Signal Plan (90 sec. CL) with 2 sec. All-Red for Olden LTs		Optimized Signal Plan (90 sec. CL)		Optimized Signal Plan (90 sec. CL) with 2 sec. All-Red for Olden LTs		Optimized Signal Plan (90 sec. CL)		Optimized Signal Plan (90 sec. CL) with 2 sec. All-Red for Olden LTs	
Parkside LT Type	Prot ONLY		Prot ONLY		Prot + Perm		Prot + Perm		Perm ONLY		Perm ONLY	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
Olden Ave (EB)	31	C	32	C	27	C	28	C	23	C	25	C
Olden Ave (WB)	29	C	30	C	27	C	28	C	23	C	24	C
Parkside Ave (NB)	43	D	45	D	38	C	40	D	35	D	36	D
Parkside Ave (SB)	25	C	25	C	20	B	22	C	26	C	28	C
Total Intersection	31	C	32	C	28	C	29	C	26	C	27	C

	Medium-Term											
	New Timing and Geometry: *Scenario 5:* Left and Right-Turn Lanes for Parkside Avenue; One Receiving Lane for Parkside Avenue											
	Optimized Signal Plan (90 sec. CL)		Optimized Signal Plan (90 sec. CL) with 2 sec. All-Red for Olden LTs		Optimized Signal Plan (90 sec. CL)		Optimized Signal Plan (90 sec. CL) with 2 sec. All-Red for Olden LTs		Optimized Signal Plan (90 sec. CL)		Optimized Signal Plan (90 sec. CL) with 2 sec. All-Red for Olden LTs	
Parkside LT Type	Prot ONLY		Prot ONLY		Prot + Perm		Prot + Perm		Perm ONLY		Perm ONLY	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
Olden Ave (EB)	26	C	28	C	24	C	25	C	19	B	21	C
Olden Ave (WB)	26	C	27	C	23	C	25	C	19	B	20	C
Parkside Ave (NB)	32	C	32	C	28	C	30	C	26	C	27	C
Parkside Ave (SB)	27	C	27	C	24	C	25	C	29	C	30	C
Total Intersection	27	C	28	C	24	C	26	C	23	C	24	C

PM PEAK HOUR

	Existing (103 sec. CL)		Optimized Signal Plan (90 sec. CL)		Optimized Signal Plan (90 sec. CL.) with 2 sec. All-Red for Olden LTs		Parkside Split Phased (90 sec. CL)		Parkside Split Phased (90 sec. CL) with 2 sec. All-Red for Olden LTs	
Parkside LT Type	Perm ONLY		Perm ONLY		Perm ONLY		Prot ONLY		Prot ONLY	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
Olden Ave (EB)	30	C	33	C	35	C	44	D	45	D
Olden Ave (WB)	61	E	30	C	32	C	38	D	41	D
Parkside Ave (NB)	24	C	18	B	19	B	52	D	52	D
Parkside Ave (SB)	55	D	43	D	48	D	69	E	86	F
Total Intersection	45	D	32	C	34	C	48	D	52	D

	Optimized Signal Plan (90 sec. CL)		Optimized Signal Plan (90 sec. CL) with 2 sec. All-Red for Olden LTs		Optimized Signal Plan (90 sec. CL)		Optimized Signal Plan (90 sec. CL) with 2 sec. All-Red for Olden LTs		Optimized Signal Plan (90 sec. CL)		Optimized Signal Plan (90 sec. CL) with 2 sec. All-Red for Olden LTs	
Parkside LT Type	Prot ONLY		Prot ONLY		Prot + Perm		Prot + Perm		Perm ONLY		Perm ONLY	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
Olden Ave (EB)	48	D	51	D	45	D	48	D	39	D	42	D
Olden Ave (WB)	43	D	45	D	39	D	43	D	34	C	37	D
Parkside Ave (NB)	68	E	79	E	56	E	77	E	38	D	38	D
Parkside Ave (SB)	47	D	49	D	37	D	40	D	59	E	58	E
Total Intersection	49	D	53	D	43	D	49	D	41	D	43	D

	Optimized Signal Plan (90 sec. CL)		Optimized Signal Plan (90 sec. CL) with 2 sec. All-Red for Olden LTs		Optimized Signal Plan (90 sec. CL)		Optimized Signal Plan (90 sec. CL) with 2 sec. All-Red for Olden LTs		Optimized Signal Plan (90 sec. CL)		Optimized Signal Plan (90 sec. CL) with 2 sec. All-Red for Olden LTs	
Parkside LT Type	Prot ONLY		Prot ONLY		Prot + Perm		Prot + Perm		Perm ONLY		Perm ONLY	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
Olden Ave (EB)	47	D	48	D	43	D	48	D	39	D	42	D
Olden Ave (WB)	43	D	43	D	38	D	41	D	34	C	37	D
Parkside Ave (NB)	62	E	80	F	56	E	56	E	35	D	35	D
Parkside Ave (SB)	37	D	38	D	27	C	27	C	46	D	44	D
Total Intersection	46	D	49	D	40	D	43	D	38	D	40	D

	Optimized Signal Plan (90 sec. CL)		Optimized Signal Plan (90 sec. CL) with 2 sec. All-Red for Olden LTs		Optimized Signal Plan (90 sec. CL)		Optimized Signal Plan (95 sec. CL) with 2 sec. All-Red for Olden LTs		Optimized Signal Plan (90 sec. CL)		Optimized Signal Plan (90 sec. CL) with 2 sec. All-Red for Olden LTs	
Parkside LT Type	Prot ONLY		Prot ONLY		Prot + Perm		Prot + Perm		Perm ONLY		Perm ONLY	
	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS	Delay (s)	LOS
Olden Ave (EB)	37	D	41	D	32	C	34	C	27	C	29	C
Olden Ave (WB)	34	C	37	D	29	C	31	C	26	C	28	C
Parkside Ave (NB)	35	D	35	D	33	C	33	C	26	C	26	C
Parkside Ave (SB)	31	C	31	C	28	C	28	C	39	D	41	D
Total Intersection	35	C	37	D	30	C	32	C	29	C	30	C

Saturation Flow Rate Calculation

$s = s_o * N * f_w * f_{HV} * f_g * f_p * f_{bb} * f_a * f_{LU} * f_{LT} * f_{RT} * f_{Lpb} * f_{Rpb}$

where:

s = saturation flow rate (veh/h)
s_o = base saturation flow rater per lane (pc/h/ln)
N = number of lanes in lane group
f_w = adjustment factor for lane width
f_{HV} = adjustment factor for heavy vehicles in traffic stream
f_g = adjustment factor for approach grade
f_p = adjustment factor for existence of a parking lane and parking activity adjacent to lane group
f_{bb} = adjustment factor for blocking effort of local buses that stop within intersection area
f_a = adjustment factor for area type
f_{LU} = adjustment factor for lane utilization
f_{LT} = adjustment factor for left turns in lane group
f_{RT} = adjustment factor for right turns in lane group
f_{Lpb} = pedestrian adjustment factor adjustment for left turn movements
f_{Rpb} = pedestrian adjustment factor adjustment for right turn movements

s = 1900 * 2 * 1.0 * 0.98 * 1.0 * 1.0 * 1.0 * 0.9 * 1.0 * 1.0 * 0.985 * 1.0 * 1.0

s = 3301 veh/h

Title of Report: ***Congestion and Crash Site Analysis Program – Ewing Township, Mercer County***

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Geographic Area Covered:
Signalized intersection of North Olden Avenue (CR 622) and Parkside Avenue (CR 636) and its environs in Ewing Township, Mercer County, New Jersey; and the section of Parkside Avenue from Buttonwood Road to Pennington Road.

Key Words:
Congestion, level of service, intersection, safety, fatalities, injuries, crashes, crash types, statewide, strategies, signalized, traffic signal, pedestrian, actions, roadway, driveway, goal, objectives, potential, deficiency, scenario, bicycle, pedestrians, turning movements, average annual daily traffic volumes, peak hour, exclusive, approach, circulation, left turn, access, road diet, two-way center left turn lane, all red phase, refuge, curb ramps.

ABSTRACT: This document represents the findings and recommendations for the Mercer County Congestion and Crash Site Analysis project. This project represents an effort to improve the mobility and safety of the roadways in the DVRPC region. The goal of the program is to identify cost effective improvement strategies which will reduce congestion and crashes and improve the mobility and safety of all road users. Working with the Mercer County Planning and Engineering Departments, the intersection of North Olden Avenue (CR 622) and Parkside Avenue (CR 636) was chosen for analysis. This intersection was identified as having congestion and safety issues. An in-depth crash and level of service analysis was performed to quantify and gain an understanding of the issues. With input from local stakeholders improvement strategies were identified to address the issues. These strategies vary from signal timing adjustments, intersection geometry and circulation changes to a road diet application. As appropriate, proposed improvement strategies were tested for level of effectiveness.

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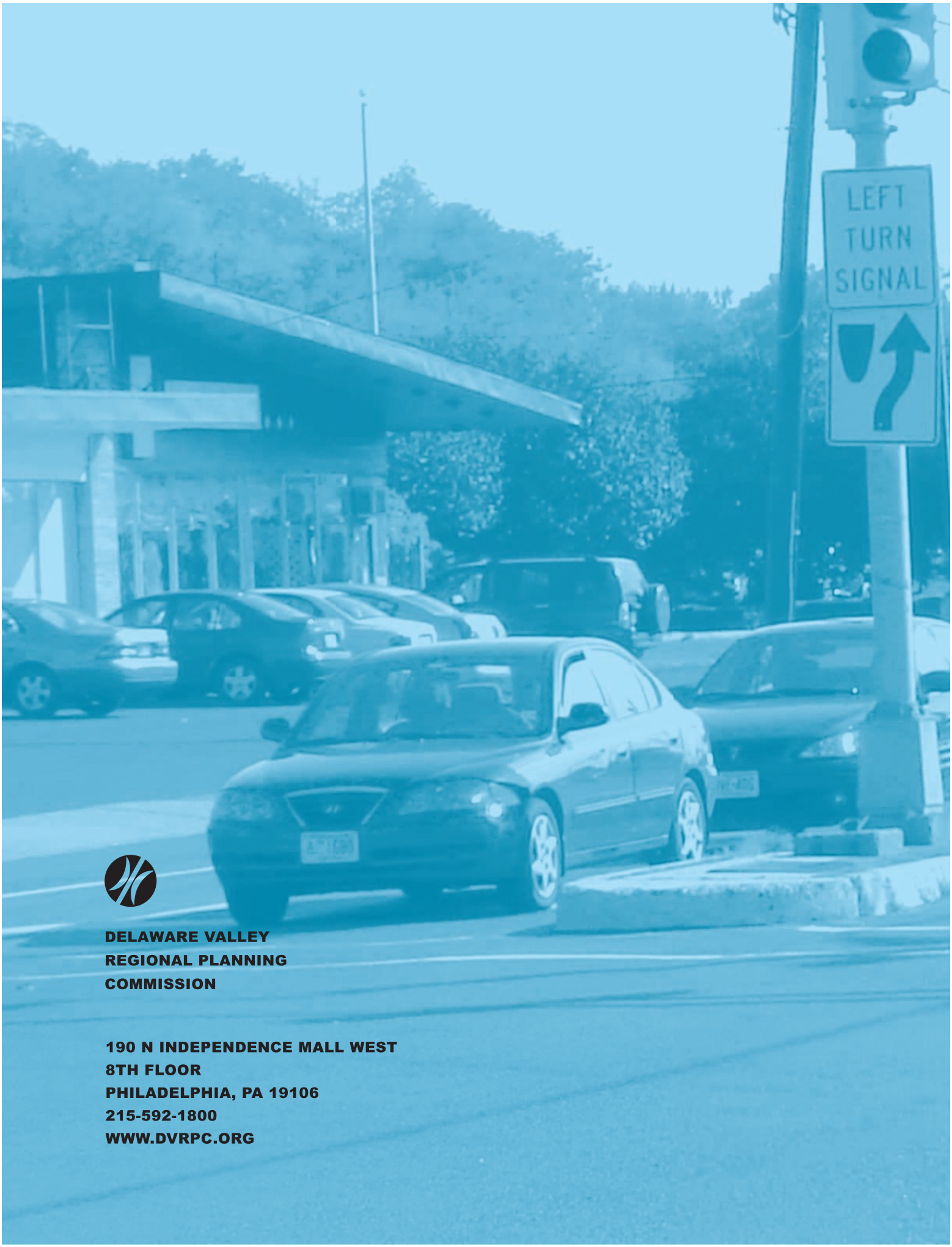

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