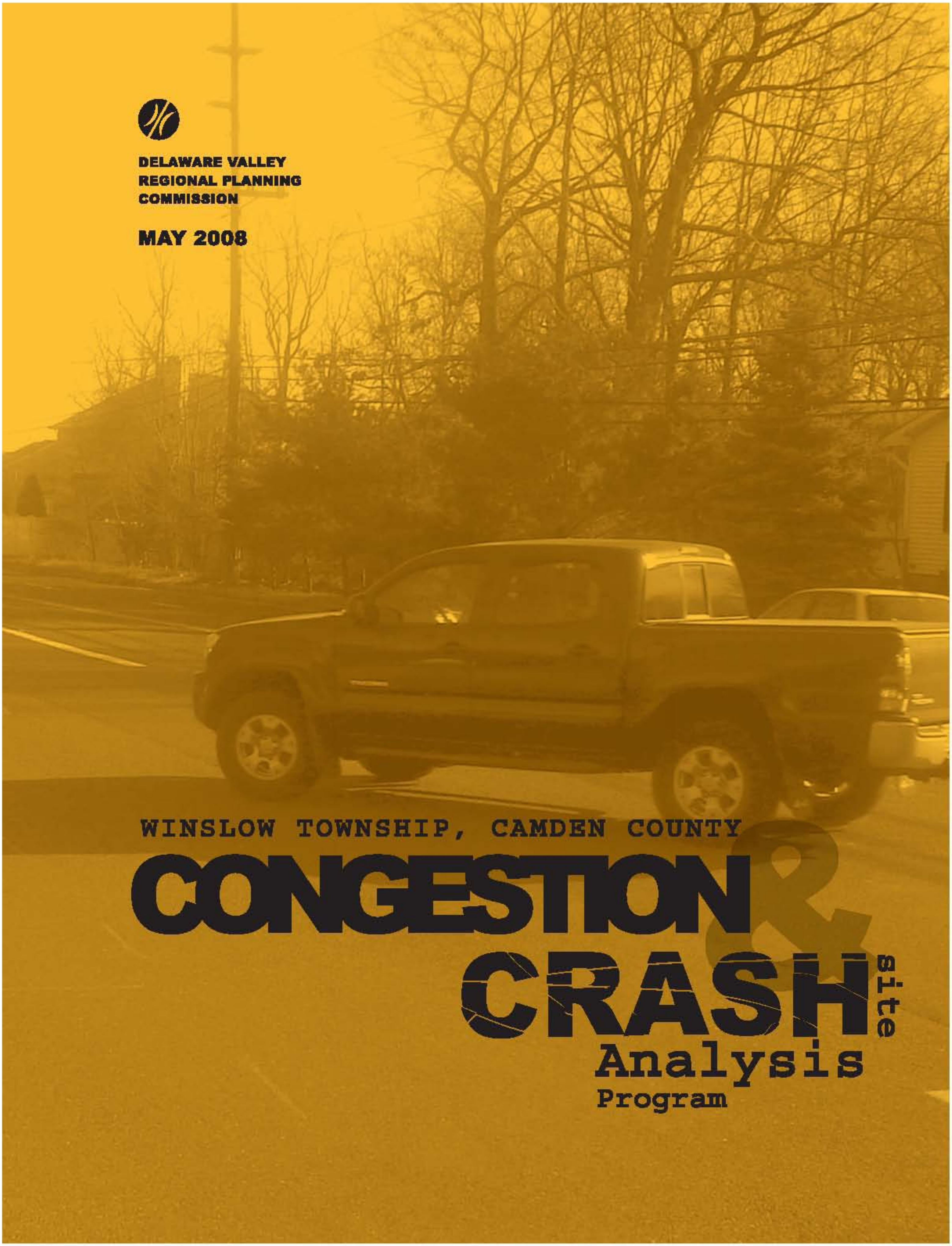

DELAWARE VALLEY
REGIONAL PLANNING
COMMISSION

MAY 2008

WINSLOW TOWNSHIP, CAMDEN 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 a 0.8 mile section of Erial Road consisting of five intersections in Winslow 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 Burlington and Mercer counties. These 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, for each location, a combination of strategies may need to be implemented to have an impact on improving safety and reducing congestion.

Methodology

The Camden County Engineering 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. Camden County selected only one location (a section of Erial Road around the intersection of Duke/Duchess Drives) to be analyzed. The location selected was not one provided by the *Cluster Finder Tool*. The selection was based on the location demonstrating high levels of crashes and coordination between Camden County Engineering and Winslow Township Police Department. This location met several program criteria – not already programmed for improvement; it provides a regional function, and on the county 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), and turning movement counts. Stakeholder meetings were held with the appropriate state, county, and municipal officials and others as deemed necessary. Local residents were active participants in stakeholder meetings. 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 specific 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.

The 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. A speed study, crash analysis, and LOS analysis were conducted for the intersection and adjacent area.

The speed study and crash analysis were performed to substantiate problems presented during the municipal field views and to identify any probable causes and potential improvements. Reportable crash records for a four-year period were collected from the Winslow Township Police Department. Reportable crashes typically involve an injury, fatality, and/or significant property damage of $500 or more. In some of the locations, non-reportable crashes are included in the analysis. 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 ($500 or more), 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 issue 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 usually range from optimizing signal timing and signal coordination to adding turning lanes and intersection redesign/reconstruction. For this location speed reduction, traffic calming measures and a road diet application was analyzed. An 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 operations of the study area 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, midrange, 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 midrange 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 midrange 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 area. 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 LOS designations and the number of seconds of delay associated with unsignalized intersections vary from signalized intersections because driver perception differs. At unsignalized intersections, driver's tolerance level for waiting to proceed through an intersection is low. Longer delays are accepted at signalized intersections since the driving task is simplified through the signal assignment of which vehicle has the right-of-way to continue through the intersection.The exact parameters of delay that determine the various LOS categories for a signalized and an unsignalized (stop controlled) intersection are displayed in ***Table 1***.

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

	Unsignalized Intersection		**Signalized Intersection**	
LOS	**Control Delay per vehicle (sec)**	**Expected Delay to Minor Street Traffic**	**Control Delay per vehicle (sec)**	**Expected Delay At Intersection**
A	<=10 (Desirable)	Little or no delay	<=10 (Desirable)	Very low delay
B	>10 and <=15 (Desirable)	Short traffic delays	>10 and <=20 (Desirable)	Short traffic delays
C	>15 and <=25 (Desirable)	Average traffic delays	>20 and <=35 (Desirable)	Number of vehicles stopping is significant
D	>25 and <=35 (Acceptable)	Long traffic delays	>35 and <=55 (Acceptable)	Influence of congestion becomes more noticeable
E	>35 and <=50 (Unacceptable)	Very long traffic delays	>55 and <=80 (Unacceptable)	Limit of acceptable delay
F	>50 (Unsatisfactory)	Extreme delays	>80 (Unsatisfactory)	Over-saturated

Source: Highway Capacity Manual - Special Report 209

A review of the existing conditions and of the various improvement scenarios was conducted using SYNCHRO traffic signal software for select intersections in the project area. Necessary information for determining delay and LOS measures usually include turning movement counts, roadway geometry, signal timing, and actuation plans. The turning movement counts were mostly gathered by DVRPC staff; no signal timing, actuation data, and roadway geometrics were necessary because the study area comprised of all unsignalized intersection.

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.

ERIAL ROAD, WINSLOW TOWNSHIP

LOCATION DESCRIPTION

The study area consists of approximately 0.8 miles of Erial Road (CR 706) in Winslow Township, Camden County; from south of Wiltons Landing Road to north of Duke/Duchess Drives intersection, as shown in ***Figure 1***. It includes five intersections along Erial Road – Wilton's Landing Road, Elsworth Drive, Franklin Lane, Prospect Road, and Duke/Duchess Drive. Wiltons Landing Road, Elsworth Drive, and Franklin Lane form "T" intersections with Erial Road, while Prospect Road and Duke/Duchess Drives form four way intersections. All five intersections in the study area are unsignalized.

Erial Road, which is functionally classified as an urban collector, generally runs in a north-south direction. Erial Road runs from CR 705 (Sicklerville Road) in Winslow Township northward to NJ 168 (Black Horse Pike) in Gloucester Township. It connects with several major roads which includes CR 705 and CR 536 Spur (Williamstown New Freedom Road) south of the study area while to the north Erial Road connects with CR 689 (Berlin-Cross Keys Road), CR 687 (Jarvis Road), CR 703 (Garwood Road/Erial Clementon Road), CR 688 (Hickstown Road), CR 673 (College Drive), CR 759 (Little Gloucester Road/Peter Cheeseman Road), CR 534 (Blackwood Clementon Road), NJ 168 (Black Horse Pike), and CR 681 (Good Intent Road).

As shown in ***Figure 2***, throughout the study area, Erial Road carries two lanes in each direction with left-turn lanes at three of the five intersections. Erial Road has a southbound dedicated left-turn lane at Wilton's Landing Road, a northbound and a southbound dedicated left-turn lane at the Prospect Road intersection, and a northbound and a southbound dedicated left-turn lane at the Duke and Duchess Road intersection. Immediately south of the study area Erial Road is two lanes, one lane in each direction. To the north of the study area Erial Road enters the intersection with Berlin-Cross Keys Road, at the northbound approach there are four-lanes, two dedicated left-turn lanes, a thru lane and a shared right/thru lane. North of that intersection the roadway transitions to one lane in each direction.

A striped median separates directional traffic on Erial Road throughout the study area except between Franklin Lane and Elsworth Drive. There are no shoulders along Erial Road in the study area. A multi-use path is located on the east-side of Erial Road for non-motorized modes of travel. It begins at Wiltons Landing Road and ends at Duchess Drive. Sidewalk is sporadic on the west-side of the road. It is only available from just north of Franklin Lane to south of Wiltons Landing Road. The speed limit is 50 MPH in the study area. There are no transit services within the study area.

The land use in the study area is predominantly single family residential, as shown in ***Figure 3***. The Wiltons Corner development is not yet at built out stage. The area is zoned a mix of high, medium, and low density residential. The residential parcels adjacent to Erial Road do not have access to this roadway. The neighborhoods adjacent

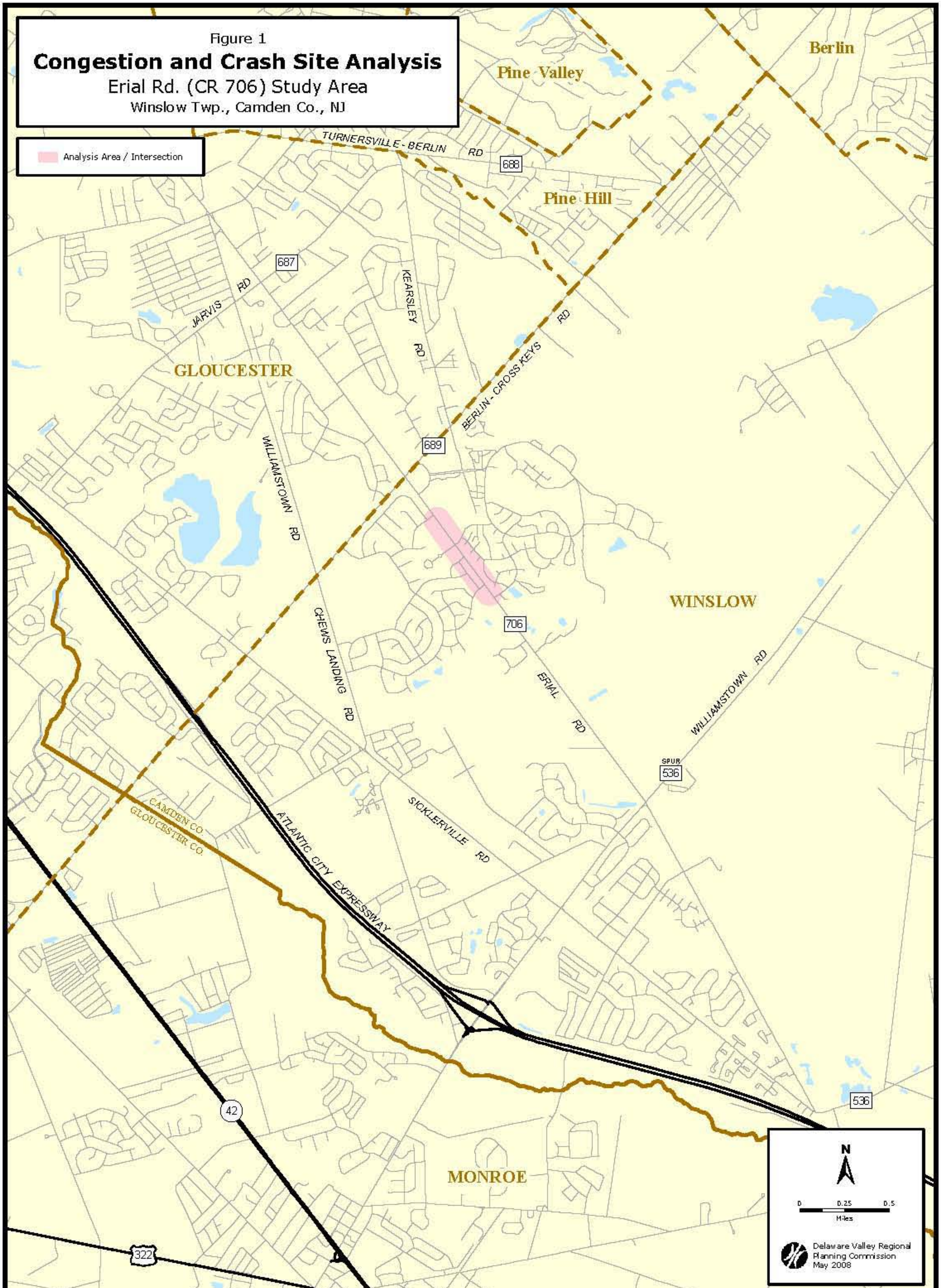

Figure 1
Congestion and Crash Site Analysis
Erial Rd. (CR 706) Study Area
Winslow Twp., Camden Co., NJ

to the study area are mixed residential, commercial, and community use. On Berlin-Cross Keys Road and Williamstown New Freedom Road are large commercial areas. Large big box stores are located along Berlin-Cross Keys Road as well as the Camden County Technical School.

Figure 2
Congestion and Crash Site Analysis
Erial Rd. (CR 706) Existing Lane Configuration
Winslow Twp., Camden Co., NJ
CR 706 ERIAL RD
DUCHESS DR
PROSPECT DR
WILTONS LANDING RD
CR 706 ERIAL RD
DUKE DR
FRANKLIN LN
ELSWORTH DR
CR 689 BERLIN - CROSSKEYS RD
Winslow Twp.
Gloucester Twp.
0
200
400
Feet
DVRPC Aerial Imagery: Spring, 2005
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May 2008

Figure 3
Congestion and Crash Site Analysis
Erial Rd. (CR 706) Land Use
Winslow Twp., Camden Co., NJ
CR 706 ERIAL RD
CR 706 ERIAL RD
DUCHESS DR
PROSPECT DR
WILTONS LANDING RD
DUKE DR
FRANKLIN LN
ELSWORTH DR
CR 689 BERLIN - CROSSKEYS RD
Winslow Twp.
Gloucester Twp.
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
0
200
400
Feet
DVRPC Aerial Imagery: Spring, 2005
Delaware Valley Regional
Planning Commission
May 2008

EXISTING CONDITION

Erial Road serves a significant amount of commuter traffic moving in both a north-south and east-west directions during peak periods. Erial Road runs parallel to Atlantic City Expressway and NJ 42, a major commuter route in southern New Jersey. The Atlantic City Expressway and NJ 42 can be accessed from the study area via Williamstown New Freedom Road west of the study area and to the north at Blackwood Clementon Road in Gloucester Township. Erial Road is located just outside the NJ 42/Atlantic City Expressway congested corridor but is designated an emerging regional corridor in DVRPC's Congestion Management Process. Therefore, Erial Road in the study area carries a large number of through trips along with trips destined for this area. In addition to commuter trips, trips destined for the adjacent commercial areas and institutions like Camden County College use this roadway.

The study section of Erial Road serves five cross streets, each of which provides access to residential subdivisions, some with numerous homes. It is a straight 4-lane section of roadway with additional left turn lane at some intersections with few obstructions to sight distance except for a rise in the roadway east of Duke/Duchess Drives intersection. When traveling on Erial Road, this obscures the Duke/Duchess Drives intersection and makes it difficult for motorists exiting Duke/Duchess Drives to see westbound Erial Road traffic and to judge their speeds.

Traffic Volumes

Daily Traffic Counts

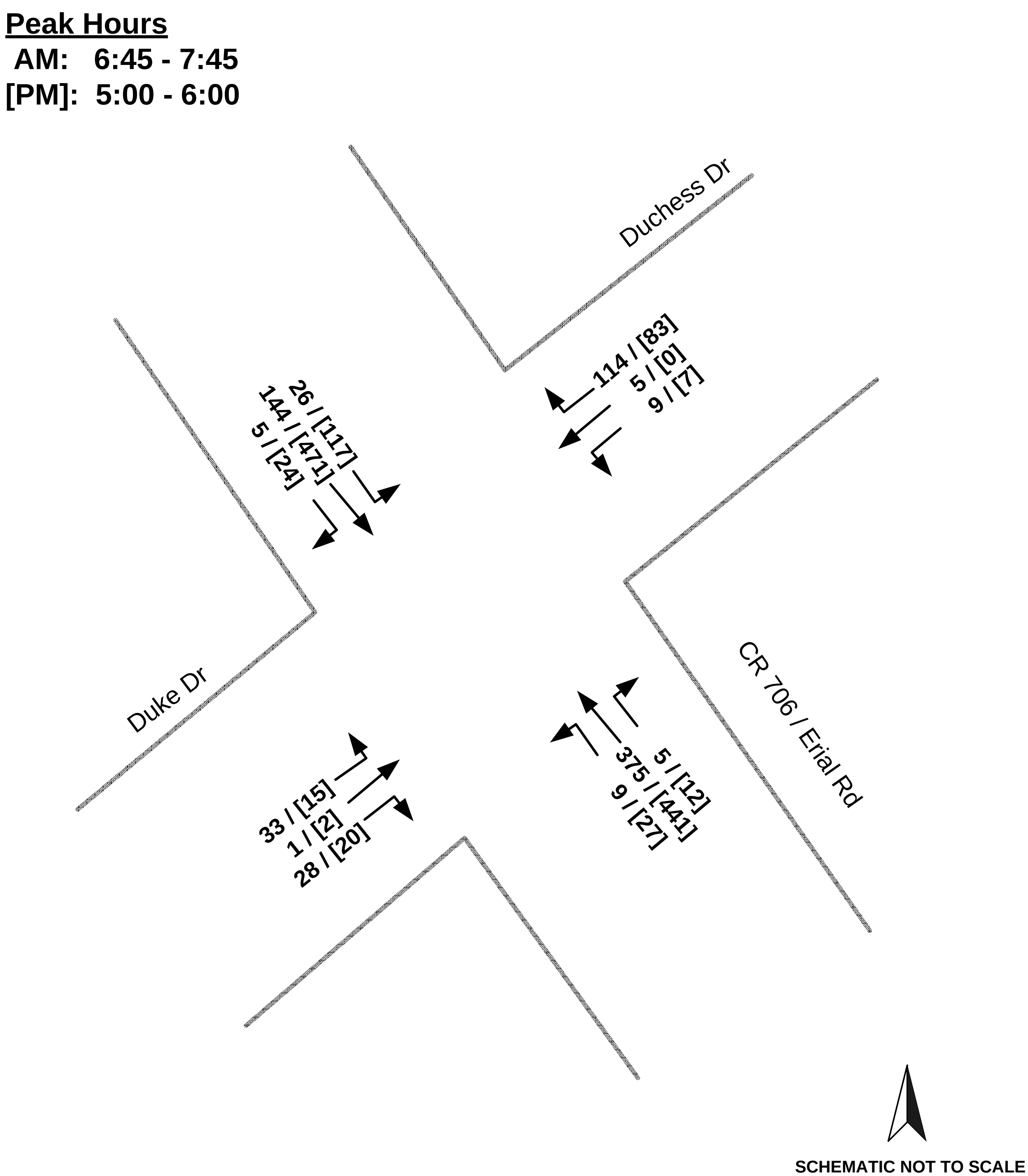
Traffic counts were taken by DVRPC's Office of Travel Monitoring between February 11, 2008 and February 13, 2008 on Erial Road between Prospect Road and Duke/Duchess Drives to determine average annual daily traffic (AADT) volumes. It was determined that the AADT for northbound Erial Road was 5,874 vehicles. The morning peak hour (7:00 – 8:00 AM) carried 11.9 percent of the total while the afternoon peak hour (4:00 – 5:00 PM) carried 7.8 percent. For southbound Erial Road the AADT is 5,107 vehicles with the morning peak hour (8:00 – 9:00 AM) carrying 5.2 percent of the total and the afternoon peak (5:00 – 6:00 PM) with 10.3 percent. This correlates with peak commuting patterns – northbound is the dominant movement in the mornings and the dominant movement in the afternoon is southbound. The complete traffic counts are available in the **Appendix**.

Turning Movement Counts

Manual turning movement counts were taken for three intersections along Erial Road in between November 2007 and February 2008. Counts were taken at Duke and Duchess Drives, Wiltons Landing Road, and Elsworth Drive. Counts were conducted from 6:00 AM to 9:00 AM for the morning peak; and from 4:00 PM to 7:00 PM for the afternoon peak period. The complete manual turning movement counts are available in the **Appendix**.

Figure 4 shows the turning movement counts for the morning and afternoon peak hours for the Erial Road and Duke/Duchess Drives intersection. There are 754 vehicles

Figure 4
Existing Peak-Hour Turning Movement Counts
Erial Road & Duke/Duchess Drives Intersection



Delaware Valley Regional Planning Commission
May 2008

moving through the intersection during the morning peak hour. The dominant movement is the northbound Erial Road approach, with 52 percent of the total. The westbound Duchess Drive approach had 128 vehicles in the morning peak hour and 89 percent were making right-turns onto northbound Erial Road. From the eastbound Duke Drive approach the dominant movements are left-turning vehicles on to northbound Erial Road during the morning peak hour. The high percentage of left-turn movements from the side streets, heavy through traffic on Erial Road and the slope to the south of the intersection all increase the potential for conflicts.

During the afternoon peak hour there were 1219 vehicles moving through the intersection, 62 percent more than the morning peak hour. The dominant movement is the southbound Erial Road approach with 612 vehicles, approximately 50 percent of the total. The through movements on Erial Road are the dominant single movements with southbound carrying 39 percent of the total and northbound traffic at 36 percent. Southbound Erial Road shows a high volume of left-turn movements onto Duchess Drive of 117 vehicles during the afternoon peak hour. Right-turns out of Duchess Drive on Erial Road are 92 percent of that approach's volume.

Figure 5 shows the turning movement counts for the morning and afternoon peak hours for the Erial Road and Elsworth Drive intersection. In the morning peak hour there are 632 vehicles traveling through the intersection while the afternoon peak hour has 47 percent more vehicle movements. The heaviest traffic flows are the through movements on Erial Road. In the morning and afternoon peak hours the northbound movement on Erial Road is higher than the southbound movement by 25 and 12 percent, respectively. Traffic movements for Elsworth Drive are relatively low except during the morning peak hour; 100 vehicles were recorded exiting with the right-turns and left-turns evenly split.

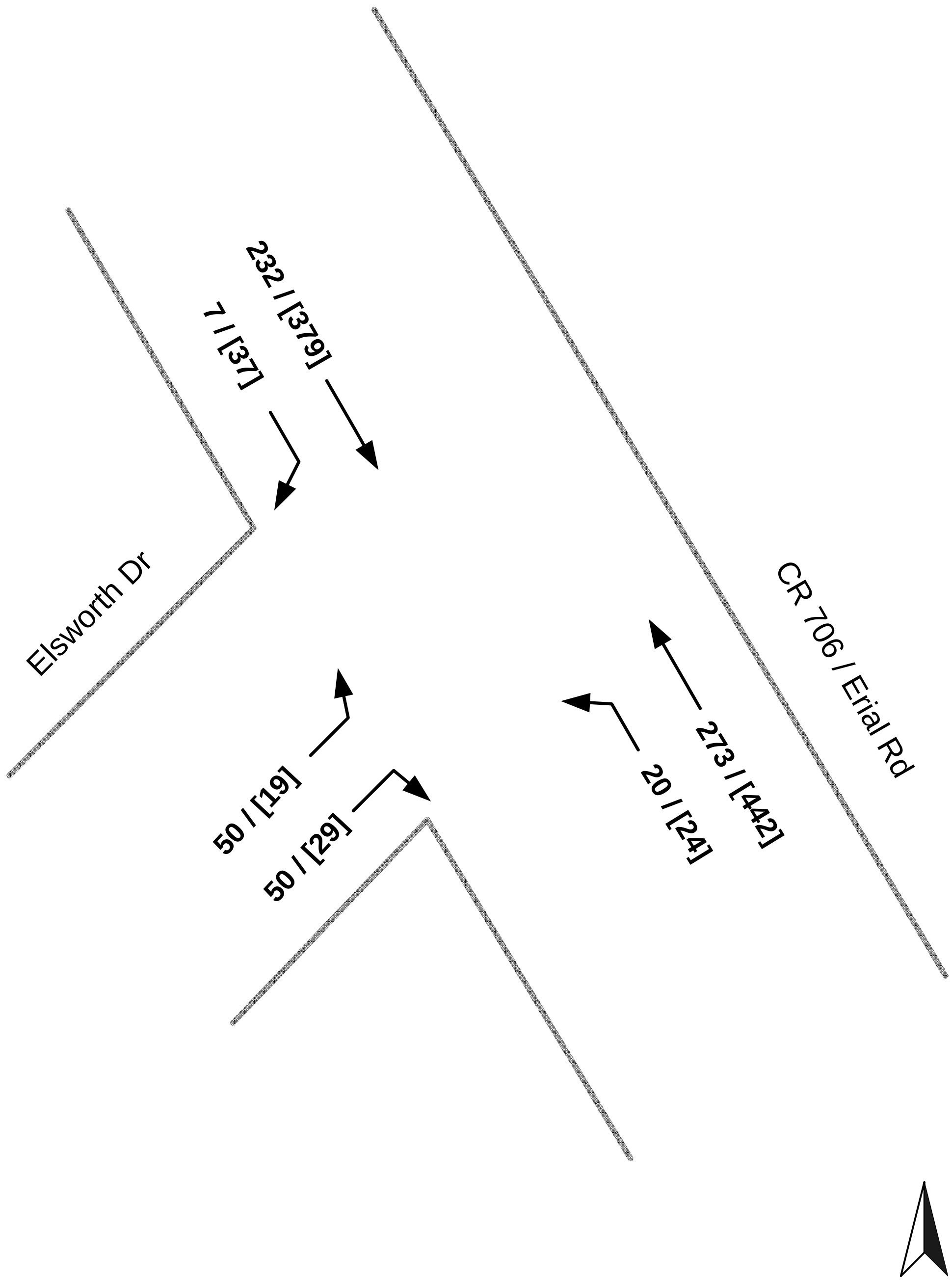
Of the three intersections the Wiltons Landing Road intersection has the lowest number of vehicles exiting on to Erial Road during the morning peak. As depicted in ***Figure 6***, Wiltons Landing Road has 73 vehicles exiting in the morning peak hour and 43 during the afternoon peak hour. Erial Road had the dominant movement at this intersection with the southbound through movement during the morning peak (294) with the single highest volume. Left-turn conflicts at this intersection for the morning and afternoon peak hours are 15 and 25 vehicles, respectively from southbound Erial Road and 35 and 19 vehicles, respectively for Wiltons Landing Road. Right-turn movements from Erial Road on to Wiltons Landing Road are 34 vehicles in the morning peak hour and 45 in the afternoon peak hour.

Level of Service (LOS)

SYNCHRO software was used to analyze and determine the effectiveness of existing and potential alternative scenarios for the project intersections. As a result, performance measures such as Level of Service (LOS) and average delay-per-vehicle were obtained for each approach and for the overall intersections. There are three unsignalized intersections along Erial Road within the study area that were analyzed. The LOS analysis was conducted for the morning and afternoon peak periods. ***Table 2*** displays the LOS and vehicle delay for the existing conditions for all three intersections.

Figure 5
Existing Peak Hour Turning Movement Counts
Erial Road & Elsworth Drive Intersection

Peak Hours
AM: 7:15 - 8:15
[PM]: 5:00 - 6:00



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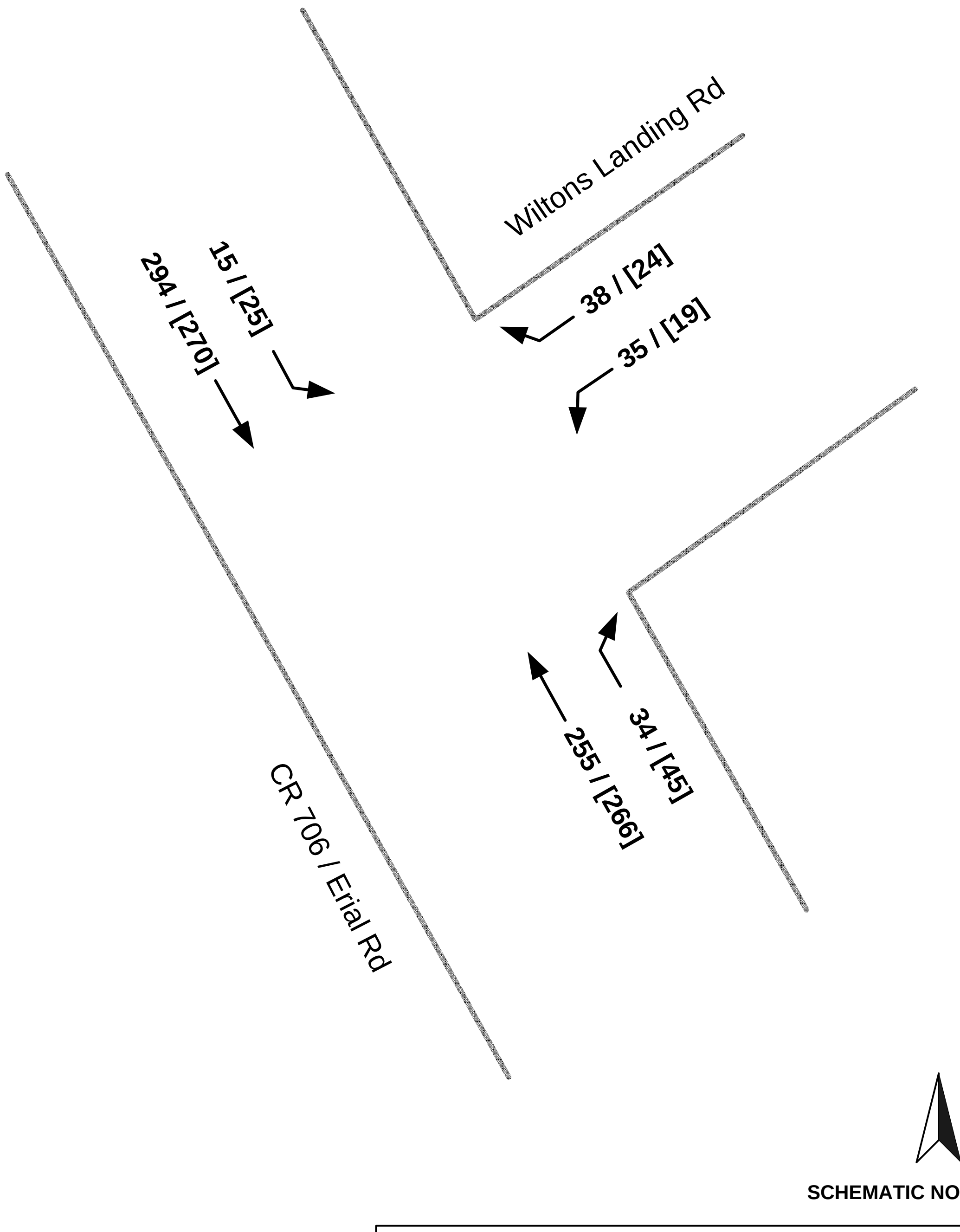
May 2008

Figure 6
Existing Peak-Hour Turning Movement Counts
Erial Road & Wiltons Landing Road Intersection

Peak Hours
AM: 8:00 - 9:00
[PM]: 4:00 - 5:00



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Intersection of Erial Road and Duke Drive/Duchess Drive
During the morning and afternoon peak hours, the intersection operates at an overall LOS of A, with 3 seconds of vehicle delay. The northbound and southbound approaches of Erial Road experiences a LOS A with 8 and 9 seconds of delays in the morning and afternoon respectively in the left-turn lanes. In the morning, the eastbound and westbound approaches are LOS B. The poorest performing approach is eastbound Duke Drive, with 26 seconds of delay and LOS D.

Table 2: Existing Peak Hour Level of Service (LOS) Analysis

		Existing Conditions			
		AM		PM	
	Direction	Delay (sec)	LOS	Delay (sec)	LOS
Erial Road & Duchess Drive/Duke Drive	Duchess Drive – Westbound	11	B	13	B
	Duke Drive – Eastbound	14	B	26	D
	Erial Road – Northbound	8 (LT only)	A	9 (LT only)	A
	Erial Road – Southbound	8 (LT only)	A	9 (LT only)	A
	Total	**3**	**A**	**3**	**A**
Erial Road & Elsworth Drive	Elsworth Drive – Eastbound	12	B	13	B
	Erial Road – Northbound	1	A	1	A
	Erial Road – Southbound	0	A	0	A
	Total	**2**	**A**	**2**	**A**
Erial Road & Wiltons Landing Road	Wiltons Landing Road – Westbound	11	B	11	B
	Erial Road – Northbound	0	A	0	A
	Erial Road – Southbound	8 (LT only)	A	8 (LT only)	A
	Total	**1**	**A**	**1**	**A**

Source: DVRPC, 2008

Intersection of Erial Road and Elsworth Drive
The overall LOS for this intersection is A with 2 seconds of overall vehicle delay for both morning and afternoon peak hours. Erial Road experiences a LOS of A, with 0 and 1 second delay in the southbound and northbound direction, respectively. The Elsworth

Drive approach has the longest delay of 12 and 13 seconds during the morning and afternoon peak hours, respectively and LOS of B.

Intersection of Erial Road and Wiltons Landing Road

This intersection experiences an overall LOS A during the morning and afternoon peak periods. Although Erial Road has a LOS A in both directions, there is an 8 second delay for southbound Erial Road vehicles turning left onto Wiltons Landing Road. The LOS for the Wiltons Landing Road approach is B with 11 seconds of delay in both the morning and afternoon peak hours.

Crash Analysis

The crash analysis for this location focused on crashes occurring on Erial Road between the intersections of Duke/Duchess Drives and Wiltons Landing Road.

The crash data used in this analysis was derived from Police Crash Investigation Reports for years 2004 – 2007, provided by the Winslow Township Police Department. For this study both reportable and non-reportable police records were utilized.

The main goals of this analysis are to identify problematic locations, and highlight crash trends. Graphic representation of the location, collision type, and frequency of vehicular crashes within the study area are shown in a collision diagram as depicted in ***Figure 7*** for the study years. ***Table 3*** shows the crash summary as well as the 2006 New Jersey Statewide County Road System averages. This is a summation of various crash conditions obtained from the police reports. The statewide averages are used for comparison and tend to be similar for each of the study years. These documents can be used to determine crash trends which may be addressed through engineering and/or behavioral measures.

There were 2 crashes in 2004, 8 crashes in 2005, 7 in 2006, and 3 crashes in 2007, making the total 20 crashes for the analysis period. With an average of five crashes per year, the degree of fluctuation is somewhat marginal. As shown in ***Table 3***, there were no recorded fatalities, 7 injury crashes, and 13 property damage only crashes. In terms of severity, only injury crashes (35%) exceeded the statewide average (29.16%).

Over the four year study period sideswipe, left-turn, hit-fixed object, hit non-fixed object, and “other” crash percentages all exceeded statewide crash type averages. There were five hit-fixed object crashes which account for 25 percent of the total by collision type. This percentage is twice the statewide average of 11.89 percent. Hit-fixed object crashes typically occur when vehicles run off the roadway. There were four left-turn crashes along the corridor which account for 20 percent of the total. By definition, left-turn crashes involve vehicles moving in opposite directions and often result in a collision as one vehicle turns in front of the other without proper clearance. There are several side streets along the study corridor which present opportunities for left-turn crashes. The probability for conflicts is increased due to the four-lane cross section of Erial Road which means turning vehicles must find a gap in at least two lanes of oncoming traffic.

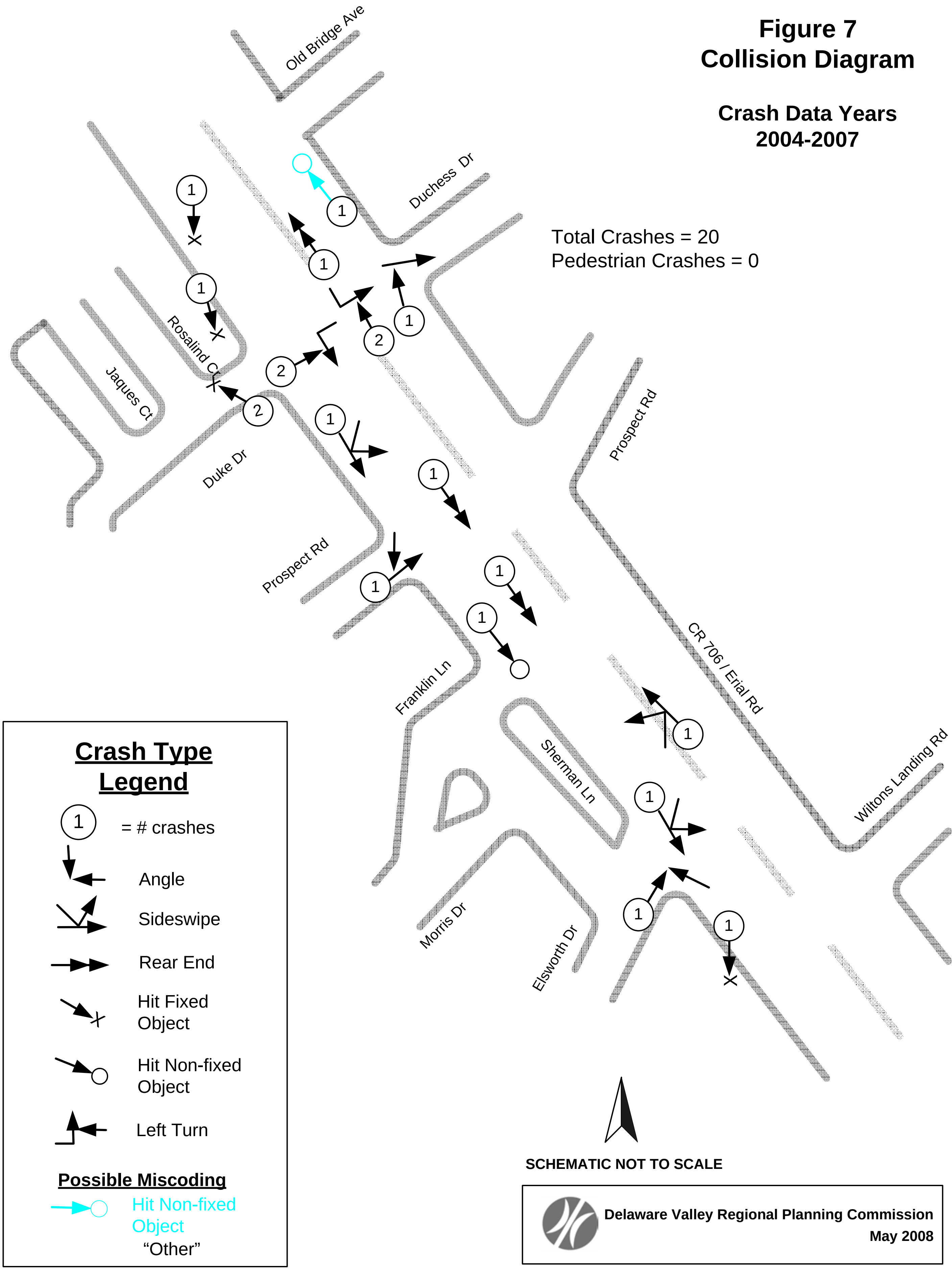
TABLE 3: Crash Summary (Erial Road from MP 3.3 to MP 4.1)

Erial Road (CR 706)	2004		2005		2006		2007		Total		2006 NJ County Road Average
Crash Summary	**Crash**	**%**	**Crash**	**%**	**Crash**	**%**	**Crash**	**%**	**Crash**	**%**	
Reportable	2	100.00%	7	87.50%	5	71.43%	3	100.00%	17	85.00%	~
Non-Reportable	~	~	1	12.50%	2	28.57%	~	~	3	15.00%	~
Collision Type											
Rear-End	~	~	3	37.50%	~	~	~	~	3	15.00%	30.32%
Angle	~	~	1	12.50%	2	28.57%	~	~	3	15.00%	18.09%
Sideswipe	~	~	1	12.50%	~	~	2	66.67%	3	15.00%	11.45%
Left Turn	1	50.00%	1	12.50%	1	14.29%	1	33.33%	4	20.00%	7.89%
Hit Fixed Object	1	50.00%	1	12.50%	3	42.86%	~	~	5	25.00%	11.89%
Hit Non-fixed Object	~	~	~	~	1	14.29%	~	~	1	5.00%	0.47%
Other	~	~	1	12.50%	~	~	~	~	1	5.00%	0.20%
Intersection Type											
At Intersection	~	~	3	37.50%	4	57.14%	3	100.00%	10	50.00%	39.52%
Not at Intersection	2	100.00%	5	62.50%	3	42.86%	~	~	10	50.00%	60.45%
Severity Type											
Fatality	~	~	~	~	~	~	~	~	~	~	0.27%
Injured	~	~	4	50.00%	2	28.57%	1	33.33%	7	35.00%	29.16%
Property Damage Only	2	100.00%	4	50.00%	5	71.43%	2	66.67%	13	65.00%	70.57%
Lighting Condition											
Day	~	~	3	37.50%	4	57.14%	1	33.33%	8	40.00%	70.25%
Dusk/Dawn	~	~	1	12.50%	~	~	~	~	1	5.00%	3.84%
Night	2	100.00%	4	50.00%	3	42.86%	2	66.67%	11	55.00%	25.49%
Road Surface Condition											
Dry	2	100.00%	7	87.50%	5	71.43%	3	100.00%	17	85.00%	77.54%
Wet	~	~	1	12.50%	1	14.29%	~	~	2	10.00%	19.67%
Ice/Snow	~	~	~	~	1	14.29%	~	~	1	5.00%	2.13%

Source: Winslow Township Police Department

Figure 7
Collision Diagram

Crash Data Years 2004-2007

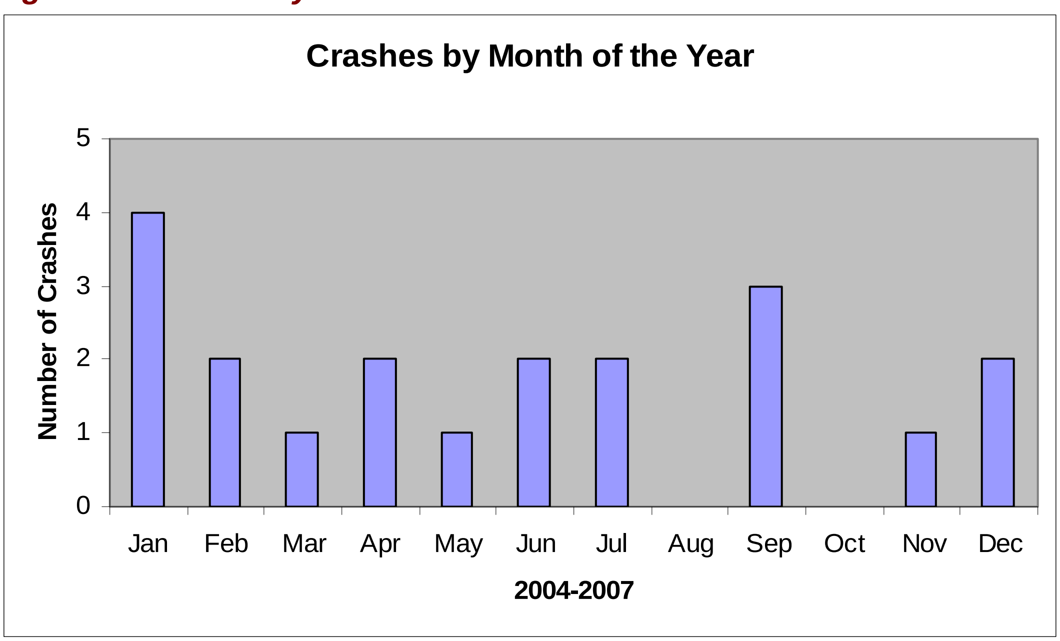


Rear-end, angle, and sideswipe collisions each account for three crashes representing 15 percent of the total, each. Of the three, only sideswipe crashes exceeded the statewide average of 11.45 percent. Sideswipe crashes often occur as a result of cars weaving and passing one another which are common in roadways with a configuration consisting of at least two lanes in one direction. Hit non-fixed object and "other" crashes exceeded statewide county road averages but at one crash each they are not statistically significant.

Table 3 also shows crash percentages according to light and road surface conditions. The number of crashes occurring during daylight hours was eight, or 40%, and the night time crash number was 11, or 55%. This is not typical as evidenced by the statewide averages of 70.25% for daytime crashes and 25.49% for night time crashes. One crash was coded as dusk/dawn. Eighty-five percent of the total, or 17 crashes, occurred when the road surface was dry, a percentage exceeding the statewide average of 77.54%. Only two crashes were recorded during wet road surface conditions and one during ice/snow conditions.

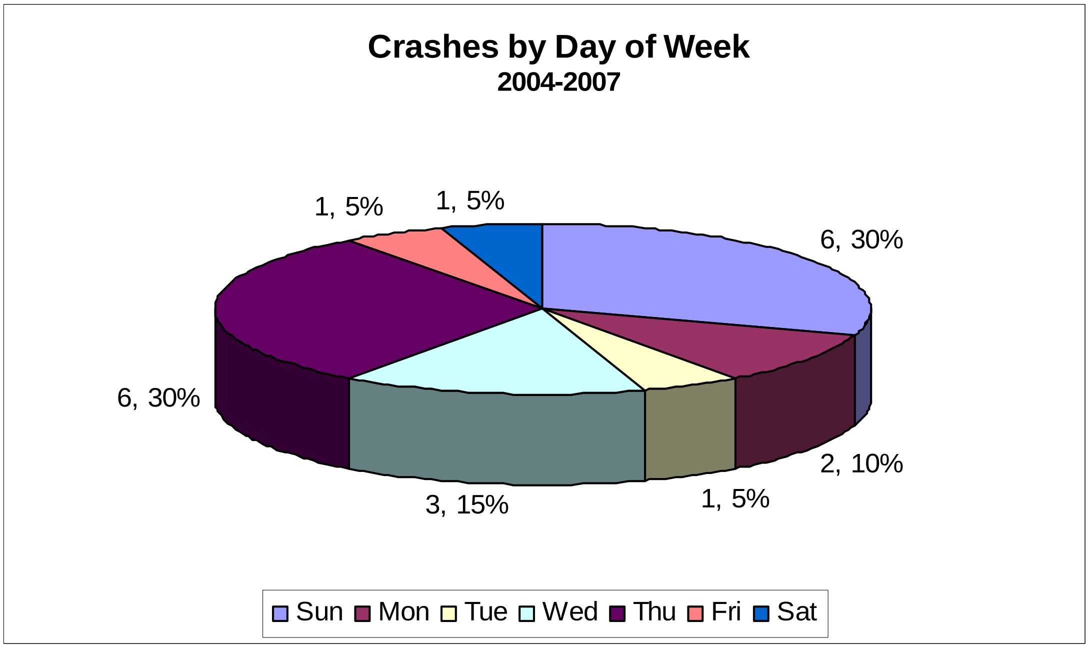
As shown in ***Figure 7***, the highest crash area was from Prospect Road to the vicinity of Duke/Duchess Drives. This subsection of the study corridor was the location of approximately seventy percent of the crash total. This could be the result of more frequent ingress and egress traffic from the housing developments, the difficulty of making left-turns onto the four-lane Erial Road, the rise in Erial Road compromising sight distance of oncoming traffic and motorists exiting Duke and Duchess Drives misjudging the speed of oncoming vehicles down the incline.

Figure 8: Crashes by Month of the Year



Source: Winslow Township Police Department

Figure 9: Crashes by Day of Week



Source: Winslow Township Police Department

Figures 8 and 9 depict crashes by month and by day of the week, respectively. Although crash frequency by month is fairly consistent, a few variations are noticeable. March, May, and November each had one crash, and no crashes occurred during August or October. Of the remaining months each experienced two crashes except for September and January which saw three and four crashes respectively, representing a combined 35% of the crash total. Greater fluctuations are apparent when crash totals are examined by day of week. The most crashes occurred on Sundays (6), and Thursdays (6); they represent 60% of the total combined. The days with the next highest crash totals were Wednesday (3) and Monday (2), with the remaining days experiencing only one crash each.

Speeding

In Camden County's proposal for the inclusion of this location for analysis their supporting documentation referred to a large percentage of crashes attributed to loss of vehicular control. At the technical task force meeting local stakeholders referred to speeding along this corridor as a contributing factor to crashes many of which are not reported. During subsequent field visits, a number of vehicles did seem to be exceeding the 50 MPH speed limit.

A speed study was conducted using the Pneumatic Road Tube Method to determine the prevailing speeds of travel for motorists using the roadway. Pneumatic tubes are placed in the travel lanes, attached to the pavement, and connected to recorders on the side of the road. As vehicles pass over the tubes, the recorders gather vehicle data that is used to calculate vehicle speeds. This data was collected in both directions of Erial Road between 9:00AM on March 3, 2008 and 11:00AM on March 5, 2008. Typically, speeds are measured and the recommended speed limit is determined as the speed at or below which 85 percent of the vehicles are traveling (85th percentile speed). **Table 4** shows a summary of the data collected**.** The complete data is available in the **Appendix**.

TABLE 4: Erial Road Travel Speeds

SPEED (MPH)	FREQUENCY OF VEHICLE	CUMULATIVE FREQUENCY	CUMULATIVE PERCENTAGE	SPEED PERCENTILE
0-15	11	11	0.05	
16-20	8	19	0.09	
21-25	19	38	0.18	
26-30	189	227	1.10	
31-35	745	972	4.69	
36-40	2714	3686	17.80	
41-45	6882	10568	51.03	50th
46-50	6522	17090	82.52	
51-55	2850	19940	96.28	85th
56-60	623	20563	99.29	
61-65	116	20679	99.85	
66-70	20	20699	99.94	
71-75	7	20706	99.98	
76-99	2	20711	100	

Source: DVRPC, 2008

The 50th percentile speed falls within the 41-45 MPH range and is approximately 45 MPH. The 85th percentile speed falls within the 51-55 MPH range and is approximately 51 MPH. A 5 MPH rule of thumb is often used to determine whether the 85th percentile of speed is too high compared to the posted speed limit. If the 85th percentile speed is more than 5 MPH above the posted speed limit then actions should be taken. In this case the 85th percentile speed is only 1 MPH above the posted speed limit.

OPPORTUNITIES AND CONSTRAINTS

Overall level of service for the main arterial of the study area ranges is desirable. The minor streets level of service varies between desirable and acceptable. Clearly, there is not a congestion problem in the study area. Clearly, there is a safety concern in the study area based on the number and type of crashes which have occurred. This study will concentrate on strategies that have the potential to reduce crashes.

Although there will be an emphasis on engineering improvement strategies, the human behavioral contributions to these crashes should not be ignored. The data has shown that 18 percent of the motorists that use Erial Road travel above the 50 MPH speed limit. The data has also shown that driver inattention and loss of vehicular control have contributed to crashes. Therefore education and enforcement strategies which address motorist behavior should supplement physical safety improvements.

There is a combination of possible causes for the safety issues experienced in the study area. They include – speeding, high ingress and egress traffic volumes from the housing developments, the difficulty of making left-turns on to the four-lane Erial Road, the incline on Erial Road compromising sight distance of the Duke and Duchess Drives intersection and oncoming traffic and motorists exiting Duke and Duchess Drives misjudging the speed of oncoming vehicles down the incline.

Stopping Sight Distance

TABLE 5: Design Intersection Sight Distance – Left-turn from Stop

Metric				US Customary			
Design speed (km/h)	Stopping sight distance (m)	Intersection sight distance for passenger cars: Calculated (m)	Intersection sight distance for passenger cars: Design (m)	Design speed (mph)	Stopping sight distance (ft)	Intersection sight distance for passenger cars: Calculated (ft)	Intersection sight distance for passenger cars: Design (ft)
20	20	41.7	45	15	80	165.4	170
30	35	62.6	65	20	115	220.5	225
40	50	83.4	85	25	155	275.6	280
50	65	104.3	105	30	200	330.8	335
60	85	125.1	130	35	250	385.9	390
70	105	146.0	150	40	305	441.0	445
80	130	166.8	170	45	360	496.1	500
90	160	187.7	190	50	425	551.3	555
100	185	208.5	210	55	495	606.4	610
110	220	229.4	230	60	570	661.5	665
120	250	250.2	255	65	645	716.6	720
130	285	271.1	275	70	730	771.8	775
				75	820	826.9	830
				80	910	882.0	885

Note: Intersection sight distance shown is for a stopped passenger car to turn left onto a two-lane highway with no median and grades 3 percent or less. For other conditions, the time gap must be adjusted and required sight distance recalculated.

Source: A Policy on Geometric Design of Highways and Streets, AASHTO, 2004

According to American Association of State Highway Transportation Officials' (AASHTO) publication *A Policy on Geometric Design of Highways and Streets* stopping sight distance for a stopped passenger car to turn left onto a two-lane roadway with no median with design speed of 50 MPH is 425 feet and the intersection sight distance is 555 feet as shown in the table above. A vehicle crossing a four-lane undivided roadway, like Erial Road will need to cross two near lanes rather than one. Therefore the recommended time gap will increase, thus increasing the intersection sight distances shown in ***Table 5.***

Using the formula: ***ISD = 1.47Vt,*** from AASHTO publication
ISD = intersection sight distance;
V=design speed of major road; (Assuming the design speed for Erial Road is 50 MPH)
t=time gap for minor road vehicle to enter major road. (8 seconds for Erial Road)

The calculated intersection sight distance for passenger cars is 588 feet. Measurements taken in the field from the crest of the incline to the Duke/Duchess Drive intersection is less than 300 feet. Based on these factors this intersection does not have adequate sight distance.

The provision of stopping sight distance at all locations along the roadway, including intersection approaches is essential to the safe operation of intersections. Stopping sight distance should be provided continuously along each roadway to allow drivers a view of the roadway ahead that is sufficient to allow drivers to stop. Adequate sight distance should also be provided at intersections to allow the drivers of stopped vehicles sufficient view of the intersecting roadway to decide when to enter the intersection or cross it. If the available sight distance for an entering vehicle is at least equal to the appropriate stopping sight distance for the major road, drivers have sufficient time to anticipate and avoid collisions. However, sometimes this may require a major road vehicle to stop or slow to accommodate the maneuver by a minor road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road.

The speed study has shown that the 85^{th} percentile speed (the speed at which most drivers are comfortable) is 51 MPH. Therefore a speed limit reduction is not justified. According to the study, *"Effect of Raising and Lowering Speed Limits," Report No. FHWA-RD-92-084 sponsored by Federal Highway Administration,* raising or lowering speed limit has little effect on motorist speeds. Lowering speed limits below the 50^{th} percentile does not reduce crashes, but does significantly increase driver violations of the speed limit. Geometric variables have to be introduced to effect driver's behavior.

Traffic Calming

Traffic calming measures and a road diet application will be considered as possible strategies to improve the safety in the study area. According to www.TrafficCalming.org, traffic calming measures can be separated into two groups based on the main impact intended. Volume control measures are primarily used to address cut-through traffic problems by blocking certain movements, thereby diverting traffic to streets better able to handle it. Speed control measures are primarily used to address speeding problems by changing vertical alignment, changing horizontal alignment, or narrowing the roadway. The distinction between the two types of measures is not as clear as their names suggest, since speed control measures frequently divert traffic to alternate routes, and volume control measures usually slow traffic. Narrowing of travel lanes and landscaping is the strategy that was considered for the study area.

The study team introduced the concept of the installation of lateral rumble strips on the incline of Erial Road on the northbound approach to the Duke/Duchess Drives intersection. Although there has been evidence in the DVRPC region where lateral rumble strips have succeeded in slowing traffic and assisted in improving crashes, this concept was summarily dismissed because of the potential effects of the noise associated with it on the residential development in close proximity.

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 three-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.

Night Time Crashes

The crash data shows an unusually high percentage of night time crashes compared to daytime. Although a lack of adequate lighting was not mentioned as an issue during the task force meetings, our night time field visit revealed that it gets fairly dark along the corridor due to the suburban/rural land use pattern along Erial Road, as there are no businesses along the corridor. The improvement strategies will address this.

POTENTIAL IMPROVEMENT SCENARIOS

Four improvement scenarios were analyzed to address the safety issues along the study corridor. For three of the four scenarios a LOS analysis was performed at the three major intersections in the corridor to determine the impact of each improvement on the overall intersection efficiency and operation.

Scenario 1

Characteristics

- Reduce travel speeds along Erial Road from 50 MPH to 40 MPH.
- Install the appropriate speed limit signage.
- Add street lights strategically in the corridor.
- Add street name signs in accordance with Manual for Uniform Traffic Control Devices (MUTCD) guideline for visibility.

Table 6: Scenario 1 – Peak-Hour Level of Service (LOS) Analysis

		Speed Reduction			
		AM		PM	
	Direction	Delay (sec)	LOS	Delay (sec)	LOS
Erial Road & Duchess Drive/Duke Drive	Duchess Drive – Westbound	11	B	13	B
	Duke Drive – Eastbound	14	B	26	D
	Erial Road – Northbound	8 (LT only)	A	9 (LT only)	A
	Erial Road – Southbound	8 (LT only)	A	9 (LT only)	A
	Total	**3**	**A**	**3**	**A**
Erial Road & Elsworth Drive	Elsworth Drive – Eastbound	12	B	13	B
	Erial Road – Northbound	1	A	1	A
	Erial Road – Southbound	0	A	0	A
	Total	**2**	**A**	**2**	**A**
Erial Road & Wiltons Landing Road	Wiltons Landing Road – Westbound	11	B	11	B
	Erial Road – Northbound	0	A	0	A
	Erial Road – Southbound	8 (LT only)	A	8 (LT only)	A
	Total	**1**	**A**	**1**	**A**

Source: DVRPC, 2008

Advantages

- Slower speeds tend to lower the severity of crashes.
- Shorter stopping sight distance required for vehicles traveling on Erial Road and vehicles entering Erial Road.

Disadvantages

- Based on the speed study conducted a speed reduction is not warranted.
- Given the geometry of Erial Road motorists are still likely to speed. In addition studies have shown that lowering the speed limit does not always lead to slower speeds.
- Stopping sight distances still compromised.
- Potential for sideswipe crashes from lane change still exists.
- Motorists from side streets still have to consider at least two active lanes of traffic when making a left-turn.

Level of Service Analysis

With this scenario, a speed limit reduction to 40 MPH was simulated using SYNCHRO software to determine the operational impact at the intersections. The LOS and vehicle delay remains the same as the existing conditions for all three intersections as shown in ***Table 6***. The overall LOS for each intersection is A, with vehicle delays ranging between 1 to 3 seconds. With the exception of the afternoon westbound Duke Drive approach, the remaining side streets maintain a LOS B, with average delays of 11 to 14 seconds. The 8 and 9 second delays associated along Erial Road approaches are attributed to vehicles making left-turns onto Duchess Drive/Duke Drive and Elsworth Drive. The full SYNCHRO analysis is shown in the **Appendix**.

Scenario 2

Characteristics

- Narrow travel lanes from 12 feet to 10 feet.
- Add a landscaped median to separate directional travel with left-turn bays at intersections.
- Add intersection warning signs (W2-1) for Duke/Duchess Drive intersection 500 feet before the intersection.
- Add street lights strategically in the corridor.
- Add street name signs in accordance with MUTCD guideline for visibility.

Advantages

- Traffic calming measure designed to encourage slower speeds.
- Provides additional right-of-way for other uses.
- Although motorists from side streets have to consider at least two active lanes of traffic when making a left-turn the actual distance is shorter.

Disadvantages

- Costs associated with construction and maintenance of the landscaped median.

- Potential for sideswipe crashes from lane change still exists.
- Motorists from side streets still have to consider at least two active lanes of traffic when making a left-turn.

Figure 10 and 11 represents a conceptual drawing of this scenario.

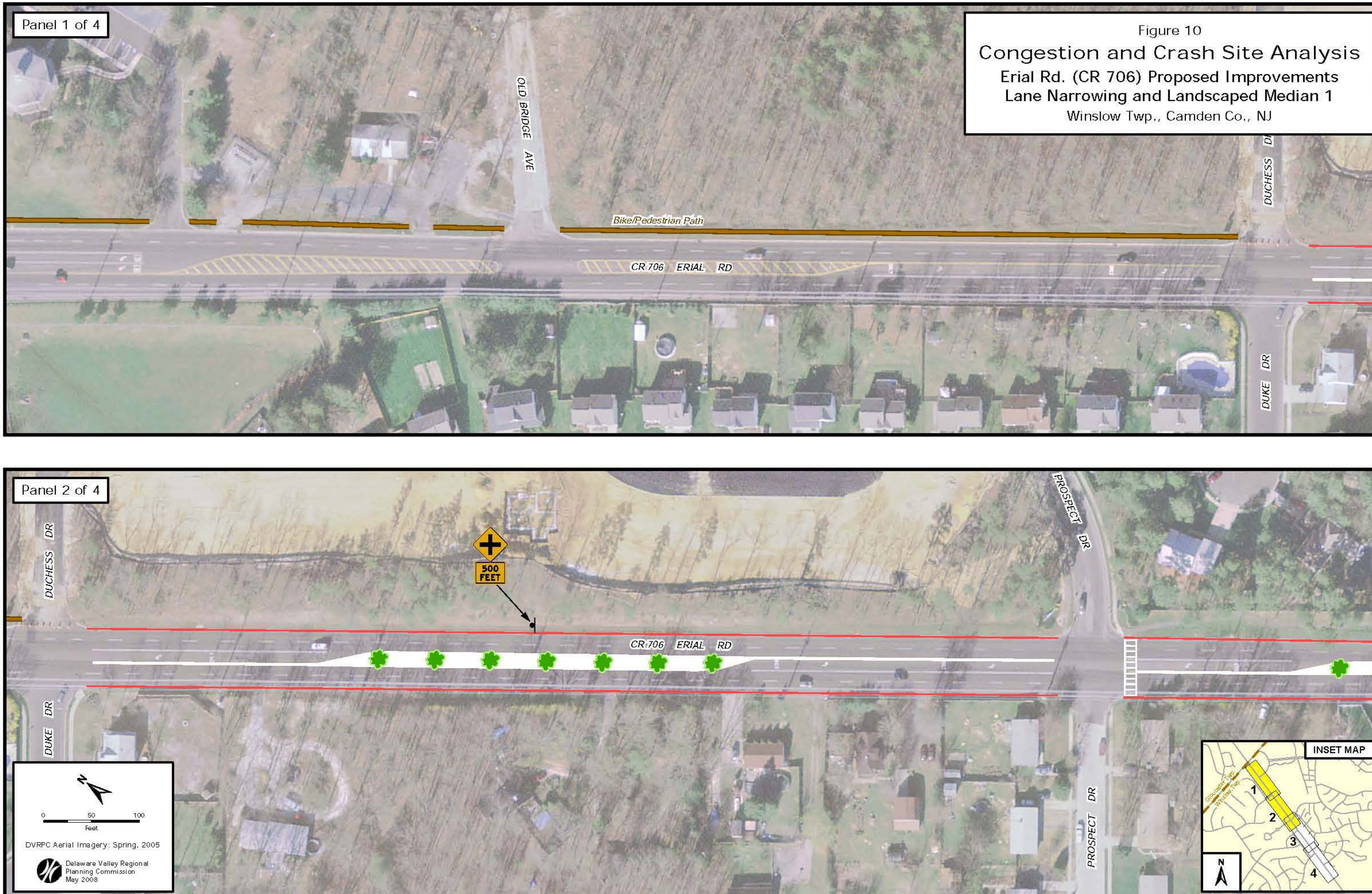
Level of Service Analysis

The LOS and vehicle delay output derived from SYNCHRO analysis for this scenario is the same as the existing conditions. As shown in ***Table 7***, the LOS for all three intersections is A, with delays ranging between 1 to 3 seconds. Traffic flow along Erial Road is free flow with minimal delays associated at the left-turning lanes. Duke Drive approach has the highest level of delay of 26 seconds and LOS D. The remaining side street approaches along the corridor maintain a LOS B and average delays from 11 to 14 seconds. The full SYNCHRO analysis is shown in the **Appendix**.

Table 7: Scenario 2 – Peak-Hour Level of Service (LOS) Analysis

		Lane Narrowing and Landscaped Median			
		AM		PM	
	Direction	Delay (sec)	LOS	Delay (sec)	LOS
Erial Road & Duchess Drive/ Duke Drive	Duchess Drive – Westbound	11	B	13	B
	Duke Drive – Eastbound	14	B	26	D
	Erial Road – Northbound	8 (LT only)	A	9 (LT only)	A
	Erial Road – Southbound	8 (LT only)	A	9 (LT only)	A
	Total	**3**	**A**	**3**	**A**
Erial Road & Elsworth Drive	Elsworth Drive – Eastbound	12	B	13	B
	Erial Road – Northbound	1	A	1	A
	Erial Road – Southbound	0	A	0	A
	Total	**2**	**A**	**2**	**A**
Erial Road & Wiltons Landing Road	Wiltons Landing Road – Westbound	11	B	11	B
	Erial Road – Northbound	0	A	0	A
	Erial Road – Southbound	8 (LT only)	A	8 (LT only)	A
	Total	**1**	**A**	**1**	**A**

Source: DVRPC, 2008



Panel 1 of 4
Figure 10
Congestion and Crash Site Analysis
Erial Rd. (CR 706) Proposed Improvements
Lane Narrowing and Landscaped Median 1
Winslow Twp., Camden Co., NJ
OLD BRIDGE AVE
DUCHESS DR
Bike/Pedestrian Path
CR 706 ERIAL RD
DUKE DR
Panel 2 of 4
DUCHESS DR
500 FEET
PROSPECT DR
CR 706 ERIAL RD
DUKE DR
PROSPECT DR
0 50 100
Feet
DVRPC Aerial Imagery: Spring, 2005
Delaware Valley Regional Planning Commission
May 2008
INSET MAP
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2
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4
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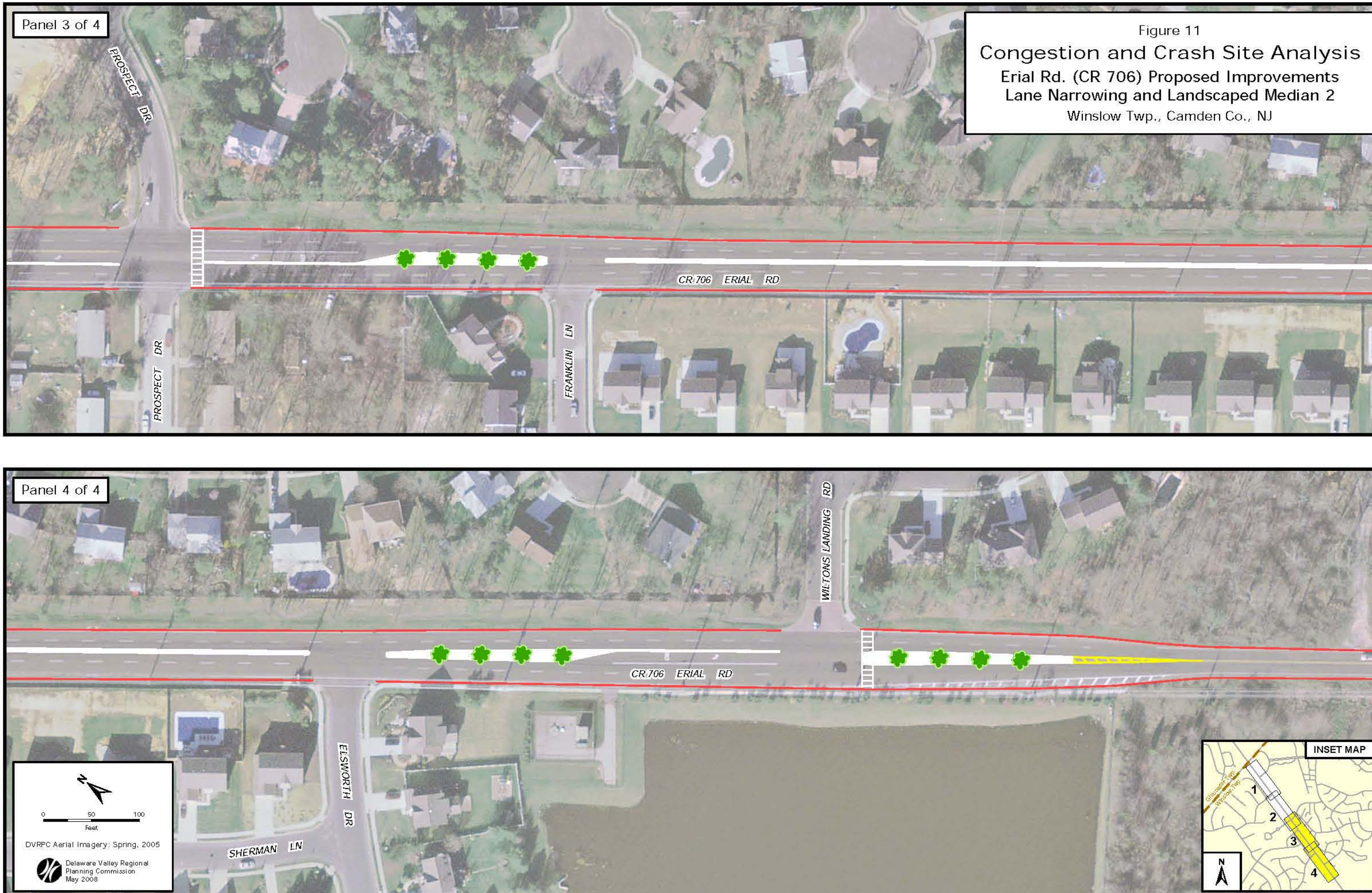


Figure 11
Congestion and Crash Site Analysis
Erial Rd. (CR 706) Proposed Improvements
Lane Narrowing and Landscaped Median 2
Winslow Twp., Camden Co., NJ

Figure 12: Existing Erial Road Cross Section
Source: DVRPC, 2008

Figure 13: Rendering of Lane Narrowing and Landscaped Median
Source: DVRPC, 2008

Scenario 3

Characteristics

- Road diet application
    - Convert Erial Road from 4 lanes to 3 lanes
    - One lane in each direction with a two way center left-turn lane
    - Convert the excess right-of-way to shoulders in both directions.
    - Add lateral rumble strips to appropriate sections of the center dual left-turn lane to prevent improper use by through traffic.
    - Add appropriate signage.
- Add intersection warning signs (W2-1) for Duke/Duchess Drive intersection 500 feet before the intersection.
- Extend the multi-purpose trail on the eastside of Erial Road to Berlin Cross Keys Road.
- Add street lights strategically in the corridor.
- Add street name signs in accordance with MUTCD guideline for visibility.

Advantages

- The number of potential conflict points is reduced.
- The number of sideswipe and left-turn crashes can be reduced.
- The severity of crashes can be reduced.
- Can result in slower travel speeds.
- Provides amenities for other users (bicycle and pedestrian facilities).
- Low cost associated with implementation.
- Increased intersection sight distance for Erial Road traffic.
- Motorists entering or crossing Erial Road from side streets only have to consider one active lane at a time.
- Level of service remains adequate.
- Shoulders provide area for traffic law enforcement.
- If traffic volumes overwhelmingly increase in the future on Erial Road and demand more capacity the road can easily be converted back to the four-lane configuration.

Disadvantages

- Slower travel speeds by individual motorists or vehicles may result in aggressive driving from others.

Figure 12 and 13 represents a conceptual drawing of this scenario.

Level of Service Analysis

As shown in ***Table 8,*** there is a change in the operation of two of the three intersections. In the morning, the overall LOS at the Duchess Drive/Duke Drive intersection is A, but with increased vehicle delay by one second over the existing conditions. During the afternoon peak period, the delay at the Duke Drive approach decreases by 9 seconds and LOS improves from D to C. Compared with existing conditions; the Elsworth Drive approach level of service remains at B; however the vehicle delay was reduced by one second, making delays with this scenario, 11 and 12 seconds in the morning and afternoon respectively. The road diet application did not change LOS or associated delay at the Wiltons Landing Road intersection. The LOS along Erial Road is A, with 8 to 9 seconds of delays for left-turn movements at the Duchess Drive/Duke Drive and Wiltons Landing Road intersections. The full SYNCHRO analysis is shown in the **Appendix**.

Table 8: Scenario 3 – Peak-Hour Level of Service (LOS) Analysis

		Road Diet Application			
		AM		PM	
	Direction	**Delay (sec)**	**LOS**	**Delay (sec)**	**LOS**
Erial Road & Duchess Drive/Duke Drive	Duchess Drive – Westbound	12	B	13	B
	Duke Drive – Eastbound	13	B	17	C
	Erial Road – Northbound	8 (LT only)	A	9 (LT only)	A
	Erial Road – Southbound	8 (LT only)	A	9 (LT only)	A
	Total	**4**	**A**	**3**	**A**
Erial Road & Elsworth Drive	Elsworth Drive – Eastbound	11	B	12	B
	Erial Road – Northbound	1	A	1	A
	Erial Road – Southbound	0	A	0	A
	Total	**2**	**A**	**2**	**A**
Erial Road & Wiltons Landing Road	Wiltons Landing Road – Westbound	11	B	11	B
	Erial Road – Northbound	0	A	0	A
	Erial Road – Southbound	8 (LT only)	A	8 (LT only)	A
	Total	**1**	**A**	**1**	**A**

Source: DVRPC, 2008

Figure 14: Existing Erial Road Cross Section
Source: DVRPC, 2008

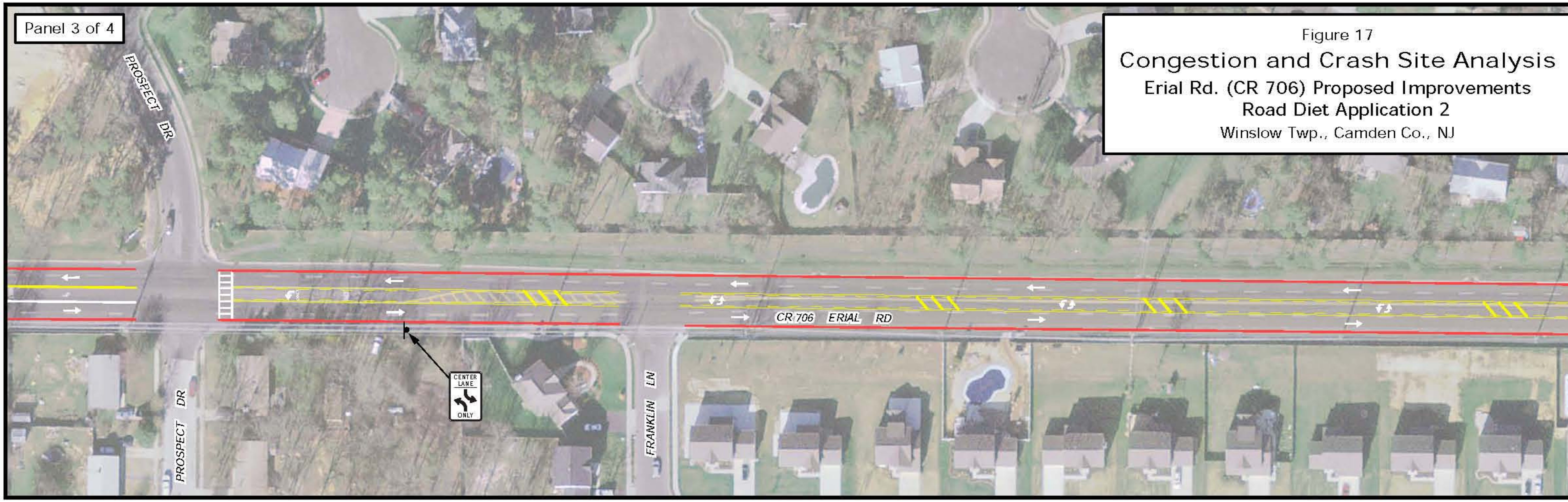
Figure 15: Rendering of Road Diet Application
Source: DVRPC, 2008

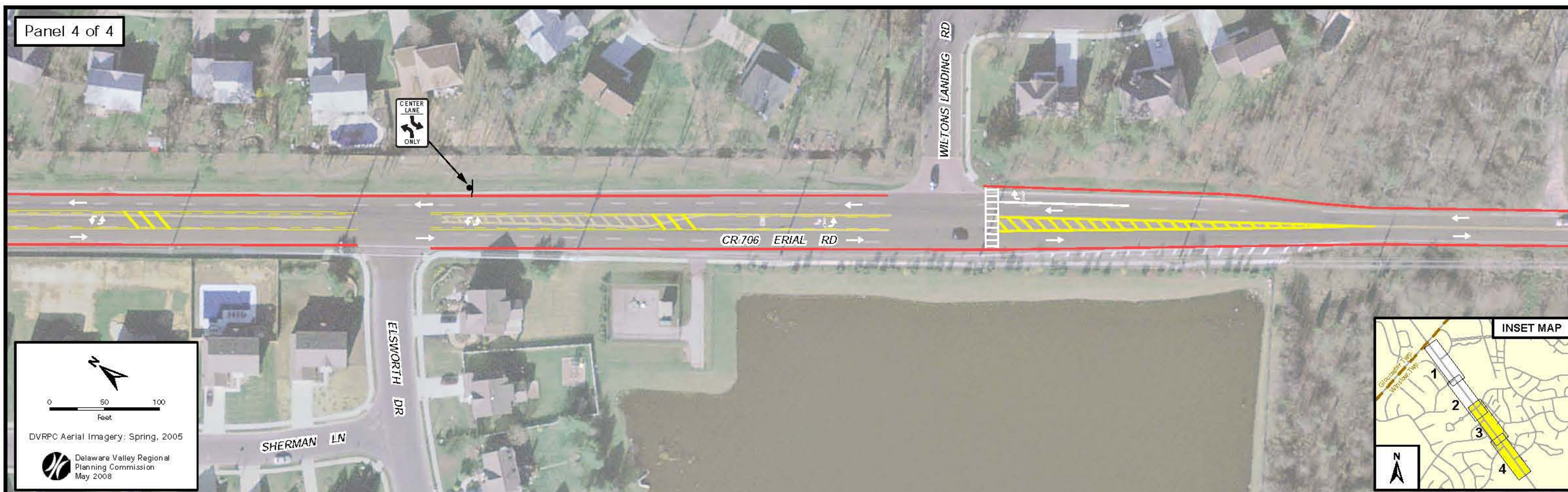
Figure 17

Congestion and Crash Site Analysis

Erial Rd. (CR 706) Proposed Improvements
Road Diet Application 2

Winslow Twp., Camden Co., NJ





Scenario 4

Characteristics

- Same as *Scenario 3.*
- Shift road diet striping to the east and stripe excess right-of-way as a bike lane on the southbound side of Erial Road and sidewalk in areas where they do not currently exist.

Advantages

- Same as *Scenario 3*.
- Northbound Erial Road has an existing multi-use trail which can be used by bicyclist providing a dedicated bike lane in the southbound direction and sidewalk on this side of the road allows for safer travel for bicyclists and pedestrians.

Disadvantages

- Same as *Scenario 3*.
- Does not provide for traffic law enforcement in the northbound direction.

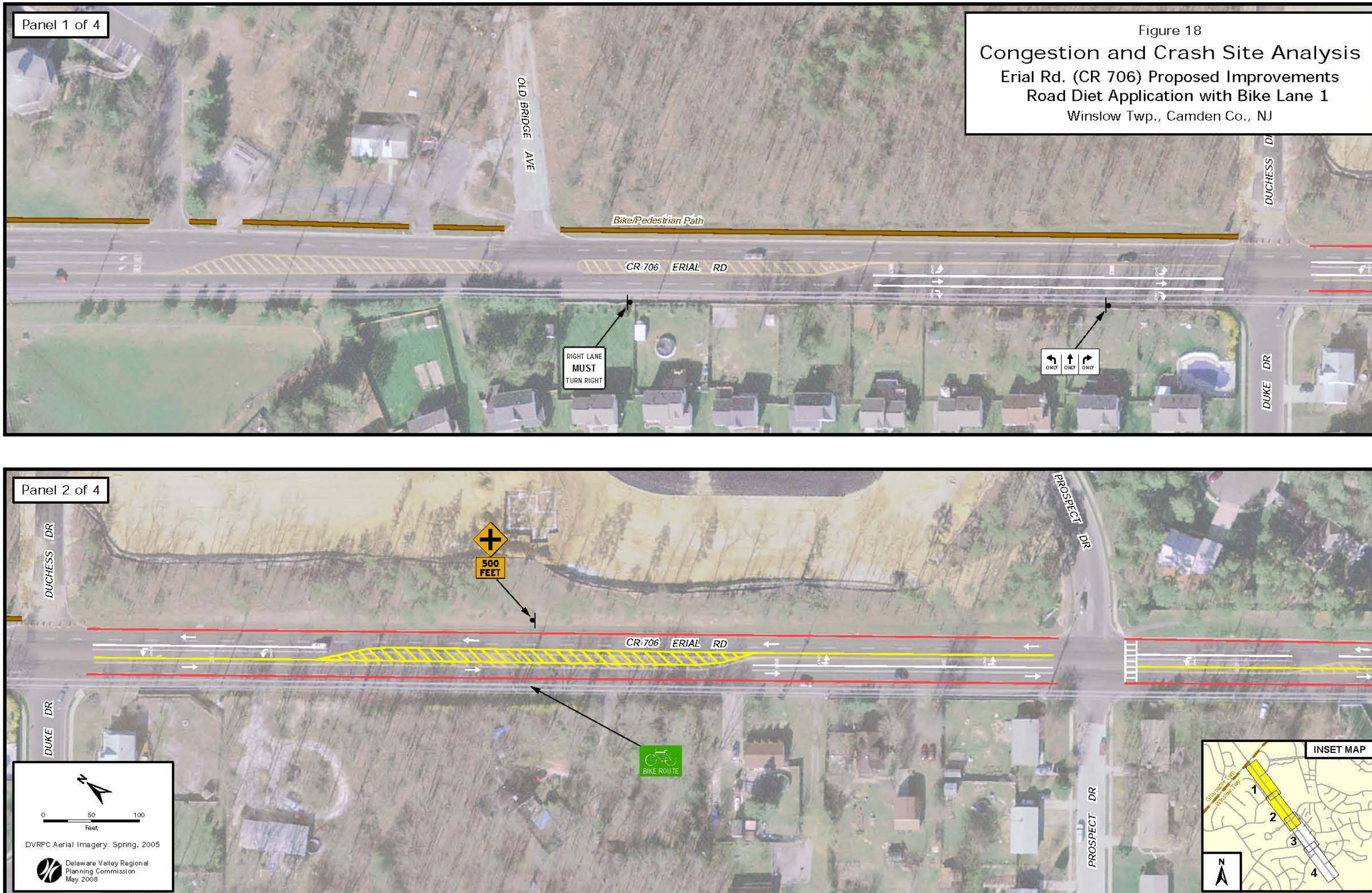
Figures 18 and 19 represent conceptual drawings of this scenario.

Figure 18

Congestion and Crash Site Analysis

Erial Rd. (CR 706) Proposed Improvements
Road Diet Application with Bike Lane 1

Winslow Twp., Camden Co., NJ



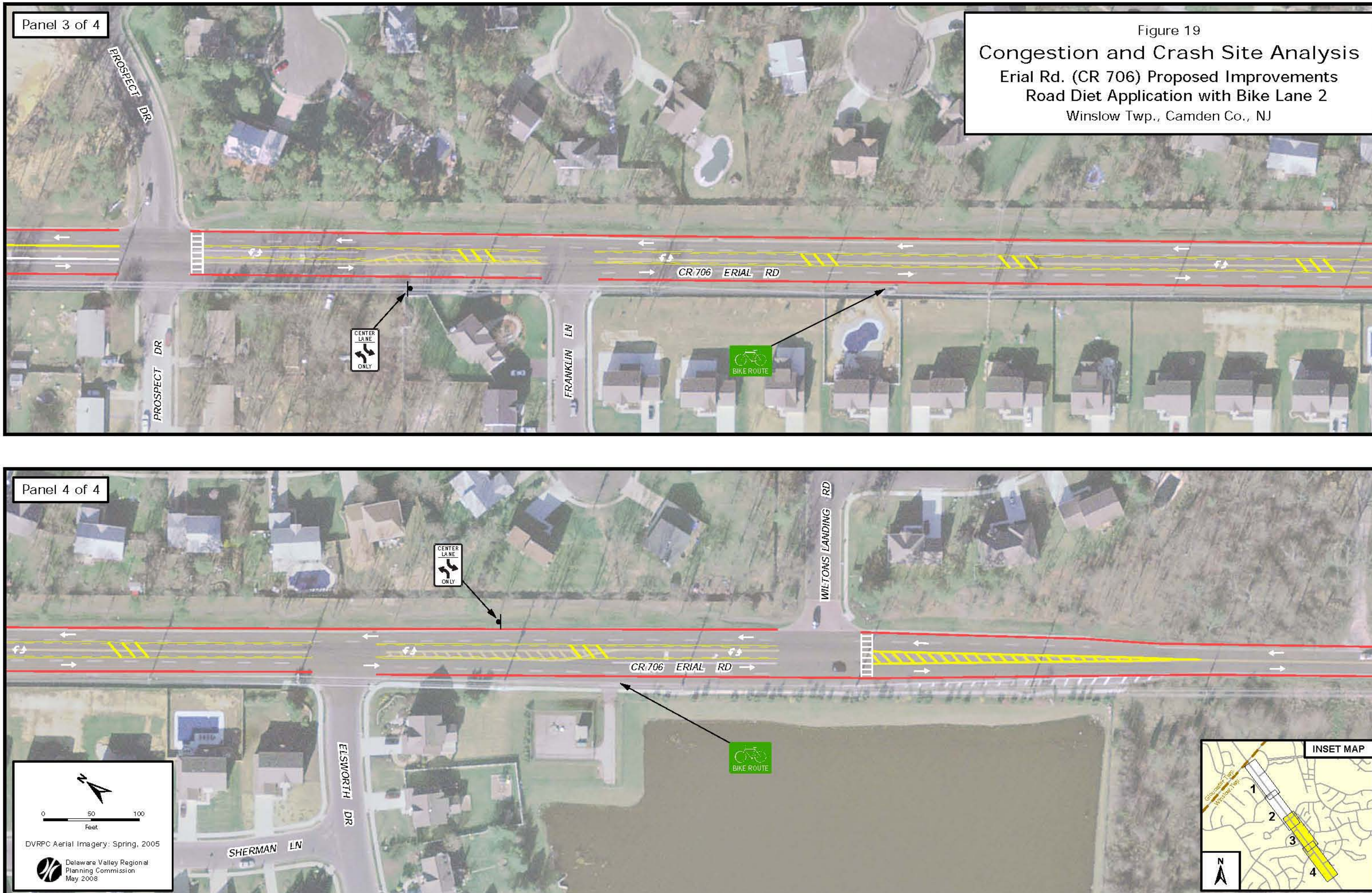


Figure 19
Congestion and Crash Site Analysis
Erial Rd. (CR 706) Proposed Improvements
Road Diet Application with Bike Lane 2
Winslow Twp., Camden Co., NJ
Panel 3 of 4
PROSPECT DR
FRANKLIN LN
CR 706 ERIAL RD
CENTER LANE ONLY
BIKE ROUTE
Panel 4 of 4
WILTONS LANDING RD
ELSWORTH DR
SHERMAN LN
0 50 100
Feet
DVRPC Aerial Imagery: Spring, 2005
Delaware Valley Regional Planning Commission
May 2008
INSET MAP
Gloucester Twp.
Winslow Twp.
1
2
3
4
N

FINDINGS

- The data does not support a reduction in the speed limit from 50 MPH. Based on the SYNCHRO Analysis minimal change to the overall operation and efficiency of the three intersections evaluated is realized.
- *Scenarios 1 (speed reduction) and 2 (lane narrowing with landscaped median)* showed no change in the LOS and vehicle delays associated at the three intersections
- Potential for sideswipe crashes from lane change still exist with *Scenarios 1 and 2*
- With *Scenarios 1 and 2,* motorists from side streets still have to consider at least two active lanes of traffic when making left-turns.
- High costs are associated with construction and maintenance of the landscaped median in *Scenario 2*, while relatively low costs associated with the speed reduction or road application of *Scenarios 3 and 4.*
- *Scenarios 3 and 4*, the road diet application showed large improvement at the Duke Drive approach.
- For the road diet application traffic continued to flow freely on Erial Road.
- The road diet application to the study corridor continues the two lane configuration of the roadway. Except for at select intersections, Erial Road in Winslow Township is a two lane roadway, one lane in each direction. As such, the study location is an anomaly in the township.
- The road diet application reduces the number of potential conflict points along the corridor and increases intersection sight distance for Erial Road traffic.
- *Scenarios 3 and 4* can result in slower travel speeds and can potentially reduce the severity of crashes.
- ***Table 9*** below addresses concerns that motorists use this four-lane stretch to make up time when trapped behind slower moving vehicles.

Table 9: Travel Time for the Study Area

MPH	TIME * (minutes)	DIFFERENCE (minutes) (based on 50 MPH)
50	0.96	-
45	1.07	0.09
40	1.20	0.24
35	1.37	0.41
30	1.60	0.64
25	1.92	0.96

*** Based on the 0.8 miles of the study corridor and does not include time for changing lanes or other factors such as grade.**
Source: DVRPC, 2008

- Based on the speed study, 50 percent of the motorists on Erial Road traveled above 40 MPH. At 40 MPH, the travel time difference in the study corridor vs 50 MPH is 0.24 minutes, less than 15 seconds.

- Amenities for other road users (bicycle and pedestrian facilities) are provided through the road diet application
- *Scenario 3* provides shoulders on both sides of the roadway which can also be utilized by local traffic law enforcement.
- If traffic volumes overwhelmingly increase in the future on Erial Road and demand more capacity the road can easily be converted back to the four-lane configuration from the three lane configuration of the road diet application at minimal cost.

RECOMMENDATIONS

Given, the safety and operational benefits of *Scenario 3*, a road diet should be considered for Erial Road with the appropriate signage. A more in-depth engineering analysis should be conducted before implementing this strategy. Of the four scenarios, *Scenario 3* provides the safest solution for traffic flow along the Erial Road corridor. This scenario also lends itself to a higher level of flexibility given that there is continuing development in the area and the corridor has been identified as an emerging corridor in *DVRPC Congestion Management Process*. Additionally, there was a general consensus in favor of this improvement scenario from corridor stakeholders at our last meeting.

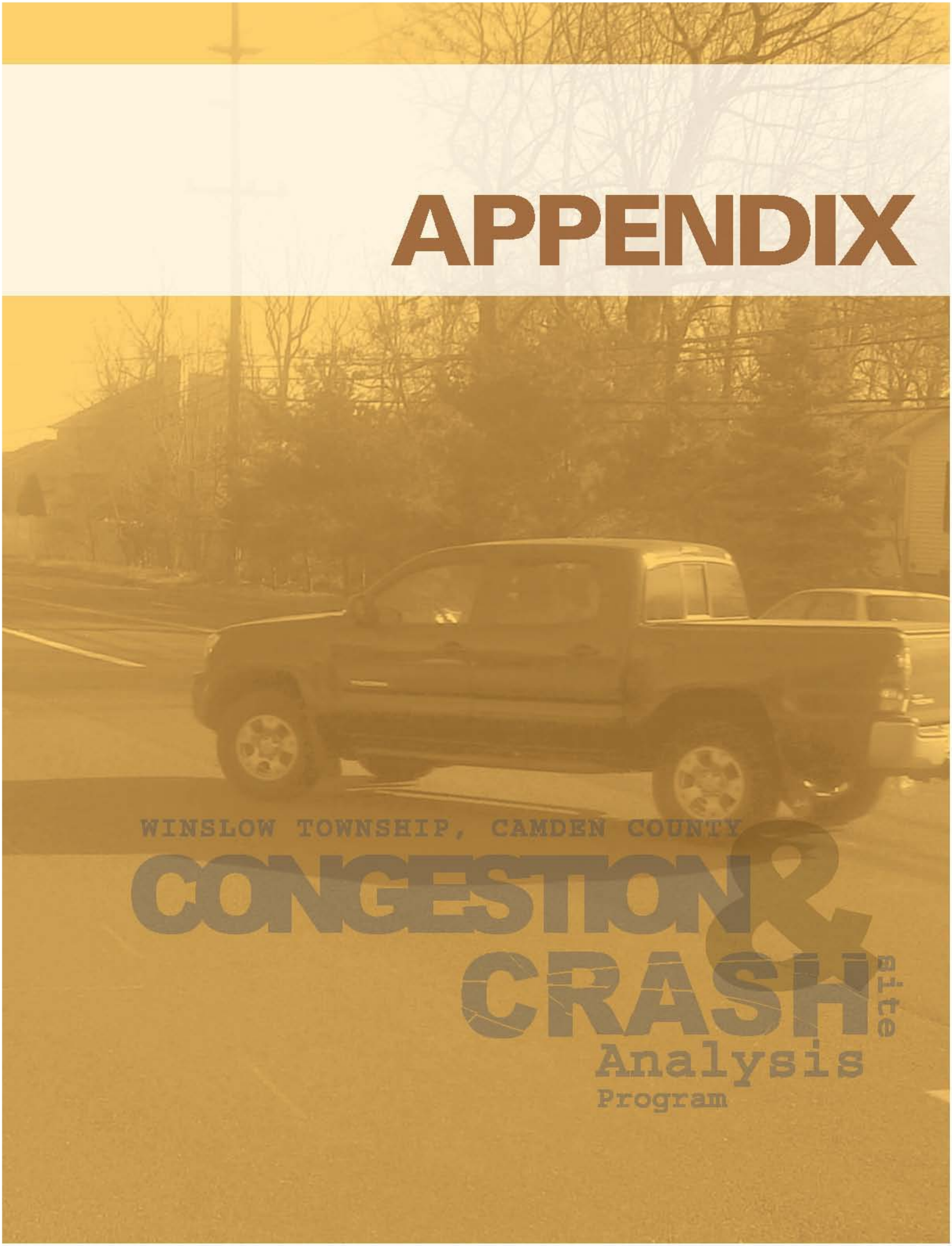
In converting Erial Road from 4 lanes to 3 lanes, one lane in each direction with a two way center left-turn lane, the excess right-of-way should be converted to shoulders in both directions. This will accommodate bicycle travel in both directions, stopped vehicles outside the travel lanes and local traffic law enforcement. In addition, lateral rumble strips should be applied to appropriate sections of the center dual left-turn lane to prevent improper use by through traffic.

Appropriate signage needs to be added to enhance safety for road users. Intersection warning signs (W2-1) with distance plaque should be added for Duke/Duchess Drive intersection at approximately 500 feet before the intersection in the northbound direction. Add appropriate lane designation signs (R3-8b) on Erial Road for the southbound approach at Duke/Duchess Drive intersection. In addition, install "center lane two way left turn only" (R3-9b) signs along the corridor as appropriate. Improve street name signs in accordance with MUTCD guideline for greater visibility.

Extend the multi-purpose trail on the eastside of Erial Road to Berlin Cross Keys Road to accommodate travel beyond Duchess Drive.

Improve street lighting strategically along the corridor to enhance safety. Night time field visit revealed that it gets fairly dark along the corridor, in addition, the crash data shows an unusually high percentage of night time crashes compared to daytime. Installing street lighting will greatly enhance visibility and lead to safer travel.

APPENDIX



WINSLOW TOWNSHIP, CAMDEN COUNTY

CONGESTION & CRASH site Analysis Program

DVRPC - Travel Monitoring

TAKEN BY: RS **DATE:** 2/11/2008

ROAD: **CR 706 NB NEW BROOKLYN BLACKWOOD** **FROM:** PROSPECT RD **TO:** DUKE DR

COUNTY: CAMDEN **MCD:** 315 - WINSLOW TOWNSHIP **SR/SEG/OFF:** 04000706/3.85 **FC:** 17

PROJECT 8-45-010 **COUNT DIR:** NORTH **TRAFFIC DIR:** BOTH **SPEED LIMIT:** **STATE:** NJ

STATION ID: **DVRPC FILE #:** 47546 **COUNTER #:** 704 **WEATHER:** **LOOP OR CLASS:**

ROAD DESCRIPTION:

HOUR ENDING	Monday 02/11/08	Tuesday 02/12/08	Wednesday 02/13/08	Thursday 02/14/08	Friday 02/15/08
1AM		31	26		
2 AM		12	17		
3 AM		12	10		
4 AM		18	23		
5 AM		34	38		
6 AM		111	112		
7 AM		397	356		
8 AM		706	639		
9 AM		618	577		
10 AM		393	379		
11 AM		312	319		
12 PM		294	248		
1 PM	249	284			
2 PM	255	311			
3 PM	279	335			
4 PM	329	426			
5 PM	411	462			
6 PM	483	364			
7 PM	238	288			
8 PM	203	176			
9 PM	185	130			
10 PM	80	75			
11 PM	94	91			
12 AM	34	31			
		5,911			

DATA SOURCE: INTERNAL

COMMENTS:

SEASONAL FACTOR:	1.013	**AADT:**	**5,874**	AM Peak %	11.9	Hour Ending	8:00 AM
AXLE CORR. FACTOR:	0.981			PM Peak %	7.8	Hour Ending	5:00 PM

DVRPC - Travel Monitoring

TAKEN BY: RS **DATE:** 2/11/2008

ROAD: **CR 706 SB NEW BROOKLYN BLACKWOOD** **FROM:** PROSPECT RD **TO:** DUKE DR

COUNTY: CAMDEN **MCD:** 315 - WINSLOW TOWNSHIP **SR/SEG/OFF:** 04000706/3.85 **FC:** 17

PROJECT 8-45-010 **COUNT DIR:** SOUTH **TRAFFIC DIR:** BOTH **SPEED LIMIT:** **STATE:** NJ

STATION ID: **DVRPC FILE #:** 47547 **COUNTER #:** 517 **WEATHER:** **LOOP OR CLASS:**

ROAD DESCRIPTION:

HOUR ENDING	Monday 02/11/08	Tuesday 02/12/08	Wednesday 02/13/08	Thursday 02/14/08	Friday 02/15/08
1AM		43	31		
2 AM		27	17		
3 AM		12	7		
4 AM		20	14		
5 AM		16	20		
6 AM		55	56		
7 AM		173	159		
8 AM		250	241		
9 AM		265	245		
10 AM		195	184		
11 AM		199	221		
12 PM		198	220		
1 PM	224	257			
2 PM	257	256			
3 PM	345	332			
4 PM	344	443			
5 PM	435	405			
6 PM	517	527			
7 PM	446	464			
8 PM	349	329			
9 PM	263	252			
10 PM	224	235			
11 PM	136	122			
12 AM	59	64			
		5,139			

DATA SOURCE: INTERNAL

COMMENTS:

SEASONAL FACTOR:	1.013	**AADT:**	**5,107**	AM Peak %	5.2	Hour Ending	9:00 AM
AXLE CORR. FACTOR:	0.981			PM Peak %	10.3	Hour Ending	6:00 PM

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

COUNTY: CAMDEN
MUNICIPALITY: WINSLOW

INTERSECTION: North-South Street & East-West Street
STREETS: CR 706 ERIAL RD & DUKE DR

DATE: 11/14/07
DAY: WEDNESDAY
WEATHER: FAIR

FILE NUMBER: 1AM

AM INTERVAL COUNTS

	CR 706 ERIAL RD								DUKE DR										
	1-NORTHBOUND				2-SOUTHBOUND				3-EASTBOUND				4-WESTBOUND				N-S	E-W	
STARTING 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	24	1	26	1	22	0	23	5	0	4	9	0	0	17	17	49	26	75
6:15 6:30	0	39	1	40	0	31	1	32	5	1	3	9	1	0	23	24	72	33	105
6:30 6:45	1	54	2	57	1	44	7	52	9	0	6	15	0	0	31	31	109	46	155
6:45 7:00	2	106	2	110	4	42	1	47	9	1	10	20	4	2	33	39	157	59	216
7:00 7:15	4	97	1	102	6	41	1	48	14	0	7	21	1	0	40	41	150	62	212
7:15 7:30	3	74	0	77	5	36	1	42	3	0	3	6	1	0	23	24	119	30	149
7:30 7:45	0	98	2	100	11	25	2	38	7	0	8	15	3	3	18	24	138	39	177
7:45 8:00	0	48	0	48	8	33	3	44	2	1	3	6	0	1	31	32	92	38	130
8:00 8:15	4	48	0	52	6	26	2	34	6	1	0	7	2	0	29	31	86	38	124
8:15 8:30	2	85	3	90	9	65	3	77	7	0	2	9	3	0	22	25	167	34	201
8:30 8:45	2	82	3	87	13	36	0	49	11	0	3	14	1	0	30	31	136	45	181
8:45 9:00	0	82	1	83	7	47	1	55	3	0	0	3	3	0	23	26	138	29	167
TOTALS	19	837	16	872	71	448	22	541	81	4	49	134	19	6	320	345	1413	479	1892
P.H. am																			
P.H. pm																			

HOURLY VOLUMES

	CR 706 ERIAL RD								DUKE DR										
	1-NORTHBOUND				2-SOUTHBOUND				3-EASTBOUND				4-WESTBOUND				N-S	E-W	
STARTING 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	223	6	233	6	139	9	154	28	2	23	53	5	2	104	111	387	164	551
7:00 8:00	7	317	3	327	30	135	7	172	26	1	21	48	5	4	112	121	499	169	668
8:00 9:00	8	297	7	312	35	174	6	215	27	1	5	33	9	0	104	113	527	146	673
TOTALS	19	837	16	872	71	448	22	541	81	4	49	134	19	6	320	345	1413	479	1892

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

COUNTY: CAMDEN
MUNICIPALITY: WINSLOW

INTERSECTION: North-South Street & East-West Street
STREETS: CR 706 ERIAL RD DUKE DR

DATE: 11/14/07
DAY: WEDNESDAY
WEATHER: FAIR

FILE NUMBER: 1PM

PM INTERVAL COUNTS

	CR 706 ERIAL RD								DUKE DR										
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	61	4	67	21	62	3	86	3	1	0	4	3	2	13	18	153	22	175
3:15 3:30	2	57	1	60	11	54	4	69	2	0	4	6	4	0	12	16	129	22	151
3:30 3:45	4	67	0	71	12	67	4	83	7	9	3	19	1	4	14	19	154	38	192
3:45 4:00	4	77	1	82	28	77	5	110	2	0	1	3	3	0	8	11	192	14	206
4:00 4:15	3	82	2	87	19	75	6	100	5	0	12	17	2	1	10	13	187	30	217
4:15 4:30	2	88	4	94	31	90	6	127	4	0	2	6	1	0	10	11	221	17	238
4:30 4:45	2	110	7	119	29	131	7	167	2	0	2	4	4	0	14	18	286	22	308
4:45 5:00	2	91	1	94	20	75	6	101	1	1	1	3	3	1	16	20	195	23	218
5:00 5:15	5	87	2	94	29	91	3	123	10	0	2	12	2	0	12	14	217	26	243
5:15 5:30	2	114	2	118	22	114	8	144	0	0	1	1	2	0	11	13	262	14	276
5:30 5:45	7	124	3	134	25	147	4	176	3	2	8	13	0	0	36	16	310	29	339
5:45 6:00	13	116	5	134	41	119	9	169	2	0	9	11	3	0	24	17	303	28	331
TOTALS	48	1074	32	1154	288	1102	65	1455	41	13	45	99	28	8	180	186	2609	285	2894
P.H. am																			
P.H. pm																			

HOURLY VOLUMES

	CR 706 ERIAL RD								DUKE DR										
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	12	262	6	280	72	260	16	348	14	10	8	32	11	6	47	64	628	96	724
5:00 6:00	9	371	14	394	99	371	25	495	12	1	17	30	10	2	50	62	889	92	981
6:00 7:00	27	441	12	480	117	471	24	612	15	2	20	37	7	0	83	60	1092	97	1189
TOTALS	48	1074	32	1154	288	1102	65	1455	41	13	45	99	28	8	180	186	2609	285	2894

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

COUNTY: CAMDEN
MUNICIPALITY: WINSLOW

INTERSECTION: North-South Street & East-West Street
STREETS: ERIAL RD ELSWORTH DR

DATE: 2/12/08
DAY: TUESDAY
WEATHER: FAIR

FILE NUMBER: 33AM

AM INTERVAL COUNTS

STARTING		ERIAL RD								ELSWORTH DR										
		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
6:00 6:15		1	35	0	36	0	22	1	23	2	0	2	4	0	0	0	0	59	4	63
6:15 6:30		1	49	0	50	0	26	2	28	2	0	5	7	0	0	0	0	78	7	85
6:30 6:45		2	41	0	43	0	47	0	47	9	0	3	12	0	0	0	0	90	12	102
6:45 7:00		3	45	0	48	0	45	2	47	14	0	13	27	0	0	0	0	95	27	122
7:00 7:15		3	62	0	65	0	47	1	48	6	0	7	13	0	0	0	0	113	13	126
7:15 7:30		8	67	0	75	0	54	2	56	13	0	14	27	0	0	0	0	131	27	158
7:30 7:45		2	77	0	79	0	65	1	66	17	0	11	28	0	0	0	0	145	28	173
7:45 8:00		7	64	0	71	0	76	3	79	8	0	16	24	0	0	0	0	150	24	174
8:00 8:15		3	65	0	68	0	37	1	38	12	0	9	21	0	0	0	0	106	21	127
8:15 8:30		3	52	0	55	0	47	1	48	6	0	10	16	0	0	0	0	103	16	119
8:30 8:45		5	79	0	84	0	60	0	60	4	0	6	10	0	0	0	0	144	10	154
8:45 9:00		3	47	0	50	0	47	4	51	1	0	10	11	0	0	0	0	101	11	112
	TOTALS	41	683	0	724	0	573	18	591	94	0	106	200	0	0	0	0	1315	200	1515
	P.H. am																			
	P.H. pm																			

HOURLY VOLUMES

STARTING	ERIAL RD								ELSWORTH DR										
	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
6:00 7:00	7	170	0	177	0	140	5	145	27	0	23	50	0	0	0	0	322	50	372
7:00 8:00	20	270	0	290	0	242	7	249	44	0	48	92	0	0	0	0	539	92	631
8:00 9:00	14	243	0	257	0	191	6	197	23	0	35	58	0	0	0	0	454	58	512
TOTALS	41	683	0	724	0	573	18	591	94	0	106	200	0	0	0	0	1315	200	1515

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

COUNTY: CAMDEN
MUNICIPALITY: WINSLOW

INTERSECTION: North-South Street & East-West Street
STREETS: ERIAL RD & ELSWORTH DR

DATE: 2/12/08
DAY: TUESDAY
WEATHER: FAIR

FILE NUMBER: 33PM

PM INTERVAL COUNTS

	ERIAL RD								ELSWORTH DR										
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	5	30	0	35	0	42	2	44	2	0	4	6	0	0	0	0	79	6	85
3:15 3:30	5	26	0	31	0	59	5	64	3	0	1	4	0	0	0	0	95	4	99
3:30 3:45	6	37	0	43	0	55	4	59	4	0	3	7	0	0	0	0	102	7	109
3:45 4:00	11	61	0	72	0	65	6	71	3	0	5	8	0	0	0	0	143	8	151
4:00 4:15	8	46	0	54	0	78	7	85	11	0	10	21	0	0	0	0	139	21	160
4:15 4:30	8	60	0	68	0	64	5	69	3	0	5	8	0	0	0	0	137	8	145
4:30 4:45	11	71	0	82	0	79	7	86	2	0	8	10	0	0	0	0	168	10	178
4:45 5:00	13	71	0	84	0	95	6	0	0	0	13	13	0	0	0	0	84	13	97
5:00 5:15	6	93	0	99	0	73	5	78	4	0	5	9	0	0	0	0	177	9	186
5:15 5:30	5	104	0	109	0	75	8	83	5	0	7	12	0	0	0	0	192	12	204
5:30 5:45	7	118	0	125	0	97	12	109	6	0	10	16	0	0	0	0	234	16	250
5:45 6:00	6	127	0	133	0	134	12	146	4	0	7	11	0	0	0	0	279	11	290
TOTALS	91	844	0	935	0	916	79	894	47	0	78	125	0	0	0	0	1829	125	1954
P.H. am																			
P.H. pm																			

HOURLY VOLUMES

	ERIAL RD								ELSWORTH DR										
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	27	154	0	181	0	221	17	238	12	0	13	25	0	0	0	0	419	25	444
5:00 6:00	40	248	0	288	0	316	25	240	16	0	36	52	0	0	0	0	528	52	580
6:00 7:00	24	442	0	466	0	379	37	416	19	0	29	48	0	0	0	0	882	48	930
TOTALS	91	844	0	935	0	916	79	894	47	0	78	125	0	0	0	0	1829	125	1954

DELAWARE VALLEY REGIONAL PLANNING COMMISSION
OFFICE OF TRAVEL MAM INTERVAL COUNTS

COUNTY: CAMDEN
MUNICIPALITY: WINSLOW

INTERSECTION: North-South Street & East-West Street
STREETS: ERIAL RD WILTON'S LANDING RD

DATE: 2/14/08
DAY: WEDNESDAY
WEATHER: FAIR

FILE NUMBER: 32AM

AM INTERVAL COUNTS

STARTING TIME	ERIAL RD 1-NORTHBOUND L	S	R	TOTAL	2-SOUTHBOUND L	S	R	TOTAL	WILTON'S LANDING RD 3-EASTBOUND L	S	R	TOTAL	4-WESTBOUND L	S	R	TOTAL	N-S TOTAL	E-W TOTAL	TOTAL
6:00 6:15	0	17	1	18	1	20	0	21	0	0	0	0	2	0	1	3	39	3	42
6:15 6:30	0	22	2	24	0	27	0	27	0	0	0	0	5	0	2	7	51	7	58
6:30 6:45	0	19	1	20	1	41	0	42	0	0	0	0	1	0	7	8	62	8	70
6:45 7:00	0	47	4	51	2	60	0	62	0	0	0	0	8	0	9	17	113	17	130
7:00 7:15	0	51	4	55	0	37	0	37	0	0	0	0	13	0	11	24	92	24	116
7:15 7:30	0	33	2	35	0	40	0	40	0	0	0	0	4	0	12	16	75	16	91
7:30 7:45	0	70	1	71	3	102	0	105	0	0	0	0	10	0	8	18	176	18	194
7:45 8:00	0	66	2	68	1	56	0	57	0	0	0	0	8	0	8	16	125	16	141
8:00 8:15	0	60	10	70	1	61	0	62	0	0	0	0	6	0	6	12	132	12	144
8:15 8:30	0	51	5	56	4	84	0	88	0	0	0	0	6	0	7	13	144	13	157
8:30 8:45	0	69	10	79	3	59	0	62	0	0	0	0	12	0	10	22	141	22	163
8:45 9:00	0	75	9	84	7	90	0	97	0	0	0	0	11	0	15	26	181	26	207
TOTALS	0	580	51	631	23	677	0	700	0	0	0	0	86	0	96	182	1331	182	1513
P.H. am																			
P.H. pm																			

HOURLY VOLUMES

STARTING TIME	ERIAL RD 1-NORTHBOUND L	S	R	TOTAL	2-SOUTHBOUND L	S	R	TOTAL	WILTON'S LANDING RD 3-EASTBOUND L	S	R	TOTAL	4-WESTBOUND L	S	R	TOTAL	N-S TOTAL	E-W TOTAL	TOTAL
6:00 7:00	0	105	8	113	4	148	0	152	0	0	0	0	16	0	19	35	265	35	300
7:00 8:00	0	220	9	229	4	235	0	239	0	0	0	0	35	0	39	74	468	74	542
8:00 9:00	0	255	34	289	15	294	0	309	0	0	0	0	35	0	38	73	598	73	671
TOTALS	0	580	51	631	23	677	0	700	0	0	0	0	86	0	96	182	1331	182	1513

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

COUNTY: CAMDEN CO
MUNICIPALITY: WINSLOW

INTERSECTION: North-South Street & East-West Street
STREETS: ERIAL RD & WILTON'S LANDING RD

DATE: 2/26/08
DAY: TUESDAY
WEATHER: FAIR

FILE NUMBER: 32PM

PM INTERVAL COUNTS

	ERIAL RD								WILTON'S LANDING RD										
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	0	39	11	50	6	63	0	69	0	0	0	0	2	0	5	7	119	7	126
3:15 3:30	0	49	12	61	10	78	0	88	0	0	0	0	2	0	7	9	149	9	158
3:30 3:45	0	34	9	43	7	58	0	65	0	0	0	0	3	0	9	12	108	12	120
3:45 4:00	0	35	3	38	9	37	0	46	0	0	0	0	7	0	4	11	84	11	95
4:00 4:15	0	60	11	71	4	71	0	75	0	0	0	0	4	0	6	10	146	10	156
4:15 4:30	0	54	10	64	8	71	0	79	0	0	0	0	8	0	9	17	143	17	160
4:30 4:45	0	63	9	72	8	58	0	66	0	0	0	0	2	0	5	7	138	7	145
4:45 5:00	0	89	15	104	5	70	0	0	0	0	0	0	5	0	4	9	104	9	113
5:00 5:15	0	49	10	59	7	39	0	46	0	0	0	0	0	0	4	4	105	4	109
5:15 5:30	0	38	9	47	6	55	0	61	0	0	0	0	2	0	0	2	108	2	110
5:30 5:45	0	60	13	73	14	55	0	69	0	0	0	0	5	0	6	11	142	11	153
5:45 6:00	0	40	7	47	8	43	0	51	0	0	0	0	3	0	3	6	98	6	104
TOTALS	0	610	119	729	92	698	0	715	0	0	0	0	43	0	62	105	1444	105	1549
P.H. am																			
P.H. pm																			

HOURLY VOLUMES

	ERIAL RD								WILTON'S LANDING RD										
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	0	157	35	192	32	236	0	268	0	0	0	0	14	0	25	39	460	39	499
5:00 6:00	0	266	45	311	25	270	0	220	0	0	0	0	19	0	24	43	531	43	574
6:00 7:00	0	187	39	226	35	192	0	227	0	0	0	0	10	0	13	23	453	23	476
TOTALS	0	610	119	729	92	698	0	715	0	0	0	0	43	0	62	105	1444	105	1549

DELAWARE VALLEY REGIONAL PLANNING COMMISSION
OFFICE OF TRAVEL MONITORING - Northbound Speed Counts

COUNTY: CAMDEN   MUNICIPALITY: WINSLOW   STREET: ERIAL RD

DATE	TIME	MPH 0-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	76-99
3/3/2008	09:00 AM	5	0	0	0	6	18	69	86	41	15	4	1	0	2
3/3/2008	10:00 AM	1	0	0	0	6	22	54	81	42	12	2	0	0	0
3/3/2008	11:00 AM	0	0	1	0	3	25	69	68	44	6	1	0	0	0
3/3/2008	12:00 PM	0	0	0	0	5	17	51	88	39	12	3	0	0	0
3/3/2008	01:00 PM	0	0	0	1	3	20	74	94	37	17	4	1	0	0
3/3/2008	02:00 PM	0	0	0	1	4	17	61	82	49	14	2	0	0	0
3/3/2008	03:00 PM	0	0	0	3	5	31	70	101	81	13	3	0	0	0
3/3/2008	04:00 PM	1	1	0	1	1	18	79	148	104	17	6	0	0	0
3/3/2008	05:00 PM	0	0	0	2	5	31	111	153	84	20	2	1	0	0
3/3/2008	06:00 PM	0	0	1	2	11	46	118	101	42	6	1	0	0	0
3/3/2008	07:00 PM	0	1	0	2	12	36	76	63	32	2	2	0	0	0
3/3/2008	08:00 PM	0	0	0	0	4	31	64	34	17	1	1	1	0	0
3/3/2008	09:00 PM	0	0	0	1	6	26	27	24	15	2	1	0	0	0
3/3/2008	10:00 PM	0	0	0	1	6	14	35	26	16	3	0	0	0	0
3/3/2008	11:00 PM	0	0	0	0	2	8	19	12	7	3	0	0	0	0
3/4/2008	12:00 AM	0	0	0	0	0	4	15	13	7	3	0	0	0	0
3/4/2008	01:00 AM	0	0	0	0	2	3	6	4	2	1	0	0	1	0
3/4/2008	02:00 AM	0	0	0	0	1	0	6	2	1	0	0	0	0	0
3/4/2008	03:00 AM	0	0	1	0	2	3	5	9	3	0	0	0	0	0
3/4/2008	04:00 AM	0	0	0	1	1	5	12	7	6	1	0	0	0	0
3/4/2008	05:00 AM	0	0	0	0	3	12	36	23	24	7	1	0	0	0
3/4/2008	06:00 AM	0	0	0	0	9	36	99	80	41	6	1	0	0	0
3/4/2008	07:00 AM	0	0	0	0	8	46	122	155	106	20	4	0	0	0
3/4/2008	08:00 AM	0	0	0	2	10	47	131	157	74	18	4	0	0	0
3/4/2008	09:00 AM	0	0	0	1	6	37	95	98	66	8	1	0	0	0
3/4/2008	10:00 AM	0	0	0	1	4	25	72	71	41	9	2	2	0	0
3/4/2008	11:00 AM	0	0	0	0	1	36	68	75	46	8	0	0	0	0
3/4/2008	12:00 PM	0	0	1	0	10	37	70	88	47	10	2	0	0	0
3/4/2008	01:00 PM	0	0	0	0	2	39	65	81	39	9	1	0	0	0
3/4/2008	02:00 PM	0	0	0	0	19	20	68	90	52	9	0	0	0	0
3/4/2008	03:00 PM	0	0	0	5	13	38	94	110	52	12	3	0	1	0
3/4/2008	04:00 PM	0	1	0	1	7	26	76	143	73	17	5	0	0	0
3/4/2008	05:00 PM	0	0	0	1	12	41	109	143	78	8	4	1	0	0
3/4/2008	06:00 PM	0	0	0	3	9	40	118	100	45	3	2	0	0	0
3/4/2008	07:00 PM	0	0	0	0	9	28	97	74	25	5	4	0	0	0
3/4/2008	08:00 PM	0	0	0	1	10	22	48	37	19	7	0	0	0	0
3/4/2008	09:00 PM	0	0	0	1	5	17	32	28	16	4	1	0	0	0
3/4/2008	10:00 PM	0	0	0	0	5	17	25	24	14	2	0	0	0	0
3/4/2008	11:00 PM	0	0	0	0	5	8	25	17	4	2	0	0	0	0
3/5/2008	12:00 AM	0	0	0	0	1	5	12	7	4	0	1	0	0	0
3/5/2008	01:00 AM	0	0	0	0	2	5	2	3	0	1	0	0	0	0
3/5/2008	02:00 AM	0	0	0	0	0	2	2	2	0	0	0	0	0	0
3/5/2008	03:00 AM	0	0	0	1	1	6	9	3	3	1	0	0	0	0
3/5/2008	04:00 AM	0	0	0	0	3	6	15	6	3	1	0	0	0	0
3/5/2008	05:00 AM	0	0	0	0	4	14	26	28	9	3	0	0	0	0
3/5/2008	06:00 AM	0	0	0	1	8	50	99	83	36	8	1	1	0	0
3/5/2008	07:00 AM	0	0	0	3	16	70	190	146	53	16	4	0	0	0
3/5/2008	08:00 AM	0	0	0	3	10	75	179	128	34	9	1	0	0	0
3/5/2008	09:00 AM	0	1	0	1	7	44	85	83	43	7	2	0	0	0
3/5/2008	10:00 AM	0	0	0	2	3	33	70	66	32	13	0	0	0	1
3/5/2008	11:00 AM	0	0	0	0	4	17	45	62	23	4	0	0	0	0

DELAWARE VALLEY REGIONAL PLANNING COMMISSION
OFFICE OF TRAVEL MONITORING - Southbound Speed Counts

COUNTY: CAMDEN   MUNICIPALITY: WINSLOW   STREET: ERIAL RD

DATE	TIME	MPH 0-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	76-99
3/3/2008	09:00 AM	0	0	0	3	8	24	66	70	22	5	2	0	0	0
3/3/2008	10:00 AM	0	0	0	3	8	19	65	53	30	5	0	0	0	0
3/3/2008	11:00 AM	0	0	0	5	11	20	81	71	24	5	1	1	0	0
3/3/2008	12:00 PM	0	0	0	2	7	27	79	81	38	8	2	1	0	0
3/3/2008	01:00 PM	0	1	0	2	17	20	57	82	49	10	1	0	0	0
3/3/2008	02:00 PM	0	0	1	3	14	34	90	117	58	10	2	1	0	0
3/3/2008	03:00 PM	0	1	2	8	9	22	118	159	66	23	2	1	0	0
3/3/2008	04:00 PM	1	0	1	2	6	30	138	172	60	13	4	1	0	0
3/3/2008	05:00 PM	0	0	1	6	13	52	188	156	37	17	3	0	0	0
3/3/2008	06:00 PM	0	0	0	2	24	79	166	104	37	5	2	0	0	1
3/3/2008	07:00 PM	0	0	0	1	12	68	146	66	24	5	1	0	1	0
3/3/2008	08:00 PM	0	0	0	3	8	65	102	52	12	4	0	0	0	0
3/3/2008	09:00 PM	0	0	0	1	13	37	80	56	14	5	2	0	0	0
3/3/2008	10:00 PM	0	0	0	1	5	28	43	25	2	1	0	0	0	1
3/3/2008	11:00 PM	0	0	0	0	6	21	43	15	6	2	0	0	0	0
3/4/2008	12:00 AM	0	0	0	1	6	8	20	14	3	3	0	0	0	0
3/4/2008	01:00 AM	0	0	0	0	3	9	9	3	0	1	0	0	1	0
3/4/2008	02:00 AM	0	0	0	0	2	4	1	1	1	1	0	0	0	0
3/4/2008	03:00 AM	0	0	0	1	2	2	5	1	1	0	0	0	0	0
3/4/2008	04:00 AM	0	0	0	3	2	2	5	6	1	0	0	0	0	0
3/4/2008	05:00 AM	0	0	0	1	3	9	20	16	7	1	1	1	0	0
3/4/2008	06:00 AM	0	0	0	5	7	21	42	73	26	3	0	0	1	0
3/4/2008	07:00 AM	0	0	0	6	13	35	51	91	44	17	1	0	0	0
3/4/2008	08:00 AM	0	0	0	5	11	29	69	94	40	7	4	0	0	0
3/4/2008	09:00 AM	0	0	1	1	6	25	81	99	30	8	0	1	0	0
3/4/2008	10:00 AM	0	0	0	2	12	22	48	59	16	6	1	0	0	0
3/4/2008	11:00 AM	0	0	0	4	13	20	74	68	20	2	1	0	1	0
3/4/2008	12:00 PM	0	0	1	1	12	25	88	69	43	7	1	1	0	0
3/4/2008	01:00 PM	1	0	0	5	11	20	78	100	26	8	1	0	0	0
3/4/2008	02:00 PM	0	1	0	7	12	38	117	100	33	6	0	0	0	0
3/4/2008	03:00 PM	0	1	4	16	23	51	140	116	33	10	1	1	0	0
3/4/2008	04:00 PM	2	0	0	1	5	40	147	138	44	10	0	0	0	0
3/4/2008	05:00 PM	0	0	0	1	9	50	192	150	36	10	1	0	0	0
3/4/2008	06:00 PM	0	0	1	3	26	103	189	89	22	6	0	0	0	0
3/4/2008	07:00 PM	0	0	0	2	12	68	129	78	16	0	0	0	0	0
3/4/2008	08:00 PM	0	0	0	0	14	57	125	55	11	1	0	0	0	0
3/4/2008	09:00 PM	0	0	0	2	12	36	91	49	10	2	0	1	1	0
3/4/2008	10:00 PM	0	0	0	1	9	31	58	26	7	0	1	1	0	0
3/4/2008	11:00 PM	0	0	0	2	6	19	38	15	4	2	2	0	0	0
3/5/2008	12:00 AM	0	0	0	0	5	14	15	5	5	0	0	0	0	0
3/5/2008	01:00 AM	0	0	0	1	5	2	8	2	1	1	0	0	0	0
3/5/2008	02:00 AM	0	0	0	1	2	4	1	3	0	0	0	0	0	0
3/5/2008	03:00 AM	0	0	0	2	0	3	6	2	0	0	0	0	0	0
3/5/2008	04:00 AM	0	0	0	2	5	4	6	2	1	0	0	0	0	0
3/5/2008	05:00 AM	0	0	1	1	3	11	26	11	8	1	0	1	0	0
3/5/2008	06:00 AM	0	0	0	4	10	18	60	52	14	4	1	0	0	0
3/5/2008	07:00 AM	0	0	0	7	7	31	84	83	27	3	2	0	0	0
3/5/2008	08:00 AM	0	0	0	9	9	44	65	64	25	2	0	0	0	0
3/5/2008	09:00 AM	0	0	1	4	11	23	69	54	23	3	0	0	0	0
3/5/2008	10:00 AM	0	0	1	4	5	16	58	48	22	5	0	0	0	0

CR 689 and CR 706 Intersection Crash Data
WINSLOW TOWNSHIP - CAMDEN COUNTY

Reportable and Non Reportable crashes (2004-2007)

Reportable or Non-reportable	DATE	DAY	TIME	TOTAL KILLED	TOTAL INJURED	ROAD SYSTEM	INTERSECTION OR NOT AT INTERSECTION	WEATHER COND.	LIGHT COND.	ROAD COND.	CRASH TYPE	VEHICLE 1 CONTRIBUTING FACTORS	VEHICLE 2 CONTRIBUTING FACTORS
Reportable	5/12/2004	Wednesday	6:17 PM	0	1	County	At Intersection	Clear	Dark	Dry	Left Turn	Failed To Yield ROW to Vehicle/Pedestrian	None
Reportable	6/9/2004	Wednesday	3:41 PM	0	0	County	Not at Intersection	Clear	Dark	Dry	Fixed Object	Other	~
Non Reportable	12/1/2005	Thursday	11:14 PM	0	0	County	Not at Intersection	Clear	Dark	Dry	Other	Other	None
Reportable	1/27/2005	Thursday	12:26 PM	0	1	County	Not at Intersection	Clear	Dark	Dry	Rear End	Driver Inattention	Other
Reportable	2/7/2005	Monday	7:19 PM	0	0	County	At Intersection	Clear	Dark	Dry	Angle	Other	Other
Reportable	5/4/2005	Saturday	5:33 AM	0	0	County	Not at Intersection	Clear	Dark	Wet	Rear End	Driver Inattention	Unsafe Speed
Reportable	9/18/2005	Sunday	12:00 AM	0	1	County	Not at Intersection	Fog	Dusk	Dry	Fixed Object	Other	~
Reportable	9/27/2005	Tuesday	7:43 AM	0	1	County	At Intersection	Clear	Daylight	Dry	Rear End	Driver Inattention	None
Reportable	1/3/2005	Thursday	3:18 PM	0	0	County	Not at Intersection	Clear	Daylight	Dry	Side Swipe	Improper Passing	None
Reportable	11/5/2005	Sunday	12:56 PM	0	1	County	At Intersection	Clear	Daylight	Dry	Left Turn	None	Driver Inattention
Reportable	~	~	~	0	1	County	At Intersection	Clear	Daylight	Dry	Left Turn	None	Improper Turning
Reportable	3/11/2006	Saturday	11:35 PM	0	0	County	Not at Intersection	Clear	Dark	Dry	Angle	Failed To Obey Traffic Control Device	~
Reportable	7/14/2006	Friday	7:12 PM	0	1	County	At Intersection	Clear	Daylight	Dry	Angle	Failed To Yield ROW to Vehicle/Pedestrian	~
Reportable	12/24/2006	Sunday	12:05 PM	0	0	County	At Intersection	Clear	Daylight	Dry	Non-fixed Object	~	~
Non Reportable	1/2/2006	Monday	3:17 PM	0	0	County	Not at Intersection	Snow	Daylight	Wet	Fixed Object	Unsafe Speed	~
Non Reportable	2/12/2006	Sunday	4:01 AM	0	0	County	At Intersection	Snow	Dark	Snowy	Fixed Object	Unsafe Speed	Unsafe Speed
Reportable	6/25/2006	Sunday	9:52 PM	0	0	County	At Intersection	Snow	Dark	Dry	Fixed Object	Driver Inattention	Unsafe SpeedFailed To Yield ROW to Vehicle/Pedestrian
Reportable	4/5/2007	Thursday	11:21 PM	0	0	County	~	~	Dark	Dry	Side Swipe	None	Driver Inattention
Reportable	9/27/2007	Thursday	6:53 AM	0	1	County	At Intersection	Clear	Daylight	Dry	Left Turn	Driver Inattention	~
Reportable	4/5/2007	Thursday	11:21 PM	0	0	County	At Intersection	~	Dark	Dry	Side Swipe	None	Driver Inattention

Source: Winslow Township Police Department

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	33	1	28	9	5	114	26	144	5	9	375	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	14	12	12	14	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	150		0	150		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.940			0.880			0.995			0.998	
Flt Protected		0.974			0.996		0.950			0.950		
Satd. Flow (prot)	0	1705	0	0	1633	0	1888	3522	0	1888	3532	0
Flt Permitted		0.974			0.996		0.950			0.950		
Satd. Flow (perm)	0	1705	0	0	1633	0	1888	3522	0	1888	3532	0
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		96			69			259			320	
Travel Time (s)		2.2			1.6			3.5			4.4	
Lane Group Flow (vph)	0	67	0	0	139	0	28	162	0	10	413	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 34.1%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	232	7	20	273	50	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		25	25		25	25
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.995				0.932	
Flt Protected				0.997	0.976	
Satd. Flow (prot)	3522	0	0	3529	1694	0
Flt Permitted				0.997	0.976	
Satd. Flow (perm)	3522	0	0	3529	1694	0
Link Speed (mph)	50			50	25	
Link Distance (ft)	320			228	88	
Travel Time (s)	4.4			3.1	2.4	
Lane Group Flow (vph)	260	0	0	319	108	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 30.6%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (vph)	35	38	15	289	255	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	14	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25	25	25			25
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt	0.930				0.982	
Flt Protected	0.977		0.950			
Satd. Flow (prot)	1693	0	1888	3539	3476	0
Flt Permitted	0.977		0.950			
Satd. Flow (perm)	1693	0	1888	3539	3476	0
Link Speed (mph)	25			50	50	
Link Distance (ft)	70			228	146	
Travel Time (s)	1.9			3.1	2.0	
Lane Group Flow (vph)	79	0	16	314	314	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 23.4%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	33	1	28	9	5	114	26	144	5	9	375	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	14	12	12	14	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	150		0	150		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.940			0.880			0.995			0.998	
Flt Protected		0.974			0.996		0.950			0.950		
Satd. Flow (prot)	0	1705	0	0	1633	0	1888	3522	0	1888	3532	0
Flt Permitted		0.974			0.996		0.950			0.950		
Satd. Flow (perm)	0	1705	0	0	1633	0	1888	3522	0	1888	3532	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		96			69			259			320	
Travel Time (s)		2.6			1.9			4.4			5.5	
Lane Group Flow (vph)	0	67	0	0	139	0	28	162	0	10	413	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 34.1%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	232	7	20	273	50	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		25	25		25	25
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.995				0.932	
Flt Protected				0.997	0.976	
Satd. Flow (prot)	3522	0	0	3529	1694	0
Flt Permitted				0.997	0.976	
Satd. Flow (perm)	3522	0	0	3529	1694	0
Link Speed (mph)	40			40	25	
Link Distance (ft)	320			228	88	
Travel Time (s)	5.5			3.9	2.4	
Lane Group Flow (vph)	260	0	0	319	108	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 30.6%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (vph)	35	38	15	289	255	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	14	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25	25	25			25
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt	0.930				0.982	
Flt Protected	0.977		0.950			
Satd. Flow (prot)	1693	0	1888	3539	3476	0
Flt Permitted	0.977		0.950			
Satd. Flow (perm)	1693	0	1888	3539	3476	0
Link Speed (mph)	25			40	40	
Link Distance (ft)	70			228	146	
Travel Time (s)	1.9			3.9	2.5	
Lane Group Flow (vph)	79	0	16	314	314	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 23.4%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	33	1	28	9	5	114	26	144	5	9	375	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	10	10	12	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	150		0	150		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.940			0.880			0.995			0.998	
Flt Protected		0.974			0.996		0.950			0.950		
Satd. Flow (prot)	0	1705	0	0	1633	0	1770	3287	0	1770	3297	0
Flt Permitted		0.974			0.996		0.950			0.950		
Satd. Flow (perm)	0	1705	0	0	1633	0	1770	3287	0	1770	3297	0
Link Speed (mph)		30			30			50			50	
Link Distance (ft)		96			69			259			320	
Travel Time (s)		2.2			1.6			3.5			4.4	
Lane Group Flow (vph)	0	67	0	0	139	0	28	162	0	10	413	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 34.1%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	232	7	20	273	50	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		25	25		25	25
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.995				0.932	
Flt Protected				0.997	0.976	
Satd. Flow (prot)	3287	0	0	3293	1694	0
Flt Permitted				0.997	0.976	
Satd. Flow (perm)	3287	0	0	3293	1694	0
Link Speed (mph)	50			50	25	
Link Distance (ft)	320			228	88	
Travel Time (s)	4.4			3.1	2.4	
Lane Group Flow (vph)	260	0	0	319	108	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 30.6%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (vph)	35	38	15	289	255	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	10	10	10
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25	25	25			25
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt	0.930				0.982	
Flt Protected	0.977		0.950			
Satd. Flow (prot)	1693	0	1770	3303	3244	0
Flt Permitted	0.977		0.950			
Satd. Flow (perm)	1693	0	1770	3303	3244	0
Link Speed (mph)	25			50	50	
Link Distance (ft)	70			228	146	
Travel Time (s)	1.9			3.1	2.0	
Lane Group Flow (vph)	79	0	16	314	314	0
Sign Control	Stop			Free	Free	

Intersection Summary		
Area Type:	Other	
Control Type: Unsignalized		
Intersection Capacity Utilization 23.4%		ICU Level of Service A
Analysis Period (min) 15		

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	33	1	28	9	5	114	26	144	5	9	375	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	14	12	12	14	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	150		0	150		0
Storage Lanes	0		0	0		0	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.940			0.880				0.850		0.998	
Flt Protected		0.974			0.996		0.950			0.950		
Satd. Flow (prot)	0	1705	0	0	1633	0	1888	1863	1583	1888	1859	0
Flt Permitted		0.974			0.996		0.950			0.950		
Satd. Flow (perm)	0	1705	0	0	1633	0	1888	1863	1583	1888	1859	0
Link Speed (mph)		25			25			50			50	
Link Distance (ft)		96			69			259			320	
Travel Time (s)		2.6			1.9			3.5			4.4	
Lane Group Flow (vph)	0	67	0	0	139	0	28	157	5	10	413	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 38.5%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	232	7	20	273	50	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		25	25		25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.996				0.932	
Flt Protected				0.997	0.976	
Satd. Flow (prot)	1855	0	0	1857	1694	0
Flt Permitted				0.997	0.976	
Satd. Flow (perm)	1855	0	0	1857	1694	0
Link Speed (mph)	50			50	25	
Link Distance (ft)	320			228	88	
Travel Time (s)	4.4			3.1	2.4	
Lane Group Flow (vph)	260	0	0	319	108	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 43.3%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (vph)	35	38	15	289	255	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	14	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25	25	25			25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.930				0.984	
Flt Protected	0.977		0.950			
Satd. Flow (prot)	1693	0	1888	1863	1833	0
Flt Permitted	0.977		0.950			
Satd. Flow (perm)	1693	0	1888	1863	1833	0
Link Speed (mph)	25			50	50	
Link Distance (ft)	70			228	146	
Travel Time (s)	1.9			3.1	2.0	
Lane Group Flow (vph)	79	0	16	314	314	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 26.4%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	15	2	20	7	0	83	117	471	24	27	441	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	14	12	12	14	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	150		0	150		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.926			0.876			0.993			0.996	
Flt Protected		0.980			0.996		0.950			0.950		
Satd. Flow (prot)	0	1690	0	0	1625	0	1888	3514	0	1888	3525	0
Flt Permitted		0.980			0.996		0.950			0.950		
Satd. Flow (perm)	0	1690	0	0	1625	0	1888	3514	0	1888	3525	0
Link Speed (mph)		25			25			50			50	
Link Distance (ft)		187			276			259			320	
Travel Time (s)		5.1			7.5			3.5			4.4	
Lane Group Flow (vph)	0	40	0	0	98	0	127	538	0	29	492	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 35.8%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	379	37	24	442	19	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		25	25		25	25
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.987				0.918	
Flt Protected				0.997	0.981	
Satd. Flow (prot)	3493	0	0	3529	1678	0
Flt Permitted				0.997	0.981	
Satd. Flow (perm)	3493	0	0	3529	1678	0
Link Speed (mph)	50			50	25	
Link Distance (ft)	320			228	88	
Travel Time (s)	4.4			3.1	2.4	
Lane Group Flow (vph)	452	0	0	506	53	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 37.9% ICU Level of Service A
Analysis Period (min) 15

Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (vph)	19	24	25	270	266	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	14	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25	25	25			25
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt	0.925				0.978	
Flt Protected	0.978		0.950			
Satd. Flow (prot)	1685	0	1888	3539	3461	0
Flt Permitted	0.978		0.950			
Satd. Flow (perm)	1685	0	1888	3539	3461	0
Link Speed (mph)	25			50	50	
Link Distance (ft)	70			228	163	
Travel Time (s)	1.9			3.1	2.2	
Lane Group Flow (vph)	47	0	27	293	338	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 25.5%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	15	2	20	7	0	83	117	471	24	27	441	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	14	12	12	14	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	150		0	150		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.926			0.876			0.993			0.996	
Flt Protected		0.980			0.996		0.950			0.950		
Satd. Flow (prot)	0	1690	0	0	1625	0	1888	3514	0	1888	3525	0
Flt Permitted		0.980			0.996		0.950			0.950		
Satd. Flow (perm)	0	1690	0	0	1625	0	1888	3514	0	1888	3525	0
Link Speed (mph)		25			25			40			40	
Link Distance (ft)		187			276			259			320	
Travel Time (s)		5.1			7.5			4.4			5.5	
Lane Group Flow (vph)	0	40	0	0	98	0	127	538	0	29	492	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 35.8% ICU Level of Service A
Analysis Period (min) 15

Lane Group	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	379	37	24	442	19	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		25	25		25	25
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.987				0.918	
Flt Protected				0.997	0.981	
Satd. Flow (prot)	3493	0	0	3529	1678	0
Flt Permitted				0.997	0.981	
Satd. Flow (perm)	3493	0	0	3529	1678	0
Link Speed (mph)	40			40	25	
Link Distance (ft)	320			228	88	
Travel Time (s)	5.5			3.9	2.4	
Lane Group Flow (vph)	452	0	0	506	53	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 37.9% ICU Level of Service A
Analysis Period (min) 15

Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (vph)	19	24	25	270	266	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	14	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25	25	25			25
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt	0.925				0.978	
Flt Protected	0.978		0.950			
Satd. Flow (prot)	1685	0	1888	3539	3461	0
Flt Permitted	0.978		0.950			
Satd. Flow (perm)	1685	0	1888	3539	3461	0
Link Speed (mph)	25			40	50	
Link Distance (ft)	70			228	163	
Travel Time (s)	1.9			3.9	2.2	
Lane Group Flow (vph)	47	0	27	293	338	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 25.5%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	15	2	20	7	0	83	117	471	24	27	441	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	10	10	12	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	150		0	150		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	0.95
Ped Bike Factor												
Frt		0.926			0.876			0.993			0.996	
Flt Protected		0.980			0.996		0.950			0.950		
Satd. Flow (prot)	0	1690	0	0	1625	0	1770	3280	0	1770	3290	0
Flt Permitted		0.980			0.996		0.950			0.950		
Satd. Flow (perm)	0	1690	0	0	1625	0	1770	3280	0	1770	3290	0
Link Speed (mph)		25			25			50			50	
Link Distance (ft)		187			276			259			320	
Travel Time (s)		5.1			7.5			3.5			4.4	
Lane Group Flow (vph)	0	40	0	0	98	0	127	538	0	29	492	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary	
Area Type: Other	
Control Type: Unsignalized	
Intersection Capacity Utilization 35.8%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	379	37	24	442	19	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		25	25		25	25
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor						
Frt	0.987				0.918	
Flt Protected				0.997	0.981	
Satd. Flow (prot)	3260	0	0	3293	1678	0
Flt Permitted				0.997	0.981	
Satd. Flow (perm)	3260	0	0	3293	1678	0
Link Speed (mph)	50			50	25	
Link Distance (ft)	320			228	88	
Travel Time (s)	4.4			3.1	2.4	
Lane Group Flow (vph)	452	0	0	506	53	0
Sign Control	Free			Free	Stop	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 37.9%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (vph)	19	24	25	270	266	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	10	10	10
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25	25	25			25
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	0.95
Ped Bike Factor						
Frt	0.925				0.978	
Flt Protected	0.978		0.950			
Satd. Flow (prot)	1685	0	1770	3303	3231	0
Flt Permitted	0.978		0.950			
Satd. Flow (perm)	1685	0	1770	3303	3231	0
Link Speed (mph)	25			50	50	
Link Distance (ft)	70			228	163	
Travel Time (s)	1.9			3.1	2.2	
Lane Group Flow (vph)	47	0	27	293	338	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 25.5%	ICU Level of Service A
Analysis Period (min) 15	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SEL	SET	SER	NWL	NWT	NWR
Lane Configurations												
Volume (vph)	15	2	20	7	0	83	117	471	24	27	441	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	14	12	12	14	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	150		0	150		0
Storage Lanes	0		0	0		0	1		1	1		0
Taper Length (ft)	25		25	25		25	25		25	25		25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor												
Frt		0.926			0.876				0.850		0.996	
Flt Protected		0.980			0.996		0.950			0.950		
Satd. Flow (prot)	0	1690	0	0	1625	0	1888	1863	1583	1888	1855	0
Flt Permitted		0.980			0.996		0.950			0.950		
Satd. Flow (perm)	0	1690	0	0	1625	0	1888	1863	1583	1888	1855	0
Link Speed (mph)		25			25			50			50	
Link Distance (ft)		187			276			259			320	
Travel Time (s)		5.1			7.5			3.5			4.4	
Lane Group Flow (vph)	0	40	0	0	98	0	127	512	26	29	492	0
Sign Control		Stop			Stop			Free			Free	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 47.2% ICU Level of Service A

Analysis Period (min) 15

Lane Group	SET	SER	NWL	NWT	NEL	NER
Lane Configurations						
Volume (vph)	379	37	24	442	19	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)		0	0		0	0
Storage Lanes		0	0		1	0
Taper Length (ft)		25	25		25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.988				0.918	
Flt Protected				0.997	0.981	
Satd. Flow (prot)	1840	0	0	1857	1678	0
Flt Permitted				0.997	0.981	
Satd. Flow (perm)	1840	0	0	1857	1678	0
Link Speed (mph)	50			50	25	
Link Distance (ft)	320			228	88	
Travel Time (s)	4.4			3.1	2.4	
Lane Group Flow (vph)	452	0	0	506	53	0
Sign Control	Free			Free	Stop	

Intersection Summary

Area Type: Other

Control Type: Unsignalized

Intersection Capacity Utilization 52.8% ICU Level of Service A

Analysis Period (min) 15

Lane Group	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Volume (vph)	19	24	25	270	266	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	14	12	12	12
Grade (%)	0%			0%	0%	
Storage Length (ft)	0	0	100			0
Storage Lanes	1	0	1			0
Taper Length (ft)	25	25	25			25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor						
Frt	0.925				0.980	
Flt Protected	0.978		0.950			
Satd. Flow (prot)	1685	0	1888	1863	1825	0
Flt Permitted	0.978		0.950			
Satd. Flow (perm)	1685	0	1888	1863	1825	0
Link Speed (mph)	25			50	50	
Link Distance (ft)	70			228	163	
Travel Time (s)	1.9			3.1	2.2	
Lane Group Flow (vph)	47	0	27	293	338	0
Sign Control	Stop			Free	Free	

Intersection Summary	
Area Type:	Other
Control Type: Unsignalized	
Intersection Capacity Utilization 30.8%	ICU Level of Service A
Analysis Period (min) 15	

Title of Report: ***Congestion and Crash Site Analysis Program – Winslow Township, Camden County***

Publication No.: **08041**

Date Published: May 2008

Geographic Area Covered:
Erial Road between the intersections of Duke and Duchess Drives and Wiltons Landing Road in Winslow Township, Camden County, New Jersey.

Key Words:
Level of service, traffic calming, intersection, safety, fatalities, injuries, crashes, crash types, statewide, road diet, strategies, pedestrian, speed, actions, roadway, driveway, goal, objectives, potential, deficiency, scenario, bicycle, pedestrians, turning movements, average annual daily traffic volumes, peak hour, approach, left turn, access.

ABSTRACT: This document is the result 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 improvements strategies which will reduce congestion and crashes and improve mobility and safety of all road users. Working with the Camden County Engineering Department, the section of Erial Road between the intersections of Duke and Duchess Drives and Wiltons Landing Road was chosen for analysis. This section of Camden County has seen rapid residential growth over the last decade. The area was identified as experiencing a large number of crashes. 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 vary from employing select traffic calming measures to a road diet application. As appropriate, proposed improvement strategies were tested for level of effectiveness.

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