PENNDOT

Delaware Valley Regional Planning Commission

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PA 10

Road Safety Audit

The Delaware Valley Regional Planning Commission is dedicated to uniting the region's elected officials, planning professionals and the public with a common vision of making a great region even greater. Shaping the way we live, work and play, DVRPC builds consensus on improving transportation, promoting smart growth, protecting the environment and enhancing the economy. We serve a diverse region of nine counties: Bucks, Chester, Delaware, Montgomery and Philadelphia in Pennsylvania; and Burlington, Camden, Gloucester and Mercer in New Jersey. DVRPC is the federally designated Metropolitan Planning Organization for the Greater Philadelphia Region - leading the way to a better future.

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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The crash data used in this report was provided by the Pennsylvania Department of Transportation for the Delaware Valley Regional Planning Commission's traffic safety related transportation planning and programming purposes only. The raw data remains the property of the Pennsylvania Department of Transportation, and its release to third parties is expressly prohibited without the written consent of the Department.

PA 10 ROAD SAFETY AUDITS

1.0 Background

All state departments of transportation are required to develop a Strategic Highway Safety Plan (SHSP) in order to draw on safety funds according to SAFETEA-LU, the federal transportation legislation. In Pennsylvania, each district is required to have a Safety Plan to be incorporated in the state's SHSP. In PennDOT's District 6 Safety Plan, several corridors are identified under Section 148 Planned Safety Projects eligible for Highway Safety Improvement Program funding. PennDOT completed their Comprehensive Strategic Highway Safety Improvement Plan in October 2006. The PA 10 corridors are the last corridors identified under Section 148 in the 2006 Plan to be addressed.

The Delaware Valley Regional Planning Commission's (DVRPC) Planning Work Program includes a road safety audit program as a component of the transportation safety and security planning element. In fiscal year 2007, DVRPC began coordination with PennDOT District 6 to conduct road safety audits on corridors identified under Section 148 that were not already programmed. This was an opportunity to analyze corridors that were already on the plan and eligible for dedicated funding. To date, six corridors throughout the region have been addressed, three classified as "high risk rural roads" (PA 896, PA 412, PA 663); two suburban corridors (Conestoga Road, Aquetong/Windy Bush Roads); and one urban corridor (Allegheny Avenue in the City of Philadelphia).

Whereas the goal of this project is to improve and promote transportation safety on the region's roadways while maintaining mobility, the main objective is to address the safe operation of the roadway and ensure a high level of safety for all road users. The road safety audit program is conducted to generate improvement recommendations and countermeasures for roadway segments demonstrating a history of, or potential for, a high incidence of motor vehicle crashes. The emphasis is placed on identifying low-cost, safety projects with a quick turnaround to address the issues where possible but will not exclude the more complex projects.

This document represents the final report for the PA 10 Road Safety Audits. Road safety audits were conducted on two separate sections of PA 10 in Chester County. These sections are not contiguous and are identified as "high risk rural roads." The report is separated in two sections and documents each road safety audit separately.

1.1 The Audit

A road safety audit (RSA) is a formal safety performance examination of an existing or future road or intersection by an audit team. Road safety audits can be used on any size project, from minor maintenance to mega-projects. Eight major steps are involved in conducting a road safety audit, but these can be simplified into a three-step process – identify the corridor/intersection and audit team; conduct the RSA and report on the findings; and follow-up on RSA findings where feasible. Major benefits of a road safety audit include: (1) it is a proactive tool, (2) not solely dependent on crash data; (3) a planning tool to identify safety issues to be considered in improvement projects; (3) can determine if the needs of all road users are adequately met; (4) adaptable to local needs and conditions; and (5) allows for recommendations to be implemented in small stages as time and resources permit.

Prior to the road safety audit activities on site, DVRPC collected, reviewed, and analyzed relevant data (video of roadway under different conditions, traffic volume data, turning movement counts, maps, aerial photographs, and crash data). Using the crash data, crash clusters were identified and mapped for locations along the corridor. These locations were the main focus of the road safety audit.

2.0 PA 10 North Section

The road safety audit was conducted on September 16 and 18, 2008. The pre-audit meeting was conducted on the first day and involved the definition of road safety audit and how it differs from the corridor study process; the required steps of an audit; presentation of the corridor issues; and an exchange of ideas and knowledge of the roadway. A video showing the corridor under nighttime conditions was also shown. The field view followed where the audit team, made up of federal, state, and local officials and other stakeholders walked the corridor and identified transportation safety issues. See ***Appendix B*** for the list of audit team members. On the second day, the post-audit meeting was spent discussing the findings from the field view, identifying strategies to address issues and determining priorities.

2.1 Overview of the Study Area

The study area consists of approximately 10 miles of PA 10 from Welsh Road in Caernarvon Township, Lancaster County, to the Sadsbury/West Sadsbury Township Line. Initially, the study area began at Todd Road in Honey Brook Township, but from conversations with local stakeholders it was decided to extend the study area to Welsh Road just beyond the Chester County border; see ***Appendix C*** for *Study Area Map*. PA 10 is functionally classified as a minor arterial. The roadway runs in a north-south direction from Reading Township, Berks County, to Oxford Township in Chester County. PA 10 connects with several major roadways, including US 1 (Kennett Oxford Bypass), US 30 (West Lincoln Highway), US 322 (Horseshoe Pike), I-76, I-176 and US 422. In addition, many regionally significant roadways feed into PA 10, PA 896 (Newark Road), PA 926 (Street Road), PA 41 (Gap Newport Pike), PA 372 (Valley Road), and PA 340 (West Kings Highway).

The corridor has two lanes throughout its length, one travel lane in each direction with shoulders of varying widths. The roadway consists of numerous curves and some steep grades. The speed limit is generally 45 MPH with advisory speeds of 25 MPH in sections. There are no sidewalks in the study area except in Honey Brook Borough. There are 32 intersections in the study corridor, two are signalized (US 322 and PA 340). The land use overall is rural character, with a mix of residences, farmland, open space, and commercial uses.

Traffic volumes along the corridor vary. Traffic volumes are higher in the northern and southern areas of the study corridor. Traffic counts taken in 2006 shows average annual daily traffic (AADT) of 8,510 vehicles on PA 10 just north of Reservoir Road and 7,612 south of Beacon Light Road. AADTs taken in 2005 show, moving from north to south, the volumes get lower – 7,655 south of Poplar Road, 6,971 south of Walnut Street, and 6,098 at Beaver Dam Road. North of Lammey Road an AADT of 5,932 vehicles was recorded in 2008 with 8 percent consisting of heavy trucks. Between 12 midnight and 4:00 AM trucks make up over 20 percent of each hour's total and between 7:00 AM and 3:00 PM the percentage of trucks varies between 8 to 12 percent of that hourly total. The traffic data is shown in ***Appendix D***.

2.2 Crash Data

According to PennDOT's crash data, there were 174 reportable crashes between 2003 and 2007 along PA 10 in the study area. Reportable crashes are crashes that may result in a fatality, injury, and/or property damage rendering the vehicle disabled, requiring it be towed from the scene. A comprehensive analysis of the crash data is shown in ***Appendix D***. Of the reportable crashes, there were 44 crashes in 2003 (25%); 35 crashes in 2004 (20%); 39 crashes in 2005 (22%); 25 crashes in 2006 (14%) and 31 crashes in 2007 (17%). Crash totals have gone up and down over the five-year period. When analyzing crash frequency by month, January and July had the highest number of crashes with 22 each; December was next with 18 crashes; and March and October both had 17 crashes each. Crashes occurred in every month of the year with April and August having the lowest number of crashes at 8 crashes each. Thursday, Friday, Saturday, and Sunday had the highest percentage of crashes – between 14 and 18 percent.

Hit fixed object (78), angle (40), and rear end (26) crashes represented 83% of the 174 reportable crashes. There were three (2%) fatal crashes during the study period resulting in three fatalities. There were 95 (54%) injury crashes of varying levels of severity, and 76 (44%) property damage only crashes. The majority of the crashes occurred during fair weather (74%) with 25% occurring during rainy, snowy, sleeting, or foggy conditions. In an analysis of roadway surface conditions during the occurrence of crashes, only 64% occurred on dry road surface. Sixty-one percent of the crashes occurred during daylight hours.

3.0 PA 10 North Findings and Recommendations

The following represents the findings and recommendations and priorities for the PA 10 North Section Road Safety Audit. This section has been divided into four distinct tables. The first two are the agreed upon priorities for both the corridor wide and site-specific safety issues and recommendations. The third and fourth tables show other corridor wide and site specific safety issues and recommendations which if addressed will contribute to the overall safety of the roadways but because of fiscal constraints may have to be considered separately. Coordination and collaboration is required by PennDOT, Chester County, and corridor municipalities to determine responsibilities.

Audit team-identified priorities for the corridor

1. Corridor wide Priorities
    a. Signs
    b. Roadway Delineation
    c. Shoulders (to help prevent run off road crashes)
    d. Pavement Markings
    e. Drainage
2. Site-Specific Priorities
    f. Curve at Shirktown Road and Welsh Road (Lancaster County)
    g. Both intersections of PA 10 and PA 340
    h. State Hill section of PA 10

3.1 Priority Issues

Table 1 – North Section Audit Team Corridor-wide Priorities

Issue	Recommended Strategies	Comments
a) Signs • Speed limit signs are non-reflective • Chevrons are missing from several curves in the corridor • Street name signs are not legible, especially at night • Intersection ahead signs are missing prior to several intersections	• Replace signs with higher reflective material • Add or replace chevrons as needed • Replace all street name signs according to MUTCD specifications • Identify locations that do not have advance signs and add signs as	***Conduct a sign inventory along the corridor and upgrade signs for the appropriate conditions according to the Manual on Uniform Traffic Control Devices (MUTCD) requirements. Conduct an analysis to determine appropriate curve***

Issue	Recommended Strategies	Comments
a) Signs Cont'd • Roadway geometry restricts sight distance along the corridor • Sign sizes may not be appropriate for the speed limit and geometry of the roadway	appropriate with street name plaque • Utilize appropriate warning signs to alert motorists of conditions (e.g., "Hill blocks view" signs) • Consider replacing existing signs with larger ones as appropriate	***advisory speeds for the corridor.Consider the buggy and truck traffic when placing signs.*** **Level of Effort Required – Low** **Potential Safety Benefit – High**
b) Roadway Delineation • Roadway pavement markings are not visible in dark conditions • Curves not clearly delineated • Double yellow centerline does not appropriately indicate side streets to guide motorists (some are extended through the intersection and some end too far from the intersection) • 44 percent of the crashes over the 5 year period were run-off-the-road crashes hitting a fixed object; most involved a utility pole	• Install raised pavement markers (RPM) in the centerline; reflective pavement markings; dashed edge line across intersections • Consider raised pavement markers or flexible tubular delineators to better define intersections at night along the corridor • Install chevrons around curves • Re-stripe double yellow centerlines to adequately guide motorists at intersections • Consider relocating and/or adding delineation to the utility poles in the corridor • Add edge line and centerline rumble strips throughout the corridor as appropriate	***Perform corridor-wide assessment of delineation; implement consistent treatment*** **Level of Effort Required – Low/Medium** **Potential Safety Benefit – High**

Issue	Recommended Strategies	Comments
c) Shoulders • Narrow shoulders • In many areas along the corridor vegetation has overgrown the shoulder reducing its width	• Maintain a consistent minimum shoulder width of 4 feet throughout the corridor • Cut back vegetation from shoulders	***Conduct feasibility assessment of maintaining a consistent shoulder width throughout the corridor. Identify priority areas. Consideration should be given to edge-line rumble strips application with horse-and-buggy and cyclist concerns.*** **Level of Effort Required – Low/Medium/High** **Potential Safety Benefit – High**
d) Pavement Markings • Lack of striping on side streets to guide motorists, some side streets only have a single yellow centerline that does not meet standards • On side streets, where centerlines exist, they do not extend far enough to the approach of intersection • Some curve warning signs are not prominent	• Add standard double yellow centerline and stop bars on side streets. Add dashed edge line on PA 10 • Continue yellow striping to stop bar where appropriate • Add advance curve warning legend pavement marking	***In cooperation with the municipalities, conduct an inventory of pavement markings on the side street approaches and PA 10; and address as appropriate.*** **Level of Effort Required – Low** **Potential Safety Benefit – High**
e) Drainage • Clogged inlets, ditches, and pipes • Low points in the roadway prevent adequate storm water flow • Some tangent sections of roadway have inappropriate cross slopes	• Clear pipes, inlets and drains • Examine municipal hydrology plans, change roadway profile as needed, install storm water system • Develop inventory of all locations noted and request roadway survey to help with engineering solutions	***Coordinate with corridor municipalities to determine priority areas.*** **Level of Effort Required – Medium/High** **Potential Safety Benefit – High**

Table 2 – North Section Audit Team Site-Specific Priorities

Issue	Recommended Strategies	Level of Effort	Potential Safety Benefit
f) Shirktown/Welsh Road			
• No access control for the scrap yard and church located south of the intersections • Offset intersection is very close to the top of the hill where the roadway curves resulting in compromised sight distance of northbound PA 10 traffic for both intersections • The proximity of the church parking lot to the roadway presents potential hazards and parked cars obstruct sight distance for Welsh Road • Shoulder at the scrap yard driveway has edge drop-off and is exacerbated by parking for the scrap yard. Curve southbound has a super-elevation that creates an excessive break in grade at the edge of the travel lane • Southbound crest vertical curve with a cross slope towards the centerline north of the intersections • At church frontage there is a washed out area with edge drop-off • Pavement markings on side streets are not MUTCD compliant • Intersections are skewed and offset • Area is dark at night. 71 percent of the crashes occur under dark conditions	• Define access to the church on the northbound side of PA 10 • Conduct a Ball Bank study to identify the appropriate recommended speeds for each curve and measure sight distances to determine the extent of the problem and appropriate solutions • Determine the traffic volumes for the scrap yard to decide appropriate actions to improve safety • Review existing driveway permit and determine if real property owner is meeting requirements for classification of driveway use • Add a stop bar and a transversable concrete or painted median to the side streets to guide vehicles to a perpendicular stop at the intersection to improve sight distance • Add dashed edge lines to delineate side streets for where motorist should be before entering the intersection • Install “slow vertical curve ahead” or “hill blocks view” and/or “side street ahead” signs with street names prior to the curve in both directions • Install appropriate delineation (e.g., RPM, chevrons) for roadway curves and centerline	Medium Low Medium Low Low Low Low Low	Medium High High Medium High High High High

Issue	Recommended Strategies	Level of Effort	Potential Safety Benefit
f) Shirktown/Welsh Road Cont'd	• Add centerline and edge line rumble strips	Medium	High
	• Add street lighting to the area	Medium	High
	• Consider realigning intersections to eliminate offset	High	Medium
	• Improve/upgrade shoulders and correct edge drop-off as appropriate	Medium	High
g) PA 340 (signalized)			
• Pavement rutting at the southbound approach of the intersection	• Repave with rut-resistant materials to minimize effects of heavy braking	Medium	High
• Large number of angle crashes at the intersection	• Evaluate the signal for split phasing for PA 10 and Compass Road	Low	High
	• Consider no turn on red	Low	High
• Drainage issues – cross slope inefficient with water running into the intersection	• Assess the problem and address as appropriate	Medium	High
• Access management issues at Turkey Hill store and driveways	• Consider defined access away from the intersection	Medium	Medium
• Signal ahead warning signs are not consistent with the fold down "stop" signs at the intersection	• Install "signal ahead" signs that can be flipped for "stop ahead" when needed	Low	Medium
• Crushed bollards in front of the stone wall on the northeast corner of the intersection	• Remove crushed bollards and install appropriate protection	Low	Medium
g) At PA 340 (unsignalized)			
• Extra-wide shoulders approaching the intersection northbound encourage speeding	• Decrease speed limit to 35 MPH approaching the intersection northbound	Low	High
• Sight distance from PA 340 looking	• Evaluate for traffic signal and	Medium/High	High

Issue	Recommended Strategies	Level of Effort	Potential Safety Benefit
g) At PA 340 (unsignalized) Cont'd			
south is compromised by the hill.	coordinate with the existing signalized intersection to the north		
• PA 340 intersection approach is skewed.	• Re-align PA 340 approach with a painted island to make it perpendicular to PA 10	Low	High
• Southbound PA 10 centerline stops too far from intersection	• Extend centerline to the intersection to better guide motorists for left turns on to PA 340	Low	High
• Utility pole in the clear zone on the northeast corner of the intersection	• Relocate utility pole	Medium	High
• Traffic speeds through the intersection on PA 10 appear excessive	• Add traffic calming treatment at both approaches on PA 10, consider targeted enforcement	Low/Medium	High
• Debris dripping oil at intersection	• Clean up oil – roadway maintenance	Low	High
h) State Hill			
• Poorly delineated and signed	• Overhead lane warning signs to prevent damage by oversized vehicles	Low/Medium	High
• Roadway numerous curves and driveways with inadequate warning signs and compromised sight distances	• Add flashing light to warning signs	Low	High
	• Increase the number of and size of signs	Low	High
• Vehicles experience difficulty maintaining the posted speed limit (25 MPH) going northbound	• Add delineation for roadway and guide rail	Low	High
• Area very dark at night	• Add center line and edge line rumble strips	Medium	High
	• Consider NOVA chip for pavement to increase skid resistance	Medium	High
	• Reevaluate the posted 25 MPH speed limit for all vehicles	Low	High
	• Add lighting to the area.	High	High

3.2 Additional Safety Issues

Table 3 – North Section Corridor-wide Issues

Issue	Recommended Strategies	Level of Effort	Potential Safety Benefit
Passing Zones • Many passing zones may be too short in length for a vehicle to pass safely, and many extend through intersections	• Reevaluate the need for existing passing zones throughout the corridor and restripe and sign as appropriate	Low	High
Speeding • Many vehicles were observed traveling too fast in the corridor	• Identify and create pull off areas in the corridor for enforcement • Conduct speed inventory to determine the appropriateness of current posted speed limit and use results to identify appropriate signage • Evaluate the feasibility of narrowing the lanes to 11 feet with consideration given to truck and horse-and-buggy traffic	Low/Medium Low Medium	High High High
Maintenance • Vegetation encroaches on the roadway blocking signs and pavement markings as well as shadowing the roadway from direct sunlight (preventing melting of snow and ice)	• Cut back vegetation encroaching on the roadway ***Inventory the corridor to identify locations that need this treatment.***	Low	High
Coordination • Need for better coordination between all responsible agencies to ensure safer travel in the corridor	• Improve coordination between agencies at all levels to implement transportation safety strategies • Consider continued joint field views	Low Low	High High

Issue	Recommended Strategies	Level of Effort	Potential Safety Benefit
Coordination Cont'd	between PennDOT Maintenance and municipalities to address on-going issues.		

Table 4 – North Section Site Specific Issues

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
Between Shirktown/Welsh Road and Reservoir Road			
• Clogged inlet south of county border	• Clear clogged inlet	Low	High
• Water outlets onto private property with an inadequate swale	• Clear water path	Low	High
• Southbound curve sign with advisory speed is inappropriate	• Replace existing sign with "curve and offset intersection" sign	Low	High
Reservoir Road Vicinity			
• Pavement rutting on PA 10 southbound approaching Reservoir Road	• Repave as appropriate	Medium	High
• Insufficient warning signs for curve and intersection	• Add warning signs ("intersection ahead" with advisory speed, "hill blocks view," chevrons)	Low	High
• Drainage issue – stormwater seems to be crossing the centerline just south of the intersection	• Conduct a hydrology and hydraulic study to determine how to better manage the storm-water	Medium	High
• On the northbound side of the roadway evidence of washout resulting in shoulder edge drop-off	• Repair edge drop-off	Low	High
• Single yellow centerline pavement	• Replace with standard centerline	Low	Medium

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
Reservoir Road Vicinity Cont'd marking on Reservoir Road is not standard.	pavement markings (double yellow)		
Poplar Road • Relatively high incidence of HFO crashes may result from drainage problems in vicinity of intersection • Passing zone goes through the intersection • Horse crossing sign is nonstandard	• **See *Drainage* in *Table 1*** • **See *Passing Zones* in *Table 3*** • Remove or replace with standard warning sign	Low	High
Todd Road • Southbound intersection warning sign is too far in advance of the intersection • Southbound visibility of intersection is compromised due to vertical curve • South of Todd Road inadequate guide rail shields for culvert pipe • Traffic traveling very fast through Todd Road intersection. Speed limit increases to 45 MPH before the intersection in the northbound direction	• Relocate southbound intersection warning sign • Install "hill blocks view" sign • Extend guide rail with correct taper and end treatment • Consider gateway treatment just south of Todd Road for Honey Brook Borough. (Traffic Calming). Consider extending the 35 MPH speed limit in the northbound direction	Low Low Low Medium/High	High High High Medium/High

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
Between Todd Road and US 322			
• **"**Buggy" warning sign is blocked by tree	• Trim tree	Low	Medium
• Gravel build up in southbound shoulder just north of Wawassan Road is indicative of drainage issue	• Remove the gravel and assess the problem and address as appropriate	N/A	N/A
• Inlet grate south of Wawassan Road is higher than the roadway	• Make inlet grate flush with roadway	Low	High
• Guide rail in place to shield house on the northbound side of PA 10 is not warranted	• Verify that guide rail is not warranted and consider removing	Low	Medium
• Large "arrow" sign in the curve at Water Road is blocked by trees and is too small	• Trim trees and replace existing sign with a larger one	Low	High
• Southbound travel lane is curbed and sloped to the other side of the street – poor drainage	• Consider roadway reconstruction from Water Road to just north of US 322. Conduct a hydrology and hydraulic study to determine how to better manage the storm water that in turn will alleviate most of the maintenance problems.	High	High
• Driveway ramp on the northbound side of PA 10 over parallel pipe extends into the travel lane and creates a hazard	• Coordinate with property owner to correct their driveway.	Medium	High
• Insufficient curve warnings (esp. NB)	• **See *Signs* in *Table 1***		

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
US 322			
• Poor sidewalk conditions	• Upgrade sidewalks	Low	High
• Faded pavement markings (crosswalks, centerlines, stop bars)	• Restripe pavement, install skip (dotted) lines through PA10	Medium	High
• Deficient turning radii	• Re-curb the turning radius of northern intersection approach	Low	High
• Intersection offset	• Consider split signal phasing to provide for safer turning movements	High	High
• Bollards at the intersection	***In the short term stripe a dotted centerline through the intersection for PA 10. Other safety issues at the intersection should be addressed under existing PennDOT contract for this intersection.***		
Walnut Road			
• Large number of angle crashes at the intersection	• Consider a roundabout for traffic calming and a gateway treatment into Honey Brook Borough. Coordination with future development slated for the southeast quadrant of the intersection	High	High
• Inconsistent cross slope southbound	• Consider reprofiling PA 10 for better drainage in the southbound lane.	Medium	High
• Pavement marking faded	• Restripe pavement markings	Low	High
• Insufficient curve warning signs	• **See *Signs* in *Table 1***		
• “Buggy” sign between chevron	• Relocate “buggy” sign outside of the	Low	Medium

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
Walnut Road Cont'd southbound, south of the intersection	conflict zone with chevrons		
Cambridge Road			
• Northwest shoulder is breaking away	• Repair shoulder	Low	High
• Lack of stop bars on Cambridge Road	• Install stop bars as appropriate	Low	High
• On northeast corner, hole marked by a delineator	• Fix hole	Low	Medium
• Impaired line of sight looking north from eastbound Cambridge Road	• Address with appropriate signage	Low	High
Between Cambridge and Mount Pleasant			
• North of bridge, culvert crossing with concrete headwall is not protected	• Replace or protect concrete headwall	Low	High
• Vegetation in front of the guide rail	• Trim vegetation in front of guide rail	Low	High
• Super elevation is not appropriate (sloped in the wrong direction)	• Roadway over bridge needs to be re-profiled	Medium	High
• Northbound, the ET2000 guide rail is hit and on backwards and guide rail is too low and lacks delineation	• Reset guide rail and install end treatment properly. Add reflectors to guide rail on the west side of the road	Medium/High	High
• Wheel ruts on the bridge and pavement is worn	• Repave roadway and increase skid resistance of pavement	Medium	High
• Bridge deck needs repair, bridge appears too narrow, and on the SE side of the bridge, road is caving in	• Re-deck and widen bridge, add shoulders and repair roadway	High	High

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
Mount Pleasant Road			
• U-shaped culvert on the southwest corner of the intersection is a hazard	• Remove, modify, protect or delineate culvert	Low/Medium	Medium/High
• Edge drop-off on the northbound side across from the intersection	• Repair edge drop-off	Low	High
• Several hills between Mount Pleasant Road and King Road	• Install appropriate warning signs for motorists	Low	High
King Road			
• Sight distance compromised looking north – crest of the hill on PA 10 just north of intersection	• Install appropriate warning signs with speed advisory for motorists	Low	High
Beaver Dam Road			
• Inlets on the south side of the intersection have hazardous grates	• Replace grates	Low	Medium
• Numerous HFO crashes involving utility poles	• Relocate and delineate utility poles	High	High
• Runoff may be problematic especially in the winter			
Between Beaver Dam and Hill Road			
• Warning signs inadequate	• **See *Signs* in *Table 1***		
Hill Road			
• Vegetation blocks sight distance	• Cut vegetation along the north side	Low	High
• PA 10 is not defined, can confuse motorists	• Add dotted edge lines at the intersection	Low	High
• Lack of adequate advance warning signs for the curve	• Consider re-designing the intersection	High	High
	• ***See Signs in Table 1***		

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
Hill Road Cont'd • "Stop" sign at Michael Road is too low	• Re-install at the appropriate height according to MUTCD specifications	Low	Medium
Lammey Road • 3-foot drop-off with exposed headwall on the northwest corner of the intersection • The headwall impedes right turns from southbound PA 10 • Passing zone goes through the intersection • Inadequate advance intersection warning signs	• Replace headwall with manhole and make flush with the pavement. Widen the corner radius • **See *Passing Zones* in *Table 3*** • **See *Signs* in *Table 1***	Low	High
Cains Road and Caton Road • Unprotected swale drop-off hazard northbound between the two intersections • Lack of adequate sight distance from side roads and driveways • Lack of advance warning for curve, side roads, and driveways • Traffic observed traveling at high speeds • Passing zones go through the intersection • Narrow shoulders	• Assess the problem and address as appropriate – re-grade to eliminate the hazard or install barrier • **See *Signs* in *Table 1*** • **See *Signs* in *Table 1*** • **See *Passing Zones* in *Table 3*** • **See *Shoulder* in *Table 1***	Medium	High

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
Leary Road			
• No access control at School House Bar located on the northeast corner of the intersection	• Implement access management strategy (install curb to define access locations)	Medium	Medium
• Cornfield affects sight distance from Leary Road looking south (seasonal)	• Coordinate with property owner to restrict high crops within an appropriately designated sight distance triangle	Medium	Medium
Between Leary Road and PA 340			
• PA 340 and PA 10 signs on separate assemblies – sign clutter.	• Consolidate the signs on the same assembly	Low	Medium
• Tree branches in the travel way and blocking signs	• Trim tree branches	Low	High
• Inadequate advance warning signage for curve and signal	• **See *Signs* in *Table 1***		
• Boulders with delineators on northbound side are a hazard	• Remove boulders from the clear zone	Medium	High
• Narrow shoulders (1 foot); on southbound side	• **See *Shoulder* in *Table 1***		
• Shoulders are overgrown with vegetation	• Remove vegetation	Low	High
• Edge drop-off on the northbound side	• Repair edge drop-off	Low	High
• Short passing zone	• **See *Passing Zones* in *Table 3***		
PA 340 (signalized)			
• Pavement rutting at the southbound approach of the	• Repave with materials that can withstand the braking of heavy	Medium	High

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
PA 340 (signalized) Cont'd intersection • Large number of angle crashes at the intersection • Drainage issues – cross slope inefficient with water running into the intersection • Access management issues at Turkey Hill store and driveways • Signal ahead warning signs are not consistent with the fold down "stop" signs at the intersection • Crushed bollards in front of the stone wall on the northeast corner of the intersection	vehicles. • Evaluated the signal for split phasing for PA 10 and Compass Road • Consider no turn on red • Assess the problem and address as appropriate • Consider defined access away from the intersection • Install "signal ahead" signs that can be flipped for "stop ahead" when needed • Remove bollards	Low Low Medium Medium Low Low	High High High Medium Medium Medium
PA 340 (unsignalized) • Extra-wide shoulders approaching the intersection northbound encourage speeding • Sight distance from PA 340 looking south is compromised by the hill • PA 340 intersection approach is skewed • Southbound PA 10 centerline stops too far from intersection • Utility pole in clear zone-northeast corner of intersection	• Decrease speed limit to 35 MPH approaching the intersection northbound • Evaluate for traffic signal and coordinate with the existing signalized intersection to the north • Re-align PA 340 approach with a painted island to make it perpendicular to PA 10 • Extend centerline to the intersection to better guide motorists for left turns on to PA 340. • Relocate utility pole	Low Medium/High Low Low High	High High High High High

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
PA 340 (unsignalized) Cont'd			
• Traffic speeds through the intersection on PA 10 appears excessive	• Add traffic calming treatment at both approaches on PA 10.	Low/Medium	High
• Debris dripping oil at intersection	• Clean up oil – roadway maintenance	Low	High
Between PA 340 and State Hill			
• Narrow bridge inadequately signed.	• Sign as appropriate in both directions	Low	High
Quarry Road and Beacon Light Road			
• No stop bars on side streets	• Install stop bars	Low	High
• Vegetation and mail boxes limit sight distance at Quarry Road and Beacon Light Road	• Trim vegetation and relocate mail boxes	Low	High
• Geometry is difficult making left turns from Beacon Light	• **See *Signs* in *Table 1***		
Between Compass Road and Beacon Light Road			
• Driveways are hidden by vegetation	• Trim vegetation and add advance warning signs.	Low	High
• Large number of HFO crashes, narrow shoulders	• Consider re-striping for 11-foot lanes with 4-foot shoulders – add edge line rumble strips to address HFO crashes	Low/Medium	High
Compass Road			
• Weeds growing out of the inlet on the southbound side of the road	• Clear inlet and pipe	Low	High
• Vegetation growing in the pipe on the northbound side of the road			
• No shoulder on southbound side	• **See *Shoulders* in *Table 1***		

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
Compass Road Cont'd on PA 10		Low/Medium	High
• Receiving width of Compass Road is very narrow	• Widen roadway and upgrade the approach of Compass Road with striping and signs		
• Difficult right turns on to Compass Road	• Intersection should be opened up to make right turns easier	Medium	High
• Lack of advance signs for the intersection of PA 10	• **See *Signs* in *Table 1***		

4.0 PA 10 SOUTH SECTION

The road safety audit was conducted on September 17 and 18, 2008. The pre-audit meeting was conducted on the first day and involved the definition of road safety audit and how it differs from the corridor study process; the required steps of an audit; presentation of the corridor issues; and an exchange of ideas and knowledge of the roadway. A video showing the corridor under nighttime conditions was also shown. The field view followed where the audit team made up of federal, state, and local officials and other stakeholders walked the corridor and identified transportation safety issues. See ***Appendix H*** for the list of audit team members. On the second day, the post-audit meeting was spent discussing the findings from the field view, identifying strategies to address issues, and determining priorities.

4.1 Overview of the Study Area

The study area consists of approximately 6.7 miles of PA 10, Webster Lane to Friendship Church Road in Chester County. See ***Appendix I*** for study area map. PA 10 is functionally classified as a minor arterial. The roadway runs in a north-south direction from Reading Township, Berks County, to Oxford Township in Chester County. PA 10 connects with several major roadways, including US 1 (Kennett Oxford Bypass), US 30 (West Lincoln Highway), US 322 (Horseshoe Pike), I-76, I-176 and US 422. In addition, many regionally significant roadways feed into PA 10, PA 896 (Newark Road), PA 926 (Street Road), PA 41 (Gap Newport Pike), PA 372 (Valley Road), and PA 340 (West Kings Highway).

The corridor has two lanes throughout its length, one travel lane in each direction with shoulders of varying widths. Passing is allowed along portions of the roadway. The roadway consists of numerous curves and some steep grades. The speed limit is generally 45 MPH with advisory speeds of 25 MPH in sections. There are no sidewalks in the study area except in Cochranville. There are 22 intersections in the study corridor; one is signalized (PA 41) and one with flashing red signal at the four-way stop at PA 896. The land use overall is rural in character, with a mix of residences, farmland, open space, and commercial uses.

Traffic volumes along the corridor vary. Traffic counts taken in 2004 and 2006 just north of PA 41 showed a 7 percent increase in AADT over the two years. In general daily traffic volumes are highest around PA 41. North of PA 896 shows a 2004 AADT of 8,778 vehicles while a 2006 AADT south of Freeman Road is 7,603 vehicles. In 2008 an AADT recorded south of Fallowfield Road was 8,984 vehicles. Of this volume 12 percent represented Class 5-13 trucks. The highest percentages of trucks were recorded in the hours between midnight and 4:00 AM representing between 22 and 35 percent in each hour. The hours between 7:00 AM and 2:00 PM also experienced between 13 and 19 percent trucks each hour. Motorcycles represented 1.2 percent of the volume. The traffic data is shown in ***Appendix J***.

4.2 Crash Data

According to PennDOT's crash data there were 109 reportable crashes between 2003 and 2007 along PA 10 in the study area. Reportable crashes are crashes that result in a fatality, injury and/or property damage rendering the vehicle disabled, requiring it be towed from the scene. A comprehensive analysis of the crash data is shown in ***Appendix J***. Of the reportable crashes, there were 27 crashes in 2003 (24%), 35 crashes in 2004 (32%), 18 crashes in 2005 (16%) 15 crashes in 2006 (13%), and 14 crashes in 2007 (12%). Crash totals have been decreasing since 2004. When analyzing crash frequency by month, December had the highest number of crashes with 14, October was next with 13 crashes and January and May both had 11 crashes each. Crashes occurred in every month of the year with April having the lowest number of crashes at four. Sunday and Monday had the highest percentage of crashes with 19 and 18 percent, respectively. All days of the week had over 10 percent of the total crashes for the five-year period except Wednesday which had only 8 percent.

Angle (43), hit fixed object (34), and rear end (16) crashes represented 84 percent of the 109 reportable crashes. There were two fatal crashes (2%) during the study period resulting in two fatalities. There were 62 (58%) injury crashes of varying levels of severity, and 45 (41%) property damage only crashes. The majority of the crashes occurred during fair weather (81%) with 17 percent occurring during rainy, snowy, or foggy conditions. In an analysis of roadway surface conditions during the occurrence of crashes, only 63 percent occurred on dry road surface. Sixty-one percent of the crashes occurred during daylight hours.

5.0 PA 10 SOUTH FINDINGS AND RECOMMENDATIONS

The following represents the findings and recommendations and priorities for the PA 10 South Section Road Safety Audit. This section is divided into four tables. The first two are the agreed upon priorities for both the corridor wide and site-specific safety issues and recommendations. The third and fourth tables show other corridor wide and site specific safety issues and recommendations which if addressed will contribute to the overall safety of the roadways, but because of fiscal constraints may have to be considered separately. Coordination and collaboration is required by PennDOT, Chester County, and corridor municipalities to determine responsibilities.

Audit team-identified priorities for the corridor

1. Corridor-wide Priorities
   a. Signs
   b. Roadway Delineation
   c. Speeding and Speed Limit Evaluation
2. Site-Specific Priorities
   d. Ewing Road
      1. Drainage crossing
      2. Cross slope
   e. Cochranville (Traffic calming with pedestrian amenities)
   f. PA 41 (Signal upgrade and left turn phasing)
   g. Gum Tree Road

5.1 Priority Issues

Table 5 – South Section Audit Team Corridor-wide Priorities

Issue	Recommended Strategies	Comments
a) Signs • Speed limit signs are non-reflective • Chevrons are missing from several curves in the corridor • Street name signs are not legible, especially at night • Intersection ahead signs are	• Add/replace with reflective • Add or replace chevrons as needed • Replace all street name signs according to MUTCD specifications • Identify locations that do not have	***Conduct a sign inventory along the corridor and upgrade signs with the appropriate signs for the existing conditions according to MUTCD requirements.*** ***Conduct an analysis to determine the appropriate advisory speeds for***

Issue	Recommended Strategies	Comments
missing at several intersections	advance signs and add signs as appropriate with street name plaque	***curves along the corridor. Consider the buggy traffic when placing signs*** **Level of Effort Required – Low** **Potential Safety Benefit – High**
• Roadway geometry restricts sight distance along the corridor • Sign sizes may not be appropriate for the speed limit and geometry of the roadway	• Utilize appropriate warning signs to alert motorists of conditions (e.g.: "Hill blocks view" signs) • Consider replacing existing signs with larger ones as appropriate	
b) Roadway Delineation		
• Roadway pavement markings are not visible in dark conditions	• Install raised pavement markers (RPM) in the centerline; reflective pavement markings; dashed edgeline across intersections • Consider raised pavement markers or flexible tubular delineators to better define intersections at night along the corridor	***Perform corridor-wide assessment of delineation; implement consistent treatment*** **Level of Effort Required – Low/Medium** **Potential Safety Benefit – High**
• Curves not clearly delineated	• Install chevrons around curves	
• Double yellow centerline does not appropriately indicate side streets to guide motorists (some are extended through the intersection and some end too far from the intersection)	• Restripe double yellow centerlines to adequately guide motorists at intersections	
• 31 percent of the crashes over the 5 year period were run-off-the-road crashes hitting a fixed object. Many involved a utility pole	• Coordinate with utility companies and PennDOT Utility Unit to consider relocation and/or addition of delineation to the utility poles in the corridor • Add edge line and centerline rumble strips throughout the corridor as appropriate. (Coordinate	

Issue	Recommended Strategies	Comments
	with strategy for shoulder widening)	
c) Speeding and Speed Limit Evaluation • Many vehicles were observed traveling too fast in the corridor	• Conduct speed inventory to determine the appropriateness of current posted speed limit and use results to identify appropriate signage • Conduct speed inventory • Identify and create pull off areas in the corridor for enforcement • Evaluate the feasibility of narrowing the lanes to 11 feet with consideration given to truck and horse-and-buggy traffic	***Perform a speed inventory to determine the appropriateness of existing speed zones, opportunities for enforcement, and travel lane widths.*** **Level of Effort Required – Low/Medium** **Potential Safety Benefit – High**

Table 6 – South Section Audit Team Site Specific Priorities

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
d) Ewing Road/Edenton Road			
• Clogged drain on the southwest corner of Edenton Road	• Clear drain	Low	High
• Crushed drain pipe on southbound PA 10 north of Edenton Road	• Repair/replace pipe	Low	High
• On Edenton Road approaching PA 10, the “stop” sign obstructed by trees	• Trim back trees	Low	High
• Edge drop-off on the southeast corner of Ewing Road	• Repair roadway edge	Low	High
• Utility pole on southeast corner of	• Relocate the utility pole	Medium	High

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
Ewing Road • Streets are offset on the curve with no advance warning sign • Curve warning sign is missing (not indicating the side road)	• Install offset intersection advance warning signs • Add advance curve warning sign southbound	Low Low	High High
d) Ewing Road/Edenton Road Cont'd • Super-elevation grade needs to be checked from the north side to south side	• Assess the problem and address as appropriate	N/A	N/A
e) Cochranville – Highview Drive • Speed limit signs approaching the intersection lacks reflectivity • Excessive speeds prior to intersection where speeds are reduced to 35 MPH • Blind crest approaching the intersection • Centerline and edge line do not properly indicate the intersection of Highview Drive • Shrub south of the Highview Drive intersection impairs sight distance of motorists at the Highview Drive approach	• Upgrade signs • Consider a traffic calming gateway treatment for Cochranville south of Highview Drive • Add dashed edge line across the intersection and break the double yellow centerlines to properly indicate the intersection • Trim the shrub to improve sight distance	Low Medium/High Low Low	High High High High
e) Cochranville – Glenville Road • Open access to the business at the	• Access management – create	Medium	Medium

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
northwest corner • Drainage grate on the southwest corner is depressed • Edge drop-off on the southbound side of PA 10	defined access to the business • Make drainage grate flush with pavement and make all inlets bicycle safe • Repair roadway to reduce drop-off	Low Medium	High High
e) Cochranville – Homeville Road/Church Road • The curve is super elevated and seems unnecessary for the posted speed limit. • Vehicles run the stop signs at the intersection • "Stop" sign at Church and PA 10 is low and obstructed by bushes	• Evaluate the super elevation and or cross slope on the curve. Consider re-design of the Homeville Road/PA 10 intersection to a "T," and convert Church Road to one-way out • Cut back bushes and re-install "stop" sign according to MUTCD specification	Medium Low	High High
e) Cochranville – Daleville Road and Cochran Road • No access control at business (between Daleville Road and Cochran Road on east side of PA 10) • "Stop" signs for Daleville Road and Cochran Road are either missing for in the wrong location • Concrete wall on the southbound side of PA 10 just north of Old Route 41 is a run-off-the-road hazard	• Define Daleville Road and Cochran Road with paint and/or curb. Consider defined access points for the businesses • Add or relocate "stop" signs for both intersections • Add clearance marker in advance of concrete wall	Low Low Low	High High High

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
• Poor street name signs • Sidewalks in poor condition	• Upgrade street name signs • Upgrade and add sidewalk from Hillview Drive to PA 41	Low Medium	High High
f) PA 41 • Turkey Hill driveway is too close to the intersection • "No left turn" sign exiting the driveway is too low and leaning • Northbound traffic queues for the PA 41 intersection back to Church Road • Left turns are problematic; no dedicated left turn signals • Red light running at the end of the green cycle at PA 41 • Existing pedestrian signals are not visible, and no pedestrian signal exists on the southwest corner for pedestrians traveling east • Faded pavement markings at the intersection (crosswalks, stop bars and lane striping) • Stop bar at southbound PA 10 creates turning difficulties	• Restrict left turns in and out of the driveway. Construct channelized island to prevent left turns • Re-install sign according to MUTCD specifications ***Turkey Hill plans to relocate driveway further south; existing driveway should be eliminated at that time*** • Upgrade signal and revise phasing to accommodate dedicated left turn phasing on all approaches ***Municipality needs to submit request to PennDOT before any action can be taken*** • Upgrade existing pedestrian heads and as new ones as needed to man/hand with countdown timers • Re-stripe all pavement markings as appropriate • Relocate stop bar as appropriate.	Low Low Medium Medium Low Low	High High High High High High
g) Gum Tree Road • Road drops off at the drain on the southbound side of PA 10 south of the intersection • Culvert on the northeast corner has	• Add guide rail to protect run-off-the-road motorists • Replace headwall with a drop inlet	Low Medium	High High

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
a huge hole with a concrete headwall	and re-grade the area to make it traversable		
• A large number of crashes at the intersection run into the stone wall on PA 10 opposite Gum Tree Road	• Install lighting at the intersection • Add reflectors to the stone wall • Install larger double arrows opposite the intersection	Medium Low Low	High High High
• Some crashes involve vehicles running the “stop” sign on Gum Tree Road	• Install rumble stripes approaching stop sign at Gum Tree Rd (milling or thermoplastic)	Low	High
	• Install “stop sign ahead” signs with flashing beacons on Gum Tree Road	Low	High
	• Increase the size of “stop” signs	Low	High
	• Add reflective strips on the “stop” sign posts	Low	High
• Tree obstructs “stop” sign on the left at the Gum Tree Road approach, trees interfere with sight distance at the intersection	• Cut back trees	Low	High
• Gum Tree Road approach is skewed	• Add a painted island to the Gum Tree Road approach to align vehicles perpendicular to PA 10 and improve sight distance	Low	High

5.2 Additional Safety Issues

Table 7 – South Section Corridor-wide Issues

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
Shoulders • Narrow shoulders from the PA 926 intersection and north	• Maintain a consistent minimum shoulder width of 4 feet throughout the corridor ***Conduct feasibility assessment of maintaining a consistent shoulder width throughout the corridor. Identify priority areas. Consideration should be given to edge-line rumble strips application with horse-and-buggy and cyclist concerns***	Medium/High	High
Passing Zones • Many passing zones may be too short in length for a vehicle to pass safely • Many extend through intersections	• Reevaluate the need for existing passing zones throughout the corridor and restripe and sign as appropriate	Low	High
Pavement Markings • Lack of striping on side streets to guide motorists • On side streets, where centerlines exist they do not extend far enough to the approach of intersection. • Some curve warning signs are not prominent	• Add centerline and stop bars on side streets. Add dashed edge line on PA 10 • Continue yellow striping to stop bar where appropriate • Add advance curve warning legend (ACWL) pavement markings or appropriate legends to supplement the existing warning signs	Low Low Low	High High High

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
	In cooperation with the municipalities, conduct an inventory of pavement markings on the side street approaches and PA 10 and address as appropriate.		
Drainage • Clogged inlets, ditches, and pipes • Low points in the roadway prevent adequate storm water flow	• Clear pipes, inlets, and drains • Examine municipal hydrology plans. Change roadway profile as appropriate and install pipes and storm water system parallel to the roadway. ***Consider a corridor-wide hydrologic assessment in coordination with municipalities***	Low Medium/High	High High
Coordination • Need increased coordination between all responsible agencies to ensure safer travel in the corridor	• Improve coordination between agencies at all levels to implement transportation safety strategies • Consider continued joint field views between PennDOT Maintenance, Chester County and municipalities to address on-going safety issues.	Medium Low	High High
Maintenance • Vegetation encroaches on the roadway blocking signs and pavement markings as well as shadowing the roadway from	• Cut back vegetation beyond the edge of shoulder to ensure no encroachment on the roadway	Low	High

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
direct sunlight (prevent melting of snow and ice) • Additionally, it forces the buggies from the shoulder and into the travel way			
Utility Poles • Utility poles are located on both sides of PA 10	• Coordinate with utility companies to share the poles to reduce fixed object hazards	High	High
Oil and Chip • This treatment makes other safety treatments impossible to implement, e.g., edge line rumble strips	• Coordinate the oil and chip treatment with safety treatment along the corridor ***PA 10 is programmed for FY 09 Resurfacing***	Low	High

Table 8 – South Section Site Specific Issues

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
Webster Lane to PA 896 • Cross slope appears excessive southbound north of Webster Ln • Future park at Catamount Road may generate bicycle and pedestrian traffic in this area • Centerline and edge line do not	• Assess the cross slope problem and address as appropriate • Provide safe pedestrian and bicycle amenities with the development of the park. (to be accomplished through the township review process)	N/A N/A	N/A N/A

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
Webster Lane to PA 896 Cont'd			
• indicate the intersection at Old Limestone Road	• Revise existing pavement markings	Low	High
• Centerline and edge line do not indicate the intersections of Catamount Road and Cullen Road	• Add dotted edge line across the intersection and advance "intersection ahead" warning sign with street name plaque, and add advance "offset intersection ahead" warning sign	Low	High
• "Stop" sign at Old Limestone Road approach is too low	• Re-install sign according MUTCD specifications	Low	High
• Sign posts with no signs on northbound side of PA 10 north of Cullen Road	• Replace missing signs or remove posts	Low	Medium
• Sign post with no sign on southbound side of PA 10 north of Old Limestone Road	• Replace missing sign or remove post	Low	Medium
• Ruts in the pavement along northbound side of PA 10 north of Cullen Road	• Repair pavement	Low	Medium
• Break in guide rail approaching PA 896 northbound for a driveway at 1804 PA 10. Guide rail has two blunt ends at driveway opening, second rail string is ineffective	• Remove the ineffective section of guide rail and consider whether or not ET must be changed	Low	High
• Trees between Log House Road and PA 896 overhang roadway obstructing visibility of signs, signal, and intersection and impedes buggy traffic from using the shoulder	• Cut back trees from the right of way	Low	High

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
• Faded "stop ahead" pavement markings	• Repaint pavement legend	Low	High
• Guide rail on the southbound side of PA 10 south of the PA 896 intersection is too short, resulting in ineffective protection for run-off-the-road vehicles	• Extend guide rail as appropriate and upgrade end treatment	Low	High
PA 896			
• Rippled, rutted, damaged pavement at the intersection approaches due to the high braking demands of the 4-way stop.	• Repair/repave pavement	Medium	High
	• With the coordination of municipalities and residents consider installation of transverse rumble strips/stripes to slow traffic approaching the intersection	Low	High
	• Consider "stop ahead" raised pavement markings on all approaches	Low	High
	• Add flashing beacons to the advance warning "stop ahead" signs in both directions	Low	High
• Tight turning radii at the intersection	• Consider widening the corner radii	Medium/High	High
• Missing/faded stop bars on all intersection approaches	• Install stop bars on all approaches of the intersection	Low	High
• "End 25 MPH" sign is inappropriately placed west of the PA 10/PA 896 intersection in the eastbound direction on PA 896	• Relocate sign after the PA 10/PA 896 intersection	Low	High

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
Between PA 896 and PA 926			
• Faded “stop ahead” pavement markings	• Repaint “stop ahead” pavement markings	Low	High
• On the northbound side, the guide rail has the improper end treatment and is not properly bolted down	• Upgrade the guide rail end treatment as appropriate	Low	High
• Clogged inlet pipe on the southbound side of the road next to 45 MPH sign	• Clear clogged pipes	Low	High
Old Limestone Road			
• There are no advance warning signs for the intersection	• Install advance intersection warning signs in both direction	Low	High
• Inadequate sight distance looking south from Old Limestone Road	• Evaluate CSD and determine an appropriate course of action	Medium	High
	• Add pavement markings on Old Limestone Road and dashed edge line across the intersection on PA 10	Low	High
• Old barrier located in the clear zone on the northwest corner of the intersection	• Remove the barrier and delineate	Medium	High
PA 926			
• Inadequate sight distance from PA 926. Motorists needs better guidance for stopping at the intersection and pulling out	• Add a painted island and a dotted edge line to the PA 926 approach to better align vehicles perpendicular to PA 10 and improve sight distance and add a stop bar	Low	High
• “Stop” sign on the right at the PA 926 approach is blocked by trees	• Trim tree	Low	High

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
PA 926 Cont'd			
• The PA 10 route marker on PA 926 approach has graffiti markings	• Replace PA 10 route marker	Low	High
• Sign clutter on PA 10 opposite the PA 926 approach (route markers, double arrow)	• Remove route markers	Low	Medium
Between PA 926 and Ewing Road			
• Low point in the roadway causing drainage problems	• Conduct hydrology and hydraulic study to determine the source of water and where it is going to better manage the volume of stormwater	Medium	High
Between Ewing Road and Troop Road			
• Sign hidden behind utility pole	• Relocate sign	Low	High
• Narrow lanes (10′ lane and 2′ shoulder)	• Widen roadway to a minimum of 11-foot lanes and 4-foot shoulders	Medium	High
• Roadway failing northbound at the curve south of Troop Road	• Repair roadway as appropriate	Medium	High
High Point Road and Troop Road			
• Water pooling at southeast corner of Troop Road	• Assess the problem and address as appropriate	N/A	N/A
• On the southwest corner of the intersection there is a drainage opening with a concrete headwall	• Replace headwall with inlet or make flush with the pavement	Low	High
• "Stop" sign on the southwest corner of the intersection is too low	• Re-install sign according MUTCD specifications	Low	High

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
High Point Road and Troop Road Cont'd			
• Tight intersection radii makes it difficult for turns at the intersection (especially farm vehicles)	• Improve turning radii at the intersections of High Point Road and Troop Road	Medium	Medium
• Southbound lane appears to be sloped to the centerline	• Correct the positive cross slope along the southbound lane	Medium	High
• High Point Road approach to PA 10 is steep and abrupt; may contribute to vehicles losing control	• Re-grade the approach of High Point Road	High	Medium
• At the High Point Road approach looking southbound on PA 10 fence posts obstruct view	• Relocate fence posts to improve sight distance	Medium	High
• Centerline and edge line do not indicate the intersections of High Point Road and Troop Road	• Add dashed edge line across the intersections and break the centerlines as appropriate	Low	High
Hostetter Road			
• Unpaved roadway	• Consider paving the approach to keep gravel off PA 10	Medium	Medium
Between PA 41 and Gum Tree Road			
• Cross slope falls towards centerline in the northbound lane between house number 3191 and 3219 along PA 10	• Assess the problem and address as appropriate	N/A	N/A

Issue	Recommended Strategies	Level Of Effort	Potential Safety Benefit
Friendship Church Road • Intersection is in a curve • PA 10 crests at the intersection, this limits sight distance for turning vehicles at the intersection	• Consider installing left turn lane for southbound PA 10 • Consider preliminary design of crest vertical curve • Add advance intersection ahead sign with flashing beacon • Consider adding street light	Medium Medium Low Medium	High High High High

6.0 CONCLUSIONS

The road safety audit program is conducted to generate improvement recommendations and countermeasures for roadway segments or intersections demonstrating a history of or potential for a high incidence of motor vehicle crashes. The safety issues identified during the audit and documented in this report, along with the recommended strategies, are intended to improve the overall safety of the study corridor. Some of the strategies identified can be implemented through routine maintenance. The full impact of the improvement strategies will be realized when they are combined, but time and budget constraints may dictate when remedial strategies are implemented. Although this road safety audit was not conducted to primarily examine the operational characteristics of the corridor, the audit team recommended strategies to address several operational issues that are affecting safety in the corridor.

Engineering strategies alone will not eliminate the traffic safety issues identified in the study corridor. Enforcement and education are necessary components to address the human behavioral aspects to effectively reduce the number of crashes occurring. For example, speeding or driving at unsafe speed for condition represented the highest driver action contributor to crashes along the corridor. This unsafe practice by motorists warrants a combination of engineering, education, and enforcement strategies to effectively prevent this behavior. Engaging the appropriate stakeholders is important as coordination and collaboration is the key to making the corridor safer for all users.

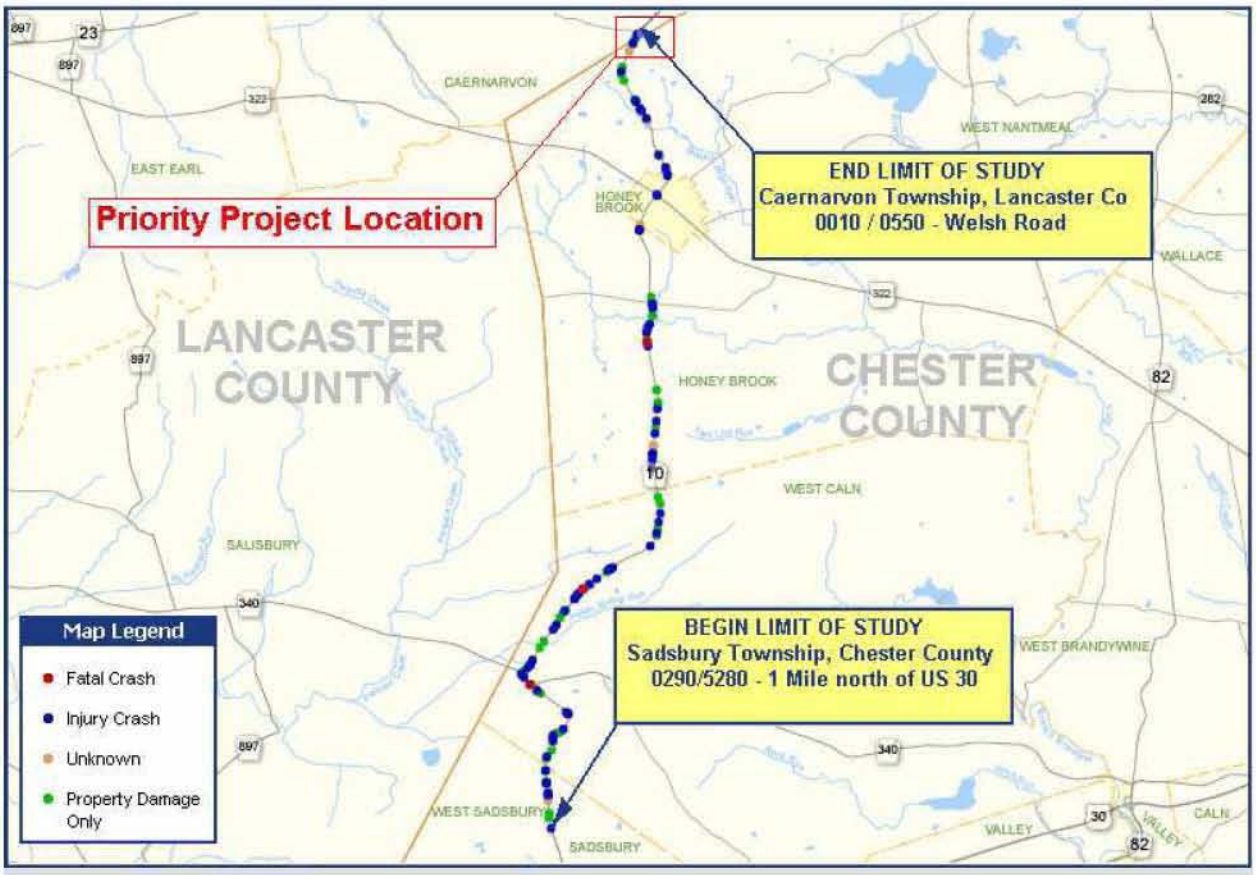
APPENDIX A
North Section
Scope of Work
&
Cost Estimates

Benefit-to-Cost Ratio Calculation

The estimated benefit, in terms of crash reductions, for this project is $72,533 per year. See attached sheet Titled "PA Route 10 at Shirktown Road/Welsh Road HSIP Benefit Calculations".

The estimated cost for the above scope of work is $1.06 million. See the attached "Cost Estimate Sheet". Assuming a 20-year life cycle for this safety project, the annual cost of the project is $53,067.

The project will have an annual benefit-to-cost ratio of $72,533:$53,067 or 1.37 to 1.



Project Purpose:

The purpose of this project is to reduce the number of crashes and related injuries and severity of the crashes which occur at the intersection of PA Route 10 and Shirktown Road/Welsh Road in Lancaster County. The anticipated benefits of this project are the minimization of the number of crashes, specifically hit fixed object and angle type crashes.

Project Scope:

The scope of work for this project was developed from a priority location identified in the Road Safety Audit which was conducted in September 2008 and undertaken by DVRPC in conjunction with the Pennsylvania Department of Transportation. A more detailed description of the scope of work is included in the attached cost estimate, and is summarized below:

- Increase shoulder width along PA Route 10 at Shirktown Road/Welsh Road.
- Install appropriate signage along PA Route 10 at Shirktown Road/Welsh Road.
- Install raised pavement markers (RPM), delineators, and rumble strips along PA Route 10 at Shirktown Road/Welsh Road.
- Relocate the utility poles in the roadway clear zone on both sides of PA Route 10 at Shirktown Road/Welsh Road.
- Install painted island on Shirktown Road and Welsh Road to guide motorists.
- Consider realignment of Shirktown Road/Welsh Road.

PA ROUTE 10 AT SHIRKTOWN ROAD/WELSH ROAD HSIP BENEFIT CALCULATIONS

Crashes: 2003 through 2007

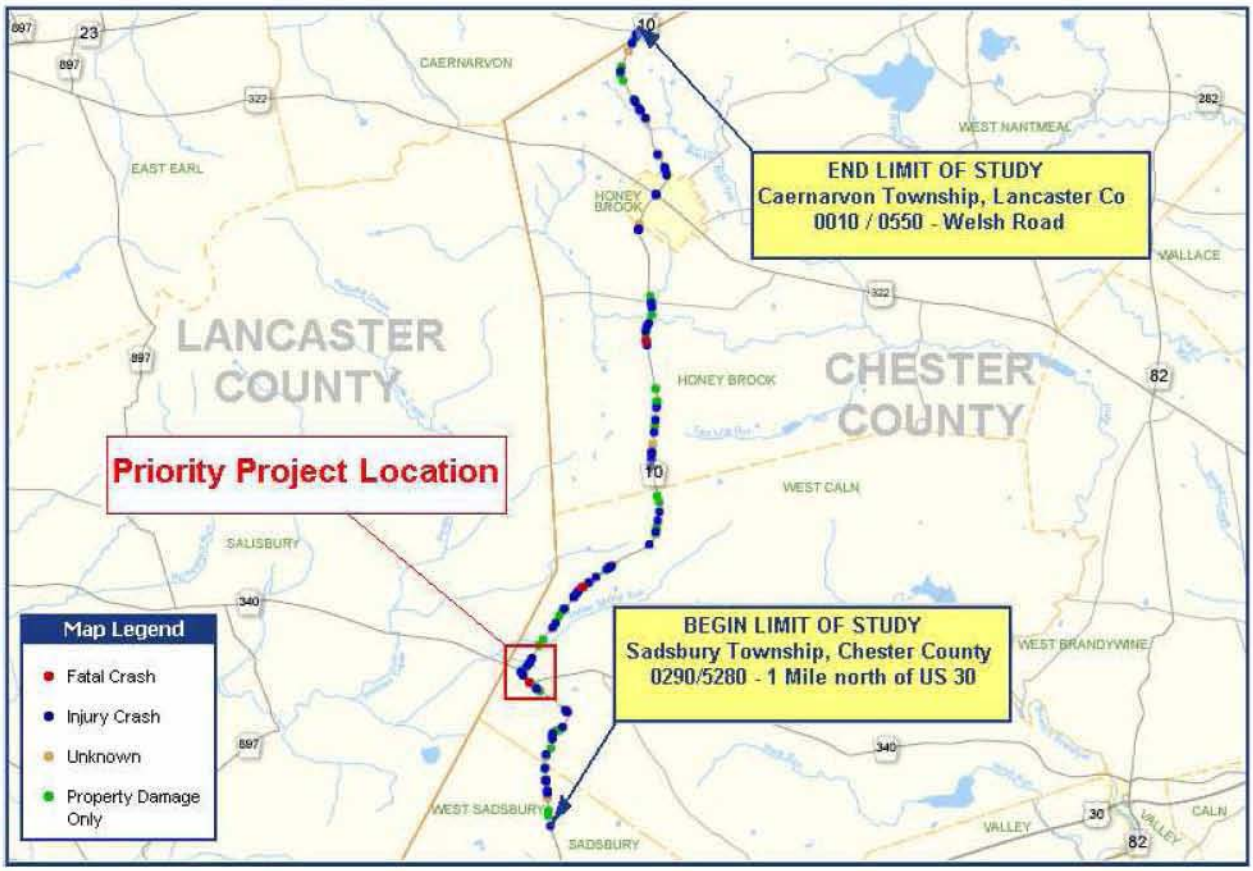
Crash Type	# of Crashes		Average Cost per Crash[1]		Total Costs
Hit Fixed Object	6	X	$ 122,200	=	$ 733,200
Angle	3	X	$ 154,000	=	$ 462,000
Non Collision	1	X	$ 148,000	=	$ 148,000
Total	10		Total 5 Year Cost	=	$1,343,200
			Average Annual Cost	=	$268,640

1 From CDART: Accident Cost by Category Report for Accidents in Years 2003 to 2007.

According to the CDART data, the corridor experienced an average crash rate that was approximately 1.37 times higher than corridors with similar characteristics during the 2003 through 2007 period. If it is assumed that the planned safety improvements will produce a crash rate (results in a reduction) that is consistent with statewide averages for similar corridors, then the expected crash rate for the post-improvement period will be 1 ÷ 1.37 or 73 percent of the current rate. This translates into a post-improvement annual cost of $196,107. The expected benefit will be $268,640 – $196,107 or $72,533 per year.

COST ESTIMATE:

Intersection / Location	Proposed Work	Construction	Engineering cost	Order of Magnitude Cost Estimate
Shirktown Road/Welsh Road	Define access to church, install stop bar and island to side streets, install lighting, install appropriate warning signs, install centerline and edgeline rumble strips, consider realignment of roadway, improve shoulders and correct drop-off, re grade roadway.	$839,000	$125,850	$964,850
	Subtotal	$839,000	$125,850	$964,850
	Contingency (10%)	$83,900	$12,585	$96,485
	Total			**$1,061,335**



Project Purpose:

The purpose of this project is to reduce the number of crashes and related injuries and severity of the crashes which occur at the intersection of PA Route 10 and PA Route 340 in Chester County. The anticipated benefits of this project are the minimization of the number of crashes, specifically hit fixed object, angle, and rear-end type crashes.

Project Scope:

The scope of work for this project was developed from a priority location identified in the Road Safety Audit which was conducted in September 2008 and undertaken by DVRPC in conjunction with the Pennsylvania Department of Transportation. A more detailed description of the scope of work is included in the attached cost estimate, and is summarized below:

- Increase shoulder width along PA Route 10 at PA Route 340.
- Install appropriate signage along PA Route 10 at PA Route 340.
- Install raised pavement markers (RPM), delineators, and rumble strips along PA Route 10 at PA Route 340.
- Relocate the utility poles in the roadway clear zone on both sides of PA Route 10 at PA Route 340.
- Improve drainage along PA Route 10 at PA Route 340.

Benefit-to-Cost Ratio Calculation

The estimated benefit, in terms of crash reductions, for this project is $192,528 per year. See attached sheet Titled "PA Route 10 at PA Route 340 HSIP Benefit Calculations".

The estimated cost for the above scope of work is $1.02 million. See the attached "Cost Estimate Sheet". Assuming a 20-year life cycle for this safety project, the annual cost of the project is $50,973.

The project will have an annual benefit-to-cost ratio of $192,528:$50,973 or 3.77 to 1.

PA ROUTE AT PA ROUTE 340 HSIP BENEFIT CALCULATIONS

Crashes: 2003 through 2007

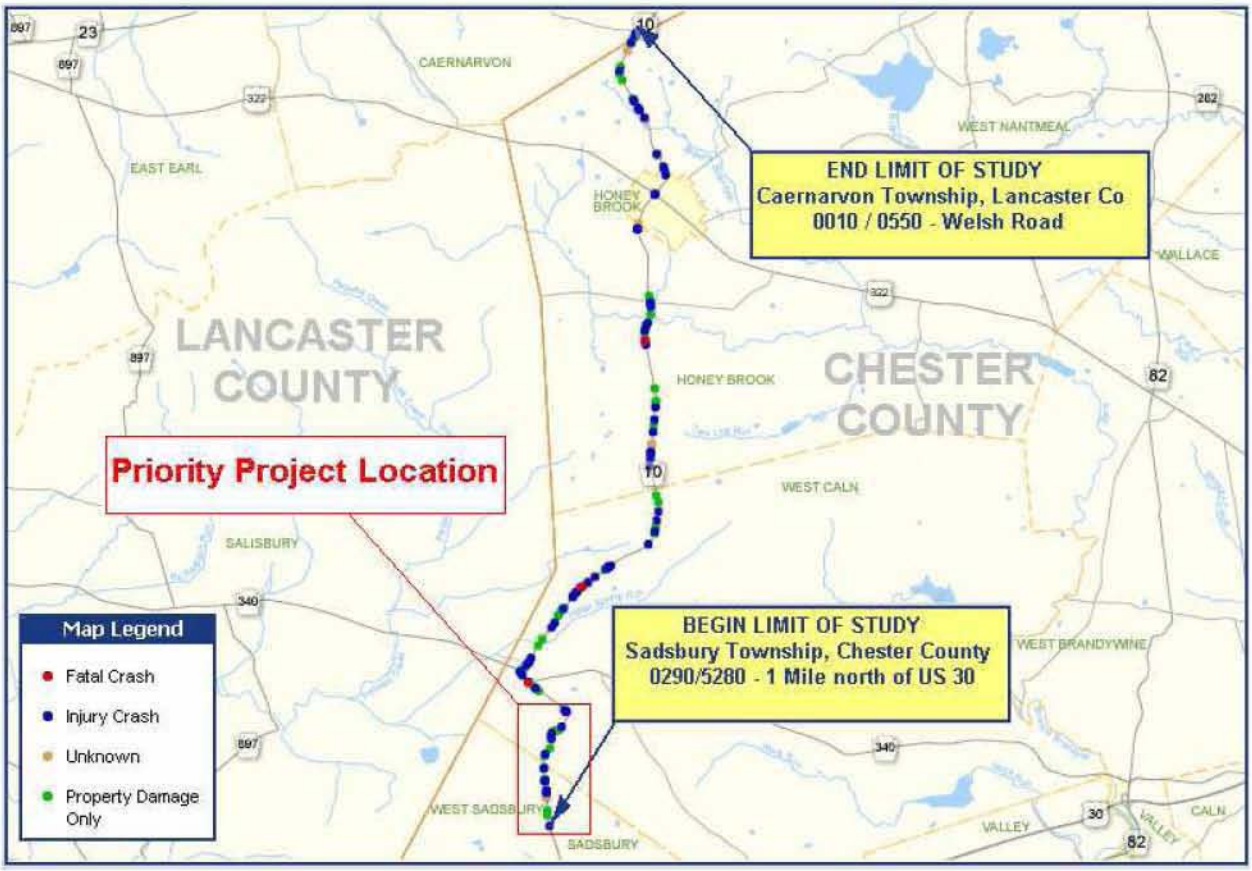
Crash Type	# of Crashes		Average Cost per Crash[1]		Total Costs
Hit Fixed Object	8	X	$ 122,200	=	$ 977,600
Angle	5	X	$ 154,000	=	$ 770,000
Rear End	3	X	$ 73,700	=	$ 221,100
Head On	1	X	$ 569,600	=	$ 569,600
Sideswipe	1	X	$ 135,700	=	$ 135,700
Total	18		Total 5 Year Cost	=	$ 2,674,000
			Average Annual Cost	=	$534,800

1 From CDART: Accident Cost by Category Report for Accidents in Years 2003 to 2007.

According to the CDART data, the corridor experienced an average crash rate that was approximately 1.57 times higher than corridors with similar characteristics during the 2003 through 2007 period. If it is assumed that the planned safety improvements will produce a crash rate (results in a reduction) that is consistent with statewide averages for similar corridors, then the expected crash rate for the post-improvement period will be 1 ÷ 1.57 or 64 percent of the current rate. This translates into a post-improvement annual cost of $342,272. The expected benefit will be $534,800 – $342,272 or $192,528.

COST ESTIMATE:

Intersection / Location	Proposed Work	Construction	Engineering cost	Order of Magnitude Cost Estimate
PA Route 340	Repave, signal modifications, relocate Turkey Hill access, replace signs, relocate utility poles, install traffic calming at both approaches on PA Route 10 (narrow NB approach width), realign PA Route 340.	$805,900	$120,885	$926,785
	Subtotal	$805,900	$120,885	$926,785
	Contingency (10%)	$80,590	$12,089	$92,679
	Total			**$1,019,464**



Project Purpose:

The purpose of this project is to reduce the number of crashes and related injuries and severity of the crashes which occur along PA Route 10 between PA Route 340 and Beacon Light Road/Quarry Road in Chester County. The anticipated benefits of this project are the minimization of the number of crashes, specifically hit fixed object and angle type crashes.

Project Scope:

The scope of work for this project was developed from a priority location identified in the Road Safety Audit which was conducted in September 2008 and undertaken by DVRPC in conjunction with the Pennsylvania Department of Transportation. A more detailed description of the scope of work is included in the attached cost estimate, and is summarized below:

- Install appropriate signage along PA Route 10 (sign inventory and installation).
- Trim vegetation along PA Route 10.
- Install raised pavement markers.
- Widen shoulder and re stripe to eleven foot lanes/four foot shoulders with rumble strips.

Benefit-to-Cost Ratio Calculation

The estimated benefit, in terms of crash reductions, for this project is $443,680 per year. See attached sheet Titled "PA Route 10 – State Hill Section HSIP Benefit Calculations".

The estimated cost for the above scope of work is $1.19 million. See the attached "Cost Estimate Sheet". Assuming a 20-year life cycle for this safety project, the annual cost of the project is $59,500.

The project will have an annual benefit-to-cost ratio of $443,680:$59,500 or 7.5 to 1.

PA ROUTE – STATE HILL SECTION HSIP BENEFIT CALCULATIONS

Crashes: 2003 through 2007

Crash Type	# of Crashes		Average Cost per Crash[1]		Total Costs
Hit Fixed Object	8	X	$ 122,200	=	$ 977,600
Angle	7	X	$ 154,000	=	$1,078,000
Non Collision	4	X	$ 148,000	=	$ 592,000
Sideswipe	3	X	$ 135,700	=	$ 407,100
Head On	1	X	$ 569,600	=	$ 569,600
Unknown	1	X	$ 135,700	=	$ 135,700
Total	24		Total 5 Year Cost	=	$ 3,760,000
			Average Annual Cost	=	$752,000

1 From CDART: Accident Cost by Category Report for Accidents in Years 2003 to 2007.

According to the CDART data, the corridor experienced an average crash rate that was approximately 2.45 times higher than corridors with similar characteristics during the 2003 through 2007 period. If it is assumed that the planned safety improvements will produce a crash rate (results in a reduction) that is consistent with statewide averages for similar corridors, then the expected crash rate for the post-improvement period will be 1 ÷ 2.45 or 41 percent of the current rate. This translates into a post-improvement annual cost of $308,320. The expected benefit will be $752,000 – $308,320 or $443,680.

COST ESTIMATE:

Intersection / Location	Proposed Work	Construction	Engineering cost	Order of Magnitude Cost Estimate
State Hill Section	Install appropriate signs, install stop bars on Quarry Road and Beacon Light Road, trim vegetation, install rpm's, widen shoulders and restripe to provide 11-foot lanes and 4-foot shoulders, resurface with NovaChip, install overhead flashing warning sign.	$941,000	$141,150	$1,082,150
	Subtotal	$941,000	$141,150	$1,082,150
	Contingency (10%)	$94,100	$14,115	$108,215
	Total			**$1,190,365**

APPENDIX B
North Section
Audit Team

DELAWARE VALLEY REGIONAL PLANNING COMMISSION
PA 10 NORTH ROAD SAFETY AUDIT

AUDIT TEAM

Name	Organization
Rosemarie Anderson	Delaware Valley Regional Planning Commission
Larry Bucci	Pennsylvania Department of Transportation District 6-0
Michael Castellano	Federal Highway Administration
Gary Dunlap	West Caln Township
Heath Eddy	Honey Brook Township
Joe Fiocco	McMahon Associates (PennDOT Consultants)
Natasha Goguts	Chester County Planning Commission
Terry Hartranft	Caernarvon Township
Jason Hershock	Pennsylvania Department of Transportation District 8-0
Matthew Kasunick	Pennsylvania Department of Transportation District 8-0
Regina Moore	Delaware Valley Regional Planning Commission
Kevin Murphy	Delaware Valley Regional Planning Commission
Libby Nixdorf	Honey Brook Fire Company
Randy Waltermeyer	Chester County Planning Commission
Kathy White	Honey Brook Borough

APPENDIX C
North Section
Study Area Maps

PA Route 10
Road Safety Audit

Northern Section - Upper
Study Area

Delaware Valley
Regional Planning Commission
September 2008

PA Route 10
Road Safety Audit

Northern Section - Lower
Study Area

APPENDIX D
North Section
Traffic and Crash Data

PA Route 10
Road Safety Audit

Northern Section - Lower
Traffic Volume

DVRPC Traffic Count

AADT (Year)

Delaware Valley
Regional Planning Commission
September 2008

CLASSIFICATION COUNTS FOR PA 10

BETWEEN LAMMEY ROAD AND HILL ROAD

DATE: 9/11/2008
SR: 10
MCDNAME: WEST CALN TWP
COUNTY: CHESTER
STATE: PA

SPEED: 45
COUNTDIR: BOTH
ROADDIR: BOTH
LOCATION: PA 10 BET. LAMMEY ROAD AND HILL ROAD
WEATHER: FAIR

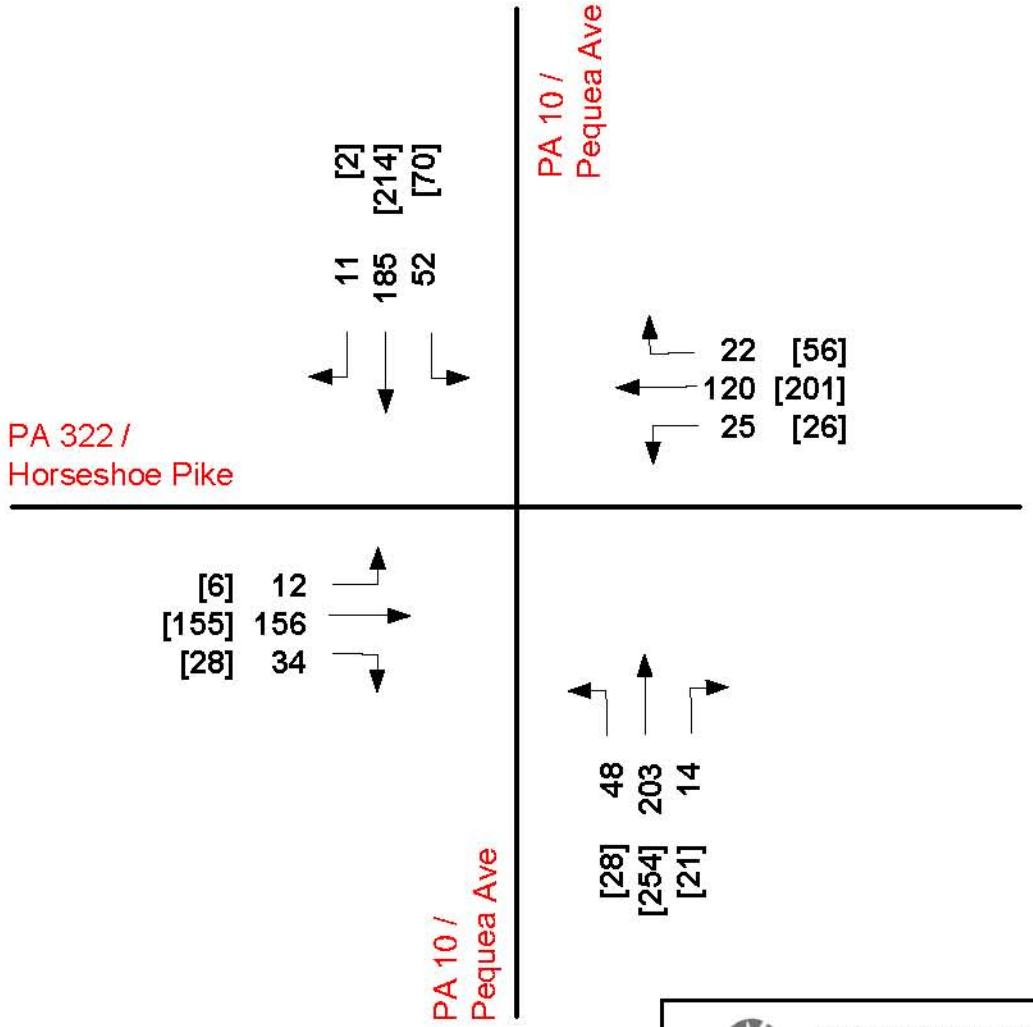
TIME	1	2	3	4	5	6	7	8	9	10	11	12	13	Total	5-13	%
12:00 AM	1	23	2	0	4	0	0	1	4	0	0	0	0	35	9	26%
1:00 AM	0	12	2	1	5	1	0	0	0	1	0	0	0	22	7	32%
2:00 AM	0	12	4	0	0	0	0	0	2	0	0	0	0	18	2	11%
3:00 AM	1	19	5	1	2	0	0	1	5	0	0	0	0	34	8	24%
4:00 AM	2	56	7	0	1	0	0	1	4	1	0	0	0	72	7	10%
5:00 AM	3	138	22	0	4	2	1	3	4	0	0	0	0	177	14	8%
6:00 AM	4	245	54	0	7	0	2	5	4	2	0	0	0	323	20	6%
7:00 AM	9	298	40	0	11	1	7	10	7	6	0	0	0	389	42	11%
8:00 AM	9	307	29	0	16	5	0	5	5	3	0	0	0	379	34	9%
9:00 AM	3	258	20	0	10	4	3	8	11	2	0	0	0	319	38	12%
10:00 AM	8	256	18	0	11	3	2	12	19	1	0	0	0	330	48	15%
11:00 AM	4	288	29	0	17	2	1	4	15	3	0	0	0	363	42	12%
12:00 PM	4	259	17	0	8	5	3	9	9	0	0	0	0	314	34	11%
1:00 PM	4	289	24	0	10	2	2	6	7	1	0	0	0	345	28	8%
2:00 PM	5	282	20	1	14	2	4	5	6	2	0	0	0	341	33	10%
3:00 PM	8	382	26	1	15	4	2	8	5	1	0	0	0	452	35	8%
4:00 PM	12	406	34	0	9	2	1	2	6	1	0	0	0	473	21	4%
5:00 PM	9	392	29	0	3	2	0	3	6	2	0	0	0	446	16	4%
6:00 PM	4	319	15	0	6	3	0	5	5	2	0	0	0	359	21	6%
7:00 PM	1	253	9	2	8	1	1	3	2	0	0	0	0	280	15	5%
8:00 PM	4	152	6	0	4	2	0	2	3	1	0	0	0	174	12	7%
9:00 PM	3	121	3	2	1	0	0	2	2	0	0	0	0	134	5	4%
10:00 PM	2	86	3	0	3	1	0	1	0	0	0	0	0	96	5	5%
11:00 PM	0	49	2	1	2	0	0	0	3	0	0	0	0	57	5	9%
TOTAL	***100***	***4902***	***420***	***9***	***171***	***42***	***29***	***96***	***134***	***29***	***0***	***0***	***0***	***5932***	***501***	8%

Class 1	Motorcycles	Class 6	Three axle single	Class 10	Greater than five axle double
Class 2	Cars, trailers	Class 7	Four Axle single	Class 11	Less than six axle multi
Class 3	Two axle long (pickups, vans)	Class 8	Less than five axle double	Class 12	Six axle multi
Class 4	Buses	Class 9	Five axle double	Class 13	Greater than six axle multi
Class 5	Two axle, six tires				

PA 10 / Pequea Avenue and PA 322 / Horseshoe Pike Intersection

Peak Hour Turning Movement Counts

Peak Hours
AM: 7:45 - 8:45
PM: [5:15 - 6:15]



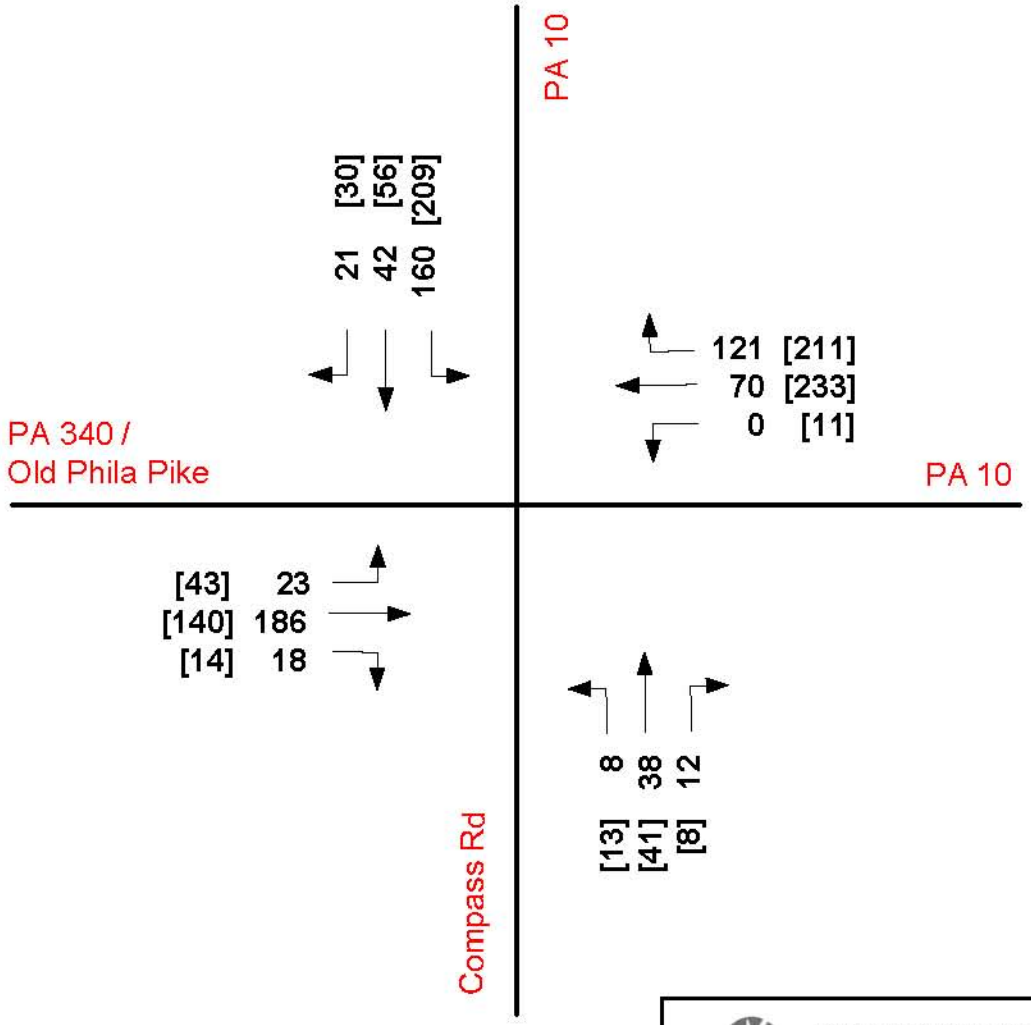
SCHEMATIC NOT TO SCALE

Delaware Valley Regional Planning Commission
September 2008

PA 10 / Compass Road and PA 340 / Old Philadelphia Pike Intersection

Peak Hour Turning Movement Counts

Peak Hours
AM: 7:00 - 8:00
PM: [4:45 - 5:45]



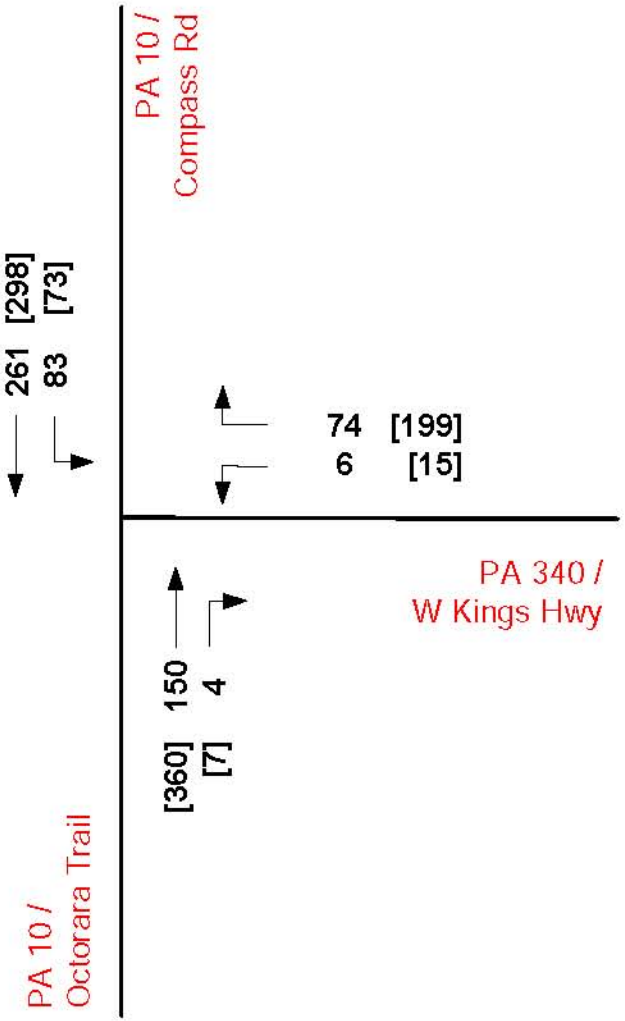
SCHEMATIC NOT TO SCALE

Delaware Valley Regional Planning Commission
September 2008

PA 10 and PA 340 / West Kings Highway Intersection

Peak Hour Turning Movement Counts

Peak Hours
AM: 8:00 - 9:00
PM: [4:45 - 5:45]



SCHEMATIC NOT TO SCALE

Delaware Valley Regional Planning Commission
September 2008

PA 10 RSA CHESTER 0290/5280 TO 0510/1273 & LANCASTER 0010/0000 TO 0010/0550

Date Range: 1/1/2003 to 12/31/2007

Area of Interest: (In County 15 On State Route 0010(P) Between Segment 0290 Offset 5280 and Segment 0510 Offset 1273) or (In County 36 On State Route 0010(P) Between Segment 0010 Offset 0 and Segment 0010 Offset 550) or (In County 36 On State Route 0010(S) Between Segment 0011 Offset 0 and Segment 0011 Offset 550)

USER ID/QUERY ID: lkubli/ 0020080807001

MONTH OF YEAR

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
CRASHES	22	14	17	8	11	14	22	8	13	17	10	18	174
PCT	12%	8%	9%	4%	6%	8%	12%	4%	7%	9%	5%	10%	100%

DAY OF WEEK

	SUN	MON	TUE	WED	THR	FRI	SAT	
CRASHES	24	21	23	19	25	32	30	174
PCT	13%	12%	13%	10%	14%	18%	17%	100%

HOUR OF DAY

	00	01	02	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	99	
CRASHES	6	3	4	6	10	3	5	4	10	11	10	5	10	5	14	14	14	6	11	8	6	3	3	3	174
PCT	3%	1%	2%	3%	5%	1%	2%	2%	5%	6%	5%	2%	5%	2%	8%	8%	8%	3%	6%	4%	3%	1%	1%	1%	100%

YEAR

	CRASHES	PCT
2003	44	25%
2004	35	20%
2005	39	22%
2006	25	14%
2007	31	17%
TOTAL	174	100%

COLLISION TYPE

	CRASHES	PCT
HIT FIX OBJ	78	44%
ANGLE	40	22%
REAR END	26	14%
HEAD ON	10	5%
NON COLL	10	5%
OPP DIR SS	6	3%
SAME DIR SS	2	1%
UNKNOWN	2	1%
TOTAL	174	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
FATAL	3	1%
MAJOR	5	2%
MODERATE	26	14%
MINOR	41	23%
UNK SEVERITY	13	7%
UNK IF INJURED	10	5%
PDO	76	43%
TOTAL	174	100%

SEVERITY COUNT

	PERSONS
FATALITIES	3
MAJOR	11
MODERATE	28
MINOR	57
UNK SEVERITY	23
UNK IF INJURED	22

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	98	30%
TOO FAST FOR CONDITION	58	18%
OTHER IMPROPER DRIVING	18	5%
PROCEED W/O CLEARANCE	18	5%
DRIVER WAS DISTRACTED	16	5%
OVER/UNDER COMP CURVE	14	4%
AFFECTED PHYSICAL COND	13	4%
IMPROPER/CARELESS TURN	11	3%
SPEEDING	10	3%
DRIVER INEXPERIENCED	9	2%
TAILGATING	9	2%
WRONG SIDE OF ROADWAY	7	2%
OTHERS	36	11%
TOTAL	317	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	144	54%
SMALL TRUCK	43	16%
LARGE TRUCK	32	12%
SUV	14	5%
VAN	13	4%
MOTORCYCLE	11	4%
HORSE AND BUG	2	0%
BUS	1	0%
FARM EQUIPMEN	1	0%
CONSTRUCTION	1	0%
OTHERS	1	0%
TOTAL	263	100%

ROAD CONDITION

	CRASHES	PCT
DRY	113	64%
WET	28	16%
SNOW	12	6%
ICE	10	5%
ICE PATCH	6	3%
SLUSH	4	2%
WATER	1	0%
TOTAL	174	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	107	61%
DARK	53	30%
STREET LIGHTS	9	5%
DUSK	4	2%
DAWN	1	0%
TOTAL	174	100%

WEATHER

	CRASHES	PCT
CLEAR	130	74%
RAIN	19	10%
SNOW	14	8%
RAIN/FOG	4	2%
SLEET	3	1%
FOG	2	1%
OTHER	2	1%
TOTAL	174	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	131	74%
SLIPPERY ICE/SNOW	26	14%
SUBSTANCE ON RDWY	5	2%
OTHER WEATHER COND	4	2%
ANIMAL IN RDWY	3	1%
DEER IN ROADWAY	3	1%
OTHER RDWY FACTOR	2	1%
SHLDR SOFT/DROPOFF	1	0%
SUDDEN WEATHER COND	1	0%
WINDY CONDITIONS	1	0%
TOTAL	177	100%

PA Route 10
Road Safety Audit

Northern Section - Upper
Crash Data

2003 - 2007
Crash Location
Source: PADOT, 2008

Delaware Valley
Regional Planning Commission
September 2008

CDART - CRASH SUMMARY REPORT (09-06)

NOTES:

1

The data available in this application is dynamic and should be used with care. Please take note of the following data alerts:

2 2008 crash records are incomplete
Data for the current year, 2008, is not fully represented in CDART. Crashes will be added for this year as they are made available to the Department. Include this year in queries with caution.

3 Complete data years
Complete records of reportable crashes are available in CDART for the following years: 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005,2006, 2007

REPORT PARAMETERS:

Query ID:	0020080807001
User ID:	lkubli
Area of Interest:	(In County 15 On State Route 0010(P) Between Segment 0290 Offset 5280 and Segment 0510 Offset 1273) or (In County 36 On State Route 0010(P) Between Segment 0010 Offset 0 and Segment 0010 Offset 550) or (In County 36 On State Route 0010(S) Between Segment 0011 Offset 0 and Segment 0011 Offset 550)
Date Range:	1/1/2003 to 12/31/2007
Criteria:	STATE ROAD

PA Route 10
Road Safety Audit

Northern Section - Lower

Crash Data

2003 - 2007
Crash Location
Source: PADOT, 2008

Delaware Valley
Regional Planning Commission
September 2008

PA Route 10
Road Safety Audit

Northern Section - Upper
Traffic Volume

DVRPC Traffic Count

AADT (Year)

1. PA 10 Vicinity of Shirktown Road and Welsh Road

Segment 10, Offset 335 to Segment 10, Offset 528

COLLISION TYPE	
Hit Fixed Object	6
Angle	1
Total	**7**
ILLUMINATION	
Dark	5
Daylight	2
Total	**7**
WEATHER	
Clear	4
Rain/Fog	2
Rain	1
Total	**7**
SEVERITY COUNT	
Fatalities	0
Major	0
Moderate	1
Minor	1
Unk Severity	0
Unk If Injured	0

Delaware Valley
Regional Planning Commission
September 2008

LANCASTER CO SR 0010 0010/0335 TO 0010/0528 RSA

Date Range: 1/1/2003 to 12/31/2007

Area of Interest: (In County 36 On State Route 0010(P) Between Segment 0010 Offset 335 and Segment 0010 Offset 528) or (In County 36 On State Route 0010(S) Between Segment 0011 Offset 335 and Segment 0011 Offset 528)

USER_ID/QUERY ID: lkubli/ 0020080826001

MONTH OF YEAR

	JAN	FEB	MAR	SEP	NOV	
CRASHES	3	1	1	1	1	7
PCT	42%	14%	14%	14%	14%	100%

DAY OF WEEK

	MON	TUE	WED	THR	FRI	SAT	
CRASHES	1	1	1	1	2	1	7
PCT	14%	14%	14%	14%	28%	14%	100%

HOUR OF DAY

	04	05	16	17	19	21	
CRASHES	1	1	1	2	1	1	7
PCT	14%	14%	14%	28%	14%	14%	100%

YEAR

	CRASHES	PCT
2003	2	28%
2004	2	28%
2007	3	42%
TOTAL	7	100%

COLLISION TYPE

	CRASHES	PCT
HIT FIX OBJ	6	85%
ANGLE	1	14%
TOTAL	7	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
MODERATE	1	14%
MINOR	1	14%
PDO	5	71%
TOTAL	7	100%

SEVERITY COUNT

	PERSONS
FATALITIES	0
MAJOR	0
MODERATE	1
MINOR	1
UNK SEVERITY	0
UNK IF INJURED	0

DRIVER ACTIONS

	ACTIONS	PCT
TOO FAST FOR CONDITION	3	33%
OTHER IMPROPER DRIVING	2	22%
CARELESS PASS/LN CHNG	1	11%
IMPROPER/CARELESS TURN	1	11%
NO CONTRIBUTING ACTION	1	11%
SPEEDING	1	11%
TOTAL	9	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	6	75%
SMALL TRUCK	1	12%
LARGE TRUCK	1	12%
TOTAL	8	100%

ROAD CONDITION

	CRASHES	PCT
DRY	4	57%
WET	3	42%
TOTAL	7	100%

ILLUMINATION

	CRASHES	PCT
DARK	5	71%
DAYLIGHT	2	28%
TOTAL	7	100%

WEATHER

	CRASHES	PCT
CLEAR	4	57%
RAIN/FOG	2	28%
RAIN	1	14%
TOTAL	7	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	7	100%
TOTAL	7	100%

CDART - CRASH SUMMARY REPORT (09-06)

NOTES:

1

The data available in this application is dynamic and should be used with care. Please take note of the following data alerts:

2 2008 crash records are incomplete

Data for the current year, 2008, is not fully represented in CDART. Crashes will be added for this year as they are made available to the Department. Include this year in queries with caution.

3 Complete data years

Complete records of reportable crashes are available in CDART for the following years: 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005,2006, 2007

REPORT PARAMETERS:

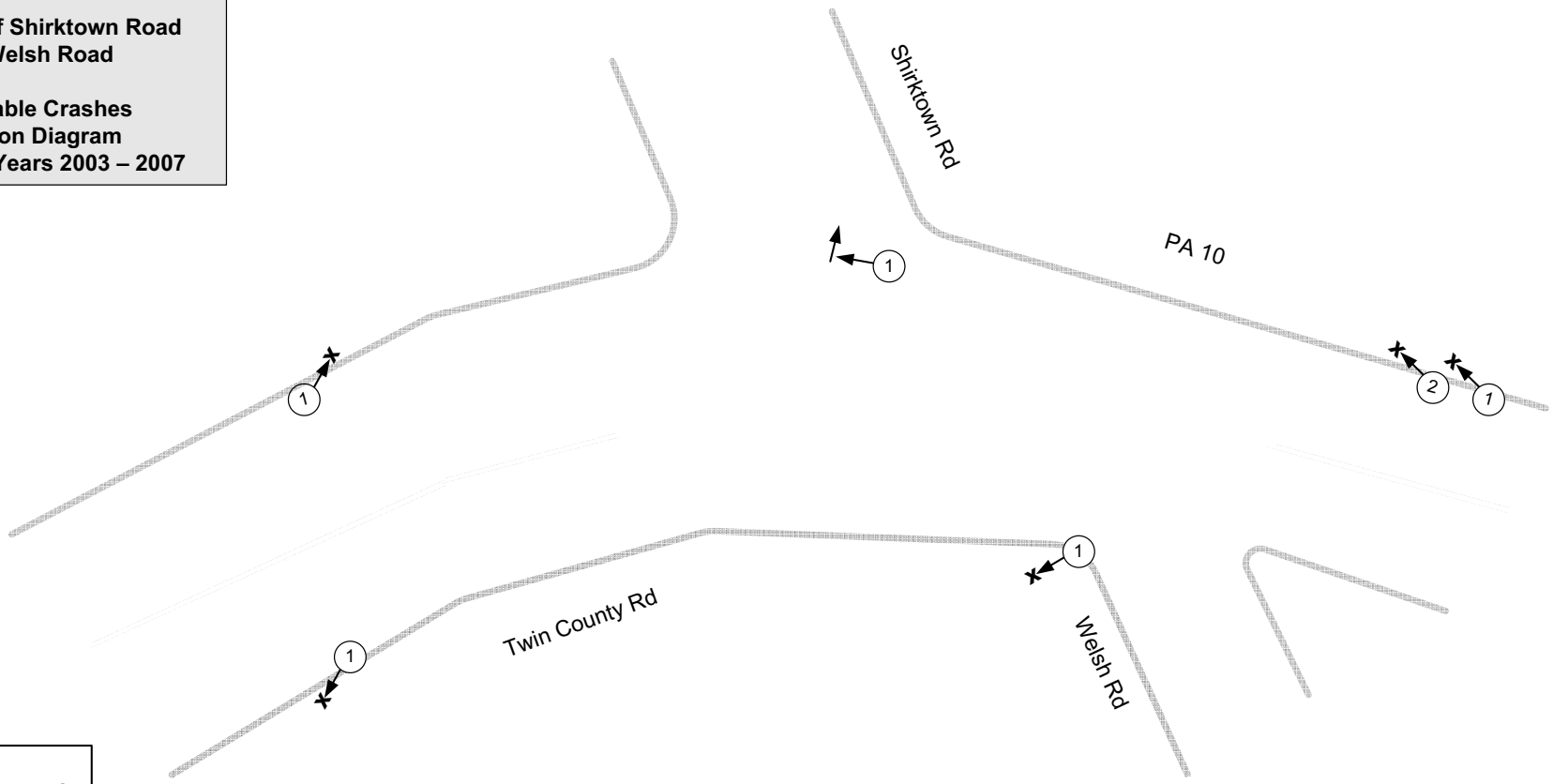
Query ID:	0020080826001
User ID:	lkubli
Area of Interest:	(In County 36 On State Route 0010(P) Between Segment 0010 Offset 335 and Segment 0010 Offset 528) or (In County 36 On State Route 0010(S) Between Segment 0011 Offset 335 and Segment 0011 Offset 528)
Date Range:	1/1/2003 to 12/31/2007
Criteria:	STATE ROAD

Road Safety Audit
PA 10

1. Vicinity of Shirktown Road and Welsh Road

Reportable Crashes
Collision Diagram
Crash Data Years 2003 – 2007

Total Crashes = 7



Crash Type Legend

(1) = # Crashes

Angle

Hit Fixed Object

SCHEMATIC NOT TO SCALE

Delaware Valley Regional Planning Commission
September 2008

2. PA 10 Vicinity of Poplar Road

Segment 490, Offset 2921 to Segment 500, Offset 748

COLLISION TYPE	
Hit Fixed Object	5
Angle	2
Head On	1
Total	**8**
ILLUMINATION	
Daylight	5
Dark	2
Dusk	1
Total	**8**
WEATHER	
Clear	6
Rain/Fog	1
Snow	1
Total	**8**
SEVERITY COUNT	
Fatalities	0
Major	0
Moderate	0
Minor	4
Unk Severity	2
Unk If Injured	2

Delaware Valley
Regional Planning Commission
September 2008

CHESTER CO SR 0010 0490/2921 TO 0500/0748 RSA

Date Range: 1/1/2003 to 12/31/2007

Area of Interest: (In County 15 On State Route 0010(P) Between Segment 0490 Offset 2921 and Segment 0500 Offset 748)

USER_ID/QUERY ID: lkubli/ *0620080912003*

MONTH OF YEAR

	JAN	FEB	JUN	SEP	NOV	
CRASHES	2	2	1	1	2	8
PCT	25%	25%	12%	12%	25%	100%

DAY OF WEEK

	SUN	MON	TUE	WED	THR	FRI	SAT	
CRASHES	1	1	1	1	1	2	1	8
PCT	12%	12%	12%	12%	12%	25%	12%	100%

HOUR OF DAY

	02	06	14	15	16	17	99	
CRASHES	1	1	2	1	1	1	1	8
PCT	12%	12%	25%	12%	12%	12%	12%	100%

YEAR

	CRASHES	PCT
2003	1	12%
2005	4	50%
2007	3	37%
TOTAL	8	100%

COLLISION TYPE

	CRASHES	PCT
HIT FIX OBJ	5	62%
ANGLE	2	25%
HEAD ON	1	12%
TOTAL	8	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
MINOR	3	37%
UNK SEVERITY	2	25%
UNK IF INJURED	1	12%
PDO	2	25%
TOTAL	8	100%

SEVERITY COUNT

	PERSONS
FATALITIES	0
MAJOR	0
MODERATE	0
MINOR	4
UNK SEVERITY	2
UNK IF INJURED	2

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	5	38%
TOO FAST FOR CONDITION	3	23%
OTHER IMPROPER DRIVING	2	15%
AFFECTED PHYSICAL COND	1	7%
DRIVER INEXPERIENCED	1	7%
PROCEED W/O CLEARANCE	1	7%
TOTAL	13	100%

VEHICLE TYPE

	VEHICLES	PCT
SMALL TRUCK	5	41%
AUTOMOBILE	4	33%
LARGE TRUCK	1	8%
SUV	1	8%
VAN	1	8%
TOTAL	12	100%

ROAD CONDITION

	CRASHES	PCT
DRY	4	50%
WET	3	37%
SNOW	1	12%
TOTAL	8	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	5	62%
DARK	2	25%
DUSK	1	12%
TOTAL	8	100%

WEATHER

	CRASHES	PCT
CLEAR	6	75%
RAIN/FOG	1	12%
SNOW	1	12%
TOTAL	8	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	7	87%
SUBSTANCE ON RDWY	1	12%
TOTAL	8	100%

CDART - CRASH SUMMARY REPORT (09-06)

NOTES:

1

The data available in this application is dynamic and should be used with care. Please take note of the following data alerts:

2 2008 crash records are incomplete

Data for the current year, 2008, is not fully represented in CDART. Crashes will be added for this year as they are made available to the Department. Include this year in queries with caution.

3 Complete data years

Complete records of reportable crashes are available in CDART for the following years: 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005,2006, 2007

REPORT PARAMETERS:

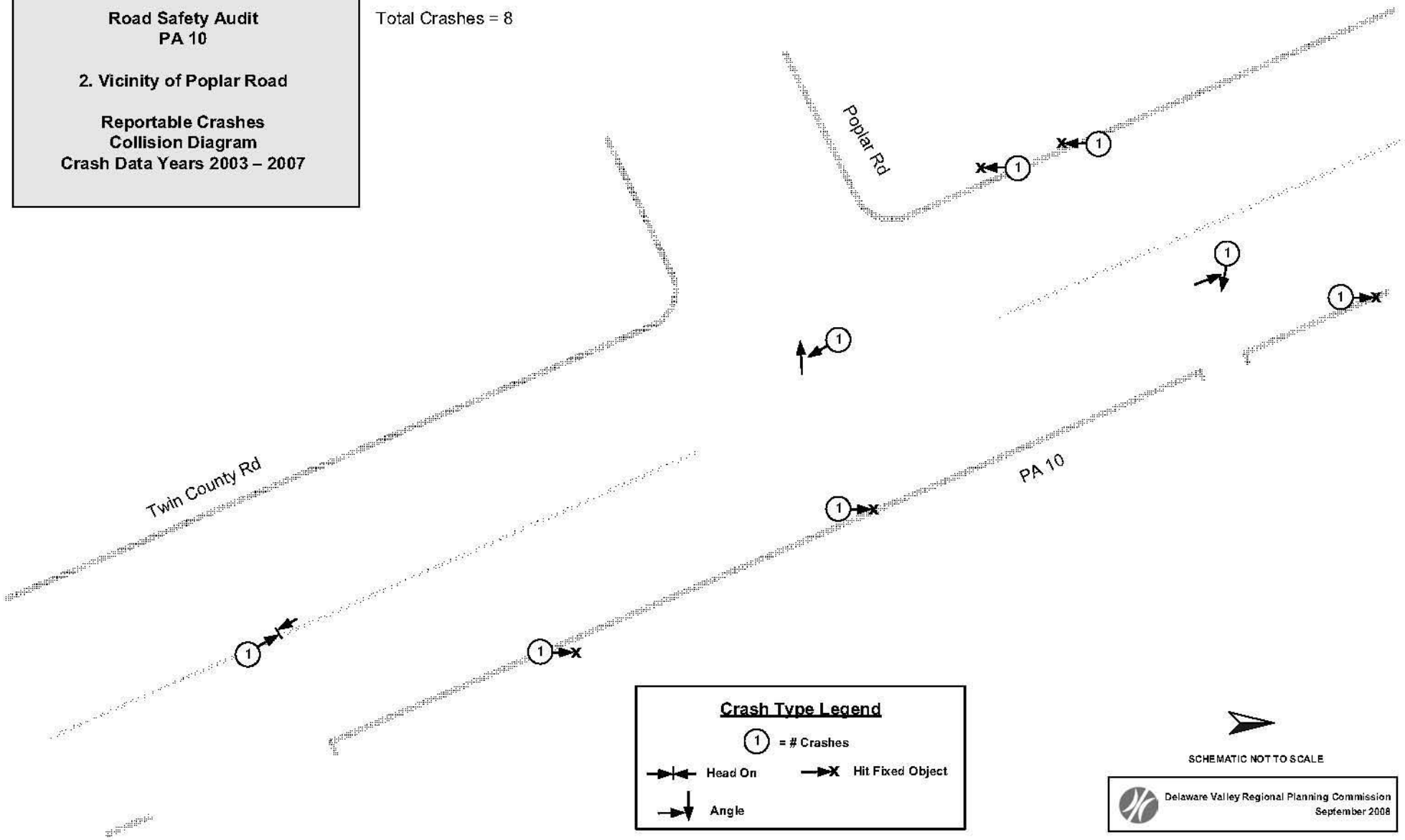
Query ID:	0620080912003
User ID:	lkubli
Area of Interest:	(In County 15 On State Route 0010(P) Between Segment 0490 Offset 2921 and Segment 0500 Offset 748)
Date Range:	1/1/2003 to 12/31/2007
Criteria:	STATE ROAD

Road Safety Audit
PA 10

2. Vicinity of Poplar Road

Reportable Crashes
Collision Diagram
Crash Data Years 2003 – 2007

Total Crashes = 8



3. PA 10 Vicinity of Walnut Road

Segment 480, Offset 0 to Segment 480, Offset 318

COLLISION TYPE	
Angle	5
Total	**5**
ILLUMINATION	
Daylight	3
Dark	1
Dusk	1
Total	**5**
WEATHER	
Clear	3
Rain	2
Total	**5**
SEVERITY COUNT	
Fatalities	0
Major	1
Moderate	0
Minor	2
Unk Severity	1
Unk If Injured	1

Delaware Valley
Regional Planning Commission
September 2008

CHESTER CO SR 0010 0480/0000 TO 0480/0318 RSA

Date Range: 1/1/2003 to 12/31/2007

Area of Interest: (In County 15 On State Route 0010(P) Between Segment 0480 Offset 0 and Segment 0480 Offset 318)

USER ID/QUERY ID: lkubli/ 0620080912002

MONTH OF YEAR

	APR	JUN	SEP	DEC	
CRASHES	1	1	1	2	5
PCT	20%	20%	20%	40%	100%

DAY OF WEEK

	MON	
CRASHES	5	5
PCT	100%	100%

HOUR OF DAY

	15	16	19	
CRASHES	2	2	1	5
PCT	40%	40%	20%	100%

YEAR

	CRASHES	PCT
2003	2	40%
2005	1	20%
2006	1	20%
2007	1	20%
TOTAL	5	100%

COLLISION TYPE

	CRASHES	PCT
ANGLE	5	100%
TOTAL	5	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
MAJOR	1	20%
MINOR	2	40%
UNK IF INJURED	1	20%
PDO	1	20%
TOTAL	5	100%

SEVERITY COUNT

	PERSONS
FATALITIES	0
MAJOR	1
MODERATE	0
MINOR	2
UNK SEVERITY	1
UNK IF INJURED	1

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	4	33%
PROCEED W/O CLEARANCE	3	25%
DRIVER INEXPERIENCED	1	8%
IMPROPER ENTRANCE HWY	1	8%
IMPROPER/CARELESS TURN	1	8%
RUNNING STOP SIGN	1	8%
USING HAND-HELD PHONE	1	8%
TOTAL	12	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	6	60%
MOTORCYCLE	1	10%
BUS	1	10%
SMALL TRUCK	1	10%
VAN	1	10%
TOTAL	10	100%

ROAD CONDITION

	CRASHES	PCT
DRY	3	60%
WET	2	40%
TOTAL	5	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	3	60%
DARK	1	20%
DUSK	1	20%
TOTAL	5	100%

WEATHER

	CRASHES	PCT
CLEAR	3	60%
RAIN	2	40%
TOTAL	5	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	5	100%
TOTAL	5	100%

CDART - CRASH SUMMARY REPORT (09-06)

NOTES:

1

The data available in this application is dynamic and should be used with care. Please take note of the following data alerts:

2 2008 crash records are incomplete

Data for the current year, 2008, is not fully represented in CDART. Crashes will be added for this year as they are made available to the Department. Include this year in queries with caution.

3 Complete data years

Complete records of reportable crashes are available in CDART for the following years: 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005,2006, 2007

REPORT PARAMETERS:

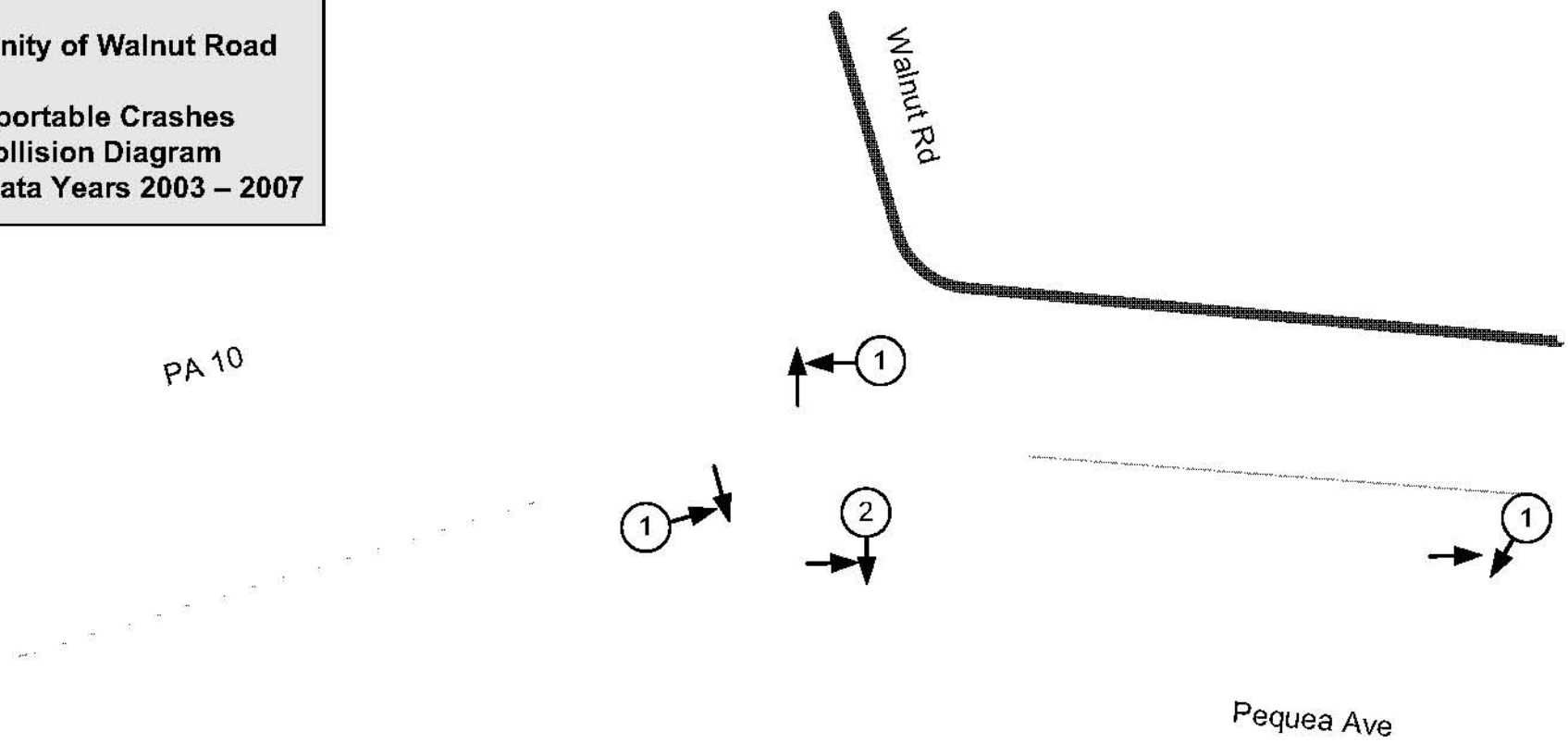
Query ID:	0620080912002
User ID:	lkubli
Area of Interest:	(In County 15 On State Route 0010(P) Between Segment 0480 Offset 0 and Segment 0480 Offset 318)
Date Range:	1/1/2003 to 12/31/2007
Criteria:	STATE ROAD

Road Safety Audit
PA 10

3. Vicinity of Walnut Road

Reportable Crashes
Collision Diagram
Crash Data Years 2003 – 2007

Total Crashes = 5



Crash Type Legend

(1) = # Crashes

Angle

SCHEMATIC NOT TO SCALE

Delaware Valley Regional Planning Commission
September 2008

4. PA 10 Vicinity of Mount Pleasant Road and Cambridge Road

Segment 450, Offset 3030 to Segment 470, Offset 370

COLLISION TYPE	
Rear-end	6
Angle	5
Hit Fixed Object	4
Head-on	1
Non Collision	1
Opp Dir Sideswipe	1
Total	**18**
ILLUMINATION	
Daylight	11
Dark	6
Street Lights	1
Total	**18**
WEATHER	
Clear	14
Rain	2
Other	1
Sleet	1
Total	**18**
SEVERITY COUNT	
Fatalities	1
Major	0
Moderate	7
Minor	5
Unk Severity	3
Unk If Injured	1

Delaware Valley
Regional Planning Commission
September 2008

CHESTER CO SR 0010 0450/3030 TO 0470/0370 RSA

Date Range: 1/1/2003 to 12/31/2007
Area of Interest: (In County 15 On State Route 0010(P) Between Segment 0450 Offset 3030 and Segment 0470 Offset 370)

USER ID/QUERY ID:
lkubli/ 0620080912001

MONTH OF YEAR

	JAN	MAR	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
CRASHES	2	2	3	4	1	2	1	1	2	18
PCT	11%	11%	16%	22%	5%	11%	5%	5%	11%	100%

DAY OF WEEK

	SUN	MON	TUE	WED	THR	SAT	
CRASHES	1	7	2	1	6	1	18
PCT	5%	38%	11%	5%	33%	5%	100%

HOUR OF DAY

	00	05	09	10	11	12	15	16	17	18	19	21	23	
CRASHES	1	1	1	1	1	1	2	2	2	2	2	1	1	18
PCT	5%	5%	5%	5%	5%	5%	11%	11%	11%	11%	11%	5%	5%	100%

YEAR

	CRASHES	PCT
2003	6	33%
2004	3	16%
2005	4	22%
2006	4	22%
2007	1	5%
TOTAL	18	100%

COLLISION TYPE

	CRASHES	PCT
REAR END	6	33%
ANGLE	5	27%
HIT FIX OBJ	4	22%
HEAD ON	1	5%
NON COLL	1	5%
OPP DIR SS	1	5%
TOTAL	18	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
FATAL	1	5%
MODERATE	5	27%
MINOR	2	11%
PDO	10	55%
TOTAL	18	100%

SEVERITY COUNT

	PERSONS
FATALITIES	1
MAJOR	0
MODERATE	7
MINOR	5
UNK SEVERITY	3
UNK IF INJURED	1

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	12	35%
TOO FAST FOR CONDITION	5	14%
OTHER IMPROPER DRIVING	4	11%
PROCEED W/O CLEARANCE	3	8%
DRIVER WAS DISTRACTED	2	5%
TAILGATING	2	5%
USING HAND-HELD PHONE	2	5%
WRONG SIDE OF ROADWAY	2	5%
IMPROPER/CARELESS TURN	1	2%
UNKNOWN	1	2%
TOTAL	34	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	13	41%
LARGE TRUCK	8	25%
SMALL TRUCK	6	19%
SUV	2	6%
VAN	1	3%
HORSE AND BUG	1	3%
TOTAL	31	100%

ROAD CONDITION

	CRASHES	PCT
DRY	13	72%
ICE	2	11%
SLUSH	1	5%
SNOW	1	5%
WATER	1	5%
TOTAL	18	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	11	61%
DARK	6	33%
STREET LIGHTS	1	5%
TOTAL	18	100%

WEATHER

	CRASHES	PCT
CLEAR	14	77%
RAIN	2	11%
OTHER	1	5%
SLEET	1	5%
TOTAL	18	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	14	77%
SLIPPERY ICE/SNOW	3	16%
OTHER RDWY FACTOR	1	5%
TOTAL	18	100%

CDART - CRASH SUMMARY REPORT (09-06)

NOTES:

1

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2 2008 crash records are incomplete

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3 Complete data years

Complete records of reportable crashes are available in CDART for the following years: 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005,2006, 2007

REPORT PARAMETERS:

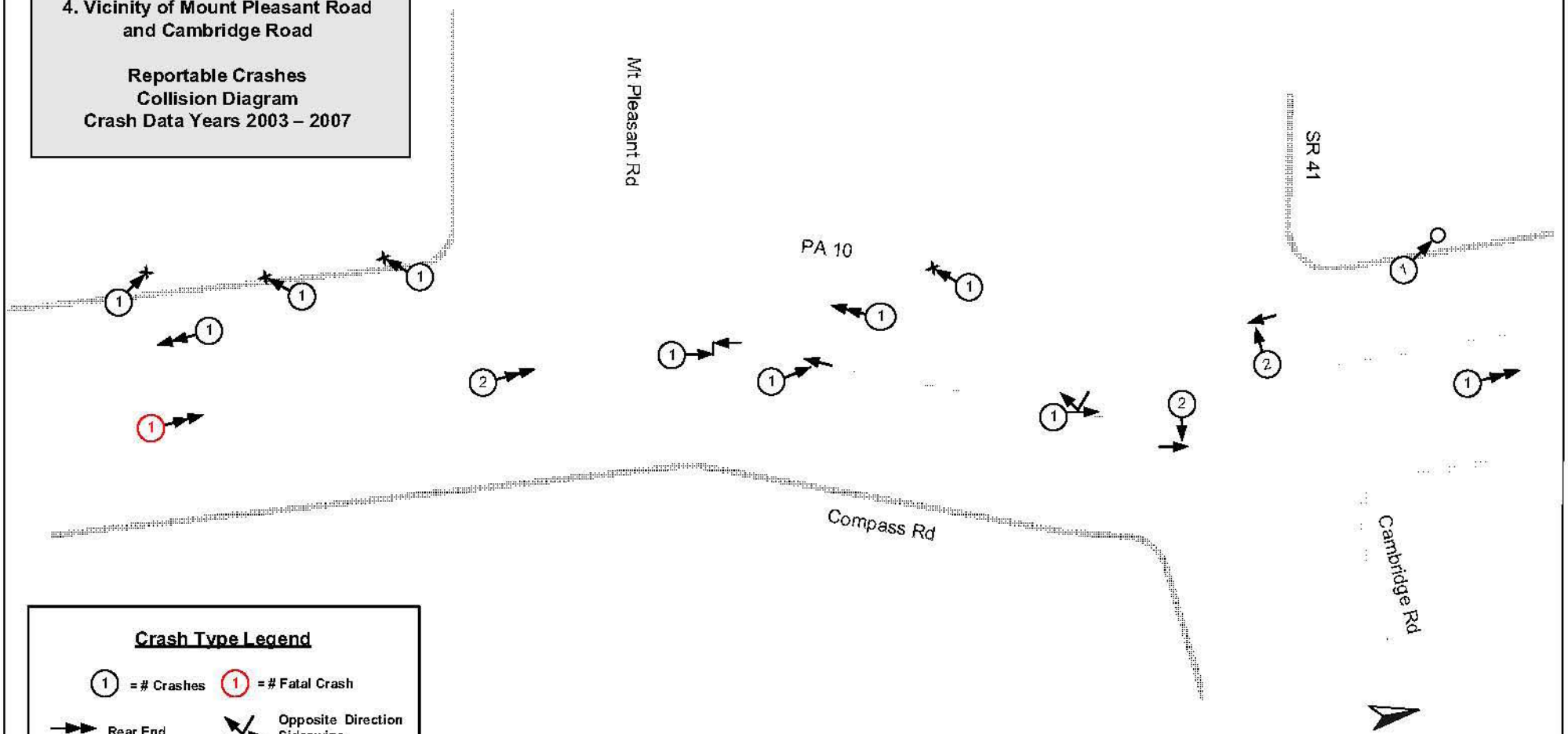
Query ID:	0620080912001
User ID:	lkubli
Area of Interest:	(In County 15 On State Route 0010(P) Between Segment 0450 Offset 3030 and Segment 0470 Offset 370)
Date Range:	1/1/2003 to 12/31/2007
Criteria:	STATE ROAD

Road Safety Audit
PA 10

4. Vicinity of Mount Pleasant Road and Cambridge Road

Reportable Crashes
Collision Diagram
Crash Data Years 2003 – 2007

Total Crashes = 18



Crash Type Legend

(1) = # Crashes
(1) = # Fatal Crash
Rear End
Opposite Direction Sideswipe
Head On
Non-collison
Hit Fixed Object
Angle

SCHEMATIC NOT TO SCALE

Delaware Valley Regional Planning Commission
September 2008

5. PA 10 Vicinity of Beaver Dam Road

Segment 430, Offset 660 to Segment 440, Offset 499

COLLISION TYPE	
Hit Fixed Object	5
Angle	2
Non Collision	1
Rear-end	1
Total	**9**
ILLUMINATION	
Daylight	7
Dark	2
Total	**9**
WEATHER	
Clear	7
Fog	1
Snow	1
Total	**9**
SEVERITY COUNT	
Fatalities	0
Major	0
Moderate	2
Minor	2
Unk Severity	1
Unk If Injured	1

Note: Crash summary total differs from crash diagram total due to police report miscoding.

Delaware Valley
Regional Planning Commission
September 2008

CHESTER CO SR 0010 0430/0660 TO 0440/0499 RSA

Date Range: 1/1/2003 to 12/31/2007

Area of Interest: (In County 15 On State Route 0010(P) Between Segment 0430 Offset 660 and Segment 0440 Offset 499)

USER_ID/QUERY ID: lkubli/ 0620080911017

MONTH OF YEAR

	JAN	MAR	MAY	JUN	AUG	SEP	OCT	NOV	
CRASHES	1	1	2	1	1	1	1	1	9
PCT	11%	11%	22%	11%	11%	11%	11%	11%	100%

DAY OF WEEK

	SUN	MON	TUE	FRI	
CRASHES	1	1	3	4	9
PCT	11%	11%	33%	44%	100%

HOUR OF DAY

	00	06	07	11	14	17	18	21	99	
CRASHES	1	1	1	1	1	1	1	1	1	9
PCT	11%	11%	11%	11%	11%	11%	11%	11%	11%	100%

YEAR

	CRASHES	PCT
2003	1	11%
2004	2	22%
2005	2	22%
2006	2	22%
2007	2	22%
TOTAL	9	100%

COLLISION TYPE

	CRASHES	PCT
HIT FIX OBJ	5	55%
ANGLE	2	22%
NON COLL	1	11%
REAR END	1	11%
TOTAL	9	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
MODERATE	2	22%
MINOR	2	22%
UNK SEVERITY	1	11%
UNK IF INJURED	2	22%
PDO	2	22%
TOTAL	9	100%

SEVERITY COUNT

	PERSONS
FATALITIES	0
MAJOR	0
MODERATE	2
MINOR	2
UNK SEVERITY	1
UNK IF INJURED	1

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	4	33%
TOO FAST FOR CONDITION	2	16%
DRIVER WAS DISTRACTED	1	8%
OVER/UNDER COMP CURVE	1	8%
PROCEED W/O CLEARANCE	1	8%
RUNNING STOP SIGN	1	8%
TAILGATING	1	8%
UNKNOWN	1	8%
TOTAL	12	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	7	58%
MOTORCYCLE	2	16%
SMALL TRUCK	1	8%
LARGE TRUCK	1	8%
VAN	1	8%
TOTAL	12	100%

ROAD CONDITION

	CRASHES	PCT
DRY	7	77%
SNOW	1	11%
WET	1	11%
TOTAL	9	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	7	77%
DARK	2	22%
TOTAL	9	100%

WEATHER

	CRASHES	PCT
CLEAR	7	77%
FOG	1	11%
SNOW	1	11%
TOTAL	9	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	8	88%
SLIPPERY ICE/SNOW	1	11%
TOTAL	9	100%

CDART - CRASH SUMMARY REPORT (09-06)

NOTES:

1

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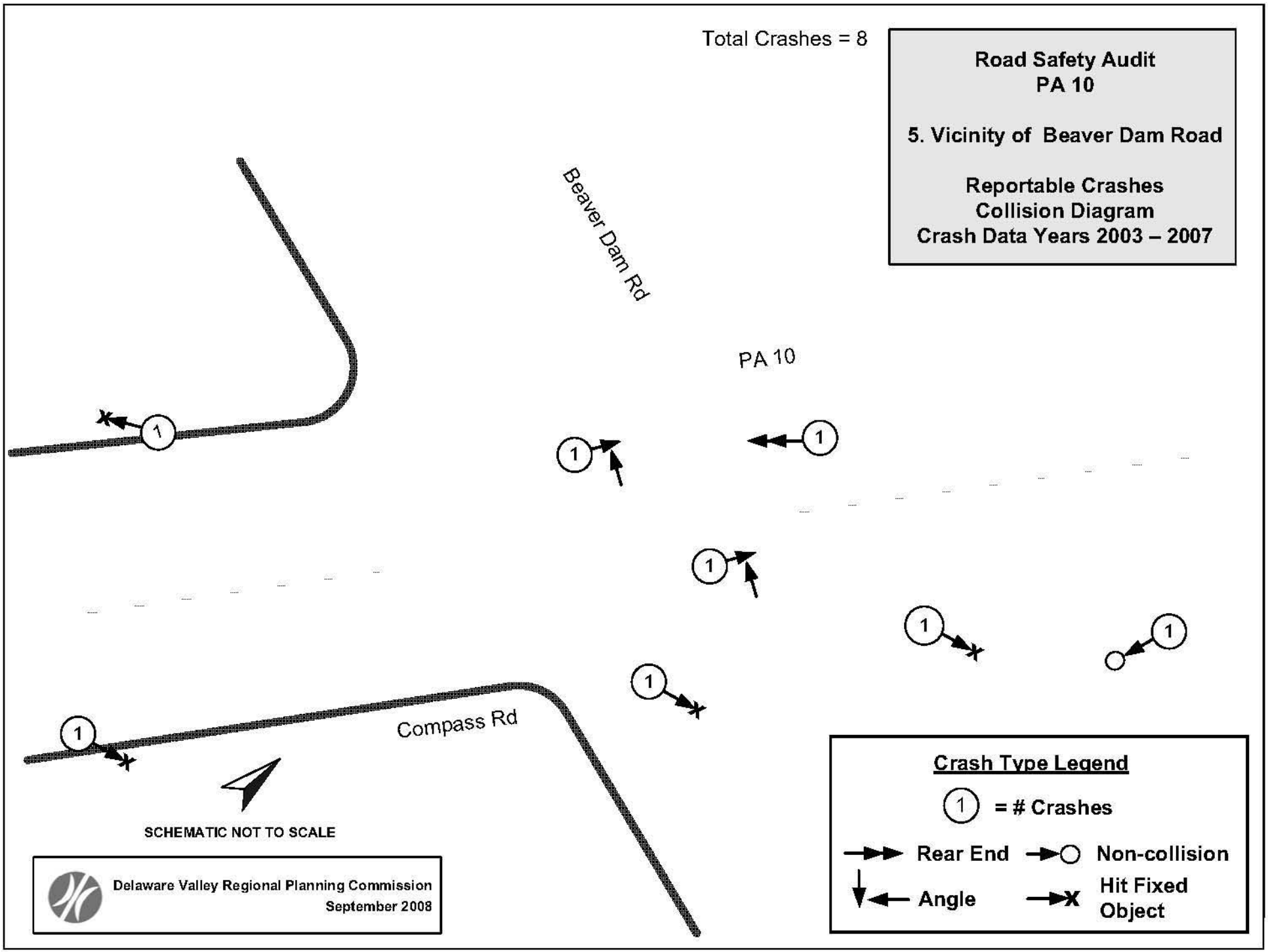
3 Complete data years

Complete records of reportable crashes are available in CDART for the following years: 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005,2006, 2007

REPORT PARAMETERS:

Query ID:	0620080911017
User ID:	lkubli
Area of Interest:	(In County 15 On State Route 0010(P) Between Segment 0430 Offset 660 and Segment 0440 Offset 499)
Date Range:	1/1/2003 to 12/31/2007
Criteria:	STATE ROAD


Total Crashes = 8
Road Safety Audit
PA 10
5. Vicinity of Beaver Dam Road
Reportable Crashes
Collision Diagram
Crash Data Years 2003 – 2007
Beaver Dam Rd
PA 10
Compass Rd
SCHEMATIC NOT TO SCALE
Delaware Valley Regional Planning Commission
September 2008
Crash Type Legend
1 = # Crashes
Rear End
Non-collision
Angle
Hit Fixed Object

6. PA 10 Vicinity of Michael Road

Segment 410, Offset 0 to Segment 410, Offset 1461

COLLISION TYPE	
Hit Fixed Object	2
Rear-end	2
Head-on	1
Unknown	1
Total	**6**
ILLUMINATION	
Daylight	4
Dark	2
Total	**6**
WEATHER	
Clear	6
Total	**6**
SEVERITY COUNT	
Fatalities	0
Major	0
Moderate	0
Minor	3
Unk Severity	0
Unk If Injured	0

Delaware Valley
Regional Planning Commission
September 2008

CHESTER CO SR 0010 0410/0000 TO 0410/1461 RSA

Date Range: 1/1/2003 to 12/31/2007

Area of Interest: (In County 15 On State Route 0010(P) Between Segment 0410 Offset 0 and Segment 0410 Offset 1461)

USER_ID/QUERY ID: lkubli/ *0620080911015*

MONTH OF YEAR

	JAN	APR	JUN	SEP	OCT	
CRASHES	1	1	1	1	2	6
PCT	16%	16%	16%	16%	33%	100%

DAY OF WEEK

	SUN	TUE	WED	THR	SAT	
CRASHES	1	1	1	2	1	6
PCT	16%	16%	16%	33%	16%	100%

HOUR OF DAY

	05	08	09	15	16	
CRASHES	2	1	1	1	1	6
PCT	33%	16%	16%	16%	16%	100%

YEAR

	CRASHES	PCT
2004	2	33%
2005	1	16%
2006	1	16%
2007	2	33%
TOTAL	6	100%

COLLISION TYPE

	CRASHES	PCT
HIT FIX OBJ	2	33%
REAR END	2	33%
HEAD ON	1	16%
UNKNOWN	1	16%
TOTAL	6	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
MINOR	3	50%
PDO	3	50%
TOTAL	6	100%

SEVERITY COUNT

	PERSONS
FATALITIES	0
MAJOR	0
MODERATE	0
MINOR	3
UNK SEVERITY	0
UNK IF INJURED	0

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	6	42%
DRIVER WAS DISTRACTED	2	14%
TAILGATING	2	14%
AFFECTED PHYSICAL COND	1	7%
FAILR MAINT PROP SPEED	1	7%
OTHER IMPROPER DRIVING	1	7%
TOO FAST FOR CONDITION	1	7%
TOTAL	14	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	4	36%
SMALL TRUCK	2	18%
LARGE TRUCK	2	18%
SUV	2	18%
VAN	1	9%
TOTAL	11	100%

ROAD CONDITION

	CRASHES	PCT
DRY	5	83%
ICE	1	16%
TOTAL	6	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	4	66%
DARK	2	33%
TOTAL	6	100%

WEATHER

	CRASHES	PCT
CLEAR	6	100%
TOTAL	6	100%

ENVIR/ROADWAY FACTORS

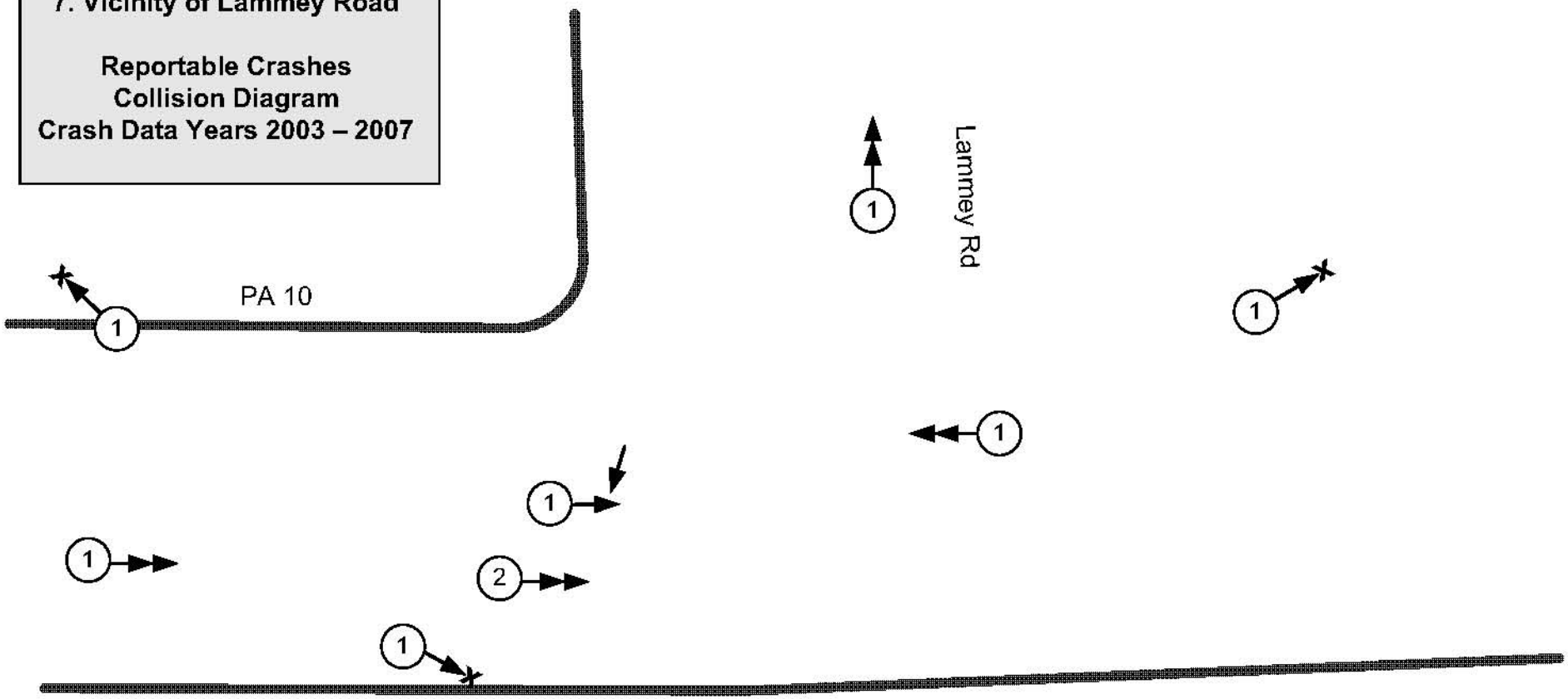
	FACTORS	PCT
NONE	4	66%
DEER IN ROADWAY	1	16%
SLIPPERY ICE/SNOW	1	16%
TOTAL	6	100%

Road Safety Audit
PA 10

7. Vicinity of Lammey Road

Reportable Crashes
Collision Diagram
Crash Data Years 2003 – 2007

Total Crashes = 9



Crash Type Legend

(1) = # Crashes

Rear End

Hit Fixed Object

Angle

SCHEMATIC NOT TO SCALE

Delaware Valley Regional Planning Commission
September 2008

CDART - CRASH SUMMARY REPORT (09-06)

NOTES:

1

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2 2008 crash records are incomplete

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3 Complete data years

Complete records of reportable crashes are available in CDART for the following years: 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005,2006, 2007

REPORT PARAMETERS:

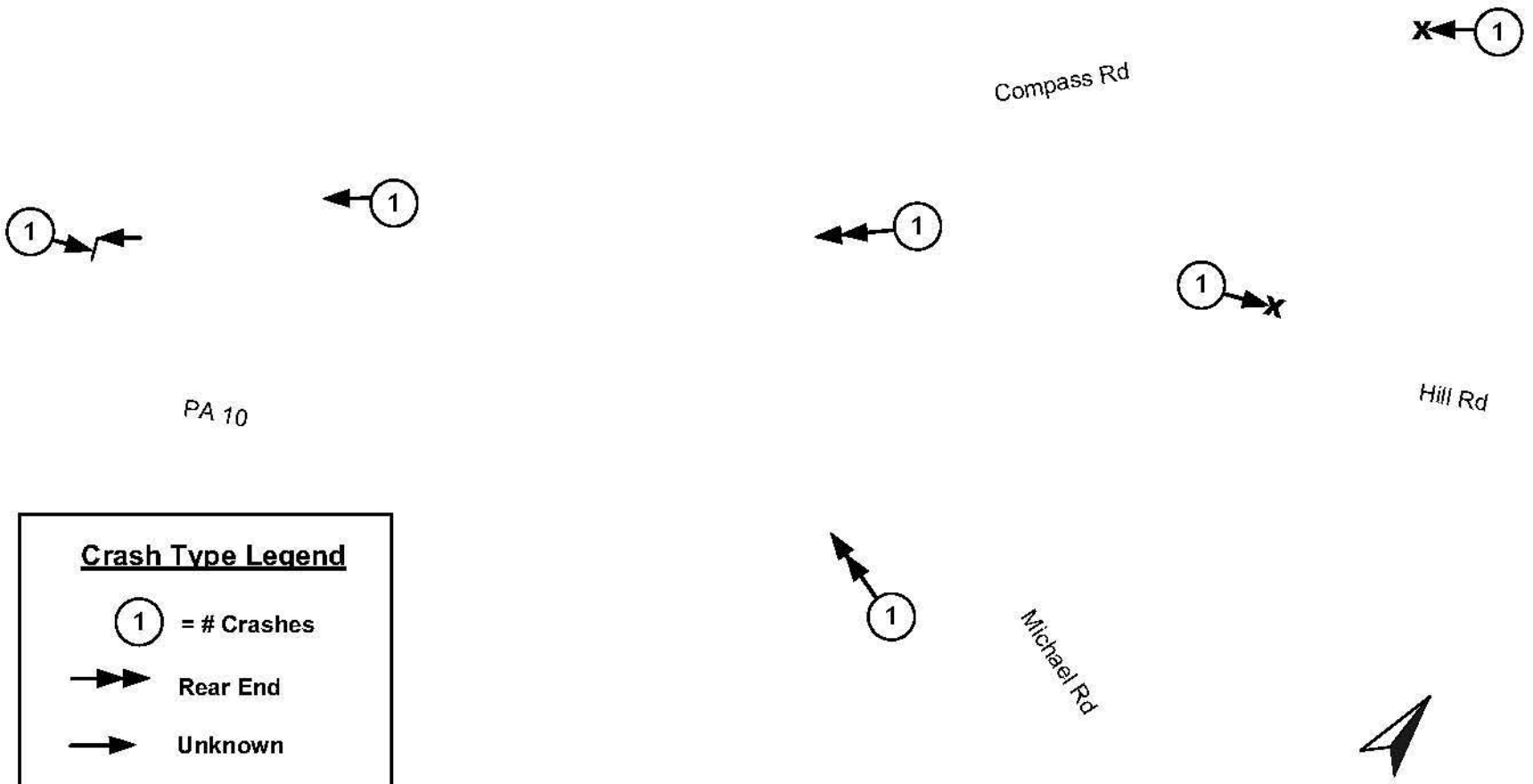
Query ID:	0620080911015
User ID:	lkubli
Area of Interest:	(In County 15 On State Route 0010(P) Between Segment 0410 Offset 0 and Segment 0410 Offset 1461)
Date Range:	1/1/2003 to 12/31/2007
Criteria:	STATE ROAD

Road Safety Audit
PA 10

6. Vicinity of Michael Road

Reportable Crashes
Collision Diagram
Crash Data Years 2003 – 2007

Total Crashes = 6



Crash Type Legend

- (1) = # Crashes
- Rear End
- Unknown
- Hit Fixed Object
- Head On

Delaware Valley Regional Planning Commission
September 2008

7. PA 10 Vicinity of Lammey Road

Segment 390, Offset 1614 to Segment 400, Offset 188

COLLISION TYPE	
Rear-end	5
Hit Fixed Object	3
Angle	1
Total	**9**
ILLUMINATION	
Daylight	8
Dark	1
Total	**9**
WEATHER	
Clear	8
Sleet	1
Total	**9**
SEVERITY COUNT	
Fatalities	0
Major	0
Moderate	0
Minor	4
Unk Severity	7
Unk If Injured	0

Delaware Valley
Regional Planning Commission
September 2008

CHESTER CO SR 0010 0390/1614 TO 0400/0188 RSA

Date Range: 1/1/2003 to 12/31/2007

Area of Interest: (In County 15 On State Route 0010(P) Between Segment 0390 Offset 1614 and Segment 0400 Offset 188)

USER_ID/QUERY ID: lkubli/ 0620080911014

MONTH OF YEAR

	MAR	APR	MAY	JUL	AUG	NOV	
CRASHES	1	1	1	4	1	1	9
PCT	11%	11%	11%	44%	11%	11%	100%

DAY OF WEEK

	SUN	TUE	THR	FRI	SAT	
CRASHES	4	1	1	2	1	9
PCT	44%	11%	11%	22%	11%	100%

HOUR OF DAY

	10	12	14	15	16	17	20	
CRASHES	2	1	1	2	1	1	1	9
PCT	22%	11%	11%	22%	11%	11%	11%	100%

YEAR

	CRASHES	PCT
2003	2	22%
2004	2	22%
2005	2	22%
2006	2	22%
2007	1	11%
TOTAL	9	100%

COLLISION TYPE

	CRASHES	PCT
REAR END	5	55%
HIT FIX OBJ	3	33%
ANGLE	1	11%
TOTAL	9	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
MINOR	4	44%
UNK SEVERITY	2	22%
PDO	3	33%
TOTAL	9	100%

SEVERITY COUNT

	PERSONS
FATALITIES	0
MAJOR	0
MODERATE	0
MINOR	4
UNK SEVERITY	7
UNK IF INJURED	0

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	6	31%
DRIVER WAS DISTRACTED	4	21%
CARELESS PASS/LN CHNG	2	10%
TOO FAST FOR CONDITION	2	10%
DRIVER INEXPERIENCED	1	5%
OTHER IMPROPER DRIVING	1	5%
PROCEED W/O CLEARANCE	1	5%
SPEEDING	1	5%
SUDDEN SLOWING/STOP	1	5%
TOTAL	19	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	8	53%
SMALL TRUCK	4	26%
VAN	2	13%
LARGE TRUCK	1	6%
TOTAL	15	100%

ROAD CONDITION

	CRASHES	PCT
DRY	8	88%
ICE	1	11%
TOTAL	9	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	8	88%
DARK	1	11%
TOTAL	9	100%

WEATHER

	CRASHES	PCT
CLEAR	8	88%
SLEET	1	11%
TOTAL	9	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	7	77%
SHLDR SOFT/DROPOFF	1	11%
SLIPPERY ICE/SNOW	1	11%
TOTAL	9	100%

CDART - CRASH SUMMARY REPORT (09-06)

NOTES:

1

The data available in this application is dynamic and should be used with care. Please take note of the following data alerts:

2 2008 crash records are incomplete

Data for the current year, 2008, is not fully represented in CDART. Crashes will be added for this year as they are made available to the Department. Include this year in queries with caution.

3 Complete data years

Complete records of reportable crashes are available in CDART for the following years: 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005,2006, 2007

REPORT PARAMETERS:

Query ID:	0620080911014
User ID:	lkubli
Area of Interest:	(In County 15 On State Route 0010(P) Between Segment 0390 Offset 1614 and Segment 0400 Offset 188)
Date Range:	1/1/2003 to 12/31/2007
Criteria:	STATE ROAD

8. PA 10 Vicinity of Cains Road and Caton Road

Segment 380, Offset 1290 to Segment 390, Offset 559

COLLISION TYPE	
Hit Fixed Object	4
Rear-end	2
Angle	1
Head-on	1
Non Collision	1
Opp Dir Sideswipe	1
Same Dir Sideswipe	1
Total	**11**
ILLUMINATION	
Daylight	9
Dark	2
Total	**11**
WEATHER	
Clear	9
Rain	1
Snow	1
Total	**11**
SEVERITY COUNT	
Fatalities	1
Major	4
Moderate	2
Minor	4
Unk Severity	2
Unk If Injured	1

Delaware Valley
Regional Planning Commission
September 2008

CHESTER CO SR 0010 0380/1290 TO 0390/0559 RSA

Date Range: 1/1/2003 to 12/31/2007

Area of Interest: (In County 15 On State Route 0010(P) Between Segment 0380 Offset 1290 and Segment 0390 Offset 559)

USER_ID/QUERY ID: lkubli/ 0620080911013

MONTH OF YEAR

	FEB	MAY	JUN	JUL	AUG	OCT	DEC	
CRASHES	1	2	1	2	1	3	1	11
PCT	9%	18%	9%	18%	9%	27%	9%	100%

DAY OF WEEK

	SUN	TUE	WED	THR	FRI	SAT	
CRASHES	1	2	1	1	1	5	11
PCT	9%	18%	9%	9%	9%	45%	100%

HOUR OF DAY

	07	11	13	16	17	22	
CRASHES	1	3	1	2	3	1	11
PCT	9%	27%	9%	18%	27%	9%	100%

YEAR

	CRASHES	PCT
2003	2	18%
2004	1	9%
2005	3	27%
2006	3	27%
2007	2	18%
TOTAL	11	100%

COLLISION TYPE

	CRASHES	PCT
HIT FIX OBJ	4	36%
REAR END	2	18%
ANGLE	1	9%
HEAD ON	1	9%
NON COLL	1	9%
OPP DIR SS	1	9%
SAME DIR SS	1	9%
TOTAL	11	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
FATAL	1	9%
MODERATE	2	18%
MINOR	3	27%
UNK SEVERITY	2	18%
UNK IF INJURED	1	9%
PDO	2	18%
TOTAL	11	100%

SEVERITY COUNT

	PERSONS
FATALITIES	1
MAJOR	4
MODERATE	2
MINOR	4
UNK SEVERITY	2
UNK IF INJURED	1

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	7	25%
AFFECTED PHYSICAL COND	4	14%
OVER/UNDER COMP CURVE	3	11%
TOO FAST FOR CONDITION	3	11%
DRIVER WAS DISTRACTED	2	7%
SPEEDING	2	7%
CARELESS PASS/LN CHNG	1	3%
DRIVER INEXPERIENCED	1	3%
FAILR MAINT PROP SPEED	1	3%
IMPROPER EXIT FROM HWY	1	3%
UNKNOWN	1	3%
WRONG SIDE OF ROADWAY	1	3%
TOTAL	27	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	10	58%
SMALL TRUCK	3	17%
LARGE TRUCK	3	17%
SUV	1	5%
TOTAL	17	100%

ROAD CONDITION

	CRASHES	PCT
DRY	9	81%
ICE PATCH	1	9%
WET	1	9%
TOTAL	11	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	9	81%
DARK	2	18%
TOTAL	11	100%

WEATHER

	CRASHES	PCT
CLEAR	9	81%
RAIN	1	9%
SNOW	1	9%
TOTAL	11	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	9	81%
OTHER WEATHER COND	1	9%
SLIPPERY ICE/SNOW	1	9%
TOTAL	11	100%

CDART - CRASH SUMMARY REPORT (09-06)

NOTES:

1

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2 2008 crash records are incomplete

Data for the current year, 2008, is not fully represented in CDART. Crashes will be added for this year as they are made available to the Department. Include this year in queries with caution.

3 Complete data years

Complete records of reportable crashes are available in CDART for the following years: 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005,2006, 2007

REPORT PARAMETERS:

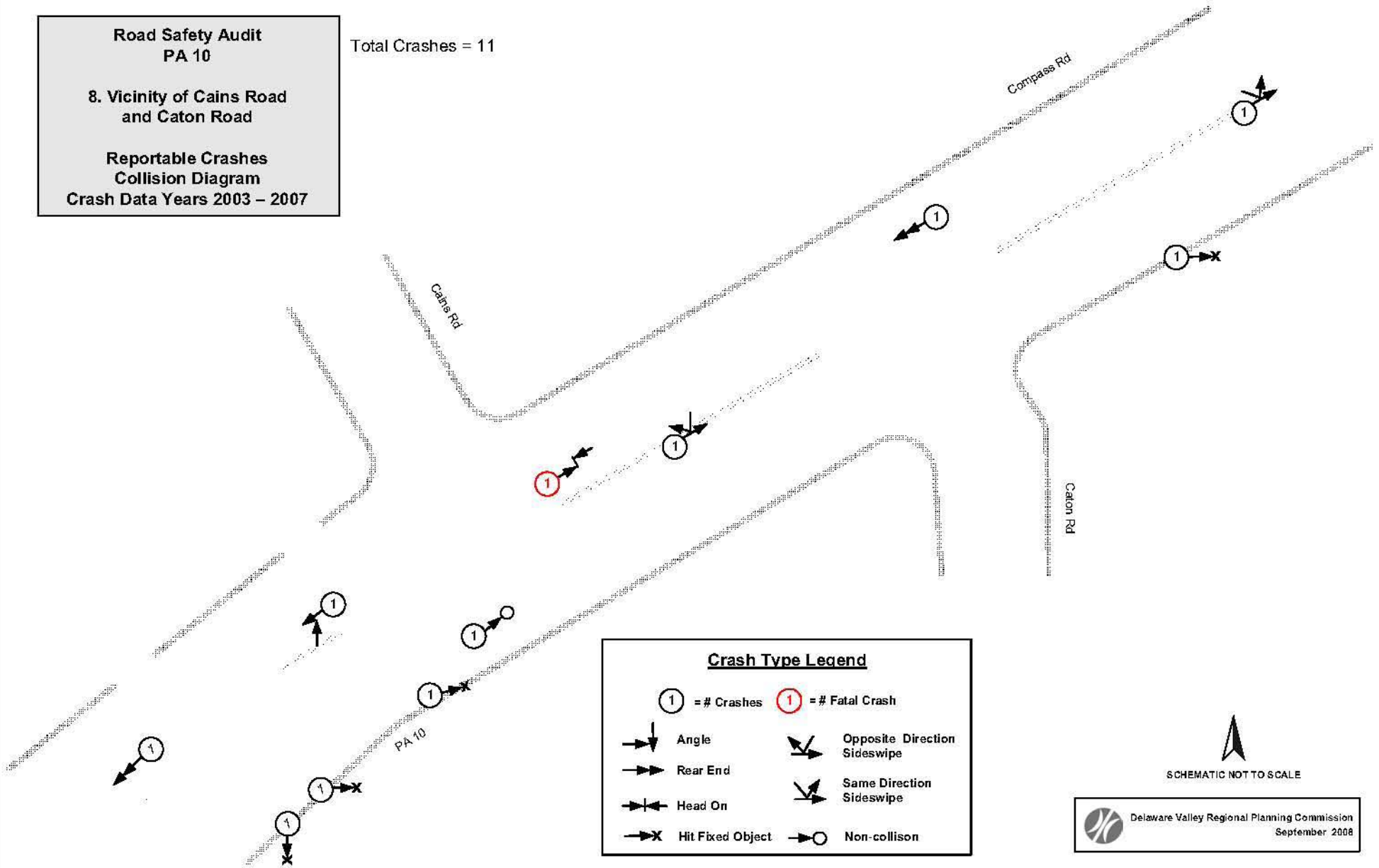
Query ID:	0620080911013
User ID:	lkubli
Area of Interest:	(In County 15 On State Route 0010(P) Between Segment 0380 Offset 1290 and Segment 0390 Offset 559)
Date Range:	1/1/2003 to 12/31/2007
Criteria:	STATE ROAD

Road Safety Audit
PA 10

8. Vicinity of Cains Road and Caton Road

Reportable Crashes
Collision Diagram
Crash Data Years 2003 – 2007

Total Crashes = 11



9. PA 10 Vicinity of PA 340 Kings Highway

Segment 360, Offset 691 to Segment 370, Offset 1000

COLLISION TYPE	
Hit Fixed Object	10
Angle	4
Rear-end	4
Head-on	2
Opp Dir Sideswipe	1
Total	**21**
ILLUMINATION	
Daylight	14
Dark	5
Street Lights	2
Total	**21**
WEATHER	
Clear	17
Rain	3
Snow	1
Total	**21**
SEVERITY COUNT	
Fatalities	1
Major	1
Moderate	4
Minor	9
Unk Severity	0
Unk If Injured	1

Delaware Valley
Regional Planning Commission
September 2008

CHESTER CO SR 0010 0360/0691 TO 0370/1000 RSA

Date Range: 1/1/2003 to 12/31/2007

Area of Interest: (In County 15 On State Route 0010(P) Between Segment 0360 Offset 691 and Segment 0370 Offset 1000)

USER_ID/QUERY ID:
lkubli/ 0620080912005

MONTH OF YEAR

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	OCT	NOV	DEC	
CRASHES	2	2	3	2	1	3	3	1	1	1	2	21
PCT	9%	9%	14%	9%	4%	14%	14%	4%	4%	4%	9%	100%

DAY OF WEEK

	SUN	TUE	WED	THR	FRI	SAT	
CRASHES	4	2	2	3	6	4	21
PCT	19%	9%	9%	14%	28%	19%	100%

HOUR OF DAY

	02	07	08	09	10	11	13	14	15	16	18	19	20	
CRASHES	1	1	2	2	1	1	3	1	2	1	1	1	4	21
PCT	4%	4%	9%	9%	4%	4%	14%	4%	9%	4%	4%	4%	19%	100%

YEAR

	CRASHES	PCT
2003	10	47%
2004	5	23%
2005	3	14%
2007	3	14%
TOTAL	21	100%

COLLISION TYPE

	CRASHES	PCT
HIT FIX OBJ	10	47%
ANGLE	4	19%
REAR END	4	19%
HEAD ON	2	9%
OPP DIR SS	1	4%
TOTAL	21	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
FATAL	1	4%
MAJOR	1	4%
MODERATE	4	19%
MINOR	2	9%
UNK IF INJURED	1	4%
PDO	12	57%
TOTAL	21	100%

SEVERITY COUNT

	PERSONS
FATALITIES	1
MAJOR	1
MODERATE	4
MINOR	9
UNK SEVERITY	0
UNK IF INJURED	1

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	12	33%
TOO FAST FOR CONDITION	7	19%
IMPROPER ENTRANCE HWY	2	5%
IMPROPER EXIT FROM HWY	2	5%
OVER/UNDER COMP CURVE	2	5%
SPEEDING	2	5%
AFFECTED PHYSICAL COND	1	2%
CARELESS/ILLEGAL BACKING	1	2%
DRIVER INEXPERIENCED	1	2%
FAILR MAINT PROP SPEED	1	2%
IMPROPER/CARELESS TURN	1	2%
OTHER IMPROPER DRIVING	1	2%
OTHERS	3	8%
TOTAL	36	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	20	62%
SMALL TRUCK	5	15%
LARGE TRUCK	3	9%
MOTORCYCLE	2	6%
SUV	1	3%
FARM EQUIPMEN	1	3%
TOTAL	32	100%

ROAD CONDITION

	CRASHES	PCT
DRY	12	57%
WET	5	23%
ICE PATCH	3	14%
ICE	1	4%
TOTAL	21	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	14	66%
DARK	5	23%
STREET LIGHTS	2	9%
TOTAL	21	100%

WEATHER

	CRASHES	PCT
CLEAR	17	80%
RAIN	3	14%
SNOW	1	4%
TOTAL	21	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	17	80%
SLIPPERY ICE/SNOW	3	14%
SUBSTANCE ON RDWY	1	4%
TOTAL	21	100%

CDART - CRASH SUMMARY REPORT (09-06)

NOTES:

1

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2 2008 crash records are incomplete

Data for the current year, 2008, is not fully represented in CDART. Crashes will be added for this year as they are made available to the Department. Include this year in queries with caution.

3 Complete data years

Complete records of reportable crashes are available in CDART for the following years: 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005,2006, 2007

REPORT PARAMETERS:

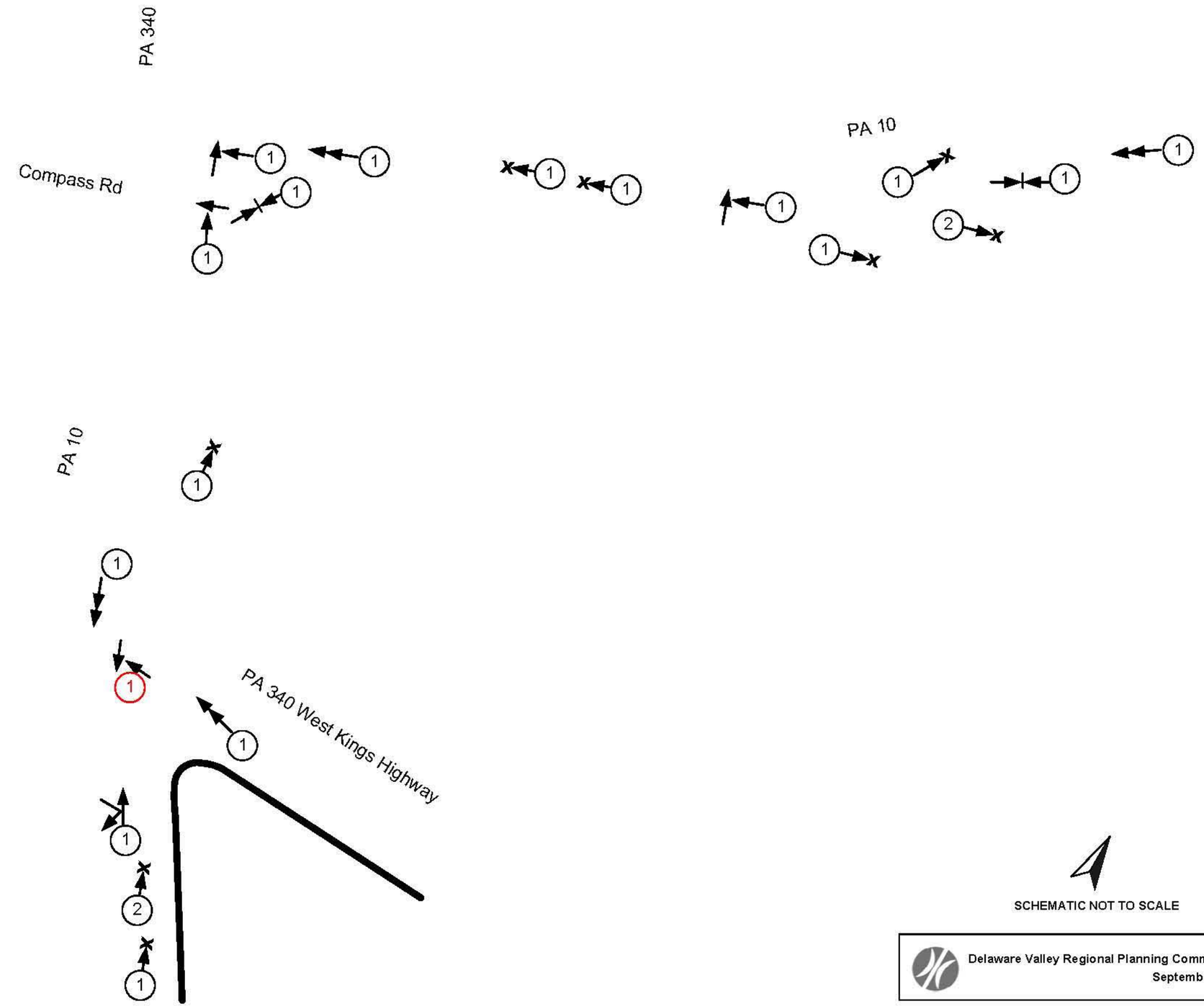
Query ID:	0620080912005
User ID:	lkubli
Area of Interest:	(In County 15 On State Route 0010(P) Between Segment 0360 Offset 691 and Segment 0370 Offset 1000)
Date Range:	1/1/2003 to 12/31/2007
Criteria:	STATE ROAD

Road Safety Audit
PA 10

9. Vicinity of Kings Highway

Reportable Crashes
Collision Diagram
Crash Data Years 2003 – 2007

Total Crashes = 21



Crash Type Legend

(1) = # Crashes (1) = # Fatal Crash

Rear End

Opposite Direction Sideswipe

Angle

Hit Fixed Object

Head On

SCHEMATIC NOT TO SCALE

Delaware Valley Regional Planning Commission
September 2008

10. PA 10 North of Quarry Road

Segment 310, Offset 675 to Segment 330, Offset 4659

COLLISION TYPE	
Hit Fixed Object	8
Angle	7
Non Collision	4
Opp Dir Sideswipe	3
Head-on	1
Unknown	1
Total	**24**
ILLUMINATION	
Daylight	13
Dark	10
Dusk	1
Total	**24**
WEATHER	
Clear	15
Rain	3
Snow	3
Fog	1
Other	1
Rain/Fog	1
Total	**24**
SEVERITY COUNT	
Fatalities	0
Major	2
Moderate	4
Minor	8
Unk Severity	2
Unk If Injured	4

Delaware Valley
Regional Planning Commission
September 2008

CHESTER CO SR 0010 0310/0675 TO 0330/4659 RSA

Date Range: 1/1/2003 to 12/31/2007

Area of Interest: (In County 15 On State Route 0010(P) Between Segment 0310 Offset 675 and Segment 0330 Offset 4659)

USER_ID/QUERY ID: lkubli/ 0620080911008

MONTH OF YEAR

	JAN	FEB	MAR	APR	MAY	JUN	AUG	SEP	OCT	DEC	
CRASHES	6	1	1	1	1	3	1	1	5	4	24
PCT	25%	4%	4%	4%	4%	12%	4%	4%	20%	16%	100%

DAY OF WEEK

	SUN	MON	TUE	WED	THR	FRI	SAT	
CRASHES	4	1	2	5	4	3	5	24
PCT	16%	4%	8%	20%	16%	12%	20%	100%

HOUR OF DAY

	00	04	05	09	10	11	12	13	15	16	17	18	19	23	
CRASHES	2	2	1	1	1	2	1	2	3	2	2	1	3	1	24
PCT	8%	8%	4%	4%	4%	8%	4%	8%	12%	8%	8%	4%	12%	4%	100%

YEAR

	CRASHES	PCT
2003	4	16%
2004	7	29%
2005	9	37%
2006	4	16%
TOTAL	24	100%

COLLISION TYPE

	CRASHES	PCT
HIT FIX OBJ	8	33%
ANGLE	7	29%
NON COLL	4	16%
OPP DIR SS	3	12%
HEAD ON	1	4%
UNKNOWN	1	4%
TOTAL	24	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
MAJOR	1	4%
MODERATE	4	16%
MINOR	6	25%
UNK SEVERITY	2	8%
UNK IF INJURED	1	4%
PDO	10	41%
TOTAL	24	100%

SEVERITY COUNT

	PERSONS
FATALITIES	0
MAJOR	2
MODERATE	4
MINOR	8
UNK SEVERITY	2
UNK IF INJURED	4

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	15	31%
TOO FAST FOR CONDITION	8	17%
OTHER IMPROPER DRIVING	4	8%
OVER/UNDER COMP CURVE	4	8%
PROCEED W/O CLEARANCE	4	8%
DRIVER INEXPERIENCED	2	4%
IMPROPER ENTRANCE HWY	2	4%
IMPROPER/CARELESS TURN	2	4%
DRIVER WAS DISTRACTED	1	2%
FAILR MAINT PROP SPEED	1	2%
RUNNING STOP SIGN	1	2%
SPEEDING	1	2%
OTHERS	2	4%
TOTAL	47	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	20	55%
LARGE TRUCK	5	13%
SMALL TRUCK	3	8%
SUV	3	8%
VAN	3	8%
MOTORCYCLE	2	5%
TOTAL	36	100%

ROAD CONDITION

	CRASHES	PCT
DRY	12	50%
WET	5	20%
ICE	2	8%
SLUSH	2	8%
SNOW	2	8%
ICE PATCH	1	4%
TOTAL	24	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	13	54%
DARK	10	41%
DUSK	1	4%
TOTAL	24	100%

WEATHER

	CRASHES	PCT
CLEAR	15	62%
RAIN	3	12%
SNOW	3	12%
FOG	1	4%
OTHER	1	4%
RAIN/FOG	1	4%
TOTAL	24	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	14	56%
SLIPPERY ICE/SNOW	6	24%
ANIMAL IN RDWY	2	8%
OTHER RDWY FACTOR	1	4%
OTHER WEATHER COND	1	4%
SUBSTANCE ON RDWY	1	4%
TOTAL	25	100%

CDART - CRASH SUMMARY REPORT (09-06)

NOTES:

1

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3 Complete data years

Complete records of reportable crashes are available in CDART for the following years: 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005,2006, 2007

REPORT PARAMETERS:

Query ID:	0620080911008
User ID:	lkubli
Area of Interest:	(In County 15 On State Route 0010(P) Between Segment 0310 Offset 675 and Segment 0330 Offset 4659)
Date Range:	1/1/2003 to 12/31/2007
Criteria:	STATE ROAD

11. PA 10 Compass Road and South

Segment 290, Offset 5902 to Segment 310, Offset 100

COLLISION TYPE	
Hit Fixed Object	6
Angle	2
Rear-end	1
Total	**9**
ILLUMINATION	
Daylight	4
Dark	3
Street Lights	2
Total	**9**
WEATHER	
Clear	6
Rain	3
Total	**9**
SEVERITY COUNT	
Fatalities	0
Major	0
Moderate	3
Minor	2
Unk Severity	2
Unk If Injured	3

Delaware Valley
Regional Planning Commission
September 2008

CHESTER CO SR 0010 0290/5902 TO 0310/0100 RSA

Date Range: 1/1/2003 to 12/31/2007

Area of Interest: (In County 15 On State Route 0010(P) Between Segment 0290 Offset 5902 and Segment 0310 Offset 100) or (In County 15 On State Route 0010(S) Between Segment 0291 Offset 5902 and Segment 0311 Offset 100)

USER_ID/QUERY ID: lkubli/ 0620080826001

MONTH OF YEAR

	FEB	APR	JUL	SEP	DEC	
CRASHES	1	1	4	1	2	9
PCT	11%	11%	44%	11%	22%	100%

DAY OF WEEK

	TUE	WED	THR	FRI	SAT	
CRASHES	2	2	1	2	2	9
PCT	22%	22%	11%	22%	22%	100%

HOUR OF DAY

	00	01	02	05	11	13	17	19	21	
CRASHES	1	1	1	1	1	1	1	1	1	9
PCT	11%	11%	11%	11%	11%	11%	11%	11%	11%	100%

YEAR

	CRASHES	PCT
2003	2	22%
2004	3	33%
2005	1	11%
2007	3	33%
TOTAL	9	100%

COLLISION TYPE

	CRASHES	PCT
HIT FIX OBJ	6	66%
ANGLE	2	22%
REAR END	1	11%
TOTAL	9	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
MODERATE	3	33%
MINOR	1	11%
UNK SEVERITY	1	11%
UNK IF INJURED	1	11%
PDO	3	33%
TOTAL	9	100%

SEVERITY COUNT

	PERSONS
FATALITIES	0
MAJOR	0
MODERATE	3
MINOR	2
UNK SEVERITY	2
UNK IF INJURED	3

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	4	33%
TOO FAST FOR CONDITION	4	33%
TAILGATING	2	16%
DRIVER WAS DISTRACTED	1	8%
IMPROPER/CARELESS TURN	1	8%
TOTAL	12	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	8	66%
SMALL TRUCK	2	16%
LARGE TRUCK	2	16%
TOTAL	12	100%

ROAD CONDITION

	CRASHES	PCT
DRY	6	66%
WET	3	33%
TOTAL	9	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	4	44%
DARK	3	33%
STREET LIGHTS	2	22%
TOTAL	9	100%

WEATHER

	CRASHES	PCT
CLEAR	6	66%
RAIN	3	33%
TOTAL	9	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	7	77%
DEER IN ROADWAY	1	11%
SUBSTANCE ON RDWY	1	11%
TOTAL	9	100%

CDART - CRASH SUMMARY REPORT (09-06)

NOTES:

1

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2 2008 crash records are incomplete

Data for the current year, 2008, is not fully represented in CDART. Crashes will be added for this year as they are made available to the Department. Include this year in queries with caution.

3 Complete data years

Complete records of reportable crashes are available in CDART for the following years: 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005,2006, 2007

REPORT PARAMETERS:

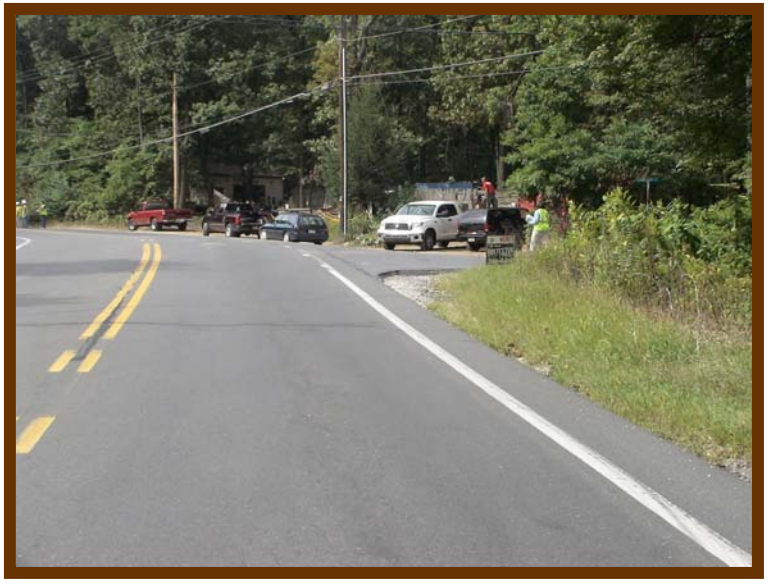
Query ID:	0620080826001
User ID:	lkubli
Area of Interest:	(In County 15 On State Route 0010(P) Between Segment 0290 Offset 5902 and Segment 0310 Offset 100) or (In County 15 On State Route 0010(S) Between Segment 0291 Offset 5902 and Segment 0311 Offset 100)
Date Range:	1/1/2003 to 12/31/2007
Criteria:	STATE ROAD

APPENDIX E
North Section
Photo Log

Scrapyard entrance on PA 10 next to Shirktown Road

The skewed Shirktown Road approach to PA 10

Welsh Road approach to PA 10



Scrapyard access and Shirktown Road located on a curve on PA 10

Open access and edge drop off at the church parking lot on the northbound side of PA 10

Edge drop off adjacent to Scrap yard entrance on PA 10. This area is usually used for parking by patrons

Edge drop off south of Shirktown Road on PA 10.

Crest approaching Shirktown Road traveling north on PA 10

Reservoir Road/PA 10 skewed intersection, located on a curve

No pavement marking visible on Reservoir Road

Evidence of drainage problems on eastside of PA 10, north of Reservoir Road

Pavement marking on PA 10 continues through the intersection at Poplar Road

Faded pavement markings on Poplar Road. “Stop” sign is mounted too low

Water pooling on the corner of Poplar Road

Faded pavement markings at Todd Road.

Todd Road intersection located on a grade. Limited sight distance for Todd Road traffic for southbound PA 10 traffic

Grade north of the Todd Road intersection

Guide rail just south of the Todd Road intersection protecting the drainage pipes

Open access to business located on the southwest corner of Todd Road intersection

Sign clutter at Wawassan Drive.

Trees overhang the roadway north of Water Street

Sign post with no sign on the corner of Water Street

Damaged sign opposite Wawassan Drive

Large ”arrow” sign is blocked by trees at Water Street

Sign blocked by tree branches south of Wawassan Drive

Sign leaning in the travel way south of the US 322 intersection on the southbound side of PA 10

Evident of drainage problems on eastside of PA 10, south of Water Street

Sidewalk on PA 10 in poor condition north of the US 322 intersection

US 322/PA 10 intersection is skewed. Heavy truck volume

Pavement markings are faded at the US 322/PA 10 intersection

Bollards used to protect the traffic signal are run off the road crash hazard and they are damaged

“Horse and buggy” sign south of the Walnut Road intersection is between the chevrons.

Open land on the southeast corner of Walnut Road intersection is site of proposed housing development

Curve north of the Walnut Road intersection

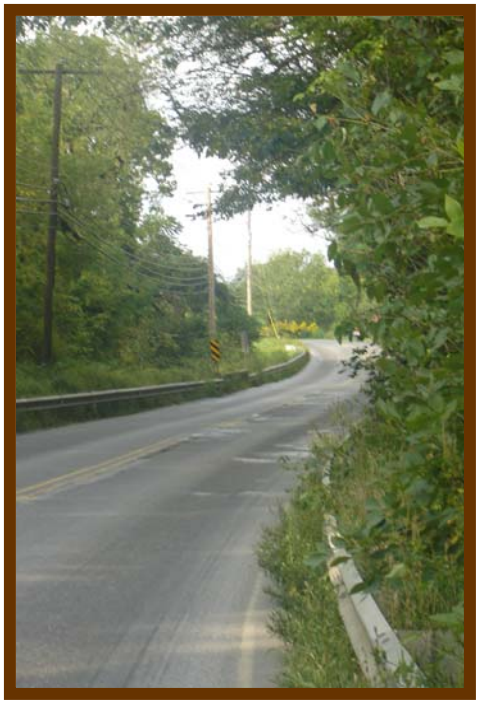
Edge drop off at the northwest corner of the Walnut Road intersection

On the northeast corner of the Cambridge Road intersection – hole marked by delineator. There are no stop bars on Cambridge Road approaches

On the northwest corner of the Cambridge Road intersection the pavement is breaking away, maybe indicative of a drainage problem

Shoulder breaking away north of the PA 10/Cambridge Road intersection. Pavement markings are fading

South of the PA 10/Cambridge Road intersection, shoulders are narrow and pavement markings are faded



Narrow bridge south of the PA 10/Cambridge Road intersection, wheel ruts on the bridge. Pavement is worn

Narrow bridge south of the PA 10/Cambridge Road intersection, road is caving in. Delineator is leaning

Narrow bridge south of the PA 10/Cambridge Road intersection, guide rail is too low and lacks delineation.

Unprotected U-shaped culvert on the southwest corner of the Mt Pleasant Road intersection

Open access area with edge drop off opposite Mount Pleasant Road on the northbound side of PA 10

Shoulder breaking away opposite Mount Pleasant Road on the northbound side of PA 10

Beaver Dam Road eastbound approach to PA 10. “Stop” sign is mounted too low

Edge drop off, headwall and grate presents safety issues at the Beaver Dam Road intersection

Grade north of the Beaver Dam Road intersection encourage higher speeds towards the intersection

Poor pavement condition at the south leg of the Hill Road intersection with PA 10

South leg of the Hill Road intersection with PA 10, there are no delineation for the intersection and pavement markings on Hill Road is faded

PA 10 at the Michael Road and Hill Road intersection. The curve limits sight distance

PA 10 southbound approach to the north leg of Hill Road intersection

North leg of Hill Road approach to PA 10

South leg of Hill Road approach to PA 10

Grade and curve south of Hill Road

Drop off with exposed headwall on the northwest corner of Lammey Road

Compromised sight distance from Lammey Road by the crest of the hill to the north

Offset intersections of Caton and Cains Roads. Shoulders are very narrow and sight distance is compromised by the curve to the south

Passing zone goes through the intersection at Caton Road

No access control at the School House Bar at Leary Road intersection. Corn field limits sight distance on the southeast corner

Pavement markings faded at the Leary Road approach to PA 10

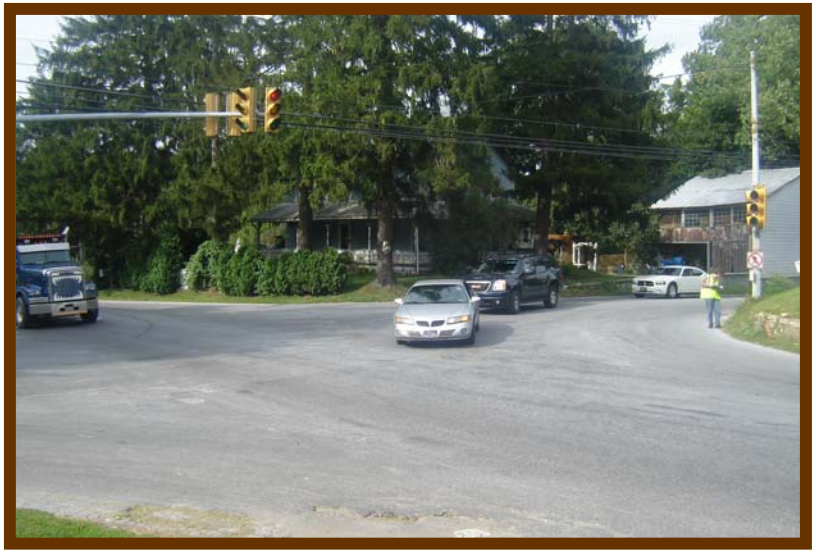
Vegetation overgrown on the shoulder of PA 10 between PA 340 and Leary Road

Southbound approach to the PA 340 intersection

Pavement rutting at the southbound approach of the intersection with PA 340

Pavement crumbling in front of the Turkey Hill Store – could signify a drainage problem

Many signs and sign posts at the southbound PA 10 approach of the intersection with PA 340



Signalized intersection of PA 10 with PA 340

Passing zone north of the PA 10/PA 340 signalized intersection

Compromised sight distance at the PA 10/PA 340 unsignalized intersection for traffic entering PA 10

Northbound approach to PA 10/PA 340 signalized intersection

Northbound approach to the PA 10/PA 340 unsignalized intersection. There are extra wide shoulders

PA 10 south of the PA 10/PA 340 unsignalized intersection.

Southbound approach to the PA 10/PA 340 unsignalized intersection. There are extra wide shoulders

PA 340 approach to the PA 10/PA 340 unsignalized intersection. Oil on the roadway

PA 340 approach to the PA 10/PA 340 unsignalized intersection. There is no stop bar. The intersection is skewed. PA 340 slopes towards PA 10

Crest on PA 10 at Beacon Light Road/Quarry Road

Several driveways access PA 10 between Compass Road and Beacon Light Road/Quarry Road

Compromised sight distance for Quarry Road traffic at PA 10 to the north

Compromised sight distance for Beacon Light Road traffic at PA 10 to the north

Skewed intersection at Compass Road with pavement damage on the southeast corner

Shoulder overgrown north of Compass Road

Crest of the hill to the north compromised sight distance for Compass Road traffic entering PA 10

Utility poles in the clear zone

Passing zone continues through the intersection. Undulating roadway compromised sight distance for traffic entering PA 10 from Beaver Dam Road

Horse and buggy and motor vehicles share the road on PA 10 south of the PA 10/PA 340 unsignalized intersection

APPENDIX F
North Section
Response Sheet

PA 10 NORTH ROAD SAFETY AUDIT
RESPONSE SHEET

Audit Team Corridor-wide Priorities

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
a) Signs • Speed limit signs are non-reflective • Chevrons are missing from several curves in the corridor • Street name signs are not legible, especially at night • Intersection ahead signs are missing prior to several intersections • Roadway geometry restricts sight distance along the corridor • Sign sizes may not be appropriate for the speed limit and geometry of the roadway	• Replace signs on higher reflective material • Add or replace chevrons as needed • Replace all street name signs according to MUTCD specifications • Identify locations that do not have advance signs and add signs as appropriate with street name plaque below • Utilize appropriate warning signs to alert motorists of conditions (e.g., “Hill blocks view” signs) • Consider replacing existing signs with larger ones as appropriate ***Conduct a sign inventory along the corridor and upgrade signs with the appropriate signs at all times for the appropriate***			

Issue	Recommended Strategies	Decision Agree/Reject	Planned Completion Date	Comments
a) Signs Cont'd	***conditions according to MUTCD requirements. Conduct an analysis to determine the appropriate advisory speeds for curves along the corridor. Consider the buggy and truck traffic when placing signs.***			
b) Roadway delineation • Roadway pavement markings are not visible in dark conditions	• Install raised pavement markers (RPM) in the centerline; reflective pavement markings; dashed edge line across intersections • Consider raised pavement markers or flexible tubular delineators to better define intersections at night along the corridor			
• Curves not clearly delineated	• Install chevrons around curves			
• Double yellow centerline does not appropriately indicate side streets to guide motorists (some are extended through the intersection and some end too far from the	• Re-stripe double yellow centerlines to adequately guide motorists at intersections			

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
b) Roadway delineation Cont'd intersection) • 44 percent of the crashes over the 5 year period were run-off-the-road crashes hitting a fixed object; most involved a utility pole	• Consider relocating and/or adding delineation to the utility poles in the corridor • Add edge line and centerline rumble strips throughout the corridor as appropriate ***Perform corridor-wide assessment of delineation; implement consistent treatment***			
c) Shoulders • Narrow shoulders • In many areas along the corridor vegetation has overgrown the shoulder reducing its width	• Maintain a consistent minimum shoulder width of 4 feet throughout the corridor • Cut back vegetation from shoulders ***Conduct feasibility assessment of maintaining a consistent shoulder width throughout the corridor. Identify priority areas. Horse-and-buggy and cyclist considerations should be made when applying edge-line rumble strips***			

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
d) Pavement Markings • Lack of striping on side streets to guide motorists. Some side streets only have a single yellow line centerline that does not meet standards • On side streets, where centerlines exist, they do not extend far enough to the approach of intersection • Some curve warning signs are not prominent	• Add standard double yellow centerline and stop bars on side streets. Add dashed edge line on PA 10 • Continue yellow striping to stop bar where appropriate • Add advance curve warning legend pavement marking ***In cooperation with the municipalities, conduct an inventory of pavement markings on the side street approaches and PA 10; and address as appropriate***			
e) Drainage • Clogged inlets, ditches, and pipes • Low points in the roadway prevent adequate storm water flow	• Clear pipes, inlets and drains • Examine municipal hydrology plans Change roadway profile as appropriate and install pipes and storm water system			

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
e) Drainage Cont'd • Some tangent sections of roadway have inappropriate cross slopes	parallel to the roadway • Develop inventory of all locations noted and request roadway survey to help with engineering solutions ***Coordinate with corridor municipalities to determine priority areas***			

Audit Team Site-Specific Priorities

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
f) Shirktown/Welsh Road • No access control for the scrap yard and church located south of the intersections • Offset intersection is very close to the top of the hill where the roadway curves resulting in compromised sight distance of northbound PA 10 traffic for both intersections • The proximity of the church parking lot to the roadway presents potential hazards and parked cars obstruct sight distance for Welsh Road • Shoulder at the scrap yard driveway has edge drop-off and is exacerbated by parking for the scrap yard • Curve southbound has a super-elevation that creates an excessive	• Define access to the church on the northbound side of PA 10 • Conduct a Ball Bank study to identify the appropriate recommended speeds for each curve and measure sight distances to determine the extent of the problem and appropriate solutions • Determine the traffic volumes for the scrap yard to decide appropriate actions to improve safety • Review existing driveway permit and determine if real property owner is meeting requirements for classification of driveway use • Add a stop bar and a transversable concrete or painted median to the side streets to guide vehicles to a perpendicular stop at the intersection to improve sight distance			

Issue	Recommended Strategies	Decision Agree/Reject	Planned Completion Date	Comments
f) Shirktown/Welsh Road Cont'd break in grade at the edge of the travel lane • Southbound crest vertical curve with a cross slope towards the centerline north of the intersections • At church frontage there is a washed out area with edge drop-off • Pavement markings on side streets are not MUTCD compliant • Intersections are skewed and offset • Area is dark at night. 71 percent of the crashes occur under dark conditions	• Add dashed edge lines to delineate side streets for where motorist should be before entering the intersection • Install "slow vertical curve ahead" or "hill blocks view" and/or "side street ahead" signs with street names prior to the curve in both directions • Install appropriate delineation (e.g., RPM, chevrons) for roadway curves and centerline • Add centerline and edge line rumble strips • Add street lighting to the area • Consider realigning intersections to eliminate offset • Improve/upgrade shoulders and correct edge drop-off as appropriate			
g) At PA 340 (signalized) • Pavement rutting at the southbound approach of the intersection	• Repave with materials which can withstand the braking of heavy vehicles			

Issue	Recommended Strategies	Decision Agree/Reject	Planned Completion Date	Comments
• Large number of angle	• Evaluate the signal for split phasing for PA 10 and Compass Road			
g) At PA 340 (signalized) Cont'd • crashes at the intersection	• Consider no turn on red			
• Drainage issues – cross slope inefficient with water running into the intersection	• Assess the problem and address as appropriate.			
• Access management issues at Turkey Hill store and driveways	• Consider defined access away from the intersection.			
• Signal ahead warning signs are not consistent with the fold down "stop" signs at the intersection.	• Install "signal ahead" signs that can be flipped for "stop ahead" when needed.			
• Crushed bollards in front of the stone wall on the northeast corner of the intersection.	• Remove crushed bollards and install appropriate protection			
g) At PA 340 (Y-intersection) • Extra-wide shoulders approaching the intersection northbound encourage speeding	• Decrease speed limit to 35 MPH approaching the intersection northbound			

Issue	Recommended Strategies	Decision Agree/Reject	Planned Completion Date	Comments
• Sight distance from PA 340 looking south is compromised by the hill. • PA 340 intersection approach is skewed. • Southbound PA 10 centerline stops too far from intersection • Utility pole in the clear zone on the northeast corner of the intersection • Traffic speeds through the intersection on PA 10 appear excessive • Debris dripping oil at intersection	• Evaluate for traffic signal and coordinate with the existing signalized intersection to the north • Re-align PA 340 approach using painted island-make perpendicular to PA 10 • Extend centerline to the intersection to better guide motorists for left turns on to PA 340 • Relocate utility pole • Add traffic calming treatment on PA 10 at both approaches, consider targeted enforcement • Clean up oil – roadway maintenance			
h) State Hill • Poorly delineated and signed • Roadway has numerous curves and driveways with inadequate warning signs and compromised sight distances • Vehicles experience	• Consider overhead lane warning signs to avoid knock down by oversized vehicles • Add flashing light to warning signs • Increase the number of and size of signs			

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
difficulty maintaining the posted speed limit (25) **h) State Hill Cont'd** • MPH) going northbound • Area very dark at night	• Add delineation for roadway and guide rail • Add center line and edge line rumble strips • Consider NOVA chip for pavement to increase skid resistance • Reevaluate the posted 25 MPH speed limit for all vehicles • Add lighting to the area.			

ADDITIONAL SAFETY ISSUES

Corridor Wide Issues

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
Passing Zones • Many passing zones may be too short in length for a vehicle to pass safely • Many extend through intersections	• Reevaluate the need for existing passing zones throughout the corridor and restripe and sign as appropriate			
Speeding • Many vehicles were observed traveling too fast in the corridor	• Identify and create pull off areas in the corridor for enforcement • Conduct speed inventory to determine the appropriateness of current posted speed limit and use results to identify appropriate signage • Evaluate the feasibility of narrowing the lanes to 11 feet with consideration given to truck and horse-and-buggy traffic			
Maintenance • Vegetation encroaches on the roadway blocking signs and pavement markings as well as shadowing the roadway	• Cut back vegetation encroaching on the roadway ***Inventory the corridor to identify locations that need***			

Issue	Recommended Strategies	Decision Agree/Reject	Planned Completion Date	Comments
from direct sunlight (preventing melting of snow and ice)	***this treatment.***			
Coordination • Need for better coordination between all responsible agencies to ensure safer travel in the corridor	• Improve coordination between agencies at all levels to implement transportation safety strategies • Consider continued joint field views between PennDOT Maintenance and municipalities to address on-going safety issues.			

Site Specific Issues

Issue	Recommended Strategies	Decision Agree/Reject	Planned Completion Date	Comments
Between Shirktown/Welsh Road and Reservoir Road • Clogged inlet south of county border • Water outlets onto private property with an inadequate swale • Southbound curve sign	• Clear clogged inlet • Clear water path • Replace existing sign with “curve and offset			

Issue	Recommended Strategies	Decision Agree/Reject	Planned Completion Date	Comments
with advisory speed is inappropriate	intersection" sign			
Reservoir Road Vicinity • Pavement rutting on PA 10 southbound approaching Reservoir Road	• Repave as appropriate			
Reservoir Road Vicinity Cont'd • Insufficient warning signs for curve and intersection • Drainage issue – stormwater seems to be crossing the centerline just south of the intersection • On the northbound side of the roadway evidence of washout resulting in shoulder edge drop-off • Single yellow centerline pavement marking on Reservoir Road is not standard.	• Add warning signs ("intersection ahead" with advisory speed, "hill blocks view," chevrons) • Conduct a hydrology and hydraulic study to determine how to better manage the storm-water • Repair edge drop-off • Replace with standard centerline pavement markings (double yellow)			

Issue	Recommended Strategies	Decision Agree/Reject	Planned Completion Date	Comments
Poplar Road • Relatively high incidence of HFO crashes may result from drainage problems in vicinity of intersection • Passing zone goes through the intersection • Horse crossing sign is nonstandard	• ***See Corridorwide strategy*** • Remove or replace with standard warning sign			
Todd Road • Southbound intersection warning sign is too far in advance of the intersection • Southbound visibility of intersection is compromised due to vertical curve • South of Todd Road inadequate guide rail shields for culvert pipe • Traffic traveling very fast through Todd Road intersection. Speed limit increases to 45 MPH before the intersection in the northbound	• Relocate southbound intersection warning sign • Install “hill blocks view” sign • Extend guide rail with correct taper and end treatment • Consider gateway treatment just south of Todd Road for Honey Brook Borough. (Traffic Calming). Consider extending the 35 MPH speed limit in the			

Issue	Recommended Strategies	Decision Agree/Reject	Planned Completion Date	Comments
direction	northbound direction			
Between Todd Road and US 322 • **"**Buggy" warning sign is blocked by tree • Gravel build up in southbound shoulder just north of Wawassan Road is indicative of drainage issue • Inlet grate south of Wawassan Road is higher than the roadway	• Trim tree • Remove the gravel and assess the problem and address as appropriate • Make inlet grate flush with roadway			
Between Todd Road and US 322 Cont'd • Guide rail in place to shield house on the northbound side of PA 10 is not warranted • Large "arrow" sign in the curve at Water Road is blocked by trees and is too small • Southbound travel lane is curbed and sloped to the other side of the street – poor drainage	• Verify that guide rail is not warranted and consider removing • Trim trees and replace existing sign with a larger one • Consider roadway reconstruction from Water Road to just north of US 322. Conduct a hydrology and hydraulic study to			

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
• Driveway ramp on the northbound side of PA 10 over parallel pipe extends into the travel lane and creates a hazard • Insufficient curve warnings (esp NB)	determine how to better manage the storm water that in turn will alleviate most of the maintenance problems. • Coordinate with property owner to correct their driveway. ***See Corridor-wide strategy (signs)***			
US 322 • Poor sidewalk conditions • Faded pavement markings (crosswalks, centerlines, stop bars)	• Install skip (dotted) lines through PA 10 • Upgrade sidewalks • Restripe pavement			
US 322 Cont'd • Deficient turning radii • Bollards at the intersection • Intersection offset	• Re-curb the turning radius of northern intersection approach • Consider split phasing the signal provide for better turning movements ***In the short term stripe a dotted centerline through the intersection for PA 10. Other safety issues at the intersection should be***			

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
	addressed under existing PennDOT contract for this intersection.			
Walnut Road • Large number of angle crashes at the intersection • Inconsistent cross slope southbound • Pavement marking faded • Insufficient curve warning signs • "Buggy" sign between chevron southbound, south of the intersection	• Consider a roundabout for traffic calming and a gateway treatment into Honey Brook Borough. Coordination with future development slated for the southeast quadrant of the intersection • Consider re-profiling PA 10 for better drainage in the southbound lane. • Restripe pavement markings • ***See Corridor-wide strategy (signs)*** • Relocate "buggy" sign outside of the conflict zone with chevrons			
Cambridge Road • Northwest shoulder is breaking away • Lack of stop bars on Cambridge Road • On northeast corner,	• Repair shoulder • Install stop bars as appropriate			

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
hole marked by a delineator • Impaired line of sight looking north from eastbound Cambridge Rd	• Fix hole • Address with appropriate signage			
Between Cambridge and Mount Pleasant • North of bridge, culvert crossing with concrete headwall is not protected • Vegetation in front of the guide rail • Super elevation is not appropriate (sloped in the wrong direction) • Northbound, the ET2000 is hit and on backwards • Guide rail is too low and lacks delineation • Wheel ruts on the bridge and pavement is worn • Bridge deck needs repair • Bridge is narrow • On the SE side of the	• Replace or protect concrete headwall • Trim back vegetation in front of guide rail • Roadway over bridge needs to be re-profiled • Reset guide rail and install end treatment properly. Add reflectors to guide rail on the west side of the road • Repave roadway and increase skid resistance of pavement • Re-deck and widen bridge, add shoulders • Repair roadway			

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
bridge, road is caving in				
Mount Pleasant Road • U-shaped culvert on the southwest corner of the intersection is a hazard • Edge drop-off on the northbound side across from the intersection • Several hills between Mount Pleasant Road and King Road	• Remove, modify, protect or delineate culvert • Repair edge drop-off • Install appropriate warning signs for motorists			
King Road • Sight distance compromised looking north – crest of the hill on PA 10 just north of intersection	• Install appropriate warning signs with speed advisory for motorists			
Beaver Dam Road • Inlets on the south side of the intersection have hazardous grates • Numerous HFO crashes involving utility poles • Runoff may be problematic especially in the winter •	• Replace grates • Relocate and delineate utility poles			
Between Beaver Dam and				

Issue	Recommended Strategies	Decision Agree/Reject	Planned Completion Date	Comments
Hill Road • Warning signs inadequate	• ***See Corridor-wide strategy (signs)***			
Hill Road • Vegetation blocks sight distance • PA 10 is not defined, may confuse motorists • Lack of adequate advance warning signs for the curve • "Stop" sign at Michael Road is too low	• Cut back vegetation along the north side • Add dotted edge lines at the intersection • Consider re-designing the intersection • ***See Corridor-wide strategy (signs)*** • Re-install at the appropriate height according to MUTCD specifications			
At Lammey Road • 3-foot drop-off with exposed headwall on the northwest corner of the intersection • The headwall impedes right turns from southbound PA 10 • Passing zone goes through the intersection • Inadequate advance	• Replace headwall with manhole and make flush with the pavement. Widen the corner radius • ***See Corridor-wide strategy (passing zones)*** • ***See Corridor-wide***			

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
intersection warning signs	***strategy (signs)***			
Cains Road and Caton Road • Unprotected swale drop-off hazard northbound between the two intersections • Lack of adequate sight distance from side roads and driveways • Lack of advance warning for curve, side roads, and driveways • Traffic observed traveling at high speeds • Passing zones goes through the intersection • Narrow shoulders	• Assess the problem and address as appropriate – re-grade to eliminate the hazard or install barrier • ***See Corridor-wide strategy(signs)*** • ***See Corridor-wide strategy(signs)*** • ***See Corridor-wide strategy (passing zones)*** • ***See Corridor-wide strategy (shoulder)***			
At Leary Road • No access control at School House Bar located on the northeast corner of the intersection • Cornfield affects sight	• Implement access management strategy (install curb to define access locations) • Coordinate with property			

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
distance from Leary Road looking south (seasonal)	owner to restrict high crops within an appropriately designated sight distance triangle			
Between Leary Road and PA 340 • PA 340 and PA 10 signs on separate assemblies – sign clutter. • Tree branches in the travel way and blocking signs • Inadequate advance warning signage for curve and signal • Boulders with delineators on northbound side are a hazard • Narrow shoulders (1 foot); on southbound side • Shoulders are overgrown with vegetation • Edge drop-off on the	• Consolidate the signs on the same assembly • Trim tree branches • ***See Corridor-wide strategy (signs)*** • Remove boulders from the clear zone • ***See Corridor-wide strategy (shoulders)*** • Remove vegetation • Repair edge drop-off • ***See Corridor-wide strategy (passing zones)***			

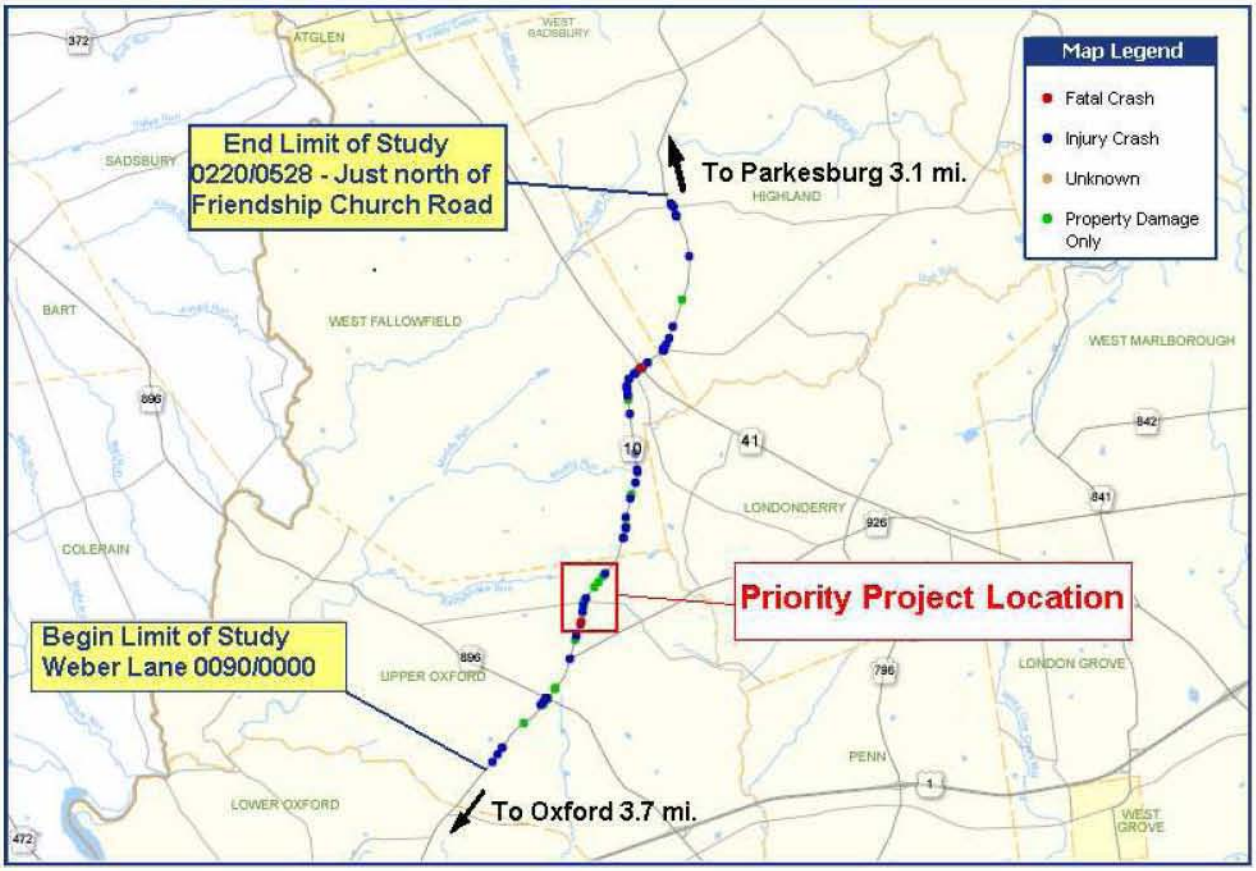
Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
northbound side • Short passing zone				
At PA 340 (signalized) • Pavement rutting at the southbound approach of the intersection • Large number of angle crashes at the intersection	• Repave with materials that can withstand the braking of heavy vehicles. • Evaluated the signal for split phasing for PA 10 and Compass Road • Consider no turn on red			
At PA 340 (signalized) Cont'd • Drainage issues – cross slope inefficient with water running into the intersection • Access management issues at Turkey Hill store and driveways • Signal ahead warning signs are not consistent with the fold down "stop" signs at the intersection • Crushed bollards in front of the stone wall on the northeast corner	• Assess the problem and address as appropriate • Consider defined access away from the intersection • Install "signal ahead" signs that can be flipped for "stop ahead" when needed • Remove bollards			

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
of the intersection				
At PA 340 (Y-intersection) • Extra-wide shoulders approaching the intersection northbound encourage speeding • Sight distance from PA 340 looking south is compromised by the hill • PA 340 intersection approach is skewed	• Decrease speed limit to 35 MPH approaching the intersection northbound • Evaluate for traffic signal and coordinate with the existing signalized intersection to the north • Re-align PA 340 approach with a painted island to make it perpendicular to PA 10			
At PA 340 (Y-intersection) Cont'd • Southbound PA 10 centerline stops too far from intersection • Utility pole in the clear zone on the northeast corner of the intersection • Traffic speeds through the intersection on PA 10 appears excessive • Debris dripping oil at	• Extend centerline to the intersection to better guide motorists for left turns on to PA 340. • Relocate utility pole • Add traffic calming treatment at both approaches on PA 10. • Clean up oil – roadway maintenance			

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
intersection				
Between PA 340 and State Hill • Narrow bridge inadequately signed.	• Sign as appropriate in both directions			
Quarry Road and Beacon Light Road • No stop bars on side streets • Vegetation and mail boxes limit sight distance at Quarry Road and Beacon Light Road • Geometry is difficult making left turns from Beacon Light	• Install stop bars • Trim vegetation and relocate mail boxes • ***See Corridor-wide strategy (signs)***			
Between Compass Road and Beacon Light Road • Driveways are hidden by vegetation • Large number of HFO crashes. • Narrow shoulders	• Trim vegetation and add advance warning signs. • Consider re-striping for 11-foot lanes with 4-foot shoulders – add edge line rumble strips to address HFO crashes			
Compass Road • Weeds growing out of	• Clear inlet and pipe			

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
the inlet on the southbound side of the road • Vegetation growing in the pipe on the northbound side of the road • No shoulder on southbound side of PA 10 • Receiving width of Compass Road is very narrow • Difficult right turns on to Compass Road • Lack of advance signs for the intersection	• ***See Corridor-wide strategy (shoulders)*** • Widen roadway and upgrade the approach of Compass Road with striping and signs • Intersection should be opened up to make right turns easier • ***See Corridor-wide strategy (signs)***			

APPENDIX G
South Section
Scope of Work
&
Cost Estimates



Project Purpose:

The purpose of this project is to reduce the number of crashes and related injuries and severity of the crashes which occur at the intersection of PA Route 10 and Ewing Road in Chester County. The anticipated benefits of this project are the minimization of the number of crashes, specifically hit fixed object and wet/icy type crashes.

Project Scope:

The scope of work for this project was developed from a priority location identified in the Road Safety Audit which was conducted in September 2008 and undertaken by DVRPC in conjunction with the Pennsylvania Department of Transportation. A more detailed description of the scope of work is included in the attached cost estimate, and is summarized below:

- Repair/Replace drain pipe across PA Route 10 and clear trench that carries water away from PA Route 10.
- Install offset intersection advanc warning signs.
- Install advance curve warning signs.

Benefit-to-Cost Ratio Calculation

The estimated benefit, in terms of crash reductions, for this project is $24,622 per year. See attached sheet Titled "PA Route 10 and Ewing Road HSIP Benefit Calculations".

The estimated cost for the above scope of work is $37,950. See the attached "Cost Estimate Sheet". Assuming a 7-year life cycle for this safety project, the annual cost of the project is $5,421.

The project will have an annual benefit-to-cost ratio of $24,622:$5,421 or 4.5 to 1.

PA Route 10 and Ewing Road HSIP Benefit Calculations

Crashes: 2003 through 2007

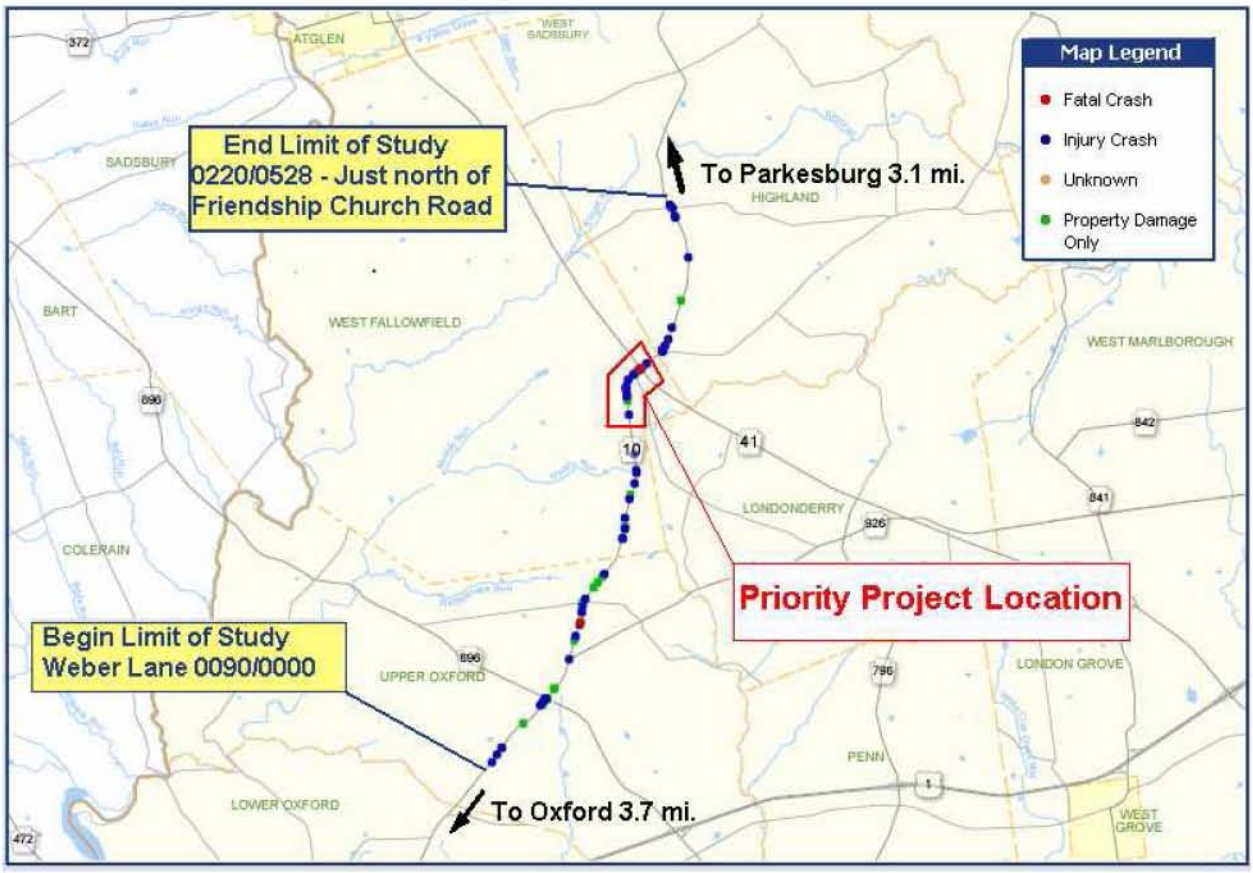
Crash Type	# of Crashes		Average Cost per Crash[1]		Total Costs
Hit Fixed Object	7	X	$ 122,200	=	$ 855,400
Angle	1	X	$ 154,000	=	$ 154,000
Rear End	1	X	$ 73,700	=	$ 73,700
Non Collision	1	X	$ 148,000	=	$ 148,000
Total	14		Total 5 Year Cost	=	$1,231,100
			Average Annual Cost	=	$246,220

1 From CDART: Accident Cost by Category Report for Accidents in Years 2003 to 2007.

According to the CDART data, the corridor experienced an average crash rate that was approximately .88 times of corridors with similar characteristics during the 2003 through 2007 period. If it is assumed that expected crash rate for the post-improvement period will be 90 percent of the current rate, this translates into a post-improvement annual cost of $221,598. Therefore, the expected benefit will be 246,220 - $221,598 or $24,622 per year.

COST ESTIMATE:

Intersection / Location	Proposed Work	Construction	Engineering cost	Order of Magnitude Cost Estimate
Ewing Road	Clear clogged drain, repair/replace drain pipe, repair road drop off on the SE corner, relocate utility poles, install offset intersection advance signs, install advance curve warning signs.	$30,000	$4,500	$34,500
	Subtotal	$30,000	$4,500	$34,500
	Contingency (10%)	$3,000	$450	$3,450
	Total			**$37,950**



Project Purpose:

The purpose of this project is to reduce the number of crashes and related injuries and severity of the crashes which occur at the intersection of PA Route 10 in Cochranville in Chester County. The anticipated benefits of this project are the minimization of the number of crashes, specifically hit fixed object, rear end, head on, and angle type crashes.

Project Scope:

The scope of work for this project was developed from a priority location identified in the Road Safety Audit which was conducted in September 2008 and undertaken by DVRPC in conjunction with the Pennsylvania Department of Transportation. A more detailed description of the scope of work is included in the attached cost estimate, and is summarized below:

- Consider gateway treatment for Cochranville.
- Trim vegetation along PA Route 10.
- Adjust Cross slope on PA Route 10 and realign Homeville Road to create a "T" intersection.
- Signal upgrade and left-turn phasing at PA Route 10 and PA Route 41.

Benefit-to-Cost Ratio Calculation

The estimated benefit, in terms of crash reductions, for this project is $632,255 per year. See attached sheet Titled "PA Route 10 at Cochranville HSIP Benefit Calculations".

The estimated cost for the above scope of work is $1.24 million. See the attached "Cost Estimate Sheet". Assuming a 20-year life cycle for this safety project, the annual cost of the project is $62,100.

The project will have an annual benefit-to-cost ratio of $632,255:$62,100 or 10.2 to 1.

PA ROUTE 10 AT COCHRANVILLE HSIP BENEFIT CALCULATIONS

Crashes: 2003 through 2007

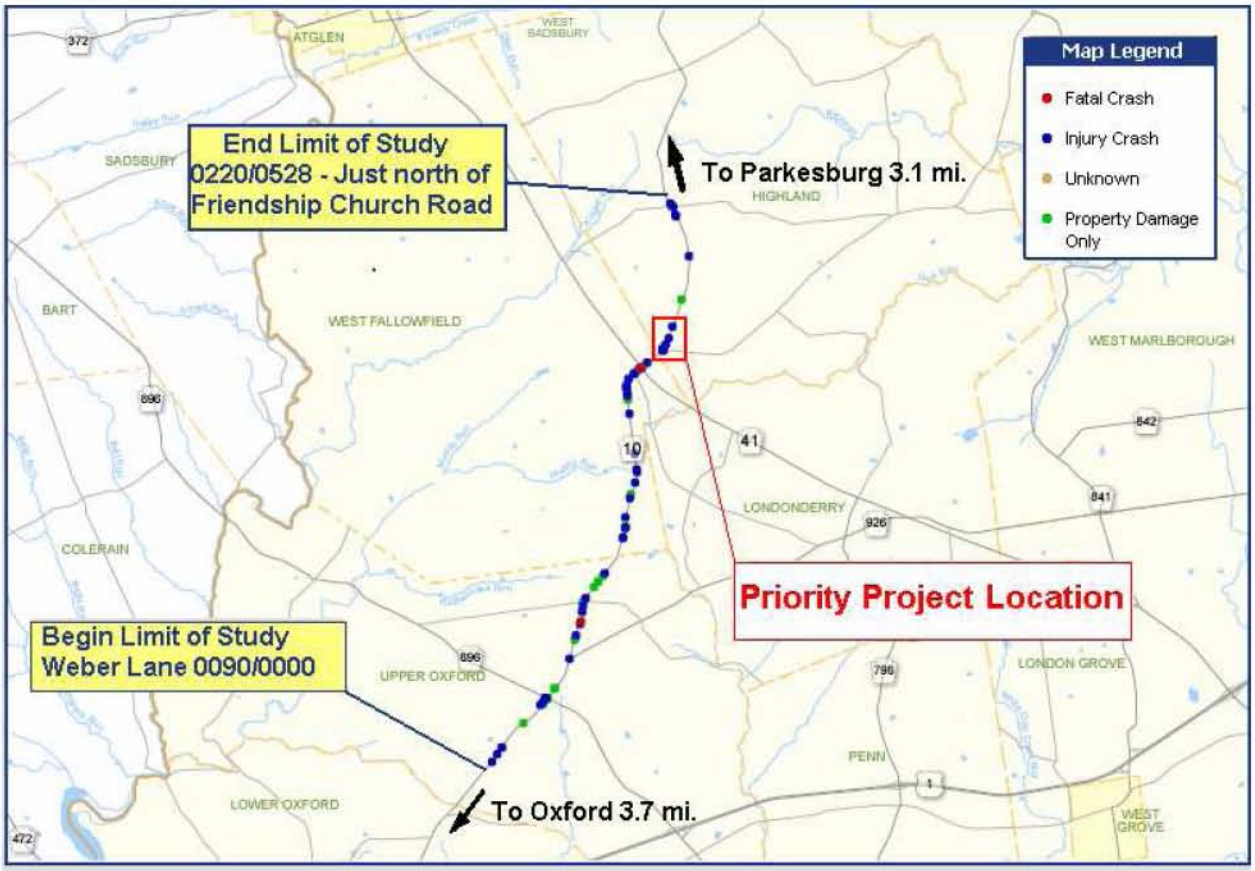
Crash Type	# of Crashes		Average Cost per Crash[1]		Total Costs
Angle	14	X	$ 154,000	=	$ 2,156,000
Rear End	3	X	$ 73,700	=	$ 221,100
Hit Fixed Object	3	X	$ 122,200	=	$ 366,600
Head On	3	X	$ 569,600	=	$ 1,708,800
Total	23		Total 5 Year Cost	=	$4,452,500
			Average Annual Cost	=	$890,500

1 From CDART: Accident Cost by Category Report for Accidents in Years 2003 to 2007.

According to the CDART data, the corridor experienced an average crash rate that was approximately 3.50 times higher than corridors with similar characteristics during the 2003 through 2007 period. If it is assumed that the planned safety improvements will produce a crash rate (results in a reduction) that is consistent with statewide averages for similar corridors, then the expected crash rate for the post-improvement period will be 1 ÷ 3.50 or 29 percent of the current rate. This translates into a post-improvement annual cost of $258,245. The expected benefit will be $890,500 – $258,245 or $632,255 per year.

COST ESTIMATE:

Intersection / Location	Proposed Work	Construction	Engineering cost	Order of Magnitude Cost Estimate
Cochranville Borough	Upgrade speed limit signs, consider Gateway treatment for entering Cochranville, install dashed line across Glenview Road, trim vegetation, create defined access to business, reset inlet grate and replace with bicycle safe grates, repair edge drop off on SB side PA Route 10, adjust cross slope on curve and realign Homeville Road to a "T" intersection, define Daleville Road and Cochran Road with curb, install stop signs, replace sidewalk from Hillview Drive to PA Route 41, install clearance markers for headwall, replace street name signs, restrict left turns in and out of Turkey Hill driveway, upgrade traffic signal at PA Route 41, restripe all pavement markings at PA Route 10 and PA Route 41, relocate SB PA Route 10 stop bar at PA Route 41, relocate utility poles.	$982,000	$147,300	$1,129,300
	Subtotal	$982,000	$147,300	$1,129,300
	Contingency (10%)	$98,200	$14,730	$112,930
	Total			**$1,242,230**



Project Purpose:

The purpose of this project is to reduce the number of crashes and related injuries and severity of the crashes which occur at the intersection of PA Route 10 and Gum Tree Road in Chester County. The anticipated benefits of this project are the minimization of the number of crashes, specifically hit fixed object and angle type crashes.

Project Scope:

The scope of work for this project was developed from a priority location identified in the Road Safety Audit which was conducted in September 2008 and undertaken by DVRPC in conjunction with the Pennsylvania Department of Transportation. A more detailed description of the scope of work is included in the attached cost estimate, and is summarized below:

- Install guiderail to protect drainage.
- Trim vegetation along PA Route 10.
- Install painted island on Gum Tree Road to align vehicles at intersection with PA Route 10.
- Install rumble strips on Gum Tree Road.

Benefit-to-Cost Ratio Calculation

The estimated benefit, in terms of crash reductions, for this project is $234,422 per year. See attached sheet Titled "PA Route 10 and Gum Tree Road HSIP Benefit Calculations".

The estimated cost for the above scope of work is $33,143. See the attached "Cost Estimate Sheet". Assuming a 7-year life cycle for this safety project, the annual cost of the project is $4,735.

The project will have an annual benefit-to-cost ratio of $234,422:$4,735 or 50 to 1.

PA ROUTE 10 AND GUM TREE ROAD HSIP BENEFIT CALCULATIONS

Crashes: 2003 through 2007

Crash Type	# of Crashes		Average Cost per Crash[1]		Total Costs
Hit Fixed Object	6	X	$ 122,200	=	$ 733,200
Angle	5	X	$ 154,000	=	$ 770,000
Rear End	3	X	$ 73,700	=	$ 221,100
Non Collision	1	X	$ 148,000	=	$ 148,000
Head On	1	X	$ 569,600	=	$ 569,600
Total	16		Total 5 Year Cost	=	$2,441,900
			Average Annual Cost	=	$488,380

1 From CDART: Accident Cost by Category Report for Accidents in Years 2003 to 2007.

According to the CDART data, the corridor experienced an average crash rate that was approximately 1.91 times higher than corridors with similar characteristics during the 2003 through 2007 period. If it is assumed that the planned safety improvements will produce a crash rate (results in a reduction) that is consistent with statewide averages for similar corridors, then the expected crash rate for the post-improvement period will be 1 ÷ 1.91 or 52 percent of the current rate. This translates into a post-improvement annual cost of $253,958. The expected benefit will be $488,380 – $253,958 or $234,422 per year.

COST ESTIMATE:

Intersection / Location	Proposed Work	Construction	Engineering cost	Order of Magnitude Cost Estimate
Gum Tree Road	Install guide rail to protect drainage, replace headwall with inlet and regrade, install lighting, install reflectors on stone wall, install rumble strips on Gum Tree Road, install stop ahead sign with flashers, trim vegetation, install painted island to align vehicles.	$26,200	$3,930	$30,130
	Subtotal	$26,200	$3,930	$30,130
	Contingency (10%)	$2,620	$393	$3,013
	Total			**$33,143**

APPENDIX H
South Section
Audit Team

DELAWARE VALLEY REGIONAL PLANNING COMMISSION
PA 10 SOUTH ROAD SAFETY AUDIT

AUDIT TEAM

Name	Organization
Matthew Anderson	Chester County Planning Commission
Rosemarie Anderson	Delaware Valley Regional Planning Commission
Larry Bucci	Pennsylvania Department of Transportation
Michael Castellano	Federal Highway Administration
Joe Fiocco	McMahon Associates (PennDOT Consultants)
Charles Fleischmann	Upper Oxford Township
Natasha Goguts	Chester County Planning Commission
Charles Kaufman	West Fallowfield Township
Regina Moore	Delaware Valley Regional Planning Commission
Kevin Murphy	Delaware Valley Regional Planning Commission
Kevin Myers	Chester County Planning Commission
Maurice Nadachowski	Pennsylvania State Police
Gwen Null	West Fallowfield Township
Michael Santos	Pennsylvania State Police
Derrick Sexton	Delaware Valley Regional Planning Commission

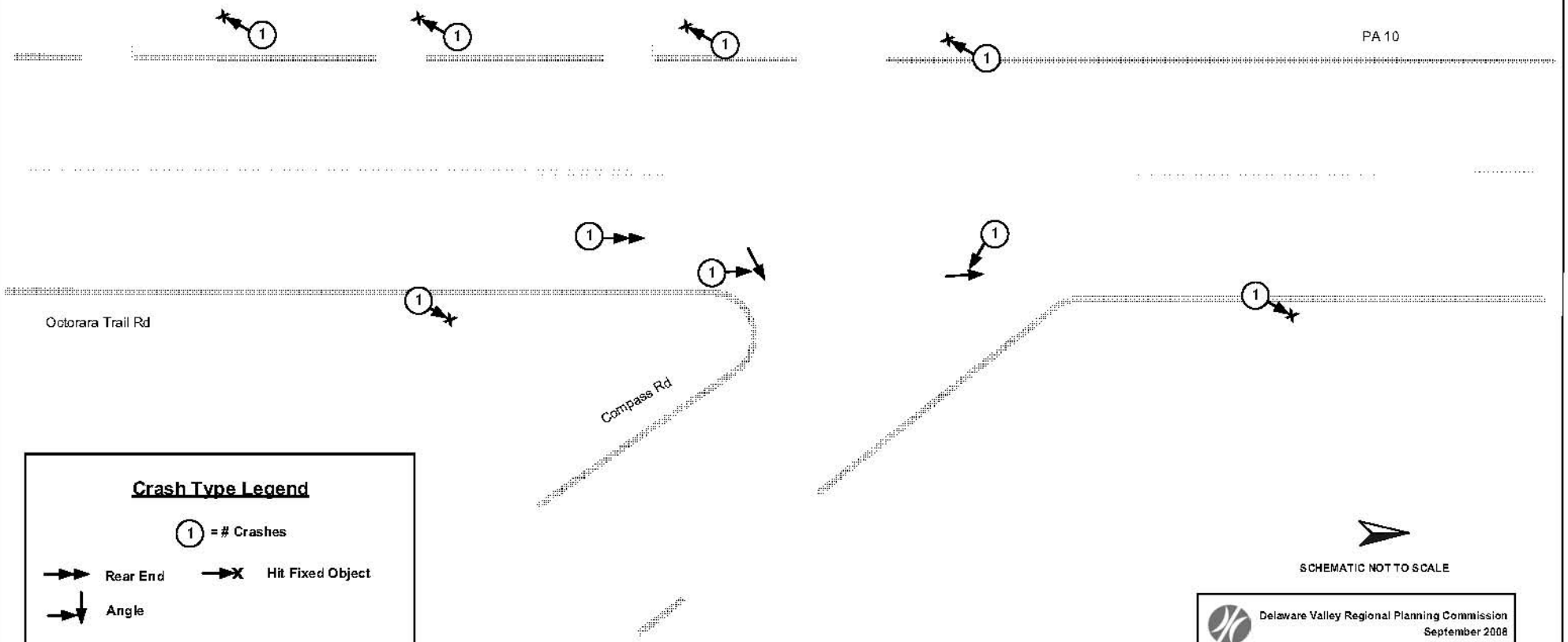
APPENDIX I
South Section
Study Area Map

Road Safety Audit
PA 10

11. Compass Road and South

Reportable Crashes
Collision Diagram
Crash Data Years 2003 – 2007

Total Crashes = 9



Crash Type Legend

(1) = # Crashes

Rear End

Hit Fixed Object

Angle

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Delaware Valley Regional Planning Commission
September 2008

PA Route 10
Road Safety Audit

Southern Section
Study Area

Delaware Valley Regional Planning Commission
September 2008

APPENDIX J
South Section
Traffic and Crash Data

PA Route 10
Road Safety Audit

Southern Section
Traffic Volume

DVRPC Traffic Count

AADT (Year)

Delaware Valley Regional Planning Commission
September 2008

CLASSIFICATION COUNTS FOR PA 10

BETWEEN TROOP ROAD AND HOSTETTER ROAD

DATE: 9/11/2008
SR: 10
MCDNAME: WEST FALLOWFIELD TWP
COUNTY: CHESTER
STATE: PA

SPEED: 45
COUNTDIR: BOTH
ROADDIR: BOTH
LOCATION: PA 10 BET. TROOP ROAD AND HOSTETTER ROAD
WEATHER: FAIR

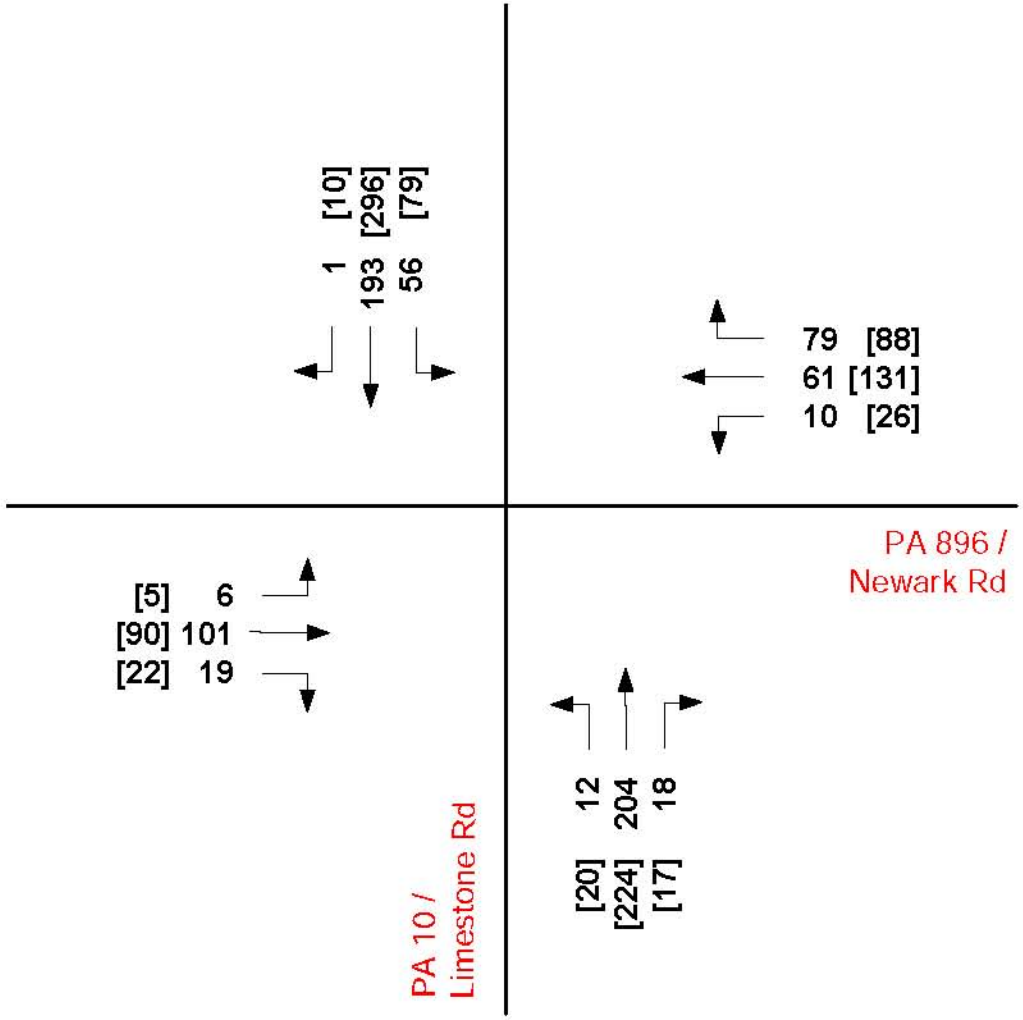
TIME	1	2	3	4	5	6	7	8	9	10	11	12	13	Total	5-13	%
12:00 AM	1	39	3	0	4	0	0	2	6	0	0	0	0	*55*	*12*	*22%*
1:00 AM	0	23	2	0	2	0	0	1	4	0	0	0	0	*32*	*7*	*22%*
2:00 AM	0	22	1	0	5	0	0	0	7	0	0	0	0	*35*	*12*	*34%*
3:00 AM	3	29	6	0	5	0	0	1	13	0	0	0	0	*57*	*19*	*33%*
4:00 AM	0	47	16	1	7	0	2	7	19	0	0	0	0	*99*	*35*	*35%*
5:00 AM	1	131	37	2	10	4	0	6	12	0	0	0	0	*203*	*32*	*16%*
6:00 AM	6	268	108	0	17	6	3	8	24	0	0	0	0	*440*	*58*	*13%*
7:00 AM	5	450	98	3	10	7	2	11	32	0	0	0	0	*618*	*62*	*10%*
8:00 AM	5	400	108	4	22	10	7	11	27	0	0	0	0	*594*	*77*	*13%*
9:00 AM	4	342	86	3	28	8	11	12	28	2	0	0	0	*524*	*89*	*17%*
10:00 AM	9	280	75	0	22	8	5	12	41	0	0	0	0	*452*	*88*	*19%*
11:00 AM	10	307	78	0	26	9	6	12	23	3	0	0	0	*474*	*79*	*17%*
12:00 PM	14	300	88	3	19	10	3	12	28	0	0	0	0	*477*	*72*	*15%*
1:00 PM	5	322	72	2	13	11	7	14	26	1	1	0	0	*474*	*73*	*15%*
2:00 PM	4	317	85	7	21	10	5	15	24	2	0	0	0	*490*	*77*	*16%*
3:00 PM	5	477	100	9	28	14	0	12	14	0	0	0	0	*659*	*68*	*10%*
4:00 PM	15	536	147	5	22	5	3	11	15	0	0	0	0	*759*	*56*	*7%*
5:00 PM	5	558	102	2	22	3	0	8	19	0	0	0	0	*719*	*52*	*7%*
6:00 PM	6	468	78	0	9	3	2	5	15	0	0	0	0	*586*	*34*	*6%*
7:00 PM	5	309	64	2	12	3	0	5	6	0	0	0	0	*406*	*36*	*9%*
8:00 PM	5	246	44	3	5	3	0	3	9	0	0	0	0	*318*	*20*	*6%*
9:00 PM	2	199	30	2	5	1	0	1	4	1	0	0	0	*245*	*12*	*5%*
10:00 PM	1	142	20	1	2	1	0	2	4	0	0	0	0	*173*	*9*	*5%*
11:00 PM	1	75	8	0	2	0	0	1	7	0	1	0	0	*95*	*11*	*12%*
TOTAL	***112***	***6287***	***1456***	***49***	***318***	***116***	***56***	***172***	***407***	***9***	***2***	***0***	***0***	***8984***	***1090***	*12%*

Class 1	Motorcycles	Class 6	Three axle single	Class 10	Greater than five axle double
Class 2	Cars, trailers	Class 7	Four Axle single	Class 11	Less than six axle multi
Class 3	Two axle long (pickups, vans)	Class 8	Less than five axle double	Class 12	Six axle multi
Class 4	Buses	Class 9	Five axle double	Class 13	Greater than six axle multi
Class 5	Two axle, six tires				

PA 10 / Limestone Road and PA 896 / Newark Road

Peak Hour Turning Movement Counts

Peak Hours
AM: 7:30 - 8:30
PM: [4:45 - 5:45]



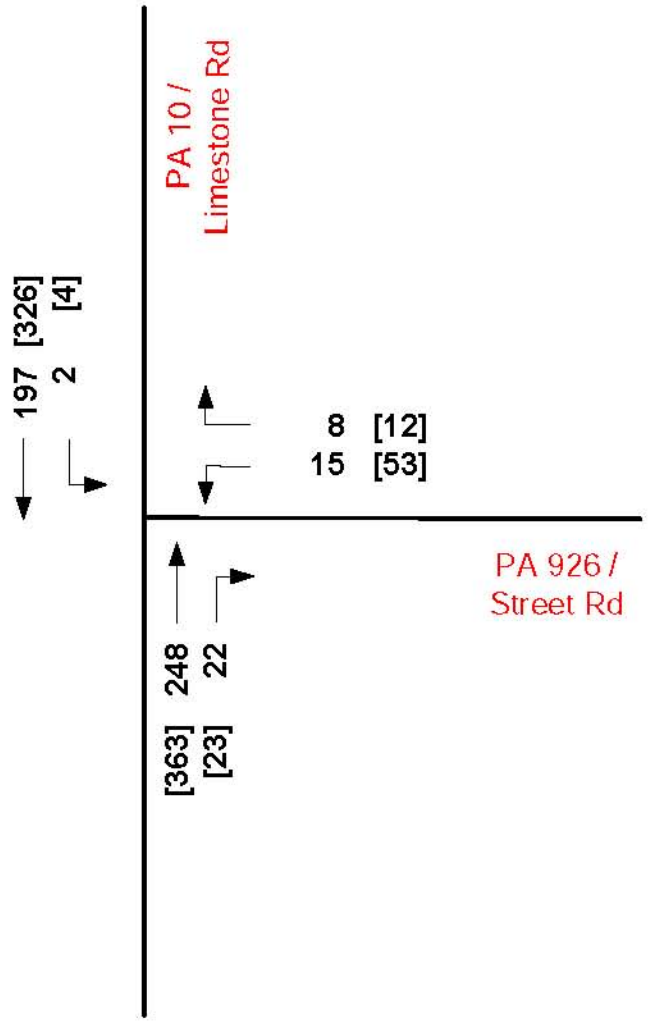
SCHEMATIC NOT TO SCALE

Delaware Valley Regional Planning Commission
September 2008

PA 10 / Limestone Road and PA 926 / Street Road

Peak Hour Turning Movement Counts

Peak Hours
AM: 7:30 - 8:30
PM: [4:45 - 5:45]



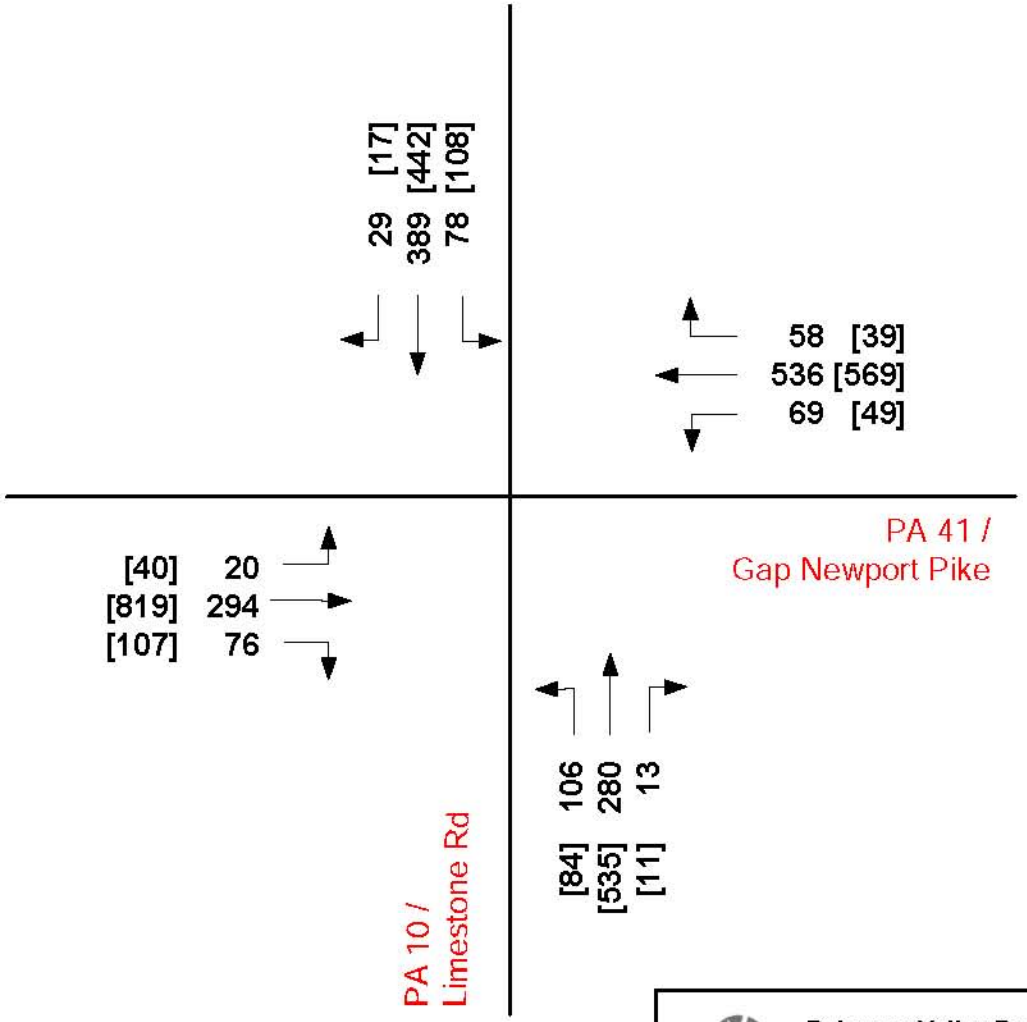
SCHEMATIC NOT TO SCALE

Delaware Valley Regional Planning Commission
September 2008

PA 10 / Limestone Road and PA 41 / Gap Newport Pike

Peak Hour Turning Movement Counts

Peak Hours
AM: 7:15 - 8:15
PM: [4:30 - 5:30]



SCHEMATIC NOT TO SCALE

Delaware Valley Regional Planning Commission
September 2008

CHESTER CO PA 10 0090/0000 TO 0220/0528 RSA

Date Range: 1/1/2003 to 12/31/2007

Area of Interest: (In County 15 On State Route 0010(P) Between Segment 0090 Offset 0 and Segment 0220 Offset 528) or (In County 15 On State Route 0010(S) Between Segment 0091 Offset 0 and Segment 0221 Offset 528)

USER ID/QUERY ID: lkubli/ 0620080729011

MONTH OF YEAR

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	
CRASHES	11	8	9	4	11	5	6	9	10	13	9	14	109
PCT	10%	7%	8%	3%	10%	4%	5%	8%	9%	11%	8%	12%	100%

DAY OF WEEK

	SUN	MON	TUE	WED	THR	FRI	SAT	
CRASHES	21	20	12	9	16	16	15	109
PCT	19%	18%	11%	8%	14%	14%	13%	100%

HOUR OF DAY

	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	99	
CRASHES	2	3	3	2	1	4	3	6	3	2	2	3	7	5	14	3	9	8	13	6	3	3	1	2	1	109
PCT	1%	2%	2%	1%	0%	3%	2%	5%	2%	1%	1%	2%	6%	4%	12%	2%	8%	7%	11%	5%	2%	2%	0%	1%	0%	100%

YEAR

	CRASHES	PCT
2003	27	24%
2004	35	32%
2005	18	16%
2006	15	13%
2007	14	12%
TOTAL	109	100%

COLLISION TYPE

	CRASHES	PCT
ANGLE	43	39%
HIT FIX OBJ	34	31%
REAR END	16	14%
HEAD ON	7	6%
NON COLL	5	4%
OPP DIR SS	3	2%
UNKNOWN	1	0%
TOTAL	109	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
FATAL	2	1%
MAJOR	9	8%
MODERATE	17	15%
MINOR	33	30%
UNK SEVERITY	2	1%
UNK IF INJURED	1	0%
PDO	45	41%
TOTAL	109	100%

SEVERITY COUNT

	PERSONS
FATALITIES	2
MAJOR	13
MODERATE	25
MINOR	70
UNK SEVERITY	6
UNK IF INJURED	2

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	80	33%
TOO FAST FOR CONDITION	33	13%
IMPROPER/CARELESS TURN	18	7%
RUNNING STOP SIGN	16	6%
OTHER IMPROPER DRIVING	13	5%
DRIVER WAS DISTRACTED	11	4%
AFFECTED PHYSICAL COND	10	4%
OVER/UNDER COMP CURVE	8	3%
PROCEED W/O CLEARANCE	8	3%
WRONG SIDE OF ROADWAY	7	2%
DRIVER INEXPERIENCED	6	2%
FAILURE TO RESPOND TCD	4	1%
OTHERS	23	9%
TOTAL	237	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	102	53%
SMALL TRUCK	36	18%
SUV	21	11%
VAN	13	6%
LARGE TRUCK	11	5%
MOTORCYCLE	4	2%
PEDALCYCLE	2	1%
CONSTRUCTION	1	0%
TOTAL	190	100%

ROAD CONDITION

	CRASHES	PCT
DRY	69	63%
WET	16	14%
SNOW	9	8%
ICE	8	7%
ICE PATCH	5	4%
SLUSH	1	0%
WATER	1	0%
TOTAL	109	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	67	61%
DARK	31	28%
STREET LIGHTS	4	3%
DAWN	3	2%
DUSK	3	2%
UNK LIGHTING	1	0%
TOTAL	109	100%

WEATHER

	CRASHES	PCT
CLEAR	88	80%
RAIN	10	9%
SNOW	7	6%
FOG	2	1%
OTHER	2	1%
TOTAL	109	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	83	72%
SLIPPERY ICE/SNOW	23	20%
OBSTACLE ON RDWY	2	1%
SUDDEN WEATHER COND	2	1%
WINDY CONDITIONS	2	1%
OTHER RDWY FACTOR	1	0%
OTHER WEATHER COND	1	0%
TOTAL	114	100%

CDART - CRASH SUMMARY REPORT (09-06)

NOTES:

1

The data available in this application is dynamic and should be used with care. Please take note of the following data alerts:

2 2008 crash records are incomplete

Data for the current year, 2008, is not fully represented in CDART. Crashes will be added for this year as they are made available to the Department. Include this year in queries with caution.

3 Complete data years

Complete records of reportable crashes are available in CDART for the following years: 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005,2006, 2007

REPORT PARAMETERS:

Query ID:	0620080729011
User ID:	lkubli
Area of Interest:	(In County 15 On State Route 0010(P) Between Segment 0090 Offset 0 and Segment 0220 Offset 528) or (In County 15 On State Route 0010(S) Between Segment 0091 Offset 0 and Segment 0221 Offset 528)
Date Range:	1/1/2003 to 12/31/2007
Criteria:	STATE ROAD

PA Route 10
Road Safety Audit

Southern Section
Crash Data

2003 - 2007
Crash Location
Source: PADOT, 2008

Delaware Valley
Regional Planning Commission
September 2008

1. PA 10 Between Webster Lane and Old Limestone Road

Segment 90, Offset 0 to Segment 100, Offset 102

COLLISION TYPE	
Hit Fixed Object	2
Rear-end	2
Angle	1
Total	**5**
ILLUMINATION	
Daylight	3
Dark	2
Total	**5**
WEATHER	
Clear	3
Other	1
Snow	1
Total	**5**
SEVERITY COUNT	
Fatalities	0
Major	1
Moderate	1
Minor	3
Unk Severity	0
Unk If Injured	0

Delaware Valley
Regional Planning Commission
September 2008

CHESTER CO SR 0010 0090/0000 TO 0100/0102 RSA

Date Range: 1/1/2003 to 12/31/2007

Area of Interest: (In County 15 On State Route 0010(P) Between Segment 0090 Offset 0 and Segment 0100 Offset 102) or (In County 15 On State Route 0010(S) Between Segment 0091 Offset 0 and Segment 0101 Offset 102)

USER_ID/QUERY ID: lkubli/ 0620080820004

MONTH OF YEAR

	JAN	MAY	OCT	DEC	
CRASHES	1	2	1	1	5
PCT	20%	40%	20%	20%	100%

DAY OF WEEK

	SUN	WED	THR	SAT	
CRASHES	2	1	1	1	5
PCT	40%	20%	20%	20%	100%

HOUR OF DAY

	02	10	11	14	18	
CRASHES	1	1	1	1	1	5
PCT	20%	20%	20%	20%	20%	100%

YEAR

	CRASHES	PCT
2003	3	60%
2004	1	20%
2005	1	20%
TOTAL	5	100%

COLLISION TYPE

	CRASHES	PCT
HIT FIX OBJ	2	40%
REAR END	2	40%
ANGLE	1	20%
TOTAL	5	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
MAJOR	1	20%
MODERATE	1	20%
MINOR	1	20%
PDO	2	40%
TOTAL	5	100%

SEVERITY COUNT

	PERSONS
FATALITIES	0
MAJOR	1
MODERATE	1
MINOR	3
UNK SEVERITY	0
UNK IF INJURED	0

DRIVER ACTIONS

	ACTIONS	PCT
TOO FAST FOR CONDITION	4	36%
NO CONTRIBUTING ACTION	3	27%
OTHER IMPROPER DRIVING	2	18%
DRIVER WAS DISTRACTED	1	9%
FAILR MAINT PROP SPEED	1	9%
TOTAL	11	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	4	44%
SUV	4	44%
CONSTRUCTION	1	11%
TOTAL	9	100%

ROAD CONDITION

	CRASHES	PCT
DRY	3	60%
SNOW	2	40%
TOTAL	5	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	3	60%
DARK	2	40%
TOTAL	5	100%

WEATHER

	CRASHES	PCT
CLEAR	3	60%
OTHER	1	20%
SNOW	1	20%
TOTAL	5	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	3	37%
SLIPPERY ICE/SNOW	2	25%
OBSTACLE ON RDWY	1	12%
SUDDEN WEATHER COND	1	12%
WINDY CONDITIONS	1	12%
TOTAL	8	100%

CDART - CRASH SUMMARY REPORT (09-06)

NOTES:

1

The data available in this application is dynamic and should be used with care. Please take note of the following data alerts:

2 2008 crash records are incomplete

Data for the current year, 2008, is not fully represented in CDART. Crashes will be added for this year as they are made available to the Department. Include this year in queries with caution.

3 Complete data years

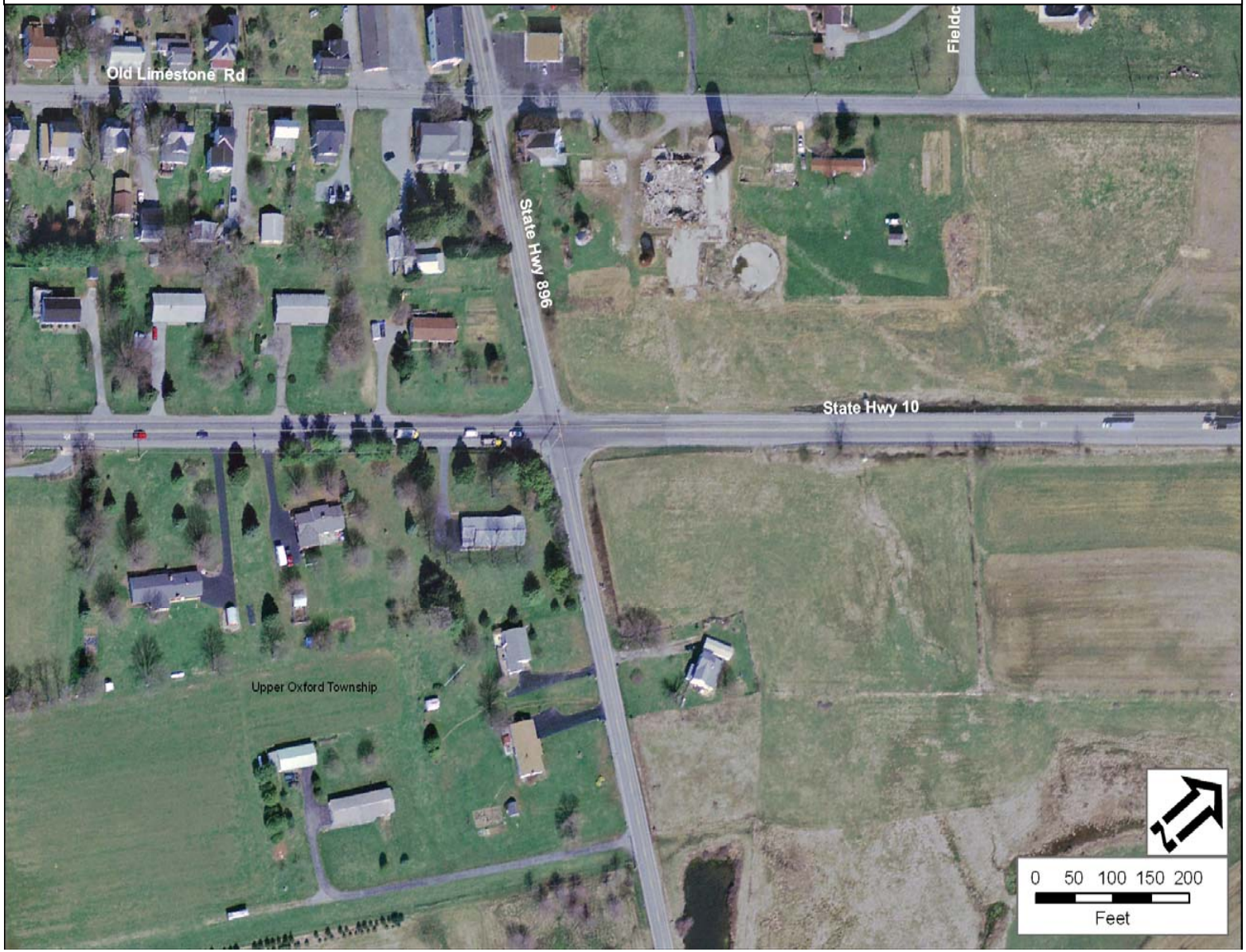
Complete records of reportable crashes are available in CDART for the following years: 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005,2006, 2007

REPORT PARAMETERS:

Query ID:	0620080820004
User ID:	lkubli
Area of Interest:	(In County 15 On State Route 0010(P) Between Segment 0090 Offset 0 and Segment 0100 Offset 102) or (In County 15 On State Route 0010(S) Between Segment 0091 Offset 0 and Segment 0101 Offset 102)
Date Range:	1/1/2003 to 12/31/2007
Criteria:	STATE ROAD

2. PA 10 in the Vicinity of PA 896 Newark Road

Segment 100, Offset 1562 to Segment 110, Offset 782



COLLISION TYPE	
Angle	9
Hit Fixed Object	2
Rear-end	2
Opp Dir Sideswipe	1
Unknown	1
Total	**15**
ILLUMINATION	
Daylight	10
Dark	5
Total	**15**
WEATHER	
Clear	12
Rain	2
Snow	1
Total	**15**
SEVERITY COUNT	
Fatalities	0
Major	1
Moderate	1
Minor	4
Unk Severity	3
Unk If Injured	0

Delaware Valley
Regional Planning Commission
September 2008

CHESTER CO SR 0010 0100/1562 TO 0110/0782 RSA

Date Range: 1/1/2003 to 12/31/2007

Area of Interest: (In County 15 On State Route 0010(P) Between Segment 0100 Offset 1562 and Segment 0110 Offset 782) or (In County 15 On State Route 0010(S) Between Segment 0101 Offset 1562 and Segment 0111 Offset 782)

USER_ID/QUERY ID: lkubli/ 0620080820005

MONTH OF YEAR

	JAN	MAR	MAY	JUN	JUL	SEP	OCT	NOV	DEC	
CRASHES	1	1	2	2	1	2	2	2	2	15
PCT	6%	6%	13%	13%	6%	13%	13%	13%	13%	100%

DAY OF WEEK

	SUN	MON	TUE	WED	THR	FRI	SAT	
CRASHES	5	2	1	1	1	1	4	15
PCT	33%	13%	6%	6%	6%	6%	26%	100%

HOUR OF DAY

	01	02	12	13	14	15	16	18	19	21	
CRASHES	1	1	2	1	3	1	1	2	2	1	15
PCT	6%	6%	13%	6%	20%	6%	6%	13%	13%	6%	100%

YEAR

	CRASHES	PCT
2003	2	13%
2004	9	60%
2005	1	6%
2006	1	6%
2007	2	13%
TOTAL	15	100%

COLLISION TYPE

	CRASHES	PCT
ANGLE	9	60%
HIT FIX OBJ	2	13%
REAR END	2	13%
OPP DIR SS	1	6%
UNKNOWN	1	6%
TOTAL	15	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
MAJOR	1	6%
MODERATE	1	6%
MINOR	3	20%
UNK SEVERITY	1	6%
PDO	9	60%
TOTAL	15	100%

SEVERITY COUNT

	PERSONS
FATALITIES	0
MAJOR	1
MODERATE	1
MINOR	4
UNK SEVERITY	3
UNK IF INJURED	0

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	16	44%
RUNNING STOP SIGN	8	22%
FAILURE TO RESPOND TCD	3	8%
AFFECTED PHYSICAL COND	2	5%
DRIVER WAS DISTRACTED	2	5%
OTHER IMPROPER DRIVING	2	5%
PROCEED W/O CLEARANCE	1	2%
TOO FAST FOR CONDITION	1	2%
WRONG SIDE OF ROADWAY	1	2%
TOTAL	36	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	19	63%
SMALL TRUCK	5	16%
SUV	3	10%
VAN	3	10%
TOTAL	30	100%

ROAD CONDITION

	CRASHES	PCT
DRY	12	80%
WET	3	20%
TOTAL	15	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	10	66%
DARK	5	33%
TOTAL	15	100%

WEATHER

	CRASHES	PCT
CLEAR	12	80%
RAIN	2	13%
SNOW	1	6%
TOTAL	15	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	14	93%
OBSTACLE ON RDWY	1	6%
TOTAL	15	100%

CDART - CRASH SUMMARY REPORT (09-06)

NOTES:

1

The data available in this application is dynamic and should be used with care. Please take note of the following data alerts:

2 2008 crash records are incomplete

Data for the current year, 2008, is not fully represented in CDART. Crashes will be added for this year as they are made available to the Department. Include this year in queries with caution.

3 Complete data years

Complete records of reportable crashes are available in CDART for the following years: 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005,2006, 2007

REPORT PARAMETERS:

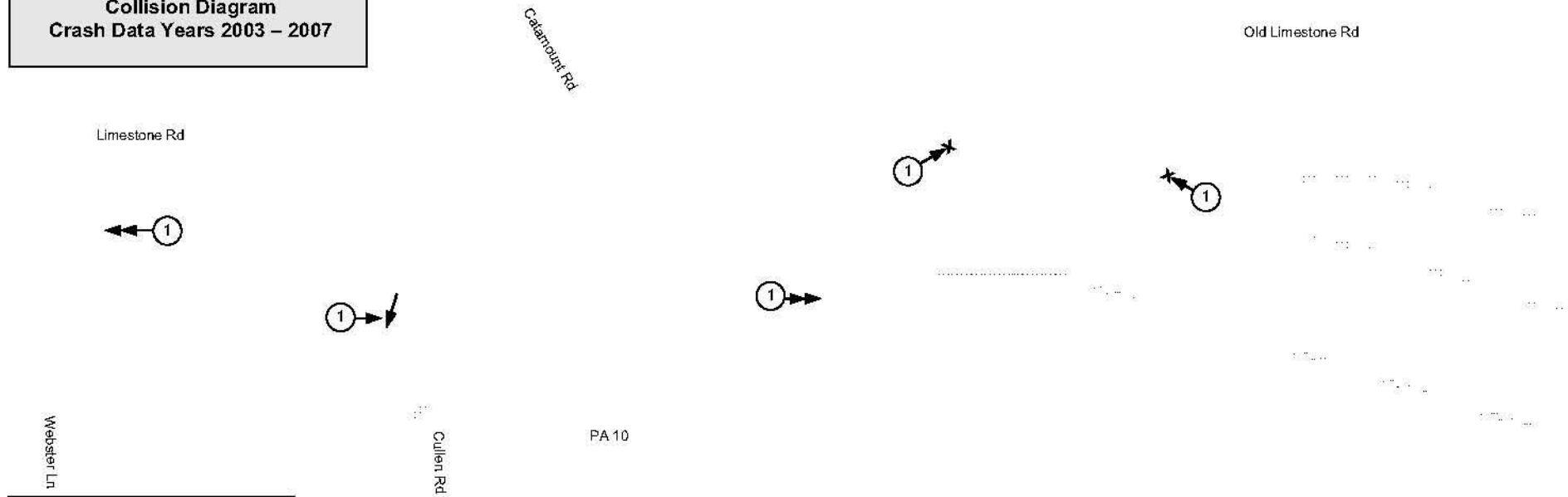
Query ID:	0620080820005
User ID:	lkubli
Area of Interest:	(In County 15 On State Route 0010(P) Between Segment 0100 Offset 1562 and Segment 0110 Offset 782) or (In County 15 On State Route 0010(S) Between Segment 0101 Offset 1562 and Segment 0111 Offset 782)
Date Range:	1/1/2003 to 12/31/2007
Criteria:	STATE ROAD

Road Safety Audit
PA 10

1. Between Webster Lane and Old Limestone Road

Reportable Crashes
Collision Diagram
Crash Data Years 2003 – 2007

Total Crashes = 5



Crash Type Legend

1 = # Crashes

Rear End

Angle

Hit Fixed Object

SCHEMATIC NOT TO SCALE

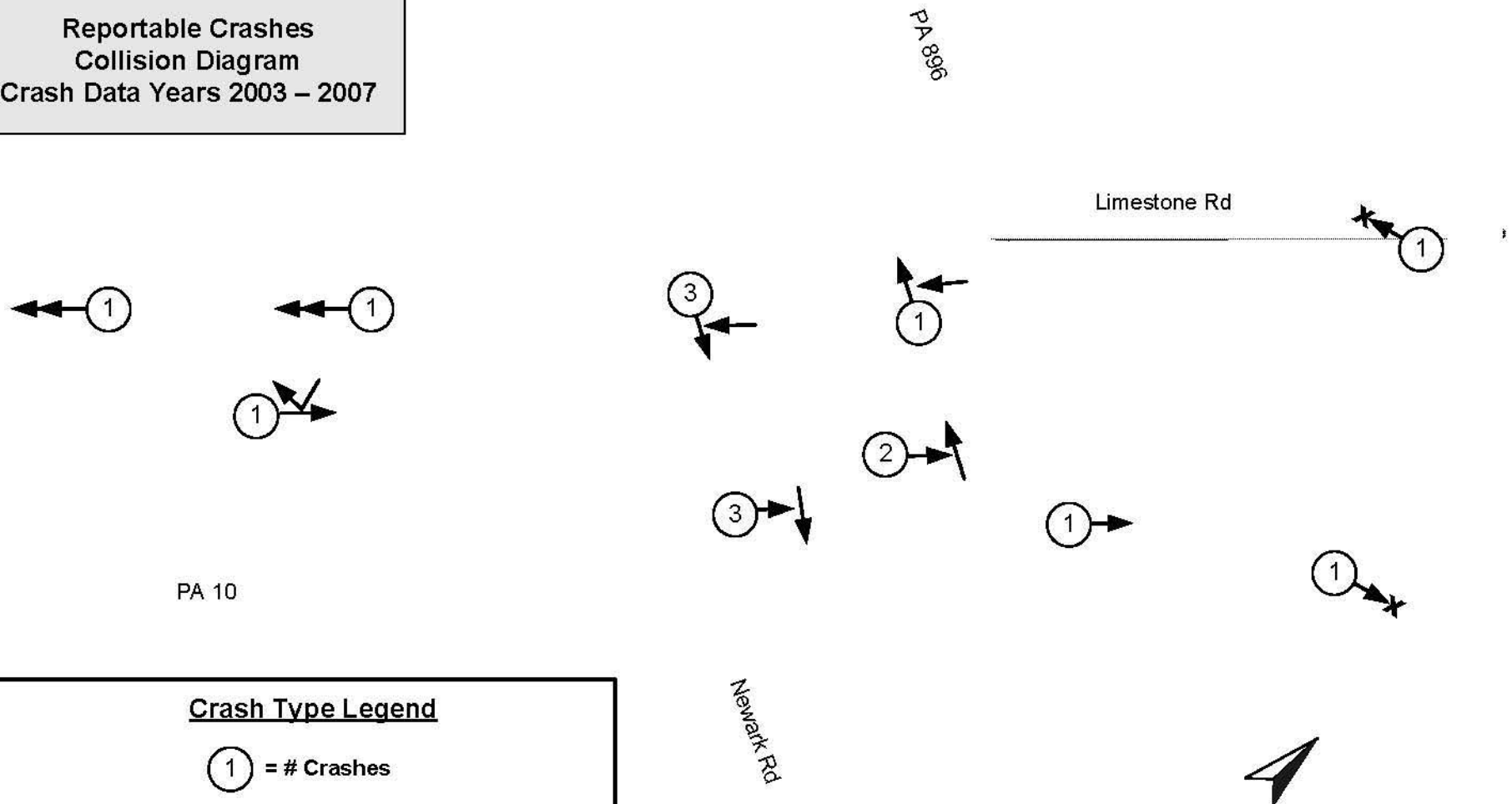
Delaware Valley Regional Planning Commission
September 2008

Road Safety Audit
PA 10

2. Vicinity of Newark Road

Reportable Crashes
Collision Diagram
Crash Data Years 2003 – 2007

Total Crashes = 15



Crash Type Legend

(1) = # Crashes

- Rear End
- Angle
- Opposite Direction Sideswipe
- Hit Fixed Object
- Unknown
- "Hit Non-fixed Object"

Delaware Valley Regional Planning Commission
September 2008

3. PA 10 Vicinity of Edenton Road and Ewing Road

Segment 120, Offset 2052 to Segment 140, Offset 617

COLLISION TYPE	
Hit Fixed Object	10
Angle	1
Head On	1
Non Collision	1
Rear-end	1
Total	**14**
ILLUMINATION	
Daylight	9
Dark	4
Dusk	1
Total	**14**
WEATHER	
Clear	8
Snow	3
Rain	2
Other	1
Total	**14**
SEVERITY COUNT	
Fatalities	1
Major	1
Moderate	3
Minor	6
Unk Severity	2
Unk If Injured	0

Delaware Valley
Regional Planning Commission
September 2008

CHESTER CO SR 0010 0120/2052 TO 0140/0617 RSA

Date Range: 1/1/2003 to 12/31/2007

Area of Interest: (In County 15 On State Route 0010(P) Between Segment 0120 Offset 2052 and Segment 0140 Offset 617)

USER_ID/QUERY ID: lkubli/ 0620080912006

MONTH OF YEAR

	JAN	FEB	MAR	APR	MAY	AUG	OCT	NOV	DEC	
CRASHES	1	4	2	1	1	2	1	1	1	14
PCT	7%	28%	14%	7%	7%	14%	7%	7%	7%	100%

DAY OF WEEK

	SUN	MON	TUE	WED	THR	FRI	SAT	
CRASHES	2	1	2	1	3	3	2	14
PCT	14%	7%	14%	7%	21%	21%	14%	100%

HOUR OF DAY

	03	07	09	14	15	16	17	18	20	21	
CRASHES	1	1	1	3	1	3	1	1	1	1	14
PCT	7%	7%	7%	21%	7%	21%	7%	7%	7%	7%	100%

YEAR

	CRASHES	PCT
2003	4	28%
2004	3	21%
2005	4	28%
2006	2	14%
2007	1	7%
TOTAL	14	100%

COLLISION TYPE

	CRASHES	PCT
HIT FIX OBJ	10	71%
ANGLE	1	7%
HEAD ON	1	7%
NON COLL	1	7%
REAR END	1	7%
TOTAL	14	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
FATAL	1	7%
MODERATE	2	14%
MINOR	3	21%
PDO	8	57%
TOTAL	14	100%

SEVERITY COUNT

	PERSONS
FATALITIES	1
MAJOR	1
MODERATE	3
MINOR	6
UNK SEVERITY	2
UNK IF INJURED	0

DRIVER ACTIONS

	ACTIONS	PCT
TOO FAST FOR CONDITION	7	21%
NO CONTRIBUTING ACTION	5	15%
OVER/UNDER COMP CURVE	5	15%
AFFECTED PHYSICAL COND	2	6%
DRIVER INEXPERIENCED	2	6%
IMPROPER EXIT FROM HWY	2	6%
IMPROPER/CARELESS TURN	2	6%
TAILGATING	2	6%
WRONG SIDE OF ROADWAY	2	6%
DRIVER WAS DISTRACTED	1	3%
ILLEGAL STOPPED ON RD	1	3%
OTHER IMPROPER DRIVING	1	3%
TOTAL	32	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	6	31%
SMALL TRUCK	6	31%
LARGE TRUCK	4	21%
MOTORCYCLE	1	5%
SUV	1	5%
VAN	1	5%
TOTAL	19	100%

ROAD CONDITION

	CRASHES	PCT
DRY	5	35%
SNOW	3	21%
ICE	2	14%
ICE PATCH	2	14%
WET	2	14%
TOTAL	14	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	9	64%
DARK	4	28%
DUSK	1	7%
TOTAL	14	100%

WEATHER

	CRASHES	PCT
CLEAR	8	57%
SNOW	3	21%
RAIN	2	14%
OTHER	1	7%
TOTAL	14	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	7	46%
SLIPPERY ICE/SNOW	7	46%
SUDDEN WEATHER COND	1	6%
TOTAL	15	100%

CDART - CRASH SUMMARY REPORT (09-06)

NOTES:

1

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2 2008 crash records are incomplete

Data for the current year, 2008, is not fully represented in CDART. Crashes will be added for this year as they are made available to the Department. Include this year in queries with caution.

3 Complete data years

Complete records of reportable crashes are available in CDART for the following years: 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005,2006, 2007

REPORT PARAMETERS:

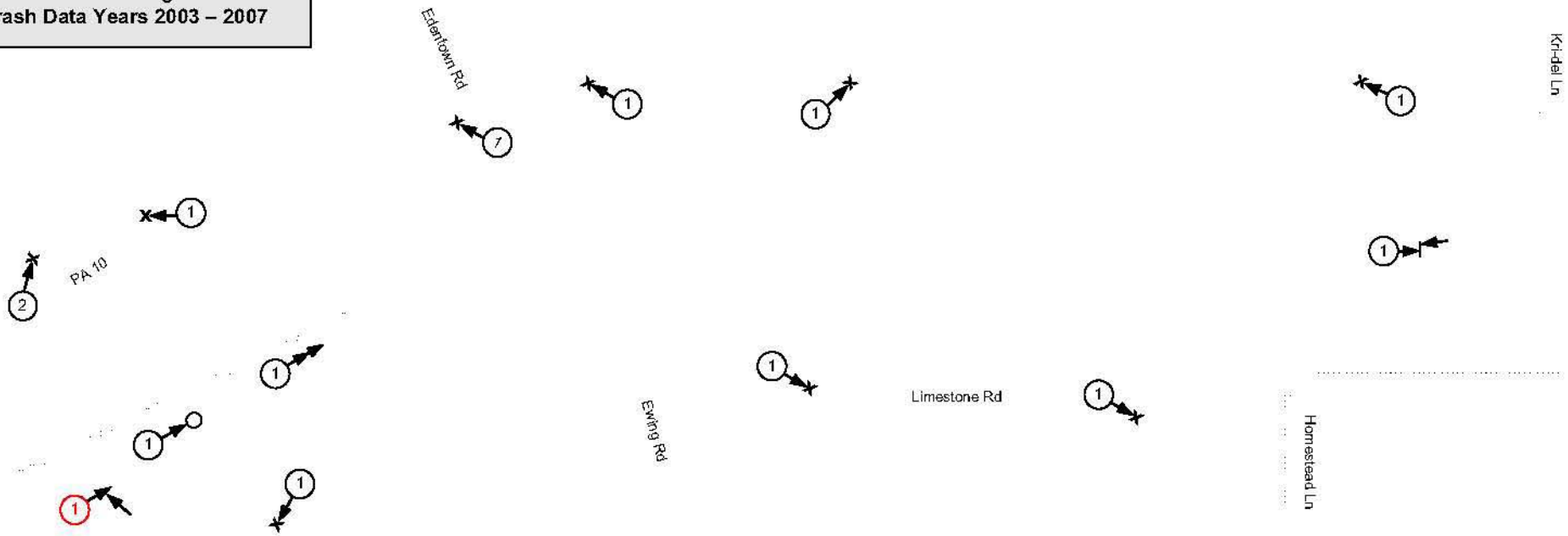
Query ID:	0620080912006
User ID:	lkubli
Area of Interest:	(In County 15 On State Route 0010(P) Between Segment 0120 Offset 2052 and Segment 0140 Offset 617)
Date Range:	1/1/2003 to 12/31/2007
Criteria:	STATE ROAD

Road Safety Audit
PA 10

3. Vicinity of Edentown Road and Ewing Road

Reportable Crashes
Collision Diagram
Crash Data Years 2003 – 2007

Total Crashes = 14



Crash Type Legend

(1) = # Crashes (1) = # Fatal Crash

Rear End
Angle
Head On
Hit Fixed Object
Non-Collision
"Hit Non-fixed Object"

SCHEMATIC NOT TO SCALE

Delaware Valley Regional Planning Commission
September 2008

4. PA 10 at High Point Road and Troop Road

Segment 140, Offset 2880 to Segment 150, Offset 609

COLLISION TYPE	
Angle	2
Head On	1
Hit Fixed Object	1
Non Collision	1
Opp Dir Sideswipe	1
Total	**6**
ILLUMINATION	
Daylight	4
Dark	2
Total	**6**
WEATHER	
Clear	5
Rain	1
Total	**6**
SEVERITY COUNT	
Fatalities	0
Major	0
Moderate	2
Minor	3
Unk Severity	0
Unk If Injured	0

Delaware Valley
Regional Planning Commission
September 2008

CHESTER CO SR 0010 0140/2880 TO 0150/0609 RSA

Date Range: 1/1/2003 to 12/31/2007

Area of Interest: (In County 15 On State Route 0010(P) Between Segment 0140 Offset 2880 and Segment 0150 Offset 609)

USER_ID/QUERY ID: lkubli/ 0620080912007

MONTH OF YEAR

	JAN	FEB	MAR	APR	JUL	
CRASHES	2	1	1	1	1	6
PCT	33%	16%	16%	16%	16%	100%

DAY OF WEEK

	TUE	WED	THR	
CRASHES	3	2	1	6
PCT	50%	33%	16%	100%

HOUR OF DAY

	07	11	14	19	22	99	
CRASHES	1	1	1	1	1	1	6
PCT	16%	16%	16%	16%	16%	16%	100%

YEAR

	CRASHES	PCT
2003	2	33%
2004	3	50%
2006	1	16%
TOTAL	6	100%

COLLISION TYPE

	CRASHES	PCT
ANGLE	2	33%
HEAD ON	1	16%
HIT FIX OBJ	1	16%
NON COLL	1	16%
OPP DIR SS	1	16%
TOTAL	6	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
MODERATE	2	33%
MINOR	2	33%
PDO	2	33%
TOTAL	6	100%

SEVERITY COUNT

	PERSONS
FATALITIES	0
MAJOR	0
MODERATE	2
MINOR	3
UNK SEVERITY	0
UNK IF INJURED	0

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	4	30%
TOO FAST FOR CONDITION	3	23%
IMPROPER/CARELESS TURN	2	15%
FAILR MAINT PROP SPEED	1	7%
OVER/UNDER COMP CURVE	1	7%
PROCEED W/O CLEARANCE	1	7%
TAILGATING	1	7%
TOTAL	13	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	8	72%
SMALL TRUCK	1	9%
SUV	1	9%
VAN	1	9%
TOTAL	11	100%

ROAD CONDITION

	CRASHES	PCT
DRY	2	33%
SNOW	2	33%
ICE	1	16%
ICE PATCH	1	16%
TOTAL	6	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	4	66%
DARK	2	33%
TOTAL	6	100%

WEATHER

	CRASHES	PCT
CLEAR	5	83%
RAIN	1	16%
TOTAL	6	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
SLIPPERY ICE/SNOW	4	57%
NONE	2	28%
WINDY CONDITIONS	1	14%
TOTAL	7	100%

CDART - CRASH SUMMARY REPORT (09-06)

NOTES:

1

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2 2008 crash records are incomplete

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3 Complete data years

Complete records of reportable crashes are available in CDART for the following years: 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005,2006, 2007

REPORT PARAMETERS:

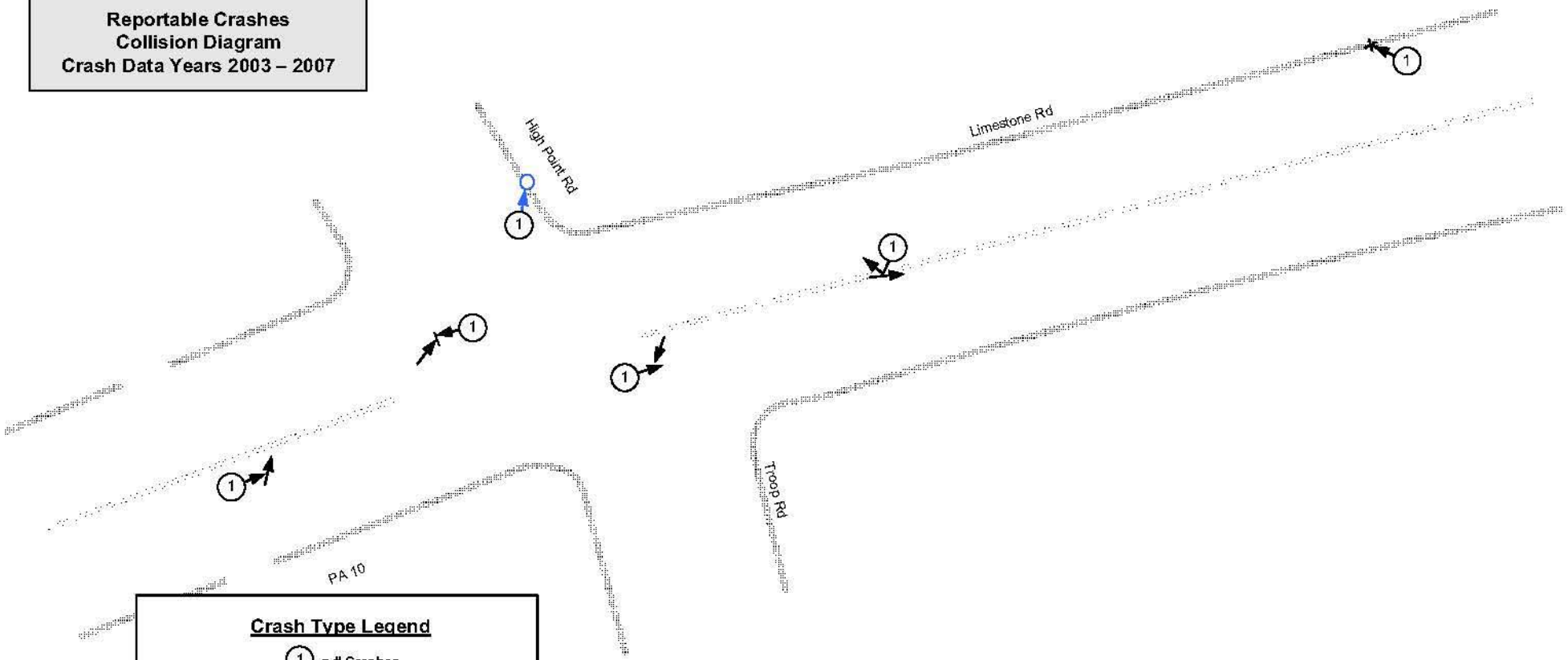
Query ID:	0620080912007
User ID:	lkubli
Area of Interest:	(In County 15 On State Route 0010(P) Between Segment 0140 Offset 2880 and Segment 0150 Offset 609)
Date Range:	1/1/2003 to 12/31/2007
Criteria:	STATE ROAD

Road Safety Audit
PA 10

4. At High Point Road and Troop Road

Reportable Crashes
Collision Diagram
Crash Data Years 2003 – 2007

Total Crashes = 6



Crash Type Legend

(1) = # Crashes

- Hit Fixed Object
- Opposite Direction Sideswipe
- Angle
- Possible Miscoding
- Non-Collision "Hit Fixed Object"
- Head On

SCHEMATIC NOT TO SCALE

Delaware Valley Regional Planning Commission
September 2008

5. PA 10 Vicinity of Glenville Road

Segment 170, Offset 36 to Segment 170, Offset 1257

COLLISION TYPE	
Rear-end	4
Angle	2
Hit Fixed Object	2
Opp Dir Sideswipe	1
Total	**9**
ILLUMINATION	
Daylight	5
Dark	3
Street Lights	1
Total	**9**
WEATHER	
Clear	8
Rain	1
Total	**9**
SEVERITY COUNT	
Fatalities	0
Major	0
Moderate	8
Minor	13
Unk Severity	1
Unk If Injured	0

Note: Crash summary total differs from crash diagram total due to police report miscoding.

Delaware Valley
Regional Planning Commission
September 2008

CHESTER CO SR 0010 0170/0036 TO 0170/1257 RSA

Date Range: 1/1/2003 to 12/31/2007

Area of Interest: (In County 15 On State Route 0010(P) Between Segment 0170 Offset 36 and Segment 0170 Offset 1257)

USER_ID/QUERY ID: lkubli/ 0620080912008

MONTH OF YEAR

	FEB	SEP	OCT	NOV	DEC	
CRASHES	1	2	1	1	4	9
PCT	11%	22%	11%	11%	44%	100%

DAY OF WEEK

	SUN	MON	TUE	FRI	SAT	
CRASHES	3	1	1	2	2	9
PCT	33%	11%	11%	22%	22%	100%

HOUR OF DAY

	05	08	10	13	17	18	19	20	
CRASHES	1	1	1	1	1	2	1	1	9
PCT	11%	11%	11%	11%	11%	22%	11%	11%	100%

YEAR

	CRASHES	PCT
2003	3	33%
2004	4	44%
2006	2	22%
TOTAL	9	100%

COLLISION TYPE

	CRASHES	PCT
REAR END	4	44%
ANGLE	2	22%
HIT FIX OBJ	2	22%
OPP DIR SS	1	11%
TOTAL	9	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
MODERATE	3	33%
MINOR	3	33%
UNK SEVERITY	1	11%
PDO	2	22%
TOTAL	9	100%

SEVERITY COUNT

	PERSONS
FATALITIES	0
MAJOR	0
MODERATE	8
MINOR	13
UNK SEVERITY	1
UNK IF INJURED	0

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	6	28%
OTHER IMPROPER DRIVING	3	14%
TOO FAST FOR CONDITION	3	14%
AFFECTED PHYSICAL COND	2	9%
IMPROPER/CARELESS TURN	2	9%
SUDDEN SLOWING/STOP	2	9%
DRIVER WAS DISTRACTED	1	4%
SPEEDING	1	4%
TAILGATING	1	4%
TOTAL	21	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	7	43%
SMALL TRUCK	5	31%
SUV	2	12%
VAN	2	12%
TOTAL	16	100%

ROAD CONDITION

	CRASHES	PCT
DRY	7	77%
ICE PATCH	1	11%
WET	1	11%
TOTAL	9	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	5	55%
DARK	3	33%
STREET LIGHTS	1	11%
TOTAL	9	100%

WEATHER

	CRASHES	PCT
CLEAR	8	88%
RAIN	1	11%
TOTAL	9	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	8	88%
SLIPPERY ICE/SNOW	1	11%
TOTAL	9	100%

CDART - CRASH SUMMARY REPORT (09-06)

NOTES:

1

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2 2008 crash records are incomplete

Data for the current year, 2008, is not fully represented in CDART. Crashes will be added for this year as they are made available to the Department. Include this year in queries with caution.

3 Complete data years

Complete records of reportable crashes are available in CDART for the following years: 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005,2006, 2007

REPORT PARAMETERS:

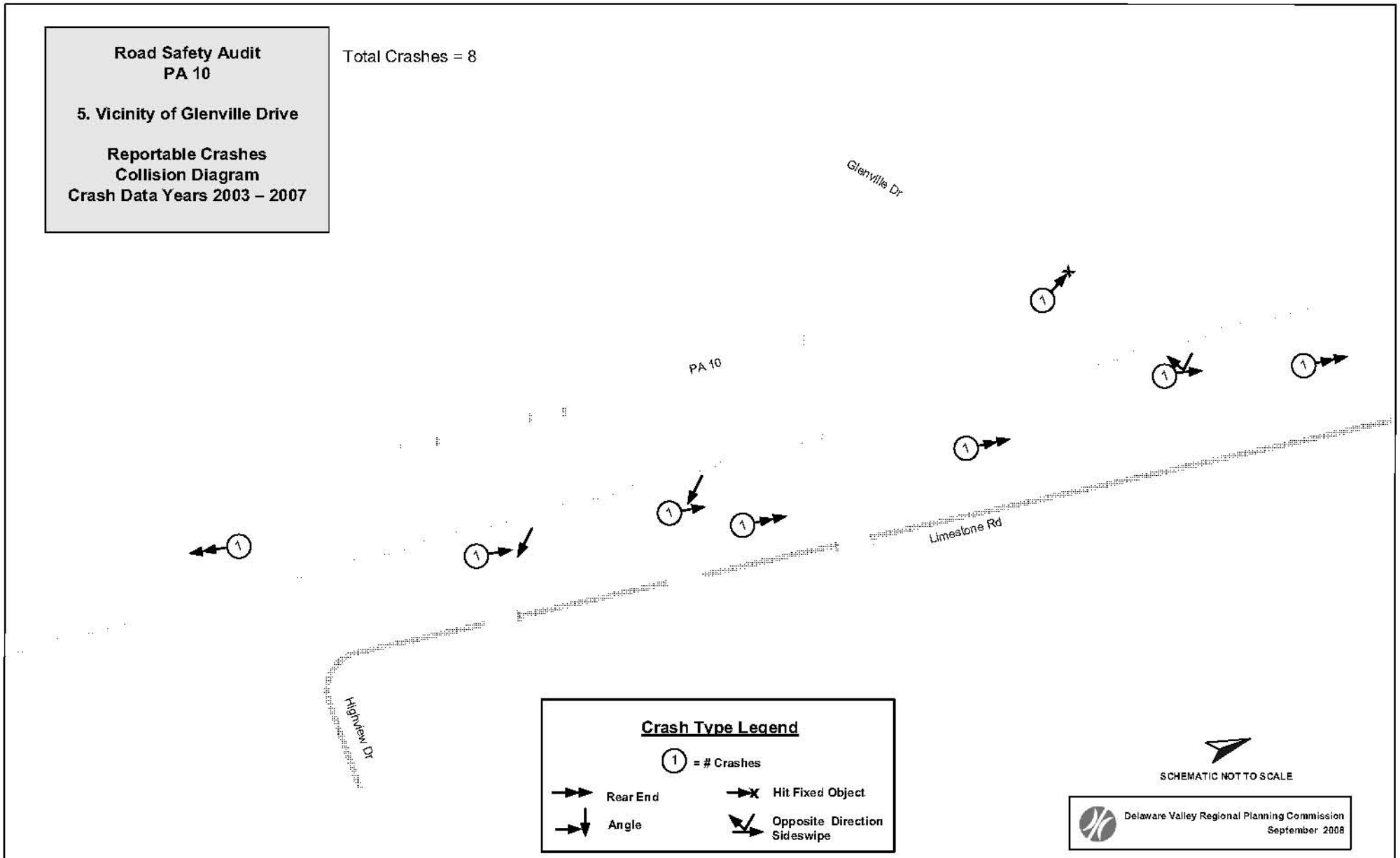
Query ID:	0620080912008
User ID:	lkubli
Area of Interest:	(In County 15 On State Route 0010(P) Between Segment 0170 Offset 36 and Segment 0170 Offset 1257)
Date Range:	1/1/2003 to 12/31/2007
Criteria:	STATE ROAD

Road Safety Audit
PA 10

5. Vicinity of Glenville Drive

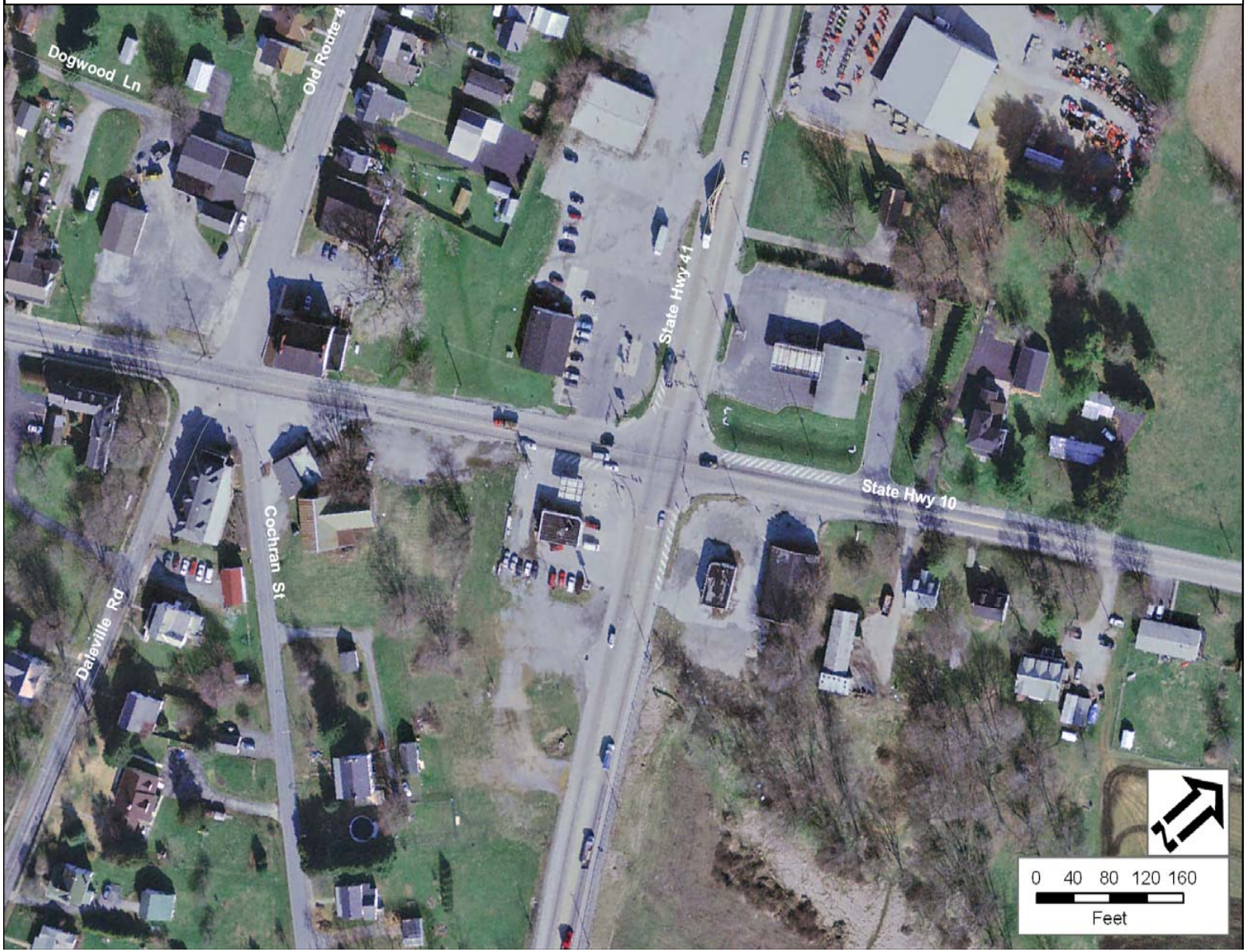
Reportable Crashes
Collision Diagram
Crash Data Years 2003 – 2007

Total Crashes = 8



6. PA 10 Vicinity of Daleville Road and PA 41

Segment 170, Offset 1752 to Segment 180, Offset 957



COLLISION TYPE	
Angle	14
Head-on	3
Hit Fixed Object	3
Rear-end	3
Total	**23**
ILLUMINATION	
Daylight	17
Dark	4
Street Lights	1
Dawn	1
Total	**23**
WEATHER	
Clear	22
Rain	1
Total	**23**
SEVERITY COUNT	
Fatalities	1
Major	4
Moderate	2
Minor	15
Unk Severity	0
Unk If Injured	1

Delaware Valley
Regional Planning Commission
September 2008

CHESTER CO SR 0010 0170/1752 TO 0180/0957 RSA

Date Range: 1/1/2003 to 12/31/2007

Area of Interest: (In County 15 On State Route 0010(P) Between Segment 0170 Offset 1752 and Segment 0180 Offset 957)

USER_ID/QUERY ID: lkubli/ 0620080820009

MONTH OF YEAR

	JAN	MAR	APR	MAY	JUN	JUL	AUG	OCT	NOV	DEC	
CRASHES	3	1	1	1	3	4	4	3	1	2	23
PCT	13%	4%	4%	4%	13%	17%	17%	13%	4%	8%	100%

DAY OF WEEK

	SUN	MON	TUE	WED	THR	FRI	SAT	
CRASHES	3	8	3	1	2	3	3	23
PCT	13%	34%	13%	4%	8%	13%	13%	100%

HOUR OF DAY

	00	01	05	07	08	12	13	14	15	16	17	18	20	
CRASHES	1	1	2	1	1	3	1	4	1	3	3	1	1	23
PCT	4%	4%	8%	4%	4%	13%	4%	17%	4%	13%	13%	4%	4%	100%

YEAR

	CRASHES	PCT
2003	3	13%
2004	10	43%
2005	2	8%
2006	4	17%
2007	4	17%
TOTAL	23	100%

COLLISION TYPE

	CRASHES	PCT
ANGLE	14	60%
HEAD ON	3	13%
HIT FIX OBJ	3	13%
REAR END	3	13%
TOTAL	23	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
FATAL	1	4%
MAJOR	2	8%
MODERATE	2	8%
MINOR	5	21%
PDO	13	56%
TOTAL	23	100%

SEVERITY COUNT

	PERSONS
FATALITIES	1
MAJOR	4
MODERATE	2
MINOR	15
UNK SEVERITY	0
UNK IF INJURED	1

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	23	43%
IMPROPER/CARELESS TURN	7	13%
DRIVER WAS DISTRACTED	3	5%
OTHER IMPROPER DRIVING	3	5%
PROCEED W/O CLEARANCE	3	5%
RUNNING RED LIGHT	3	5%
AFFECTED PHYSICAL COND	2	3%
TOO FAST FOR CONDITION	2	3%
WRONG SIDE OF ROADWAY	2	3%
CARELESS PASS/LN CHNG	1	1%
ILLEGAL STOPPED ON RD	1	1%
IMPROPER ENTRANCE HWY	1	1%
OTHERS	2	3%
TOTAL	53	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	26	56%
SMALL TRUCK	8	17%
SUV	4	8%
VAN	3	6%
LARGE TRUCK	2	4%
PEDALCYCLE	2	4%
MOTORCYCLE	1	2%
TOTAL	46	100%

ROAD CONDITION

	CRASHES	PCT
DRY	18	78%
WET	5	21%
TOTAL	23	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	17	73%
DARK	4	17%
DAWN	1	4%
STREET LIGHTS	1	4%
TOTAL	23	100%

WEATHER

	CRASHES	PCT
CLEAR	22	95%
RAIN	1	4%
TOTAL	23	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	23	100%
TOTAL	23	100%

CDART - CRASH SUMMARY REPORT (09-06)

NOTES:

1

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2 2008 crash records are incomplete

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3 Complete data years

Complete records of reportable crashes are available in CDART for the following years: 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005,2006, 2007

REPORT PARAMETERS:

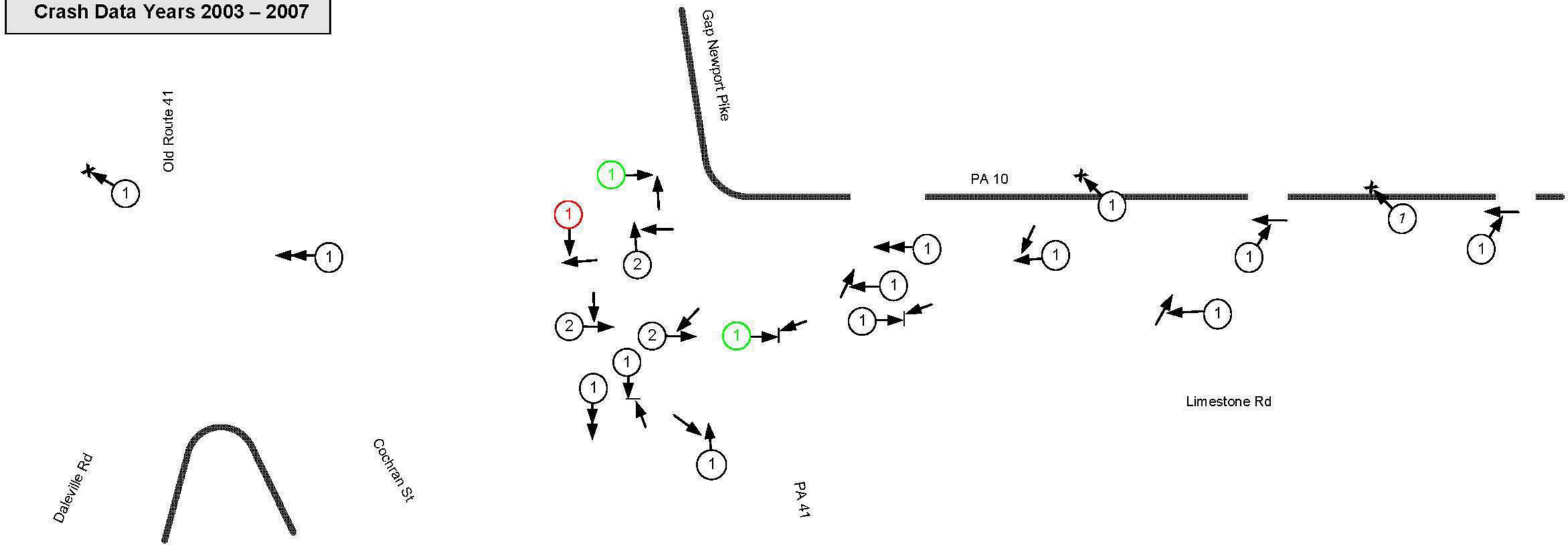
Query ID:	0620080820009
User ID:	lkubli
Area of Interest:	(In County 15 On State Route 0010(P) Between Segment 0170 Offset 1752 and Segment 0180 Offset 957)
Date Range:	1/1/2003 to 12/31/2007
Criteria:	STATE ROAD

Road Safety Audit
PA 10

6. Vicinity of Daleville Road and PA 41

Reportable Crashes
Collision Diagram
Crash Data Years 2003 – 2007

Total Crashes = 23



Crash Type Legend

(1) = # Crashes
(1) = # Fatal Crash
(1) = # Pedacycle Involved Crash
Hit Fixed Object
Head On
Angle
Rear End

SCHEMATIC NOT TO SCALE

Delaware Valley Regional Planning Commission
September 2008

7. PA 10 Vicinity of Gum Tree Road

Segment 190, Offset 0 to Segment 190, Offset 1398

COLLISION TYPE	
Hit Fixed Object	6
Angle	5
Rear-end	3
Head-on	1
Non Collision	1
Total	**16**
ILLUMINATION	
Daylight	6
Dark	5
Street Lights	2
Dawn	1
Dusk	1
Unknown Lighting	1
Total	**16**
WEATHER	
Clear	13
Fog	2
Rain	1
Total	**16**
SEVERITY COUNT	
Fatalities	0
Major	2
Moderate	2
Minor	14
Unk Severity	0
Unk If Injured	0

Delaware Valley
Regional Planning Commission
September 2008

CHESTER CO SR 0010 0190/0000 TO 0190/1398 RSA

Date Range: 1/1/2003 to 12/31/2007

Area of Interest: (In County 15 On State Route 0010(P) Between Segment 0190 Offset 0 and Segment 0190 Offset 1398)

USER_ID/QUERY ID: lkubli/ 0620080820010

MONTH OF YEAR

	JAN	MAR	APR	MAY	AUG	SEP	OCT	NOV	DEC	
CRASHES	1	2	1	3	2	3	2	1	1	16
PCT	6%	12%	6%	18%	12%	18%	12%	6%	6%	100%

DAY OF WEEK

	SUN	MON	TUE	WED	THR	FRI	SAT	
CRASHES	1	4	1	2	3	4	1	16
PCT	6%	25%	6%	12%	18%	25%	6%	100%

HOUR OF DAY

	00	01	04	05	06	13	16	17	18	19	23	
CRASHES	1	1	1	1	3	1	2	2	1	2	1	16
PCT	6%	6%	6%	6%	18%	6%	12%	12%	6%	12%	6%	100%

YEAR

	CRASHES	PCT
2003	4	25%
2004	1	6%
2005	3	18%
2006	3	18%
2007	5	31%
TOTAL	16	100%

COLLISION TYPE

	CRASHES	PCT
HIT FIX OBJ	6	37%
ANGLE	5	31%
REAR END	3	18%
HEAD ON	1	6%
NON COLL	1	6%
TOTAL	16	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
MAJOR	2	12%
MODERATE	2	12%
MINOR	9	56%
PDO	3	18%
TOTAL	16	100%

SEVERITY COUNT

	PERSONS
FATALITIES	0
MAJOR	2
MODERATE	2
MINOR	14
UNK SEVERITY	0
UNK IF INJURED	0

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	10	30%
RUNNING STOP SIGN	8	24%
TOO FAST FOR CONDITION	3	9%
DRIVER WAS DISTRACTED	2	6%
SPEEDING	2	6%
AFFECTED PHYSICAL COND	1	3%
DRIVER INEXPERIENCED	1	3%
FAILURE TO RESPOND TCD	1	3%
IMPROPER EXIT FROM HWY	1	3%
IMPROPER/CARELESS TURN	1	3%
OTHER IMPROPER DRIVING	1	3%
OVER/UNDER COMP CURVE	1	3%
OTHERS	1	3%
TOTAL	33	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	15	60%
SMALL TRUCK	6	24%
LARGE TRUCK	2	8%
SUV	2	8%
TOTAL	25	100%

ROAD CONDITION

	CRASHES	PCT
DRY	10	62%
WET	4	25%
ICE	1	6%
ICE PATCH	1	6%
TOTAL	16	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	6	37%
DARK	5	31%
STREET LIGHTS	2	12%
DAWN	1	6%
DUSK	1	6%
UNK LIGHTING	1	6%
TOTAL	16	100%

WEATHER

	CRASHES	PCT
CLEAR	13	81%
FOG	2	12%
RAIN	1	6%
TOTAL	16	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	13	81%
SLIPPERY ICE/SNOW	2	12%
OTHER WEATHER COND	1	6%
TOTAL	16	100%

CDART - CRASH SUMMARY REPORT (09-06)

NOTES:

1

The data available in this application is dynamic and should be used with care. Please take note of the following data alerts:

2 2008 crash records are incomplete

Data for the current year, 2008, is not fully represented in CDART. Crashes will be added for this year as they are made available to the Department. Include this year in queries with caution.

3 Complete data years

Complete records of reportable crashes are available in CDART for the following years: 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005,2006, 2007

REPORT PARAMETERS:

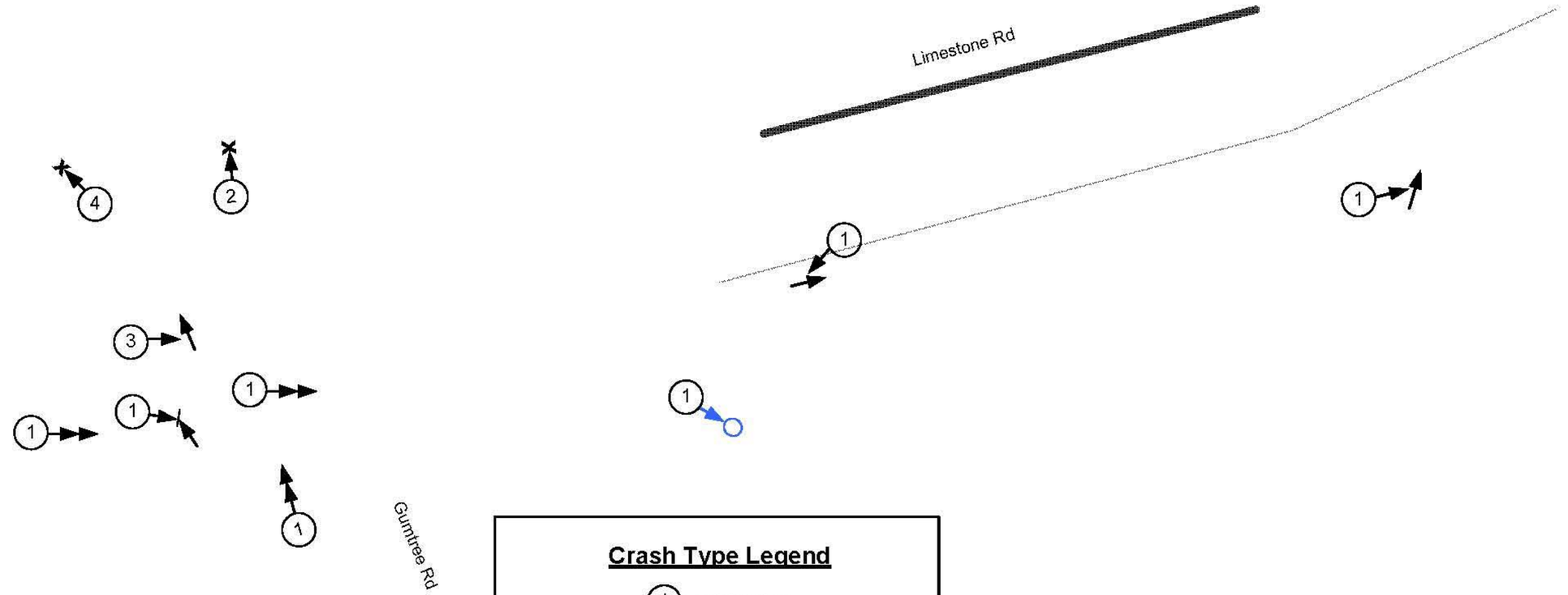
Query ID:	0620080820010
User ID:	lkubli
Area of Interest:	(In County 15 On State Route 0010(P) Between Segment 0190 Offset 0 and Segment 0190 Offset 1398)
Date Range:	1/1/2003 to 12/31/2007
Criteria:	STATE ROAD

Road Safety Audit
PA 10

7. Vicinity of Gumtree Road

Reportable Crashes
Collision Diagram
Crash Data Years 2003 – 2007

Total Crashes = 16



Crash Type Legend

1 = # Crashes

Hit Fixed Object

Head On

Rear End

Angle

Possible Miscoding

Non-Collision

"Hit Fixed Object"

SCHEMATIC NOT TO SCALE

Delaware Valley Regional Planning Commission
September 2008

8. PA 10 at Friendship Church Road

Segment 220, Offset 0 to Segment 220, Offset 174

COLLISION TYPE	
Angle	5
Hit Fixed Object	1
Total	**6**
ILLUMINATION	
Dark	4
Daylight	1
Dusk	1
Total	**6**
WEATHER	
Clear	6
Total	**6**
SEVERITY COUNT	
Fatalities	0
Major	0
Moderate	0
Minor	2
Unk Severity	0
Unk If Injured	1

Delaware Valley
Regional Planning Commission
September 2008

CHESTER CO SR 0010 0220/0000 TO 0220/0174 RSA

Date Range: 1/1/2003 to 12/31/2007

Area of Interest: (In County 15 On State Route 0010(P) Between Segment 0220 Offset 0 and Segment 0220 Offset 174)

USER_ID/QUERY ID:
lkubli/ *0620080820011*

MONTH OF YEAR

	FEB	MAY	OCT	NOV	
CRASHES	1	1	1	3	6
PCT	16%	16%	16%	50%	100%

DAY OF WEEK

	SUN	MON	THR	FRI	
CRASHES	2	2	1	1	6
PCT	33%	33%	16%	16%	100%

HOUR OF DAY

	13	18	21	23	
CRASHES	1	3	1	1	6
PCT	16%	50%	16%	16%	100%

YEAR

	CRASHES	PCT
2003	1	16%
2004	2	33%
2005	2	33%
2007	1	16%
TOTAL	6	100%

COLLISION TYPE

	CRASHES	PCT
ANGLE	5	83%
HIT FIX OBJ	1	16%
TOTAL	6	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
MINOR	2	33%
UNK IF INJURED	1	16%
PDO	3	50%
TOTAL	6	100%

SEVERITY COUNT

	PERSONS
FATALITIES	0
MAJOR	0
MODERATE	0
MINOR	2
UNK SEVERITY	0
UNK IF INJURED	1

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	5	41%
IMPROPER/CARELESS TURN	4	33%
DRIVER INEXPERIENCED	1	8%
OVER/UNDER COMP CURVE	1	8%
PROCEED W/O CLEARANCE	1	8%
TOTAL	12	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	6	54%
VAN	3	27%
SMALL TRUCK	1	9%
SUV	1	9%
TOTAL	11	100%

ROAD CONDITION

	CRASHES	PCT
DRY	6	100%
TOTAL	6	100%

ILLUMINATION

	CRASHES	PCT
DARK	4	66%
DAYLIGHT	1	16%
DUSK	1	16%
TOTAL	6	100%

WEATHER

	CRASHES	PCT
CLEAR	6	100%
TOTAL	6	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	6	100%
TOTAL	6	100%

CDART - CRASH SUMMARY REPORT (09-06)

NOTES:

1

The data available in this application is dynamic and should be used with care. Please take note of the following data alerts:

2 2008 crash records are incomplete

Data for the current year, 2008, is not fully represented in CDART. Crashes will be added for this year as they are made available to the Department. Include this year in queries with caution.

3 Complete data years

Complete records of reportable crashes are available in CDART for the following years: 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005,2006, 2007

REPORT PARAMETERS:

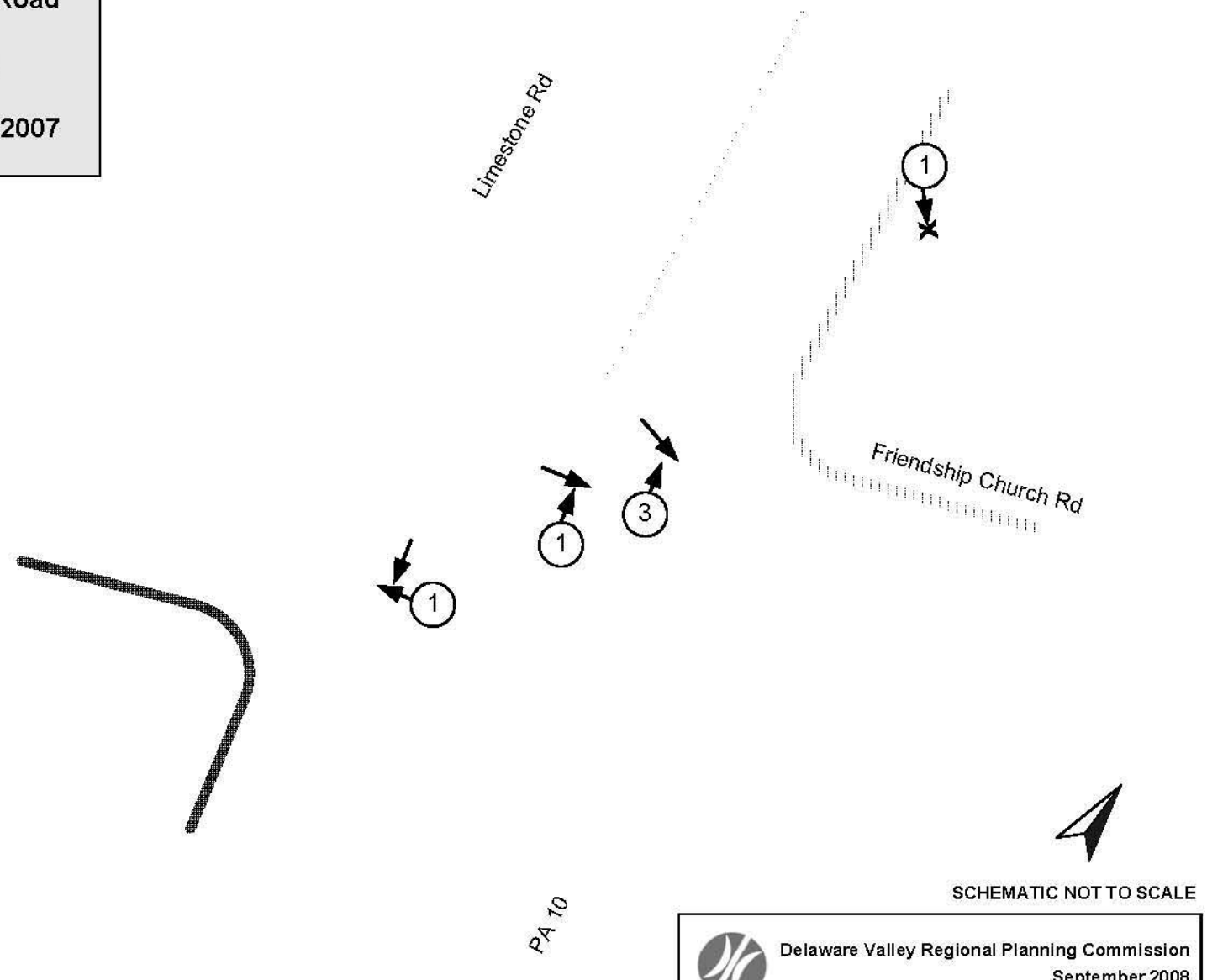
Query ID:	0620080820011
User ID:	lkubli
Area of Interest:	(In County 15 On State Route 0010(P) Between Segment 0220 Offset 0 and Segment 0220 Offset 174)
Date Range:	1/1/2003 to 12/31/2007
Criteria:	STATE ROAD

Road Safety Audit
PA 10

8. At Friendship Church Road

Reportable Crashes
Collision Diagram
Crash Data Years 2003 – 2007

Total Crashes = 6



Crash Type Legend

(1) = # Crashes

Rear End

Angle

Hit Fixed Object

SCHEMATIC NOT TO SCALE

Delaware Valley Regional Planning Commission
September 2008

APPENDIX K
South Section
Photo Log

Stop sign at Catamount Road is too low

Catamount Road, pavement markings do not indicate intersection

Pavement marking at the intersection of Old Limestone Road does not indicate intersection

Trees overhang northbound PA 10 approaching PA 896 obstructing signs, signals and impeding horse and buggy traffic

Guide rail with two blunt ends for driveway on northbound side of PA 10

Guide rail with two blunt ends for driveway, second string of guide rail is ineffective

PA 10 pavement rutted at the PA 896 approach

“Stop Ahead” legend faded at the northbound approach of PA 896

Tight turning radii at the intersection of PA 10/PA 896

Damaged sign north of PA 896 intersection

The guide rail has improper end treatment and is not properly secured along northbound PA 10, north of the PA 896 intersection

Faded “Stop Ahead” pavement marking approaching PA 896 intersection southbound

Old Limestone Road slopes away from the PA 10 intersection. Inadequate sight distance from Old Limestone Road looking south at PA 10

Damaged signs at the Old Limestone Road intersection

Old, damaged barrier blocking the previous Old Limestone Road alignment is located in the clear zone

PA 926 intersection at PA 10, intersection is skewed. “Stop” sign on the right is setback too far from the intersection and is blocked by trees.

Tight intersection radii at High Point Road makes it difficult for turns at the intersection

Offset intersections of High Point and Troop Roads with PA 10; water pooling on the corner of Troop Road deteriorating pavement edge causing drop off

Drainage opening with a concrete headwall on the corner of the intersection of PA 10/High Point Road; “Stop” sign is too low

High Point Road approach to PA 10 is steep and abrupt

Ewing Road and Edenton Road – offset intersections on the curve

Ewing Road and Edenton Road – limited sight distance looking south

Ewing Road approach to PA 10

Edenton Road approach to PA 10

Blind crest approaching Highview Drive

Edge drop off opposite Glenville Road on the northbound side of PA 10

Holes in the pavement on PA 10 north of Highview Drive

Open access for the businesses on the corner of Glenville Road and PA 10. Curve is super-elevated

No curb or sidewalk on the northbound side of PA 10 north of Church Road

PA 10 slopes to the inside of the curve at the Church Road intersection on PA 10

Skewed alignment of Church Road at PA 10. “Stop” sign is too low and covered in the trees.

Sidewalks in poor condition approaching PA 41 northbound

Sidewalks in poor condition on PA 10 in Cochranville. The “fire station” and the “curve signs are mounted too low

Sidewalk in poor condition with huge drop to street.

No access management at shops

No access management at shops. Stop signs at Daleville and Cochran Roads are missing or in the wrong position

Traffic backed up at the PA 10/PA 41 intersection. Turkey Hill driveway is right at the intersection

Gas station access at the northbound approach of the PA 10/PA 41 intersection

Traffic signal at PA 10/PA 41 does not have a protected left turn phase, traffic is often stranded beyond the stop bar

PA 10/PA 41 northbound intersection approach

The stop bar for the PA 10/PA 41 intersection southbound approach is too close to the intersection

Truck making a right turn on to PA10 southbound from eastbound PA 41

Pavement markings are faded at the PA 10/PA 41 intersection

Truck making a left turn on to PA10 northbound from eastbound PA 41

The skewed intersection of Gum Tree Road/PA 10. This intersection in on a curve. Stop bar is missing

Drain and concrete head wall on the northeast corner of Gum Tree Road

Unprotected drain on the southbound side of PA 10 opposite Gum Tree Road

Gum Tree Road approach to PA 10. “Stop” sign on the left is leaning and blocked by tree. Concrete wall is directly opposite the intersection in the clear zone of southbound PA 10

Traffic was observed speeding southbound around the curve north of Friendship Church Road

Sign at the Friendship Church Road intersection is leaning. Street name sign is not legible.

Friendship Church Road is in a curve on PA 10, sight distance is limited to the south due to the undulating roadway

At Friendship Church Road, some vehicles are not visible due to the geometry of the roadway

APPENDIX L
South Section
Response Sheet

PA 10 SOUTH ROAD SAFETY AUDIT
RESPONSE SHEET

Audit Team Corridor-wide Priorities

Issue	Recommended Strategies	Decision Agree/Reject	Planned Completion Date	Comments
a) Signs • Speed limit signs are non-reflective • Chevrons are missing from several curves in the corridor • Street name signs are not legible, especially at night • Intersection ahead signs are missing prior to several intersections • Roadway geometry restricts sight distance along the corridor • Sign sizes may not be appropriate for the speed limit and geometry of the roadway	• Replace signs with reflective material • Add or replace chevrons as needed • Replace all street name signs according to MUTCD specifications • Identify locations that do not have advance signs and add signs as appropriate with street name plaque below • Utilize appropriate warning signs to alert motorists of conditions (e.g.: “Hill blocks view” signs) • Consider replacing existing signs with larger ones as appropriate ***Conduct a sign inventory along the corridor and upgrade signs with the appropriate signs for the existing conditions***			

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
	according to MUTCD requirements.			
a) Signs Cont'd	***Conduct an analysis to determine the appropriate advisory speeds for curves along the corridor. Consider the buggy traffic when placing signs***			
b) Roadway delineation • Roadway pavement markings are not visible in dark conditions • Curves not clearly delineated • Double yellow centerline does not appropriately indicate side streets to guide motorists (some are extended through the	• Install raised pavement markers (RPM) in the centerline; reflective pavement markings; dashed edgeline across intersections • Consider raised pavement markers or flexible tubular delineators to better define intersections at night along the corridor • Install chevrons around curves • Restripe double yellow centerlines to adequately guide motorists at intersections			

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
intersection and some end too far from the intersection)				
b) Roadway delineation cont'd • 31 percent of the crashes over the 5 year period were run-off-the-road crashes hitting a fixed object. Many involved a utility pole	• Coordinate with utility companies and PennDOT Utility Unit to consider relocation and/or addition of delineation to the utility poles in the corridor • Add edge line and centerline rumble strips throughout the corridor as appropriate. (Coordinate with strategy for shoulder widening) ***Perform corridor-wide assessment of delineation; implement consistent treatment***			
c) Speeding • Many vehicles were observed traveling too fast in the corridor	• Conduct speed inventory to determine the appropriateness of current posted speed limit and use results to identify			

Issue	Recommended Strategies	Decision Agree/Reject	Planned Completion Date	Comments
	appropriate signage • Conduct speed inventory • Identify and create pull off areas in the corridor for enforcement • Evaluate the feasibility of narrowing the lanes to 11 feet with consideration given to truck and horse-and-buggy traffic			
c) Speeding Cont'd	***Perform a speed inventory to determine the appropriateness of existing speed zones, opportunities for enforcement, and travel lane widths.***			

Audit Team Site Specific Priorities

Issue	Recommended Strategies	Decision Agree/Reject	Planned Completion Date	Comments
• Clogged drain on the southwest corner of Edenton Road • Crushed drain pipe on southbound PA 10 north of Edenton Road	• Clear drain • Repair/replace pipe			

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
• On Edenton Road approaching PA 10, the "stop" sign obstructed by trees • Edge drop-off on the southeast corner of Ewing Road • Utility pole on southeast corner of Ewing Road • Streets are offset on the curve with no advance warning sign •	• Trim back trees • Repair roadway edge • Relocate the utility pole • Install offset intersection advance warning signs			
d) Ewing Road/Edenton Road Cont'd • Curve warning sign is missing (not indicating the side road) • Super-elevation grade needs to be checked from the north side to south side	• Add advance curve warning sign southbound • Assess the problem and address as appropriate			
e) Cochranville – Highview Drive • Speed limit signs approaching the intersection lack	• Upgrade signs			

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
reflectivity • Excessive speeds prior to intersection where speeds are reduced to 35 MPH • Blind crest approaching the intersection • Centerline and edge line do not properly indicate the intersection of Highview Drive • Shrub south of the Highview Drive intersection impairs sight distance of motorists at the Highview Drive approach	• Consider a traffic calming gateway treatment for Cochranville south of Highview Drive • Add dashed edge line across the intersection and break the double yellow centerlines to properly indicate the intersection • Trim the shrub to improve sight distance			
e) Cochranville – Glenville Road • Open access to the business at the northwest corner • Drainage grate on the southwest corner is depressed • Edge drop-off on the southbound side of PA 10	• Access management – create defined access to the business • Make drainage grate flush with pavement and make all inlets bicycle safe • Repair roadway to reduce drop-off			

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
e) Cochranville – Homeville Road/Church Road • The curve is super elevated and seems unnecessary for the posted speed limit. • Vehicles run the stop signs at the intersection • "Stop" sign at Church and PA 10 is low and obstructed by bushes	• Evaluate the super elevation and or cross slope on the curve. Consider re-design of the Homeville Road/PA 10 intersection to a "T," and convert Church Road to one-way out • Cut back bushes and re-install "stop" sign according to MUTCD specification			
e) Cochranville – Daleville Road and Cochran Road • No access control at gift shop/restaurant business (between Daleville Road and Cochran Road on the east side of PA 10)	• Define Daleville Road and Cochran Road with paint and/or curb. Consider defined access points for the businesses			
e) Cochranville – Daleville Road and Cochran Road Cont'd • "Stop" signs for Daleville Road and Cochran Road are	• Add or relocate "stop" signs for both intersections			

Issue	Recommended Strategies	Decision Agree/Reject	Planned Completion Date	Comments
either missing or in the wrong location • Concrete wall on the southbound side of PA 10 just north of Old Route 41 is a run-off-the-road hazard • Poor street name signs • Sidewalks in poor condition	• Add clearance marker in advance of concrete wall • Upgrade street name signs • Upgrade and add sidewalk from Hillview Drive to PA 41			
f) PA 41 • Turkey Hill driveway is too close to the intersection • "No left turn" sign exiting the driveway is too low and leaning	• Restrict left turns in and out of the driveway. Construct channelized island to prevent left turns • Re-install sign according to MUTCD specifications ***Turkey Hill plans on relocating driveway further south; existing driveway should be eliminated at that time***			
• Northbound traffic queues for the PA 41 intersection back to	• Upgrade signal and revise phasing to accommodate dedicated left turn phasing			

Issue	Recommended Strategies	Decision Agree/Reject	Planned Completion Date	Comments
Church Road • Left turns are problematic; no dedicated left turn signals • Red light running at the end of the green cycle at PA 41 • Existing pedestrian signals are not visible, and no pedestrian signal exists on the southwest corner for pedestrians traveling east • Faded pavement markings at the intersection (crosswalks, stop bars and lane striping) • Stop bar at southbound PA 10 creates turning difficulties	on all approaches ***Municipality needs to submit request to PennDOT before any action can be taken*** • Upgrade existing pedestrian heads or add new as needed; utilize countdown timers • Re-stripe all pavement markings as appropriate • Relocate stop bar as appropriate.			
g) Gum Tree Road • Road drops off at the drain on the southbound side of PA 10 south of the intersection • Culvert on the northeast corner has a huge hole	• Add guide rail to protect run-off-the-road motorists • Replace headwall with a drop inlet and re-grade the			

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
with a concrete headwall	area to make it traversable			
g) Gum Tree Road Cont'd • A large number of crashes at the intersection run into the stone wall on PA 10 opposite Gum Tree Road • Some crashes involve vehicles running the "stop" sign on Gum Tree Road • Tree obstructs "stop" sign on the left at the Gum Tree Road approach • Trees interfere with sight distance at the intersection • Gum Tree Road	• Install lighting at the intersection • Add reflectors to the stone wall • Install larger double arrows opposite the intersection • Install rumble stripes approaching stop sign at Gum Tree Rd (milling or thermoplastic) • Install "stop sign ahead" signs with flashing beacons on Gum Tree Road • Increase the size of "stop" signs • Add reflective strips on the "stop" sign posts • Cut back trees • Add a painted island to the Gum Tree Road approach to align vehicles			

Issue	Recommended Strategies	Decision Agree/Reject	Planned Completion Date	Comments
approach is skewed	perpendicular to PA 10 and improve sight distance			

ADDITIONAL SAFETY ISSUES

Corridor-Wide Issues

Issue	Recommended Strategies	Decision Agree/Reject	Planned Completion Date	Comments
Shoulders • Narrow shoulders from the PA 926 intersection and north	• Maintain a consistent minimum shoulder width of 4 feet throughout the corridor ***Conduct feasibility assessment of maintaining a consistent shoulder width throughout the corridor. Identify priority areas. Consideration should be given to edge-line rumble strips application with horse-and-buggy and cyclist concerns***			
Passing Zones • Many passing zones may be too short in length for a vehicle to	• Reevaluate the need for existing passing zones throughout the corridor and			

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
pass safely • Many extend through intersections	restripe and sign as appropriate			
Pavement Markings • Lack of striping on side streets to guide motorists • On side streets, where centerlines exist they do not extend far enough to the approach of intersection.	• Add centerline and stop bars on side streets. Add dashed edge line on PA 10 • Continue yellow striping to stop bar where appropriate			
Pavement Markings Cont'd • Some curve warning signs are not prominent	• Add advance curve warning legend (ACWL) pavement markings or appropriate legends to supplement the existing warning signs ***In cooperation with the municipalities, conduct an inventory of pavement markings on the side street approaches and PA 10 and address as appropriate.***			
Drainage				

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
• Clogged inlets, ditches, and pipes • Low points in the roadway prevent adequate storm water flow	• Clear pipes, inlets, and drains • Examine municipal hydrology plans. Change roadway profile as appropriate and install pipes and storm water system parallel to the roadway. ***Consider a corridor-wide hydrologic assessment in coordination with municipalities***			
Coordination • Need increased coordination between all responsible agencies to ensure safer travel in the corridor	• Improve coordination between agencies at all levels to implement transportation safety strategies			
Coordination Cont'd	• Consider continued joint field views between PennDOT Maintenance, Chester County and municipalities to address on-going safety issues.			
Maintenance				

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
• Vegetation encroaches on the roadway blocking signs and pavement markings as well as shadowing the roadway from direct sunlight (prevents melting of snow and ice) • Additionally, it forces the buggies from the shoulder and into the travel way	• Cut back vegetation beyond the edge of shoulder to ensure no encroachment on the roadway			
Utility Poles • Utility poles are located on both sides of PA 10	• Coordinate with utility companies to share the poles to reduce fixed object hazards			
Oil and Chip • This treatment makes other safety treatments impossible to implement, e.g., edge line rumble strips	• Coordinate the oil and chip treatment with safety treatment along the corridor ***PA 10 is programmed for FY 09 Resurfacing***			

Site Specific Issues

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
Webster Lane to PA 896 • Cross slope appears excessive southbound north of Webster Lane • Future park at Catamount Road may generate bicycle and pedestrian traffic in this area • Centerline and edge line do not indicate the intersection of Old Limestone Road • Centerline and edge line do not indicate the intersections of Catamount Road and Cullen Road • "Stop" sign at Old Limestone Road approach is too low • Sign posts with no signs on northbound side of PA 10 north of Cullen Road	• Assess the cross slope problem and address as appropriate • Provide safe pedestrian and bicycle amenities with the development of the park. (to be accomplished through the township review process) • Revise existing pavement markings • Add dotted edge line across the intersection and advance "intersection ahead" warning sign with street name plaque • Add dotted edge line across the intersection and advance "offset intersection ahead" warning sign with street name plaque • Re-install sign according to MUTCD specifications • Replace missing signs or remove posts			

Issue	Recommended Strategies	Decision Agree/Reject	Planned Completion Date	Comments
• Sign post with no sign on southbound side of PA 10 north of Old Limestone Road	• Replace missing sign or remove post			
Webster Lane to PA 896 Cont'd • Ruts in the pavement along northbound side of PA 10 north of Cullen Road • Break in guide rail approaching PA 896 northbound for a driveway at 1804 PA 10. Guide rail has two blunt ends for driveway opening. The second string of guide rail is ineffective • Trees between Log House Road and PA 896 overhang roadway obstructing visibility of signs, signal, and intersection and impedes buggy traffic from using the shoulder • Faded "stop ahead" pavement markings • Guide rail on the	• Repair pavement • Remove the ineffective section of guide rail and consider whether or not ET must be changed • Cut back trees from the right of way • Repaint pavement legend • Extend guide rail as appropriate and upgrade			

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
southbound side of PA 10 south of the PA 896 intersection is too short, resulting in ineffective protection for run-off-the-road vehicles	end treatment			
PA 896 • Rippled, rutted, damaged pavement at the intersection approaches due to the high braking demands of the 4-way stop. • Tight turning radii at the intersection • Missing/faded stop bars on all intersection approaches • "End 25 MPH" sign is inappropriately placed west of the PA 10/PA 896 intersection in the eastbound direction on	• Repair/repave pavement • Through coordination with municipalities and residents consider installation of transverse rumble strips/stripes to slow traffic approaching the intersection • Consider "stop ahead" raised pavement markings on all approaches • Add flashing beacons to the advance warning "stop ahead" signs in both direction • Consider widening the corner radii. • Install stop bars on all approaches of the intersection • Relocate sign after the PA 10/PA 896 intersection			

Issue	Recommended Strategies	Decision Agree/Reject	Planned Completion Date	Comments
PA 896				
Between PA 896 and PA 926 • Faded “stop ahead” pavement markings	• Repaint “stop ahead” pavement markings			
Between PA 896 and PA 926 **Cont’d** • On the northbound side, the guide rail has the improper end treatment and is not properly bolted down • Clogged inlet pipe on the southbound side of the road next to 45 MPH sign	• Upgrade the guide rail end treatment as appropriate • Clear clogged pipes			
Old Limestone Road • There are no advance warning signs for the intersection • Inadequate sight distance looking south from Old Limestone Road	• Install advance intersection warning signs in both directions • Evaluate CSD and determine an appropriate course of action • Add pavement markings on			

Issue	Recommended Strategies	Decision Agree/Reject	Planned Completion Date	Comments
• Old barrier located in the clear zone on the northwest corner of the intersection	Old Limestone Road and dashed edge line across the intersection on PA 10 • Remove the barrier and delineate			
PA 926 • Inadequate sight distance from PA 926. Motorists needs better guidance for stopping at the intersection and pulling out	• Add a painted island and a dotted edge line to the PA 926 approach to better align vehicles perpendicular to PA 10 and improve sight distance and add a stop bar			
PA 926 Cont'd • "Stop" sign on the right at the PA 926 approach is blocked by the trees • The PA 10 route marker on PA 926 approach has graffiti markings • Sign clutter on PA 10 opposite the PA 926 approach (route markers, double arrow)	• Trim tree • Replace PA 10 route marker • Remove route markers			
Between PA 926 and Ewing Road • Low point in the	• Conduct hydrology and			

Issue	Recommended Strategies	Decision Agree/Reject	Planned Completion Date	Comments
roadway causing drainage problems	hydraulic study to determine the source of water and where it is going to better manage the volume of storm water			
Between Ewing Road and Troop Road • Sign hidden behind utility pole • Narrow lanes (10′ lane and 2′ shoulder) • Roadway failing northbound at the curve south of Troop Road	• Relocate sign • Widen roadway to a minimum of 11-foot lanes and 4-foot shoulders • Repair roadway as appropriate			
High Point Road and Troop Road • Water pooling at southeast corner of Troop Road • On the southwest corner of the intersection there is a drainage opening with a concrete headwall • “Stop” sign on the southwest corner of the intersection is too low	• Assess the problem and address as appropriate • Replace headwall with inlet or make flush with the pavement • Re-install sign according MUTCD specifications • Improve turning radii at the			

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
• Tight intersection radii makes it difficult for turns at the intersection (especially farm vehicles) • Southbound lane appears to be sloped to the centerline • High Point Road approach to PA 10 is steep and abrupt can contribute to vehicles losing control • At the High Point Road approach looking southbound on PA 10 fence posts obstruct view • Centerline and edge line do not indicate the intersections of High Point Road and Troop Road	intersections of High Point Road and Troop Road • Correct the positive cross slope along the southbound lane • Re-grade the approach of High Point Road • Relocate fence posts to improve sight distance • Add dashed edge line across the intersections and break the centerlines as appropriate			
Hostetter Road • Unpaved roadway	• Consider paving the approach to keep gravel off PA 10			

Issue	Recommended Strategies	**Decision** Agree/Reject	**Planned** Completion Date	Comments
Between PA 41 and Gum Tree Road • Cross slope falls towards centerline in the northbound lane between house number 3191 and 3219 along PA 10	• Assess the problem and address as appropriate			
Friendship Church Road • Intersection is in a curve • PA 10 crests at the intersection, this limits sight distance for turning vehicles at the intersection	• Consider installing left turn lane for southbound PA 10 • Consider preliminary design of crest vertical curve • Add advance intersection ahead sign with flashing beacon • Consider adding street light			

Title of Report: ***PA 10 ROAD SAFETY AUDIT***

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Geographic Area Covered:
The study area consists of two sections of PA 10 in Chester and Lancaster Counties, incorporating seven municipalities

Key Words:
Potential fatalities, injuries, crashes, issues, strategies, coordination, engineering, enforcement, stakeholders, prioritize, intersection, speed limit, traffic volumes, audit team, geometry, pavement markings, curves, signs, traffic signals, pedestrian, sight distance, shoulders, drainage, edge drop-off.

ABSTRACT: This is a documentation of the process and findings of the PA 10 Road Safety Audit (RSA) undertaken by Delaware Valley Regional Planning Commission (DVRPC). This project represents the collaboration between PennDOT District 6 and DVRPC to address locations in the region with safety issues, to obligate HSIP funding for remedial actions with the aim of making the region's roadways safer. This corridor was identified under Section 148 Planned Safety Projects in the 2006 District 6 Safety Plan as a "high risk rural road." The goal of the audit is to generate improvement recommendations and countermeasures for the two sections of PA 10 to reduce the incidence of motor vehicle crashes. The emphasis is placed on identifying low-cost, quick-turnaround safety projects to address the issues where possible. The report details safety issues identified by the audit team along the study corridor and remedial strategies to address them. Priorities for implementation are identified, and scope of work and cost estimate are formulated.

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