PENNDOT

Delaware Valley Regional Planning Commission

JANUARY 2007

PA 896

Road Safety Audit

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

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

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

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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 896 ROAD SAFETY AUDIT

1.0 BACKGROUND

This project represents the coordination of the Delaware Valley Regional Planning Commission's (DVRPC) Planning Work Program and Pennsylvania Department of Transportation (PennDOT) District 6 Safety Plan. DVRPC's planning work program includes a Road Safety Audit Program. 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. This was an opportunity to analyze corridors which were already on the plan and eligible for dedicated funding.

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, quick turnaround safety projects to address the issues where possible but will not exclude the more complex projects.

1.1 Overview of the Study Area

The study area is approximately 5 miles of PA 896 from Elbow Lane in London Britain Township to Shepherd Lane in New London Township in Chester County, see **Study Area Map** (page 3). PA 896 is functionally classified as a rural minor collector and runs in a northwest-southeast direction. It extends from Lancaster County and points north to the Delaware state border and points south. The land use in this area is predominantly farmland with relatively new residential development along the main arterials. Commuting travel is mainly oriented towards the state of Delaware. The portion of PA 896 under this study is identified as a "High Risk Rural Road" in PennDOT District 6 Safety Plan.

Approximately 4,300 vehicles daily were recorded on PA 896 south of Shepherd Lane in each direction. The southern portion of the study area experiences lower traffic volumes whereas around Parsons Road volumes are approximately 5,000 in the southbound direction and almost 4,700 in the northbound. Speed limit is 45 MPH corridor-wide with lower speeds of 35 MPH at Kemblesville Village and 30mph (advisory speed limit) at curves. There are no signalized intersections within the study area. The intersection of PA 896 and Flint Hill Road is four-way stop controlled. All other intersections in the study area are stop controlled on the side streets.

1.2 Crash Data

According, to PennDOT's crash data there were 132 reportable crashes between 2003 and 2005. Data supplied by Pennsylvania State Police for 2004 and 2005 showed 71 non-reportable crashes on PA 896. Reportable crashes are crashes which result in fatality, injury and/or property damage rendering the vehicle disabled; and non-reportable crashes are those where there are no injuries and/or fatalities and the vehicle(s) can be driven away from the crash scene. A comprehensive analysis of the crash data is shown in **Appendix C**. Of the reportable crashes 49 crashes occurred in 2003 (37%), 47 crashes in 2004 (35%) and 2005 saw a 23% reduction of crashes over 2004 with 36 crashes. The month of September had the most crashes at 19 (14%), January was second with 16 crashes while June and November had 15 and 14 crashes, respectively. Of the 132 reportable crashes, crashes involving a fixed object were 42% (56 crashes), angle crashes were 29% and rear-end crashes were 14%, and one crash involved a pedestrian. There were two fatalities resulting from reportable crashes during the study period, 59 injury crashes with varying levels of severity and 57 property damage only crashes. 71 reportable crashes (53%) occurred on dry road surface conditions, 30% on wet surface and 13% in wintry conditions.

1.3 The Audit

Prior to the road safety audit activities on site, DVRPC collected, reviewed and analyze traffic data (video roadway under different conditions, traffic volume data, turning movement counts provided by *McCormick Taylor* (from the RT. 896 corridor study they had completed earlier this year for Chester County), maps, aerial photographs, previous traffic reports and crash data). Using the crash data, crash clusters were identified and mapped for 14 locations along PA 896. These locations were the main focus of the road safety audit.

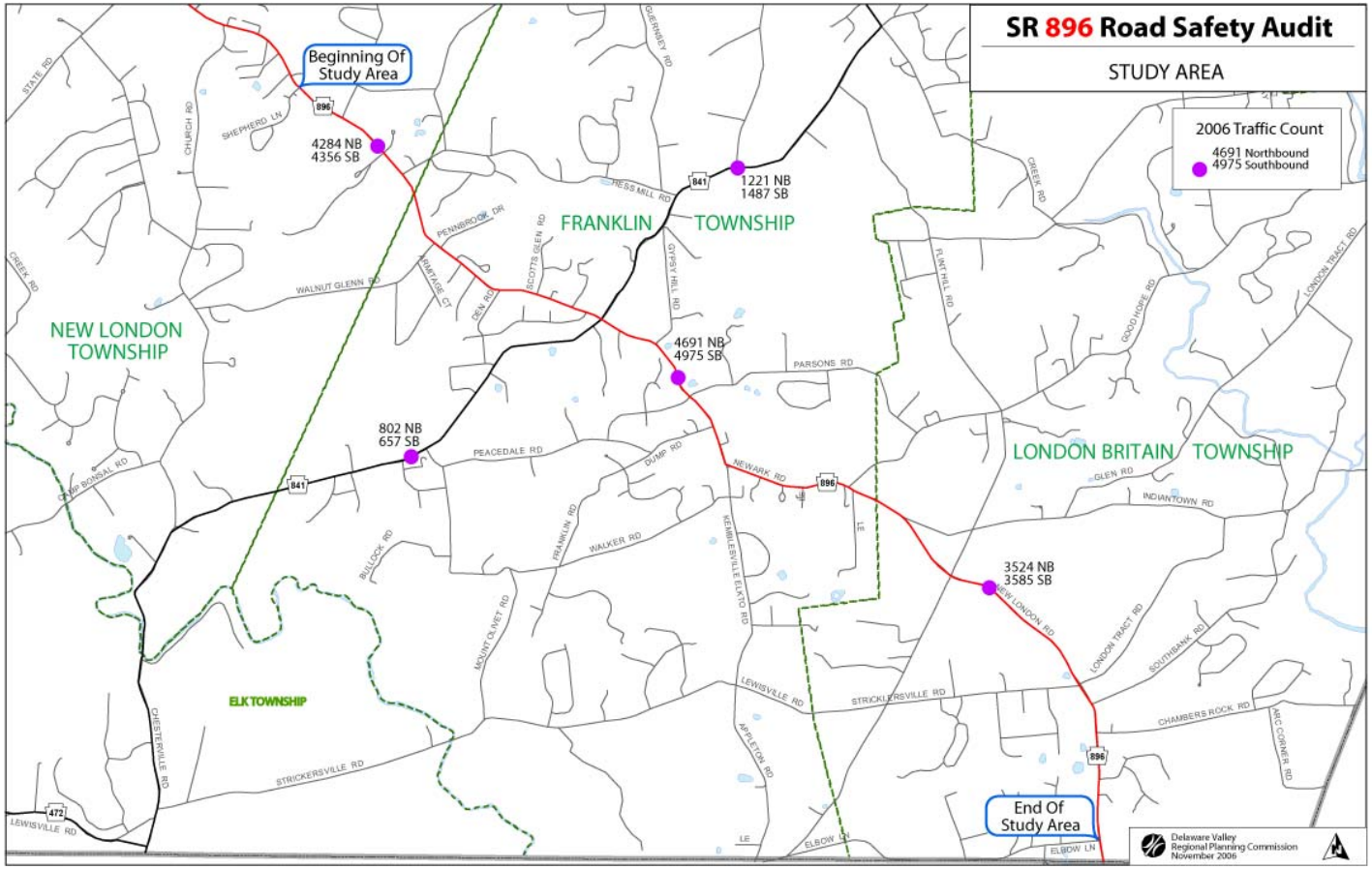
The Road Safety Audit was conducted on November 6, 2006 (Pre-Audit Meeting); November 8, 2006 (Field View); and November 9, 2006 (Post-Audit Meeting).

The Pre-Audit meeting involved the definition of road safety audit and how it differs from a corridor study process; the required steps of an audit; presentation on a previous corridor study conducted by *McCormick Taylor*; presentation of the corridor issues and an exchange of ideas and knowledge of the roadway. See **Appendix B** for presentations. Two videos shot by the DVRPC study team were shown of the study area under both day and night time conditions.

The field view involved the audit team which was made up of federal, state, and local officials and other stakeholders traveling the corridor and identifying transportation safety problems. **See Appendix A** for list of audit team members. The

field view was carried out under rainy conditions. This proved to be beneficial to the audit team because they were able to see first hand the drainage issues along the roadway which were not in evidence on previous visits.

The post-audit meeting was spent discussing the findings from the field view and determining priorities. See **Appendix F** for list of safety issues the audit team identified.



2.0 FINDINGS AND RECOMMENDATIONS

The following represents the findings and recommendations of the PA 896 Road Safety Audit.

CORRIDOR WIDE ISSUES	LEVEL OF EFFORT REQUIRED	POTENTIAL SAFETY BENEFIT	COMMENTS
Roadway Geometry: • Narrow lane widths • Narrow shoulder widths • Overall profile of road needs to be checked	High	High	To increase the lane and shoulder width as appropriate may require right-of-way acquisition
Drainage: • Poor drainage throughout the corridor • Inadequate drainage at intersections	High	High	Due to poor drainage water settles on the roadway or creates a sheet across the roadway. This creates hazardous conditions for the motorist especially in the colder season when this water freezes
Signs: • Inconsistent signage (street name signs, advance warning signs) • Inconsistent signing at curves • Need for additional advisory speed warning signs	Low	High	Installing appropriate signage is a low cost quick turnaround project which can have high safety benefits
Pavement Markings and Delineation • Lack of raised pavement markers (RPM) and delineators • Rumble strips are not utilized (centerline, edge-line, transverse/lateral)	Moderate	High	Raised pavement markers (RPM), delineators and rumble strips have been shown to have high safety benefits. Applying these at the time of re-surfacing can considerably lower cost and effort
Other Considerations • Utility poles in roadway clear zone and on both sides of the road in many locations	High	High	42% (56) of the reportable crashes during the study period were hit fixed object crashes. Approximately 40% (22) of these crashes involved a vehicle hitting a utility pole.
• Lack of locations appropriate for enforcement	High	High	Providing location for enforcement as appropriate may require right-of-way acquisition.

PRIORITY SAFETY ISSUES	REMEDIAL STRATEGIES	LEVEL OF EFFORT REQUIRED			POTENTIAL SAFETY BENEFIT		
		Low	Medium	High	Low	Medium	High
Location # 1 (between School Road and Cobblers Lane)							
• NE corner of School Rd at PA 896 – embankment interferes with sight distance • Inadequate radii at NE quadrant of School Rd • Left-turning traffic blocks through traffic on PA 896 at School Rd	• Channelization on PA 896 at School Rd		X			X	
Location #2 (at Hess Mill Road)							
• Illegible street names/signage (especial under nighttime conditions)	• Replace existing street name signs with MUTCD compliant signage	X					X
• Lack of advance warning signs	• Add MUTCD compliant intersection advance warning signs in both directions of PA 896	X					X
• Southbound sight distance problem due to dirt bank and vegetation on PA 896 south of intersection	• Remove dirt bank on southbound side of PA 896 south of intersection	X				X	
• Left-turning traffic blocks through traffic on PA 896 at Hess Mill Rd	• Investigate the possibility of adding a left turn lane at Hess Mill Road on PA 896 southbound or providing a wider southbound lane to accommodate through traffic passing left turning vehicles		X			X	
Location #3 (between Hess Mill Road and Pennbrook Drive)							
• Bicyclists cannot be accommodated on existing shoulder	• Coordination with Chester County Cycling Coalition to develop strategy for implementing “Share-the-Road” signs	X				X	
• Vertical and horizontal alignment issues	• Recommend centerline rumble strips		X				X

PRIORITY SAFETY ISSUES	REMEDIAL STRATEGIES	LEVEL OF EFFORT REQUIRED			POTENTIAL SAFETY BENEFIT		
		Low	Medium	High	Low	Medium	High
Location #4 (at Pennbrook Drive)							
• Inlet on southwest corner of intersection only serves rainfall - roadside has worn away	• Roadside needs to be built up		X			X	
• Bank on southbound side of PA 896 north of the intersection with Pennbrook Drive presents a sight distance problem.	• Cut back bank on southbound side of PA 896 north of the intersection with Pennbrook Drive	X					X
• Chevrons missing on the PA 896 curve north of Pennbrook Drive	• Upgrade signage and replace missing chevrons	X					X
• Sight distance problem on northeast corner of Pennbrook Drive due to the utility pole and bush	• Clear bush from roadway.	X				X	
Location #5 (at Den Road)							
• Edge drop off – poor drainage in front of Diner (asphalt washed away) • Drainage problems • Rain sheets across driveway – poor swell on the west side	• Address the drainage problems identified per *corridor-wide issues*			X			X
• Access management needed specifically at the restaurant	• Construct curb with defined access and egress point	X				X	
• Utility pole in front of restaurant needs relocation	• Relocate utility pole		X		X		
• Chevrons needed on the curve north of the intersection	• Add chevrons in advance of the curve south of the intersection	X					X
• Inadequate stopping sight distance for northbound PA 896 traffic approaching the intersection	• Add MUTCD compliant intersection ahead signs with street names	X					X

PRIORITY SAFETY ISSUES	REMEDIAL STRATEGIES	LEVEL OF EFFORT REQUIRED			POTENTIAL SAFETY BENEFIT		
		Low	Medium	High	Low	Medium	High
Location #7 (at SR 841)							
• Sight distance is a problem at both northbound and southbound PA 841 at the intersection of PA 896	• Develop collision diagrams of intersection crashes						
• Drainage inlet is located in the intersection	• Relocate the drainage inlet		X		X		
• Vertical and horizontal sight distance problems	• Install "Intersection Ahead" sign with flashing beacon for southbound traffic approaching the intersection before entering the curve • Further study to consider - - Roundabout - 4-way Stop - Traffic Signal	X					X
• Steep grade and curve approaching the intersection on southbound PA 896	• Consider transverse rumble strips to slow traffic approaching intersection		X				X
Location #8 (at Parsons Road)							
• Drainage issues • Ditch drop-off • Check for over super elevation	• Install new inlet		X				X
• Guide rail needs crash worthy end treatment	• Install AASHTO compliant crash worthy guide rail end treatment	X				X	
• Poor sight lines for vehicles approaching the intersection • Stopping sight distance inadequate	• Install signage with advisory speed for curve • Place chevrons on curve • Install Intersection Ahead signage	X					X

PRIORITY SAFETY ISSUES	REMEDIAL STRATEGIES	LEVEL OF EFFORT REQUIRED			POTENTIAL SAFETY BENEFIT		
		Low	Medium	High	Low	Medium	High
Location #9 (at Appleton Road)							
• Travel lanes not wide enough for trucks • Lanes too narrow for vehicles to navigate safely at posted speeds	• Restripe centerline to accommodate a northbound PA 896 10-foot lane • Add centerline rumble-strip to PA 896 • Add lateral rumble-strips on northbound PA 896 before curve to raise driver awareness • Trim tree over road at eastside of PA 896 curve at the intersection • Develop collision diagram of crashes at the intersection ***See Appendix C***	X X	 X X 	 	 X	 	X X X
• Better warning signage on PA 896 northbound curve	• Install advance curve warning speed signs	X					X
• Pavement marking faded	• Re-stripe pavement markings and add "Curve Ahead" pavement markings	X					X
• Complicated intersection design and operation	• Realign Appleton at PA 896 as T-intersection • Traffic calming study needed to identify projects - Village concept curb/sidewalks/paths • TE projects • Add pedestrian amenities		 X X	X 		 X 	X X
Location #10 (at Good Hope Road)							
• Drainage problems • Roadway adversely super elevated	• Address the drainage problems identified per *corridor-wide issues*			X			X
• Stop sign at Good Hope Road located away from intersection	• Relocate stop sign at intersection	X					X
• Pavement markings inadequate to position vehicles to make left turn	• Improve pavement markings to better accommodate left turning vehicles from Good Hope Road	X				X	

PRIORITY SAFETY ISSUES	REMEDIAL STRATEGIES	LEVEL OF EFFORT REQUIRED			POTENTIAL SAFETY BENEFIT		
		Low	Medium	High	Low	Medium	High
Location #10 (at Good Hope Road continued)							
• Left turning traffic blocks through traffic on southbound PA 896 at the intersection	• Consider a shoulder bypass lane on PA 896 for left-turning traffic onto Good Hope Road (bulb-out) • Evaluation of roundabout	X		X		X	X
• Hump in PA 896 just south of the intersection makes it difficult to see northbound traffic	• Remove hump in roadway		X			X	
Location #11 (at Indiantown Road)							
• Utility poles on both sides of PA 896 in the clear zone	• Work with utility companies to remove poles from clear zone as appropriate			X			X
• Poor drainage on PA 896 results in the pooling of water which freezes in the winter	• Address the drainage problems identified per *corridor-wide issues*		X				X
• Sight distance compromised for Indiantown Road traffic entering PA 896 northbound	• Realign Indiantown Road - make perpendicular with PA 896 **** New development may close Indiantown Road***			X			X
Location #12 (at Flint Hill Road)							
• Road cross section less than 1% • Possible hydroplaning • Ponding on eastside of PA 896 north of intersection	• Consider the re-profiling of the intersection • Address the drainage problems identified per *corridor-wide issues*		X X			X	X
• Rutting in pavement – water collects in wheel paths	• Add curbing at intersection	X				X	
• Missing stop bars and legend	• Install stop bars and "STOP" legend at intersection	X					X
• Stop signs for PA 896 at intersection does not meet driver expectation	• Add adequate advance warning of stop sign including pavement marking **** Intersection will be signalized when construction of the approved sub-division begins***	X					X

PRIORITY SAFETY ISSUES	REMEDIAL STRATEGIES	LEVEL OF EFFORT REQUIRED			POTENTIAL SAFETY BENEFIT		
		Low	Medium	High	Low	Medium	High
Location #13 (at London Tract Road/Stricklersville Road)							
• Compromise sight distance from Stricklersville Road • High traffic volume turning to and from Stricklersville Rd	• Install advisory speed sign • Install intersection ahead sign • Develop collision diagram of crashes at the intersection. ***See Appendix C*** **** According to London Britain Township in order to avoid conflicts traffic on Stricklersville Road headed to PA 896 will be diverted to the proposed signalized intersection at Flint Hill Road***	X X					X X
• Wall at northwest corner of intersection presents hazard for turning vehicles	Consider demolishing the wall or re-routing traffic to/from Stricklersville Road			X			X
• Roadside drainage problem	• Address the drainage problems identified per *corridor-wide issues*		X			X	
Location #14 (Chambers Rock Road)							
• Embankment on northeast corner of the intersection interferes with sight distance • Crest vertical curve north of the intersection results in inadequate stopping distance for PA 896 southbound traffic approaching Chambers Rock Road • No shoulder • High volume intersection	Further study required • Traffic counts (including turning movement counts) needed at the intersection • Collision diagrams with intersection crashes needed. ***See Appendix C*** • Re-evaluate existing traffic control for predominant movement • Examine the feasibility of adding a left turn lane for southbound PA 896 • Evaluate possibility of re-aligning the intersection Interim • Install intersection ahead warning signs • Install "Watch for Stopped Traffic" warning sign with flashers	X X	X				X

PRIORITY SAFETY ISSUES	REMEDIAL STRATEGIES	LEVEL OF EFFORT REQUIRED			POTENTIAL SAFETY BENEFIT		
		Low	Medium	High	Low	Medium	High
Peacedale Road Intersection							
• Poor sight distance of oncoming traffic on PA 896 for exiting Peacedale Road traffic • Peacedale Road eastbound traffic currently uses the school parking lot on the southwest corner of the intersection to access PA 896	• Convert Peacedale Road to one way westbound from PA 896 to Sunset Circle. This would allow only turns onto Peacedale Road from PA 896. Peacedale Road traffic would use Kimberlot Lane to access PA 896.		X				X

3.0 CONCLUSION

As discussed earlier, 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 safety issues identified during the audit and documented in this report along with recommended strategies should improve the overall safety of PA 896. Additionally, these remedial strategies can be implemented as time and budget limitations permit. There are some areas which the audit team thought required further study for example the intersections of PA 896 and PA 841, Appleton Road and Chambers Rock Road.

Given that 10 of the reportable crashes were identified as also involving impaired driver and eight were hit and run, engineering strategies cannot effectively address these traffic safety issues; enforcement and education is a necessary component to address the human behavioral aspects. This will supplement identified engineering strategies and effectively reduce the number of crashes in the study area.

APPENDIX A
Audit Team

PA 896 Road Safety Audit
Pre-Audit Meeting – November 6, 2006

Attendees:

Rosemarie Anderson	Delaware Valley Regional Planning Commission
Lou Belmonte	Pennsylvania Department of Transportation
Matt Bochanski	Pennsylvania Department of Transportation
Larry Bucci	Pennsylvania Department of Transportation
Gary Cary	PECO
Michael Castellano	Federal Highway Administration
Steve Dunlop	Pennsylvania Department of Transportation
Al Federico	McCormick Taylor
John Madera	Delaware Valley Regional Planning Commission
Regina Moore	Delaware Valley Regional Planning Commission
Kevin Murphy	Delaware Valley Regional Planning Commission
Ronald Ragan	Ragan Engineering/New London Township
Steve Ross	Franklin Township
Lt. Shelton Sneed	Pennsylvania State Police
Joe Stafford	Bicycle Access Council
Randy Waltermeyer	Chester County Planning Commission
Jack Weber, Jr.	New London Township
Richard Whipple	Franklin Township
Lee Whitmore	Chester County Planning Commission

PA 896 Road Safety Audit
Field Audit – November 8, 2006

Attendees:

Rosemarie Anderson	Delaware Valley Regional Planning Commission
Matt Bochanski	Pennsylvania Department of Transportation
Larry Bucci	Pennsylvania Department of Transportation
Steve Dunlop	Pennsylvania Department of Transportation
Al Federico	McCormick Taylor
Carmen Fiscina	Federal Highway Administration
Officer James Grudzinski	Pennsylvania State Police
David Messaros	London Britain Township
Regina Moore	Delaware Valley Regional Planning Commission
Kevin Murphy	Delaware Valley Regional Planning Commission
Ronald Ragan	Ragan Engineering/New London Township
Lt. Shelton Sneed	Pennsylvania State Police
Joe Stafford	Bicycle Access Council
Randy Waltermeyer	Chester County Planning Commission
Jack Weber, Jr.	New London Township
Richard Whipple	Franklin Township

PA 896 Road Safety Audit
Post-Audit Meeting – November 9, 2006

Attendees:

Rosemarie Anderson	Delaware Valley Regional Planning Commission
Lou Belmonte	Pennsylvania Department of Transportation
Matt Bochanski	Pennsylvania Department of Transportation
Larry Bucci	Pennsylvania Department of Transportation
Mark Cassel	TMA of Chester County
Carmine Fiscina	Federal Highway Administration
Steve Dunlop	Pennsylvania Department of Transportation
Al Federico	McCormick Taylor
John Madera	Delaware Valley Regional Planning Commission
David Messaros	London Britain Township
Regina Moore	Delaware Valley Regional Planning Commission
Kevin Murphy	Delaware Valley Regional Planning Commission
Ronald Ragan	Ragan Engineering/New London Township
Joe Stafford	Bicycle Access Council
Jack Weber, Jr.	New London Township
Richard Whipple	Franklin Township
Lee Whitmore	Chester County Planning Commission

APPENDIX B
Pre-Audit Meeting Agenda and Presentations

DELAWARE VALLEY REGIONAL PLANNING COMMISSION

PA 896 ROAD SAFETY AUDIT

PRE-AUDIT MEETING
CHESTER COUNTY PLANNING COMMISSION
Westtown Road, West Chester, PA

MONDAY, NOVEMBER 6, 2006

AGENDA

1. **Welcome and Introduction**
   Audit team will have an opportunity to introduce themselves and mention their area of expertise.

2. **Purpose**
   The background and purpose of the project will be discussed.

3. **Presentation**
   Albert Federico, Project Manager, McCormick Taylor Engineers & Planning will present findings from their recently completed *PA 896 Corridor Plan.*

4. **PA 896 Road Safety Audit**
   This agenda item will involve discussion on:
   a) Road Safety Audits and their benefits;
   b) Overview of the physical conditions of PA 896
   c) Detailed analysis of select locations along the corridor
   d) Video of the corridor
   e) Open Discussion

5. **Field View**
   Procedure for performing the field view and other logistics

6. **Adjourn**

Delaware Valley Regional Planning Commission

PA 896 Road Safety Audit

Presentation to:

Audit Team

November 6, 2006

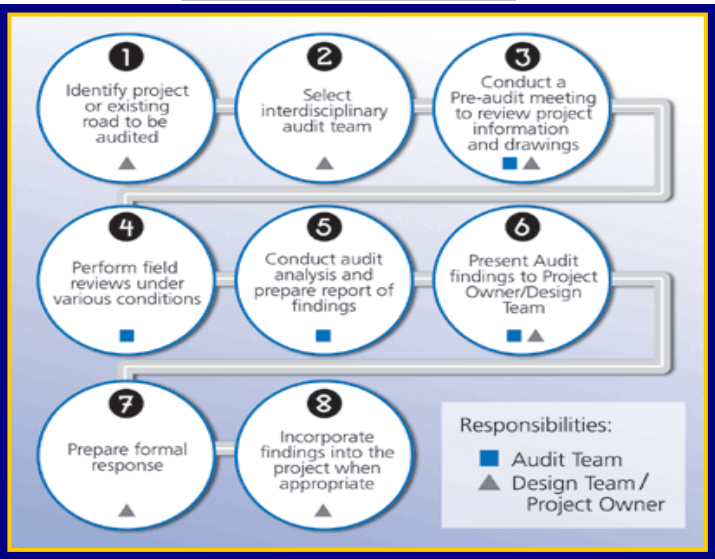
What is RSA?

- Proactive approach to improving transportation safety
- An examination of a future or existing roadway, in which an independent, qualified audit team reports on safety issues
- RSA can be performed during any or all stages of a project

Benefits

- Proactive, not dependent solely on crash statistics
- Concentrate on specific road section to address safety issues
- Can be used as a planning tool to identify safety issues to be considered in improvement projects
- Team with varying background and expertise
- Adaptable to local needs and conditions
- Can be implemented in small stages as time and resources permit

Steps in RSA



Source: Roadsafetyaudits.org FHWA, ITE

Team

- PennDOT – District 6
- FHWA
- Chester County Planning
- Chester County TMA
- Bicycle Assess Coalition
- PECO
- McCormick Taylor
- PA State Police
- London Britain Township
- New London Township
- Franklin Township
- DVRPC

Agenda

Day 1, November 6, 2006

- Pre-Audit Meeting
- Review Materials

Day 2, November 8, 2006

- Field View

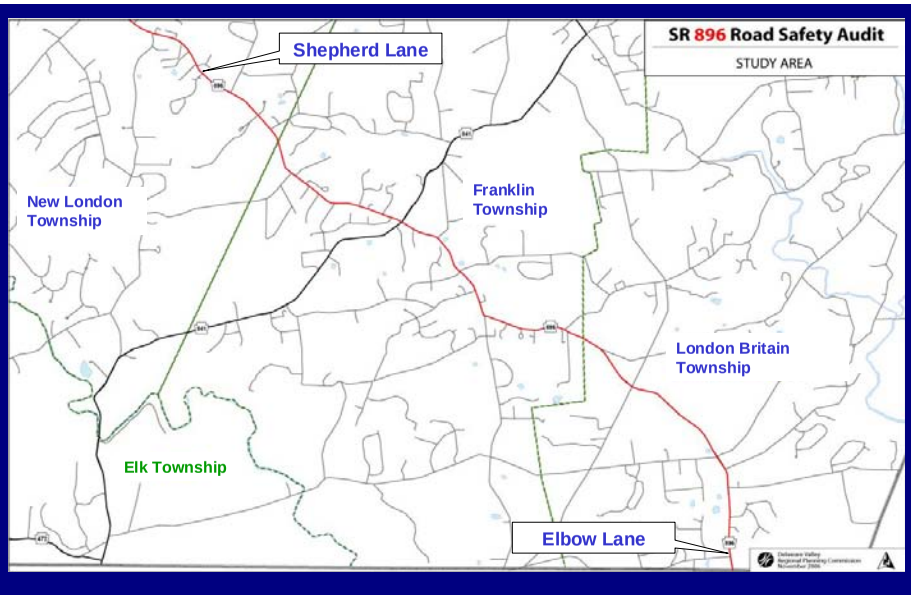
Day 3, November 9, 2006

- Conduct Audit Analysis

Materials

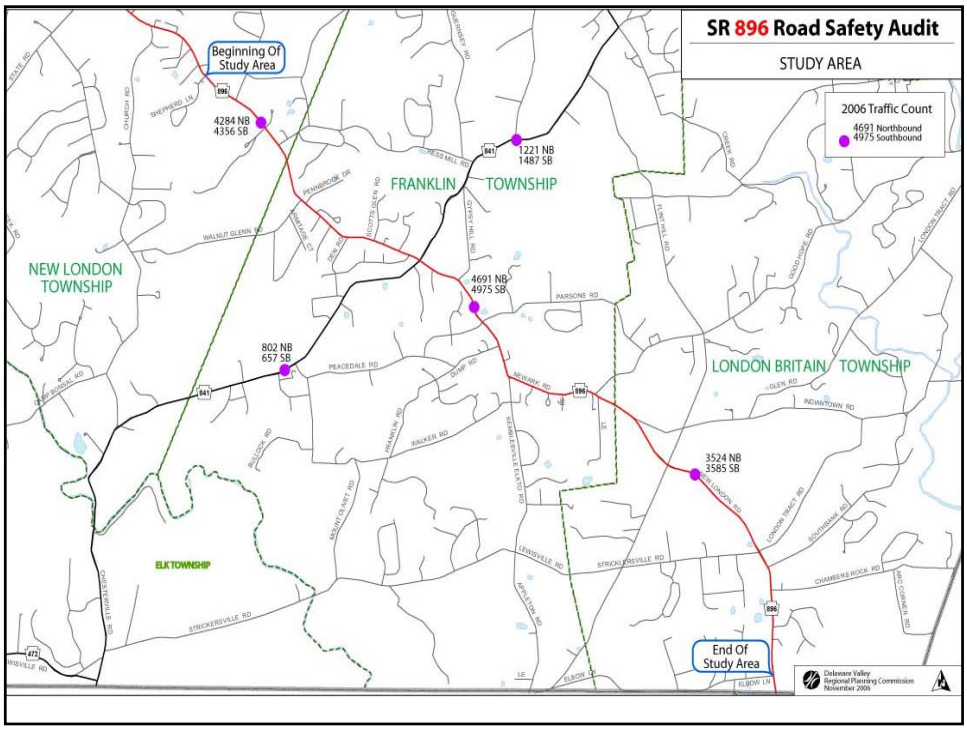
- Location Maps/Aerials
- Crash Data
- AADT's
- Traffic Counts
- Line Diagrams
- Checklist
  - Formulated to guide the process

Overview of PA 896 Study Area



Operational Characteristics

- Roadway functional classification
  - Rural minor arterial
- Speed limit
  - 45 mph throughout the corridor-wide
  - 35 mph at Kembleville Village
  - 30mph at curves
- Intersections (25)
  - All unsignalized
  - One 4-way stop control (at Flint Hill Rd)



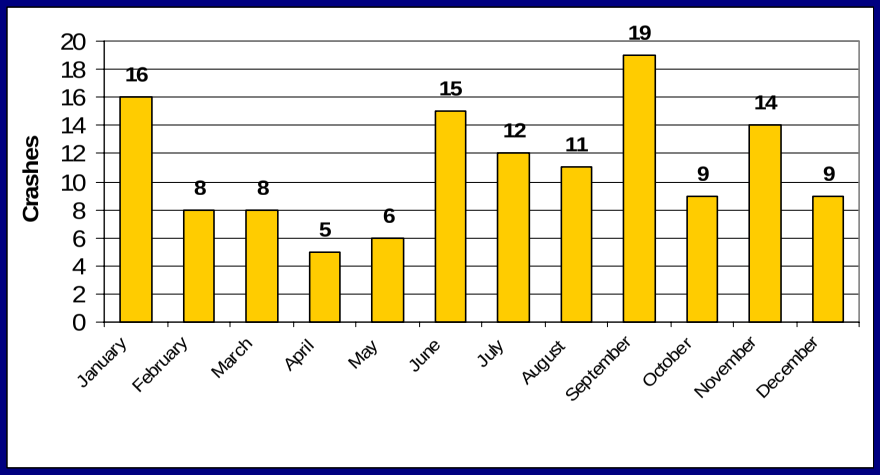
Corridor-wide Crash Findings

Crash Data

- Utilized PennDOT Crash Database
- 132 reportable crashes
- Crash data analyzed for years 2003-2005
  - 2003 – 49 crashes (37%)
  - 2004 – 47 crashes (35%)
  - 2005 – 36 crashes (27%)

Corridor-wide Crash Findings

MONTH OF YEAR



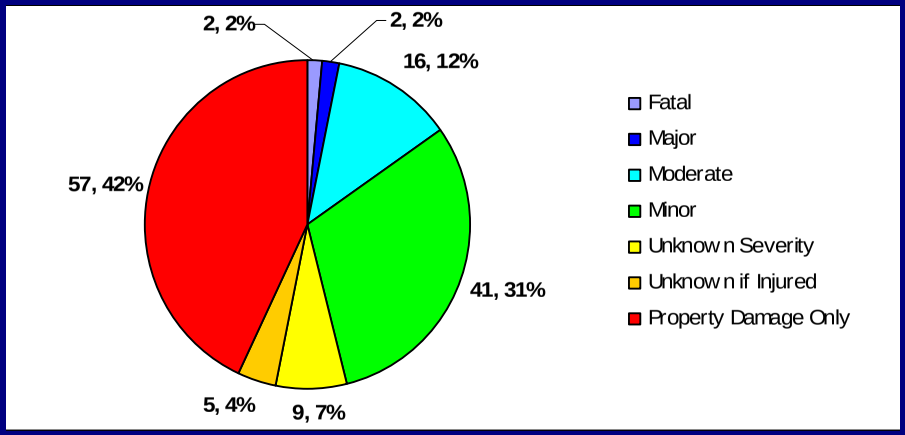
Corridor-wide Crash Findings

COLLISION TYPE

	Actual Number	Percentage
Hit Fixed Object	56	42%
Angle	38	29%
Rear End	18	14%
Head On	8	6%
Sideswipe (Opp Dir)	7	5%
Non collision	2	2%
Unknown	2	2%
Pedestrian	1	1%
Total	132	100%

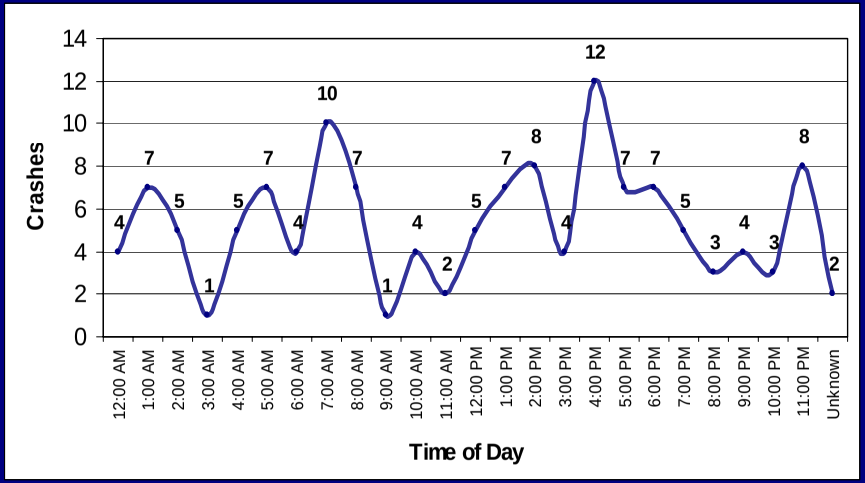
Corridor-wide Crash Findings

CRASH SEVERITY LEVEL



Corridor-wide Crash Findings

TIME OF DAY



Corridor-wide Crash Findings

Road Surface Conditions

- Dry – 71 (53%)
- Wet – 40 (30%)
- Wintry – 21 (13%)
- Other – 1 (0%)

Weather

- Clear – 93 (70%)
- Rain – 30 (22%)
- Snow – 7 (5%)
- Unknown – 2 (1%)

Illumination

- Daylight – 72 (54%)
- Dark –
  - (no lights) – 43 (32%)
  - (with street lights) – 12 (9%)
- Dusk – 2 (1%)
- Dawn – 1 (0%)
- Other – 1 (0%)
- Unknown – 1 (0%)

Corridor-wide Crash Findings

Driver Actions

- Driving too fast for conditions – 62 (46%)
- Over/under compensation at curves – 32 (24%)
- Proceeding without clearance – 17 (12%)
- Running stop sign – 11 (8%)

Environmental/Roadway Factors

- None – 98 (74%)
- Slippery Ice/Snow – 19 (14%)
- Other weather condition – 8 (6%)
- Deer in the roadway – 2 (1%)

Cluster Locations

Clusters Along SR 0896 At These Locations:

1. Between School Road and Cobblers Lane
2. Hess Mill Road
3. S. of Hess Mill Road
4. Pennbrook Drive
5. Den Road
6. N. of Hunt View Lane
7. SR 0841
8. Parsons Road
9. Appleton Road
10. Good Hope Road
11. Indiantown Road
12. Flint Hill Road
13. London Tract Road
14. Chambers Rock Road

1. **896**: Between School Rd. and Cobblers Ln.
Segment 90, Offset 1284

TOTAL CRASHES	4
COLLISION TYPE	
Hit Fix Obj	2
Rear End	1
Unknown	1
ILLUMINATION	
Daylight	2
Dark	1
Other	1
WEATHER	
Clear	3
Unknown	1
SEVERITY COUNT	
Fatalities	0
Injuries	1

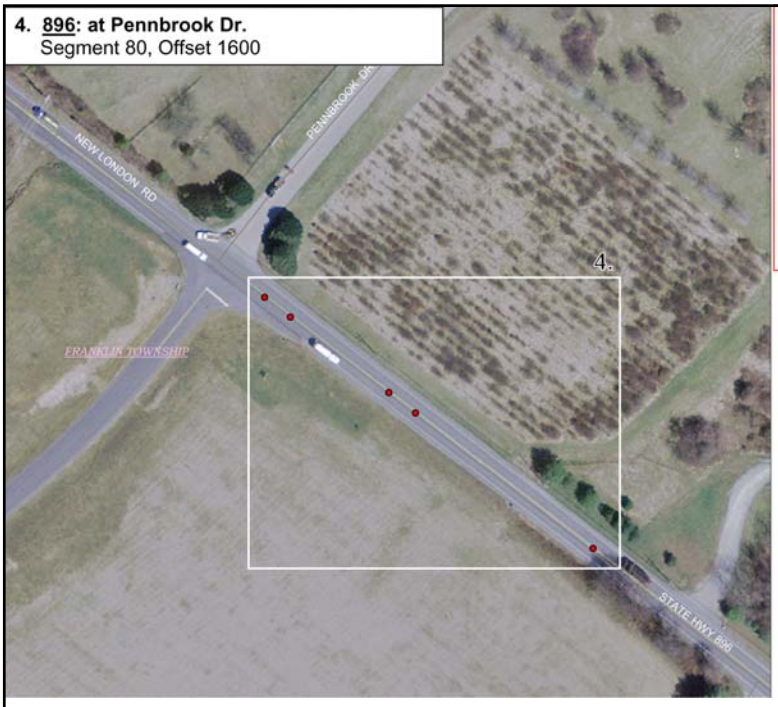
2. **896**: at Hess Mill Rd.
Segment 90, Offset 0

TOTAL CRASHES	4
COLLISION TYPE	
Rear End	3
Hit Fix Obj	1
ILLUMINATION	
Daylight	4
WEATHER	
Clear	4
SEVERITY COUNT	
Fatalities	0
Injuries	4

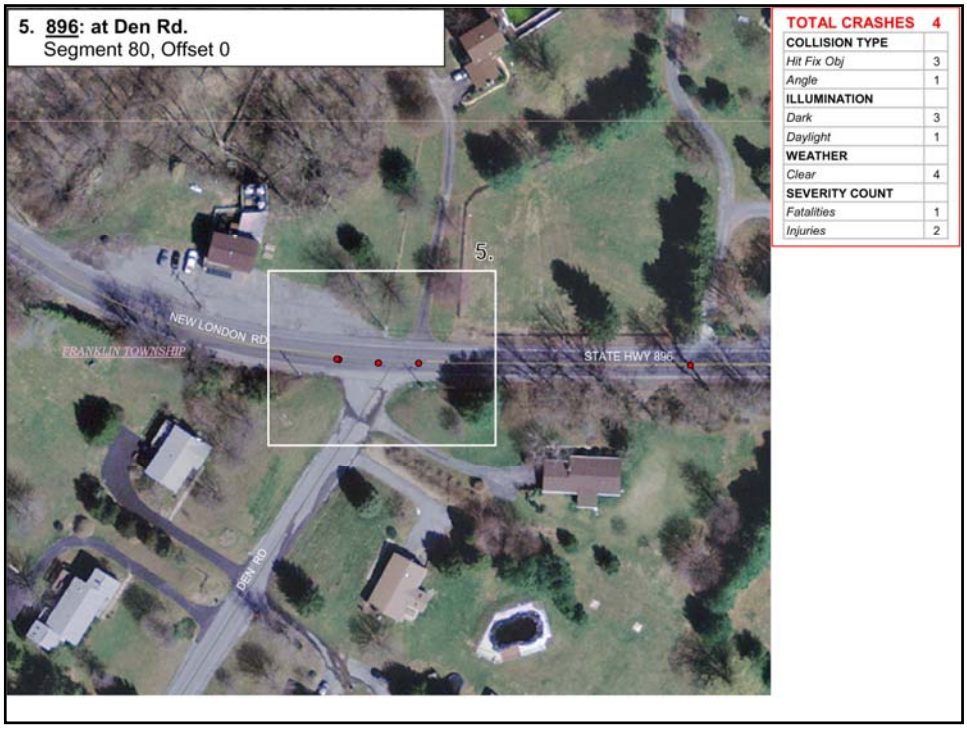
3. 896: S. of Hess Mill Rd.
Segment 80, Offset 3408

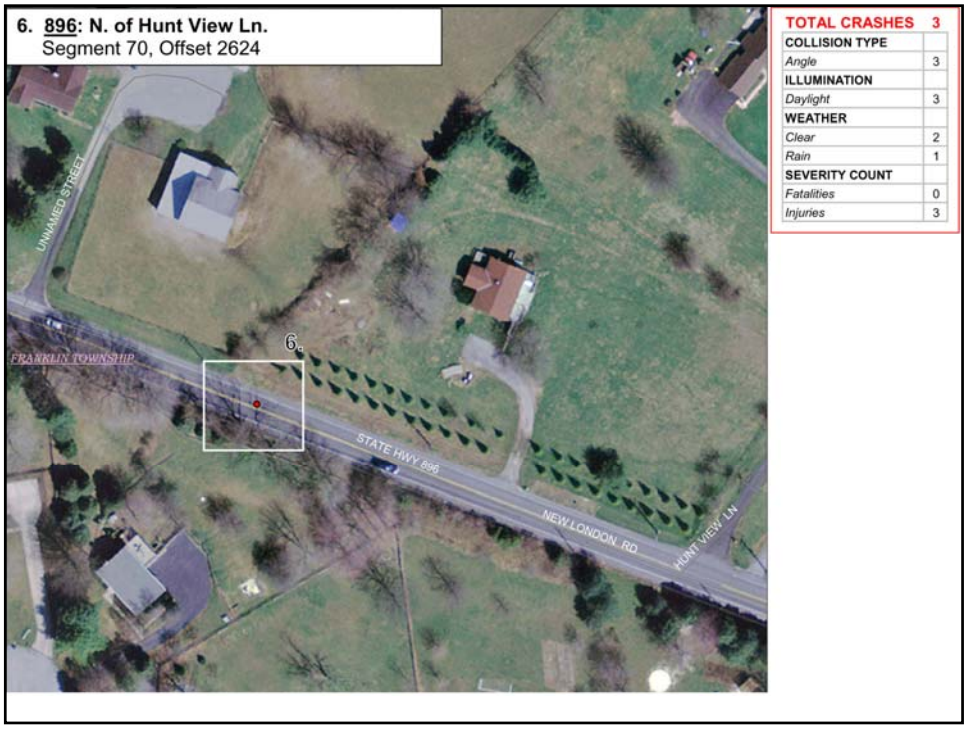
TOTAL CRASHES	3
COLLISION TYPE	
Hit Fix Obj	3
ILLUMINATION	
Dark	2
Daylight	1
WEATHER	
Clear	1
Rain	1
Snow	1
SEVERITY COUNT	
Fatalities	0
Injuries	3

4. 896: at Pennbrook Dr.
Segment 80, Offset 1600



TOTAL CRASHES	5
COLLISION TYPE	
Hit Fix Obj	4
Angle	1
ILLUMINATION	
Dark	3
Street Lights	2
WEATHER	
Clear	3
Rain	2
SEVERITY COUNT	
Fatalities	0
Injuries	3


5. 896: at Den Rd.
Segment 80, Offset 0
5.
NEW LONDON RD
FRANKLIN TOWNSHIP
STATE HWY 896
DEN RD
TOTAL CRASHES 4
COLLISION TYPE
Hit Fix Obj 3
Angle 1
ILLUMINATION
Dark 3
Daylight 1
WEATHER
Clear 4
SEVERITY COUNT
Fatalities 1
Injuries 2


6. 896: N. of Hunt View Ln.
Segment 70, Offset 2624
UNNAMED STREET
FRANKLIN TOWNSHIP
6.
STATE HWY 896
NEW LONDON RD
HUNT VIEW LN
TOTAL CRASHES 3
COLLISION TYPE
Angle 3
ILLUMINATION
Daylight 3
WEATHER
Clear 2
Rain 1
SEVERITY COUNT
Fatalities 0
Injuries 3

7. 896: at SR 841
Segment 70, Offset 1481

TOTAL CRASHES	12
COLLISION TYPE	
Angle	11
Hit Fixed Obj	1
ILLUMINATION	
Daylight	10
Dark	1
Unknown Lighting	1
WEATHER	
Clear	11
Rain	1
SEVERITY COUNT	
Fatalities	0
Injuries	12

8. 896: at Parsons Rd.
Segment 60, Offset 2000

TOTAL CRASHES	6
COLLISION TYPE	
Hit Fixed Obj	3
Angle	2
Opposite Dir Sideswipe	1
ILLUMINATION	
Daylight	5
Street Lights	1
WEATHER	
Clear	3
Rain	3
SEVERITY COUNT	
Fatalities	0
Injuries	5

9. 896: at Appleton Rd.
Segment 60, Offset 0

TOTAL CRASHES	16
COLLISION TYPE	
Angle	7
Hit Fixed Obj	4
Head On	3
Opposite Dir Sideswipe	1
Rear End	1
ILLUMINATION	
Daylight	9
Street Lights	5
Dark	1
Dawn	1
WEATHER	
Rain	9
Clear	4
Snow	3
SEVERITY COUNT	
Fatalities	0
Injuries	12

10. 896: at Good Hope Rd.
Segment 50, Offset 100

TOTAL CRASHES	8
COLLISION TYPE	
Hit Fixed Obj	5
Angle	1
Head On	1
Opposite Dir Sideswipe	1
ILLUMINATION	
Daylight	5
Dark	3
WEATHER	
Clear	7
Rain	1
SEVERITY COUNT	
Fatalities	3
Injuries	8

11. 896: at Indiantown Rd.
Segment 40, Offset 1800

TOTAL CRASHES	5
COLLISION TYPE	
Hit Fixed Obj	2
Angle	1
Head On	1
Rear End	1
ILLUMINATION	
Dark	3
Daylight	2
WEATHER	
Clear	3
Rain	2
SEVERITY COUNT	
Fatalities	0
Injuries	4

12. 896: at Flint Hill Rd.
Segment 40, Offset 0

TOTAL CRASHES	8
COLLISION TYPE	
Angle	4
Hit Fixed Obj	2
Opposite Dir Sideswipe	1
Rear End	1
ILLUMINATION	
Daylight	5
Dark	2
Dusk	1
WEATHER	
Clear	6
Rain	2
SEVERITY COUNT	
Fatalities	0
Injuries	6

13. 896: at London Tract Rd.
Segment 20, Offset 559

TOTAL CRASHES	5
COLLISION TYPE	
Angle	2
Hit Fixed Obj	2
Rear End	1
ILLUMINATION	
Dark	2
Daylight	2
Street Lights	1
WEATHER	
Clear	4
Rain	1
SEVERITY COUNT	
Fatalities	0
Injuries	6

14. 896: at Chambers Rock Rd.
Segment 10, Offset 3200

TOTAL CRASHES	10
COLLISION TYPE	
Rear End	6
Angle	1
Head On	1
Hit Fixed Obj	1
Opposite Dir Sideswipe	1
ILLUMINATION	
Daylight	6
Dark	4
WEATHER	
Clear	8
Rain	2
SEVERITY COUNT	
Fatalities	0
Injuries	8

Day #2 Field View

- Meet at Country Cricket Café, by 8AM
  - Continental Breakfast will be served
- Materials are in binders
- Bus transportation will be available along the corridor
- Vests and clipboards will be provided
- Wear appropriate garments and footwear, expect to be on foot most of the day
- Lunch will be provided at the Country Cricket Café
- Audit is expected to be completed by 4:00PM

Day #3 Post-Audit

- Chester County Planning Commission at 9:00AM
- Continental breakfast will be provided
- Debriefing from Field View
- Recommendations
- Next Steps
- Expected to end at Noon

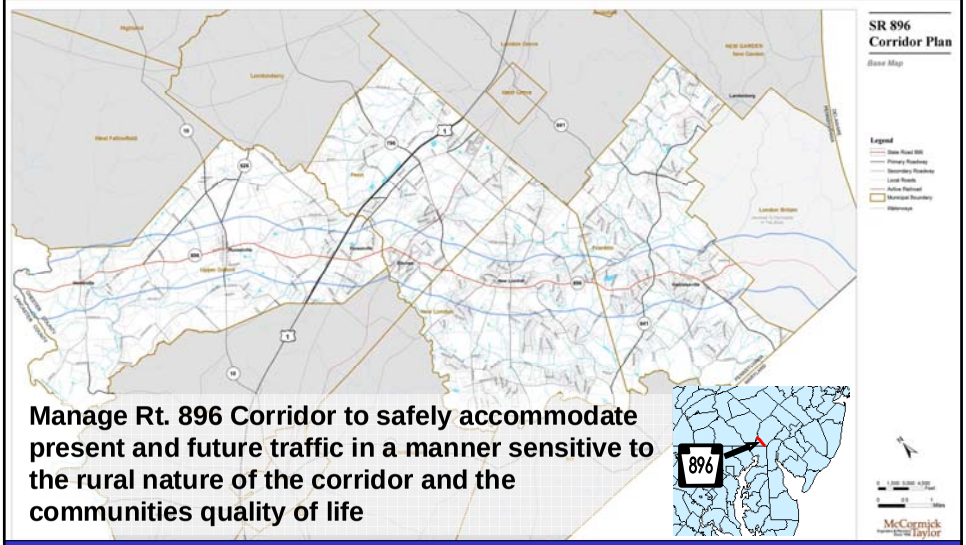
RT. 896 CORRIDOR PLAN
CHESTER COUNTY, PENNSYLVANIA

PA 896 Road Safety Audit – Pre-Audit Meeting
November 6, 2006



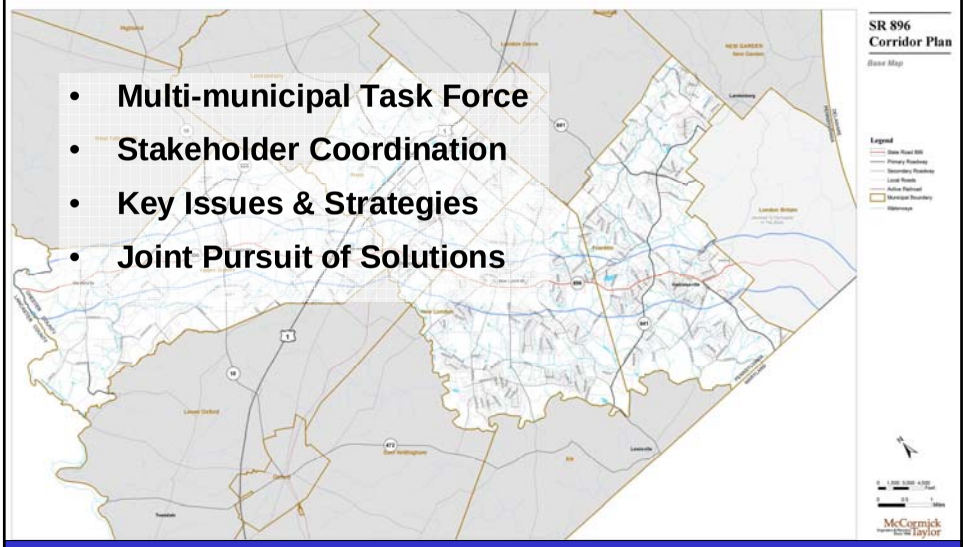
McCormick Taylor
Engineers & Planners Since 1946

The Challenge:



Manage Rt. 896 Corridor to safely accommodate present and future traffic in a manner sensitive to the rural nature of the corridor and the communities quality of life

Meeting the Challenge



- Multi-municipal Task Force
- Stakeholder Coordination
- Key Issues & Strategies
- Joint Pursuit of Solutions

1. Multi-Municipal Task Force

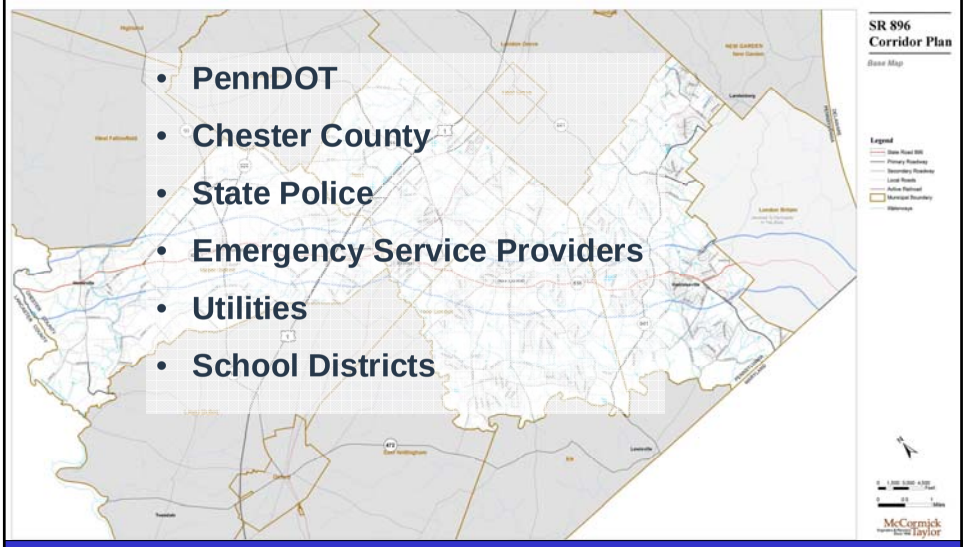
Five municipalities within Chester County

- Franklin
- New London
- Penn
- Upper Oxford
- London Britain*

Meeting for over three years

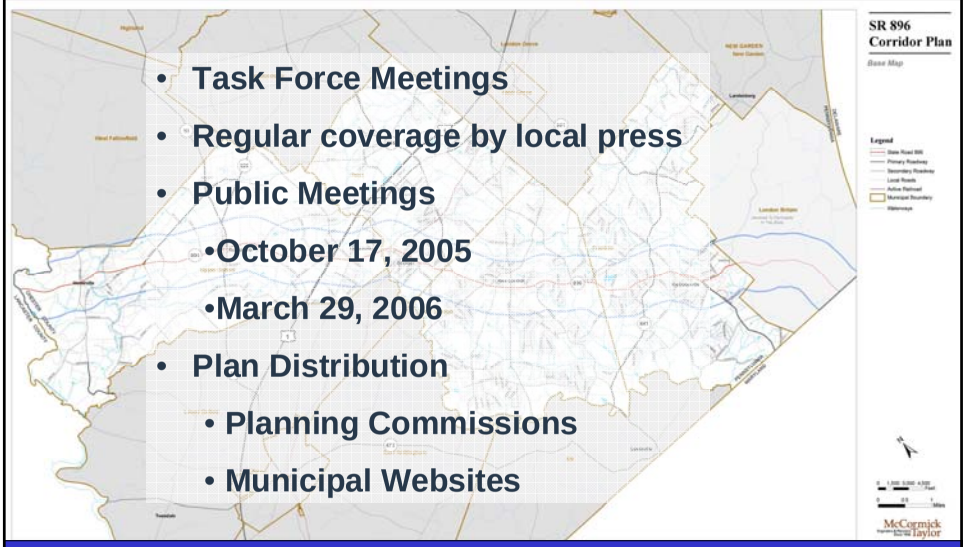
** Task Force Member, opted not to participate in the Corridor Plan.*

1. Stakeholder Coordination



- PennDOT
- Chester County
- State Police
- Emergency Service Providers
- Utilities
- School Districts

1. Public Coordination



- Task Force Meetings
- Regular coverage by local press
- Public Meetings
  - •October 17, 2005
  - •March 29, 2006
- Plan Distribution
  - • Planning Commissions
  - • Municipal Websites

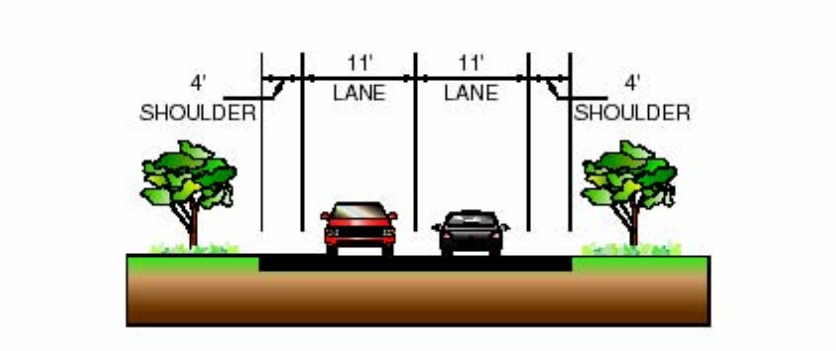
2. Planning Goals

- Safety
- Mobility
- Quality of Life

2. Key Issues & Strategies

Cross Section

2. Plan Concepts



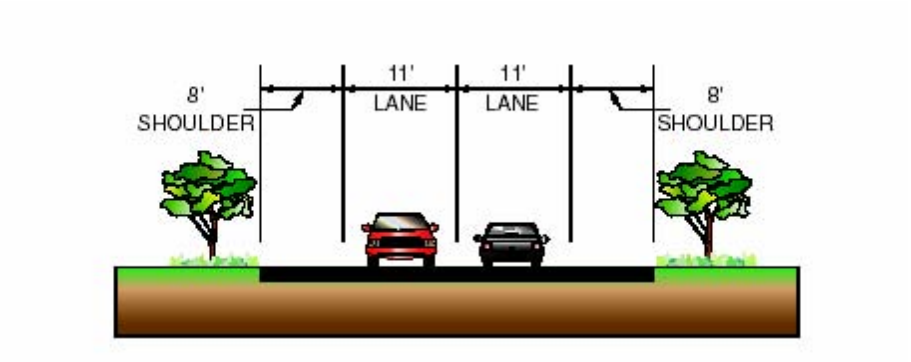
- Upper Oxford – except Homeville & Russellville
- Franklin Township – except Kemblesville

Cross Section: Typical

2. Key Issues & Strategies

Cross Section

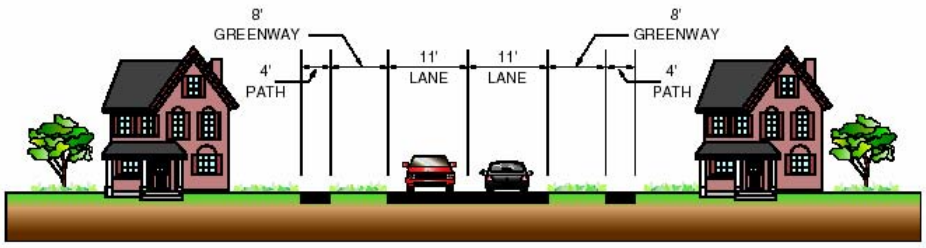
2. Plan Concepts



- Areas of substantial residential and non-residential development

Cross Section: Special Use

2. Plan Concepts



- Homeville
- Russellville
- New London
- Kemblesville

Cross Section: Village

2. Key Issues & Strategies

Cross Section

2. Key Issues & Strategies

Roadway Design

2. Key Issues & Strategies

Roadway Design

2. Key Issues & Strategies

Roadway Design

2. Key Issues & Strategies

Roadway Design

2. Key Issues & Strategies

Roadway Design

2. Key Issues & Strategies

Enforcement Opportunities

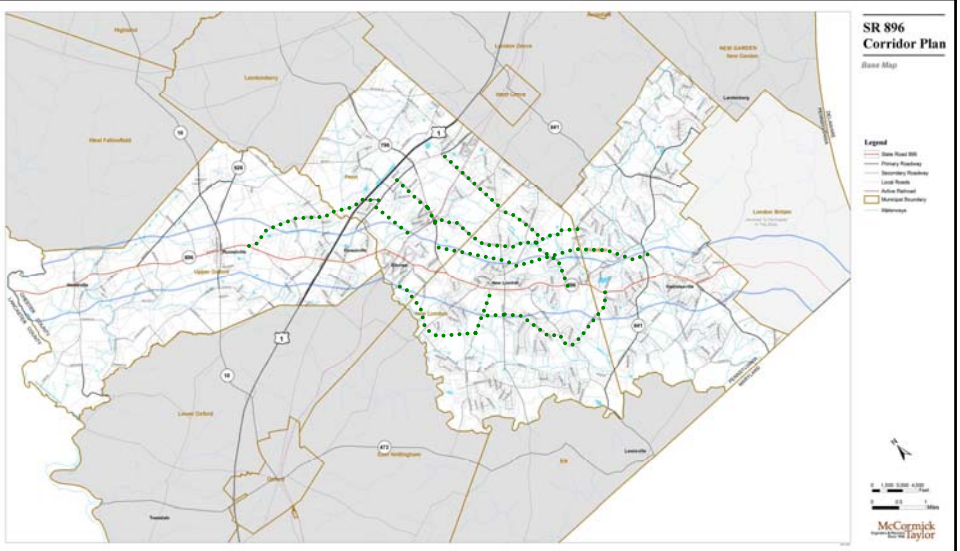
2. Key Issues & Strategies

Utility Poles

2. Key Issues & Strategies

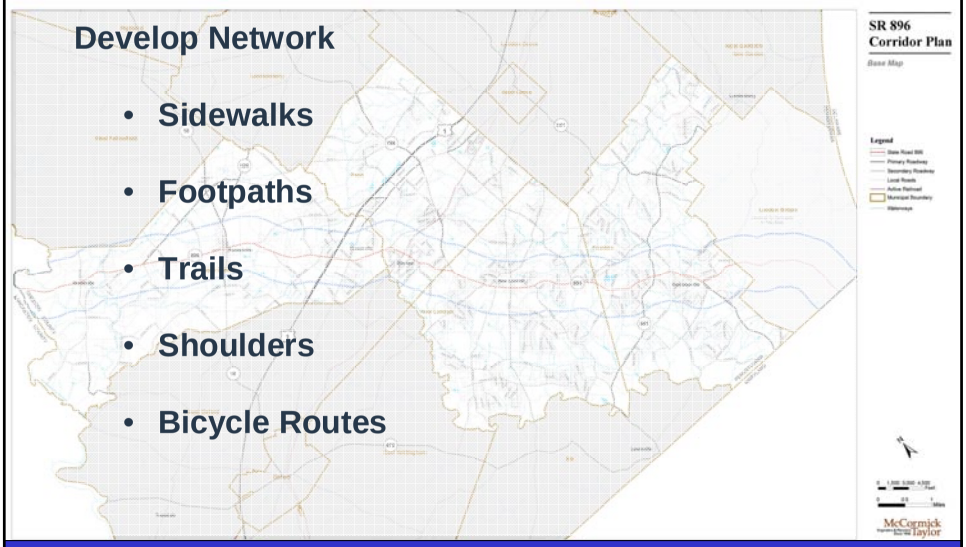
Intersections

2. Key Issues & Strategies:



Community Connectors

2. Key Issues & Strategies:



Develop Network

- Sidewalks
- Footpaths
- Trails
- Shoulders
- Bicycle Routes

Pedestrian & Bicycle Connections

2. Key Issues & Strategies:

Park & Ride

- Identify Future Locations
- Promote Ride Sharing

Transit

- Future Routes
- Non-Traditional Service
- Paratransit

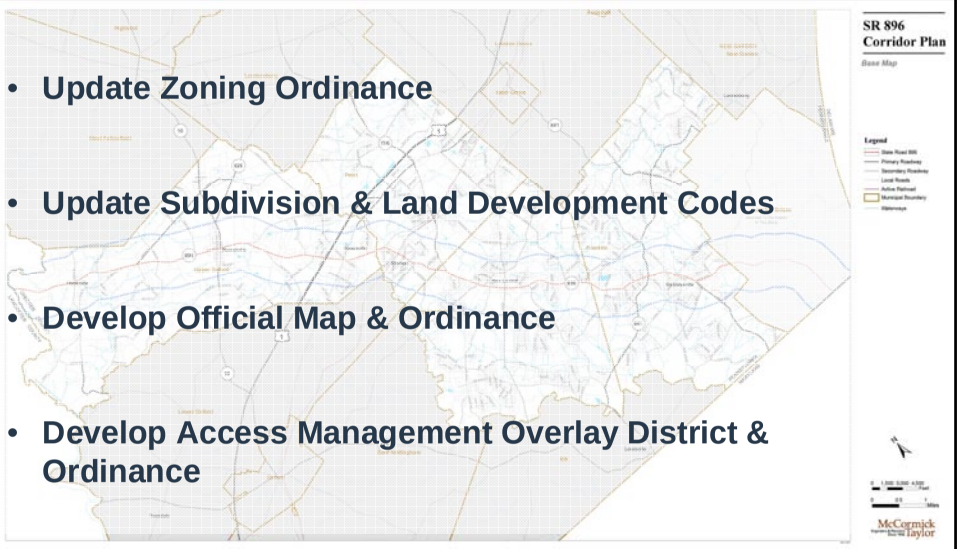
Transportation Demand Management

3. Implementation

- Implementation Matrix
- Organized by Goals
  - Safety
  - Mobility
  - Quality of life
- Menu of actions
- Identifies municipalities involved & stakeholders

Future Projects

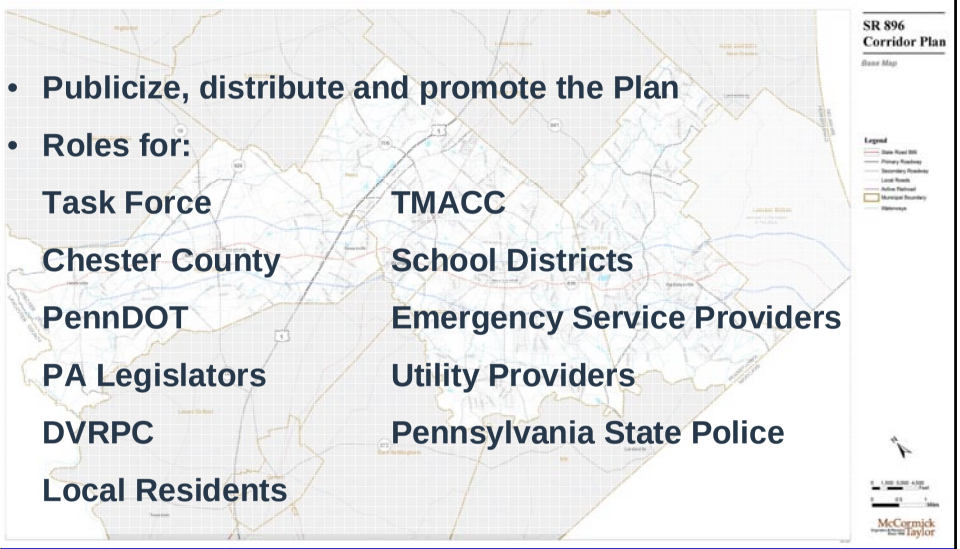
3. Implementation



- Update Zoning Ordinance
- Update Subdivision & Land Development Codes
- Develop Official Map & Ordinance
- Develop Access Management Overlay District & Ordinance

Municipal Regulations

3. Implementation



- Publicize, distribute and promote the Plan
- Roles for:

Task Force	TMACC
Chester County	School Districts
PennDOT	Emergency Service Providers
PA Legislators	Utility Providers
DVRPC	Pennsylvania State Police
Local Residents	

Outreach/Roles & Responsibilities

APPENDIX C
Traffic Data

SR 896 Road Safety Audit

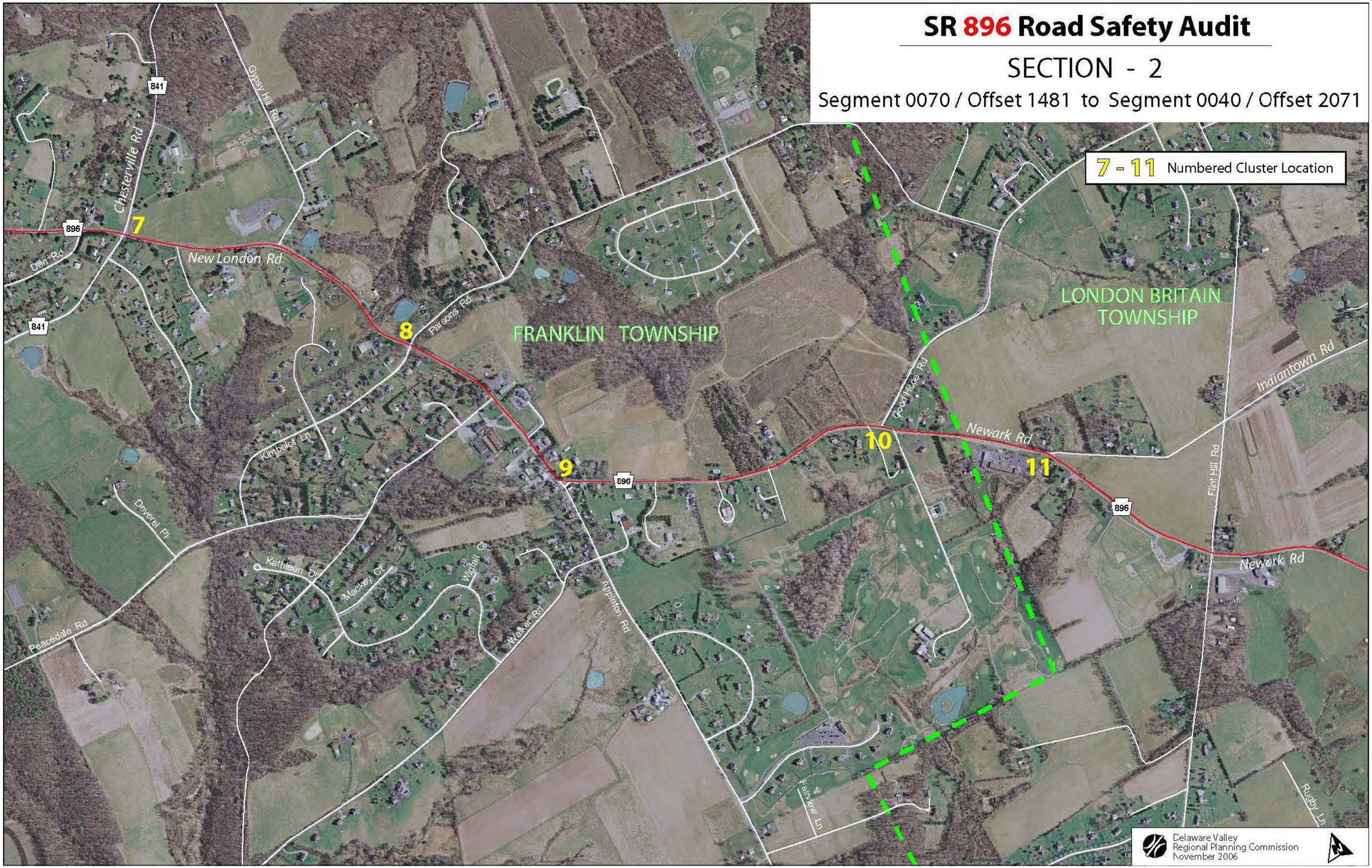
SECTION - 1

Segment 0090 / Offset 1208 to Segment 0070 / Offset 2624

SR 896 Road Safety Audit

SECTION - 2

Segment 0070 / Offset 1481 to Segment 0040 / Offset 2071



SR 896 Road Safety Audit

SECTION - 3

Segment 0040 / Offset 0110 to Segment 0010 / Offset 3362

12 - 14 Numbered Cluster Location

LONDON BRITAIN TOWNSHIP

12

13

14

End Of Study Area

Indiantown Rd
Newark Rd
Flint Hill Rd
London Tract Rd
Southbank Rd
Chambers Rock Rd
Arc Corner Rd
Blue Heron Ct
Strickersville Rd
Rugby Ln
Fox Dr
Vixen Dr
Foxbrook Dr
Brunswick Ln
Rexfield Dr
Fenhec Dr
Hampstead Ct
Jack's Pl
Driveway
Elbow Ln
Woodhaven Dr
Riverwood Dr
Driveway
Christine Ct
Hopkins Bridge Rd
896

Delaware Valley
Regional Planning Commission
November 2006

1. SR 0896 BETWEEN SCHOOL RD & COBBLERS LN

Date Range: 1/1/2003 to 12/31/2005

Area of Interest: (In County 15 On State Route 0896(P) Between Segment 0090 Offset 1208 and Segment 0090 Offset 1385)

USER ID/QUERY ID: wfreima/ 0620061031007

MONTH OF YEAR

	APR	MAY	NOV	
CRASHES	2	1	1	4
PCT	50%	25%	25%	100%

DAY OF WEEK

	MON	TUE	WED	SAT	
CRASHES	1	1	1	1	4
PCT	25%	25%	25%	25%	100%

HOUR OF DAY

	08	14	18	99	
CRASHES	1	1	1	1	4
PCT	25%	25%	25%	25%	100%

YEAR

	CRASHES	PCT
2004	1	25%
2005	3	75%
TOTAL	4	100%

COLLISION TYPE

	CRASHES	PCT
HIT FIX OBJ	2	50%
REAR END	1	25%
UNKNOWN	1	25%
TOTAL	4	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
MAJOR	1	25%
UNK IF INJURED	2	50%
PDO	1	25%
TOTAL	4	100%

SEVERITY COUNT

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

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	2	50%
DRIVER WAS DISTRACTED	1	25%
OTHER IMPROPER DRIVING	1	25%
OVER/UNDER COMP CURVE	1	25%
TAILGATING	1	25%
TOO FAST FOR CONDITION	1	25%
UNKNOWN	1	25%
TOTAL	4	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	1	20%
MOTORCYCLE	1	20%
SMALL TRUCK	1	20%
VAN	1	20%
UNK VEHICLE	1	20%
TOTAL	5	100%

ROAD CONDITION

	CRASHES	PCT
DRY	3	75%
OTHER	1	25%
TOTAL	4	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	2	50%
DARK	1	25%
OTHER	1	25%
TOTAL	4	100%

WEATHER

	CRASHES	PCT
CLEAR	3	75%
UNK	1	25%
TOTAL	4	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	2	50%
DEER IN ROADWAY	1	25%
UNKNOWN	1	25%
TOTAL	4	100%

2. SR 0896 at HESS MILL RD.

Date Range: 1/1/2003 to 12/31/2005

Area of Interest: (In County 15 On State Route 0896(P) Between Segment 0080 Offset 3736 and Segment 0090 Offset 200)

USER ID/QUERY ID: wfreima/ 0020061024027

MONTH OF YEAR

	JAN	MAR	APR	JUN	
CRASHES	1	1	1	1	4
PCT	25%	25%	25%	25%	100%

DAY OF WEEK

	SUN	THR	
CRASHES	2	2	4
PCT	50%	50%	100%

HOUR OF DAY

	07	15	16	18	
CRASHES	1	1	1	1	4
PCT	25%	25%	25%	25%	100%

YEAR

	CRASHES	PCT
2003	2	50%
2004	2	50%
TOTAL	4	100%

COLLISION TYPE

	CRASHES	PCT
REAR END	3	75%
HIT FIX OBJ	1	25%
TOTAL	4	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
MINOR	3	75%
PDO	1	25%
TOTAL	4	100%

SEVERITY COUNT

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

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	3	75%
OTHER IMPROPER DRIVING	2	50%
DRIVER WAS DISTRACTED	1	25%
SUDDEN SLOWING/STOP	1	25%
TAILGATING	1	25%
TOO FAST FOR CONDITION	1	25%
TOTAL	4	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	7	77%
SMALL TRUCK	2	22%
TOTAL	9	100%

ROAD CONDITION

	CRASHES	PCT
DRY	3	75%
ICE	1	25%
TOTAL	4	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	4	100%
TOTAL	4	100%

WEATHER

	CRASHES	PCT
CLEAR	4	100%
TOTAL	4	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	4	100%
TOTAL	4	100%

3. SR 0896 S. of HESS MILL RD.

Date Range: 1/1/2003 to 12/31/2005
Area of Interest: (In County 15 On State Route 0896(P) Between Segment 0080 Offset 3208 and Segment 0080 Offset 3608)

USER ID/QUERY ID:
wfreima/ 0020061024024

MONTH OF YEAR

	JAN	NOV	
CRASHES	2	1	3
PCT	66%	33%	100%

DAY OF WEEK

	WED	SAT	
CRASHES	2	1	3
PCT	66%	33%	100%

HOUR OF DAY

	07	14	20	
CRASHES	1	1	1	3
PCT	33%	33%	33%	100%

YEAR

	CRASHES	PCT
2003	2	66%
2004	1	33%
TOTAL	3	100%

COLLISION TYPE

	CRASHES	PCT
HIT FIX OBJ	3	100%
TOTAL	3	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
MAJOR	1	33%
UNK IF INJURED	1	33%
PDO	1	33%
TOTAL	3	100%

SEVERITY COUNT

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

DRIVER ACTIONS

	ACTIONS	PCT
TOO FAST FOR CONDITION	3	100%
OVER/UNDER COMP CURVE	1	33%
TOTAL	3	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	2	66%
SMALL TRUCK	1	33%
TOTAL	3	100%

ROAD CONDITION

	CRASHES	PCT
DRY	1	33%
SNOW	1	33%
WET	1	33%
TOTAL	3	100%

ILLUMINATION

	CRASHES	PCT
DARK	2	66%
DAYLIGHT	1	33%
TOTAL	3	100%

WEATHER

	CRASHES	PCT
CLEAR	1	33%
RAIN	1	33%
SNOW	1	33%
TOTAL	3	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	2	66%
SLIPPERY ICE/SNOW	1	33%
TOTAL	3	100%

4. SR 0896 at PENNBROOK DR.

Date Range: 1/1/2003 to 12/31/2005
Area of Interest: (In County 15 On State Route 0896(P) Between Segment 0080 Offset 1417 and Segment 0080 Offset 1824)

USER ID/QUERY ID:
wfreima/ 0020061024023

MONTH OF YEAR

	OCT	NOV	
CRASHES	2	3	5
PCT	40%	60%	100%

DAY OF WEEK

	TUE	WED	FRI	SAT	
CRASHES	1	1	1	2	5
PCT	20%	20%	20%	40%	100%

HOUR OF DAY

	00	01	05	19	
CRASHES	1	2	1	1	5
PCT	20%	40%	20%	20%	100%

YEAR

	CRASHES	PCT
2003	2	40%
2004	1	20%
2005	2	40%
TOTAL	5	100%

COLLISION TYPE

	CRASHES	PCT
HIT FIX OBJ	4	80%
ANGLE	1	20%
TOTAL	5	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
MINOR	1	20%
PDO	4	80%
TOTAL	5	100%

SEVERITY COUNT

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

DRIVER ACTIONS

	ACTIONS	PCT
TOO FAST FOR CONDITION	3	60%
OVER/UNDER COMP CURVE	2	40%
FAILR MAINT PROP SPEED	1	20%
IMPROPER/CARELESS TURN	1	20%
NO CONTRIBUTING ACTION	1	20%
WRONG SIDE OF ROADWAY	1	20%
TOTAL	5	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	4	66%
SMALL TRUCK	1	16%
SUV	1	16%
TOTAL	6	100%

ROAD CONDITION

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

ILLUMINATION

	CRASHES	PCT
DARK	3	60%
STREET LIGHTS	2	40%
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%

5. SR 0896 at DEN RD.

Date Range: 1/1/2003 to 12/31/2005

Area of Interest: (In County 15 On State Route 0896(P) Between Segment 0070 Offset 4093 and Segment 0080 Offset 15)

USER ID/QUERY ID: wfreima/ 0020061024022

MONTH OF YEAR

	FEB	JUN	JUL	DEC	
CRASHES	1	1	1	1	4
PCT	25%	25%	25%	25%	100%

DAY OF WEEK

	SUN	TUE	THR	FRI	
CRASHES	1	1	1	1	4
PCT	25%	25%	25%	25%	100%

HOUR OF DAY

	01	12	
CRASHES	3	1	4
PCT	75%	25%	100%

YEAR

	CRASHES	PCT
2003	1	25%
2004	1	25%
2005	2	50%
TOTAL	4	100%

COLLISION TYPE

	CRASHES	PCT
HIT FIX OBJ	3	75%
ANGLE	1	25%
TOTAL	4	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
FATAL	1	25%
MODERATE	1	25%
PDO	2	50%
TOTAL	4	100%

SEVERITY COUNT

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

DRIVER ACTIONS

	ACTIONS	PCT
OVER/UNDER COMP CURVE	3	75%
IMPROPER EXIT FROM HWY	1	25%
NO CONTRIBUTING ACTION	1	25%
SPEEDING	1	25%
TOO FAST FOR CONDITION	1	25%
WRONG SIDE OF ROADWAY	1	25%
TOTAL	4	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	3	60%
SMALL TRUCK	2	40%
TOTAL	5	100%

ROAD CONDITION

	CRASHES	PCT
DRY	3	75%
SLUSH	1	25%
TOTAL	4	100%

ILLUMINATION

	CRASHES	PCT
DARK	3	75%
DAYLIGHT	1	25%
TOTAL	4	100%

WEATHER

	CRASHES	PCT
CLEAR	4	100%
TOTAL	4	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	3	75%
SLIPPERY ICE/SNOW	1	25%
TOTAL	4	100%

6. SR 0896 N. of HUNT VIEW LN.

Date Range: 1/1/2003 to 12/31/2005

Area of Interest: (In County 15 On State Route 0896(P) Between Segment 0070 Offset 2424 and Segment 0070 Offset 2824)

USER ID/QUERY ID: wfreima/ 0020061024021

MONTH OF YEAR

	MAR	JUN	AUG	
CRASHES	1	1	1	3
PCT	33%	33%	33%	100%

DAY OF WEEK

	SUN	WED	THR	
CRASHES	1	1	1	3
PCT	33%	33%	33%	100%

HOUR OF DAY

	06	16	99	
CRASHES	1	1	1	3
PCT	33%	33%	33%	100%

YEAR

	CRASHES	PCT
2003	2	66%
2005	1	33%
TOTAL	3	100%

COLLISION TYPE

	CRASHES	PCT
ANGLE	3	100%
TOTAL	3	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
MINOR	2	66%
UNK SEVERITY	1	33%
TOTAL	3	100%

SEVERITY COUNT

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

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	3	100%
PROCEED W/O CLEARANCE	3	100%
DRIVER WAS DISTRACTED	1	33%
USING HAND-HELD PHONE	1	33%
TOTAL	3	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	4	66%
SMALL TRUCK	2	33%
TOTAL	6	100%

ROAD CONDITION

	CRASHES	PCT
DRY	2	66%
WET	1	33%
TOTAL	3	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	3	100%
TOTAL	3	100%

WEATHER

	CRASHES	PCT
CLEAR	2	66%
RAIN	1	33%
TOTAL	3	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	3	100%
TOTAL	3	100%

7. SR 0896 at SR 0841

Date Range: 1/1/2003 to 12/31/2005

Area of Interest: (In County 15 On State Route 0896(P) Between Segment 0070 Offset 1281 and Segment 0070 Offset 1681)

USER ID/QUERY ID: wfreima/ 0020061024019

MONTH OF YEAR

	JAN	MAR	MAY	JUN	JUL	AUG	SEP	NOV	DEC	
CRASHES	1	1	1	2	3	1	1	1	1	12
PCT	8%	8%	8%	16%	25%	8%	8%	8%	8%	100%

DAY OF WEEK

	SUN	MON	TUE	WED	THR	FRI	
CRASHES	2	2	4	2	1	1	12
PCT	16%	16%	33%	16%	8%	8%	100%

HOUR OF DAY

	06	07	08	10	13	14	15	17	22	
CRASHES	2	2	1	1	2	1	1	1	1	12
PCT	16%	16%	8%	8%	16%	8%	8%	8%	8%	100%

YEAR

	CRASHES	PCT
2003	2	16%
2004	6	50%
2005	4	33%
TOTAL	12	100%

COLLISION TYPE

	CRASHES	PCT
ANGLE	11	91%
HIT FIX OBJ	1	8%
TOTAL	12	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
MODERATE	2	16%
MINOR	6	50%
UNK SEVERITY	1	8%
PDO	3	25%
TOTAL	12	100%

SEVERITY COUNT

	PERSONS
FATALITIES	0
MAJOR	0
MODERATE	3
MINOR	7
UNK SEVERITY	2
UNK IF INJURED	0

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	11	91%
PROCEED W/O CLEARANCE	8	66%
RUNNING STOP SIGN	4	33%
FAILR MAINT PROP SPEED	1	8%
FLEEING POLICE (CHASE)	1	8%
TOO FAST FOR CONDITION	1	8%
TOTAL	12	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	12	52%
SMALL TRUCK	4	17%
LARGE TRUCK	3	13%
SUV	3	13%
VAN	1	4%
TOTAL	23	100%

ROAD CONDITION

	CRASHES	PCT
DRY	10	83%
WET	2	16%
TOTAL	12	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	10	83%
DARK	1	8%
UNK LIGHTING	1	8%
TOTAL	12	100%

WEATHER

	CRASHES	PCT
CLEAR	11	91%
RAIN	1	8%
TOTAL	12	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	12	100%
TOTAL	12	100%

8. SR 0896 at PARSONS RD.

Date Range: 1/1/2003 to 12/31/2005

Area of Interest: (In County 15 On State Route 0896(P) Between Segment 0060 Offset 1884 and Segment 0060 Offset 2421)

USER ID/QUERY ID: wfreima/ 0020061024020

MONTH OF YEAR

	JAN	MAR	JUN	JUL	SEP	
CRASHES	1	1	1	2	1	6
PCT	16%	16%	16%	33%	16%	100%

DAY OF WEEK

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

HOUR OF DAY

	02	07	08	10	16	
CRASHES	1	1	1	1	2	6
PCT	16%	16%	16%	16%	33%	100%

YEAR

	CRASHES	PCT
2003	3	50%
2005	3	50%
TOTAL	6	100%

COLLISION TYPE

	CRASHES	PCT
HIT FIX OBJ	3	50%
ANGLE	2	33%
OPP DIR SS	1	16%
TOTAL	6	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
MODERATE	1	16%
MINOR	3	50%
PDO	2	33%
TOTAL	6	100%

SEVERITY COUNT

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

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	3	50%
RUNNING STOP SIGN	2	33%
TOO FAST FOR CONDITION	2	33%
DRIVER INEXPERIENCED	1	16%
DRIVER WAS DISTRACTED	1	16%
OTHER IMPROPER DRIVING	1	16%
OVER/UNDER COMP CURVE	1	16%
TOTAL	6	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	5	55%
SMALL TRUCK	2	22%
LARGE TRUCK	1	11%
SUV	1	11%
TOTAL	9	100%

ROAD CONDITION

	CRASHES	PCT
DRY	3	50%
WET	3	50%
TOTAL	6	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	5	83%
STREET LIGHTS	1	16%
TOTAL	6	100%

WEATHER

	CRASHES	PCT
CLEAR	3	50%
RAIN	3	50%
TOTAL	6	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	4	66%
OTHER WEATHER COND	1	16%
SUBSTANCE ON RDWY	1	16%
TOTAL	6	100%

9. SR 0896 at APPLETON RD.

Date Range: 1/1/2003 to 12/31/2005

Area of Interest: (In County 15 On State Route 0896(P) Between Segment 0050 Offset 3033 and Segment 0060 Offset 6)

USER ID/QUERY ID: wfreima/ 0620061031006

MONTH OF YEAR

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

DAY OF WEEK

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

HOUR OF DAY

	00	04	05	08	11	13	14	16	17	20	23	
CRASHES	1	2	2	1	1	1	2	1	3	1	1	16
PCT	6%	12%	12%	6%	6%	6%	12%	6%	18%	6%	6%	100%

YEAR

	CRASHES	PCT
2003	8	50%
2004	2	12%
2005	6	37%
TOTAL	16	100%

COLLISION TYPE

	CRASHES	PCT
ANGLE	7	43%
HIT FIX OBJ	4	25%
HEAD ON	3	18%
OPP DIR SS	1	6%
REAR END	1	6%
TOTAL	16	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
MODERATE	1	6%
MINOR	5	31%
UNK SEVERITY	3	18%
PDO	7	43%
TOTAL	16	100%

SEVERITY COUNT

	PERSONS
FATALITIES	0
MAJOR	0
MODERATE	1
MINOR	5
UNK SEVERITY	6
UNK IF INJURED	0

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	13	81%
TOO FAST FOR CONDITION	13	81%
OVER/UNDER COMP CURVE	10	62%
WRONG SIDE OF ROADWAY	2	12%
DRIVER INEXPERIENCED	1	6%
OTHER IMPROPER DRIVING	1	6%
SPEEDING	1	6%
TAILGATING	1	6%
TOTAL	16	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	12	38%
SMALL TRUCK	10	32%
SUV	5	16%
VAN	3	9%
LARGE TRUCK	1	3%
TOTAL	31	100%

ROAD CONDITION

	CRASHES	PCT
WET	11	68%
DRY	3	18%
ICE PATCH	1	6%
SNOW	1	6%
TOTAL	16	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	9	56%
STREET LIGHTS	5	31%
DARK	1	6%
DAWN	1	6%
TOTAL	16	100%

WEATHER

	CRASHES	PCT
RAIN	9	56%
CLEAR	4	25%
SNOW	3	18%
TOTAL	16	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	7	43%
OTHER WEATHER COND	5	31%
SLIPPERY ICE/SNOW	3	18%
DEER IN ROADWAY	1	6%
TOTAL	16	100%

10. SR 0896 at GOOD HOPE RD.

Date Range: 1/1/2003 to 12/31/2005

Area of Interest: (In County 15 On State Route 0896(P) Between Segment 0040 Offset 3353 and Segment 0050 Offset 200)

USER ID/QUERY ID: wfreima/ 0620061031002

MONTH OF YEAR

	MAR	JUL	AUG	SEP	OCT	
CRASHES	1	3	2	1	1	8
PCT	12%	37%	25%	12%	12%	100%

DAY OF WEEK

	SUN	WED	THR	SAT	
CRASHES	1	1	1	5	8
PCT	12%	12%	12%	62%	100%

HOUR OF DAY

	03	06	10	12	13	16	21	
CRASHES	1	1	1	1	1	1	2	8
PCT	12%	12%	12%	12%	12%	12%	25%	100%

YEAR

	CRASHES	PCT
2003	2	25%
2004	3	37%
2005	3	37%
TOTAL	8	100%

COLLISION TYPE

	CRASHES	PCT
HIT FIX OBJ	5	62%
ANGLE	1	12%
HEAD ON	1	12%
OPP DIR SS	1	12%
TOTAL	8	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
FATAL	1	12%
MINOR	1	12%
UNK SEVERITY	1	12%
UNK IF INJURED	1	12%
PDO	4	50%
TOTAL	8	100%

SEVERITY COUNT

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

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	3	37%
IMPROPER/CARELESS TURN	2	25%
OVER/UNDER COMP CURVE	2	25%
TOO FAST FOR CONDITION	2	25%
WRONG SIDE OF ROADWAY	2	25%
AFFECTED PHYSICAL COND	1	12%
DRIVER WAS DISTRACTED	1	12%
IMPROPER ENTRANCE HWY	1	12%
OTHER IMPROPER DRIVING	1	12%
PROCEED W/O CLEARANCE	1	12%
RUNNING STOP SIGN	1	12%
TOTAL	8	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	5	62%
WET	2	25%
ICE	1	12%
TOTAL	8	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	5	62%
DARK	3	37%
TOTAL	8	100%

WEATHER

	CRASHES	PCT
CLEAR	7	87%
RAIN	1	12%
TOTAL	8	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	7	87%
OTHER WEATHER COND	1	12%
TOTAL	8	100%

11. SR 0896 at INDIANTOWN RD.

Date Range: 1/1/2003 to 12/31/2005

Area of Interest: (In County 15 On State Route 0896(P) Between Segment 0040 Offset 1650 and Segment 0040 Offset 2071)

USER ID/QUERY ID: wfreima/ 0620061031003

MONTH OF YEAR

	JAN	AUG	NOV	DEC	
CRASHES	1	1	2	1	5
PCT	20%	20%	40%	20%	100%

DAY OF WEEK

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

HOUR OF DAY

	08	14	17	23	
CRASHES	1	1	1	2	5
PCT	20%	20%	20%	40%	100%

YEAR

	CRASHES	PCT
2003	2	40%
2004	2	40%
2005	1	20%
TOTAL	5	100%

COLLISION TYPE

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

CRASH SEVERITY LEVEL

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

SEVERITY COUNT

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

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	4	80%
TOO FAST FOR CONDITION	2	40%
DRIVER WAS DISTRACTED	1	20%
OTHER IMPROPER DRIVING	1	20%
WRONG SIDE OF ROADWAY	1	20%
TOTAL	5	100%

VEHICLE TYPE

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

ROAD CONDITION

	CRASHES	PCT
WET	2	40%
DRY	1	20%
ICE	1	20%
ICE PATCH	1	20%
TOTAL	5	100%

ILLUMINATION

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

WEATHER

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

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	3	60%
SLIPPERY ICE/SNOW	2	40%
TOTAL	5	100%

12. SR 0896 at FLINT HILL RD.

Date Range: 1/1/2003 to 12/31/2005

Area of Interest: (In County 15 On State Route 0896(P) Between Segment 0020 Offset 4787 and Segment 0040 Offset 110)

USER ID/QUERY ID: wfreima/ 0620061031005

MONTH OF YEAR

	JAN	AUG	SEP	OCT	
CRASHES	2	2	3	1	8
PCT	25%	25%	37%	12%	100%

DAY OF WEEK

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

HOUR OF DAY

	04	07	14	16	19	21	
CRASHES	1	2	2	1	1	1	8
PCT	12%	25%	25%	12%	12%	12%	100%

YEAR

	CRASHES	PCT
2003	4	50%
2004	4	50%
TOTAL	8	100%

COLLISION TYPE

	CRASHES	PCT
ANGLE	4	50%
HIT FIX OBJ	2	25%
OPP DIR SS	1	12%
REAR END	1	12%
TOTAL	8	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
MODERATE	1	12%
MINOR	2	25%
UNK SEVERITY	1	12%
PDO	4	50%
TOTAL	8	100%

SEVERITY COUNT

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

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	6	75%
RUNNING STOP SIGN	4	50%
TOO FAST FOR CONDITION	3	37%
OTHER IMPROPER DRIVING	2	25%
OVER/UNDER COMP CURVE	1	12%
SPEEDING	1	12%
USING HAND-HELD PHONE	1	12%
WRONG SIDE OF ROADWAY	1	12%
TOTAL	8	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	10	62%
SUV	3	18%
SMALL TRUCK	2	12%
MOTORCYCLE	1	6%
TOTAL	16	100%

ROAD CONDITION

	CRASHES	PCT
DRY	5	62%
WET	3	37%
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	2	25%
TOTAL	8	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	8	100%
TOTAL	8	100%

13. SR 0896 at LONDON TRACT RD.

Date Range: 1/1/2003 to 12/31/2005

Area of Interest: (In County 15 On State Route 0896(P) Between Segment 0020 Offset 459 and Segment 0020 Offset 659)

USER ID/QUERY ID: wfreima/ 0620061031004

MONTH OF YEAR

	JAN	MAY	JUN	SEP	NOV	
CRASHES	1	1	1	1	1	5
PCT	20%	20%	20%	20%	20%	100%

DAY OF WEEK

	SUN	MON	THR	
CRASHES	2	1	2	5
PCT	40%	20%	40%	100%

HOUR OF DAY

	02	10	12	20	23	
CRASHES	1	1	1	1	1	5
PCT	20%	20%	20%	20%	20%	100%

YEAR

	CRASHES	PCT
2004	5	100%
TOTAL	5	100%

COLLISION TYPE

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

CRASH SEVERITY LEVEL

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

SEVERITY COUNT

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

DRIVER ACTIONS

	ACTIONS	PCT
OTHER IMPROPER DRIVING	3	60%
AFFECTED PHYSICAL COND	2	40%
NO CONTRIBUTING ACTION	2	40%
PROCEED W/O CLEARANCE	2	40%
SPEEDING	1	20%
TOTAL	5	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	5	55%
SUV	3	33%
SMALL TRUCK	1	11%
TOTAL	9	100%

ROAD CONDITION

	CRASHES	PCT
DRY	4	80%
WET	1	20%
TOTAL	5	100%

ILLUMINATION

	CRASHES	PCT
DARK	2	40%
DAYLIGHT	2	40%
STREET LIGHTS	1	20%
TOTAL	5	100%

WEATHER

	CRASHES	PCT
CLEAR	4	80%
RAIN	1	20%
TOTAL	5	100%

ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	4	80%
WORK ZONE RELATED	1	20%
TOTAL	5	100%

14. SR 0896 at CHAMBERS ROCK RD.

Date Range: 1/1/2003 to 12/31/2005

Area of Interest: (In County 15 On State Route 0896(P) Between Segment 0010 Offset 3027 and Segment 0010 Offset 3362)

USER ID/QUERY ID: wfreima/ 0620061031001

MONTH OF YEAR

	JAN	MAY	JUN	JUL	SEP	OCT	NOV	
CRASHES	2	1	1	1	3	1	1	10
PCT	20%	10%	10%	10%	30%	10%	10%	100%

DAY OF WEEK

	SUN	TUE	WED	FRI	SAT	
CRASHES	3	1	1	3	2	10
PCT	30%	10%	10%	30%	20%	100%

HOUR OF DAY

	01	08	12	13	16	17	18	22	
CRASHES	1	1	1	2	1	1	2	1	10
PCT	10%	10%	10%	20%	10%	10%	20%	10%	100%

YEAR

	CRASHES	PCT
2003	3	30%
2004	5	50%
2005	2	20%
TOTAL	10	100%

COLLISION TYPE

	CRASHES	PCT
REAR END	6	60%
ANGLE	1	10%
HEAD ON	1	10%
HIT FIX OBJ	1	10%
OPP DIR SS	1	10%
TOTAL	10	100%

CRASH SEVERITY LEVEL

	CRASHES	PCT
MODERATE	2	20%
MINOR	3	30%
UNK SEVERITY	1	10%
UNK IF INJURED	1	10%
PDO	3	30%
TOTAL	10	100%

SEVERITY COUNT

	PERSONS
FATALITIES	0
MAJOR	0
MODERATE	2
MINOR	5
UNK SEVERITY	1
UNK IF INJURED	1

DRIVER ACTIONS

	ACTIONS	PCT
NO CONTRIBUTING ACTION	8	80%
TOO FAST FOR CONDITION	3	30%
PROCEED W/O CLEARANCE	2	20%
SPEEDING	2	20%
TAILGATING	2	20%
AFFECTED PHYSICAL COND	1	10%
CARELESS PASS/LN CHNG	1	10%
CARELESS/ILLEGAL BACKING	1	10%
IMPROPER/CARELESS TURN	1	10%
OTHER IMPROPER DRIVING	1	10%
SUDDEN SLOWING/STOP	1	10%
TOTAL	10	100%

VEHICLE TYPE

	VEHICLES	PCT
AUTOMOBILE	7	31%
SMALL TRUCK	6	27%
SUV	6	27%
VAN	3	13%
TOTAL	22	100%

ROAD CONDITION

	CRASHES	PCT
DRY	7	70%
WET	3	30%
TOTAL	10	100%

ILLUMINATION

	CRASHES	PCT
DAYLIGHT	6	60%
DARK	4	40%
TOTAL	10	100%

WEATHER

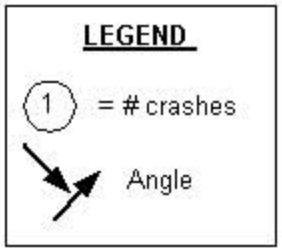
	CRASHES	PCT
CLEAR	8	80%
RAIN	2	20%
TOTAL	10	100%

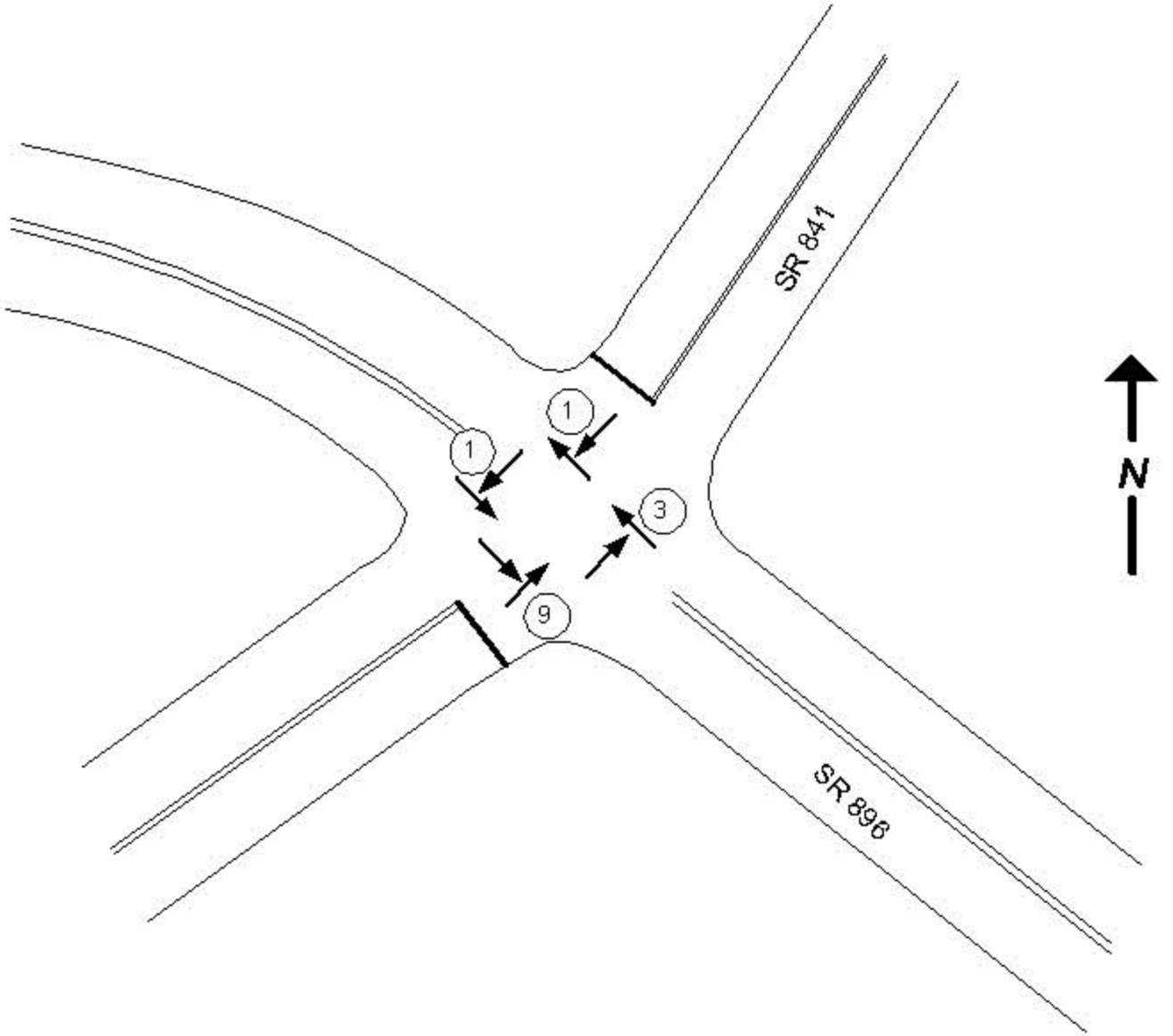
ENVIR/ROADWAY FACTORS

	FACTORS	PCT
NONE	8	80%
OTHER WEATHER COND	1	10%
SUDDEN WEATHER COND	1	10%
TOTAL	10	100%

ROAD SAFETY AUDIT

SR 896 at SR 841
Collision Diagram
Crash Data Years 2003-2005



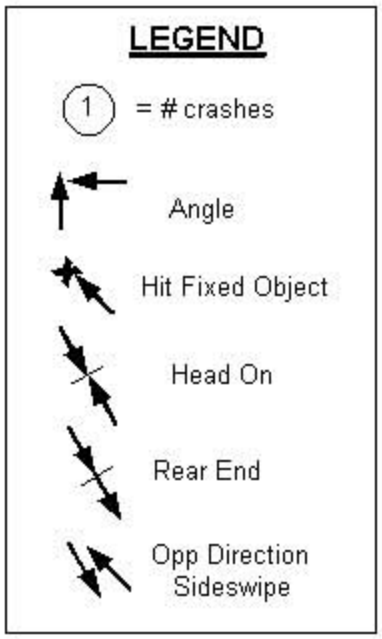


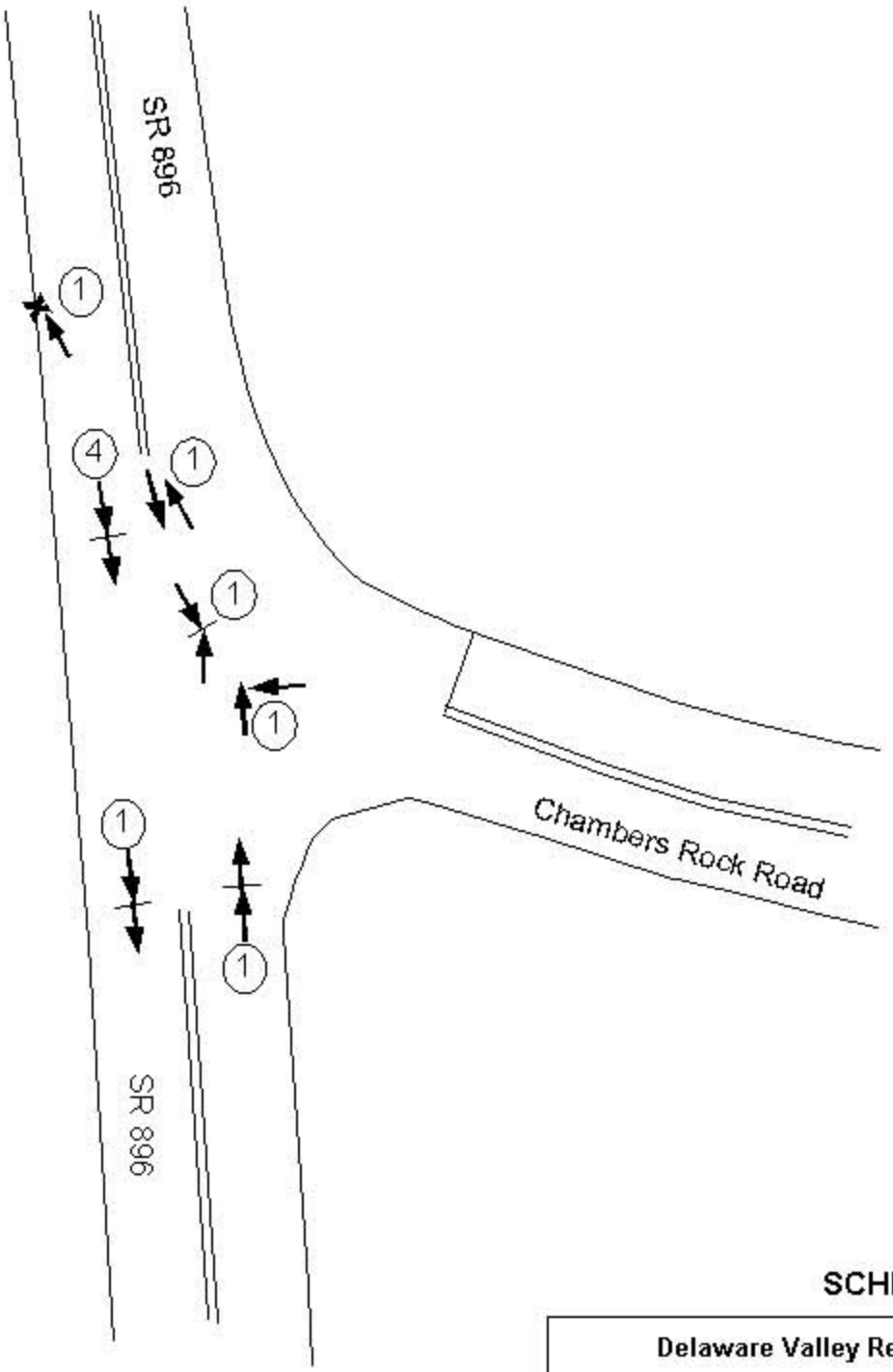
Narrative Summary:
After entering the intersection, vehicles on 841 NB or SB struck, or were struck by, vehicles traveling on 896 NB or SB resulting in 14 angle crashes during analysis period 2003-2005.

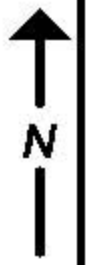
SCHEMATIC NOT TO SCALE

Delaware Valley Regional Planning Commission
December 2006

ROAD SAFETY AUDIT
SR 896
at
Chambers Rock Rd.
Collision Diagram
Crash Data Years 2003-2005





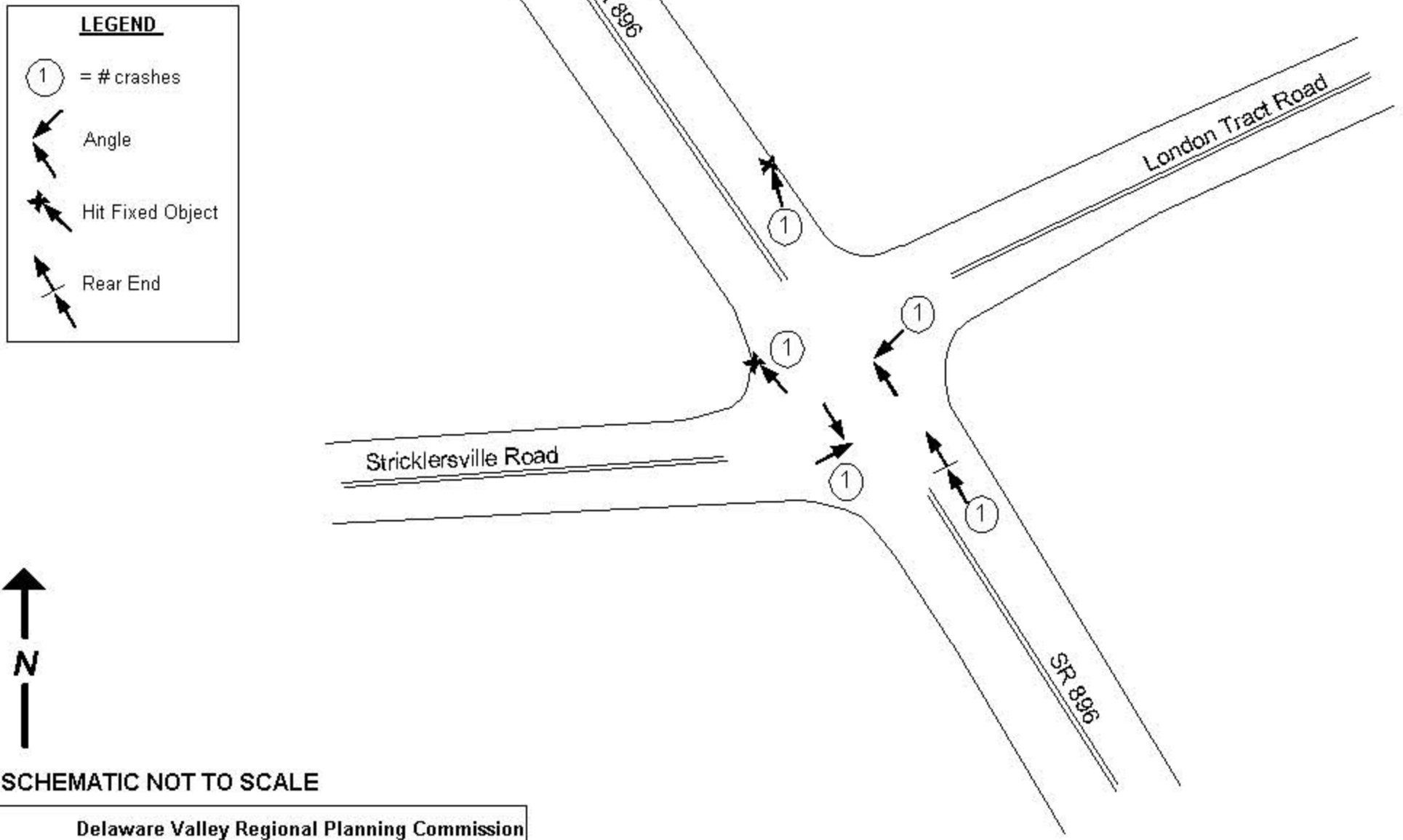


SCHEMATIC NOT TO SCALE

Delaware Valley Regional Planning Commission
December 2006

ROAD SAFETY AUDIT

SR 896 at Stricklersville Rd.
Collision Diagram
Crash Data Years 2003-2005



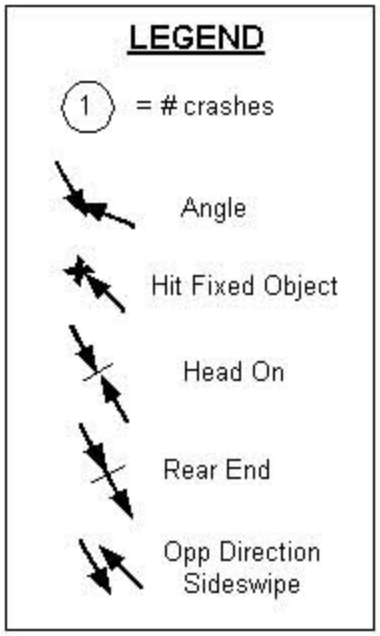
SCHEMATIC NOT TO SCALE

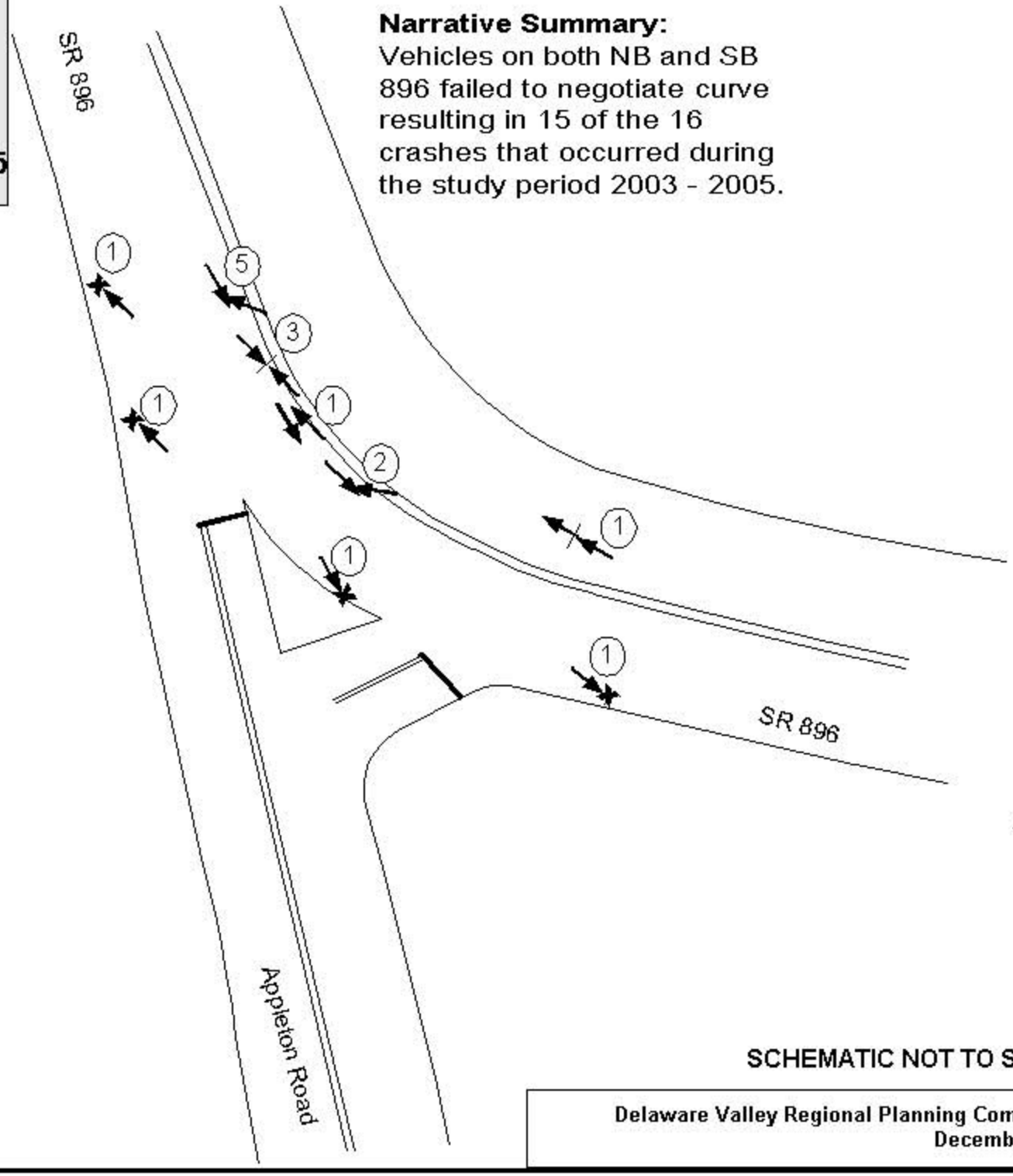
Delaware Valley Regional Planning Commission
December 2006

ROAD SAFETY AUDIT

SR 896 at Appleton Road
Collision Diagram
Crash Data Years 2003-2005

Narrative Summary:
Vehicles on both NB and SB 896 failed to negotiate curve resulting in 15 of the 16 crashes that occurred during the study period 2003 - 2005.





SCHEMATIC NOT TO SCALE

Delaware Valley Regional Planning Commission
December 2006

APPENDIX D
Photo Log

Cluster 1.
Between School Rd. and Cobblers Ln.


SB view of PA 896

NB view of PA 896

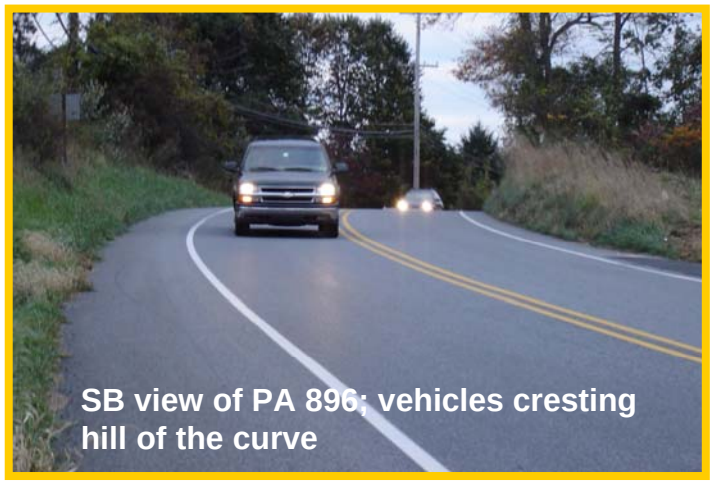

NB view of PA 896


SB view of PA 896; wide shoulders

Cluster 2.
At Hess Mill Rd.

SB view of PA 896 at approach of Hess Mill Rd.

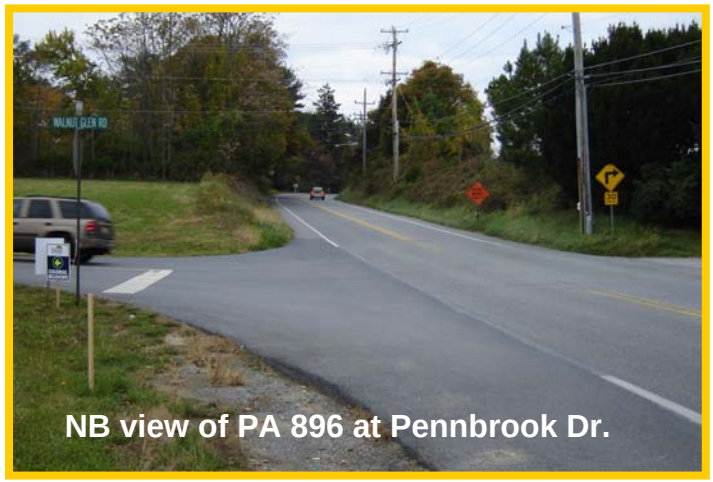
NB view of PA 896; vehicle turning left onto Hess Mill Rd.

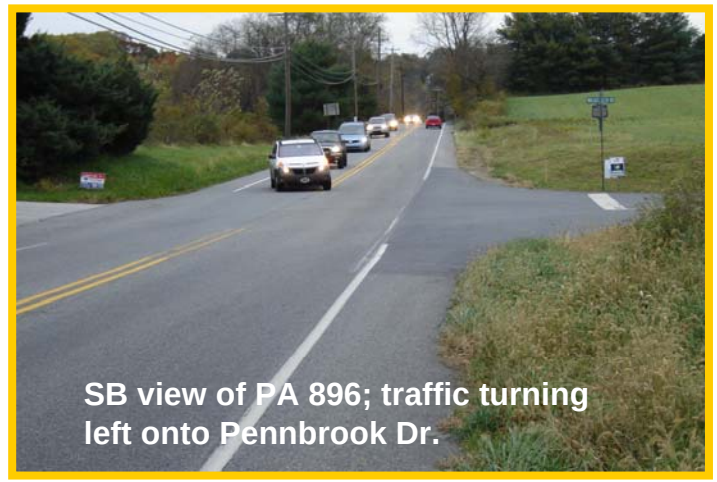


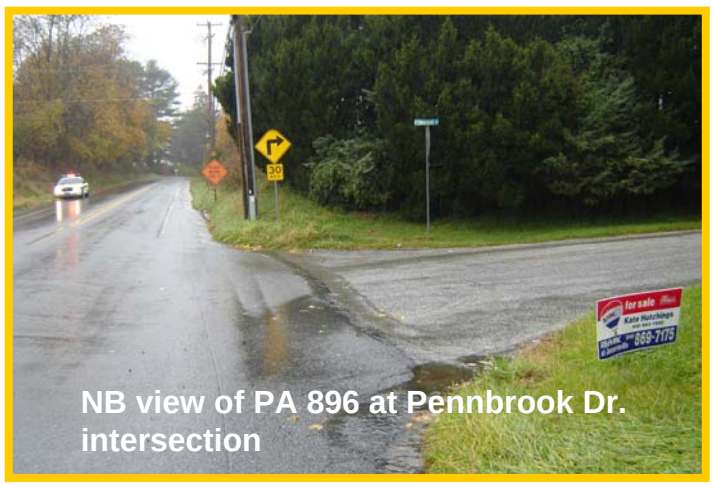
SB view of PA 896; vehicles cresting hill of the curve

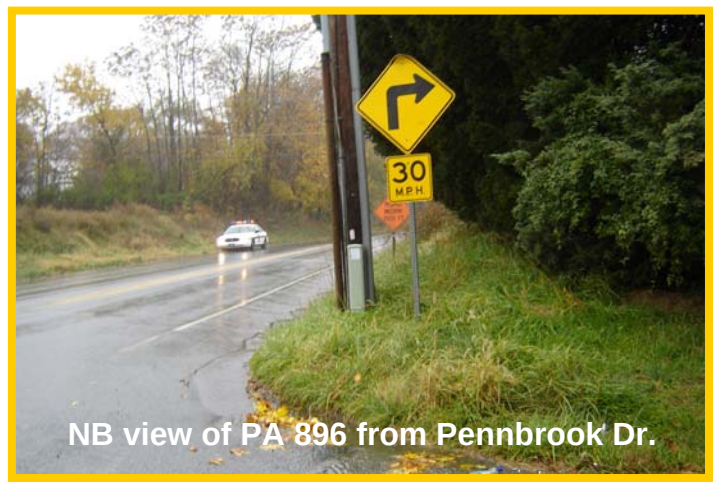
SB view of PA 896; wet pavement conditions

Cluster 4.
At Pennbrook Dr.


NB view of PA 896 at Pennbrook Dr.


SB view of PA 896; traffic turning left onto Pennbrook Dr.


NB view of PA 896 at Pennbrook Dr. intersection



NB view of PA 896 from Pennbrook Dr.

Cluster 5.
At Den Rd.


NB view of PA 896


SB view of PA 896


NB view from Den Rd; sheeting across roadway


SB view of PA 896 from Den Rd.

Cluster 7.
At SR 841

SB view of PA 896; truck heading WB on SR 841

NB view of PA 896 at SR 841

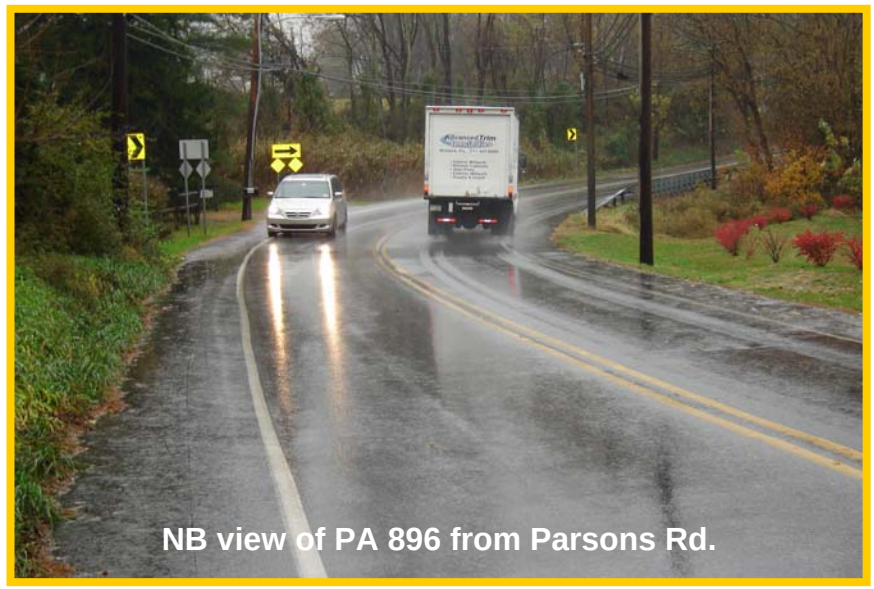
SB view of PA 896/PA 841 intersection

WB view from PA 841 approaching PA 896

Cluster 8.
At Parsons Rd.

NB view of PA 896 at Parsons Rd.

SB view of PA 896 at Parsons Rd.


NB view of PA 896 from Parsons Rd.

Cluster 9.
At Appleton Rd.

NB view of PA 896 at Appleton Rd.

SB view of PA 896 at Appleton Rd.

Truck traveling SB on PA 896 at Appleton Rd.

SB view of PA 896; wet pavement conditions

Cluster 10.
At Good Hope Rd.

NB view of PA 896

PA 896/Good Hope Rd. intersection

Good Hope Rd. at PA 896

NB view of PA 896 from Good Hope Rd.

Cluster 11.
At Indiantown Rd.

View of Indiantown Rd. at PA 896

Curve warning pavement marking on PA 896 approaching Indiantown Rd.

Utility crew repairing downed pole after overnight crash

SB view of PA 896/Indiantown Rd. intersection

Cluster 12.
At Flint Hill Rd.

NB view of PA 896/Flint Hill Rd. intersection

SB view of PA 896/Flint Hill Rd. intersection

EB view of Flint Hill Rd. approach to PA 896

WB view of Flint Hill Rd. approach to PA 896

Cluster 13.
At London Tract Rd/Stricklersville Rd.

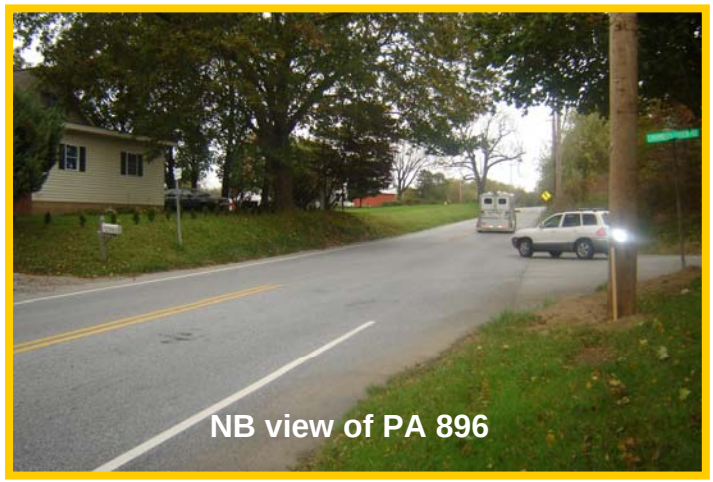
Stricklersville Rd./PA 896 intersection

Left turning traffic onto Stricklersville Rd.

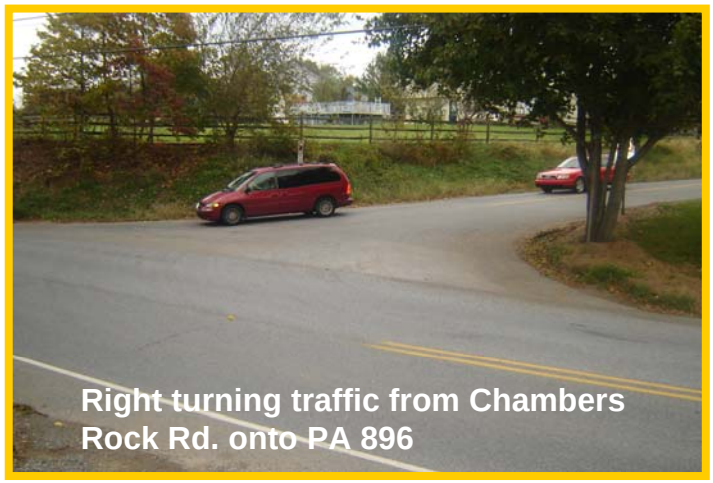
EB traffic on Stricklersville Rd. intersection

Stricklersville Rd./PA 896 intersection

Cluster 14.
At Chambers Rock Rd.


NB view of PA 896

SB view of PA 896


Right turning traffic from Chambers Rock Rd. onto PA 896

Chambers Rock Rd. at PA 896

Peacedale Road Intersection

SB view of PA 896 at Peacedale Rd; wide shoulders

Van pulling out from Peacedale Rd.

PA 896 Road Safety Audit Team

APPENDIX E
Checklist

CHECKLIST

Audit Team Member_____

Location_____

GENERAL ISSUES

Item #	***Description***	***Check***	***Comments***
1 Drainage	Do drainage items seem to be adequate?		
	Are drainage items clear of debris?		
2 Landscaping	Is landscaping in accordance with guidelines (sight distance, clearances etc.)		
3 Public Utilities	Are boxes, poles, and/or posts located in a safe position?		
	Do the above items interfere with sight distance?		
4 Access Management	Are there locations where access management is problematic?		
5 Lighting	Is lighting needed in specific locations?		

ALIGNMENT AND CROSS SECTION

Item #	***Description***	***Check***	***Comments***
1 Visibility	Are the sight lines clear of obstruction?		

	Are sight distances adequate for the speed of traffic on Rte. 896?		
	Is adequate sight distance provided at intersections?		
2 Driver expectation	Are there any sections of the roadway which may cause driver confusion such as:		
	a. Is alignment of roadway clearly defined?		
	b. Are crossroads or hidden driveways properly signed along corridor?		
	c. Has disused pavement (if any) been removed or treated?		
	d. Are curves properly delineated?		
	e. Have old pavement markings been removed properly?		
	f. Do streetlight and tree lines conform with the road alignment?		
	g. Where there is new pavement, will the transition give rise to potential hazards?		
3 Design speed	Is the horizontal and vertical alignment suitable for the traffic speed? If not:		
	a. Are advisory speed signs posted?		
	b. Are warning sings installed?		

	c. Are posted advisory speeds for curves appropriate?		
4 Widths	Are all the traffic lanes and roadway widths adequate?		
5 Shoulders	Are shoulder widths appropriate for broken down vehicle or emergency vehicles?		
	Is the shoulder cross slope sufficient to provide proper drainage?		
	Are there locations where guide rail may be appropriate?		
6 Side slopes	Are the side slopes and table drains safe for run off vehicles to traverse?		
7 Overtaking	Are adequate passing opportunities provided?		

INTERSECTIONS

Item #	***Description***	***Check***	***Comments***
1 Location	Are intersections located safely with respect to horizontal and vertical alignment?		
	Are there any roadside objects nearby which would intrude driver's line of sight?		
	Are the intersections adequate for all vehicular movements?		
2 Controls	Are pavement markings and intersection control signing satisfactory?		

3 Signage	Is the intersection appropriately signed?		
	Are there advance warning signs indicating the intersection?		
	Are signs appropriately located and of the appropriate size?		
4 Layout	Is the intersection layout obvious to all users?		
	Is the alignment of curbs satisfactory?		
	Are turning radii and tapers appropriate?		
5 Visibility, sight distance	Is sight distance adequate for all movements and all users?		

PEDESTRIANS

Item #	***Description***	***Check***	***Comments***
1 Pedestrians	Are there locations where pedestrian facilities could be used?		
2 Bus stops	Are bus stops appropriately located with adequate clearance from the traffic lane for safety and visibility?		
	Are there appropriate travel paths and crossing points for pedestrians?		

BICYCLISTS

Item #	***Description***	***Check***	***Comments***

1 Bicyclists	Are shoulder widths adequate for bicycle lanes?		
	Are there share the road signs posted?		
	Is the road surface of suitable quality for bicyclists?		
	Are turning radii and tapers appropriate?		
	Are bicycle safe grates provided at drainage pits where necessary?		
	Are drainage grates bicycle friendly?		
	Is the pavement width adequate for the number of cyclists using the route?		

SIGNAGE, PAVEMENT MARKINGS, DELINEATION AND LIGHTING

Item #	***Description***	***Check***	***Comments***
1 Signage	Are there signs missing from key locations?		
	Are signs easy to understand?		
	Are the correct signs used for each situation, and is each sign necessary?		
	Are signs effective for all likely conditions (i.e. day, night, oncoming headlights etc)?		

	Are there locations where there is sign clutter?		
	Are all necessary regulatory, warning, and direction signs (including detours) in place? Are they conspicuous?		
	Are they redundant?		
	Are traffic signs in their correct locations, and properly positioned with respect to lateral clearance and height?		
	Are signs placed so as to restrict sight distance, particularly for vehicles?		
	Do signs supports conform to guidelines?		
2 Pavement Markings and Delineation	Does existing pavement markings need to be re-painted?		
	Have retro-reflective markers been placed installed?		
	Where colored markers are used, have they been installed correctly?		
	Are raised pavement markers needed?		
	Are pavement markers easily visible and effective for all likely conditions (i.e. at night, day, inclement weather etc.)?		
	Have the correct chevron markers been used?		
	Are the chevron markers placed correctly?		

	Are there locations where more chevrons are needed?		
	Are centerline and/or edge line rumble-strips needed?		
	Are all line markings (center line, edge line, transverse lines) in good condition?		
	Are guide posts correctly placed, clean, and visible?		
3 Lighting	Is appropriate lighting installed at intersections, pedestrian and bicycle crossings?		
	Are the appropriate types of poles used for all locations and correctly installed?		
	Are all locations free of any lighting which may conflict visually with signs?		

PAVEMENT

Item #	***Description***	***Check***	***Comments***
1 Pavement defects	Is the pavement free of defects (i.e. excessive roughness, potholes) which could result in safety problems?		
2 Skid resistance	Does the pavement appear to have adequate skid resistance on curves, steep grades and approach to intersection?		
3 Ponding	Is the pavement free of areas where ponding may occur resulting in a safety problem?		

PHYSICAL OBJECTS

Item #	***Description***	***Check***	***Comments***

1 Fencing	Is pedestrian fencing were needed?		
	Is fencing in the clear zone free of separate horizontal rails?		
	Is there adequate delineation/visibility of barriers and fences at night?		

OTHER ITEMS

Item #	***Description***	***Check***	***Comments***
1			
2			
3			
4			
5			
6			

ADDITIONAL COMMENTS/OBSERVATIONS

APPENDIX F
List of Identified Safety Issues

GENERAL COMMENTS

Location #1

- NE corner of School Rd at 896 – environment interferes with sight distance
- There is a large drop-off located at the house in front of the vet clinic
- Drainage problems
- Shoulders are inadequate for bicycles
- Left-turn blocks through traffic on SB lane
- Access to vet clinic is too narrow: cannot accommodate 2 vehicles (private project being undertaken)
- Sheet flow across the roadway – drainage problem
- Curve signs inadequate
- Pavement markings need repainting
- Paved lip present roadside drop off hazard
- Brick planter over 4 feet in CZ
- Lighting needed
- Pavement markings and delineation needed
- Minor sheet flow across 896
- Need bank work on NE quadrant due to inadequate radii at School Rd
- Possible need to for channelization on 896 at School Rd
- Utility poles on both side of 896
- Shoulder is less than 3 feet

Location #2

- Vertical crest
- Poor street names/signage
- Lack of advance warning signs
- Active HOP future access to the new development opposite of Hess Mill Rd
- Utility poles on both sides
- No curve warning sign SB
- SB sight distance problem
    - Due to vegetation

- Remove dirt bank on SB side
- Signage not appropriate for night time
- Intersection is close to the horizontal curve in the South
- Future sight distance will be a problem with upcoming development

Location #3

- Eastside NB vegetation needs to be cut back
- Need advisory speed warning signs
- No shoulders
- Shoulder width not adequate for bicyclists
- Right curve issue – bank to be removed
- Vertical and horizontal alignment issues
- No shoulder on the left curve
- Recommend center-line rumble strips
- Curve sign needed at hidden driveway
- Speed limit too high at 45 mph for windy road
- Add share the road signs
- Add centerline rumblestrips

Location #4 at Pennbrook Dr.

- Poor drainage on Eastside, deep flow within shoulder
- Inlet on SW only serves rainfall
- Roadside worn away needs to be built up
- Sight distance issue, cut back bank on SB side north of Pennbrook
- Warning sign needed SB
- Slope above shoulder causes drainage problem
- Guide rail needed on curve
- More working lights on curve
- Lacking shoulder width
- Horizontal curve problems
- Better signage
- Street lights needed

- Private road sight distance issues
- Need street lights at intersection
- Need for chevrons north of Pennbrook
- Sight distance push at NE corner
- Utility pole on NE side of road adjacent to cartway is problematic

Location #5 at Den Rd.

- Edge drop off
- Drainage problems
- Access management needs specifically at the restaurant
- Utility pole issues
- Sheeting across driveway
- Shoulder cross slope insufficient to provide proper drainage
- Needs signage upgrade for curves
- Utility pole in front of restaurant needs relocation
- Clogged inlet
- Chevrons needed
- Stopping sight distance on NB 896 is a problem
- Close to school bus stop
- Needs more curve warning signs
- Potential pedestrians crossing issues
- Insufficient sight distance looking SB
- Need intersection ahead signs with names

Location #6 N. of Hunt View Ln.

- Signing at cross road
- Shoulder on SB needs be cut back at crest of hill
- Side street warning with distance plaque
- Vegetation overgrowth near signs
- Recommend CLRS ??(Joe)
- Vertical alignment issues

- Deteriorated pavement

Location #7

- Sight distance both NB and SB on 841 trying to get onto 896
- Drainage
- Tough to accelerate from SB 841
- Vertical and horizontal sight distance problems
- Not enough chevrons in general
- Traffic speed not suitable for horizontal and vertical alignment
- Possible need for RPM's
- Steep grade
- Sight distance going EB on 841
- Relocate the drainage inlet
- Plot collision diagrams of crashes
- Flashing beacon at the approach of intersection
- Further study consideration of roundabout
- Study of potential traffic signal

Location #8

- Speeding through curve
- Drainage issues
- Utility poles on both sides
- Delineation
- Speed related horizontal alignment
- RPMs
- Install new inlet
- Consider pavement markings
- Crash worthy end treatment
- Check for over super elevation
- Ditch drop-off
- Damaged utility pole
- Kimbelot NW corner missing guy wire

- Guide rail needed at NW corner of Kimbelot SB 896
- Cut back vegetation
- Poor sight lines for vehicles approaching the intersection
- Near school bus stop going up the hill
- Clogged inlets
- Sheet flow

Location #9

- Travel lanes not wide enough for trucks
- Realign Appleton at 896 as T-intersection
- Pole in the island
- Better warning signage on 896 NB curve
- Remove tree, 896 NB curve
- 896 S to Kimblelot 1-way to increase the width
- Lanes too narrow for vehicles to navigate safely at post speeds
- Consider roundabouts or T intersection,
- Traffic calming study needed to identify projects
- TE projects
- Possible roundabout considered
- Add lateral rumble-strips at NB
- Pavement lines not properly marked
- Village concept reinforced with curves/sidewalks/paths
- Paved with rounded edge
- Eliminate island and have Appleton enter 896 at right angle
- Rumblestrip from N to S would raise drivers awareness to curve ahead
- Drainage problems at Good Hope and 896
- Plot collision diagrams
- Trim tree over ROW at curve??
- Add pedestrian amenities

Location #10

- Drainage problems

- Incorrect signage
- Sight distance problems coming out of Good Hope Rd
- Roadway adversely super elevated
- Needs stop signs at Good Hope Rd
- Pavement markings to better position vehicles to make left turn
- Pull out drainage
- Warning and regulatory signs needed
- Poor cross section
- Cutback vegetation
- Add pedestrian facilities for new development
- Chevrons needs
- SB left turn lane needed on 896
- Consider a shoulder bypass lane for left-turning traffic onto Good Hope Rd
- Clean drains
- Evaluation of roundabout
- Hump in 896 in S of intersection makes It difficult to see NB traffic
- Developer to make needed improvement at intersection
- Water ponding north of intersection

Location #11

- Utility pole issues
- Drainage
- Sight distance for Indiantown Rd traffic entering 896 NB
    - Realignment more perpendicular
- RPM's

Location #12

- Re-graded at drainage inlets
- Additional pavement markings
- Open throats across Flint Hill
- Add curbing at intersection
- Road cross section less than 1%

- Hydroplaning
- Rutting
- Inlet hazardous
- Consider curbing at intersection
- Missing stop bars
- Better advance warning of stop sign
    - Does not meet driver expectation
- Ponding on Eastside of 896 north of intersection

Location #13

- Compromise sight distance from Stricklersville Rd looking NB
- Realign intersection
- High traffic turning to and from Stricklersville Rd
- Removal of wall NW corner
- Roadside drainage problem

Location #14

- Cut back embankment
- No shoulder
- Consider stopping vehicles NB in the interim to feasibility of SB left turn lane
    - Consider realignment
- Inadequate stopping distance for 896 SB traffic approaching Chambers Rock Rd
- Candidate for left turn lane
- Stop sign misplaced on Chambers Rock Rd
- High volume intersection

Peacedale Intersection

- Poor sight distance of SB 896 traffic for motorists exiting Peacedale
- Local cut though school parking lot instead of exiting at Peacedale
- New development coming across 896, may provide opportunity to address this location

Overall Corridor Wide Issues

- Narrow lane widths
- Inconsistent signage
- Shoulder widths inadequate
- Inconsistent signing at curves
- RPM’s and delineators
- Overall profile of road needs to be checked
- Maintenance and drainage
- Intersection drainage issues
- Enforcement of speeding drivers
- Consolidation of utility poles
    - More ROW needed to accommodate utility consolidation
- Additional ROW during the future development

Title of Report: ***PA 896 ROAD SAFETY AUDIT – CHESTER COUNTY***

Publication No.: 07042-A Technical Memorandum

Date Published: January 2007

Geographic Area Covered:
The study area includes portions of New London, Franklin and London Britain Townships in Chester County.

Key Words:
Road, safety, audit, potential, fatalities, injuries, reportable, crashes, issues, strategies, coordination, engineering, enforcement, education, prioritize, intersection, signalized, speed limit, traffic volumes, hit fixed object, PennDOT, stakeholders, audit team, drainage, sight distance, clear zone, geometry, shoulder, rumble strip, delineator, pavement markings, signs.

ABSTRACT: This is a documentation of the process and findings of the PA 896 Road Safety Audit (RSA) undertaken by Delaware Valley Regional Planning Commission (DVRPC) in conjunction with Pennsylvania Department of Transportation (PennDOT). The RSA was done over three days in November 2006. The goal of the audit is 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, quick turnaround safety projects to address the issues where possible. The roadway studied is identified in the Safety Plan for PennDOT District 6 as a "high risk rural road"

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PENNDOT

Delaware Valley Regional Planning Commission

JANUARY 2007

PA 896

Road Safety Audit