



DELAWARE STRATEGIC HIGHWAY SAFETY PLAN: TOWARD ZERO DEATHS



Review of Pedestrian Safety Audits

Built Environment Subcommittee of
Advisory Council on Walkability and Pedestrian
Awareness

August 18, 2016

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DelDOT

Agenda

- Pedestrian safety and the Delaware SHSP
- Roadway Safety Audit process
- SR 2 Pedestrian Safety Study summary
- US 13 Pedestrian Safety Study summary
- Next Steps



SHSP Background / DE's SHSP History

- AASHTO SHSP (1998)
- Federal Legislation
 - SAFETEA-LU
 - MAP-21
 - FAST Act
- *Toward Zero Deaths: A National Strategy on Highway Safety*



Delaware's SHSP

- **MISSION STATEMENT:**

- The *Delaware Strategic Highway Safety Plan: Toward Zero Deaths* aims to eliminate fatalities and serious injuries on Delaware's roadways through a multi-agency approach that utilizes education, enforcement, engineering, and emergency medical service strategies.

- **OVERALL GOAL:**

- The goal of the *Delaware Strategic Highway Safety Plan: Toward Zero Deaths* is to achieve a reduction of at least 3 fatalities and 15 serious injuries annually and continue to reduce the total number of fatalities and serious injuries to achieve at least a 50 percent reduction by 2035.

2015 SHSP EMPHASIS AREAS

1. Intersections
2. Roadway Departure
3. Impaired Driving
4. Unrestrained Motorists
5. Motorcycles
6. Speeding
7. Pedestrians
8. Traffic Records



Delaware's SHSP Emphasis Area History

DELAWARE'S SHSP EMPHASIS AREA HISTORY

2006 / 2008 SHSP

1. Curbing Aggressive Driving
2. Reducing Impaired Driving
3. Increasing Seatbelt Usage
4. Improving Pedestrian Safety
5. Making Truck Traffic Safer
6. Keeping Vehicles on the Roadway
7. Minimizing the Consequences of Run-Off-Road Crashes
8. Designing Safer Work Zones
9. Improving Information and Decision Support Services

2010 SHSP

- P1. Reducing the Frequency and Severity of Roadway Departure Crashes
- P2. Curbing Aggressive Driving
- P3. Increasing Seatbelt Usage
- P4. Reducing Impaired Driving
- P5. Improving the Design and Operation of Highway Intersections
- P6. Making Walking and Street Crossing Safer
- P7. Improving Motorcycle Safety and Increasing Motorcycle Awareness
- S1. Sustaining Proficiency in Older Drivers
- S2. Making Heavy Vehicle Travel Safer
- S3. Designing Safer Work Zones
- S4. Improving Traffic Records

P = Primary Emphasis Area
S = Secondary Emphasis Area

2015 SHSP

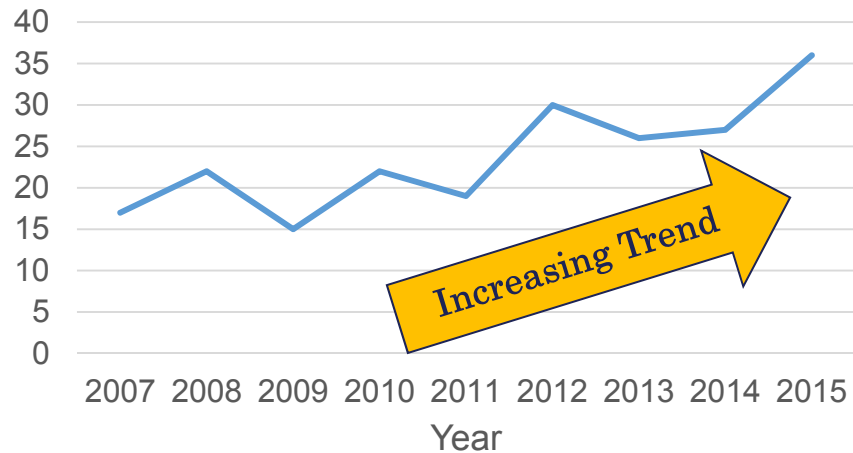
1. Intersections
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An emphasis area for pedestrian safety has been included in all DE SHSP versions



Pedestrian Crash Trends

Pedestrian Fatalities in DE



2007 to 2014 Pedestrian Fatalities & Serious Injuries

- 90% occurred in urban areas
- 69% were in New Castle County
- 63% were male
- 58% involved no contributing factor on the part of the vehicle driver
- 52% were 20 to 49 years old
- 51% occurred between 4 PM and 11 PM
- 42% occurred along divided roadways
- 36% occurred on principal arterials
- 33% of pedestrian fatalities were impaired
- 33% occurred during dark (unlit) conditions
- 33% occurred on a Friday or Saturday
- 25% occurred at an intersection

Source: 2015 DE SHSP



SHSP Strategies to Reduce Pedestrian Fatalities and Serious Injuries

- Continue a multi-agency approach to addressing pedestrian safety issues
- Develop and distribute consistent public information messages to increase public awareness and laws on pedestrian safety
- Conduct high-visibility enforcement campaigns targeting both pedestrians and drivers to promote pedestrian safety
- Improve infrastructure (e.g., sidewalks, crosswalks, lighting, transit facilities) to reduce pedestrian exposure and the potential for pedestrian/vehicle conflicts, and increase pedestrian visibility and awareness
- Research and implement the latest pedestrian safety “best practice” treatments and devices
- Conduct pedestrian safety audits at high-crash locations ← *Today's Focus*
- Install effective countermeasures to improve pedestrian safety at high crash locations and consider pedestrians when installing roadway improvements
- Perform before/after studies to evaluate and identify the most effective pedestrian safety treatments
- Ensure drivers education instructors emphasize vehicle-pedestrian laws in their lesson plans
- Support legislative action to strengthen pedestrian safety laws and enforcement efforts
- Develop policies and/or guidelines to support pedestrian safety measures



Pedestrian Safety Audit Site Selection

- DeIDOT, OHS, & DSP established the Pedestrian / Bicycle Safety Working Group in February 2013
 - Also includes City of Wilmington, WILMAPCO, Dover/Kent MPO, UD T² Center, Bike Delaware, local law enforcement agencies
- DeIDOT's crash data review identified principal arterial roadways in New Castle County with a high concentration of pedestrian crashes
- DeIDOT Traffic Safety leads the safety audits



Pedestrian Safety Audit Process

- Review pedestrian & bicycle crash history along corridor
- Perform pedestrian observations & counts
- Compile existing data -
 - Pedestrian facilities: sidewalk, pedestrian signals, etc.
 - Bus stop locations and ridership data
 - Roadway facilities: channelization, lighting, etc.
 - Vehicular and pedestrian volumes
- Develop existing condition maps
- Conduct walking tour of corridor with stakeholders
- Perform additional analysis to evaluate potential improvements (short and long-term)
- Present improvements to stakeholders for concurrence



Sample Existing Conditions Maps

October 2014

Existing Conditions SR 2

St. James Church Rd
to
SR 141

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

Crash study period - January 2005
through December 2012

0 50 100 150 200 Feet

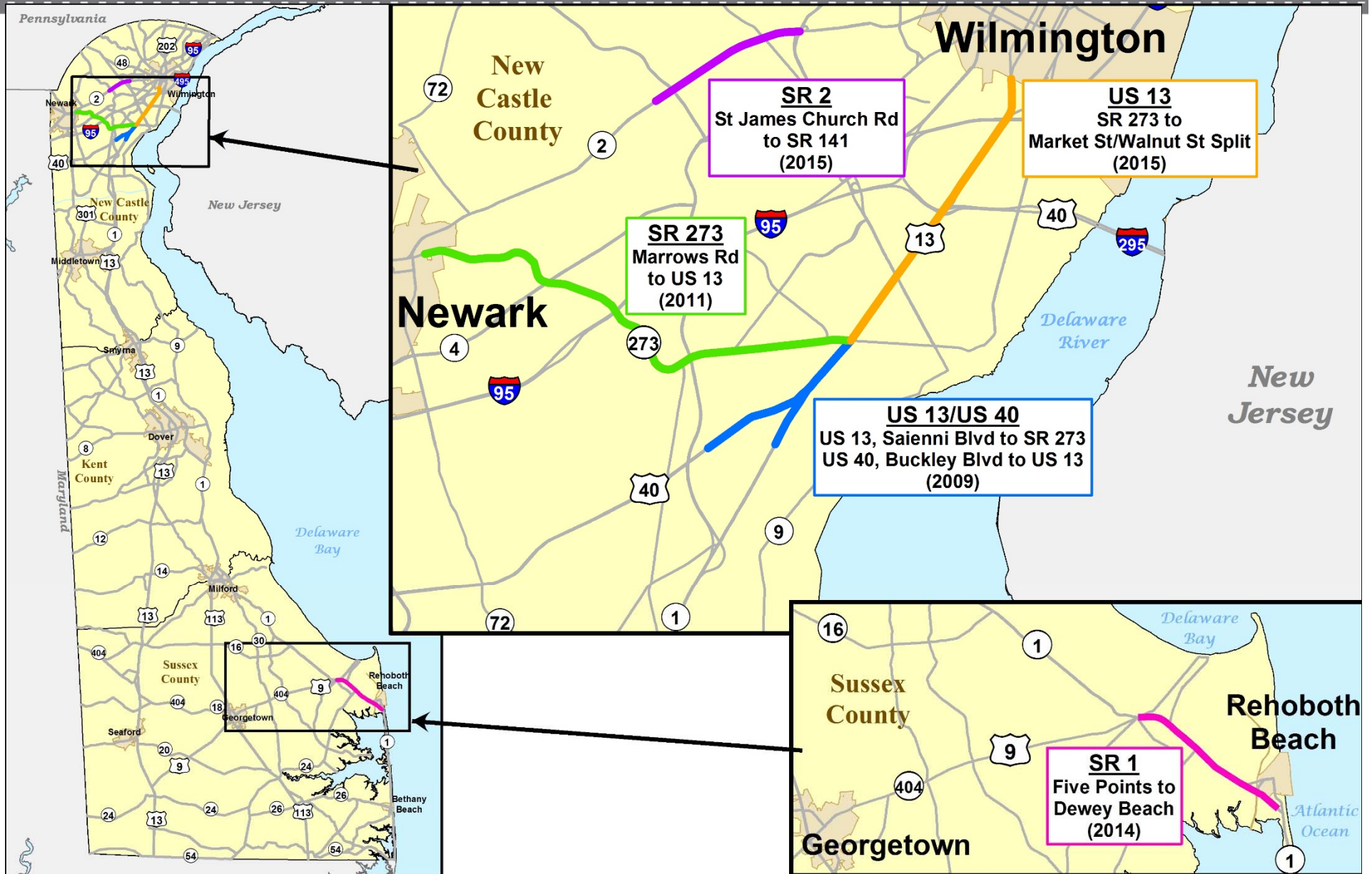


Figure 2-3



Figure 2-4

Completed Pedestrian Safety Audit Locations



2

KIRKWOOD HIGHWAY

PEDESTRIAN SAFETY STUDY

Summary of Recommendations

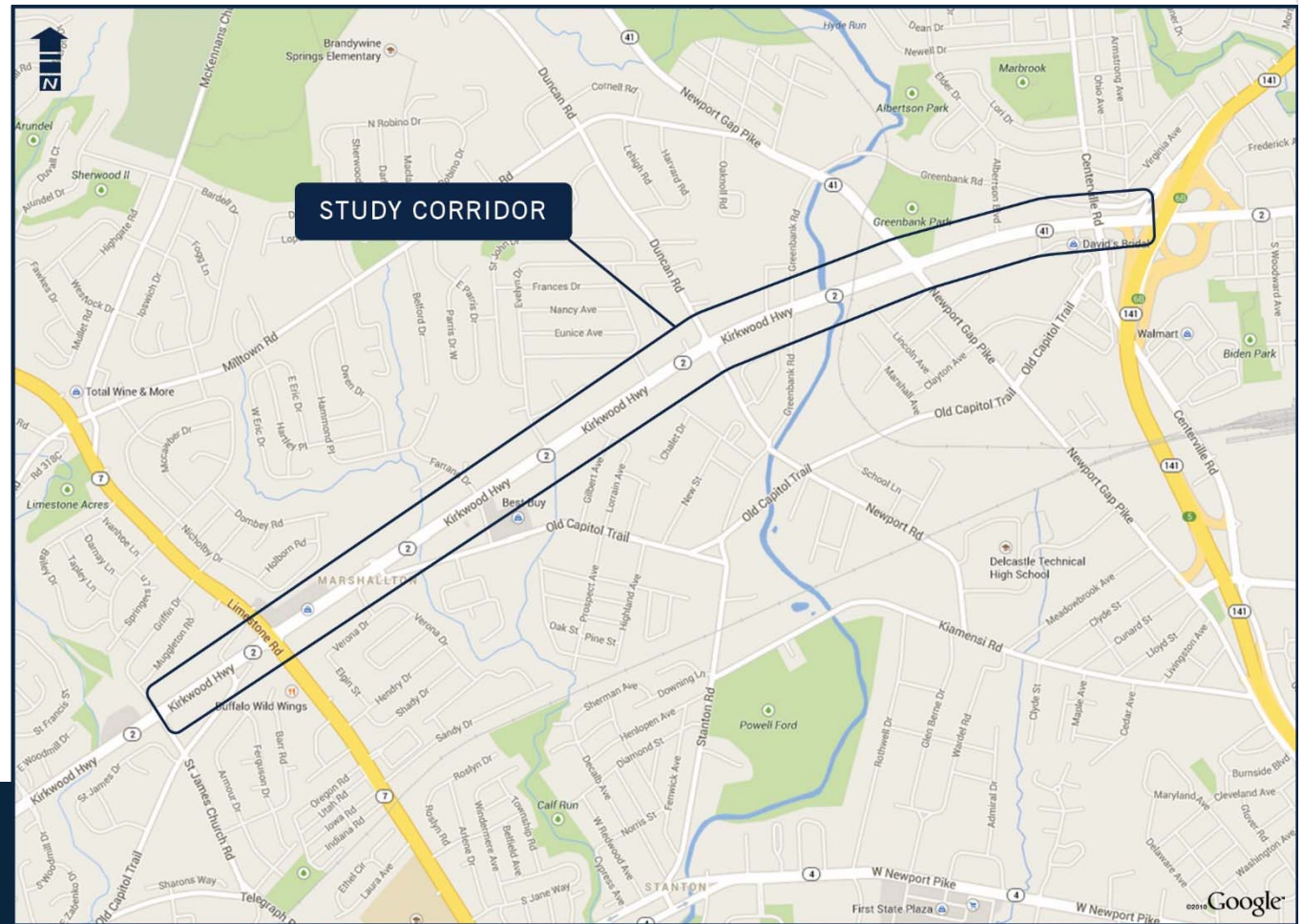


2 Study Background & Location

- SR 2 serves a high volume of vehicular traffic AND has numerous pedestrian generators
- Study Purpose
 - Review crash trends
 - Observe pedestrian activity
 - Identify pedestrian safety improvements

**Final Report located on
DeIDOT Website:**

www.delDOT.gov/information/community_programs_and_services/DSHSP/pedestrian_safety.shtml



2 SR 2 Pedestrian Study Recommendations

- Corridor-Wide
 - Perform lighting evaluation and install roadway & bus stop lighting (*completed*)
 - Reduce the number and frequency of access points as part of future projects
 - Install ADA-compliant curb ramps and sidewalks as part of future projects
- SR 2 at St. James Church Rd/Griffin Dr
 - Install signalized crosswalks on south and west legs (*completed*)
- SR 2 at Old Capitol Trail/Midway Plaza Shopping Center driveway
 - Pursue pedestrian hybrid beacon (coordinated with adjacent signals)
- SR 2 at SR 7
 - Install Pedestrian warning signs across the NB right-turn lane (*completed*)
 - Install No Pedestrian Crossing & Use Crosswalk signs
 - Remove business signs that obstruct sight lights to the crosswalk on the SE corner
 - Signalize NB SR 7 right-turn and tighten turning radius (*in design*)
 - Relocate bus stops closer to SR 7



2

SR 2 Pedestrian Study Recommendations

- SR 2 at Kirkwood Plaza (*in design*)
 - Install protected-only left-turn phasing (*in design, pending additional evaluation*)
 - Install signalized crosswalk across SR 2 (*in design*)
 - Investigate options to remove the landscaping bed along the south side of SR 2
- SR 2 at Farrand Dr
 - Install No Pedestrian Crossing & Use Crosswalk signs
 - Remove SB right-turn acceleration lane and relocate WB bus stop closer to intersection (*in design*)
- SR 2 at Duncan Rd
 - Install No Pedestrian Crossing & Use Crosswalk signs
 - Install signalized crosswalk across north leg (*in design*)
 - Install intersection lighting (*completed*)
 - Remove SB right-turn acceleration lane and relocate WB bus stop closer to intersection (*in design*)
 - Install / replace sidewalk connections along SR 2 and Duncan Rd (long-term)
- SR 2 at Greenbank Rd
 - Perform educational outreach to Anna P. Mote Elementary School (SRTS)
 - Install School warning signs



2 SR 2 Pedestrian Study Recommendations

- SR 2 at SR 41
 - Install intersection lighting (*completed*)
- SR 2 at Albertson Boulevard
 - Remove shrubbery on SE corner
 - Install flush sidewalk in front of fire company building
 - Install signalized crosswalk on south leg (*in design*)
 - Channelize the WB right-turning movement - requires modifying the north and east leg crossings (*in design*)
- SR 2 at Prices Corner
 - Install ADA curb ramps in vicinity of intersection
 - Install signalized crosswalk across west leg of SR 2 (*in design*)
 - Consider consolidating the two EB bus stops and the two WB bus stops
 - Consolidate access points and consider relocation the EB right-turning movement into Prices Corner to Albertson Blvd as part of future





US 13 PEDESTRIAN SAFETY STUDY

SR 273 TO MARKET STREET/WALNUT STREET SPLIT

Summary of Recommendations



Whitman Reardon & Associates, LLP
1915 100 YEARS 2015

Study Background & Location

U S 13 P E D E S T R I A N S A F E T Y S T U D Y

- US 13 serves a high volume of vehicular traffic AND has numerous pedestrian generators
- Study Purpose
 - Review crash trends
 - Observe pedestrian activity
 - Identify pedestrian safety improvements

Final Report located on
DelDOT Website:

www.deldot.gov/information/community_programs_and_services/DSHSP/pedestrian_safety.shtml



Study Location

US 13 Pedestrian Study Recommendations

U S 1 3 P E D E S T R I A N S A F E T Y S T U D Y

- Corridor-Wide: Short Term
 - Upgrade pedestrian clearance intervals, as necessary
 - Replace/install pushbutton signs and arrows
 - Perform lighting evaluation and install roadway lighting
 - Install bus stop shelters and/or benches, as warranted
 - Install speed limits signs to match latest speed resolutions



US 13 Pedestrian Study Recommendations

U S 1 3 P E D E S T R I A N S A F E T Y S T U D Y

- Corridor-Wide: Long Term
 - Pursue construction of sidewalk along corridor (*in design*)
 - US 13, US 40 to Memorial Drive Pedestrian Improvement project in the proposed FY17 to FY22 CTP
- Install ADA-compliant curb ramps and sidewalk as part of future projects
- Reduce the number and frequency of access points as part of future projects
- Investigate the need for and impacts of modifying and/or closing unsignalized median openings along corridor



US 13 Pedestrian Study Recommendations

U S 1 3 P E D E S T R I A N S A F E T Y S T U D Y

- US 13 at SR 273
 - Consolidate SB US 13 bus stops (*pending discussions with DTC and status of proposed New Castle Town Center*)
 - Install signalized crosswalk across north leg (*as recommended by Churchmans Road Trail Study*)
- US 13 at School Lane
 - Install signalized crosswalk across east leg
 - Relocate SB US 13 bus stop from south to north leg of intersection
 - Remove SB US 13 bus stop at NCC Airport right-in only access
 - Install sidewalk to connect NW corner of intersection to proposed SB US 13 bus stop
 - Install sidewalk to connect NE corner of intersection to NB US 13 bus stop
- US 13 at Lincoln Avenue and US 13 at Harrison Avenue/Stahl Avenue
 - Install signalized crosswalk across west leg of both intersections

US 13 Pedestrian Study Recommendations

U S 1 3 P E D E S T R I A N S A F E T Y S T U D Y

- US 13 at Roosevelt Avenue
 - Install signalized crosswalk across west leg
- US 13 at Bacon Avenue/Boulden Boulevard
 - Install signalized crosswalk across east leg
 - Realign signalized crosswalk across south leg
- US 13 at Marsh Lane/Wildel Avenue
 - Relocate signalized crosswalk across US 13 to north leg of intersection, install signalized crosswalk across east leg, and install accessible pedestrian signals (APS)
 - Project to be prioritized due to request from DE Dept. of the Visually Impaired (*in design; DelDOT coordinating with NCC*)
 - Relocate NB US 13 bus stop closer to intersection
 - Remove NB US 13 bus stop located approximately 625 ft south of intersection in front of Collins Business Systems



US 13 Pedestrian Study Recommendations

U S 1 3 P E D E S T R I A N S A F E T Y S T U D Y

- US 13 at E. Hazeldell Avenue and Memorial Drive
 - Install sidewalk along north side of large grass island on west side of US 13
 - Recommendations from follow-up study:
 - Signal timing improvements implemented at US 13 at Memorial Dr in June 2015 to increase SB left-turn capacity
 - Extend SB left-turn lane at US 13 at Memorial Drive by approximately 200 – 250 feet (maximum practical distance)
- US 13 at Hessler Boulevard
 - Install signalized crosswalks across north, east, and west legs
- US 13, north of Rogers Road
 - Install oversized Pedestrian warning signs
 - Perform enforcement and public outreach through D.A.T.E.



Next Steps

- Implementation of SR 2 and US 13 Pedestrian Study recommendations
- Continue prioritization of high pedestrian crash corridors and perform safety audits
 - US 40 – SR 72 to Buckley Boulevard (Fall 2016)
 - US 13 – Dover to Camden (Spring 2017)
- Continue implementation of SHSP strategies to reduce pedestrian fatalities and serious injuries

