Presentation to:
Pedestrian Council

February 23, 2016
Agenda

• What is the Strategic Highway Safety Plan?
• Pedestrian Crash Data
• Evaluation of 2010 To-Do List
• 2015 Strategies
• Next steps
Delaware’s SHSP
Delaware’s SHSP History

- **2006**
  - First Plan Adopted

- **2008**
  - First Plan Update

- **2010**
  - New Plan Adopted

- **2015**
  - New Plan Adopted

- **2020**
  - Update Plan

**MAP-21** (July 2012)

**SAFETEA-LU** (August 2005)

**FAST Act** (Dec. 2015)
Core Committee

- DelDOT Traffic
- OHS
- DSP

Stakeholder Committee

- FHWA
- NHTSA
- FMCSA
- DelDOT Traffic
- DelDOT Planning
- DelDOT - DMV
- Office of Highway Safety
- Delaware State Police
- DSP Truck Enforcement Unit
- DE Police Chiefs’ Council
- New Castle County PD
- DART/DTC
- Delaware Office of Emergency Medical Services
- Department of Justice
- WILMAPCO
- Dover/Kent County MPO
- City of Wilmington
- Sussex County
- UD T^2 / LTAP Center

Emphasis Area Focus Groups / Implementation Teams

- Team 1
- Team 2
- Team 3
- Team ...

DE SHSP 2015 Committee Members
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 service strategies.
Overall Delaware Crash Trends

Delaware Highway Fatalities and Serious Injuries by Year

Serious Injury data not available prior to 2005
2013 Fatality Rates per 100 Million Vehicle Miles Traveled by State

Sources: FARS
Emphasis Areas Ranked by % of Fatalities & Serious Injuries

<table>
<thead>
<tr>
<th>Emphasis Area</th>
<th>2007 - 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roadway Departure</td>
<td>34%</td>
</tr>
<tr>
<td>Impaired Driver</td>
<td>27%</td>
</tr>
<tr>
<td>Speeding</td>
<td>21%</td>
</tr>
<tr>
<td>Unrestrained Motorists</td>
<td>13%</td>
</tr>
<tr>
<td>Motorcycles</td>
<td>13%</td>
</tr>
<tr>
<td>Head-On &amp; Cross Median</td>
<td>12%</td>
</tr>
<tr>
<td>Distracted Driving</td>
<td>10%</td>
</tr>
<tr>
<td>Heavy Vehicles</td>
<td>10%</td>
</tr>
<tr>
<td>Older Drivers &amp; Pedestrians</td>
<td>9%</td>
</tr>
<tr>
<td>Young Drivers</td>
<td>9%</td>
</tr>
<tr>
<td>Bicyclists</td>
<td>8%</td>
</tr>
<tr>
<td>Fatigued Driver</td>
<td>7%</td>
</tr>
<tr>
<td>Work Zone</td>
<td>3%</td>
</tr>
<tr>
<td>Trains</td>
<td>2%</td>
</tr>
<tr>
<td>Trains</td>
<td>1%</td>
</tr>
<tr>
<td>Pedestrians</td>
<td>0%</td>
</tr>
</tbody>
</table>

% of Total Fatalities & Serious Injuries
Pedestrian Data
Delaware: Historical Trends

Rate Per 100,000 Population
Pedestrian Crashes: 2007 - 2014

### Injuries

<table>
<thead>
<tr>
<th>Injury Type</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>Total</th>
<th>EA Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of total fatalities</td>
<td>14%</td>
<td>18%</td>
<td>13%</td>
<td>21%</td>
<td>18%</td>
<td>26%</td>
<td>26%</td>
<td>22%</td>
<td>20%</td>
<td>5</td>
</tr>
<tr>
<td>% of total fatalities &amp; serious injuries</td>
<td>8%</td>
<td>9%</td>
<td>8%</td>
<td>9%</td>
<td>11%</td>
<td>13%</td>
<td>12%</td>
<td>8%</td>
<td>10%</td>
<td>7</td>
</tr>
<tr>
<td># of fatalities per 100,000 DE Residents</td>
<td>1.95</td>
<td>2.49</td>
<td>1.68</td>
<td>2.45</td>
<td>2.09</td>
<td>3.27</td>
<td>2.81</td>
<td>2.89</td>
<td>2.46</td>
<td>-</td>
</tr>
</tbody>
</table>

**Highest State pedestrian fatality rate per 100,000 population**
Pedestrians – Where?

Significant clusters of pedestrian fatalities:
- US 40/US 13 in NCC
- SR 2 in NCC
- City of Wilmington
- US 13 in Dover area
- SR 1 in Lewes/Rehoboth Beach area
- US 113 between Milford and Georgetown
Pedestrian Data:

- 65% of the total pedestrian fatal crashes occurred in New Castle County.
- 91% of the pedestrian fatal crashes that occurred in New Castle County were above the C & D Canal.
- 56% of fatal crashes involving pedestrians occurred along principal arterial roadways.
Pedestrians – Where?

74% of pedestrian fatalities & 50% of seriously injured pedestrians occurred along divided roadways.
Pedestrians – Where?

- 63% of Total Pedestrian Fatalities & Serious Injuries
- 17% of Total Pedestrian Fatalities & Serious Injuries
- 5% of Total Pedestrian Fatalities & Serious Injuries
- 5% of Total Pedestrian Fatalities & Serious Injuries

- 83% of pedestrian fatalities & 55% of seriously injured pedestrians occurred outside of municipalities

Unincorporated Areas
- 63% of Fatalities
- 17% of Serious Injuries

Wilmington
- 5% of Fatalities
- 5% of Serious Injuries

Newark, Middletown, Smyrna, Dover, Milford, Seaforth, Georgetown, New Castle Urban - Other, Kent Urban - Other, Sussex Urban - Other
- Less than 5% of Fatalities and Serious Injuries in each category
Pedestrians – Where?

17% of pedestrian fatalities & 27% of seriously injured pedestrians occurred at an intersection

Pedestrian Location Prior to Crash

- 43% of pedestrian fatalities & serious injuries occurred at the intersection
- 11% occurred on the shoulder/roadside
- 10% occurred on the sidewalk
- 8% occurred on the driveway access
- 5% occurred on the non-trafficway area
- 5% occurred in unknown locations

Legend:
- Fatalities
- Serious Injuries

% of Total Pedestrian Fatalities & Serious Injuries
Pedestrians - When?

Number of Fatalities and Serious Injuries

- Fatalities
- Serious Injuries

Month-wise analysis:
- January
- February
- March
- April
- May
- June
- July
- August
- September
- October
- November
- December

Graph showing the number of fatalities and serious injuries for each month and day of the week.
Pedestrians – When?

Number of Fatalities and Serious Injuries

Time of Day (Hour Beginning)

<table>
<thead>
<tr>
<th>Time of Day (Hour Beginning)</th>
<th>Fatalities</th>
<th>Serious Injuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 AM</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>1 AM</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>2 AM</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>3 AM</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td>4 AM</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>5 AM</td>
<td>35</td>
<td>30</td>
</tr>
<tr>
<td>6 AM</td>
<td>40</td>
<td>35</td>
</tr>
<tr>
<td>7 AM</td>
<td>45</td>
<td>40</td>
</tr>
<tr>
<td>8 AM</td>
<td>50</td>
<td>45</td>
</tr>
<tr>
<td>9 AM</td>
<td>55</td>
<td>50</td>
</tr>
<tr>
<td>10 AM</td>
<td>60</td>
<td>55</td>
</tr>
<tr>
<td>11 AM</td>
<td>65</td>
<td>60</td>
</tr>
<tr>
<td>12 PM</td>
<td>70</td>
<td>65</td>
</tr>
<tr>
<td>1 PM</td>
<td>75</td>
<td>70</td>
</tr>
<tr>
<td>2 PM</td>
<td>80</td>
<td>75</td>
</tr>
<tr>
<td>3 PM</td>
<td>85</td>
<td>80</td>
</tr>
<tr>
<td>4 PM</td>
<td>90</td>
<td>85</td>
</tr>
<tr>
<td>5 PM</td>
<td>95</td>
<td>90</td>
</tr>
<tr>
<td>6 PM</td>
<td>100</td>
<td>95</td>
</tr>
<tr>
<td>7 PM</td>
<td>105</td>
<td>100</td>
</tr>
<tr>
<td>8 PM</td>
<td>110</td>
<td>105</td>
</tr>
<tr>
<td>9 PM</td>
<td>115</td>
<td>110</td>
</tr>
<tr>
<td>10 PM</td>
<td>120</td>
<td>115</td>
</tr>
<tr>
<td>11 PM</td>
<td>125</td>
<td>120</td>
</tr>
</tbody>
</table>

Fatalities
Serious Injuries
Pedestrians – Who?

Gender

- Male: 63% of fatalities and serious injuries
- Female: 37% of fatalities and serious injuries

Age

- 36% of pedestrian fatalities & 17% of seriously injured pedestrians were impaired

*Fatalities* | *Serious Injuries*
---|---
0-9 | 10-19 | 20-29 | 30-39 | 40-49 | 50-59 | 60-69 | 70-79 | 80-89 | 90-99 | Age UNK
---|---|---|---|---|---|---|---|---|---|---

% of Total Pedestrian Fatalities & Serious Injuries
Pedestrians - Crash Conditions

**Lighting Condition**
- Daylight: 40%
- Dawn/Dusk: 24%
- Dark - Lit: 33%
- Dark - Unlit: 0%
- Unknown: 100%

**Surface Condition**
- Dry: 83%
- Wet: 14%
- Snow/Ice/Frost: 0%
- Other/Unknown: 0%

% of Total Pedestrian Fatalities & Serious Injuries
Pedestrian Action Prior to Crash

2010 – 2014 Pedestrian Crashes*

Number of Fatalities and Serious Injuries

Crossing Roadway: 52%
Waiting to Cross Roadway: 0%
Walking Along Roadway with Traffic: 15%
Walking Along Roadway Against Traffic: 7%
Walking on Sidewalk: 12%
In Roadway – Other (Working, Playing, Etc.): 7%
Adjacent to Roadway (e.g., Shoulder, Median): 0%
To/From School (K-12): 0%
Working in Roadway (Incident Response): 0%
None: 0%
Other: 0%
Unknown: 0%

Fatalities
Serious Injuries

% of Total Pedestrian Fatalities & Serious Injuries

* Data not available prior to 2010
Pedestrian Action at Time of Crash

2010 – 2014 Pedestrian Crashes*

Number of Fatalities and Serious Injuries

- No Improper Action: 19%
- Dart/Dash: 20%
- Failure to Obey Traffic Signs, Signals, or Officer: 9%
- In Roadway Improperly: 15%
- Disabled Vehicle Related: 11%
- Entering/Exiting Parking/Standing Vehicle: 7%
- Inattentive (Talking, Eating, Etc.): 6%
- Not Visible (Dark Clothing, No Lighting, Etc.): 7%
- Wrong-Way Riding or Walking: 6%
- Other: 7%
- Unknown: 6%

% of Total Pedestrian Fatalities & Serious Injuries

* Data not available prior to 2010
Driver Contributing Circumstances

- **No Contributing Action**: 80% of drivers in pedestrian fatal crashes and 57% of drivers in pedestrian serious injury crashes

- **Operating vehicle aggressively**: 6% of drivers in pedestrian fatal/serious injury crashes

- **8% of drivers in pedestrian fatal/serious injury crashes** were distracted drivers

- **8% of drivers in pedestrian fatal/serious injury crashes** were 65 years old or older

**Fatilities**

**Serious Injuries**

% of Total Driver Contributing Circumstances
- 40% of pedestrian fatal crashes involved an impaired pedestrian; however, the pedestrian sobriety was unknown in 5% of pedestrian fatal crashes.
- 51% of pedestrian fatal crashes between 6PM and 3AM involved an impaired pedestrian.
2010 SHSP To-Do List
## 2010 SHSP: Our Plan & Progress

**Strategies and Programs to Improve Pedestrian Safety**

<table>
<thead>
<tr>
<th>Education</th>
<th>What did we plan to do?</th>
<th>What did we do?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conduct media outreach</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>✓ Emphasize pedestrian safety, vehicle-pedestrian right-of-way, pedestrian responsibilities and the dangers of walking while impaired</td>
<td></td>
<td><strong>Walk Smart</strong></td>
</tr>
<tr>
<td>✓ Participate in health and safety fairs</td>
<td></td>
<td>• Zombie/Walking Dead campaign</td>
</tr>
<tr>
<td>✓ Develop consistent messages to the public</td>
<td></td>
<td>• Happy Crab campaign</td>
</tr>
<tr>
<td>✓ Increase high visibility education, especially among high-risk groups</td>
<td></td>
<td><strong>Summer Wave Pedestrian outreach</strong></td>
</tr>
<tr>
<td>✓ Increase risk perception by publicizing information about enforcement initiatives</td>
<td></td>
<td><em>(DE OHS partnership with Ocean City, MD)</em></td>
</tr>
<tr>
<td>✓ Use billboard, radio, and TV advertisements</td>
<td></td>
<td><strong>Live pedestrian safety demonstrations (NCC &amp; SC)</strong></td>
</tr>
<tr>
<td>✓ Encourage drivers to slow down and look for pedestrians, particularly in commercial and residential corridors</td>
<td></td>
<td><strong>Safe Routes to School Program</strong></td>
</tr>
<tr>
<td>✓ Educate pedestrians on the dangers of walking along or crossing roadways while under the influence of alcohol and/or drugs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<p>| Implement driver’s education improvements to emphasize vehicle-pedestrian right-of-way and laws | |                 |</p>
<table>
<thead>
<tr>
<th>What did we plan to do? (2010 SHSP Strategies)</th>
<th>What did we do?</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Conduct high visibility enforcement campaigns to ensure pedestrians and drivers alike are obeying pedestrian safety laws</td>
<td>Targeted enforcement campaigns</td>
</tr>
<tr>
<td></td>
<td>• SR 2</td>
</tr>
<tr>
<td></td>
<td>• US 13</td>
</tr>
<tr>
<td></td>
<td>• SR 1</td>
</tr>
<tr>
<td>❌ Evaluate the use of automated speed enforcement in school zones</td>
<td>Passed Senate Bill 269 (August 2010)</td>
</tr>
<tr>
<td>✓ Increased penalties for drivers convicted of inattentive or careless driving resulting in injury to a “vulnerable user”</td>
<td>Passed Senate Bill 269 (August 2010)</td>
</tr>
</tbody>
</table>
## 2010 SHSP: Our Plan & Progress

### Strategies and Programs to Improve Pedestrian Safety

<table>
<thead>
<tr>
<th>What did we plan to do? (2010 SHSP Strategies)</th>
<th>What did we do?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System and policy initiatives</strong></td>
<td>• Implemented Complete Streets policy</td>
</tr>
<tr>
<td>✓ Consider pedestrian accommodations early in the planning process for all new projects &amp; review crossings at existing locations</td>
<td>• Pedestrian accommodations considered in all DelDOT projects</td>
</tr>
<tr>
<td>✓ Provide consistent pedestrian crossing design</td>
<td>• Safe Routes to School Program</td>
</tr>
<tr>
<td>✓ Improve design to focus on sight distance to crosswalks and warning signs</td>
<td>• Sidewalk and Multi-Use Path Maintenance Policy (effective July 17, 2013)</td>
</tr>
<tr>
<td>✓ Provide adequate crossing times for older pedestrians</td>
<td>• Pedestrian/Bicycle Working Group</td>
</tr>
<tr>
<td>✓ Improve maintenance of pedestrian accommodations</td>
<td>• Updated Traffic Calming Design Manual (2012)</td>
</tr>
<tr>
<td>x Consider revising DelDOT’s street lighting guidance to include guidance for installing street lighting to address pedestrian concerns</td>
<td>• Governor’s Pedestrian Council</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Spot or target location improvements</th>
<th>Pedestrian Safety Audits along High-Risk Corridors</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Eliminate conflict between pedestrians and left-turning vehicles by installing protected-only left-turn phasing</td>
<td>• US 13/US 40</td>
</tr>
<tr>
<td>✓ Where appropriate, install traffic calming devices</td>
<td>• SR 2</td>
</tr>
<tr>
<td>✓ Install raised crosswalks</td>
<td>• US 13</td>
</tr>
<tr>
<td>✓ Install pedestrian-hybrid signals</td>
<td>Pedestrian Signalization-Related Improvements</td>
</tr>
<tr>
<td>✓ Provide leading pedestrian phases to enhance visibility</td>
<td>• Accessible pedestrian signals</td>
</tr>
<tr>
<td>✓ Install curb extensions to improve visibility and reduce pedestrian crossing time</td>
<td>• Pedestrian Hybrid Beacons (HAWK)</td>
</tr>
<tr>
<td>✓ Perform pedestrian safety audits for roadways and intersections</td>
<td>• Pushbutton Activated Warning Beacons</td>
</tr>
<tr>
<td>✓ Install street lighting at locations with a high number of nighttime pedestrian crashes</td>
<td>• Lead pedestrian intervals</td>
</tr>
<tr>
<td>Traffic calming through TE/TAP projects and the Traffic Calming Program</td>
<td></td>
</tr>
</tbody>
</table>

### Engineering

- Pedestrian Safety Audits along High-Risk Corridors
  - US 13/US 40
  - SR 2
  - US 13

- Pedestrian Signalization-Related Improvements
  - Accessible pedestrian signals
  - Pedestrian Hybrid Beacons (HAWK)
  - Pushbutton Activated Warning Beacons
  - Lead pedestrian intervals
  - Rectangular Rapid Flashing Beacons (RRFB) (planned)
NCHRP Strategies to Address Crashes Involving Pedestrians

- Reduce Pedestrian Exposure to Vehicular Traffic
  - Provide sidewalks/walkways and curb ramps
  - Install or upgrade traffic and pedestrian signals
  - Construct pedestrian refuge islands and raised medians
  - Provide vehicle restriction/diversion measures
  - Install overpasses/underpasses

- Improve Sight Distance and/or Visibility Between Motor Vehicles and Pedestrians
  - Provide crosswalk enhancements
  - Implement lighting/crosswalk illumination measures
  - Eliminate screening by physical objects
  - Signals to alert motorists that pedestrians are crossing
  - Improve reflectorization/conspicuity of pedestrians

- Reduce Vehicle Speeds
  - Implement road narrowing measures
  - Install traffic calming – road sections & intersections
  - Provide school route improvements

- Improve Pedestrian and Motorist Safety Awareness and Behavior
  - Provide education, outreach, and training
  - Implement enforcement campaigns
2015 SHSP Strategies
Pedestrian: Emphasis Area Fact Sheet

**Emphasis Area Goal**

**Emphasis Area #**

**Brief Background / Description of Emphasis Area**

**Strategies**

- 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.
- 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.

**Crash Data Highlights**

**EA Fatalities & Serious Injuries by Year**

**Data Trends: 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 (unit) conditions.
- 33% occurred on a Friday or Saturday.
- 25% occurred at an intersection.

**Background**

Due to their complexity, addressing pedestrian-involved crashes is a challenge. In Delaware, a large portion of pedestrian crashes occur on high-speed, multi-lane suburban corridors that are surrounded by commercial and residential land uses and significant transit usage which combine to create an unsafe environment for pedestrian crossings. Pedestrian safety is evaluated and engineered as part of most transportation projects; however, infrastructure improvement projects require significant resources. Delaware officials recognize that the use of education and enforcement techniques may have the greatest potential for reductions in pedestrian fatalities and serious injuries. Improving driver awareness of pedestrians is critical to increasing pedestrian safety. In Delaware, pedestrian fatalities accounted for 20 percent of all fatalities and 8 percent of all serious injuries from 2007 through 2014. In 2012 and 2013, Delaware had the highest pedestrian fatality rate per 100,000 population of all the states.
### Strategies to Reach Goal

- 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
- 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

### Data Trends: 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
Next Steps
Next Steps

• March 2016 – Review SHSP action item list
• Spring 2016 – Start barrier planning/design
• Spring 2016 – Implement first RRFB
• Summer 2016 – Begin next Pedestrian Safety Audit
• Spring 2017 – Formal SHSP stakeholder update meeting
• On-Going:
  • Support Pedestrian Council
  • Continue Pedestrian Working Group
  • Support Walkable / Bikeable Delaware Summit
  • Focus on Implementation of Pedestrian Audit Recommendations
Mark Luszcz
DelDOT Chief Traffic Engineer
E: mark.luszcz@state.de.us
P: 302.659.4062