

*Delaware*  
**STRATEGIC HIGHWAY  
SAFETY PLAN:**  
Toward Zero Deaths

***Transportation Management Team - North***  
***March 21, 2011***

Adam Weiser, PE, PTOE  
DeIDOT Safety Programs Manager

## **Agenda**

- ◆ Purpose of SHSP
- ◆ Delaware's SHSP Timeline
- ◆ Overall Crash Trends
- ◆ Delaware's Program
  - Delaware's SHSP Process
  - Coordinating Agencies and Stakeholders
  - Mission and Vision Statements
  - Emphasis Area Selection and Goals
  - Emphasis Area Descriptions
  - Strategy Selection
  - Implementation



## Purpose of SHSP

- ◆ Required as part of SAFETEA-LU, an SHSP is a comprehensive safety plan with a goal of reducing highway fatalities and serious injuries on all public roads
- ◆ Establishes consistent statewide goals, objectives, emphasis areas, priorities, and countermeasures with stakeholders and other transportation plans
- ◆ Makes effective use of State, regional, and local crash data and determines priorities based on crash data
- ◆ Addresses engineering, management, operation, education, enforcement, and EMS



## Delaware's SHSP Timeline

**2006**  
First Delaware  
SHSP Developed

**2010 –**  
Complete  
rewrite of  
Delaware SHSP

**2008**  
First biannual  
update of  
Delaware SHSP



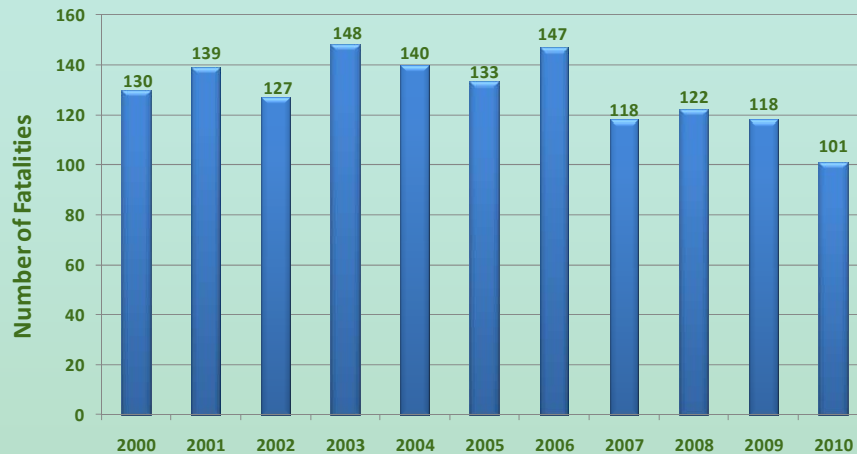
## Delaware vs. National Fatality Rates (2000 – 2009)



Sources: FARS/NHTSA for national rates; DSP for Delaware rates



## Total Fatalities in Delaware by Year (2000 – 2009)



## Delaware's SHSP Process

- ◆ Determine stakeholders
- ◆ Define Mission and Vision for Plan
- ◆ Data-driven Emphasis Area Selection
  - Fatal crash data used to develop emphasis areas
- ◆ Select Strategies
- ◆ Evaluate Progress
- ◆ Develop and Adopt Plan
- ◆ Present Plan to Key Stakeholders
- ◆ Implement Plan
- ◆ Review and Update Plan
  - Next update in 2013 (every 3 years)



## Delaware's SHSP Coordinating Agencies and Stakeholders

- ◆ Core Group
  - FHWA
  - NHTSA
  - Delaware Department of Transportation
  - Delaware Office of Highway Safety
  - Delaware State Police
  - Department of Justice
  - Delaware Office of Emergency Medical Services
- ◆ Other Stakeholders
  - Division of Motor Vehicles
  - Dover/Kent County MPO
  - WILMAPCO
  - Trucking Industry
  - Operation Lifesaver
  - Department of Education

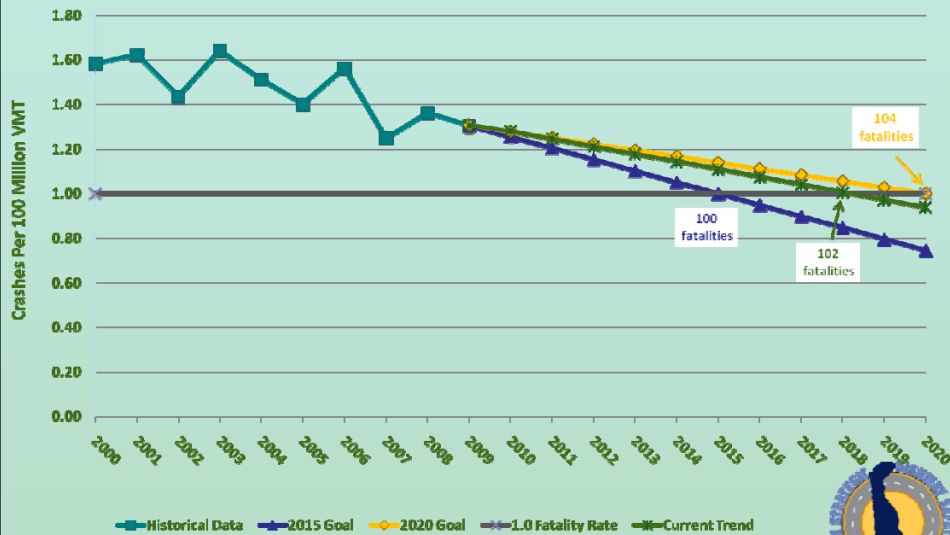


## Delaware's 2010 SHSP Mission and Vision Statements

- ◆ Mission Statement: The *Delaware Strategic Highway Safety Plan: Toward Zero Deaths* aims to eliminate fatalities on Delaware's roadways through a multi-agency approach that utilizes education, enforcement, engineering and emergency service strategies.
  
- ◆ Vision Statement: The goal of Delaware's *Strategic Highway Safety Plan* is to achieve a fatality rate of 1.0 per 100 million vehicle miles traveled per year by 2018.



## Delaware Fatality Rates Per Year (2000 – 2020)



Source: DelDOT/DSP



## 2010 Emphasis Area Selection

### ◆ Data Review

- Compared 2007 - 2008 national and statewide fatal crash data for each of AASHTO's emphasis areas
- Compared 2007 - 2008 statewide fatal crash data to 2001 - 2006 data

### ◆ Selected Emphasis Areas

- A higher fatal crash percentage in DE as compared to national averages (e.g., Curbing Aggressive Driving)
- One of the highest fatal crash percentages in DE (e.g., Increasing Seat Belt Usage)
- An increasing concern in the near future (e.g., Sustaining Proficiency in Older Drivers)

*Note: Fatality data (rather than fatal crash data) was used for the emphasis area related to seat belt usage; 2009 data was not available at the time 2010 emphasis areas were selected*



## Previous Emphasis Areas

- ◆ Curbing Aggressive Driving
- ◆ Reducing Impaired Driving
- ◆ Increasing Seatbelt Usage and Improving Airbag Awareness
- ◆ Making Walking and Street Crossing Safer
- ◆ Making Truck Travel Safer
- ◆ Keeping Vehicles on the Roadway
- ◆ Minimizing the Consequences of Leaving the Road
- ◆ Designing Safer Work Zones
- ◆ Improving Information and Decision Support Services



## Changes to Emphasis Areas in the 2010 Plan

- ◆ Eleven total emphasis areas, including 7 primary and 4 secondary emphasis areas
- ◆ The two emphasis areas related to roadway departures were combined into one
- ◆ Emphasis areas were prioritized based on crash data (listed in priority order)



## Delaware's 2010 Emphasis Areas (listed in priority order)

- ◆ Primary Emphasis Areas
  - Data Driven
    - Reducing the Frequency and Severity of Roadway Departure Crashes
    - Curbing Aggressive Driving
    - Increasing Seatbelt Usage
    - Reducing Impaired Driving
    - Improving the Design and Operation of Highway Intersections
    - Making Walking and Street Crossing Safer
    - Improving Motorcycle Safety and Increasing Motorcycle Awareness
- ◆ Secondary Emphasis Areas
  - Data Driven
    - Sustaining Proficiency in Older Drivers
    - Making Heavy Vehicle Travel Safer
    - Designing Safer Work Zones
  - Non-Data Driven
    - Improving Traffic Records



## Data Summary (2007 – 2008)

PRIMARY EMPHASIS AREA	NATIONAL PERCENTAGE	DELAWARE PERCENTAGE
1 - Reducing the Frequency and Severity of Roadway Departure Crashes	53%	47%
2 - Curbing Aggressive Driving	53%	55%
3 - Increasing Seatbelt Usage	50%	40%
4 - Reducing Impaired Driving	31%	37%
5 - Improving the Design and Operation of Highway Intersections	22%	25%
6 - Making Walking and Street Crossing Safer	12%	17%
7 - Improving Motorcycle Safety and Increasing Motorcycle Awareness	14%	15%
SECONDARY EMPHASIS AREA	NATIONAL PERCENTAGE	DELAWARE PERCENTAGE
1 - Sustaining Proficiency in Older Drivers	15%	12%
2 - Making Heavy Vehicle Travel Safer	12%	7%
3 - Designing Safer Work Zones	2%	2%
4 - Improving Traffic Records	N/A	N/A

Delaware percentage is greater than national percentage



## Performance-Based Goals for Each Primary Emphasis Area

- ◆ Intermediate (i.e., 2012, 2015, and 2018) performance-based goals for each primary emphasis area have been established
- ◆ Goals are based on the overall goal and vision statement, which equates to a 5% reduction in fatal crashes (fatalities) every 3 years
- ◆ Performance-based goals can be used to evaluate progress within each emphasis area during the 2013, 2016, and 2019 plan updates

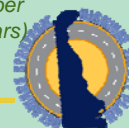




## 2012, 2015, and 2018 Primary Emphasis Area Goals

EMPHASIS AREA	NUMBER OF FATAL CRASHES (FATALITIES)			
	2009	2012 GOAL	2015 GOAL	2018 GOAL
1 - Reducing the Frequency and Severity of Roadway Departure Crashes	50	48	45	43
2 - Curbing Aggressive Driving	40	38	36	34
3 - Increasing Seat Belt Usage	41 (fatalities)	39 (fatalities)	37 (fatalities)	35 (fatalities)
4 - Reducing Impaired Driving	28	27	25	24
5 - Improving the Design and Operation of Highway Intersections	18	17	16	15
6 - Making Walking and Street Crossing Safer	14	13	12	11
7 - Improving Motorcycle Safety	13	12	11	10

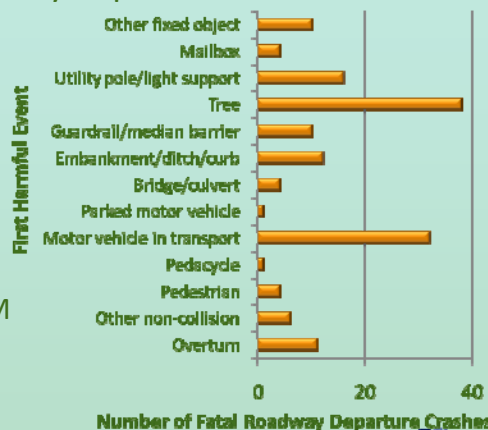
*Note: Intermediate goals are based on an overall goal of reducing the total number of fatalities from 118 in 2009 to 102 in 2018 (i.e., a 5% reduction every three years)*



## Primary Emphasis Area 1: Reducing the Frequency and Severity of Roadway Departure Crashes

### ◆ Characteristics of fatal roadway departure crashes:

- Driving under the influence
- Unrestrained motorists
- Speeding
- Rural, collector roadways
- Males, 15 to 24 years old
- Weekends, Midnight to 3 AM
- Trees



## Strategies to Reduce the Frequency and Severity of Roadway Departure Crashes

- ◆ System and policy initiatives
  - Guideline/policy implementation for safety edge, rumble strips, clear zone requirements, skid resistant pavement, and guardrail maintenance
- ◆ Target location improvements
  - Widen shoulders
  - Install pavement grooving, RPMs, HIBs, traffic calming devices, signing/markings improvements, delineators
  - Remove, relocate, delineate, or protect roadside obstacles



## Evaluation and Status – Reducing the Frequency and Severity of Roadway Departure Crashes

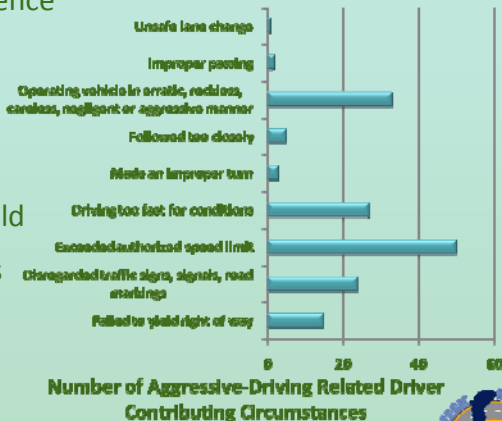
- ◆ System and policy initiatives
  - Currently updating the DGM for installing rumble strips
  - Developing a DGM for safety edge
  - Updating and training on the *Delaware MUTCD*
- ◆ Target location improvements
  - Implementing HSIP site-specific improvements
    - Installing delineators, RPMs, and other signing, striping and traffic control device improvements
    - Providing skid-resistant or grooved pavement surfaces
  - Installed rumble strips
    - SR 1 from US 113 to Christiana Mall
    - US 301
    - SR 1 between Dewey Beach and Fenwick Island
    - I-495 in the vicinity of the US 13 (Claymont) interchange
  - Installed barrier
    - High tension cable barrier installed along SR 1 from SR 299 to north of SR 896
    - Installed W-beam within the median of SR 1 from north of SR 273 to Tybouts Corner



## Primary Emphasis Area 2: Curbing Aggressive Driving

### ◆ Characteristics of fatal aggressive driving crashes:

- Driving under the influence
- Speeding
- Roadway departures
- Rural roadways
- Males, 15 to 24 years old
- Unrestrained motorists



## Strategies to Curb Aggressive Driving

### ◆ Education

- Conduct media outreach to emphasize:
  - Consequences of aggressive driving (e.g., red light running, roadway departures, traffic citations, etc.)
  - Aggressive driving while impaired, on a motorcycle, or not wearing a seat belt increases the severity of crashes
  - How motorists should react when encountering an aggressive driver
- Discuss the dangers of aggressive driving in driver's education and defensive driving classes

### ◆ Enforcement

- Increase targeted traffic enforcement
- Strengthen aggressive driving laws and increase penalties for violators



## Strategies to Curb Aggressive Driving

### ◆ Engineering

- System and policy initiatives
  - Provide real-time information to drivers to reduce driver frustration
  - Avoid artificially low speed limits
  - Provide uniform traffic control devices
  - Manage traffic impacts and improve incident management
- Target location improvements
  - Coordinate traffic signals and improve signal timings
  - Install traffic calming devices
  - Install red light enforcement cameras



## Evaluation and Status – Curbing Aggressive Driving

### ◆ Education and Enforcement

- Running annual “Stop Aggressive Driving” and “120 Days of Summer HEAT” campaigns
- “Driver Personality Survey” created
- Electronic Red Light Safety Program (ERLSP) continues to monitor red light violations
- DelDOT ran a campaign to emphasize the dangers of speeding in residential areas

### ◆ Engineering

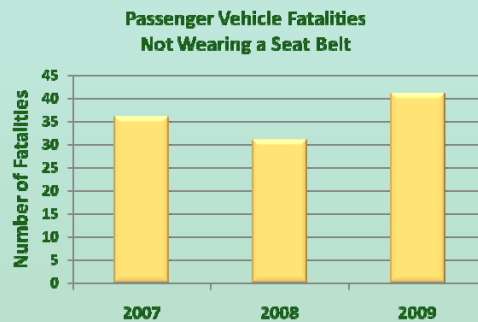
- System and policy initiatives
  - Updating and training on the *Delaware MUTCD*
  - MAP trucks are providing monitoring and assistance
  - Utilizing real-time detection and video and aerial traffic monitoring to provide traffic updates and travel time messages via WTMC 1380 AM, dynamic message signs, and FTTC and improve incident management
  - Considering “511” implementation
- Target location improvements
  - Traffic control device improvements are being implemented through the HSIP
  - Coordinating traffic signals, providing traffic responsive signals, and adding signals to ACTRA



## Primary Emphasis Area 3: Increasing Seat Belt Usage

### ◆ Characteristics of unrestrained fatalities :

- Collectors and local roadways
- Rural roadways
- Males, 15 to 24 years old
- Roadway departures
- Midnight to 3 AM
- Impaired and/or aggressive drivers



## Strategies to Increase Seat Belt Usage

### ◆ Education

- Conduct media outreach to educate the public on the greater potential for injury or death when not wearing a seatbelt during a crash, particularly when drivers are aggressive or impaired
- Emphasize seat belt usage in driver's education classes
- Create an online survey to assess the public's understanding of the safety risks of not wearing a seat belt

### ◆ Enforcement

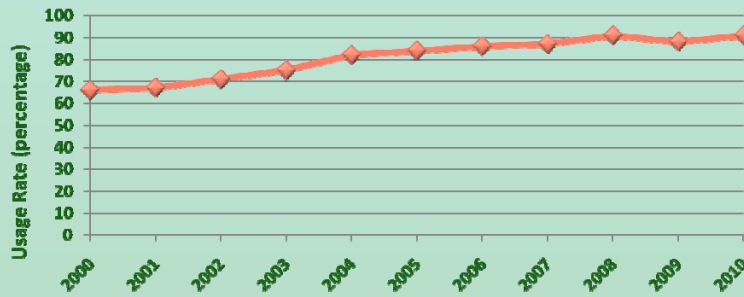
- Increase targeted traffic enforcement
- Strengthen seat belt laws and increase penalties for violators
- Consider removing the seat belt "assessment" provision



## Evaluation and Status – Increasing Seat Belt Usage

### ♦ Education and Enforcement

- Running annual “Click It or Ticket” and “120 Days of Summer HEAT” campaigns
- Completed a statewide enforcement and awareness mobilization program in 2009
- SmartDrive program is implementing a phase aimed towards teens



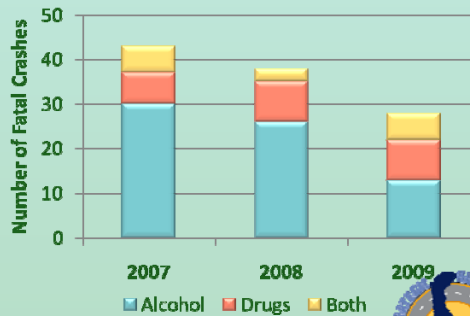
Source: Delaware OHS FY 2011 Highway Safety Plan



## Primary Emphasis Area 4: Reducing Impaired Driving

### ♦ Characteristics of fatal impaired driving crashes:

- Rural roadways
- Collector and local roadways
- Saturdays, Midnight to 3 AM
- Males, 15 to 34 years old
- Roadway departures
- Aggressive driving
- Unrestrained motorists



## Strategies to Reduce Impaired Driving

### ◆ Education

- Conduct media outreach to emphasize:
  - Consequences of impaired driving (e.g., DUI arrest, roadway departure, etc.)
  - Impaired driving while on a motorcycle, driving aggressively, or not wearing a seat belt increases the severity of crashes
  - How motorists should react when encountering an impaired driver
- Educate young and at-risk drivers on the risk and consequences of impaired driving as part of the driving curriculum
- Advertise designated driver programs in bars
- Create an online survey to assess the public's understanding of the safety risks of impaired driving
- Educate liquor store and bar employees on identifying impaired persons and discouraging such persons from driving



## Strategies to Reduce Impaired Driving

### ◆ Enforcement

- Increase targeted traffic enforcement
- Improve the judicial process for DUI cases
- Increase DUI penalties
- Require ignition interlocks for DUI offenders
- Consider enacting the open container law
- Screen and treat for alcohol and substance abuse problems in a healthcare setting
- Monitor DUI offenders to ensure treatment is completed





## Evaluation and Status – Reducing Impaired Driving

### ◆ Education and Enforcement

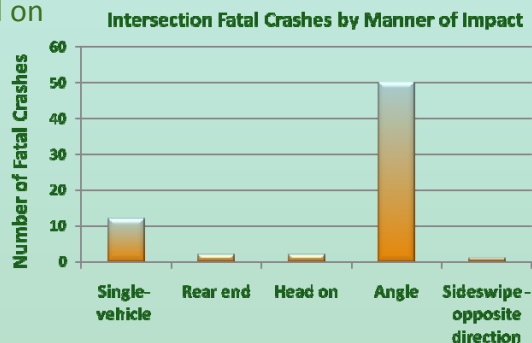
- In 2009, HB 152 and SB 177 increased penalties for DUI offenses
- Running annual Checkpoint Strikeforce and “120 Days of Summer HEAT” campaigns
- Underage Drinking and Cops-in-Shops programs deter minors from drinking
- Hero designated driver campaign promotes the use of designated drivers
- The DUI tracking system provides real-time data post-arrest
- Delaware’s First Offense Election program requires ignition interlock
- DUI offenders must be evaluated through DERP
- Delaware’s Drug Recognition Expert program was initiated in 2005
- Role of Traffic Safety Resource Prosecutor was assumed in FY 2008



## Primary Emphasis Area 5: Improving the Design and Operation of Highway Intersections

### ◆ Characteristics of fatal intersection crashes:

- Principal arterial roadways
- 33% of crashes occurred on dark, unlit roadways
- Aggressive driving
- Angle crashes





## Strategies to Improve the Design and Operation of Highway Intersections

- ◆ Education and Enforcement
  - Emphasize intersection-related offenses (e.g., red light running, failing to stop at STOP signs, failing to yield the right-of-way, etc.) as part of initiatives and programs to address aggressive driving
- ◆ Engineering
  - Maintain consistent traffic control devices
  - Increase enforcement of DelDOT's Subdivision Manual
  - Strategies are separated into signalized and unsignalized intersections



## Strategies to Improve the Design and Operation of Signalized Intersections

- ◆ Traffic Control and Operational Improvements
  - Install protected left-turn phasing
  - Provide optimal clearance interval timings
  - Restrict turning movements
  - Coordinate traffic signals
  - Install emergency vehicle preemption
  - Install pedestrian and bicycle improvements
- ◆ Geometric Improvements
  - Improve channelization
  - Install or lengthen turn bays
  - Improve left-turn lane offsets
  - Improve pedestrian and bicycle facilities
  - Improve intersection alignment
  - Construct special solutions (e.g., jug handles, channelize median crossovers)
- ◆ Improve Driver Awareness
  - Improve visibility (e.g., install warning signs, lighting, back plates, pavement markings, etc.)
  - Install rumble strips
- ◆ Improve Access Management
  - Consolidate and/or remove driveways (especially within 250 feet of intersections)
- ◆ Other Improvements
  - Improve drainage at intersections
  - Improve skid resistance of pavement
  - Relocate signal hardware and other fixed objects outside the clear zone
  - Install ITS improvements
  - Clear sight distance obstructions



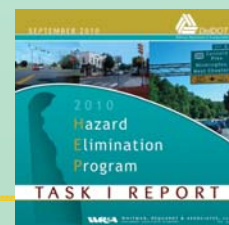
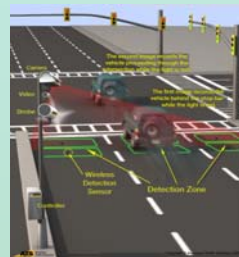
## Strategies to Improve the Design and Operation of Unsignalized Intersections

- ◆ Improve Access Management
  - ◆ Geometric Improvements
    - Provide adequate left-turn and right-turn lanes
    - Offset turn lanes
    - Provide adequate acceleration lanes
    - Provide paved shoulders
    - Restrict turning movements
    - Close or relocate high-crash intersections
    - Realign intersections
    - Improve pedestrian and bicycle facilities
  - ◆ Improve Sight Distance
    - Clear sight triangles
    - Restrict parking
    - ◆ Improve Availability of Gaps in Traffic and Assist Drivers in Judging Gaps
      - Install automated real-time devices to inform drivers of available gaps
      - Retime adjacent signals to create gaps at unsignalized intersections
- ◆ Improve Driver Awareness
  - Improve signing, striping, and delineation
  - Install intersection lighting
  - Install channelizing islands
  - Install stop lines
  - Install rumble strips
  - Install left and right edge line extensions
  - Install supplemental and overhead STOP signs
  - Install ICBs or HIBs
  - Choose Appropriate Intersection Traffic Control
    - Avoid traffic signalization when possible
    - Consider all-way STOP control
    - Consider roundabouts at appropriate locations
    - Guide motorists more effectively on approaches
      - Provide turn path markings
      - Install a double yellow centerline within the median of a divided highway
      - Provide lane assignment signing



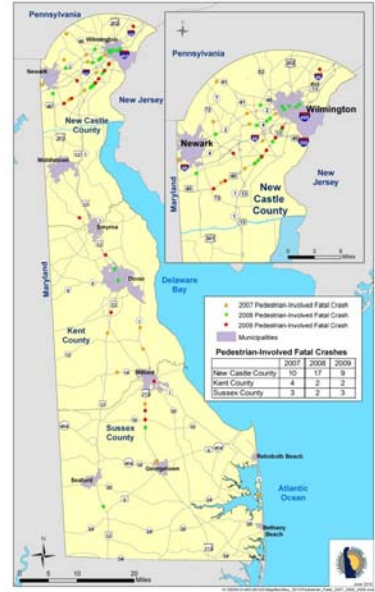
## Evaluation and Status - Improving the Design and Operation of Highway Intersections

- ◆ Education and Enforcement
  - Outreach brochures, fliers and emails to educate the public on pedestrian count-down signals, HAWK signals and roundabouts
  - ERLSP
- ◆ Engineering
  - HSIP site-specific improvements at high-crash locations
    - Hazard Elimination Program (HEP)
    - High Risk Rural Roads Program (HRRRP)
    - Transparency Report
  - Traffic signal improvements (e.g., coordination, box spans, new guidelines for protected-only left-turn phasing, etc.)
  - Reevaluation of lighting warrants
  - Pedestrian and bicycle improvements
  - Updating the *Delaware MUTCD*
  - DeIDOT Flashing Red Arrow Study



## Primary Emphasis Area 6: Making Walking and Street Crossing Safer

- ◆ Characteristics of fatal pedestrian crashes:
  - Urban, principal arterial roadways
  - Males, 45 to 54 years old
  - Saturdays, 9 PM to midnight
  - US 40/US 13 corridors in New Castle County
  - Mid-block locations
  - Impaired pedestrians
  - Pedestrian is generally at-fault



## Strategies to Make Walking and Street Crossing Safer

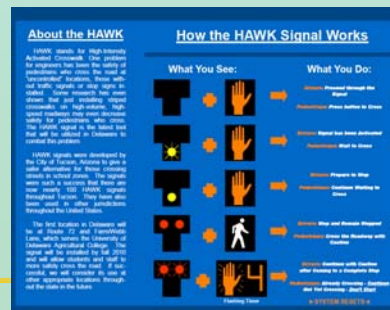
- ◆ Education
  - Conduct media outreach to emphasize
    - Pedestrian safety, right-of-way, and responsibilities
    - Drivers' speed and pedestrian awareness
  - Emphasize pedestrian awareness in driver's education classes
- ◆ Enforcement
  - Increase targeted traffic enforcement
  - Evaluate the use of automated speed enforcement in school zones (if allowable under Delaware Code)



# Strategies to Make Walking and Street Crossing Safer

## ♦ Engineering

- System and policy initiatives
  - Consider pedestrians in the early planning stages of design
  - Review all existing pedestrian facilities
  - Provide adequate crossing time for older pedestrians
  - Improve maintenance of pedestrian facilities
  - Consider revisions to lighting warrants to include pedestrians
- Target location improvements
  - Eliminate conflicts between pedestrians and turning vehicles
  - Install HAWK signals
  - Provide a leading pedestrian phase to enhance visibility
  - Perform pedestrian safety audits
  - Install street lighting



# Evaluation and Status – Making Walking and Street Crossing Safer

## ♦ Education and Enforcement

- Running annual Walk Smart campaigns
- Educational materials explain the proper use of pedestrian signals, crosswalks and HAWK signals
- Safe Routes to Schools program
- SB 269 for “vulnerable users”



## ♦ Engineering

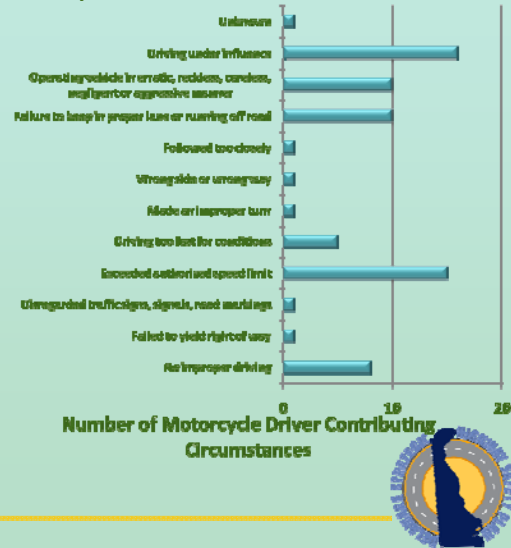
- System and policy initiatives
  - Countdown pedestrian signals
  - Complete Streets policy
  - Review of all unsignalized pedestrian crossings
  - Audible pedestrian signals
  - HAWK signals
- Target location improvements
  - Pedestrian improvements through HSIP projects
  - Numerous improvements along US 40, US 13, SR 273, and SR 4



## Primary Emphasis Area 7: Improving Motorcycle Safety and Increasing Motorcycle Awareness

### ◆ Characteristics of fatal motorcycle crashes:

- 3 PM to 6 PM
- Males, 35 to 54 years old
- Roadway departures
- Impaired driving
- Speeding
- Not wearing a helmet



## Strategies to Improve Motorcycle Safety and Increase Motorcycle Awareness

### ◆ Education

- Conduct media outreach to emphasize:
  - Increased severity of consequences of poor driver behaviors (e.g., aggressive, fatigued, inexperienced or impaired driving) while on a motorcycle
  - Vulnerability of motorcyclists to other vehicles on the roadway
  - Other vehicles' blind spots to motorcycles
  - Importance of wearing protective clothing and helmets
- Teach and measure skills required for crash avoidance
  - Educate new drivers to share the road with motorcycles
  - Increase capacity of motorcycle training classes

### ◆ Enforcement

- Increase targeted traffic enforcement
- Consider enacting a helmet law that applies to all motorcyclists



## Strategies to Improve Motorcycle Safety and Increase Motorcycle Awareness

### ◆ Engineering

#### ■ System and policy initiatives

- Consider motorcycles when installing roadside barriers
- Use high-traction materials for pavement and markings
- Minimize uneven pavement surfaces
- Promote use of safety edge
- Patch pot holes promptly
- Consider motorcycle safety in work zones

#### ■ Target location improvements

- Consider paved shoulders
- Install motorcycle hazard warning signs where needed



## Evaluation and Status - Improving Motorcycle Safety and Increasing Motorcycle Awareness

### ◆ Education and Enforcement

- 2009 *Ride Safe. Ride Smart* campaign launched in conjunction with May's Motorcycle Safety Awareness Month
- OHS formed a partnership with Delaware's Motorcycle Rider Education Advisory Committee
- Motorcycle training courses offered through the DMV
- SB 269 for "vulnerable users"

### ◆ Engineering

#### ■ System and policy initiatives

- Developing a DGM for safety edge
- Updating and training on the *Delaware MUTCD*
- Recently developed motorcycle-friendly standards for vertical differences in work zones

#### ■ Target location improvements

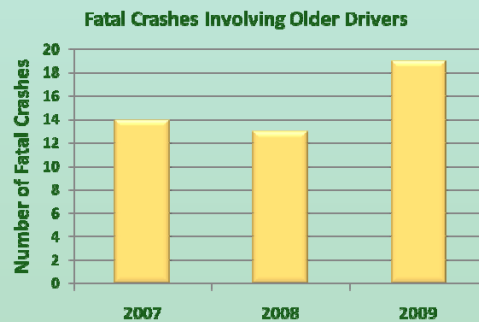
- HSIP site-specific improvements at high-crash locations
- Constructing paved shoulders where feasible
- Installing skid resistant overlays
- Installing motorcycle hazard warning signs





## Secondary Emphasis Area 1: Sustaining Proficiency in Older Drivers

- ◆ Characteristics of older driver crashes:
  - Collector and local roadways
  - 12 PM to 3 PM
  - The older driver was not at-fault in approximately half the crashes



## Strategies to Sustain Proficiency in Older Drivers

- ◆ Education
  - Conduct media outreach to improve awareness of older driver concerns
  - Continue to plan for the aging population through the Old Driver Task Force
  - Identify and assess older drivers' disabilities and potential solutions
- ◆ Engineering
  - Signing improvements
    - Advance signing
    - Increase size and letter height
  - Increase retroreflectivity of pavement markings
  - Intersection improvements
  - Other roadway improvements
    - Provide lighting
    - Improve delineation



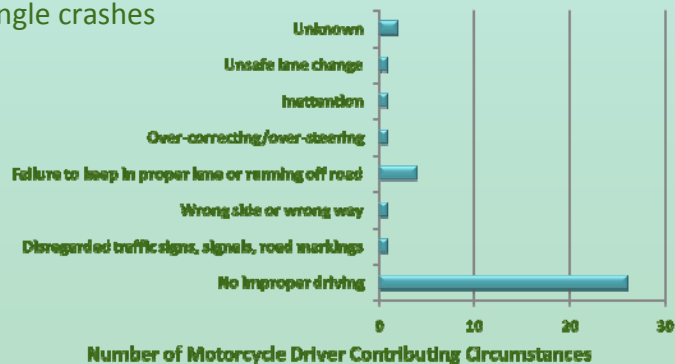
## Evaluation and Status – Sustaining Proficiency in Older Drivers

- ◆ Education and Outreach
  - Delaware’s Older Driver Task Force was launched in 2010
  - “Safe and Mobile Delaware” campaign educates older drivers
  - Certified Driver Rehabilitation School
  - DMV launched first “Senior Driver Day” in October 2010
- ◆ Engineering
  - Installing larger signs, overhead street name signs, and using Clearview font
  - A striping management program is under development to ensure proper retroreflectivity
  - Many intersection improvements are being implemented (as noted previously)
  - Many updates to the *Delaware MUTCD* are specifically related to older driver research and recommendations



## Secondary Emphasis Area 2: Making Heavy Vehicle Travel Safer

- ◆ Characteristics of heavy vehicle fatal crashes:
  - Rural roadways
  - 12 PM to 3 PM and Midnight to 3 AM
  - Angle crashes
  - The driver of the heavy vehicle was not at-fault in 70% of crashes





## Strategies to Make Heavy Vehicle Travel Safer

- ◆ Education and Enforcement
  - Conduct media outreach to improve awareness of large trucks and blind spots, emphasizing:
    - The more severe consequences of a crash with a heavy vehicle
    - Crashes involving heavy vehicles are not typically the fault of the heavy vehicle driver
  - Strengthen commercial vehicle laws and penalties
  - Allocate resources for inspection and weigh stations
  - Perform targeted enforcement of truck laws
  - Strengthen CDL program
  - Improve safety and maintenance of heavy vehicles
- ◆ Engineering
  - Create additional rest and pull-off areas to reduce fatigue-related crashes
  - Identify and treat truck crash roadway segments (e.g., improve signing, install rumble strips, install interactive truck rollover signs, etc.)



## Evaluation and Status – Making Heavy Vehicle Travel Safer

- ◆ Education and Outreach
  - DSP's CVEU activities aimed at improving truck travel safety:
    - Vehicles in violation of inspections or authority are declared "out of service" until violations are corrected
    - Enforcement targeting aggressive truck drivers and those not wearing seat belts are performed along roadways identified as a high crash corridor for commercial vehicles
    - Education and outreach activities include motor carrier safety meetings and educating young drivers and others on "No Zones" (blind spots)
    - A second scale house was constructed on US 301 in June 2009
    - Additional inspectors have been trained in HazMat inspections
    - Continued improvements are being made to data collection, quality, and reporting
- ◆ Engineering
  - Implementing HSIP site-specific improvements at high-crash locations (e.g., warning signs to indicate proper ramp speeds, rumble strips)
  - Updating the *Delaware MUTCD*



## Secondary Emphasis Area 3: Designing Safer Work Zones

- ◆ Characteristics of work zone fatal crashes – 3 total crashes:
  - All occurred at nighttime
  - All occurred in 2008
  - Workers were not present
  - 2 crashes occurred on I-95; 1 crash occurred on SR 141
  - All involved alcohol



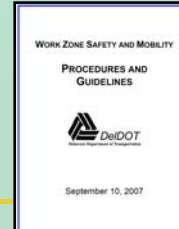
## Strategies to Design Safer Work Zones

- ◆ Education and Enforcement
  - Conduct media outreach to improve awareness of work zones, emphasizing that
    - Motorists need to slow down and pay close attention to the roadway through work zones
    - Work zone workers are very vulnerable
  - Increase law enforcement and police presence within work zones
  - Incorporate work zone safety into drivers' education lesson plans
  - Continue to improve work zone operations through training of workers, inspectors, and law enforcement
- ◆ Engineering
  - Increase contractor penalties for non-compliance with the *Delaware MUTCD*
  - Design pull-over areas into roadway construction projects
  - Coordinate efforts between DelDOT, OEMS and law enforcement to improve incident management
  - Reduce driver frustration by reducing the number, duration and impacts of work zones, providing real-time work zone updates, and coordinating traffic signals
  - Install speed feedback signs to deter speeding
  - Utilize portable detection equipment to monitor traffic conditions
  - Develop public information guidelines for work zones



## Evaluation and Status – Designing Safer Work Zones

- ◆ Education and Outreach
  - Work Zone Safety Awareness Week runs every April
  - Speed enforcement continues to be used during construction
  - Move Over law became effective in 2007
- ◆ Engineering
  - In response to FHWA's Final Rules, DelDOT developed:
    - > *Work Zone Safety and Mobility Procedures and Guidelines*
    - > *Guidelines for the Use of Uniformed Law Enforcement Officers in Work Zones*
    - > DGM for the use of temporary traffic barrier in work zones
  - Adopted ATTSA's *Quality Guidelines for Work Zone Traffic Control Devices*
  - Updating and training on the *Delaware MUTCD*
  - Real-time detection and traffic monitoring
  - WTCM 1380 AM traffic updates
  - Real-time travel time messages and advisories
  - MAP trucks
  - Considering "511" implementation
  - New requirements for sheeting of channelizing devices



## Secondary Emphasis Area 4: Improving Traffic Records

- ◆ Traffic Records Coordinating Committee (TRCC) Mission
  - Make information needed to effectively manage transportation safety available to the transportation safety community
- ◆ Traffic Records Coordinating Committee (TRCC) goals:
  - Facilitate the comprehensive collection, maintenance, and dissemination of traffic safety related data to set the direction for traffic safety improvement measures
  - Improve the timeliness, accuracy, completeness, uniformity, and accessibility of data that is needed to identify priorities for traffic safety programs
  - Strive to ensure that all Traffic Safety Information System projects funded by and under the direction of the TRCC, move forward on schedule and within budget. For projects outside of this scope, use the authority of the TRCC to ensure that these projects move forward in a timely manner, recognizing budgetary and staffing constraints.



## Strategies to Improve Traffic Records

- ◆ Develop an E-Crash Users Manual/Data Dictionary
  - Improve the accuracy of crash data collection
- ◆ CARS (Crash Analysis Reporting System) development – Phase 2
  - Support DelDOT's safety programs, including the HSIP
  - Identify locations with high crash rates based on crash characteristics (e.g., roadway departures) to support the SHSP
- ◆ Develop an DMV Data Analysis Tool
  - Provide a secure data mining tool for the DMV and the Department of Safety and Homeland Security
- ◆ DIMES (Delaware Information Management for Emergency Services)
  - Upgrade the EDIN system to support statewide injury data collection



## Evaluation and Status – Improving Traffic Records

- ◆ E-Crash System
  - Implemented a new crash system contained within DelJIS's LEISS system
  - Replaces TraCS
  - Implemented new Incident Locator Tool
  - Currently developing a QA/QC program to improve accuracy
- ◆ CARS (Crash Analysis Reporting System)
  - Under development to replace the current crash system (SDM) and allow for spatial mapping and querying of crash data
- ◆ CHAMPS (Criminal and Highway Analysis Mapping for Public Safety)
  - GIS-based mapping tool
  - Available to all police agencies, DelDOT, and OHS
- ◆ E-Ticket System
  - Electronic citation tool in used by all law enforcement agencies statewide



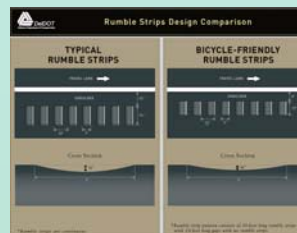
## Strategy Selection

- ◆ Strategies based on the three E's of safety
  - Engineering
  - Education
  - Enforcement
- ◆ Emphasis placed on cost-effective and proven countermeasures
- ◆ Strategies were selected for each emphasis area; however, many strategies address multiple emphasis areas



## Examples of Engineering Strategies

- ◆ System and policy initiatives
  - Develop system-wide procedure for installation of rumble strips
  - Develop standards for using skid resistant pavements
  - Provide uniform traffic control devices statewide
  - Consider pedestrian accommodations for all projects
- ◆ Spot or target location improvements
  - Widen and/or pave shoulders in target locations
  - Remove, relocate, shield or delineate fixed objects
  - Coordinate traffic signals and improve signal timings
  - Perform pedestrian safety audits for roadways and intersections



## Examples of Education Strategies

### ◆ Public information and education campaigns

- Aggressive driving campaigns
- Pedestrian safety campaigns
- Designated Driver Program



### ◆ Educate high-risk drivers

- Improved driver education classes that focus on high-risk behaviors
- Increased awareness through defensive driving courses
- Improved motorcycle driver training
- Educate servers and liquor store workers on identifying impaired persons and discouraging them from driving



## Examples of Enforcement Strategies

### ◆ Improve compliance with traffic laws

- Increased enforcement funding to better address high-risk behavior
- Promote use of 911 to report impaired or aggressive driving
- Provide specialized law enforcement training



### ◆ Support legislative action to strengthen laws

- Conduct judicial outreach to promote consistency in verdicts and sentencing
- Increase point structure and penalties for aggressive driving
- Conduct high visibility enforcement campaigns



## Implementation

- ◆ The goals and strategies included in the plan should be incorporated into other safety programs and initiatives, when possible
- ◆ Programs and projects should be prioritized based on their consistency with the *SHSP*
- ◆ Development of Implementation Teams is underway
  - Teams will meet quarterly or semi-annually to discuss implementation and evaluate and monitor safety initiatives and their effectiveness



## Questions and Contact Information

Adam Weiser, P.E., PTOE  
Safety Programs Manager  
Delaware Department of Transportation  
169 Brickstore Landing Road  
Smyrna, DE 19977  
P: (302) 659-4073

E: [adam.weiser@state.de.us](mailto:adam.weiser@state.de.us)

W: [www.deldot.gov](http://www.deldot.gov)

New Safety Programs Website:

[http://deldot.gov/information/community\\_programs\\_and\\_services/DSHSP/index.shtml](http://deldot.gov/information/community_programs_and_services/DSHSP/index.shtml)

