

PA DOT Safety Initiative

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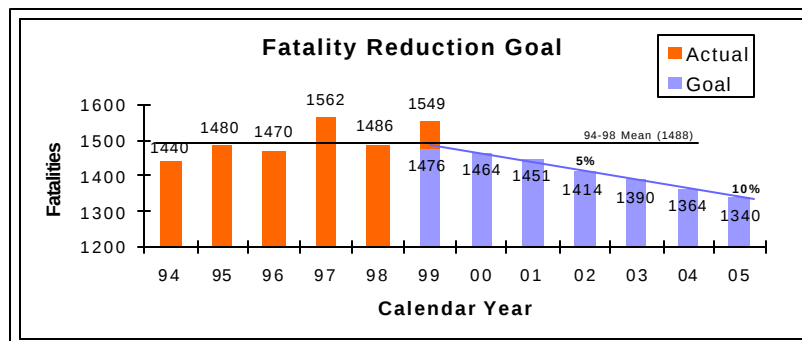


PennDOT's Safety SFA Safer Travel

- High Level Goal
- By 2002 - 5% reduction in deaths
- By 2005 - 10% reduction in deaths



Trend Analysis





Safer Travel Objectives

- Implement effective, low cost safety improvements @ targeted high crash sites.
- Upgrade safe driving performance thru education, awareness & enforcement.
 - alcohol
 - safety belts
 - aggressive driving
 - trucks
 - pedestrians



Safer Travel Measures

- 5% reduction equates to 74 lives saved.
- 10% reduction equates to 148 lives saved.





Crashes are Devastating



Low Cost Safety Improvements

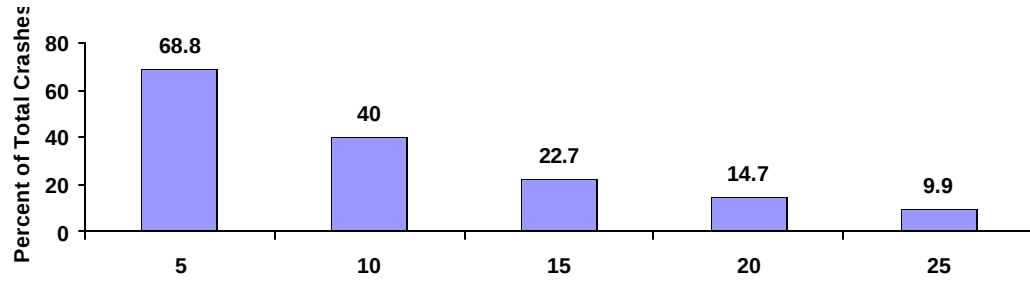
- 35-40% of crashes occur
 - on 3-4% of the highways.
- 12 crash categories identified
 - DUI, aggressive driving, seat belt, peds, head-on, curves, trees, utility poles, guiderail, intersections.
- Objective -
 - deploy large number of innovative/effective improvements.
 - on targeted sites in any of 12 crash categories.

DUI CORRIDOR INITIATIVE

Fatalities – 2,108

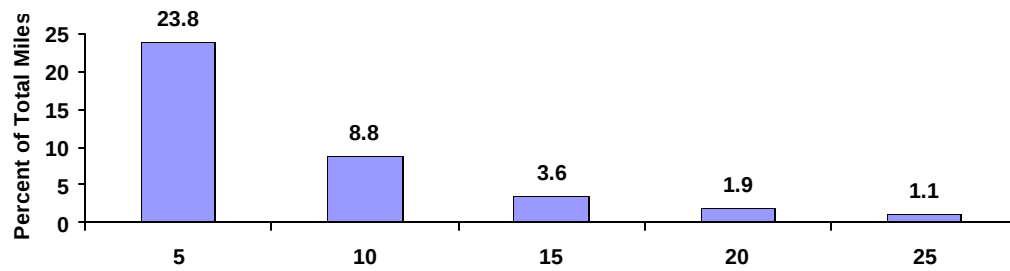
Crashes – 46,768

Percent DUI Crashes



Fatalities 1325 662 342 211 149

Percent Miles

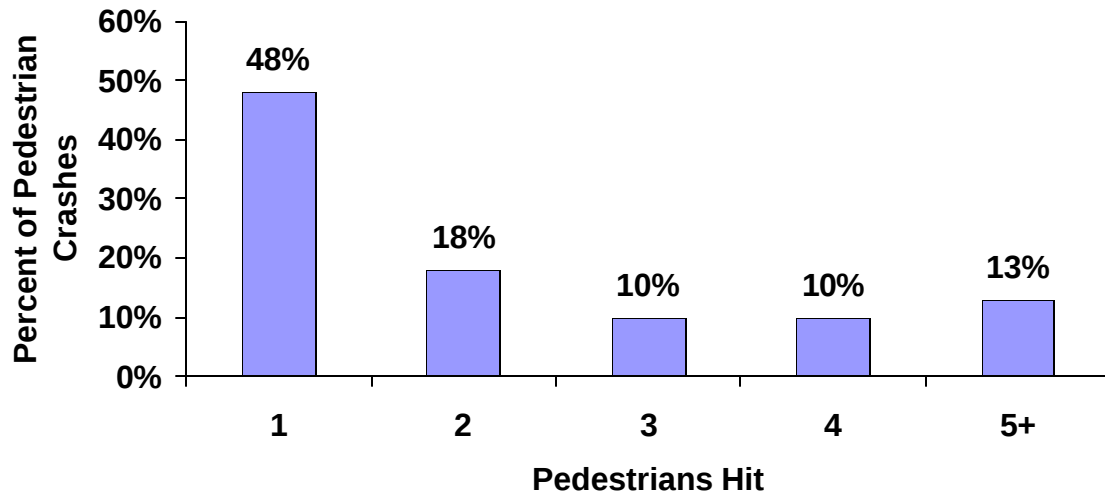


Sections 3249 1168 463 239 135

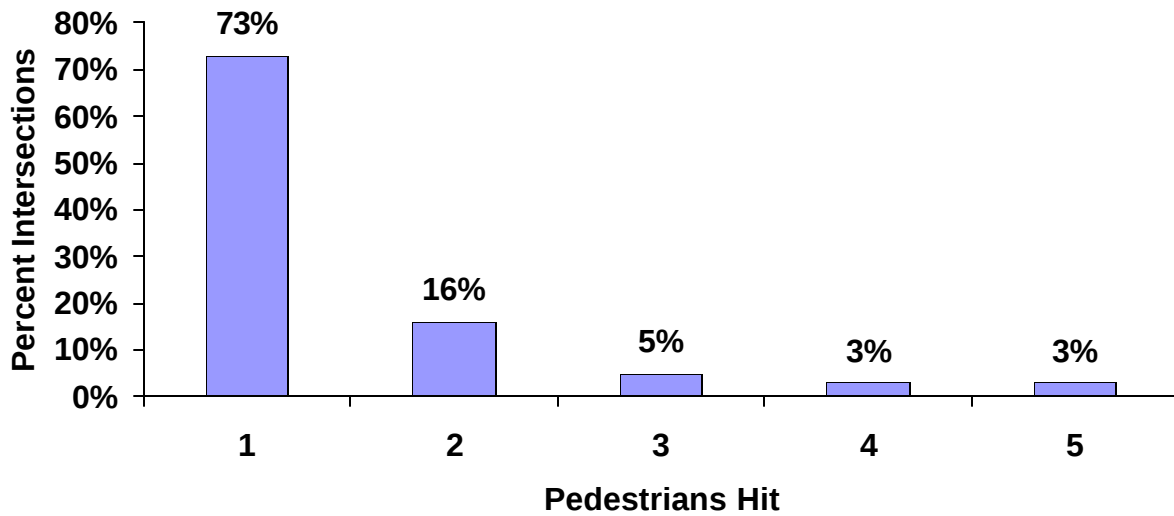
PEDESTRIAN INTERSECTION CRASHES

Problem over the past five years (1993-1997)

- 3,431 crashes
- 94 pedestrian deaths
- Occurred in 2,256 intersections



63 deaths 14 deaths 6 deaths 4 deaths 7 deaths

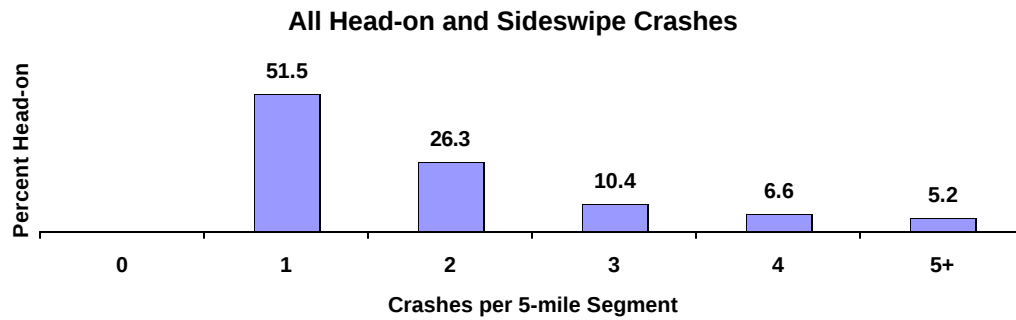


Intersections 1455 355 316 64 66

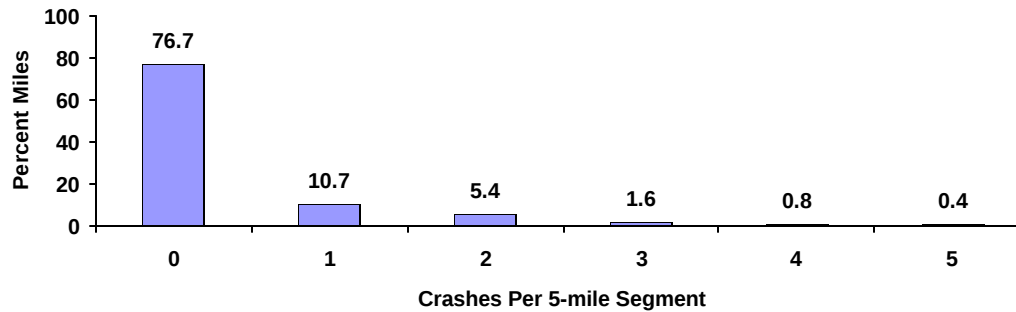
HEAD-ON AND SIDESWIPE CRASHES AND FATALTIES

Problem over the past five years (1993-1997)

- 11,923 head-on and sideswipe crashes
- 1,536 deaths
- Scattered over 40,244 miles



Fatalities	681	412	202	124	117



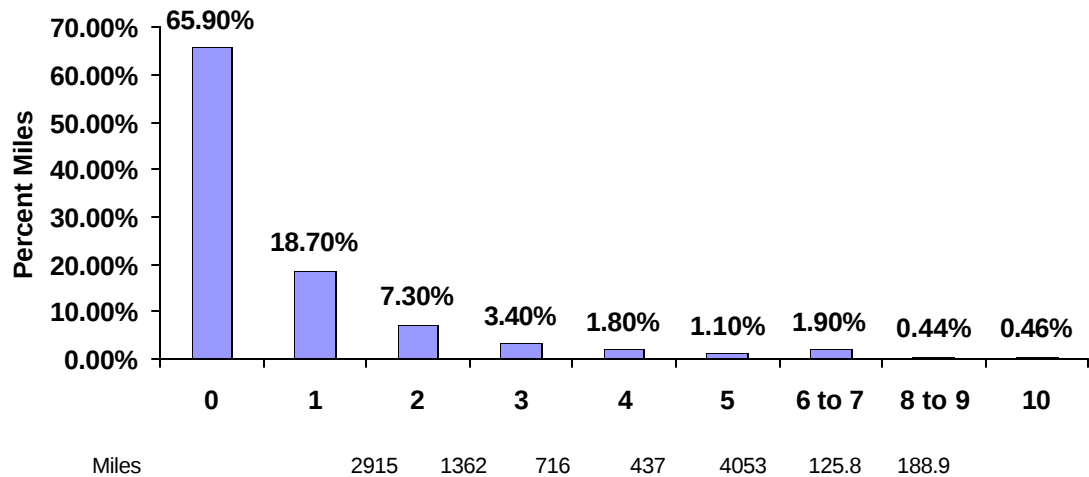
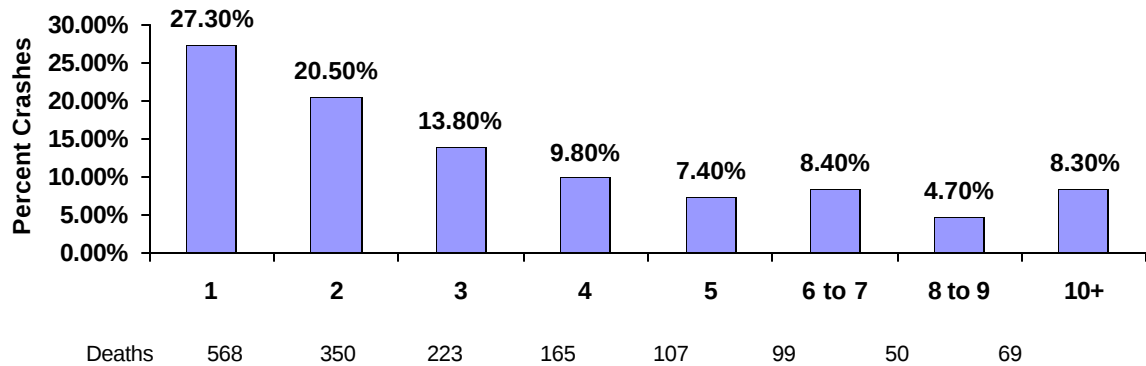
Miles	32,564	4,310	2,200	660	325	185

CURVE CRASHES AND FATALITIES

Problem over the past five years (1993-1997)

- 56,708 crashes
- 1,631 fatalities on curves
- Scattered over 40,244 miles
- No formal inventory system of curves available yet

ALL CURVE CRASHES



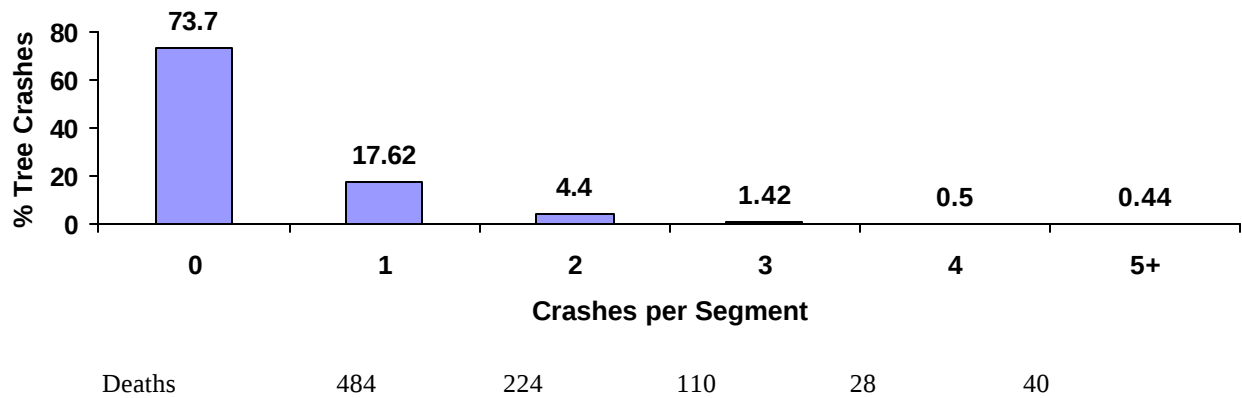
TREE CRASHES AND FATALITIES

Problem over the past five years (1993-1997)

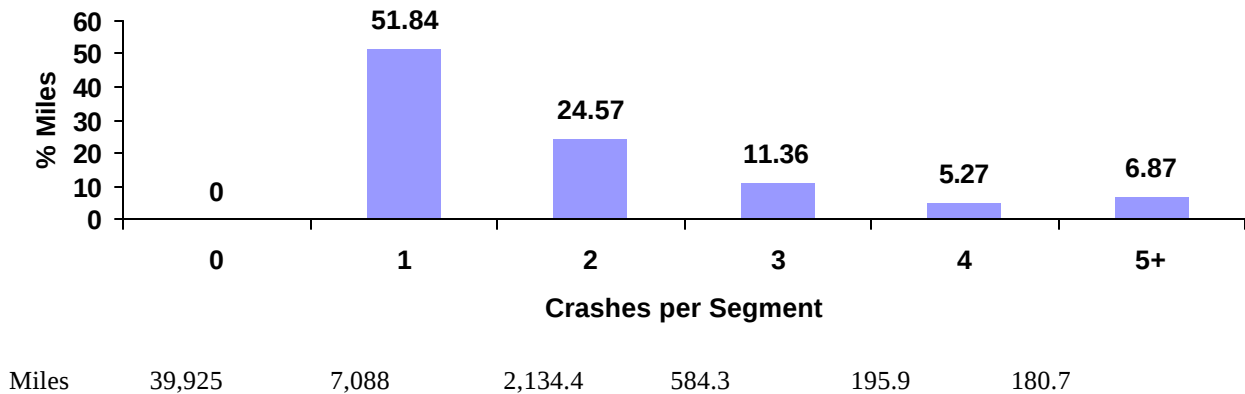
- ◆ 27,406 tree crashes
- ◆ 4,703 major injury and death crashes
- ◆ 886 deaths associated with striking a tree
- ◆ Scattered over 40,244 miles
- ◆ Approximately 1 million trees in clear zone (average 25 trees per mile both sides but with very significant deviations)

No formal inventory system available.

All Tree Crashes

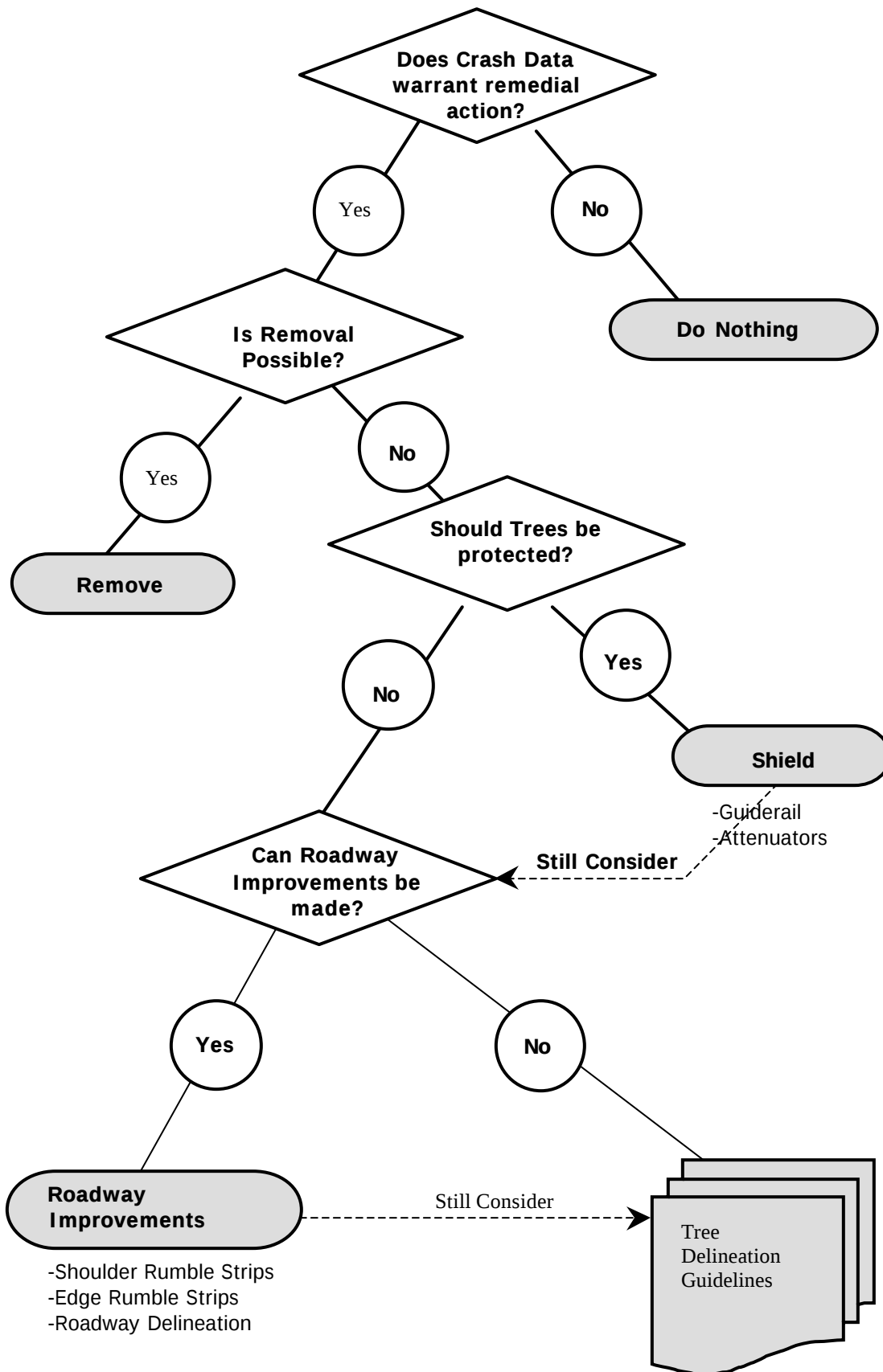


All Tree Crashes





Tree Crash Cluster Decision Tree



Decision Process:

1. Does Crash Data warrant remedial action?

Consider a location if it is listed in the Hit Tree Cluster list. Locations are listed as a cluster if there are 3 or more crashes in ½ mile. Sites that have a high potential for future crashes should also be given consideration (1 or 2 crashes per ½ mile section).

2. Is Removal Possible?

Consider trees for removal where:

- a. The roadside is such that removing the trees will increase recovery area significantly, such as the outside of a curve, or when removal is coinciding with an initiative to clear the roadside of all other significant hazards.
- b. There are isolated trees well within the clear zone
- c. Trees show bark damage from repeated involvement in crashes

And which are not in any of the following categories:

- a. Outside of Department right-of-way and no additional Right-of-way can be purchased
- b. Member of an endangered species
- c. Habitat for endangered species (i.e. Indiana Bats)
- d. Of any historic or cultural significance

Vulnerable trees located beyond the right-of-way should be considered for removal through the purchase of right-of-way to increase the clear zone or the attainment of a release from the property owner which can include replacement by planting less vulnerable trees or shrubbery.

3. Should the Trees be shielded?

Guiderail may be considered if a significant net safety benefit is realized. Perform analysis using Roadside Safety Analysis Program (RSAP) or equivalent method to determine if a continuous guiderail in front of multiple trees in close proximity will result in a substantial net safety benefit (increase in less severe guiderail crashes is less than fewer more severe tree crashes). If a substantial net benefit is realized, install guiderail in place.

Consider attenuating system for locations with one or few trees with multiple hits and conditions in which removal of the tree is not a viable option.

If trees are to be shielded, improvements to the existing roadway should still be considered as an addition.

4. Can improvements be made to the existing roadway?

Consider additional delineation on the existing roadway such as Edge Lines, RPMs, Post Delineators or Chevrons. Also, consider widened and paved shoulders.

In addition to delineation, consider alternative methods to keep the vehicle from leaving the roadway. Shoulder Rumble Strips may be effective if a paved shoulder 6 feet or wider exists. Edge Rumble Strips may be effective where paved shoulder is 2 to 4 feet wide.

Other low-cost improvements to be considered are as follows:

DRAFT 10/23/00

- Advanced Warning signs
- Skid resistant pavement overlays
- Increased highway lighting

If additional improvements are possible, tree delineation should still be considered as an addition.

5. Can trees be effectively delineated?

Based on the guidelines for tree delineation, it should be determined whether vulnerable trees in the cluster area should be delineated. See the attached Delineation Guidelines and specifications.

UTILITY POLE CRASHES AND FATALITIES

Problem over the past five years:

31,794 utility pole crashes

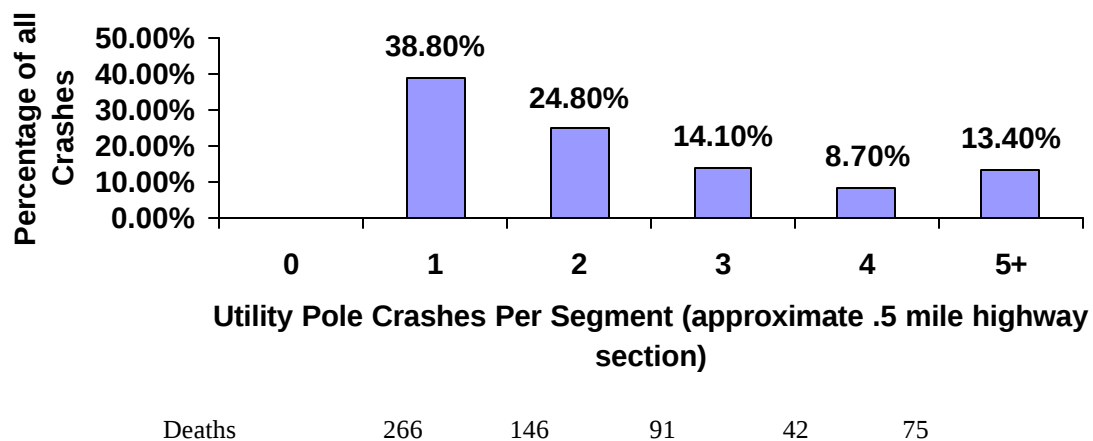
620 utility pole deaths

Scattered over 40,244 miles

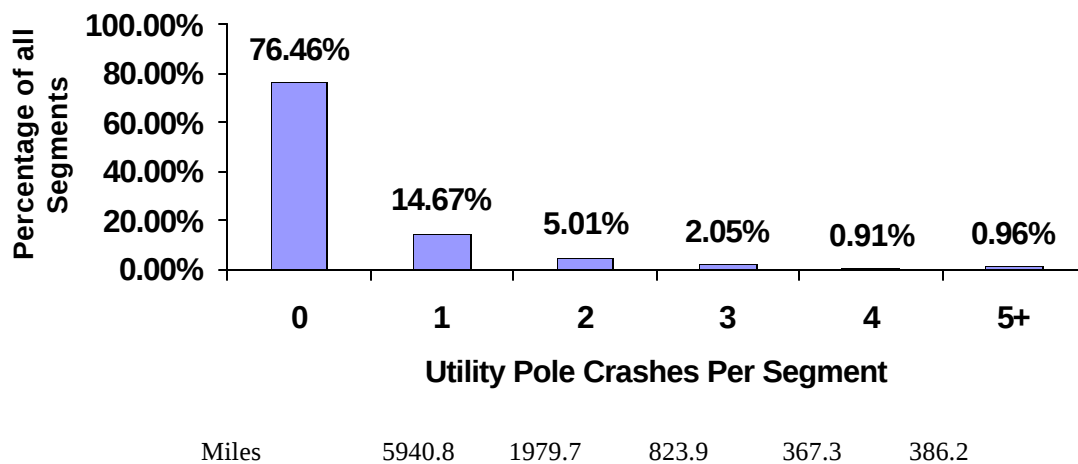
No good estimate of number of utility poles

No formal inventories of utility poles or exact correlation between poles and crashes by specific pole.

All Utility Pole Crashes



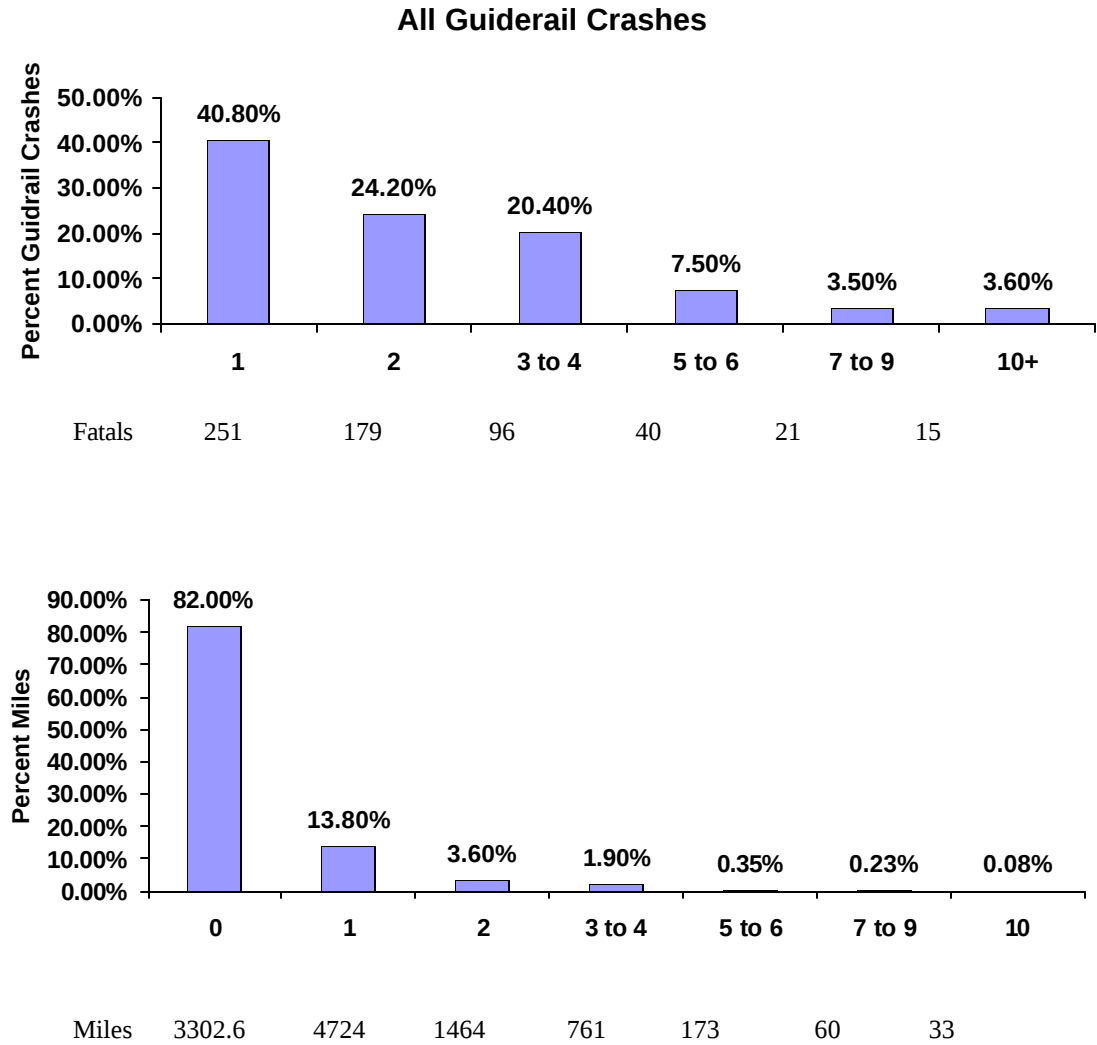
Percent Miles of State Highway



GUARDRAIL CRASHES AND FATALITIES

Problem over the past five years (1993-1997)

- 23,752 crashes
- 602 deaths associated with striking guiderail
- Scattered over 40,244 miles
- Formal inventory system available (RMS) to define type and condition of guardrail.





Safety

Pedestrian Channelization Devices



Digitally Enhanced Photograph



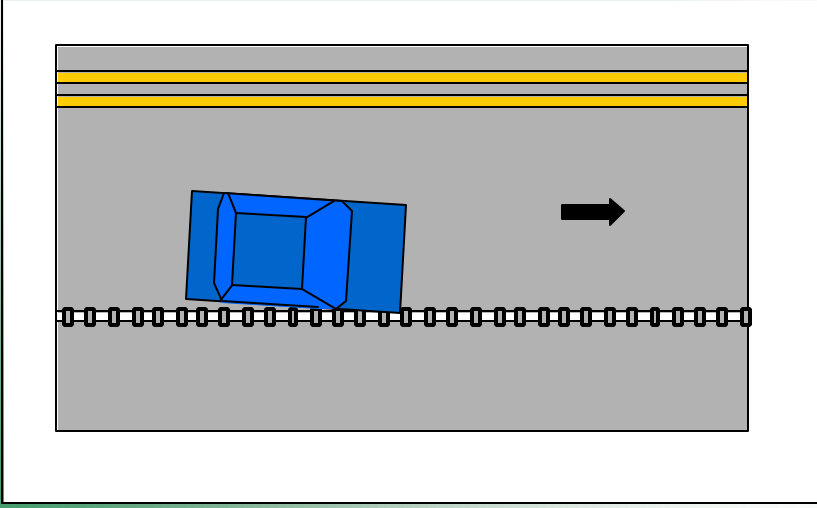
Safety

Milled Centerline Rumble Strips



**Safety**

Pennsylvania Pavement Edge Rumble Strips



**Safety**

Bicycle Friendly Rumble Strips





Safety

Utility Pole Relocation/Consolidation



BEFORE



AFTER

Digitally Enhanced Photograph



Safety

Utility Pole Delineation





Safety

Advanced Curve Warning Initiative





Safety

“DOT” Tailgating Treatment



Digitally Enhanced Photograph

**Safety**

Driver Safety Corridors



**Safety**

Low Cost Intersection Gap Warning System



Digitally Enhanced Photograph



Safe Driver Performance

- Objectives
 - Safety belt usage ▲ 70 to 73%
 - alcohol-related deaths ▼ by 3%
 - aggressive driving-related deaths ▼ by 3%
 - tractor trailer-related deaths ▼ by 3%
 - pedestrian deaths ▼ by 3%



Safe Driver Performance

- SFY 99-00
 - limited statewide paid advertising (OCCR \$500k).
- SFY 00-01
 - targeted paid advertising on (8-0 seat belts/10-0 alcohol). [OCCR]
 - new Public Info & Educ (PI&E) contract.
 - new Truck Safety Campaign.
 - evaluate 8-0/10-0 pilot efforts.



Safe Driver Performance

- SFY 01-02
 - expand paid advertising. [OCCR]
 - develop new PI&E efforts.
 - introduce corridor police enforcement.
 - continue to evaluate results.
- SFY 02-03
 - if evaluation is positive, expand concept statewide (advertising, education, awareness, and enforcement).



In-Summary

- These two organizational objectives are in fact the two Safer Travel strategic objectives.
- Educ/Enforcement -- being proposed systematically, if it works → then expand.
- LCSIP -- wide deployment of low cost proj. are needed that target problem sites.
 - we must also continue-on with the many other existing good safety practices.

Safety					
Our Goals					
Projected Lives Saved					
	<u>00-01</u>	<u>01-02</u>	<u>02-03</u>	<u>03-04</u>	<u>04-05</u>
LCSIP	15	26	37	48	59
Law	30	30	30	30	30
Chgs.					
Educ/	0	3	15	30	45
Enfor					
Total	45	59	82	108	134 *
* Other law changes will be necessary to get from 134 to 148 lives saved (by 2005).					