

Roadway Departure Systemic Safety Kentucky Implementation Plan

Brian Chandler, P.E., PTOE
Senior Transportation Engineer
SAIC

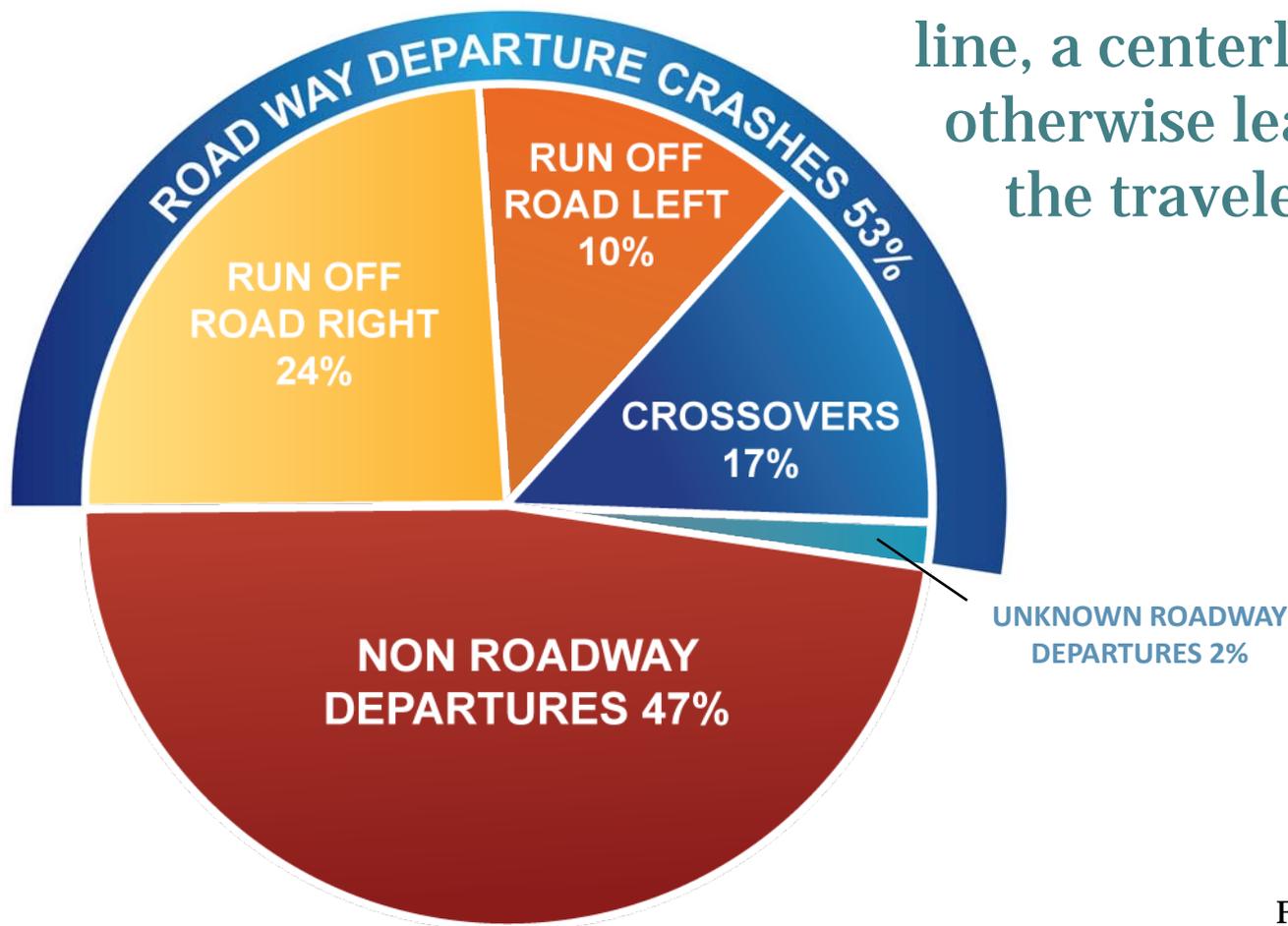


U.S. Department
of Transportation
**Federal Highway
Administration**

Roadway Departure Fatal Crashes

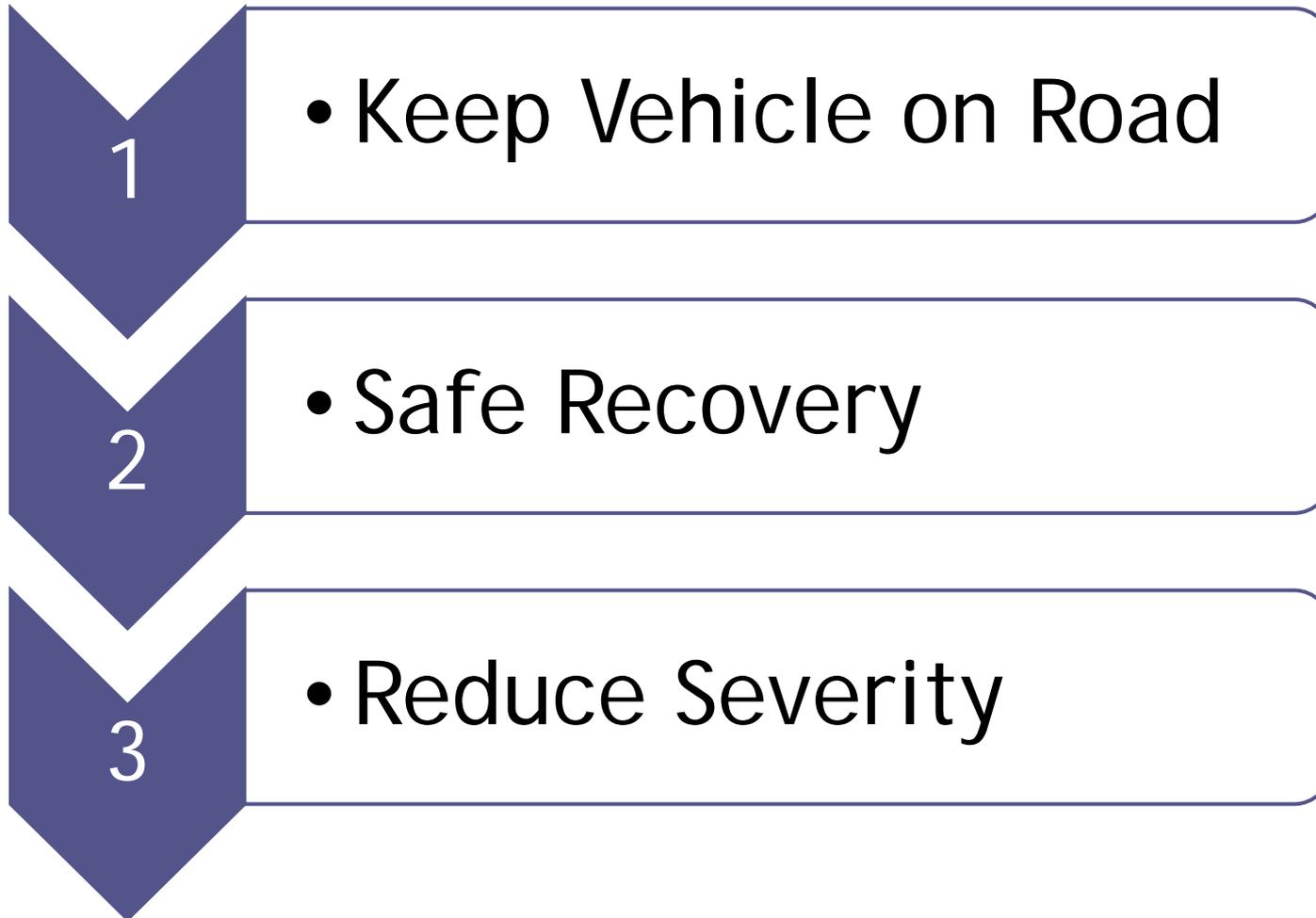
34,017
U.S.
Fatal
Crashes

Non-intersection crash in which a vehicle crosses an edge line, a centerline, or otherwise leaves the traveled way



17,818 U.S.
Roadway
Departure

Roadway Departure Solutions



Roadway Departure Safety Implementation Plan: Approach

Traditional

- **Minimal
Statewide Impact**

Systematic

- **Low Cost
Countermeasures**
- **Find Over-
representation**

Comprehensive

- **Incorporate
Enforcement,
Education**
 - *Both vital*

Roadway Departure Safety Implementation Plan: Process

1. Analyze Safety Data (crash, roadway)
2. Develop Draft Strategy Matrix
 - Countermeasures
 - Deployment Levels (balance goal and cost)
 - Recommended Locations
3. Implementation Plan Workshop
4. Customized Implementation Plan

Roadway Departure Safety Implementation Plan: Strategies



Analysis Example: Curves



U.S. Department
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**Federal Highway
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Example

Kentucky Curve Roadway Departure Crashes

State Roads

1,001-3,000 Annual Average Daily Traffic (AADT)

Table 13: Curve Roadway Departure Crashes - State Roads – 1,001 – 3,000 AADT – 2004-2008

LOCALITY	TOTAL CRASHES	TOTAL FATALITIES	TOTAL INCAPACITATING CRASHES	FATALITIES PER 100 CRASHES	INCAPACITATING CRASHES PER 100 CRASHES
Rural	16,072	369	1,069	2.30	6.65
Urban	977	9	46	0.92	4.71
Total	17,049	378	1,115	2.22	6.54

Curve Crashes Summary - State Rural Roads 1,001 - 3,000 ADT

Table 14: Curve Roadway Departure Crashes - State Rural Roads - 1,001 – 3,000 AADT - 2004-2008 - Summary

NUMBER OF CRASHES PER CURVE	NUMBER OF CURVES (PC - PT)	CUMULATIVE		CUMULATIVE	
		CURVES	PERCENT	CRASHES	PERCENT
50 and greater	-	-	0.00%	-	0.00%
30 - 49	-	-	0.00%	-	0.00%
20 - 29	1	1	0.01%	22	0.14%
10 - 19	23	24	0.22%	304	1.89%
5 - 9	206	230	2.09%	1,509	9.39%
4	196	426	3.87%	2,293	14.27%
3	605	1,031	9.37%	4,108	25.56%
2	1,986	3,017	27.40%	8,080	50.27%
1	7,992	11,009	100.00%	16,072	100.00%
Total	11,009	11,009	100.00%	16,072	100.00%

Summary

Table 134: Enhanced Signs and Markings for Curves – Curve Roadway Departure Crashes – State Rural Roads

AADT (Between PC and PT)	Threshold Crash Level (5 Years)	Number of Curves	Number of Targeted 5 Year Crashes on Curves	Estimated Number of Improvements ¹	Construction Costs (\$ Million) ²	Fatalities per 100 Crashes	Incapacitating Crashes per 100 Crashes	Annual Targeted Crash Reduction ³	Annual Estimated Incapacitating Injury Crash Reduction	Annual Estimated Fatality Reduction
<1,000	3 (B or sharper) 2 (C or sharper)	578	1,463	405	2.02	2.54	7.27	61	4.43	1.55
1,000-3,000	4 (B or sharper)	170	894	119	0.60	2.30	6.65	38	2.52	0.87
3,001 - 5,000	4 (B or sharper)	109	601	76	0.38	2.74	6.37	25	1.59	0.68
>5000	5 (B or sharper)	59	440	42	0.21	3.04	6.45	18	1.16	0.55
Total		-	-	642	3.21	-	-	142	9.70	3.65

¹ Assumes 70% of curves can be improved.

² Assumes an average cost of \$5,000 per curve.

³ A CRF of 0.30 is used (oversized, left, and right fluorescent yellow, advance warning signs; chevrons; slow and XX mph pavement markings; center and edge lines).

Roadway Departure Safety Implementation Plan: Strategy Matrix

Total Cost Annual Benefits	Cost	Estimated Crashes Reduced per year	Estimated Serious Injury Crashes Reduced per year	Estimated Fatalities Reduced per year
Kentucky	\$48M	2,146	146	66

Kentucky's Implementation











EXIT
113 ↗

EXIT
113
↗

03/31/2010

EXIT
113 ↗

25 MPH



RAMP
4-10
NO
DELAY



RAMP
25
MPH



12/09/2010

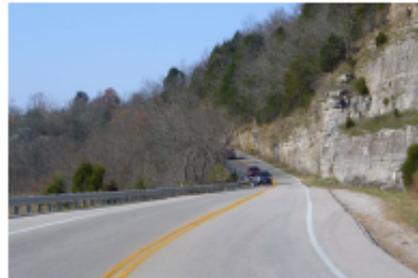
Roadway Departure Safety Implementation Plans

Kentucky Implements Roadway Departure Safety Plan with Rumble Stripes and Friction Treatments.

Roadway departure crashes account for the majority of highway fatalities in the United States. A roadway departure crash is defined as a non-intersection crash which occurs after a vehicle crosses an edge line or a center line, or otherwise leaves the traveled way.

The Problem In Kentucky

In Kentucky, roadway departure crashes account for more than 60 percent of all traffic-related deaths. Roadway departure crashes resulted in an average of 628 fatalities annually from 2005 to 2009.



Kentucky's roadways include horizontal and vertical curves and varying shoulder widths.

funding needed to achieve a 15 percent reduction in roadway departure fatalities. When implemented, this will help Kentucky save up to 65 lives per year.

The Implementation Plan developed for KYTC included traditional treatments at high crash locations, systematic treatments on corridors with a moderate level of crashes, and comprehensive safety solutions incorporating law enforcement and education to reduce the number and severity of roadway departure crashes.

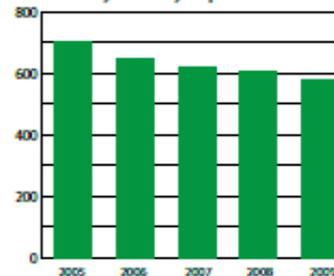


Customized Solution

FHWA first provided a technical training session to the Kentucky Transportation Cabinet (KYTC) and other traffic safety stakeholders. The training included a discussion of recommended roadway departure countermeasures.

The second event was an Implementation Plan Workshop tailored to the roadway departure safety needs of Kentucky. FHWA developed a customized data analysis package and identified a set of cost-effective countermeasures, deployment levels, and

Kentucky Roadway Departure Fatalities



Source: Kentucky Strategic Highway Safety Plan

Contacts

Frank Julian
FHWA Resource Center
frank.julian@dot.gov
(404) 562-3689

Brian Chandler
SAIC
brian.e.chandler@saic.com
(573) 356-7520

Jarrold Stanley
Kentucky Transportation Cabinet
Jarrod.Stanley@ky.gov
(502) 564-4556

