

6 Safety and Security

6.1 Introduction

With the passage of the Safe Accountable, Flexible, Efficient Transportation Equity Act (SAFETEA-LU), security became a separate, stand-alone planning factor to be reflected in, and coordinated between, both statewide and metropolitan planning processes, and consistent with security planning and review processes, plans, and programs. SAFETEA-LU continues long-established requirements for transportation safety. This chapter documents the freight safety and security analysis for the OKI region.

6.2 Highway Safety

Since 2006, overall highway crashes in the OKI region have declined. Based on 2009 data, overall highway crashes dropped from 68,606 to 62,815 representing an eight percent decrease.²⁵ Table 6-1 shows the breakdown of highway crashes by county.

Table 6-1: OKI Highway Crash Incidents, 2009

State	County	Total 2006	Total 2009	Total by %	Fatal	Injury	Property Damage Only	Unknown*
Ohio	Butler	9,953	8,980	14%	24	2,412	6,379	165
Ohio	Clermont	5,654	5,167	8%	8	1,330	3,778	51
Ohio	Hamilton	33,538	30,041	48%	42	5,615	24,190	194
Ohio	Warren	5,061	5,168	8%	12	1,275	3,835	46
Kentucky	Boone	3,953	3,958	6%	12	611	3,335	--
Kentucky	Campbell	2,847	2,714	4%	3	354	2,357	--
Kentucky	Kenton	5,621	4,893	8%	12	794	4,087	--
Indiana	Dearborn	1,979	1,894	3%	6	255	1,633	--
OKI Region Total		68,606	62,815	100%	119	12,646	49,594	456

Source: Ohio Traffic Safety Facts 2009; Kentucky Traffic Collision Facts 2009 Report; Indiana Traffic Safety Facts County Profiles 2009

* Crash statistics of "unknown" available for only Ohio counties

Hamilton County in Ohio is the leading county of crash incidents, representing nearly half (48 percent) of total crashes in the OKI region. Dearborn County in Indiana maintains the lowest number of highway crashes in the OKI region, which can be explained, in part, by the population differences between the two counties. According to the 2005–2009 U.S. Census American Community Survey Five-Year Estimates, Dearborn County's population is 49,608—the lowest among the eight county OKI region. Hamilton County had the largest population with 851,867 people.²⁶ In terms of severity, fatalities declined between 2006 and 2009 by 28 percent, while injury and property damage only accidents declined by eight percent.

²⁵ OKI 2030 Regional Transportation Plan, Chapter 5, p. 5-1

²⁶ Source: U.S. Census – American Community Survey, 2005–2009

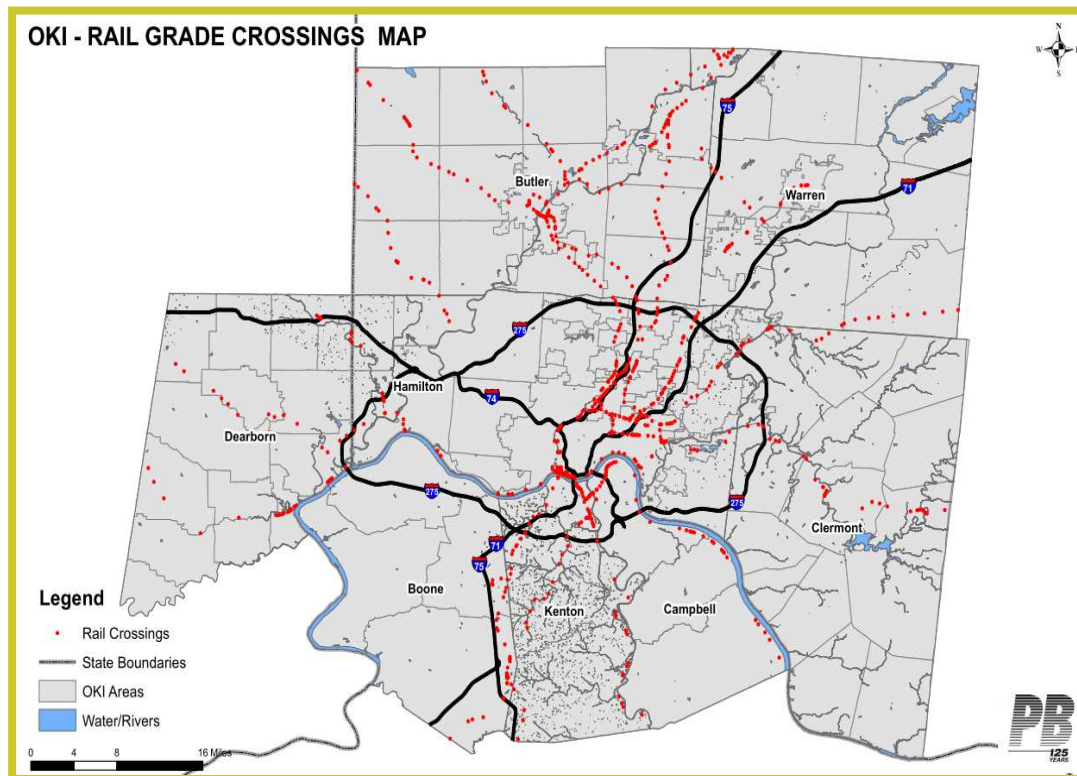
Hamilton County's crash totals reflect its larger population and road network, where many of the interstate and arterial highways converge in this part of the OKI region. Large concentrations of traffic traverse the I-71, I-74, I-75, and I-275 corridors.

State routes, such as SR 264, have experienced a high frequency of highway crashes. According to the 2007 FHWA's Five Percent Plan as mandated by SAFETEA-LU, SR 264 was called out as having the most severe safety needs in the OKI region. In Ohio, there were 25 highway segments/intersections exhibiting the most severe safety needs, of which seven were located in the OKI region—all in Hamilton County.²⁷ In Kentucky, approximately 16 roadways were identified as having the most severe safety needs. Most of these roads were in Kenton and Campbell counties. Indiana's Dearborn County did not have any roads or highways in the Five Percent Plan.²⁸

6.3 Highway Railroad Crossing Incidents

Like many regions, OKI has a number of highway-rail grade crossings, which present a hazard to motorist safety. By and large, railroad and highway infrastructure must coexist, though projects have been implemented over time to build highway-rail grade separations at particular high volume grade crossings. Even then, there are still hundreds of grade crossings in the OKI region, as shown by the red dots on Figure 6-1.

Figure 6-1: OKI Rail Grade Crossing Map



Source: Parsons Brinckerhoff

²⁷ Source: <http://safety.fhwa.dot.gov/hsp/fivepercent/2007/index.cfm?state=oh> (Map ID: 30-36)

²⁸ OKI 2030 Regional Transportation Plan, Chapter 5, p.5-2

The train volume on some of these rail crossings is very heavy, such as on the CSX line through the Mill Creek Valley. This line has more than 70 trains per day and parallels the NS mainline with about 30 trains per day.

With respect to grade crossing incidents, Butler County in the OKI region had the most highway-rail grade crossing accidents. Table 6-2 shows the historical number of railroad crossing incidents from 2006 through 2010 that include fatalities.

According to FRA's Office of Safety Analysis, the total number of highway-rail grade crossing crashes nationwide was 13 in 2010, which is an increase from 2009 levels. The lower than average statistics for 2009 could reflect the fewer vehicles and rail movements caused by the economic recession. Of 2010 totals, Butler County had five crashes, one of which was fatal. Campbell County in Kentucky is the second worst in the OKI region with two crashes, one of which was fatal. Historically, Butler County had the most number of crashes, whereas Clermont County had the fewest. In Butler County, the cities of Middletown and Hamilton have experienced the most frequent highway-rail crossing incidents. Hamilton County, particularly the city of Cincinnati, had the worst number of incidents in 2006, but since then has improved its crash statistics. Table 6-3 represents a historical breakdown of highway-rail crossing accidents by cities from 2006 through 2010.

Those cities marked "unknown" were not indicated in the FRA Crash Statistics. There was no available information for those counties marked "no data" which suggests there were no grade crossing incidents or at least none that were recorded.

Furthermore, in the Ohio and Kentucky counties in the OKI region, the number of fatalities in 2010 exceeded their respective statewide average. Specifically in Butler, Clermont, Hamilton, and Warren counties, which make up the Ohio portion of the OKI region, approximately 14 percent of crashes (one fatality out of seven accidents) were fatal, compared to the state of Ohio's average of seven percent (five fatalities out of 73 crashes). The same was true in Kentucky where in Boone, Campbell and Kenton counties, 33 percent (one fatality out of three crashes) of incidents were fatal, compared to the statewide average of 14 percent (eight fatalities out of 56 crashes).

One potential reason for Butler County's rail grade crossing safety issue is the number of high-volume train lines and increased train speed, as trains leave the urban core of Cincinnati and travel faster through the more suburban setting of Butler County. The major rail lines in Butler County include:

- CSX to Indianapolis (five trains per day)
- CSX to Lima (48 trains per day)
- NS to Ft. Wayne (28 trains per day)

Table 6-2: OKI Region Highway-Rail Crossing Accidents, 2006-2010

State	County	2010		2009		2008		2007		2006	
		Total # of Accidents	Fatalities	Total # of Accidents	Fatalities	Total # of Accidents	Fatalities	Total # of Accidents	Fatalities	Total # of Accidents	Fatalities
Ohio	Butler	5	1	3	—	2	3	3	—	5	1
Ohio	Clermont	—	—	—	—	—	—	—	—	2	—
Ohio	Hamilton	2	—	1	—	3	—	4	—	6	1
Ohio	Warren	—	—	—	—	2	—	1	—	—	—
Kentucky	Boone	1	—	1	—	2	—	3	3	—	—
Kentucky	Campbell	2	1	1	—	—	—	—	—	1	—
Kentucky	Kenton	—	—	2	—	3	—	3	—	1	—
Indiana	Dearborn	3	—	—	—	1	—	1	—	—	—
OKI Region Total		13	2	8	—	13	3	15	3	15	2

Source: FRA Office of Safety Analysis 5.07 - Hwy/Rail Incidents By State/Railroad

Table 6-3: Historical Highway-Rail Crossing Incidents for OKI Counties, 2006-2010

		2010		2009		2008		2007		2006	
		Crash Sites	Fatalities	Crash Sites	Fatalities	Crash Sites	Fatalities	Crash Sites	Fatalities	Crash Sites	Fatalities
Ohio	Butler	Middletown	0	Trenton	0	Middletown	1	Unknown	—	Overpeck	0
		New Miami	0	Hamilton	0	Unknown	2	Unknown	—	Middletown	1
		Mason	0	Unknown	0			Unknown	—	Middletown	0
		Unknown	0							Hamilton	0
		College Corner	1							Hamilton	0
	Total Annual Crashes/Fatalities	5	1	3	0	2	3	3	—	5	1
	Clermont	No Data	—	No Data	—	No Data	—	No Data	—	Unknown	—
										Unknown	—
	Total Annual Crashes/Fatalities	—	—	—	—	—	—	—	—	2	—
	Hamilton	Blue Ash	0	Cincinnati	0	Cincinnati	0	Harrison	0	Cincinnati	0
Cincinnati		0			Sharonville	0	Northwood	0	Cincinnati	0	
					Cincinnati	0	North Bend	0	Springdale	0	
							Blue Ash	0	Norwood	0	
									Springdale	0	
									Elmwood Place	1	
Total Annual Crashes/Fatalities	2	0	1	0	3	0	4	0	6	1	
Warren	No Data	—	No Data	—	Mason	0	Unknown	—	No Data	—	
					Unknown	—					
Total Annual Crashes/Fatalities	—	—	—	—	2	—	1	—	—	—	
Kentucky	Boone	Unknown	—	Unknown	—	Walton	0	Walton	2	No Data	—
						Walton	0	Unknown	1		
								Walton	0		
	Total Annual Crashes/Fatalities	1	—	1	—	2	0	3	3	—	—
	Campbell	California	0	Melbourne	0	No Data	—	No Data	—	Dayton	0
		Fort Thomas	1								
Total Annual Crashes/Fatalities	2	1	1	0	—	—	—	—	1	0	
Kenton	No Data	—	Kenton	0	Visalia	0	Covington	0	Taylor Mill	0	
			Visalia	0	Kenton	0	Covington	0			
					Independence	0	Visalia	0			
Total Annual Crashes/Fatalities	—	—	2	0	3	0	3	0	1	0	
Indiana	Dearborn	Brookville	0	No Data	—	Aurora	0	Aurora	0	No Data	—
		Aurora	0								
		Aurora	0								
	Total Annual Crashes/Fatalities	3	0	—	—	1	0	1	0	—	—
GRAND TOTAL	13	2	8	0	13	3	15	3	15	2	

Source: FRA Office of Safety Analysis 5.07 - Hwy/Rail Incidents by State/Railroad

6.4 At-Grade Crossings: Safety Review and Improvements

At-grade highway-rail crossings are a large safety concern of local governments in the OKI region. As train volumes are expected to increase based on the rail forecasts, the potential for collisions at these crossings also increases. Therefore, OKI identified a list of at-grade crossings that pose the greatest danger, with follow up improvement recommendations.

The Federal Railroad Administration's (FRA) Web Accident Prediction System (WBAPS), an analytical tool which, combined with other site-specific information (such as sight-distance, highway congestion, bus or hazardous material traffic, and local topography), can assist in determining where scarce highway-rail grade crossing resources can best be directed.

Regional planners should use WBAPS as a tool for a comprehensive safety review of area at-grade crossings, in concert with state and local transportation officials. Table 6-4 shows the top ranking highway-rail at-grade crossings by WBAPS that should receive further on-the-ground review by highway traffic engineers and specialists.

There are different types of warning devices and safety improvements available for at-grade crossings:

- Crossbucks/warning signs
- Flashing lights
- Flashing lights and gates
- Traffic channelization (to prevent motor vehicles from driving around gates); or four-quadrant gates
- Closing at-grade crossings (often in concert with other improvements above)
- Rail-highway grade separation projects

Areas of concern in the OKI region include Butler County, which had five at-grade crossing crashes in 2010 (out of 13 total for the region). Waneta Street in Middletown has been the site of two fatal at-grade crossing crashes (2006 and 2008). The Waneta Street rail crossing is part of the on-going NS "CJ" Corridor Projects which is currently planned for improvement under an agreement between the Ohio Rail Development Commission, city of Middletown and NS.

Table 6-4: Top 25 Public At-Grade Highway-Rail Crossings Predicted Collisions

Rank	Predicted Collisions	Crossing	Railroad	State	County	City	Road	Number of Collisions Reported in the Year					Warning Device	Total Trains Per Day	Total Number of Tracks Between Warning Devices	Maximum Timetable Speed for Trains Through Crossing	Paved Highway?	Highway Lanes	Average Annual Daily Traffic
								2009	2008	2007	2006	2005							
1	0.162617	525235M	IORY	OH	Warren	Mason	W Main Street	0	1	0	0	1	XB	2	1	10	Yes	2	23,425
2	0.124452	152383Y	CSX	OH	Butler	Fairfield	Seward St	0	0	0	0	1	GT	64	2	45	Yes	4	7,551
3	0.120196	524683S	NS	OH	Butler	Middletown	Waneta St	0	1	0	1	0	GT	22	2	50	Yes	2	2,786
4	0.119351	524882U	NS	OH	Hamilton	Sharonville	E Sharon Rd	0	1	0	0	0	GT	28	2	60	Yes	5	20,490
5	0.112264	152394L	CSX	OH	Butler	Hamilton	Central Avenue	0	0	0	0	1	GT	56	4	35	Yes	2	11,215
6	0.098231	345725G	CSX	KY	Boone	Walton	Main Street/US 25	0	0	1	0	0	FL	31	1	35	Yes	2	6,510
7	0.096354	524976V	NS	OH	Butler	Hamilton	Grand Blvd	0	0	0	0	1	GT	28	2	60	Yes	3	11,697
8	0.095606	152388H	CSX	OH	Butler	Fairfield	Gilmore Road	0	0	0	0	1	GT	64	2	45	Yes	2	2,962
9	0.092874	152357J	CSX	OH	Hamilton	Cincinnati	W North Bend Rd	1	0	0	0	0	GT	41	2	35	Yes	2	6,360
10	0.091856	720018X	NS	KY	Boone	Walton	Church	0	1	1	0	0	FL	27	1	60	Yes	2	500
11	0.091401	154041F	GMRX	OH	Butler	Hamilton	N B St	1	0	0	0	0	XB	6	2	10	Yes	2	13,779
12	0.089421	524684Y	NS	OH	Butler	Middletown	Oxford State Rd	0	0	0	0	1	GT	22	2	50	Yes	2	9,737
13	0.086655	152395T	CSX	OH	Butler	Hamilton	Hanover Rd	0	0	0	1	0	GT	58	3	35	Yes	2	1,620
14	0.085847	524678V	NS	OH	Butler	Middletown	First Ave	0	0	0	0	1	GT	22	2	25	Yes	2	7,430
15	0.081599	154079C	CSX	OH	Butler	Oxford	E Chestnut St	0	0	0	0	1	FL	10	1	35	Yes	2	10,582
16	0.080642	52474G	NS	OH	Butler	Hamilton	Bobmeyer Rd	0	0	1	0	0	GT	28	1	50	Yes	2	5,804
17	0.079857	152421F	CSX	OH	Butler	Trenton	S First St	1	0	0	0	0	FL	26	1	50	Yes	2	2,858
18	0.079855	524977C	NS	OH	Butler	Hamilton	Hensley Ave	0	0	0	1	0	FL	28	1	60	Yes	2	2,526
19	0.079586	525203G	NS	OH	Butler	New Miami	Trenton Rd	0	0	1	0	0	GT	28	1	60	Yes	2	5,076
20	0.078387	524744F	NS	OH	Hamilton	St. Bernard	Springrove A	0	0	0	0	0	XB	23	1	35	Yes	6	8,210
21	0.07129	152494R	CSX	IN	Dearborn	Aurora	George St	0	0	1	0	0	FL	2	1	25	Yes	3	24,580
22	0.070163	525239P	IORY	OH	Warren	Mason	Reading Rd & T	0	0	0	0	1	XB	4	1	10	Yes	4	5,171
23	0.070123	525187A	NS	OH	Butler	Collinsville	Oxford Middlet	0	1	0	0	0	XB	28	1	60	Yes	2	36
24	0.069714	524800K	INOH	OH	Hamilton	Harrison	S State St	0	0	1	0	0	XB	1	1	10	Yes	2	8,441
25	0.069356	524667H	NS	OH	Warren	Carlisle	Lower Carlisle	0	0	1	0	0	GT	18	2	50	Yes	2	3,029

Source: Federal Railroad Administration's Web Accident Prediction System (WBAPS), June 2011.

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6.5 Local Agency Safety Concerns Related to Freight Transportation

In outreach to local agencies as part of the OKI freight planning effort, city and county officials identified the following freight transportation safety issues.

6.5.1 Boone County, Kentucky

As noted by the Boone County Engineer, at-grade crossings represent the largest freight safety concern for the county. Crossings are an obvious safety concern but also present an access problem when the crossings are blocked.

Blocked railroad crossings are a particular problem in the area of the Richwood Road interchange with I-71/75. This area includes crossings at Richwood Road and Shorland Drive which are in close proximity to each other. Also located nearby is Walton Fire House #2 and an existing industrial park that accommodates high volumes of truck traffic. Moving and standing trains block these crossings. Within the past year, there was a truck/train crash at the Richwood at-grade crossing, with no injuries, but property (empty truck) damage.

KYTC's Six-Year Plan includes an upgrade of the Richwood Road interchange to a diverging diamond design and an upgrade to the near interchange to the north at Mt. Zion Road and I-71/75 (Mt. Zion – 536 Corridor improvement to AA/KY 17). There is also an existing at-grade crossing on Mt. Zion Road, east of the interchange. Boone County desires that both interchange projects include grade separation for the rail crossings within close proximity.

6.5.2 Campbell County, Kentucky

Officials in Campbell County restate a common perception that truck volume on the AA Highway is heavy, with a high occurrence of speed limit violations and severe traffic crashes. In 2009, there were two crashes involving tractor trailers with one fatality and one injury. In 2010, there were no crashes and to date in 2011 two crashes with no injuries have occurred

One concern involving the inordinately heavy truck traffic on the AA Highway is that overweight trucks use the road to avoid weigh stations. Thus far, the majority of information about truck flows, truck weights, and weigh station avoidance is anecdotal, and Campbell County officials are working to verify citizen complaints.

6.5.3 Butler County, Ohio

Butler County has experienced major residential, retail and industrial growth over the past 20 years, and this growth shows little signs of slowing. This development has stressed the infrastructure system. Both NS and CSX operate multiple main lines through the county and major industrial centers are generally located in the southern and southeastern portions of the county.

Rail issues dominate transportation safety concerns. The county is home to several vital at-grade crossings. Blockage of these crossings is a major issue in terms of access and congestion. Major issues regularly occur with stopped trains in St. Clair Township blocking crossings at Augsberger,

Hamilton-Eaton, West Elkin, and Fear Not Mills roads. Trains are typically stopped on these crossings for significant periods of time while crews are switched. This blockage leads to access and congestion issues for freight movement.

In addition, some unannounced rail crossing closures were executed by the railroad companies west of downtown Hamilton, causing further access and congestion issues. Local officials were greatly frustrated with the lack of cooperation and responsiveness they received in dealing with the rail carriers operating in the county.

Butler County is home to a number of rail bridges that pass over major east-west roadway arteries. These “mouse holes” are becoming choke points for the roadway network in terms of width and clearance issues. This has been a particular issue along the NS route passing over Cincinnati-Dayton, Hamilton-Mason, Princeton, Kyles Station, and West Chester roads in the southeastern part of Butler County. In particular, Hamilton-Mason Road’s five-lane section to the west is reduced to one lane in each direction under the railroad. For this reason, the “mouse hole” at Hamilton-Mason is a top concern of local officials.

6.5.4 City of Sharonville, Ohio

The intersection on East Sharon Road and Medallion Drive experiences a high volume of truck traffic servicing industrial and commercial businesses in Evendale. The entrance/exit to the Sharon Yard is located within 300 yards of the Medallion Drive intersection with East Sharon Road. Within the past year, the intersection of the yard entrance/exit and East Sharon Road has been the site of a traffic fatality. The City of Sharonville believes that a traffic signal is warranted to protect left turns out of the intermodal yard. In light of projected increases in intermodal traffic at NS Sharon Yard, this segment of East Sharon Road becomes even larger concern.

The other major concern for Sharonville is the at-grade NS rail crossing with Reading Road. As currently configured, yard switching causes blocked grade crossings at Reading, Kemper and Hauck roads (north of Sharon Yard). A grade separation project at this location was programmed by ODOT, which subsequently pulled funding when the preferred alternative was deemed prohibitively expensive. Nonetheless, a grade separation at this location is still a primary concern for the city.

6.5.5 Warren County, Ohio

A major truck access issue in Warren County is an impassable bridge and a hairpin turn on King Avenue/Grandin Road in the Kings Mills area. The Sumco Phoenix Corporation is located on Grandin Road and uses several trucks per day. The county has tried to communicate alternate routes, including the SR 48/I-71 Interchange and Fujitec Drive, with limited success. Some county routes are not conducive to 53 foot trailers, but the county lacks the ability to communicate these local issues to the broader trucking community.

Another issue for Warren County is truck turning radius noted on the Turtlecreek Road Bridge, just east of US 42 and at the Lebanon Commerce Park near the Turtlecreek and Kingsview Road intersection.

6.6 State and Local Safety Programs

ODOT's Highway Safety Program invests approximately \$65 million per year in transportation projects that enhance safety. The programs that address safety include the Highway Safety Program, Hot Spot, Congestion and Corridor Safety program. Every year, top locations of safety and crash incidents are identified and reported to ODOT's district offices. Each of these district offices conducts its investigation that entails an engineering analysis and short-term, low-cost strategies (such as new signs, pavement markings, and drainage improvements) to mid-cost and mid-term strategies (such as new traffic signals, turn lanes, and realignments.) Many of these improvements are paid for by the \$65 million fund however, long-term, high-cost strategies over \$5 million are funded through ODOT's Major New Construction Program. In Ohio, the overall goal was to reduce fatalities to no more than one fatality per 100 million vehicle miles traveled by 2008.²⁹

In Kentucky, the governor created an Executive Committee on Highway Safety to combat the epidemic of highway fatalities and injuries occurring on Kentucky's highways. The Executive Committee is charged with creating a safety management program that is data-driven and performance based. The Executive Committee also coordinates the development and implementation of goals, support actions, facilities and drives the overall mission of the safety program. The Incident Management emphasis area laid out four specific goals of its safety strategic plan:

1. Improve safety of responders and motorists
2. Reduce traffic delay
3. Improve motorist awareness
4. Improve responder preparedness

Based on these goals, action strategies were evaluated and scored on a scale of one to 10, where one represented the lowest priority order and 10, the highest. The top five strategies were as follows:

1. Improve the warning system for the end of the track queue at major incidents and during construction or maintenance activities.
2. Promote the use of the national incident management system.
3. Incorporate incident management training into the basic training of all responders.
4. Develop and implement alternate route plans for all critical roadways.
5. Establish or enhance local incident management teams and cultivate their development.³⁰

In Kentucky, the overall goal is to reduce the number of highway fatalities to no more than 700 by end of 2008.³¹

The Indiana Strategic Highway Safety Plan serves as a framework to promote and improve safety. By establishing benchmarks, the plan identifies highway safety problems and opportunities for reducing accidents by analyzing and prioritizing the greatest threats to highway safety. This new document provides coordination of purpose, data sources, problem identification, emphasis areas and

²⁹ Source: <http://www.dot.state.oh.us/Divisions/TransSysDev/ProgramMgt/CapitalPrograms/Pages/SafetyPrograms.aspx>

³⁰ Source: "Toward Zero Deaths: Kentucky Strategic Highway Safety Plan 2011-2014"

³¹ OKI Regional Council of Governments 2030 Regional Transportation Plan, Chapter 5 Safety

partnerships. The lead state agencies evaluate implementation action plans annually as part of federally required highway safety action plans and reports:³²

- Highway Safety Improvement Program (Per 23 CFR 924)
- Highway-Rail Grade Crossing Safety Action Plan (Per 49 U.S.C. § 202)
- Highway Safety Plan (Per 23 U.S.C. § 402)
- Commercial Vehicle Safety Plan (Per 49 CFR 350)

Indiana's goal is to reduce traffic crash fatalities to 0.98 per 100 million VMTs in 2008 and down to 0.92 in 2010.³³

The OKI Safety Plan entails coordinating with individual states and local communities. As each of the three states developed State Highway Safety Plans as mandated by SAFETEA-LU, each state has also developed a Five Percent Plan, which identifies the most severe highway safety needs statewide.³⁴

6.7 Hazardous Materials Cargo Flows

Hazardous materials (HAZMAT) make up approximately 5 percent of total freight flows in the OKI region. Table 6-5 provides a breakdown of HAZMAT by mode and their projected growth over a 30-year horizon.

Table 6-5: OKI Region Hazardous Materials Traffic by Mode

	Tons in Thousands			
	2009		2040	
Air	5	0%	7	0%
Rail	702	6%	731	5%
Truck	8,913	76%	11,669	80%
Water	2,090	18%	2,130	15%
OKI Region Total	11,710	100%	14,537	100%

Source: IHS Global Insight Commodity Flows in the Cincinnati and Dayton Regions

Based on the forecast, HAZMAT volumes are expected to grow at a rate of 0.7 percent per year, which represents half the growth rate of overall freight volumes in the OKI. Today, approximately three-quarters of HAZMAT moves by truck, followed by inland water. Rail represents a nominal share of HAZMAT movements in the region of approximately 6 percent. The breakdown of HAZMAT materials by mode is expected to remain relatively stable over the 30 year horizon with trucks gaining slightly more market share (80 percent) at the slight expense of rail and water. The HAZMAT volumes that move by truck are primarily chemical and petroleum/ coal products.

Given that a good portion of this volume is through-traffic (approximately 38 percent), most of the materials move along the north-south corridor on I-71, as well as I-75. Comparatively, water

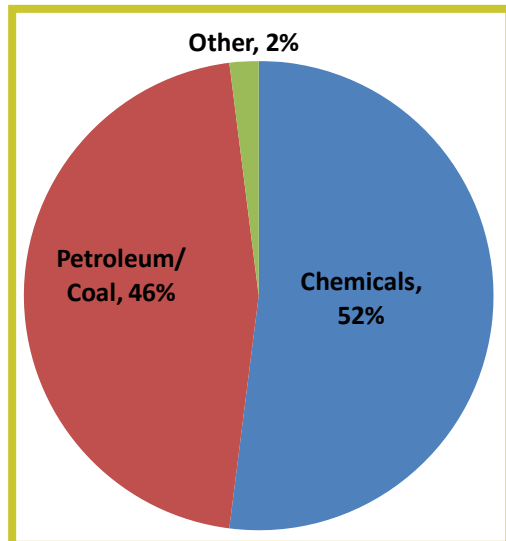
³² Indiana Strategic Highway Safety Plan Revised 2010

³³ OKI Regional Council of Governments 2030 Regional Transportation Plan, Chapter 5 Safety

³⁴ OKI Regional Council of Governments 2030 Regional Transportation Plan, Chapter 5 Safety

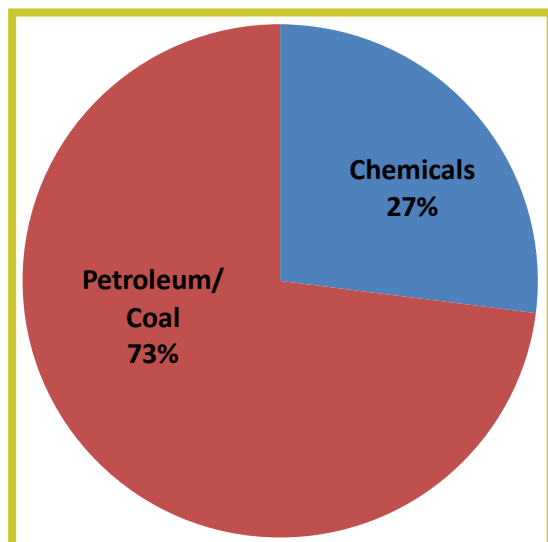
movements represent over 90 percent of inbound traffic moving more petroleum/coal products than chemicals. Petroleum and coal products represent nearly three-quarters of the HAZMAT volumes moved by inland waterways, and that number is expected to increase slightly to 77 percent by 2040.³⁵

Figure 6-2: OKI Composition of HAZMAT moved by Trucks, 2009



Source: IHS Global Insight Commodity Flows in the Cincinnati and Dayton Regions

Figure 6-3: OKI Composition of HAZMAT moved by Inland Waterway, 2009



Source: IHS Global Insight Commodity Flows in the Cincinnati

³⁵ All volumes and forecast numbers based on IHS Global Insight Commodity Flows in the Cincinnati and Dayton Regions

According to the USDOT's Office of Hazardous Materials Safety, the Incidents Reports Database indicated 81 HAZMAT transportation incidents in the last 10 years by mode (Table 6-6). Of the total incidents, approximately 40 percent of the incidents occurred in Hamilton County—the highest number in the OKI region. Furthermore, highways represented the largest number of HAZMAT incidents of cargo while in transit.

Table 6-6: OKI Region HAZMAT Incidents by County and Mode of Transportation (2000-2010)

	Boone	Butler	Dearborn	Hamilton	Kenton	Grand Total	Breakdown of Incidents by Mode
Air	3				4	7	9%
Highway	15	3	3	29	17	67	83%
Rail		1	1	3	2	7	9%
OKI Region Totals	18	4	4	32	23	81	
Breakdown of HAZMAT Incidents by County	22%	5%	5%	40%	28%		

Source: USDOT's Office of Hazardous Materials Safety, the Incidents Reports Database

Again, the high proportion of HAZMAT incidents on Hamilton County highways reflects the large population and concentration of traffic where key interstate highways and state highway corridors converge, increasing the accident rates in this locality. Of the 81 incidents, three of them occurred in a HAZMAT release, and gas dispersion was the common occurrence. There were no fatalities reported and only one HAZMAT related injury.

6.8 Homeland Security

Transportation assets are vital to the region's economic well being, but since September 11, 2001, they are also seen as targets for terrorist attack. In addition to the potential loss of life from terrorist attack, incapacitating strategic infrastructure could be a way for terrorists to disrupt the U.S. economy for a period of months or years.

Natural disasters like Hurricane Katrina have also exposed the vulnerability of infrastructure and the disruption possible if major human or natural catastrophes destroy parts of the transportation system. For this reason, the discussion of homeland security for OKI includes both human and natural calamity.

The U.S. Department of Homeland Security coordinates emergency preparedness and response. Of relevance to the OKI freight plan, the U.S. Department of Homeland Security developed a National Infrastructure Protection Plan (NIPP) which integrates several programs underway to protect the nation's infrastructure. The NIPP includes 17 sector-specific plans (one of which is transportation) that manage, mitigate and minimize risk factors. According to the report, the Transportation Systems Sector-Specific Plan's strategic approach was developed and based on the tenets outlined in the NIPP and the principles of Executive Order 13416, Strengthening Surface Transportation Security. The Transportation Systems Sector-Specific Plan describes the security framework that will enable sector stakeholders to make effective and appropriate risk-based security and resource

allocation decisions.³⁶ The program is meant to identify assets that are vulnerable to hazards caused by both security breaches and natural disasters, as well as assess the risks and develop countermeasures around those risks.

6.9 OKI Area Critical Infrastructure

The OKI region contains critical transportation infrastructure, any disruption of which could severely impact the flow of freight, economic activity, and the quality of life in the area. A brief description of these assets is included in the following sections.

6.9.1 Highway/Trucking

The tri-state, OKI region consists of almost two million people. Their livelihood, and the economy of the region, greatly depends on the highway system. With the natural barrier of the Ohio River, highway bridges are a critical element of the region and a key consideration of disaster preparedness. The population and economy of the region depends on seven bridges:

1. I-275 western Ohio River Crossing (Carroll C. Cropper Bridge)
2. I-71/75 (Brent Spence Bridge)
3. US 42 (Clay Wade Bailey Bridge)
4. John A. Roebling Suspension Bridge
5. US 27 (Central Bridge) Taylor Southgate Bridge
6. I-471 (Daniel Carter Beard Bridge)
7. I-275 eastern Ohio River Crossing (Combs-Hehl Bridge)

6.9.2 Railroads

The main railroad lines through the Mill Creek Valley form the spine of the region's rail system. CSX operates more than 70 trains per day through the area and NS operates as many as 30 trains per day. Any major disruption to these lines, such as through natural or human causes, would result in rerouting trains around the region with significant impacts to congestion on other rail lines, shipment time, and delays. It could also result in a temporary mode shift, exacerbating truck congestion in the region.

The NS and CSX railroads have bridges crossing the Ohio River south of Cincinnati and these structures represent a safety/security risk with a profile similar to the Ohio River Highway Bridges.

6.9.3 Pipeline

Because of their strategic importance and the amount of hazardous or explosive materials they carry, there is little public information available on the location of pipelines in the region. Emergency management agencies have access to more in-depth information on pipelines, which they use for emergency preparedness planning and response.

³⁶ Source: <http://www.dhs.gov/xlibrary/assets/nipp-ssp-transportation.pdf>

6.10 OKI Security and Emergency Management Agencies

There are three levels of emergency response in the OKI region: local fire and police agencies, which have the resources and equipment to manage most natural and human disasters; county emergency management agencies, which plan and coordinate major response activities; and state emergency management agencies, which can coordinate emergency response staff and equipment from a deeper resource pool.

For the vast majority of security and emergency cases, local police and fire agencies are equipped to handle incidents, including HAZMAT releases or major infrastructure failures. Where there is an uncommon release of material, agencies have “mutual aid” agreements to share technical resources if a certain agency lacks capacity or expertise. Similarly, larger emergency incidents—such as extraordinary fires, materials spills, or infrastructure failures—can draw on the combined human and equipment resources of multiple jurisdictions across a region.

County emergency management agencies play a key role in emergency planning and coordination. Planning includes inventorying resources that might be deployed in the event of a disaster, planning for infrastructure disruptions, identifying temporary housing resources for displaced people and conducting mock disaster exercises with local response agencies.

Regional Emergency Mapping System

OKI, in cooperation with regional partners, successfully developed and used a cutting-edge emergency management system known as the Regional Emergency Operation Center, OKI, Geographic Information System, Regional Emergency Mapping System (ROGREMS). This system incorporates critical infrastructure layers, live data feeds, and analytic capabilities into an Internet-based common operating picture, allowing emergency responders from across the Greater Cincinnati region to identify significant infrastructure and key resources.

ROGREMS provides a common operating picture to achieve situational awareness and a series of tools to prepare for, respond to, or recover from a large-scale emergency. ROGREMS can help identify local resources such as the closest fire stations and urgent care centers. It can gather intelligence about a particular emergency via an integrated Twitter search function. Also, ROGREMS can view live feeds around emergency scenes, which are helpful in determining evacuation capacities and routes.

This system is utilized by first responder disciplines defined by the Department of Homeland Security including Fire, EMS, Hazardous Materials, Law Enforcement, Public Health, Government, Hospitals, Public Works, Emergency Management, Communications, Volunteers/Public (such as Red Cross or Salvation Army) and Private Industry Partners.

ROGREMS incorporates the aforementioned emergency response tools and technologies into a single Web-based interface, which ensures that all stakeholders are “reading from the same script” and facilitates a common operating picture for all users. ROGREMS provides a progressive solution to traditional pen and paper systems, which allows emergency personnel to define incidents spatially and visualize response assets.

The system covers a 12-county, three-state region, encompassing southwest Ohio, southeast Indiana, and northern Kentucky. OKI's project partner, the Hamilton County Emergency Management Agency (HCEMA) worked on behalf of emergency management agencies from across the region.