

## Bella Vista Bypass Safety Analysis

### Introduction

A safety analysis was conducted for the Highway 71 corridor between Highway 71B interchange south of the City of Bella Vista and Highway H south of Pineville (study area). The analysis considered crashes occurring in years 2006 and 2007, and examined crashes by severity, and crashes by type of impact. Additional crash data analysis for earlier years can be found in the Final Environmental Impact Statement completed in 2000.

In 2006, there were 93 crashes in Arkansas, and 65 crashes in Missouri. In 2007, the Arkansas portion of the study area had 100 crashes, with 77 crashes in Missouri. This is an average number of crashes of 168 crashes per year within the entire corridor.

### Crash Rates

Arkansas study area crash rates for the existing corridor were 1.27 crashes per million vehicle miles (MVM) in 2006, and 1.23 crashes per MVM in 2007. Comparatively, the statewide average crash rates were 2.37 and 2.50 for years 2006 and 2007, respectively, for similar facility types. Crash rates for the existing corridor in Missouri were 1.25 crashes per MVM and 1.49 crashes per MVM for 2006 and 2007, respectively. The statewide average crash rate in Missouri for similar type facilities was 1.53 crashes per MVM in 2007.

### Severity of Crashes

Table S-1 displays the number and severity of crashes that have occurred along existing Highway 71 within the study area. Over the two-year study period, there were a total of 7 crashes that resulted in 7 fatalities, 134 crashes that resulted in 317 people injured, and 194 crashes that resulted in property damage only.

**Table S-1: Crash Data by Severity**

	Arkansas		Missouri		TOTAL	
	2006 Crashes	2007 Crashes	2006 Crashes	2007 Crashes	2006 Crashes	2007 Crashes
<b>Fatality</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>3</b>
<b>Injury</b>	<b>47</b>	<b>39</b>	<b>21</b>	<b>27</b>	<b>68</b>	<b>66</b>
<i>Number Injured</i>	<i>108</i>	<i>68</i>	<i>89</i>	<i>52</i>	<i>197</i>	<i>120</i>
<b>Property Damage Only</b>	<b>44</b>	<b>61</b>	<b>42</b>	<b>47</b>	<b>86</b>	<b>108</b>
<b>TOTAL</b>	<b>93</b>	<b>100</b>	<b>65</b>	<b>77</b>	<b>158</b>	<b>177</b>

### Crashes by Type of Impact

Table S-2 below shows crash data summarized by type of impact for Highway 71 between the Highway 71/71B interchange south of Bella Vista and the Missouri State Line for the two-year study period (Arkansas portion of the study area). Similar trends could be expected for the Missouri portion of Highway 71 study area.

**Table S-2  
Crash Data by Type of Impact  
Highway 71 in Arkansas**

<b>Crashes by Type of Impact</b>	<b>2006</b>	<b>2007</b>	<b>Total</b>	<b><i>Percent Total</i></b>
Rear End	42	56	<b>98</b>	<i>51%</i>
Angle	28	21	<b>49</b>	<i>25%</i>
Single Vehicle	10	14	<b>24</b>	<i>12%</i>
Sideswipe	10	7	<b>17</b>	<i>9%</i>
Head On	3	2	<b>5</b>	<i>3%</i>
<b>Total</b>	<b>93</b>	<b>100</b>	<b>193</b>	<i>100%</i>

In the two-year study period, 76 percent of the crashes on Highway 71 were comprised of Rear End and Angle type collisions. There were 98 Rear End collisions and 49 Angle collisions. These types of crashes typically occur in congested, stop-and-go driving conditions near signalized and unsignalized intersections.

#### **Driver Expectation**

Drivers entering the area on Highway 71 from both the north and south arrive in Bella Vista from Interstate-type facilities. However, on Highway 71, from Highway 71B south of Bella Vista to south of Pineville, drivers encounter nine traffic signals, many cross-streets, and numerous driveways. These at-grade intersections introduce potential conflict points for vehicles as traffic enters and exits the highway from and to side streets. Long distance travelers typically arrive in the area from faster Interstate-type facilities, while local motorists are accessing Highway 71 for relatively short trips with origins or destinations along Highway 71. Thus, speed differentials are also a concern for driver safety, as local motorists may drive slower speeds after entering and before exiting the highway and long distance travelers may expect to drive speeds similar to Interstate-type facilities.

With construction of the proposed Bypass, traffic on the Bypass would enter and exit the main lanes via ramps, and would have the opportunity to travel at Interstate-type speeds. Trips through the area would have the opportunity to avoid existing Highway 71. Existing Highway 71 would benefit by reduced traffic volumes that would use the alternate Bypass route.

#### **Benefit Cost Analysis for Value of Safety Improvements**

In order to evaluate safety aspects of alternatives that include improving a highway cross-section on equal terms of benefits and costs, the FHWA has assigned statistical values to crashes. While no price can be placed on a life, the estimated financial impact to society related to the crashes within the project study area equates to a cost of \$26.5 million in 2006 and \$19.6 million in 2007, with an average of \$23.1 million annually.

## Safety Analysis

A comparison of the annual crash rates for different types of roadway facilities illustrates the improvement in safety that would be provided by the Bypass. In 2007, the average crash rate on a four-lane divided facility similar to Highway 71 through Bella Vista was 2.50 crashes per MVM traveled. By diverting through traffic to the Bypass, those vehicles and drivers would travel on a facility of type that typically averages 0.37 crashes per MVM statewide. Safety along the existing alignment would also improve as less traffic would be traveling on that facility.

As traffic volumes increase over time, it would be expected that crash rates on the existing Highway 71 would have a tendency to be more aligned with the statewide average if no improvements were made in the roadway network. The facility types to which these statistics (2.50 crashes per MVM) apply are typically routes designed to carry both high volumes of through traffic and to provide land access for local traffic. The Bypass would potentially change the proportion of traffic on the existing route to more local drivers familiar with the area and fewer commercial vehicles, thus roadway safety would be expected to improve.

Crash rates on the Bypass would be expected to be about 0.37 crashes per MVM based upon statewide average crash rates for Interstate-type facilities. Interstate-type facilities are proven to enhance safety and reduce the possibility of crashes when compared to congested multi-lane arterials with frequent at-grade intersections. Construction of the proposed Bypass would allow separate facilities for the locally-oriented road user from the long-distance traveler. This is expected to reduce crashes within the roadway network to 60% of expected future rates of the existing Highway 71 if nothing were done. The result would be safer driving conditions due to more similar travel characteristics and less congestion along the existing route.

After the Bypass is in place, the rate of increase in traffic along existing Highway 71 would slow. Long distance trips and trucks traveling through the area would have the opportunity to divert to the Bypass, which serves to reduce congestion and improve safety for existing Highway 71. The attractiveness of using the Bypass would increase in the future as traffic in the region increases. The improved Bypass facility would provide a safer route with a high level of service, thus improving safety in the region.

In addition to providing the opportunity for more efficient travel on the Bypass, and along the Highway 71 corridor, the Bypass would improve safety conditions for drivers within the existing corridor. By separating through traffic and local traffic, the potential for crashes would be reduced. By reducing the volume of heavy trucks through Bella Vista, the existing route would become more attractive to other transportation users such as pedestrians and bicyclists. Finally, by removing the majority of the heavy trucks from the downtown Bella Vista area, drivers, cyclists, and pedestrians would feel more comfortable in their travels on foot and on the road. Many large, slow to accelerate, high emission vehicles would also be removed from the local roadway.