Safety and Roadway Geometric Deficiencies

As identified in the Key Issues section above, safety is an important aspect of the transportation system. A closer examination of the accident data presented earlier in Table 10 was performed to endeavor to recognize trends in the data. It was expected that higher accident rates on county roads would be shown because of their narrower more winding nature. Table 18 is a summary of the accident rates on both county and state roadways. The state wide average accident rate for rural state highway collectors is 1.63 per million vehicle miles of travel. It is important to note that on low volume roadways the accident rate can vary substantially from year to year with even a small change in the number of accidents. For example, some roadways that are short in length have a very small amount of vehicle miles of travel and with a single accident they can have accident rates over 100/million vehicle miles of travel. Likewise, safety improvements to a corridor may not demonstrate significant improvement until a longer period of time can be evaluated.

Table 18. Palouse Accident Rates Summary

County Roads					Total
	Asotin	Columbia	Garfield	Whitman	
Total Miles	400.2	503.39	447.1	1908.6	3259.29
Total MVMT	148.78	56.86	70.62	234.04	510.3
Total Accidents (2006 - 2008)	162	69	29	296	556
Accidents / MVMT	1.09	1.21	0.41	1.26	1.09

State Roads					Total
	Asotin	Columbia	Garfield	Whitman	
Total Miles	55.38	44.04	43.18	278.35	420.95
Total MVMT	115.27	94.4487	84.2985	723.1083	1017.13
Total Accidents (2006 - 2008)	211	131	107	1122	1571
Accidents / MVMT	1.83	1.39	1.27	1.55	1.54

Note: Whitman County city road mileage and accidents also include Washington State University.

The hypothesis of higher accident rates on county roads is not evident in the data. However, it is interesting to note that of the 556 accidents on county roads that 440 (79%) of them are single vehicle accidents, while of the 1571 accidents on state highways there were 843 (54%) that were single vehicle accidents. In urban areas most accidents involve multiple vehicles due to the unpredictability of moving objects. In rural areas where less traffic is present it would seem that accident rates would be lower, which they are, however the statistics described above with respect to the percentage of single vehicle accidents would tend to indicate that there is a significant difference between the characteristics of county roads when compared with state highways. Even though some of the state highways in the region are not built to state highway standards, they generally have shoulders and wider lanes. This would indicate that in rural areas there is a much higher correlation between accidents and road design than there is with traffic volumes. Because of the topography of the region, many of the roadways have frequent horizontal and vertical alignment changes as they bend around the

hills and follow rivers and streams through the valleys. Initial construction of these roadways was achieved without many cuts and fills to straighten alignments and improve sight distances. Also, travel lanes are often narrow and shoulders are sometimes non-existent, very narrow or in disrepair. Several intersections in the region have poor sight distances and adverse approach angles making it difficult for trucks to turn onto main highways safely.

Many accidents on rural highways could be preventable if roadways were built to current standards. If there is no shoulder along a roadway there is very little margin for error. Additional roadway width would allow drivers more time to take corrective measures. Table 19 identifies the current roadway design standard for the Palouse region and compares each county's current road dimensions in order to determine the amount of deficient roads. As a result it was identified that most low volume county roads are graveled. Therefore they have a relatively high deficiency rating. Other deficiencies noted were based on roadway width and surface type. Table 20 identifies how many paved road miles are deficient in shoulder width and what the cost would be to improve the shoulders to the current standard. In conclusion, improvements made to the current deficient roads could assist in decreasing the number of accidents within the region.

Table 19. Regional Roadway Design Standards

	Rural					Urban		
	Arterial	Major Col.	Minor Col.	Local	Low Vol.	Arterial	Collector	Local
Number Lanes								
Low	2	2	2	2	2	2	2	2
High	2	2	2	2	2	4	2	2
Lane Width								
Low	11	12	11	11	10	11	11	11
High	12	12	12	12	11	12	12	12
Center Lane Width								
Low	0	0	0	0	0	12	12	12
High	0	0	0	0	0	14	14	14
Shoulder Width								
Low	3	2	1	1	2	6	4	2
High	8	6	6	4	2	8	6	4
Roadway Width								
Low	28	28	24	24	24	46	42	38
High	40	36	36	32	26	78	50	46

Table 20. County Roadway Design Standard and Deficiencies

Low Range of Standard

Performance Measure	Asotin			Columbia		
	Miles Deficient	Total Miles	% Deficient	Miles Deficient	Total Miles	% Deficient
Paved Roads						
Rural Arterial	-	-	-	-	-	-
Rural Major Collector	43.60	72.20	60%	99.74	106.36	94%
Rural Minor Collector	1.89	7.11	27%	17.32	34.91	50%
Rural Local	-	-	-	-	-	-
Rural Low Volume	1.62	5.43	30%	4.16	5.43	77%
Urban Arterial	10.50	14.61	72%	-	-	-
Urban Collector	6.17	6.43	96%	-	-	-
Urban Local	57.55	60.30	95%	-	-	-
Total Paved Roads	**121.33**	**166.08**	**73%**	**121.22**	**146.69**	**83%**
Unpaved Totals	211.01	234.13	90%	333.26	356.65	93%
TOTAL	**332.34**	**400.21**	**83%**	**454.48**	**503.34**	**90%**

Low Range of Standard

Performance Measure	Garfield			Whitman		
	Miles Deficient	Total Miles	% Deficient	Miles Deficient	Total Miles	% Deficient
Paved Roads						
Rural Arterial	-	-	-	-	-	-
Rural Major Collector	74.05	113.18	65%	165.22	271.35	61%
Rural Minor Collector	1.43	14.33	10%	45.32	147.98	31%
Rural Local	-	-	-	0.07	2.71	3%
Rural Low Volume	2.91	5.25	55%	10.55	15.40	68%
Urban Arterial	-	-	-	-	-	-
Urban Collector	-	-	-	-	-	-
Urban Local	-	-	-	-	-	-
Total Paved Roads	**78.39**	**132.75**	**59%**	**221.15**	**437.45**	**51%**
Unpaved Totals	277.29	314.35	88%	1269.65	1471.17	86%
TOTAL	**355.68**	**447.10**	**80%**	**1490.81**	**1908.61**	**78%**

Table 21. Shoulder Improvement Costs

Low Range	Paved County Roads					
	Asotin			Columbia		
Deficient Width	Miles Deficient	Cost/0.10 Mile	Total Cost	Miles Deficient	Cost/0.10 Mile	Total Cost
2	35.355	$ 19,000	$ 6,717,000	3.45	$ 19,000	$ 655,000
4	26.744	$ 25,000	$ 6,686,000	42.90	$ 25,000	$ 10,724,000
6	7.95	$ 32,000	$ 2,544,000	35.36	$ 32,000	$ 11,315,000
8	12.264	$ 39,000	$ 4,783,000	39.13	$ 39,000	$ 15,262,000
10	4.962	$ 45,000	$ 2,233,000	0.16	$ 45,000	$ 72,000
12	11.65	$ 52,000	$ 6,058,000	0.22	$ 52,000	$ 116,000
14	8.718	$ 58,000	$ 5,056,000	0.00	$ 58,000	$ -
16	2.916	$ 65,000	$ 1,895,000	0.00	$ 65,000	$ -
18	4.705	$ 71,000	$ 3,341,000	0.00	$ 71,000	$ -
20	3.878	$ 78,000	$ 3,025,000	0.00	$ 78,000	$ -
22	0.426	$ 85,000	$ 362,000	0.00	$ 85,000	$ -
24	0.61	$ 91,000	$ 555,000	0.00	$ 91,000	$ -
26	1.149	$ 98,000	$ 1,126,000	0.00	$ 98,000	$ -
Grand Total	**121.33**		**$ 44,381,000**	**121.22**		**$ 38,144,000**

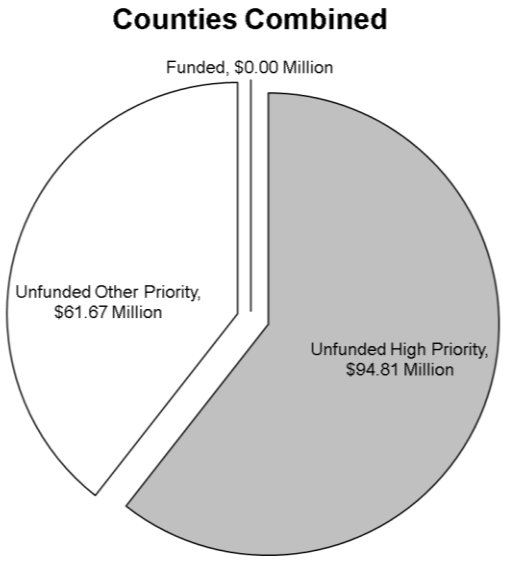
Low Range	Paved County Roads					
	Garfield			Whitman		
Deficient Width	Miles Deficient	Cost/0.10 Mile	Total Cost	Miles Deficient	Cost/0.10 Mile	Total Cost
2	36.90	$ 19,000	$ 7,010,000	74.96	$ 19,000	$ 14,243,000
4	31.89	$ 25,000	$ 7,972,000	99.34	$ 25,000	$ 24,834,000
6	8.69	$ 32,000	$ 2,781,000	34.62	$ 32,000	$ 11,080,000
8	0.45	$ 39,000	$ 176,000	11.54	$ 39,000	$ 4,501,000
10	0.46	$ 45,000	$ 207,000	0.40	$ 45,000	$ 180,000
12	0.00	$ 52,000	$ -	0.00	$ 52,000	$ -
14	0.00	$ 58,000	$ -	0.00	$ 58,000	$ -
16	0.00	$ 65,000	$ -	0.29	$ 65,000	$ 189,000
18	0.00	$ 71,000	$ -	0.00	$ 71,000	$ -
20	0.00	$ 78,000	$ -	0.00	$ 78,000	$ -
22	0.00	$ 85,000	$ -	0.00	$ 85,000	$ -
24	0.00	$ 91,000	$ -	0.00	$ 91,000	$ -
26	0.00	$ 98,000	$ -	0.00	$ 98,000	$ -
Grand Total	**78.39**		**$ 18,146,000**	**221.15**		**$ 55,027,000**

More detailed examination was undertaken of accident data secured as part of this RTP update. County roadways with a higher accident rate than the county wide average accident rate were identified. Lists of these corridors in each county are included in Appendix F. Figure 6 identifies the 20 year funding minimum needs for safety improvements within the Palouse region. The Palouse region needs $156.48 million dollars to improve the roadway safety for the county roads. As shown in the Figure, three separate improvement priorities are identified based on the accident rates for the roadways. Unfunded High Priority projects are those roadways which had an accident rate higher than the county average, while the unfunded other priority projects are those which require shoulder improvements.

The Unfunded High Priority projects include implementing low cost improvements such as signage, rumble strips and other safety devices to help increase driver awareness and safety. For the purposes of this study an estimate of $2,000 per mile was used. Shoulder improvements include those listed above in Table 21 which would widen the shoulders of the existing deficient roadways to meet the regions current design standards. For the purposes of this study, shoulder improvements for roadways with an above average accident rate were identified as a High Priority project.

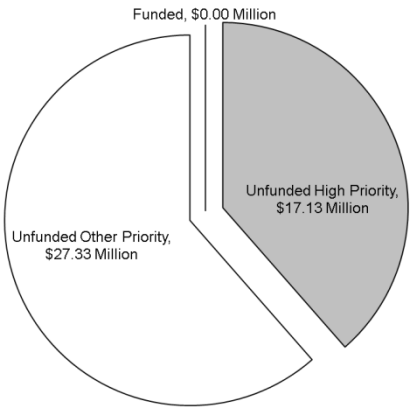
Of the safety projects, $94.81 million is needed for High Priority areas while an additional $61.67 million is needed to improve Other Priority areas. This compares to the Unfunded High Priority of $200 million identified in the WTP (pg. 73) to improve rural two-lane county roads by implementing low-cost safety improvements.

Figure 6. Safety Improvement Costs

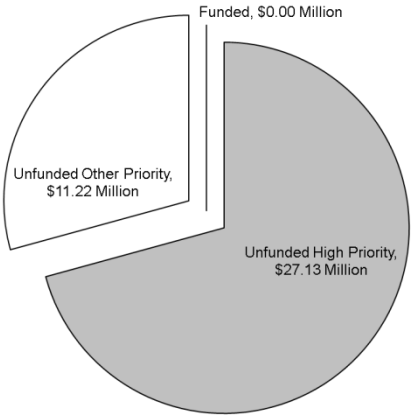


All Counties Combined
($ in Millions)

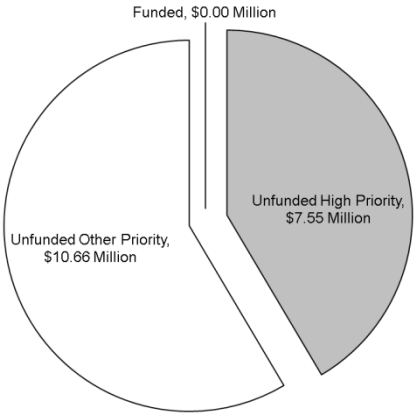
Asotin County



Columbia County



Garfield County



Whitman County