2017 OREGON INTERSTATE HIGHWAY SPEED LIMIT
ENGINEERING INVESTIGATION
June 1, 2017

EXECUTIVE SUMMARY

Introduction

The Oregon Interstate Highway System consists of approximately 730 centerline miles of interstates. In response to a possible legislation to raise truck speeds to 60 mph in Oregon, the Oregon Department of Transportation analyzed the segments of interstate system where the speeds of vehicles were currently posted 65 mph for cars and 55 mph for trucks to determine if truck speeds should be increased (about 330 miles). The investigated segments were on I-5 (south of Portland), I-205 (from the junction of I-5 to West Linn) and on I-84 (from Troutdale to The Dalles).

The investigations were completed in the spring of 2017. The segments were divided into 16 separate study sections (these do not include segments of interstate where the speeds were previously lowered for other reasons, i.e., Myrtle Creek Curves). The data are tabulated and displayed in the individual investigation reports for each study section. Data collected and compiled included all elements required by OAR 734-020-0010. A summary of the engineering investigation data is displayed in a table below.

Crash data was compiled for all study sections and compared against the statewide averages for interstate highways. Speed data was collected and summarized for each section. Other data such as roadway characteristics, traffic volumes, restrictions, congestion levels, emergency medical response times, and adverse weather conditions is also included.

The investigations indicate that in the areas where the speed is currently set at 65 miles per hour (mph) for cars and 55 mph for trucks the posted speed limits on Oregon's interstate highways could be reasonably set at 60 mph for trucks.

Recommendations

The State Traffic-Roadway Engineer recommends a 60 mph truck speed in all of the investigated segments (those segments that are currently 65 mph for autos and 55 mph for trucks) except through the Roseburg urban area.

ODOT recommends that consideration be given to lowering auto speeds through the Roseburg city limits to 60 mph for autos and keep the 55 mph for trucks (similar to other urban areas on I-5).

Reasons for Recommendations:

The speed data compiled as part of this investigation indicates that the trucks are currently traveling at an average speed near 60 mph (58 to 62 mph) mph on the investigated segments of interstate in Oregon, 85th percentile speeds are nearer to 64 mph (62 to 65 mph).

Although Oregon's crash history on interstate highways have consistently remained lower than the national averages, the number of crashes on the interstates have increased over the past decade (comparing 2001-2003 crash data to 2012-2014 crash data). During that same time period truck crashes have not increased, remaining about the same over the period. In addition truck-at-fault crashes are under-represented in truck involved crashes, i.e., passenger vehicles are more often at fault for the crashes involving trucks.

Traffic volumes show only a slight increase, but actually the volumes decreased during the recession and now have risen again until they slightly exceed where they were a decade ago.

The Roseburg area of I-5 showed increased levels of crashes, especially fatal and serious injury crashes. Interchanges through this area are closely spaced for an urban area and local area traffic often uses the interstate to get around Roseburg. The traffic volumes are approaching the levels that three lanes may be needed within the next 20 years (more study would be needed to determine the exact nature of improvements needed).

Two possibilities exist for creating a reduced speed through the Roseburg urban area. First a speed reduction that extends approximately city limit to city limit (about 4.5 miles). Second a little longer speed reduction that would extend from approximately the northern city limit through the interchange with OR 42 to the south (about 7.5 miles).

Both segments have about the same crash rates and fatal and serious injury rates, only the shorter segment has higher volumes, more built environment, an auxiliary lane with weaving and an urban feel. ODOT is recommending the shorter option covering the area within the city limits as it seems the more reasonable option.

Additional information regarding non-engineering issues is presented in the Issues Report being prepared separately. A separate summary of public comments is included also.

Discussion

The most common metric used in the United States to establish posted speeds is the 85th percentile speed. The "85th percentile speed" is the speed at or below which 85% of vehicles are traveling. Or said another way, the fastest 15% of vehicles are exceeding the 85th percentile speed. Numerous studies have found that establishing speed limits at a point between the average speeds and the 85th percentile speeds has resulted in the lowest crash rates[1].

The differences in measured travel speeds between autos and trucks are not as great as the posted speed difference of 10 mph. The speed data indicates that the difference between average speeds of autos and trucks is about 2-3 mph. The difference between 85th percentile speeds is about 4-5 mph. The recommended increase to truck posted speeds (60 mph) would more closely represent the speeds trucks are actually traveling i.e., the reasonable speed as determined by the drivers. This may reduce speed variance between all vehicles which may further reduce conflicts and crashes.

It is fairly well established that increasing speeds leads to increasing crashes, the magnitude of the increase is most dependent on segment specific geometric and traffic characteristics. Access controlled facilities like interstates have lower crash rates and less impact from speed increases (see the Issues Report for more comparison of research and further discussion of findings).

Raising posted speeds encourages vehicles to travel faster and may result in more crashes. Setting the speeds closer to the desired speed of travel will reduce travel speed variance between vehicles and may result in fewer crashes. The implication is that raising the speed and reducing the speed variance may offset each other to some extent depending on the extent of speed increases and the variance of speeds between vehicles.

A posted speed increase in truck speeds may not result in much actual increase in truck travel speeds, unlike a similar raise in passenger car speeds. Truck drivers might be more cautious than non-commercial drivers because of the risk of losing their driving privileges if they get citations. Some trucks are limited by speed governors and some drivers want to save on fuel. Also if they exceed the speed limit they will be passing cars and be more conspicuous to enforcement.

Law enforcement can also serve to reduce speed variance between vehicles and keep the higher speeds down (those speeds above the 85th percentile). The Speed Zone Review Panel heard several concerns over tolerance of higher speeds on

[1] See Transportation Research Board (TRB) Special Report 254, "Managing Speed – Review of Current Practice for Setting and Enforcing Speed Limits", 1998, for discussion of Engineering Study Method of setting speeds (beginning on p.90). In particular see footnote #11 on p.93

Interstates. Oregon has one of the lowest per capita ratios of enforcement to population in the nation making enforcement of speeds more challenging.

Setting speeds nearer to the 85th percentile speed makes more sense to drivers (i.e., the posted speeds are not unrealistically low or high). The measured traveling speeds indicate that if enforcement maintains a 5 mph tolerance, they would only be ticketing those exceeding the 85th percentile speed. Those vehicles traveling over the 85th percentile typically have a greater risk of a crash.

Other Portions of Interstate Speeds

ODOT looked in greater detail at some other portions of the Interstate:

- The Roseburg area has travel speeds and total crashes that are similar to other portions of the interstate, but the fatal and serious injury crash rates are higher than usual. Drivers will more readily accept a lower travel speed in an urban area interstate than in a rural area and drivers will more likely reduce travel speeds due to the presence of the urban area, higher density of traffic exiting and entering the interstate and the added reinforcement of the reduced posted speed. A lower posted auto speed (and retaining the truck speed at 55 mph) seems reasonable.

- The Wilsonville urban area has been looked at in the past for speed reductions. The crash rates are lower than other similar segments and the speeds throughout the area do not seem to support any difference in posted speed. The same 60 mph truck speed as other areas of the interstate seems reasonable.

- The area between Hood River and The Dalles has two investigated segments that seem to have an elevated crash rates. Upon closer examination the higher rates are due to an usually high number of winter weather crashes in 2014 that seems to be unconnected to the posted speeds. The same 60 mph truck speed as other areas of the interstate seems reasonable.

Other Considerations for the Interstate

The Interstates have undergone some improvements over the past decade. ODOT has adopted a policy that all medians less than 100 feet of width shall have a median barrier to protect against cross-over crashes, many of the medians have already been closed although there are still some in the design process.

On I-5 near the junction of I-205 and on I-205 near the junction of I-5 auxiliary lanes have been built in order to improve flow and safety within the segments. Other

improvements include planning and implementation of climbing lanes on I-5 to the north of Grants Pass in 2018.

Interchanges are areas where vehicles exit and enter the interstate, these areas often display a higher than average number of conflicts. A number of interchanges within the investigated segments have been rebuilt and modernized during the past decade. The design elements were improved, acceleration and deceleration lengths and horizontal and vertical geometry were brought to current standards resulting in improved operations for all vehicles.

TABLE 1

Summary of Interstate Speed Engineering Investigation

Route	Location Description	File No.	Direction	Begin MP	End MP	85% Speed MPH (cars)	Average Speed MPH (cars)	85% Speed MPH (trucks)	Average Speed MPH (trucks)	2015 Total Volume	Percent Trucks	Peak Congestion Level	Enforcement Level*	Total Crashes All Vehicles	Crash Rate all Vehicles 1/	"Statewide" Average Crash Rate 1/	Total Fatal & Serious Injury (F+A) Crashes All Vehicles	Crash Rate Fatal & Serious Injury (F+A) Crashes All Vehicles 2/	"Statewide" Average Crash Rate Fatal & Serious Injury (F+A) Crashes 2/	Total Crashes (Trucks)	% of Total Truck Crashes	Truck at Fault Crashes	Existing Speed (Cars)	Existing Speed (Trucks)	Recommended Speed (Trucks)
I-5	Ashland-Medford	I5_2		10.08	27	67	60	62	58	29,700	23%	5	1-2	111	*0.22*	*0.39*	9	*1.77*	*1.36*	17	15%	7	65 MPH	55 MPH	60 MPH
	Medford- Myrtle Creek Curves	I5_4	NB	30.85	107.83	68	61	63	59	13,200	26%	5	1-2	299	*0.30*	*0.33*	15	*1.48*	*1.24*	63	21%	33	65 MPH	55 MPH	60 MPH
	Medford - Grants Pass - Smith Hill Summit	I5_5	SB	30.85	73.18	69	62	64	59	15,204	22%	5	2	206	*0.32*	*0.33*	12	*1.89*	*1.24*	34	17%	16	65 MPH	55 MPH	60 MPH
	Smith Hill Summit - Myrtle Creek Curves	I5_7	SB	73.95	107.86	68	60	63	59	11,200	31%	2	1-2	114	*0.33*	*0.33*	8	*2.33*	*1.24*	25	22%	14	65 MPH	55 MPH	60 MPH
	Myrtle Creek Curves - South Roseburg	I5_8		108.85	117	68	60	62	58	27,500	29%	2	1-2	73	*0.30*	*0.33*	4	*1.62*	*1.24*	24	33%	11	65 MPH	55 MPH	60 MPH
	South Roseburg	I5_9		117	122.64	70	63	64	60	34,700	29%	6	1-2	57	*0.27*	*0.39*	6	*2.80*	*1.36*	8	14%	2	65 MPH	55 MPH	60 MPH
	Roseburg	I5_10		122.64	127	69	62	64	60	40,600	29%	7	1-2	75	*0.39*	*0.39*	5	*2.61*	*1.36*	14	19%	6	65 MPH	55 MPH	60 MPH
	Roseburg - Eugene	I5_11		127	190.41	69	62	65	60	28,500	32%	8	1-2	522	*0.29*	*0.33*	30	*1.69*	*1.24*	104	20%	33	65 MPH	55 MPH	60 MPH
	Eugene - Coburg	I5_13		196	202	69	63	64	60	41,700	24%	6	1-2	62	*0.24*	*0.39*	0	*0.00*	*1.36*	9	15%	2	65 MPH	55 MPH	60 MPH
	Coburg - South Salem	I5_14		202	251	70	63	65	61	49,800	24%	9	1	597	*0.24*	*0.33*	16	*0.65*	*1.24*	91	15%	35	65 MPH	55 MPH	60 MPH
	Salem - Tualatin	I5_17	NB	260.85	288.6	69	62	65	60	48,600	17%	9	1	406	*0.29*	*0.33*	11	*0.78*	*1.24*	35	9%	13	65 MPH	55 MPH	60 MPH
	Salem - Tualatin	I5_18	SB	259.86	288.6	69	61	65	59	48,200	17%	9	1	372	*0.26*	*0.33*	11	*0.77*	*1.24*	35	9%	17	65 MPH	55 MPH	60 MPH
I-84	Troutdale - Hood River	I84_3		18.25	63	69	62	66	61	26,500	27%	2	1-2	375	*0.34*	*0.33*	11	*1.01*	*1.24*	80	21%	32	65 MPH	55 MPH	60 MPH
	Hood River - Memaloose Safety Rest Area	I84_4		63	73	68	62	66	61	23,600	30%	2	1	117	*0.48*	*0.33*	1	*0.41*	*1.24*	22	19%	10	65 MPH	55 MPH	60 MPH
	Memaloose Safety Rest Area - The Dalles	I84_5		73	81.75	68	62	66	60	22,400	25%	1	1-2	85	*0.43*	*0.33*	0	*0.00*	*1.24*	21	25%	11	65 MPH	55 MPH	60 MPH
I-205	Tualatin - West Linn	I_205_1		0	6	65	62	62	58	88,700	9%	9	1-2	174	*0.32*	*0.33*	2	*0.37*	*1.24*	16	9%	9	65 MPH	55 MPH	60 MPH

(5/9/2017)

Congestion Level Table

Level	Name	Description
1	Uncongested	No decrease in Speeds during the peak hour.
2	Uncongested to Moderatley	
3	Moderatley Congested	Speed decrease slightly during portions of the peak hour.
4	Moderatley to Congested	
5	Congested	Speed decrease significantly during portions of the peak hour.

Level	Name	Description
6	Congested to Very	
7	Very Congested	Speed decrease substantially for substantial portions of the peak hour.
8	Very to Extremely	
9	Extremely Congested	Speed decrease substantially for more than the peak hour.

*Number of Oregon State Police troopers available 6am - 2am

1/ Per million vehicle miles traveled

2/ Per hundred million vehicle miles traveled