LEWIS COUNTY PUBLIC WORKS
ENGINEERING AND TRAFFIC INVESTIGATION REPORT

REASON FOR INVESTIGATION : Initiated by Traffic Engineer Erik Martin based on citizen concerns for sight distance and safe travel on the roadway.

COUNTY ROAD : Tennessee Road

IN THE MATTER OF : Assessing the appropriate speed limit for travel on Tennessee Road (LC Road # 39000).

FINDINGS :

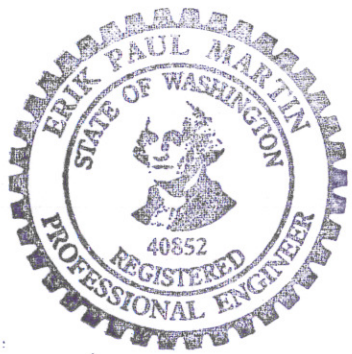
a.) Current Speed Limit : [50]

85% Prevailing Vehicle Speed : [49]

Average Daily Traffic : [240]

b.) Physical Features: Tennessee Road is a thru road with an un-posted 50 MPH speed limit. The road is a 3.115 mile north-south Local Access Road beginning at the City of Winlock City Limits (M.P. 0.169) and terminating at Pleasant Valley Road (M.P. 3.284). The northerly portion of road, from Pleasant Valley to Nelson Road is a strait road, 24-feet in width with rolling terrain. There is one know location (M.P. 2.029) where the road falls below the AASHTO recommendations for vertical curve sight distance. The portion of the road south of Nelson Road continuing to the City Limits of Winlock drops into narrow (20') steepening grade and includes winding curves. In the last 6 years, this road has produced 15 vehicular accidents, one of which being fatal. This number of accidents has put Tennessee Road above the critical accident rate (rate which is above the normal range of crashes per million vehicle miles of travel MVMT) based on Countywide data for this type of roadway.

c.) Remarks / Recommendations: Given the reduced sight distance, adverse road conditions, and the number of accidents, it is my recommendation to lower the speed limit to 40 MPH. US LIMITS, a Federal Highways Administration speed limit determination application, has also been used in evaluation of the road. This methodology also recommends 40 mph as an appropriate speed limit. The vertical curve at M.P. 2.029 with limited sight distance (ref. Table 3-4 in the ASHTO Design Manual) will be posted for an advisory speed of 35 mph.



Erik Paul Martin, PE
Lewis County Maintenance and Traffic Engineer

USLIMITS2

ROAD SECTION IN DEVELOPED AREA

User Name - epmartin
Project Name - Tennessee Speed Study
Project Number - 14-003
State - Washington
County - Lewis County
City - Rural/Other
Route Name - Tennessee Rd
Termini From - Pleasant Valley Rd
Termini To - City Limits
Description - Speed Study based on citizen concerns about sight distance on Tennessee Road due to vertical alignment of the road.

Recommended Speed Limit is: 40 mph

Note: Sections with adverse alignments may need specific 'advisory speed warnings' which may be different from the general speed limit for the section. See Procedures for Setting Advisory Speeds on Curves, Publication No. FHWA-SA-11-22, June 2011, for more guidance.

The crash rate of the section is 556 per 100 MVMT. The average rate for similar sections is 226 per 100 MVMT, and the critical rate is 480 per 100 MVMT. The crash rate of this section is 146% Higher than the average crash rate for similar sections.

The rate of injury crashes for the section is 148 per 100 MVMT. The average rate for similar sections is 101 per 100 MVMT, and the critical rate is 278 per 100 MVMT. The rate of injury crashes for this section is 46% Higher than the average rate for similar sections. A comprehensive crash study should be undertaken to identify engineering and traffic control deficiencies and appropriate corrective actions. The speed limit should only be reduced as a last measure after all other treatments have either been tried or ruled out.

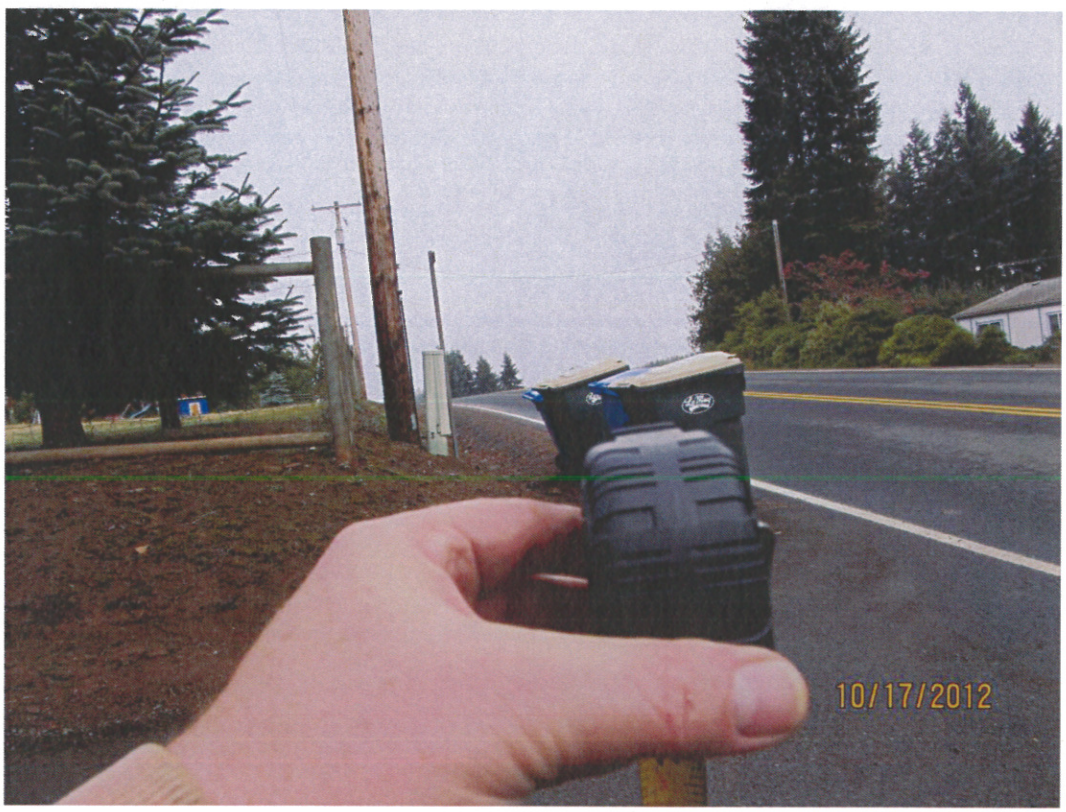
Add Additional Comments

Create Project File More Info

SIGHT DISTANCE REVIEW

Tennessee Road un-posted 50 MPH 10/17/2012

Looking south toward Silver Thistle road. Red arrow notes access, SD = 255'.



Looking north from Silver Thistle Road eye height 3.5' same as target, pole, phone ped impedes line of sight.

Looking south from Silver Thistle Road, SD = 199', brush impedes line of sight.

Lewis County Public Works

A>B: South
B<A: North
MP: 2.210

Site: Tennessee Road
Wednesday, 1/23/2013, 10:27:38 AM -
Friday, 1/25/2013, 2:51:14 PM

Speed Grand Totals
Combined

Hourly Averages

mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200
12:00 AM	2.0	0.0	0.0	0.0	0.5	0.0	0.0	0.5	0.5	0.0	0.0	0.5	0.0	0.0
1:00 AM	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2:00 AM	0.5	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3:00 AM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4:00 AM	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.5	0.0	0.0	0.0
5:00 AM	2.5	0.0	0.0	0.0	0.5	0.0	0.5	0.5	0.0	1.0	0.0	0.0	0.0	0.0
6:00 AM	6.5	0.0	0.0	1.0	0.0	0.0	0.0	1.0	2.5	0.5	0.0	0.5	0.0	1.0
7:00 AM	8.0	0.0	0.0	0.0	0.0	0.0	1.0	2.5	1.5	2.5	0.5	0.0	0.0	0.0
8:00 AM	11.5	0.0	0.0	0.5	0.0	1.0	0.5	1.5	5.0	1.0	1.5	0.0	0.5	0.0
9:00 AM	18.0	0.0	0.5	0.0	0.0	0.0	3.5	3.5	3.0	3.0	4.0	0.0	0.5	0.0
10:00 AM	10.7	1.0	0.0	0.3	0.3	0.0	2.3	1.3	2.3	1.7	0.7	0.3	0.3	0.0
11:00 AM	10.7	0.3	0.7	0.0	0.7	1.7	0.7	2.0	2.3	1.7	0.3	0.3	0.0	0.0
12:00 PM	16.3	0.0	0.0	0.3	0.7	0.3	1.0	3.3	5.0	3.0	0.7	2.0	0.0	0.0
1:00 PM	14.7	0.0	0.0	0.3	0.0	0.7	1.7	3.0	5.7	2.3	1.0	0.0	0.0	0.0
2:00 PM	13.0	0.0	0.0	0.3	0.3	0.0	1.0	4.3	4.3	2.3	0.3	0.0	0.0	0.0
3:00 PM	15.0	0.0	0.0	0.5	1.0	0.5	1.5	3.0	3.0	1.5	3.0	1.0	0.0	0.0
4:00 PM	27.5	0.0	0.0	0.0	0.0	0.5	3.0	5.0	8.0	5.5	3.5	0.5	1.0	0.5
5:00 PM	17.5	0.0	0.0	0.0	0.5	0.5	1.0	2.0	9.0	4.0	0.0	0.5	0.0	0.0
6:00 PM	22.0	0.0	0.0	0.5	2.0	0.5	5.0	8.0	3.5	1.5	1.0	0.0	0.0	0.0
7:00 PM	15.0	0.0	0.0	0.5	0.0	1.0	0.5	5.0	4.5	1.5	1.5	0.5	0.0	0.0
8:00 PM	10.0	0.0	0.0	0.0	0.5	0.5	2.5	1.5	2.5	2.0	0.5	0.0	0.0	0.0
9:00 PM	5.0	0.0	0.0	0.5	0.0	0.0	1.0	1.5	1.0	1.0	0.0	0.0	0.0	0.0
10:00 PM	7.0	0.0	0.0	0.0	0.0	0.0	0.5	3.5	1.5	0.5	1.0	0.0	0.0	0.0
11:00 PM	2.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0
ADT	236.8	1.3	1.2	4.8	7.0	7.2	28.2	54.0	66.7	36.5	20.0	6.2	2.3	1.5

Percentile Speeds	10%	15%	50%	85%	90%
(mph)	35.2	37.6	46.2	53.7	56.1

10 mph Pace Speed 40.3 - 50.3
Number in Pace 283 (52.5 %)

Average 45.5 mph
Minimum 6.4 mph
Maximum 77.0 mph

Speeds Exceeded	45 mph	55 mph	65 mph
	56.2 %	12.2 %	1.5 %
Count	303	66	8

Study Grand Totals

mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200
A>B	279	2	1	6	11	11	36	82	74	38	14	3	1	0
		0.7%	0.4%	2.2%	3.9%	3.9%	12.9%	29.4%	26.5%	13.6%	5.0%	1.1%	0.4%	0.0%
B<A	260	2	2	5	5	6	27	40	79	46	29	12	4	3
		0.8%	0.8%	1.9%	1.9%	2.3%	10.4%	15.4%	30.4%	17.7%	11.2%	4.6%	1.5%	1.2%
Combined	539	4	3	11	16	17	63	122	153	84	43	15	5	3
		0.7%	0.6%	2.0%	3.0%	3.2%	11.7%	22.6%	28.4%	15.6%	8.0%	2.8%	0.9%	0.6%

A<B: North
B<A: South
M.p.: Bridge

Site: Tennessee
Monday, 11/28/2011, 11:02:17 AM -
Friday, 12/02/2011, 11:56:41 AM

Speed Grand Totals
Combined

Hourly Averages

mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200
12:00 AM	2.0	0.0	1.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1:00 AM	3.5	0.3	2.0	1.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2:00 AM	0.5	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3:00 AM	0.5	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4:00 AM	0.8	0.3	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5:00 AM	0.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6:00 AM	2.0	0.3	1.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7:00 AM	7.3	0.3	5.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8:00 AM	9.5	1.5	5.3	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9:00 AM	15.5	2.3	10.8	2.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10:00 AM	10.3	1.5	5.8	2.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11:00 AM	12.0	2.0	7.0	2.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
12:00 PM	11.8	2.3	6.8	2.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1:00 PM	12.8	2.0	9.3	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2:00 PM	14.0	2.0	8.8	3.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3:00 PM	13.5	2.3	8.3	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4:00 PM	21.0	3.0	14.5	3.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5:00 PM	19.5	3.3	12.3	3.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6:00 PM	24.3	2.8	17.5	3.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7:00 PM	15.0	2.0	9.0	3.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8:00 PM	11.5	0.8	6.3	4.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9:00 PM	8.8	1.5	5.0	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10:00 PM	9.5	1.8	4.8	2.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11:00 PM	7.8	1.0	4.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ADT	233.3	33.0	146.0	50.8	3.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Percentile Speeds	10%	15%	50%	85%	90%
(mph)	14.4	15.1	18.0	20.8	21.5

10 mph Pace Speed 12.6 - 22.6
Number in Pace 868 (91.9 %)

Average 18.0 mph
Minimum 7.9 mph
Maximum 30.4 mph

Speeds Exceeded	45 mph	55 mph	65 mph
	0.0 %	0.0 %	0.0 %
Count	0	0	0

Study Grand Totals

mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200
A>B	491	52	299	127	12	1	0	0	0	0	0	0	0	0
		10.6%	60.9%	25.9%	2.4%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
B>A	454	82	292	79	1	0	0	0	0	0	0	0	0	0
		18.1%	64.3%	17.4%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Combined	945	134	591	206	13	1	0	0	0	0	0	0	0	0
		14.2%	62.5%	21.8%	1.4%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

A>B: North
B>A: South
M.p.: 1.616

Site: Tennessee
Monday, 10/11/2010, 9:50:37 AM -
Friday, 10/15/2010, 8:36:55 AM

Speed Grand Totals
Combined

Hourly Averages

mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200
12:00 AM	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.3	0.0	0.0	0.0	0.0
1:00 AM	0.5	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.3	0.0
2:00 AM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3:00 AM	0.8	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0
4:00 AM	3.0	0.0	0.0	0.0	0.0	1.0	0.5	0.8	0.0	0.5	0.3	0.0	0.0	0.0
5:00 AM	8.8	0.0	0.0	0.0	0.8	0.3	1.8	1.5	1.8	1.3	1.0	0.3	0.3	0.0
6:00 AM	6.0	0.0	0.0	0.0	0.0	0.5	1.8	0.5	2.0	0.8	0.5	0.0	0.0	0.0
7:00 AM	16.0	0.0	0.3	1.0	0.0	0.8	2.8	2.3	6.0	3.0	0.0	0.0	0.0	0.0
8:00 AM	12.3	0.3	0.0	0.0	0.0	2.0	0.8	2.5	3.3	2.0	1.3	0.3	0.0	0.0
9:00 AM	10.5	0.3	0.5	0.0	0.5	1.0	2.5	2.3	2.0	1.0	0.3	0.3	0.0	0.0
10:00 AM	11.0	0.0	0.3	0.3	0.5	1.5	2.3	2.5	2.0	1.3	0.3	0.3	0.0	0.0
11:00 AM	15.3	0.0	0.3	0.0	0.3	1.8	2.5	3.0	4.8	1.5	0.8	0.5	0.0	0.0
12:00 PM	14.0	0.5	0.3	0.0	0.5	0.8	3.0	2.3	3.8	1.3	1.3	0.0	0.5	0.0
1:00 PM	15.0	0.0	0.3	0.5	0.3	1.5	1.8	2.8	4.5	2.3	0.5	0.3	0.3	0.3
2:00 PM	14.5	0.0	0.0	0.0	0.5	0.8	1.8	2.3	3.3	4.8	0.8	0.3	0.3	0.0
3:00 PM	25.0	0.0	0.0	0.3	0.3	1.8	3.8	6.8	5.5	5.0	1.3	0.3	0.3	0.0
4:00 PM	22.0	0.3	0.3	0.3	0.5	1.3	3.3	6.5	4.5	3.0	2.0	0.3	0.0	0.0
5:00 PM	19.8	0.0	0.3	0.0	0.5	2.0	2.0	4.8	5.0	3.5	0.8	0.5	0.0	0.5
6:00 PM	15.8	0.3	0.0	0.3	0.0	1.5	4.0	2.8	3.0	2.8	1.0	0.0	0.3	0.0
7:00 PM	7.3	0.0	0.0	0.0	0.0	0.5	0.5	1.3	3.3	0.8	0.8	0.0	0.0	0.3
8:00 PM	9.8	0.3	0.0	0.0	0.3	0.3	0.8	2.8	1.5	2.8	0.8	0.0	0.0	0.5
9:00 PM	5.8	0.0	0.3	0.0	0.0	1.0	0.5	1.3	1.0	1.3	0.5	0.0	0.0	0.0
10:00 PM	4.0	0.0	0.0	0.3	0.0	0.3	0.3	0.3	0.5	0.8	0.8	0.5	0.0	0.5
11:00 PM	1.3	0.0	0.0	0.0	0.0	0.5	0.0	0.3	0.3	0.0	0.0	0.3	0.0	0.0
ADT	238.5	1.8	2.5	2.8	4.8	20.8	36.8	49.5	58.0	39.5	14.5	3.8	2.0	2.0

Percentile Speeds	10%	15%	50%	85%	90%
(mph)	33.6	35.6	45.0	52.4	54.5

10 mph Pace Speed 42.0 - 52.0
Number in Pace 446 (46.8 %)

Average 44.3 mph
Minimum 6.6 mph
Maximum 90.8 mph

Speeds Exceeded	45 mph	55 mph	65 mph
	50.2 %	9.3 %	1.7 %
Count	479	89	16

Study Grand Totals

mph	Total	0 - < 15	15 - < 20	20 - < 25	25 - < 30	30 - < 35	35 - < 40	40 - < 45	45 - < 50	50 - < 55	55 - < 60	60 - < 65	65 - < 70	70 - < 200
A>B	477	5	5	5	4	26	67	88	133	90	41	8	3	2
		1.0%	1.0%	1.0%	0.8%	5.5%	14.0%	18.4%	27.9%	18.9%	8.6%	1.7%	0.6%	0.4%
B>A	477	2	5	6	15	57	80	110	99	68	17	7	5	6
		0.4%	1.0%	1.3%	3.1%	11.9%	16.8%	23.1%	20.8%	14.3%	3.6%	1.5%	1.0%	1.3%
Combined	954	7	10	11	19	83	147	198	232	158	58	15	8	8
		0.7%	1.0%	1.2%	2.0%	8.7%	15.4%	20.8%	24.3%	16.6%	6.1%	1.6%	0.8%	0.8%