

Seward Highway Traffic Study at Potter Marsh

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State of Alaska DOT&PF

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I. Background

Residents of the Potter Marsh community reached out to DOT&PF and have explained that installation of rumble strips near two Seward Highway intersections would produce excessive noise for the surrounding populace. The community has asked DOT&PF to consider turn pockets at both the New Seward Highway/Potter Valley Rd intersection, and also the New Seward Highway/Potter Creek Trailhead intersection, as a means of reducing unwanted noise. The DOT&PF is conducting a peak traffic volume study in order to determine if turn pockets are warranted for these unsignalized intersections.

II. Methodology

Peak traffic volume is a serious determining factor when deciding whether or not a turn pocket is warranted at an un-signalized intersection. Traffic counts will be performed at both intersections to determine if turn pockets are warranted for both left and right turning movements.

There is already a left hand turn pocket at the New Seward Highway/Potter Valley Rd intersection for southbound traffic, so only turning movements and traffic volume flowing northbound will be studied at that intersection in order to determine if a right turn pocket is warranted at this intersection.

At the New Seward Highway/Potter Creek Trailhead, there are currently no turn pockets. This means that turning movements for both northbound and southbound traffic volumes must be studied in order to determine if a right and/or left turn pocket is warranted.

A local resident of the Potter Marsh area recommended that this traffic study be completed on Friday, Saturday, or Sunday, within the summer months of June – August. A traffic volume report at Potter Marsh from 2011-2013 was used by an analysis team to determine the time and day for peak volume of traffic flow through this area. The greatest flow of traffic through this area in August, as shown in figure 1, is on Sundays from 4-7 PM. There will be an engineer stationed at both intersections conducting manual counts of vehicles passing through every 15 minutes. Manual counts are more isolated in time than automatic counts and therefore will be used for this three hour traffic study. The count will determine peak traffic volumes entering each intersection in question. This peak data will then be analyzed with highway design guidelines to decide if turn pockets may be warranted.

SEWARD HIGHWAY AT POTTER MARSH - TOTAL

ROUTE: 130000 MILEPOINT: 116.460 STATION NUMBER: 11410031 9 PERMANENT STN SUMMARY: 2013

MNTH	MADT	% AADT	6AM		PERCENT OF AADT FOR DAY OF WEEK										HISTORY		PERCENT GROWTH
			-10PM	-6AM	MON	TUE	WED	THU	FRI	WKDY	SAT	SUN	YEAR	AADT			
JAN	5912	63.7	93.5	6.5	93.6	86.1	89.3	92.5	117.5	95.8	119.1	101.8	2013	9283	4.5		
FEB	6231	67.1	93.7	6.3	100.7	85.9	85.2	93.4	114.5	95.9	120.0	100.3	2012	8880	-1.9		
MAR	7432	80.1	93.8	6.2	87.3	93.3	91.4	90.7	108.6	94.3	118.5	110.0	2011	9050	-1.5		
APR	8394	90.4	93.6	6.4	81.9	77.3	78.8	89.8	117.5	89.1	133.1	121.6	2010	9187	1.5		
MAY	10912	117.5	91.8	8.2	102.9	87.9	84.5	86.7	110.2	94.4	105.3	122.5	2009	9051	4.4		
JUN	14021	151.0	89.5	10.5	89.8	86.0	88.1	91.6	111.9	93.5	115.8	116.9	2008	8670	-6.9		
JUL	17000	183.1	88.2	11.8	84.4	80.2	87.7	92.6	114.6	91.9	120.0	120.5	2007	9316	4.3		
AUG	12756	137.4	91.5	8.5	91.3	86.6	82.3	91.6	112.8	92.9	117.6	117.7	2006	8936	-4.1		
SEP	9835	105.9	93.6	6.4	91.6	86.4	82.2	91.1	109.4	92.1	121.9	117.3	2005	9321	-0.4		
OCT	7492	80.7	93.7	6.3	87.7	89.3	90.7	89.7	121.5	95.8	123.4	97.6	2004	9356	1.4		
NOV	5597	60.3	93.2	6.8	94.4	96.1	103.5	95.4	111.3	100.1	111.4	87.8	2003	9224	-0.9		
DEC	5810	62.6	93.1	6.9	103.6	96.7	86.2	90.2	111.1	97.6	110.7	101.4	2002	9311	9.4		
AADT	9283		92.4	7.6	92.4	87.7	87.5	91.3	113.4	94.5	118.1	109.6	2001	8514	2.5		
													2000	8309	0.2		
													1999	8294	0.0		
													1998	8296	9.5		
													1997	7574	1.5		
													1996	7464	-1.3		
													1995	7565	-0.1		
													1994	7571	2.8		
													1993	7366	6.3		
													1992	6929	4.7		
													1991	6621	69.3		
													1990	3910			

HIGH DAYS	1ST	2ND	3RD	4TH	5TH	6TH	7TH	8TH	9TH	10TH	AVG
VOLUME	23411	22305	22092	20988	20209	19503	19270	19067	19031	18749	20463
DAY	07/21	07/19	07/20	07/06	07/28	07/13	07/07	07/14	07/27	07/26	
% AADT	252.2	240.3	238.0	226.1	217.7	210.1	207.6	205.4	205.0	202.0	220.4

HIGH HOURS	1ST	2ND	3RD	4TH	5TH	6TH	7TH	8TH	9TH	10TH	20TH	30TH	40TH	50TH	AVG
VOLUME	1922	1920	1859	1826	1762	1758	1732	1703	1695	1694	1626	1539	1490	1462	1787
HOUR	6PM	7PM	4PM	5PM	5PM	3PM	3PM	7PM	4PM	5PM	2PM	4PM	6PM	6PM	
DAY	07/19	07/19	07/21	07/21	07/07	07/06	07/21	07/28	07/06	07/06	07/07	07/19	07/05	07/20	
% AADT	20.7	20.7	20.0	19.7	19.0	18.9	18.7	18.3	18.3	18.2	17.5	16.6	16.1	15.7	19.3
	Fri	Fri	Sun	Sun	Sun	Sat	Sun	Sun	Sat	Sat					

PERCENT OF AADT BY HOUR																							
1AM	2AM	3AM	4AM	5AM	6AM	7AM	8AM	9AM	10AM	11AM	12PM	1PM	2PM	3PM	4PM	5PM	6PM	7PM	8PM	9PM	10PM	11PM	12AM
1.1	0.7	0.5	0.4	0.5	0.9	1.9	3.3	4.1	5.0	5.5	6.0	6.7	6.9	7.3	7.7	8.1	7.9	7.2	5.8	4.6	3.6	2.5	1.6

2011-2013 Traffic Volume Report

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Figure 1: 2011-2013 Traffic Volume Report at Potters Marsh [1]

III. Results

Traffic on Sunday, August 12th, 2018 was steady throughout the three hour time period. The weather was fair, being mostly sunny with some overcast during the duration of the study. There were no major traffic issues, or notable accidents that would slow traffic during the study.

Northbound traffic turning right at the New Seward/Potter Valley Rd intersection was at peak volume from 5pm – 6pm, as observed in table 1. Northbound traffic flowing on the Seward Highway during this peak hour was approximately 757 vehicles, while the peak number of vehicles taking a right hand turn at

the intersection was found to be 12. Visit appendix A to see the number of vehicles passing through this intersection every 15 minutes.

Table 1: Peak Traffic Volume at New Seward and Potter Valley Road

	Southbound	Northbound	Left Hand Turn	Right Hand Turn
Peak # Right Turns Per Hour (5pm – 6pm)	NA	757	NA	12

Traffic turning left at the New Seward/Potter Creek Trailhead intersection was at peak volume from 4pm – 5pm, as observed in table 2. Southbound traffic flowing on the New Seward Highway during this peak hour was approximately 496 vehicles, while the peak number of vehicles taking a left hand turn at the intersection was found to be 6.

Traffic turning right at the New Seward/Potter Creek Trailhead intersection was at peak volume from 4pm – 5pm as well. The northbound traffic flowing on the New Seward Highway during this peak hour was approximately 751 vehicles, while the peak number of vehicles taking a right hand turn at the intersection was found to be 6. Visit appendix B to see the number of vehicles passing through this intersection every 15 minutes.

Table 2: Peak Traffic Volume at New Seward and Potter Creek Trailhead

	Southbound	Northbound	Left Hand Turn	Right Hand Turn
Peak # Left/Right Turns Per Hour (4pm – 5pm)	496	751	6	6

IV. Conclusion

A. New Seward and Potter Valley Rd

As shown in Figure 2, 40 right hand turning vehicles per hour may warrant a full-width turn pocket on a two lane road with a posted speed limit above 45 mph and an approach volume of 700+ vehicles. DOT&PF currently does not practice taper turn pockets, therefore this style of turn lane is not considered in this report. With the current peak at 12 right turns, it is not advised to add a turn pocket to this intersection. It is advised however that this study be

repeated periodically, preferably during the peak travel month of July, because this pocket may be warranted in the near future.

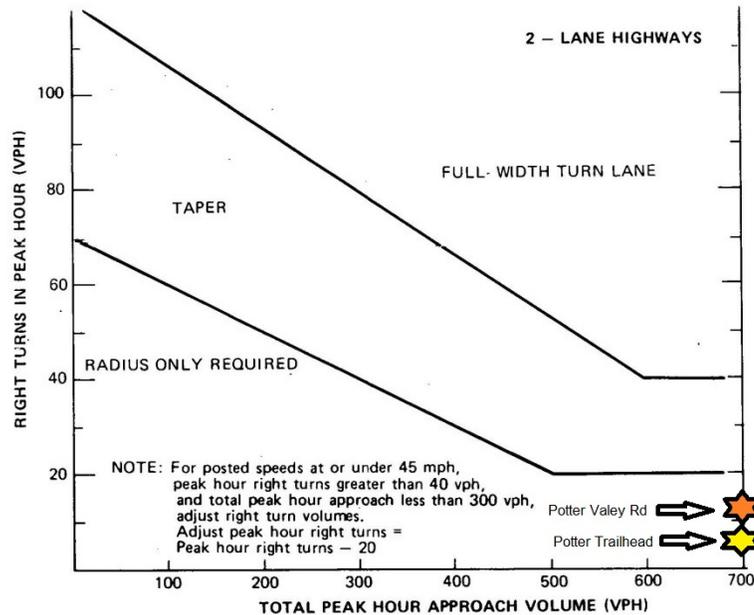


Figure 2: Volume warrants for right hand turn lanes at unsignalized intersections [2]

B. New Seward and Potter Creek Trailhead Intersection

As shown in Figure 2, and similar to the Potter Valley Road Intersection, 40 right turning vehicles per hour are needed to warrant a right turn pocket. With current peak right turns at 6 turns per hour, it is not advised to add a turn pocket to this intersection. It is advised however that this study be repeated periodically because this pocket may be warranted in the future.

In figure 3, Opposing Volume (V_0) is considered northbound through traffic at the trailhead intersection, and Advancing Volume (V_A) is considered southbound through traffic. When applying 496 vehicles per peak hour to the bottom axis and 751 vehicles per peak hour to the left axis, the graph indicates that a left turn is warranted. However, vehicle through movement data at this intersection was collected during what might be considered a peak or worst case time, while left turn volume is relatively low. This worst case scenario could lead to the decision that a left turn pocket may not be warranted, when compared with

average traffic volumes. With these two conflicting findings, a left turn pocket *may* be warranted. This intersection requires further analysis, which may include automatic traffic data and a Level of Service (LOS) determination based on the Highway Capacity Manual (HCM).

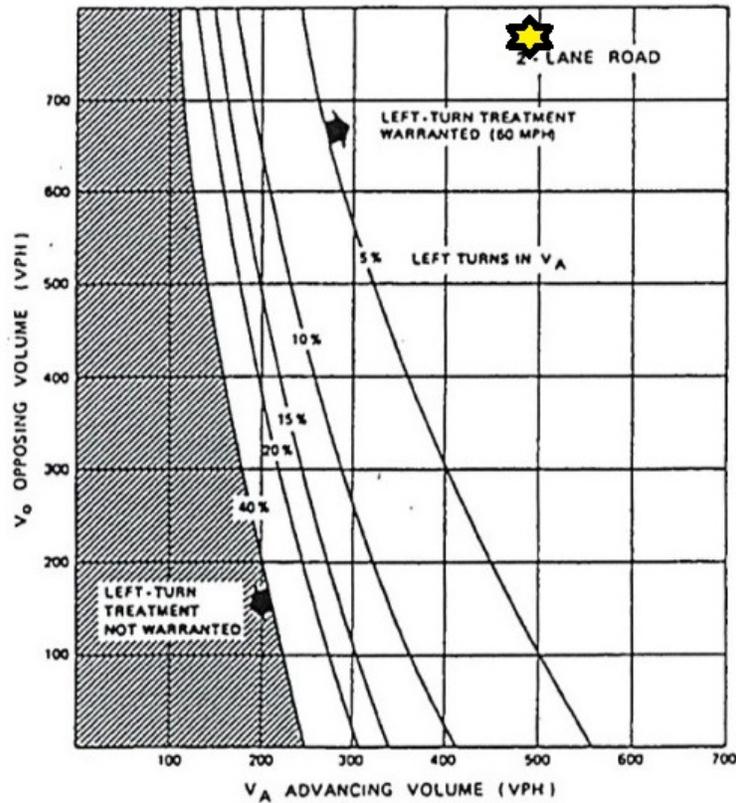


Figure 3: Volume warrants for left turn lanes at unsignalized intersections [3]

V. References

- [1] J. W. Witt, "Central Region Traffic Volume Report," Highway Data Section, 2013.
- [2] T. R. Neuman, "National Cooperative Highway Research Program 279, Intersection Channelization Design Guide," Transportation Research Board, Washington, D.C, 1985.
- [3] M. Harmelink, "Volume Warrant for Left Turn Storage Lanes at Unsignalized Grade Intersections," Highway Research Board, Highway Research Record 211, 1967.

VI. Appendix A: New Seward & Potter Valley Road Traffic Volume

Seward Highway Traffic Count					
DATE:	8/12/2018				
WEATHER:	Sunny w/ Overcast, High Winds	(Note any pertinent change in weather) -> 5:15 Overcast turned into cloud cover			
Temp:	Upper 60's				
# of Cars at New Seward/Potter Valley Road Intersection					
		Southbound	Northbound	Right Hand Turn	
Time Intervals:	4:00 - 4:15	NA		227	2
	4:15 - 4:30	NA		186	1
	4:30 - 4:45	NA		201	2
	4:45 - 5:00	NA		213	2
	5:00 - 5:15	NA		173	2
	5:15 - 5:30	NA		199	5
	5:30 - 5:45	NA		208	3
	5:45 - 6:00	NA		182	2
	6:00 - 6:15	NA		177	1
	6:15 - 6:30	NA		196	3
	6:30 - 6:45	NA		146	2
	6:45 - 7:00	NA		181	3
	Peak Right Turns Per Hour (5pm-6pm)		0	757	12

VII. Appendix B: New Seward & Potter Creek Trailhead Traffic Volume

Seward Highway Traffic Count						
DATE:	8/12/2018					
WEATHER:	Partly Cloudy, 25 MPH Wind Gusts	(Note any pertinent change in weather) -> 5pm-7pm: High Clouds, 26 MPH Wind Gusts, 69 Degrees Fahrenheit				
Temp:	71 Degrees Fahrenheit					
	# of Cars at New Seward/Potter Creek Trailhead					
		Southbound	Northbound	Left Hand Turn	Right Hand Turns	
Time Intervals:	4:00 - 4:15		138	173	4	5
	4:15 - 4:30		121	189	1	1
	4:30 - 4:45		128	188	1	0
	4:45 - 5:00		109	201	0	0
	5:00 - 5:15		102	181	0	0
	5:15 - 5:30		101	182	3	0
	5:30 - 5:45		101	180	1	1
	5:45 - 6:00		81	182	0	0
	6:00 - 6:15		72	189	0	1
	6:15 - 6:30		66	188	0	0
	6:30 - 6:45		74	135	0	0
	6:45 - 7:00		63	157	0	0
	Peak Left/Right Turns Per Hour (4pm-5pm)		496	751	6	6