

Appendix E
HOV Evaluation

1. INTRODUCTION

The study evaluates a potential High Occupancy Vehicle (HOV) lane in each eastbound (EB) and westbound (WB) direction on I-80 corridor between Vista Boulevard/Greg Street and USA Parkway interchange. NDOT’s Reno Sparks Freeway Traffic Study (RSFTS) was used as the primary reference for the HOV evaluation. A combination of qualitative and quantitative approach was used for performing the traffic analysis to determine the improvements of the HOV lanes.

RSFTS recommended three lanes in each direction within this study’s limits and did not exclusively evaluated for HOV lane considerations. An approach to evaluate the lane capacity per *Highway Capacity Manual 6th Edition* (HCM) along with the future traffic demand was used to determine a potential HOV lane in each direction. A coordination effort was done with Regional Transportation Commission (RTC) of Washoe and RTC of Southern Nevada Freeway and Arterial System of Transportation (RTC-FAST) to get their feedback on any HOV related information that could be considered to our recommendations.

2. TRAFFIC DATA

2.1. 2040 TRAFFIC VOLUMES

Peak-hour traffic volumes for the year 2040 on I-80 for EB and WB are shown in Figure 1. The traffic volumes are taken from RSFTS for the worst case scenario and rounded off to nearest fifty. I-80 from Vista Boulevard/Greg Street and USA Parkway interchange has two lanes in each direction with a posted speed limit of 65 mph east of Vista Boulevard/Greg Street interchange.

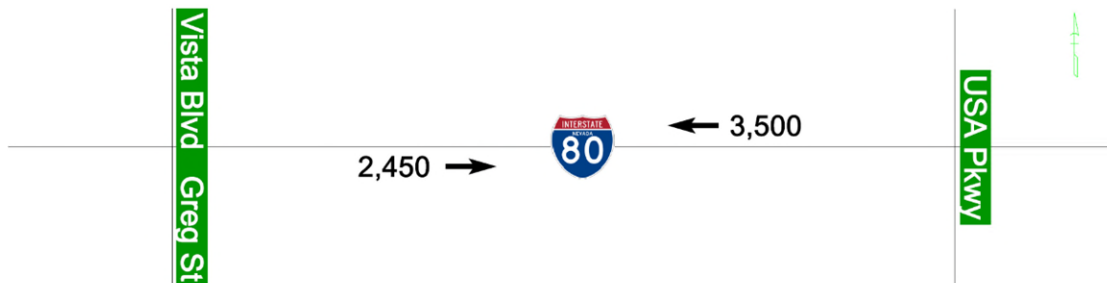


Figure 1: 2040 Peak-Hour Volume

2.2. RTC WASHOE TRAVEL-DEMAND MODEL

RTC Washoe provided the shared ride information from the regional travel-demand model for the year 2040. Based on the calculation, around 24% are the shared riders of the total traffic on I-80. Table 1 shows the detail calculation for the shared riders during various time periods.

2.3. RTCNV-FAST HOV DATA

RTC-FAST provided the HOV hourly volumes from 5:00 AM to 10:00 AM, and 2:00 PM to 8:00 PM on US 95 from 2010 to 2019 April/May (Tables 2 & 3). However, RTC-FAST is currently working on the corresponding mainline volumes and will be available at a later time. Hence, this data was for information only and not used in our analysis/recommendation.

Table 1: 2040 Ride Share Percent from RTC Washoe TDM

2040 RTC Washoe TransCAD Model						
Period	Mode	Vehicle Trips	Total Trips	Shared Ride Percent	Total Daily Trips	Total Daily Shared Ride Percent
AM (6 to 9)	Da	214,371	290,186	24%	1,685,836	24%
	sr2	49,565				
	sr3	21,208				
	singleUnitTrucks	3,070				
	multiUnitTrucks	1,972				
MD (9 to 4)	Da	472,856	275,528	25%		
	sr2	119,377				
	sr3	50,522				
	singleUnitTrucks	19,955				
	multiUnitTrucks	12,818				
PM (4 to 7)	Da	267,385	371,422	24%		
	sr2	62,387				
	sr3	25,263				
	singleUnitTrucks	9,978				
	multiUnitTrucks	6,409				
NT (7 to 6)	Da	255,988	348,700	24%		
	sr2	59,816				
	sr3	24,073				
	singleUnitTrucks	5,373				
	multiUnitTrucks	3,451				

Table 2: US 95 Northbound Hourly HOV Volumes, by Year & Hour

hr	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2019x
5	100	117	147	100	102	103	108	105	136	130	111
6	100	137	181	109	108	119	129	113	199	184	133
7	102	161	227	153	148	177	177	133	240	244	168
8	110	167	243	143	169	192	190	157	229	261	178
9	111	161	228	117	136	154	170	126	204	202	167
14	259	335	325	294	327	353	338	286	374	413	315
15	317	411	385	365	366	408	385	321	417	467	363
16	413	443	459	416	442	525	461	375	527	658	557
17	536	549	573	529	586	693	585	497	690	767	671
18	359	389	411	362	464	503	431	390	510	568	470
19	232	282	266	254	302	321	341	268	363	362	249

- Data collected from the HOV lane segment between Rancho and Lake Mead Blvd.
- The hourly volume is maximum from data collected for April through June of each year.
- For 2019, the 2019 column is the max volume from April or May; the 2019x column is the max volume from the first three weeks of June.

Table 3: US 95 Southbound Hourly HOV Volumes, by Year & Hour

hr	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2019x
5	151	244	207	224	271	312	358	327	315	347	230
6	270	352	309	336	451	542	566	494	526	603	404
7	375	420	355	487	593	716	734	655	755	843	640
8	296	367	288	395	475	576	656	579	657	730	587
9	242	397	260	385	446	517	547	484	545	587	516
14	291	472	220	455	506	579	584	537	645	679	589
15	297	470	225	437	495	590	609	555	640	711	615
16	283	468	221	426	486	572	576	530	606	686	599
17	296	456	243	461	515	582	561	519	627	705	610
18	273	418	197	416	442	527	537	473	542	570	503
19	199	346	178	322	359	423	431	402	430	448	414

- Data collected from the HOV lane segment between Rancho and Lake Mead Blvd.
- The hourly volume is maximum volume from data collected for April through June of each year.
- For 2019, the 2019 column is the max volume from April or May; the 2019x column is the max volume from the first three weeks of June.

3. TRAFFIC ANALYSIS & TRAFFIC VOLUME VALIDATION

Traffic analysis was performed using the demand to capacity per HCM methodology. Level-of-Service (LOS) D or better was used as a desired threshold for freeway segment traffic operations. Figure 2 shows the HCM speed to flow rate for various speeds and LOS. A flow rate of 1,700 pc/hr/ln is the maximum volume considered for each lane on I-80.

Traffic volume validations indicates that for I-80 EB, two lanes will have enough capacity to meet the demand, while I-80 WB need three lanes. I-80 WB will mostly fail due to the various factors; merge/diverge, weaving, type of drivers (conservative/aggressive), repositioning to exit, truck traffic, daylight/night, etc.

RSFTS recommended three general-purpose lanes on I-80 in each direction in order to meet the desired traffic operations.

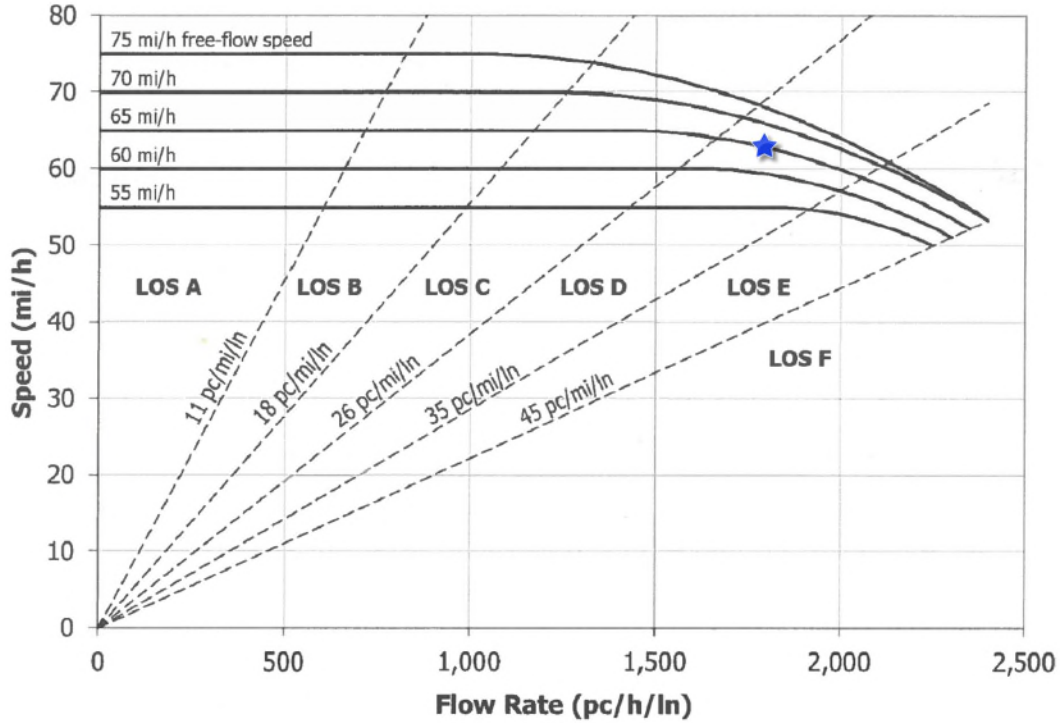


Figure 2: HCM LOS Criteria for Basic Freeway Segments

4. CONCLUSION & RECOMMENDATIONS

The following are the key conclusions:

1. I-80 EB with two lanes will have enough capacity to meet the 2040 traffic demand
2. I-80 WB need three lanes to meet the 2040 traffic demand

It is recommended that I-80 needs three lanes in each direction. One of the general-purpose lane could be considered as an HOV lane with time of the day restriction within the limits.