

## **Appendix D    Traffic Queuing Calculations**

**Table D-1. Baseline Inbound Traffic (July 30 through August 5, 2006)**

2006	30-Jul SUN	31-Jul MON	1-Aug TUE	2-Aug WED	3-Aug THU	4-Aug FRI	5-Aug SAT	AVG 2006	AVG 2015 124% increase	AVG 2035 139% increase
12 to 1 AM	510	436	481	680	492	612	637	550	682	764
1 to 2 AM	607	422	499	646	567	659	615	574	711	797
2 to 3 AM	606	491	446	525	537	468	567	520	645	723
3 to 4 AM	525	435	447	398	317	269	423	402	498	559
4 to 5 AM	493	512	503	428	342	315	462	436	541	607
5 to 6 AM	546	555	493	414	430	343	431	459	569	638
6 to 7 AM	555	594	505	503	441	391	534	503	624	700
7 to 8 AM	391	997	920	946	1122	863	660	843	1045	1171
8 to 9 AM	497	1029	924	884	940	969	687	847	1050	1178
9 to 10 AM	754	928	801	803	956	860	785	841	1043	1169
10 to 11 AM	792	702	902	842	1026	810	816	841	1043	1170
11 AM to 12 PM	653	706	756	809	773	800	843	763	946	1060
12 to 1 PM	733	689	824	857	789	737	751	769	953	1068
1 to 2 PM	695	715	809	813	744	714	792	755	936	1049
2 to 3 PM	709	672	791	797	436	751	722	697	864	969
3 to 4 PM	628	658	439	720	716	793	617	653	810	908
4 to 5 PM	586	643	537	812	754	763	677	682	845	948
5 to 6 PM	615	643	683	829	611	598	704	669	830	930
6 to 7 PM	474	658	650	888	666	664	811	687	852	955
7 to 8 PM	704	570	611	757	607	695	709	665	824	924
8 to 9 PM	668	616	724	743	716	725	695	698	866	970
9 to 10 PM	702	599	832	693	811	636	671	706	876	982
10 to 11 PM	604	643	811	816	789	724	629	717	889	996
11 PM to 12 AM	382	498	541	507	641	534	609	530	658	737

The rate of traffic increase is derived from the traffic study presented in Appendix B.

The following calculations assume steady traffic flow within each hour.

Using the observed inspection rates discussed in the Traffic Study (Appendix B) the Calexico LPOE currently process 76 cars per lane per hour. With 10 lanes, the POE can process 760 cars per hour. The average hourly traffic volume from 2006 shows 6 hours out of the day where the average hourly traffic exceeds the POE's maximum hourly inspection capacity. When the maximum hourly inspection capacity is exceeded, the traffic backs up into the following hour. If the maximum hourly inspection capacity is exceeded for several hours in a row, the queue grows until it takes several hours for the queue to be processed and the traffic rate to become less than the maximum hourly inspection rate. Using the 2006 average inbound rates from Table D-1, Table D-2 shows how once the maximum hourly rate is exceeded in the 7 am to 8 am hour, it takes until the 5 pm to 6 pm hour to inspect the excess.

**Table D-2. 2006 Queue Buildup**

Hour Period	Cars Arriving	Cars Inspected	Cars Left Over	Buildup
12 to 1 AM	550	550	-	-
1 to 2 AM	574	574	-	-
2 to 3 AM	520	520	-	-
3 to 4 AM	402	402	-	-
4 to 5 AM	436	436	-	-
5 to 6 AM	459	459	-	-
6 to 7 AM	503	503	-	-
7 to 8 AM	843	760	83	83
8 to 9 AM	847	760	87	170
9 to 10 AM	841	760	81	251
10 to 11 AM	841	760	81	332
11 AM to 12 PM	763	760	3	335
12 to 1 PM	769	760	9	344
1 to 2 PM	755	760	-	339
2 to 3 PM	697	760	-	276
3 to 4 PM	653	760	-	169
4 to 5 PM	682	760	-	91
5 to 6 PM	669	760	-	0
6 to 7 PM	687	687	-	-
7 to 8 PM	665	665	-	-
8 to 9 PM	698	698	-	-
9 to 10 PM	706	706	-	-
10 to 11 PM	717	717	-	-
11 PM to 12 AM	530	530	-	-
Total	15807	-	-	-
Avg.	659	-	-	-

Using the 2015 average hourly rates from Table D-1, the average hourly traffic rate is 817 vehicles. This rate exceeds the maximum hourly inspection rate for the current Calexico LPOE, Table D-3 shows how the build up from the maximum hourly inspection rate is exceeded for so many hours that it would be beyond the capacity of the LPOE to handle in a 24-hour period.

**Table D-3. 2015 Queue Buildup**

Hour Period	Cars Arriving	Cars Inspected	Cars Left Over	Buildup
12 to 1 AM	682	682	-	-
1 to 2 AM	711	711	0	-
2 to 3 AM	645	645	0	-
3 to 4 AM	498	498	0	-
4 to 5 AM	541	541	0	-
5 to 6 AM	569	569	0	-
6 to 7 AM	624	624	0	-
7 to 8 AM	1045	760	285	285
8 to 9 AM	1050	760	290	575
9 to 10 AM	1043	760	283	858
10 to 11 AM	1043	760	283	1141
11 AM to 12 PM	946	760	186	1327
12 to 1 PM	953	760	193	1520
1 to 2 PM	936	760	176	1696
2 to 3 PM	864	760	104	1800
3 to 4 PM	810	760	50	1850
4 to 5 PM	845	760	85	1935
5 to 6 PM	830	760	70	2005
6 to 7 PM	852	760	92	2097
7 to 8 PM	824	760	64	2161
8 to 9 PM	866	760	106	2267
9 to 10 PM	876	760	116	2383
10 to 11 PM	889	760	129	2512
11 PM to 12 AM	658	760	-	2410
Total	19600	-	-	-
Avg.	817	-	-	-

Under the Proposed Action, the number of inspection lanes would be increased from 10 to 16 lanes. Using 16 lanes, the maximum hourly inspection rate would be 1216 vehicles. Using the traffic increase rate of 39 percent from the Traffic Study (Appendix B), Table D-4 shows that

with 16 lanes the average hourly traffic rate would not exceed the maximum hourly inspection rate during any hour of the day.

**Table D-4. 2035 Queue Buildup**

Hour Period	Cars Arriving	Cars Inspected	Cars Left Over	Buildup
12 to 1 AM	764	764	-	-
1 to 2 AM	797	797	0	-
2 to 3 AM	723	723	0	-
3 to 4 AM	559	559	0	-
4 to 5 AM	607	607	0	-
5 to 6 AM	638	638	0	-
6 to 7 AM	700	700	0	-
7 to 8 AM	1171	1171	0	-
8 to 9 AM	1178	1178	0	-
9 to 10 AM	1169	1169	0	-
10 to 11 AM	1170	1170	0	-
11 AM to 12 PM	1060	1060	0	-
12 to 1 PM	1068	1068	0	-
1 to 2 PM	1049	1049	0	-
2 to 3 PM	969	969	0	-
3 to 4 PM	908	908	0	-
4 to 5 PM	948	948	0	-
5 to 6 PM	930	930	0	-
6 to 7 PM	955	955	0	-
7 to 8 PM	924	924	0	-
8 to 9 PM	970	970	0	-
9 to 10 PM	982	982	0	-
10 to 11 PM	996	996	0	-
11 PM to 12 AM	737	737	0	-
Total	21972	-	-	-
Avg.	916	-	-	-