Appendix G

Traffic Study Methodology

Traffic Forecasting Model Methodology

In addition to the existing/baseline condition (year 2005), a level of service (LOS) analysis was conducted for the year 2015, which is the year in which the proposed project is scheduled to be open to traffic, and year 2030, which is the design horizon year for the proposed project. To complete this analysis, a traffic forecasting model was developed as part of the study to forecast future traffic volumes with and without the project in the years 2015 and 2030.

The model was based upon the travel demand forecasting model (Port Model) developed for the Ports of Long Beach/Los Angeles Transportation Study (2001). That Port Model, completed in 2000, is based on the Southern California Association of Governments' (SCAG) Regional Travel Demand Forecasting Model. Elements of the SCAG Heavy-Duty Truck (HDT) model were used, as well as input data from the City of Long Beach model and the City of Los Angeles Transportation Improvement Mitigation Program (TIMP) models for Wilmington and San Pedro. TRANPLAN is the software platform used for modeling. Special model features include the following:

Network Coverage

The roadway network used for traffic assignment in the SCAG model was augmented in the area of the ports to include all of the public roadways. Outside the area of the ports, the SCAG 2000 and 2030 roadway networks were used. The future networks include planned and programmed highway improvements included in SCAG's Destination 2030: 2004 Regional Transportation Plan (RTP), which is the current plan for the region in which the project is located. The future year networks do not include truck lanes or other widening on the State Route (SR) 710 freeway nor improvements to the SR 47 Expressway or Schuyler Heim Bridge on SR 47; however, a sensitivity analysis was performed with these improvements in place.

Traffic Analysis Zone Disaggregation

The traffic analysis zones (TAZs) used for trip generation in the SCAG model were disaggregated into more refined zones within the area of the ports. A TAZ was provided for each of the ports' container terminals.

Coding of Highway Grades and Reduced Capacities

An important feature of the model, which was explicitly accounted for and coded to the network, are locations of steep uphill and downhill grades. These include the Gerald Desmond Bridge, Schuyler Heim Bridge, and Ocean Boulevard/SR 710 connector ramps.

Implementation of Truck Passenger Car Equivalencies (PCEs)

The presence of vehicles other than passenger cars in the traffic stream affects traffic flow in two ways: (1) these vehicles, which are much larger than passenger cars, occupy more roadway space (and capacity) than individual passenger cars, (2) the operational capabilities of these vehicles, including acceleration, deceleration, and maintenance of speed, are generally inferior to passenger cars and result in the formation of large gaps in the traffic stream that reduce highway capacity. On long sustained grades, and segments with impaired capacities where trucks operate considerably slower, formation of these large gaps can have a profound impact on the traffic stream. The above characteristics are also accounted for in the model as discussed below.

Grades and Passenger Car Equivalents

Grades are coded in the TRANPLAN network as they are in the field to an accuracy of one percent. The grade is coded in directly, and then TRANPLAN has a specialized PCE procedure that converts assigned truck traffic to PCEs. It is not impedance; it is simply a conversion to PCEs. In this way, the effect of the truck volume is accounted for in the analysis using PCEs. The PCE factors are the same as those used in the Southern California HDT Model, which was based on the 1997 Highway Capacity Manual (HCM) PCE factors. They were developed by SCAG for the HDT model, and they include a sliding scale of PCE factors that takes into account the grade, the length of grade, and the percent of truck traffic.

While the SCAG PCE factors were used in the assignment of forecast traffic to the roadway network, they were not used in the assessment of roadway LOS. HCM vehicle density calculations were used to determine LOS. To adhere to the HCM procedures more closely, HCM PCE factors were used in LOS analysis. A standardized set of port-provided PCE factors for all trucks based on the HCM factors was utilized in the LOS analysis. The PCE factors for each vehicle type used in the LOS analysis are:

1.0 for motorcycles, cars, pickup trucks, sport-utility vehicles (SUVs), and vans;

1.1 for bobtails (tractor trailer combinations operated without a trailer);

2.0 for buses, 2-axle trucks, and 3-axle trucks; and

2.0 for container trucks, chassis trucks, and all other 4-axle or larger trucks.

Trips from Other Non-Port Zones

Trips generated by major developments within the area of the ports for which specific trip generation rates were not included in the Port Model were added to the model at the TAZ locations. Those developments include, but are not limited to, Queensway Bay, Cabrillo Marina, and the Port of Los Angeles Industrial Center.

Port Area Trip Distribution

Distribution of port trips was accomplished predominantly through information developed in the Ports Transportation Study, including results of user surveys and traffic counts. The port trip tables were allocated to known locations for major destinations, including off-dock rail yards, warehouse/industrial facilities, and other intermodal transfer facilities. The locations of these facilities by TAZ were identified, and they were explicitly coded into the trip tables. These port trips are not part of the gravity model distribution process. Both trips internal to the ports and with one trip end internal to the ports were addressed using this methodology.

2015 and 2030 Port Trip Tables

The port trip tables were developed in two parts. First, the port model zone trip tables were developed in a similar manner to those used in the Ports Transportation Study and model. Those trip tables were developed based on a detailed port area zone system and specialized trip generation rates for autos and trucks in the port. Second, special trip generation rates for autos were developed for the port studies and applied to 2015 and 2030 TEU forecasts. Truck trip generation for container terminals was developed using the QuickTrip model, which is discussed below.

2030 Regional Trip Tables

The 2030 regional trip tables for the Port Model were developed using the SCAG 2030 trip tables. Regional person-trip productions and attractions on a zonal level were obtained from SCAG for the entire SCAG modeling area for year 2030. For the traffic zones within the ports, trip productions and attractions were disaggregated to the more refined zones described above. The port and regional person productions and attractions were then converted into vehicle trips based on SCAG's socio-economic data (SED), trip distribution model, mode-split factors, and average auto-occupancy tables. Trips included in the model are drive alone, high-occupancy vehicle (HOV), HOV 3+, port autos, light heavy-duty trucks, medium heavy-duty trucks, heavy heavy-duty trucks, bobtails, chassis, and container trucks. Consistent with the SCAG model, the year 2030 trip tables reflect the throughput of 42 million TEUs at the ports.

Traffic Assignment

The total daily trips for all types of land uses in the region were allocated into SCAG's AM, MD, PM, and off-peak periods. Since the Port Model analyzes conditions for the AM, MD, and PM peak hours, the SCAG model data were converted to peak-hour values. This was accomplished by the application of conversion factors developed in cooperation with SCAG. SCAG previously applied similar factors to perform peak-hour analysis in other areas of the region. The factors were applied and calibrated as part of the original Port Model development in 1999 and have been consistently used since then. The resulting models include unique hourly trip tables for the peak activity hours of the ports. The trip tables contain peak-hour trip generation estimates that were developed specifically for the port zones. The hours for which trip tables have been developed are 8:00 AM to 9:00 AM, 2:00 PM to 3:00 PM, and 4:00 PM to 5:00 PM, representing the AM peak hour, MD peak hour, and PM peak hour, respectively. The TRANPLAN model uses an Equilibrium Traffic Assignment method, which is an iterative process. After each of the model iterations, the roadway volume/capacity ratios are calculated, and traffic is then reassigned to the shortest route until a predefined systemwide "closure" is achieved between two consecutive iterations. Equilibrium-type multi-class assignments are used.

QuickTrip Model

The QuickTrip model is well documented in the *Ports of Long Beach and Los Angeles Transportation Study* (2001). It is a spreadsheet model for truck trip generation analysis that was developed in a collaborative effort between the staff of both ports and a team of consultants. The model builds upon a gate trip generation model that was previously developed, with considerable refinements. It includes detailed input variables, such as mode split (rail versus truck moves), time of day factoring, weekend moves, empty return factors, and other characteristics that affect the numbers of trucks through the gates. The end product is a forecast of truck trip generation, by type of truck trip, for each hour of the day, by direction. The model was carefully validated against gate counts at each container terminal gate, and it was found to replicate within 2 to 12 percent overall, depending on the peak hour.

Post-Processing of Model Assignment Results

Model volume post processing is a procedure that is applied to remove any model validation differences and make the future roadway, ramp, and intersection forecasts more accurate at the intersection and link levels. The intersection turning movement volumes and the link volumes on roadway segments from the year 2005 model were compared to actual turning movement and link volumes from ground counts. Based on that comparison, adjustment factors (the difference in volumes by traffic movement) are developed for the model volumes so that they match the ground counts. That same adjustment factor is then carried forward to the future 2030 model. For example, if the model underestimates a given intersection traffic movement by 50 vehicles, then an adjustment of 50 added vehicles is made to the model output for that movement's volume for model runs of forecast years. In this way, the localized micro-level inaccuracies in the model are accounted for and corrected at the intersection level.

Forecasting Model Validation (Base Year 2005)

Within the port area, the model has been validated for individual roadway links. Model validation concentrated on Ocean Boulevard/ Seaside Avenue, from the vicinity of SR-710/downtown Long Beach (in the POLB) to Navy Way (in the POLA). Traffic ground counts were previously collected in August and September 2005 on two consecutive weekdays. Count locations are shown in **Table G-1**. The port area travel demand model was updated from 1999 base year conditions to 2005 base year conditions. To develop regional background trips, the SCAG trip regional tables were interpolated between the 1999 model trip tables and the 2030 model trip tables. This accounted for trips outside of the port area. For Port-area trips, the QuickTrip truck generation model was utilized to estimate 2005 truck trips. Year 2005 port area auto trips were estimated using auto trip generation rates developed for the Port of Long Beach and Los Angeles Transportation Study. For 2005, the following TEU throughput totals were used to develop the QuickTrip model truck trip generation forecasts: 6.8 million TEUs per year (616,330 per month) for the POLB, and 7.5 million TEUs per year (681,100 per month) for the POLA.

The goal of model validation was to adjust model parameters so that the model will most closely match ground counts, within acceptable thresholds. Typically, subregional travel demand models are validated at the screenline level and on major facilities. For this project, however, a screenline approach was not appropriate since the focus area consists of Ocean Boulevard and the bridge facility and nearby ramp systems; therefore, the validation focused on the specific roadways themselves. Based on the National Cooperative Highway Research Program (NCHRP) Report 255 "Highway Traffic Data for Urbanized Area Project Planning and Design," typical "acceptable deviation" for individual roadway links with volumes of 50,000 vehicles per day or less (Ocean Boulevard carries an ADT of just under 60,000 vehicles currently) is 20 percent (NCHRP Report 255, page 41, Figure A-3).

Ground counts are known to vary by 10 to 20 percent depending on the prevailing conditions on the days that the counts were collected; therefore, a model that replicates counts to within that threshold for major facilities is considered to be accurately estimating travel patterns. This is also consistent with the NCHRP report, as noted in the prior paragraph. For individual lower volume links, such as on- and off-ramps, validation to those thresholds is not feasible, as they carry very low volumes and are subject to significant fluctuation in daily ground counts; therefore, the focus of model validation was on Ocean Boulevard itself, although every ramp was also reviewed during the validation process.

The validation results at the link level indicate that the model is replicating existing/baseline volumes to within 10 to 25 percent for nearly all link locations along Ocean Boulevard/Seaside Avenue at the highest volume locations. During the AM peak hour, 8 locations have model volumes within 10 percent of ground counts, and during the PM peak hour, 8 locations are within 25 percent. Truck validation differences are somewhat larger than auto or total vehicles in percentage terms. This is to be expected, as truck volumes are only 30 to 35 percent of auto volumes at most locations. Lower-volume facilities, including ramps, tend to have somewhat higher differences between ground counts and the model; however, many of those locations carry very few trips (less than 50 to 100 trips in many locations). For lower-volume streets and ramps, validation is based on parameters contained in the NCHRP Report 255.

Table G-1
Count Locations and Specifications Summary

Location	Type of Count	Time Period
Terminal Island Freeway and Ocean Boulevard intersection	Manual	6-9 AM, 2-6 PM
Pier S Avenue and Ocean Boulevard intersection	Manual	6-9 AM, 2-6 PM
Terminal Island Freeway SB Off-Ramp and New Dock Street intersection	Manual	6-9AM; 2-6 PM
Terminal Island Freeway NB On-Ramp and New Dock Street Intersection	Manual	6-9 AM, 2-6 PM
Pier S Avenue and New Dock Street intersection	Manual	6-9 AM, 2-6 PM
Navy Way and Seaside Avenue intersection	Manual	6-9 AM, 2-6 PM
Pico Avenue / Pier B Street and 9th Street intersection	Manual	6-9 AM, 2-6 PM
Pico Avenue and Pier C Street intersection	Manual	6-9 AM, 2-6 PM
Pico Avenue and Pier D Street intersection	Manual	6-9 AM, 2-6 PM
Pico Avenue and Broadway intersection	Manual	6-9 AM, 2-6 PM
Pico Avenue and Pier E Street intersection	Manual	6-9 AM, 2-6 PM
Pico Avenue WB Off-Ramp from Ocean Boulevard (one-lane)	24-Hour Machine	24-hour
Pico Avenue WB On-Ramp to Ocean Boulevard (one-lane)	24-Hour Machine	24-hour
Pico Avenue EB Off-Ramps from Ocean Boulevard (one-lane)	24-Hour Machine	24-hour
Pico Avenue. EB on-ramp to Ocean Boulevard (one-lane)	24-Hour Machine	24-hour
Gate 5 / Pier T Avenue WB Off-Ramp (one-lane)	24-Hour Machine	24-hour
SB SR 710 Connector Ramp to WB Ocean Boulevard (two-lane ramp)	24-Hour Machine	24-hour
NB SR 710 Connector Ramp from EB Ocean Boulevard (two-lane ramp)	24-Hour Machine	24-hour
Ocean Boulevard east of the Pico Avenue ramps, but west of the Harbor Scenic Drive On-Ramp	24-Hour Machine	24-hour

Source: Iteris, 2008.

To achieve acceptable validation results, multiple model runs were made for each peak hour, and a series of model adjustments were made. The adjustments included the following:

- Increasing or decreasing facility speeds and capacities on a segment-by-segment basis where assigned volumes where either too high or too low, with different adjustments made by peak hour as appropriate;
- Correcting the model network where errors in coding were detected;
- Adjusting the TAZ loading points to provide more accurate representation of travel patterns from local streets to the arterial system; and
- Refining the regional peak-hour trip tables to achieve the proper level of background traffic.

Year 2015 Model Development

A key task during development of the 2015 model for both ports was to generate 2015 trip ends based on SCAG's regional trip tables. Regional production and attraction of "person trips" and regional HDT trip tables were obtained from SCAG for 2005 and 2030. Use of the regional 2030 trip tables ensures that cumulative traffic from planned growth region wide is included in the model forecasts. The SCAG regional trip table for 2015 was interpolated between 2005 and 2030. The person trips were aggregated to the current Port Model's trip purposes and zone system. The trip distribution models were then run. Next, the person trips were converted to vehicle trips using the SCAG mode choice model. Time-of-day trip tables were generated using the SCAG peak period and peak-hour adjustment factors.

A second key task was development of port-specific trip tables for 2015 trips to and from port zones themselves. Use of the 2015 forecast trip tables ensures that cumulative traffic from planned growth in the vicinity of the ports and not included in the SCAG regional projections is included in the model forecasts. The port area peak-hour auto, bobtail, chassis, and container trip tables were generated based on the 2015 TEUs using the Quick Trip model. The total estimated TEU throughput for both ports for 2015 is approximately 27 million TEUs. For the peak month, this equates to approximately 2.5 million TEUs. The TEU throughput for each terminal was provided by the POLB. **Table G-2** summarizes the 2015 TEU throughput by terminal and the resultant truck and auto trips. Truck trips are disaggregated into bobtail, chassis, and container truck trips, representing the major types of truck trips in the ports. For both ports, the combined forecast 2015 trip generation totals for container terminals accounts for approximately 90 percent of port truck trips.

A third key task was to develop model roadway networks for the project conditions with and without the proposed bridge. New links were added to the network, and new lane configurations were coded in the model network based on the configuration with each condition. Finally, the full model, including post-processing, was run and traffic volume forecasts were generated.

Year 2030 Model Development

The first task during development of the 2030 model for both ports was to generate 2030 trip ends based on SCAG's regional trip tables. Regional production and attraction of "person trips" and regional HDT trip tables were obtained from SCAG for 2030. The person trips were aggregated to the current Port Model's trip purposes and zone system. The trip distribution models were then run. Next, the person trips were converted to vehicle trips, and time-of-day trip tables were generated.

The second task was development of port-specific trip tables for 2030 trips to and from port zones themselves. The port area peak-hour auto, bobtail, chassis, and container trip tables were generated based on the 2030 TEUs using the Quick Trip model. The total estimated TEU throughput for both ports for 2030 is approximately 42 million TEUs. For the peak month, this equates to approximately 3.8 million TEUs. The TEU throughput for each terminal was provided by the POLB. **Table G-3** summarizes the 2030 TEU throughput by terminal and the resultant truck and auto trips. Truck trips are disaggregated into bobtail, chassis, and container truck trips, representing the major types of truck trips in the ports. For both ports, the combined forecast 2030 trip generation totals for container terminals accounts for approximately 90 percent of port truck trips.

The third task was to develop model roadway networks for the project conditions with and without the proposed bridge. New links were added to the network, and new lane configurations were coded in the model network based on the configuration with each condition. Finally, the full model, including post-processing, was run, and traffic volume forecasts were generated.

Table G-2

2015 Peak Month Container Terminal Trip Generation Estimates

Year 2015		AM Peak Hour (8:00AM - 9:00AM)														
		Autos		Bobtail		Chassis		Container		Total Trucks			Total Vehicles		
Terminal	TEU	In	Out	In	Out	In	Out	In	Out	In	Out	Total	In	Out	Total
Pier A	166,252	135	135	85	56	26	13	120	94	232	163	395	367	298	664
Pier C	38,886	31	31	26	17	14	5	32	28	72	50	122	103	82	185
Pier DEF	200,420	162	162	82	49	11	9	129	86	221	144	365	383	307	690
Pier GJ	184,557	149	149	101	57	38	14	137	95	276	166	442	426	315	741
Pier J South	237,335	192	192	110	65	23	14	166	111	300	190	489	492	382	874
Pier S	91,664	74	74	46	30	13	7	66	51	124	88	213	199	163	361
Pier T	266,845	216	216	142	80	50	19	196	134	388	233	621	604	449	1,053
Total POLB	1,185,959	961	961	592	355	175	81	846	599	1,613	1,034	2,648	2,574	1,995	4,569
YML	213,496	173	173	116	69	43	17	158	115	317	200	517	490	373	863
Trapac	139,428	113	113	76	46	28	11	104	76	208	133	341	321	246	567
SSAT	57,641	47	47	39	26	21	8	47	42	106	76	183	153	123	276
TI East	149,922	121	121	69	42	14	9	104	72	188	123	310	309	244	553
TI West	186,948	151	151	96	57	30	13	135	96	260	165	426	412	317	729
Pier 300	197,156	160	160	82	49	7	9	133	86	221	144	365	381	304	685
Pier 400	329,755	267	267	136	79	10	14	221	139	367	233	600	634	500	1,134
Total POLA	1,274,346	1,032	1,032	613	368	152	81	903	626	1,668	1,075	2,742	2,700	2,107	4,807
Total Ports	2,460,305	1,993	1,993	1,205	722	327	162	1,749	1,225	3,281	2,109	5,390	5,274	4,102	9,376

Year 2015		MD Peak Hour (2:00PM - 3:00PM)													
		Autos		Bobtail		Chassis		Container		Total Trucks			Total Vehicles		
Terminal	TEU	In	Out	In	Out	In	Out	In	Out	In	Out	Total	In	Out	Total
Pier A	166,252	50	85	99	95	31	22	140	160	269	277	546	319	362	680
Pier C	38,886	12	20	30	30	16	9	37	49	83	88	171	95	107	202
Pier DEF	200,420	60	102	95	94	12	18	150	164	256	276	532	316	378	694
Pier GJ	184,557	55	94	117	112	44	27	159	187	320	327	647	376	421	797
Pier J South	237,335	71	121	128	121	27	25	192	207	347	353	700	418	474	892
Pier S	91,664	27	47	53	52	15	12	76	88	144	152	296	172	199	371
Pier T	266,845	80	136	165	156	58	37	228	260	450	453	903	530	589	1,119
Total POLB	1,185,959	356	605	687	660	203	151	981	1,114	1,870	1,925	3,795	2,226	2,529	4,756
YML	213,496	64	109	134	130	49	32	183	216	367	377	745	431	486	917
Trapac	139,428	42	71	88	86	33	21	120	144	241	252	493	283	323	606
SSAT	57,641	17	29	45	45	24	13	55	72	123	130	253	141	159	300
TI East	149,922	45	76	80	77	16	16	121	133	217	227	444	262	303	566
TI West	186,948	56	95	111	111	34	26	157	187	302	324	626	358	419	777
Pier 300	197,156	59	101	95	94	8	17	154	165	256	276	532	316	376	692
Pier 400	329,755	99	168	157	154	12	28	257	271	426	454	880	525	622	1,147
Total POLA	1,274,346	382	650	711	698	176	153	1,047	1,188	1,933	2,038	3,972	2,316	2,688	5,004
Total Ports	2,460,305	738	1,255	1,397	1,357	379	303	2,028	2,302	3,804	3,963	7,766	4,542	5,218	9,759

Year 2015		PM Peak Hour (4:00PM - 5:00PM)													
		Autos		Bobtail		Chassis		Container		Total Trucks			Total Vehicles		
Terminal	TEU	In	Out	In	Out	In	Out	In	Out	In	Out	Total	In	Out	Total
Pier A	166,252	125	243	53	78	17	18	76	132	146	229	374	270	471	742
Pier C	38,886	29	57	16	21	9	6	20	34	45	61	106	74	117	192
Pier DEF	200,420	150	293	51	66	7	13	81	115	139	194	333	289	487	776
Pier GJ	184,557	138	269	64	96	24	24	86	160	174	280	453	312	549	861
Pier J South	237,335	178	347	69	107	15	23	104	183	188	313	501	366	659	1,026
Pier S	91,664	69	134	29	36	8	8	41	61	78	105	183	147	239	386
Pier T	266,845	200	390	89	142	31	34	123	238	244	414	658	444	804	1,248
Total POLB	1,185,959	889	1,732	372	547	110	125	532	923	1,014	1,595	2,609	1,903	3,327	5,230
YML	213,496	160	312	73	108	27	26	99	180	199	314	513	359	625	984
Trapac	139,428	105	204	48	66	18	16	65	109	131	192	322	235	395	630
SSAT	57,641	43	84	24	31	13	9	30	50	67	89	156	110	174	284
TI East	149,922	112	219	43	60	9	13	66	103	118	176	294	230	395	625
TI West	186,948	140	273	60	78	19	18	85	132	164	228	392	304	501	805
Pier 300	197,156	148	288	51	66	4	12	83	116	139	194	333	287	482	769
Pier 400	329,755	247	481	85	111	6	20	139	194	231	325	556	478	806	1,285
Total POLA	1,274,346	956	1,861	385	519	95	114	567	884	1,048	1,518	2,565	2,004	3,378	5,382
Total Ports	2,460,305	1,845	3,592	757	1,066	205	239	1,099	1,807	2,062	3,113	5,175	3,907	6,705	10,612

Source: Iteris, 2008.

Table G-3

2030 Peak Month Container Terminal Trip Generation

Year 2030		AM Peak Hour (8:00AM - 9:00AM)															
		Autos		Bobtail		Chassis		Container		Total Trucks			Total Vehicles		
Terminal	TEU	In	Out	In	Out	In	Out	In	Out	In	Out	Total	In	Out	Total
Pier A	289,471	234	234	143	120	51	29	197	201	390	350	740	625	585	1,209
Pier C	52,962	43	43	33	26	17	7	40	41	90	75	165	133	118	251
Pier DEF	302,120	245	245	125	102	29	22	186	175	340	299	639	585	544	1,129
Pier GJ	293,839	238	238	160	138	70	35	208	226	438	399	837	676	637	1,313
Pier J South	385,840	313	313	152	124	17	24	242	217	410	364	775	723	677	1,400
Pier S	121,940	99	99	63	49	25	12	84	81	172	142	314	270	241	511
Pier T	402,402	326	326	215	177	91	45	282	291	589	513	1,102	915	839	1,754
Total POLB	1,848,574	1,497	1,497	890	736	301	174	1,238	1,233	2,429	2,143	4,572	3,926	3,640	7,566
YML	339,721	275	275	137	115	47	29	188	193	372	337	709	648	612	1,260
Trapac	205,005	166	166	82	66	28	16	113	110	223	192	416	389	358	748
SSAT	100,901	82	82	55	45	32	14	64	71	150	130	280	232	212	444
TI East	213,158	173	173	95	75	41	20	122	125	258	220	478	430	393	823
TI West	290,472	235	235	119	102	43	26	161	171	323	299	623	559	535	1,093
Pier 300	268,077	217	217	110	88	40	22	149	148	298	258	556	515	475	990
Pier 400	560,196	454	454	229	188	83	47	311	316	623	551	1,175	1,077	1,005	2,082
Total POLA	1,977,530	1,602	1,602	827	680	312	174	1,110	1,134	2,249	1,988	4,237	3,851	3,590	7,440
Total Ports	3,826,104	3,099	3,099	1,717	1,416	613	348	2,348	2,366	4,678	4,131	8,808	7,777	7,230	15,006

Year 2030		MD Peak Hour (2:00PM - 3:00PM)													
		Autos		Bobtail		Chassis		Container		Total Trucks			Total Vehicles		
Terminal	TEU	In	Out	In	Out	In	Out	In	Out	In	Out	Total	In	Out	Total
Pier A	289,471	87	148	166	164	59	39	228	274	452	478	930	539	626	1,165
Pier C	52,962	16	27	38	38	20	11	46	61	105	110	215	121	137	258
Pier DEF	302,120	91	154	145	138	34	30	215	235	394	403	797	485	557	1,042
Pier GJ	293,839	88	150	185	182	81	47	241	299	507	528	1,035	595	678	1,273
Pier J South	385,840	116	197	176	163	20	31	280	285	476	479	954	591	676	1,267
Pier S	121,940	37	62	73	73	28	18	98	121	199	213	411	235	275	510
Pier T	402,402	121	205	249	234	106	60	327	385	683	679	1,361	803	884	1,687
Total POLB	1,848,574	555	943	1,032	992	348	236	1,435	1,662	2,816	2,889	5,705	3,370	3,832	7,202
YML	339,721	102	173	159	155	54	39	218	259	432	453	885	534	627	1,160
Trapac	205,005	62	105	95	95	32	24	131	159	259	277	536	320	382	702
SSAT	100,901	30	51	64	64	37	20	74	102	174	185	360	205	237	441
TI East	213,158	64	109	110	110	47	29	142	181	299	320	619	363	429	792
TI West	290,472	87	148	138	138	50	34	187	231	375	403	778	462	551	1,013
Pier 300	268,077	80	137	127	121	46	30	173	202	346	353	698	426	489	916
Pier 400	560,196	168	286	266	250	96	62	361	418	723	730	1,453	891	1,016	1,907
Total POLA	1,977,530	593	1,009	959	931	362	238	1,287	1,552	2,607	2,722	5,329	3,200	3,730	6,930
Total Ports	3,826,104	1,148	1,951	1,990	1,923	710	474	2,722	3,213	5,423	5,611	11,033	6,570	7,562	14,132

Year 2030		PM Peak Hour (4:00PM - 5:00PM)													
		Autos		Bobtail		Chassis		Container		Total Trucks			Total Vehicles		
Terminal	TEU	In	Out	In	Out	In	Out	In	Out	In	Out	Total	In	Out	Total
Pier A	289,471	217	423	90	118	32	28	124	198	245	345	590	462	767	1,230
Pier C	52,962	40	77	21	26	11	8	25	42	57	76	133	96	154	250
Pier DEF	302,120	227	441	79	118	18	26	117	202	214	346	560	440	787	1,228
Pier GJ	293,839	220	429	100	139	44	36	130	229	275	404	679	495	833	1,328
Pier J South	385,840	289	563	95	151	11	29	152	264	258	444	701	547	1,007	1,554
Pier S	121,940	91	178	39	51	15	13	53	84	108	148	256	199	326	525
Pier T	402,402	302	588	135	223	57	57	177	368	370	649	1,019	672	1,236	1,908
Total POLB	1,848,574	1,386	2,699	559	828	189	196	778	1,388	1,526	2,412	3,938	2,912	5,111	8,023
YML	339,721	255	496	86	115	29	29	118	192	234	336	570	489	832	1,321
Trapac	205,005	154	299	52	67	17	17	71	113	140	196	337	294	496	790
SSAT	100,901	76	147	34	44	20	14	40	71	94	129	223	170	276	446
TI East	213,158	160	311	59	77	26	20	77	127	162	225	387	322	536	858
TI West	290,472	218	424	75	97	27	24	101	163	203	284	487	421	708	1,129
Pier 300	268,077	201	391	69	105	25	26	94	176	187	307	494	389	698	1,087
Pier 400	560,196	420	818	144	226	52	57	196	378	392	661	1,053	812	1,479	2,291
Total POLA	1,977,530	1,483	2,887	520	732	196	187	697	1,220	1,413	2,138	3,551	2,896	5,025	7,922
Total Ports	3,826,104	2,870	5,586	1,079	1,560	385	382	1,475	2,608	2,939	4,550	7,489	5,809	10,136	15,945

Source: Iteris, 2008

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