

Appendix C2
Rail Grade Crossing Analysis

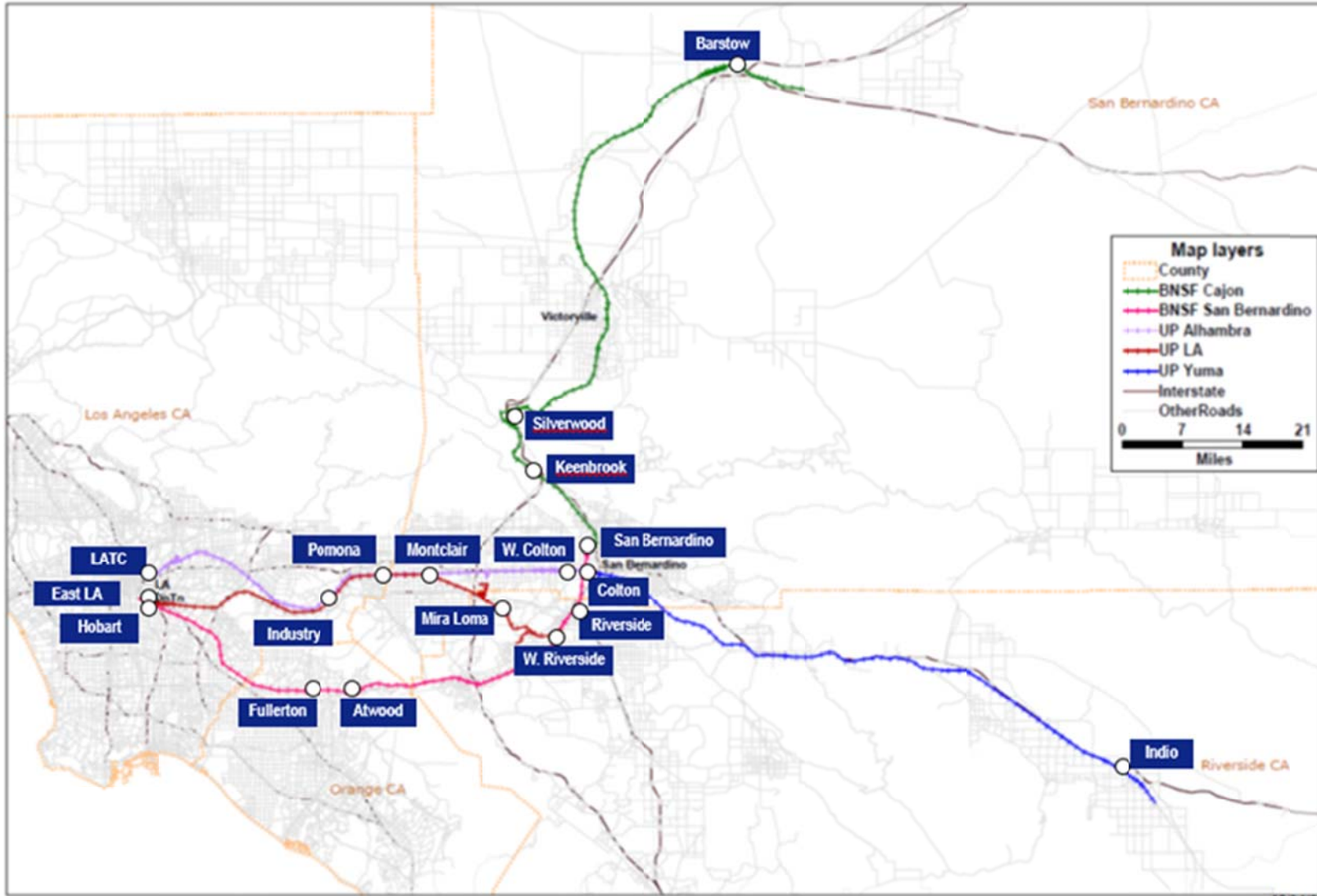
C2.1 Rail Transportation Setting

The Ports of Los Angeles and Long Beach are served by two Class I railroads: Union Pacific Railroad (UP) and the Burlington Northern Santa Fe Railway (BNSF). Pacific Harbor Line, Inc. (PHL) is a rail switching company that is responsible for building the trains that the mainline rail companies will transport outside the Port Complex, and provides rail switching, maintenance, and dispatching services within the harbor area. Rail traffic between the Ports and the railroads' main lines uses the Alameda Corridor, which was completed in 2002 and eliminated all at-grade road-rail crossings. Those mainlines begin near downtown Los Angeles and head east out of the region through the Inland Empire (San Bernardino and Riverside counties and inland portions of Orange and Los Angeles counties (Figure C2-1).

Between downtown Los Angeles and Colton (near San Bernardino), trains hauling marine containers use the BNSF San Bernardino Subdivision, the UP Los Angeles Subdivision, or the UP Alhambra Subdivision. The UP Los Angeles Subdivision terminates at West Riverside Junction where it joins the BNSF San Bernardino Subdivision. The BNSF San Bernardino Subdivision continues north of Colton Crossing and transitions to the BNSF Cajon Subdivision. The Cajon line continues north to Barstow and Daggett, and then east toward Needles and beyond. UP trains exercise trackage rights over the BNSF Subdivision from West Riverside Junction to San Bernardino and over the Cajon Subdivision from San Bernardino to Daggett, which is a short distance east of Barstow. The BNSF main lines are mostly double-tracked but there are substantial triple-track segments. The UP main lines include both single-track and double-track segments.

The Class I railroads operate several intermodal railyards in the region to handle containers (both marine and domestic) and trailers. BNSF's facilities are Hobart and Commerce Yards (in the City of Commerce, near downtown Los Angeles), and San Bernardino Yard. The UP's facilities are East Los Angeles Yard (near downtown Los Angeles), Los Angeles Transportation Center (LATC), City of Industry, and the Intermodal Container Transfer Facility (ICTF) near the south end of the Alameda Corridor.

Figure C2-1: Southern California Freight Railroad Lines



In March 2013, the Los Angeles Harbor Commission certified the Final EIR and approved the Southern California International Gateway (SCIG) intermodal yard, a near-dock facility that was designed to increase the efficiency and competitiveness of moving containerized cargo through the Ports of Los Angeles and Long Beach. SCIG would initially handle approximately 570,800 TEUs per year, and reach its maximum capacity of 2,800,000 TEUs per year by 2023. The facility would be built and operated by the BNSF on a 185-acre site approximately four miles north of the San Pedro Bay Port Complex. The SCIG project would divert intermodal cargo from BNSF's Hobart Yard near downtown Los Angeles, thereby eliminating approximately 1,300,000 truck trips annually along a 24-mile stretch of the Long Beach (I-710) Freeway. The project has been the subject of legal challenge since its approval, and it is not clear when, if ever, it will be built.

In December 2007, Union Pacific submitted to the ICTF Joint Powers Authority (ICTF-JPA) an Application for Development Project (ADP) to modernize the ICTF intermodal yard. The proposed modernization would include the construction of additional working rail tracks, the construction of a new gate facility, the improvement of existing gate facilities, and additional parking. The proposed Project would more than double the throughput capacity of the ICTF from 725,000 to 1.5 million containers per year. The project has been delayed indefinitely, and at this point does not have an expected completion date.

Because of the uncertainty concerning the SCIG project and the ICTF expansion project, the rail analysis in this Draft SEIR, considered the rail transportation setting in the future both with and without SCIG intermodal yard and ICTF intermodal yard modernization. These future scenarios would have the same total on-dock and total off-dock direct intermodal demand in TEUs (intact marine containers from/to ports that are not transloaded). However, in the scenario without SCIG project and ICTF modernization project, the off-dock direct intermodal demand would be higher at off-dock intermodal yards in Los Angeles downtown area than in the scenario with SCIG project and ICTF modernization project.

Geographic Study Rail Lines and At-Grade Crossings

The geographic study area for the rail analysis includes those at-grade crossings that could be affected by the Revised Project. The existing and projected increase in rail traffic from the China Shipping Terminal would access all of the railroads' mainlines; therefore, the geographic study area includes the following five rail mainlines:

- BNSF San Bernardino Subdivision from Hobart and Commerce Yards to San Bernardino,
- BNSF Cajon Subdivision from San Bernardino to Barstow,
- UP Alhambra Subdivision from LATC to Colton Crossing,
- UP Los Angeles Subdivision from ELA to West Riverside Junction, and
- UP Yuma Subdivision from Colton Crossing to Indio.

BNSF at-grade crossings between Barstow and the Nevada border and UP at-grade crossings between Indio and Arizona border are in rural areas with low traffic volumes (typically less than 5,000 average daily trips) and therefore are not included in the geographic study. Additionally, the Alameda Corridor is used to transport cargo to downtown railyards, which eliminates 200 rail/street crossings within the San Pedro,

Wilmington, Long Beach, and other communities between the Port Complex and downtown Los Angeles.

There are no at-grade crossings on UP Mojave Subdivision between West Colton and Silverwood. The Alameda Corridor eliminated all of the at-grade crossings between the Ports and the intermodal yards on Washington Boulevard in the Cities of Vernon and Commerce (BNSF's Hobart and Commerce Yards and UP's ELA). On the UP and BNSF rail lines east of these yards, many railway-roadway grade separations have been constructed, but in 2013 about 170 at-grade crossings remain in the geographic study area: 56 of them are along the BNSF San Bernardino Subdivision, 13 along BNSF Cajon Subdivision, 38 along UP Alhambra Subdivision, 40 along UP Los Angeles Subdivision, and 20 along UP Yuma Subdivision. In the Pomona/Montclair area, the UP Alhambra and Los Angeles Subdivisions are close parallel lines, at-grade crossings are pairwise separated by a distance of a few hundred feet (all under about 500 feet, and most commonly under about 100 feet); which results in additive delays to vehicular traffic on the crossing streets. Thus, this rail analysis evaluated the two lines in this area as 10 effective at-grade crossings on one railroad corridor.

In addition to the at-grade crossings on the five rail mainlines, the rail impacts were also evaluated for an at-grade crossing at Henry Ford Avenue (Figure C2-2). This is a north-south, six-lane roadway extending from Anaheim Street on the north to the Dominguez Channel on the south. The street crosses east-west tracks that provides access to the West Basin of the Port of Los Angeles. The railroad crossing is a single east-west track that provides access to the West Basin Intermodal Container Transfer Facility (WBICTF) intermodal yard of the Port of Los Angeles.

Rail Volumes Estimation Methodology for At-Grade Crossings on Rail Mainlines

Average daily total train volumes under 2014 baseline, 2045 conditions, and those added by the Revised Project were estimated for at-grade crossings on the five rail mainlines. The baseline condition represents the rail transportation demand in 2014. The cumulative condition includes trains added by the Revised Project and growth in all other background trains up to 2045. The rail transportation demand was estimated in three steps as follows:

- The number of peak-month average daily intermodal (container) trains by length was estimated for each intermodal yard using a tool called "Train Builder" developed by Cambridge Systematics for the San Pedro Bay Ports.
- Train Builder allocated the intermodal trains by intermodal yard to specific segments of track.
- The intermodal trains were combined with segment-level volume estimates derived from 2010 data and 2035 projections for average daily non-intermodal freight and passenger trains developed by Dr. Robert Leachman as part of the 2011 Regional Rail Simulation Study for Southern California Association of Governments (SCAG) to estimate average daily total train volumes. These data and projections were also used in the 2013 Port of Los Angeles' Port Master Plan Update and 2016 SCAG Regional Transportation Plan.

Train Builder used the following data for estimating peak-month average daily intermodal train volumes:

Figure C2-2: At-Grade Crossing at Henry Ford Avenue



Source: Google Maps

- Detailed annual and peak-month container lifts data and projections for marine terminals at San Pedro Bay Ports;
- Additional throughput of the Revised Project;
- Detailed annual container lifts data and projections for the Ports' on-dock intermodal yards;
- Revised Project-added throughput for the West Basin Container Terminal (WBCT) on-dock intermodal yard and off-dock intermodal yards;
- Detailed annual lifts data and projections for off-dock intermodal yards containers, with markets including:
 - direct intermodal containers from the Ports (intact containers that are not transloaded);
 - transloaded containers (cargo that has been first taken out of 40-foot containers at a warehouse and then placed into 53-foot domestic containers before arriving at the intermodal yard); and
 - "pure" domestic cargo and empty containers in either domestic 53-foot containers or trailers (cargo that has not passed through the Ports);

Train Builder used the following parameters for estimating peak-month average daily intermodal train volumes:

- annual lifts handled by individual yards;

- marine-terminal-specific lifts-to-TEUs conversion factor;
- monthly peaking factor;
- average rail car length (depends on the mix of cars that make up the trains);
- locomotive length and number per train;
- slot utilization (percentage of rail car capacity actually used by containers); for example, since a five-well rail car can carry 10 containers, if only nine containers are loaded onto the car, then the slot utilization is 90 percent;
- length distribution of trains both overall and at the intermodal railyard (WBICTF) serving the China Shipping and Yang Ming terminals (percentage of trains, including locomotives, in each of several defined length categories); and
- yard-to-rail segment allocation matrix.

For each intermodal yard and each type of market (direct intermodal, transload, pure domestic, and non-intermodal), peak-month average daily trains were estimated. Train volumes were then allocated to specific railroad tracks from downtown Los Angeles to Indio and Barstow. For BNSF, 100 percent of the train volumes were assigned to the BNSF San Bernardino and Cajon Subdivisions. For UP, 50 percent of trains were assigned to the Alhambra Subdivision and 50 percent to the Los Angeles Subdivision. Exceptions to that rule are UP trains loaded at the COI yard, which must use the UP Alhambra Subdivision, and automobile trains loaded at the Mira Loma Yard, which must use the UP Los Angeles Subdivision. UP trains on the Los Angeles Subdivision also use the BNSF San Bernardino Subdivision between West Riverside and Colton Crossing. Beyond the Colton Crossing, it was assumed that 85 percent of the UP trains would use the Yuma Subdivision to the east and 15 percent would use the BNSF Cajon Subdivision to the north between Barstow and Keenbrook. Approximately 10 percent of the UP volumes would use the BNSF Cajon Subdivision between Keenbrook and San Bernardino, and five percent would use the UP Mojave Subdivision between Keenbrook and West Colton.

The increase in the CS Terminal's direct intermodal trains at intermodal yards between 2014 baseline and 2045 cumulative conditions was used to estimate the Revised Project added trains.

Average daily non-intermodal freight and passenger train volumes under 2014 baseline condition were derived using interpolation between Dr. Leachman's 2010 data and 2035 projections. Average daily non-intermodal freight and passenger train volumes under 2045 cumulative condition, on the other hand, were assumed to be the same as the 2035 projections.

P.M. peak-hour (4-5 P.M.) rail volumes were required to conduct the rail analysis. The P.M. peak hour passenger train volumes were derived from the average daily Metrolink and Amtrak train volumes using existing actual distribution of Metrolink and Amtrak passenger train schedules over a weekday. The P.M. peak-hour freight train volumes were obtained by uniformly distributing daily total freight trains over 24 hours of the day. To validate the assumption that freight trains are uniformly distributed over 24 hours, actual train volumes by time of day were acquired from the ACTA and the BNSF Railway. Because the actual distributions by time period (Tables C2-1 and C2-2) were reasonably close to the uniform distribution shown in Table C2-3, a uniform distribution of freight train volumes for 2014 baseline condition was considered to be a reasonable assumption. Accordingly, the P.M. peak hourly factor for freight trains was estimated as 16.7 percent divided by 4 (the number of hours in the entire P.M. peak period), that is,

4.2 percent. The hourly factors for passenger and freight trains were kept the same under 2014, 2045 cumulative, and Revised Project conditions.

Table C2-1: Alameda Corridor Train Volume by Time of Day, 2010

Time Period	Time of Day	Average No. of Trains per Period*	Percent of Total Daily
A.M. Peak Period	6:00 A.M. to 9:00 A.M.	5.0	12.9 percent
Midday	9:00 A.M. to 3:00 P.M.	8.2	21.3 percent
P.M. Peak Period	3:00 P.M. to 7:00 P.M.	5.5	14.4 percent
Night	7:00 P.M. to 6:00 A.M.	19.9	51.5 percent
Total Daily		38.6	100.0 percent

Source: ACTA, 2010 (*Daily average for last week of each quarter in 2010)

Table C2-2: BNSF Train Volume at Highgrove in Riverside County by Time of Day, 2010

Time Period	Time of Day	Average No. of Trains per Period*	Percent of Total Daily
A.M. Peak Period	6:00 A.M. to 9:00 A.M.	10	14.1 percent
Midday	9:00 A.M. to 3:00 P.M.	16	22.2 percent
P.M. Peak Period	3:00 P.M. to 7:00 P.M.	10	14.3 percent
Night	7:00 P.M. to 6:00 A.M.	35	49.4 percent
Total Daily		71	100.0 percent

Source: BNSF, 2011 (*Measured over 62 days, July 1-31, 2008 and August 1-31, 2010)

Table C2-3: Time Periods of the Day

Time Period	Time of Day	No. of Hours	Percent of 24 Hours (Uniform Distribution)
A.M. Peak Period	6:00 A.M. to 9:00 A.M.	3	12.5 percent
Midday	9:00 A.M. to 3:00 P.M.	6	25.0 percent
P.M. Peak Period	3:00 P.M. to 7:00 P.M.	4	16.7 percent
Night	7:00 P.M. to 6:00 A.M.	7	45.8 percent
Total Daily		24	100.0 percent

This study includes two separate analyses. In the first, the effects of the Revised Project's trains on traffic delay is considered by comparing conditions in 2014 without the Revised Project (the 2014 Baseline) to conditions in 2014 with the Revised Project, and then comparing conditions in 2045 with the Revised Project to the 2014 Baseline. This is the analysis required by CEQA.

In the second analysis, the effects of the Revised Project are evaluated by examining the future (2045) condition with and without the Revised Project. In this second analysis, the basis for comparison is the Future Baseline, which consists of the conditions in 2045 with the cumulative effects of forecasted growth in population and vehicular and train traffic, and probable infrastructure improvements (grade separations, additional rail lines, etc.). The Future Baseline is then compared to 2045 conditions with the Revised Project added; i.e., with the additional trains generated by the Revised Project, including its increased throughput relative to the Approved Project.

Rail Volumes Estimation Methodology for Henry Ford Avenue At-Grade Crossing

2014 Baseline: The average total train blockage time in the P.M. peak hour (4-5 P.M.) was estimated as 4.3 minutes using six weeks (May 1-June 17, 2016) of crossing controller data. This information was combined with an average train length assumption of 3,100 feet to estimate P.M. peak-hour train volumes under 2014 baseline conditions.

Future (2045 Cumulative) Baseline: The average total train blockage time in the P.M. peak hour was estimated as 7.7 minutes, based on a simulation projection of the rail system under 2045 conditions. This was combined with an average train length assumption of about 4,400 feet to estimate P.M. peak-hour train volumes under 2045 cumulative conditions.

The trains added by the Revised Project at the Henry Ford Avenue at-grade crossing were estimated using a very similar methodology to that for at-grade crossings on the five rail mainlines. However, there are a few differences. Based on empirical evidence collected by the Port of Los Angeles, UP's ICTF intermodal yard located near the Port was assumed to "cut" full length (8,831 feet in the 2014 baseline condition, 9,985 feet in the 2045 cumulative condition) on-dock direct intermodal trains moving south into the WBICTF, as well as UP's westbound on-dock direct intermodal trains, into shorter length (2,000 feet) trains. This activity increases train volumes at the Henry Ford Avenue at-grade crossing above that seen on the five rail mainlines. In addition, there are no off-dock intermodal trains crossing Henry Ford Avenue as all off-dock intermodal yards are located north of this at-grade crossing. Finally, the train numbers added by the Revised Project in the P.M. peak hour were estimated from the daily total rail volume estimate using the crossing controller data, which indicated that the peak hour rail volume formed 5.8 percent of the daily total rail volume. In other words, uniform distribution of rail volumes over a day was not assumed.

Roadway Volumes Estimation Methodology for At-Grade Crossings on Rail Mainlines

San Pedro Bay Ports collected average daily total vehicular traffic volumes for at-grade crossing streets on the five rail mainlines over a wide period of time, 2000 to 2013. To project average daily traffic volumes under 2014 baseline and 2045 cumulative conditions, the ports also identified annualized growth rates.

For traffic data belonging to the period 2000-2008, an average annualized growth rate of 1.0 percent based on California Public Utilities Commission (CPUC) data was applied to estimate at-grade crossing roadway traffic in 2008. For traffic data on or after 2008 and for 2008 traffic estimates, average annualized growth rates by rail subdivision and by county (Table C2-4) were used to project at-grade crossing roadway traffic under 2014 baseline condition and up to 2035. For the period 2035-2045, a nominal average annualized growth rate of 1.0 percent was assumed and applied to 2035 traffic estimates to project at-grade crossing roadway traffic under 2045 cumulative condition.

Table C2-4: Annualized Growth Rates for At-Grade Crossing Roadway Traffic by Rail Subdivision and County, 2008-2035

Rail Subdivision	County	Annualized Growth Rate for At-Grade Crossing Roadway Traffic
BNSF Cajon	San Bernardino	1.31%
BNSF San Bernardino	San Bernardino	1.76%
	Riverside	1.38%
	Orange	0.41%
	Los Angeles	0.32%
UP Los Angeles	San Bernardino	1.43%
	Riverside	1.48%
	Los Angeles	0.53%
UP Alhambra	San Bernardino	1.29%
	Los Angeles	0.55%
UP Yuma	Riverside	1.95%

Source: 2008 SCAG Regional Transportation Plan.

Time-of-day shares of daily total traffic volumes by county were estimated using an average of traffic counts and traffic volume forecasts by county in the 2008 SCAG regional transportation plan (RTP). The time-of-day shares by county were then divided by number of hours in each time period to estimate hourly factors by county (Table C2-5). The hourly factors for roadway volumes were kept the same under 2014 and 2045 cumulative conditions.

Table C2-5: Hourly Factors Applied to Average Daily Traffic (ADT), by County

Time Period	Time of Day	San Bernardino County	Riverside County	Orange County	Los Angeles County
A.M. Peak Period	6:00 A.M. to 9:00 A.M.	0.0687	0.0661	0.0693	0.0686
Midday	9:00 A.M. to 3:00 P.M.	0.0450	0.0492	0.0461	0.0462
P.M. Peak Period	3:00 P.M. to 7:00 P.M.	0.1054	0.0873	0.0929	0.0945
Night	7:00 P.M. to 6:00 A.M.	0.0093	0.0143	0.0131	0.0126

Source: 2008 SCAG Regional Transportation Plan.

Roadway Volumes Estimation Methodology for Henry Ford Avenue At-Grade Crossing

For Henry Ford Avenue at-grade crossing, the PortTAM travel demand model assignment outputs were used to collect P.M. period (3-7 P.M.) total traffic volumes under 2014 baseline condition and 2045 cumulative condition. The assignment outputs were converted to P.M. peak hour (4-5 P.M.) total traffic volumes under 2014 baseline condition and 2045 cumulative condition, by distributing the peak period traffic volumes uniformly over the four-hour time period, that is dividing the assignment outputs by four.

Intermodal TEUs and Rail Volumes From the China Shipping Terminal In the 2014 Baseline

Direct intermodal containers to and from the CS Terminal in 2014 amounted to 263,712 TEUs, of which 207,998 TEUs were handled at the on-dock intermodal yard facility and 55,714 TEUs were handled at the off-dock intermodal yard facilities. The peak-month average daily rail volume at this yard from the CS Terminal in 2014 was estimated as 1.8 trains, which includes 0.9 8,831-foot (full-length) trains and 0.8 2,000-foot (cut) trains. North of the ICTF intermodal yard, all on-dock trains were full-length trains, and their peak month average daily rail volume in 2014 was estimated as 1.1 trains.

The off-dock direct intermodal peak month average daily rail volume relating to China Shipping Terminal in 2014 was estimated as 0.35 trains, which includes 0.11 10,000-foot trains, 0.14 8,000-foot trains and 0.11 6,000-foot trains.

Intermodal TEUs and Rail Volumes Added By the Revised Project in 2045

As a result of the Revised Project, direct intermodal containers to and from the CS Terminal would increase by 296,794 TEUs over the 2014 baseline condition to become 560,506 TEUs by 2045. Of that total, 433,016 TEUs would be handled at the on-dock intermodal yard facility and 127,490 TEUs would be handled at the off-dock intermodal yard facilities. The growth in on-dock direct intermodal demand is supported by the expansion and modernization of the WBICTF intermodal yard proposed as part of a separate project (Berths 121-136 [Yang Ming] Container Terminal Improvements Project). The yard expansion would also enable longer trains to be built, so that the length of a full train would increase from 8,831 feet to 9,985 feet.

The peak month average daily rail volume from the Revised Project at the WBICTF in 2045 was estimated as 3.9 trains, which includes 1.6 9,985-foot (full) trains and 2.3 2,000-foot (cut) trains. North of the ICTF intermodal yard, all on-dock trains would be full-length trains, and their peak month average daily rail volume in 2045 was estimated as 2.1 trains.

The off-dock direct intermodal peak month average daily rail volume generated by the China Shipping Terminal in 2045 under without SCIG project and ICTF modernization project scenario was estimated as 0.74 trains, which includes 0.24 10,000-foot trains and 0.50 8,000-foot trains. With the SCIG and ICTF modernization projects, the corresponding rail volume in 2045 was estimated as 0.77 trains, which includes 0.13 10,000-foot trains and 0.64 8,000-foot trains.

At the Henry Ford Avenue at-grade crossing, located south of the ICTF intermodal yard, the Revised Project would add 2.1 trains, which includes increases of 1.57 9,985-foot long trains and 1.50 2,000-foot long trains, and a decrease of 0.92 8,831-foot long trains.

North of the ICTF intermodal yard, the Revised Project under without SCIG project and ICTF modernization project scenario was estimated to add 1.4 trains, which includes increases of 0.14 10,000-foot trains, 2.10 9,985-foot trains and 0.35 8,000-foot trains, and decreases of 1.14 8,831-foot trains and 0.11 6,000-foot trains. The Revised Project under with SCIG project and ICTF modernization project scenario was estimated to add 1.4 trains, which includes increases of 0.02 10,000-foot trains, 2.10 9,985-foot trains and 0.50 8,000-foot trains, and decreases of 1.14 8,831-foot trains and 0.11 6,000-foot trains.

The reason for the differences in train volumes under with and without SCIG project and ICTF modernization project scenarios is that the maximum train length at the SCIG

facility would be 8,000 feet while other off-dock intermodal yards (including ICTF intermodal yard) can handle longer (10,000-foot) trains. To transport a fixed amount of cargo, the number of trains that would be generated/received at the SCIG intermodal yard would be somewhat higher than at other off-dock intermodal yards.

The SCIG and ICTF projects would result in a shift of off-dock direct intermodal container lifts from the downtown railyards to SCIG and ICTF. However, this shift would not result in any changes in train volumes at at-grade crossings, as the majority of the study at-grade crossings are located east of downtown Los Angeles, and the Henry Ford Avenue crossing is located south of the ICTF. Hence, the rail volumes for at-grade crossings on UP rail mainlines and at the Henry Ford Avenue crossing are the same under both scenarios.

Year 2014 Baseline Total Intermodal TEUs and Rail Volume Results

In 2014, total direct intermodal containers to and from the marine terminals in the San Pedro Bay ports amounted to 5,557,738 TEUs, of which 4,085,067 TEUs were handled at the on-dock intermodal yard facilities and 1,472,671 TEUs were handled at the off-dock intermodal yard facilities. The off-dock intermodal yard facilities also handled 2,106,819 TEUs of transloaded intermodal containers and 3,410,929 TEUs of “pure domestic” intermodal containers in 2014.

North of the ICTF, the total on-dock intermodal peak month average daily rail volume in 2014 was estimated as 25.5 trains, which includes 7.0 10,000-foot trains, 2.2 8,831-foot trains, 9.3 8,000-foot trains and 7.0 6,000-foot trains. The total off-dock direct intermodal peak month average daily rail volume in 2014 was estimated as 40.3 trains, which includes 11.2 10,000-foot trains, 20.9 8,000-foot trains and 8.2 6,000-foot trains. The total of 40.3 trains includes 9.3 direct intermodal, 9.9 transloaded intermodal and 21.0 “pure domestic” intermodal trains.

Year 2045 Cumulative Total Intermodal TEUs and Rail Volume Results

In 2045, direct intermodal containers to and from the terminal is forecasted at 11,621,610 TEUs by 2045, of which 9,154,058 TEUs would be handled at the on-dock intermodal yard facilities and 2,467,552 TEUs would be handled at the off-dock intermodal yard facilities. The off-dock intermodal yard facilities would also handle 5,266,179 TEUs of transloaded intermodal containers and 7,541,581 TEUs of “pure domestic” intermodal containers in 2045.

North of the ICTF intermodal yard, the total on-dock intermodal peak month average daily rail volume in 2045 was estimated as 25.5 trains, which includes 7.0 10,000-foot trains, 2.2 8,831-foot trains, 9.3 8,000-foot trains and 7.0 6,000-foot trains. The total off-dock direct intermodal peak month average daily rail volume in 2045 under without SCIG project and ICTF modernization project scenario was estimated as 68.4 trains, which includes 12.6 12,000-foot trains, 22.6 10,000-foot trains and 33.2 8,000-foot trains. The total of 68.4 trains includes 14.3 direct intermodal, 18.7 transloaded intermodal and 35.3 “pure domestic” intermodal trains. With the SCIG and ICTF projects, the total off-dock direct intermodal peak month average daily rail volume in 2045 was estimated as 68.9 trains, which includes 12.6 12,000-foot trains, 20.3 10,000-foot trains and 36.1 8,000-foot trains. The total of 68.9 trains includes 14.9 direct intermodal, 18.7 transloaded intermodal and 35.3 “pure domestic” intermodal trains.

As mentioned above, although the SCIG and ICTF projects would cause off-dock direct intermodal container lifts to shift from the downtown Los Angeles railyards to SCIG and ICTF, that shift would not result in any changes in train volumes at at-grade crossings.

Year 2014 Baseline and Year 2045 Cumulative At-Grade Crossing Rail and Roadway Volumes and Revised Project-Added Rail Volumes

China Shipping Terminal related on-dock and off-dock direct intermodal trains along with all of the background intermodal trains were allocated to specific segments of tracks using “Train Builder” and combined with non-intermodal freight and passenger trains. Tables C2-6 through C2-11 show the estimates of average daily train volumes and average daily traffic volumes at study at-grade crossings on the five rail mainlines under 2014 baseline, 2045 cumulative and Revised Project conditions.

Table C2-12 shows P.M. peak-hour train and traffic volumes at the Henry Ford Avenue at-grade crossing under 2014 baseline, 2045 cumulative, and Revised Project conditions.

C2.2 Rail Analysis Methodology

Rail impacts of the Revised Project were assessed by quantifying differences in vehicular delays due to at-grade crossings between baseline conditions and baseline conditions plus the Revised Project.

The LAHD has developed a standard methodology for evaluating potential transportation impacts of port development projects on existing at-grade railroad crossings.

Specifically, cargo terminal or intermodal yard projects potentially generate additional freight train movements that could result in additional “gate down” time and motorist delays at existing at-grade crossings.

Peak Hour Average Vehicular Delay Calculation Methodology

Impacts of the Revised Project were analyzed in terms of average vehicle delay at the study area at-grade crossings in the P.M. peak commute hour of 4-5 P.M. Average vehicle delay is calculated by dividing the total vehicle delay caused by trains passing a crossing during the P.M. peak hour by the number of vehicles passing the at-grade crossing in that hour. This is a universally accepted approach for evaluating vehicle delay at signalized intersections consistent with methodologies contained in the 2010 HCM. At-grade crossings operate similarly to traditional signalized intersections, where some vehicles experience no delay (during a green phase or when the gate is up) and others are stopped for a certain period of time (during a red phase or when a train is crossing). While different approaches could be considered, the LOS procedures for signalized intersections were identified as the most logical and consistent approach for assessing the significance of average vehicle delays at at-grade crossings.

Per the 2010 HCM, LOS D includes delays of up to 55 seconds. LOS D is an acceptable LOS at signalized intersections in most urban areas in the Southern California region. Anything exceeding this threshold is generally considered unacceptable. LOS is measured using P.M. peak hour average vehicle delay (PHAVD). PHAVD is based on the train and vehicular volumes and calculated using the following data:

- P.M. peak hour vehicle arrival and departure rates (vehicles per minute per lane);
- gate down time (function of speed and length of train, width of intersection, clearance distance, and lead and lag times of gate operation); and
- total number of vehicles arriving per period.

Table C2-6: BNSF San Bernardino Subdivision, from Hobart Yard to San Bernardino, Rail and Roadway Average Daily Volumes for Study At-Grade Crossings, 2014 Baseline, 2045 Cumulative, and Revised Project

Boundary/Junction – Street	# of Lanes	2014 Baseline Average Daily Traffic (Vehicles/Day)	2014 Baseline Average Daily Trains (Trains/Day)	2045 Cumulative Average Daily Traffic (Vehicles/Day)	2045 Cumulative Average Daily Trains (Trains/Day) Without SCIG and ICTF	2045 Cumulative Average Daily Trains (Trains/Day) With SCIG and ICTF	Revised Project Added Average Daily Trains (Trains/Day) Without SCIG and ICTF	Revised Project Added Average Daily Trains (Trains/Day) With SCIG and ICTF
San Bernardino MP 0.0								
Laurel Street	2	2,340	60.3	3,730	109.4	110.0	0.6	0.7
Olive Street	2	2,790	60.3	4,440	109.4	110.0	0.6	0.7
E Street	2	730	60.3	1,170	109.4	110.0	0.6	0.7
H Street	2	1,470	60.3	2,330	109.4	110.0	0.6	0.7
Valley Boulevard	2	11,000	60.3	17,510	109.4	110.0	0.6	0.7
Colton Crossing MP 3.2								
Highgrove Junction MP 6.1 (Connection to Perris via MetroLink)								
Main Street	2	2,680	70.2	4,260	161.0	161.6	1.0	1.0
Riverside-San Bernardino County Line MP 6.41								
Center Street	4	6,360	70.2	9,360	161.0	161.6	1.0	1.0
Iowa Avenue	4	23,440	70.2	34,500	161.0	161.6	1.0	1.0
Palmyrita Avenue	2	3,840	70.2	5,650	161.0	161.6	1.0	1.0
Chicago Avenue	4	13,880	70.2	20,430	161.0	161.6	1.0	1.0
Spruce Street	4	7,410	70.2	10,910	161.0	161.6	1.0	1.0
3rd Street	4	11,160	70.2	16,420	161.0	161.6	1.0	1.0
Mission Inn (7th Street)	4	5,460	70.2	8,030	161.0	161.6	1.0	1.0
Riverside Yard and Amtrak Station MP 10.02-10.16								
Cridge Street	2	3,850	99.1	5,670	173.0	173.6	1.0	1.0
West Riverside Junction MP 10.6 (Connection to UP Los Angeles Sub)								
Jane Street	2	2,210	65.3	3,260	118.9	119.5	0.6	0.6
Mary Street	4	12,220	65.3	17,990	118.9	119.5	0.6	0.6
Washington Street	2	8,490	65.3	12,490	118.9	119.5	0.6	0.6
Madison Street	4	16,090	65.3	23,670	118.9	119.5	0.6	0.6
Jefferson Street	2	8,390	65.3	12,350	118.9	119.5	0.6	0.6
Adams Street	4	17,920	65.3	26,370	118.9	119.5	0.6	0.6
Jackson Street	4	8,000	65.3	11,770	118.9	119.5	0.6	0.6

Boundary/Junction – Street	# of Lanes	2014 Baseline Average Daily Traffic (Vehicles/Day)	2014 Baseline Average Daily Trains (Trains/Day)	2045 Cumulative Average Daily Traffic (Vehicles/Day)	2045 Cumulative Average Daily Trains (Trains/Day) Without SCIG and ICTF	2045 Cumulative Average Daily Trains (Trains/Day) With SCIG and ICTF	Revised Project Added Average Daily Trains (Trains/Day) Without SCIG and ICTF	Revised Project Added Average Daily Trains (Trains/Day) With SCIG and ICTF
Gibson Street	2	870	65.3	1,280	118.9	119.5	0.6	0.6
Harrison Street	2	6,820	65.3	10,030	118.9	119.5	0.6	0.6
Tyler Street	4	15,990	65.3	23,530	118.9	119.5	0.6	0.6
Pierce Street	2	11,440	65.3	16,840	118.9	119.5	0.6	0.6
Buchanan Street	2	9,790	65.3	14,410	118.9	119.5	0.6	0.6
Magnolia Avenue(eastbound)	2	9,000	65.3	13,240	118.9	119.5	0.6	0.6
Magnolia Avenue(westbound)	2	9,000	65.3	13,240	118.9	119.5	0.6	0.6
Mckinley Street	4	27,270	65.3	40,120	118.9	119.5	0.6	0.6
Radio Road	2	4,410	65.3	6,480	118.9	119.5	0.6	0.6
Joy Street	2	7,450	65.3	10,960	118.9	119.5	0.6	0.6
Sheridan Street	2	2,420	65.3	3,560	118.9	119.5	0.6	0.6
Cota Street	4	6,180	65.3	9,090	118.9	119.5	0.6	0.6
Railroad Street	4	9,900	65.3	14,570	118.9	119.5	0.6	0.6
Smith Street	4	14,010	65.3	20,620	118.9	119.5	0.6	0.6
Auto Center Drive	2	11,840	65.3	17,430	118.9	119.5	0.6	0.6
Riverside-Orange County Line								
Kellogg Drive	4	6,900	65.3	8,300	118.9	119.5	0.6	0.6
Lakeview Avenue	3	18,940	65.3	22,780	118.9	119.5	0.6	0.6
Richfield Road	4	9,510	65.3	11,440	118.9	119.5	0.6	0.6
Atwood Junction MP 40.6 (Connection to Old Olive Sub)								
Van Buren Street	2	6,790	47.4	8,170	89.9	90.5	0.6	0.6
Jefferson Street	3	6,370	47.4	7,670	89.9	90.5	0.6	0.6
Tustin Avenue (Rose Drive)	4	29,290	47.4	35,230	89.9	90.5	0.6	0.6
Orangethorpe Avenue	4	28,440	47.4	34,210	89.9	90.5	0.6	0.6
Kraemer Boulevard	4	19,860	47.4	23,890	89.9	90.5	0.6	0.6
Placentia Avenue	4	14,550	47.4	17,510	89.9	90.5	0.6	0.6
State College Boulevard	4	23,670	47.4	28,480	89.9	90.5	0.6	0.6
Acacia Avenue	4	6,760	47.4	8,140	89.9	90.5	0.6	0.6
Raymond Avenue	4	21,110	47.4	25,390	89.9	90.5	0.6	0.6

Boundary/Junction – Street	# of Lanes	2014 Baseline Average Daily Traffic (Vehicles/Day)	2014 Baseline Average Daily Trains (Trains/Day)	2045 Cumulative Average Daily Traffic (Vehicles/Day)	2045 Cumulative Average Daily Trains (Trains/Day) Without SCIG and ICTF	2045 Cumulative Average Daily Trains (Trains/Day) With SCIG and ICTF	Revised Project Added Average Daily Trains (Trains/Day) Without SCIG and ICTF	Revised Project Added Average Daily Trains (Trains/Day) With SCIG and ICTF
Fullerton Junction MP 45.5 = MP 165.5								
Orange-LA County Line								
Valley View Avenue	4	24,230	92.4	28,610	144.9	145.5	0.6	0.6
Rosecrans/Marquardt Avenue	4	22,890	92.4	27,020	144.9	145.5	0.6	0.6
Lakeland Road	2	6,450	92.4	7,610	144.9	145.5	0.6	0.6
Los Nietos Road	4	20,200	92.4	23,840	144.9	145.5	0.6	0.6
Norwalk Boulevard	4	25,890	92.4	30,550	144.9	145.5	0.6	0.6
Pioneer Boulevard	4	15,100	92.4	17,830	144.9	145.5	0.6	0.6
Passons Boulevard	4	12,530	92.4	14,780	144.9	145.5	0.6	0.6
Serapis Avenue	2	6,190	92.4	7,300	144.9	145.5	0.6	0.6
Commerce Yard MP 148.5								
Hobart Yard MP 146.0								

Source: San Pedro Bay Ports "Train Builder" model for intermodal trains estimation; SCAG's non-intermodal freight and passenger train data and projections; and San Pedro Bay Ports compiled vehicular traffic data and projections.

Table C2-7: BNSF Cajon Subdivision from San Bernardino to Barstow, Rail and Roadway Average Daily Volumes for Study At-Grade Crossings, 2014 Baseline, 2045 Cumulative and Revised Project

Boundary/Junction – Street	# of Lanes	2014 Baseline Average Daily Traffic (Vehicles/Day)	2014 Baseline Average Daily Trains (Trains/Day)	2045 Cumulative Average Daily Traffic (Vehicles/Day)	2045 Cumulative Average Daily Trains (Trains/Day) Without SCIG and ICTF	2045 Cumulative Average Daily Trains (Trains/Day) With SCIG and ICTF	Revised Project Added Average Daily Trains (Trains/Day) Without SCIG and ICTF	Revised Project Added Average Daily Trains (Trains/Day) With SCIG and ICTF
Barstow MP 0								
Lenwood Road	2	4,570	65.2	6,640	107.4	108.0	0.7	0.7
Hinkley Road	2	490	65.2	710	107.4	108.0	0.7	0.7
Indian Trail Road	2	550	65.2	800	107.4	108.0	0.7	0.7
Vista Road	2	2,820	65.2	4,100	107.4	108.0	0.7	0.7
Turner Road	2	30	65.2	50	107.4	108.0	0.7	0.7
North Bryman Road	2	160	65.2	240	107.4	108.0	0.7	0.7

Boundary/Junction – Street	# of Lanes	2014 Baseline Average Daily Traffic (Vehicles/Day)	2014 Baseline Average Daily Trains (Trains/Day)	2045 Cumulative Average Daily Traffic (Vehicles/Day)	2045 Cumulative Average Daily Trains (Trains/Day) Without SCIG and ICTF	2045 Cumulative Average Daily Trains (Trains/Day) With SCIG and ICTF	Revised Project Added Average Daily Trains (Trains/Day) Without SCIG and ICTF	Revised Project Added Average Daily Trains (Trains/Day) With SCIG and ICTF
South Bryman Road	2	1,970	65.2	2,860	107.4	108.0	0.7	0.7
Robinson Ranch Road	2	120	65.2	170	107.4	108.0	0.7	0.7
1st Street	2	700	65.2	1,020	107.4	108.0	0.7	0.7
6th Street	4	3,680	65.2	5,340	107.4	108.0	0.7	0.7
Silverwood Junction MP 56.6								
Keenbrook Junction MP 69.4								
Swarthout Canyon Road	2	180	77.3	270	113.4	114.0	0.7	0.7
Devore Road/Glen Helen Parkway	4	6,400	77.3	9,300	113.4	114.0	0.7	0.7
Dike Junction								
Palm Avenue	2	12,100	58.5	17,570	89.8	90.3	0.6	0.7
San Bernardino MP 81.4								

Source: San Pedro Bay Ports "Train Builder" model for intermodal trains estimation; SCAG's non-intermodal freight and passenger train data and projections; and San Pedro Bay Ports compiled vehicular traffic data and projections.

Table C2-8: UP Alhambra Subdivision from Los Angeles Transportation Center (LATC) to Colton Crossing, Rail and Roadway Average Daily Volumes for Study At-Grade Crossings, 2014 Baseline, 2045 Cumulative and Revised Project (Excluding Segment That is Combined with UP Los Angeles Subdivision)

Boundary/Junction – Street	# of Lanes	2014 Baseline Average Daily Traffic (Vehicles/Day)	2014 Baseline Average Daily Trains (Trains/Day)	2045 Cumulative Average Daily Traffic (Vehicles/Day)	2045 Cumulative Average Daily Trains* (Trains/Day)	Revised Project Added Average Daily Trains* (Trains/Day)
LATC MP 482.9						
San Pablo Street	4	4,050	19.8	5,020	41.7	0.4
Vineburn Avenue	2	1,350	19.8	1,680	41.7	0.4
Worth/Boca Road	2	7,840	19.8	9,720	41.7	0.4
Valley Boulevard	4	27,500	19.8	34,080	41.7	0.4
Ramona Street	2	12,720	19.8	15,770	41.7	0.4

Boundary/Junction – Street	# of Lanes	2014 Baseline Average Daily Traffic (Vehicles/Day)	2014 Baseline Average Daily Trains (Trains/Day)	2045 Cumulative Average Daily Traffic (Vehicles/Day)	2045 Cumulative Average Daily Trains* (Trains/Day)	Revised Project Added Average Daily Trains* (Trains/Day)
Mission Road	3	23,040	19.8	28,550	41.7	0.4
Del Mar Avenue	2	21,060	19.8	26,100	41.7	0.4
San Gabriel Boulevard	4	35,110	19.8	43,510	41.7	0.4
Walnut Grove Avenue	3	15,340	19.8	19,010	41.7	0.4
Encinita Avenue	2	6,390	19.8	7,920	41.7	0.4
Lower Azusa Road	4	17,400	19.8	21,570	41.7	0.4
Temple City Boulevard	4	20,880	19.8	25,870	41.7	0.4
Baldwin Avenue	4	25,900	19.8	32,100	41.7	0.4
Arden Drive	4	11,050	19.8	13,690	41.7	0.4
El Monte Junction MP 494.99						
Tyler Avenue	4	11,770	58.1	14,590	84.5	0.4
Cogswell Road	2	10,070	58.1	12,480	84.5	0.4
Temple Avenue	4	27,060	58.1	33,530	84.5	0.4
Bassett Junction MP 498.45						
Vineland Avenue	2	12,550	20.6	15,550	42.5	0.4
Puente Avenue	4	31,800	20.6	39,410	42.5	0.4
Orange Avenue	2	5,770	20.6	7,150	42.5	0.4
California Avenue	2	18,770	20.6	23,260	42.5	0.4
City of Industry Junction MP 501.5						
Fullerton Road	4	18,280	23.9	22,660	48.5	0.4
Fairway Drive	4	19,830	23.9	24,580	48.5	0.4
Lemon Road	4	17,180	23.9	21,290	48.5	0.4
Brea Canyon Road	2	14,390	23.9	17,830	48.5	0.4
Pomona Junction MP 514.3	HANDLED SEPARATELY DUE TO PROXIMITY TO UP LOS ANGELES SUBDIVISION					
LA-San Bernardino County Line MP 516.7						
Montclair Junction						
Bon View Avenue	2	10,230	27.6	14,800	55.9	0.4
Vineyard Avenue	4	31,400	27.6	45,430	55.9	0.4

Boundary/Junction – Street	# of Lanes	2014 Baseline Average Daily Traffic (Vehicles/Day)	2014 Baseline Average Daily Trains (Trains/Day)	2045 Cumulative Average Daily Traffic (Vehicles/Day)	2045 Cumulative Average Daily Trains* (Trains/Day)	Revised Project Added Average Daily Trains* (Trains/Day)
Milliken Avenue	6	34,910	27.6	50,510	55.9	0.4
Kaiser Junction MP 527.5						
West Colton MP 534.7						
Colton Crossing MP 538.70						

*The number of trains would not be affected by the presence or absence of SCIG and ICTF modernization projects.

Source: San Pedro Bay Ports "Train Builder" model for intermodal trains estimation; SCAG's non-intermodal freight and passenger train data and projections; and San Pedro Bay Ports compiled vehicular traffic data and projections.

Table C2-9: UP Los Angeles Subdivision from East Los Angeles Yard to West Riverside Junction, Rail and Roadway Average Daily Volumes for Study At-Grade Crossings, 2014 Baseline, 2045 Cumulative and Revised Project (Excluding Segment That is Combined with UP Alhambra Subdivision)

Boundary/Junction – Street	# of Lanes	2014 Baseline Average Daily Traffic (Vehicles/Day)	2014 Baseline Average Daily Trains (Trains/Day)	2045 Cumulative Average Daily Traffic (Vehicles/Day)	2045 Cumulative Average Daily Trains* (Trains/Day)	Revised Project Added Average Daily Trains* (Trains/Day)
East Los Angeles MP 5.85						
S. Vail Avenue	2	7,900	29.1	9,750	50.5	0.4
Maple Avenue	2	5,550	29.1	6,860	50.5	0.4
S. Greenwood Avenue	4	7,280	29.1	8,980	50.5	0.4
Montebello Boulevard	4	20,550	29.1	25,370	50.5	0.4
Durfee Avenue	2	13,960	29.1	17,230	50.5	0.4
Rose Hills Road	4	9,450	29.1	11,660	50.5	0.4
Mission Mill Road	2	2,180	29.1	2,690	50.5	0.4
Workman Mill	4	7,650	29.1	9,440	50.5	0.4
Turnbull Canyon Road	4	14,440	29.1	17,830	50.5	0.4
Stimson Avenue & Puente Avenue	4	14,720	29.1	18,170	50.5	0.4
Bixby Drive	2	2,960	29.1	3,660	50.5	0.4
Fullerton Road	4	24,240	29.1	29,920	50.5	0.4
Nogales Street	6	37,730	29.1	46,570	50.5	0.4
Fairway Drive	4	25,350	29.1	31,300	50.5	0.4
Lemon Street	4	15,060	29.1	18,590	50.5	0.4

Boundary/Junction – Street	# of Lanes	2014 Baseline Average Daily Traffic (Vehicles/Day)	2014 Baseline Average Daily Trains (Trains/Day)	2045 Cumulative Average Daily Traffic (Vehicles/Day)	2045 Cumulative Average Daily Trains* (Trains/Day)	Revised Project Added Average Daily Trains* (Trains/Day)
Pomona Junction MP 31.9	HANDLED SEPARATELY DUE TO PROXIMITY TO UP ALHAMBRA SUBDIVISION					
LA-San Bernardino County Line MP 33.17						
E. Montclair Junction MP 35.02						
Bonview Avenue	2	3,560	30.5	5,300	49.1	0.4
Grove Avenue	6	40,370	30.5	60,130	49.1	0.4
Vineyard Avenue	4	4,550	30.5	6,780	49.1	0.4
Archibald Avenue	4	5,380	30.5	8,010	49.1	0.4
San Bernardino-Riverside County Line MP 43.36						
Milliken Avenue	6	21,520	30.5	32,360	49.1	0.4
Mira Loma Junction MP 45.7						
Bellevue Avenue	2	7,910	30.8	11,890	54.1	0.4
Rutile Street	2	8,490	30.8	12,760	54.1	0.4
Clay Street	2	16,730	30.8	25,160	54.1	0.4
Jurupa Ave	4	14,500	30.8	21,810	54.1	0.4
Mountain View Avenue	2	1,760	30.8	2,640	54.1	0.4
Streeter Avenue	4	14,220	30.8	21,390	54.1	0.4
Palm Avenue	2	7,690	30.8	11,560	54.1	0.4
Brockton Avenue	4	13,710	30.8	20,610	54.1	0.4
Riverside Avenue	2	11,800	30.8	17,740	54.1	0.4
Panorama Road	2	6,550	30.8	9,860	54.1	0.4
West Riverside Junction MP 56.7						

*The number of trains would not be affected by the presence or absence of SCIG and ICTF modernization projects.

Source: San Pedro Bay Ports "Train Builder" model for intermodal trains estimation; SCAG's non-intermodal freight and passenger train data and projections; and San Pedro Bay Ports compiled vehicular traffic data and projections.

Table C2-10: Combined UP Alhambra and Los Angeles Subdivisions in Pomona and Montclair Area, Rail and Roadway Average Daily Volumes for Study At-Grade Crossings, 2014 Baseline, 2045 Cumulative and Revised Project

Boundary/Junction – Street	# of Lanes	2014 Baseline Average Daily Traffic (Vehicles/Day)	2014 Baseline Average Daily Trains (Trains/Day)	2045 Cumulative Average Daily Traffic (Vehicles/Day)	2045 Cumulative Average Daily Trains* (Trains/Day)	Revised Project Added Average Daily Trains* (Trains/Day)
Pomona Junction MP 514.3						
Hamilton Boulevard	4	8,000	53.9	9,910	105.1	0.8
Park Avenue	2	5,660	53.9	7,020	105.1	0.8
Main Street	2	1,570	53.9	1,950	105.1	0.8
Palomares Street	2	3,870	53.9	4,790	105.1	0.8
San Antonio Avenue	4	6,880	53.9	8,530	105.1	0.8
LA-San Bernardino County Line MP 516.7						
Monte Vista Avenue	4	12,440	53.9	16,350	105.1	0.8
San Antonio Avenue	4	10,540	53.9	15,250	105.1	0.8
Vine Avenue	2	7,730	53.9	11,190	105.1	0.8
Sultana Avenue	2	11,530	53.9	12,130	105.1	0.8
Campus Avenue	2	10,820	53.9	15,660	105.1	0.8
Montclair Junction						

*The number of trains would not be affected by the presence or absence of SCIG and ICTF modernization projects.

Source: San Pedro Bay Ports "Train Builder" model for intermodal trains estimation; SCAG's non-intermodal freight and passenger train data and projections; and San Pedro Bay Ports compiled vehicular traffic data and projections.

Table C2-11: UP Yuma Subdivision from Colton Crossing to Indio, Rail and Roadway Average Daily Volumes for Study At-Grade Crossings, 2014 Baseline, 2045 Cumulative and Revised Project

Boundary/Junction – Street	# of Lanes	2014 Baseline Average Daily Traffic (Vehicles/Day)	2014 Baseline Average Daily Trains (Trains/Day)	2045 Cumulative Average Daily Traffic (Vehicles/Day)	2045 Cumulative Average Daily Trains* (Trains/Day)	Revised Project Added Average Daily Trains* (Trains/Day)
Colton Crossing MP 539.0						
Hunts Lane	4	14,110	44.4	23,380	84.0	0.7
Whittier Avenue	2	200	44.4	330	84.0	0.7
Beaumont Avenue	2	480	44.4	800	84.0	0.7
San Timoteo Canyon Road	2	12,160	44.4	20,150	84.0	0.7
Alessandro Road	2	300	44.4	500	84.0	0.7
San Bernardino-Riverside County Line MP 549.25						
Live Oak Canyon Road	2	1,150	44.4	1,900	84.0	0.7
San Timoteo Canyon Road	2	1,480	44.4	2,460	84.0	0.7
Viele Avenue	2	110	44.4	190	84.0	0.7
California Avenue	2	6,860	44.4	11,370	84.0	0.7
Pennsylvania Avenue	2	8,500	44.4	14,080	84.0	0.7
North Sunset Avenue	2	3,960	44.4	6,570	84.0	0.7
22nd Street	4	16,080	44.4	26,640	84.0	0.7
San Gorgonio Avenue	2	13,310	44.4	22,040	84.0	0.7
Hargrave Street	2	17,300	44.4	28,670	84.0	0.7
Apache Trail	2	2,630	44.4	4,350	84.0	0.7
Broadway	2	6,930	44.4	11,480	84.0	0.7
Tipton Road	2	120	44.4	200	84.0	0.7
Garnet MP 588.32						
West Indio MP 609.63						
Indio MP 610.9						
Avenue 52	4	11,410	44.4	18,900	84.0	0.7
Avenue 56/Airport	2	4,970	44.4	8,240	84.0	0.7

Boundary/Junction – Street	# of Lanes	2014 Baseline Average Daily Traffic (Vehicles/Day)	2014 Baseline Average Daily Trains (Trains/Day)	2045 Cumulative Average Daily Traffic (Vehicles/Day)	2045 Cumulative Average Daily Trains* (Trains/Day)	Revised Project Added Average Daily Trains* (Trains/Day)
Boulevard						
Avenue 66/4th Street	2	8,150	44.4	13,500	84.0	0.7

*The number of trains would not be affected by the presence or absence of SCIG and ICTF modernization projects.

Source: San Pedro Bay Ports “Train Builder” model for intermodal trains estimation; SCAG’s non-intermodal freight and passenger train data and projections; and San Pedro Bay Ports compiled vehicular traffic data and projections.

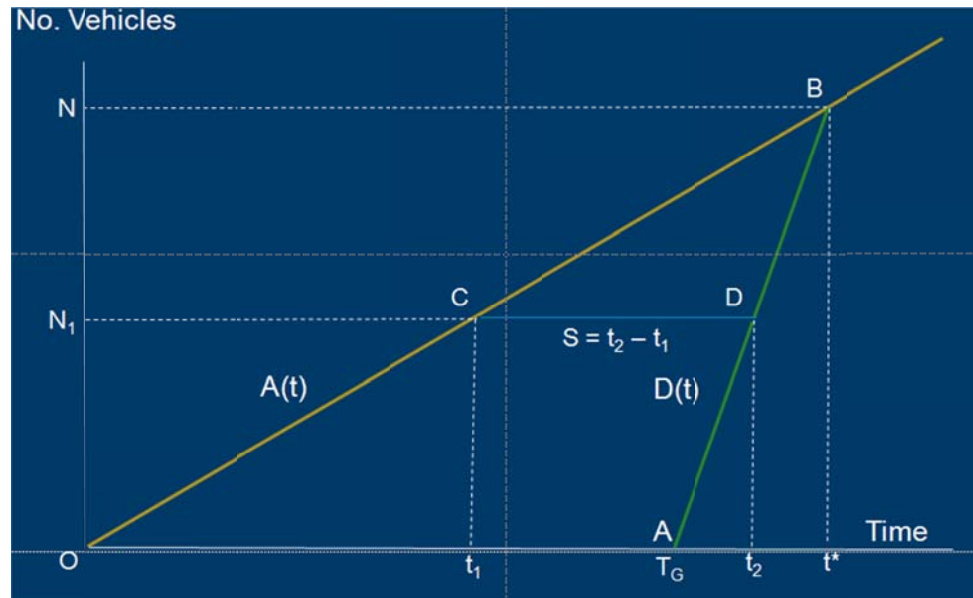
Table C2-12: Rail and Roadway P.M. Peak Hour (4-5 P.M.) Volumes for Henry Ford Avenue At-Grade Crossing, 2014 Baseline, 2045 Cumulative and Revised Project

Boundary/Junction – Street	# of Lanes	2014 Baseline P.M. Peak Hour (4- 5 P.M.) Traffic (Vehicles)	2014 Baseline P.M. Peak Hour (4-5 P.M.) Trains* (Trains)	2045 Cumulative P.M. Peak Hour (4-5 P.M.) Traffic (Vehicles)	2045 Cumulative P.M. Peak Hour (4-5 P.M.) Trains* (Trains)	Revised Project Added Average Daily Trains* (Trains/Day)
Henry Ford Avenue	6	1,010	0.92	1,600	1.23	0.13

*The number of trains would not be affected by the presence or absence of SCIG and ICTF modernization projects.

Source: Henry Ford Avenue crossing controller data for May/June 2016; POLA 2045 build out rail simulation data; San Pedro Bay Ports “Train Builder” model for intermodal trains estimation; and PortTAM Travel Demand Model for this EIR.

The methodology for computing vehicular delay is based on Figure C2-3, which shows total vehicle arrivals and departures at an isolated at-grade crossing. The yellow line represents vehicles arriving at an at-grade crossing, beginning at the time when the gates go down (point “O” in the figure). Total gate down time is depicted as “ T_G .” The green line represents the vehicles departing the queue after the gate is lifted starting at time = T_G (point “A” in the figure). The queues are fully dissipated at time = t^* (point “B” in the figure). The total vehicle delay is represented by the area of triangle OAB bounded by the yellow line, the green line, and the “X” axis. The length of the line represents the amount of delay experienced by the n th vehicle. Calculating the value of this line for each vehicle arriving at the crossing and then adding those values up is equivalent to computing the area of triangle OAB. This calculation is performed for each train arriving at the crossing over the course of a day. Delay will vary by time of day, because there is more highway traffic during peak hours. Many of the vehicles arriving at the crossing will not be delayed by a train, but they are included in the calculation of average delay. This is the same way that average delay is computed for signalized intersections.



Source: Leachman, 1984; and Powell, 1982

Figure C2-3: Total Arrivals and Departures for an Isolated Blockage

The equation for total vehicle delay for an isolated blockage, V , is:

$$V = \left(\frac{1}{2}\right) \frac{qT_G^2}{(1 - q/d)}$$

where T_G = gate down time, q = vehicle arrival rate, and d = vehicle departure rate. Note that delay is a function of the square of the gate down time. P.M. peak-hour average delay per vehicle is calculated by dividing total delay over the P.M. peak hour by the number of vehicles arriving at the crossing in that hour.

The calculation of hourly average vehicle delay accounts for the following:

- total vehicles arriving at the crossing in a one-hour period, whether the vehicles are delayed by a train or not;
- total delay experienced by all vehicles in that hour; and

- all trains passing through the crossing in that hour.

The equation above relates to the effects of an isolated blockage; that is, it is assumed that the vehicle queues are completely dissipated before the next train arrives at the crossing. However, where the rail corridor has more than one track, it is possible that a second train traveling in the opposite direction could arrive at the crossing before the queues from the first train have fully dissipated. More complex delay equations for these “multiple events” have been derived by Dr. Robert Leachman of U.C. Berkeley (Leachman, 1984). In an effort to compute these effects and how likely they are to occur, Dr. Leachman simulated railroad traffic for both 2010 and 2035 against streets with varying average daily traffic (ADT) per lane and recomputed vehicular delays, including the impacts of multiple events. With higher train volumes, multiple events occur more often, and the level of the impact is greater on streets with more vehicular traffic per lane. Based on a sample of Dr. Leachman’s results for different train volumes and ADT per lane, a curve for the calculation of a “Bias Factor” was created/fitted. This Bias Factor adjustment accounts for additional delay associated with multiple crossings that overlap in time. The fitted equation for the Bias Factor (BF) is as follows:

$$BF = \exp\left(-0.52868 + (.000173) \times \left(\frac{ADT}{Lane}\right) + (0.01036) \times (Total\ Train\ Volume\ per\ Day)\right)$$

The R-squared value for the fitted equation is 0.9322, indicating a very good correlation among the variables. Using this equation, a Bias Factor was computed for each grade crossing that has more than one track crossing the street. The Bias Factor is then multiplied by the unadjusted vehicle hours of delay for an isolated blockage to account for the effects of multiple events. For example, the average Bias Factor for all grade crossings on the BNSF San Bernardino Subdivision for 2013 is approximately 1.025, meaning that the unadjusted delay values were increased by an average of 2.5 percent. In the particular case of the Henry Ford Avenue crossing, which has a single track, the Bias Factor is set to 1.0; in other words, multiple crossings are impossible.

The LOS definitions/ranges for the intersection operational methodology contained in the 2010 HCM were applied to the PHAVD results.

C2.3 Revised Project Analysis

This analysis calculated the 2014 Baseline the P.M. peak-hour average vehicular delays for at-grade crossings under 2014 Baseline (January through December) and 2014 Baseline plus Revised Project conditions. To estimate average vehicular delays under the 2014 baseline plus Revised Project condition, at each at-grade crossing, added train volumes resulting from the Revised Project’s additional throughput were added to 2014 baseline train volumes.

Further, two Revised Project scenarios were considered, one without the SCIG and ICTF projects and the other with those two projects. Revised Project-added train volumes with SCIG and ICTF were slightly higher than those without at-grade crossings on BNSF rail mainlines, but there was no difference on the UP rail mainlines and at the Henry Ford Avenue crossing. The roadway volumes for at-grade crossings were kept the same under both 2014 Baseline and 2014 Baseline plus Revised Project conditions.

As Tables C2-13 through C2-21 show, none of the locations, including the Henry Ford Avenue crossing, experienced per-vehicle delay greater than 55 seconds.

Table C2-13: BNSF San Bernardino Subdivision, from Hobart Yard to San Bernardino, P.M. Peak-Hour Average Vehicular Delays for Study At-Grade Crossings, 2014 Baseline and 2014 Baseline plus Revised Project (without SCIG and ICTF)

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/Day)	Average Daily Train Volume (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change
San Bernardino MP 0.0														
Laurel Street	2	2,340	60.3	61.0	0.6	119.3	121.3	2.0	3.9	4.0	0.1	6.2	6.4	0.1
Olive Street	2	2,790	60.3	61.0	0.6	119.3	121.3	2.0	4.7	4.8	0.1	6.3	6.5	0.1
E Street	2	730	60.3	61.0	0.6	119.3	121.3	2.0	1.2	1.2	0.0	5.9	6.0	0.1
H Street	2	1,470	60.3	61.0	0.6	119.3	121.3	2.0	2.4	2.4	0.1	6.0	6.2	0.1
Valley Boulevard	2	11,000	60.3	61.0	0.6	119.3	121.3	2.0	24.4	25.0	0.6	9.4	9.7	0.2
Colton Crossing MP 3.2														
Highgrove Junction MP 6.1 (Connection to Perris via MetroLink)														
Main Street	2	2,680	70.2	71.2	1.0	147.9	150.8	3.0	5.8	5.9	0.2	8.0	8.3	0.2
Riverside-San Bernardino County Line MP 6.41														
Center Street	4	6,360	70.2	71.2	1.0	148.3	151.2	3.0	13.7	14.1	0.4	8.1	8.3	0.2
Iowa Avenue	4	23,440	70.2	71.2	1.0	148.3	151.2	3.0	64.0	65.7	1.7	11.3	11.6	0.3
Palmyrita Avenue	2	3,840	70.2	71.2	1.0	147.9	150.8	3.0	8.4	8.6	0.2	8.2	8.4	0.2
Chicago Avenue	4	13,880	70.2	71.2	1.0	148.3	151.2	3.0	32.9	33.8	0.9	9.2	9.5	0.2
Spruce Street	4	7,410	70.2	71.2	1.0	148.3	151.2	3.0	16.2	16.6	0.4	8.2	8.4	0.2
3rd Street	4	11,160	70.2	71.2	1.0	148.3	151.2	3.0	25.5	26.2	0.7	8.8	9.0	0.2
Mission Inn (7th Street)	4	5,460	70.2	71.2	1.0	148.3	151.2	3.0	11.7	12.0	0.3	8.0	8.2	0.2
Riverside Yard and Amtrak Station MP 10.02-10.16														
Cridge Street	2	3,850	99.1	100.1	1.0	169.1	172.0	3.0	9.1	9.3	0.2	9.1	9.3	0.2

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change
West Riverside Junction MP 10.6 (Connection to UP Los Angeles Sub)														
Jane Street	2	2,210	65.3	65.9	0.6	110.0	111.8	1.8	3.2	3.3	0.1	5.5	5.6	0.1
Mary Street	4	12,220	65.3	65.9	0.6	110.4	112.2	1.8	19.7	20.2	0.5	6.3	6.5	0.1
Washington Street	2	8,490	65.3	65.9	0.6	110.0	111.8	1.8	14.5	14.9	0.3	6.9	7.1	0.2
Madison Street	4	16,090	65.3	65.9	0.6	110.4	112.2	1.8	27.3	28.0	0.6	6.8	7.0	0.2
Jefferson Street	2	8,390	65.3	65.9	0.6	110.0	111.8	1.8	14.3	14.7	0.3	6.9	7.1	0.2
Adams Street	4	17,920	65.3	65.9	0.6	110.4	112.2	1.8	31.3	32.0	0.7	7.1	7.3	0.2
Jackson Street	4	8,000	65.3	65.9	0.6	110.4	112.2	1.8	12.2	12.5	0.3	5.9	6.0	0.1
Gibson Street	2	870	65.3	65.9	0.6	110.0	111.8	1.8	1.2	1.3	0.0	5.3	5.4	0.1
Harrison Street	2	6,820	65.3	65.9	0.6	110.0	111.8	1.8	11.1	11.4	0.3	6.5	6.6	0.1
Tyler Street	4	15,990	65.3	65.9	0.6	110.4	112.2	1.8	27.1	27.8	0.6	6.8	7.0	0.2
Pierce Street	2	11,440	65.3	65.9	0.6	110.0	111.8	1.8	21.4	21.9	0.5	7.9	8.0	0.2
Buchanan Street	2	9,790	65.3	65.9	0.6	110.0	111.8	1.8	17.4	17.8	0.4	7.3	7.5	0.2
Magnolia Avenue(eastbound)	2	9,000	65.3	65.9	0.6	110.0	111.8	1.8	15.6	16.0	0.4	7.1	7.2	0.2
Magnolia Avenue(westbound)	2	9,000	65.3	65.9	0.6	110.0	111.8	1.8	15.6	16.0	0.4	7.1	7.2	0.2
Mckinley Street	4	27,270	65.3	65.9	0.6	110.4	112.2	1.8	55.4	56.7	1.3	8.8	9.0	0.2
Radio Road	2	4,410	65.3	65.9	0.6	110.0	111.8	1.8	6.8	6.9	0.2	5.9	6.1	0.1
Joy Street	2	7,450	65.3	65.9	0.6	110.0	111.8	1.8	12.4	12.7	0.3	6.6	6.8	0.2
Sheridan Street	2	2,420	65.3	65.9	0.6	110.0	111.8	1.8	3.5	3.6	0.1	5.6	5.7	0.1
Cota Street	4	6,180	65.3	65.9	0.6	110.4	112.2	1.8	9.2	9.5	0.2	5.7	5.8	0.1
Railroad Street	4	9,900	65.3	65.9	0.6	110.4	112.2	1.8	15.5	15.9	0.4	6.1	6.2	0.1
Smith Street	4	14,010	65.3	65.9	0.6	110.4	112.2	1.8	23.1	23.7	0.5	6.6	6.7	0.2
Auto Center Drive	2	11,840	65.3	65.9	0.6	110.0	111.8	1.8	22.5	23.0	0.5	8.0	8.2	0.2
Riverside-Orange County Line														
Kellogg Drive	4	6,900	65.3	65.9	0.6	110.4	112.2	1.8	10.5	10.7	0.2	5.8	6.0	0.1
Lakeview Avenue	3	18,940	65.3	65.9	0.6	110.2	112.0	1.8	38.0	38.9	0.9	8.7	8.9	0.2
Richfield Road	4	9,510	65.3	65.9	0.6	110.4	112.2	1.8	14.9	15.3	0.4	6.1	6.2	0.1

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change
Atwood Junction MP 40.6 (Connection to Old Olive Sub)														
Van Buren Street	2	6,790	47.4	48.0	0.6	92.9	94.7	1.8	10.1	10.3	0.3	5.8	6.0	0.2
Jefferson Street	3	6,370	47.4	48.0	0.6	93.1	94.9	1.8	8.8	9.1	0.2	5.3	5.4	0.1
Tustin Avenue (Rose Drive)	4	29,290	47.4	48.0	0.6	93.2	95.0	1.8	57.0	58.5	1.5	8.6	8.8	0.2
Orangethorpe Avenue	4	28,440	47.4	48.0	0.6	93.2	95.0	1.8	54.4	55.9	1.4	8.4	8.6	0.2
Kraemer Boulevard	4	19,860	47.4	48.0	0.6	93.2	95.0	1.8	32.6	33.4	0.8	6.7	6.9	0.2
Placentia Avenue	4	14,550	47.4	48.0	0.6	93.2	95.0	1.8	22.0	22.6	0.6	6.0	6.1	0.2
State College Boulevard	4	23,670	47.4	48.0	0.6	93.2	95.0	1.8	41.4	42.5	1.1	7.4	7.6	0.2
Acacia Avenue	4	6,760	47.4	48.0	0.6	93.2	95.0	1.8	9.2	9.4	0.2	5.2	5.3	0.1
Raymond Avenue	4	21,110	47.4	48.0	0.6	93.2	95.0	1.8	35.3	36.2	0.9	6.9	7.1	0.2
Fullerton Junction MP 45.5 = MP 165.5														
Orange-LA County Line														
Valley View Avenue	4	24,230	92.4	93.0	0.6	129.2	131.0	1.8	52.7	53.8	1.1	9.5	9.7	0.2
Rosecrans/Marqu ardt Avenue	4	22,890	92.4	93.0	0.6	129.2	131.0	1.8	48.5	49.6	1.1	9.1	9.3	0.2
Lakeland Road	2	6,450	92.4	93.0	0.6	128.7	130.5	1.8	11.5	11.8	0.3	7.2	7.3	0.2
Los Nietos Road	4	20,200	92.4	93.0	0.6	129.2	131.0	1.8	40.8	41.7	0.9	8.5	8.7	0.2
Norwalk Boulevard	4	25,890	92.4	93.0	0.6	129.2	131.0	1.8	58.2	59.5	1.3	9.9	10.1	0.2
Pioneer Boulevard	4	15,100	92.4	93.0	0.6	129.2	131.0	1.8	28.0	28.6	0.6	7.6	7.7	0.2
Passons Boulevard	4	12,530	92.4	93.0	0.6	129.2	131.0	1.8	22.4	22.9	0.5	7.2	7.3	0.2
Serapis Avenue	2	6,190	92.4	93.0	0.6	128.7	130.5	1.8	11.0	11.2	0.2	7.1	7.2	0.1
Commerce Yard MP 148.5														
Hobart Yard MP 146.0														
OVERALL:														

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change
Total Daily Vehicle Hours of Delay (Veh- Hrs/Day)									1,211.7	1,241.0	29.3			
Maximum P.M. Peak Average Delay per Vehicle (Seconds/Vehicle)												11.3	11.6	0.3

Source: San Pedro Bay Ports "Train Builder" model for intermodal trains estimation; SCAG's non-intermodal freight and passenger train data and projections; San Pedro Bay Ports compiled vehicular traffic data and projections; and San Pedro Bay Ports Peak Hour Average Vehicular Delay Calculation Methodology.

Table C2-14: BNSF San Bernardino Subdivision, from Hobart Yard to San Bernardino, P.M. Peak-Hour Average Vehicular Delays for Study At-Grade Crossings, 2014 Baseline and 2014 Baseline plus Revised Project (with SCIG and ICTF)

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/Day)	Average Daily Train Volume (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change
San Bernardino MP 0.0														
Laurel Street	2	2,340	60.3	61.0	0.7	119.3	121.3	2.0	3.9	4.0	0.1	6.2	6.4	0.1
Olive Street	2	2,790	60.3	61.0	0.7	119.3	121.3	2.0	4.7	4.8	0.1	6.3	6.5	0.1
E Street	2	730	60.3	61.0	0.7	119.3	121.3	2.0	1.2	1.2	0.0	5.9	6.0	0.1
H Street	2	1,470	60.3	61.0	0.7	119.3	121.3	2.0	2.4	2.4	0.1	6.0	6.1	0.1
Valley Boulevard	2	11,000	60.3	61.0	0.7	119.3	121.3	2.0	24.4	25.0	0.6	9.4	9.7	0.2
Colton Crossing MP 3.2														
Highgrove Junction MP 6.1 (Connection to Perris via MetroLink)														
Main Street	2	2,680	70.2	71.2	1.0	147.9	150.9	3.0	5.8	5.9	0.2	8.0	8.3	0.2
Riverside-San Bernardino County Line MP 6.41														
Center Street	4	6,360	70.2	71.2	1.0	148.3	151.2	3.0	13.7	14.1	0.4	8.1	8.3	0.2
Iowa Avenue	4	23,440	70.2	71.2	1.0	148.3	151.2	3.0	64.0	65.7	1.7	11.3	11.6	0.3
Palmyrita Avenue	2	3,840	70.2	71.2	1.0	147.9	150.9	3.0	8.4	8.6	0.2	8.2	8.4	0.2
Chicago Avenue	4	13,880	70.2	71.2	1.0	148.3	151.2	3.0	32.9	33.8	0.9	9.2	9.5	0.2
Spruce Street	4	7,410	70.2	71.2	1.0	148.3	151.2	3.0	16.2	16.6	0.4	8.2	8.4	0.2
3rd Street	4	11,160	70.2	71.2	1.0	148.3	151.2	3.0	25.5	26.2	0.7	8.8	9.0	0.2
Mission Inn (7th Street)	4	5,460	70.2	71.2	1.0	148.3	151.2	3.0	11.7	12.0	0.3	8.0	8.2	0.2
Riverside Yard and Amtrak Station MP 10.02-10.16														
Cridge Street	2	3,850	99.1	100.1	1.0	169.1	172.1	3.0	9.1	9.3	0.2	9.1	9.3	0.2

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change
West Riverside Junction MP 10.6 (Connection to UP Los Angeles Sub)														
Jane Street	2	2,210	65.3	65.9	0.6	110.0	111.9	1.8	3.2	3.3	0.1	5.5	5.6	0.1
Mary Street	4	12,220	65.3	65.9	0.6	110.4	112.2	1.8	19.7	20.2	0.5	6.3	6.5	0.1
Washington Street	2	8,490	65.3	65.9	0.6	110.0	111.9	1.8	14.5	14.9	0.3	6.9	7.1	0.2
Madison Street	4	16,090	65.3	65.9	0.6	110.4	112.2	1.8	27.3	28.0	0.6	6.8	7.0	0.2
Jefferson Street	2	8,390	65.3	65.9	0.6	110.0	111.9	1.8	14.3	14.6	0.3	6.9	7.1	0.2
Adams Street	4	17,920	65.3	65.9	0.6	110.4	112.2	1.8	31.3	32.0	0.7	7.1	7.3	0.2
Jackson Street	4	8,000	65.3	65.9	0.6	110.4	112.2	1.8	12.2	12.5	0.3	5.9	6.0	0.1
Gibson Street	2	870	65.3	65.9	0.6	110.0	111.9	1.8	1.2	1.3	0.0	5.3	5.4	0.1
Harrison Street	2	6,820	65.3	65.9	0.6	110.0	111.9	1.8	11.1	11.4	0.3	6.5	6.6	0.1
Tyler Street	4	15,990	65.3	65.9	0.6	110.4	112.2	1.8	27.1	27.8	0.6	6.8	7.0	0.2
Pierce Street	2	11,440	65.3	65.9	0.6	110.0	111.9	1.8	21.4	21.9	0.5	7.9	8.0	0.2
Buchanan Street	2	9,790	65.3	65.9	0.6	110.0	111.9	1.8	17.4	17.8	0.4	7.3	7.5	0.2
Magnolia Avenue(eastbound)	2	9,000	65.3	65.9	0.6	110.0	111.9	1.8	15.6	16.0	0.4	7.1	7.2	0.2
Magnolia Avenue(westbound)	2	9,000	65.3	65.9	0.6	110.0	111.9	1.8	15.6	16.0	0.4	7.1	7.2	0.2
Mckinley Street	4	27,270	65.3	65.9	0.6	110.4	112.2	1.8	55.4	56.6	1.3	8.8	9.0	0.2
Radio Road	2	4,410	65.3	65.9	0.6	110.0	111.9	1.8	6.8	6.9	0.2	5.9	6.1	0.1
Joy Street	2	7,450	65.3	65.9	0.6	110.0	111.9	1.8	12.4	12.7	0.3	6.6	6.8	0.1
Sheridan Street	2	2,420	65.3	65.9	0.6	110.0	111.9	1.8	3.5	3.6	0.1	5.6	5.7	0.1
Cota Street	4	6,180	65.3	65.9	0.6	110.4	112.2	1.8	9.2	9.5	0.2	5.7	5.8	0.1
Railroad Street	4	9,900	65.3	65.9	0.6	110.4	112.2	1.8	15.5	15.8	0.4	6.1	6.2	0.1
Smith Street	4	14,010	65.3	65.9	0.6	110.4	112.2	1.8	23.1	23.7	0.5	6.6	6.7	0.1
Auto Center Drive	2	11,840	65.3	65.9	0.6	110.0	111.9	1.8	22.5	23.0	0.5	8.0	8.2	0.2
Riverside-Orange County Line														
Kellogg Drive	4	6,900	65.3	65.9	0.6	110.4	112.2	1.8	10.5	10.7	0.2	5.8	6.0	0.1
Lakeview Avenue	3	18,940	65.3	65.9	0.6	110.2	112.0	1.8	38.0	38.9	0.9	8.7	8.9	0.2
Richfield Road	4	9,510	65.3	65.9	0.6	110.4	112.2	1.8	14.9	15.3	0.3	6.1	6.2	0.1

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change
Atwood Junction MP 40.6 (Connection to Old Olive Sub)														
Van Buren Street	2	6,790	47.4	48.0	0.6	92.9	94.8	1.8	10.1	10.3	0.3	5.8	6.0	0.1
Jefferson Street	3	6,370	47.4	48.0	0.6	93.1	94.9	1.8	8.8	9.1	0.2	5.3	5.4	0.1
Tustin Avenue (Rose Drive)	4	29,290	47.4	48.0	0.6	93.2	95.0	1.8	57.0	58.5	1.5	8.6	8.8	0.2
Orangethorpe Avenue	4	28,440	47.4	48.0	0.6	93.2	95.0	1.8	54.4	55.8	1.4	8.4	8.6	0.2
Kraemer Boulevard	4	19,860	47.4	48.0	0.6	93.2	95.0	1.8	32.6	33.4	0.8	6.7	6.9	0.2
Placentia Avenue	4	14,550	47.4	48.0	0.6	93.2	95.0	1.8	22.0	22.6	0.6	6.0	6.1	0.2
State College Boulevard	4	23,670	47.4	48.0	0.6	93.2	95.0	1.8	41.4	42.5	1.1	7.4	7.6	0.2
Acacia Avenue	4	6,760	47.4	48.0	0.6	93.2	95.0	1.8	9.2	9.4	0.2	5.2	5.3	0.1
Raymond Avenue	4	21,110	47.4	48.0	0.6	93.2	95.0	1.8	35.3	36.2	0.9	6.9	7.1	0.2
Fullerton Junction MP 45.5 = MP 165.5														
Orange-LA County Line														
Valley View Avenue	4	24,230	92.4	93.0	0.6	129.2	131.0	1.8	52.7	53.8	1.1	9.5	9.7	0.2
Rosecrans/Marquardt Avenue	4	22,890	92.4	93.0	0.6	129.2	131.0	1.8	48.5	49.6	1.0	9.1	9.3	0.2
Lakeland Road	2	6,450	92.4	93.0	0.6	128.7	130.5	1.8	11.5	11.7	0.2	7.2	7.3	0.1
Los Nietos Road	4	20,200	92.4	93.0	0.6	129.2	131.0	1.8	40.8	41.7	0.9	8.5	8.7	0.2
Norwalk Boulevard	4	25,890	92.4	93.0	0.6	129.2	131.0	1.8	58.2	59.4	1.2	9.9	10.1	0.2
Pioneer Boulevard	4	15,100	92.4	93.0	0.6	129.2	131.0	1.8	28.0	28.6	0.6	7.6	7.7	0.2
Passons Boulevard	4	12,530	92.4	93.0	0.6	129.2	131.0	1.8	22.4	22.8	0.5	7.2	7.3	0.1
Serapis Avenue	2	6,190	92.4	93.0	0.6	128.7	130.5	1.8	11.0	11.2	0.2	7.1	7.2	0.1
Commerce Yard MP 148.5														
Hobart Yard MP 146.0														
OVERALL:														

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Base	Base + Proj.	Chang e	Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change
Total Daily Vehicle Hours of Delay (Veh- Hrs/Day)									1,211. 7	1,240.6	28.9			
Maximum P.M. Peak Average Delay per Vehicle (Seconds/Vehicle)												11.3	11.6	0.3

Source: San Pedro Bay Ports "Train Builder" model for intermodal trains estimation; SCAG's non-intermodal freight and passenger train data and projections; San Pedro Bay Ports compiled vehicular traffic data and projections; and San Pedro Bay Ports Peak Hour Average Vehicular Delay Calculation Methodology.

Table C2-15: BNSF Cajon Subdivision from San Bernardino to Barstow, P.M. Peak-Hour Average Vehicular Delays for Study At-Grade Crossings, 2014 Baseline and 2014 Baseline plus Revised Project (without SCIG and ICTF)

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change
Barstow MP 0														
Lenwood Road	2	4,570	65.2	65.9	0.7	116.3	118.0	1.7	6.3	6.4	0.1	5.1	5.2	0.1
Hinkley Road	2	490	65.2	65.9	0.7	116.3	118.0	1.7	0.6	0.6	0.0	4.5	4.6	0.1
Indian Trail Road	2	550	65.2	65.9	0.7	116.3	118.0	1.7	0.7	0.7	0.0	4.5	4.6	0.1
Vista Road	2	2,820	65.2	65.9	0.7	116.3	118.0	1.7	3.7	3.8	0.1	4.9	4.9	0.1
Turner Road	2	30	65.2	65.9	0.7	116.3	118.0	1.7	0.0	0.0	0.0	4.5	4.6	0.1
North Bryman Road	2	160	65.2	65.9	0.7	116.3	118.0	1.7	0.2	0.2	0.0	4.5	4.6	0.1
South Bryman Road	2	1,970	65.2	65.9	0.7	116.3	118.0	1.7	2.6	2.6	0.0	4.7	4.8	0.1
Robinson Ranch Road	2	120	65.2	65.9	0.7	116.3	118.0	1.7	0.2	0.2	0.0	4.5	4.6	0.1
1st Street	2	700	65.2	65.9	0.7	137.4	139.4	2.0	1.2	1.3	0.0	6.4	6.5	0.1
6th Street	4	3,680	65.2	65.9	0.7	159.5	161.9	2.4	9.0	9.2	0.2	9.0	9.1	0.2
Silverwood Junction MP 56.6														
Keenbrook Junction MP 69.4														
Swarthout Canyon Road	2	180	77.3	78.0	0.7	226.2	229.1	2.9	0.7	0.7	0.0	14.5	14.8	0.3
Devore Road/Glen Helen Parkway	4	6,400	77.3	78.0	0.7	226.8	229.7	2.9	27.6	28.1	0.5	15.9	16.2	0.3
Dike Junction														
Palm Avenue	2	12,100	58.5	59.2	0.6	174.5	177.2	2.7	51.1	52.2	1.1	17.1	17.4	0.4
San Bernardino MP 81.4														
OVERALL:														

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change
Total Daily Vehicle Hours of Delay (Veh- Hrs/Day)									104.1	106.1	2.0			
Maximum P.M. Peak Average Delay per Vehicle (Seconds/Vehicle)												17.1	17.4	0.3

Source: San Pedro Bay Ports "Train Builder" model for intermodal trains estimation; SCAG's non-intermodal freight and passenger train data and projections; San Pedro Bay Ports compiled vehicular traffic data and projections; and San Pedro Bay Ports Peak Hour Average Vehicular Delay Calculation Methodology.

Table C2-16: BNSF Cajon Subdivision from San Bernardino to Barstow, P.M. Peak-Hour Average Vehicular Delays for Study At-Grade Crossings, 2014 Baseline and 2014 Baseline plus Revised Project (with SCIG and ICTF)

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change
Barstow MP 0														
Lenwood Road	2	4,570	65.2	65.9	0.7	116.3	118.0	1.7	6.3	6.4	0.1	5.1	5.2	0.1
Hinkley Road	2	490	65.2	65.9	0.7	116.3	118.0	1.7	0.6	0.6	0.0	4.5	4.6	0.1
Indian Trail Road	2	550	65.2	65.9	0.7	116.3	118.0	1.7	0.7	0.7	0.0	4.5	4.6	0.1
Vista Road	2	2,820	65.2	65.9	0.7	116.3	118.0	1.7	3.7	3.8	0.1	4.9	4.9	0.1
Turner Road	2	30	65.2	65.9	0.7	116.3	118.0	1.7	0.0	0.0	0.0	4.5	4.6	0.1
North Bryman Road	2	160	65.2	65.9	0.7	116.3	118.0	1.7	0.2	0.2	0.0	4.5	4.6	0.1
South Bryman Road	2	1,970	65.2	65.9	0.7	116.3	118.0	1.7	2.6	2.6	0.0	4.7	4.8	0.1
Robinson Ranch Road	2	120	65.2	65.9	0.7	116.3	118.0	1.7	0.2	0.2	0.0	4.5	4.6	0.1
1st Street	2	700	65.2	65.9	0.7	137.4	139.4	2.0	1.2	1.3	0.0	6.4	6.5	0.1
6th Street	4	3,680	65.2	65.9	0.7	159.5	161.9	2.4	9.0	9.2	0.2	9.0	9.1	0.2
Silverwood Junction MP 56.6														
Keenbrook Junction MP 69.4														
Swarthout Canyon Road	2	180	77.3	78.0	0.7	226.2	229.1	2.9	0.7	0.7	0.0	14.5	14.8	0.3
Devore Road/Glen Helen Parkway	4	6,400	77.3	78.0	0.7	226.8	229.7	2.9	27.6	28.1	0.5	15.9	16.2	0.3
Dike Junction														
Palm Avenue	2	12,100	58.5	59.2	0.7	174.5	177.2	2.7	51.1	52.2	1.0	17.1	17.4	0.3
San Bernardino MP 81.4														
OVERALL:														

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change
Total Daily Vehicle Hours of Delay (Veh- Hrs/Day)									104.1	106.0	1.9			
Maximum P.M. Peak Average Delay per Vehicle (Seconds/Vehicle)												17.1	17.4	0.3

Source: San Pedro Bay Ports "Train Builder" model for intermodal trains estimation; SCAG's non-intermodal freight and passenger train data and projections; San Pedro Bay Ports compiled vehicular traffic data and projections; and San Pedro Bay Ports Peak Hour Average Vehicular Delay Calculation Methodology.

Table C2-17: UP Alhambra Subdivision from Los Angeles Transportation Center (LATC) to Colton Crossing, P.M. Peak-Hour Average Vehicular Delays for Study At-Grade Crossings, 2014 Baseline and 2014 Baseline plus Revised Project (Excluding Segment That is Combined with UP Los Angeles Subdivision)

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/Day)	Average Daily Train Volume (Trains/Day)*			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change
LATC MP 482.9														
San Pablo Street	4	4,050	19.8	20.2	0.4	98.0	100.5	2.5	12.5	12.9	0.4	11.4	11.8	0.4
Vineburn Avenue	2	1,350	19.8	20.2	0.4	69.1	70.9	1.8	2.0	2.1	0.1	5.5	5.7	0.2
Worth/Boca Road	2	7,840	19.8	20.2	0.4	69.1	70.9	1.8	14.6	15.1	0.5	7.6	7.8	0.2
Valley Boulevard	4	27,500	19.8	20.2	0.4	46.4	47.5	1.1	26.4	27.2	0.8	4.2	4.3	0.1
Ramona Street	2	12,720	19.8	20.2	0.4	69.1	70.9	1.8	26.3	27.1	0.9	8.8	9.1	0.3
Mission Road	3	23,040	19.8	20.2	0.4	69.2	71.0	1.8	53.0	54.7	1.7	10.2	10.6	0.3
Del Mar Avenue	2	21,060	19.8	20.2	0.4	69.1	70.9	1.8	65.3	67.4	2.1	15.8	16.4	0.5
San Gabriel Boulevard	4	35,110	19.8	20.2	0.4	69.3	71.1	1.8	89.5	92.4	2.9	11.9	12.3	0.4
Walnut Grove Avenue	3	15,340	19.8	20.2	0.4	40.6	41.6	1.0	9.9	10.2	0.3	2.6	2.7	0.1
Encinita Avenue	2	6,390	19.8	20.2	0.4	40.5	41.5	1.0	3.7	3.8	0.1	2.2	2.3	0.1
Lower Azusa Road	4	17,400	19.8	20.2	0.4	40.6	41.6	1.0	10.8	11.1	0.3	2.5	2.5	0.1
Temple City Boulevard	4	20,880	19.8	20.2	0.4	40.6	41.6	1.0	13.7	14.1	0.4	2.7	2.8	0.1
Baldwin Avenue	4	25,900	19.8	20.2	0.4	40.6	41.6	1.0	18.5	19.1	0.6	3.0	3.1	0.1
Arden Drive	4	11,050	19.8	20.2	0.4	40.6	41.6	1.0	6.3	6.4	0.2	2.2	2.2	0.1
El Monte Junction MP 494.99														
Tyler Avenue	4	11,770	58.1	58.5	0.4	68.2	69.1	1.0	9.2	9.4	0.2	3.2	3.3	0.1
Cogswell Road	2	10,070	58.1	58.5	0.4	67.9	68.9	1.0	8.9	9.1	0.2	3.9	3.9	0.1
Temple Avenue	4	27,060	58.1	58.5	0.4	68.2	69.1	1.0	27.3	27.9	0.6	4.7	4.8	0.1
Bassett Junction MP 498.45														

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/Day)	Average Daily Train Volume (Trains/Day)*			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change
Vineland Avenue	2	12,550	20.6	21.0	0.4	41.2	42.2	1.0	8.9	9.2	0.3	3.0	3.1	0.1
Puente Avenue	4	31,800	20.6	21.0	0.4	41.3	42.3	1.0	26.0	26.7	0.8	3.7	3.8	0.1
Orange Avenue	2	5,770	20.6	21.0	0.4	41.2	42.2	1.0	3.3	3.4	0.1	2.2	2.3	0.1
California Avenue	2	18,770	20.6	21.0	0.4	41.2	42.2	1.0	17.6	18.1	0.5	4.5	4.7	0.1
City of Industry Junction MP 501.5														
Fullerton Road	4	18,280	23.9	24.3	0.4	47.9	48.9	1.0	13.5	13.8	0.3	3.0	3.0	0.1
Fairway Drive	4	19,830	23.9	24.3	0.4	47.9	48.9	1.0	15.0	15.3	0.4	3.1	3.2	0.1
Lemon Road	4	17,180	23.9	24.3	0.4	47.9	48.9	1.0	12.4	12.8	0.3	2.9	3.0	0.1
Brea Canyon Road	2	14,390	23.9	24.3	0.4	47.8	48.8	1.0	12.7	13.0	0.3	3.9	4.0	0.1
Pomona Junction MP 514.3	HANDLED SEPARATELY DUE TO PROXIMITY TO UP LOS ANGELES SUBDIVISION													
LA-San Bernardino County Line MP 516.7														
Montclair Junction														
Bon View Avenue	2	10,230	27.6	28.0	0.4	54.5	55.5	1.0	8.6	8.8	0.2	3.4	3.5	0.1
Vineyard Avenue	4	31,400	27.6	28.0	0.4	54.6	55.6	1.0	32.5	33.2	0.8	4.6	4.7	0.1
Milliken Avenue	6	34,910	27.6	28.0	0.4	54.7	55.7	1.0	31.1	31.9	0.7	3.7	3.8	0.1
Kaiser Junction MP 527.5														
West Colton MP 534.7														
Colton Crossing MP 538.70														
OVERALL:														
Total Daily Vehicle Hours of Delay (Veh-Hrs/Day)									579.3	596.4	17.1			

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume (Trains/Day)*			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change
Maximum P.M. Peak Average Delay per Vehicle (Seconds/Vehicle)												15.8	16.4	0.6

*The number of trains would not be affected by the presence or absence of SCIG and ICTF modernization projects.

Source: San Pedro Bay Ports "Train Builder" model for intermodal trains estimation; SCAG's non-intermodal freight and passenger train data and projections; San Pedro Bay Ports compiled vehicular traffic data and projections; and San Pedro Bay Ports Peak Hour Average Vehicular Delay Calculation Methodology.

Table C2-18: UP Los Angeles Subdivision from East Los Angeles Yard to West Riverside Junction, P.M. Peak-Hour Average Vehicular Delays for Study At-Grade Crossings, 2014 Baseline and 2014 Baseline plus Revised Project (Excluding Segment That is Combined with UP Alhambra Subdivision)

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/Day)	Average Daily Train Volume* (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change
East Los Angeles MP 5.85														
S. Vail Avenue	2	7,900	29.1	29.5	0.4	63.4	65.0	1.6	10.5	10.9	0.4	5.4	5.6	0.2
Maple Avenue	2	5,550	29.1	29.5	0.4	63.4	65.0	1.6	6.9	7.1	0.2	4.9	5.1	0.2
S. Greenwood Avenue	4	7,280	29.1	29.5	0.4	63.6	65.2	1.6	8.7	9.0	0.3	4.6	4.8	0.2
Montebello Boulevard	4	20,550	29.1	29.5	0.4	63.6	65.2	1.6	29.6	30.6	1.0	6.1	6.3	0.2
Durfee Avenue	2	13,960	29.1	29.5	0.4	44.3	45.3	1.0	10.6	10.9	0.3	3.4	3.5	0.1
Rose Hills Road	4	9,450	29.1	29.5	0.4	42.4	43.3	1.0	4.8	5.0	0.1	2.1	2.1	0.1
Mission Mill Road	2	2,180	29.1	29.5	0.4	42.2	43.2	1.0	1.0	1.1	0.0	1.9	1.9	0.1
Workman Mill	4	7,650	29.1	29.5	0.4	42.4	43.3	1.0	3.8	3.9	0.1	2.0	2.0	0.1
Turnbull Canyon Road	4	14,440	29.1	29.5	0.4	42.4	43.3	1.0	7.9	8.1	0.2	2.3	2.3	0.1
Stimson Avenue & Puente Avenue	4	14,720	29.1	29.5	0.4	42.4	43.3	1.0	8.1	8.3	0.2	2.3	2.3	0.1
Bixby Drive	2	2,960	29.1	29.5	0.4	42.2	43.2	1.0	1.4	1.5	0.0	1.9	2.0	0.1
Fullerton Road	4	24,240	29.1	29.5	0.4	42.4	43.3	1.0	15.5	16.0	0.5	2.8	2.9	0.1
Nogales Street	6	37,730	29.1	29.5	0.4	42.5	43.5	1.0	24.7	25.5	0.7	2.9	3.0	0.1
Fairway Drive	4	25,350	29.1	29.5	0.4	42.4	43.3	1.0	16.6	17.1	0.5	2.9	3.0	0.1
Lemon Street	4	15,060	29.1	29.5	0.4	42.4	43.3	1.0	8.3	8.6	0.3	2.3	2.4	0.1
Pomona Junction MP 31.9	HANDLED SEPARATELY DUE TO PROXIMITY TO UP ALHAMBRA SUBDIVISION													
LA-San Bernardino County Line MP 33.17														
E. Montclair Junction MP 35.02														
Bonview Avenue	2	3,560	30.5	30.9	0.4	44.7	45.7	1.0	1.9	1.9	0.1	2.1	2.1	0.1
Grove Avenue	6	40,370	30.5	30.9	0.4	45.0	45.9	1.0	29.6	30.4	0.8	3.3	3.4	0.1
Vineyard Avenue	4	4,550	30.5	30.9	0.4	44.8	45.8	1.0	2.3	2.4	0.1	2.0	2.0	0.1
Archibald Avenue	4	5,380	30.5	30.9	0.4	44.8	45.8	1.0	2.8	2.9	0.1	2.0	2.1	0.1

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume* (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change
San Bernardino- Riverside County Line MP 43.36														
Milliken Avenue	6	21,520	30.5	30.9	0.4	45.0	45.9	1.0	12.5	12.8	0.4	2.4	2.5	0.1
Mira Loma Junction MP 45.7														
Bellegrave Avenue	2	7,910	30.8	31.2	0.4	45.1	46.1	1.0	4.7	4.8	0.1	2.5	2.5	0.1
Rutile Street	2	8,490	30.8	31.2	0.4	45.1	46.1	1.0	5.1	5.2	0.1	2.5	2.6	0.1
Clay Street	2	16,730	30.8	31.2	0.4	45.2	46.2	1.0	10.1	10.3	0.3	2.5	2.6	0.1
Jurupa Ave	4	14,500	30.8	31.2	0.4	53.1	54.2	1.2	15.2	15.6	0.4	4.8	4.9	0.1
Mountain View Avenue	2	1,760	30.8	31.2	0.4	53.1	54.2	1.2	1.3	1.3	0.0	2.7	2.8	0.1
Streeter Avenue	4	14,220	30.8	31.2	0.4	53.2	54.4	1.2	11.7	12.0	0.3	3.3	3.4	0.1
Palm Avenue	2	7,690	30.8	31.2	0.4	49.9	51.0	1.1	5.6	5.8	0.2	3.0	3.1	0.1
Brockton Avenue	4	13,710	30.8	31.2	0.4	53.2	54.4	1.2	11.2	11.5	0.3	3.3	3.4	0.1
Riverside Avenue	2	11,800	30.8	31.2	0.4	53.1	54.2	1.2	11.2	11.5	0.3	4.1	4.2	0.1
Panorama Road	2	6,550	30.8	31.2	0.4	53.1	54.2	1.2	5.3	5.4	0.2	3.3	3.3	0.1
West Riverside Junction MP 56.7														
OVERALL:														
Total Daily Vehicle Hours of Delay (Veh- Hrs/Day)									288.7	297.4	8.7			
Maximum P.M. Peak Average Delay per Vehicle (Seconds/Vehicle)												6.1	6.3	0.2

*The number of trains would not be affected by the presence or absence of SCIG and ICTF modernization projects.

Source: San Pedro Bay Ports "Train Builder" model for intermodal trains estimation; SCAG's non-intermodal freight and passenger train data and projections; San Pedro Bay Ports compiled vehicular traffic data and projections; and San Pedro Bay Ports Peak Hour Average Vehicular Delay Calculation Methodology.

Table C2-19: Combined UP Alhambra and Los Angeles Subdivisions in Pomona and Montclair Area, P.M. Peak-Hour Average Vehicular Delays for Study At-Grade Crossings, 2014 Baseline and 2014 Baseline plus Revised Project

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume* (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change
Pomona Junction MP 514.3														
Hamilton Boulevard	4	8,000	53.9	54.7	0.8	94.0	96.1	2.0	9.8	10.0	0.3	4.7	4.8	0.1
Park Avenue	2	5,660	53.9	54.7	0.8	93.8	95.8	2.0	7.2	7.4	0.2	5.0	5.1	0.1
Main Street	2	1,570	53.9	54.7	0.8	93.8	95.8	2.0	1.8	1.8	0.0	4.3	4.4	0.1
Palomares Street	2	3,870	53.9	54.7	0.8	93.8	95.8	2.0	4.7	4.8	0.1	4.7	4.8	0.1
San Antonio Avenue	4	6,880	53.9	54.7	0.8	94.0	96.1	2.0	8.3	8.5	0.2	4.6	4.7	0.1
LA-San Bernardino County Line MP 516.7														
Monte Vista Avenue	4	12,440	53.9	54.7	0.8	94.0	96.1	2.0	16.0	16.5	0.4	5.1	5.2	0.1
San Antonio Avenue	4	10,540	53.9	54.7	0.8	94.0	96.1	2.0	13.2	13.6	0.4	4.9	5.1	0.1
Vine Avenue	2	7,730	53.9	54.7	0.8	93.8	95.8	2.0	10.3	10.6	0.3	5.4	5.5	0.1
Sultana Avenue	2	11,530	53.9	54.7	0.8	93.8	95.8	2.0	17.4	17.9	0.5	6.4	6.6	0.2
Campus Avenue	2	10,820	53.9	54.7	0.8	93.8	95.8	2.0	15.9	16.4	0.4	6.2	6.4	0.2
Montclair Junction														
OVERALL:														
Total Daily Vehicle Hours of Delay (Veh- Hrs/Day)									104.6	107.5	2.9			
Maximum P.M. Peak Average Delay per Vehicle (Seconds/Vehicle)												6.4	6.6	0.2

*The number of trains would not be affected by the presence or absence of SCIG and ICTF modernization projects.

Source: San Pedro Bay Ports "Train Builder" model for intermodal trains estimation; SCAG's non-intermodal freight and passenger train data and projections; San Pedro Bay Ports compiled vehicular traffic data and projections; and San Pedro Bay Ports Peak Hour Average Vehicular Delay Calculation Methodology.

Table C2-20: UP Yuma Subdivision from Colton Crossing to Indio, P.M. Peak-Hour Average Vehicular Delays for Study At-Grade Crossings, 2014 Baseline and 2014 Baseline plus Revised Project

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/Day)	Average Daily Train Volume* (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change
Colton Crossing MP 539.0														
Hunts Lane	4	14,110	44.4	45.1	0.7	101.3	103.3	2.0	23.6	24.1	0.6	6.5	6.7	0.2
Whittier Avenue	2	200	44.4	45.1	0.7	119.6	122.0	2.4	0.4	0.4	0.0	7.0	7.2	0.2
Beaumont Avenue	2	480	44.4	45.1	0.7	119.6	122.0	2.4	0.9	1.0	0.0	7.1	7.3	0.2
San Timoteo Canyon Road	2	12,160	44.4	45.1	0.7	119.6	122.0	2.4	33.8	34.6	0.9	11.8	12.1	0.3
Alessandro Road	2	300	44.4	45.1	0.7	119.6	122.0	2.4	0.6	0.6	0.0	7.1	7.2	0.2
San Bernardino-Riverside County Line MP 549.25														
Live Oak Canyon Road	2	1,150	44.4	45.1	0.7	119.6	122.0	2.4	2.3	2.3	0.1	7.2	7.4	0.2
San Timoteo Canyon Road	2	1,480	44.4	45.1	0.7	119.6	122.0	2.4	3.0	3.0	0.1	7.3	7.5	0.2
Viele Avenue	2	110	44.4	45.1	0.7	101.0	103.0	2.0	0.2	0.2	0.0	5.0	5.1	0.1
California Avenue	2	6,860	44.4	45.1	0.7	101.0	103.0	2.0	11.0	11.3	0.3	6.2	6.3	0.2
Pennsylvania Avenue	2	8,500	44.4	45.1	0.7	101.0	103.0	2.0	14.2	14.6	0.4	6.6	6.7	0.2
North Sunset Avenue	2	3,960	44.4	45.1	0.7	101.0	103.0	2.0	5.9	6.1	0.1	5.6	5.7	0.1
22nd Street	4	16,080	44.4	45.1	0.7	101.3	103.3	2.0	26.7	27.3	0.7	6.5	6.6	0.2
San Gorgonio Avenue	2	13,310	44.4	45.1	0.7	101.0	103.0	2.0	25.5	26.1	0.6	8.0	8.2	0.2
Hargrave Street	2	17,300	44.4	45.1	0.7	101.0	103.0	2.0	38.0	39.0	1.0	9.7	10.0	0.2
Apache Trail	2	2,630	44.4	45.1	0.7	101.0	103.0	2.0	3.8	3.9	0.1	5.4	5.5	0.1
Broadway	2	6,930	44.4	45.1	0.7	101.0	103.0	2.0	11.1	11.4	0.3	6.2	6.3	0.2
Tipton Road	2	120	44.4	45.1	0.7	101.0	103.0	2.0	0.2	0.2	0.0	5.0	5.1	0.1
Garnet MP 588.32														
West Indio MP 609.63														

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume* (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change
Indio MP 610.9														
Avenue 52	4	11,410	44.4	45.1	0.7	101.3	103.3	2.0	17.9	18.3	0.4	6.0	6.1	0.1
Avenue 56/Airport Boulevard	2	4,970	44.4	45.1	0.7	101.0	103.0	2.0	7.6	7.8	0.2	5.8	5.9	0.1
Avenue 66/4th Street	2	8,150	44.4	45.1	0.7	101.0	103.0	2.0	13.5	13.8	0.3	6.5	6.6	0.2
OVERALL:														
Total Daily Vehicle Hours of Delay (Veh- Hrs/Day)									240.0	246.1	6.1			
Maximum P.M. Peak Average Delay per Vehicle (Seconds/Vehicle)												11.8	12.1	0.3

*The number of trains would not be affected by the presence or absence of SCIG and ICTF modernization projects.

Source: San Pedro Bay Ports "Train Builder" model for intermodal trains estimation; SCAG's non-intermodal freight and passenger train data and projections; San Pedro Bay Ports compiled vehicular traffic data and projections; and San Pedro Bay Ports Peak Hour Average Vehicular Delay Calculation Methodology.

Table C2-21: P.M. Peak-Hour Average Vehicular Delays for Henry Ford Avenue At-Grade Crossing, 2014 Baseline and 2014 Baseline plus Revised Project

Boundary/Junction – Street	# of Lanes	P.M. Peak Hour Traffic (Vehicles)	P.M. Peak Hour Train Volume* (Trains)			P.M. Peak Hour Total Gate Down Time (Minutes)			P.M. Peak Hour Total Vehicle Hours of Delay (Veh-Hrs)			P.M. Peak Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change	Base	Base + Proj.	Change
Henry Ford Avenue	6	1,010	0.92	1.05	0.13	4.3	5.2	0.9	4.8	6.4	1.6	17.1	22.9	5.8

*The number of trains would not be affected by the presence or absence of SCIG and ICTF modernization projects.

Source: Henry Ford Avenue crossing controller data for May/June 2016; POLA 2045 build out rail simulation data; PortTAM Travel Demand Model for this EIR; and San Pedro Bay Ports Peak Hour Average Vehicular Delay Calculation Methodology.

Table C2-22: P.M. Peak-Hour Average Vehicular Delays at the Henry Ford Avenue At-Grade Crossing, Future Baseline and Revised Project Cumulative Scenarios

Boundary/Junction – Street	# of Lanes	P.M. Peak Hour Traffic (Vehicles)	P.M. Peak Hour Train Volume* (Trains)			P.M. Peak Hour Total Gate Down Time (Minutes)			P.M. Peak Hour Total Vehicle Hours of Delay (Veh-Hrs)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Future Base	Cum.	Change	Future Base	Cum.	Change	Future Base	Cum.	Change	Future Base	Cum.	Change
Henry Ford Avenue	6	1,600	1.10	1.23	0.13	6.8	7.7	0.9	18.3	21.3	3.0	41.3	47.9	6.6

*The number of trains would not be affected by the presence or absence of SCIG and ICTF modernization projects.

Source: Henry Ford Avenue crossing controller data for May/June 2016; POLA 2045 build out rail simulation data; San Pedro Bay Ports "Train Builder" model for intermodal trains estimation; PortTAM Travel Demand Model for this EIR; and San Pedro Bay Ports Peak Hour Average Vehicular Delay Calculation Methodology.

C2.4 Cumulative Analysis – Henry Ford Avenue Crossing

This analysis calculated the P.M. peak-hour average vehicular delays for the Henry Ford Avenue at-grade crossing under the Future Baseline (2045 conditions with background growth and all related projects) and Revised Project Cumulative (Future Baseline plus the Revised Project) conditions. The Revised Project Cumulative scenario includes Revised Project-added trains resulting from the increased throughput of the Revised Project compared to the Approved Project. There was no difference in Revised Project-added train volumes with or without the SCIG and ICTF projects for the Henry Ford Avenue at-grade crossing. The vehicular traffic volumes at the Henry Ford Avenue crossing were kept the same under both Future Baseline and Revised Project Cumulative conditions.

As Table C2-22 shows, P.M. peak-hour average vehicular delay at that crossing were predicted to be less than 55 seconds under Revised Project Cumulative conditions.

C2.5 Cumulative Analysis – Inland Empire At-Grade Rail Crossings (Information Only)

This analysis calculated P.M. peak-hour average vehicular delays for at-grade crossings on rail mainlines east of the downtown railyards (Figure CS-1) for Future Baseline (2045) and Revised Project Cumulative conditions (see previous section for descriptions of these scenarios). This analysis was conducted for informational purposes only because CEQA does not require the Port to evaluate impacts of rail activity outside its vicinity (see Section 3.3.2.3). Revised Project-added train volumes with the SCIG and ICTF projects were slightly higher than those without those projects for at-grade crossings on BNSF rail lines, but there was no difference on the UP rail lines. The roadway volumes at at-grade crossings were kept the same under both Future Baseline and Revised Project Cumulative conditions.

As tables C2-23 to C2-30 show, P.M. peak-hour average vehicular delays at the Del Mar Avenue at-grade crossing on the UP Alhambra line and at the Hargrave Street at-grade crossing on the UP Yuma line would be more than 55 seconds under both Future Baseline and Revised Project Cumulative conditions. The Revised Project's rail traffic would add 1 second of delay at Del Mar Avenue (Table C2-) and 0.7 second or delay at Hargrave Street (Table C2-). The average vehicular delays at all other at-grade crossings would be less than 55 seconds.

The delays at Del Mar Avenue and Hargrave Street exceed the threshold of 55 seconds per vehicle (equivalent to LOS D) considered acceptable operating conditions. However, both at-grade crossings will be removed. A grade separation project is already underway at the Del Mar Avenue crossing, and the Riverside County Transportation Commission has identified Hargrave Street as one of the topmost priority crossings for grade separation (RCTC 2012). Accordingly, at some point in the future there will be no vehicular delay at either location.

C2.6 References

Riverside County Transportation Commission (RCTC). 2012. Grade Separation Priority Update Study for Alameda Corridor East (Riverside County). Final Report. Prepared by InfraConsult. March 2012. http://rctc.org/uploads/media_items/rctc-gradecrossingpriorityreport-final-withappendix-040612.original.pdf

Table CS-23: BNSF San Bernardino Subdivision, from Hobart Yard to San Bernardino, P.M. Peak-Hour Average Vehicular Delays for Study At-Grade Crossings, 2045, Future Baseline and Revised Project Cumulative (without SCIG and ICTF projects)

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/Day)	Average Daily Train Volume (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change
San Bernardino MP 0.0														
Laurel Street	2	3,730	108.8	109.4	0.6	228.7	230.6	2.0	13.4	13.6	0.2	13.6	13.8	0.2
Olive Street	2	4,440	108.8	109.4	0.6	228.7	230.6	2.0	16.3	16.5	0.2	14.1	14.2	0.2
E Street	2	1,170	108.8	109.4	0.6	228.7	230.6	2.0	3.9	4.0	0.0	12.3	12.4	0.1
H Street	2	2,330	108.8	109.4	0.6	228.7	230.6	2.0	8.1	8.1	0.1	12.9	13.0	0.1
Valley Boulevard	2	17,510	108.8	109.4	0.6	228.7	230.6	2.0	115.9	117.3	1.3	32.5	32.9	0.4
Colton Crossing MP 3.2														
Highgrove Junction MP 6.1 (Connection to Perris via MetroLink)														
Main Street	2	4,260	160.0	161.0	1.0	323.0	326.0	3.0	22.1	22.3	0.3	19.8	20.0	0.2
Riverside-San Bernardino County Line MP 6.41														
Center Street	4	9,360	160.0	161.0	1.0	323.9	326.9	3.0	48.7	49.3	0.6	19.7	20.0	0.2
Iowa Avenue	4	34,500	160.0	161.0	1.0	323.9	326.9	3.0	283.4	287.1	3.7	37.2	37.7	0.5
Palmyrita Avenue	2	5,650	160.0	161.0	1.0	323.0	326.0	3.0	30.0	30.4	0.4	20.4	20.6	0.2
Chicago Avenue	4	20,430	160.0	161.0	1.0	323.9	326.9	3.0	125.7	127.2	1.6	24.9	25.2	0.3
Spruce Street	4	10,910	160.0	161.0	1.0	323.9	326.9	3.0	58.0	58.7	0.7	20.3	20.6	0.2
3rd Street	4	16,420	160.0	161.0	1.0	323.9	326.9	3.0	94.6	95.8	1.2	22.8	23.0	0.3
Mission Inn (7th Street)	4	8,030	160.0	161.0	1.0	323.9	326.9	3.0	41.0	41.5	0.5	19.3	19.5	0.2
Riverside Yard and Amtrak Station MP 10.02-10.16														
Cridge Street	2	5,670	172.0	173.0	1.0	331.8	334.8	3.0	30.9	31.2	0.4	21.1	21.4	0.3

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change
West Riverside Junction MP 10.6 (Connection to UP Los Angeles Sub)														
Jane Street	2	3,260	118.3	118.9	0.6	220.1	221.9	1.8	10.7	10.8	0.1	12.4	12.5	0.1
Mary Street	4	17,990	118.3	118.9	0.6	220.7	222.6	1.8	69.2	69.9	0.8	15.5	15.7	0.2
Washington Street	2	12,490	118.3	118.9	0.6	220.1	221.9	1.8	53.7	54.3	0.6	18.1	18.3	0.2
Madison Street	4	23,670	118.3	118.9	0.6	220.7	222.6	1.8	99.8	101.0	1.1	17.7	17.8	0.2
Jefferson Street	2	12,350	118.3	118.9	0.6	220.1	221.9	1.8	52.8	53.4	0.6	18.0	18.2	0.2
Adams Street	4	26,370	118.3	118.9	0.6	220.7	222.6	1.8	116.8	118.1	1.3	18.9	19.1	0.2
Jackson Street	4	11,770	118.3	118.9	0.6	220.7	222.6	1.8	41.4	41.8	0.5	13.7	13.8	0.1
Gibson Street	2	1,280	118.3	118.9	0.6	220.1	221.9	1.8	4.0	4.0	0.0	11.6	11.7	0.1
Harrison Street	2	10,030	118.3	118.9	0.6	220.1	221.9	1.8	39.6	40.1	0.4	16.1	16.3	0.2
Tyler Street	4	23,530	118.3	118.9	0.6	220.7	222.6	1.8	99.0	100.1	1.1	17.6	17.8	0.2
Pierce Street	2	16,840	118.3	118.9	0.6	220.1	221.9	1.8	86.2	87.2	1.0	23.2	23.5	0.3
Buchanan Street	2	14,410	118.3	118.9	0.6	220.1	221.9	1.8	66.6	67.3	0.7	20.1	20.3	0.2
Magnolia Avenue(eastbound)	2	13,240	118.3	118.9	0.6	220.1	221.9	1.8	58.5	59.1	0.7	18.9	19.1	0.2
Magnolia Avenue(westbound)	2	13,240	118.3	118.9	0.6	220.1	221.9	1.8	58.5	59.1	0.7	18.9	19.1	0.2
Mckinley Street	4	40,120	118.3	118.9	0.6	220.7	222.6	1.8	242.8	245.6	2.8	29.3	29.7	0.3
Radio Road	2	6,480	118.3	118.9	0.6	220.1	221.9	1.8	23.0	23.3	0.3	13.9	14.1	0.2
Joy Street	2	10,960	118.3	118.9	0.6	220.1	221.9	1.8	44.6	45.1	0.5	16.8	17.0	0.2
Sheridan Street	2	3,560	118.3	118.9	0.6	220.1	221.9	1.8	11.7	11.9	0.1	12.5	12.6	0.1
Cota Street	4	9,090	118.3	118.9	0.6	220.7	222.6	1.8	30.8	31.2	0.3	13.0	13.1	0.1
Railroad Street	4	14,570	118.3	118.9	0.6	220.7	222.6	1.8	53.2	53.8	0.6	14.4	14.6	0.2
Smith Street	4	20,620	118.3	118.9	0.6	220.7	222.6	1.8	82.6	83.5	0.9	16.4	16.6	0.2
Auto Center Drive	2	17,430	118.3	118.9	0.6	220.1	221.9	1.8	91.7	92.8	1.0	24.1	24.4	0.3
Riverside-Orange County Line														
Kellogg Drive	4	8,300	118.3	118.9	0.6	220.7	222.6	1.8	28.1	28.4	0.3	12.9	13.1	0.1
Lakeview Avenue	3	22,780	118.3	118.9	0.6	220.4	222.2	1.8	112.8	114.0	1.3	22.2	22.4	0.2
Richfield Road	4	11,440	118.3	118.9	0.6	220.7	222.6	1.8	40.4	40.9	0.4	13.8	13.9	0.1

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change
Atwood Junction MP 40.6 (Connection to Old Olive Sub)														
Van Buren Street	2	8,170	89.3	89.9	0.6	187.9	189.7	1.8	27.7	28.0	0.3	13.5	13.7	0.2
Jefferson Street	3	7,670	89.3	89.9	0.6	188.2	190.0	1.8	23.8	24.1	0.3	11.9	12.1	0.1
Tustin Avenue (Rose Drive)	4	35,230	89.3	89.9	0.6	188.4	190.2	1.8	174.0	176.1	2.1	23.1	23.4	0.3
Orangethorpe Avenue	4	34,210	89.3	89.9	0.6	188.4	190.2	1.8	164.6	166.7	2.0	22.3	22.6	0.3
Kraemer Boulevard	4	23,890	89.3	89.9	0.6	188.4	190.2	1.8	92.2	93.4	1.1	16.3	16.5	0.2
Placentia Avenue	4	17,510	89.3	89.9	0.6	188.4	190.2	1.8	60.6	61.4	0.7	13.9	14.1	0.2
State College Boulevard	4	28,480	89.3	89.9	0.6	188.4	190.2	1.8	120.3	121.8	1.5	18.5	18.7	0.2
Acacia Avenue	4	8,140	89.3	89.9	0.6	188.4	190.2	1.8	24.6	24.9	0.3	11.5	11.6	0.1
Raymond Avenue	4	25,390	89.3	89.9	0.6	188.4	190.2	1.8	100.8	102.0	1.2	16.9	17.1	0.2
Fullerton Junction MP 45.5 = MP 165.5														
Orange-LA County Line														
Valley View Avenue	4	28,610	144.3	144.9	0.6	231.8	233.6	1.8	140.7	142.3	1.6	21.9	22.1	0.2
Rosecrans/Marquar dt Avenue	4	27,020	144.3	144.9	0.6	231.8	233.6	1.8	128.2	129.6	1.4	20.8	21.1	0.2
Lakeland Road	2	7,610	144.3	144.9	0.6	231.0	232.8	1.8	28.7	29.0	0.3	15.2	15.3	0.2
Los Nietos Road	4	23,840	144.3	144.9	0.6	231.8	233.6	1.8	105.8	106.9	1.2	19.0	19.2	0.2
Norwalk Boulevard	4	30,550	144.3	144.9	0.6	231.8	233.6	1.8	157.3	159.1	1.8	23.4	23.6	0.3
Pioneer Boulevard	4	17,830	144.3	144.9	0.6	231.8	233.6	1.8	70.7	71.5	0.8	16.2	16.4	0.2
Passons Boulevard	4	14,780	144.3	144.9	0.6	231.8	233.6	1.8	55.7	56.3	0.6	15.1	15.3	0.2
Serapis Avenue	2	7,300	144.3	144.9	0.6	231.0	232.8	1.8	27.3	27.6	0.3	15.0	15.1	0.2
Commerce Yard MP 148.5														
Hobart Yard MP 146.0														
OVERALL:														

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change
Total Daily Vehicle Hours of Delay (Veh- Hrs/Day)									4,013.5	4,060.4	46.8			
Maximum P.M. Peak Average Delay per Vehicle (Seconds/Vehicle)												37.2	37.7	0.5

Source: San Pedro Bay Ports "Train Builder" model for intermodal trains estimation; SCAG's non-intermodal freight and passenger train data and projections; San Pedro Bay Ports compiled vehicular traffic data and projections; and San Pedro Bay Ports Peak Hour Average Vehicular Delay Calculation Methodology.

Table C2-24: BNSF San Bernardino Subdivision, from Hobart Yard to San Bernardino, P.M. Peak-Hour Average Vehicular Delays for Study At-Grade Crossings, 2045, Future Baseline and Revised Project Cumulative (with SCIG and ICTF projects)

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/Day)	Average Daily Train Volume (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change
San Bernardino MP 0.0														
Laurel Street	2	3,730	109.3	110.0	0.7	229.0	231.0	2.0	13.4	13.5	0.1	13.6	13.7	0.1
Olive Street	2	4,440	109.3	110.0	0.7	229.0	231.0	2.0	16.3	16.4	0.2	14.0	14.2	0.2
E Street	2	1,170	109.3	110.0	0.7	229.0	231.0	2.0	3.9	3.9	0.0	12.3	12.4	0.1
H Street	2	2,330	109.3	110.0	0.7	229.0	231.0	2.0	8.0	8.1	0.1	12.8	13.0	0.1
Valley Boulevard	2	17,510	109.3	110.0	0.7	229.0	231.0	2.0	115.6	116.9	1.3	32.4	32.8	0.4
Colton Crossing MP 3.2														
Highgrove Junction MP 6.1 (Connection to Perris via MetroLink)														
Main Street	2	4,260	160.6	161.6	1.0	323.4	326.4	3.0	22.0	22.3	0.3	19.7	20.0	0.2
Riverside-San Bernardino County Line MP 6.41														
Center Street	4	9,360	160.6	161.6	1.0	324.3	327.3	3.0	48.6	49.2	0.6	19.7	19.9	0.2
Iowa Avenue	4	34,500	160.6	161.6	1.0	324.3	327.3	3.0	283.0	286.6	3.6	37.2	37.7	0.5
Palmyrita Avenue	2	5,650	160.6	161.6	1.0	323.4	326.4	3.0	30.0	30.3	0.4	20.4	20.6	0.2
Chicago Avenue	4	20,430	160.6	161.6	1.0	324.3	327.3	3.0	125.4	127.0	1.5	24.9	25.2	0.3
Spruce Street	4	10,910	160.6	161.6	1.0	324.3	327.3	3.0	57.8	58.5	0.7	20.3	20.5	0.2
3rd Street	4	16,420	160.6	161.6	1.0	324.3	327.3	3.0	94.4	95.6	1.2	22.7	23.0	0.3
Mission Inn (7th Street)	4	8,030	160.6	161.6	1.0	324.3	327.3	3.0	40.9	41.4	0.5	19.2	19.5	0.2
Riverside Yard and Amtrak Station MP 10.02-10.16														
Cridge Street	2	5,670	172.6	173.6	1.0	332.2	335.2	3.0	30.8	31.2	0.4	21.1	21.3	0.2

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Future Base	Rev Proj Cum	Chang e	Future Base	Rev Proj Cum	Chang e	Future Base	Rev Proj Cum	Chang e	Future Base	Rev Proj Cum	Chang e
West Riverside Junction MP 10.6 (Connection to UP Los Angeles Sub)														
Jane Street	2	3,260	118.8	119.5	0.6	220.5	222.3	1.8	10.6	10.7	0.1	12.3	12.5	0.1
Mary Street	4	17,990	118.8	119.5	0.6	221.1	223.0	1.8	68.9	69.7	0.8	15.4	15.6	0.2
Washington Street	2	12,490	118.8	119.5	0.6	220.5	222.3	1.8	53.5	54.1	0.6	18.1	18.3	0.2
Madison Street	4	23,670	118.8	119.5	0.6	221.1	223.0	1.8	99.5	100.6	1.1	17.6	17.8	0.2
Jefferson Street	2	12,350	118.8	119.5	0.6	220.5	222.3	1.8	52.6	53.2	0.6	18.0	18.2	0.2
Adams Street	4	26,370	118.8	119.5	0.6	221.1	223.0	1.8	116.4	117.7	1.3	18.8	19.0	0.2
Jackson Street	4	11,770	118.8	119.5	0.6	221.1	223.0	1.8	41.2	41.7	0.4	13.6	13.8	0.1
Gibson Street	2	1,280	118.8	119.5	0.6	220.5	222.3	1.8	4.0	4.0	0.0	11.5	11.7	0.1
Harrison Street	2	10,030	118.8	119.5	0.6	220.5	222.3	1.8	39.5	39.9	0.4	16.1	16.3	0.2
Tyler Street	4	23,530	118.8	119.5	0.6	221.1	223.0	1.8	98.7	99.8	1.1	17.5	17.7	0.2
Pierce Street	2	16,840	118.8	119.5	0.6	220.5	222.3	1.8	85.9	86.9	1.0	23.2	23.4	0.3
Buchanan Street	2	14,410	118.8	119.5	0.6	220.5	222.3	1.8	66.3	67.1	0.7	20.0	20.2	0.2
Magnolia Avenue(eastbound)	2	13,240	118.8	119.5	0.6	220.5	222.3	1.8	58.3	58.9	0.6	18.8	19.0	0.2
Magnolia Avenue(westbound)	2	13,240	118.8	119.5	0.6	220.5	222.3	1.8	58.3	58.9	0.6	18.8	19.0	0.2
Mckinley Street	4	40,120	118.8	119.5	0.6	221.1	223.0	1.8	242.1	244.8	2.7	29.3	29.6	0.3
Radio Road	2	6,480	118.8	119.5	0.6	220.5	222.3	1.8	23.0	23.2	0.3	13.9	14.0	0.1
Joy Street	2	10,960	118.8	119.5	0.6	220.5	222.3	1.8	44.5	45.0	0.5	16.8	17.0	0.2
Sheridan Street	2	3,560	118.8	119.5	0.6	220.5	222.3	1.8	11.7	11.8	0.1	12.5	12.6	0.1
Cota Street	4	9,090	118.8	119.5	0.6	221.1	223.0	1.8	30.7	31.1	0.3	13.0	13.1	0.1
Railroad Street	4	14,570	118.8	119.5	0.6	221.1	223.0	1.8	53.1	53.6	0.6	14.4	14.5	0.2
Smith Street	4	20,620	118.8	119.5	0.6	221.1	223.0	1.8	82.4	83.3	0.9	16.4	16.5	0.2
Auto Center Drive	2	17,430	118.8	119.5	0.6	220.5	222.3	1.8	91.4	92.4	1.0	24.1	24.3	0.3
Riverside-Orange County Line														
Kellogg Drive	4	8,300	118.8	119.5	0.6	221.1	223.0	1.8	28.0	28.3	0.3	12.9	13.0	0.1
Lakeview Avenue	3	22,780	118.8	119.5	0.6	220.8	222.6	1.8	112.4	113.7	1.2	22.1	22.4	0.2
Richfield Road	4	11,440	118.8	119.5	0.6	221.1	223.0	1.8	40.3	40.7	0.4	13.7	13.9	0.1

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Future Base	Rev Proj Cum	Chang e	Future Base	Rev Proj Cum	Chang e	Future Base	Rev Proj Cum	Chang e	Future Base	Rev Proj Cum	Chang e
Atwood Junction MP 40.6 (Connection to Old Olive Sub)														
Van Buren Street	2	8,170	89.8	90.5	0.6	188.3	190.1	1.8	27.5	27.9	0.3	13.4	13.6	0.2
Jefferson Street	3	7,670	89.8	90.5	0.6	188.5	190.4	1.8	23.7	24.0	0.3	11.9	12.0	0.1
Tustin Avenue (Rose Drive)	4	35,230	89.8	90.5	0.6	188.8	190.6	1.8	173.4	175.5	2.1	23.0	23.3	0.3
Orangethorpe Avenue	4	34,210	89.8	90.5	0.6	188.8	190.6	1.8	164.0	166.0	2.0	22.2	22.5	0.3
Kraemer Boulevard	4	23,890	89.8	90.5	0.6	188.8	190.6	1.8	91.9	93.0	1.1	16.2	16.4	0.2
Placentia Avenue	4	17,510	89.8	90.5	0.6	188.8	190.6	1.8	60.4	61.1	0.7	13.9	14.0	0.2
State College Boulevard	4	28,480	89.8	90.5	0.6	188.8	190.6	1.8	119.8	121.3	1.4	18.4	18.6	0.2
Acacia Avenue	4	8,140	89.8	90.5	0.6	188.8	190.6	1.8	24.6	24.8	0.3	11.4	11.6	0.1
Raymond Avenue	4	25,390	89.8	90.5	0.6	188.8	190.6	1.8	100.4	101.7	1.2	16.9	17.1	0.2
Fullerton Junction MP 45.5 = MP 165.5														
Orange-LA County Line														
Valley View Avenue	4	28,610	144.8	145.5	0.6	232.2	234.0	1.8	140.2	141.8	1.6	21.8	22.1	0.2
Rosecrans/Marqu ardt Avenue	4	27,020	144.8	145.5	0.6	232.2	234.0	1.8	127.8	129.2	1.4	20.8	21.0	0.2
Lakeland Road	2	7,610	144.8	145.5	0.6	231.4	233.2	1.8	28.6	28.9	0.3	15.1	15.3	0.2
Los Nietos Road	4	23,840	144.8	145.5	0.6	232.2	234.0	1.8	105.4	106.6	1.2	18.9	19.1	0.2
Norwalk Boulevard	4	30,550	144.8	145.5	0.6	232.2	234.0	1.8	156.8	158.6	1.8	23.3	23.6	0.3
Pioneer Boulevard	4	17,830	144.8	145.5	0.6	232.2	234.0	1.8	70.5	71.2	0.8	16.2	16.3	0.2
Passons Boulevard	4	14,780	144.8	145.5	0.6	232.2	234.0	1.8	55.5	56.1	0.6	15.1	15.2	0.2
Serapis Avenue	2	7,300	144.8	145.5	0.6	231.4	233.2	1.8	27.2	27.5	0.3	14.9	15.1	0.2
Commerce Yard MP 148.5														
Hobart Yard MP 146.0														
OVERALL:														

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Future Base	Rev Proj Cum	Chang e	Future Base	Rev Proj Cum	Chang e	Future Base	Rev Proj Cum	Chang e	Future Base	Rev Proj Cum	Chang e
Total Daily Vehicle Hours of Delay (Veh- Hrs/Day)									4,001.1	4,047.3	46.2			
Maximum P.M. Peak Average Delay per Vehicle (Seconds/Vehicle)												37.2	37.7	0.5

Source: San Pedro Bay Ports "Train Builder" model for intermodal trains estimation; SCAG's non-intermodal freight and passenger train data and projections; San Pedro Bay Ports compiled vehicular traffic data and projections; and San Pedro Bay Ports Peak Hour Average Vehicular Delay Calculation Methodology.

Table C2-25: BNSF Cajon Subdivision from San Bernardino to Barstow, P.M. Peak-Hour Average Vehicular Delays for Study At-Grade Crossings, 2045, Future Baseline and Revised Project Cumulative (without SCIG and ICTF projects)

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change
Barstow MP 0														
Lenwood Road	2	6,640	106.7	107.4	0.7	170.0	171.7	1.7	15.7	15.9	0.2	9.0	9.1	0.1
Hinkley Road	2	710	106.7	107.4	0.7	170.0	171.7	1.7	1.5	1.5	0.0	7.5	7.5	0.1
Indian Trail Road	2	800	106.7	107.4	0.7	170.0	171.7	1.7	1.7	1.7	0.0	7.5	7.6	0.1
Vista Road	2	4,100	106.7	107.4	0.7	170.0	171.7	1.7	9.1	9.2	0.1	8.3	8.4	0.1
Turner Road	2	50	106.7	107.4	0.7	170.0	171.7	1.7	0.1	0.1	0.0	7.3	7.4	0.1
North Bryman Road	2	240	106.7	107.4	0.7	170.0	171.7	1.7	0.5	0.5	0.0	7.4	7.4	0.1
South Bryman Road	2	2,860	106.7	107.4	0.7	170.0	171.7	1.7	6.2	6.3	0.1	8.0	8.0	0.1
Robinson Ranch Road	2	170	106.7	107.4	0.7	170.0	171.7	1.7	0.3	0.4	0.0	7.3	7.4	0.1
1st Street	2	1,020	106.7	107.4	0.7	202.3	204.3	2.0	3.0	3.0	0.0	10.7	10.8	0.1
6th Street	4	5,340	106.7	107.4	0.7	236.3	238.6	2.4	22.4	22.6	0.3	15.4	15.6	0.2
Silverwood Junction MP 56.6														
Keenbrook Junction MP 69.4														
Swarthout Canyon Road	2	270	112.7	113.4	0.7	288.3	291.2	2.9	1.6	1.6	0.0	21.5	21.7	0.3
Devore Road/Glen Helen Parkway	4	9,300	112.7	113.4	0.7	289.0	291.9	2.9	61.2	62.0	0.7	24.6	24.9	0.3
Dike Junction														
Palm Avenue	2	17,570	89.1	89.8	0.6	261.1	263.8	2.7	153.2	155.1	1.9	38.0	38.5	0.5
San Bernardino MP 81.4														
OVERALL:														

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change
Total Daily Vehicle Hours of Delay (Veh- Hrs/Day)									276.8	279.8	3.4			
Maximum P.M. Peak Average Delay per Vehicle (Seconds/Vehicle)												38.0	38.5	0.5

Source: San Pedro Bay Ports "Train Builder" model for intermodal trains estimation; SCAG's non-intermodal freight and passenger train data and projections; San Pedro Bay Ports compiled vehicular traffic data and projections; and San Pedro Bay Ports Peak Hour Average Vehicular Delay Calculation Methodology.

Table C2-26: BNSF Cajon Subdivision from San Bernardino to Barstow, P.M. Peak Hour Average Vehicular Delays for Study At-Grade Crossings, 2045, Future Baseline and Revised Project Cumulative (with SCIG and ICTF projects)

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change
Barstow MP 0														
Lenwood Road	2	6,640	107.3	108.0	0.7	170.4	172.1	1.7	15.6	15.8	0.2	9.0	9.1	0.1
Hinkley Road	2	710	107.3	108.0	0.7	170.4	172.1	1.7	1.5	1.5	0.0	7.4	7.5	0.1
Indian Trail Road	2	800	107.3	108.0	0.7	170.4	172.1	1.7	1.7	1.7	0.0	7.5	7.5	0.1
Vista Road	2	4,100	107.3	108.0	0.7	170.4	172.1	1.7	9.1	9.2	0.1	8.2	8.3	0.1
Turner Road	2	50	107.3	108.0	0.7	170.4	172.1	1.7	0.1	0.1	0.0	7.3	7.4	0.1
North Bryman Road	2	240	107.3	108.0	0.7	170.4	172.1	1.7	0.5	0.5	0.0	7.3	7.4	0.1
South Bryman Road	2	2,860	107.3	108.0	0.7	170.4	172.1	1.7	6.2	6.2	0.1	7.9	8.0	0.1
Robinson Ranch Road	2	170	107.3	108.0	0.7	170.4	172.1	1.7	0.3	0.4	0.0	7.3	7.4	0.1
1st Street	2	1,020	107.3	108.0	0.7	202.7	204.7	2.0	3.0	3.0	0.0	10.7	10.8	0.1
6th Street	4	5,340	107.3	108.0	0.7	236.7	239.0	2.4	22.3	22.5	0.3	15.3	15.5	0.2
Silverwood Junction MP 56.6														
Keenbrook Junction MP 69.4														
Swarthout Canyon Road	2	270	113.3	114.0	0.7	288.7	291.7	2.9	1.6	1.6	0.0	21.4	21.6	0.3
Devore Road/Glen Helen Parkway	4	9,300	113.3	114.0	0.7	289.4	292.3	2.9	61.0	61.7	0.7	24.5	24.8	0.3
Dike Junction														
Palm Avenue	2	17,570	89.7	90.3	0.7	261.5	264.2	2.7	152.6	154.4	1.9	37.9	38.4	0.5
San Bernardino MP 81.4														
OVERALL:														

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change
Total Daily Vehicle Hours of Delay (Veh- Hrs/Day)									275.4	278.7	3.3			
Maximum P.M. Peak Average Delay per Vehicle (Seconds/Vehicle)												37.9	38.4	0.5

Source: San Pedro Bay Ports "Train Builder" model for intermodal trains estimation; SCAG's non-intermodal freight and passenger train data and projections; San Pedro Bay Ports compiled vehicular traffic data and projections; and San Pedro Bay Ports Peak Hour Average Vehicular Delay Calculation Methodology.

Table C2-27: UP Alhambra Subdivision from Los Angeles Transportation Center (LATC) to Colton Crossing, P.M. Peak-Hour Average Vehicular Delays for Study At-Grade Crossings, 2045, Future Baseline and Revised Project Cumulative (Excluding Segment That is Combined with UP Los Angeles Subdivision)

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/Day)	Average Daily Train Volume (Trains/Day)*			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change
LATC MP 482.9														
San Pablo Street	4	5,020	41.3	41.7	0.4	217.8	220.3	2.5	37.6	38.1	0.5	27.9	28.3	0.4
Vineburn Avenue	2	1,680	41.3	41.7	0.4	153.1	154.9	1.8	6.0	6.1	0.1	13.2	13.4	0.2
Worth/Boca Road	2	9,720	41.3	41.7	0.4	153.1	154.9	1.8	46.7	47.3	0.6	20.2	20.5	0.3
Valley Boulevard	4	34,080	41.3	41.7	0.4	102.1	103.2	1.1	89.0	90.2	1.2	12.0	12.2	0.2
Ramona Street	2	15,770	41.3	41.7	0.4	153.1	154.9	1.8	87.9	89.1	1.2	25.1	25.4	0.3
Mission Road	3	28,550	41.3	41.7	0.4	153.3	155.0	1.8	187.8	190.4	2.6	31.8	32.3	0.4
Del Mar Avenue	2	26,100	41.3	41.7	0.4	153.1	154.9	1.8	308.2	312.5	4.3	72.9	73.9	1.0
San Gabriel Boulevard	4	43,510	41.3	41.7	0.4	153.5	155.2	1.8	340.9	345.6	4.7	40.9	41.5	0.6
Walnut Grove Avenue	3	19,010	41.3	41.7	0.4	89.1	90.1	1.0	31.4	31.8	0.4	7.0	7.1	0.1
Encinita Avenue	2	7,920	41.3	41.7	0.4	89.0	90.0	1.0	11.1	11.3	0.1	5.6	5.6	0.1
Lower Azusa Road	4	21,570	41.3	41.7	0.4	89.2	90.2	1.0	33.4	33.8	0.4	6.4	6.4	0.1
Temple City Boulevard	4	25,870	41.3	41.7	0.4	89.2	90.2	1.0	43.2	43.8	0.6	7.1	7.2	0.1
Baldwin Avenue	4	32,100	41.3	41.7	0.4	89.2	90.2	1.0	61.0	61.8	0.8	8.6	8.7	0.1
Arden Drive	4	13,690	41.3	41.7	0.4	89.2	90.2	1.0	18.7	19.0	0.2	5.3	5.4	0.1
El Monte Junction MP 494.99														
Tyler Avenue	4	14,590	84.1	84.5	0.4	119.9	120.9	1.0	24.0	24.2	0.3	6.7	6.8	0.1
Cogswell Road	2	12,480	84.1	84.5	0.4	119.5	120.5	1.0	24.3	24.6	0.3	8.6	8.7	0.1
Temple Avenue	4	33,530	84.1	84.5	0.4	119.9	120.9	1.0	79.4	80.3	0.9	11.3	11.4	0.1
Bassett Junction MP 498.45														

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/Day)	Average Daily Train Volume (Trains/Day)*			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change
Vineland Avenue	2	15,550	42.1	42.5	0.4	89.7	90.6	1.0	28.9	29.3	0.4	8.3	8.4	0.1
Puente Avenue	4	39,410	42.1	42.5	0.4	89.8	90.8	1.0	91.0	92.2	1.2	11.4	11.5	0.1
Orange Avenue	2	7,150	42.1	42.5	0.4	89.7	90.6	1.0	9.9	10.0	0.1	5.4	5.5	0.1
California Avenue	2	23,260	42.1	42.5	0.4	89.7	90.6	1.0	68.8	69.7	0.9	16.3	16.5	0.2
City of Industry Junction MP 501.5														
Fullerton Road	4	22,660	48.2	48.5	0.4	103.4	104.4	1.0	41.6	42.1	0.5	7.6	7.7	0.1
Fairway Drive	4	24,580	48.2	48.5	0.4	103.4	104.4	1.0	46.7	47.3	0.5	8.0	8.1	0.1
Lemon Road	4	21,290	48.2	48.5	0.4	103.4	104.4	1.0	38.2	38.6	0.4	7.4	7.5	0.1
Brea Canyon Road	2	17,830	48.2	48.5	0.4	103.2	104.2	1.0	42.9	43.4	0.5	11.3	11.5	0.1
Pomona Junction MP 514.3	HANDLED SEPARATELY DUE TO PROXIMITY TO UP LOS ANGELES SUBDIVISION													
LA-San Bernardino County Line MP 516.7														
Montclair Junction														
Bon View Avenue	2	14,800	55.6	55.9	0.4	115.3	116.3	1.0	33.0	33.3	0.4	9.8	9.9	0.1
Vineyard Avenue	4	45,430	55.6	55.9	0.4	115.5	116.6	1.0	155.5	157.2	1.7	18.2	18.4	0.2
Milliken Avenue	6	50,510	55.6	55.9	0.4	115.8	116.8	1.0	123.9	125.2	1.3	11.2	11.3	0.1
Kaiser Junction MP 527.5														
West Colton MP 534.7														
Colton Crossing MP 538.70														
OVERALL:														
Total Daily Vehicle Hours of Delay (Veh-Hrs/Day)									2,111.0	2,138.2	27.3			

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume (Trains/Day)*			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change
Maximum P.M. Peak Average Delay per Vehicle (Seconds/Vehicle)												72.9	73.9	1.0

*The number of trains would not be affected by the presence or absence of SCIG and ICTF modernization projects.

Source: San Pedro Bay Ports "Train Builder" model for intermodal trains estimation; SCAG's non-intermodal freight and passenger train data and projections; San Pedro Bay Ports compiled vehicular traffic data and projections; and San Pedro Bay Ports Peak Hour Average Vehicular Delay Calculation Methodology.

Table C2-28: UP Los Angeles Subdivision from East Los Angeles Yard to West Riverside Junction, P.M. Peak-Hour Average Vehicular Delays for Study At-Grade Crossings, 2045, Future Baseline and Revised Project Cumulative (Excluding Segment That is Combined with UP Alhambra Subdivision)

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume* (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change
East Los Angeles MP 5.85														
S. Vail Avenue	2	9,750	50.1	50.5	0.4	134.2	135.8	1.6	32.0	32.5	0.5	13.4	13.6	0.2
Maple Avenue	2	6,860	50.1	50.5	0.4	134.2	135.8	1.6	20.6	20.9	0.3	11.9	12.0	0.2
S. Greenwood Avenue	4	8,980	50.1	50.5	0.4	134.6	136.2	1.6	25.5	25.9	0.4	10.9	11.0	0.2
Montebello Boulevard	4	25,370	50.1	50.5	0.4	134.6	136.2	1.6	92.5	93.8	1.4	15.6	15.9	0.2
Durfee Avenue	2	17,230	50.1	50.5	0.4	90.9	91.9	1.0	33.6	34.1	0.5	9.2	9.3	0.1
Rose Hills Road	4	11,660	50.1	50.5	0.4	86.4	87.4	1.0	13.6	13.8	0.2	4.6	4.7	0.1
Mission Mill Road	2	2,690	50.1	50.5	0.4	86.2	87.2	1.0	2.9	2.9	0.0	4.1	4.1	0.1
Workman Mill	4	9,440	50.1	50.5	0.4	86.4	87.4	1.0	10.7	10.8	0.1	4.4	4.5	0.1
Turnbull Canyon Road	4	17,830	50.1	50.5	0.4	86.4	87.4	1.0	22.8	23.1	0.3	5.2	5.3	0.1
Stimson Avenue& Puente Avenue	4	18,170	50.1	50.5	0.4	86.4	87.4	1.0	23.3	23.6	0.3	5.3	5.4	0.1
Bixby Drive	2	3,660	50.1	50.5	0.4	86.2	87.2	1.0	4.0	4.1	0.1	4.2	4.3	0.1
Fullerton Road	4	29,920	50.1	50.5	0.4	86.4	87.4	1.0	47.4	48.1	0.7	7.2	7.3	0.1
Nogales Street	6	46,570	50.1	50.5	0.4	86.7	87.6	1.0	76.0	77.0	1.0	7.5	7.6	0.1
Fairway Drive	4	31,300	50.1	50.5	0.4	86.4	87.4	1.0	51.1	51.8	0.7	7.5	7.6	0.1
Lemon Street	4	18,590	50.1	50.5	0.4	86.4	87.4	1.0	24.0	24.3	0.3	5.3	5.4	0.1
Pomona Junction MP 31.9	HANDLED SEPARATELY DUE TO PROXIMITY TO UP ALHAMBRA SUBDIVISION													
LA-San Bernardino County Line MP 33.17														
E. Montclair Junction MP 35.02														
Bonview Avenue	2	5,300	48.8	49.1	0.4	85.3	86.2	1.0	6.2	6.3	0.1	4.6	4.6	0.1
Grove Avenue	6	60,130	48.8	49.1	0.4	85.7	86.6	1.0	131.2	132.9	1.8	11.2	11.3	0.1
Vineyard Avenue	4	6,780	48.8	49.1	0.4	85.5	86.4	1.0	7.5	7.6	0.1	4.3	4.3	0.1
Archibald Avenue	4	8,010	48.8	49.1	0.4	85.5	86.4	1.0	9.1	9.2	0.1	4.4	4.4	0.1

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume* (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change
San Bernardino- Riverside County Line MP 43.36														
Milliken Avenue	6	32,360	48.8	49.1	0.4	85.7	86.6	1.0	44.5	45.1	0.6	5.8	5.9	0.1
Mira Loma Junction MP 45.7														
Bellegrave Avenue	2	11,890	53.8	54.1	0.4	93.4	94.4	1.0	18.1	18.4	0.2	6.5	6.6	0.1
Rutile Street	2	12,760	53.8	54.1	0.4	93.4	94.4	1.0	20.1	20.3	0.2	6.8	6.9	0.1
Clay Street	2	25,160	53.8	54.1	0.4	93.6	94.6	1.0	39.5	40.0	0.5	6.8	6.9	0.1
Jurupa Ave	4	21,810	53.8	54.1	0.4	111.7	112.9	1.2	78.3	79.3	1.0	18.9	19.1	0.2
Mountain View Avenue	2	2,640	53.8	54.1	0.4	111.7	112.9	1.2	4.5	4.5	0.1	6.4	6.5	0.1
Streeter Avenue	4	21,390	53.8	54.1	0.4	112.0	113.2	1.2	45.6	46.2	0.6	8.9	9.0	0.1
Palm Avenue	2	11,560	53.8	54.1	0.4	104.5	105.6	1.1	22.0	22.3	0.3	8.1	8.2	0.1
Brockton Avenue	4	20,610	53.8	54.1	0.4	112.0	113.2	1.2	43.4	44.0	0.6	8.7	8.9	0.1
Riverside Avenue	2	17,740	53.8	54.1	0.4	111.7	112.9	1.2	50.1	50.8	0.6	13.4	13.6	0.2
Panorama Road	2	9,860	53.8	54.1	0.4	111.7	112.9	1.2	20.4	20.6	0.3	8.5	8.6	0.1
West Riverside Junction MP 56.7														
OVERALL:														
Total Daily Vehicle Hours of Delay (Veh- Hrs/Day)									1,020.5	1,034.3	13.8			
Maximum P.M. Peak Average Delay per Vehicle (Seconds/Vehicle)												18.9	19.1	0.2

*The number of trains would not be affected by the presence or absence of SCIG and ICTF modernization projects.

Source: San Pedro Bay Ports "Train Builder" model for intermodal trains estimation; SCAG's non-intermodal freight and passenger train data and projections; San Pedro Bay Ports compiled vehicular traffic data and projections; and San Pedro Bay Ports Peak Hour Average Vehicular Delay Calculation Methodology.

Table C2-29: Combined UP Alhambra and Los Angeles Subdivisions in Pomona and Montclair Area, P.M. Peak-Hour Average Vehicular Delays for Study At-Grade Crossings, 2045, Future Baseline and Revised Project Cumulative

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume* (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change
Pomona Junction MP 514.3														
Hamilton Boulevard	4	9,910	104.3	105.1	0.8	205.7	207.7	2.0	29.3	29.7	0.4	11.4	11.5	0.1
Park Avenue	2	7,020	104.3	105.1	0.8	205.2	207.2	2.0	22.0	22.2	0.3	12.3	12.5	0.1
Main Street	2	1,950	104.3	105.1	0.8	205.2	207.2	2.0	5.3	5.4	0.1	10.1	10.3	0.1
Palomares Street	2	4,790	104.3	105.1	0.8	205.2	207.2	2.0	14.1	14.2	0.2	11.3	11.4	0.1
San Antonio Avenue	4	8,530	104.3	105.1	0.8	205.7	207.7	2.0	24.8	25.1	0.3	11.1	11.2	0.1
LA-San Bernardino County Line MP 516.7														
Monte Vista Avenue	4	16,350	104.3	105.1	0.8	205.7	207.7	2.0	52.9	53.5	0.6	12.9	13.1	0.2
San Antonio Avenue	4	15,250	104.3	105.1	0.8	205.7	207.7	2.0	48.5	49.1	0.6	12.6	12.8	0.2
Vine Avenue	2	11,190	104.3	105.1	0.8	205.2	207.2	2.0	39.8	40.2	0.5	14.8	15.0	0.2
Sultana Avenue	2	12,130	104.3	105.1	0.8	205.2	207.2	2.0	44.6	45.1	0.5	15.5	15.7	0.2
Campus Avenue	2	15,660	104.3	105.1	0.8	205.2	207.2	2.0	66.4	67.2	0.8	19.1	19.3	0.2
Montclair Junction														
OVERALL:														
Total Daily Vehicle Hours of Delay (Veh- Hrs/Day)									347.6	351.8	4.2			
Maximum P.M. Peak Average Delay per Vehicle (Seconds/Vehicle)												19.1	19.3	0.2

*The number of trains would not be affected by the presence or absence of SCIG and ICTF modernization projects.

Source: San Pedro Bay Ports "Train Builder" model for intermodal trains estimation; SCAG's non-intermodal freight and passenger train data and projections; San Pedro Bay Ports compiled vehicular traffic data and projections; and San Pedro Bay Ports Peak Hour Average Vehicular Delay Calculation Methodology.

Table C2-30: UP Yuma Subdivision from Colton Crossing to Indio, P.M. Peak-Hour Average Vehicular Delays for Study At-Grade Crossings, 2045, Future Baseline and Revised Project Cumulative

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume* (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change
Colton Crossing MP 539.0														
Hunts Lane	4	23,380	83.4	84.0	0.7	203.3	205.2	2.0	99.2	100.4	1.2	17.8	18.1	0.2
Whittier Avenue	2	330	83.4	84.0	0.7	240.9	243.3	2.4	1.4	1.4	0.0	15.4	15.6	0.2
Beaumont Avenue	2	800	83.4	84.0	0.7	240.9	243.3	2.4	3.4	3.5	0.0	15.6	15.8	0.2
San Timoteo Canyon Road	2	20,150	83.4	84.0	0.7	240.9	243.3	2.4	187.3	189.6	2.3	47.0	47.6	0.6
Alessandro Road	2	500	83.4	84.0	0.7	240.9	243.3	2.4	2.1	2.2	0.0	15.5	15.7	0.2
San Bernardino- Riverside County Line MP 549.25														
Live Oak Canyon Road	2	1,900	83.4	84.0	0.7	240.9	243.3	2.4	8.3	8.4	0.1	16.1	16.3	0.2
San Timoteo Canyon Road	2	2,460	83.4	84.0	0.7	240.9	243.3	2.4	10.9	11.1	0.1	16.4	16.6	0.2
Viele Avenue	2	190	83.4	84.0	0.7	202.8	204.8	2.0	0.6	0.6	0.0	10.8	10.9	0.1
California Avenue	2	11,370	83.4	84.0	0.7	202.8	204.8	2.0	44.7	45.2	0.5	15.9	16.1	0.2
Pennsylvania Avenue	2	14,080	83.4	84.0	0.7	202.8	204.8	2.0	60.3	61.0	0.7	18.0	18.2	0.2
North Sunset Avenue	2	6,570	83.4	84.0	0.7	202.8	204.8	2.0	22.7	22.9	0.3	13.2	13.4	0.2
22nd Street	4	26,640	83.4	84.0	0.7	203.3	205.2	2.0	111.7	113.1	1.3	17.5	17.7	0.2
San Gorgonio Avenue	2	22,040	83.4	84.0	0.7	202.8	204.8	2.0	131.8	133.4	1.6	29.0	29.4	0.4
Hargrave Street	2	28,670	83.4	84.0	0.7	202.8	204.8	2.0	274.6	278.1	3.5	56.5	57.2	0.7
Apache Trail	2	4,350	83.4	84.0	0.7	202.8	204.8	2.0	14.2	14.4	0.2	12.3	12.4	0.1
Broadway	2	11,480	83.4	84.0	0.7	202.8	204.8	2.0	45.3	45.8	0.5	16.0	16.2	0.2
Tipton Road	2	200	83.4	84.0	0.7	202.8	204.8	2.0	0.6	0.6	0.0	10.8	10.9	0.1
Garnet MP 588.32														

Boundary/Junction – Street	# of Lanes	Average Daily Traffic (Vehicles/ Day)	Average Daily Train Volume* (Trains/Day)			Daily Total Gate Down Time (Minutes/Day)			Daily Total Vehicle Hours of Delay (Veh-Hrs/Day)			P.M. Peak-Hour Average Delay per Vehicle (Seconds/Vehicle)		
			Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change	Future Base	Rev Proj Cum	Change
West Indio MP 609.63														
Indio MP 610.9														
Avenue 52	4	18,900	83.4	84.0	0.7	203.3	205.2	2.0	70.6	71.5	0.8	14.8	15.0	0.2
Avenue 56/Airport Boulevard	2	8,240	83.4	84.0	0.7	202.8	204.8	2.0	29.7	30.0	0.4	14.1	14.2	0.2
Avenue 66/4th Street	2	13,500	83.4	84.0	0.7	202.8	204.8	2.0	56.7	57.4	0.7	17.5	17.7	0.2
OVERALL:														
Total Daily Vehicle Hours of Delay (Veh- Hrs/Day)									1,176.1	1,190.5	14.3			
Maximum P.M. Peak Average Delay per Vehicle (Seconds/Vehicle)												56.5	57.2	0.7

*The number of trains would not be affected by the presence or absence of SCIG and ICTF modernization projects.

Source: San Pedro Bay Ports "Train Builder" model for intermodal trains estimation; SCAG's non-intermodal freight and passenger train data and projections; San Pedro Bay Ports compiled vehicular traffic data and projections; and San Pedro Bay Ports Peak Hour Average Vehicular Delay Calculation Methodology