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ASSESSING THE NEED FOR THE SOUTHERN CALIFORNIA INTERNATIONAL GATEWAY

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EXECUTIVE SUMMARY

The Southern California International Gateway (SCIG) is a proposed near-dock rail facility situated adjacent to the existing Intermodal Container Transfer Facility (ICTF). The SCIG, operated by BNSF, and ICTF, operated by UPRR, are intended to supplement existing and proposed on-dock rail facilities, accommodating anticipated port growth and ultimately shifting more rail activity to near-dock facilities from off-dock locations. The SCIG is expected to be constructed between 2013 and 2015, beginning operations in 2016. Its maximum practical capacity is estimated to be 2.8 million TEUs per year.

The analysis below addresses the following questions:

- When will rail capacity be needed, according to cargo forecasts?

  Given the projects currently in progress and the proposed terminal on-dock rail projects, the infrastructure inside the terminals along with the existing ICTF-capacity will be adequate to meet forecasted traffic up until 2035, the year when the ports are likely to hit their capacity limits. Assuming a faster rate of growth or higher sure of rail volume changes this result, as presented in the answer to question four below.

- Based on the cargo forecasts and assessment of existing and proposed port terminal/rail projects, when do each of the projects need to roll out in order to meet the projected forecast year to year?

  Under the scenario outlined in the answer to #1, the existing timeline for each of the terminal expansion projects (described in this report) will be sufficient to accommodate the projected demand.

- What infrastructure is needed to handle cargo flows over the course of the next 25 years? At what point does all on-dock rail capacity get maxed out if all projects are built?

  Rail infrastructure outside of the terminals, but within the port complex, is key to meeting demand for on-dock rail. Currently scheduled projects are adequate to meet most of the demand for on-dock rail through 2020; however, as noted in the 2006 Rail Study Update and in the SCIG EIR, unless substantial improvements are made in the West Basin of POLA and Terminal Island area, maximum practical capacity of on-dock rail cannot be attained. These projects would need to be completed (including triple-track projects that have no NOI as of yet) in order to make full use of expanded on-dock capacity slated for the 2020–2030 period.

- After full build-out and maximization of on-dock rail, existing near-dock rail, and off-dock infrastructure, what is the gap between demand and capacity according to the cargo forecast?

  The gap between forecasted rail demand and the ability to meet the demand with existing/projected on-dock rail and the ICTF as currently configured depends upon the rate of forecasted growth, the assumed share of direct intermodal rail, and whether on-dock rail can achieve maximum practical capacity.

  - If the share of direct intermodal rail is assumed to be 37% (due to reduced rail demand caused by Panama Canal diversion), then

    * On-dock and existing ICTF capacity can accommodate direct intermodal rail until nearly 2035 under a low annual growth rate (4.3%).
    * Under a higher annual growth rate (4.7% after 2020), on-dock and existing ICTF capacity can accommodate direct intermodal rail until 2030. Even if the ICTF were expanded, a higher growth rate would yield a 284,000 TEU deficit in capacity in 2035.
  - If the share of direct intermodal rail is assumed to be 40%, then there will be a shortage of rail capacity by 2035, even with ICTF expansion. This gap will exist by 2030 if the ICTF is not expanded.
  - If productivity-enhancing measures are not adopted that allow on-dock rail to be used to its maximum practical capacity, then, even under an expanded ICTF, rail capacity will be insufficient by 2020, with an unmet demand of 354,000 to 1.9 million TEUs in 2020, increasing to 1.5 million to 3.0 million TEUs in 2030.

- What should be the planning/operational priorities?

  The 2006 Rail Study Update outlines the major obstacles in obtaining maximum capacity from on-dock rail and these obstacles are reiterated in the SCIG DEIR. Improvements in rail infrastructure between the terminals and the Alameda Corridor must be a priority, and cannot be deferred beyond the opening of the SCIG, as that might encourage shifting freight to near-dock rail that would otherwise be best served through on-dock rail. Beyond the infrastructure consideration is the constraints imposed by labor costs and work rules. On-dock rail productivity is maximized through a three shift model. Obviously the recession made this non-economical due to lack of traffic, however, as freight rebounds, terminals should be able to move towards this type of operation, which requires increasing labor productivity through new work rules. This is a jurisdictional issue (the ILWU negotiates with the PMA) outside of the scope of the Ports and railroads. However, this change should actually be the first priority, as it does not require substantial capital expenditure. Constructing additional near-dock facilities before these changes are made has the potential to shift freight to near-dock facilities that would be better served by on-dock rail facilities (from both a private and social cost perspective).

DESCRIPTION OF THE STATUS QUO

For the sake of exposition, we provide a brief description of port rail operations, though a more complete explanation can be found in the SCIG EIR itself. Currently, approximately 45% of freight moved by terminals is rail traffic. Rail traffic can be decomposed into "direct intermodal" rail (freight moved out of the region without being transloaded into a different container) and transloaded rail. The rail study update prepared by Parsons in 2006 finds that "direct intermodal" freight comprises approximately 40

On-dock facilities allow trains to be built on terminal property, thus minimizing the impact on the surrounding neighborhoods. Near-dock rail facilities are located outside of terminal facilities (though, in the case of the ICTF and SCIG, on port property) and require a short dray from terminals to the rail facility (and vice versa). In the case of the SCIG and ICTF, the dray is approximately five miles, depending on the origin/destination terminal. Finally, off-dock rail involves longer truck drays. In the case of the current BNSF operations, the rail-yards used are in Los Angeles. The Hobart facility, the BNSF facility in Los Angeles that currently handles the bulk of international freight, is located 24 miles from the San Pedro Bay ports. The Clean Air Action Plan, enacted by both ports, stresses the importance of on-dock and near-dock rail versus off-dock rail due to environmental considerations.

Parsons' 2006 rail study finds that of the 45% rail share, 40% is "direct intermodal" freight—freight that is moved out of the region without any transloading. The remaining 5% of the 45% rail share is transloaded rail freight—freight moved by truck out of the terminal and then transloaded to a domestic container before leaving the region via rail. Using 2008 data, the SCIG EIR presents the share of on-dock rail as 23.7%, near-dock at 7.4%, and off-dock at 11.1%.

Currently nine terminals at the Ports of Los Angeles and Long Beach have on-dock rail facilities (new and pending projects are described later in this document). The ICTF currently handles all near-dock rail freight, at approximately 1.2 million TEUs moved in 2005 and 833,000 TEUs move in 2010 (this assumes a standard 1.85 TEUs per container, which is the conversion rate assumed throughout this report). The off-dock facility most heavily used is the BNSF Hobart rail-yard, which handled 1.2 million TEUs of intermodal freightin 2010.

ONGOING PROJECTS INVOLVING CONTAINER TERMINALS AND ICTF

For the sake of clarity, the projects described below are those that directly involve terminals or the ICTF. Infrastructure projects that affect rail infrastructure outside of terminal or ICTF facilities are described in the next section. Additional projects are described in Appendix A.

- ICTF Reconfiguration—The Rail Simulation Study (2006) estimates the maximum practical capacity of ICTF at 1.4 million TEUs; this was at a time when the ICTF was handling 1.08 million TEUs per year. According to the ICTF-Joint Powers Authority website, the ICTF currently averages 725,000 containers per year (1.3 million TEUs); however, according to the Air Resources Board (ARB), in 2010 the ICTF handled 833,000 TEUs, down from 1.2 million TEUs in 2005. After reconfiguration, the total capacity of the ICTF would increase to a maximum of 1.5 million containers (2.8 million TEUs) by 2016 under full project completion.

- Pier B On-Dock Rail Facility—This project would improve operations, expand capacity, and increase efficiency of a current on-dock rail-yard (which is currently used for rail storage and staging) and improve traffic flow and safety near Pier B. There are three phases intended to make Pier B a fully functioning on-dock rail facility. Specific projects include expanding railcar storage and staging, adding fueling and repairing tracks, realigning SR-47 bridge supports, adding tracks in both directions, and building a grade separation. The renovation will also allow the facility to serve as a place to hold trains coming off the Alameda Corridor that cannot enter terminals during certain hours. This would provide improved productivity for on-dock rail at several terminals.
- Middle Harbor Project —This project will expand, redevelop, and update existing Piers D, E, and F at POLB. Specific projects include deepening channel waters, widening slips and wharves to accommodate larger ships, and lengthening berths. As part of this project, two terminals will be consolidated into one, and cranes will be replaced so that they may serve larger ships. This will improve traffic flow for cargo handling, link the new improved terminal to existing on-dock intermodal rail-yard facilities, and separate loading/unloading from the main track. Baseline 2005 capacity is 1,264,021 TEUs. When the terminal is at its capacity in 2025, total TEUs will be 3,320,000 annually. In 2025, about 2,523,200 TEUs would be moved to and from the terminal via truck; of that, 252,320 TEUs would be transported to and from off-dock and near-dock rail-yards by truck. About 544,480 TEUs would be transported via on-dock rail. This would increase on-dock rail from 138 trains in 2005 (assuming 25 rail cars per train) to 2,098 in 2030. Daily truck trips would increase from 6,528 in 2005 to 10,112 in 2030.

The expansion is substantial; in 2010, Pier F handled 122 trains per year. According to the EIR, by 2015 it would handle 1,092 trains per year (assuming 25 cars per train) and increase to 2,098 trains per year in 2020. The Pier F rail-yard is expected to handle 26% of the new terminal's capacity (moving 872,480 TEUs of the 3.3 million TEUs through on-dock rail). It should be noted that the EIR figures for rail capacity may be a bit low. Even assuming 25 trains per day, and a practical capacity (not maximum capacity) of 270 cars per train, yields approximately 1 million TEUs annual capacity at full operations in 2020 and roughly 835,000 TEUs per year in 2015.

- Pier S —This project will optimize efficiency and increase capacity for cargo. Specific projects include the construction of a new marine terminal with on-dock rail access at Pier S, improvements to the back channel, dredging, wharf construction, the addition of cranes, the widening and deepening of the back channel, improvements to the container yard and buildings, improved truck gates and roadwork, a new intermodal rail-yard and dual rail lead, the relocation of the oil and utility facility, and improvements to the Terminal Island Wye rail infrastructure. Noted in the SPB Rail Enhancement Report (2006) as a project slated for completion by 2010, the Pier S (POLB) project's EIR had to be modified due to operational considerations regarding ship navigation and access. Under an optimistic scenario, construction would end in 2013, but it is likely to end after that. The Pier S container terminal is assumed to handle 1.8 million TEUs at full build-out in 2020. The location and layout of Pier S means that there will be limited on-dock rail service. It is anticipated that Pier S activity will produce 549 annual on-dock trains and 1,179 annual near-dock or off-dock trains—approximately 32% of rail will be transported using on-dock rail facilities (p. ES-6 of the EIR, 2011). It should be noted that if the trains carry 280 containers (or 518 TEUs, assuming the standard 1.85 TEU/container conversion rate), there would be demand for 284,000 TEUs of on-dock rail and 611,000

TEUs moving from near-dock or off-dock rail in 2020. This would imply nearly 50% of the freight from Pier S is ultimately moving via rail (though only a limited amount by on-dock rail).

- APL —This project will expand and improve an existing container terminal. Proposed projects include adding cranes, modifying the main gates, converting container storage to refrigerated storage area, replacing a truck inspection facility, building a power shop facility and office space, extending a current wharf, developing an out-gate, and dredging. The baseline capacity between 2008 and 2009 for this terminal was 1,128,080 TEUs and the baseline is projected to be 3,206,000 TEUs at capacity in 2027. The breakdown of total TEUs for the terminal and projected mode of transportation in the base year and 2027 is given in the table below. Total TEUs for each mode increase, but the percentages of TEUs transported by near-dock and truck increase by 2027.

Projected Change in TEU Distribution by Mode Between 2008 and 2027

	2008		2027		Increase in TEUs
Mode	% of Total	TEUs	% of Total	TEUs	2008 to 2027
On-Dock	35	394,828	32	1,025,920	631,092
Near-Dock	11	124,089	13	416,780	292,691
Truck	54	609,163	55	1,763,300	1,154,137
Total	100	1,128,080	100	3,206,000	2,077,920

The capacity of on-dock rail is expected to increase from 2,197 annual train capacity in 2012 to 2,831 in 2020 and 2,953 in 2027 at full capacity. Assuming 518 TEUs per train, this amounts to an increase in on-dock capacity of 391,000 TEUs between 2012 and 2027.

- West Basin/China Shipping—This project will expand and improve an existing container terminal. Specifically, the project involves lengthening two of the berths in the terminal, adding 10 cranes, developing 142 acres of terminal backlands, constructing new container terminal buildings and gate facilities, constructing new bridges, and dredging. The terminal capacity is expected to reach a maximum of 1,551,000 TEUs annually in 2030. Of the 2030 expected capacity, 1,015,754 TEUs (65%) will be transported by truck to off-dock destinations, local destinations, or national destinations. About 303,996 TEUs of intermodal cargo will be transported to near-dock rail-yards. The remaining cargo, 231,250 TEUs, will be transported by on-dock rail from the adjacent Yang Ming facility.
- West Basin/TraPac – This project will expand and improve an existing container terminal. Specific actions include deepening the berths, improving wharves, replacing six older cranes with five new cranes, adding new container terminal buildings, adding a new on-dock intermodal rail-yard, improving the surrounding road, and redeveloping 57 acres of terminal backlands. This will significantly increase cargo movement once completed. Construction began in 2008 and is to be completed by 2025. The maximum capacity of 2,389,000 TEUs annually is expected to be reached by 2025. Of that capacity, 70%, or 1,689,000 TEUs annually, would be moved by truck either to an off-site rail-yard, to local destinations, or to other national destinations.

The EIR assumes that the new on-dock rail-yard could handle 700,000 TEUs per year, assuming 24-hour rail operations, 350 days per year, with four trains per day at 330 containers per train (EIR, ES-16). The figure of 330 containers per train is a bit higher than the figure assumed under other models, and it should be noted that under this assumption the number of TEUs that could be handled is closer to 850,000 TEUs, though these assumptions are unlikely to be met without other operational/infrastructure changes noted in the next section.

PRACTICAL CONSIDERATIONS THAT LIMIT ON-DOCK RAIL

Practical considerations that limit on-dock rail facilities include operational constraints and infrastructure constraints.

There are two main operational considerations. First, terminals do not have rail service that operates 24 hours per day. This is primarily due to both labor rules and economic conditions (i.e., there is not enough freight to justify the added cost of train operations that span three shifts). Restructuring labor rules (including rules about what work can be done when trains are moving in the terminal) may bring the costs of operating trains on three shifts down to a level that would make it economically feasible given current and anticipated volumes.

The second operational consideration is the nature of building an on-dock train. The most efficient trains are "unit trains," which consist of full-length trains with similarly destined cargo. The cargo does not necessarily all need to have the same ultimate destination, but it needs to be freight that is routed through the same rail hub. For example, freight might have a final destination of the upper Midwest or Northeast and a unit train could be built on-dock that sends all of this freight on a full train destined for Chicago. Full length unit trains typically consist of 29 five-bay railcars, hold approximately 280 containers (518 TEUs) and are 8000 feet long.

Another possibility is to build trains that are not full unit trains, but have substantial "blocks" with a common destination (e.g., Texas or Chicago). This train could be built on-dock and then "block swapped" elsewhere where the block destined for Chicago is merged with a block of freight from another terminal also destined for Chicago to ultimately form a unit train. This needs to happen in the region (possibly at the reconfigured Pier B facility), and the process is obviously less efficient than forming a unit train at the terminal itself. It is also important to note that "block swapping" requires a fair amount of space/track capacity; generally, this would happen at a rail yard. It is not something easily done outside of a terminal facility or railyard.

Finally, if a terminal has a small amount of freight with a particular destination, this cargo would be most efficiently moved to a near-dock or off-dock facility so it could be combined with other freight heading toward the same destination. It would take up terminal space and delay the freight delivery to keep the cargo at the terminal until there were sufficient amounts to build either a block or unit train of similarly destined freight. Thus, not all freight that comes into a terminal can easily be sent out of the region using on-dock rail.

The main infrastructure considerations include the following:

- Bottlenecks of on-dock rail will occur when freight from East POLB, West Basin, and Terminal Island yards converge on the route to the Alameda Corridor. Some of this congestion will be ameliorated with the Terminal Island Wye Track Realignment project (part of the Pier S project). The location of the SCIG, much like the ICTF, avoids this convergence (Appendix G2, SCIG Draft EIR).
- The continued existence of crossings at grade, including the Reeves crossing.
- Badger Bridge lifts that allow ships to access the Cerritos Channel.
- Lack of double-track and triple-track access in high-demand sections of the ports (again, East POLB and West Basin).

Pending projects that will address some of these infrastructure problems are presented in the San Pedro Bay Ports Rail Study Update (2006, p. ES-18), and many of these problems are currently being addressed in portions of existing terminal improvements, including Pier S and Pier B projects. Additionally, the San Pedro Bay ports received $17 million from the US DoT for their Green Port Gateway Project which will be used for some of these improvements. Triple-tracking the Badger Bridge and the area south of the Thenard Junction, however, is not scheduled to occur until after 2015, and no notices of intent have been posted for these projects.

These infrastructure constraints mean that additional on-dock rail built on Terminal Island or at the West Basin will have limited contributions to meaningful capacity since there will be substantial bottlenecks between these facilities and the Alameda Corridor. The projected start dates, finish dates, and year at capacity for the West Basin and Pier S projects are presented below. In order to accommodate the current planned expansion of West Basin terminals and Pier S, the rail infrastructure projects mentioned above should be completed in the next five years (after most project completion, but before the terminals hit capacity).

Timetable for Selected Port Projects

Project	Projected Start	Projected Finish	Year at capacity
Pier S**	2011	2013	2020
West Basin-China Shipping	2002	2012	2030
West Basin-TraPac	2008	2025	2025

**As previously mentioned, the Pier S project is unlikely to be completed by 2013.

EVALUATION OF ON-DOCK AND NEAR-DOCK CAPACITY AND CONTAINER VOLUME FORECASTS

To evaluate the need for additional near-dock facilities requires us to examine both the demand for rail and the supply of existing and projected on-dock and near-dock rail facilities. We begin with the supply analysis, move to demand analysis, and wrap up with some conclusions based on sensitivity analyses of both supply and demand factors.

CURRENT AND PROJECTED ON-DOCK AND NEAR-DOCK RAIL CAPACITY

While off-dock rail is a possible source of long-term capacity, this would require the Hobart Yard to remain a yard that handles substantial amounts of international traffic, though the intent is to switch this yard over to domestic service if the SCIG were built. The UPRR currently has limited capacity for off-dock rail demand. Off-dock rail is also less attractive from an environmental perspective as it requires longer truck trips and would increase traffic on the I-710. The amount of on-dock rail capacity has been simulated by Parsons as part of their Rail Simulation Modeling Study (available as an appendix in the SCIG EIR). The key assumptions of their rail modeling simulation are as follows:

- Both rail lines split the freight volume 50-50 based on current market conditions.
- All existing plans for rail development at POLA and POLB come to fruition in their proposed state (summaries of these were provided earlier in this report).

- There are three rail shifts per day (which is not the status quo).
- ILWU work rules are modified to increase efficiency.

The 2006 Rail Update Study presented MPC (maximum practical capacity) as well as Intermodal Forecast (based on other constraints) for each on-dock rail facility. A consolidated table of the terminals and their corresponding MPC and Intermodal Forecast are presented in Appendix B. These figures were adjusted between the 2006 study and the 2011 Draft EIR. As discussed earlier in this document, some projects were delayed (such as the Pier S project). Revised total on-dock capacity used in the 2011 Draft EIR is presented below:

Total On-Dock Capacity Over Time: As Published in the 2011 Draft EIR

	2008	2012	2016	2020	2030	2035
On-Dock TEUs	3,400,000	5,500,000	7,900,000	10,300,000	12,900,000	12,900,000

Currently, the ICTF handles approximately 1.3 million TEUs per year. Under expansion, it would be able to handle 2.8 million TEUs by 2016. Adding the current and future ICTF numbers to the table above yields available and projected on-dock and ICTF near-dock capacity as follows:

Total On-Dock Capacity Over Time: Inclusive of ICTF Reconfiguration

	2008	2012	2016	2020	2030	2035
On-Dock + ICTF TEUs	4,700,000	6,800,000	10,700,000	13,100,000	15,700,000	15,700,000

While we noted earlier that there seemed to be some additional capacity that could be handled by on-dock rail, the current infrastructure constraints imply that the numbers above reflect the most optimistic capacity of on-dock and near-dock ICTF rail (including the proposed ICTF expansion). Actual on-dock capacity may be lower if the terminals are not able to alter work rules to take advantage of on-dock infrastructure capacity.

FORECASTS

There are only a few long-term forecasts of San Pedro Bay container traffic. The Mercer forecast (1998) assumed a 6% cumulative annual growth rate (CAGR) through 2020 and is sufficiently old to be of little practical use for this project. Tioga produced forecasts in 2007 and 2009. Clearly the 2009 forecast was designed to incorporate the likely impact of the U.S. economic recession and involved substantial downward revisions of the forecast. For example, the 2007 forecast projected port traffic to reach 65.1 million TEUs in 2030, versus 34.6 million TEUs in the 2009 forecast. Using data from the 2009 forecast, the EIR estimates that ports will reach infrastructure capacity in 2035, using an estimated San Pedro Bay capacity of 43.2 million TEUs and also extending the TIOGA forecast out from 2030 with an assumed annual growth rate of 4.7%.

Assuming the share of direct intermodal traffic remains at 40%, the projected demand for rail facilities would be 17.3 million TEUs between 2030 and 2035. Of this total, 12.9 million TEUs are assumed to be provided by on-dock rail and 4.4 million TEUs remain, which would presumably require near-dock rail facilities.

The Draft EIR (p. 1–23) notes that the 2010 and 2011 volumes exceeded the 2009 Tioga forecast, leading them to comment that the 2009 forecast underestimates total volumes. It should be noted, however, that the year-end volumes for 2011 were approximately 14 million TEUs (POLA December figures were unavailable at the time of

Total Forecast TEUs through San Pedro Bay Ports

	2008 Forecast	2012 Forecast	2016 Forecast	2020 Forecast	2030 Forecast	2035 Forecast
2007 Forecast	14,300,000	23, 400,000	29,900,000	36,400,000	43,200,000	65,100,000** 43,200,000
2009 Forecast	14,300,000	14,300,000	17,800,000	21,800,000	34,600,000	43,200,000

Source: SCIG Draft EIR, p. 1-23.
** The forecast is 65.1 million TEUs, but port capacity is constrained to 43.2 million.

writing), lower than anticipated, and therefore there is little indication that the 2009 forecast numbers are too low.

Thus, we will focus mainly on the assumptions of the 2009 forecast and discuss the possible sources of bias in this forecast and the potential ramifications for the demand for rail service. The key assumptions made in the 2009 Tioga forecast are as follows:

No major business cycle fluctuations between 2009 and 2030.

- No major changes in U.S. tax structure.
- Constant consumer confidence.
- 2.6% average annual inflation rate.
- 5.9% average unemployment rate (settling to 5%).
- 2.3% potential GDP growth rate per annum.
- 1.7% average annual growth in trade.
- Minimal diversions, including only a 3% diversion due to the Panama Canal expansion.
- Stable SPB shares of total U.S. volumes—roughly 33% through 2015, rising to 37% in 2030 (p. 23).

These assumptions lead to CAGRs in San Pedro Bay volumes of:

- -1.7% from 2005–2010,
- 5.5% from 2010–2020,
- and 4.7% from 2020–2030 (p. 20).

No reports on forecasting error are provided in the report. Given two additional years of data, we observe some limitations with the key assumptions:

- The current economic climate in Europe could have problematic effects on the assumed level of world trade.
- The unemployment rate is declining very slowly; at 8.5% in December 2011, it has a long way to fall before hitting the steady state of 5% assumed in the forecast.
- The impact of the expansion of the Panama Canal is unknown; however, the canal opening will affect rail freight significantly more than freight destined for the region.

- SPB freight volumes were flat or slightly down between 2010 and 2011, which means the 5.5% CAGR assumed by TIOGA for the 2010–2020 period will be increasingly difficult to attain unless there is substantial growth this year.

To illustrate the potential effects of missing the 5.5% CAGR forecast for 2010–2020, the table below presents some alternative possible growth rates:

1. 5.5% from 2010–2019 and 4.7% onward, based on the TIOGA forecast CAGR.
2. A constant 4.7% CAGR.
3. A pessimistic 4.3% CAGR.

Alternative Growth Scenarios

	5.5%/4.7% Projections	4.7% CAGR Projections	4.3% CAGR Projections
2011	14,000,000	14,000,000	14,000,000
2012	14,770,000	14,658,000	14,602,000
2013	15,582,350	15,346,926	15,229,886
2014	16,439,379	16,068,232	15,884,771
2015	17,343,545	16,823,438	16,567,816
2016	18,297,440	17,614,140	17,280,232
2017	19,303,799	18,442,005	18,023,282
2018	20,365,508	19,308,779	18,798,283
2019	21,485,611	20,216,291	19,606,610
2020	22,495,435	21,166,457	20,449,694
2021	23,552,720	22,161,281	21,329,031
2022	24,659,698	23,202,861	22,246,179
2023	25,818,704	24,293,395	23,202,765
2024	27,032,183	25,435,185	24,200,484
2025	28,302,696	26,630,638	25,241,104
2026	29,632,922	27,882,279	26,326,472
2027	31,025,670	29,192,746	27,458,510
2028	32,483,876	30,564,805	28,639,226
2029	34,010,618	32,001,350	29,870,713
2030	35,609,118	33,505,414	31,155,154
2031	37,282,746	35,080,168	32,494,825
2032	39,035,035	36,728,936	33,892,103
2033	40,869,682	38,455,196	35,349,463
2034	42,790,557	40,262,591	36,869,490
2035	44,801,713	42,154,932	38,454,878

Only under the TIOGA 2009 CAGR assumptions will San Pedro Bay port capacity be reached by 2035. Port capacity is assumed to be 43.2 million TEUs. Originally estimated at 42.7 million TEUs in most pre-2008 reports, the expansion of Pier S allowed the projected capacity to be increased to 43.2 million TEUs. However, it should be noted that this capacity is based upon throughput of 8,000–10,000 TEUs per acre, substantially higher than the current 5,000 TEUs per acre productivity measures. Achieving 10,000 TEUs per acre relies upon both improvements in technology and alterations in current work rules which would allow full implementation of productivity-enhancing technology.

Absent an increase in automation, POLA estimates are that productivity would reach 7,500 TEUs per acre, 6.25% to 20% lower than the maximum. Taking the average of this (13.125%) and scaling the maximum TEUs down ac-

cordingly leads to a maximum San Pedro Bay port capacity of 37.6 million TEUs, implying that capacity will be reached in 2030, according to the TIOGA CAGR figures, and in 2035 under the pessimistic scenario.

COMBINING SUPPLY AND DEMAND

What can the analyses above tell us about the demand for near-dock rail facilities? We combine the on-dock/near-dock capacity numbers with the forecast TEUs above (both the TIOGA and pessimistic CAGRs; columns 1 and 3). If we retain the 40% direct intermodal share assumed in the Draft EIR, by 2035 the demand for direct intermodal rail will range from 15.4 million TEUs to 17.3 million TEUs. However, following the expansion of the Panama Canal, due to open in 2014, some diversion is expected. The 2009 TIOGA forecast assumes a 3% diversion. Diversion would affect freight moving outside of the region; thus we apply this 3% diversion factor to the demand for rail and use a 37% share of direct intermodal rail in our calculations.

Assuming full expansion of the ICTF, there would be a shortage of 284,000 TEUs under the optimistic forecast scenario and a surplus of near-dock and on-dock capacity under the pessimistic forecast scenario. Without ICTF expansion, there will be a shortage of capacity that may reach as high as 1.8 million TEUs under the optimistic forecast growth rates.

Our figures differ somewhat from those in the Draft EIR due to the following:

- The use of the actual ICTF capacity cited by the ICTF's webpage, rather than the 1.8 million TEUs used in the Draft EIR.
- The application of the CAGR to the 2011 numbers, rather than the use of the 2008 benchmark from the Tioga study.
- The assumption of a 37% share of direct intermodal rail, rather than a 40% share, based on anticipated freight diversion (particularly of intermodal freight) following the opening of the expanded Panama Canal.

Consistent with the Draft EIR we find that on-dock and existing near-dock will be reached by 2035. Under the optimistic forecast scenario, and assuming no expansion of the ICTF, capacity would be reached between 2030 and 2035.

SENSITIVITY ANALYSIS

Our finding that there may be adequate capacity of on-dock and near-dock rail is sensitive to the assumptions of the model. Below we outline two alternative results:

- Assuming a share of direct rail intermodal of 40% (rather than the 37% in our analysis above) results in a deficit in on-dock and near-dock rail capacity by 2035 under the assumption of ICTF expansion, and a capacity shortage in 2030 without ICTF expansion.
- Our analysis relies upon the 2006 Rail Study Update simulations for estimates of on-dock capacity which assume that on-dock rail facilities are used to their maximum potential within the terminal. This requires

Forecast TEU Counts and On- and Near-Dock Excess Capacity

Forecast Item	Forecast Assumptions	2015	2020	2030	2035
TEU Forecast	5.5%/4.7% CAGR Forecast	17,343,545	22,495,435	35,609,118	43,200,000
	4.3% CAGR Forecast	16,567,816	20,449,694	31,155,154	38,454,878
Forecast of Rail TEUs	5.5%/4.7% CAGR Forecast	6,417,112	8,323,311	13,175,374	15,984,000
	4.3% CAGR Forecast	6,130,092	7,566,387	11,527,407	14,228,305
On-Dock/Near-Dock Capacity	On-Dock Only	7,900,000	10,300,000	12,900,000	12,900,000
	On-Dock with existing ICTF	9,200,000	11,600,000	14,200,000	14,200,000
	On-Dock with reconfigured ICTF	10,700,000	13,100,000	15,700,000	15,700,000
Forecast between projected volumes and capacity:					
- without ICTF reconfiguration	5.5%/4.7% CAGR Forecast	2,782,888	3,276,689	1,024,626	-1,784,000
	4.3% CAGR Forecast	3,069,908	4,033,613	2,672,593	-28,305
- with ICTF reconfiguration	5.5%/4.7% CAGR Forecast	4,282,888	4,776,689	2,524,626	-284,000
	4.3% CAGR Forecast	4,569,908	5,533,613	4,172,593	1,471,695

work rules to be altered and intermodal operations at the terminals to be run three shifts a day year-round. If these productivity-enhancing measures are not implemented by the terminals, the Rail Simulation Study indicates that the on-dock rail capacity would be 18% below the projected capacity in 2020 and 23% below the projected capacity in 2030 and 2035. Under this scenario, even with an expanded ICTF, on-dock and near-dock rail capacity is insufficient by 2020, with an unmet demand of 354,000 to 1.9 million TEUs in 2020, increasing to a deficit of 1.5 million to 3 million TEUs in 2030.

CONCLUSIONS

Our analysis finds that there is considerable time before there is a need for the SCIG based on capacity constraints. In particular:

- Under a low-growth scenario of 4.3% CAGR, on-dock and existing near-dock rail will likely be adequate to handle rail demand in 2035.

  There will be a small projected deficit of 28,305 TEUs; however, this is a small amount of freight relative to the total traffic and it is likely that it could be accommodated in the existing system.

- Under the high-growth scenario outlined in the 2009 TIOGA forecast, on-dock and existing near-dock capacity will not be adequate to handle forecasted demand by 2035.

  The deficit will be 1.8 million TEUs. Although there are practical limitations on additional on-dock capacity (beyond that which is already planned), which suggest a need for the SCIG or reconfigured ICTF, any deficit is far in the future and much can change between now and 2030-35. In particular, forecasts can be revealed to be too high or too low, or new methods or technologies for moving freight can come into play, perhaps reducing the projected deficit.

These findings beg the question of which forecast is likely to be right. On this point, only time will tell. At the same time, the high growth forecast has already been revealed to be overly optimistic, missing its targets in 2010 and 2011. The low-growth forecast is not offered because it is more likely, but rather to make the point that growth rates need not be much lower than in the high-growth forecast to eliminate the projected deficit.

These conclusions rely on an assumption of 3% freight diversion due to the Panama Canal expansion. The 3% figure was chosen based upon the TIOGA 2009 forecast numbers and is not likely to overstate the impact of the Panama Canal.

These conclusions also rely upon the adoption of modified work rules, by terminals and by labor, that will maximize on-dock rail capacity within the ports and improve the ability of freight to move efficiently from on-dock rail facilities to the Alameda Corridor. The modification of work rules will require a transformation of how existing resources are used. As these changes will be relatively low-cost (though not without dissent from labor), their implementation is crucial for realizing the full potential of on-dock rail projects.

Freight infrastructure outside of the terminals but within the port property must continue to be a priority. While it is understandable that the ACTA postponed some projects during the recession (such as Phase 2 of the West Thenard Track Connection), these projects must be prioritized as freight volumes rebound in order to maximize productivity of on-dock rail, given the length of time involved in undertaking major capital projects.

What does our analysis imply about the necessity of the SCIG? Under a low-growth scenario, it appears that the additional capacity from the SCIG is not needed. However, if growth rates exceed the pessimistic scenario, additional capacity will be needed (even if on-dock productivity is maximized). Given the time needed to build the SCIG, unexpectedly high growth without new near-dock capacity could result in congestion. However, even if growth is unexpectedly high, the need to consider the SCIG is more than 10 years, and more likely 15 years in the future. This would be sufficient time to avoid capacity issues that might arise by 2030.

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APPENDIX A: ADDITIONAL PORT INFRASTRUCTURE PROJECTS

1. Port of Los Angeles Channel Deepening Project

   The Port of Los Angeles Channel Deepening Project has been ongoing for many years. Deepening in the outer harbor of the port was completed in 2000. Also in 2000, the port was authorized to deepen the Main Channel and make other modifications to allow deeper draft container vessels to access the container terminals along the Main Channel. This construction began in 2002, but the project produced more dredged material than planned for. Construction was halted and additional plans for dredged materials had to be approved. After a five-year period, the final stage of the deepening project began in July 2010 and is expected to be completed in 2013. Some of the dredged materials will contribute to other projects described in this report, including the Berths 136-147 (TraPac) Container Terminal Project and Berths 97-109 (China Shipping) Container Terminal Project. The remaining dredged materials will expand the Eelgrass Habitat Area and be disposed in a designated ocean area. Once completed, the deepening project will have an impact on the flow of cargo, since larger ships will be accommodated. Estimates are not available on the impact on goods movement from its current state to the completed state.

2. Eagle Rock Aggregate Terminal Project (POLB)

   This project involves the construction of a sand, gravel, and granite receiving, storage, and distribution terminal. Specific actions include dredging, berth improvements, installation of a conveyer and distribution system and truck scales, and construction of an office building. The site is currently vacant; once built, the new terminal will have a capacity of 3 million tons of aggregate (sand, gravel, and granite) per year. The product would be transported to and from the terminal by truck, with an estimated 125,000 trucks per year. Most trucks will travel to destinations within a 30-mile radius. The EIR for this project is not available.

3. I-710 Corridor Project (POLB)

   This project proposes expanding and improving an 18-mile portion of I-710, which originates at the port and runs north and south, for purposes of improving safety, improving capacity for goods movement and increased population, and addressing current design flaws. The EIR is not available. This will accommodate increased goods movement by trucks; a specific estimate is not available.

4. Gerald Desmond Bridge Replacement (POLB)

   This project involves updating the bridge connecting Terminal Island to I-710 to Long Beach in order to address safety concerns, expand capacity of the bridge, and allow larger boats to pass under the bridge. The bridge currently accommodates about 15% of all port-related container traffic. In the baseline year, 2005, daily truck trips reached 15,200. In 2030, there will be 59,730 daily truck trips (assuming the project is completed).

5. Pier G Modernization (POLB)

   This project will update and modernize the terminal, constructing more efficient/environmentally friendly truck gates, while relying on the use of materials from dredging. Most construction on this project is complete.

6. John S. Gibson Blvd/I-110 Access Ramps and SR-47/I-110 Connector Improvement Project (POLA)

   This project involves widening the lanes of the SR-47/I-110 connector, extending I-110, improving the intersection, improving the drainage system, widening minor streets, and adding sound walls. This will perhaps cause minor changes to truck movement.

7. I-110/C Street Interchange Project (POLA)

   This project improves a key truck interchange and will perhaps cause minor changes to truck movements.

8. Schuyler Heim Bridge Replacement Project/ SR-47 Port Access Expressway (AC)

   This project will improve safety, increase mobility of traffic, decrease local congestion, and provide an emergency route from Terminal Island to I-405. Specific actions include a bridge replacement and the creation of a grade-separated expressway. This will allow for increases in truck traffic and provide an alternative route for near-dock railyards. Specific estimates on daily truck trips once the project is completed are not available.

9. Alameda Corridor East Project

   This project will improve safety and mobility and accommodate increased traffic flow in the San Gabriel Valley, along a 35-mile stretch of rail lines. The project includes multiple construction projects to improve safety at crossings, such as constructing grade separations that eliminate 22 grade crossings, and will decrease the time spent at rail crossings. Many of these projects have already been completed. Specific estimates on how this will affect rail capacity are not available.

Below is a brief table of projects not expected to directly impact containerized freight.

Project	Entity	Description
TTI Grain Export Terminal Project	POLB	Installation of a grain transloading facility on 10 acres of vacant land. This would expand transfer for grains using existing rail and infrastructure. This would accommodate same imports, but increase export of grain (vessel frequency expected to stay constant).
Sulex Demolition Plan	POLB	Demolishing a sulfur facility (a byproduct of oil refineries) at Pier G. This could potentially decrease exports, but this does not change on-dock or near-dock capacity.
Mitsubishi Cement Facility Modification	POLB	Includes environmental pollution control for NOX, additional storage capacity for cement/cement products, improvements to ship unloading equipment. Would not change ship loading or truck loading rates.
San Pedro Waterfront Project, Wilmington Waterfront Project	POLA	Similar projects. Aesthetic improvements on harbor, cruise terminals, more recreational open space and commercial space, improve access to harbor and create pedestrian passages. Does not affect goods movement.
West Channel/Cabrillo Marina Phase II Development Project	POLA	Redevelop 48 acres of land and 37 acres of water. Construct new public boat launch facility. Does not affect goods movement.
Pacific L.A. Marine Terminal LLC Crude Oil Terminal	POLA	Construction and operation of a new terminal used for crude oil and partially refined crude oil. Pipeline infrastructure for transportation of the oil would also be developed. Perhaps minor changes in truck flow.
USS Iowa Project	POLA	Permanent docking of the USS Iowa at the POLA. Would include visitor facilities. Does not affect goods movement.
ILWU Local 13 Dispatch Hall Project	POLA	Building a new labor dispatch hall for laborers to support cargo growth and customer needs at terminals and facilities at POLA. Does not affect goods movement.
City Dock No. 1 Marine Research Center Project	POLA	Provide space for marine research (labs, office, classroom, public amenities); replace SCMI facilities with new research center. Does not affect goods movement.
Al Larson Boat Shop Improvement Project	POLA	Replace existing boat shop, dredging, space for maintenance and repair of boats, new wharves, new travel-lift boat hoist, improve storm water drainage, and mitigate sediment/soil contamination. Does not affect goods movement.

APPENDIX B: ON-DOCK RAIL PROJECTIONS FROM 2006 RAIL STUDY UPDATE

		2005		2010		2015		2020		2030	
		MPC	IM Forecast	MPC	IM Forecast	MPC	IM Forecast	MPC	IM Forecast	MPC	IM Forecast
POLB	Pier J	377,023	320,000	437,364	440,000	1,471,822	910,000	1,879,404	1,270,000	1,879,404	1,480,000
	Pier G	119,415	120,000	372,943	370,000	474,003	470,000	605,265	610,000	695,265	610,000
	Pier F/MHB	187,157	180,000	217,102	210,000	1,181,278	770,000	1,508,401	1,000,000	1,508,401	1,160,000
	Pier A	258,086	200,000	433,929	370,000	707,729	640,000	1,641,446	950,000	1,641,446	1,110,000
	Pier S	0		274,091	230,000	410,842	360,000	524,613	400,000	524,613	470,000
	Pier T	571,526	460,000	662,970	660,000	990,495	990,000	1,264,786	1,260,000	1,264,786	1,260,000
POLA	Pier 300	614,022	510,000	712,265	580,000	986,580	870,000	1,259,786	1,260,000	1,259,786	1,260,000
	TICTF	613,645	610,000	711,829	710,000	1,054,441	1,050,000	1,346,440	1,350,000	1,346,440	1,350,000
	Pier 400	747,602	690,000	867,219	870,000	1,738,662	1,450,000	2,642,847	2,080,000	2,642,847	2,640,000
	WB West	262,207	260,000	321,954	320,000	504,224	500,000	893,079	890,000	893,079	890,000
	WB East			394,247	310,000	452,225	450,000	700,546	670,000	700,546	700,000
	SPB Total	3,750,683	3,350,000	5,405,913	5,070,000	9,972,301	8,460,000	14,266,613	11,740,000	14,356,613	12,930,000

Source: Rail Study Update, 2006.
IM Forecast - Projected demand for on-dock rail based on forecasted demand.
MPC - Maximum practical capacity.