FINAL

TECHNICAL MEMORANDUM – I-710 RAILROAD GOODS MOVEMENT STUDY

WBS TASK ID: 160.10.50

Prepared for

Metro

Los Angeles County
Metropolitan Transportation Authority

February 3, 2009

URS

2020 East First Street, Suite 400
Santa Ana, California 92705

CAMBRIDGE SYSTEMATICS

555 12th Street, Suite 1600
Oakland, CA 94607

TABLE OF CONTENTS

1.0 INTRODUCTION

The purpose of this report is to assess possible Class I railroad mainline and intermodal facility capacity constraints which could cause a diversion from rail to truck transport in the Los Angeles Basin, given an increase in San Pedro Bay Port traffic from 15.8M annual twenty-foot equivalent units (TEUs) in 2006 to 28.5M TEUs or 43M TEUs before 2035. Critical railroad mainline components of this assessment include:

- **Alameda Corridor** - railroad mainline shared by Burlington Northern Santa Fe Railway (BNSF) and Union Pacific Railroad (UP) that provides direct access to the Port of Los Angeles (POLA) and the Port of Long Beach (POLB), as well as to near-dock intermodal facilities.

- **BNSF San Bernardino Subdivision** - connection between Alameda Corridor and Transcon Corridor. Provides access to BNSF's off-dock intermodal facilities.

- **UP Los Angeles Subdivision** - connection between Alameda Corridor and Sunset Corridor. Provides access to UP's off-dock intermodal facilities.

- **UP Alhambra Subdivision** - connection between Alameda Corridor and West Riverside, BNSF's San Bernardino Subdivision. Provides access to UP's off-dock intermodal facilities.

Critical railroad intermodal facility components of this assessment include:

- On-dock intermodal terminal capacity at the POLA and POLB.

- Near-dock intermodal terminal capacity, proximate to POLA and POLB, including UP's Intermodal Container Transfer Facility (ICTF) and BNSF's proposed Southern California International Gateway (SCIG).

- Off-dock intermodal capacity available for both international and domestic container traffic at BNSF's Hobart and San Bernardino yards, and UP's East Los Angeles (ELA), Los Angeles Transportation Center (LATC) and City of Industry (CofI) yards.

The success of the San Pedro Bay ports attracting higher TEU volumes, combined with intermodal facility development and mainline track investment are all determining factors in the number of truck trips traveling from the Ports on the LA Basin freeway system. Several scenarios had been previously constructed to try to understand the balance between railroad mainline capacity and intermodal yard capacity. These are:

- **Scenario 1:** High Cargo Demand Forecast, High On-Dock Rail Capacity, No New Near-Dock Rail Facilities. This scenario assumes the use of 300 containers per international train to calculate daily train volumes, in recognition of current and projected operating practices of the railroads to increase effective capacity by running longer trains (typically 8,000-foot lengths).

- **Scenario 2:** High Cargo Demand Forecast, High On-Dock Rail Capacity, Both ICTF and SCIG Constructed/Expanded. This scenario assumes the use of 300 containers per international train.

- **Scenario 3:** Low Cargo Demand Forecast, Low On-Dock Rail Capacity, No New Near-Dock Rail Facilities. This scenario assumes the use of 240 containers per international train. The 240 container per train assumption reflects train lengths comparable to those used in the recent past and concerns that with increasing train traffic, the railroads may not be able to achieve the longer train lengths and provide reliable service. This operating scenario is also more consistent with previous forecasts of train traffic in the LA Basin and serves as a more comparable point of comparison.

The December 2006 *San Pedro Bay Ports Rail Study Update* concluded that if all proposed on-dock and near-dock rail facilities are constructed, there will be no need for off-dock railroad intermodal facilities to load international container traffic. Assuming this is true, and on- and near-dock intermodal facilities are accommodating all port-rail traffic, the analysis shifts from a question of available intermodal facility capacity to the sufficiency of railroad mainline capacity to haul what has been loaded over railroad corridors in the LA Basin. Thus the primary alternative analyzed in this report is Scenario 2: High Cargo Demand Forecast, High On-Dock Rail Capacity, Both ICTF and SCIG Constructed/Expanded. The two other scenarios were reviewed in comparison with Scenario 2. These analyses can be found in Appendix A.

1.1 Comparison of Key Assumptions used in Prior Regional Railroad Studies

To conduct this analysis and understand the differences between results found herein and previously recorded findings, those earlier LA Basin rail studies were referenced. However, note that there are varying assumptions between this *I-710 Railroad Goods Movement Study* and other previous studies, including the *Inland Empire Mainline Rail Capacity Study*, the *San Pedro Bay Ports Rail Study Update*, and the *Multi-County Goods Movement Action Plan.* These studies have been reviewed against the projections used in this I-710 Study and the principal differences between this study and others are related to assumptions about number of containers/trains directly served by rail at the Ports, domestic intermodal and other non-intermodal train growth, assumptions about train lengths, and assumptions about passenger rail. These differences are highlighted in Table 1.

Table 1. Comparison of LA Basin Rail-Related Study Assumptions

Study	Port Traffic	Future Yard Capacity	Intermodal Growth	Train Length/ Containers per Train	Passenger Trains
Inland Empire Railroad Mainline Study (June 2005)	N/A	N/A	Used actual volumes from railroads for base trains, LAEDC growth was used for future traffic[1]	Combination of 6,000' and 8,000' trains[2]. Goal to get future trains operating at same speed as today's trains. 50 trains per day/track[3]	Provided by operating agencies through 2025[4]
San Pedro Bay Ports Rail Study Update (Dec. 2006)	42.5M TEUs (2030)	On-Dock = 12.9M TEUs Near-Dock = expanded mini-ICTF at Pier B[5] Off-Dock = at capacity by 2015 with domestic intermodal traffic	Determined on- and near-dock volumes based on port growth Off-dock assumed to be at capacity.	-	N/A

[1] Inland Empire Railroad Mainline Study, June 2005. Zero growth rates were applied to certain carload trains providing local origination and termination services. International intermodal traffic is assumed to undergo 80.6% growth over the period 2000 – 2010 (6.09% per year), and a 77.3% growth over the period 2010-2025 (3.89% per year). Domestic intermodal traffic is assumed to undergo 28.0% growth over the period 2000-2010 (2.5% per year) and a 25.0% growth over the period 2010-2025 (1.5% per year). Unit oil, auto, white bulk, and coal movements, and all other carload traffic, are assumed to undergo a 16.1% growth over the period 2000 – 2010 (1.5% per year), and 16.1% growth over the period 2010-2025 (1.0% per year). See Page 32.

[2] Inland Empire Railroad Mainline Study, June 2005. See Pages 33 and 34.

[3] Inland Empire Railroad Mainline Study, June 2005. See Page 48.

[4] Inland Empire Railroad Mainline Study, June 2005. See Page 39.

[5] San Pedro Bay Ports Rail Study Update, Dec. 2006. See Page ES-9.

Table 2. Comparison of LA Basin Rail-Related Study Assumptions *(cont'd)*

Study	Port Traffic	Future Yard Capacity	Intermodal Growth	Train Length/ Containers per Train	Passenger Trains
Multi-County Goods Movement Action Plan (Jan. 2008)	42.5M TEUs (2030) 40% direct rail, all handled on/near-dock.	On-Dock = 12.9M TEUs Near-Dock = ICTF expanded to hold 1.84M TEUs[6] Off-Dock = at capacity by 2015, entirely domestic intermodal. 2.43M lifts in 2030	International – growth based on port growth Domestic – growth based on economic growth of 2-3% annually Transload – 12% of what had been Intn'l repackaged into domestic containers. 85% dom fleet is 53' containers, 15% dom fleet is 48' containers	BNSF Operating 8,000' container trains UP runs less than 8,000' trains as the Sunset Corridor doesn't accommodate longer trains on sidings	Provided by operating agencies through 2025
I-710 Railroad Goods Movement Study *(Scenario 2)*	43M TEUs, 40% direct rail, 30% on-dock, 10% near-dock	On-Dock = expanded, 12.8M TEUs Near-Dock = ICTF expanded, 2.136M TEUs SCIG constructed, 2.136M TEUs Off-Dock = at capacity with domestic intermodal traffic, 6.35M TEUs (3.43M lifts)	International – growth based on port growth Domestic – all spare capacity at yards will be backfilled with domestic – actual growth not calculated Transload – 12% of what had been Intn'l repackaged into domestic containers. 1- 53' container = 3 TEUs	International – 300 containers/train Domestic – 200 container/train Non-intermodal traffic projected using Inland Empire Study values projected to 2035 321 operating days/year 50 trains per day/mainline	No growth – values are based on 2008 schedules

Explaining the information in Table 1 in more detail:

- **Port Traffic:**
    - Most of the comparison studies looked at San Pedro Bay Port volumes close to the 43M TEUs reviewed in this study. The exception to this is the *Inland Empire*

Railroad Mainline Study that did not look at port traffic as an input into intermodal growth in the LA Basin.

Implication to this study: None.

- **Future Yard Capacity:**

  - On-Dock: Both the *San Pedro Bay Ports Rail Study Update* and the *Multi-County Goods Movement Action Plan* use the maximum practical capacity (MPC) projections for on-dock intermodal, resulting in accommodation of approximately 13M TEUs, or 30% of Port traffic. This same assumption was used for this study and results in a similar number of TEUs coming out of the Ports.

    Implication to this study: None.

  - Near-Dock: Both the *San Pedro Bay Ports Rail Study Update* and the *Multi-County Goods Movement Action Plan* note that the ICTF will undergo a mini-expansion (to 1.84M TEUs), while this study assumes near-dock facility full-build. This full-build includes a larger expansion of the ICTF (to 2.136M TEUs), as well as development of the SCIG (to 2.136M TEUs). The impact of this assumption is evaluated in the comparisons with other I-710 port growth scenarios discussed in Appendix A.

    Implication to this study: More containers will be transported directly to rail from the port in this study, as there is significantly more capacity on- and near-dock. Higher train counts will be experienced in the Alameda Corridor and LA Basin mainlines as a result of direct port-rail transfer. In other words, mainline capacity constraints in this study are based on maximum train growth, no other scenarios being considered for I-710 analysis would put more trains on the LA Basin mainlines than the assumptions in the base scenario described in this study.

  - Off-Dock: Both the *San Pedro Bay Ports Rail Study Update* and the *Multi-County Goods Movement Action Plan* note that off-dock intermodal facilities will be at capacity by 2015, and that there is no new off-dock intermodal facility development. These studies maintain current day percent of international traffic

[6] Multi-County Goods Movement Action Plan, Jan. 2008. See Page 1-18. Matches San Pedro Bay Ports Rail Study Update.

at each yard, resulting in total of 2.43M lifts[7]/year. This study assumes that all off-dock facilities will be at capacity and the annual number of lifts is equal to 3.43M.

Implication to this study: Full utilization of off-dock capacity for domestic traffic is assumed in this study.

- **Intermodal Growth:**

  - International: The *Inland Empire Railroad Mainline Study* assumes a percentage growth rate derived by the Los Angeles Economic Development Corporation (LAEDC) and applied to current train counts. Both the *San Pedro Bay Ports Rail Study Update* and the *Multi-County Goods Movement Action Plan* determined international intermodal growth based on port traffic.

    Implication to this study: The methodology for this study matches that of the two latter mentioned reports.

  - Domestic: The *Inland Empire Railroad Mainline Study* assumes a percentage growth rate derived by the Los Angeles Economic Development Corporation (LAEDC) and applied to current train counts. The *San Pedro Bay Ports Rail Study Update* assumed no growth in domestic intermodal and only evaluated off-dock intermodal facilities with respect to how much international intermodal they accommodate today. The *Multi-County Goods Movement Action Plan* assumed domestic intermodal to grow 3% per year.

    Implication to this study: This study does not project domestic intermodal growth, but assumes that domestic intermodal will backfill all off-dock intermodal facilities. As a check against available capacity in off-dock intermodal yards, the Multi-County Goods Movement Action Plan domestic intermodal value of 2.43M lifts/year was used.

  - Transload: The *Multi-County Goods Movement Action Plan* and this study both assume that 12% of international container traffic will be transloaded as domestic

[7] Note that in most cases this report uses "lifts" as the unit of intermodal terminal volume and capacity. However, when talking about on-dock rail capacity (where all of the cargo is in international containers) and in selected instances where international cargo is being referred to the report may use TEUs as the unit of volume or capacity. Since most off-dock intermodal terminals handle a mix of international and domestic cargo, and domestic cargo uses a different size container or trailer than international cargo, it is inappropriate to measure volumes or capacities with this cargo mix in terms of TEUs (which only applies to international cargo). To convert TEUs to lifts, divide by a factor of 1.85 TEUs per lift (or per container).

containers at intermodal facilities in the LA Basin. Different assumptions for how TEUs are translated into 53' domestic containers.

Implication to this study: None. This study calculates transload volumes, however domestic yards are operating at capacity, so how transload traces back to train count is irrelevant.

- **Train Length/ Containers per Train**

  - *Inland Empire Railroad Mainline Study* and *Multi-County Goods Movement Action Plan* note that train volumes presented are Peak Day. This analysis looks at train counts for an average day.

    Implication to this study: Train counts will be higher in other studies to reflect peak conditions.

  - The *Inland Empire Railroad Mainline Study* notes there is a combination of 6,000' and 8,000' intermodal trains within the Alameda Corridor and on BNSF and UP mainlines, the majority of which are 6,000' trains. Therefore, trains calculated in the Inland Empire study have fewer containers than this I-710 analysis as here as this study assumes that all international intermodal trains grow to at least 8,000' (300 containers per 8,000' intermodal train equate to 225 containers per 6,000' train).

    Implication to this study: Train counts will be higher in other studies to reflect shorter, more frequent trains to accommodate similar container volumes coming from the port.

- **Passenger Trains**

  - Other studies assume continued growth in the number of daily passenger trains (Metrolink and Amtrak) consistent with demand. The passenger rail assumptions made in this study reflect the condition that any additional passenger trains will only be added if track capacity can be added to the system.

    Implication to this study: Corridor train counts will be higher in other studies to reflect an increased number of passenger trains in the future.

2.0 LOS ANGELES BASIN MAIN LINES - EXISTING

Shown below in Figure 1 is the primary freight rail network in the Los Angeles Basin. The present network is composed of lines constructed by BNSF predecessor Atchison, Topeka & Santa Fe, UP, and UP-predecessor Southern Pacific (SP). Santa Fe developed what is now the BNSF Transcon over Cajon Pass through San Bernardino, Fullerton, and Los Angeles, as well as the Fullerton to San Diego line. Prior to its acquisition of the Southern Pacific in 1996, Union Pacific had the smallest presence in Southern California, entering the region through trackage rights on Santa Fe's Cajon Pass to West Riverside, where it connected to its own route to downtown Los Angeles (LA Subdivision).

Figure 1. Los Angeles Basin Freight Mainlines

Source: Multi-County Goods Movement Action Plan

Southern Pacific had by far the largest presence in the region, with an extensive network of local lines connected to two mainlines to the north and the Sunset route to the southeast.[8] UP's acquisition of SP permitted substantial efficiencies in the use of the two east-west mainline routes through directional operations and specialization of terminal facilities.

The massive growth in international container traffic at the two Ports has primarily impacted the rail routes to the east, with access to markets in the Midwest and South. This trend is expected to continue, and with it, the need to assess the capacity of the Alameda Corridor, BNSF's San Bernardino Subdivision, UP's LA Subdivision, and UP's Alhambra Subdivision, all of which connect the Ports to the national rail network. The characteristics and capacity of each of these routes is reviewed in the following sections.

2.1 ALAMEDA CORRIDOR

The Alameda Corridor (Corridor) was constructed to consolidate all Port rail traffic onto a single route. Completed in 2002, the Corridor is a grade separated rail route linking the Ports with the downtown Los Angeles transcontinental routes of the UP and BNSF. All freight trains to and from Port on-dock terminals, as well as the Union Pacific's near-dock Intermodal Container Transfer Facility (ICTF) are routed over the Corridor. In addition, BNSF'S proposed Southern California International Gateway (SCIG) near-dock terminal will also be accessed over the Corridor. Trains transporting carload rail traffic destined for industries situated along the line or in the Port Complex also operate over the Corridor. Carload trains are those transporting goods other than intermodal containers, such as lumber, chemicals, automobiles, paper, steel etc.

Table 2 shows the average daily train count on the Alameda Corridor since its opening.

Table 3. Alameda Corridor Daily Train Count

Year	Average # of Trains Per Day Alameda Corridor
2002	39
2003	40
2004	44
2005	47
2006	55
2007	49

Source: Alameda Corridor Transportation Authority

[8] The "Colton Cutoff" connecting Colton in the east with Palmdale in the west was developed in the late 1960's as a means to shuttle traffic around the congested downtown area to the then new West Colton classification yard.

Note that the reduction in Alameda Corridor trains in Table 2 is largely accounted for by the operation of longer trains. UP and BNSF both have goals to carry 300 containers per train from the on- and near-dock facilities. Had this goal been wholly successful in 2007, the average number of container trains operated on the Corridor each day would have been 26, instead of 49, an even further reduction due to longer trains, with high utilization.

Future train projections for the Alameda Corridor are presented in Section 4.

2.2 BNSF San Bernardino Subdivision

The BNSF San Bernardino Subdivision (SB) forms the westernmost segment of the BNSF's Transcon main line from Los Angeles to Chicago. The SB Subdivision connects to the Alameda Corridor at Redondo Junction in Los Angeles and spans across the Basin to San Bernardino. In addition to BNSF freight coming from the Ports and BNSF's largest intermodal facility (Hobart Yard), the line hosts substantial passenger train traffic between Redondo Junction and Fullerton. The SB Subdivision connects to the San Diego Line at Fullerton. Amtrak's Pacific Surfliner corridor service between Santa Barbara, Los Angeles and San Diego, Metrolink commuter trains, and Amtrak long distance services operate over the Los Angeles to Fullerton segment.

Dispatching records provided by BNSF for Friday, April 11, 2008, offer a snapshot of the traffic on this busy line during a typical weekday. On that day, there were 38 freight trains, 22 Pacific Surfliners, 28 Metrolink commuter and 2 Amtrak long distance trains for a total of 90 trains. On weekends, Pacific Surfliner and Amtrak long distance frequencies are similar, but Metrolink commuter trains operate at significantly reduced schedules. The frequency of freight trains varies considerably from day to day and by day of week, depending on port container volumes as well as domestic intermodal and carload traffic.

Table 3 shows the train density by type of train at 4 locations on the SB Subdivision.

Table 4. BNSF Train Count Various Locations
April 11, 2008

Location	BNSF Freight	UP Trackage Rights*	Metrolink Commuter	Amtrak Long Distance	Pacific Surfliner	Total
Norwalk	38	-0-	28	2	22	**90**
Prado Dam (Corona)	45	-0-	26	2	-0-	**73**
High Grove (Riverside)	44	25	8	2	-0-	**79**
Colton Crossing (SB Line)	46	6	8	2	-0-	**62**

Source: BNSF Railway.

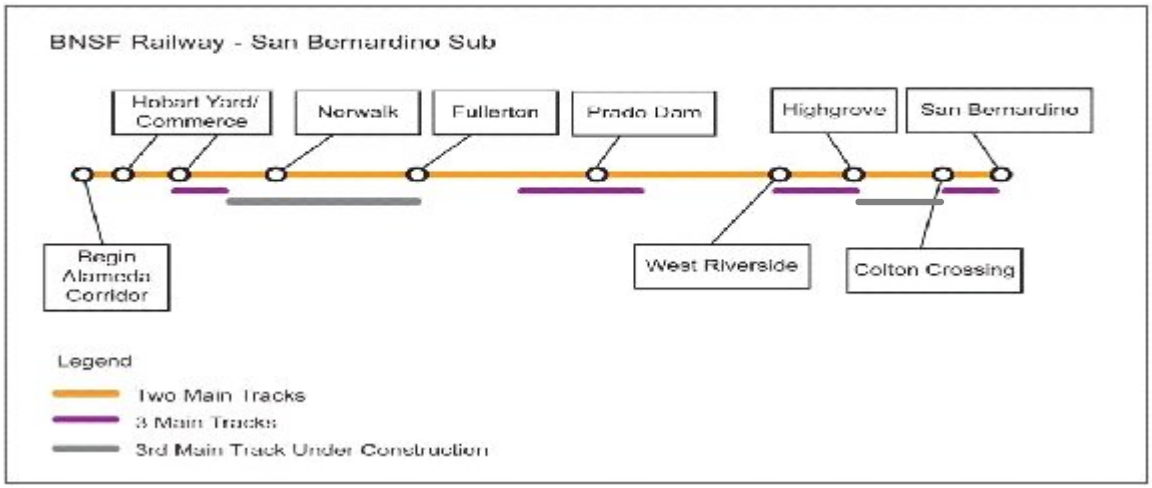
*UP has trackage rights on BNSF owned track from West Riverside to Daggett.

The data in Table 3 shows that most of the UP trains operating between Riverside and San Bernardino transition to the Sunset Corridor (a.k.a. El Paso Line) at Colton rather than continuing on the BNSF. Of the 6 trains operating on BNSF through the Cajon Pass, 2 were westbound and destined for the auto distribution facility at Mira Loma, and 2 were eastbound empty rail cars returning east. At the present time, UP operates its primary auto service to Mira Loma on its Northern Corridor and on the BNSF between West Riverside and Daggett, located approximately five miles east of Barstow where UP's line to Las Vegas and Salt Lake City diverges from BNSF's Transcon line.

Figure 2 is a representation of current conditions. The entire corridor from Los Angeles to San Bernardino has a minimum of two main tracks. As shown, a third main track is currently planned to be constructed between Hobart Yard and Fullerton. Another mainline track is also planned for construction between High Grove and Colton Crossing. According to BNSF, these additional tracks will ensure sufficiency of capacity to meet the demand generated by Port growth. To materially increase passenger train service along the San Bernardino Subdivision, a fourth mainline track may be required.

Future train projections for the San Bernardino Subdivision are presented in Section 4. Potential choke points are evaluated in Section 4 against these future projections.

Figure 2. LA Basin Track Infrastructure - BNSF



Source: BNSF Railway.

2.3 UP Los Angeles Subdivision[9]

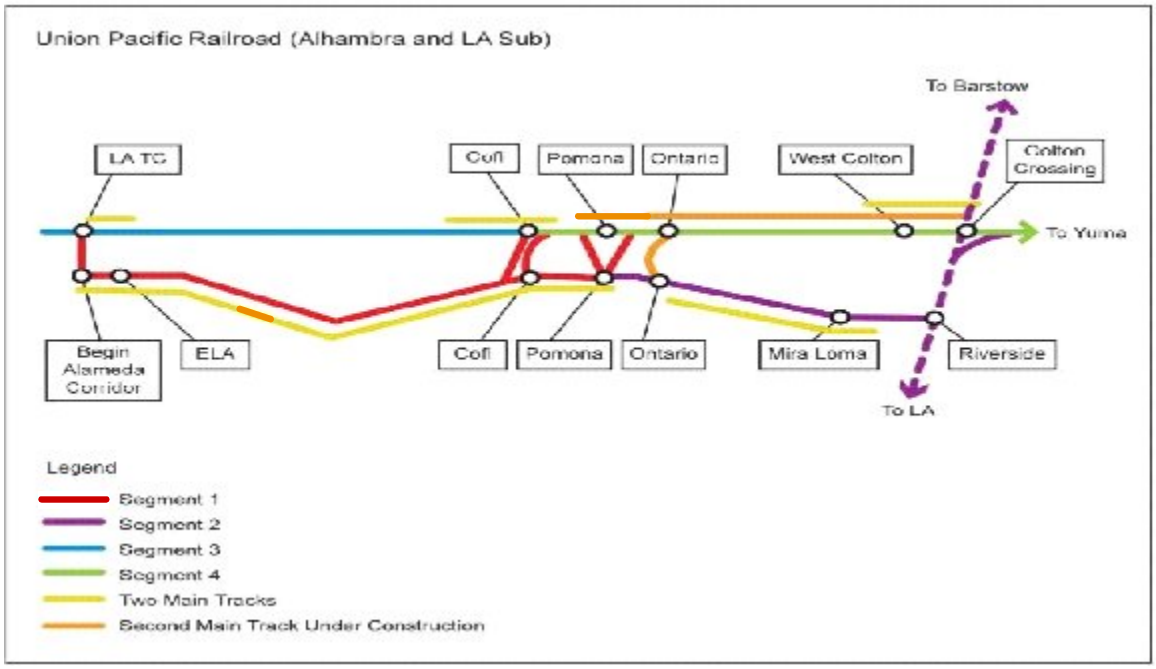
The Los Angeles Subdivision (LA Sub) spans the Basin between the Alameda Corridor and West Riverside where it connects to the SB Subdivision of BNSF. The line should be viewed in the context of two segments, as shown in Figure 3. The line between Los Angeles and Pomona is named Segment 1 and the line between Pomona and West Riverside is named Segment 2. The LA Sub is 54 route miles; Segment 1 has 31 route miles, all of which is operated with 2 main tracks, and Segment 2 is 23 miles long, of which, 18 miles is operated with 2 main tracks. Line Segments 1 and 2 are populated with commuter and freight trains. UP operates 12 Metrolink commuter trains each weekday on the LA Sub, between Riverside and Los Angeles. The UP operating strategy is to operate eastbound freight trains on the LA Sub. Other than service to Mira Loma, UP does not operate westbound freight trains on Segment 2. It does operate westbound trains on Segment 1.

As can be observed from Figure 3, UP's Alhambra Line and LA Sub are in close physical proximity to each other through Pomona. Both lines are in the same right of way. UP has constructed high-speed parallel connection tracks at Pomona. The connection tracks link the LA Sub and Alhambra Line, such that UP can interchangeably use segments of each line to route its Basin freight trains.

Table 4 shows the train density by type of train along UP Line Segments. Future train projections for the LA Sub are presented in Section 4.

[9] The SCAG capacity study dated 2002, (by LAEDC) refers to the Los Angeles Subdivision as the San Gabriel Line. There is no rail line in the Basin titled, "San Gabriel line" by the owner.

Figure 3. LA Basin Track Infrastructure - UP



Source: UP Railroad

Table 5. UP Train Count by Segment
April 11, 2008

Segment	Freight Trains	Commuter Trains	Amtrak Long Distance	Total*
Segment 1 (LA Sub)	28	12	-0-	**40**
Segment 2 (LA Sub)	25	12	-0-	**37**
Segment 3 (Alhambra Line)	21	-0-	1	**22**
Segment 4 (Alhambra Line)	33	-0-	1	**34**

Source: UP Railroad.

*Peak day demand.

2.4 UP ALHAMBRA LINE

The UP Alhambra Line spans the Basin from Los Angeles to the Colton Crossing where it connects with the El Paso Line. There are no commuter trains operating on the Alhambra Line. Like the LA Sub, this line is operated as 2 segments and shown in Figure 3; Segment 3 is the segment between Los Angeles and Pomona and Segment 4 is the line between Pomona and Colton.

The basic operating plan of UP is to route all of its westbound trains on Segment 4. From Pomona west, UP has the option of using Segment 1 or 3 and routing decisions are driven by commuter train operations on the LA Sub and the location of UP facilities. During heavy commuter train operations on Segment 1 in the early morning and late afternoon, UP is more likely to route Port and ICTF trains on Segment 3.

UP's off-dock intermodal facilities, the Los Angeles Transportation Center (LATC) and the City of Industry (CofI), are situated along the Alhambra Line but have direct connections to the LA Sub as well. Underscoring the point is that 3 of the eastbound trains operating on BNSF at High Grove (April 11, 2008), originated at either LATC or CofI.

The West Colton Classification Yard is situated on the Alhambra Line and is used to aggregate carload rail traffic destined for a common geographical point. There are 8 westbound Basin carload trains serving local industries that originate and terminate at West Colton each day. The net effect is that there are 8 eastbound trains daily operating in Segment 4 which operate counter to the prevailing westbound flow and congest the Segment 4 operation. Segment 4 is a single track main track with sidings spaced at about 4 mile intervals. A second mainline track is under construction, as shown in Figure 3, and is expected to be complete by 2011. This project will also include a "balloon track" connection between the Alhambra Line and the LA Sub at Ontario. This connection will provide the operational flexibility to route westbound trains destined for Mira Loma on the Alhambra Line, to Ontario, and connect through the balloon track to the LA Sub and proceed east to the automobile unloading center at Mira Loma.

Several Westbound trains destined for East Los Angeles (ELA) transition from Segment 4 to 1 at Pomona. Once more, depending on commuter train operations, westbound trains destined for ICTF or the Ports are likely to be routed on Segment 1. Routing ICTF and Port trains on a combination of, Segments 1 and 4, provides UP with the shortest and fastest route to the eastern edge of the Basin.

After improvements are complete, by using the Alhambra Line and LA Sub in tandem, UP will have the equivalent of 3 mainline tracks through the Basin. The combination of Segments 1 and 3 account for 3 tracks west of Pomona, and the combination of Segments 2 and 4 account for 3 tracks east of Pomona.

Current train volumes by segment are shown in Table 4. Future train projections for the Alhambra Line are presented in Section 4.

3.0 INTERMODAL FACILITIES – EXISTING AND FUTURE

There are three types of intermodal facilities; on-dock, near-dock, and off-dock. On-dock refers to an intermodal facility which is situated at a port marine terminal. Near-dock refers to an intermodal facility situated within 5 miles of the ports. Off-dock is an intermodal facility located more than 5 miles from the ports. These intermodal yards, as well as several additional major rail facilities in the LA Basin are shown in Figure 4, and Table 5 shows historic intermodal yard volume by operating railroad in the LA Basin.

Figure 4. Major Rail Facilities in the Los Angeles Basin

Source: Multi-County Goods Movement Action Plan.

As previously noted, this section describes conditions given future port cargo volumes and improvements of Scenario 2 are realized; that there will be intermodal facility growth in the future at on- and near-dock facilities. Scenario 2 also assumed that this on- and near-dock growth will be sufficient to handle all international container traffic from the Ports of LA and Long Beach; 30 percent handled on-dock and the remaining 10 percent handled near-dock. An

additional 12 percent of international traffic will be handled as transload intermodal and will reappear in the system as domestic containers (See Section 3.4). Volumes at each facility are described in more detail in the following text, by yard. Volumes at intermodal facilities in Scenarios 1 and 3 are provided in Appendix A.

Table 6. Historic LA Basin Railroad Intermodal Lifts – Total by Railroad

Year	LATC (Off-Dock)	City of Industry (Off-Dock)	East LA (Off-Dock)	ICTF (Near-Dock)	On-Dock	Total
Union Pacific						
2000	226,424	163,400	407,636	630,636	Not Avail.	**1,428,096**
2001	193,526	193,584	386,209	679,879	366,250	**1,819,448**
2002	188,752	240,592	438,209	689,432	394,240	**1,951,225**
2003	206,532	252,320	470,927	558,993	458,483	**1,947,255**
2004	228,361	242,428	466,540	569,349	507,127	**2,013,805**
2005	207,056	222,245	357,738	640,746	621,704	**2,049,489**
2006	202,384	191,018	340,003	726,622	831,314	**2,291,341**
2007	186,393	191,892	358,769	710,460	873,106	**2,320,620**

Year	Hobart Yard (Off-Dock)*	San Bernardino (Off-Dock)	On-Dock	Total
BNSF				
2001	1,040,601	410,922	421,084	**1,872,607**
2002	1,069,602	449,906	423,404	**1,942,912**
2003	1,216,652	494,777	591,298	**2,302,727**
2004	1,318,583	557,151	783,589	**2,659,323**
2005	1,338,374	554,904	977,954	**2,871,232**
2006	1,366,535	569,047	1,285,115	**3,220,697**
2007	1,374,480	499,974	1,171,647	**3,046,101**

Source: BNSF and UP Railroads.

Note: 1.85 TEUs per container.
These numbers are based on operating data. Other reports are based on billing information. For operating convenience, containers may be unloaded at a facility other than the billing address. In this case, the railroad will dray the container to its billed point. There may be a small volume variance in reports because of these disparate data sources.

3.1 On-Dock Intermodal Facilities

The Ports have 10 on-dock intermodal facilities, with five each at POLA and POLB. Located at the Port of Los Angeles are the following:

- West Basin ICTF (operated by China Shipping and Yang Ming),
- Terminal Island Container Intermodal Facility, operated by NYK and Evergreen (considered to be two terminals as each operator has a designated lease of tracks for it's exclusive use and operation),
- Pier 400 operated by Maersk, and
- Pier 300 operated by American President Lines.

The Port of Long Beach's facilities include:

- Pier T operated by Hanjin,
- Pier A operated by Mediterranean Shipping Company,
- Pier F operated by Long Beach Container Terminal on behalf of OOCL,
- Pier G operated for K-Line, and
- Pier J operated for COSCO (Pier J has two separate terminals, which are assumed to operate in tandem as one facility to serve the needs of COSCO in this study.).

Three major port tenants do not have on-dock intermodal facilities. They are TraPac in POLA, which is operated for Mitsui. Cal United Terminal, Pier D and E in the POLB, operated for Hyundai, and Pier C in the POLB which is operated for Matson.

The Environmental Impact Report (EIR) for the expansion of TraPac, which includes an on-dock intermodal facility, has been approved by the POLA Board of Harbor Commissioners. The process awaits approval by the City Council of Los Angeles. If approved, it will be the first Port expansion project cleared for construction in the past 7 years and, according to the *San Pedro Bay Ports Rail Study Update*, it will be operational by the end of 2009.

The POLB has plans to develop a Middle Harbor Terminal Rail Yard. This project would combine Piers D, E, (Hyundai) and F (OOCL) into a mega terminal and provide an on-dock intermodal facility for Hyundai. According to the Plan, this project has a completion date of late 2015. It is worth noting that at Pier F, OOCL has an on-dock facility in POLB that is inadequate to meet the volume demand of OOCL for on-dock loading. The Middle Harbor project will satisfy this demand too, in addition to meeting the needs of Hyundai.

The construction of the facilities described herein will greatly lessen the need for off-dock rail intermodal facilities, provided new and modernized near-dock terminals are also constructed. In addition, the POLB is in the process of constructing a new facility at Pier S, with an on-dock

intermodal facility, on Terminal Island. The *San Pedro Bay Ports Rail Study Update* shows this project being completed in 2009.

Table 6 shows the trend in on-dock rail loadings for the past five years, and Table 7 shows the projected growth in on-dock rail volume for Scenario 2. Similar information for Scenarios 1 and 3 can be found in Appendix A.

Table 7. On-Dock Rail Volume by Year

Year	Container Volume (Lifts)	Percentage of Total Port Throughput
2003	1,049,781	15.9%
2004	1,290,716	18.1%
2005	1,599,658	20.7%
2006	2,116,429	24.2%
2007	2,044,753	23.5%

Source: BNSF and UP Railroads.

Note: The *San Pedro Bay Ports Rail Study Update* forecasts that the volume of direct ship to rail containers will be 40 percent in 2030, and projects that 30 percent of all Port containers will be loaded on dock in 2030. The balance or 10 percent will be loaded at near-dock facilities. To convert TEUs (20' equivalent unit) to containers requires a factor of 1.85 TEUs, to account for the composite average marine container length.

Table 8. On-Dock Rail Volume

Year	Yard Capacity (Lifts)	Container Volume (Lifts)*	Percent International	International Trains/Day	Domestic Trains/Day
2006	-	2,116,429	100%	22	0
2035	6,924,000	6,924,000	100%	72	0

Note: Based on 43M TEUs, 1.85 TEUs per container.

International Trains per Day = Containers/300 containers per train/321 operating days per year.

It is assumed that on-dock containers will be shared by BNSF and UP 50/50.

* Container Volume (Lifts) was determined to be 30% of Port TEU throughput

The planned expansion of existing and construction of new facilities at POLA and POLB will greatly lessen the need for off-dock facilities, but new and modernized near-dock terminals will still be required. The handling of international traffic exclusively through on-dock rail facilities would be very difficult, of which the primary reasons are as follows:

- Rail equipment configuration, which typically is in the form of a five-well double stack car that must be loaded with containers to the same destination. Each well can be loaded with two 40-foot containers (stacked one on top of the other). Often, the marine terminal does not have ten 40-foot containers destined to the same destination. In that case the containers will be drayed to a railroad intermodal facility which can aggregate sufficient volume from all marine terminals to fill a rail car with containers having a common destination. The efficient utilization of well capacity is critical to effectively manage equipment and rail network infrastructure. For example, BNSF has a goal of filling 96 percent of all slots on a train and will not pull a car (or train) from a marine terminal that does not meet its loading criteria.

- Containers may miss the train schedule because of a U.S. Customs hold. Rather than being delayed at the marine terminal for the next scheduled train which could be as much as one week away, the container (after clearing Customs) will be drayed to a railroad facility from which a train to a given destination will operate more frequently.

- Overflow containers are drayed to railroad facilities. An example would be the situation where a train is scheduled for operation once each week. If the marine terminal has 350 containers and the train size is limited to 300 containers, the balance are drayed to a railroad facility rather than be delayed for a week at the marine terminal. Once more, the railroad facility has the mass of containers from all terminals. In addition, the railroad may operate a train mixed with domestic and international containers. This creates even more mass to operate trains more frequently to a single destination.

- Many small markets never generate enough containers to operate a train. The necessary volume to operate a train comes from combining small market containers from all marine terminals with domestic boxes at off-dock facilities.

- Marine terminals rarely operate daily schedules to any destination, even those as large as Chicago. They may operate a single schedule weekly to some destinations (Memphis, Dallas, Houston are examples), and the train to some markets may be operated several days after the arrival of a ship. The marine terminal sequences train loading consistent with shipper directions. Some containers are urgently needed by the consignee business and cannot be held at the marine terminal for several days before being transported. In such an instance, the container will be drayed to a rail terminal that has daily service to the destination.

Railroad facilities (as opposed to on-dock terminals) generate the mass needed to operate frequent trains to a given destination. They combine the containers from all marine terminals and can mix this traffic with domestic containers or truck trailers. The port on-dock facilities are proprietarily operated for a single steamship company or vessel sharing alliance. Thus, the port

container volume is distributed between 10 marine terminals. The port facilities do not load domestic containers, so this element is missing with respect to the creation of mass within the ports.

3.2 NEAR–DOCK INTERMODAL FACILITIES

3.2.1 Intermodal Container Transfer Facility

The Intermodal Container Transfer Facility (ICTF) is operated by UP for its exclusive use. The facility is situated about 5 miles north of the Ports. Access is from the Terminal Island Freeway, SR 47/103. The original facility, which opened in 1986 had a footprint of 148 acres, all constructed on POLA property. The property lease is for 50 years and expires in 2034. Since its opening, UP has expanded the operation to 233 acres by purchasing and leasing adjacent property. In its first full year of operation, (1987) ICTF loaded 303,056 containers. In 2007, the lift volume was 710,460 containers. A moderating influence on growth has been the construction of on-dock facilities which did not exist when ICTF opened. Now there are 10 such facilities situated in the Port Complex. Each time an on-dock terminal has begun operation, volume at ICTF declines for a short while, then begins to grow again. There are no other near-dock intermodal facilities at this time.

Table 8 below shows the intermodal volume at ICTF for the past 5 years.

Table 9. ICTF Rail Volume by Year

Year	Lifts
2003	558,993
2004	569,349
2005	640,746
2006	726,622
2007*	710,460

Source: UP Railroad.

*Represents 8 percent of Port volume

ICTF Modernization:

UP submitted an application for "ICTF modernization" project development to the Governing Board of the Intermodal Container Transfer Facility, Joint Powers Board, on December 26, 2007. Per UP's application[10] the capacity of ICTF is 760,000 containers (or lifts) annually with a

[10] dated January 30, 2007

current throughput of about 725,000 units. The modernization plan is expected to increase the capacity of ICTF to 1.5 million containers (lifts) annually by converting the overhead straddle cranes from diesel to electric, eliminating hostler activity, and reducing congestion on the Terminal Island Freeway. The net result of these improvements will be a reduction in the operational size from 233 to 177 acres. The key to the UP plan is to employ overhead, rail mounted wide span lift cranes. Presently, ICTF is a wheeled operation whereby all containers are loaded onto chassis and stored on chassis. None of the containers are grounded or stacked vertically. The modernization plan will convert the facility from a wheeled operation to one where the containers are stacked vertically and the need to store chassis on-site is eliminated, greatly reducing the land required for operation. Today more than 50 acres of property is used to store chassis. The wide span cranes described in the modernization plan can span 6 tracks and will stack containers to the side of working tracks vertically as trains are unloaded. Inbound containers from the Ports, will be live loaded. In rare cases, the inbound containers will be grounded for later loading. UP describes this project as a "green overhaul" of an existing facility. The POLA has contracted with the South Coast Air Quality Management District (SCAQMD) to prepare the Environmental Impact Report (EIR), and a decision on the project is expected in late 2010.

Table 9 shows the projected growth in ICTF rail volume in the future assumed for Scenario 2. Similar information for Scenarios 1 and 3 can be found in Appendix A.

Table 10. ICTF Rail Volume (Annual)

Year	Yard Capacity (Lifts)	Container Volume (Lifts)*	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	760,000	726,622	100%	8	0
2035	1,500,000	1,155,000	100%	12	0

Note: Based on 43M TEUs, 1.85 TEUs per container.
International Trains per Day = Containers/300 containers per train/321 operating days per year.
* Container Volume (Lifts) was determined to be 5% of Port TEU throughput

3.2.2 Proposed Southern California International Gateway

The Southern California International Gateway, (SCIG) is a proposed near-dock intermodal facility that would be exclusively operated by BNSF, thereby providing competitive parity with UP for near-dock intermodal service. It is planned to be developed on POLA property situated approximately 4 miles north of the Ports and immediately south of ICTF. Access to the facility will be from the Terminal Island Freeway at Pacific Coast Highway. An EIR for the project is currently underway. BNSF estimates SCIG capacity at 1.5 million containers annually. The design plan is to construct two clusters of 6 working tracks, with each track being about 4,000' in

length. The working tracks will be connected to a lead track which in turn will connect to the Alameda Corridor. The facility will be "green" and like ICTF, will use wide span electric lift cranes to eliminate hostler activity. BNSF has pledged to purchase a clean fleet of diesel trucks for the dray between the Ports and SCIG. BNSF has stated that the SCIG operation will eliminate the need to use Hobart Yard as an international container loading facility for port cargo, thus eliminating 1.2 million truck trips annually on I-710 (BNSF estimate). According to BNSF, when at full capacity, SCIG will eliminate more than 2 million truck trips annually.

Table 10 shows the projected SCIG rail volumes and train traffic in the future assumed for Scenario 2. Similar information for Scenarios 1 and 3 can be found in Appendix A.

Table 11. SCIG Rail Volume (Annual)

Year	Yard Capacity (Lifts)	Container Volume (Lifts)*	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	-	-	-	-	-
2035	1,500,000	1,155,000	100%	12	0

Note: Based on 43M TEUs, 1.85 TEUs per container.
International Trains per Day = Containers/300 containers per train/321 operating days per year.
* Container Volume (Lifts) was determined to be 5% of Port TEU throughput

3.3 OFF-DOCK IM FACILITIES

There are five off-dock intermodal facilities in the Basin. Off-dock facilities process a mix of international and domestic containers and trucks. Today, most of the international containers loaded off-dock are concentrated at BNSF's Hobart Yard and UP's East Los Angeles Yard. Table 11 provides an overview of international container lifts at all intermodal yards today. In the Scenario 2 future it is assumed that all international traffic will be handled at on- and near-dock facilities, opening up the off-dock facilities to be exclusively for domestic traffic.

Table 12. Off-Dock Intermodal Facilities (Annual)

Facility	Capacity (Lifts)	2006 International Lifts	Percent of Yard Intn'l Traffic
BNSF Hobart	1,700,000	808,096	59%
BNSF San Bernardino	660,000	0	0%
UP East Los Angeles	510,000	80,108	24%
UP LATC	340,000	32,912	16%
UP City of Industry	220,000	2,254	1%

Total Off-Dock	3,430,000	923,370	

Source: BNSF and UP Railroads.

3.3.1 Hobart Yard

Hobart is the largest intermodal facility in the U.S., dwarfing all other such facilities in terms of throughput. The main terminal site constitutes 285 acres of property. BNSF supports the operation from several remote yards which are situated near the main facility. The *San Pedro Bay Ports Rail Study Update* estimates the capacity of Hobart to be 1.7 million lifts annually.

As BNSF does not operate a near-dock intermodal facility, Hobart is used to serve its marine customers as support for the on-dock operation. By volume, about 60 percent of all containers passing through Hobart are international containers, with the balance being domestic containers and trailers. The number of international containers processed at Hobart in 2007 was 789,656 units. This makes the throughput of international containers at Hobart greater than ICTF, with more international volume than any intermodal facility in the U.S. The balance of throughput at Hobart was about 584,824 units of domestic containers and trailers.

The volume of trailers moving by rail has declined in recent years, as the superior economics of double-stack service has made domestic containerized shipping more compelling. Both of the western Class I railroads have been pushing their intermodal service partners strongly towards containers, but for some applications trailers continue to be preferred. During the forecast period through 2035, it is likely that the remaining shipment of trailers by rail will disappear, at least in conventional intermodal service.

Table 12 shows the projected growth in Hobart yard rail volumes and subsequent number of trains generated in the yard in the future assumed for Scenario 2. Similar information for Scenarios 1 and 3 can be found in Appendix A.

Table 13. Hobart Rail Volume (Annual)

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	1,700,000	1,366,535	59%	9	9
2035	1,700,000	1,700,000	0%	0	27

Note: 1.85 TEUs per container.
International Trains per Day = Containers/300 containers per train/321 operating days per year.
Domestic Trains per Day = Containers/200 containers per train/321 operating days per year.

3.3.2 East Los Angeles

East Los Angeles (ELA) is a UP operated intermodal facility. The facility is situated on approximately 120 acres. The *San Pedro Bay Ports Rail Study Update* estimates the capacity of ELA to be 510,000 lifts annually. Of the 358,769 containers and trucks processed at ELA in 2007, 80,253 were international and the balance, domestic. While ICTF is the primary UP facility utilized for loading international containers, international containers loaded at East LA are combined with domestic containers to make a solid train which is likely destined for small intermodal markets like Salt Lake City and Denver. The UP's operating scheme is to operate a daily train to Denver with domestic, (including UPS service), and international containers. This train sets out traffic destined for Salt Lake City on its route to Denver.

Table 13 shows the projected growth in East LA yard rail volumes and subsequent number of trains generated in the yard in the future assumed for Scenario 2. Similar information for Scenarios 1 and 3 can be found in Appendix A.

Table 14. East LA Rail Volume (Annual)

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	510,000	340,000	24%	1	5
2035	510,000	510,000	0%	0	8

Note: 1.85 TEUs per container.
International Trains per Day = Containers/300 containers per train/321 operating days per year.
Domestic Trains per Day = Containers/200 containers per train/321 operating days per year.

3.3.3 Los Angeles Transportation Center

Los Angeles Transportation Center (LATC) is situated on the east side of the Los Angeles River across from the Los Angeles Union Passenger Terminal. This facility is the only Basin intermodal terminal from which Pacific Northwest service is operated. LATC is located on about 110 acres of property. The *San Pedro Bay Ports Rail Study Update* estimates the capacity of LATC to be 340,000 lifts annually.

Table 14 shows the projected growth in LATC yard rail volumes and subsequent number of trains generated in the yard in the future assumed for Scenario 2. Similar information for Scenarios 1 and 3 can be found in Appendix A.

Table 15. LATC Rail Volume (Annual)

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	340,000	202,384	16%	1	3
2035	340,000	340,000	0%	0	6

Note: 1.85 TEUs per container.
International Trains per Day = Containers/300 containers per train/321 operating days per year.
Domestic Trains per Day = Containers/200 containers per train/321 operating days per year.

3.3.4 City of Industry

City of Industry (CofI) is another UP operated intermodal facility. It is situated on a 90 acre parcel of property. The *San Pedro Bay Ports Rail Study Update* estimates the capacity to be 220,000 lifts annually. UP has long term plans to expand the terminal to 160 acres by combining two contiguous pieces of property. UP forecasts that the build out will increase the facility's capacity to 600,000 domestic trailers and containers annually. As this is a long term plan with an unknown timeframe it is not included in the assumptions for this analysis.

Table 15 shows the projected growth in CofI yard rail volumes and subsequent number of trains generated in the yard in the future assumed for Scenario 2. Similar information for Scenarios 1 and 3 can be found in Appendix A.

Table 16. City of Industry Rail Volume (Annual)

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	220,000	191,892	1%	1	3
2035	220,000	220,000	0%	0	4

Note: 1.85 TEUs per container.
International Trains per Day = Containers/300 containers per train/321 operating days per year.
Domestic Trains per Day = Containers/200 containers per train/321 operating days per year.

3.3.5 San Bernardino

San Bernardino (SB) is operated by BNSF and is the only intermodal facility in the Inland Empire. The *San Pedro Bay Ports Rail Study Update* estimates that the capacity of SB is 660,000 lifts annually. SB is situated on 150 acres of land. Expansion of this facility is unlikely

as it would require the taking of residential property. San Bernardino does not process any international containers.

Table 16 shows the projected growth in San Bernardino yard rail volumes and subsequent number of trains generated in the yard in the future assumed for Scenario 2. Similar information for Scenarios 1 and 3 can be found in Appendix A.

Table 17. SB Rail Volume (Annual)

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	660,000	569,047	0%	0	9
2035	660,000	660,000	0%	0	11

Note: 1.85 TEUs per container.
Domestic Trains per Day = Containers/200 containers per train/321 operating days per year.

3.3.6 Victorville

BNSF has announced plans to construct an intermodal facility at Victorville. For now, construction has been placed on hold as the demand for lift capacity has not materialized due to a weak intermodal market. BNSF plans describe Victorville as a domestic intermodal facility.

3.4 TRANSLOAD INTERMODAL

Transloading entails the unloading of cargoes from marine containers into domestic trailers and containers for distribution to inland points either by highway or rail. By transloading, shippers can take advantage of the higher loading capacity of 53' domestic trailers and containers, and fine-tune the staging of goods destined for interior markets. The degree to which transloading occurs is dependent on several factors, of which the primary elements are: (1) the relative cost differences between shipping a marine container directly to the hinterlands versus using domestic equipment, and (2) the cost of handling the goods through a warehouse in the Los Angeles region versus elsewhere. The *San Pedro Bay Ports Rail Study Update* cites a 2004 Alameda Corridor Transportation Authority (ACTA) study that estimated that the railroads hauled cargo equal to twelve percent of the Port generated TEUs in domestic boxes. However the amount of transloaded cargo has and can fluctuate considerably based on above cited factors, leading to a significantly higher volume of transload containers at domestic intermodal yards and an increase in the number of over the road trucks.

International containers are 20 feet, 40 feet, and 45 feet in length, with 40 foot containers being most prevalent. Domestic containers are 28 feet 48 feet, and 53 feet in length, with 53 foot

containers being most prevalent. For this analysis it is assumed that one 53 foot container converts to 3 TEUs by volume. Rather than return empty marine containers from the hinterlands, the steamship companies try to fill these boxes with westbound domestic product. In 2006 this strategy resulted in about 125,000 international containers returning to the west coast loaded with domestic goods. Likewise, international cargo may be transported in 53 foot domestic boxes. Transload and warehoused cargo is re-stuffed into 53 foot containers, all occurring at off-dock facilities.

As shown in Table 17, 1.7 million domestic containers that have been transloaded will generate 27 trains each day. It is assumed that BNSF and UP will share a 50/50 market split for this transload intermodal.

Table 18. Transload Rail Volume (Annual)

Year	Port Throughput	% of Port Throughput Transload	Transload TEUs	Transload 53' Containers	Domestic Trains/Day
2006	15.8M TEU	12%	1.9M TEUs	.633M	10
2035	43M TEU	12%	5.1M TEUs	1.7M	27

Note: 1.85 TEUs per container. 1- 53' container = 3 TEUs.
Domestic Trains per Day = Containers/200 containers per train/321 operating days per year.

4.0 LOS ANGELES BASIN MAIN LINES - FUTURE

4.1 ALAMEDA CORRIDOR

Trains traveling within the Alameda Corridor are coming from the Ports from both on-dock and near-dock facilities. There are also a number of local carload trains, light engines, and empty container trains. Given full build-out of on- and near-dock facilities, the number of average daily trains in 2035 is estimated and shown in Table 18. This table shows the railroad operator, as well as where the trains are coming to/from. This average will fluctuate based on the day of the week and the time of year. Using the rule-of-thumb that a single mainline track can service an average of 50 trains/day, the Alameda Corridor has adequate capacity (150 trains/day) to accommodate future train counts.

Appendix A provides projected train counts in the Alameda Corridor for Scenarios 1 and 3. Scenario 1 (high cargo growth) shows that 108 trains will be generated by on- and near dock facilities. Scenario 3 (low cargo growth) shows that 78 trains will be generated by on- and near dock facilities. Thus, all three scenarios are easily accommodated with current Alameda Corridor capacity.

Table 19. Projected Daily Alameda Corridor Train Counts (2035)

Railroad	From Yard	Trains
BNSF	On-Dock	36
BNSF	SCIG	12
UP	On-Dock	36
UP	ICTF	12
BNSF & UP	Unit Auto*	4
BNSF & UP	Carload*	6
BNSF & UP	Unit Coal*	10
BNSF & UP	Unit White Bulk*	2
BNSF & UP	Unit Oil*	6
Total Trains		**124**
Number of mainline tracks		**3**

Note : Based on 43M TEUs, 30% handled on-dock

1.85 TEUs per container.

International Trains per Day = Containers/300 containers per train/321 operating days per year.

Domestic Trains per Day = Containers/200 containers per train/321 operating days per year.

*Inland Empire Railroad Main Line Study, June 2005 / 2025 trains grown to 2035, 1% per year

4.2 BNSF SAN BERNARDINO SUBDIVISION

BNSF has only one mainline corridor over which to route its trains in the LA Basin. Therefore future BNSF traffic using the SB Subdivision will either be heading west to the Port or east from the Port. Traffic from east/westbound traffic from Hobart Yard also uses the SB Subdivision.

UP holds trackage rights on this BNSF line between West Riverside and Colton Crossing, as UP's LA Subdivision (east end of Segment 2) intersects with the SB Subdivision at West Riverside. UP traffic using the SB Subdivision will be eastbound from the Port, ICTF, LATC, ELA, and CofI, as well as both east and westbound from the auto facility at Mira Loma.

As noted in Section 2.2, the SB Subdivision also serves Amtrak long distance, Metrolink, and Pacific Surfliner trains.

The forecast number of average daily trains on the SB Subdivision in 2035 for Scenario 2 is shown in Table 19 (approaching 150 trains/day). This table shows railroad operator, as well as where the trains are coming to/from. This average will fluctuate based on the day of the week and the time of year. Using the rule-of-thumb that a single mainline track can service 50 trains/day, the SB Subdivision has capacity to accommodate future train counts at the points shown in the table, assuming BNSF builds a third track at some time after 2009, as previously discussed. However, note that while much of this mainline has or will have 3 tracks, there are two segments that have only two tracks; between Fullerton and west of Prado Dam, and between east of Prado Dam and West Riverside (see Figure 3).

Appendix A provides similar information for Scenarios 1 and 3. Scenario 3 illustrates both a lower number of TEUs at the Port, as well as shorter international trains (240 containers per train vs. 300 containers per train). In Scenario 3 train volumes between Fullerton and west of Prado Dam, and between east of Prado Dam and West Riverside are just under 100 trains/day and within the 50 trains/day threshold of the available track in these sections. Of course, it should be remembered that none of these scenarios include growth in passenger train traffic. As noted previously, to accommodate growth in passenger train traffic, there could be a need for additional track capacity in certain segments of this line. Therefore, it is important to also consider available right of way to accommodate this additional growth as well as the additional capacity that is likely to be needed at the choke point locations identified above.

A stretch of the BNSF mainline through east Fullerton and west Placentia has right-of-way that appears to be as narrow as 50 to 55 feet for a stretch of about 1.8 miles. Railroad engineers have confirmed that 3 mainline tracks can be fit into a 50' right-of-way, should the need arise to add a third mainline track to these segments in the future (needed for Scenarios 1 and 2). While

this would provide sufficient capacity to meet the forecasted future growth in freight, a third mainline track will not provide for future growth in passenger rail service in this segment as well.

Table 20. Projected Daily San Bernardino Subdivision Train Counts (2035)

Railroad	From Yard	Norwalk	Prado Dam	High Grove	Colton Crossing
BNSF	On-Dock	36	36	36	36
BNSF	SCIG	12	12	12	12
BNSF	Hobart	27	27	27	27
UP	On-Dock (EB)			18	18
UP	ICTF (EB)			6	6
UP	LATC (EB)**			2	2
UP	ELA (EB)			4	4
UP	Cofl (EB)			2	2
UP	Mira Loma			6	6
BNSF	Unit Auto*	6	9	9	9
BNSF	Carload*	7	12	12	12
BNSF	Unit Coal*	2	2	2	2
BNSF	Unit White Bulk*		3	3	3
Metrolink***	N/A	28	26	8	8
Amtrak Long Distance***	N/A	2	2	2	2
Surfliner***	N/A	22	0	0	0
Total Trains		**142**	**129**	**149**	**149**
Number of mainline tracks available		**3**	**3**	**3**	**3**

Note : Based on 43M TEUs, 30% handled on-dock

1.85 TEUs per container.

International Trains per Day = Containers/300 containers per train/321 operating days per year.

Domestic Trains per Day = Containers/200 containers per train/321 operating days per year.

It is assumed that on-dock containers will be shared by BNSF and UP 50/50.

* Inland Empire Railroad Main Line Study, June 2005 / 2025 trains grown to 2035, 1% / year

** Assume only 40% of LATC trains head through the LA Basin. 60% head north on Santa Clara Line.

***No growth is assumed for passenger trains.

4.3 UP Los Angeles Subdivision & Alhambra Line

The LA Subdivision and Alhambra Line are in close physical proximity to each other through Pomona. High speed, parallel connection tracks at Pomona linking the LA Sub and Alhambra Lines allow line segments to be used interchangeably. Routing is generally along the LA Sub (Segment 2) for eastbound traffic and along the Alhambra Line (Segment 4) for westbound traffic. For trains entering/exiting the Port, either Segments 1 or 3 may be used, and generally depend on commuter train activity. For the purpose of this analysis, all Port traffic was assigned to Segment 1. However, by using the LA Sub and Alhambra Line in tandem, UP will have the equivalent of 3 main tracks through the Basin. The combination of Segments 1 and 3 account for 3 tracks west of Pomona, and Segments 2 and 4 combine for 3 tracks east of Pomona.

As noted in Sections 2.3 and 2.4, these UP mainline also serve Amtrak and Metrolink passenger trains.

The number of average daily trains on the LA Sub and Alhambra Line in 2035 is shown in Table 20. This table shows railroad operator, as well as where the trains are coming to/from. This average will fluctuate based on the day of the week and the time of year. Using the rule-of-thumb that a single mainline track can service 50 trains/day, both corridors have adequate capacity (150 trains/day when additional trackage is built) to accommodate future train counts along the segments shown in the table with one exception beginning to approach maximum capacity. While much of the Segment 2 mainline has 2 tracks, east of Mira Loma to West Riverside has a single track (see Figure 4). As the routing was assigned for this analysis Segment 2 does appear to have adequate capacity, but with the close proximity to BNSF's SB Subdivision, and the potential for heavy switching activity, this location could become problematic in the future.

Appendix A provides similar information for Scenarios 1 and 3. Again, Scenario 3 illustrates both a lower number of TEUs at the Port, as well as shorter international trains. Along Segment 2, east of Mira Loma to West Riverside, train volumes are lowest in Scenario 3 with 43 trains/day. This is a bit more under the 50 trains/day in Scenarios 1 and 2 and within the 50 trains/day threshold of the available track in this section.

Table 21. Projected Daily LA Subdivision & Alhambra Line Train Counts (2035)

Railroad	From Yard	Segment 1	Segment 2	Segment 3	Segment 4
UP	On-Dock (EB)	18	18		
UP	On-Dock (WB)	18			18
UP	ICTF (EB)	6	6		
UP	ICTF (WB)	6			6
UP	ELA (EB)	4	4		
UP	ELA (WB)	4			4
UP	LATC (EB)**		2	2	
UP	LATC (WB)**			2	2
UP	Cofl (EB)		2	2	
UP	Cofl (WB)			2	2
UP	West Colton*				23
UP	Mira Loma*		6		
UP	Unit Auto*	3			3
UP	Carload*	11		12	23
UP	Unit Coal*	8			8
UP	Unit White Bulk*	1			1
Metrolink***	N/A	12	12		
Amtrak Long Distance***	N/A			1	1
Total Trains		**91**	**50**	**21**	**91**
Number of mainline tracks available		**2**	**2 (partial)**	**1**	**2**

Note : Based on 43M TEUs, 30% handled on-dock

1.85 TEUs per container.

International Trains per Day = Containers/300 containers per train/321 operating days per year.

Domestic Trains per Day = Containers/200 containers per train/321 operating days per year.

It is assumed that on-dock containers will be shared by BNSF and UP 50/50.

* Inland Empire Railroad Main Line Study, June 2005 / 2025 trains grown to 2035, 1% / year

** Assume only 40% of LATC trains head through the LA Basin. 60% head north on Santa Clara Line.

***No growth is assumed for passenger trains.

5.0 2035 CAPACITY ISSUES & CONCLUSIONS

As described earlier in this report there are two components that need to be reviewed to assess whether or not the existing rail system can meet future San Pedro Bay Port demand of 43M TEUs: railroad mainline capacity and intermodal facility capacity. This section highlights the findings of this analysis.

5.1 LA BASIN MAINLINE CORRIDORS

While railroads have employed a variety of operational strategies to meet container demand, including longer trains with higher utilization rates, it is difficult to say with absolute confidence that there will be sufficient mainline capacity in the future, regardless of what the numbers in Section 4 detail. Given that tight operating windows must consistently be maintained by railroads within the LA Basin, there is little room for error (or slightly deviating off schedule), and any such deviation could result in unavoidable delays which could not be mitigated.

Described below are concerns regarding whether or not there will be sufficient main line capacity to meet the LA Basin demand:

1. Passenger Rail: This *report assumes no growth in passenger trains in the future.* The most recent of reports reviewed, the *Multi-County Goods Movement Action Plan,* included train projections from Amtrak and Metrolink in mainline freight projections. As a spot check whether capacity is available along Class I mainlines, two locations were reviewed, as follows.

    - Along the San Bernardino Subdivision between Hobart Yard and Fullerton 52 Metrolink trains are projected in the *Multi-County Goods Movement Action Plan* (low growth scenario). This equates to 194 total trains at Norwalk, requiring a 4th track at this location, at a minimum

    - Along the LA Subdivision at Mira Loma 40 Metrolink trains are projected (low growth scenario). This equates to 90 total trains along Segment 2, requiring a 2nd track at this location. Note that this line mostly consists of two tracks, with a single track connection to the San Bernardino Subdivision.

    As previously stated in this report, the passenger rail assumptions made in this study reflect the condition that any additional passenger trains will only be added if track capacity can be added to the system. It is unlikely that Metrolink's growth plans will be realized absent additional capacity added by the railroads themselves or in cooperation with Metrolink. Noted in Section 4.2, there is a segment through east Fullerton and west Placentia that has right-of-way as narrow as 50 to 55 feet. Based on freight growth, it is

assumed that this width will be used to establish a 3rd mainline track in this section for freight, not passenger rail.

2. Colton Crossing: The Colton Crossing consists of two BNSF mainline tracks running north-south on the SB Subdivision (part of the Transcon Corridor) crossing two UP mainline tracks running east-west on the Alhambra Line (heading east to join the Sunset Corridor). UP also holds trackage rights on the BNSF San Bernardino/Cajon Subdivisions from Riverside to Daggett, just east of Barstow. Train volumes in this location can be roughly calculated by adding the train counts from the SB Subdivision at Colton Crossing (149 trains/day) and UP's Segment 4 of the Alhambra Line (91 trains/day) for a total of 240 trains/day. This averages 10 trains per hour. Maintaining fluid operations over an at-grade crossing with this number of trains is not practical.

   BNSF and UP have plans to grade separate the Colton Crossing. The proposed improvement to the Colton Crossing is to construct an elevated structure on the UP double track that parallels I-10 and crosses over the BNSF double track. To date a public benefit study, supplemented by an economic impact analysis (EIA) of construction have been completed. Based on the results of these studies the railroads are pursuing public funds to help mitigate the situation.

3. Cajon Pass: According to the recently completed EIR for third mainline track, the sustainable capacity of the existing two main tracks through Cajon Pass is currently 102 trains per day. A rough estimate of what volumes will pass through the Cajon Pass in 2035 can be determined by combining the BNSF train counts on the San Bernardino Line at Colton Crossing (149 trains), and then adding the number of trains projected to come from San Bernardino intermodal yard (11). This results in 160 trains, and indicates that the corridor will be beyond capacity in 2035 with only 2 tracks present. At least a third mainline is required to handle these projected train counts.

4. Adoption of new technologies: During the study period, the rail industry is expected to adopt Positive Train Control and Electro-Pneumatic braking. For both technologies, the productivity benefits to the railroads are expected to be substantial, and will permit significant increases in traffic density over existing practice. These technologies may well diminish or even eliminate the need for some of the track capacity that would otherwise be required to handle the expected traffic.

5.2 On-Dock Intermodal Facilities

The Port's plan to construct new terminals and enlarge others is likely to occur, however the likelihood of achieving the yard efficiency used in this analysis may not be fully realized. A major barrier to on-dock productivity is the terminal/ILWU work rule which restricts terminal switching to times when ILWU employees are not working. The *San Pedro Bay Ports Rail*

Study Update reviewed the 43M TEU capacity in the context of a 3-shift operation with modified working conditions by 2020. Absent this type of operational efficiency improvement, the throughput additional on-dock capacity allows will not be realized. This factor will undermine the ability of trains to go directly to loading/unloading on arrival at the Port terminals. Track turnover (switching) is critical to the efficient use of terminal tracks. Simply put, when a track(s) is loaded or unloaded, it must be made accessible to the railroad for replacement. Marine Terminal work rules and productivity are not controlled by the railroads.

Additionally, the fragmentation of on-dock facilities spread over 10 marine terminals will undermine the optimization of Port operations. An anecdotal but real situation regarding this observation is the Maersk terminal (Pier 400) in the POLA. The Pier 400 on-dock capacity is estimated at 650,000 containers annually. In 2007, 232,000 containers were loaded at Pier 400. In 2006, 450,000 were loaded. Obviously, there is real capacity at Pier 400, yet those terminals without on-dock facilities drayed their containers over the Region's freeways to railroad terminals.

Another concern with respect to on-dock efficiency is referenced in the *San Pedro Bay Ports Rail Study Update*; the need to reverse the normal up position of the Badger Avenue Bridge situated on the access route to Terminal Island. By 2035, more than 50 percent of all containers loaded at on-dock facilities will be on Terminal Island. According to the plan, a seamless train operation to and from Terminal Island will be essential in accommodating the increase in containers and thereby necessitating that the bridge be locked in the down position. The importance in changing the bridge's normal position is underscored by the *San Pedro Bay Ports Rail Study Update's* statement that, "In 2010, lifting the bridge increases the delay ratio on Terminal Island by 35 percent". Greater delays will occur as on-dock capacity increases and volume grows on Terminal Island. Since the bridge spans a navigable waterway, (Cerritos Channel), the U.S. Coast Guard has jurisdiction over the bridges normal or, at rest position. Therefore, the POLA, as the lead agency, along with the POLB has petitioned the Coast Guard to change the normal bridge position to down. In response, the Coast Guard has proposed that the change be implemented as a pilot program for 8 weeks. POLA is the lead agency.

The train movement simulation shown in the *San Pedro Bay Ports Rail Study Update* makes several operational assumptions that are challenged by the BNSF. The objective of the rail modeling was to develop a template for success. Success in this instance translates to trains moving at an acceptable speed without serious delay. For insight into the railroad reaction to the operating assumptions of the simulation, see Appendix B and the attached BNSF comments. These comments were provided at the request of George Fetty after a presentation of the simulation findings, including the operating assumptions attendant thereto, in May 2006.

5.3 NEAR-DOCK INTERMODAL FACILITIES

Implementation of all near-dock expansion and construction assumed in Scenario 2 of this study will be a great challenge. While beneficial to overall goods movement in the LA Basin, the ICTF and SCIG projects will have local impacts that need to be addressed in implementation plans. Currently, both projects face a great deal of community opposition. These projects will also require plans by the railroads to ensure that they meet overall air quality of the ports embodied in the Clean Air Action Plan (CAAP). Since both projects involve sites that are in public ownership, they are not exempt from NEPA/CEQA review as would be other projects the railroads might undertake on their own property.

This situation leaves considerable uncertainty as to whether or not there will be near-dock terminal expansion. To be prudent, the I-710 EIR/EIS includes two alternative scenarios for port cargo growth and rail system capacity that assume no expansion of existing near-dock terminal capacity, as shown in Appendix A as Scenarios 1 and 3.

While Scenarios 1 and 3 both result in fewer trains in the Alameda Corridor because of lower on- and near-dock capacity, upon review of the intermodal lift shortfall in each of these scenarios it can then be inferred that as a result of low on- and near-dock capacity more trucks use area roadways to dray from the Port to off-dock intermodal facilities. As shown in Appendix A, Scenario 1 results in a 2.26M lift shortfall and Scenario 3 results in a 2.52M lift shortfall. Compare this to Scenario 2 that has a high-level of near-dock facility growth and an over all intermodal lift shortfall of .7M lifts.

Additionally, upon review of the projected volumes in the Alameda Corridor for the three Scenarios, it can be argued that Scenario 3 with only 90 trains/day, in a corridor that can handle 150 trains/day, is not making the best use of the mainline. This low volume in trains through the corridor is directly related to the amount of on- and near-dock capacity available.

5.4 OFF-DOCK INTERMODAL FACILITES

An important question is whether or not there is ample off-dock capacity to handle domestic container traffic and international transload traffic. While domestic traffic was not projected in this analysis, as a logic check the domestic traffic accommodated here is compared to domestic traffic projected in the *Multi-County Goods Movement Action Plan*. That study projected that based on the economy and population that domestic traffic will grow 2-3% annually, to 2.43M lifts (this is in addition to the transload traffic served at domestic intermodal facilities).

This Scenario 2 analysis assumes that off-dock available capacity for domestic and transload intermodal is 3.43M lifts. Subtracting the transload lifts calculated in Section 3.4 of this report (1.7M lifts/yr), that leaves 1.73M lifts available for domestic intermodal, which results in an overall domestic intermodal shortfall of 0.7M lifts. Note, as transload traffic has fluctuated

considerably over the years, this domestic intermodal shortfall could be even greater than what is stated in this report. Similarly, as explained in Section 5.3, above, both Scenarios 1 and 3 result in considerable intermodal shortfalls. Scenario 1 results in a 2.26M lift shortfall and Scenario 3 results in a 2.52M lift shortfall.

In order to accommodate the domestic need, consideration must be given to streamlining existing yard operations, expanding existing yards, or constructing new intermodal facilities. Several off-dock options could be considered by the railroads, including 1) expansion of Hobart Yard, 2) expansion of City of Industry Yard, or 3) construction of Victorville Yard. Note that for the Scenario 2 shortfall of 0.7M lift, only one of these suggested projects may need to be pursued, while for either Scenario 1 and 3, where the shortfall is well of 2M lifts/year, a combination of expansion and new construction will need to be considered.

Conclusions

In the future, as in recent years, it is expected that freight railroads will employ operational strategies to meet container demand on their systems. However, given container volumes and constraints presented in this study, it is difficult to say with certainty that these operational strategies will be enough to meet growing demand. Freight railroads are nearing their efficient capacity in the LA Basin. Findings of this analysis include:

- While expansion of Port on-dock terminals is likely to occur, the level of yard efficiency assumed in this study may not be fully realized. Barriers to achieving 30% of containers via direct port-rail include fragmentation of on-dock yards, ILWU work rules limiting productivity, and the inability to get 100% of trains leaving the port fully double-stacked. *Fewer containers served on-dock result in more containers traveling to near- or off-dock facilities on area roadways.*

- Implementation of all near-dock expansion and construction assumed in Scenario 2 will be a great challenge. While beneficial to overall goods movement in the LA Basin, the ICTF and SCIG projects will have local impacts that need to be addressed in implementation plans. Currently, both projects face a great deal of community opposition. *In the event these obstacles cannot be overcome, fewer containers will be served near-dock and more containers will travel to off-dock facilities on area roadways.*

- Although Scenario 2 provides for a substantial increase in intermodal capacity at on- and near-dock facilities, considering domestic needs along with international needs results in an overall intermodal lift shortfall of 0.7M lifts. Therefore, while significant capacity has been added to accommodate containers, capacity to meet the actual need has not been constructed. *Additional intermodal facilities will need to be*

constructed, or existing yards expanded. If intermodal need is not met, these trips will be made via truck on area roadways.

- While Scenario 2 tries to provide a "worst-case" picture of railroad mainline capacity, it does not account for any growth in passenger trains. Reviewing passenger train growth provided in the *Multi-County Goods Movement Action Plan* by transit operators, at a minimum, 40 trains are desired to be added to the LA Subdivision and 52 to the SB Subdivision. In each case, these passenger train volumes reach beyond the efficient capacity of freight mainlines. *Additional mainline tracks will need to be constructed to accommodate passenger train growth, and Right-of-Way constraints may limit the addition of these tracks.*

LA Basin stakeholders have a challenge in front of them; to determine what their ideal balance is between desired level of growth and investment. How the challenge is approached, and how resources are allocated, will impact 1) the amount of railroad mainline traffic, 2) the mainline capacity available for additional passenger trains, 3) significant investment in new intermodal yard capacity, and 4) the amount of truck traffic that will be diverted onto area roadways, including I-710. An ideal solution could be to balance each of these factors, with an emphasis on minimizing those that impact economic development and community interests negatively.

APPENDIX A: GROWTH SCENARIOS

Several scenarios had been previously constructed to try to understand the balance between railroad mainline capacity and intermodal yard capacity. These are:

- **Scenario 1: High Cargo Demand Forecast, High On-Dock Rail Capacity, No New Near-Dock Rail Facilities.**
    - 40% of Port TEUs go by rail. Port TEUs = 43M
    - Significant on-dock expansion to nearly 7M lifts/year capacity)
    - ICTF expanded to 760,000 lifts/year capacity (No SCIG).
    - Assumes the use of 300 containers per international train to calculate daily train volumes, in recognition of current and projected operating practices of the railroads to increase effective capacity by running longer trains (typically 8000-foot lengths).
- **Scenario 2: High Cargo Demand Forecast, High On-Dock Rail Capacity, Both ICTF and SCIG Constructed/Expanded** (*Discussed in detail in body of this report).*
    - 40% of Port TEUs go by rail. Port TEUs = 43M
    - Significant on-dock expansion to nearly 7M lifts/year capacity)
    - Expanded ICTF and construction of SCIG (each will have 1.5M lift/year capacity)
    - Assumes the use of 300 containers per international train.
- **Scenario 3: Low Cargo Demand Forecast, Low On-Dock Rail Capacity, No New Near-Dock Rail Facilities.**
    - 40% of Port TEUs go by rail. Port TEUs = 28.5M
    - ICTF expanded to 760,000 lifts/year capacity (No SCIG).
    - Assumes the use of 240 containers per international train to reflect train lengths comparable to those used in the recent past and concerns that with increasing train traffic, the railroads may not be able to achieve the longer train lengths and provide reliable service. This operating scenario is also more consistent with previous forecasts of train traffic in the LA Basin and serves as a more comparable point of comparison.

Scenario 1: High Cargo Demand Forecast, High On-Dock Rail Capacity, No New Near-Dock Rail Facilities

PORT TEUs	**42,700,000**	PORT Lifts	**23,081,081**
40% TEUs	17,080,000	40% Lifts	9,232,432

Detailed Breakdown By Yard:

ON DOCK

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent International	International Trains/Day	Domestic Trains/Day
2006	-	2,116,429	100%	22	0
2035	6,924,000	6,924,000	100%	72	0

Note: Based on 42.7M TEUs, 1.85 containers per TEU.
International Trains per Day = Containers/300 containers per train/321 operating days per year.
It is assumed that on-dock containers will be shared by BNSF and UP 50/50.

ICTF

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	760,000	726,622	100%	8	0
2035	760,000	760,000	100%	8	0

Note: Based on 42.7M TEUs, 1.85 containers per TEU.
International Trains per Day = Containers/300 containers per train/321 operating days per year.

SCIG

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	-	-	-	-	-
2035	-	0	-	-	-

Hobart

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	1,700,000	1,366,535	59%	9	9
2035	1,700,000	1,700,000	59%	11	11

Note: 1.85 containers per TEU.
International Trains per Day = Containers/300 containers per train/321 operating days per year.
Domestic Trains per Day = Containers/200 containers per train/321 operating days per year.

EAST LA

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	510,000	340,000	24%	1	5
2035	510,000	510,000	24%	2	7

Note: 1.85 containers per TEU.
International Trains per Day = Containers/300 containers per train/321 operating days per year.
Domestic Trains per Day = Containers/200 containers per train/321 operating days per year.

Scenario 1 (cont'd)

LATC

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	340,000	202,384	16%	1	3
2035	340,000	340,000	16%	1	5

Note: 1.85 containers per TEU.
International Trains per Day = Containers/300 containers per train/321 operating days per year.
Domestic Trains per Day = Containers/200 containers per train/321 operating days per year.

Cofl

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	220,000	191,892	1%	1	3
2035	220,000	220,000	1%	1	4

San Bernardino

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	660,000	569,047	0%	0	9
2035	660,000	660,000	0%	0	11

Note: 1.85 containers per TEU.
Domestic Trains per Day = Containers/200 containers per train/321 operating days per year.

Victorville

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	-	-	-	-	-
2035	650,000	0	0%	0	0

High Growth w/o ICTF & SCIG	Lifts
Total Lifts Accomodated	11,114,000
Intn'l Lifts	9,232,432
Transload Lifts	1,708,000
Domestic Lifts (MCGM)	2,430,000
Lift Shortfall	(2,256,432)

Scenario 1 (cont'd)

Alameda Corridor

Railroad	From Yard	Trains
BNSF	On-Dock	36
BNSF	SCIG	-
UP	On-Dock	36
UP	ICTF	8
BNSF & UP	Unit Auto*	4
BNSF & UP	Carload*	6
BNSF & UP	Unit Coal*	10
BNSF & UP	Unit White Bulk*	2
BNSF & UP	Unit Oil*	6
Total Trains		**108**
Number of mainline tracks		**3**

*Inland Empire Railroad Main Line Study, June 2005 / 2025 trains grown to 2035, 1% / year

BNSF

Railroad	From Yard	Norwalk	Prado Dam	High Grove	Colton Crossing
BNSF	On-Dock	36	36	36	36
BNSF	SCIG	-	-	-	-
BNSF	Hobart	22	22	22	22
UP	On-Dock (EB)			18	18
UP	ICTF (EB)			4	4
UP	LATC (EB)			2	2
UP	ELA (EB)			5	5
UP	Cofl (EB)			3	3
UP	Mira Loma			6	6
BNSF	Unit Auto*	6	9	9	9
BNSF	Carload*	7	12	12	12
BNSF	Unit Coal*	2	2	2	2
BNSF	Unit White Bulk*		3	3	3
Metrolink**	N/A	28	26	8	8
Amtrak Long Distance**	N/A	2	2	2	2
Surfliner**	N/A	22	0	0	0
Total Trains		**125**	**112**	**132**	**132**
Number of mainline tracks		**3**	**3**	**3**	**3**

*Inland Empire Railroad Main Line Study, June 2005 / 2025 trains grown to 2035, 1% / year

Scenario 1 (cont'd)

UP

Railroad	From Yard	Segment 1	Segment 2	Segment 3	Segment 4
UP	On-Dock (EB)	18	18		
UP	On-Dock (WB)	18			18
UP	ICTF (EB)	4	4		
UP	ICTF (WB)	4			4
UP	ELA (EB)	5	5		
UP	ELA (WB)	5			5
UP	LATC (EB)		2	2	
UP	LATC (WB)			2	2
UP	Cofl (EB)		3	3	
UP	Cofl (WB)			3	3
UP	West Colton*				23
UP	Mira Loma*		6		
UP	Unit Auto*	3			3
UP	Carload*	11		12	23
UP	Unit Coal*	8			8
UP	Unit White Bulk*	1			1
Metrolink*	N/A	12	12		
Amtrak Long Distance*	N/A			1	1
Total Trains		**89**	**50**	**22**	**91**
Number of mainline tracks		**2**	**2 (partial)**	**1**	**2**

*Inland Empire Railroad Main Line Study, June 2005 / 2025 trains grown to 2035, 1% / year

Scenario 2: High Cargo Demand Forecast, High On-Dock Rail Capacity, Both ICTF and SCIG Constructed/Expanded

PORT TEUs	**42,700,000**	PORT Lifts	**23,081,081**
40% TEUs	17,080,000	40% Lifts	9,232,432

Detailed Breakdown By Yard:

ON DOCK

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent International	International Trains/Day	Domestic Trains/Day
2006	-	2,116,429	100%	22	0
2035	6,924,000	6,924,000	100%	72	0

Note: Based on 42.7M TEUs, 1.85 containers per TEU.
International Trains per Day = Containers/300 containers per train/321 operating days per year.
It is assumed that on-dock containers will be shared by BNSF and UP 50/50.

ICTF

Year	Yard Capacity (Lifts)	Container Volume (Lifts)*	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	760,000	726,622	100%	8	0
2035	1,500,000	1,155,000	100%	12	0

Note: Based on 42.7M TEUs, 1.85 containers per TEU.
International Trains per Day = Containers/300 containers per train/321 operating days per year.
* Container Volume (Lifts) was determined to be 5% of Port TEU throughput

SCIG

Year	Yard Capacity (Lifts)	Container Volume (Lifts)*	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	-	-	-		-
2035	1,500,000	1,155,000	100%	12	0

Note: Based on 42.7M TEUs, 1.85 containers per TEU.
International Trains per Day = Containers/300 containers per train/321 operating days per year.
* Container Volume (Lifts) was determined to be 5% of Port TEU throughput

Hobart

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	1,700,000	1,366,535	59%	9	9
2035	1,700,000	1,700,000	0%	0	27

Note: 1.85 containers per TEU.
International Trains per Day = Containers/300 containers per train/321 operating days per year.
Domestic Trains per Day = Containers/200 containers per train/321 operating days per year.

EAST LA

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	510,000	340,000	24%	1	5
2035	510,000	510,000	0%	0	8

Note: 1.85 containers per TEU.
International Trains per Day = Containers/300 containers per train/321 operating days per year.
Domestic Trains per Day = Containers/200 containers per train/321 operating days per year.

Scenario 2 (cont'd)

LATC

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	340,000	202,384	16%	1	3
2035	340,000	340,000	0%	0	6

Note: 1.85 containers per TEU.
International Trains per Day = Containers/300 containers per train/321 operating days per year.
Domestic Trains per Day = Containers/200 containers per train/321 operating days per year.

Cofl

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	220,000	191,892	1%	1	3
2035	220,000	220,000	0%	0	4

Note: 1.85 containers per TEU.
International Trains per Day = Containers/300 containers per train/321 operating days per year.
Domestic Trains per Day = Containers/200 containers per train/321 operating days per year.

San Bernardino

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	660,000	569,047	0%	0	9
2035	660,000	660,000	0%	0	11

Note: 1.85 containers per TEU.
Domestic Trains per Day = Containers/200 containers per train/321 operating days per year.

Victorville

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	-	-	-	-	-
2035	650,000		0%	0	0

High Growth w/ICTF & SCIG	Lifts
Total Lifts Accomodated	12,664,000
Intn'l Lifts	9,232,432
Transload Lifts	1,708,000
Domestic Lifts (MCGM)	2,430,000
Lift Shortfall	(706,432)

Scenario 2 (cont'd)

Alameda Corridor

Railroad	From Yard	Trains
BNSF	On-Dock	36
BNSF	SCIG	12
UP	On-Dock	36
UP	ICTF	12
BNSF & UP	Unit Auto*	4
BNSF & UP	Carload*	6
BNSF & UP	Unit Coal*	10
BNSF & UP	Unit White Bulk*	2
BNSF & UP	Unit Oil*	6
Total Trains		**124**
Number of mainline tracks		**3**

*Inland Empire Railroad Main Line Study, June 2005 / 2025 trains grown to 2035, 1% / year

BNSF

Railroad	From Yard	Norwalk	Prado Dam	High Grove	Colton Crossing
BNSF	On-Dock	36	36	36	36
BNSF	SCIG	12	12	12	12
BNSF	Hobart	27	27	27	27
UP	On-Dock (EB)			18	18
UP	ICTF (EB)			6	6
UP	LATC (EB)			2	2
UP	ELA (EB)			4	4
UP	CofI (EB)			2	2
UP	Mira Loma			6	6
BNSF	Unit Auto*	6	9	9	9
BNSF	Carload*	7	12	12	12
BNSF	Unit Coal*	2	2	2	2
BNSF	Unit White Bulk*		3	3	3
Metrolink**	N/A	28	26	8	8
Amtrak Long Distance**	N/A	2	2	2	2
Surfliner**	N/A	22	0	0	0
Total Trains		**142**	**129**	**149**	**149**
Number of mainline tracks		**3**	**3**	**3**	**3**

*Inland Empire Railroad Main Line Study, June 2005 / 2025 trains grown to 2035, 1% / year

Scenario 2 (cont'd)

UP

Railroad	From Yard	Segment 1	Segment 2	Segment 3	Segment 4
UP	On-Dock (EB)	18	18		
UP	On-Dock (WB)	18			18
UP	ICTF (EB)	6	6		
UP	ICTF (WB)	6			6
UP	ELA (EB)	4	4		
UP	ELA (WB)	4			4
UP	LATC (EB)		2	2	
UP	LATC (WB)			2	2
UP	CofI (EB)		2	2	
UP	CofI (WB)			2	2
UP	West Colton*				23
UP	Mira Loma*		6		
UP	Unit Auto*	3			3
UP	Carload*	11		12	23
UP	Unit Coal*	8			8
UP	Unit White Bulk*	1			1
Metrolink*	N/A	12	12		
Amtrak Long Distance*	N/A			1	1
Total Trains		**91**	**50**	**21**	**91**
Number of mainline tracks		**2**	**2 (partial)**	**1**	**2**

*Inland Empire Railroad Main Line Study, June 2005 / 2025 trains grown to 2035, 1% / year

Scenario 3: Low Cargo Demand Forecast, Low On-Dock Rail Capacity, No New Near-Dock Rail Facilities

PORT TEUs	**28,500,000**	PORT Lifts	**15,405,405**
40% TEUs	11,400,000	40% Lifts	6,162,162

Detailed Breakdown By Yard:

ON DOCK

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent International	International Trains/Day	Domestic Trains/Day
2006	-	2,116,429	100%	28	0
2035	3,027,027	3,027,027	100%	40	0

Note: Based on 42.7M TEUs, 1.85 containers per TEU.
International Trains per Day = Containers/240 containers per train/321 operating days per year.
It is assumed that on-dock containers will be shared by BNSF and UP 50/50.

ICTF

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	760,000	726,622	100%	10	0
2035	760,000	760,000	100%	10	0

Note: Based on 42.7M TEUs, 1.85 containers per TEU.
International Trains per Day = Containers/240 containers per train/321 operating days per year.

SCIG

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006					
2035					

Hobart

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	1,700,000	1,366,535	59%	11	9
2035	1,700,000	1,700,000	59%	14	11

Note: 1.85 containers per TEU.
International Trains per Day = Containers/240 containers per train/321 operating days per year.
Domestic Trains per Day = Containers/200 containers per train/321 operating days per year.

EAST LA

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	510,000	340,000	24%	2	5
2035	510,000	510,000	24%	2	7

Note: 1.85 containers per TEU.
International Trains per Day = Containers/240 containers per train/321 operating days per year.
Domestic Trains per Day = Containers/200 containers per train/321 operating days per year.

Scenario 3 (cont'd)

LATC

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	340,000	202,384	16%	1	3
2035	340,000	340,000	16%	1	5

Note: 1.85 containers per TEU.
International Trains per Day = Containers/240 containers per train/321 operating days per year.
Domestic Trains per Day = Containers/200 containers per train/321 operating days per year.

Cofl

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	220,000	191,892	1%	1	3
2035	220,000	220,000	1%	1	4

Note: 1.85 containers per TEU.
International Trains per Day = Containers/240 containers per train/321 operating days per year.
Domestic Trains per Day = Containers/200 containers per train/321 operating days per year.

San Bernardino

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	660,000	569,047	0%	0	9
2035	660,000	660,000	0%	0	11

Note: 1.85 containers per TEU.
Domestic Trains per Day = Containers/200 containers per train/321 operating days per year.

Victorville

Year	Yard Capacity (Lifts)	Container Volume (Lifts)	Percent of Yard Intn'l Traffic	International Trains/Day	Domestic Trains/Day
2006	-	-	-	-	-
2035	650,000		0%	0	0

Low Growth w/o ICTF & SCIG	Lifts
Total Lifts Accomodated	7,217,027
Intn'l Lifts	6,162,162
Transload Lifts	1,140,000
Domestic Lifts (MCGM)	2,430,000
Lift Shortfall	(2,515,135)

Scenario 3 (cont'd)

Alameda Corridor

Railroad	From Yard	Trains
BNSF	On-Dock	20
BNSF	SCIG	0
UP	On-Dock	20
UP	ICTF	10
BNSF & UP	Unit Auto*	4
BNSF & UP	Carload*	6
BNSF & UP	Unit Coal*	10
BNSF & UP	Unit White Bulk*	2
BNSF & UP	Unit Oil*	6
Total Trains		**78**
Number of mainline tracks		**3**

*Inland Empire Railroad Main Line Study, June 2005 / 2025 trains grown to 2035, 1% / year

BNSF

Railroad	From Yard	Norwalk	Prado Dam	High Grove	Colton Crossing
BNSF	On-Dock	20	20	20	20
BNSF	SCIG	0	0	0	0
BNSF	Hobart	25	25	25	25
UP	On-Dock (EB)			10	10
UP	ICTF (EB)			5	5
UP	LATC (EB)			2	2
UP	ELA (EB)			5	5
UP	Cofl (EB)			3	3
UP	Mira Loma*			6	6
BNSF	Unit Auto*	6	9	9	9
BNSF	Carload*	7	12	12	12
BNSF	Unit Coal*	2	2	2	2
BNSF	Unit White Bulk*		3	3	3
Metrolink**	N/A	28	26	8	8
Amtrak Long Distance**	N/A	2	2	2	2
Surfliner**	N/A	22	0	0	0
Total Trains		**112**	**99**	**112**	**112**
Number of mainline tracks		**3**	**3**	**3**	**3**

*Inland Empire Railroad Main Line Study, June 2005 / 2025 trains grown to 2035, 1% / year

Scenario 3 (cont'd)

UP

Railroad	From Yard	Segment 1	Segment 2	Segment 3	Segment 4
UP	On-Dock (EB)	10	10		
UP	On-Dock (WB)	10			10
UP	ICTF (EB)	5	5		
UP	ICTF (WB)	5			5
UP	ELA (EB)	5	5		
UP	ELA (WB)	5			5
UP	LATC (EB)		2	2	
UP	LATC (WB)			2	2
UP	Cofl (EB)		3	3	
UP	Cofl (WB)			3	3
UP	West Colton*				23
UP	Mira Loma*		6		
UP	Unit Auto*	3			3
UP	Carload*	11		12	23
UP	Unit Coal*	8			8
UP	Unit White Bulk*	1			1
Metrolink*	N/A	12	12		
Amtrak Long Distance*	N/A			1	1
Total Trains		**75**	**43**	**22**	**84**
Number of mainline tracks		**2**	**2 (partial)**	**1**	**2**

*Inland Empire Railroad Main Line Study, June 2005 / 2025 trains grown to 2035, 1% / year

APPENDIX B: SAN PEDRO BAY PORTS RAILROAD CAPACITY AND PERFORMANCE ANALYSIS

Prepared for Port of Long Beach and Port of Los Angeles
May 2006

Comments of BNSF Railway

1) The study indicates that many capital investment projects are going to be required over the next 25 years in the Port Complex (as defined in the Alameda Corridor Use and Operating Agreement) if on-dock rail facilities are to be utilized effectively. BNSF agrees with that finding.

2) The study makes numerous operational assumptions which will be required for the study's conclusions to be made reality. Those assumptions are:

- The Badger Avenue lift bridge across the Cerritos Channel must be locked in the down position at all times except for emergencies
- ILWU work rules cannot deny 24/7 railroad access to all on-dock rail facilities
- BNSF will not make light engine moves across the Cerritos Channel Badger Avenue Bridge
- UP will operate a "few" light engines to/from Dolores
- Trains will be immediately assembled and operated out of the on-dock facilities when released to the railroad
- All trains will pull straight into the on-dock working tracks or storage tracks on arrival.
- Trains will not shove into storage tracks or on-dock working tracks
- PHL will yard inbound and assemble outbound trains, thus relieving the line haul carrier of those duties
- The line haul carriers will provide crews, locomotives, and rail cars immediately on demand to replicate a "passenger train like" operation

In general, BNSF thinks the assumptions are extremely aggressive, and not replicated anywhere in the United States. However, if the assumptions were to become part of the Port Complex rail operation, BNSF believes the conclusions are possibly correct. BNSF has not

studied this operation independent of this report so is unable to say with certainty that the conclusions are correct.

3) In this section BNSF will comment on assumptions and rate them as most to least onerous to its operation:

Assumption (b) is the most onerous operating restriction imposed on the railroads in the Port Complex

Assumption (i) would layer the railroads with new and redundant costs relative to normal operations. BNSF would be forced to hire a much large on-train work force in the LA Area, and purchase more locomotives and rail cars. There are ebbs and flows in port demand for rail assets, and having an "always available" supply of everything required for a seamless train operation would be very expensive.

Assumption (a) is required and BNSF believes this can be accomplished. One could make an argument that absent a bridge lock down position is as important an assumption as is (b).

Assumption (h) requires that PHL yard and assembles all trains at the on-dock rail facilities. This too, would add expense to the operation. See also, comments below concerning PHL.

The other assumptions are iterative of an operation that may be possible if all of the planned capital projects are constructed and more supporting storage tracks and locomotive servicing facilities are constructed. It should be noted that repositioning locomotives and cars is an important part of rail operations.

A general observation is that the Port Complex does not now have enough storage tracks, nor are future storage track construction plans adequate for the placement of a seamless rail operation in the Port Complex. During the period of time when operations are slack, the rail equipment must have a place for storage if repositioning is unacceptable for an effective operation.

4) BNSF will not agree to any of the report's assumptive operational restrictions. In its sole discretion, BNSF reserves the right to operate in the Port Complex as provided in existing agreements with the Ports, PHL, and including the Alameda Corridor Use and Operating Agreement.

5) BNSF wants the references to PHL as the assembler and yarder of trains at the on-dock rail facilities stricken from the report. We suggest that the wording be, "The yarding or assembly of trains may be required of a non-line haul crew for purposes of operating between the ports and crew change locations to avoid hours of service tie ups".

Recommendations

1) During the question and answer period, consultant Willard Keeney noted that moving SCIG to Terminal Island is a “non-starter” and such a relocation would crater the rail operation. He made this comment in the context of the observation that the model indicated the Terminal Island operation in 2035 would be strained, but operational. He noted that such a re-location has not been modeled. BNSF requests that the effect of placing additional train traffic to handle a net (of the Pier W Project, which was included in the study) additional one million containers per year should be modeled.

2) Examine the potential positive effects on the Long Beach Subdivision if SCIG is not constructed. The purpose of this exercise is to examine the extent to which the SCIG operation degrades the operation of this segment of the Port Complex. In the model, it would be assumed that SCIG is relocated to Terminal Island, so that the impact on the Texaco Slot is kept intact.

3) BNSF requests that the draft document be finalized with the notation that modeling as requested in (1) and (2) above will be subsequently added to the report in supplemental form.

4) Board action on the capital investment occur quickly, so that the program of improvements can begin immediately.