

Port/Rail Interface in an Urban Setting

The Influence of At-Grade Crossings in the Los Angeles Basin and the Case for Grade Separations to Ease Vehicular and Railroad-Related Congestion

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Abstract

The dramatic increase in freight activity in recent years has resulted in rail lines and port facilities operating at or near capacity. To accommodate such growth, trains have become longer and heavier than ever before with the longest averaging 7,500 feet in length. As these trains transit to and from port facilities, they often travel through densely populated urban areas. Congestion on rail lines at or near ports can result in train delays, consequently blocking at-grade highway/rail crossings. Such delays can negatively impact air quality, create traffic congestion, and frustrate motorists.

This study will catalogue locations in several West Coast urban settings where trains in excess of 7,500 feet could be held without delaying vehicular traffic. This will be accomplished by reviewing recent aerial photographs and comparing those photographs to track charts furnished by either BNSF Railway or Union Pacific Railroad. Each state's transportation program will also be reviewed to ascertain which at-grade crossings will be eliminated in the near future. Once catalogued, this guide could be used to identify key locations where one or two strategically constructed grade separations could increase mainline capacity, resulting in more efficient freight operations and better interface with local communities.

Introduction

The burgeoning demand for consumer goods is placing an unprecedented strain on our nation's transportation infrastructure. U.S. ports, particularly those on the West Coast, are grappling with how to handle the surge of imports and exports.



Figure 1: A typical ocean-going container vessel.

This so called “Goods Movement” is essential to our national economy, but it is not without consequence. With freight volumes expected to double by 2015 and triple by the year 2020

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(Washington Public Ports Association Rail Status Report, 2004), both private industry and the public sector are searching for ways to accommodate the freight boom while mitigating the negative environmental and economic effects of such growth on our communities.

Although an escalation in freight transportation subsequently affects the entire nation, it is the communities located near port facilities that suffer the greatest burden. A disproportionate number of cargo ships, trucks and locomotives releasing toxic emissions are concentrated near ports, resulting in a decrease in air quality for local residents. Furthermore, as port facilities near capacity, more and more trucks are needed to transport goods to nearby rail yards, container forwarding stations (CFS), and distribution centers, contributing to severe congestion on area roadways. While this study will not analyze the economic consequences of such growth including increased health care costs, costs to repair roadways, and the time value of congestion, these issues are relevant and should be considered in a comprehensive study.

Viable rail corridors and connections are viewed as one solution to managing the proliferation of rail freight. As proponents are quick to point out, rail is three to four times more efficient than trucks and produces significantly fewer emissions per ton-mile. Additionally, moving more freight by rail could result in fewer trucks and less congestion on our nation's roadways. According to the Association of American Railroads (AAR), one intermodal train can take 240 to 280 trucks off of roadways. The addition of on-dock and near-dock rail facilities would eliminate much truck traffic in and around ports, improving the ship/rail connection and resulting in increased mobility for local residents.

This study will catalogue locations within the Los Angeles Basin where trains up to 7,500 feet could be temporarily held without interfering with vehicular traffic until congestion on a rail line or port is alleviated. Identifying locations to hold trains will not only result in better interface with local communities, but will also increase velocity for all modes of transportation.

Background

The history of separating the intersection of a highway and a set of railroad tracks dates to the early 1900's. Time and again, steam locomotives would frighten horse-drawn carriages. When the use of the automobile became prevalent in the 1920's, the shower of sparks from the passing train would create considerable annoyance to motorists waiting at a crossing. Consequently, major urban areas launched campaigns to eliminate at-grade crossings within city limits. This trend was more common in urban areas east of the Mississippi River where population densities warranted grade separations. Figure 2 displays the urban core of several cities east of the Mississippi River that had the initiative to eliminate many at-grade highway/rail crossings within

their communities. Figures 3, 4 and 5 are examples of these initiative.

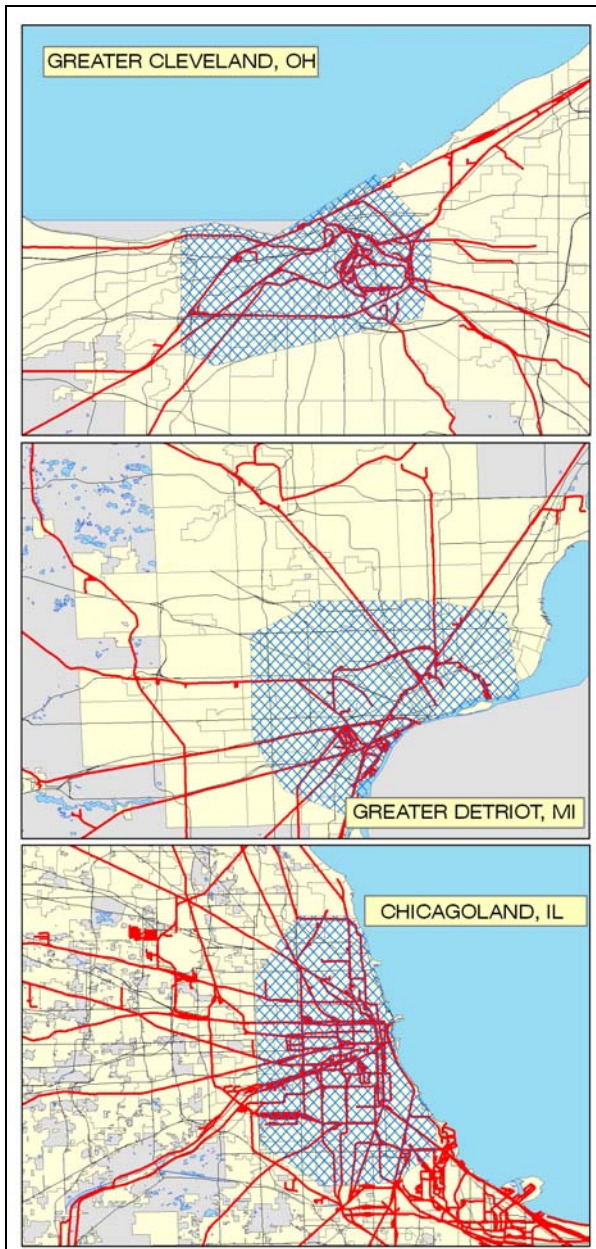


Figure 2: Rail networks of the Chicago, Detroit, and Cleveland urban cores. Hachured pattern corresponds to area in which nearly all major at-grade highway/rail crossings have been eliminated.

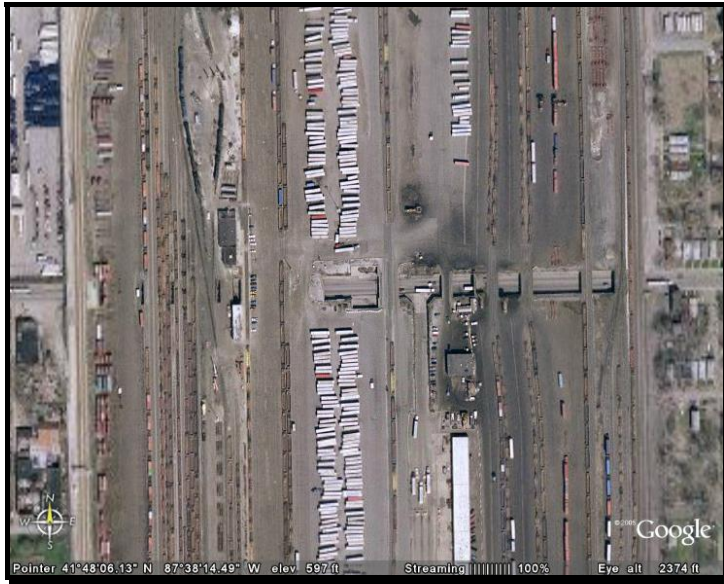


Figure 3: West 51st Street crossing under NS mainline and Intermodal Yard in South Chicago.

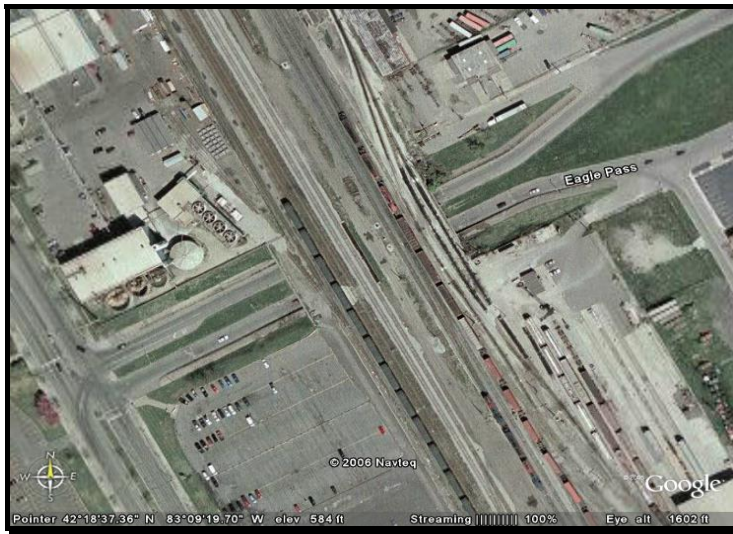


Figure 4: Grade separation under CSX and CN mainlines in Detroit.

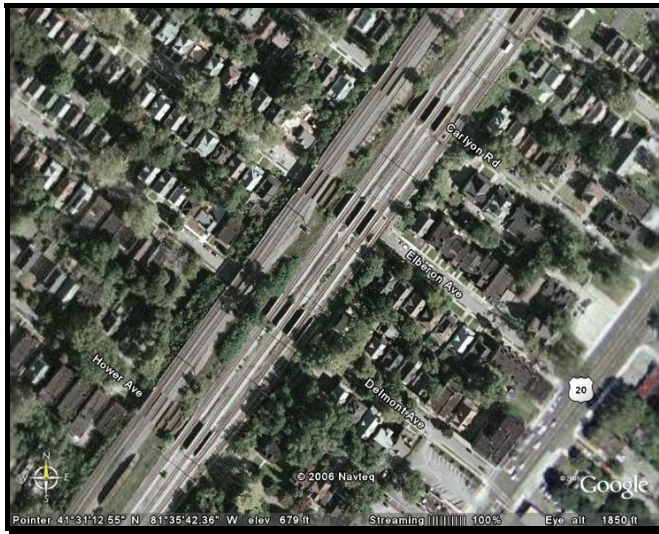


Figure 5: CSX and NS mainlines passing through East Cleveland.

Changing Patterns

As urban areas continued to grow and the migration to the suburbs began in earnest following World War II, there was a pronounced shift away from the use of passenger trains and streetcars to personal automobiles. With the start-up of construction of the interstate highway system, many believed the era of railroading was drawing to a close.

Initially, low population densities in the suburbs, coupled with a less-than-certain future for the railroad industry combined to create the tendency to construct at-grade highway/rail crossings as opposed to installing a grade separation. However, two important pieces of legislation prompted a resurgence of rail. The first was the passage of the Staggers Act in 1982 (Figure 6) which deregulated the rail industry and rekindled competition between rail carriers, weeding out many less profitable rail lines and carriers and leading to mergers among those that remained. The

result has been that the surviving carriers transport more goods in terms of ton-miles than ever before (Railroad Facts, AAR, 2005).

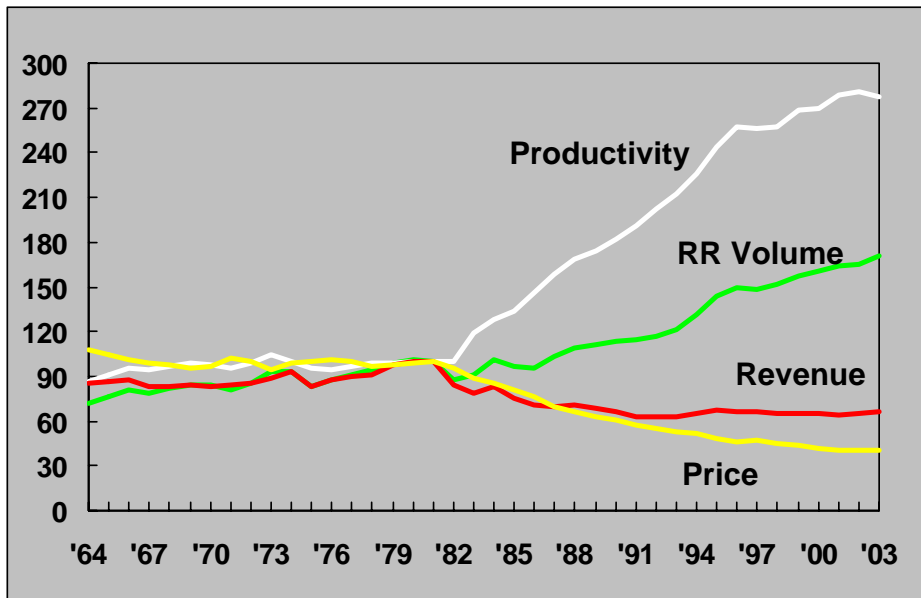


Figure 6: Reaction of the Rail Industry following the passage of the Staggers Act.

The enactment of the North American Free Trade Agreement, or NAFTA, in the 1990's also benefited rail carriers. The NAFTA legislation recognized a growing trend established by U.S. automakers in the early 1970's to outsource work to Canadian and to "Maquiladora" industries in Northern Mexico. The rail industry provided *the* key element in the logistics chain necessary to make outsourcing attractive – efficient, just-in-time delivery schedules at a reasonable cost. This enabled businesses to import goods for one-seventh of the previous cost. It was not long before the business community recognized that these same goods could be obtained from Asian producers for one-thirtieth of the cost of producing the same product in the U.S.

Indications that a shift from Mexican to Asian production and imports was underway became apparent in mid-2003 as western rail carriers BNSF Railway and Union Pacific Railroad began preparing for the upcoming surge in holiday traffic. The transition from NAFTA to Asian traffic resulted in double-digit growth in intermodal traffic ranging from 16 percent to 31 percent, far exceeding the forecasted growth rate of 4 percent (Figure 7). These overwhelming volumes sorely taxed each carrier's ability to furnish the necessary locomotives, yard space, train crews and other pertinent elements essential to running a railroad. This growth has severely impacted the capacity of the three mainlines that serve the Ports of Los Angeles and Long Beach from that time since. Intermodal traffic continued to increase in 2004 and 2005 with industry wide growth of 10 percent and 6.4 percent respectively. Union Pacific's 2005 intermodal growth exceeded industry figures with an average increase of 12 percent.



Figure 7: Illustration of the movement of goods across the Pacific Ocean to American destinations.

Los Angeles and Railroads

The Los Angeles Basin was not nearly as significant in respect to trade before World War II. Prior to the 1940's, the population of Los Angeles was low and the port system was only equipped to handle local and perhaps regional needs. However, many returning servicemen from the war "discovered" Los Angeles and the aircraft industry soon resurged following a post-war dip. These changes led to a population explosion in the LA Basin. Soon, ships began calling on the Ports of Los Angeles and Long Beach to handle local imports.

Beginning in the mid 1970's, "bridge" traffic began in earnest. Bridge traffic refers to goods produced in Asia which are brought to the West Coast by ship, transported across the United States by rail, and placed onto ships on the East Coast bound for Europe. Steamship companies soon realized that they could double their efficiency by calling on the Ports of Long Beach and Los Angeles to off-load bridge traffic in addition to the local and regional imports.

The Staggers Act allowed railroads to "de-market" rail corridors that were not profitable. This resulted in several rail lines within the LA Basin being declared surplus. The resurgence of passenger rail capitalized on reusing these under-utilized lines. For example, both Union Pacific and Santa Fe (a precursor railroad to BNSF) negotiated with Metrolink to begin commuter service within the Basin. In the mid 1990's, both BNSF and UPRR completed major railroad mergers that considerably strengthened their respective markets in the LA Basin. Burlington Northern Railroad merged with the Atchison Topeka & Santa Fe Railway and Union Pacific merged with Southern Pacific. These mergers optimized transcontinental rail routes that had been hitherto somewhat inefficient due to geography, past railroad interface issues, and the fact that the industry had been regulated.

Ancillary Developments

The concept of intermodal transportation, where commodities are shipped via standardized containers and multiple modes of transportation was, initially developed by Sealand in the late



Figure 8: Trucks entering an automated electronic tracking gate at a port facility.

1950's and resulted in a proliferation of global trade. There are many factors responsible for this growth, but shipping goods in a relatively theft-proof, easily traceable, standardized container has given shippers around the world the confidence to expand international trade.

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Another development that has impacted freight operations is the use of distributive power units, or DPU's. This technology allows railroads to intersperse locomotives throughout a train in order to minimize the strain on the drawbars that connect each rail car to the car ahead of it. This development has allowed longer trains to be handled more efficiently, but has significantly added to the overall length of a train. For example, the majority of trains that depart the Los Angeles Basin travel east over Beaumont Pass adjacent to Interstate 10 (which has a 2 percent gradient), or over Cajon Pass adjacent to Interstate 15 (with gradients ranging from 2 percent to 3 percent). These are considered severe grades for a railroad, requiring two to three

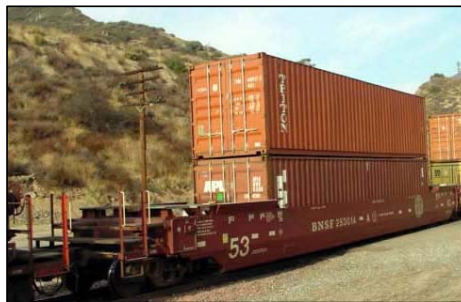


Figure 9: 53-foot freight containers double-stacked on a rail car.

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horsepower per each trailing ton. Assuming the average train carries 240 containers, and each container weighs 25 tons, then the trailing tonnage of a train would be 6,000 tons plus the weight of each railcar (generally 12 tons each) for a total trailing tonnage of 7,440 tons. If each

locomotive can produce 4,000 horsepower, then at least five, and oftentimes six, locomotives would be required to pull a train over either Beaumont or Cajon Passes. Five locomotives add 375 to 400 feet to a train's overall length.

Limits of Study

This analysis will focus on the three mainlines that run generally east to west across the Los Angeles Basin. Figure 10 below depicts these three lines. They include, from north to south:

- (1) The Alhambra Subdivision owned and operated by Union Pacific;
- (2) The Los Angeles Subdivision also owned and operated by Union Pacific. Metrolink, a commuter rail agency, operates commuter service over this corridor;
- (3) The San Bernardino Subdivision owned and operated by BNSF. Metrolink and Amtrak operate through this corridor.

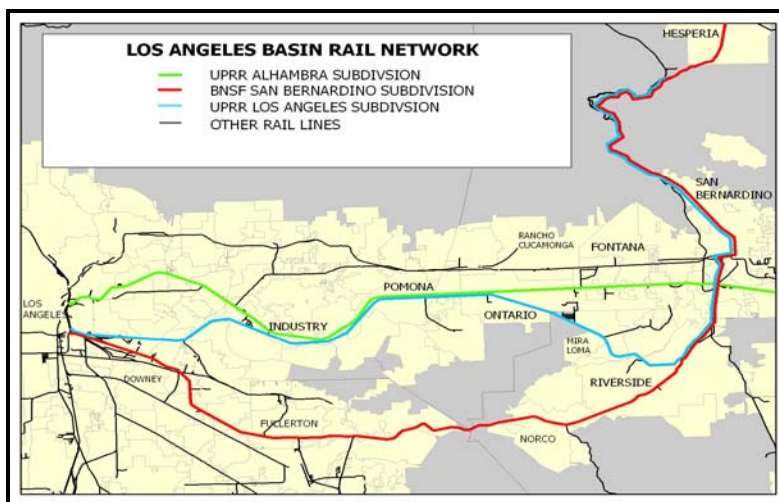


Figure 10: Map of a portion of the Los Angeles Basin rail network.

The study will analyze locations along each of these three mainlines where a train 7,500 feet in length could be held without blocking at-grade highway/rail crossings or interfering with rail yard operations. The track charts compiled in Appendix A will serve as the basis for this

analysis. Track charts amount to “road atlases” for each railroad, displaying the pertinent information of each segment of trackage including the number of mainlines, type of signalization, road crossing locations, location of switches and turnouts, degree of curvature and of gradient, and so forth. Only sections where the railroad has two or more tracks will be considered as potential holding or staging locations. For obvious reasons, one track must be kept in operation while the train being held occupies the other mainline or siding. Once compiled, this information will be reviewed with the operating practices now employed on each railroad. Finally, the data will be compared with aerial photographs obtained from GoogleEarth™.

Analysis

Alhambra Sub (UPRR)

For purposes of this analysis, the Alhambra Subdivision begins on the west end at Los Angeles Union Passenger Terminal (LAUPT) and extends eastward to Redlands. This route is the former Southern Pacific Transportation Company east-west mainline. Union Pacific Railroad acquired this mainline in 1996 and operates approximately 20-25 trains per day. In the late 1970’s, the Alhambra Subdivision between Aurant and San Gabriel was placed in a trench similar to the recently completed Alameda Corridor. Alameda Corridor East (ACE) has received a Congressional earmark to begin preliminary engineering on an extension of the trench from Alhambra Creek to Rosemead Boulevard. Once constructed, the trench extension would eliminate five at-grade crossings.

The following analysis indicates where Union Pacific trains 7,500 feet in length could be held between LAUPT and Redlands along the Alhambra Sub. The data for this analysis can be found in Appendix A. The green highlight indicates segments of track that are long enough to hold one

or more trains. The blue highlight indicates crossings that are recommended in this report as candidates for grade separation.

- Currently, Union Pacific could hold a 7,500 foot train anywhere between Valley. and Ramona boulevards., a distance of 4.5 miles. Once the ACE extension is completed, the segment of track without an at-grade road crossing would extend to Encinita Boulevard for a total distance of seven miles.
- Between California Avenue and Fullerton Road, a distance of 4.2 miles without an at-grade road crossing, Union Pacific holds many trains while waiting to enter or depart its facility in the City of Industry.
- The siding at Walnut, nearly 7,000 feet in length, is of limited benefit to the railroad due to the fact that there is an at-grade crossing at Lemon Road near the west end of the siding. Consequently, Union Pacific must hold back of the crossing or only use the siding for trains less than 5,000 in length, the distance between the east switch and Lemon Road.
- The alignment at Spadra Farms just west of Pomona has been shifted to connect with UPRR's Los Angeles Sub, a corridor consolidation sponsored by ACE. Consequently, a segment of track between Benton Feed Yard and Hamilton Boulevard in Pomona is without any crossings, a distance of nearly five miles.

- Between Monte Vista and San Antonio avenues, a distance of 2.1 miles, UPRR could hold a 7,500 foot train. Due to the spread between the Alhambra Sub and the nearby Los Angeles Sub, it is recommended that San Antonio Avenue near North Montclair be considered for grade separation.
- Near the Ontario Airport, crossings have been eliminated for a distance of three miles between Vineyard and Milliken avenues.
- The Colton Yard area, a major UPRR classification facility, has no at-grade crossings.
- At Loma Linda, there is a 3.5 mile segment of track without a road crossing (Hunts Lane to Whittier Avenue). UPRR currently stages trains at this location as they enter and depart Colton Yard.

Findings

Given the above analysis, the following recommendations are made:

- Valley Boulevard should be grade separated given the skew angled crossing and the proximity of this crossing to the south end Aurant Yard.
- There has been discussion about extending the ACE San Gabriel Trench concept to the east. If this project is extended, then crossings between Encinita east to include Arden would be eliminated, a total of five additional crossings.

- Crossings at Tyler and Cypress should be considered for elimination.
- At Walnut, elimination of the Lemon Road crossing would allow UPRR to hold a 7,500 foot train between Fairway and Brea Canyon roads, a distance of 2.3 miles (12,000 feet). However, to truly be effective, it is recommended that all crossings between Fullerton Road and Benton Feed Yard be considered for elimination. This segment should be free of road crossings due to the proximity of the entrance of the City of Industry yard complex where trains are oftentimes held before entering the yard.
- East of Pomona, the elimination of the Monte Vista crossing would allow the controlled siding at North Montclair to be used more efficiently. Eliminating this crossing would allow the railroad to meet and pass trains at this location without the public incurring extensive crossing blockages. Also, the crossings at San Antonio and Vine, as well as the corresponding crossings on the nearby UPRR Los Angeles Sub are recommended for closure.
- At Ontario, if the crossing Vineyard and Milliken avenues were eliminated, trains could be held from Bon View Avenue to Colton, a total extension of 4.5 miles. The total segment without crossings would then be over 20 miles to a location beyond Colton (Hunts Lane).

- If the Hunts Lane crossing were grade separated, then the total segment of track without a crossing would be extended to 23.5 miles (assuming Milliken and Vineyard are also closed).

Los Angeles Sub (UPRR)

The Los Angeles Sub is the second of two primary routes Union Pacific uses to move 60-80 trains per day east of Los Angeles. In addition, Metrolink operates 20 trains Monday through Friday. This segment begins near LAUPT, and for the purposes of this analysis, extends to just east of San Bernardino.

The following analysis indicates where Union Pacific trains 7,500 feet in length could be held between LAUPT and San Bernardino along the LA Sub. Union Pacific operates on BNSF trackage rights between West Riverside and San Bernardino. The data for this analysis can be found in Appendix A. The green highlight indicates segments of track that are long enough to hold one or more trains. The blue highlight indicates crossings that are recommended in this report as candidates for grade separation.

- Union Pacific can hold trains 7,500 feet or longer between Redondo Junction and South Vail Avenue, a distance of nearly six miles. This segment borders the East Los Angeles classification yard where trains are assembled and broken apart for local distribution.
- Four at-grade crossings (South Vail, South Maple, South Greenwood, and Montebello) interrupt UPRR's ability to hold a train. East of Montebello, there is a 1.9 mile (approximately 10,000 feet) segment where a 7,500 foot or longer train could be held. At

Pico Rivera, the track reduces to one mainline over the San Gabriel River, and consequently, no trains are held in this vicinity.

- Between Mission Mill and Workman Mill roads, a 7,900 foot segment allows for a 7,500 foot train to be held. The practice of holding a train at this location has been verified by personnel who work near these crossings. Just east of Workman Mill Road and extending east to Turnbull Canyon Road, another long segment (3.2 miles or 17,000 feet) allows UPRR to temporarily park a train on this double track segment.
- East of Bixby Road, a 2.3 mile (12,000 feet) segment extending to Fullerton Road allows UPRR to hold 7,500 foot trains.
- A three mile segment between Diamond Bar and Spadra is long enough to hold 7,500 foot trains, but there is only a single main track through this stretch negating the possibility of holding a train. However, the Temple Street Diversion has created an opportunity to hold trains between Spadra and Pomona (Hamilton Boulevard.), a distance of 2.4 miles or 12,700 feet.
- The segment between Monte Vista and San Antonio, a distance of 2.1 miles matches the segment described in the Alhambra Sub analysis. The LA Sub and Alhambra Sub combine to create a section of double track through this segment.
- A 1.5 mile (7,900') segment exists between Bon View Avenue and Vineyard.

- A section 2.2 miles in length, long enough to hold a 7,500 foot train currently exists between Archibald and Milliken.
- Between Milliken and Bellgrove, a 3.5 mile segment is long enough to hold at least two 7,500 foot trains.
- A 1.6mile segment between Jarupa Road near Pedley and the end of double track at Limonite is sufficient to hold trains up to 8,400 in length.
- There is a 2.2 mile segment without a crossing between Clay Street and Jarupa Street. However, this segment is only a single main track and therefore trains are not likely to be held.

Findings

Below are the findings of the Los Angeles Subdivision analysis:

- In Pico Rivera, elimination of the Dupres Street crossing would allow UPRR trains to utilize the full extent of the double track.
- Rose Hills, Mission Mill, and Workman Mill roads should all be a candidates for grade separation. If these crossings were eliminated, UPRR would have a 4.7 mile (24,800 feet) segment of track on which trains could be held.

- Turnbull Canyon and Bixby roads should also be considered for closure.
- It is recommended that all crossings between Fullerton and Brea Canyon roads be considered for elimination. This segment should be free of road crossings due to the proximity of the entrance of the City of Industry Yard complex where trains are oftentimes held before entering the yard.
- As recommended in the Alhambra Sub analysis, if the Vineyard Road crossing is eliminated, then the full functionality of the Bon View double track could be realized. If closed, then a segment 2.5 miles in length could be used to hold trains. Equally important, if the Archibald crossing is also closed, then a total segment of 4.7 miles in length stretching to Milliken could be realized. If the Milliken crossing is closed, a segment of 8.5 miles would be crossing-free.
- Eliminating the three remaining at-grade crossings near Pedley would provide a six mile stretch without an at-grade road crossing. If the four crossings near Arlington were eliminated, then all crossings between Arlington and Mira Loma would be closed, a distance of over 12 miles.

San Bernardino Sub (BNSF)

BNSF's San Bernardino Subdivision is the only route for the 70-plus trains per day that operate between the Ports of Los Angeles and Long Beach and Hobart Yard to eastern destinations. In addition, Metrolink operates 34 trains Monday through Friday, and Amtrak provides passenger

service daily. This segment begins near Redondo Junction, and for the purposes of this analysis, extends to just east of San Bernardino.

The following analysis indicates where BNSF trains 7,500 feet in length could be held between Redondo Junction and San Bernardino along the San Bernardino Sub. The data for this analysis can be found in Appendix A. The green highlight indicates segments of track that are long enough to hold one or more 7,500 foot or longer trains. The blue highlight indicates crossings that are recommended in this report as candidates for grade separation.

- Through Hobart Yard, no at-grade crossings exist from Washington Boulevard to Serapis Street near Pico Rivera, a distance of 7.9 miles (42,000 feet). This segment is used by BNSF to stage trains entering and departing Hobart Yard.
- BNSF trains exceeding 7,500 feet can be held between Los Nietos and Lakeland roads, a distance of 1.9 miles (10,000 feet).
- From Valley View Avenue in La Mirada to Raymond Avenue near Fullerton Junction, there are no at-grade crossings for a distance of 6.5 miles.
- From Imperial Highway east of Placentia to Auto Center Drive in Corona, a distance of over 12 miles is without an at-grade crossing. This segment is along the Santa Ana River, and BNSF routinely holds many trains along this segment.

- In La Sierra, from Pierce to Tyler streets, a 2.1 mile (11,000 feet) long segment provides sufficient space to hold a 7,500 foot or longer train. However, this segment passes through the Metrolink passenger platform minimizing the time during the day when trains could actually be held.
- In Riverside, between Jane and Cridge streets, a two mile (10,500 feet) long segment allows BNSF to hold trains as they wait for a signal at the interlocker at West Riverside.
- Between Main Street and Valley Boulevard, a segment 3.4 miles or 18,000 feet in length allows trains 7,500 feet or longer to be held as they wait for clearance to cross the rail crossing at Colton.
- East of Laurel Street, there is a four mile stretch through San Bernardino without a road crossing where several trains could be held.

Findings

Based on the above analysis, the following recommendations are made:

- Near Pico Rivera, Serapis Street and Passons Boulevard should both be closed to provide additional switching capability on the east end of the yard. Also, Norwalk Boulevard and Los Nietos and Lakeland roads in Santa Fe Springs should be eliminated for the same reason.

- Near La Mirada, Marquardt Avenue and Rosecrans, as well as Valley View should all be considered as candidates for grade separation.
- Between Fullerton and Esperanza, fifteen crossings over a distance of seven miles should be considered for elimination.
- Near Prado Dam, a private crossing near the County Line should grade separated as BNSF holds many trains in this vicinity.
- At Porphyry, the elimination of Radio Road would create an unbroken segment of 2.3 miles (12,200 feet) in length, long enough to hold a 7,500 foot or longer train.
- The at-grade crossings at Pierce, Tyler and Harrison should all be eliminated near La Sierra.
- Strong consideration should be given to eliminating the six crossings within a 2.6 mile stretch along the BNSF mainline through Casablanca.
- Just east of San Bernardino, the elimination of the at-grade crossing at University Parkway (or State Street) would allow the extension of several mainlines that originate in San Bernardino and extend toward Cajon Pass.

Summary

Table 1: At-Grade Crossings Recommended as Candidates for Grade Separations

UPRR Alhambra Sub	UPRR Los Angeles Sub	BNSF San Bernardino Sub
Valley Blvd near Aurant	Dupres Street near Pico Rivera	Serapis Street near Pico Rivera
Ramona near San Gabriel*	Rose Hills Road near Whittier	Passons Blvd near Pico Rivera
Mission near San Gabriel*	Mission Mill Road near Whittier	Norwalk Blvd near Pico Rivera
Del Mar Ave. near San Gabriel*	Workman Mill Rd near Whittier	Los Nietos Rd near Pico Rivera
San Gabriel Ave near San Gabriel*	Turnbull Cyn Rd near City of Ind.	Lakeland Road near Santa Fe Spgs
Walnut Grove near San Gabriel*	Bixby Rd near City of Industry	Marquardt Ave near Santa Fe Spgs
Encinita near Temple City	Fullerton Rd near City of Industry	Rosecrans Blvd near Santa Fe Spgs
Lower Azusa near Temple City	Nogales Rd near City of Industry	Valley View Ave near La Mirada
Temple City Blvd near Temple City	Fairway Rd near City of Industry	Raymond Ave near Fullerton
Baldwin Ave near Temple City	Lemon Rd near City of Industry	Acacia Ave near Fullerton
Arden Drive near Temple City	Brea Cyn Rd near City of Industry	State College Blvd near Fullerton
Tyler Street near El Monte	San Antonio Ave near Montclair	Placentia Ave near Fullerton
Cypress Ave near El Monte	Vine Ave east of Pomona	Bradford Ave near Placentia
Ramona Blvd near El Monte	Vineyard near Ontario	Kraemer Blvd near Placentia
Fullerton Road near City of Industry	Archibald near Ontario	Orangethorpe Ave near Placentia
Nogales Ave near City of Industry	Milliken Rd near Ontario	Tustin Ave near Placentia
Fairway Road near City of Industry	Bellgrave Rd near Pedley	Jefferson Street near Placentia
Lemon Road near City of Industry	Rutile Rd near Pedley	Van Buren Street near Atwood
Brea Canyon Road near City of Industry	Jarupa Rd near Pedley	Richfield Road near Atwood
Benton Feed Yard near Spadra	Clay Street near Arlington	Lakeview Ave near Atwood
Monte Vista Ave east of Pomona	Jarupa Street near Arlington	Kellogg Drive near Atwood
San Antonio Ave east of Pomona	Mtn View Ave near Arlington	Imperial Highway near Esparenza
Vine Ave east of Pomona	Streeter Ave near Arlington	Prado Dam County Line Pvt X-ing
Vineyard Ave near Ontario Airport	Los Angeles Sub Total = 23	Radio Road near Porphyry
Milliken Ave near Ontario Airport		Pierce Street near La Sierra
Hunts Lane near Loma Linda		Tyler Street near La Sierra
Alhambra Sub Total = 26		Harrison Street near La Sierra
		Auto Center Drive near Casablanca
		Jefferson St near Casablanca
		Madison St near Casablanca
		Washington St near Casablanca
		Mary St near Casablanca
		Jane St near Casablanca
		University Pkwy east of San Berdo
		San Bernardino Sub Total = 34
Grand Total = 83 crossings		

* Indicates crossing proposed to be eliminated during San Gabriel Trench project.

Conclusion

Section 130 of the Highway Trust Fund dedicates gas tax dollars for highway modernization projects, for which grade crossing elimination projects qualify. This report identifies locations in the Los Angeles Basin whereby the fluidity of the regional rail system could be improved by the judicious allocation of public dollars to eliminate of at-grade crossings. While there are many more at-grade crossings in the region that should be eliminated, the removal of the 83 at-grade crossings listed herein would have the double benefit of not only improving vehicular flow for communities between Los Angeles and San Bernardino, but would also greatly improve rail operations between the Ports of Los Angeles and Long Beach and eastern destinations.

APPENDIX A: L.A. BASIN TRACK CHARTS



Indicates track segments of 7500' or longer



Indicates at-grade crossing recommended for closure or grade separation.