LOSSAN Corridor Strategic Assessment
Final Report

Submitted to **Orange County Transportation Authority, Caltrans Division of Rail, and LOSSAN Rail Corridor Agency**

Submitted by
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In association with
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LTK Engineering Services, Inc.
Steve Roberts

January 14, 2010

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PURPOSE OF THIS STUDY

The 351-mile-long Los Angeles-San Diego-San Luis Obispo (LOSSAN) Rail Corridor is the second busiest passenger rail corridor in the U.S., second only to the Boston-to-Washington DC Northeast Corridor. More than 9 million passenger riders make trips on LOSSAN Corridor trains annually. Looking toward a future of population increases, higher gasoline prices, more congestion on parallel road systems, and longer commutes, the demand for the corridor's rail service is likely to grow.

There are four different corridor passenger rail services:

- The *Pacific Surfliner*, operated by Amtrak with financial support from Caltrans Division of Rail, between San Diego and San Luis Obispo. Caltrans pays 70% of *Surfliner* costs above fare revenue. Amtrak contributes 30%, as the service is considered part of Amtrak's basic intercity service.
- The Metrolink commuter rail service, operated by the Southern California Regional Rail Authority (SCRRA) between Oceanside and Montalvo, north of Oxnard.
- COASTER commuter rail, operated by North County Transit District (NCTD) between San Diego and Oceanside.
- Amtrak Long Distance Services: the *Coast Starlight* operating between Seattle, Northern California and Los Angeles; and the *Southwest Chief* operating between Chicago and Los Angeles.

There are three freight rail operators on the LOSSAN Corridor, sharing track with passenger trains. The Union Pacific Railroad (UP) serves customers between San Luis Obispo and Los Angeles. The BNSF Railway (formerly the Burlington Northern Santa Fe Railway) runs trains between Los Angeles, Fullerton, and San Diego. Both UP and BNSF are major railroads, known as Class 1s. A short line or small railroad, the Pacific Sun Railroad, serves local customers in the Oceanside area.

On a typical weekday, there are as many as 100 trains per day on the busiest segment of the corridor, between Redondo Junction near Downtown Los Angeles and Fullerton. Of these, half are passenger trains.

The growth of corridor ridership has been dramatic. In 1979, the Amtrak *San Diegans* carried 1.2 million passengers. Ten years later, ridership totaled 1.8 million. Metrolink commuter rail service started in 1992, followed by COASTER in 1995. In 2000, the *San Diegans* were renamed *Pacific Surfliner* to more accurately capture the range of its service, which by then extended to San Luis Obispo. *Surfliners* today carry 2.7 million passengers annually. All three services have expanded to meet the ever growing demand, which is now eight times what it was 30 years ago.

Continued ridership and service growth, however, face challenges. Higher numbers of trains are reaching the capacity limits of the physical plant and testing line dispatchers' abilities to route traffic safely and efficiently. The different passenger operations are largely uncoordinated, resulting in some growing travel markets remaining underserved. Complicating investment decisions is the fractured nature of corridor ownership. Segment owners include five public agencies, UP, and BNSF, all of whom have different priorities.

There have been many studies of the LOSSAN rail corridor. The original planning work began in the 1980s. In the last 10 years, passenger rail operators separately have developed service expansion plans, but these studies have been service-specific. The LOSSAN Rail Corridor Agency, the Joint Powers Authority charged with coordinating planning efforts for the corridor, identified various long term investment options to support more passenger rail service in 2007. However, no past study has focused on how all passenger services (intercity rail, commuter rail, and potential high-speed rail), along with freight services, could be meaningfully coordinated with the goal of furthering corridor ridership increases.

The purpose of this study has been to define a long term strategic vision for the LOSSAN Corridor, by which services and investments could be coordinated to spur ridership growth. Secondly, it was to identify the type of governance structure that could most effectively implement this vision.

STUDY PROCESS

The study process was comprised of three elements:

Crafting a Strategic Vision

The development of a long term strategic vision progressed in three steps. First was to assess the state of the corridor. Current operations were profiled. Passenger rail operators' services (trains and stations), ridership, fare policies and major connections were identified. Freight railroads trains were also noted. Second, funded or programmed capital investments in the corridor's physical plant were identified. Lastly, operating conditions on the corridor were assessed, with capacity bottlenecks identified. This assessment appears as Chapter 1.

The second step involved focusing on the desires of current and prospective corridor users, and also on opportunities for better coordination of corridor services, making them more convenient to use. This work was done with three tasks: an intercept or onboard survey of existing corridor service riders; a telephone survey of non-riders; and analysis of corridor services' strengths, weaknesses, opportunities and threats (SWOT). The survey efforts were aimed at capturing what is important to the customer. The SWOT analysis was aimed at identifying critical policy issues and looking at ways in which services might be better coordinated. The results of the surveys and SWOT analysis appear in Chapter 2.

The output of these efforts served as primary input for the third step in the process: the crafting of the long term strategic vision, focused on user needs and opportunities for meaningful coordination. The vision is detailed in Chapter 3.

Rethinking Governance

With the vision defined, the work effort shifted to an identification of a governance structure best able to deliver that vision. While the LOSSAN Rail Corridor Agency is tasked with coordination of public agency planning of corridor improvements, the agency does not control the investments. Public investment is still in the hands of Caltrans and those county transportation agencies owning segments of the corridor. These are Ventura County Transportation Commission (VCTC), Los Angeles County Metropolitan Transportation Authority (Metro), Orange County Transportation Authority (OCTA), NCTD, and San Diego Metropolitan Transit System (MTS). County agency investments are tied to the respective counties. While Caltran's investments are corridor-wide, any county transportation agency's investment is typically made on a county-specific basis.

The study investigated alternatives to the current structure that could have the authority to coordinate investments on a corridor-wide basis rather than a county-specific basis, and thereby exert a level of control required to implement a corridor-wide long term strategic vision. The alternatives are discussed in Chapter 4.

Outreach to Stakeholders

Vision and governance concepts were presented to corridor stakeholders on various occasions. Stakeholders included the senior leadership of the Project Partners, the transportation agencies sponsoring the study. They also included the members of LOSSAN Rail Corridor Agency Board of Directors and Technical Advisory Committee (TAC) and the Riverside County Transportation Commission (RCTC). The Project Partners and other stakeholders agreed of a set of specific next steps in the LOSSAN Corridor planning process discussed in Chapter 5.

PROJECT PARTNERS

In alphabetical order, the seven Project Partners sponsoring this work effort are listed below. Project Partner staff members served as technical advisory committee members for this project. They are listed below as well. Committee meetings and conference calls occurred at least monthly from the fall of 2008 through the spring of 2009.

- Amtrak, represented by Suzanne Fike.
- Caltrans Division of Rail, represented by Pat Merrill.
- Los Angeles County Metropolitan Transportation Authority, represented by Patricia Chen, Jay Fuhrman, and Alex Clifford.
- North County Transit District, represented by Lane Fernandes and Tom Lichterman.
- Orange County Transportation Authority, represented by Darrell Johnson, Jennifer Bergener, and Michael Litschi.
- Southern California Regional Rail Authority, represented by Joanna Capelle.
- San Diego Association of Governments, represented by Linda Culp.

Chapter 1
CURRENT CORRIDOR CONDITIONS

INTRODUCTION

The purpose of this chapter is to describe the current conditions on the LOSSAN Corridor, the 351-mile rail route between San Diego, Los Angeles, and San Luis Obispo. The description has four parts. First, the ownership of line segments is defined.

Second, rail operators on the corridor are profiled. There are four passenger rail operators and three freight rail operators running trains on the corridor. The passenger operators are discussed below in terms of markets served, trains run, stations served, passengers carried, connections to other rail services and transit, and fare policy and instruments. The freight rail operations on the corridor are briefly described as well.

Third, funded and programmed corridor improvements facilitating efficient train operations on the corridor are identified.

Fourth, current corridor operating conditions are assessed. In particular, potential line capacity constraints and parking demand deficits are highlighted.

CORRIDOR OWNERSHIP

Five public agencies and two freight railroads own separately and in some cases jointly the various portions of the LOSSAN Corridor. From south to north, LOSSAN route segment ownership is summarized below:

- *San Diego-Orange County Line* – The San Diego Metropolitan Transit System (MTS) and North County Transit District (NCTD); MTS owns the line within the City of San Diego, and NCTD owns the line north of San Diego to the San Diego County/Orange County Line. The line segment is officially referred to as the San Diego Subdivision.
- *Orange County Line-Fullerton* – Orange County Transportation Authority (OCTA).
- *Fullerton-Redondo Junction* – BNSF Railway. This line is officially known as the western end of the BNSF Transcon mainline.
- *Redondo Junction-Los Angeles Union Station-Burbank-Junction* – Los Angeles County Metropolitan Transportation Authority (Metro).
- *Burbank Junction-Santa Susana Pass* – Metro and Union Pacific Railroad (UP). Metro owns 40% of the right-of-way and UP 60%.
- *Santa Susana Pass-Moorpark* – Ventura County Transportation Commission (VCTC) and UP. VCTC owns 40% of the right-of-way and UP 60%.
- *Moorpark-San Luis Obispo* – UP.
- *Montalvo Junction-Montalvo* – VCTC.

Maps showing the LOSSAN Corridor appear as Figures 1-1 and 1-2.


0
25
50
100 Miles
NORTH
San Luis Obispo
Kern
Santa Barbara
Ventura
Los Angeles
San Luis Obispo
Grover Beach
Guadalupe
Surf
Goleta
Santa Barbara
Carpinteria
Ventura
Montalvo
Oxnard
Camarillo
Moorpark
Simi Valley
Chatsworth
Northridge
Van Nuys
Burbank Airport
Burbank
Glendale
Los Angeles
LEGEND
Pacific Surfliner
Metrolink Lines
COASTER
Surfliner Stations
Joint Stations
Metrolink Stations
LOSSAN CORRIDOR NORTH
Figure 1-1

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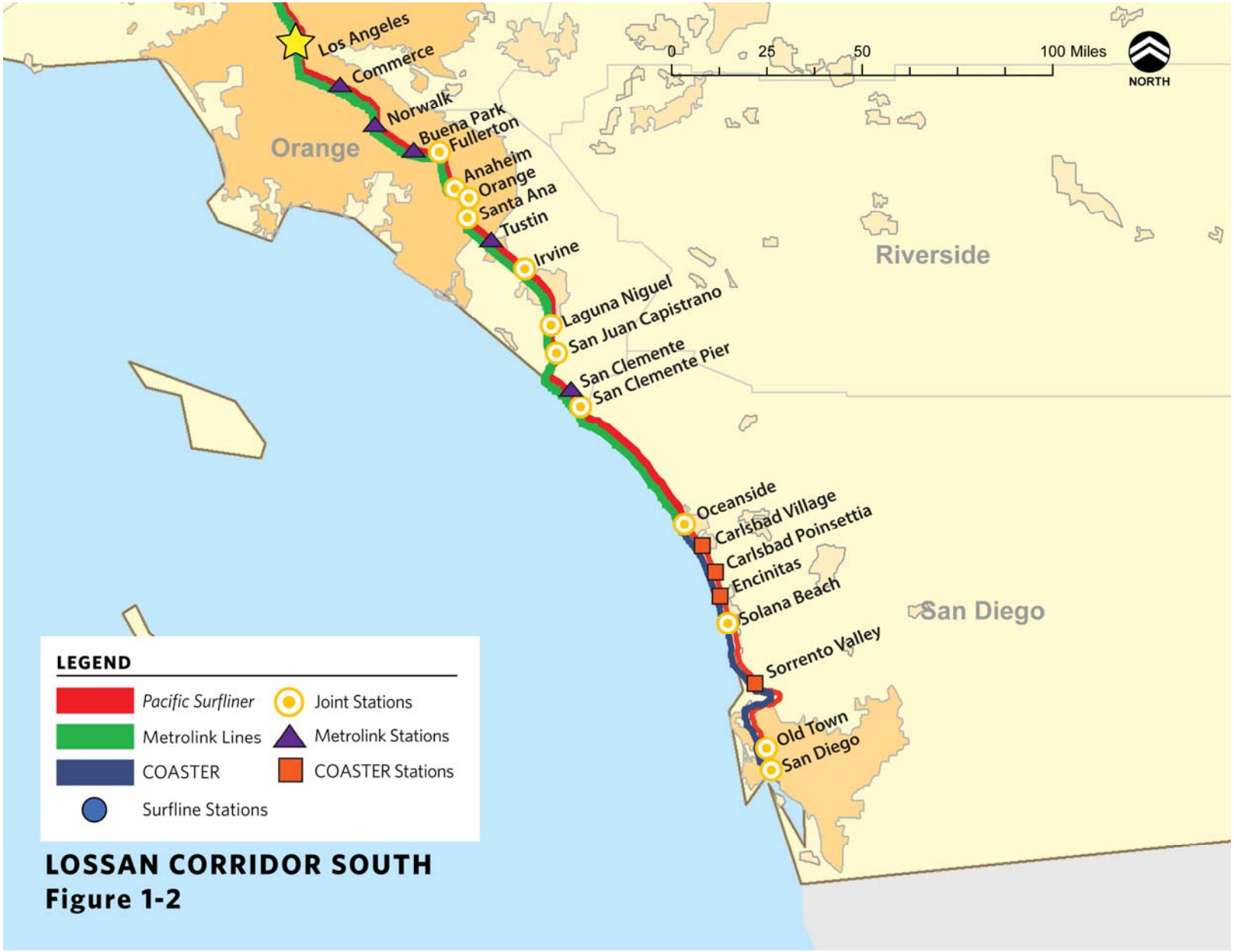
Los Angeles
Commerce
Norwalk
Buena Park
Fullerton
Anaheim
Orange
Santa Ana
Tustin
Irvine
Laguna Niguel
San Juan Capistrano
San Clemente
San Clemente Pier
Oceanside
Carlsbad Village
Carlsbad Poinsettia
Encinitas
Solana Beach
Sorrento Valley
Old Town
San Diego
Orange
Riverside
San Diego
0
25
50
100 Miles
NORTH
LEGEND
Pacific Surfliner
Metrolink Lines
COASTER
Surfline Stations
Joint Stations
Metrolink Stations
COASTER Stations
LOSSAN CORRIDOR SOUTH
Figure 1-2

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CORRIDOR OPERATORS

Pacific Surfliner

Amtrak *Pacific Surfliner* service offers a daily intercity service operating between San Diego, Los Angeles, Santa Barbara and San Luis Obispo. This service is the only service operating on the whole of the LOSSAN Corridor. *Pacific Surfliner* trains are supplemented by Amtrak Thruway Motorcoach service, extending travel options for riders bound to and from trains on the LOSSAN Corridor. Thruway buses also provide service to areas not served by rail and provide connections to the Amtrak *San Joaquin* service at Bakersfield.

Markets Served

Pacific Surfliners serve two markets. The predominant market is the single trip intercity leisure market. Between San Diego and Los Angeles, trains are spread fairly evenly through the day from early morning until late night; and they are supplemented by late night, early morning Thruway buses. North of Los Angeles, service is more limited, but trains also are spread several hours apart, and they are supplemented by bus service.

The second is as a supplement to Metrolink's commuter rail service. Trains serve commuters bound for Los Angeles and Orange County work centers. By virtue of the Rail 2 Rail program, Metrolink monthly pass holders can use their passes on *Surfliner* trains within the limits of their passes, including on weekends.

Trains

Of the 24 *Pacific Surfliner* trains that run Monday through Thursday, 22 operate between San Diego and Los Angeles in not quite hourly service in each direction. Ten of those trains operate between Los Angeles and Santa Barbara, and four of these operate to and from San Luis Obispo. Of the 26 trains that run on Friday, 24 operate between San Diego and Los Angeles in not quite hourly service in each direction. Ten of those trains operate between Los Angeles and Santa Barbara, and four of these operate to and from San Luis Obispo.

As noted, trains are supplemented by daily late night, early morning Amtrak Thruway Motorcoach bus service. One bus operates northbound from San Diego to Los Angeles and extends to Glendale. Another bus operates from Santa Ana to Los Angeles. Southbound, one bus operates between Los Angeles and San Diego, and another between Los Angeles and Santa Ana.

Stations Served

Pacific Surfliner stations appear in Figures 1-1 and 1-2. Not all trains stop at all stations. From south to north, the limited stop stations are San Diego Old Town, San Clemente Pier, Laguna Niguel/Mission Viejo, Orange, Moorpark, and Camarillo.

Stations between San Diego and Oceanside are shared with COASTER; Oceanside is shared also with Metrolink. Stations north of Oceanside through Los Angeles to Oxnard are shared with Metrolink. Also, the *Coast Starlight* stops at Los Angeles, Van Nuys, Simi Valley, Oxnard, Santa Barbara, and San Luis Obispo; and the *Southwest Chief* stops at Fullerton and Los Angeles.

Passengers

In FY 2008-09, *Pacific Surfliner* ridership totaled 2.7 million passengers, or 5.4 million ons and offs. Station usage was 33.1% north of Los Angeles, 4.5% at Los Angeles, and 62.4% south of Los Angeles.

Connections

A *Pacific Surfliner* connection to the *Coast Starlight* can be made at Los Angeles Union Station (LAUS), Van Nuys, Simi Valley, Oxnard, Santa Barbara and San Luis Obispo. A *Surfliner* connection to the *Southwest Chief* can be made at LAUS as well as Fullerton.

A major connection at LAUS is provided by Thruway buses connecting to the *San Joaquin* route at Bakersfield.

Amtrak Thruway Motorcoach connections are available at Los Angeles, Santa Barbara, and San Luis Obispo for northbound passengers whose trains terminate at these stations. Similarly connections exist for southbound riders.

Transit connections exist at all corridor stations except Surf. LAUS provides connections to the Metro Gold Line (light rail) and Red Line (heavy rail) and bus services including Greyhound. The Santa Fe Depot and San Diego Old Town Stations offer connections to MTS's San Diego Trolley light rail and bus services. Connections to Metrolink can be made at all *Pacific Surfliner* stops in Los Angeles and Orange Counties, as well as at Oceanside, Simi Valley, Moorpark, Camarillo, and Oxnard. Connections to COASTER can be made at *Pacific Surfliner* stops in San Diego County. Oceanside offers a connection to the new SPRINTER diesel multiple unit (DMU), or diesel light rail, service. Operated by NCTD, the SPRINTER runs east-west between Oceanside and Escondido.

FlyAway bus service, providing a connection to Los Angeles International Airport, is available at LAUS and Irvine. Connections to MTS's Airport Flyer bus service to San Diego International Airport are available near the Santa Fe Depot.

Fares Policy and Instruments

The *Pacific Surfliners* offer two class-based fares. Amtrak Coach Class rail fares vary depending on season or travel date (i.e. holidays). For example, a Coach Class fare between Los Angeles and San Diego can vary between $29 and $42 depending upon the season. Business Class prices are determined by adding a Business Class accommodation charge to the Coach Class fare. For trips between Los Angeles and San Diego, the additional charge is $14. Amtrak honors Metrolink monthly passes through the Rail 2 Rail program.

Discounts are available for seniors, children, active duty military personnel, and members of various organizations (e.g. American Automobile Association).

Metrolink

Metrolink is the greater Los Angeles area commuter rail service. It is operated by the Southern California Regional Rail Authority (SCRRA), a joint powers authority consisting of the transportation agencies of five Southern California counties: Los Angeles, Ventura, San Bernardino, Riverside, and Orange. Metrolink trains operate eight routes, six of which are on the LOSSAN Corridor.

Market Served

Metrolink caters to the traditional and emerging commuter rail markets. A traditional rail commuter is peak-period and peak-direction oriented and traveling on multiple trip tickets (10-ride or monthly). This orientation has mostly meant trips from Ventura and Orange Counties to Downtown Los Angeles work centers; these are trips served by the Ventura County and Orange County Lines. However, new markets have been emerging. They include trips to Orange County work centers from Los Angeles County, from San Diego County, and from both San Bernardino and Riverside Counties. The former are served by reverse commute Orange County Line trains and the latter by Inland Empire Orange County (IEOC) Line trains.

Metrolink offers bi-directional off-peak service on the corridor. Longer term, a stronger reverse commute from Orange County to developing Inland Empire work centers served by stations along the IEOC Line may occur. Whereas Metrolink today operates one outbound IEOC train (850) from Oceanside during the peak period, the SCRRA has identified a potential for three such trains in 2015 and five in 2030. A similar reverse commute pattern may occur on the Ventura County Line.

Metrolink and *Pacific Surfliners* trains offer commute options for north San Diego County residents bound for work centers in Orange County from Oceanside. However, connections between the Metrolink and COASTER at Oceanside are very limited. Northbound, there is only one COASTER-to-Metrolink connection (with less than a 30 minutes between inbound train arrival and outbound train departure), and this occurs weekday afternoons.

Trains

Metrolink trains travel in six services over the portions of the LOSSAN Corridor:

- *Orange County Line* - Metrolink runs 19 trains (600 series) in the Orange County Line service on weekdays. Ten of these operate between Los Angeles and Oceanside, seven operate between Los Angeles and Laguna Niguel, and two operate between Los Angeles and Irvine. Metrolink runs eight trains in the Orange County Line service on weekends. Four of these operate between Los Angeles and Oceanside, and four operate between Los Angeles and San Juan Capistrano.
- *Ventura County Line* - Metrolink runs 20 trains (100 series) in the Ventura County Line service on weekdays. Six of these operate between Montalvo and Los Angeles, 10 operate between Moorpark and Los Angeles, and four operate between Chatsworth and Los Angeles.
- *Antelope Valley Line* - Metrolink runs 24 trains (200 series) in the Antelope Valley Line service on weekdays. Eighteen of these operate between Lancaster and Los Angeles, four operate between the Via Princessa Station and Los Angeles, and two operate between Santa Clarita and Los Angeles. Metrolink runs 12 trains between Lancaster and Los Angeles on Saturdays and six trains on Sundays.
- *91 Line* - Metrolink runs nine trains (700 series) in the 91 Line service on weekdays. These trains operate between Riverside, Fullerton and Los Angeles.
- *Inland Empire Orange County Line* - Metrolink runs 16 trains (800 series) in the Inland Empire Orange County Line service on weekdays. Four trains operate between Riverside and Oceanside, three trains between Laguna Niguel and San Bernardino, two trains between San Bernardino and Oceanside, two between San Bernardino and Irvine, two between Riverside and Laguna Niguel, one between San Bernardino and San Juan Capistrano, one between Riverside and San Juan Capistrano, and one between Riverside and Irvine. Metrolink operates six IEOC trains on Saturdays: two operate between Riverside and Oceanside and four between San Bernardino and Oceanside. Four operate between San Bernardino and Oceanside on Sundays.
- *Burbank Airport Service* - Metrolink operates 11 trains (900 series) in the Burbank Airport service on weekdays. Nine of these operate between Los Angeles and Burbank Bob Hope Airport. Two operate between Los Angeles and Downtown Burbank.

Stations Served

Metrolink stations on the corridor appear in Figures 1-1 and 1-2. Not all trains stop at all stations. Limited stop stations are at San Clemente Pier and Commerce.

Passengers

Excluding Antelope Valley Line riders, who are on the corridor only between LAUS and Burbank Junction, Metrolink trains carry about 4.8 million annual passenger trips on the LOSSAN Corridor.

Connections

A Metrolink connection to the *Pacific Surfliner* can be made at all shared stops in Orange, Los Angeles and Ventura Counties and at Oceanside. Also, Metrolink connection to NCTD's COASTER commuter rail service and SPRINTER service can be made at Oceanside.

A Metrolink connection to the *Coast Starlight* can be made at LAUS, Van Nuys, Simi Valley, and Oxnard. A Metrolink connection to the *Southwest Chief* can be made at LAUS and Fullerton. A Metrolink connection to the *Sunset Limited* (Los Angeles-New Orleans-Orlando) can also be made at LAUS.

Metrolink connections to the Amtrak *San Joaquin* service can be made via Thruway buses at LAUS, Glendale, Burbank Airport, Van Nuys, Simi Valley and Oxnard.

Metrolink connects at Burbank Airport with major domestic air carriers.

LAX Flyaway bus service is available at LAUS and Irvine. Transit connections can be made at all Metrolink stations. LAUS provides transfer opportunities to the Metro Gold Line and Red Line.

Fares Policy and Instruments

Metrolink fares are transitioning from a zone-based to a driving mileage-based system. Fares are calculated with a distance-based formula using the driving distance between stations, with an 80-mile maximum charge. Metrolink tickets between two points that can also be served by the *Pacific Surfliner* generally are less expensive. An intercity train, the *Pacific Surfliner* provides a higher service level (with fewer stops, faster times, reclining seats, and snack service), and thus its tickets sell at a premium over commuter rail tickets.

Metrolink riders can buy one-way tickets, round-trip tickets, advance purchase tickets, 10-trip tickets and monthly passes.

All Metrolink tickets are also EZ transit passes, good for all-day travel in Los Angeles County on participating bus and Metro Rail lines. The Rail 2 Rail program allows Metrolink monthly pass holders to ride *Pacific Surfliners* within the limits of their passes. Tickets are also good for transfers to connecting transit in Orange County and Ventura County.

Multiple discounts are available for weekend travel, children, seniors, the disabled, college students, school group and recreational group travel, and for a December monthly pass (short month).

COASTER

COASTER is the commuter rail service on the LOSSAN Corridor between Oceanside and Downtown San Diego operated by NCTD.

Market Served

COASTER primarily serves the traditional peak-direction, peak-period commuter market traveling on multiple trip tickets (10-ride or monthly). The service brings riders from northern San Diego County to Downtown San Diego, Old Town and Sorrento Valley work centers. COASTER offers bi-directional off-peak service as well.

Trains

COASTER operates 22 trains Monday through Friday and 8 trains on Saturday. Expanded service is available Fridays and Saturdays for San Diego Padres games during Baseball Season.

Stations Served

COASTER stations appear in Figure 1-2.

Passengers

COASTER's current annual ridership is 1.7 million.

Connections

Oceanside, Carlsbad Village, Carlsbad Poinsettia, Encinitas and Solana Beach each have NCTD BREEZE bus routes that serve the stations.

Four MTS shuttle routes are available to transport passengers to and from the Sorrento Valley COASTER station and places of employment. These COASTER connections serve Sorrento Valley, Carroll Canyon, Genesee Ave./La Jolla Village Dr., and North University City Monday through Friday.

Transfers to the San Diego Trolley and MTS buses are available at Old Town and the San Diego Depot Stations.

COASTER monthly passes are accepted for transfers to MTS buses and shuttles.

Oceanside Station provides connections to the SPRINTER, a number of BREEZE bus routes, Greyhound bus service, and commuter bus service operated by the Riverside Transit Agency to and from southwest Riverside County.

Connections to the *Pacific Surfliner* are possible at Oceanside, Solana Beach, Old Town and San Diego. Connections to Metrolink are possible at Oceanside.

Fares Policy and Instruments

COASTER ticket prices are distance-based, using a zone system. Monthly passes are available as well. As with Metrolink tickets, COASTER tickets between two points that can also be served by the *Pacific Surfliner* are less expensive.

Discounts are available for children, seniors, disabled persons, and Medicare recipients.

COASTER monthly passes can be purchased via the Compass Card electronic fare paying system. Users of this "smart card" tap their cards at a platform validator prior to boarding trains. In the future, cardholders will be able to load cash value on their cards. The cards are accepted on connecting NCTD services.

Amtrak Long Distance Trains

In addition to the *Pacific Surfliners*, Amtrak also operates two long distance intercity services that run on the LOSSAN Corridor.

Market Served

These trains serve a long distance intercity market. They are often referred to as luxury trains, as they have lounge and sleeper cars. But long distance coach seating is available as well.

Trains

There are two Amtrak long distance services operating on the LOSSAN Corridor.

- *Coast Starlight* – This train operates daily with one round trip between Los Angeles and Seattle.
- *Southwest Chief* – This train operates daily with one round trip between Los Angeles and Chicago.

The *Sunset Limited* originates and terminates at LAUS as well, but otherwise does not run on the LOSSAN Corridor track.

Stations Served

Coast Starlight stations on the corridor include:

- LAUS
- Van Nuys
- Simi Valley
- Oxnard
- Santa Barbara
- San Luis Obispo

The *Coast Starlight* shares all of these stations with *Pacific Surfliner* trains. It shares Los Angeles County and Ventura County stations with Metrolink.

Southwest Chief has two stations on the corridor: LAUS and Fullerton. It shares both of these stations with *Pacific Surfliner* and Metrolink trains.

Passengers

Long distance train riders are predominantly luxury-oriented travelers rather than corridor riders having origins and destinations within the LOSSAN Corridor. Their typical trip lengths are in the hundreds if not thousands of miles. Thus the ridership of these trains *per se* is not material to this analysis and is not considered here.

Connections

While the long distance trains are strictly speaking not corridor trains like the other passenger services discussed here, they do generate connecting ridership and ticket revenues on both Metrolink and *Pacific Surfliner* trains. Transit connections are available at almost all corridor stations. LAX FlyAway bus service is available at LAUS.

Fares Policy and Instruments

Amtrak long distance services offer class-based fares. Amtrak long distance coach class rail fares vary depending on travel date, departure time, and/or customer demand on each departure. Revenue management strategies generally result in *Coast Starlight* and *Southwest Chief* ticket prices between corridor stations commanding a premium over prices for the *Pacific Surfliner* coach class. Reservations are required. Sleeping Car tickets are sold at a premium above coach tickets. Discounts available are the same as those listed for the *Pacific Surfliner* service.

Union Pacific Railroad

UP operates on the corridor north of LAUS with 18 daily trains on the East Bank Line (east of the Los Angeles River) between Mission Tower area and the former Taylor Yard, site of Metrolink's Central Maintenance Facility. Twelve UP trains operate between Burbank Junction and Gemco Yard south of Van

Nuys. Of these 12, eight operate to and from Northern California, two operate to and from Oxnard, and two operate to and from Gemco Yard. The remaining six trains of 18 trains operate north of Burbank Junction on the Metrolink's Antelope Valley Line. UP's Costa Mesa local also runs daily on the corridor between South Anaheim and Santa Ana.

BNSF Railway

BNSF train volumes on the corridor between Orange and San Diego average six trains per day. Trains on this corridor segment are relegated to mid-day and night-time operating windows, so as to avoid interference with peak-period commuter rail operations. Four of these trains operate to and from BNSF's major clarification yard in Barstow, but two local trains operate between La Mirada (near Buena Park) and Santa Ana via Fullerton and Anaheim. BNSF has recently assigned the operating rights between Oceanside and San Onofre to WATCO Companies (DBA Pacific Sun Railroad, see below). BNSF will continue to operate through freights between San Diego and Atwood.

In recent years, BNSF traffic between Fullerton and Hobart Yard (southeast of Downtown Los Angeles and east of Redondo Junction) averaged 48 trains per day. About half of this volume travels west of Hobart Yard to and from the Ports of Los Angeles and Long Beach via the Alameda Corridor, a joint rail facility (shared by BNSF and UP) linking Downtown Los Angeles rail yards with the San Pedro Bay ports.

Pacific Sun Railroad

Pacific Sun Railroad (PSRR) is a short line, or small railroad, which provides a freight rail services on the Escondido and Miramar Branches of the San Diego Subdivision Railroad. The carrier interchanges local freight traffic to the BNSF in Stuart Mesa. In this analysis, PSRR's train volumes are included in the BNSF's total for Orange-San Diego segment.

FUNDED / PROGRAMMED LOSSAN CORRIDOR RAIL PROJECTS

The volumes of freight and passenger trains cited above and planned service increases have raised issues of rail line capacity constraints and potential improvement projects. These projects, along with unfunded projects, are detailed in the 2007 *LOSSAN Corridor Strategic Business Plan*. In the following narrative, these projects are summarized by segment. The emphasis here is on projects that are either funded or programmed. The projects cited below are categorized by project type.

San Diego – San Diego/Orange County Line

Rail Improvements

The following are corridor improvement projects that increase capacity, enhance operational reliability and flexibility, and reduce travel times; they are either fully or partially funded in San Diego County:

- *San Onofre to Pulgas* – double-tracking in north Camp Pendleton.
- *Santa Margarita Bridge Replacement and Double Track* – Replacing a single track railway bridge and adding double track on Camp Pendleton (funded).
- *San Luis Rey River Bridge Replacement and Double Track* – Replacing a single track railway bridge and adding double track in City of Oceanside (design only funded).
- *Oceanside Station Stub Tracks* – Additional station tracks (design only funded).

- *Carlsbad Double Track Project* – Double track project within the City of Carlsbad (CP Carl to CP Farr) (design only funded).
- *Encinitas Pedestrian Crossings* – Constructing pedestrian grade separated crossings in City of Encinitas (design only funded).
- *San Elijo Lagoon* – Double track in Cities of Encinitas and Solana Beach, including bridge replacement along San Elijo Lagoon (CP Cardiff to CP Craven) (design only funded).
- *San Dieguito River Bridge Replacement and Double Track* – Replacing a single track railway bridge and adding double track in City of Del Mar (design only funded).
- *Permanent Seasonal Rail Platform at Del Mar Fairgrounds* – Constructing passenger platform at the Fairgrounds (design only funded).
- *Del Mar Bluffs Stabilization Project* – Further stabilization of sensitive coastal bluffs area in City of Del Mar (design only funded).
- *Sorrento Valley Double Track* – Double track north of the Sorrento Valley COASTER Station (design only funded).
- *Sorrento-Miramar Phase 1* – Curve straightening and double track south of Sorrento Valley Coaster Station (design only funded).
- *Bridge Rehabilitation and Replacement* – NCTD manages the bridge replacement program along the corridor (ongoing).

Connecting Services

- *Mid-Coast Trolley* – The Mid-Coast Transit Guideway Improvement Project will provide high-level transit service along the I-5 Corridor from the Old Town Transit Center to University City and the University of California San Diego (UCSD). The Mid-Coast project is part of the San Diego Association of Government's (SANDAG) TransNet Early Action Program, which includes projects that are partially funded by local transportation sales tax revenues. The trolley will have a connection to the LOSSAN Corridor at the Old Town Transit Center.
- *Blue Line Improvements* – The San Diego Trolley Blue Line light rail service provides trolley service between Mission Valley, the Old Town Transit Center, Downtown San Diego, and the International Border. Improvements planned for the Blue Line include station enhancements, signal upgrades, conversion to low-floor vehicles and grade separations in the City of Chula Vista. The Blue Line light rail system has a connection to the LOSSAN Corridor at Old Town and the Santa Fe Depot in Downtown San Diego.

Orange County Line – Los Angeles

OCTA High Frequency Service

The Orange County Transportation Authority is currently in the process of upgrading the existing LOSSAN Corridor tracks and stations from Fullerton to Laguna Niguel to provide for this new service, referred to subsequently in this study as the Orange County Shuttle. The shuttles will be operated by Metrolink but will be separate from existing Metrolink services, as they will have a service area just within Orange County, between Fullerton and Laguna Niguel. The OCTA upgrades will include new turnback and layover facilities at the northern and southern ends of the route, as well as improvements to tracks and stations. A pedestrian undercrossing has been constructed at the Orange station, linking the west side parking lot with the east side platform. Parking expansions are planned at Fullerton, Orange, Tustin, and Laguna Niguel.

BNSF Third Main Track and Grade Separation Project

BNSF and Caltrans Division of Rail are currently designing and implementing a major improvement to the section of the LOSSAN Corridor between Fullerton (Fullerton Junction) and Los Angeles (Redondo Junction). This section of the corridor, which carries BNSF freight traffic heading to and from the Ports of Los Angeles and Long Beach as well as Amtrak and Metrolink passenger service, currently carries large volumes of rail traffic and is nearing its capacity.

The project will complete a third main track for the entire section from Fullerton to Los Angeles, as well as grade separating or closing the remaining eight at-grade road crossings in this stretch of the corridor. These improvements, which are described in the Third Main Track and Grade Separation Project Final Environmental Impact Report (Caltrans, 2005), are intended to increase capacity, decrease congestion and delay, and enhance safety throughout the corridor.

The specific improvements planned for this project are listed below.

- Third main track from Control Point (CP) Basta (near Commonwealth Ave crossing in Fullerton) to CP Vail (I-5 crossing in Commerce). A southern portion of the Third Main Track Project (from CP Basta to near Beach Blvd. in Buena Park) has already been completed as part of the new Buena Park Metrolink Station. To the north, the new track has been completed from CP Vail to near Serapis Ave. in Pico Rivera. The third main track is currently under construction between Beach Blvd. and Valley View Ave. in La Mirada.
- Crossing closure of an at-grade crossing at Serapis Ave. in Pico Rivera.
- Grade separations (roadway underpasses) at the following current at-grade crossings, two of which are funded:
  - Passons Blvd. (funded)
  - Pioneer Blvd.
  - Norwalk Blvd.
  - Los Nietos Rd.
  - Lakeland Rd.
  - Rosecrans Ave. / Marquardt Ave.
  - Valley View Ave. (funded)
  - Sand Canyon Ave.

Connecting Service

OCTA is sponsoring a Go Local program to plan and implement city-initiated transit extensions to Metrolink commuter rail services in Orange County. This program is in conjunction with OCTA's efforts to implement high frequency Metrolink service between Fullerton and Laguna Niguel by 2010. The first step is to provide cities with funding to study possible transit extensions to Metrolink service. Subsequent steps will focus on refining concepts, implementation of new services, and station modifications. The Go Local program is funded by the current and renewed Measure M, Orange County's half cent sales tax for transportation improvements.

Los Angeles Station Improvements

Construction of a new station platform and renovation of canopies at LAUS are parts of an ongoing SCRRA project funded by federal, state and local sources.

At-grade Crossing Improvements

OCTA is currently constructing at-grade safety and operations enhancements for nearly all at-grade railroad crossings in Orange County. This program will improve 52 crossings in the county. The improvements

include new medians and upgraded crossing signal protection to support safe operations along Orange County railroads. Construction began in 2009. Numerous LOSSAN Corridor crossings are included in the program. In addition, a grade separation at Jeffrey Rd. in Irvine is currently under construction. The Sand Canyon Ave. crossing in Irvine may also be grade separated; proposed construction dates for this project are in the 2010-11 timeframe.

MOW Facility and Communications Improvements

SCRRA has plans and funding for a maintenance-of-way (MOW) facility and fiber optics/communications improvements for the corridor.

BNSF Hobart Yard Expansion and Access Grade Separation

The BNSF Hobart Yard, located in the cities of Vernon and Commerce, handles much of the BNSF intermodal and general carload traffic in the LA Basin. A project on the western end of the yard will allow for the expansion west of several tracks as well as the grade separation of the main truck access point to Hobart Yard from the south.

Metrolink Keller Street Yard

A small storage yard is being planned and funded by SCRRA for the area just east of Los Angeles Union Station between the existing LOSSAN Corridor tracks and Keller St. This will allow for emergency storage of trains in case of capacity problems at LAUS.

Los Angeles – Ventura

Metrolink Sealed Corridor Initiative

SCRRA is developing a comprehensive strategy to enhance the safety of trains, passengers, motorists, pedestrians, and neighboring land uses within and along a railroad corridor, using appropriate safety measures to systematically reduce the opportunity for accidents at grade crossings or elsewhere on its lines north of LAUS. Metrolink is focusing on safety enhancements at crossings, which would include closure of some crossings, separations of others, and crossing-specific enhancements (e.g. four-quadrant gates, median separators, signal system improvements, new signs and pavement markets, etc.). Ultimately the initiative will encompass the other Metrolink lines.

Ventura – San Luis Obispo

Caltrans Improvements

Caltrans Division of Rail's 2008 *Master Funding Table* cites various projects:

- Environmental work for a siding project in Ventura and Santa Barbara Counties to improve capacity on the *Pacific Surfliner* route.
- Ventura County sealed corridor project.

Positive Train Control

According to the Federal Railroad Administration website, "the Rail Safety Improvement Act of 2008 (RSIA) (signed by the President on October 16, 2008, as Public Law 110-432) has mandated the widespread installation of Positive Train Control (PTC) systems by December 2015." Presently, freight, intercity passenger and commuter rail operators are preparing their PTC implementations for submittal to the FRA in 2010.

In the LOSSAN Corridor, the GPS-based PTC technology will be overlayed on the existing wayside signal system. The system will be able to identify the positions of all trains on the line and automatically stop trains whose engineers disobey signals. PTC is designed to keep a train under its maximum speed limit and within the limits of authorization to be on a specific track. The rapid deployment of PTC was sparked by the collision of a Metrolink commuter train and a UP freight train just north of Chatsworth Station on September 12, 2008.

The primary benefits of PTC include saving lives (train crews, passengers, and railroad workers), improving passenger and freight train operation efficiency, and providing real-time train location information. PTC could increase the capacity of a rail line.

CURRENT OPERATING CONDITIONS

This section discusses capacity in terms of the number of trains that practically can be deployed on various segments of the LOSSAN Corridor. The capacity and utilization of parking at corridor stations are also discussed.

Train Capacity

This section discusses rail line capacity in general terms. No operations simulation of LOSSAN Corridor rail lines has been performed as part of this study. Such operation simulations, utilizing train priority-based computer programs, are the industry standard for testing line capacity. These programs have the ability to quantify operating performance given specific train detail: origin, destination, dwell times, stops, train length, motive power, etc. Conversely, they can test the impacts of capacity enhancements, such as new sections of double track or sidings. Simulations are an indispensible tool for detailed rail planning.

However, the attempt here is different. The project goal is to articulate a long term vision for the corridor rather than detailed rail planning. This goal requires a basic understanding of where line capacity problems exist and where more trains might be added, given both existing conditions and planned or programmed, near term line capacity improvements. The tools to enable this understanding are the capacity "yard sticks" appearing in Table 1-1.

Table 1-1: Practical Rail Line Capacities

Track Configuration	Minutes between Sidings	Minutes of Headway	Practical Capacity in Trains per Day
Single Track	15		50
	20		35
	30		25
Double Track		10	150
		20	75

The practical capacity limits of two track configurations are calculated in the table. Here, practical capacity is defined as the number of trains that can run on a track segment efficiently given its configuration and appropriate allowances for both regular maintenance-of-way and small, incidental occurrences that work to delay trains. In other words, practical capacity is the point at which the addition of new trains begins to degrade operating performance on a specific corridor segment. For example, the practical capacity of a single track segment with frequent sidings is calculated as follows:

- Seven or eight miles between sidings equates to about 15 minutes of run time between sidings, given an average freight speed of 30 miles per hour.

- With 15 minutes between sidings, maximum capacity equals four trains per hour between sidings.
- Maximum daily capacity equals four trains per hour multiplied by 24 hours or 96 trains per day.
- Practical daily capacity is half that figure, or about 50 trains per day. Theoretically, any trains above this number could negatively impact performance. This formula provides for maintenance-of-way and delaying occurrences.

The maximum capacity of a double track segment is calculated differently:

- Assumed braking distance for large freight trains (operating on all corridor segments) is two miles.
- Assuming a simplified signal system, another two miles is required to stop a train.
- Assuming 25-30 mph freight train speeds and a four-mile braking distance, maximum headways would be around eight to 10 minutes between trains.
- With 10 minutes between trains, maximum capacity equals six trains per hour.
- Maximum daily capacity equals six trains per hour multiplied by 24 hours, or 144 trains per day per track or 288 per double track.
- Practical daily capacity is half that figure, or about 150 trains per day, sufficient to allow for maintenance-of-way and delaying occurrences.

The advantage of such a theoretical approach in estimating practical line capacity is that it is straightforward and fairly simple to do. One has to know train counts and track configurations. But the conclusions on capacity rest on a number of assumptions about all train movements on a specific track segment. This is not always the case. Train type, speed and length vary and, as a result, a specific segment of track may have more or less of a practical capacity limit than the table above indicates. Nevertheless, the approach helps to point out where opportunities and trouble spots might occur. Certainly, conclusions have to be matched with what the real conditions are. And when the reality is at odds with theoretical capacity, one needs to find out why. One such case is the Fullerton-Redondo Junction segment, which will be discussed soon.

The advantage of operations simulation is it can deal easily with a multitude of variations. It is most usefully employed when projects are closer to being realized. The reason is, operations simulation is time consuming and expensive to undertake. This is to say, the dollars are better spent when the desired outcomes are better defined.

With practical capacities defined per Table 1-1, along with passenger and train volumes per the preceding section, the capacity limits of corridor segments can be estimated per Table 1-2.

Segments that have train counts near or at their practical capacity limits are colored in yellow. There are four such segments. Known bottlenecks or constraints, along with identified solutions and status of current improvement projects are identified as well. The BNSF Transcon between Fullerton and Redondo Junction is a complicated operating environment with high volumes of freight, intercity passenger, and commuter trains. That noted, capacity exists there for additional trains. However, capacity for passenger trains during peak periods does not exist, per SCRRA. This assertion is reasonable, as a full triple tracking of the segment is both funded and in design. To reflect the tightness of capacity during peak periods, this segment is colored light yellow.

Table 1-2: LOSSAN Corridor Track Segment Train Volumes, Constraints and Improvements

Segment	North End Distance from San Diego	Ownership	Track Configuration and Signaling	Trains per Weekday	Practical Daily Train Capacity	Bottlenecks or Constraints	Solution	Project Status
Santa Fe Depot-Oceanside	41	NCTD	29 miles of single track with 3 sidings 12 miles of two tracks CTC	Amtrak: 22 COASTER: 22 BNSF: 4 Total: 48	50	Sorrento-Miramar Carlsbad San Elijo Lagoon Santa Margarita Bridge San Dieguito Bridge	Double tracking	Ongoing
Oceanside-Laguna Niguel	73	NCTD / OCTA	30 miles of single track with 5 sidings 2 miles of two tracks CTC	Amtrak: 22 COASTER: 8 DHs Metrolink: 18 +8 DHs BNSF: 4 Total: 44 SM-LN	50	San Onofre-Pulgas San Luis Rey Bridge	Double tracking	Ongoing
Laguna Niguel-Orange	95	OCTA	22 miles of two tracks ; CTC CTC	Amtrak: 22 Metrolink: 35 BNSF & UP: 8 Total: 65	150	27 grade crossings	Safety improvements	In design
Orange-Fullerton	102	OCTA	7 miles of two tracks CTC	Amtrak: 22 Metrolink: 19 BNSF & UP: 4 Total:45	150	13 grade crossings	Safety improvements	In design
Fullerton-Redondo Junction	124	BNSF	15 of two tracks 6 miles of three tracks 1 mile of four tracks CTC	Amtrak: 24 Metrolink: 28 BNSF: 50 Total: 102	150	Basta-Vail	Triple tracking	In design
Redondo Junction-Mission Tower (LAUS)	128	Metro	4 miles of two tracks CTC	Amtrak: 24 Metrolink: 28 Total: 52	150	LAUS	New platform	Funded
Mission Tower-Burbank Junction	138	Metro	10 miles of two tracks CTC	Amtrak: 12 Metrolink: 55 +35 DHs UP: 18 Total: 85 CMF-BBJ	150	Glendale: holdout station	Second platform Sealed Corridor Project	Unfunded Ongoing
Burbank Junction-Van Nuys	146	Metro / UP	8 miles of two tracks CTC	Amtrak: 12 Metrolink: 20 +3 DHs UP: 18 Total: 50 BBH-VNuys	150	Van Nuys: holdout station 34 grade crossings	Second platform Sealed Corridor Project	Unfunded Ongoing
Van Nuys-Moorpark	174	Metro / UP	28 miles of single track with 4 sidings CTC Rayner	Amtrak: 12 Metrolink: 20 UP: 12 Total: 44	50	Raymer-Bernson Grade crossings	Double tracking Sealed Corridor Project	Unfunded Ongoing
Moorpark-Ventura (siding)	204	UP	30 miles of single track with 3 sidings CTC Moorpark to Camarillo ABS Camarillo to Ventura	Amtrak: 12 Metrolink: 6 UP: 10 Total: 28	35	Grade crossings	Sealed Corridor Project	Ongoing
Ventura-Santa Barbara	234	UP	30 miles of single track with 1 siding ABS	Amtrak:12 UP: 8 Total: 20	25	Sidings needed	Sidings project	Caltrans to fund
Santa Barbara-San Luis Obispo	351	UP	117 miles of single track with 13 sidings ABS	Amtrak: 6 UP: 8 Total: 14	35	Nothing immediate	None	None

Note: non revenue moves or dead head (DH) moves do not appear in total train counts, though they are identified above. The moves occur between:
Oceanside and the COASTER Stuart Mesa (SM) maintenance facility, four miles north of Oceanside.
Los Angeles Union Station (LAUS) / Mission Tower (MT) and the Central Maintenance Facility (CMF) at the former Taylor Yard, 3.5 miles north of LAUS.
CMF and the Burbank Bob Hope Airport (BBH), two miles north of Burbank Junction (BBJ).
Singaling systems on the corridor include higher capacity Centralized Traffic Control (CTC) and lower technology Automatic Block Signals (ABS).

According to the table, the track segments with the greater potential for additional train operations are between Laguna Niguel on the south and Van Nuys on the north, with the caveat that the BNSF Transcon segment's capacity may be too constrained to allow new service during peak commute periods. Still, Van Nuys is an unlikely northern terminus for train operations. Indeed, no passenger trains terminate there today. Some Metrolink trains terminate further north at Chatsworth.

However, the constraint going north is a single track segment between CP Raymer just north of Van Nuys Station and CP Bernson just south of Chatsworth. Furthermore, the single platform at Van Nuys is a constraint. While there is double track at Van Nuys, there is only a single platform south of the double track, requiring a train to "hold out", or stop short of the station, if an opposing train is already stopped there. Absent double track extending all the way to Chatsworth and new platforms at both Van Nuys and potentially at Northridge (a possible consequence of double tracking), the practical northern terminus for additional service on the corridor would be LAUS.

Parking Capacity

A LOSSAN Corridor rider survey (see Chapter 2) revealed that almost 60% of corridor train riders surveyed drive alone to their boarding stations (72% at suburban stations). Accordingly, the ability of corridor stations to provide adequate parking for the demand is essential to maintaining and building riders. On the following page, Table 1-3 shows the estimated capacity utilization of each of the 41 corridor stations, and thus indicates where improvements appear needed. Stations with parking demand at or near capacity ($\geq$90%) are highlighted in yellow.

Parking space counts and utilization at San Diego County stations was provided by NCTD. For the most part, parking space and utilization rates at Orange County and Los Angeles County stations were determined by January 2009 site visits. The exception was Northridge, whose lot was being resurfaced at the time of the visit, and thus the potential utilization rate is estimated. Parking spaces and utilization rates at Ventura County, Santa Barbara County, and San Luis Obispo County stations were provided by Ventura County Transportation Commission, Santa Barbara County Association of Governments, and San Luis Obispo Council of Governments respectively, with one exception. At Goleta, spaces and utilization were estimated from a satellite photo. Daily space counts naturally vary due to a variety of factors (e.g. site construction and repair and summertime vacations). Also, those cited below may have changed since when they were reported.

Parking spaces at metered, paid or permit lots are not cited. Parking spaces at the Ventura Station are in the county fairgrounds parking lot across Harbor Blvd., and thus are not cited. Parking spaces and thus utilization at Anaheim Station are estimated, as station lot is part of the Angel stadium lot.

Table 1-3: LOSSAN Corridor Station Parking			
	Station	Parking Spaces	Capacity Utilization
1	San Diego	0	n.a.
2	Old Town	350	100%
3	Sorrento Valley	118	76%
4	Solana Beach	250	84%
5	Encinitas	309	100%
6	Carlsbad Poinsettia	335	100%
7	Carlsbad Village	540	93%
8	Oceanside	1,200	83%
9	San Clemente Pier	Paid	n.a.
10	San Clemente	Paid	n.a.
11	San Juan Capistrano	Paid	n.a.
12	Laguna Niguel	280	90%
13	Irvine	1,652	35%
14	Tustin	304	102%
15	Santa Ana	582	83%
16	Orange	234	28%
17	Anaheim	400	89%
18	Fullerton	510	118%
19	Buena Park	300	105%
20	Norwalk	By permit	n.a.
21	Commerce	140	10%
22	Los Angeles	Paid	n.a.
23	Glendale	192	83%
24	Burbank	232	58%
25	Burbank Airport	Paid	n.a.
26	Van Nuys	323	49%
27	Northridge	250	100%
28	Chatsworth	480	70%
29	Simi Valley	400	90%
30	Moorpark	240	90%
31	Camarillo	220	90%
32	Oxnard	75	90%
33	Montalvo	55	90%
34	Ventura	At frgrds.	n.a.
35	Carpinteria	123	50%
36	Santa Barbara	Paid	n.a.
37	Goleta	90	50%
38	Surf	39	20%
39	Guadalupe	27	25%
40	Grover Beach	80	19%
41	San Luis Obispo	150	33%

Note: Space counts as of January 2009.

Chapter 2
FOCUS ON THE CUSTOMER

INTRODUCTION

The purpose of this chapter is threefold. First, it is to describe the attitudes, awareness and preferences of Metrolink, COASTER and Amtrak *Pacific Surfliner* riders traveling between Downtown Los Angeles and San Diego. This information was collected as part of an onboard intercept survey conducted between October 27 and November 5, 2008. This survey, targeting frequent corridor riders, was designed to gather information on service options in support of the *LOSSAN Corridor Strategic Assessment*[1].

Second it is to describe the characteristics, attitudes and general awareness of respondents within the entire LOSSAN Corridor study area that self-identify as non-riders. This information was collected as part of a computer-assisted telephone survey interview (CATI) survey conducted in December 2008. The design of the CATI survey instrument and sampling plan was intended to target non-riders, with a focus on attitudes and general awareness of train service along the LOSSAN Corridor. The findings of the rider and non-rider surveys are discussed separately below.

Third is to present an assessment of LOSSAN Corridor services' strengths, weaknesses, opportunities and threats (SWOT), using the market survey findings as a primary input.

The findings from the two surveys and the SWOT effort inform the crafting of a longer term strategic vision for the corridor – the subject of Chapter 3.

RIDER SURVEY

Collection Methodology

Trained surveyors approached every fifth passenger aboard the train to collect a random sample. The self-administered survey included 61 questions and took approximately 20 minutes to complete. The overall response rate for the onboard survey was 59%. Surveyors distributed and collected surveys for four service periods:

- Peak morning
- Mid-day
- Peak evening
- Saturday (Amtrak)

In total, the survey team collected 1,014 self-administered surveys for Amtrak *Pacific Surfliner*, Metrolink and COASTER services. The breakout per operator appears in Table 2-1 below. Overall, the onboard survey dataset has a +/- 3 % margin of error at the 95% confidence level.

[1] For comprehensive demographic and trip purpose profiles of LOSSAN Corridor riders, please see Amtrak *Pacific Surfliner*, Survey of Current Users, Spring 2008; COASTER, Survey of Current Users, Fall 2005; and Metrolink, 2008 Rider Survey, June 2008.

Table 2-1: LOSSAN On-board Survey Collection		
Operator	**Total Surveys**	**% of Total**
Amtrak *Pacific Surfliner*	416	40.9%
Metrolink	338	33.3%
Coaster	260	25.6%
TOTAL	1,014	100.0%

Commuting Patterns

On the trains surveyed, the majority of survey respondents (65%) are daily commuters, business travelers or part business/part leisure riders traveling for a work related purpose. Over half reported that they typically take the train on their daily commute, business trip or school trip, and that they ride between four and five days each week. Fewer than 30% reported that they drive alone on the days they do not ride the train. Less than half of respondents (44%) who reported riding less than three days a week state that they have no need to ride more frequently.

On the trains surveyed, 13% of respondents were using the train for recreational purposes and 7% for personal business on the day they were surveyed. Almost two thirds of respondents (65%) reported that they take the train for non-work related trips during other periods.

Additionally, most respondents live, work and go to school within a relatively short distance to train stations. Specifically, 77% of respondents reported living within 10 miles of their boarding stations, and 66% reported working within 10 miles of their destination station. More than half of all respondents (57%) reported that they drive alone from their home point to their boarding station when they start their trip from home, and almost three quarters (72%) reported that they drive alone from their home point to their suburban boarding station. Around 8% of respondents reported that they walk to their boarding station.

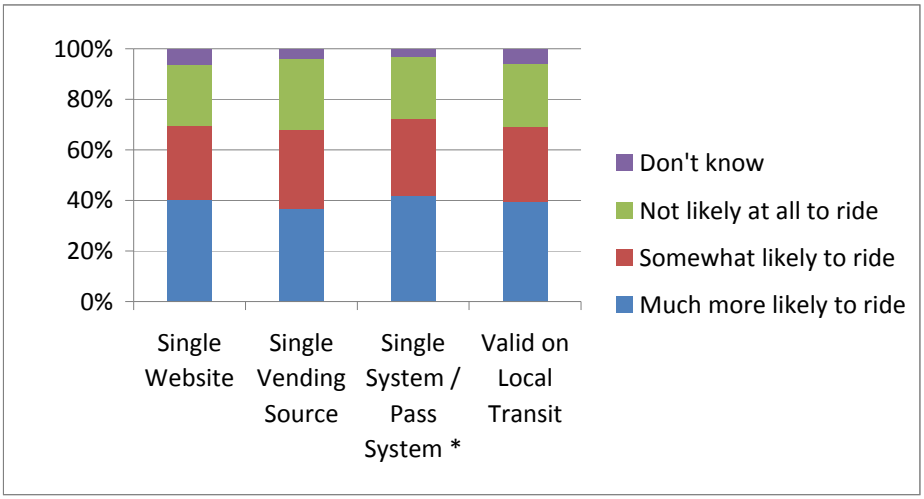
Service Options

In terms of service improvements, the majority of Metrolink and Amtrak respondents state that train service operating every 30 minutes between Laguna Niguel and Fullerton (64%) and Laguna Niguel and Los Angeles (50%) would not encourage them to ride more often. However, many survey participants respond favorably to improvements that attempt to increase Metrolink, COASTER and *Pacific Surfliner* coordination.

Figure 2-1 below illustrates commuters' general willingness to ride if these service improvements are enacted. There are four general findings:

- 40% state that they would be much more likely to ride the train if there was a single website that provided information about all transit service options between Los Angeles and San Diego.
- 37% state that they would be much more likely to ride if there was a single vending source and payment system.
- 42% state that they would be much more likely to ride if there was a single ticket/pass system.
- 40% state that they would be much more likely to ride if their tickets were valid for all local public transit services in the region.

Figure 2-1: Willingness to Ride after Improvements



* **Note:** A single ticket option exists for Amtrak and Metrolink today, i.e. Rail 2 Rail. Some respondents could have been unaware of this ticket type. Also, Rail 2 Rail is only for Metrolink monthly pass holders, not for cash fares.

Customer Satisfaction

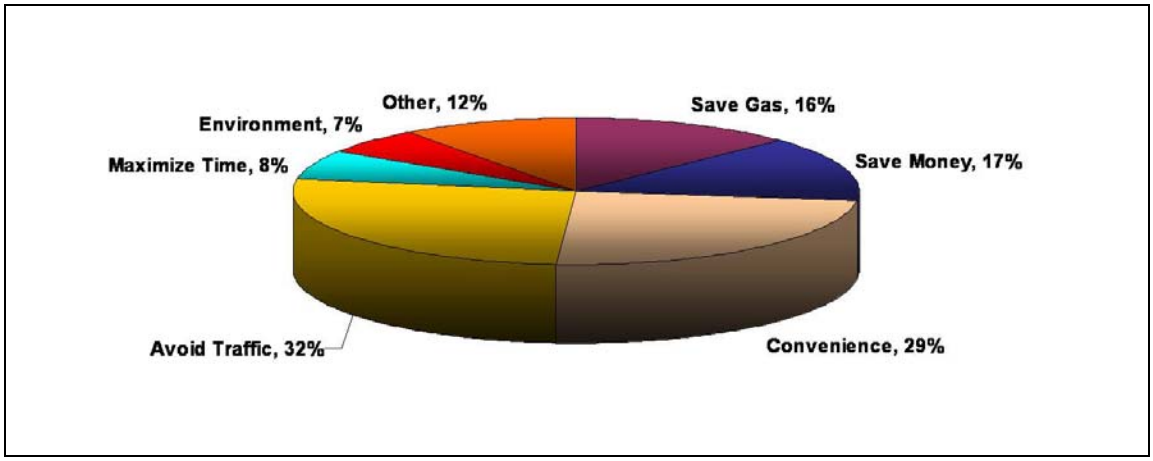
The service features that respondents are most satisfied with are their overall train experience, the friendliness and courtesy of on-board personnel and the ease of understanding train schedules and getting schedule information. The service features respondents are least satisfied with are real time accident/delay information, fares and the length of weekend and weekday service hours.

Those surveyed cite avoiding traffic (32%) and convenience (29%) as the primary reasons they began taking the train. These reasons are further illustrated in Figure 2-2 below.

Other factors that influence respondents' decisions to continue riding the train are frequency of service (49%), routes (46%), travel times (35%), fares (32%), on-time reliability (26%) and the length of weekday service hours (25%).

Customers surveyed are generally satisfied with on-time reliability and routes and as previously mentioned, less satisfied with travel times, frequency of service, length of weekday hours and fares. When asked to identify the most effective methods of enhancing the appeal of train service, the most frequently mentioned service features are more frequent service (57%), more peak hour service (44%), cheaper fares (42%) and later service (27%).

Figure 2-2: Reasons Respondents Began Taking the Train



Amenities

In terms of amenities, 56% of survey respondents state that Wi-Fi capability on-board trains would encourage them to take the train more often, although only 22% are willing to pay for the service. Other desirable amenities include electric outlets (38%), beverage and snack service (35%), television monitors (21%) and fold down trays (18%).

General Knowledge of Service Options

Knowledge of service options is relatively low among survey respondents. Less than half (41%) of respondents are familiar with the Rail 2 Rail program; for Metrolink riders, in particular it is 49%. Name recognition of the LOSSAN Corridor is also very low. Eight out of 10 respondents have never heard of the LOSSAN Corridor, and less than 11% percent of respondents are aware of the expansion plans along the corridor.

General Rider Characteristics

On the trains surveyed:

- Respondents frequently mention that the Internet (either search engine or a specific site) is their primary source for obtaining schedule information.
- 98% reported having access to the Internet at home, school or work.
- 85% reported attending college.
- 66% reported having obtained an advanced degree.
- 84% reported being employed at least part-time.
- 94% reported that English is the language that is primarily spoken at home.
- 49% reported an annual household income for more than $50,000.

A PowerPoint presentation of summary rider survey findings appears in the Appendix. Also appearing in the presentation is a summary of recent year corridor user survey findings. The summary was performed for this study. Surveys covered *Surfliner*, Metrolink and COASTER riders. Responses were categorized in terms of trip purpose, employment, age, and income.

NON-RIDER SURVEY

Collection Methodology

Interviewing Services of America (ISA) was contracted to administer and collect a random sample of 400 respondents who self-identified as non-riders in seven (7) geographic areas that comprise the LOSSAN study area from San Diego to San Luis Obispo. The telephone survey included 62 questions and took approximately 15 minutes to complete. The overall response rate for the telephone survey was 23%. Surveyors distributed and collected surveys for the following seven (7) geographic areas:

- San Diego – Oceanside
- San Clemente - Tustin
- Santa Ana – Buena Park
- Norwalk – Los Angeles
- Los Angeles – Oxnard
- Ventura – Goleta
- Goleta – San Luis Obispo (Central Coast)

In total, the survey team collected 2,012 telephone surveys, with a minimum of 400 surveys for the five sections described above (with section from Los Angeles to San Luis Obispo representing one combined segment).[2] The breakout per section appears in Table 2-2 below. Overall, the telephone survey dataset has a +/- 1.5 % margin of error at the 95% confidence level.

Table 2-2: LOSSAN Non-rider Survey Collection

Geographic Segment	Total Surveys	% of Total
San Diego – Oceanside	402	20.0%
San Clemente – Tustin	401	19.9%
Santa Ana – Buena Park	404	20.1%
Norwalk – Los Angeles	404	20.1%
Los Angeles – Oxnard	272	13.5%
Ventura – Goleta	52	2.6%
Central Coast – San Luis Obispo	77	3.8%
TOTAL	2,012	100.0%

Characteristics of Non-riders

The survey defines non-riders as respondents who reported not using the train within the last six months. The non-riders surveyed shared several common attributes that, when taken together, are major determinants of travel behavior and mode choice decisions. This section highlights several of these characteristics. First and foremost, there appears to be a strong link between vehicle access and mode of travel. The high propensity to travel via automobile among the sample that self-identified as "non-riders" correlates strongly with vehicle access:

[2] Note that the in Central Coast section, the survey was administered to respondents who self-identified as riders and non-riders. This was done to gather rider information in a section of the northern LOSSAN corridor that was not initially included in the rider survey study area, and for which no onboard rider survey data was collected. The surveys results related to this sample of riders is not included in this section.

- 95% of non-riders live in households with at least one vehicle.
- 70% of respondents reported they have two or more vehicles per household.
- 89% reported having a driver's license.
- 82% said they always have a vehicle available to them for their transportation needs, with only 6% saying "Never."

Another key factor influencing mode choice decisions relates to the proximity of the train stations to the origin and destination of the trips. Six out of 10 respondents reported having a train station close to home. However, of this subsample, only one in three respondents reported having a train station close to their work or final destination. Two in 10 respondents reported living and working close to a train station. It is this sub-sample that should be considered the target market for future LOSSAN service coordination marketing strategies.

Overall, a majority of non-riders indicated that their typical automobile trip was not severely congested: 58% of the non-rider respondents indicated that traffic along the route to/from their typical final destination was "lightly" or "moderately" congested. Another 12.4% indicated that traffic was "not congested at all." Only 26% indicated that their traffic was "heavily congested," which suggests that traffic conditions are not severe for a majority of non-riders.

Not surprisingly this survey found that if a car is available, if auto travel times are not impacted by congestion, and if trains do not serve locations where trips are destined, then the automobile will be the primary travel option.

Overall, there was a high level of awareness of train services along the LOSSAN Corridor among non-riders, although recognition of the name "LOSSAN Corridor" was very low (95% did not recognize the term). Some general observations:

- 68% of respondents living in the COASTER service corridor reported being familiar with COASTER service.
- 70% of respondents living in the Metrolink service corridor reported being familiar with Metrolink.
- 57% of all respondents reported being familiar with Amtrak's *Pacific Surfliner* service.

Other notable observations:

- Respondents reported that only 12% of their employers or schools offer a subsidy for train or bus fares, compared to 60% that do not offer.
- 52% said that they would consider taking the train if their fare was subsidized, versus 35% that said they would not.
- 40% of the respondents said the main purpose of their last trip by train was for "Recreation/Entertainment" and 32% for "Visiting friends or family." This indicates a potential willingness to use train service for non-time sensitive off-peak service, such as on weekends, when many of these activities tend to take place.

General Attitudes

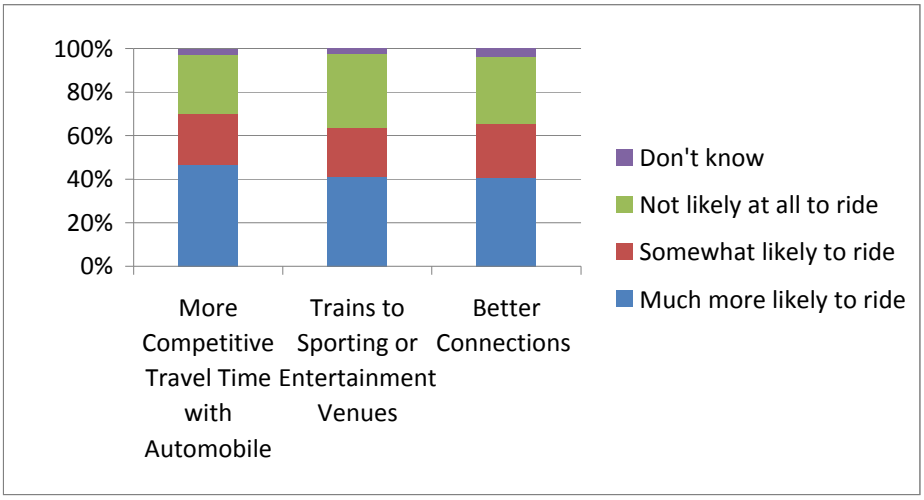
Overall, perceptions of train service along the LOSSAN Corridor among non-riders were generally favorable. One of the goals of the non-rider survey was to probe areas relating to train service improvements that might encourage mode shifts to train use. The non-rider survey specifically asked a series of questions probing what

service adjustment factors might make the respondent more likely to take the train. Several questions explore how perceived changes in the relative cost and convenience between automobile and train travel would make one more willing to take the train.

Figure 2-3 shown below illustrates three factors that would make non-riders "much more likely to take the train":

- 46% said they would be "much more likely" to take the train if they are more competitive with automobile travel times.
- 41% said they would be "much more likely" to take the train if they go to entertainment/sporting venues.
- 41% said they would be "much more likely" to take the train if there are better connections at train stations.

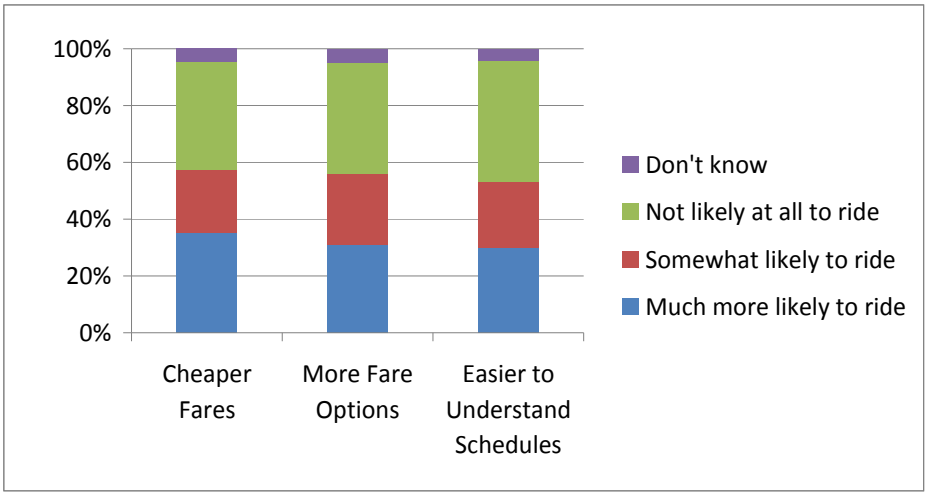
Figure 2–3: Auto Competitiveness and Convenience



There were several other factors that could positively influence the decision to take the train (Figures 2-4 and 2-5):

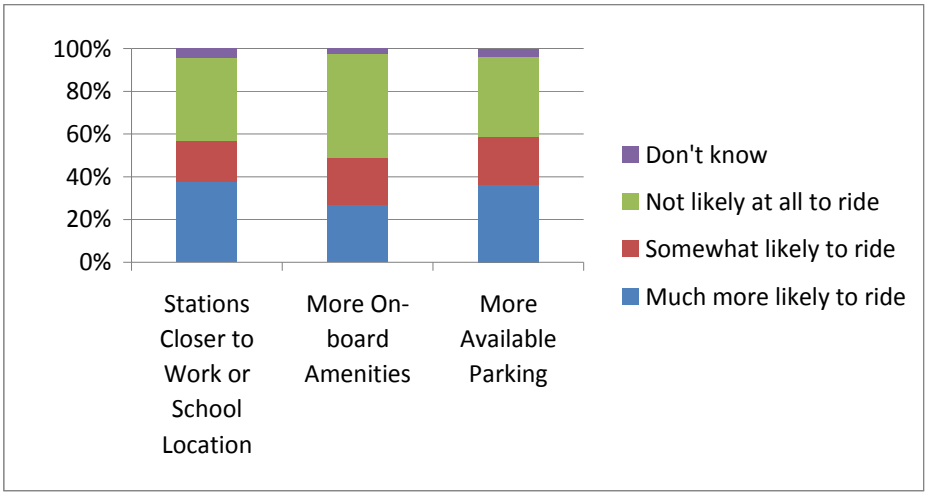
- 36% said they would be "much more likely" to take the train if train fares were cheaper.
- 31% said they would be "much more likely" to take the train if there were more fare options.
- 30% said they would be "much more likely" to take the train if train schedules were easier to understand.

Figure 2-4: Fares and Schedules



- 38% said they would be "much more likely" to take the train if stations were close to work or final destination.
- 27% said they would be "much more likely" to take the train offered more onboard amenities (Wi-Fi, CCTV, beverage service, meal service, electronic outlets, TV monitors).
- 36% said they would be "much more likely" to take the train if there was more parking at stations.

Figure 2-5: Stations and Amenities



Several factors, somewhat surprisingly, appeared to have little or no influence on their decision to take the train:

- 57% said that increases in gas prices would not at all play a factor in their decision to change from driving to taking the train to work, although 13% said that it would play a big factor.

- 51% said that increased traffic congestion would not at all play a factor in their decision to change from driving to taking the train to work, although 16% said that it would play a big factor.
- 67% said that more late night service would not at all influence their decision to take the train.

The survey also probed information about where non-riders seek information about trains. For non-riders who said they would switch to ride the train, 27% said they would likely get transit information from the Internet, 21% mentioned the train station and 12% cited Amtrak.com.

General Results

The survey of non-riders generally finds that automobile ownership per household and proximity to train stations are strong determinants of train usage. People who do not live and work close to a train station are unlikely to use the train. People who both do live and work close to a train station should be the target market for service enhancement strategies intended to make train use more attractive to non-riders. Traffic congestion, significantly impacting only about one quarter of all trips, by itself, is not a significant factor in motivating a mode shift from automobile to trains, especially if people have access to an automobile and a train station is not close to home or work.

In general, there were several factors that respondents reported would make them much more likely to take the train:

- Competitive with automobile travel times
- Service to major sporting/entertainment events
- Better connections at train stations
- More parking at stations
- Cheaper fares

With the exception of the "service to major sporting/entertainment venues" and "cheaper fares," the factors described above are all related to door-to-door travel time. The major conclusion to be drawn is that non-riders would like the overall door-to-door travel time to be comparable to that of the automobile, with sufficient parking at the origin station and good connections at the destination station. Overall, respondents indicated that gas prices and traffic congestion had little influence on their decision.

CORRIDOR SWOT ANALYSIS

A SWOT analysis typically is used by an organization to help its leaders figure out in which direction they should be moving their organization. Here specifically it is aimed at identifying critical policy issues and looking at ways in which services might be better coordinated.

Listed below are strengths, weaknesses, opportunities and threats of the LOSSAN Corridor. *Strengths* are those internal factors beneficial to ridership and ticket revenue growth, increased rider satisfaction, and improved cost recovery. *Weaknesses* are those internal factors detrimental to ridership and ticket revenue growth, rider satisfaction, and cost recovery. *Opportunities* are those external factors that will enhance the competitive position of the rail mode – resulting in increased ridership, ticket revenues and capital investment, and lower costs. *Threats* are those external factors that will make the rail mode less competitive – decreasing ridership, ticket revenues, and capital investment, and increasing costs.

Strengths

The LOSSAN Corridor has a number of key strengths:

- It serves a diverse vibrant market area with strong historic job and population growth that positions the LOSSAN Corridor for continued increases in ridership.
- The LOSSAN Corridor's service area has geographic features that force a relatively concentrated linear development pattern which is favorable to rail transportation.
- By focusing on serving its core markets of daily commuters (Metrolink and COASTER) and intercity travelers (*Pacific Surfliner*), ridership and ticket revenues have grown dramatically over the last 10 years despite the challenges of limited capital investment, operating constraints, and a collaborative organization style requiring consensus of different service providers with different priorities and perspectives.
- Despite differing priorities, the LOSSAN operators have continued to improve the system and provide vital services to their stakeholders.
- State participation and partnership with dedicated regional and local agencies.
- Without sacrificing service to the core commuter and intercity markets, the corridor operators have developed programs such as Rail 2 Rail, selected additional commuter stops on intercity trains, schedule trades and targeted joint ticket honoring, to facilitate usage by other market segments.
- Focus group, on-board surveys, and customer feedback indicates a ridership base loyal and generally satisfied with the service provided.
- The LOSSAN Corridor is a vital asset that can be expanded with additional tracks, enhanced train control technology (i.e. Positive Train Control with movable blocks), and station stops to accommodate future transportation growth with minimal land and environmental costs.
- Offering intercity as well as commuter service, the LOSSAN Corridor can tap two federal and state sources of capital funding.
- As represented by this study, there is some realization that near term actions need to be supportive of the long term vision for the LOSSAN Corridor.
- The corridor is overseen by the LOSSAN joint powers authority, giving JPA member agencies a venue to raise issues and plan for the future.
- The JPA venue provides opportunities for consensus building and JPA member buy-in.

Weaknesses

The LOSSAN Corridor faces a number of major structural challenges in maintaining its momentum:

- The hallmark of the LOSSAN Corridor's market area is dispersed development patterns. This places homes and job locations far from the rail line and limits potential ridership growth.
- Limited track and equipment capacity and other operational constraints limit near term expansion of both core markets (e.g. daily commuter) as well as new market opportunities (e.g. reverse commuter).
- Capacity and operational constraints negatively impact service reliability.
- The corridor has limited capital funding for capacity expansion, and there is no dedicated funding source for capital.

- Multiple ownership and the differing financial and political priorities create challenges in the decision making process.
- Multiple dispatching districts introduce differing priorities by route segment on a daily basis. For example, a Metrolink train operating with top priority south of Fullerton faces a far more complex operating environment north of Fullerton on the BNSF Transcon mainline. Circumstances sometimes force dispatchers of the Transcon Fullerton-Redondo Junction segment to give freight trains priority over passenger trains in order to maintain system fluidity.
- While Metrolink's sealed corridor program will reduce risks somewhat, the open nature of the right-of-way (grade crossings, trespassers, vandalism) limits top speeds and reduces service reliability.
- UP sometimes appears to feel that the benefits of additional capacity to its freight operations during the off-peak hours does not offset the hindrances to its operations of passenger rail service on the same line.
- There is no corridor-wide service plan.
- Between Oxnard and Santa Barbara, environmental and quality of life concerns are slowing capital investment that was recommended in the *LOSSAN North Corridor Strategic Plan*.
- As has been noted in on-board surveys, the majority of intercity riders and commuters use the automobile to access the rail station. Except in dense downtown areas, the market as a whole shows a reluctance to use transit connections that are perceived as time consuming.
- As a result, there is a strong linkage between station parking capacity and ridership growth. The consequence is that increasing ridership, even during the mid-day, off-peak period, requires expensive and time consuming parking lot expansions.
- Different revenue collection processes with conductor ticket lift on intercity trains and the no lift system on Metrolink/COASTER trains makes joint fares a challenge since there is no record of usage on the Metrolink and COASTER trains. Also, public funding makes it difficult to arrive at revenue sharing agreements that satisfy all stakeholders for joint tickets where there is no usage tracking.
- Achieving the long term service vision may require key tradeoffs on issues important to some stakeholders.
- While the Southern California Association of Governments (SCAG), through its interregional demand modeling effort, has begun to recognize the impact of intercity travelers on traffic congestion, many planners/stakeholders still tend to focus solely on their jurisdictions. As a result, it is difficult for them to recognize that the typical intercity traveler impacts highway usage across multiple highway congestion areas.
- LOSSAN's collaborative organizational structure combined with local political concerns sometimes makes decision making challenging and time consuming.
- The corridor JPA has no direct control over operators, making resolution of problems more challenging.
- Fluctuations in the state budget for capital and operating funding hinder mid and long range planning.
- Standing-room-only conditions on-board intercity trains degrade customer experience and cause a potential safety issue.

Opportunities

Despite all the challenges faced by the LOSSAN Corridor, there are significant opportunities on the horizon for expanding service:

- The current economic difficulties will dramatically slow the near term development. This could slow current dispersed development trends. It may also provide an opportunity to implement SB 375, the Sustainable Communities Act (also known as the Smart Growth Climate Change Bill) and foster more transit oriented development as the economy rebounds.
- Significant new capital funding flows are on the near term horizon (e.g. 2009 American Recovery and Reinvestment Act economic stimulus), Positive Train Control funding, Proposition 1B commuter/intercity rail funds, Proposition 1A connecting commuter/intercity rail funds.
- Significant long term capital funding may become available as political interest in rail increases (e.g. intercity rail capital grant program contained in the five-year Amtrak authorization bill, inclusion of intercity rail in the upcoming surface transportation authorization bill, and the new national focus on energy efficiency/carbon reduction/alternative energy such as AB 32, the Global Warming Solutions Act, which sets forth aggressive goals to reduce greenhouse gas emissions in California).
- Santa Barbara County's interest in expanded rail service may help speed the implementation of additional capital investment within the county.
- Development of agreements, such as Rail 2 Rail, Amtrak Chargers Express fare promotion, etc., that would facilitate revenue sharing between carriers for tickets that can be used on several services.
- Establishing the California High-Speed Rail Service in the corridor will present existing corridor operators Amtrak and Metrolink the opportunity to handle riders to and from connecting points LAUS and the Anaheim Regional Transportation Intermodal Center. Furthermore, ARTIC-related development will result in additional local ridership on Metrolink and Amtrak.
- Utilization of an electronic fare collection system to facilitate service integration and transfers between the various agencies' services. It may take several years for the technology to develop to establish such a system.
- Implementation of Positive Train Control could increase train speeds and track capacity without the associated capital investment in track.
- As shown in the market research for this study, all passenger market segments agree on the top priorities. Additional peak hour frequencies, a one-stop information source, later service hours, fare/ticket flexibility, and cheaper fares are the key preferences. They also desire to have their commuter or intercity ticket accepted for travel on all local transit agencies serving the LOSSAN Corridor.
- The ongoing service integration study provides an opportunity to focus on the long term service vision. As a result, near term changes supportive of the vision can be chosen rather than service changes such as adding stops every two or three miles between Fullerton and Laguna Niguel, which could undermine long term ridership growth.
- City, county and state investment to protect coastal areas and sensitive marsh areas from rising sea levels/winter storms could provide an opportunity to realign and expand the capacity of the rail line.

Threats

While the many opportunities appear to forecast strong future growth, there are substantial external threats that could undermine the service:

- The economic downturn could become a 10-year stagnation resulting in less economic growth, anemic job creation, fewer trips/ticket revenues, and reduced tax revenue for operating and capital grants.
- Continuation of dispersed development patterns placing jobs and homes far from the public transit lines.
- Restrictive state legislation and increased Public Utilities Commission authority regarding rail safety and train operations.
- Successful local resistance to rail capacity expansion.
- An unfunded requirement for Positive Train Control may result in diversion of capital funds from needed capacity projects.
- Local agencies failing to acknowledge the financial risk in decisions such as adding additional closely spaced stops that make the intercity rail travel product less competitive.
- Potential that LOSSAN's members may not be able to overcome all the challenges arising from its collaborative organizational structure, and will be unable to agree on actions required to achieve the long term vision.
- Stakeholders too focused on optimizing the corridor for local constituencies within existing resources rather than focusing on the long-term total market potential of the entire LOSSAN Corridor.
- Pressure from developers, cities and agencies to add multiple stops (two or three-mile spacing as per Caltrain on the San Francisco Peninsula) for the Orange County Shuttle between Fullerton and Laguna Niguel.
- HSR implementation on the corridor between LAUS and ARTIC could result in complex service integration challenges.
- Rising sea levels combined with stronger winter storms could put significant segments of the corridor rail line at risk.

WORKING TOWARD A LONG TERM VISION

The preceding discussions of rider and non-rider surveys and the SWOT analysis indicate that the LOSSAN Corridor clearly has strengths and opportunities that will position it to grow dramatically in the coming decades. However, it is critical that LOSSAN Rail Corridor Agency members continue to successfully collaborate, working as one in improving the service and overcoming the challenges outlined in this chapter.

One key strategy is to define the long term service vision for the corridor, both in terms of the number of frequencies for each carrier as well as the primary, secondary and overlapping markets for each carrier. The goal is to maximize the rail mode's share in the corridor, with ridership gained by serving new markets as well as improving service to users of existing services through service expansion and improved connectivity. Once this long term service vision is defined it will be easier to identify counter-productive actions proposed during the intermediate years when some service compromises/tradeoffs may be required. Also having a clearly defined service vision where the ultimate benefits are clearly outlined will help the LOSSAN Corridor agencies stand as one when other corridor stakeholders advocate counter-productive service changes.

In crafting the long term vision, LOSSAN agencies will have to develop creative solutions in order to implement rider priorities. They may also need to revisit some of the prior assumptions. The reason: while the riders show a high degree of consistency in their priorities, their preferences create several conundrums. For example, additional frequencies top the list, but doing this is very difficult during the peak period when

track capacity is at a premium. Connecting Fullerton-Laguna Niguel frequencies to increased 91 Line service and perhaps implementing some "fleeting" (e.g. express trains followed closely by locals) could help implement this priority.

Riders also want lower fares. Lower fares across the board, if implemented, could potentially create financial risk: though ridership may increase, service quality and revenue contributions could be diluted. But fare/ticket flexibility, netting riders more convenience and thus an indirect savings, is possible. It can be assumed that riders will support fare/ticket flexibility, but they predictably will be unwilling to pay a premium. Focusing the fare flexibility issue on 10-ride and monthly ticket types, while studying the implementation of an interactive fare collection system, could address this issue.

But speaking directly to lower fares, some action might occur. Applying weekend commuter fare levels to mid-day commuter rail frequencies, a period where there is excess capacity, will position commuter rail as the "discount carrier", thus expanding the corridor market.

Station access is a critical issue. Currently most riders drive from their homes to their originating train station. Some also leave automobiles at their destination station parking lot. If the current rider/parking requirement remains unchanged, growth cannot occur without investment in parking capacity. Addressing this issue with improved transit access is probably one of the top priorities.

Also high on riders' priorities is to have their commuter or intercity ticket honored by all local transit agencies. Since most of the LOSSAN Corridor transit agencies are honoring commuter rail tickets, awareness of this service may be an issue. Also expanding current agreements to cover intercity travelers would be of benefit. Establishment of a corridor-wide electronic fare system would facilitate journeys that today require multiple tickets. That noted, it may take years to develop the technology making such a system practical.

Finally, riders indicate a desire for a single information website. One such site could easily be established. However, the pitfall of such a concept is website maintenance. How will such a site be maintained? Whose responsibility will it be to make sure all information appearing on the site is up-to-date? One solution might be the creation of an "umbrella" website, with links to corridor operators' schedules on the respective operators' websites. In turn, those schedules could show connections with other carriers, and thus provide answers to inquiries pertaining to trips on two or more corridor carriers.

An example of improve information distribution is Amtrak's Twitter messages. Via this system, Amtrak distributes electronically messages concerning service problems to Twitter subscribers.

Chapter 3
LONG TERM CORRIDOR SERVICE VISION

INTRODUCTION

This chapter defines a long term service vision for the LOSSAN Corridor. The effort here has been to base the vision on what users and potential users of corridor services – *Pacific Surfliner*, Metrolink and COASTER – say about what is important to them. The results of recent corridor rider and non-rider surveys and SWOT analysis discussed in Chapter 2 were primary inputs. Based on the vision, specific service improvements and attendant capital improvements are cited. The analysis takes into account both freight train volumes and future California High-Speed Rail service on the corridor.

SERVICE OBJECTIVE

The project goal has been to craft a long term vision for the LOSSAN Corridor grounded in what existing and potential customers want. To this end, the study surveyed both the existing riders and well as non-riders for their input. The former were surveyed on board corridor trains in October and early November, 2008. The non-riders were surveyed via telephone in December. Both sets of results combined with the SWOT analysis, were the primary input to the development of a long term corridor vision.

The two main themes reflected in the survey results were the desire for more train frequency and for more fare flexibility with no increase in price, if not lower fares.

Also in late 2008, the Project Partners provided their guidance to the formation of service alternatives. Specifically, the Partners urged the study effort to:

- Define a vision, free of concerns regarding capacity constraints.
- Focus on building the network, by maximizing the potential of connections.
- Revisit the basics of the service and markets served, perhaps even by trading markets between carriers.
- Provide a consistent level of service through the corridor. That is, ensuring equity by providing for realizable benefits for all Project Partners.

Survey results and Project Partner input point to an overarching service objective, i.e. making the LOSSAN Corridor more convenient to use. The premise is straightforward: if the corridor had more trains, if the trains were more interconnected, and if transfers were easier to make, then additional riders would be drawn to corridor trains.

SERVICE VISION SUMMARY

The input received from both the train riders and the Project Partners enabled the development of a long term vision for the LOSSAN Corridor achievable in the 2020-25 timeframe. In brief, its key elements are:

- Hourly bi-directional expedited *Pacific Surfliner*s between Los Angeles and San Diego.
  - 32 limited stop trains supplemented by four one-stop (mid-route) express trains.

- Short average weekday headways, including intercity and commuter trains (assuming 16 hours of operation), on the southern portion of the corridor:
  - 15-minute headways between Los Angeles and Fullerton.
  - 19-minute headways between Fullerton and Orange.
  - 14-minute headways between Orange and Laguna Niguel.
  - 40-minute headways between Laguna Niguel and Oceanside.
  - 21-minute headways between Oceanside and San Diego.
- Improved rail connections at Oxnard, LAUS, Anaheim, Laguna Niguel, and Oceanside.
- Improved transit connections aiding off-peak travel.
- Interactive electronic fare collection system enabling the lowest allowable fares.
  - System combines market driven pricing with ease of payment.
- Hierarchy of services from express to local.
- Expansion of *Surfliner* service between Los Angeles, Santa Barbara and San Luis Obispo.
- New commuter rail service between Ventura County and Santa Barbara.

While the vision outlined above is appropriate for the long term, it must be approached in steps. Accordingly, there should be a phasing of the vision, with improvements added incrementally. Service scenarios were developed for three sequential time periods.

- Near term: 2011-15
- Intermediate term: 2015-20
- Long term: 2020-25

Each time period includes service improvements which build on each other, as described below.

It is important to remember that outer year corridor rail operations will occur with California High-Speed Rail service implementation. HSR trains will traverse the corridor between Burbank Junction, LAUS, and Anaheim. The connecting points will be LAUS and ARTIC. The high volumes of Metrolink and Amtrak trains in future years will enable these corridor services to move riders efficiently to and from the HSR connections. Furthermore, they will serve riders bound to and from ARTIC-related development.

SERVICE IMPROVEMENTS

The starting point for this analysis is the number of trains running in each passenger service in 2008, the baseline year. Added are four scenarios with proposed service improvements for 2011-15, 2015-20 and 2020-25A and 2020-25B. These, along with freight train volumes[1], appear in Table 3-1 below.

[1] Current freight train volumes reportedly have decreased, a result of the present economic downturn. Various factors may inhibit future freight train growth. These could include diversion of container ships through an enlarged Panama Canal, thereby reducing demand for transcontinental container train services to and from San Pedro Bay ports. Also, BNSF may run longer trains, transporting higher container volumes that way as opposed to running more trains. For example, average container trains could reach 10,000 feet in length, versus around 7,500 feet today. Still, it is reasonable to assume that that BNSF will insist on the higher train volumes experienced in 2008 as its baseline, from which to negotiate for more passenger train access.

Table 3-1 Service Summary					
LOSSAN South	2008 Baseline	2011-15	2015-20	2020-25A	2020-25B
Amtrak *Pacific Surfliner*	22	30	32	36	36
Orange County Line	19	26	28	50	50
Irvine	3	0	0	0	0
Laguna Niguel	6	16	18	38	50
Oceanside	10	10	10	12	0
IEOC Line	16	24	26	40	50
Irvine	3	0	0	0	0
Laguna Niguel	5	24	26	40	50
San Juan Capistrano	2	0	0	0	0
Oceanside	6	0	0	0	0
91 Line	9	20	24	40	30
COASTER	22	30	36	54	54
Orange County Shuttle	0	14	14	14	2
Fullerton-San Diego Shuttle	0	0	0	0	12
BNSF LA-Barstow	48	70	86	102	102
BNSF SD-Barstow SD	4	6	8	8	8
BNSF La Mirada-Santa Ana	2	2	2	2	2
UP South Anaheim-Santa Ana	2	2	2	2	2
Amtrak *SW Chief*	2	2	2	2	2
LOSSAN North	2008 Baseline	2011-15	2015-20	2020-25A	2020-25B
Amtrak *Pacific Surfliner* to/from SB	10	12	12	14	14
Amtrak *Pacific Surfliner* to/from SLO	4	6	6	8	8
Antelope Valley Line	24	32	42	46	46
Ventura County Line	20	28	34	42	42
Chatsworth	4	0	0	0	0
Moorpark	10	0	0	0	0
Montalvo	6	28	34	42	42
Burbank Turn	11	12	8	8	8
SB Commuter Rail	0	6	6	8	8
UP Saugus Line	6	6	6	6	6
UP Coast Line	12	12	12	16	16
Van Nuys (Gemco)	2	2	2	2	2
Oxnard	2	2	2	4	4
San Luis Obispo	8	8	8	10	10
Amtrak *Coast Starlight*	2	2	2	2	2

Note: In Scenario 2020-25B, the Orange County Line trains operating in previous scenarios to and from Oceanside operate instead to and from Laguna Niguel. For the most part, Orange County Shuttles become regular Orange County Line trains. Two shuttles remain, performing short flips between Fullerton and Laguna Niguel. In both outer year scenarios, 30-minute Orange County Line service is achieved. In 2025A, it is achieved with a combination of Orange County Line and Orange County Shuttle services. In 2020-25B, it is achieved with a combination of Orange County Line, Orange County Shuttle and a new Fullerton-San Diego Service, which is discussed later in this chapter.

Note that 2020-25 has two alternatives. The second alternative, Scenario 2020-25B, assumes that the growth in travel demand between the Inland Empire and Orange County is far greater than anticipated, eclipsing that between the Inland Empire and Los Angeles County. As a result, in Scenario 2020-25B, 10 Metrolink 91 Line trains are shifted to the IEOC Line vis a vis Scenario 2020-25A.

Alternatively, 10 Metrolink 91 Line trains could operate in a split route service. That is, one train would have two locomotives and two sections – a 91 Line section and an IEOC Line section[2]. Coming westbound from Riverside, the train would be split at Fullerton, with the 91 Line section continuing to LAUS and the IEOC Line section heading south to Laguna Niguel. In such a case, the number of 91 Line trains would remain the same as in 2020-25A.

Service levels for 2008 and future years were developed from various sources. These included the following.

- 2008 passenger frequencies are from summer 2008 schedules.
- 2008 BNSF and UP freight volumes were per research connected with the 2009 Metro-sponsored *DMU Technical Feasibility Study* and the 2008 Metro-sponsored *Multi-County Goods Movement Action Plan*. SCRRA also provided information on train counts.
- Future *Coast Starlight*, *Southwest Chief*, *Pacific Surfliner*, COASTER and Santa Barbara commuter rail volumes were per the 2007 *LOSSAN Corridor Strategic Business Plan*, sponsored by the LOSSAN Rail Corridor Agency and Caltrans. While COASTER's 54 weekday trains are now anticipated for 2030, all are shown here to reflect a fully fleshed out network by 2025. COASTER's 2011-15 and 2015-20 volumes are recently per SANDAG, developed since the 2007 *Business Plan*.
- Future Metrolink service levels were based on 2015, 2020A and 2030B scenarios in the 2007 *SCRRA Commuter Rail Strategic Assessment*.
- Volumes for all passenger rail services cited in the aforementioned plans were moved up in time to reflect a fully fleshed out network by 2025.
- Orange County (Fullerton-Laguna Niguel) Shuttle frequencies were developed by for this study.

Scenario 2011-15, the near term alternative, represents greater service improvement and integration relative to the 2008 baseline. Scenarios 2020-25A and B, the long term alternatives, represent options for a full-build vision of even further service expansion and integration. Scenario 2015-20, the intermediate alternative, bridges the near and long term concepts.

All scenarios proposed here achieve a theme expressed in the ridership survey conducted for this analysis. That is, greater frequency along the LOSSAN Corridor. Key assumptions related to specific future years are as follows.

Near term (2011-15)

- Frequencies identified in aforementioned plans are implemented. These include Orange County Shuttles and Santa Barbara commuter rail service, additional Metrolink frequencies, and additional *Pacific Surfliners* north and south of LAUS.
- Two limited stop Los Angeles-San Diego *Pacific Surfliners* are added.
  - Intermediates stops could include Solana Beach, Oceanside, Laguna Niguel, Anaheim and Fullerton.
  - A ridership forecast would determine the optimum station stop pattern for limited stop trains.
- Interregional 10-Ride and Monthly Fares are instituted from points south of Oceanside to points north of Oceanside.

[2] A minimum time estimate for splitting a train would be enough for break tests in both sections, that is, about 10 minutes.

  - An on-line customer survey is used to validate usage; agencies adjust revenue allocation formulae based on surveys.

- An umbrella internet site is established with links to carrier websites to provide one site for corridor train and connecting transit information. Site establishment will require cooperative efforts among the rail carriers, connecting transit agencies and 511 to improve on-line trip planning tools.
- All *Surfliner*s stop at Laguna Niguel. Service to San Juan Capistrano is reduced and targeted toward day tours. This change away from San Juan Capistrano facilitates service integration: it improves Metrolink and Amtrak connections while maintaining current run times. Summertime stops at San Clemente Pier and other special stop service would continue.
- Shuttle buses to San Juan Capistrano and San Clemente meet all trains at Laguna Niguel.
- Improved connections are established at Los Angeles Union Station (LAUS) between Metrolink routes.
- Development of partnerships with local transit agencies to improve access to the LOSSAN Corridor.
- OCTA improves transit links between Fullerton, Anaheim, Anaheim Canyon, and Orange. This improvement will ensure that riders of any Orange County Line, Orange County Shuttle, and IEOC Line train can reach either Anaheim, Anaheim Canyon, or Fullerton by connecting transit if not by rail.
- Common fare policies, e.g. age requirements for discounts, are pursued where appropriate by commuter rail and transit agencies. This action is aimed at maximizing the potential to move riders to and from stations by transit and would be part of a strategy to mitigate the need for expensive parking expansions.

Regarding the last item, it is important to note that changes to *Surfliner* fare policies would have broad implications on other state sponsored services. For this reason, any rationalization of intercity fare policies with commuter rail and transit agencies becomes problematic. However, given similar markets and revenue goals, it may be appropriate to coordinate fare policies between LOSSAN intercity service and the new California High-Speed Rail Authority service.

Intermediate term (2015-20)

- Frequencies identified in aforementioned plans are implemented.
- Two limited stop Los Angeles-San Diego *Pacific Surfliner*s are added.
- Timed transfers between commuter and *Surfliner* trains are established at Laguna Niguel and Oceanside.
- Corridor-wide Thru Fares are implemented linking *Surfliner* and commuter trains via the key connecting points of Oxnard, Los Angeles, Fullerton, Laguna Niguel and Oceanside.
  - Platform scanners and validators are installed at all stations for revenue allocation among carriers.
- Development of an interactive electronic fare collection system is initiated.

Regarding the last item, it is critical that transit agencies and commuter rail operators begin working toward the establishment of an interactive electronic fare collection system for all corridor trains. Many if not all of these agencies today are working on such a system. The point is, their development should not preclude the development of a system for the corridor. Essential specifications for a system would be:

- Possesses interoperability: the system works on all LOSSAN and connecting transit carriers.

- Captures origin/destination (O/D) data and specific train(s) used for each ride.
- Captures and allocates revenue between carriers based on O/D data.
- Tracks connections to allow for Thru Fare discounts.
- Tracks number of trips to allow multi-ride discounts.
- Generates ridership and revenue data for carriers.

Implicit in a future system deployment will be a "back office" system for revenue allocation.

Long term (2020-25A and 2020-25B)

There are two long term scenarios. Scenario 2020-25A assumes for the most part the service frequencies that appear in previous planning efforts. Scenario 2020-25B, on the other hand, anticipates some changes, driven in part by future work patterns different from those reflected in previous plans and in part to make operations more efficient between Fullerton and San Diego.

Scenario 2020-25A

- Frequencies identified in aforementioned plans are implemented.
  - Plans include major local service expansions between San Diego and Oceanside and between Los Angeles and Laguna Niguel.
- The 32 planned *Pacific Surfliner*s become limited stop trains.
  - Stops could include Solana Beach, Oceanside, Laguna Niguel, Anaheim, and Norwalk.
  - A ridership forecast would determine the optimum station stop pattern for limited stop trains.
- Four Los Angeles-San Diego express, or one-stop (mid-route), *Pacific Surfliner*s are added.
- *Surfliner*s north of Los Angeles could see station rationalization as well.
- Interactive electronic fare collection system becomes the corridor standard.

Per the second bullet above, Fullerton is dropped from the list of *Surfliner* stops and Norwalk is added. The switch to Norwalk has two reasons. First, Norwalk offers better station spacing: the distance between Fullerton and Anaheim is just five miles. Second, Norwalk's proximity to the Metro Green Line and I-605 improve access to the corridor for two large residential areas of the Los Angeles Basin – the South Bay area and the San Gabriel Valley.

Anaheim is retained over Fullerton as a *Surfliner* stop for three key reasons. Anaheim provides good access for Pomona Valley residents via SR-57. Also, it is an officially designated terminus for the California High-Speed Train project. Lastly, it will be adjacent to the planned Anaheim Regional Transportation Intermodal Center, a major job and event center and termini for HSR. As noted in the Chapter 2 SWOT analysis, *Surfliners* and Metrolink could handle HSR ridership to and from ARTIC Station, as well as ridership generated by ARTIC-related development.

Establishing the interactive electronic fare collection system addresses the other key theme expressed in the ridership survey. That was for fare flexibility. By offering seamless connectivity, an electronic system will make life better for riders. With an electronic system as the corridor-wide fare medium, transfers between trains of any type will be easier to do.

Scenario 2020-25B

- *Surfliner* and interactive electronic fare collection system improvements are implemented per Scenario 2020-25A.
- Laguna Niguel becomes southern terminus for Orange County Line trains.
  - 12 Orange County Shuttles become Orange County Line trains.
  - 2 Orange County Shuttles are retained, performing short flips between Fullerton and Laguna Niguel.
- To improve service and facilitate COASTER/Metrolink equipment pooling, a new peak hour route, Fullerton-San Diego Service, is established:
  - Some Metrolink trainsets would overnight in San Diego making their first trips to Fullerton.
  - Some COASTER trainsets would overnight in Fullerton making first trips to San Diego.
- Where practical, Fullerton-San Diego trains will connect to 91 Line trains at Fullerton, providing additional service to Los Angeles for San Diego County residents.
- IEOC Line service increases and 91 Line service decreases by 10 trains relative to Scenario 2025A.
  - This change assumes greater than anticipated Inland Empire-Orange County travel demand versus Inland Empire-Los Angeles travel demand.
  - An alternative would be to operate the 10 trains in a 91 Line/IEOC Line split route service.
- Selected IEOC Line trains operate to and from San Diego on weekends in order to serve leisure destinations.

Scenario 2020-25B could test whether peak hour fleeting of some *Surfliner*, 91 Line and Orange County Line trains between Los Angeles and Fullerton would result in additional passenger train capacity along that segment.

Relative to the third bullet, I-5 traveler data gathered by Caltrans shows that San Diego County-Orange County commuter traffic outweighs San Diego County-Los Angeles County traffic by six-to-one; the new Fullerton-San Diego route would serve that demand. Furthermore, the new route would facilitate Metrolink/COASTER equipment pooling, thereby lowering both capital and operating costs. The same kind of benefits would be realized with IEOC weekend trains running to/from San Diego, per the last bullet.

Relative to the fifth bullet, any change away from 91 Line volumes would require the concurrence of the Riverside County Transportation Commission.

FUTURE TRAIN COUNT SUMMARY

The weekday train counts appearing in Table 3-1 are fitted to specific corridor segments in Table 3-2, including freight volumes. No high-speed trains are included in these counts.

Table 3-2: Segment Summary					
LOSSAN South	2008 Baseline	2011-15	2015-20	2020-25A	2020-25B
Los Angeles - Fullerton	102	150	174	232	222
Fullerton - Orange	45	74	78	104	104
Orange - Laguna Niguel	65	104	112	152	162
Laguna Niguel - Oceanside	44	46	50	56	56
Oceanside - San Diego	48	66	76	98	98
LOSSAN North					
Los Angeles-Burbank Junction	85	104	116	134	134
Burbank Junction-Van Nuys	44	54	60	74	74
Van Nuys- Moorpark	42	52	58	72	72
Moorpark-Ventura	28	52	58	72	72
Ventura-Santa Barbara	20	28	28	34	34
Santa Barbara-San Luis Obispo	14	16	16	20	20

The busiest segment is Los Angeles-Fullerton. This is driven by high freight and passenger train volumes. Scenario 2020-25B has fewer trains on this segment versus 2020-25A, reflecting fewer 91 Line trains. At the same time, there are more IEOC Line trains in 2020-25B operating between Orange and Laguna Niguel versus 2020-25A. A split route service would allow 91 Line train volumes to remain per 2020-25A.

These enhancements comply with the service objective derived from the rider and non-rider surveys, and from the guidance offered by the Project Partners, i.e. making the corridor more convenient to use.

CAPITAL IMPROVEMENTS

Three capital improvement categories are discussed below: the infrastructure needed to support the future service levels, the potential need for grade crossing separations, and rolling stock.

Infrastructure Improvements

Various infrastructure improvements will be required to support these aforesaid service levels. The yard stick used to identify where improvements may be required is practical capacity, i.e. the number of trains that specific line segments can handle efficiently per day. Table 1-1 in Chapter 1 presented practical capacity limits in terms of trains per day for single and double track. To be clear, these limits are for overall guidance. The precision required for definitive assessments of capacity typically is achieved through operations simulation, which the study team to date has not undertaken. Nevertheless, Table 1-1 quantified in general terms the throughput that could be expected with specific track configurations. Table 3-3 below is a modification, in that it shows the practical capacity of triple and quadruple track *in italic*. Both triple and quadruple track configurations have been planned for the busiest section of the corridor, i.e. between Redondo Junction and Fullerton.

Table 3-3: Practical Rail Line Capacities			
Track Configuration	**Minutes between Sidings**	**Minutes of Headway**	**Practical Capacity in Trains per Day**
Single Track	15		50
	20		35
	30		25
Double Track		10	150
Triple Track		*10*	*200*
Quadruple Track		*10*	*300*

In a triple track configuration, the third track is typically used for overtakes, where a faster train passes a slower one or one stopped at a station. It is not used all the time at full capacity. So, the incremental capacity could conservatively be estimated as one-third that of one track in a double track configuration, or about 50 trains per day, resulting in a practical capacity for triple track of around 200 trains per day. Quadruple track allows for a separation of freight and passenger trains, with two tracks for each. Thus its theoretical capacity would be twice that of double track, or about 300 trains per day.

By applying these limits to the train counts in Table 3-2, the study team developed most of the infrastructure improvements listed below linked to specific time periods. All of the improvements were identified in separate efforts and documents, though the specific timing of the improvements suggested here may differ. The list pertains to track capacity improvements only.

LOSSAN South

- *Los Angeles-Fullerton:* Triple track required now. While the segment may not have reached its theoretical capacity limit, there is little to no room today for more peak period service. Quadruple track required by 2020-25.
- *Laguna Niguel-Oceanside:* Siding improvements and some double tracking required by 2020-25.
- *Oceanside-San Diego:* Capacity improvements that result in an additional 10 miles of second track are required by 2011-15. Additional second track and perhaps bypasses of critical segments are needed by 2020-25.

While the Orange-Laguna Niguel segment would be at or near its theoretical limits by 2020-25, it is important to remember that the 150-trains-per-day figure is based on 10-minute headways. Such headways are driven by considerations of long freight trains with long stopping distances. However, on this segment, passenger trains predominate, and freight trains are few. Thus it is reasonable to assume that more than 150 trains per day can operate on the segment.

Also suggested for the near term 2011-15 period are run-through tracks at LAUS, given the anticipated increases in *Surfliners*. The improvements will expedite *Surfliners* through Los Angeles, as locomotive engineers will no longer have to change push-pull train ends. The improvement would better connectivity and reduce travel time for the *Surfliners* and Metrolink Orange County Line and 91 Line trains.

LOSSAN North

LOSSAN North capital improvements achieve two network benefits. First, the lack of capacity north of Los Angeles negatively impacts the on-time performance of the intercity trains (and connectivity to commuter

trains). Second, improved capacity north of Los Angeles would facilitate more timely connections between Metrolink routes. The suggested track improvements are as follows.

- *Los Angeles-Burbank Junction:* Second platform at Glendale, presently a holdout station for Metrolink trains; relocation of Glendale siding just north of Central Maintenance Facility (CMF) to make room for a pedestrian bridge to access the second Glendale platform; northern access to CMF for Metrolink trains deadheading to and from Burbank Bob Hope Airport required ASAP.
- *Van Nuys-Moorpark:* Second platforms at Van Nuys and Northridge; double track CP Raymer to CP Bernson required by 2011-15.
- *Moorpark-Ventura:* Siding improvement required by 2011-15. More sidings or double tracking required by 2020-25. Practical capacity today is about 35 trains per day. Specific improvement could include a pedestrian crossing (bridge) at Camarillo, CP Davis to Simi Valley Station second main track, Simi Valley to Strathern second main track; CP Los Posas to MP 423 second main track; north Camarillo crossover; Leesdale Siding extension; and Oxnard to Camarillo second main track.
- *Ventura-Santa Barbara:* Sidings improvement required by 2011-15. Practical capacity today is about 25 trains per day. Specific improvements could include Seacliff Siding North and Rincon Siding. With the implementation of Santa Barbara commuter service in the near term, a north platform would be needed at Oxnard by 2011-15 as well.
- *Santa Barbara-San Luis Obispo:* Centralized Traffic Control (CTC) improvements to facilitate passes on existing "hand throw" switch sidings required by 2020-25. While practical capacity is estimated at 35 trains per day, the estimate belies that fact that siding switches north of Goleta have to be manually set by train crews, requiring extra stops and slower speeds. Island CTC allows train crews to set siding switches remotely, while aboard trains, and thus speed up entering and exiting sidings. Dispatcher-managed CTC allows the dispatcher to observe train progress electronically and remotely set siding switches. Both CTC system types are noted in the *LOSSAN Corridor Strategic Business Plan*.

Other track projects were suggested in the *LOSSAN Corridor Strategic Business Plan*. These included a Capitan Siding extension, a Goleta Service Track extension, a Sandyland Siding, and a Carpinteria Siding. Any and all of these would potentially enhance operational flexibility, but may not be absolutely essential for capacity reasons.

State of Good Repair

As noted, the projects cited above pertain to track capacity improvements only. Funding must also be assured for state of good repair for the entire corridor. For example, in San Diego County, the LOSSAN route traverses very aged bridges, which must be replaced just to ensure continuation of current service levels.

Total Infrastructure Costs

The improvements noted above are conceptual, based on a preliminary analysis of capacity needs. Many of these and many are others cited in the *LOSSAN Corridor Strategic Business Plan*, which quoted a total improvement price tag of $6.2 billion to $7.7 billion. Detailed corridor operations simulation modeling and subsequent engineering assessments would be required to fine tune the exact improvements needed and their costs.

Potential for and Impacts to Grade Separations

It is important to note that all these new trains will mean more delay at crossings for motor vehicle traffic. Except for the Laguna Niguel-Oceanside segment, train traffic on LOSSAN South segments should more than double. Train counts on LOSSAN North segments will also be much higher than today, but not as high as on LOSSAN South segments. The resultant impacts on local traffic need further analysis. Increasing train

traffic passing through very busy crossings may trigger the desire on the part of the local communities for grade separation projects.

At the same time, some existing or planned separations may be affected by corridor capacity improvements. That is, adding track may require rebuilding or redesigning some separations. Any requirements for modifications would need to be identified.

Rolling Stock Requirements

Definitive rolling stock requirements for services beyond those covered in the *California State Rail Plan* for *Pacific Surfliners* and in the *SCRRA Commuter Rail Strategic Assessment* for Metrolink trains will require further analysis. The *State Rail Plan* assumes trainsets sufficient to support 32 daily trains. The SCRRA document quantified rolling stock needs system-wide assuming the service levels adopted herein. Not covered in the existing plans are the Amtrak LAUS-San Diego *Pacific Surfliner* express, the Orange County Shuttle, and COASTER trainsets for the frequencies that appear included in Table 3-1.

This analysis assumes that at least one *Pacific Surfliner* trainset will be required to support the two LAUS-San Diego one-stop (mid-route) express trains in 2020-25. This round trip would require about two hours of run time in each direction with 30-minute minimum layovers. This pattern would require a daily run time of about 10 hours for the trainset.

This analysis also assumes two Metrolink trainsets will be required to support 12 to 14 trips in 2020-25. As per Scenario 2020-25B, if these trains were to become part of a Fullerton-San Diego service, COASTER trainset requirements could be reduced.

Chapter 4
INSTITUTIONAL CHANGES TO DELIVER THE VISION

INTRODUCTION

The purpose of this chapter is to discuss potential changes to the institutional structures for managing passenger rail services on the LOSSAN Corridor. There are four institutions managing most passenger services on the corridor today. These are:

- Caltrans Division of Rail, which manages Amtrak's operation of the *Pacific Surfliner* intercity trains operating along the entire 351-mile corridor.
- Southern California Regional Rail Authority, which manages Metrolink commuter trains in the Los Angeles area. SCRRA is a joint powers authority (JPA) composed of transportation agencies of Ventura, Los Angeles, San Bernardino, Riverside and Orange Counties.
- North County Transit District, which manages the COASTER commuter trains in San Diego County.
- LOSSAN Rail Corridor Agency, which coordinates planning efforts for passenger services on the corridor. The agency is a JPA composed of representatives of the jurisdictions served plus Caltrans.

The National Passenger Railroad Corporation (Amtrak) operates the *Coast Starlight* and *Southwest Chief* long distance luxury intercity trains that share parts of the corridor with the *Pacific Surfliners* and commuter trains. Each of these two Amtrak services has one daily round trip. The services are not considered corridor services *per se*.

What is particularly noteworthy about the corridor commuter operations is that the advent of additional commuter train services has not resulted in any permanent reduction in ridership on intercity trains. To the contrary, ridership on *Pacific Surfliner* intercity trains has grown by about one-third during the 17 years of commuter operation[1]. This performance provides strong evidence that the two different service types (commuter and intercity rail) do, in fact, serve different sub-markets and trip purposes within the same overall geographic area.

The history of LOSSAN Corridor service development and passenger growth clearly demonstrates the effectiveness of Caltrans and commuter rail management. The corridor today is the second most heavily used corridor in the nation, after the Boston-Washington DC Northeast Corridor. This result has been a remarkable achievement.

As the preceding chapter outlined the longer term vision for the LOSSAN Corridor, this chapter considers institutional changes which might be helpful in implementing that vision. One such structure among others could be a new JPA, composed of representatives of counties served plus Caltrans and Amtrak, established to coordinate some or all passenger rail service improvements.

[1] Metrolink service on the corridor (Ventura County Line) started in 1992. COASTER service began in 1995.

CURRENT INSTITUTIONAL FRAMEWORK

Caltrans

Up to this point the state role has been central to the development and success to date of intercity passenger service in the LOSSAN Corridor. Caltrans develops plans, carries forward appropriation requests to the legislature and the administration, administers contracts with Amtrak for operations and maintenance, and performs many other functions required to develop and sustain intercity passenger service in the state. Importantly, Caltrans negotiates and implements infrastructure improvements with the railroads in support of service improvements. In so doing, the Department consults with members of the LOSSAN Rail Corridor Agency, and is, in fact, a member of that body.

The *Pacific Surfliner* service is operated using a pool of 60 cars and 16 locomotives based and serviced in Los Angeles. Unlike the Northern California pool of 82 cars for the *Capitol* Corridor (San Jose-Sacramento-Auburn) and *San Joaquin* Corridor (Oakland/Sacramento-Modesto-Fresno-Bakersfield) services, where all 17 locomotives and all but 4 cars are owned by the state, all 16 of the *Pacific Surfliner* locomotives and 50 of the 60 cars are owned by Amtrak. Amtrak invested $150 million of its own funds in equipment for the corridor to bring standards up to a level comparable to those resulting from state investment in Northern California Corridors. Reflecting the original inclusion of three Los Angeles-San Diego round trips in the basic Amtrak system of 1971, the net operating cost of this part of the corridor is split between the state and Amtrak on a 70% / 30% basis.

The LOSSAN Rail Corridor Agency represents the regional entities in the corridor, and in a negotiated re-formulation could serve as the nucleus for a regional joint powers agency to manage the rail passenger services between San Diego and San Luis Obispo. Caltrans, through its management of operating contracts with Amtrak, is currently the only entity with overall responsibility for service management over the length of the corridor. State-level oversight does carry the advantage of potentially significant clout in dealing with the freight railroads, as well as a permanent institutional presence in Sacramento which is valuable in ensuring sustained financial and policy support from the legislature and administration.

In structuring any joint powers authority to acquire corridor management powers from Caltrans, should the LOSSAN Corridor counties decide to pursue such an option, it will be important to think about retaining these advantages. It will also be important to structure any joint powers authority in a way that ensures that managerial decision making transcends county boundaries, which is a significant advantage of the state-level perspective. The key to a successful JPA structure would probably rest in careful attention to structuring the JPA's relationship with Caltrans so that the benefits of the state perspective and institutional strength can be retained, while the responsiveness, local control and local accountability of the JPA can be developed.

Evolution of the County Role

The current institutional framework of the LOSSAN Corridor and its complex of services may be characterized as one of overlapping joint powers agreements based on counties, plus the State of California, whose presence is felt primarily in the form of management of operating contracts with Amtrak for *Pacific Surfliner* trains.

It is probably intuitively clear why intercity rail service, serving multiple cities and counties and covering long distances and connecting regions, could only have been introduced through state initiative. Less obvious is the evolution of the county role. There appear to be two main reasons why counties have come to the forefront of rail operation in commuter rail development. First, they are larger than the central cities, and cover at least some of the suburban municipalities which benefit from the presence of commuter rail service; they would naturally have the larger geographical perspective appropriate to commuter rail planning oriented

to longer-distance regional trip-making. Second, state law has favored transportation taxing authority and planning at the county level. In some cases counties have become owners of the railroad right-of-way.

Over the years as privately-owned transit systems died out and public entities were formed to build, own and operate services, independent districts, which are separately constituted limited-purpose governments (e.g. AC Transit District, San Francisco Bay Area Rapid Transit District, Southern California Rapid Transit District) were formed. County governments generally did not play a major role. After 1978, however, and the passage of Proposition 13, the ability of cities and special districts to raise funds through tax referenda became restricted since the law specified that new taxes, such as transportation sales taxes or property taxes, would require a 2/3 supermajority in a referendum.

There was a loophole, however; for a time, government agencies which had not previously levied a tax were permitted to pass tax referenda by simple majority. To take advantage of this loophole, which no longer exists, some California counties established themselves as transportation entities: new authorities which therefore had never previously levied a tax, and quickly passed sales tax referenda on the basis of a simple majority. When two large state rail-bond measures, Propositions 108 and 116, providing almost $3 billion in state funding for rail and other public transportation projects passed in 1990, many counties were in a position to react quickly and take advantage of the new revenue source, leveraging the newly available local sales tax revenues.

An outstanding example of this phenomenon is SCRRA, formed in 1991. By 1993 its member county transportation agencies had acquired hundreds of miles of lines from the freight railroads and created the Metrolink system. Also approved at the same election was Proposition 111, a gas tax proposal that made changes in the state's tax and spending structure, and which also created a requirement for countywide agencies to prepare a Congestion Management Plan and implement a Congestion Management Program. The Congestion Management Agencies, so designated by each county, were in many cases also the post-Proposition 13 "transportation authorities", and so, with revenue to hire staff and carry out planning and programming, counties came to dominate transportation planning and policy development.

Significant funding was also made available by the Propositions 108 and 116 to Caltrans for the design and procurement of passenger cars and locomotives, as well as trackwork, stations and other facilities. However, after a time this funding became limited by state policy to intercity service. When the former Southern Pacific Railroad threatened abandonment of the vital Peninsula commuter rail service between San Francisco and San Jose, the municipalities in the three Peninsula counties (San Francisco, San Mateo and Santa Clara) could not agree on a new entity for oversight of a public sponsorship of the system. Caltrans was seen as the only agency acceptable to all, and so the fledgling state rail program was extended to the Peninsula commute service in 1980.

Under state leadership, the service was saved, new gallery cars and locomotives were procured, and a program of capital improvements undertaken. As it was a state-managed service, the name "Caltrain" was bestowed upon it. Subsequently, however, under another administration, the policy was changed, and it was decided that state responsibility for commuter rail service would be terminated as such service would henceforth be viewed as a local or regional responsibility. West Bay Area jurisdictions were given a deadline for creation of a new entity to take over the operation from the state, and in this way, the Peninsula Joint Powers Board was established – assuming responsibility for the service in 1992, but retaining the Caltrain name. Thus the pattern of split state and county responsibility for intercity and commuter service, respectively, was established. While other institutional arrangements are legally available, to date this has remained the pattern in California.

The LOSSAN Rail Corridor Agency

The LOSSAN Rail Corridor Agency is a joint powers agreement originally formed in 1999, and subsequently modified to its present form. In its basic form, it is composed of eight county-based transportation and planning agencies (Board Members):

- San Diego Association of Governments
- San Diego Metropolitan Transit System
- North County Transit District
- Orange County Transportation Authority
- Los Angeles County Metropolitan Transportation Authority
- Ventura County Transportation Commission
- Santa Barbara County Association of Governments
- San Luis Obispo Council of Governments

plus Caltrans. The Southern California Association of Governments (SCAG) is an Ex Officio Member Agency, and there is also a Technical Committee which includes all members plus:

- Amtrak
- BNSF Railway
- California Public Utilities Commission
- Southern California Regional Rail Authority
- Union Pacific Railroad

The LOSSAN Rail Corridor Agency performs a vital role in advocacy, support and coordination of efforts to improve service through the work of other agencies, but it has no administrative function or oversight of service. However, some of its members participate directly in the management of Metrolink service through their membership in SCRRA. Likewise, some members participate in the management of COASTER. The agency is a local intergovernmental agreement formed under the powers granted to local governments to form such "joint exercise of powers" agreements, with decision making over certain kinds of powers which all participants already share are, by agreement, made collectively. The agreement includes provisions for a permanent independent staff, but currently that function is provided through agreement with SANDAG. The Agency Board meets quarterly.

Current Legislative Activity

In 2008 Senator Denise Ducheny of Chula Vista introduced SB53, a bill intended to bring all railroad-related functions of state government under one new agency, a Department of Railroads, with its own Director. SB53 became a study bill, and directed the California Research Bureau, a research and analysis division of the State Library, to prepare an analysis of the concept and report back to the legislature. The study was completed, and Senator Ducheny prepared a follow-up bill, SB409, currently co-authored by Assembly Member Norma Torres, that was approved 10-0 on June 10, 2009, by the Senate Committee on Transportation and Housing, and re-referred to the Committee on Appropriations.

Senator Alan Lowenthal of Long Beach has introduced SB454, a spot bill intended as a placeholder for other possible initiatives, in particular, possible requests for legislative action from the LOSSAN Corridor.

The Government Code was amended in 1996 by SB457, the legislation which opened the door to devolution from Caltrans to corridor joint powers agencies of the state rail passenger program. These agencies, and their structures, were specifically identified and described in the legislation, and are at present the only such entities to whom the responsibility for corridor rail program operation may be transferred by the Secretary of Business, Transportation and Housing (BT&H). It is possible that LOSSAN Corridor agencies may wish to proceed with some form of corridor management structure that is different from the form now described in the Government Code as a result of SB457, thus requiring state legislation.

LOSSAN STRATEGIC VISION AND INSTITUTIONAL ALTERNATIVES

Incorporating the long term vision plans of corridor rail operators, the LOSSAN Rail Corridor long term strategic vision in Chapter 3 outlines a very ambitious multi-year program. It combines large increases in the number of trains, major capital investment (on the order of $6-8 billion), fare simplification and coordination, and coordination of intercity and commuter services. The vision must be implemented over the entire corridor, with a very large population living in many separate jurisdictions, and must be operated on the tracks and rights-of-way owned by several public entities and two freight railroads. Fare structure rationalization must take place against a typically volatile backdrop of public funding and revenue issues.

The vision has many moving parts and multiple stakeholders, not all of whom are always in agreement on every issue. While existing institutions in the corridor have the technical ability to implement the various elements of the vision, and have already accomplished remarkable achievements in intercity and commuter rail performance, it is not surprising that questions constantly arise about whether the corridor's current institutional arrangements represent the structure most likely to achieve the ambitious goals of the vision in the proposed time frame. The central question is not so much what is wrong with existing institutions individually, but whether the current arrangements taken together as a whole are the optimal structure most likely to produce the desired results.

Commuter and intercity rail passenger service development is approached in different ways in different places, in California and elsewhere, and it is useful to consider the structures other states, counties, cities and institutions have put together in addressing these same issues.

Alternative Models

In the U.S., governance of commuter and intercity rail systems is structured in many different ways. Table 4-1 presents some public agency examples, with some key features highlighted.

As can be seen, responsibilities and functions vary widely from corridor to corridor. In some cases equipment is publicly owned, but not infrastructure. In other places both are owned – either collectively, or individually by participants. In California alone, several varieties exist. For example:

- Altamont Commuter Express (ACE) is operated by one county owner, the San Joaquin County Regional Rail Commission, which provides service to three counties under "Cooperative Service Agreements" with the other two (Alameda and Santa Clara). Interestingly, this replaces an earlier JPA arrangement. San Joaquin owns cars and locomotives and support facilities, but not currently the mainline track (owned by UP between Stockton and Santa Clara, and by the Peninsula Commute Joint Powers Board between Santa Clara and San Jose).
- Caltrain, operated by the Peninsula Commute Joint Powers Authority, is an example of a JPA in which all assets are owned collectively. The three participating counties – San Francisco, San Mateo and Santa Clara – own an apportioned and undivided interest in track, cars and locomotives.

Table 4-1: Partial Typology of Governance Structures for Commuter and Intercity Rail				
Type	**Description**	**Ownership**	**Examples**	**Notes/Questions**
1. State Agency (Strong variety)	State government-level agency; direct in-house operation, or contracted operation	Track, facilities, and rolling stock in state ownership	NJT (also w/ significant Amtrak line ownership); Rail Runner (NM DOT); MARC	Essentially runs commuter operations
2. State Agency (Weak variety)	State government-level agency; typically set up to administer Amtrak contracts and related capital programs	State owns rolling stock and some facilities, but not main trackage	Caltrans Division of Rail; Michigan DOT (owns some track); Vermont DOT	Basically oversees Amtrak and railroad contracts, and/or capital programs
3. Transit Agency (w/ significant track ownership)	Local or regional transit agency set up under state legislation but free of day-to-day state control; significant ownership of lines operated	A local or regional authority, with some level of state support, also owns rolling stock, and all or much of its track	NYMTA (Metro-North; LIRR); SEPTA; MBTA; UTA FrontRunner	NYMTA, SEPTA, UTA run operations through in-house employees; MBTA manages operating contracts
4. Transit Agency (w/o track owner-ship)	Local or regional transit agency – under state legislation but free of day-to-day state control; owns rolling stock but contracts for railroad access	A local or regional authority, with some level of state support, owns rolling stock, but contracts for railroad access	VRE; Sound Transit Sounder	Manages operating contracts
5. JPA	Joint Powers Authority (JPA) formed w/ or w/o state legislation, once formed largely independent	May or may not have ownership of track and/or rolling stock	*Capitol* Corridor; Caltrain; SCRRA Metrolink	*Capitol* Corridor owns neither rolling stock nor track; Caltrain owns rolling stock; Caltrain and SCRRA own rolling stock, with track owned by counties; manage operating contracts
6. County Based	Single county agency	May or may not have ownership of track and/or rolling stock	SJRRC ACE; NCTD COASTER	Manages operating contracts; SJRRC owns rolling stock; NCTD owns track and rolling stock

Notes: Table 4-1 includes refers to the following agencies by their initials:

- New Jersey Transit (NJT)
- Maryland Area Rail Commuter (MARC)
- New York Metropolitan Transportation Authority (NYMTA).
- Long Island Railroad (LIRR)
- Southeast Pennsylvania Transportation Authority (SEPTA)
- Massachusetts Bay Transportation Authority (MBTA)
- Utah Transportation Authority (UTA)
- Virginia Railway Express (VRE)
- Southern California Regional Rail Authority (SCRRA)
- Altamont Commuter Express (ACE)
- North County Transit District (NCTD)

- SCRRA, in contrast, is an example of a JPA in which some assets are owned collectively, while the trackage in each county is owned separately.

There is no right answer to the question of what the best attainable structure is for the LOSSAN Corridor. It is a complex issue of funding, asset ownership, management and control, with significant questions involving apportionment of weight for each of these aspects of a possible new structure. In looking at these issues, however, it is hard to escape the conclusion that some new form of governance, featuring a unified and concerted exercise of managerial authority over the wide range of issues and concerns, could provide better assurance of attainment of vision goals in the proposed 2020-25 time frame.

Lessons of the Terminal Railroad Model

Efficient and effective integration of different types of railroad services on shared infrastructure is a basic issue that needs to be addressed as the LOSSAN Corridor develops. Accordingly it is useful to consider an approach sometimes used in American railroad practice to achieve this objective – the terminal railroad. This is a concept that has arisen several times in the course of the study to date.

A terminal railroad is a small railroad, generally established in an area of concentrated railroad traffic, such as a port, a major manufacturing hub, or a convergence of several mainline systems in a major urban area. Typically, its purpose is to provide one or more specialized local services such as: connections between mainline railroad systems; access to major sources of freight traffic for the benefit of several competing railroads; access to competing railroads for the benefit of a major shipper which may be seeking competitive freight rates; ownership and operation of terminal facilities; local freight switching; ownership, maintenance and operation of a bridge, union passenger stations or other significant capital facility for the shared benefit of several railroads.

Two terminal railroads, one old and one new, may be taken as good illustrations of the concept. These are the Terminal Railroad Association of Saint Louis and the Pacific Harbor Line, Inc., of the Ports of Los Angeles and Long Beach.

Terminal Railroad Association of Saint Louis

Despite its name, the Terminal Railroad Association of Saint Louis is not an association in the usual sense, but a railroad company. It was incorporated in 1889, drawing together under one entity several predecessor corporations which individually performed some of the functions noted above. Saint Louis grew up at one of the most strategic transportation locations in North America, on the banks of the Mississippi River just below its confluence with the Missouri. It was a natural point of convergence for many trunk line railroads, both eastern railroads intent upon making connections with lines building into the developing west, and western railroads seeking connections to the Eastern Seaboard, Upper Midwest, and the Southeast. The Mississippi itself was a barrier, and railroad car ferry services and railroad yards developed on both sides of the river, as well as a great industrial and manufacturing complex. In 1874 the first railroad crossing of the Mississippi, the famous Eads Bridge, was opened between Downtown Saint Louis and the city of East Saint Louis, Illinois.

In 1889, Jay Gould, who controlled several of the railroads reaching Saint Louis from both east and west, orchestrated the creation by six trunk lines of the Terminal Railroad Association (TRRA) to connect them with an efficient, separate railroad service that could provide access to and between all lines, and most facilities, without favoring in service or tariffs any one member line over another. Eventually as many as 15 railroads serving the St. Louis hub joined as owner/members of the TRRA. The TRRA built and operated some lines of its own to make better connections and avoid congestion for the benefit of all owning railroads, and in order to handle the enormous passenger traffic of the day, constructed and operated the Saint Louis Union Station, one of the largest in the world. For a time, the TRRA also owned its own passenger

equipment and operated interstate suburban commuter rail service between Union Station and East Saint Louis over the route now used by Bi-State light rail trains.

Today the TRRA remains an important factor in the area's freight traffic, and an excellent illustration of the concept of joint use of major facilities, bridges, trackage, and the region's largest yard by several railroads – whether simply connecting or competing. The TRRA has an operating department, and runs its own switching operation with its own equipment and crews, operating over its own trackage as well as tracks of the owning railroads within the Saint Louis switching district. The TRRA today is owned by five railroads – the Union Pacific Railroad, BNSF Railway, CSX Transportation, Canadian National Railway and Norfolk Southern Railway. Amtrak trains use TRRA trackage to get into the Saint Louis Amtrak station.

Pacific Harbor Line, Inc.

Organized a hundred years later than the TRRA, Pacific Harbor Line, Inc. performs some similar functions, and shows that the concept of a joint facility is valid in a modern context.

The Pacific Harbor Line (PHL) came about as the result of dramatic growth in traffic of the Ports of Los Angeles and Long Beach. Studies conducted in the 1980s under an Alameda Corridor Task Force organized by SCAG, demonstrated that transportation access to the ports was highly inadequate. A *Consolidated Rail Corridor Strategic Plan* was produced in 1988 which laid out a strategy for a reorganization and improvement of port railroad facilities as dramatic as the forecast growth in cargo volumes. The plan called for a consolidation of all freight trains reaching the ports on a new, high-quality line, the Alameda Corridor, to be built on the Southern Pacific Railroad's San Pedro Branch right-of-way. Funding became available shortly after the plan's adoption; importantly, in 1990, the voters of California enacted Proposition 116, a $2 billion rail and transit initiative measure placed on the ballot by voter signatures. The proposition designated funding for many specific projects, including $80 million for the Alameda Corridor project. With this and other funding, the Alameda Corridor, a high quality super railroad linking the principal railroad junctions in Los Angeles to the ports, was constructed, opening in 2002.

At the same time, to complement and maximize usefulness of the Alameda Corridor, the ports' transportation planning called for a reorganization of railroad freight handling in the port areas themselves. Previously, on the Los Angeles side, a Harbor Belt Line Railroad was operated and was jointly owned by Southern Pacific Railroad (2/5), Union Pacific Railroad (1/5), the former Santa Fe Railway (1/5), and the Port of Los Angeles (1/5). On the Long Beach side, most of the switching was done by Southern Pacific, ostensibly on behalf of all railroads. The ports were linked to the main railroad systems by long, weed-grown branch lines. In the port areas, it was difficult to induce the railroad companies to invest in upgrading rail facilities because the railroads were making significant investments elsewhere in their own transcontinental mainline capacity, and they did not want to make investments in joint port facilities that might aid a competitor. The solution was to take the joint facilities out of the hands of the private railroads and pool them under common port management for maximum benefit. Port trackage already in public ownership was retained by the ports individually; privately-owned trackage was purchased by the two ports acting together. As a practical matter, this action brought all trackage under public control; the Alameda Corridor facility itself was developed by a joint powers authority on which the ports were the active entities.

The Alameda Corridor itself was intended to be operated by the mainline railroads, permitting them to operate container trains to and from transcontinental routes directly to major new yards at the ports. Within the port area, it was decided that a new, neutral terminal railroad working for the ports themselves, would provide switching service to the railroads without favoritism. Rather than establish a new publicly owned operator, the ports went out with a tender for a new, unified private operator. Pacific Harbor Line, Inc. won this bid, and has been the operator ever since; it is owned by Anacostia and Pacific, Inc., which also owns several other American short line and terminal railroads.

Today the Ports of Los Angeles and Long Beach, combined, are the largest in the Western Hemisphere. The ports generate a very high level of freight traffic, and PHL manages the flow of, and switches, all of this traffic (about 40,000 carloads per year), interchanging with the two surviving mainline operators, Union Pacific (which absorbed Southern Pacific) and BNSF (which absorbed Santa Fe). PHL also performs in-terminal switching for containership companies with on-dock rail yards. UP and BNSF trains operate from their port yards over the Alameda Corridor facility to their mainlines in Downtown Los Angeles.

Implications of the Terminal Railroad Concept for LOSSAN Corridor

The history of these two terminal railroads shows that neutral operation of joint facilities can provide significant benefits. In the Saint Louis case, the facilities are privately owned; the TRRA is a corporation owned by the member railroads themselves, has its own operating department and facilities, and handles the traffic of all connecting railroad systems without favoritism. In the California ports case, the Alameda Corridor and the port trackage are publicly owned, but are operated by the two railroads sharing common publicly-owned trackage – with port trackage operated by a neutral contractor to the ports, PHL. In both the Saint Louis and California situations, the specific ownership of pieces of track is subordinated to a borderless operation, and the movement of traffic from A to B takes precedence over the question of whose rails are involved.

The LOSSAN Corridor is both much larger and a lot more complex than either of these terminal railroad examples. Yet, there is a valid implication here for the corridor. The suggestion is that maximum benefit to the owner, which is the public in this case, probably also rests in an erasure of the effects of ownership on operations. On the highway system, the continuous flow of traffic is no respecter of county lines. Through operation of trains meeting logical market objectives probably makes more sense than trains that originate and terminate at historically determined boundaries which do not correspond to market desires.

Another useful implication of these cases is that bold action may be the most realistic and perhaps most certain way to meet important service objectives. Sweeping away old modes of doing business and old institutions, and creating new institutions to build and operate new facilities – and meet the challenges of the future – may be the strongest lesson of these successful railroad examples.

Previous Attempts: Implications of SB457 (1996)

Background

In California, the body of state law is organized into a series of 29 codes, each dealing with a legal subject area. Most law concerning the state rail program can be found in the Government Code. The final result of a bill becoming law is enactment of, or changes to, various codified sections. In the case of SB457 of 1996, provisions were added to the Government Code. They remain there until the next bill comes along that wishes to make more changes. The historical notes for the relevant sections of the Government Code indicate that the last amendments were, in fact, those made in 1996 by SB457. When we say "we will need to amend SB457", we are really making a shorthand reference to the specific provisions of the Government Code last amended in 1996 through the enactment of SB457. These are the sections of interest in any effort to develop a new management structure for the LOSSAN Corridor.

What were the main provisions of SB457?

SB457 of 1996 (principal author: Senator David Kelley of Idyllwild) was the instrument through which provisions were added to the Government Code to permit the transfer of responsibility for operating the three California intercity rail passenger corridors to joint powers agencies (joint exercise of powers agencies) composed of groupings of local governments – essentially counties, or county-based transportation agencies.

In general terms, SB457 did the following:

- It deleted from state law the then-existing fare box recovery requirements for commuter rail and intercity rail services receiving certain categories of state support.
- It authorized the state (the "Secretary", i.e. Secretary of BT&H/Caltrans) to enter into "Interagency Transfer Agreements" with three specified, statutorily created joint exercise of powers agencies (JPAs) for operation of the state's three intercity rail passenger corridors, and provided that state operating funds would be appropriated for these services pursuant to a business plan procedure. Caltrans would retain the responsibility for overall planning, coordination and budgeting of the intercity corridors, and all three corridors were to remain components "…of the statewide system of intercity rail corridors."
- The three specified JPAs were:
  - In Southern California, an expansion of the Board of the Southern California Regional Rail Authority to nine counties (the eight LOSSAN counties plus Imperial County), each having one member, to operate intercity passenger service between San Diego, Los Angeles and San Luis Obispo, as well as the Metrolink commuter rail service.
  - In Northern California, the *Capitol* Corridor Joint Powers Authority (CCJPA), with two members from each of eight counties.
  - In the San Joaquin Valley, a *San Joaquin* Corridor Joint Powers Agency, with two members from each of eight San Joaquin Valley counties, plus one member each from the CCJPA, Sacramento and Los Angeles Counties, for a total of 19 members.
- It specified the elements of the "Interagency Transfer Agreements", including:
  - Date of transfer, conditions, and annual level of state funding for the first 5 years.
  - Specification of funding levels and sources.
  - Specification of levels of service.
  - Terms for transfer of locomotives, cars and other property required for the service.
  - Descriptions of auditing, billing and related procedures.
  - A description of the Annual Business Plan, developed by a JPA and submitted to the Secretary, which was to serve as the basis for legislative appropriations and state funding allocations.
  - Contracting provisions permitting competitive procurement of service agreements by the JPAs and Caltrans with Amtrak or any other provider.

What occurred as a result of the enactment of SB457?

The language of SB457 was incorporated into the California Government Code, under its Article 5, sections 14070-14076. There do not appear to have been subsequent amendments to these sections, and therefore they presumably remain in effect.

Of the three designated corridor JPAs statutorily created by SB457, only the CCJPA was formed. Theoretically there does not appear to be any time limit for action, and so it would seem that the San Joaquin and Southern California JPAs remain dormant possibilities, legally if not politically.

What are the implications of SB457 for the members of the LOSSAN Rail Corridor Agency?

Recent conversations of the LOSSAN Corridor stakeholders[2] have suggested an interest in considering the possibility of becoming the managing entity for intercity rail passenger service in the *Pacific Surfliner* Corridor between San Diego, Los Angeles and San Luis Obispo, possibly along the lines of the CCJPA in Northern California. The LOSSAN Rail Corridor Agency was not statutorily created. The LOSSAN Rail Corridor Agency was locally formed under provisions of the Government Code generally permitting the joint exercise of powers common to all of the parties. The Joint Exercise of Powers Agreement and the By-Laws provide that additional activities and staffing could be undertaken by the Agency, but clearly do not contemplate assumption of responsibility for the actual day-to-day management of the *Surfliner* Corridor, absent an amendment to do so. SCRRA was also not created by statute, although some of its powers and responsibilities are enumerated in the Public Utilities Code, and referred to in the Government Code.

The Government Code as amended by SB457 does not authorize the BT&H Secretary to enter into an Interagency Transfer Agreement with either the LOSSAN Rail Corridor Agency or SCRRA, as presently constituted, for the transfer of responsibility for management of the *Surfliner* Corridor.

If the LOSSAN Corridor stakeholders wish to form a JPA to acquire the duties and responsibilities of managerial control and oversight over passenger rail service in the LOSSAN Corridor, they would appear to have two options:

- They could seek new legislation. This new legislation would amend the Government Code and identify some version of the LOSSAN Rail Corridor Agency, or SCRRA, or a new entity as a new statutorily-created JPA, and authorize the Secretary to transfer to it responsibility for the corridor's intercity services, along the lines of the transfer of management authority to the CCJPA. As Senator Lowenthal reportedly has introduced a spot bill in support of the LOSSAN members, presumably this bill could serve as the necessary vehicle in this case.
- Based on the existing statute which permits expansion of the SCRRA into a statutorily-created JPA, the corridor stakeholders could arrange for the nine county agencies identified in Section 14072 of the Government Code to enter into a new joint exercise of powers agreement, as prescribed. This new enlarged SCRRA could negotiate the transfer agreements with Caltrans (provided the Secretary of BT&H/Caltrans is in agreement), make the necessary findings, and proceed to assume a management role.

TENTATIVE CONCLUSIONS

- The LOSSAN Corridor long term strategic vision outlines a complex set of investments and managerial initiatives intended to produce coordinated intercity and commuter rail services of a quality unparalleled in the Western U.S. It represents a potential investment of $6-8 billion over several years, together with the focused, sustained and vigorous application of coordinated managerial techniques. The current institutional structures in the corridor may not be optimally conceived for achievement of these ambitious goals.
- The corridor has many stakeholders who appear to share both a desire for the vision's results, and in most cases a concern that current institutions may not be the best guarantors of those results. However, these stakeholders do not currently appear to be at the same point of conclusion about what

[2] Potential corridor governance modifications were discussed three times with: senior staff of Amtrak, Caltrans, and regional rail authorities on May 6; senior staff of regional transit agencies on June 19; and the LOSSAN Rail Corridor Agency Board and TAC on July 1, 2009.

should be done to create a governance structure that will do the job. A consensus, however, may be achievable.

- The *Capitol* Corridor Joint Powers Authority was established pursuant to the provisions of SB457 of 1996. Its general outline suggests some structural features that could prove attractive to the LOSSAN Corridor members. SB457 also made provisions for a LOSSAN Corridor JPA, but the potential participants did not take the necessary implementation actions, and there may be questions today about the political reality of the SB457 governance structure as actually legislated.
- Common interests, and recent spirited discussion by policy makers on the LOSSAN Board, suggest that focused discussions intended to produce a consensus about a governance strategy might yield results. One way to go about this might be to form an institutional negotiations committee, which would be given a specific charge: to discuss alternatives, including the dormant SB457 alternative; and develop a recommendation for a consensus structure to be adopted by the LOSSAN Board. This could then be presented to Senator Lowenthal for incorporation into the spot bill he has authored for such a purpose. If enacted, this would provide consensus-based legislative authority for future action and implementation.

Chapter 5
NEXT STEPS

INTRODUCTION

The purpose of this chapter is to identify the next logical steps in the continuing planning efforts for the LOSSAN Corridor. There are three: a ridership forecast to estimate the future demand given the service improvements identified in the LOSSAN Corridor's long term strategic vision; an operations simulation to identify the specific line capacity improvements required to support that vision; and continued discussion by LOSSAN stakeholders on the potential for a new governance structure to deliver the vision. The chapter concludes with a summary of recent LOSSAN Rail Corridor Agency Board action pertaining to next steps.

RIDERSHIP FORECAST

The goal of implementing service improvements is generating greater ridership and service dependibility. Past long term planning efforts for all three corridor services – Metrolink, COASTER and the *Pacific Surfliner* – included their management's assessment of future ridership potential. The services' managers periodically perform their own internal ridership forecasts contingent on service levels and improvements. These forecasts, however, are all agency-specific. To date, there has been no comprehensive ridership forecast for the LOSSAN Corridor as a whole.

The LOSSAN Corridor's long term strategic vision has three particular attributes which when implemented together would serve to induce new ridership. First, the vision calls for more and faster trains throughout the day. Second, it places an emphasis on timed transfers at key nodes between local commuter and premium service *Pacific Surfliner* trains. Third, it envisions an interactive electronic fare collection system allowing for seamless journeys. With such innovations, integrated corridor rail services will become more convenient for the rider and thus more attractive to use.

The question that remains is how many new riders will find their way to corridor stations. The answer to this question will impact rolling stock procurements, staffing, and station design, including parking improvements. Thus this analysis recommends a forecast of ridership resulting from implementation of the service vision. The forecast should estimate future trips between all origins and destinations on the corridor. Furthermore, because increasing corridor service levels will provide opportunities for more and more efficient transfers at Los Angeles Union Station, the forecast should estimate induced transfers at LAUS to other Metrolink services (San Bernardino, Antelope Valley and Riverside Lines).

A key goal of the ridership forecast will be the analysis of the service alternatives outlined in Chapter 3, and perhaps others developed by the corridor partners. An output of the forecast would be identification of where limited stop premium service *Pacific Surfliner* trains should be stopping. Another would be the result of innovations, such as the Fullerton-San Diego Service noted in 2020-25B, a concept aimed at a market which is not well served today. Yet another would be pinpointing where parking deficits are likely to occur. And another would be quantifying the Metrolink and Amtrak ridership increases attributable to implementation of California High-Speed Rail in the corridor and ARTIC-related development.

No travel demand model exists today that covers all the services in the 351-mile LOSSAN corridor as well as connecting lines. By coordinating the modeling efforts across agencies, it may be possible to forecast ridership relative to an integrated LOSSAN Corridor vision service plan. If that is not possible, then a new model may be required.

MODELING FOR CAPITAL IMPROVEMENTS

Chapter 3 identified specific line improvement projects related to increasing train volumes along the length of the LOSSAN Corridor. The effort was intended to illustrate the sorts of improvements that would be required in an incremental fashion to support the envisioned service levels. The effort showed that major improvements would be needed at specific points in time, e.g. a four-track mainline between Redondo Junction and Fullerton by 2020-25.

The next logical step in the capital planning process would be an operations simulation of the future services on the corridor. The goal of this effort would be to more accurately identify the types and extent of line improvements required for the service expansion.

An operations simulation program routes trains over a network on the basis of priority, just as a human dispatcher would in a remote location using wayside signals. For example, if a passenger train and a freight train were approaching each other on a single track network, the program would route the freight train onto a siding while the opposing passenger remains on the mainline and passes the freight train on the siding. The simulation has the ability to test where capacity of a line may no longer keep pace with demand – a condition that would be evidenced by increasing delay to train traffic. Potential remedies, consisting of operational improvements (e.g. train fleeting, whereby express trains are quickly followed by local trains) and capital improvements (e.g. multiple track and signal system improvements) could be tested to see if train delay is abated.

As with the ridership forecast, the impact of additional trains affects more than just the LOSSAN Corridor. To the extent that they share track segments and facilities with LOSSAN Corridor trains, trains on connecting lines will be affected also. Therefore, an operations simulation should reflect operations on much more than the LOSSAN Corridor. Specifically, the simulation should include all other Metrolink lines in addition to the LOSSAN Corridor. A key analysis will be confirming when rebuilding the stub-ended LAUS as a through station becomes critical for fluid trains operations on the corridor.

Operations modeling will not capture the need to replace aged infrastructure. The need for replacement of this infrastructure, particularly in San Diego County just to handle existing traffic levels, should not be overlooked in future planning efforts for improvements on the LOSSAN Corridor. Grade separations also would not be a subject of the simulation, but those potentially affected by corridor capacity improvements should be identified.

REVISIT OF GOVERNANCE

Chapter 4 explored ways in which the current institutional structures governing passenger rail operations on the LOSSAN Corridor might be modified for implementing the service vision effectively. In mid 2009 the vision and potential governance structures aimed at effectively delivering the mission were presented to corridor stakeholders, including the LOSSAN Rail Corridor Agency Board and Technical Advisory Committee. Various stakeholders have expressed interest in revisiting this question, though no consensus regarding in which direction to move has been reached.

Whereas the existing JPA is focused on coordination of planning efforts, a new structure could assume corridor-wide responsibility and authority for both planning and investment. The 2007 *LOSSAN Corridor Strategic Business Plan* identified $6-8 billion in potential improvements. Conceivably, a new agency could be established to realize such major investments by coordinating planning, assembling funding, and executing construction contracts. It could also begin the work required to establish an interactive electronic fare collection system. Were such a new agency to be desired, new enabling legislation likely would be required.

This study recommends that LOSSAN JPA members continue their discussion of the whether a new and empowered LOSSAN JPA is desired. If the answer is yes, then members need to define how the new organization will be organized in order to successfully execute its scope of responsibilities.

Such a new JPA would benefit from leadership that could be provided by a full time Executive Director, whose priority would be to implement the long term service vision. The Executive Director could be housed in a hosting member agency (e.g. SCRRA, Metro, OCTA, SANDAG or even a Caltrans District), which would provide logistical support (e.g. office, telecommunication, meeting space, reproduction, general administrative support, etc.). The JPA would be funded by contributions of the JPA membership.

The creation of a new LOSSAN JPA would require negotiation by the prospective members. Predictably, members will approach the exercise with conflicting goals, and these conflicts would need resolution through negotiation. Once members reach agreement on the scope and structure of the new organization, new enabling legislation can be crafted.

RECENT LOSSAN BOARD ACTION

In a September 9, 2009 meeting of the LOSSAN Rail Corridor Agency Board of Directors, Board Members agreed to work on an inter-agency memorandum of understanding to outline a vision for the corridor and strategic actions needed to achieve it. On October 28, the Board voted to approve the MOU calling for the hiring of a project manager and conducting the travel demand forecasting and operations simulation modeling to test a business case for the strategic vision.

APPENDIX

Appearing here is a copy of a PowerPoint presentation of summary findings from the late 2008 survey of LOSSAN Corridor rail service riders. The PowerPoint presentation concludes with a summary of corridor rider demographics.

LOSSAN CORRIDOR STRATEGIC ASSESSMENT
Intercept Survey – Revised Topline Data Report





January 2009

Submitted by:

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Intercept Survey

Task: Conduct an attitudes, awareness and preferences survey with frequent corridor riders on Metrolink, COASTER, and Amtrak trains operating between Downtown Los Angeles and San Diego [1]

Goal: Provide data that will be used to develop long and short range service modifications among rail service providers operating along the LOSSAN CORRIDOR

[1] For comprehensive demographic and trip purpose profiles of LOSSAN Corridor riders, please see Amtrak Pacific Surfliner, Survey of Current Users, Spring 2008, COASTER, Survey of Current Users. Fall 2005, and Metrolink, 2008 Rider Survey, June 2008

Methodology

- Conducted on-board intercept surveys between October 27, 2008 and November 5, 2008.
- Approached every 5th passenger aboard trains to conduct survey.
- Self administered 61 point survey instrument.
- Surveyed passengers during three key service periods
  - Peak Morning
  - Mid-Day
  - Peak Evening
  - Collected surveys on two Saturday segments of Amtrak lines
- Collected 1,014 self administered surveys between three rail service providers:

Amtrak	416
Metrolink	338
Coaster	260

- Response rate: 59%
- Overall results - +/- 3% margin of error at a 95% confidence level

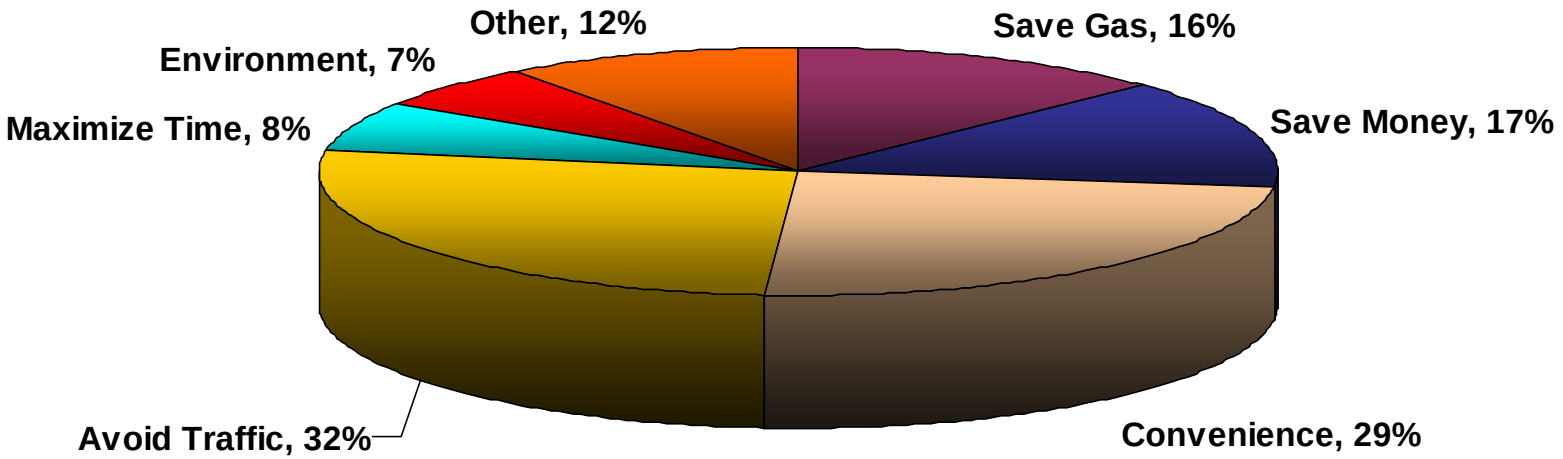
Train Use

On the trains surveyed

- 65% of respondents reported that they were daily commuters or business travelers on the day they were surveyed.
- Over half (52%) report that they usually take the train to their school or work location and just under 30% reported driving alone when they do not ride the train.
- Six of every ten respondents (61%) reported that they had been riding the train for at least a year.
  1-2 Years (18%), More than 2 years (43%)
- 60% of all riders reported that they rode the train between four and five days per week.
  4 days a week - 13.3%, 5 days a week - 47%
- Of those who reported riding less than three days a week, 44% stated that they had no need to ride any more frequently.

Travel Patterns

- More than two thirds of respondents report that both their starting location (77%) and final destination (63%) are within 10 miles of the station they use to board and alight their train.
- At suburban stations, 72% of respondents reported that they drive from their home point to their boarding station when they start their trip from home.
- Riders most often cited avoiding traffic (32%) and convenience (29%) as the reason they began using the train as a transportation solution.



Customer Satisfaction

- The service features respondents were **most satisfied** with were:
  - Their overall train experience - Mean score of 4.1
  - Friendliness and courtesy of on board personnel – Mean score of 4.1
  - Ease of understanding train schedules - Mean score of 4.0
  - Ease of getting schedule information - Mean score of 3.9

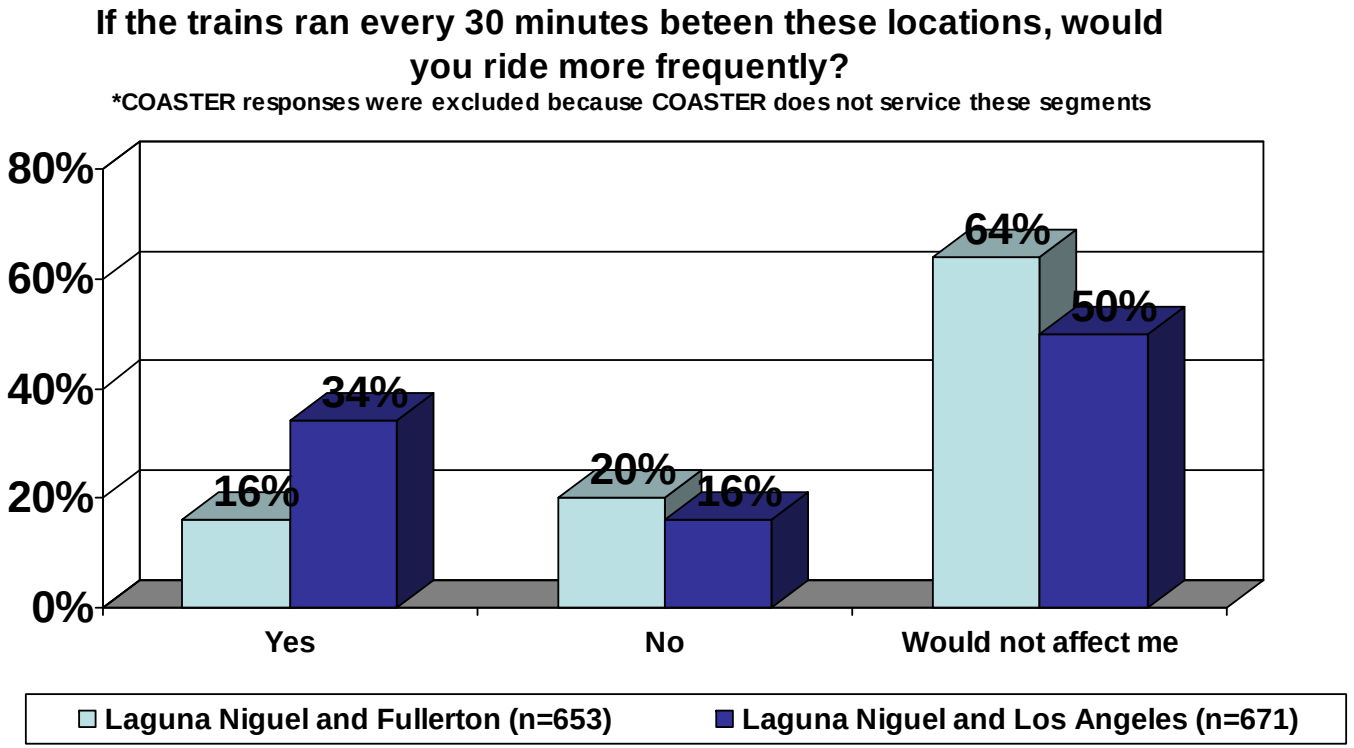
- The service features respondents were **least satisfied** with were:
  - Real time accident/delay info – Mean score of 3.0
  - Length of weekend service hours – Mean score of 3.1
  - Fares – Mean score of 3.2
  - Length of weekday service hours – Mean score of 3.2

- The factors that most influenced riders in their decision to continue to ride the train:
  - Frequency of train service 49%
  - Routes going where they wanted to go 46%
  - Amount of time it takes to travel 35%
  - Fares 32%
  - On time reliability 26%
  - Length of weekday service hours 25%

Service Options

- 64% of respondents said that it would not affect their frequency of riding if the trains ran every 30 minutes between Laguna Niguel and Fullerton.

- 50% of respondents said that it would not affect their frequency of riding if the trains ran every 30 minutes between Laguna Niguel and Los Angeles



Service Options

When asked if changes that created uniformity along the LOSSAN CORRIDOR would affect their likelihood to take the train between Los Angeles and San Diego:

- 39% of respondents reported that they would be much more likely to ride the train if there was a single website that provided info about all train service options between Los Angeles and San Diego.
- 37% say a single vending source and payment system would be make them much more likely to ride.
- 46% said a single ticket and pass system would make them much more likely to ride, but most (71%) would not be willing to pay more for the ticket.
- 55% would be much more likely to ride more if their ticket was valid for all local public transit services between Los Angeles and San Diego.

Amenities

When asked if Wi-Fi capability on board trains would be desirable, 56% said it would encourage them to take the train more often. However, when asked if they would be willing to pay for the service only 22% of respondents said “yes”.

Other desired amenities included:

* Electric outlets at each seat – 38%
* Beverage/snack service – 35%
* Television monitors at each seat – 21%
* Fold down trays at each seat – 18%

When asked to identify the most effective methods of enhancing the appeal of train service, the most frequently mentioned service features were:

More frequent service – 57%

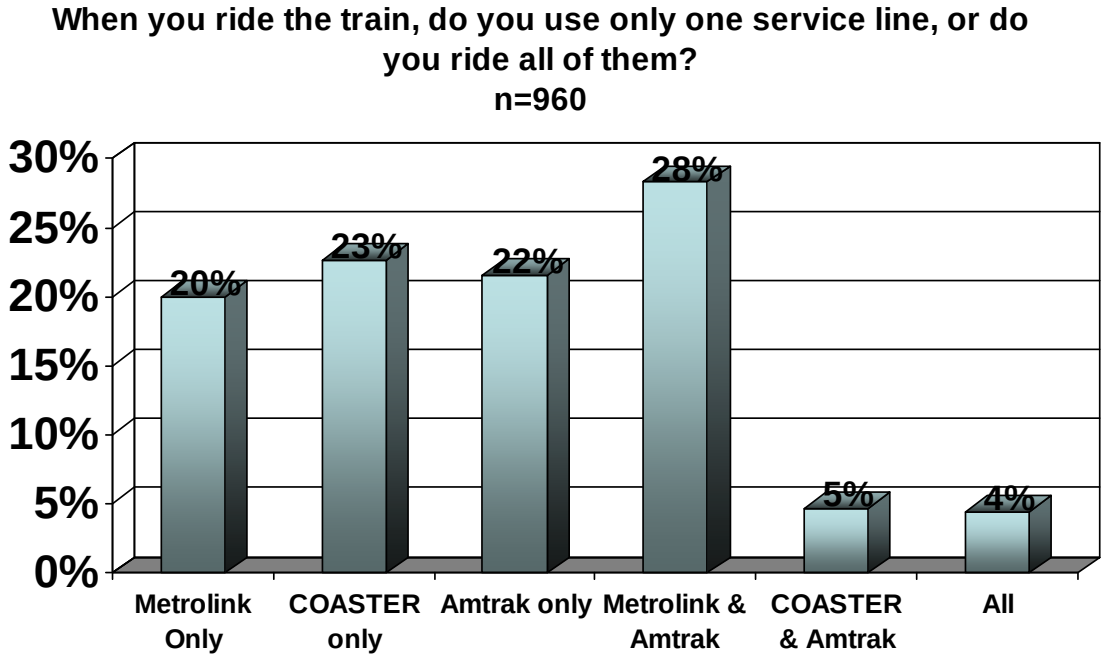
More peak hour service – 44%

Cheaper fares – 42%

Later service – 27%

Loyalty and Employer Support

– 65% of respondents reported being loyal to only one service provider. (Metrolink 20%, Coaster 23%, Amtrak 22%). 28% of respondents reported Riding both Metrolink and Amtrak as rail service options.



– Less than half of respondents (44%) reported that their employer subsidized their train fare and of those only a third (33.3%) reported having their fare totally paid for by their employer (14% of the total respondent population)

Knowledge of Service Options

- Less than half (41%) of all respondents were familiar with the Rail 2 Rail program.
- Eight of every ten respondents surveyed reported that they had never heard of the LOSSAN Corridor.
- Among LOSSAN Corridor riders (including Metrolink and COASTER riders) over 70% reported that they had traveled on the Pacific Surfliner at least once and over 20% reported that they had ridden both the Pacific Surfliner and the Coast Starlight.
- Less than a third of respondents (11%) are aware of the expansion plans along the Corridor.

The Riders

On the trains surveyed:

- Respondents frequently mentioned that the Internet (either a search engine or a specific site) was their source for obtaining schedule information.
- Eight of every ten respondents surveyed were riding alone and less than 5% were traveling in a group larger than three people.
- 98% have access to the internet at home, school, or work.
- 85% had at least attended college and 66% have obtained an advanced degree (College graduate 45.3%, Graduate degree 20.4%)
- 84% are employed at least part-time.
- 94% of respondents report that English is the language that is primarily spoken in their home.
- Almost half (49%) reported an annual household income of more than $50,000.

Rider Conundrums

- While additional frequencies are the top rider priority, they request the additional frequencies during the peak period when track capacity is at a premium.
- Another top priority is fare/ticket flexibility, but riders are unwilling to pay a premium.
- Riders also request cheaper fares which if implemented could create a financial risk.
- Also high on riders' priorities is to have their ticket honored by all local transit agencies. Since there are many cross honoring agreements in place, awareness may be a issue.
- Riders indicate a desire for a single information website. Yet "ease of getting schedule information" is one of the highest rated customer service attributes. Is there real value in improving such a highly rated activity?
- Finally, station access is a critical issue. If the current suburban station rider/parking requirement (72%) remains unchanged, growth cannot occur without heavy investment in parking capacity.

LOSSAN Corridor Demographics

	I-5		Metrolink		
	Oceanside Survey	**Amtrak Surfliner**	**Orange Cty Line**		**COASTER**
Trip Purpose	October-07	Spring 2008	June-08		Fall 2005
			Weekday	Weekend	
Daily Commute Work	36%	8%	89%	15%	79%
Business Travel*	20%	13%	2%	-	6%
Personal or					
Family Business Tvl	15%	9%	2%	1%	2%
Travel to/from School	2%	2%	3%	6%	-
Visit Family/Friends	12%	32%	3%	42%	-
Vacation	3%	8%	-	-	-
Other Leisure Travel	10%	26%	1%	33%	13%
No response or other travel	2%	2%	-	3%	-
Employment					
Full Time	NA	56%	90%	58%	80%
Part-Time	NA	11%	4%	12%	7%
Student	NA	15%	4%	14%	5%
Retired	NA	12%	1%	9%	5%
Not Employed/Homemaker	NA	6%	1%	7%	3%
No Response	NA	-	-	-	-

*Business & Part Business/Leisure Trp

LOSSAN Corridor Demographics

Age					
Under 25	3%	23%	7%	27%	7%
25 - 34 yrs	13%	17%	22%	21%	20%
35 - 44 yrs	19%	17%	21%	17%	22%
45 - 55 yrs	26%	18%	29%	14%	27%
55 - 64 yrs	24%	14%	17%	13%	17%
65+ yrs	14%	11%	4%	8%	7%
No Response	1%	-	-	-	-
Income					
Less than $19,999			5%	21%	
Less than $25,000	2%	18%			8%
$20,000 - $49,999			12%	29%	
$25,000 - $49,999	9%	19%			18%
$50,000 - $74,999	13%	19%	21%	18%	20%
$75,000 - $99,999	15%	14%	20%	12%	17%
$100,000 - $149,999	23%	15%	24%	8%	20%
$150,000+	25%	15%	18%	12%	16%
No Response	13%	-			-