PASSENGER RAIL

REGIONAL TRANSPORTATION PLAN
2012–2035 RTP
SUSTAINABLE COMMUNITIES STRATEGY
Towards a Sustainable Future

Southern California Association of Governments

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PASSENGER RAIL

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Overview and Description

While the SCAG Region is served by a large and diverse transit system, including heavy rail, light rail, fixed route bus and demand response services, it is also served by a network of intercity passenger and commuter rail services. These services operate on the region's rail network, often sharing facilities with freight rail. They operate at higher speeds and have less frequent station stops than traditional transit services, and are more likely to serve intercity and interregional trips.

Two operators offer rail services to passengers within our region: Amtrak and the Southern California Regional Rail Authority (Metrolink). Between the two services, Southern California has a passenger rail network serving five of the six counties in the SCAG region.

Within our region, intercity passenger rail service is operated by Amtrak. Four of Amtrak's fifteen long distance routes, the Coast Starlight, the Texas Eagle, the Southwest Chief, and the Sunset Limited, serve our region. Of these services, the Coast Starlight and Southwest Chief offer daily service, and the other two offer service three days a week.

Amtrak provides much more frequent intercity passenger rail service via the Pacific Surfliner. This 351 mile long service traverses the length of the Los Angeles-San Diego-San Luis Obispo (LOSSAN) rail corridor. Amtrak's Pacific Surfliner is the second most used service in Amtrak's national network, moving nearly 9 percent of the system's total national ridership. Surfliner ridership is also growing over 8 percent a year recently. Administrative and management services for this corridor are currently provided by the Caltrans Division of Rail, and both Amtrak and Caltrans contribute operating revenues for the Surfliner.

Metrolink is currently the sole operator of commuter rail service in our region. Metrolink operates 512 route miles of service along seven routes in Ventura, Orange, Los Angeles, San Bernardino, Riverside and San Diego Counties. Metrolink passengers travel further than most other transit passengers, having an average trip length of 36.9 miles. In FY 2011, Metrolink reported providing 10,605,300 unlinked passenger trips. Four routes, the Ventura County Line, the Orange County Line, the Inland Empire-Orange County Line, and the SR-91 Line, share portions of the LOSSAN Corridor with the Pacific Surfliner. Other Metrolink routes include the Antelope Valley Line, the San Bernardino Line, and the Riverside Line.

High Speed Rail

Despite these services, fast and efficient interregional ground transportation remains an issue within our region. SCAG has historically sought to address these issues through the development of a High Speed Regional Transport (HSRT) system. Beginning in the 1990s, HSRT was seen as a way of providing high speed intraregional mobility in key transportation corridors. This system was seen as a way to provide an alternative to congested commutes, to aid the regional goods movement system, and to help regionalize our aviation system.

As described in the 2001, 2004, and 2008 RTPs, an HSRT system would facilitate the development of a regional airport system and connect major activity and multi-modal transportation centers in Los Angeles, Riverside, San Bernardino and Orange Counties. In December 2002, SCAG's Regional Council approved the focused study of a 56-mile Initial Operating Segment (IOS) of the HSRT system, connecting West Los Angeles with Ontario International Airport via Los Angeles Union Station (LAUS).

TECHNICAL ANALYSES OF THE HSRT IOS

Between 1998 and the present, SCAG has produced multiple analyses of the HSRT serving the IOS Corridor. The first of these reports was "Southern California Intra Regional Maglev for the Next Millennium," published in 1998. This was followed by the "California Maglev Deployment Program" in 2000, which contained a detailed project description and ridership projections for the West L.A. to Inland Empire Corridor. The "SCAG Maglev Deployment Program Phases I and II" were published in 2003 and 2006, respectively. The report for Phase I included financial analyses, and explored the integration of the IOS with existing rail infrastructure. Phase II included detailed cost analysis, and preliminary engineering drawings and station designs. In 2007, SCAG released two more reports, the "West Los Angeles Multi-Modal Transfer Transit Site Survey" and the "HSRT Business Plan." The West Los Angeles report analyzed potential station sites in West L.A., and the Business Plan investigated financial innovations for funding the HSRT system. In early 2009, SCAG released the "HSRT Alternatives Analysis" which presented refined ridership and financial forecasts, as well as analysis of a possible HSRT extension to LAX.

HSRT and the IOS

Much of SCAG's analysis of HSRT has focused on Maglev propulsion systems. Maglev is the name for an elevated monorail using advanced magnetic levitation technology to move people and goods at a very high speed (up to 310 mph). Maglev technology exists on test tracks in Europe, Japan, and the United States. Worldwide, the only high speed Maglev system in revenue service is the Shanghai Transrapid, a 19 mile system connecting Shanghai Pudong International Airport with the Longyang Road Metro Station in Shanghai's suburbs. A low speed Maglev system also operates in the Japanese city of Nagoya. Capital and operating costs remain fairly amorphous in the North American context. As these details became apparent, analysis of the HSRT IOS became mode neutral, and further study of the proposal evaluated both Maglev and conventional High Speed Rail.

In selecting the IOS, SCAG considered the RTP performance measures, stakeholder support and environmental issues. Initial feasibility studies suggested that the HSRT system could be constructed and deployed through a public-private partnership structure administered through a public agency or a Joint Powers Authority (JPA). In 2009, the Southern California Regional High Speed Transport Authority (SCRHSTA) began meeting in order to pursue strategies to deliver an HSRT IOS project. The Cities of Los Angeles, West Covina, and Ontario were the partners in this JPA. The JPA met several times in 2009, but has since been dormant.

SCAG's technical analysis of the potential HSRT IOS evolved over the course of ten years, By the publication of the HSRT AA in 2009, consultant staff were using the most advanced analytical tools and more conservative assumptions. This led to lower performance projections than earlier studies, and methodological reasons for these differences are discussed in the appendices to the HSRT AA. Further, the HSRT AA sought to compare the costs and benefits of both conventional and Maglev high speed transport systems, and of routes along I-10 or the Union Pacific Railroad right-of-way. The proposals examined included station assumptions in West L.A., L.A.Union Station, Ontario International Airport, and either West Covina or the City of Industry.

TABLE 1 Key Findings 2009 High Speed Regional Transportation Alternatives Analysis

Technology	2035 Daily Ridership Forecast	Estimated Capital Cost (in 2008 Dollars)
Conventional High Speed Rail Technology	11,290–12,470	$4.63 Billion–$4.41 Billion
Maglev Technology	11,670–12,800	$7.03 Billion–$7.82 Billion

Source: SCAG [2009] High Speed Regional Transportation System Alternatives Analysis

- Travel Time Variation: Travel time varied by about 12 percent among the four different options. This variety is influenced by technology, alignment, and direction. Neither technology reaches its top design speed (311 mph for maglev and 220 mph for High Speed Rail).
- Capital Cost Estimates: Capital cost estimates range between $4.41 and $7.82 billion for the four options. Maglev options in this corridor appear to be about 60 percent to 70 percent more capital intensive. Maglev systems require much higher guide-beam costs, more intensive traction and power distribution investments, and higher vehicle acquisition costs.
- Operations Costs and Revenue Forecast: Forecast annual operational revenues vary between $52.6 million and $57 million. None of the four alternatives generates an operational surplus by the 2035 forecast year. Annual O&M costs were forecast to be between $73.4 and $81.2 million and projected annual operating deficits in that year range from $16.4 to $28.6 million. Maglev technologies have significantly higher propulsion costs—due to high electric consumption. HSR systems have significantly higher Maintenance of Equipment costs. Farebox recovery would be about 65 percent to 78 percent, which is fairly high for an intraregional transit system. By adjusting fares to a more distance-weighted regimen, the HSRT system would attract 28 percent more riders and 18 percent more revenues.

Given the projected operations loss, none of the proposed HSRT alternatives would likely generate revenues sufficient for bond financing. An economic analysis was performed using Monte Carlo Simulation, and found that in only 14 percent of scenarios would there be positive revenue; even assuming revenue maximizing fares only 38 percent of

operating scenarios would return positive revenue. It would be very difficult to attract private sector financing with these revenue projections. Moreover, it is important to note that in these forecasts technology has no impact on profitability while ridership, revenue, and operational performance are roughly similar across modes, and capital costs are 60–70 percent higher for MAGLEV.

While SCAG was analyzing the potential of a HSRT, the state had begun analyzing the potential of a statewide high speed rail system. In 1996, the state legislature authorized the formation of the California High-Speed Rail Authority (Authority). The Authority has spent the past fifteen years planning and designing a two-phase High-Speed Train (HST) system, intending to link Southern California and the Bay Area. In 2008, California voters approved Prop 1A, authorizing nearly $9 billion in bonds for system design and construction. Phase I of the HST system will connect San Francisco with Anaheim, with several intermediate stops, and Phase II will add connections to Sacramento, Ontario, Riverside, and San Diego.

The evolution of the state HST system illustrated very large challenges to the HSRT system. The first is financial: the HSRT's business model appears to be unprofitable, and there are no apparent programmed funds for project development or delivery. It seems that bond financing or private sector financing is also very unlikely for this proposal.

Secondly, the HSRT IOS would likely occupy a corridor that has also been analyzed by the Authority for Phase II of the California HST, specifically the Los Angeles to San Diego via the Inland Empire segment. The Authority has recently issued a preliminary Alternatives Analysis of this corridor, which included a comprehensive outreach process including monthly meetings with county transportation commissions and MPOs along the corridor, a series of technical working groups with local agency staff, one-on-one meetings with local agencies and jurisdictions, and several series of public meetings. The Authority is currently seeking Prop 1A planning funds to continue technical and outreach work in pursuit of an EIR/EIS.

This competing project is also part a state wide transport system, and ridership numbers would benefit from access to Riverside, San Diego, the Central Valley and the Bay Area. Further, given these longer distances, the fare structure is drastically different than for the HSRT, with much higher maximum ticket prices. These fares give the project a much higher likelihood of profitability, and thus private sector finance.

The state HST system will provide an additional long distance transport option in the state of California, offering an alternative to air and auto travel for Californians. Total cost for Phase I is estimated at $98.5 billion in year of expenditure dollars. This figure does not include Phase II, and the state has secured only $12.6 billion in funds for the project to date. The Authority, in partnership with the Federal Railroad Administration (FRA), has chosen to begin construction in the San Joaquin Valley, using federal High-Speed and Intercity Passenger Rail funds.

Three segments of the project are being developed in the SCAG Region: Los Angeles to Anaheim, Los Angeles to Palmdale, and Los Angeles to San Diego via the Inland Empire. All three segments have produced Alternatives Analysis documents, and are proceeding in various stages of the environmental review process. The Authority's Draft 2012 Business Plan was recently released and has introduced a new construction and implementation approach called the "Blended Approach," that recognizes the funding and implementation realities that have changed dramatically since passage of the bond. A major component of this approach is to connect to, and invest in, existing rail services in the state until the entire HST system is built.

The State of the Existing Passenger Rail System

The Pacific Surfliner

Passenger rail service has been operated in the Los Angeles to San Diego corridor since 1938. This service, dubbed the San Diegan, was initially operated by the Atchinson-Topeka and Santa Fe Railroad. In 1971, when domestic passenger rail services were nationalized, Amtrak assumed operation of the San Diegan service, In 1992, Metrolink commuter rail service was added to the corridor as a result of new state revenues from the passage of 1990's Proposition 116. In 2000, the San Diegan was renamed the Pacific Surfliner, and service was extended north to San Luis Obispo.

In order to coordinate planning activities along the corridor, stakeholders formed the Los Angeles-San Diego-San Luis Obispo Rail Corridor Agency (LOSSAN). LOSSAN is a JPA which seeks to address issues of safety, revenue, productivity and reliability along the LOSSAN corridor. Its membership consists of the San Luis Obispo Council of Governments (SLOCOG), the Santa Barbara Association of Governments (SBCAG), the Ventura County Transportation Commission (VCTC), the Los Angeles County Metropolitan

Transportation Authority (Metro), the Orange County Transportation Authority (OCTA), the San Diego Association of Governments (SANDAG), the North County Transit District (NCTD), the San Diego Metropolitan Transit System (MTS) and the California Department of Transportation's Division of Rail (Caltrans DOR). SCAG, the California High- Speed Rail Authority, and the Riverside County Transportation Commission (RCTC) are all ex officio members of this JPA.

Members of this group have been meeting to coordinate planning activities for the corridor since the 1980s. Over this time period, the LOSSAN partners have attracted nearly $1.2 billion in state and federal funds for the corridor, while also investing nearly a half billion in local funds. As a result of this activity, the Pacific Surfliner has seen significant ridership growth. Between April 2000 and 2011, annual ridership is up 77 percent.

This growth is challenged by two issues, however. The first is On-Time Performance (OTP), which remains a major challenge in the LOSSAN corridor. Due to a combination of congestion and underbuilt infrastructure, any minor delay can lead to a train losing its slot, thereby causing cascading delays throughout the network. In April 2011, OTP for the Pacific Surfliner was 81.2 percent. According to Amtrak's monthly performance report for May 2011, the Surfliner was delayed a total of 20,302 minutes during the course of the month. Of this total, 4,131 minutes of delay were imposed by Amtrak due to passenger hold orders, engine failures, or crew-related delays. An additional 13,587 minutes of delay were imposed by the seven host railroads, including freight train interference, slow orders, and passenger train interference.

Second, operating and maintenance costs also remain a challenge to the Pacific Surfliner service. As per Section 209 of the Passenger Rail Investment and Improvement Act of 2008, Amtrak medium distance corridor services funded by both state and federal revenue streams will lose federal revenues by October of 2013. The FRA is currently working with the states to promulgate operating cost allocation standards by which to make this transition and to recognize in these standards previous capital investments by states such as California. The Pacific Surfliner is one of 11 state supported Intercity Passenger Rail Corridors that will be affected by Section 209, but the only one in California.

The Pacific Surfliner operates 22 trains a day carrying over 8,000 passengers. The Pacific Surfliner carried 2.8 million passengers in FY 2011, a 6.6 percent increase over FY 2010. This continues a ten-year trend of year over year ridership increases. Revenues are also growing. In May of 2011, total fare revenues were $4,791,891, compared with $2,643,578 in May 2003. This is a growth of 81 percent for the Surfliner. However, farebox recovery for FY2010 was 50.7 percent. Of the $47 million operating subsidy for the Surfliner, roughly $28 million was contributed by Caltrans DOR, and roughly $16 million by Amtrak. While 50.7 percent would be an outstanding farebox recovery ratio for an urban mass transit service, the Pacific Surfliner is an intercity transportation mode, with a different fare structure and additional revenue streams such as business class and a dining car. Moving forward, it is important to find strategies to garner increased farebox recovery for the Pacific Surfliner.

Metrolink

Metrolink operates with a very different business model. Metrolink was formed in 1991, when five local county transportation commissions, Metro, OCTA, VCTC, RCTC and SANBAG, formed a JPA with the intent of addressing congestion on regionally significant highway corridors. This agency, the Southern California Regional Rail Authority (Metrolink) began providing commuter rail service in the fall of 1992.

Commuter rail service is defined by the National Transit Database as a transit mode that is an electric or diesel propelled railway for urban passenger train service consisting of local short distance travel operating between a central city and adjacent suburbs. Service must be operated on a regular basis by or under contract with a transit operator for the purpose of transporting passengers within urbanized areas (UZAs), or between UZAs and outlying areas.

Such rail service, using either locomotive hauled or self-propelled railroad passenger cars, is generally characterized by:

- Multi-trip tickets
- Specific station-to-station fares
- Railroad employment practices
- Minimal stations in the central business district

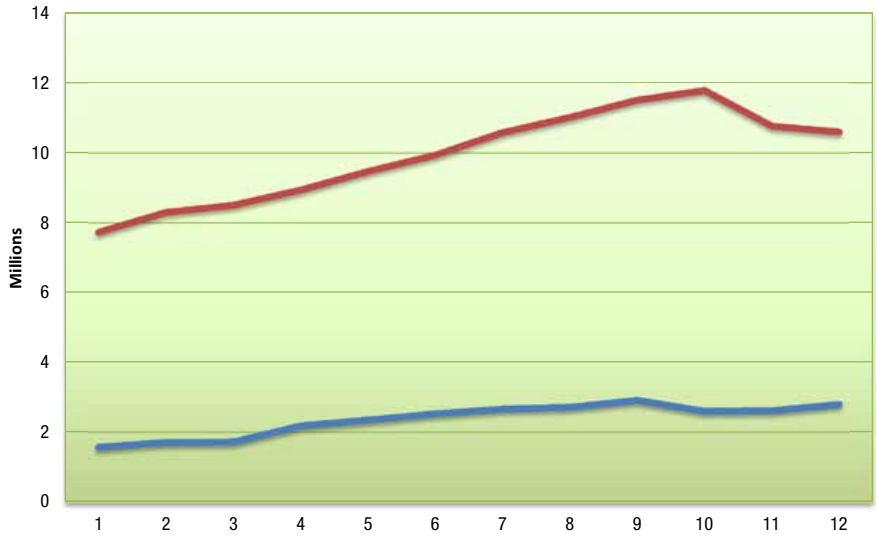
It does not include:

- Heavy rail rapid transit
- Light rail / streetcar transit service

Commuter rail station stops tend to be much closer together than those of intercity passenger rail. Also, smaller portions of the total route alignment tend to be out of urbanized statistical areas, and a much higher proportion of passengers are daily riders. Peak ridership occurs on weekdays, whereas intercity rail operators often have weekend peak ridership. Commuter rail often fuses urban transit business models with railroad style operations. As such, farebox recovery ratios tend to be lower, though operations costs tend to be similar.

Metrolink operates 164 trains on seven lines carrying roughly 42,000 passengers on weekdays. Metrolink carried 10.6 million passengers in FY 2011, a 1.6 percent decrease from FY2010. Ridership has generally increased year over year but was negatively impacted by the recession. Metrolink has made strong progress in improving its farebox recovery ratio. Nearly 44 percent of Metrolink's FY2011 $173.3 million operating budget was funded with fare revenues. This compares with a 37 percent ratio in FY2002. During the last year, Metrolink implemented operational policies that saved $10 million in costs, increased revenue by $6 million, and reduced fuel consumption by 840,000 gallons. It also is in the process of accepting its new passenger car fleet designed with special new safety features.

FIGURE 1 Pacific Surfliner and Metrolink Ridership 2000–2011



Source: Amtrak and Metrolink Ridership Reports

Compared to commuter rail operators in other metropolitan regions with populations of over five million, Metrolink is a strong fiscal performer. In 2008, Metrolink's average cost per passenger mile was 19 percent lower than the national median, and cost per trip was only 2 percent higher than the national median. The national median farebox recovery for operators in large metropolitan regions was 48 percent, which Metrolink outperformed by 2 percent. However, Metrolink's cost per service hour was 30 percent higher than the national median.

Average speeds for the Pacific Surfliner and Metrolink are 46 mph and 40 mph respectively. The average speeds vary by line and while top speeds are 79 mph, the number of stops and capacity and geographic constraints result in these average speeds which are lower than one would think. These facts demonstrate the need to fund capital projects in order to speed up the service and make these services more attractive to the SOV commuter.

The extent of the total commuter rail network is another area where Southern California is highly competitive. Our region boasts 4.32 commuter rail route miles per 100,000 residents, which is 2.71 times the median for large metropolitan regions. However, in 2008 residents of the SCAG region took only 0.7 per capita trips on the commuter rail system, well below the national median of 0.82. Chicagoans, by contrast, took 8.28 trips per capita, on a network that provides 11.8 route miles for every 100,000 residents. Residents of Baltimore took 34 percent more commuter rail trips per capita on a network similar to that of the SCAG region. Thus, our commuter rail system has the potential and capacity to be used much more intensely.

Projects In Development

Metrolink's short term capital investment priorities include improvements for capacity, access, and safety. The Metrolink Service Expansion Program (MSEP), sponsored by OCTA and Metrolink, will deliver increased Metrolink service between Fullerton and Laguna Niguel/Mission Viejo. This program was approved by OCTA's board of directors in 2005, but the Great Recession and subsequent anemic economic growth has slowed implementation. In order to facilitate increased commuter train volumes, OCTA and Metrolink have begun building station and capacity improvements along the Orange County Line. This $91 million program of improvements includes a turn back facility at Laguna Niguel/Mission Viejo Station, new track at Fullerton station, a new Metrolink station in Placentia, a new parking structure in Fullerton, and new passenger amenities including shade structures and ticket vending machines.

Also in Orange County, an $85 million investment program is also being pursued via the Orange County Grade Crossing Safety Improvement (OCX) program. This program will provide grade crossing safety enhancements at 31 grade crossings in the cities of Orange, Anaheim, Tustin, San Juan Capistrano, Dana Point, San Clemente and Irvine. Additional safety improvements are also being made along the Burlington Northern Santa Fe (BNSF) main line as part of the Orange County Bridges program. Currently, BNSF operates up to 70 freight trains a day along its mainline, and expects to run up to 130 a day by 2030. To reduce delay and improve safety, OCTA is constructing seven grade separations in the cities of Fullerton, Placentia, and Anaheim. The City of Irvine is also engaging in a $55.9 million effort to grade separate Sand Canyon Avenue. As with all grade separation projects, this new underpass will improve both safety and traffic flow.

Metrolink is also pursuing safety and capacity enhancements in Los Angeles County. The Glendale Corridor Grade Crossing Safety Improvements program will enable Metrolink to meet the latest grade crossing and safety standards by installing automatic vehicle exit gates, pedestrian gates, roadway widenings, new sidewalks and handrails, and advance traffic signal pre-emption at six grade crossings in the city of Glendale. Additionally, Metrolink is engaged in a program of improvements to install tunnel lighting and intrusion detection systems in six L.A. County train tunnels, mostly along the Antelope Valley and Ventura County Lines. Metrolink's final major capital priority is the reconstruction of L.A. Union Station's Platform 7. This $8.5 million project will restore tracks 13, 14, and 15 into service after 35 years of non-passenger use, and improve communications systems and install new lighting and message boards.

In Riverside County, the largest near term capital priority is the Perris Valley Line (PVL). The PVL is a 24 mile extension of Metrolink's 91 Line, and will connect residents of the cities of Riverside, Moreno Valley, and Perris with jobs and services in Orange and Los Angeles Counties. This service will connect to the BNSF mainline near the City of Riverside, and use the San Jacinto Branch line paralleling I-215 to reach South Perris. Four new stations will include Riverside Hunter Park, Moreno Valley March Field Station, Downtown Perris Station, and South Perris Station. This project represents the first addition of new track miles to the Metrolink system since the 1990s.

San Bernardino County is also expanding its rail network. The Downtown San Bernardino Passenger Rail Project is a one mile extension of Metrolink service into Downtown San Bernardino. Upon projected completion in 2014, commuter rail service will terminate at the future site of the San Bernardino Transit Center at E Street and Rialto Avenue. This will allow greatly increased regional transit access to downtown San Bernardino, an important center for governance, commerce, and services in the San Bernardino Valley. Metrolink passengers will also be able to connect to the sBX E Street BRT service at this location. SANBAG is also investigating potential transit connections to the city Redlands via the Redlands Subdivision.

The Constrained and Strategic Plans: Our Passenger Rail Vision

Constrained and Strategic Plan Project Selection

In June 2011, the Regional Council approved the formation of the High-Speed Rail (HSR) Subcommittee. The purpose of the subcommittee was to help guide staff in defining and formulating high-speed rail strategies for the RTP's Constrained and Strategic Plans due to the significant number of projects in the planning phase.

Since several HSR projects are in the planning phases, with varying degrees of funding, costing, and operational specifics, the Regional Council formed the HSR subcommittee to evaluate all of the projects in depth, so as to make informed project inclusion decisions for the Constrained and Strategic Plans. Due to their different levels of development, it was difficult to rate and compare the projects on a direct basis, and in some cases projects directly compete with one another. Therefore, staff developed an evaluation approach using various criteria to determine which projects in the planning phases are most viable, beneficial to our region, and offer the greatest chances of being implemented sooner rather than later.

The decision-making approach used to make a final recommendation of HSR projects to include in the RTP had three steps. The first step narrowed down the proposed HSR projects to a set of projects that were qualified for the Strategic Plan. The second step narrowed down the projects further to those to be included in the Constrained Plan. This required higher levels of details relative to costs, funding, ridership potential, community and stakeholder support and other measures. The final step evaluated how the proposed HSR system worked together with the rest of the planned transportation system using SCAG's travel demand model.

The criteria that staff used to formulate the preferred HSR alternative included: reasonableness of available funding, level and amount of costing details, current project status, level of stakeholder and public support, stakeholder consensus of project's alignment and operational characteristics, degree of regional connectivity, ridership potential and commuter rail potential.

TABLE 2 High Speed Rail Matrix

Project	Project Description	Project Readiness	Project Consensus	Stakeholder Support	Regional Connectivity	Ridership Potential	Cost	Funding	Business Plan	Commuter Rail Potential	Staff Recommendation
California High-Speed Rail Phase One	San Francisco to L.A. Union Station with additional alignment south to Anaheim. Top speed 220 mph.	Alternatives Analysis completed.	Opposition to Grapevine alignment.	Moderate, especially among cities with stations.	Very good. Connecting and adjacent transit services must be properly adjusted to provide appropriate feeder role.	Very good. Should attract significant inter-city and also current auto and airline trips.	$98.5 billion	Only partially funded. Some of those funds will be used to provide shared benefits improvements to LOSSAN and Metrolink.	New draft business plan out in early November for public comment.	Not good. High-Speed rail fares will be too expensive for commuters without local subsidies.	Include in Constrained Plan.

Project	Project Description	Project Readiness	Project Consensus	Stakeholder Support	Regional Connectivity	Ridership Potential	Cost	Funding	Business Plan	Commuter Rail Potential	Staff Recommendation
California High-Speed Rail Phase Two	Merced to Sacramento and L.A. Union Station to San Diego via the Inland Empire.	In Alternatives Analysis.	Moderate, some concerns of negative impacts in San Gabriel Valley and Inland Empire along alternative alignments.	Moderate, some concerns of negative impacts in San Gabriel Valley and Inland Empire along alternative alignments.	Very good. Connecting and adjacent transit services must be properly adjusted to provide appropriate feeder role.	Very good. Should attract significant inter-city and also current auto and airline trips.	Not estimated.	Currently not funded.	New draft business plan out in early November for public comment.	Not good. High Speed rail fares will be too expensive for commuters without local subsidies.	Include in Strategic Plan.
DesertXpress	Las Vegas to Victorville. No intermediate stops. Steel wheel on steel rail. Top speed 150 mph.	FEIS completed. FRA ROD issued July 8, 2011.	Low, due to not serving urban areas of Southern California.	Would improve if extended south of Victorville or west to Palmdale to connect with CAHSR.	Not good since southern terminal is Victorville.	Questionable due to southern terminus.	$6.5 billion	Federal loan or privately funded.	Ridership and revenue report completed for loan application but not yet available.	This service is not expected to attract commuter trips.	Include in Strategic Plan.
California/ Nevada Super-Speed Train	Maglev project from Las Vegas to Anaheim with intermediate stops in Primm, Barstow, Victorville and Ontario. Top speed 300 mph.	Program EIS begun in 2004 has not been completed.	Low. Project not moving forward and is a competing project to DesertXpress which is further along in project delivery process.	Low. Project not moving forward and is a competing project to DesertXpress which is further along in project delivery process.	Would be good if project was built.	Would be good if project was built.	$12.1 billion	$45 million federal earmark for environmental work. Potential funding from TIFIA and private bonding.	2007 Financial Plan submitted to FRA.	Moderate. This service would attract some commuter trips between Victorville, Ontario and Anaheim.	Do Not Include in 2012 RTP.

Project	Project Description	Project Readiness	Project Consensus	Stakeholder Support	Regional Connectivity	Ridership Potential	Cost	Funding	Business Plan	Commuter Rail Potential	Staff Recommendation
California/ Nevada Super-Speed Train Anaheim to Ontario IOS	Initial operating segment, or stand-alone project of CNSSTP from Ontario Airport to Anaheim. Top speed 220 mph.	Program EIS begun in 2004 has not been completed.	Good, but lower outside of corridor and operator not identified.	Good, but maglev technology does not have broad stakeholder support and consensus in our region.	Very good. Connecting and adjacent transit services must be properly adjusted to provide appropriate feeder role.	Good. Will provide excellent connection from under-utilized Ontario airport to Anaheim Resort area.	$2.77 billion	$45 million federal earmark for environmental work. Potential funding from TIFIA and private bonding.	2003 Financial Plan submitted to FRA and updated in 2011 with Implementation Plan.	Moderate. This service would attract some commuter trips between Ontario and Anaheim.	Include in Strategic Plan.
Orangeline – Northern Segment	HSR project from Santa Clarita to L.A. Union Station via Bob Hope Airport.	In Metrolink Antelope Valley and Bob Hope Airport Ground Access studies.	Good with corridor stakeholders. Operational characteristics not yet vetted. Duplicates CAHSRA alignment.	OLDA members strongly support concept. Still need to work with some corridor stakeholders.	Good. Provides multi-modal connections along alignment. Can be integrated to serve as feeder to CA HSR, Metrolink and Amtrak.	Very good. Provides direct connection to Bob Hope Burbank Airport and downtown L.A.	No updated costs available.	Not funded.	Some station area planning completed. Project requires further definition.	Very good. This service would attract commuter trips.	Include in Strategic Plan.
Amtrak LOSSAN Corridor Improvements	Speed improvements to Pacific Surfliner corridor in SCAG region. Top speeds up to 110 mph in some segments.	Improvements ready to go with funding.	Very high	Very high	Very good. Connecting and adjacent transit services must be properly adjusted to provide appropriate feeder role.	Very good. Should attract significant intercity and also current auto trips.	Costing for some identified projects is estimated.	Funding will be committed by CAHSRA MOU - up to $1 billion.	2010 LOSSAN Corridor Strategic Assessment. Ridership forecasting in progress for 2030.	Very good. This service already attracts commuter trips.	Include in Constrained Plan.

Project	Project Description	Project Readiness	Project Consensus	Stakeholder Support	Regional Connectivity	Ridership Potential	Cost	Funding	Business Plan	Commuter Rail Potential	Staff Recommendation
IOS HSRT proposed in the 2008 RTP by SCAG	IOS West L.A. to Ontario Airport with four additional possible segments. Technology neutral.	In conceptual stage.	Moderate, with stronger support in the Inland Empire. Operator not identified. JPA has not met in over a year.	Moderate, with some support in the Inland Empire.	IOS redundant to CA HSR Phase 2 from L.A. Union Station to San Bernardino.	IOS redundant to CA HSR Phase 2 from L.A. Union Station to San Bernardino.	$7.8 billion (2007 estimate)	Not funded. Planning assumptions questionable.	2007 Business Case Study	Good. This service would attract commuter trips.	Do Not Include in 2012 RTP.
Metrolink Improvements	All current Metrolink corridors, with current emphasis on the Antelope Valley Corridor. Top speeds up to 110 mph in some segments.	Improvements being studied.	Very high.	Very high.	Very good. Connecting and adjacent transit services must be properly adjusted to provide appropriate feeder role. Metrolink and the CAHSR will complement one another.	Very good. Should attract significant inter-city and also current auto trips.	Costing for some identified projects is estimated.	Funding will be committed by CAHSRA MOU - up to $1 billion.	2007 Strategic Assessment. Update in progress.	Excellent. This service already attracts many commuter trips.	Include in Constrained Plan.

The projects selected for inclusion in the Constrained Plan are detailed below:

California High-Speed Rail Phase I

Phase I is from San Francisco to Anaheim via L.A. Union Station, and in our region from the Kern County line to Anaheim via L.A. Union station with stops in Palmdale, Sylmar, Burbank, L.A. Union Station, Norwalk and Anaheim.

1. Amtrak LOSSAN Corridor, and

2. Metrolink System

There has been strong stakeholder support in our region to pursue significant improvements to the LOSSAN corridor and Metrolink system that would enable operation of HSR services at least on some segments that would meet the FRA criteria for HSR (110 mph or above). Amtrak, Metrolink and the LOSSAN Rail Corridor Agency are continuously working towards speed and service improvements. These stakeholders are in the process of identifying and planning corridor projects with estimated costs through the LOSSAN Corridorwide Strategic Implementation Plan, which will identify programs and policies to better coordinate all rail services in the corridor and aim to increase ridership and develop

new markets. The plan is expected to be completed in early 2012. This, coupled with the Authority's new blended approach for HSR implementation has resulted in consensus among our Region's stakeholders, the Regional Council and the Authority that $1 billion in HSR funding be allocated to the LOSSAN and Metrolink corridors over the next few years. Currently, a MOU is being developed between the Authority, SCAG, Metrolink, Metro, OCTA, RCTC, SANBAG and SANDAG to prescribe how these funds will be allocated.

This is the most viable way to expedite HSR operation in our region and also to connect to the CA HST Phase I that will begin construction in the Central Valley next year. This new approach in our region is reflected nationwide since much of the federal HSR appropriation awards have funded existing Amtrak intercity rail corridors.

EXHIBIT 1 Constrained Plan HSR Map

EXHIBIT 2 Commuter Rail

TABLE 3 Transit Ridership

SCAG Region Annual Transit Ridership				
	2001	2005	2008	2035 Plan
Metro Rail	61,802,000	74,243,000	86,707,000	150,000,000
Commuter Rail	7,398,000	10,693,000	12,681,000	25,000,000
Bus	548,728,000	609,795,000	622,286,000	806,000,000
Total	**617,928,000**	**694,731,000**	**721,674,000**	**981,000,000**

Source: National Transit Database (NTD) for past years and SCAG model estimates for 2035 based on Draft 2012 RTP/SCS

Funding Rail Investment: Phased Implementation and the Blended Approach

The Authority's Draft 2012 Business plan outlines new capital cost estimates and new strategies to secure necessary revenues. The new estimate of $98.5 Billion (in year of expenditure dollars) will require new state, federal, and public private partnership (P3) revenues to ensure Phase I completion by 2034. The Authority's new strategy to secure funds and deliver incremental projects between now and 2034 involves a strategy of phased implementation and blended operations.

As part of this strategy, the state's HST program will proceed in two simultaneous paths: the critical path of major corridor delivery, and a coterminous path of early investments that provide early benefits to existing rail operators and passengers. As noted on page 2-3 of the draft 2012 business plan:

"It is important to note that, although improvements to local and regional rail systems are intended to improve or facilitate connections to the High Speed Train System, they do not need to be implemented sequentially. As with the stages of the HST system, these improvements, such as grade crossing eliminations and additional tracks, have independent utility that will benefit riders prior to connection to the high speed system. Where possible, they should move ahead independently and as quickly as feasible."

The new critical path outlined by the Authority includes a vision of risk mitigation through incremental project delivery. As each phase of the critical path is delivered, the Authority's governing board comes to a decision point:

a. Should the program move forward?
b. What is the appropriate next phase/segment?

The draft business plan envisions this strategy as delivering incremental benefits while allowing the state to opt out of the project if cost or schedule overruns become too burdensome. The plan also lays out the following critical path and concurrent activities:

TABLE 4 Phased Critical Path Sections, California High-Speed Rail Program

Section	Length	Endpoints	Description	Incremental Cost in 2010 Billions	Completion Year
Initial Construction Section (ICS)	130	Fresno – Bakersfield	Provides track and structures to support system spin; allows vehicle testing.	$5.2	2018
IOS Options (North/South)	290/300	Bakersfield to San Jose/ Merced to San Fernando Valley	Supports 220 mph HSR service; includes trains and systems. Ridership and revenues sufficient to attract private participation. Connects with regional/local rail for blended operation.	$19.4 to $26.4/$21.0 to $25.8	2022
Bay to Basin	410	San Jose and Merced to the San Fernando Valley	First HSR service to connect the San Francisco Bay area with the Los Angeles Basin.	$14.2 to $17.3	2027
Phase I Blended (Non-critical path)	520	San Francisco to Los Angeles/Anaheim	Builds on Bay to Basin with blended operations with existing commuter/intercity rail, and additional improvements for a one-seat ride, connecting downtown San Francisco and Los Angeles/Anaheim. Caltrain corridor electrified for HSR, and new dedicated lines into Los Angeles and Anaheim.	$14.1 to $18.0	2026–2034
Full Phase I	520	San Francisco to Los Angeles/Anaheim	Continues dedicated highspeed alignment in full from San Jose to San Francisco and into Los Angeles/Anaheim.	$8.2 to $10.5	2034

The Authority estimates that the Initial Construction Segment (ICS) will be complete in 2018; this will lead to a decision point:

a. Should the program move forward?
b. Should the next step be to extend south, or extend north?

The business plan identifies two possible Initial Operating Segments (IOS). The first is a northward connection of the ICS into San Jose. This project is estimated to cost between $19.4 and $26.4 billion, and is estimated to generate between $207 and $368 million in net operating surplus by 2025. This option is named the IOS-North.

The second, IOS-South, would build the system south from Bakersfield, extending HST service into the San Fernando Valley. The estimated capital cost of this extension south would be $21.0 to $25.8 billion. The Authority estimates that the IOS – South would generate between $352 and $582 in annual net operating surplus by 2025.

The step on the critical path after the IOS is the "Bay to Basin" phase. In this phase, the authority will deliver the IOS section that was not selected to move forward in the previous section. Two key decisions will have to be made at this step:

a. Should the program move forward?
b. Is the operating surplus significant enough to attract P3 investment?

The net operating surpluses discussed above are crucial to this step. The business plan views the IOS stage as demonstrating the revenue generating potential of the total system, and the first point in the program where there is significant potential to attract

private sector funding. As such, a careful analysis of ridership and revenue forecasts it crucial to the IOS selection process.

Concurrent to the critical path activities are the Phase I Blended projects. These improvements will consist of incremental projects that deliver benefits to existing railroads and lay the foundation for eventual high speed service. Many core projects in this phase will begin in 2026, but early actions on the LOSSAN Corridor and the Metrolink system will occur before then.

Before the full build out of Phase I of the HST program in 2034, the business plan envisions a partial "sharing [of] existing commuter rail infrastructure" resulting in a "one-seat-ride from end-to-end." By upgrading existing Caltrain, Metrolink, or Amtrak rights of way or infrastructure, high speed trains can travel onward to San Francisco or Los Angeles at lower speeds. Eventually, upgrades to existing infrastructure will allow 125 mph service.

In the SCAG Region, this plan will be complicated by drive issues. While the Authority's HSTs will be electric drive, and powered by direct-overhead contact lines (often called catenaries), Amtrak and Metrolink currently operate diesel-electric locomotives, as do UP and BNSF. Moving forward, the region will have to reconcile the use of electric and diesel-electric locomotives in the same corridor; and resolve whether these two types of locomotives can share facilities. Blended operations may not be possible until these conflicts are resolved.

The final critical step of the program is the full build out of Phase I between downtown San Francisco, Los Angeles, and Anaheim. Final steps will include electrifying rail infrastructure and sealing corridors here in Southern California, and tunneling from 4th and King to the Transbay terminal in San Francisco.

The blended Phase I step is particularly important to the vision for passenger rail in the SCAG Region presented here. The 2012 RTP contains strategies to accelerate and implement Phase I blended investments, allowing the existing Amtrak Pacific Surfliner and Metrolink system to operate at speeds over 110 mph in the near term. Funds from Proposition 1A and other Authority revenue streams can be leveraged to allow high speed travel years before the 2034 completion of the HST program. The MOU between the Authority and local rail stakeholders discussed above will set a funding mechanism for moving funds for initial investments from the state to local agencies.

Strategies and Recommendations

There are several strategies to increase rail ridership in our region. It is important to note that there are three distinct rail markets: commuter, intercity, and interregional. The first served by Metrolink, the second by Amtrak, and the third will be served by the state HST service. However, the three carriers can be attractive to the rail travel markets different from their own. Rail strategies include:

- Increasing speed
- Increasing service levels
- Cooperative fare agreements and media
- Cooperative marketing efforts

Speed and Service

The LOSSAN partners and Metrolink are in the process of planning and implementing capital projects to improve capacity, speed, and service, bringing at least some segments of their networks up to the federally defined high speed of 110 mph or greater. This includes a strategic implementation plan for 2030 that is estimating ridership and additional service using a coordinated schedule among Metrolink, Amtrak and NCTD's Coaster commuter rail service. This effort is also looking at extending some Metrolink trips to San Diego and some Coaster trips to L.A. Union Station. As speeds improve, these services will become more competitive with SOV travel and thus ridership will continue to grow. Further, their schedules should be adjusted once the state HST project is implemented so that all rail services complement and feed each other. These local efforts will now be greatly increased and speeded up due to the new funding partnership with the Authority.

Cooperative Agreements

The LOSSAN Rail Corridor Agency Joint Powers Board consists of the Ventura County Transportation Commission (VCTC), the Orange County Transportation Authority (OCTA), the North County Transit District (NCTD), the San Diego Association of Governments (SANDAG), San Diego's Metropolitan Transit System (MTS), the San Luis Obispo Council of Governments (SLOCOG), the Santa Barbara County Association of Governments (SBCAG), the Los Angeles County Metropolitan Transportation Authority (Metro), and the California Department of Transportation, Division of Rail (DOR), and coordinates

EXHIBIT 3 Strategic Plan HSR Map

service and investment planning along the corridor. SCAG, the California High-Speed Rail Authority, Amtrak, and the Riverside County Transportation Commission (RCTC) are ex-officio members of the Joint Powers Board.

Amtrak's Pacific Surfliner is the designated intercity passenger rail service in the corridor, and Caltrans DOR provides administration and management for the Surfliner. Both Amtrak and the DOR currently provide operating subsidies for the Pacific Surfliner. Other rail operations in the corridor include NCTD and Metrolink commuter rail service, and freight service by Union Pacific and Burlington Northern Santa Fe.

The LOSSAN Corridor Strategic Assessment, outlining a long-term, shared vision for enhancing passenger rail service between San Diego, Los Angeles, and San Luis Obispo through 2025, was completed in January 2010. This vision includes express services, faster travel times, and increased coordination between operators.

At the direction of the LOSSAN Board, the LOSSAN member agency CEOs group examined changes to LOSSAN's governance structure that would enhance LOSSAN's ability to implement the Strategic Assessment vision, especially in light of upcoming changes to federal operating subsidies per the Passenger Rail Investment and Improvement Act of 2008. The LOSSAN CEOs proposed a new joint powers structure wherein the LOSSAN Rail Corridor Agency would have direct control of Amtrak operations, similar to Northern California's Capital Corridor JPA. The LOSSAN Board has reiterated that initial governance changes should focus only on the state-supported intercity rail service and not modifications to the Metrolink or NCTD COASTER governance structures.

The benefits of local management of passenger rail service in the LOSSAN corridor include:

- More efficient resource allocation related to service expansion, frequencies, and schedules;
- A unified voice at the state and federal levels when advocating on passenger rail issues, including funding for capital improvements;
- Consolidated services such as fares, ticketing, marketing, and passenger information systems;
- Coordinated capital improvement prioritization; and
- More focused oversight of on-time performance, schedule integration, mechanical issues, and customer service.

It is expected that this new JPA will be formalized over the next year.

Marketing and Fares

Cooperative fare agreements and media also offer opportunities for increasing rail ridership and attracting new riders. For example, the Rail-to-Rail pass allows Metrolink monthly-pass riders who have origin and destination points along the LOSSAN corridor to ride Amtrak. Agreements like this one could be expanded once the CA HST project is built.

Metrolink has recently been pursuing innovative marketing, ticket pricing and operations strategies to increase ridership and reduce costs. In May 2011, Metrolink started express service demonstration programs on its San Bernardino and Antelope Valley Lines. This service shaves a large amount of travel time off the conventional trips. By skipping most stops, travel time is reduced 33 percent to just one hour on the San Bernardino Line, and 25 percent to an hour and a half on the Antelope Valley Line. Metrolink has also started specific trains for both Dodgers' and Angels' games, and other special events.

Amtrak also initiated an express trip in February 2011. It shaves 17 minutes off the northbound trip (currently, there is no southbound express). The provision of more express trips in the future should attract new transit riders.

Metrolink also started some progressive new fares this year, including the $10.00 all-weekend pass. From 7:00 p.m. Friday to 12:00 p.m. Sunday, riders can take multiple trips anywhere on the Metrolink system. Monthly pass holders can also take unlimited trips on the weekend regardless of their pass' origin/destination pair.

The Strategic Plan: Our Ultimate Vision for High Speed Rail

Our ultimate vision for a true HST system that would link major urban areas and activity centers within our region and beyond would be incomplete without Phase II of the proposed state HST system. Phase II would link Los Angeles Union station to San Diego via the Inland Empire in our region. The project is being planned in segments all in different degrees of project readiness. This corridor is approximately 160 miles long, stretching

from Union Station in downtown Los Angeles through San Bernardino and Riverside Counties, and terminating in San Diego County. With 20.8 million residents, these four counties make up approximately 56 percent of the state's current population and will grow significantly by 2050.

Phase II of the state HST system, by adding connections to the Inland Empire and San Diego County, completes the backbone of a true regional High-Speed Transport system. The LOSSAN, Metrolink system, and state HST Phase I investments will provide high speed travel alternatives in Northern Los Angeles County, the San Fernando Valley, the Gateway Cities, and Orange County; Phase II will extend those alternatives to the San Gabriel Valley and the Inland Empire. Upon completion, Phase II will provide important access to planned and existing regional centers, including Ontario International Airport, the March Inland Port, and possibly San Bernardino International and Corona airports, helping to meet SCAG's long-term goal of regionalizing air travel in Southern California. Furthermore, Phase II may one day be the basis for further high speed rail extensions into Nevada or Arizona.

The state HST system will provide excellent regional connectivity to our region by connecting with a robust network of intercity and commuter rail, subway and light-rail, and fixed-route transit systems. Integrated planning and service levels of these connecting services will allow them and the state HST to feed and complement each other. While commuter, intercity and interregional rail services are distinct travel markets, the proper coordination of their schedules will further increase the region's rail and transit ridership by attracting crossover passengers to these different markets. It will also significantly relieve capacity constraints of the existing air and highway transportation system as increases in intercity travel demand in California occur. By attracting a large number of trips from current auto and air travel markets, a significant decrease in GHG emissions will be achieved in our region. In addition, the state HST system will provide a much cheaper alternative to building additional airport and highway capacity to serve intrastate aviation routes and auto trips.

Strategic Plan Projects

CALIFORNIA HIGH-SPEED RAIL PHASE II

Phase II is from Madera to Sacramento and in our region from L.A. Union Station to San Diego through the San Gabriel Valley and Inland Empire. Phase II is in the Supplemental Alternatives Analysis phase and includes some alternative alignments in our region: either I-10 or SR 60 through the San Gabriel Valley, and either I-15 or I-215 from the Inland Empire to the San Diego County line. There is currently no funding for Phase II.

DESERTXPRESS

The Desert Xpress would connect Las Vegas to Victorville using steel wheel on steel rail technology. There are no intermediate stops. The project has completed the environmental process and the FRA issued a record of decision (ROD) on July 8, 2011. DesertXpress Enterprises has applied to the FRA for a $4.9 billion loan to start and complete construction of the project. The company also states that they can acquire the necessary private funding to complete the project. Phase Two of this project would connect Victorville to Palmdale, thereby providing a connection with the CA HST system. Phase Two was not included in DesertXpress' environmental process, nor is it part of their FRA loan application. It is however a project alternative in the High-Desert Corridor's environmental process.

CALIFORNIA/NEVADA SUPER-SPEED TRAIN ANAHEIM TO ONTARIO INITIAL OPERATING SEGMENT

This is a maglev project which is part of the larger Las Vegas to Anaheim project. The project north of Ontario has not been moving forward, especially since momentum has shifted to the DesertXpress which shares the desert alignment, so the decision was to not include it in the RTP. The southernmost segment from Anaheim to Ontario however has been included in the Strategic Plan due to its strong ridership potential and ability to operate as a stand-alone project. A $45 million planning project for this segment is also included in the Constrained Plan.

ORANGELINE NORTHERN SEGMENT

The northern segment of the Orangeline is between L.A. Union Station and Santa Clarita. This segment was included in the Strategic Plan due to its ridership potential and connection to Bob Hope airport. The southern section from L.A. Union station to Cerritos is along the West Santa Ana Branch ROW Corridor that is partially funded by Measure R and has been in the Constrained Plan beginning with the 2008 RTP.

Greater Vision for our Commuter and Passenger Rail System

Metrolink Enhancements

Metrolink provides our region's commuter rail service operating 164 trips on seven lines carrying 42,000 passengers on weekdays. With the investments proposed within the Constrained Plan in Chapter 2, we expect to achieve more than double the ridership by 2035. But, we believe, the Metrolink system has even greater untapped potential for our region.

Our region boasts 4.32 commuter rail route miles per 100,000 residents, which is over 2.5 times the median for large metropolitan regions. However, in 2008, residents of the SCAG region took only 0.7 per capita trips on the commuter rail system, well below the national median of 0.82. Chicagoans, by contrast, took 8.28 trips per capita, on a network that provides 11.8 route miles for every 100,000 residents. Residents of Baltimore took 34 percent more commuter rail trips per capita on a network similar to that of the SCAG region.

The average speed for Metrolink is about 40 mph today. The average speeds vary by line and while top speeds are 79 mph, the number of stops and physical capacity and geographic constraints result in this average system speed which is lower than one would think. This shows the need to fund capital projects in order to speed up the service and make Metrolink more attractive to the SOV commuter.

The recent release of the Authority's draft 2011 Business Plan puts off the arrival of the state HST system in our region to 2033, and greatly escalates the official project cost. This confirms long-standing stakeholder concerns of the project's implementation timeline and viability, and therefore confirms the need to spend HSR dollars on our region's current rail services. In fact, the new Business Plan calls for "blended" rail services whereby incremental operating segments of the state HST system will connect with existing rail services until the entire project gets built.

Our Strategic Plan vision for Metrolink speed and service improvements calls for an intensive investment in capital projects to further increase speed and service levels over and above the Constrained Plan. The Strategic Plan results in even more segments of the network operating at speeds of 110 mph or greater. These projects include additional double tracking, sidings, station improvements, grade separations, and grade crossings. Not only will this benefit commuter rail trips in our region, but will benefit Amtrak intercity and the state HST interregional trips also as the three systems feed and complement each other. While these are three distinct travel markets, improving all three networks encourages cross-over rail travel market trips.

In addition to capital improvements, our strategic vision calls for:

- A doubling of system use by 2020, and possibly doubling again by 2035
- Considerably more express trips
- Regular special event services
- A connection to Ontario International airport
- The implementation of new BRT services that directly connect with the Metrolink system
- A robust growth of TOD around Metrolink stations
- The implementation of first mile/last mile policies for robust bicycle and pedestrian improvements around Metrolink stations.

Additional Passenger Rail Service

An additional Strategic Plan passenger rail element implements daily passenger rail service between downtown Los Angeles and the Coachella Valley. Stops would include L.A. Union Station, Fullerton, Riverside, Redlands/Loma Linda, Beaumont/Banning, Palm Springs, Rancho Mirage and Indio. Service would be operated by Amtrak with ideally at least two if not three daily round trips.

Currently, rail service between downtown L.A. and the Coachella Valley is only provided three days a week with an unattractive schedule as part of Amtrak's interstate services. Union Pacific Railroad owns this rail corridor east of Colton and is opposed to implementing additional passenger service without large capital improvements. However, Amtrak retains the right to operate passenger service on freight-owned railroads and there is a process in place to resolve freight opposition, although Amtrak and other partners such as Caltrans DOR and RCTC may be required to fund capital projects to mitigate potential financial damages to Union Pacific. A 2010 RCTC study estimates $75 million in station costs, $40 million in equipment costs, and $11.4 million in yearly operating costs to start this service. These figures do not include any capital costs required to mitigate service disruptions incurred by Union Pacific.

Enhanced Propulsion Technologies

Included in this RTP/SCS Strategic Plan is a recommendation to continue working with railroads, air quality management agencies and other stakeholders to reduce rail system emissions. Three forms of electrification have been considered in the Goods Movement Technical Appendix to the 2012 RTP, and are catalogued below.

Electric Catenary Rail Systems – These are perhaps the most technologically ready; however, construction of an electrified rail system in Southern California would be a major undertaking in terms of labor, timeline, and cost for the SCAG region, and would require a large investment as well as cooperation and investment by both passenger and freight railroads.

Dual Mode Locomotives – These have been deployed for passenger rail applications but would need development for freight applications. They have the ability to operate both on a catenary or electric third rail, and with traditional diesel power. The ability to operate in both modes could potentially reduce operational difficulties associated with the need to remove the engine at the end of the electrified system. However, additional operational considerations remain to be addressed.

Linear Synchronous Motors – This technology propels rail cars by creating an electromagnetic field from motors embedded in the railway. One advantage of LSM is that overhead electric lines would not be needed allowing the electric rail system to extend further into ports and rail yards. LSM technology is in its early stages and costs cannot be estimated, however demonstration projects are underway.

In particular, dual mode locomotives employing direct overhead contact electric drive may be particularly important in the context of blended high speed rail operations. In North America, dual mode locomotives are primarily employed in the northeast, and are powered by electric third rail. In Europe, however, dual mode locomotives are an important strategy for shared use corridors. Similarly, New Jersey Transit is currently testing Bombardier's ALP-45DP, a dual mode locomotive powered by a pantograph. By employing dual mode locomotives, the California High- Speed Rail Authority would have the ability to offer "one seat rides" between Los Angeles and the Bay Area years before the completion of the full Phase I system.

REGIONAL TRANSPORTATION PLAN
2012–2035
SUSTAINABLE COMMUNITIES STRATEGY
Towards a Sustainable Future

RTP

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