Chapter 1

High-Speed Rail's Place in California's Future

Introduction

California's transportation system, once the envy of the world and a key driver of economic growth, is facing gridlock.

- California's 170,000 miles of roadway are the busiest in the nation.[1] According to the Texas Transportation Institute *2011 Annual Urban Mobility Report*, six California urban areas rank in the 30 most congested in the nation: Los Angeles-Long Beach-Santa Ana, San Francisco-Oakland, San Jose, San Diego, Riverside-San Bernardino, and Sacramento.[2] The report also estimated that congestion cost these six California metropolitan areas approximately $6 billion in 2010 for time lost and fuel wasted. The statewide cost of time lost and fuel wasted in traffic congestion is estimated to be more than $18.7 billion annually.[3]

Six of California's metro areas are among the most congested in the nation.

- Travel on California's Interstate system is increasing at a rate five times faster than capacity has been added, with vehicle miles traveled increasing by 36 percent between 1990 and 2004, and the number of Interstate lane miles increasing by only 7 percent during that same period. This increase in traffic has significantly increased congestion.
- The busiest short-haul air market in the country is between the Los Angeles and San Francisco metropolitan areas with hundreds of daily flights and more than 5 million passengers annually. This is larger than the New York-to-Washington, D.C. market.
- The Los Angeles-to-San Francisco air route is one of the most delay-prone in the nation, with approximately one out of every four flights delayed by about an hour.[4]
- San Diego–San Francisco, Los Angeles–Sacramento, and Los Angeles–San Jose are also in the top 20 short-haul air travel markets in the nation, representing millions of additional annual passengers.[5]

California has some of the busiest "short-haul" air travel markets in the nation with hundreds of daily flights traveling to and from major airports along the high-speed rail corridor.

This situation is not new and the need to deal with it progressively has been recognized by the Legislature and leaders in California for decades. In 1996, Governor Pete Wilson signed Senate Bill (SB) 1420 into law. In part, the statute says:

> *(a) California, over the past decades, has built an extensive network of freeways and airports to meet the state's growing transportation needs.*
>
> *(b) These facilities are not adequate to meet the mobility needs of the current population.*
>
> *(c) The population of the state and the travel demands of its citizens are expected to continue to grow at a rapid rate.*
>
> *(d) The cost of expanding the current network of highways and airports fully to meet current and future transportation needs is prohibitive, and a total expansion strategy would be detrimental to air quality.*
>
> *(e) Intercity rail service, when coordinated with urban transit and airports, is an efficient, practical, and less polluting transportation mode that can fill the gap between future demand and present capacity.*
>
> *(f) Advances in rail technology have allowed intercity rail systems in Europe and Japan to attain speeds of up to 200 miles per hour and compete effectively with air travel for trips in the 200 to 500-mile range.*
>
> *(g) Development of a high-speed rail system is a necessary and viable alternative to automobile and air travel in the state.*

What are our transportation alternatives?

In the past, transportation efficiency has been one of the competitive advantages for California in the global marketplace. The state cannot continue meeting the demands of 50 to 60 million residents by taking a "more of the same" approach. California's projected population growth will necessitate, and support, viable new transportation alternatives. Keeping pace with this anticipated growth will require major new investments in state transportation infrastructure.

To put this additional demand in perspective, by 2050 California will *add* more people than now live in New York state.[6] California's existing infrastructure cannot be expected to support that level of population growth and the additional travel demand it will generate. To keep the state moving and to remain economically viable, California will need to add significant new capacity to its transportation network, and these investments, no matter what they are, will cost tens of billions of dollars to build and millions of dollars a year to maintain. The question facing California is how to make the most effective capacity investments? Issues such as land use, cost-efficiency, economic competitiveness, livability, and community impacts all need to be considered in answering that question.

History of high-speed rail planning in California

California has evaluated the potential for high-speed rail in California for several decades. It first pursued the idea of a Southern California hgh-speed rail corridor working with Japanese partners in 1981. In the mid-1990s, planning began in earnest as it became clear that California's growing population was putting increasing strain on its highways, airports, and conventional passenger rail lines. At the federal level, as part of the High-Speed Rail Development Act of 1994, authored by then-Representative Lynn Schenk, California was identified as one of five corridors nationally for high-speed rail planning. In that same timeframe, the Legislature created the Intercity High-Speed Rail Commission and charged it with determining the feasibility of an HSR system in California. In 1996, the Commission issued a report that concluded that such a project was indeed feasible.

That same year, the California High-Speed Rail Authority (CHSRA) was created by the Legislature and tasked with preparing a plan and design for the construction of an HSR line to connect the state's major metropolitan areas. In 2002, following the release of the CHSRA's first business plan in 2000, SB 1865 was passed that authorized a $9.95-billion bond issue to finance the system. Submission of that measure to the state's voters was delayed several years. In the interim, the CHSRA, together with its federal partner, the Federal Railroad Administration, issued a Draft Program-Level Environmental Impact Statement/Environmental Impact Report that described the system and its potential impacts on a statewide scale. Through that process, the CHSRA received and reviewed more than 2,000 public and government agency comments on the draft document, which was used to determine the preferred corridors and station for the system.

In November 2008, the bond measure (Proposition 1A) was approved by the state's voters, making it the nation's first-ever voter-approved financing mechanism for high-speed rail. In 2009, $8 billion in federal funds was made available for HSR nationwide as part of the American Recovery and Reinvestment Act (ARRA), which was passed to help stimulate the economy, create new jobs, and foster development of new rail manufacturing enterprises. This funding demonstrated a new and growing federal commitment to the development of high-speed rail in the United States as embodied in a plan issued by the U.S. Department of Transportation: "A Vision of High-Speed Rail in America."

California sought and successfully secured ARRA funds and other funds made available through federal appropriations and grants. As of the date of this Draft Revised 2012 Business Plan, California stands to receive $3.5 billion in federal funds for planning and environmental work, as well as construction of the IOS–First Construction section in the Central Valley.

Through the passage of Assembly Bill (AB) 32, the Global Warming Solutions Act of 2006, and SB 375, the Sustainable Communities and Climate Protection Act of 2008, California has established a clear policy direction for future growth. AB 32 fights climate change by establishing a comprehensive program to reduce greenhouse gas (GHG) emissions from all sources—with passenger vehicles being the largest source of GHG emissions, accounting for approximately one-third of total emissions. SB 375 supports and builds on that policy by requiring that emissions reduction targets be established by the state's metropolitan planning organizations (MPOs) and that each MPO develop a Sustainable Communities Strategy to achieve the emissions target for their region.

> **What this means for us in the Central Valley as a region, and in Fresno as ground zero for the start of this most ambitious project: a positive, clean, environmentally sound transportation alternative that will infuse into our sagging agrarian economy a much needed game-changing boost that will be beneficial for at least the next 100 years.**
>
> *Edward P. Graveline, Former Vice Chair, California High-Speed Rail Authority*

Even with implementation of AB 32 and SB 375, some expansions to the state's highway and aviation networks will be needed. However, recent trends suggest that the ability to add significant new highway mileage is limited, as is the ability to expand airport capacity in the state's developed urban areas. Such alternatives run counter to state policies and create noise, air quality, and other livability impacts that engender significant opposition from adjacent communities. In addition, expanding freeways and airports would require extensive right-of-way in California's dense urban areas, which would be more costly than HSR and would conflict with the land use and development goals of most communities. In its implementation plan for AB 32, the California Air Resources Board supports implementation of a high-speed rail system as "part of the statewide strategy to provide more mobility choice and reduce greenhouse gas emissions."[8]

High-speed rail makes sense in California

HSR is a viable option to expand the state's transportation capacity while supporting environmental objectives. Two studies recently prepared by America 2050, a national initiative to meet the infrastructure and economic development challenges of the Unites States in 2050, evaluated corridors where conditions exist to support strong passenger demand for high-speed rail services.[9] The studies concluded that the following attributes make California an ideal geography for high-speed rail:

- **Population size and growth**—California has some of the largest and fastest growing regions in the nation.
- **Transit connections**—California has numerous city centers where existing transit networks provide connectivity.
- **Existing intercity rail market**—California has well-patronized intercity rail services, with Amtrak's Pacific Surfliner and Capital Corridor lines representing the second and third highest volume corridors in the nation, respectively.
- **Freeway congestion**—California has some of the most congested highways in the nation.

> **With 20 million more people expected to be in California within the next 40 years, we can't build enough highways and airport runways to accommodate the demand.**
>
> *Joseph C. Szabo Federal Railroad Administrator*

> **Passenger rail will play a much greater role in how Californians move throughout the state to ensure California's economy keeps moving forward.**
>
> *U.S. Department of Transportation*[7]

- **Economic productivity**—California has highly productive metropolitan regions, leading to a well-established intercity travel market.
- **Megaregions**—California's high-speed rail system will connect two key megaregions: the San Francisco Bay area and the Los Angeles Basin via the Central Valley.

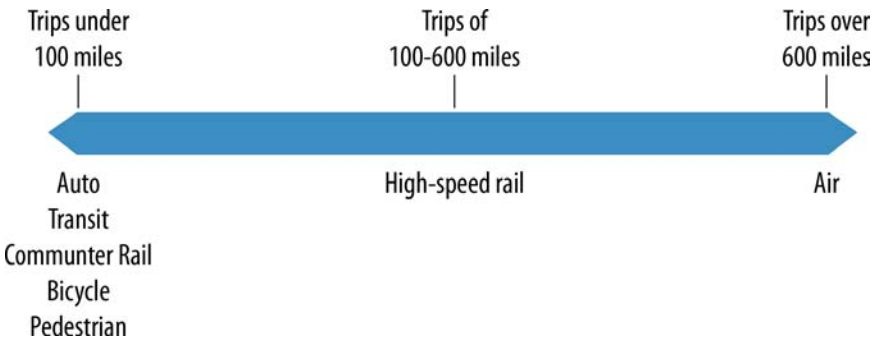
Around the world, high-speed rail continues to demonstrate its value as a complement to other transportation modes. It reduces transportation costs and demand for oil, mitigates highway and air traffic congestion, enhances other forms of public transportation, promotes livable communities, supports sustainability objectives, increases land values, links metropolitan regions together and with suburban and rural population centers, and spurs economic development in communities both large and small. These benefits accrue from long-term planning and careful program development and they support state policy. This is evidenced in Japan, Spain, France, and Germany, among other nations, where such benefits have been realized and the commitment to improve high-speed rail continues to enhance these countries' transportation networks and global competitiveness.

> **Based on the experience in Europe and the Northeast Corridor, rail trip times of less than three hours between Los Angeles and the Bay Area are likely to capture the vast majority of the point-to-point travel between the two regions.**
>
> *Regional Plan Association*[10]

High-speed rail fills a gap

Other countries' experiences demonstrate that high-speed rail meets some specific transportation needs more effectively and efficiently than other modes. As shown in Exhibit 1-1, for trips between 100 and 600 miles, automobile and air travel become inefficient measured in cost, time, energy, and greenhouse gas emissions. High-speed rail is much more efficient and economical for these shorter intercity trips, yielding substantial savings in cost, fuel, safety, and time, as well as environmental benefits. The availability of high-speed rail between key cities can free airport capacity for long-haul flights, promoting efficiency in both modes. An example of this is the implementation of high-speed rail service between Madrid and Seville, Spain. The share of passengers using rail for trips between the two cities increased from 16 percent to 51 percent, and the total traffic between the two cities increased by 35 percent overall; this indicates that high-speed rail induced some travelers to make the trip between Seville and Madrid that previously were not travelling between those destinations.

Exhibit 1-1. Most efficient methods of travel based on trip length



High-speed rail will help reduce San Francisco airport delays

A recent study prepared to support the Bay Area Regional Aviation System Planning (RASP) Update forecasts that passenger demand to and from the Bay Area's commercial airports will grow from 61 million passengers in 2007 to approximately 101 million passengers in 2035. The study predicts severe delays at SFO by 2035 unless something is done to accommodate growing aviation demand. The study evaluates a range of scenarios to meet this growth. The study concluded that scenarios that include a high-speed rail component were the highest performing with the greatest reduction in future delay. It found that HSR could be an important part of a regional strategy to serve future air passenger demand, from capacity and environmental perspectives.[11]

High-speed rail is particularly cost-effective with oil prices at or above current levels. For California, this should factor into decisions about how to make the most efficient use of transportation resources and infrastructure and how to focus limited funding.

Strengthening California's economic competitiveness

California's standing as a national and global leader has been shaped by a series of investments in its people, infrastructure, and economy. Decisions to move forward with bold initiatives have helped make California one of the world's largest and most diverse economies. Some of these transformative initiatives were undertaken during economic downturns and even during the Great Depression of the 1930s, creating jobs when they were most needed and laying the foundation for future growth and prosperity.

What is America 2050?

America 2050 is a national initiative to meet the infrastructure, economic development, and environmental challenges of the United States as it prepares to grow by about 130 million more Americans by the year 2050. America 2050 is guided by a coalition of regional planners, scholars, and policy-makers to develop a framework for future growth that considers trends such as rapid population growth and demographic change, global climate change, the rise in foreign trade, infrastructure systems that are reaching capacity, and the emergence of megaregions. America 2050 serves as a clearinghouse for research on the emergence of megaregions and its aim is to advance research on this new urban form while promoting solutions to address the challenges they face. America 2050 is supported by a number of entities including the Rockefeller Foundation, the Ford Foundation, the Lincoln Institute of Land Policy, and the Doris Duke Charitable Foundation.

These and other forward-thinking decisions propelled California into economic powerhouse status. With its $1.9 trillion economy, California ranks among the 10 largest economies in the world. Today, however, the state's infrastructure is straining to keep up with increased demands. This is especially true of California's transportation system, which is stretched to capacity. New investments are needed to support the continued health and growth of California's economy and quality of life.

Starting construction on the HSR system now—during the current economic downturn—will create many new jobs, both in the construction industry and in other economic sectors, just as the infrastructure investments made during the 1930s did. As of February 2012, many of the counties along the HSR corridor are still designated as Economically Distressed Areas (EDAs). EDAs are counties where unemployment is 1 percent or more above the national average or the per capital income is less than 80 percent of the national average. Starting the system now—by beginning construction in the Central Valley and making early investments in other sections—will help jumpstart California's economic recovery at a time when it needs it most.

As the first state to develop and operate high-speed rail (HSR), California stands to benefit by strengthening its economic competitiveness and becoming a national HSR hub. In the 1950s and 1960s, California seized the moment and took the leadership role in the burgeoning aerospace industry. Although employment has declined from its peak, aerospace remains an important California industry. Much the way the advent of aerospace industry was a boon for California, the introduction of HSR in the United States can be a catalyst for growth. The first state to develop HSR likely will be the state that becomes the country's home to domestic research, engineering, production, assembly, and repair of HSR equipment.

Californians have clearly recognized the need for investment and have repeatedly demonstrated their willingness to support major infrastructure initiatives. Super-majorities of voters in 19 counties, accounting for 81 percent of the state's population, have approved local sales tax measures generating a combined $140 billion[12] in local and regional transportation investments.

In November 2008, Californians voted to move ahead with another game-changing initiative—the creation of a statewide high-speed rail system that will transform the state and serve as an impetus for further economic prosperity. A statewide HSR system will link the state's metropolitan areas, create a world-class network that can better position California for the future by providing a more balanced, efficient transportation system, enhance economic competitiveness, and advance environmental goals.

> **"I would like to be part of the group that gets America to think big again."**
>
> *Governor Jerry Brown, August 16, 2011*[13]

Since 1964, when Japan inaugurated its first Shinkansen system, 14 countries have constructed high-speed rail lines around the world, including France, Spain, the United Kingdom, and Germany. Approximately 20 other countries are planning or building new lines. As previously noted, California—with its $1.9 trillion economy—is one of the 10 largest economies in the world. In 2010, California's Gross State Product was 30 percent larger than the Gross Domestic Product of Russia, 143 percent larger than The Netherlands, 188 percent

larger than South Korea, and 341 percent larger than Taiwan. All of these countries have made investments in high-speed rail systems a part of their strategy for economic growth and competitiveness.

Bold investments shape California's economic prosperity

Golden Gate Bridge—Many called it "the bridge that couldn't be built." But after four years, 80,000 miles of steel cable, and enough concrete to pave a sidewalk from New York to San Francisco, the Golden Gate spanned the San Francisco Bay, providing a new major artery between the San Francisco peninsula and cities to the north in Marin County.

State Water Project—California has constructed 34 dams and reservoirs, 20 pumping plants, and 5 power plants linked by more than 700 miles of canals and pipelines to provide clean, fresh drinking water and support the state's agricultural industry.

Freeway System—Today's 50,000 miles of California highways and freeways began as a vision dating back to the early-1900s. Starting with the Arroyo Seco, California created one of the nation's first freeways and committed to develop a statewide system almost a decade before the Federal Interstate Highway System was established.

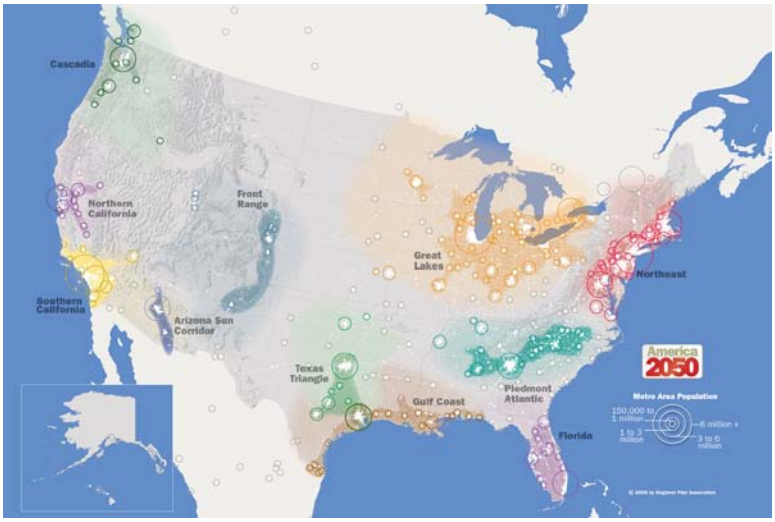
University of California Higher Education System—In the late 1800s, just 20 years after the Gold Rush, the University of California started with 10 professors and 38 students. Today it is one of the world's leading centers of academic achievement and research, serving 250,000 students on ten campuses and operating five medical centers and three national laboratories.

> **Most of America's major economic competitors in Europe and Asia–including Japan, Germany, France, Spain, and Great Britain, as well as rapidly developing and developed countries such as China, Taiwan, and South Korea–have already invested in and are reaping the benefits of improved competitiveness from their inter-metropolitan high-speed rail systems. Simply continuing to invest in the nation's existing transportation infrastructure may not be enough to maintain [our] standing in the global economy in the long run.**
>
> *American Society of Civil Engineers*[14]

California's future growth is seen by many as being part of "the era of the megaregion." Megaregions Exhibit 1-2) are areas with large or dense populations but, more importantly, they are regions where significant economic capacity, highly skilled talent, scientific achievement, and technological innovations

are concentrated and compete on a global scale. Megaregions produce billions—and sometimes trillions—of dollars in economic output. The greater San Francisco Bay/Sacramento area and the Los Angeles Basin/Inland Empire/San Diego region have been identified as two of America's eleven emerging megaregions by the National Committee for America 2050 (America 2050).[15] A key to California's continued economic growth and success is to foster the effective transfer and interaction of people, materials, and ideas ensuring free-flow and optimizing efficiencies within megaregions and between its two megaregions. While previous investments in the state highway system and airports facilitated this process, high-speed rail will increase and enhance its effectiveness for decades to come.

Exhibit 1-2. Megaregions of the United States



Advancing California's sustainability and livability objectives

Since its inception, the Authority set the goals of helping reduce statewide pollutant emissions and supporting sustainability policy objectives. Sustainability encompasses the concept of stewardship, continuous improvement, and accountability with a focus on meeting the needs of the present without compromising the ability to meet the needs of future generations. Environmental economists[16] generally cite three common sustainability goals: to achieve enhanced and balanced social, environmental, and economic outcomes.

The statewide high-speed rail system will provide greater economic, mobility, environmental, and community benefits than relying solely on the transportation systems in place today. The high-speed rail program will help promote livable communities and support sustainable housing and development.

To further its goal to advance the system sustainably, the Authority has joined with several federal agencies to establish a partnership for sustainable planning. In July 2011, the Authority signed a Memorandum of Understanding (MOU) with the Federal Railroad Administration, the U.S. Department of Housing and Urban Development, the U.S. Department of Transportation Federal Transit Administration, and the U.S. Environmental Protection Agency. Together these agencies established seven goals centered on the need to plan, site, design, construct, operate, and maintain the system using environmentally preferable practices. These seven shared goals, as embodied in the MOU, are as follows:

- **Goal 1**—Protect the health of California's residents and preserve California's natural resources
- **Goal 2**—Minimize air and water pollution, energy use, and other environmental impacts

- **Goal 3**—Promote sustainable housing and development patterns that recognize local goals and interests
- **Goal 4**—Integrate station access and amenities into the fabric of surrounding neighborhoods
- **Goal 5**—Stimulate multimodal connectivity, thereby increasing options for affordable and convenient access to goods, services, and employment
- **Goal 6**—Reduce per passenger transportation emissions across California, thereby reducing associated environmental and health impacts
- **Goal 7**—Protect ecologically sensitive and agricultural lands[17]

These seven goals will help frame sustainability policy and objectives as this program moves forward.

One of the ways the Authority plans to achieve these objectives is by committing to operate using 100-percent renewable energy. This, plus the fact that many HSR passengers will shift from driving cars, will help reduce California's dependence on price-volatile foreign oil and also will help reduce pollution in the state. Similar to other systems around the U.S. and the world, the Authority is designing the system to take a net-zero approach to renewable energy: procuring and producing enough renewable energy to feed the California electricity grid equal to the amount it consumes for facilities and traction power.

An important way the Authority is working on its sustainability objectives is through proactive station area planning. With its federal partners, the Authority is providing planning grant funds to local municipalities to develop plans that will be context-sensitive and facilitate mode shift, livable urban design, and infill and sustainable development that supports the HSR system and benefits local economic development.

In addition, the Authority has been working with experts to help frame how HSR can enhance livability. The study *Vision California* examined how population, communities, energy use, and transportation choices, including high-speed rail, will affect California in the coming decades.[18]

Summary of *Vision California*|*Charting Our Future*

California must plan for future growth—by 2050, the state's population is expected to grow to nearly 60 million people and 24 million jobs. The path that we take to accommodate growth can lead us in many directions. *Vision California* is an unprecedented effort to explore the critical role of land use and transportation investments in meeting the environmental and fiscal challenges facing California over the coming decades. *Vision California* strives to provide the information needed to make informed decisions about how and where we want to grow and explores how the high-speed rail network can support more compact and fiscally sustainable development across the state.

Vision California builds upon the challenges set forth by the California Global Warming Solutions Act (Assembly Bill 32) in 2006, the groundbreaking legislation that sets aggressive targets for the reduction of greenhouse gases (GHG) across the state. Meeting these targets will require taking a new direction in how we invest in and develop our communities, transportation systems, and critical infrastructure. In bolstering the framework for more sustainable land use patterns and choices across California, high-speed rail is a critical component not only in meeting these targets, but in creating healthier and more livable communities.

Vision California's statewide scenarios depict and model a "Business as Usual" future, in which we follow past development trends into the coming decades, and a "Growing Smart" future, in which growth is focused in a more compact and efficient manner. The results show a full range of benefits—from natural resource conservation to public and household cost savings—that can be realized by focused growth. Linked closely to the California high-speed rail system and its supportive feeder services, which reinforce cities as hubs of our economy and future growth, the Growing Smart scenario demonstrates how a coordinated vision for our land use and transportation investments can help us realize a more sustainable future.

As compared to a Business as Usual future, a Growing Smart future supported by the investments and connections of the high-speed rail network would yield considerable benefits for California:

- By 2050, households in the Growing Smart scenario would spend, on average, $7,250 less per year on auto-related costs and utility bills. These savings are tied to lower driving needs, energy, and water demands.
- Costs to build, operate, and maintain the local infrastructure needed to support new growth would be lowered by as much as $47 billion by 2050, reflecting the cost savings of more compact, efficient development patterns.
- More compact development patterns, along with more efficient cars and buildings, cleaner fuels, and a cleaner energy portfolio are all essential to reduce GHG emissions. The Growing Smart scenario prevents the release of 70 million metric tons of CO_2 equivalent in 2050, or 25 percent less than a Business as Usual future.
- The Growing Smart scenario would reduce emissions equivalent to a forest covering 45,000 square miles, about one-quarter the size of California.
- Local revenues would be higher by $120 billion, or $2.7 billion per year, due to the higher property values of more compact and urban development.
- California would save 78 million acre-feet of water, equal to nearly two-thirds of the water in Lake Tahoe, by 2050. The average household would decrease its consumption by nearly 40 percent. The cumulative cost savings for the state's residents would be $96 billion by 2050.

The proportion of housing types in the Growing Smart future, in which 37 percent of new homes are single-family detached and 63 percent are townhome and multifamily, is supported by real estate market analysis that indicates that demand is moving away from larger single-family detached homes toward smaller detached or attached housing units. Affordability, accessibility, and demographics are key factors behind this change. Market analysts predict that apartment and townhouse living near transit will drive much housing demand going forward, in California and nationwide. In California, the shift is strong enough such that the current supply of large-lot single-family detached homes may already exceed the total demand for that housing type projected in 2035. On a related note, demand for homes in transit-oriented developments—those within one-half mile of transit stations—is high enough to surpass the over 3.7 million new residential units of all housing types expected to be built by2035.

The California high-speed rail network, and the regional and local transit services to which it is linked, are integral to this vision for the future. As regional and local land use plans and policies evolve to meet California's energy and water challenges and the state's GHG and pollution reduction targets, the synergy between meeting environmental goals and changing lifestyle preferences has become clearer. Targeted investments in statewide, regional, and local transportation networks are necessary to bring about a more environmentally sustainable and economically healthy future. These same investments will help create and reinforce the living options that promote mobility, accessibility, and the community-friendly amenities (such as sidewalks, narrower streets, shops and services, and parks) desired by many Californians.

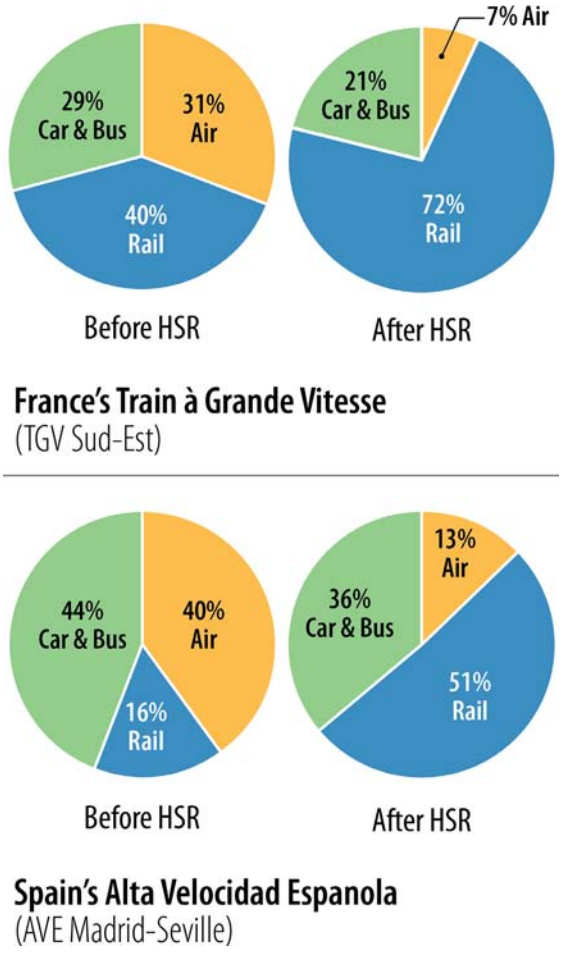
How does California high-speed rail compare to international programs?

The Authority has consulted with other countries to learn from their experiences implementing high-speed rail, how it fits into each country's broader intermodal transportation network, and to apply important lessons learned in developing California's system. The Authority is drawing from this wide experience in a variety of ways—from project development, to ridership forecasting and estimating operating costs, and determining how the private sector can participate in building and operating the system. California has entered into agreements with nine countries that already have built high-speed rail and has regularly exchanged information and sought feedback on planning and development, technical standards, technologies, procurement methods and submissions, funding options, and operation and maintenance, among other topics.

Some relevant findings shared among countries with HSR systems include the following:

- According to the International Union of Railways, high-speed rail systems throughout the world achieve positive operating revenues. The revenues generated from fares and other sources more than cover the cost of operating and maintaining the system.[19] Many systems generate sufficient revenue to cover not only the operating costs associated with the initial phases but also to help fund extensions. Two high-speed sections, the Paris-Lyon Train à Grande Vitesse (TGV) route in France and the Tokyo-Osaka route in Japan, have fully covered both their infrastructure and operating costs after 15 years of service.
- Japan Rail, which began service in 1964, is notable for its positive safety and reliability records, having carried more than six billion passengers without a single fatality caused by collision or derailment.
- Introduction of high-speed rail in other countries has resulted in modal shifts from air and car to high-speed rail, creating a more balanced and efficient transportation system. As shown in Exhibit 1-3, France and Spain provide good examples of travelers shifting to HSR from other travel modes once high-speed rail became an option.
- As a result of its speed and convenience, the new Alta Velocidad Espanola, or AVE railway line that opened in 1992, radically changed the transportation patterns and modal travel split

Exhibit 1-3. Mode of travel before and after high-speed rail operations in France and Spain



between major cities in Spain. Within 10 years of beginning operations, high-speed rail transported more than four times as many passengers as planes between Seville and Madrid, freeing limited airport capacity for long-haul flights. Between Madrid and Seville, rail modal share increased from 16 percent to 51 percent between 1991 and 1994.[20]

- In 1981, during the first year of operation, the French TGV system carried 1.26 million passengers. Three decades later, in 2010, the expanded TGV system carried 160 million passengers.[21] Rail gained more than 32 percent market share after HSR was developed between Paris and Lyon in the 1980s.
- In its first year, the Japanese Tokaido Shinkansen line between Tokyo and Osaka carried 23 million passengers. By 2008, that line was carrying more than 151 million passengers.[22] The Shinkansen currently has more than an 80 percent share of the transportation market between those two cities.

Moving forward

California's history of investing in game-changing infrastructure improvements has been key to making the state an economic powerhouse. The vision for high-speed rail as the next such investment is reinforced by the experience of other countries—some of them California's competitors in the global economy—in demonstrating that high-speed rail is integral to a more efficient transportation system, boosts economic productivity, and promotes sustainability. Leaders of California's major cities recognize this and have called for the state to move ahead and make high-speed rail a part of California's future (Exhibit 1-4).

Exhibit 1-4. State's mayors support high-speed rail

Life. Captured daily.
The Sacramento Bee
sacbee.com

Tuesday, June 2, 2011 | The Sacramento Bee | sacbee.com/**ourregion**

Viewpoints: Case for high-speed rail grows only stronger

Special to The Bee

The last time many Californians thought about high-speed rail was in the voting booth. On that day, Nov. 4, 2008, more than 6 million of us voted to tell the state to get going, to build high-speed rail in California.

Now, 2 1/2 years later, the second guessing is in full swing. In recent weeks some have suggested that we should put the project on hold.

We couldn't disagree more.

California will need high-speed rail in the coming years to do something about the gridlock on our roads and at our airports. Building it is a major investment, but the most recent estimates say it would cost twice as much over the next generation to build new highways and runways just to move the same number of people. With California expected to grow by 12 million people in the next 25 years, investment in the state's transportation system is inevitable, and high-speed rail is a cost-effective alternative.

In the last 2 1/2 years the case for high-speed rail has gotten stronger, not weaker. When voters approved the plan, a barrel of oil cost about $55; today the price is almost $100. Unemployment was around 8 percent back then, and it is now over 12 percent statewide and even higher in many areas. Californians need the jobs.

There are bound to be questions with any project of this size. We welcome the dialogue. Last month the Legislative Analyst's Office published a report calling for at least a temporary halt to the project. The report alluded to a number of concerns about the project:

The amount and timing of future federal funding are unclear.

Spending state funds on rail will mean there is less money for other things.

We do not yet know how much private investment the system can attract, or when it will come.

Starting construction in the Central Valley is "a gamble."

Let's take the criticisms one at a time.

First is federal funding. While we don't know precisely how much we will get in future years, we've competed well up to this point. California's project has received the largest slice of federal high-speed rail funds to date – $3.6 billion out of $10.2 billion. This is in large part due to the extensive planning already under way at the state level and the ability to leverage voter-approved Proposition 1A funds. There is no other program where California competes so well for federal funding. We will continue to encourage additional investment – both public and private – while promoting efficiencies that allow us to stretch every dollar in creating jobs and planning for the future growth of this great state.

Second is state funding. The voters said high-speed rail was a priority and authorized spending $9 billion in state funds. The state continues to experience fiscal constraint due to diminishing revenues, but because construction is ramping up slowly we will only need 2 percent of these funds in the coming year to keep the project on track. The amount approved by voters will be spent over many years, keeping the impact on our state's budget low in any given year.

Third is private funding. Our high-speed rail system is expected to make money and attract private investment – similar to systems in Europe and Asia. Twenty-two different funds have shown investment interest in financing part of the system's capital costs. Demonstrating our commitment by beginning major construction and finalizing all the approvals will minimize investor risk and net the best terms for the taxpayers.

Finally, there is the matter of where to start building. Many Southern Californians have said we should give priority to their part of the state; same in the Bay Area. We know that this system will never be a success until it connects these two population centers and does so in a way that is sensitive to local concerns. But the question of where to start does not require complicated analysis. The place to start is the place where we're ready to start, and that's the Central Valley.

No one thinks we should build the line through the Central Valley and then stop. And we won't. There is a parallel to the building of the Interstate Highway System more than 50 years ago. When we started building the Interstate Highway System, the first segments to be completed were not in New York or Los Angeles. The interstate was born in the middle of the country, America's heartland, with the very first sections laid in Kansas and Missouri and then connected to the rest of the nation.

On the day that first segment of interstate was dedicated we did not know where all the money would come from to build a 40,000-mile network throughout the nation, and we did not know when it would be finished. However, it was because of the vision of those who were willing to initiate the effort that, today, America has the most extensive highway system in the world.

California and the United States need high-speed rail, so let's keep going.

Edwin Lee is mayor of San Francisco. Kevin Johnson is mayor of Sacramento. Chuck Reed is mayor of San Jose. Ashley Swearengin is mayor of Fresno. Antonio Villaraigosa is mayor of Los Angeles.

End notes

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[22] *Source:* Central Japan Railway Company (JR-Central). 2011. http://english.jr-central.co.jp/company/company/achievement/transportation/index.html (accessed July 22, 2011)