A blurred high-speed train in motion against a city skyline at dusk. The train is moving from left to right, creating a sense of speed. The background features several tall skyscrapers, including a prominent one with a cylindrical top. The sky is a mix of blue and orange, suggesting sunset or sunrise. The train's motion is captured with a long exposure, resulting in horizontal streaks of light and color.

# Connecting California

Key Public Transportation Projects and  
Their Benefits for the Golden State

CALPIRG Education Fund

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Their Benefits for the Golden State

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# Executive Summary

California's transportation system is in trouble. Commuters waste time stuck in traffic, rising gasoline prices are draining consumers' pocketbooks, and our cars and trucks produce too much pollution that contributes to global warming.

Public transportation makes a vital contribution to California's transportation system, providing an alternative to drivers tired of fighting congestion, reducing our dependence on oil, and curbing pollution. However, in many communities around the state, transit systems are inadequate and cannot keep pace with demand.

The problems of our current automobile-dominated transportation system will not be solved without a concerted effort to expand transit. California must plan for a transportation system that meets the needs of the 21<sup>st</sup> century and invest in important projects to improve public transportation.

**California residents drive more miles, spend more on gasoline, experience more congestion, and produce more global warming pollution from transportation than they did a decade ago.**

- Vehicle travel on California's roads increased by approximately 19 percent from 1995 to 2005. The number of vehicle miles traveled per person in the state increased by 5 percent over that same period of time.
- Californians lose millions of hours sitting in traffic. In 2005, Californians in nine urban areas spent 871 million hours in traffic delays, a 38 percent increase from 1995.
- California residents spent approximately \$17.4 billion more on gasoline in 2005 than they did in 1995, a product of more miles being driven and higher gasoline prices, even after adjustments for inflation.
- Transportation is the leading source of global warming pollution in California, with cars and trucks the biggest contributors to the problem. California's transportation system produced 24 percent more carbon dioxide in 2005 than it did in 1990.

**Public transportation helps to address California's transportation, energy and environmental challenges.**

- Public transportation prevented more than 70 million hours of traffic delay in nine California metropolitan areas in 2005, preventing the economy from losing more than \$1.2 billion in wasted time and productivity.
- In 2006, public transportation in California saved approximately 486 million gallons of oil that would have otherwise been burned in vehicles, saving consumers more than \$1.3 billion at the pump.
- In addition, public transportation is helping to reduce global warming pollution in the state, averting about 3.6 million metric tons of carbon dioxide pollution in 2006.
- Despite these clear benefits of transit in 2006, California spent approximately \$374 million of state transportation funds on transit for capital and operating expenses and \$4.6 billion on highway construction and maintenance—a highway-to-transit spending ratio of more than 12-to-1.

**California has recently committed to several projects that can provide the beginnings of a 21<sup>st</sup> century transportation system.**

- High-speed rail linking northern and southern California is expected to serve tens of millions of passengers annually, providing a fast and reliable travel alternative to flying or driving between major urban areas.
- North of the Bay Area, the Sonoma-Marina Area Rail Transit project will build a 70-mile passenger rail line on

publicly owned right-of-way, giving travelers an alternative to congested Highway 101.

- Passage of Measure R in Los Angeles County will help to expand rail service and improve bus options. Some key projects to implement quickly are:
  - Subway service along Wilshire Boulevard through the Westside to serve an estimated 50,000 to 80,000 passengers, saving as much as 60,000 hours of travel time each day.
  - Construction of a downtown transit hub to improve connectivity between Los Angeles' existing rail lines as well as the Gold Line extension that is in progress.
  - Establishment of bus rapid transit service to help connect far flung neighborhoods with speedy, convenient buses that travel in dedicated bus lanes.

**But, these new transit projects barely scratch the surface of California's transit needs. There are dozens of worthy public transit improvements that would offer Californians better alternatives to the high cost of driving, reduce congestion by removing cars from the road, save oil, and reduce pollution. Among the most promising and important projects are the following:**

- In San Diego, an 11-mile expansion of the San Diego Trolley would provide an alternative to heavily traveled I-5 north of the city and is an important component of the broader transit expansions envisioned for the region.
- A downtown transit center in Anaheim would facilitate increased

ridership on both Metrolink's rail service and connecting transit services for Orange County.

- Construction of the Perris Valley Line in Riverside County would extend commuter rail service from Riverside to additional employment and population centers.
- Bay Area residents would benefit from several promising projects:
  - Establishment of bus rapid transit service on Van Ness Avenue in downtown San Francisco would reduce travel times by 24 to 30 percent compared to existing bus service.
  - Creating a separate lane for bus rapid transit along San Francisco's Geary Boulevard would provide bus travelers on the route a large improvement in travel times and service reliability.
  - On the east side of the Bay, bus rapid transit from San Leandro to Berkeley would draw 76 percent more riders than current bus service, while providing a shorter trip.
  - Construction of the Transbay Terminal, including the extension of Caltrain to the new terminal in downtown San Francisco, would connect service provided by nine transit agencies serving eight counties, enabling commuters and other travelers to reach their destinations more readily without driving.
  - Rail service from San Jose to San Francisco could become faster

and more frequent by upgrading Caltrain infrastructure and locomotives to operate on electricity instead of diesel fuel.

- Light rail expansions in the Sacramento area would help to ease the impacts of the region's rapidly growing population. New service north to the airport and south to residential areas would help meet the region's surging travel needs.
- Transit systems across the state could improve their existing bus and rail offerings at a relatively low cost through operations, technology and equipment changes that would allow for faster, more comfortable, and more reliable service.

**To build a 21st century transportation system that will ease congestion, reduce spending on gasoline, and help the state meet its global warming pollution reduction goals, California should do the following:**

- Prioritize funding for transit projects. State, county and local governments must provide stable funding for bus and rail service. The legislature and governor should not divert public transportation funds to other purposes.
- California officials should support a revamped federal transportation funding law that makes a large investment in needed improvements to transit systems and intercity rail, while focusing federal highway investment on the need to maintain and repair existing infrastructure.



# Introduction

California is famous for its cars, car culture, and freeways—and for good reason. For decades, the state invested heavily in building new roads and expanding existing ones as part of a long-term vision for developing the state’s economy.

The Legislature created the Bureau of Highways in 1895, California acquired its first state highway in 1896, and bonds were approved in 1909 to fund construction of a state highway system.<sup>1</sup> In subsequent years, California invested consistently and heavily in building roads. By the 1950s, the state had formally endorsed a vision of constructing a 12,414-mile highway and freeway system.

For years California’s expansive road network has supported economic growth and allowed citizens to travel throughout the state.

Now, as California faces new economic and environmental challenges, we need a new vision. To strengthen the economy and protect our health and the environment, the state’s transportation system must address the reality of volatile gas prices and the need to reduce global warming pollution. An extensive public transportation network can play an important

role in alleviating these problems.

With recent voter approval of transit infrastructure funding, California will soon invest more money in rail and bus projects that offer travelers an alternative to driving. As the state has cut operational funding for transit, cities and regional governments have stepped into the lead, providing transit service, expanding rail lines, and upgrading bus service.

But if California is to have a transportation network that meets the needs and challenges of the 21<sup>st</sup> century, it needs more than a piecemeal approach to transit. Just as leaders developed an overarching plan to guide highway development, today California needs a statewide plan for building a transit system to meet the needs of a new century. Voter approval of the high-speed rail plan is a strong first step, but California must develop a vision for a robust network of trains and buses that can carry commuters to work and shoppers to stores within one metropolitan area as well as move travelers the length of the state quickly and reliably.

The transit projects highlighted in this report are just the beginning of what California will need to make this vision a reality.

# California's Current Transportation System Fails to Meet the State's Needs

California needs a transportation system that moves people efficiently, at a reasonable cost, and that produces minimal global warming pollution. The state's current transportation system fails on all three points.

## Californians Lose Time Stuck in Traffic

Californians drove approximately 330 billion miles in 2005, a 19 percent increase

over 1995.<sup>2</sup> While some of this increase can be attributed to a 14 percent increase in population, much of the change also results from a 5 percent increase in the number of miles driven per person.<sup>3</sup> Annual driving per person averaged slightly more than 9,000 miles in 2005.

The result of a growing state population, increased per capita driving, and few alternatives to driving is growing congestion and time stuck sitting in traffic. Data for nine urban areas in California show how much time Californians lose to the state's chronic congestion. Drivers in Los Angeles

**Table 1. Californians Lost More Hours to Traffic Congestion in 2005 than in 1995<sup>5</sup>**

Urban Area	Annual Travel Delay (Million Hours)		Increase in Delay
	1995	2005	Increase
Bakersfield	1.1	3.5	205%
Fresno	4.4	6.6	52%
Los Angeles-Long Beach-Santa Ana	401.1	490.6	22%
Oxnard-Ventura	5.4	12.2	125%
Riverside-San Bernardino	18.3	48.3	164%
Sacramento	20.7	39.6	91%
San Diego	43.3	90.7	110%
San Francisco-Oakland	99.4	129.9	31%
San Jose	37.9	50.0	32%
<b>Total</b>	<b>631.6</b>	<b>871.4</b>	<b>38%</b>

spend the most time dealing with congestion, but drivers in smaller urban areas have experienced the most rapid increases in congestion.<sup>4</sup> (See Table 1.)

but it also means that the money residents spend on fuel leaves the state. For the most part, money spent on gasoline does not create jobs in California or support the state's economy.

### Californians Spend Billions on Fuel

The state's growing reliance on driving has taken a toll on Californians' pocketbooks. From 1995 to 2005, the amount of gasoline used in California increased by 21 percent.<sup>6</sup> (See Figure 1.) At the same time, the price of gasoline rose by 57 percent.<sup>7</sup> The result is that Californians spent \$36.5 billion on gasoline in 2005, 90 percent more than in 1995.<sup>8</sup> In 2005, spending on gasoline equaled more than \$1,000 for every resident of the state.<sup>9</sup>

Fuel consumption relies heavily on imports from beyond state and national borders. Not only does this expose Californians to the fluctuations of the global oil market and spikes in the price of gasoline,

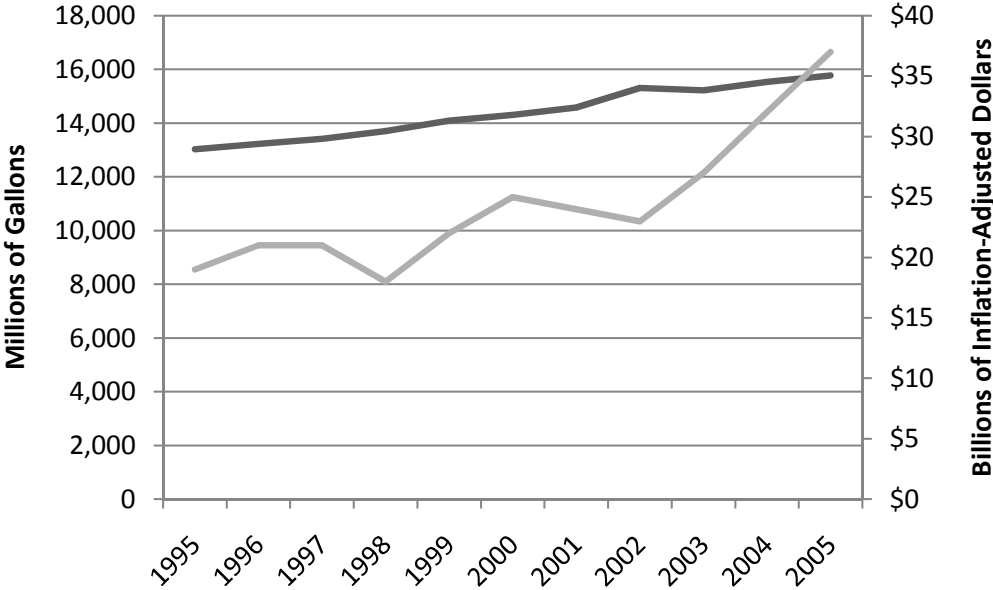
### Global Warming Pollution Is Rising

Transportation is the leading source of global warming pollution in California, responsible for approximately 38 percent of the state's emissions in 2004.<sup>11</sup>

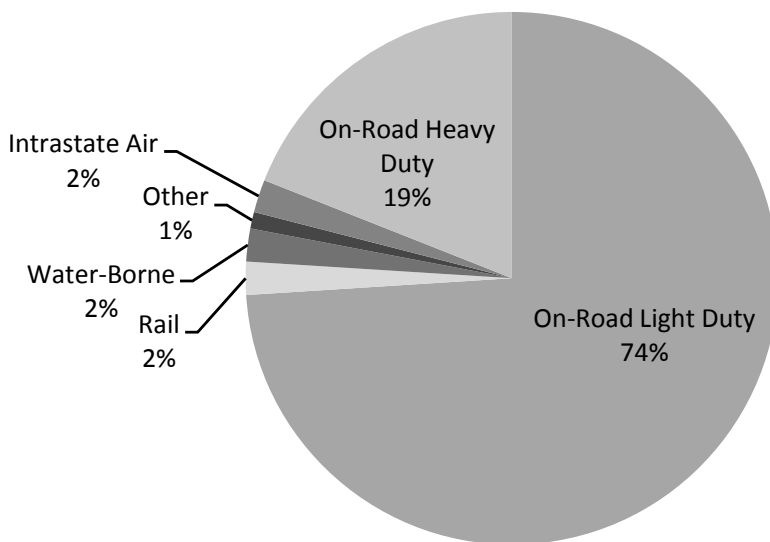
When emissions from interstate and international aviation and international shipping are excluded, cars and light trucks account for the vast majority of global warming pollution from transportation in California—approximately 73 percent.<sup>12</sup> (See Figure 2.)

Emissions from the transportation sector in California are growing and have increased by 24 percent since 1990.<sup>14</sup> (See Figure 3.)

**Figure 1. Spending on Gasoline Has Been Rising Faster than Consumption<sup>10</sup>**



**Figure 2. Cars and Light Trucks Are the Biggest Source of Global Warming Pollution in the Transportation Sector, 2004<sup>13</sup>**



There are several reasons for the growth of transportation global warming emissions in California over the past decade and a half. Vehicle fuel economy—a key determinant of global warming pollution—has been roughly stagnant over the past two decades nationally. Californians have shifted from relatively more-efficient cars to less-efficient light trucks and SUVs. And, as mentioned above, the number of miles traveled on California’s highways has grown dramatically, increasing nearly 20 percent between 1995 and 2005.<sup>16</sup>

### These Problems Will Get Worse as the State’s Population Increases

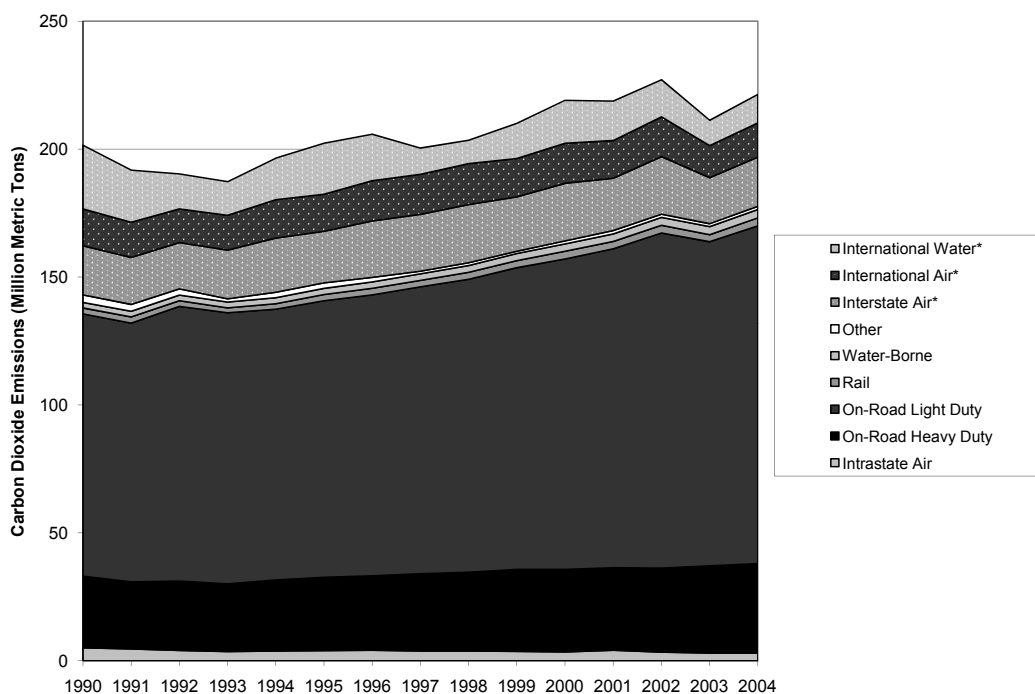
In coming years, the shortcomings of California’s transportation system will become even more apparent, unless the state begins to invest in better alternatives to driving. If projected increases in population

and growth in per capita driving occur, congestion will increase, spending on gasoline will rise, and global warming emissions will continue to grow.

The California Department of Finance projects that California’s population will increase from 37 million people to more than 50 million people by 2032.<sup>17</sup> Based on historic trends, per capita driving is also expected to increase. If historic trends continue, Californians could drive nearly 30 miles per day in 2030, a 17 percent increase from current levels.<sup>18</sup> The result is that total vehicle travel in the state could increase by as much as 45 percent between now and 2030.<sup>19</sup>

At this level of driving, Californians will spend a huge amount of money on fuel. In 2005, when gas averaged \$2.47 per gallon, Californians spent \$37 billion on gasoline, or more than \$1,000 per person.<sup>20</sup> As gas prices spiked to nearly \$4 per gallon this past summer, Californians were spending far more on transportation.<sup>21</sup> Though prices have fallen dramatically since then, residents’ heavy

**Figure 3. Emissions from Cars and Light Trucks Have Increased Since 1990<sup>15</sup>**



\* Interstate and international aviation emissions and emissions from international shipping are not included in the Air Resources Board's transportation sector inventory and are not included in the estimate of transportation sector emissions in this report.

reliance on driving leaves them vulnerable to future price increases.

Projected growth in vehicle travel also threatens to swamp California's efforts to reduce global warming pollution from transportation. Even if the state were to cut emissions from the typical car by 40 percent by 2030, total global warming pollution from cars would only decrease by 13 percent compared to today's levels, a far smaller reduction than the state needs to meet its goals. Failing to address the growth in vehicle travel, therefore, will make it very difficult for California to achieve its overall emission reduction targets.

In recent years, the growth in vehicle travel in California has begun to stabilize—the likely result of higher gasoline prices. The California Department of

Transportation reports that vehicle travel on state highways increased by only a small amount (approximately 0.02 percent) in 2007 over the year before, the smallest year to year increase since the aftershocks of the Arab oil embargo in 1974.<sup>22</sup> And the Federal Highway Administration estimates that total vehicle-miles traveled in California actually declined 4 percent between 2007 and 2008.<sup>23</sup>

## More Transit Can Improve California's Transportation System

California's current transportation system forces the state's residents to waste too

much time stuck in traffic and to spend too much money on oil, and is responsible for millions of tons of global warming pollution. Solving these problems requires that California reshape its transportation system to offer the state's residents alternatives to driving. A robust transportation network should allow travelers to choose between driving and a variety of transit options.

California's transit system already helps to reduce congestion, provide relief for commuters from high gas prices and ease global warming pollution. A 2007 study by the Texas Transportation Institute estimated that public transportation prevented more than 70 million hours of traffic delay—equivalent to about 8,100 person-years—in nine metropolitan areas in California in 2006, preventing the economy from losing more than \$1.2 billion in wasted time and productivity.<sup>24</sup>

In 2006, public transportation in California saved approximately 486 million gallons of oil that would have otherwise been burned in vehicles, saving consumers more than \$1.3 billion at the pump.<sup>25</sup> Those cost savings were based on an average gasoline price in 2006 of \$2.68 per gallon. At gasoline prices of \$4 per gallon, the savings would have been nearly \$1.9 billion.

In addition, public transportation is helping to reduce global warming pollution

in California, averting about 3.6 million metric tons of carbon dioxide pollution in 2006.<sup>26</sup>

Despite these benefits of transit, California spends far more money on highways than transit. In 2006, California spent approximately \$374 million of state funds on transit capital and operating expenses and \$4.6 billion on highway construction and maintenance—a highway-to-transit ratio of more than 12-to-1.<sup>27</sup>

As evidenced by voter approval of multiple measures to expand transit—including statewide high-speed rail and increased transit funding in Los Angeles, Contra Costa and Alameda counties—Californians are eager for better transit options that provide an alternative to driving. As gas prices have risen, Californians increasingly have turned to public transportation. A Congressional Budget Office study, for example, found that, since 2003, as the price of gasoline has risen, more and more commuters have opted to ride transit rather than drive.<sup>28</sup> The growth in transit ridership has been especially rapid.

The transit projects highlighted in the next section are some of the key projects that the state should pursue to provide better alternatives to driving to more Californians today and as the state's population grows.

**Table 2. Statewide and County Transportation Ballot Measures, November 2008 Election Results<sup>29</sup>**

<b>Ballot Measure Name</b>	<b>Location</b>	<b>Type of Funding</b>	<b>Estimated Amount</b>	<b>Brief Description</b>	<b>Approved?</b>
Prop 1A	Statewide	General Obligation Bonds	\$9,950,000,000	220-m.p.h. bullet train connecting the Bay Area, the Central Valley, Los Angeles and San Diego.	YES - 52.6%
Measure VV	Alameda and Contra Costa Counties	Property Tax	\$7,000,000 annually	Prevents fare hikes for AC Transit bus service	YES - 72.2% (Alameda) and 72.1% (Contra Costa)
Measure R	Los Angeles County	Sales Tax	\$40,000,000,000 over 30 years	Road and mass transit projects, subway to the sea, light rail extensions, and bus rapid transit	YES - 67.9%
Measure Z	Monterey County	Sales Tax		Highways 1, 68, 156 and 101 improvements; local road repairs; carpooling, bus service improvements; and paratransit	NO - 62.6%
Measure A	Santa Barbara County	Sales Tax	\$1,050,000,000 over 30 years	General transportation and transit improvements	YES - 79.2%
Measure B	Santa Clara County	Sales Tax		Operation of pending Bay Area Rapid Transit (BART) expansion connecting San Jose and the East Bay.	YES - 66.7%
Measure C	Santa Clara County	Advisory Measure	N/A	Approval of the Valley Transportation Plan 2035.	YES - 69.7%
Measures Q and R	CA Sonoma and Marin Counties	Sales Tax	\$890 million over 20 years	New light rail project from Cloverdale to Larkspur.	YES - 73.7% (Sonoma) and 62.8% (Marin)

# California Has Many Opportunities to Improve Transit

Californians want and need more transit options. Voter approval of a statewide high-speed rail system and the necessary funding is just one indication of support. In both the Los Angeles area and the Bay Area, voters assented to tax increases to pay for better local transit service. The upgraded transit made possible by this increased funding will give citizens more transportation options, reduce gasoline use and costs, and reduce

global warming pollution, while beginning to create the backbone of a new transportation system.

But these newly approved transit funding measures won't meet the full need for improved transit in California. The discussion below highlights both transit projects that will be funded by the newly approved measures and other projects that are sorely needed.



*The bullet train trip from San Francisco to Los Angeles is projected to take two and a half hours, while the trip from Los Angeles to San Diego will require slightly more than an hour. These trips on high-speed rail will be faster than traveling the same distance in a car or by plane. Photo credit: Remus Eserblom, under license from istockphoto.com*



# The Beginnings of a New Transit Network

## Statewide Connections with High-Speed Rail

The planned construction of a high-speed rail line connecting San Diego, Los Angeles, San Francisco, Sacramento and the cities in between is a strong indication of California’s commitment to creating a 21<sup>st</sup> century transportation system. Instead of driving or riding on a bus on congested roads, or dealing with the hassles of an airport to catch an expensive and polluting flight, Californians will be able to travel from northern to southern California on speedy, low-emission trains.

This investment comes none too soon. Rising congestion on highways and at the state’s airports will lengthen the time required to drive or fly within the state. The number of people traveling from one city

to another within California is projected to almost double by 2030.<sup>30</sup>

And with rising travel will come greater delays. Even with continued expansion of the state’s freeways, drivers on more than half of 68 intercity highway segments studied by the California High Speed Rail Authority would experience increased congestion, travel delays and accidents by 2020, creating unacceptable service levels.<sup>31</sup>

The state’s airports will fare no better. Already, on-time performance at California airports has deteriorated as the number of flights and passengers has increased. A 16 percent increase in the number of passengers at Los Angeles International Airport has led to a decline in the percentage of on-time departures from 86 percent to 80 percent, and the percentage of on-time arrivals to fall from 84 percent to 77 percent.<sup>32</sup> San Francisco, San Diego and Oakland have experienced comparable drops in on-time performance.<sup>33</sup> Passenger volume

**Figure 5. Estimated Total Travel Times for Auto, Air, and High Speed Rail 2030, After Construction of High Speed Rail (Door-to-Door Times for Downtown-to-Downtown Trips, Unless Otherwise Indicated)<sup>40</sup>**

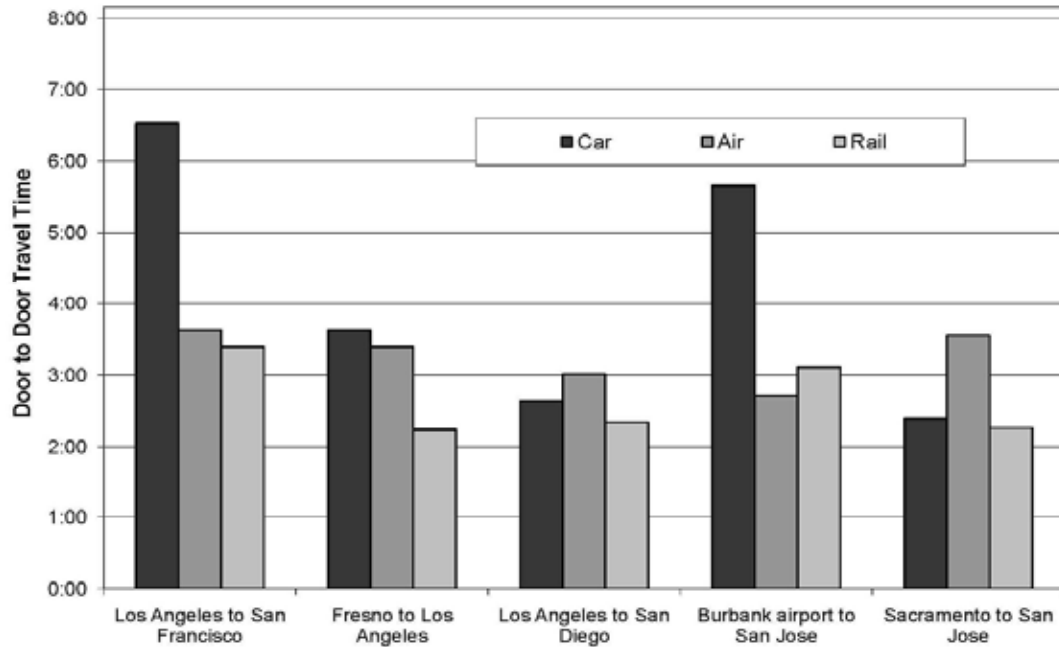


Figure 4. Proposed Route of California High-Speed Rail System<sup>39</sup>



is projected to increase 25 percent by 2015 at Los Angeles International Airport while San Diego International-Lindbergh Field expects to reach capacity prior to 2020, exacerbating delays.<sup>34</sup>

Building a high-speed rail network connecting San Diego and Los Angeles to Sacramento and the Bay Area should ease pressure on the state's roads and airports and give intercity travelers another viable transportation option. The high-speed trains proposed for California would operate at speeds greater than 200 miles per hour.<sup>35</sup> The trip from San Francisco to Los Angeles is projected to take two and a half hours, while the trip from Los Angeles to San Diego will require slightly more than an hour.<sup>36</sup> These trips on high-speed rail will be faster than traveling the same distance in a car or by plane.

Weekday service should include 230 trains, some serving the full length of the route between southern and northern California and others serving shorter, high demand corridors.<sup>37</sup> The California High-Speed Rail Authority estimates that 90 million people will ride the train annually by 2030.<sup>38</sup>

The high-speed rail line, which has been in the planning process for over a decade, would be the first of its kind in the United States, but similar to rail networks reliably connecting cities in Japan and Europe for years. Its construction offers a huge step toward a better transportation future, one that will ease congestion, reduce the state's dependence on petroleum, spark economic development and cut global warming pollution.

### **Sonoma-Marín Area Rail Transit**

Similarly, residents of Sonoma and Marin counties have embraced the idea of a better transportation future with their approval of funding for the Sonoma-Marín Area Rail Transit (SMART) project. This 70-mile passenger rail line will parallel Highway 101 and provide residents with a real alternative to driving, while creating the

backbone of a transit system to which bus service can be added.

The current transportation system does not serve Sonoma and Marin residents well. Highway 101, the counties' only north-south highway, is already extremely congested and the problem will grow worse in coming years as the region's population increases. Furthermore, employers are expected to create more than 130,000 new jobs in the two counties by 2025, meaning thousands more commuters will try to crowd onto Highway 101 each morning and evening.<sup>41</sup>

SMART will offer comfortable rail service to 14 stops, beginning with Cloverdale at the northern end of Sonoma County to Larkspur at the southern end of Marin County. The rail line will be built on a rail right-of-way that is already publicly owned. (See Figure 8.)

Commuters and other travelers will be able to ride one of 28 weekday trains, or eight weekend trains. Riding from one end of the line to the other would take 90 minutes, with trains departing every half hour at peak times.<sup>42</sup> Once train service begins in 2013, daily ridership is expected to reach 5,300 passengers.<sup>43</sup>

SMART service will be augmented by nine shuttle routes to take commuters to high use destinations such as Marin General Hospital, College of Marin, and Santa Rosa Junior College's Petaluma Campus.<sup>44</sup> For passengers who want to continue on to San Francisco, the Larkspur station will be close to the Larkspur Ferry Terminal with service across the bay.<sup>45</sup> However, the train will serve primarily commuters and travelers within Sonoma and Marin counties. Significant job creation within Sonoma and Marin counties would mean that, by 2025, just 9 percent of workers who live in the two counties would travel to jobs in San Francisco; the vast majority would work closer to home.<sup>46</sup> Overall, the establishment of rail service is expected to result in greater bus ridership.<sup>47</sup>

The SMART project also would include a bike and pedestrian path alongside the rail line, providing area residents with an additional transportation and recreation option.

SMART will help mitigate the global warming pollution projected to be produced by the region's growing population and increased driving. With per passenger emissions of global warming pollution that are 70 percent lower from the train than from a car, SMART will help cut global warming pollution by more than 30 million pounds per year and begin to create a sustainable transportation network.<sup>48</sup>

### **Los Angeles: Expanding and Linking Bus and Rail Services**

Voter approval of Measure R in Los Angeles County in November 2008 will provide approximately \$40 billion for transit projects over the next 30 years.<sup>49</sup>

An improved bus and train network will offer the region's residents an alternative to driving on some of the nation's most congested highways. Local and rapid buses, subways, light rail and commuter rail benefit all travelers in the region by easing pressure on overcrowded roads. Though the L.A. area's population has grown by 2.5 million since 1980, hours of highway delay per person increased by only one hour since 1995, compared to a 26-hour increase from 1980 to 1995, thanks in part to expansions in transit service, especially since the 1990s.<sup>50</sup>

The region's population is projected to grow by 2.4 million by 2030.<sup>51</sup> As a result, Los Angelenos are expected to drive a total of 38 percent more miles each day.<sup>52</sup> Expanding the region's transit system can help mitigate the effects of this growing population and its travel needs.

The Los Angeles County Metropolitan Transit Authority (Metro) has drafted a plan for improving the region's transit system through 2030. Improvements include a

better connection between various transit services in downtown Los Angeles, expanded bus and rail operations, more rapid bus service and the use of transit vehicles that operate on fuels with a lower global warming impact. If adequate funding is available, Metro's proposed expansions will result in a system with more than 100 miles of subway and light rail lines and more than 400 miles of bus rapid transit, offering area residents more alternatives to driving.<sup>53</sup> And Metro will continue to serve millions of passengers with conventional bus service.

This expanded transit service (combined with facilities to enhance walking and biking) will reduce the number of miles driven in private vehicles by more than 550 million annually and cut global warming pollution by more than 250,000 metric tons.<sup>54</sup>

Many of the improvements recommended by Metro are identical to those included in the Southern California Association of Governments' 2008 Regional Transportation Plan and are expected to be funded with monies collected through a half-cent sales tax that voters approved with passage of Measure R.<sup>55</sup> Some of the highest priority projects are discussed below.

#### **Expand Local Rail Service**

Metro's subway and light rail system, which began operating in 1990 with the Blue Line, currently includes 73 miles of rail, thanks to the addition of three more lines in 13 years.<sup>56</sup> For a metropolitan area the size of Los Angeles, however, that's not much rail service. In contrast to Los Angeles, where 73 miles of rail serve 4,060-square-mile Los Angeles County, the Bay Area has 104 miles of BART (plus additional Muni Metro lines) serving four counties that cover 1,951 square miles.<sup>57</sup>

Two expansions of rail service are under way, but major portions of the city where travelers have little choice but to drive or ride a bus through highly congested streets need service as well.

Work has already begun on extending the Gold Line from Union Station south through Little Tokyo and the Arts District and then eastward to Atlantic Boulevard in east L.A. The six-mile extension, scheduled to open in late 2009, will include eight new stations.<sup>58</sup>

To the west, the Expo Line will be the first rail line extending service to Culver City and other Westside locations. The line, currently under construction, extends southwest from the existing 7<sup>th</sup> Street/Metro Center station where the Blue, Red, and Purple lines overlap. Service to Culver City on the first stage of the Expo Line will open in 2010.<sup>59</sup>

Metro has begun scoping options for improved service through the Westside. The Purple Line of the subway currently ends at Wilshire and Western, while the Red Line curves north from Wilshire and Vermont, leaving the Westside with no rail service. A subway line could be extended from the end of the Purple Line, or from one of the Hollywood stations on the Red Line. As the line snakes toward the ocean, it could include stops in West Hollywood, mid-Wilshire/Miracle Mile, Beverly Hills, UCLA and/or Santa Monica.<sup>60</sup>

Depending on the alignment of a new line through the Westside, Metro estimates that 50,000 to 80,000 passengers would board a train each day.<sup>62</sup> The total amount of time saved each day by all riders could be as high as 60,000 hours compared to current transportation options.<sup>63</sup>

Metro is also planning extensions of the Green Line to LAX and the South Bay.

### **Enhance Connectivity**

Despite the fact that Metro has planned and built its entire subway and light rail system recently—rather than working with a system that evolved over decades as has occurred in many cities—the rail system suffers from poor connections in downtown Los Angeles. The Blue Line connects to the Red and Purple lines at the

7<sup>th</sup> Street/Metro Center stop, but the Gold Line and commuter rail services connect to the Red and Purple lines at Union Station. This lack of a central station forces passengers from the Blue Line (and soon the Expo Line) to make additional transfers and causes travel delays. Improving how rail lines connect in downtown Los Angeles is one of the most important changes needed by the rail system.

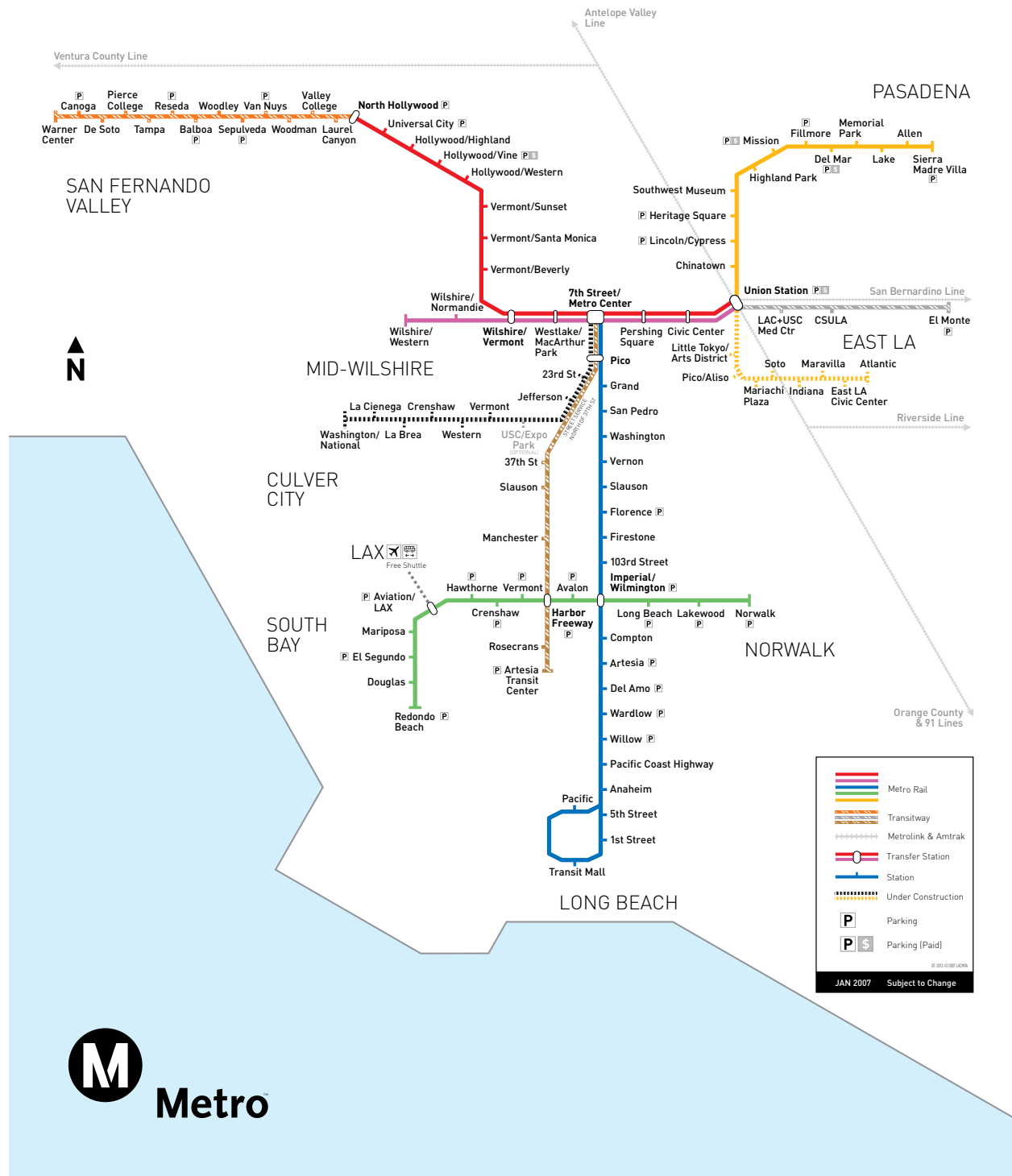
One possible configuration for the Downtown Regional Connector is a direct link from the 7<sup>th</sup> Street/Metro Center Station to the Little Tokyo/Arts District Station that will open when the Gold Line Eastside Extension is complete. By enabling the Blue Line's 65,000 daily passengers to reach Disney Hall, the County Courthouse and City Hall without transferring to another line, the Downtown Regional Connector could improve mobility and increase overall use of the rail system.<sup>64</sup> When the Expo Line begins service, the Downtown Connector would enable those passengers to avoid transfers as well.

### **Expand and Accelerate Bus Transit**

Metro projects that the average speed of freeway traffic could fall by 14 miles per hour by 2030.<sup>65</sup> As a result, bus routes that include freeway trips will take longer. Already, increasing traffic congestion on all streets has slowed buses by 12 percent since the mid-1980s.<sup>66</sup>

Metro has countered some of congestion's effect on buses with a variety of strategies. Buses on Metro's rapid bus lines have low floors for faster boarding and are given priority at traffic signals. Metro has also pursued street improvements that allow passengers to board more quickly. (When rapid buses have a dedicated lane, as is the case on a few existing routes, or separate roadway along with other speed-increasing features, the service is known as bus rapid transit (BRT).) In Los Angeles and surrounding areas, these rapid bus enhancements have reduced travel times

Figure 6. Metro Rail System Map with Planned Projects<sup>61</sup>



for passengers by 25 percent.<sup>67</sup>

Metro first began offering rapid bus service in 2000 and now carries 185,000 passengers daily through 20 corridors.<sup>68</sup> The speed, reliability, and ease of use of rapid bus service has drawn passengers who otherwise may have driven a car: 30 percent of riders on Metro’s rapid bus lines have been new transit riders.<sup>69</sup>

Supplementing existing bus lines with rapid lines and adding new rapid service is essential to creating alternatives for commuters. Though even express buses are not able to move as many passengers as rail service, the advantage of rapid bus service is that it can be implemented much more quickly than a new rail line. That speed of implementation makes rapid buses—especially if offered as BRT in its own dedicated traffic lane—an ideal transit option in situations where a rail line is planned. Los Angeles could use rapid bus service in several places, including:

- On Wilshire Boulevard through the highly congested Westside until the Purple Line of the subway can be extended.
- Within the Crenshaw Corridor between Wilshire Blvd. and El Segundo Blvd.
- Along several corridors within the San Fernando Valley.

## Planning for the Future

### Growing San Diego Trolley and Bus Services

The San Diego Trolley was the first modern light rail transit system in the United States when its initial link from downtown to San Ysidro opened in 1981.<sup>71</sup> San Diego’s

**Figure 7. Los Angeles MTA Proposed Rail and Rapid Transit Expansion, Ballot Measure R, 2008<sup>70</sup>**

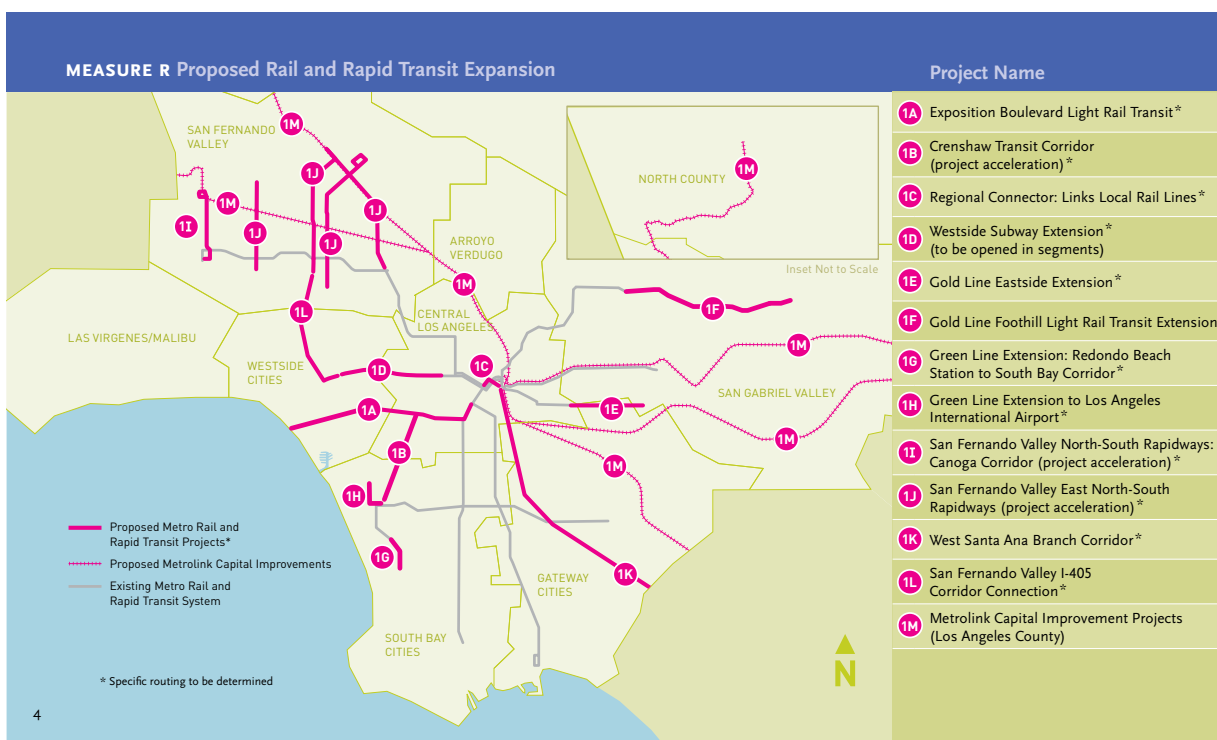
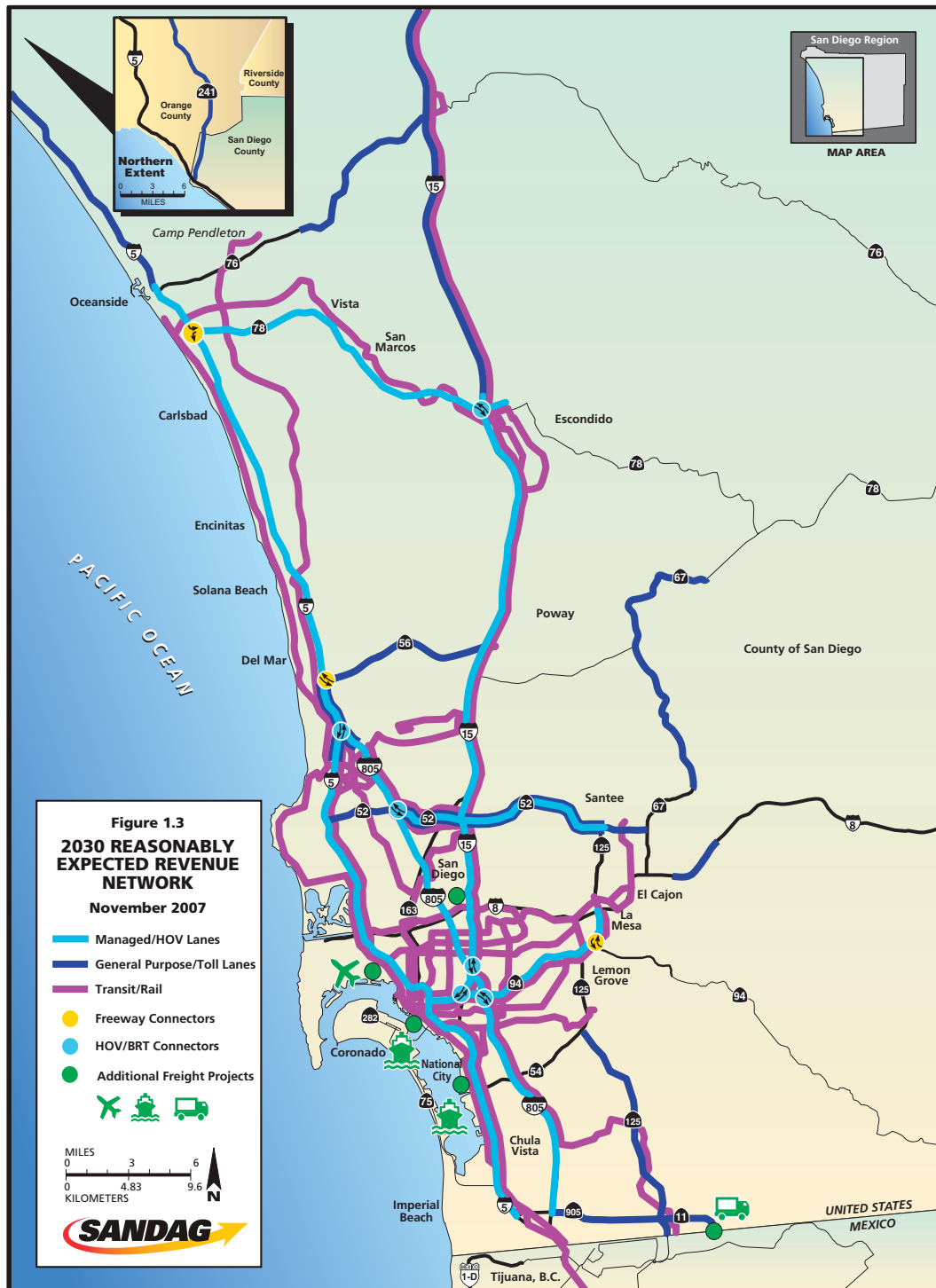


Figure 8. Proposed 2030 Transit/HOV/Toll Lane Network for San Diego Area<sup>75</sup>





gamble on building a new trolley has more than paid off over time, providing efficient transportation to the region and setting an example that has been followed by a growing number of American cities.

In 2006, the trolley carried more than 34 million passengers and saved more than 30 million gallons of fuel that would otherwise have been burned in cars.<sup>72</sup> An estimated 12 percent of trips into downtown San Diego occur on transit.<sup>73</sup> And the trolley has proven to be even more valuable in a time of high gas prices, providing San Diego residents with an alternative to increasingly expensive commutes. Ridership on the San Diego Trolley surged by 7 percent between 2006 and 2007 and increased a further 4.7 percent in the first half of 2008.<sup>74</sup>

Over the years, the San Diego Trolley has been expanded several times, and now includes three lines. But there is plenty of room for future growth. A “regional transit vision” published in 2001 by the San Diego Association of Governments envisioned that, by 2030, transit would play a much larger role in meeting the region’s transportation needs, with high-capacity transit lines crisscrossing much of the San Diego area. (See Figure 8.)

### **Mid-Coast Trolley**

The next expansion of the San Diego Trolley is planned for the Mid-Coast corridor north of downtown San Diego. The 11-mile proposed extension would parallel the congested I-5 corridor, eventually turning east to reach University City.

The Mid-Coast line would provide important benefits to the region. First, it would provide an alternative to travel on I-5 north of the city. The segment of I-5 that travels through the Mid-Coast corridor carries between 150,000 and 230,000 vehicles on the average day, with traffic volumes increasing closer to downtown San Diego.<sup>76</sup> By 2030, traffic volume on I-5 north of San Diego is expected to roughly double, creating additional congestion

and greater demand for transportation alternatives.<sup>77</sup>

The Mid-Coast line would also bring high-quality transit service to an increasingly important center of activity in the region: University City. University City is home to the University of California-San Diego, with an enrollment of more than 27,000 students.<sup>78</sup> A 2006 study ranked UCSD as one of the top universities in the world for converting laboratory discoveries in biotech into commercial start-ups.<sup>79</sup> The university’s success can be seen in the cluster of research institutes and biotech companies that have set up shop around the campus and in nearby areas such as Torrey Pines and Mira Mesa.<sup>80</sup>

The area is also home to the Westfield UTC shopping center, which is being expanded into a mixed-use development with additional stores and 250 residential units.<sup>81</sup> The redevelopment is in line to be recognized as a LEED for Neighborhood Development (LEED-ND) pilot project by the U.S. Green Building Council.<sup>82</sup> LEED-ND projects are intended to reduce sprawl by building on previously developed sites with good transit access.<sup>83</sup>

Extending the San Diego Trolley to University City would connect this bustling center of commerce, education and high-tech business with downtown San Diego and other destinations in the region. It would also produce large environmental and economic benefits. A federal evaluation of the first 3.4-mile segment of the Mid-Coast extension (stretching from the Old Town transit center to Balboa Avenue) found that even that short extension would save the equivalent of more than 400,000 gallons of gasoline per year and avoid 3,700 tons per year of carbon dioxide pollution.<sup>84</sup>

San Diego County voters have already committed local funding for the project through the TransNet half-cent sales tax approved in 2004.<sup>85</sup> The county plans to seek federal funding for the remainder of

the project's cost.<sup>86</sup>

### **Improved Bus Service**

While extension of the trolley north to University City will give drivers an alternative to using congested I-5, other communities in and around San Diego also could benefit from fast, reliable transit service. The creation of rapid bus service could quickly provide better transit to San Diego commuters.

### ***Mid-City Rapid Bus***

While an extension of the trolley would enhance transit service at UCSD, the Mid-City Rapid Bus project would operate through dense urban neighborhoods to connect San Diego State University to downtown San Diego. Typically, students and university staff are eager for alternatives to driving. Nationally, for example, 11 percent of people riding public transportation are students.<sup>87</sup>

The Mid-City Rapid Bus would replace existing local bus service with low-floor buses for faster boarding and priority through traffic signals, cutting travel time by 25 percent.<sup>88</sup> The line would also have improved bus shelters. Overall, the enhanced service is expected to draw five times more riders than the current line.<sup>89</sup> Essentially all planning for the project has been completed and local funds have been identified. All that is required now is federal funding.

### ***Escondido Rapid Bus***

Though the trip from the Escondido Transit Center to Westfield Shoppingtown North County covers just six miles, bus service is not very reliable because traffic congestion slows the trip and causes buses to bunch up. Establishment of rapid bus service would provide better transit for the many shoppers and middle and high school students who use the route.

The proposed Escondido Rapid Bus would be faster and more reliable than

current service, thanks to special bus lanes at intersections that allow buses to cut in front of other waiting traffic, extension of green lights for buses running behind schedule, and consolidation of bus stops.<sup>90</sup> Final planning for the project should be completed by the end of the year, enabling rapid implementation of improvements to the bus route if adequate funding becomes available.

### ***South Bay Bus Rapid Transit***

South of San Diego, a proposed bus rapid transit line known as the South Bay Bus Rapid Transit project would carry travelers in dedicated transit lanes, bypassing 13 miles of crowded roads.<sup>91</sup> The new bus line will connect the Otay Mesa Border Crossing to downtown San Diego, as well as employment centers in between.<sup>92</sup> In addition to operating in lanes dedicated for transit—a key feature that distinguishes bus rapid transit service from the rapid bus service planned for elsewhere in San Diego—the South Bay Rapid Bus would have better shelters, boarding platforms to speed loading, and signs to tell riders when the next bus will arrive. San Diego-area voters have already approved some funding for this project; its construction is now contingent upon federal funding.

## **Orange County: Urban Redevelopment and a Transit Hub**

Like many southern California communities, Orange County's development pattern made cars a necessity for residents. Clear separation between residential and commercial development, and the absence of downtowns in favor of strip malls have meant that Orange County citizens have no choice but to drive to work, to entertainment or to shops. The problems of this approach to development have become more obvious in recent years: traffic congestion, high household transportation costs, and a lack of community gathering points.

Now, leaders in Anaheim are trying

to address these problems by creating a more vibrant downtown where driving is optional. Improved transit can provide a boost to their redevelopment plan for a downtown area known as the Platinum Triangle.

The City of Anaheim wants to promote mixed-use development in the Platinum Triangle, an 820-acre area.<sup>93</sup> The city has been changing zoning requirements to facilitate extensive mixed-use development, including 18,000 residential units and 16 million square feet of office space. The city wants to create a dynamic urban environment connected by a “network of pedestrian walkways, streetscape improvements and recreation spaces.”<sup>94</sup> The Platinum Triangle will be centered around mixed residential and commercial uses in the core of the area, with low- and high-density office space around the periphery and industrial space along the north edge. The area already houses several entertainment facilities, including Angel Stadium and the Honda Center, home to the Anaheim Ducks.<sup>95</sup>

In the eastern portion of the Platinum Triangle, the City of Anaheim and the Orange County Transportation Authority have proposed constructing a transportation hub on a 16-acre site that would connect Metrolink, bus rapid transit routes, conventional bus routes and proposed high-speed rail through a single facility. This transit hub would improve transit service for existing riders and make it easier for new residents of the Platinum Triangle to leave their cars at home.

Since the inception of Metrolink rail service in Orange County in 1993, ridership has grown by leaps and bounds. In the first year of service, trains carried 145,000 passengers. Ten years later, annual ridership had risen to more than 3 million passengers.<sup>96</sup> The service’s popularity is partially due to the speed and ease with which riders can reach other Southern California cities: from downtown Anaheim,

Metrolink provides a 48-minute trip to Los Angeles, a 59-minute trip to Riverside, and a 2-hour trip to San Diego.<sup>97</sup>

As demand has risen, existing Metrolink facilities have become inadequate. In downtown Anaheim, for example, there is no room to improve access to the Metrolink station, and parking near the station is limited, even while the number of passengers is increasing.<sup>98</sup> Overall transportation needs in Orange County—the third most populous county in California and one with 1.6 million workers—will continue to rise. By 2030, the county’s population is projected to grow by 18 percent and employment will rise 22 percent.<sup>99</sup> If the plan for the Platinum Triangle is realized, a portion of that activity will be focused in downtown Anaheim.

Planners have proposed constructing the transit hub in phases, beginning with 56,000 square feet to serve 7,300 passengers annually.<sup>100</sup> By the time the transit hub opens, 70 trains per day will stop at the station.<sup>101</sup> Phase one construction would cost \$295 million (2007 dollars).<sup>102</sup> As demand for transit services rises, the facility would be expanded to 142,000 square feet, at an additional cost of \$605 million (2007 dollars), enabling the facility to serve a projected 44,600 riders per day.<sup>103</sup>

### **Riverside County Perris Valley Line**

Towns in Riverside County have been attractive to families looking for affordable housing. From 2000 to 2006, for example, 480,000 people moved to Riverside County.<sup>104</sup> However, relatively few jobs are based in the county, and thus the county’s population is four times greater than the number of jobs.<sup>105</sup> The result is that most employed residents must leave the county for work every day.<sup>106</sup>

Commutes from Riverside County are long, and getting worse. In fact, Riverside County commuters have the dubious distinction of having the longest average commutes in the nation.<sup>107</sup> And as the region’s

population has increased, congestion has made those commutes take even longer: the total number of hours that drivers lost to congestion increased by 85 percent from 2000 to 2005.<sup>108</sup> Clearly, Riverside County needs a more efficient way to get workers to employment centers.

Existing transit options include commuter rail service from Riverside to Los Angeles, and a network of 45 local bus routes.<sup>109</sup> However, residents of Perris Valley south and east of the city of Riverside have no option but to drive.

Workers who live in the Perris Valley must drive north on I-215 to Riverside to access commuter rail service. In coming years, traffic on I-215 is projected to increase by as much as 123 percent in some stretches, turning the 20-mile drive from Perris to Riverside into an 80 minute trip by 2030.<sup>110</sup> Train service planned for this corridor could carry travelers from South Perris Station to Riverside in just 40 minutes.<sup>111</sup> In contrast, a commuter bus would merely be stuck in traffic.

The Perris Valley Line will extend Metrolink commuter rail service from Riverside southeast to Perris, linking major employment and population centers. Stations could include the University of California Riverside campus, which, with 6,600 employees, is one of the largest employers in the area.<sup>112</sup> Furthermore, 17,000 students study at the campus, and enrollment is projected to increase by more than 4,000 students by 2015.<sup>113</sup> Further south, the train could stop at Moreno Valley and March Air Reserve Base, part of which is being converted to use as a commercial airport. The line's southern terminus will be in Perris—founded as a railroad town and named after a railroad engineer—where parking and bus service will be available.<sup>114</sup>

The Riverside County Transportation Commission (RCTC) already owns the tracks from Riverside to Perris, which should make addition of commuter rail service easier and cheaper.<sup>115</sup> Approximately

60 percent of funds for the project will be provided by the federal government; the rest will be local and state.<sup>116</sup> If construction work proceeds as scheduled, service could start in 2011.

Concurrently, Riverside County should pursue transit-oriented development near rail stations. Placing more residences and shops within walking distance of rail stations would reduce the need for commuters to drive to the train station and could encourage more people to ride the train instead of drive.

### **Bay Area Improvements: Bus Rapid Transit, Caltrain and Other Local Transit**

The Bay Area has the best developed and most used rail and bus network of any metropolitan area in California. In fact, San Francisco and Oakland have the second highest rate of transit use in the nation, behind only New York City.<sup>117</sup> Nonetheless, in too many instances transit in the Bay Area is inadequate: some neighborhoods must contend with lower quality service than they should. And growth outside of the urban core suggests that the Bay Area needs to expand the reach of transit to new areas.

The residents of the Bay Area are served by more than a dozen separate transit agencies that operate buses, light rail, subway and long-distance rail lines, cable cars, trolleys and ferries. San Francisco's Municipal Transportation Agency (Muni) is one of the oldest transit systems in the nation and the biggest in the Bay Area, covering San Francisco City and County. The Alameda-Contra Costa Transit District (AC Transit)—the third largest bus system in the state—serves 13 cities and surrounding areas.<sup>118</sup> Reaching into five counties, Bay Area Rapid Transit (BART) offers rail service. Caltrain connects downtown San Francisco to Gilroy and communities along the way with 77 miles of track.<sup>119</sup> Other transit agencies provide additional



*The Bay Area has a long legacy of providing convenient public transportation, from San Francisco's famous trolleys to BART. But to meet rising demand, transit services must be improved and expanded.* Photo credit: Travis Haney, used with permission

service to communities throughout the Bay Area.

Despite this array of transit options—which are heavily used—many residents in the Bay Area nonetheless still face limited alternatives to driving. Expanding and improving transit services would help to alleviate this problem.

### **Expand Bus Rapid Transit**

Bus rapid transit (BRT) lines typically include a separate traffic lane for buses, priority for buses through intersections, and pre-paid fares to speed boarding. High-quality bus stops, improved pedestrian amenities and regular updates for riders about when the next bus is coming improve the experience for riders.

Though light rail provides better service and a more pleasant trip for commuters, the advantage of bus rapid transit service is that it can be constructed more quickly and at

lower cost than a new rail line. In travel corridors where conventional bus service is woefully inadequate, BRT offers a way to dramatically improve transit service on a relatively short timeline.

### ***Van Ness Bus Rapid Transit***

More than 80,000 people drive a car or ride a bus on Van Ness Avenue in downtown San Francisco every day.<sup>120</sup> The tremendous traffic volume on Van Ness results in heavy travel delays. For example, buses traveling southbound on Van Ness during rush hour spend 7 minutes waiting for traffic lights or stuck in traffic for every 10 minutes that the bus is moving.<sup>121</sup> These delays, combined with delays in boarding passengers, result in bus trips that take twice as long as car trips over the same distance on the street. Nonetheless, demand for transit remains high because 46 percent of households in the Van Ness travel corridor do not own a car.

To improve transit service along Van Ness Avenue, the San Francisco County Transportation Authority (MTA) is developing plans for a two-mile BRT line. From Mission Street to Lombard Street, travel times should be reduced by 24 percent to 30 percent.<sup>122</sup> The BRT line will connect with other bus routes, and BART and Caltrain service.

The expected cost of the Van Ness BRT is \$87 million.<sup>123</sup> MTA anticipates that the project will be covered by a mix of federal funds and money from Proposition K, which city voters approved in 2003 to enable San Francisco to improve transit services. Construction on the Van Ness BRT project could begin in 2010.

### ***Geary Bus Rapid Transit***

Like Van Ness Avenue, Geary Boulevard is a major transit thoroughfare in northern San Francisco. Approximately 50,000 riders use bus service along Geary every weekday, 40,000 riders use bus service on Saturdays, and 28,000 on Sundays.<sup>124</sup>

Weekday auto trips total 30,000 to 60,000. Despite nearly equally heavy use by drivers and bus riders, the current layout of Geary prioritizes vehicle use, with the result that bus trips require twice as much time as traveling the same distance by car.<sup>125</sup> MTA has proposed creating a BRT line along Geary to shorten travel times and improve reliability while enhancing passengers' experience and boosting the attractiveness of surrounding neighborhoods.

MTA estimates that bus rapid transit could cut bus travel times by 25 to 44 percent, depending on the bus that passengers currently ride.<sup>126</sup> Based on experience in other cities, BRT could boost reliability by 25 to 50 percent.<sup>127</sup> Combined, the two improvements mean that transit riders should experience greater predictability.

Planned improvements for the Geary Boulevard corridor include upgrades to pedestrian and cyclist access and safety which will benefit those commuters regardless of whether they use the bus line.<sup>128</sup> The Geary BRT line will operate for the same hours as the light rail system (5 a.m. to 1 a.m.).<sup>129</sup> Ultimately, improved bus service and related amenities could increase ridership by 5 percent to 25 percent.<sup>130</sup>

The project will cost \$157 million to \$212 million to construct, but should have lower operating costs than the current system. Reduced operating costs are due in part to the ability of a single BRT vehicle to move passengers more efficiently than can a conventional bus.<sup>131</sup>

Funding for the project includes \$50 million from local sales tax and potentially \$75 million in federal funds.<sup>132</sup> Assuming MTA approves the project and additional funding is identified, construction on the Geary BRT service is not expected to begin until 2011 or 2012, with service beginning soon thereafter.<sup>133</sup>

### ***East Bay Bus Rapid Transit***

On the east side of the Bay, a key transportation corridor in need of improvement

runs from San Leandro north through downtown Oakland, to downtown Berkeley and the UC Berkeley campus. Demand overwhelms existing bus service. Though Alameda-Contra Costa Transit uses its largest buses, buses are so crowded that riders must stand, even during off-peak times.<sup>134</sup> High ridership slows boarding and unloading, causing travel delays and undermining the reliability of service. These crowded conditions and unreliable service deter potential transit riders.

Creating a bus rapid transit (BRT) line would improve the speed, reliability and comfort of travel by bus, and could begin service within several years.

The current proposal for BRT through this corridor would place stations every quarter to half mile along the roughly 15-mile route, allowing riders easy access to and from neighborhoods and shops.<sup>135</sup> Even with so many stops, the BRT project should reduce travel times by as much as 36 percent, and draw up to 76 percent more riders, while also improving conditions along the corridor for cyclists and pedestrians.<sup>136</sup>

The project has been in development since 1993, but with completion of a draft environmental review, AC Transit expects that construction could begin by 2012.<sup>137</sup> The project is projected to cost \$250 million and will be paid for with a mix of regional, state and federal funds.<sup>138</sup>

### **Improve Connectivity**

Better transportation hubs and connections between the many transit providers in the region would make it easier for passengers to travel around the region—and beyond—without driving.

### ***Transbay Terminal***

The proposed Transbay Terminal will connect transit service provided by nine transit agencies in downtown San Francisco.<sup>139</sup> Currently, passengers cannot easily transfer between these various bus and train services because the terminals

are too far apart. For example, the Caltrain commuter rail line currently stops 1.3 miles from the future Transbay Terminal location.<sup>140</sup>

Improved connections among various regional transit services are increasingly important. In San Francisco, for example, 20 percent of workers commute to jobs outside the city.<sup>141</sup> That's double the number of residents who left the city for work in 1970. And by 2015, an additional 48,000 commuters will travel into or out of the city each day.<sup>142</sup>

The transit agencies that will use the new Transbay Terminal reach into eight counties in northern California.<sup>143</sup> The Transbay Terminal is being designed to connect to a future high-speed rail system as well. Though initially 20 million travelers will use the Transbay Terminal annually, it is being designed with adequate capacity to handle 45 million passengers annually.<sup>144</sup>

In addition to making travel throughout the San Francisco Bay area easier, the Transbay Terminal will also be at the center of a new transit-oriented development with 3,400 new residences and more than 1 million square feet of commercial, retail and office space.<sup>145</sup> Much of the new development will replace parking lots that were created after the Loma Prieta earthquake forced the tearing down of the Embarcadero Freeway.<sup>146</sup>

Construction on the bulk of the station will be complete in 2014, with the extension of the Caltrain line ready in 2018.<sup>147</sup> Greater funding would allow for more rapid completion of the extended Caltrain line. The total cost for the project is estimated to be \$4.2 billion, with funding provided by local, state and federal sources.<sup>148</sup>

### **Caltrain Electrification**

Caltrain provides a critical transportation link between San Jose and San Francisco, as well as dozens of communities in between the two cities and south of San Jose.

In recent years, Caltrain has worked to improve service—most notably with the “baby bullet” express trains that serve limited stops between San Jose and San Francisco, slicing travel times between the two cities to less than an hour, a 35 percent reduction from normal travel times.<sup>149</sup> Bay Area residents have responded to the service changes, as well as higher gas prices, by boosting Caltrain ridership to record highs. Ridership on Caltrain increased by 8.6 percent during the period July 2007 to June 2008 compared to the previous 12-month period.<sup>150</sup>

Caltrain currently operates diesel locomotives, which have several drawbacks. They are louder and create more air pollution than electric trains.<sup>151</sup> In addition, their consumption of oil contributes to California's dependence on petroleum and makes it difficult for Caltrain's operators to accurately budget for fuel costs. In the 12-month period ending in June 2008, Caltrain budgeted \$14.4 million for diesel fuel, up 31 percent from the previous year, though the agency was not confident that was an adequate increase.<sup>152</sup>

Most importantly, diesel locomotives have important limitations when it comes to providing speedy and reliable service. Diesel trains take longer to get up to speed than electric trains. That is not much of a problem for commuter rail lines where the stations are spread far apart. But the stations along Caltrain's route are densely packed—with 22 stations in the 49 miles between downtown San Francisco and San Jose's Tamien station, an average of one station every 2.2 miles.<sup>153</sup>

Caltrain has proposed shifting from diesel to electric power along its rail line—a move that would require the installation of electric wires above the tracks, the purchase of new locomotives, and upgrades to other infrastructure. The cost of doing so would be approximately \$1.5 billion.<sup>154</sup> Electrification of the Caltrain corridor would be compatible with the needs of a

statewide high-speed rail system.<sup>155</sup>

Because electric locomotives can start and stop more quickly, Caltrain would be able to offer faster service. Electrification would carve eight minutes off the trip from Gilroy to San Francisco. Along the length of the system, travel times would be reduced by 3 to 12 percent.<sup>156</sup> As a result of the increased speed, Caltrain could also run more trains each hour, potentially as many as 12 instead of the current five.<sup>157</sup>

Electric locomotives would also be able to travel all the way into San Francisco, connecting to other transit services at the planned Transbay Terminal.<sup>158</sup>

The increased speed of service would help to attract new riders. Whether or not the system is converted to operate on electricity, Caltrain intends to increase the number of daily trains, drawing more passengers. However, the agency projects that with electrification, the system will draw an additional 4,100 daily riders compared to the non-electrification option.<sup>159</sup> Correspondingly, daily vehicle-miles of

travel will be 59,000 miles lower than otherwise.<sup>160</sup>

Electrification would benefit more than just people who ride the train:

- A system operating on electricity would consume one-third the amount of energy of one running with diesel-powered vehicles.<sup>161</sup> This would help reduce California's dependence on oil.
- Residents near the train tracks would hear less noise from each train, an important consideration in light of Caltrain's planned service expansion.<sup>162</sup>
- Air pollution would also be reduced by the substitution of electricity for diesel. The increase in emissions from power plants would be more than offset by the reduction in diesel pollution.<sup>163</sup> This improvement is especially beneficial in the most urbanized portions of Caltrain's corridor.



*Upgrading Caltrain's diesel locomotives to electric power will boost commuter train speed and cut travel time—while also reducing global warming and air pollution. Photo credit: Luc Tourn, under license from sxc.hu*



Once funding has been secured, construction on the project could begin as soon as 2011, with electric service available in 2015.<sup>164</sup>

### **Sacramento: Acting Now to Meet Future Needs**

The Sacramento region is already one of the fastest growing regions in the nation and faces tremendous growth in the next 25 years. The challenge for the region is to meet the needs of future residents without compromising the environmental and lifestyle qualities that have attracted existing residents.

By 2050, 1.7 million more people are expected to move to the six-county Sacramento region, a near doubling of population. The region's employers will add 1 million jobs.<sup>165</sup> How these new residents are accommodated could reshape the metropolitan area—for better or for worse. More than 5,000 current residents of the Sacramento area have helped to articulate a vision for development and transportation that, among other benefits, minimizes congestion and protects open space.

Their vision, developed through the Sacramento Region Blueprint Transportation/Land Use Study, has received approval from the general public, as measured through polling data and the behavior of area residents. Public opinion polling shows that residents want more compact, mixed-use development where walking and taking transit are viable options.<sup>166</sup> The behavior of area residents also demonstrates their desire for better transit services.

Californians living in census tracts within one-half mile of a subway, light rail or commuter rail stop in the state's six largest urbanized areas are far more likely to take transit, walk or bike to work than those living farther away. In Sacramento, more than 6 percent of residents who live in census tracts within a half-mile of a transit stop take transit to work, compared

with not quite 2.5 percent of those living in tracts more than a half-mile away.<sup>167</sup>

With adequate increases in transit infrastructure and service and supportive land use changes, the percentage of trips taken by transit (instead of driving or some other mode) could triple or quadruple.<sup>168</sup> Transit expansions undertaken today are essential to serving the region's growing population and to supporting the vision endorsed in the Blueprint Study. Two key projects are an extension of light rail service from downtown through Natomas to the airport, and from Riverview Road to Cosumnes River College.

### **Light Rail Extension from Downtown to the Airport**

The area between downtown and the airport is projected to experience substantial growth and transportation demand. Traffic on I-5 is expected to double by 2025, and the number of passengers at the Sacramento Airport is projected to increase by 60 percent by 2020.<sup>169</sup>

The Downtown/Natomas/Airport (DNA) project will extend Sacramento's existing 37 mile light-rail system by 13 miles north and west from downtown to Sacramento International Airport.<sup>170</sup> The planned route will provide travelers and Natomas residents an alternative to driving on ever-more congested I-5.

In addition to providing service to the airport, the DNA project will connect North Natomas Town Center (where a community college is planned for construction), Arco Arena, several high schools and commercial centers with the Sacramento Valley Station redevelopment of the Union Pacific rail yards.<sup>171</sup> At Sacramento Valley Station, passengers will be able to transfer easily to bus, intercity rail and Amtrak service, and planned light rail and commuter rail service.<sup>172</sup> Total travel time from downtown to the airport once the line is completed is expected to be 30 minutes.<sup>173</sup>

The planned travel corridor is economically important: an estimated 32,000 jobs are located within half a mile of the DNA line.<sup>174</sup> Furthermore, 21,500 people live within half a mile of the DNA line. This number will grow in coming years. Regional growth planners have already created plans for transit-oriented development—mixed use development that is designed for easy pedestrian access—along the route, particularly in the North Natomas area. Planners expect that the opening of the light rail line will support plans for compact development.

Work on the first phase of the project may begin in 2012.<sup>175</sup> The project will be funded with a mix of local, state and federal money, though the Sacramento Regional Transit District intends to begin the project without federal support.<sup>176</sup> The timing of subsequent phases is contingent on adequate funding.<sup>177</sup>

### **Light Rail Extension from Meadowview Road to Cosumnes River College**

The South Sacramento Corridor is another high-growth area that will require better transit service if development and travel patterns compatible with the vision identified in the Blueprint Study are to be realized. Commuters in the South Sacramento Corridor already have shown their eagerness for better transportation alternatives: express bus service from Elk Grove to downtown Sacramento operates beyond capacity.<sup>178</sup>

By 2025, the number of households living in the South Sacramento Corridor is projected to increase by 85 percent and the number of jobs will increase 145 percent.<sup>179</sup> With a growing population and employment base will come greater traffic congestion on both I-5 and State Route 99, the major north-south roads serving Sacramento. SR 99 already carries more vehicles than it was designed to carry. By 2025, both freeways are expected to suffer



*Expanding Sacramento's light rail services will improve connections between existing bus and rail transit options, as well as help spur smart growth in surrounding areas.* Photo credit: Under license from istockphoto.com

from severe congestion.

Light rail, rather than increased bus service, is a sensible investment. As freeway traffic conditions worsen, bus service will slow. Construction of a transit line with its own right of way would cut travel times from Elk Grove to downtown Sacramento by as much as 30 minutes compared to bus service in traffic.<sup>180</sup>

The Sacramento Regional Transit District is planning an extension of light rail service from the end of the current line at Meadowview Road to Cosumnes River College—just part of the way to Elk Grove. The extension will add four miles of track and four stations, and is projected to carry an additional 11,000 passengers a day by 2030.<sup>181</sup> The estimated cost of the light rail extension to Cosumnes River College is \$226 million, with half the cost borne by the federal government and the rest covered by local and state funds.<sup>182</sup>

Light rail service through the South Sacramento Corridor to Elk Grove has been included in official transportation planning documents since the early 1980s.<sup>183</sup> Though only a short segment of light rail has been constructed south of Sacramento, the inclusion of light rail in transportation plans means that right of way for a light rail line has been maintained in local land use plans.

Planning should begin immediately for extending light rail service all the way to Elk Grove. Better transportation options are essential to improving mobility for residents of one of the fastest growing regions of California.

## Statewide Upgrades

### Update Existing Transit Service

Existing transit service can be made more effective and attractive, often at relatively low cost. Transit that is more comfortable, convenient, reliable and efficient can draw more riders and better serve existing riders.

Service improvements include improving on-time performance through operations changes, purchasing buses with low floors that are easier and faster to board, and giving transit vehicles priority over other vehicles at intersections with stoplights. Some transit systems may need to consider revamping bus routes to ensure that they most effectively serve major population centers and destinations that may have grown since bus routes were initially laid out.

Transit priority treatments such as boarding platforms, coordinated signalization, and bus queue jumping lanes at intersections, along with enforcement, are simple ways to make on-street public transportation more reliable and dependable. San Francisco estimates a need of \$200 million to implement transit priority treatments for its trunk lines to ensure that efficiency upgrades can be realized. Similar

on-street investments will reap rewards for transit across the state.

Providing better information to transit riders and making transit easier to use can also help to attract more passengers, without much increase in operating costs. On-line trip planning tools and automatic cell phone alerts regarding transit delays—already in use by some transit agencies—could be offered by more agencies, with greater coordination between different transit agencies for travelers who need to use multiple services. Other options for easing transit use for travelers include equipping major transit stops with electronic updates on delays and arrival times, standardizing fare cards to work with multiple transit systems, equipping all buses with audio and visual announcements of upcoming stops, and coordinating schedules between transit lines.

In addition to improving the reliability of transit, agencies can offer amenities that make the ride more comfortable or attractive for riders. For example, offering wireless Internet service on commuter rail lines allows commuters to make the most of their time on the train. At a more basic level, clean vehicles and friendly operators can also improve riders' experiences.

Experience in San Francisco suggests that large improvements can be had for relatively little cost if transit agencies undertake a thorough review of service. San Francisco's Muni initiated its Transit Effectiveness Project in 2006 to review operation of the city's entire transit system with the goal of making the system "faster, more reliable and more efficient."<sup>184</sup> The travel patterns and needs of San Francisco residents and workers have changed significantly since Muni created its current network of bus lines in 1979.<sup>185</sup> To address the desire of riders for more reliable service, Muni has pursued operations changes to reduce bus break-downs, make more drivers available, and reduce missed runs.<sup>186</sup> Muni is investigating options for reducing

travel times and thus operating costs (by allowing fewer buses and drivers to serve more customers). Possibilities include a revised curb design that makes bus boarding faster, replacing stop signs with stoplights that give priority to transit vehicles and payment system changes. Finally, Muni intends to revise its bus routes to provide greater resources to corridors where ridership demand is highest.<sup>187</sup>

Despite the significant improvements to be gained through improved management and operational changes, Muni has concluded that it cannot achieve the level of reliability and service that customers want without increased funding.<sup>188</sup> While using existing funding wisely is important, efficiency improvements alone are not sufficient to achieve the 21<sup>st</sup> century transportation system that California needs.

# From Vision to Reality: A 21<sup>st</sup> Century Transit System for California

California must make sound investments in public transportation if it hopes to remain competitive in the 21<sup>st</sup> century—a time that looks increasingly likely to be one of unstable oil prices, increased concern about global warming, and continued congestion problems. Yet transit systems across the state are struggling to find adequate funding to maintain and improve transit service.

Many levels of government and other institutions have a role to play in achieving the goal of a 21<sup>st</sup> century transit system for California.

## Federal Policy

The main federal transportation funding law—the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)—will sunset in the fall of 2009. Congress is being called on to create a new transportation funding bill. It is possible that the coming federal bill will be the most sweeping reform of federal transportation policy in nearly two decades. The Congressional Budget Office

projects that the portion of the federal highway trust fund that pays for highway projects is projected to run out of money sometime during fiscal year 2009, with the public transit portion of the account scheduled to run out of money soon thereafter.<sup>189</sup> America's aging transportation network is increasingly in need of costly repairs. Meanwhile, amid rising gasoline prices, Americans are now experiencing the downside of the highway-centered investment policies of the last few decades, which leave too many Americans with few transportation choices. In short, the status quo cannot continue.

California officials should campaign for a new federal transportation funding law that makes a large investment in needed improvements to transit systems and intercity rail, while focusing federal highway investment on the need to maintain and repair existing infrastructure. Federal money should be used in a targeted and strategic way to encourage transportation investments that minimize oil dependence, congestion, environmental pollution and sprawl, and encourage the development of compact, livable communities where driving is an option, not a requirement.

Such a dramatic shift would benefit California by providing additional resources for needed transit projects. In addition to pushing for new federal transportation priorities, California should also work aggressively through existing avenues, including the recently passed American Recovery and Reinvestment Act of 2009, to obtain federal funding for transit infrastructure projects, including high-speed passenger rail.

## State Policy

Voters have repeatedly approved increases in funding for transit. In 1990, voters passed Proposition 116, approving the sale of bonds for capital improvements in transit and designating a portion of gas tax revenue to transit.<sup>190</sup> In 2006, voters approved an additional \$20 billion in funding to expand transit.<sup>191</sup> In the 2008 election, voters statewide approved high-speed rail and voters passed local funding measures for public transit in Marin, Sonoma, Contra Costa, Alameda, Santa Clara, Santa Barbara and Los Angeles counties.

However, despite clear voter support for transit funding, the California state legislature has diverted \$4.6 billion away from the Public Transportation Account (PTA) since 2000.<sup>192</sup> As a result of the recently passed 2008-2010 budget, which eliminates state funding for transit operations, many transit agencies are considering service cuts, fare increases or both. California

state lawmakers should restore funding for transit services and expansion and refrain from raiding transit funds in coming years to balance the state's budget.

California should align other public policies with a 21<sup>st</sup> century vision for transportation that is less dependent on automobiles and can take full advantage of improved public transit. The state should require that all proposed transportation investments be evaluated for their impact on oil dependence and global warming pollution. State government buildings should be located, to the extent possible, in areas with accessible transit service. And the state should encourage local governments to adopt land-use plans and zoning reforms that allow for and encourage compact development in and around transit stations.

## Conclusion

California must prioritize investments in public transportation as it considers how to shape the state's transportation network for the coming decades—years in which high gasoline prices, increased concern about the environment and continuing congestion all will argue for investment in clean, efficient transportation alternatives. The projects listed in this report should be the first transit improvements and expansions that the state undertakes in coming years.

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