San Diego Regional Economic Impact Study

of the

California High Speed Train Project

by

San Diego Institute for Policy Research

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Executive Summary

The California High Speed Train (HST) is an 800 mile long rail project that would link California's major population centers together, allowing riders to travel between San Diego and San Francisco in less than four hours. This project could provide tremendous benefits for Californians by alleviating freeway and airport congestion, giving California businesses enhanced opportunities to tap into more distant labor and customer markets, and enhancing mobility and improving the quality of life.

From this review we conclude that by 2030 the HST Alternative would create 45,250 more jobs in San Diego, create somewhat higher population growth, encourage more compact development than currently adopted plans for San Diego's freeways and airports, and provide additional tertiary benefits such as improved air quality, reduced automobile accidents and improved efficiencies at San Diego International Airport.

In addition, we find it reasonable to conclude that the HST provides several other benefits over the "No-Project" Alternative. **These include lowered transportation costs, travel time savings, reduced airport congestion, increased business attraction, air quality improvements, and reduced automobile accidents.**

Under the No-Project Alternative, San Diego County's population is forecast to grow 36.4 percent between 2005 and 2030, adding nearly 1.1 million residents. Because of congestion relief and induced economic activity, population growth would be higher from the HST being built, increasing another 4.8 percent or adding 141,615 more residents than with the No-Project Alternative.

The HST Alternative also has a positive impact on economic activity. The number of jobs in San Diego is projected to increase 46.9 percent by 2030 under the No-Project Alternative. Given the completion of the HST system, 2.4 percent more jobs would be available in San Diego. This represents an increase of 45,250 jobs over the No-Project Alternative.

In addition the HST Alternative includes 9.5 percent more efficient land use in respect to how the growth is accommodated in San Diego County over the No-Project Alternative. This is largely a result of the significant portion of the induced economic activity resulting from development that would take place in close proximity to the three HST system stations to be built in San Diego.

Further benefits of the HST over the No-Project Alternative come through time and costs that commuters save as a result of improved traffic conditions. As the HST diverts traffic from highways and airports, capacity increases lead to reduced travel times for all travelers. It is determined that the HST would lower demand for auto travel in San Diego by 9.1 percent from the No-Project Alternative. The HST would also result in a 4.1 percent reduction of travel time per intercity auto trips along the corridors where the HST travels in San Diego.

The HST would also result in fewer flights to and from California's airports, consequently decreasing delays and congestion at regional airports. These reductions in air travel time would provide benefits to travelers and the airline industry due to reduced congestion and aircraft

operating delays and, in turn, provide economic value for California. Moreover, the HST alternative provides benefits to San Diego's vital tourism industry, as more than one-half of the airline passengers coming through the San Diego Airport are visitors.

The environmental consequences of dependence on cars and airplanes are also an increasingly important consideration in evaluating the HST. Electrically propelled, high-speed trains use one-fifth the energy of cars in traffic and one-third the energy of air travel. High-speed trains would reduce CO_2 emissions that cause global warming by more than 12 billion pounds per year. This is the equivalent of removing more than one million vehicles from state roads annually and reducing oil consumption by some 12.7 million barrels (660+ million gallons) per year.

The cost to build the HST system allocated for San Diego is estimated to range from $3.3 to $3.6 billion, out of a total $40 billion for the statewide system. This is by far the most cost effective way to increase intrastate mobility.

Building an alternative infrastructure system that would provide the same capacity as the HST would be difficult to complete in San Diego County. SDI concludes that, at least for San Diego, even if the state and region had the resources to improve the region's airport and major interstate, a Modal Alternative is not an entirely viable option and would unlikely be available by 2030. Implementing the Alternative would require expanding the region's north-south freeways far more than currently planned and building additional gates and a second runway at the San Diego Airport that may not be possible.

Ultimately the HST project is about keeping California moving. Given our estimate that building an Alternative transportation system in San Diego County with a similar capacity as the HST would be difficult if not impossible to construct and would cost up to twice as much as the HST system, the choice is between a system that has the capacity to move tens of millions of Californians versus the build-out of current plans – which will admittedly be inadequate to meet the demands of the state's projected growth of 12 million by 2030, or even in the San Diego region, which is projected to be home for a million more residents by the year 2030.

I. Introduction

In the summer of 2008 the San Diego Institute for Policy Research (SDI) estimated the economic impact of a HST on the San Diego regional economy. Drawing upon previous research and over 50 years of staff experience in studying the San Diego region, SDI found that HST would have a positive economic impact on the region. Employment would be higher, congestion reduced, and land used more efficiently.

II. Findings, Methodology, and Structure of the Report

To estimate the impact of a High Speed Train in San Diego, SDI primarily based analysis on previous work conducted by *Cambridge Systematics* in their report "Economic Growth Effects Analysis for the Bay Area to Central Valley Program-Level Environmental Impact Report and Tier 1 Environmental Impact Statement," completed in 2007. *Cambridge Systematics*' "Economic Growth Effects of the System Alternatives for the Program Environmental Impact Report/Environmental Impact Statement" conducted in 2003 was also considered. These analyses were developed in a multi-phased process that used the Transportation Economic Development Impact System (TREDIS) and Regional Economic Models, Inc. (REMI) macroeconomic simulation models. These models use business attraction and macro-economic simulation, employment allocation, and residential spatial allocation to project the impact of the HST on California's population, economy, and infrastructure. In addition, Cambridge Systematics estimated traffic conditions using regional travel demand models maintained by the Metropolitan Transportation Commission (MTC), the Southern California Association of Governments (SCAG), and the San Diego Association of Governments (SANDAG).

In laymen's terms, Cambridge Systematics used statistical and mathematical models to predict the effects that a HST system would have on travel time, travel costs, and several other variables. The effects of the HST are compared against a No-Project scenario, under which, currently planned transportation improvements are assumed to be constructed. A third alternative (the Modal Alternative), based upon a more ambitious program of highway and airport improvements designed to move the same number of people forecast to use the HST by the year 2035, was also considered.

SDI also reviewed *Cambridge Systematic's* "Los Angeles-to-San Diego via-Inland Empire Corridor High-Speed Train Alignments/Stations Screening Evaluation"; *Charles River Associates'* "Independent Ridership and Passenger Revenue Projections for High-Speed Rail Alternatives in California"; *SANDAG*'s "2030 Regional Transportation Plan"; and the *San Diego County Regional Airport Authority's* "Airport Master Plan for the San Diego International Airport".

In the remainder of the report, SDI highlights key impacts of the High Speed Train project on San Diego County. These include the impact of the HST project on forecasted population growth, economic activity, land consumption and several other factors that affect the region's quality of life. Next, the report discusses the impact of the HST on the region's highways, airports, and a number of environmental factors important to the region.

The report also discusses the viability of the alternative "Modal" infrastructure plan, which attempts to develop a similar capacity as the HST Alternative and concludes that at least in San Diego County, even with spending up to twice as much as the HST Alternative, it is highly unlikely this alternative is a viable option. Finally, we summarize the conclusions.

It is important to underscore what this report is not. We make no effort to evaluate the financial projections of the HST, either in respect to system costs or the system's financing plan. We also do not unpack the underlying analytics of Cambridge's transportation modeling effort, confining our analysis to an evaluation of their findings and the plausibility of the underlying assumptions.

III. Transportation Alternatives Examined

To estimate the economic, fiscal and societal impacts of the HST, the California High Speed Rail Authority and Cambridge Systematics examined the scenario of a "No-Project" Alternative that uses the Regional Transportation Plans developed for California's major metropolitan planning areas to model the state's highway, rail and airport system as it is likely to exist by the year 2030.

The second Alternative envisions the development of a statewide "High-Speed Train" system, more than 800 miles in length, capable of travelling at speeds up to 220 miles per hour on dedicated, fully grade-separated tracks, with state-of-the-art safety, signaling, and automated train control systems. The high-speed rail line under the proposed phasing plan would initially be built between San Francisco and Anaheim through the Central Valley, with service starting in 2016. Service to San Diego and Sacramento would begin three years later in 2019. The route to San Diego would go from the Los Angeles Union Station cutting east through Riverside and south to San Diego along the I-15 corridor.

A third scenario presented by Cambridge Systematics in their previous 2003 study, the "Modal" Alternative, models a future transportation network that improves highways and airports to the point that they have a capacity equal to the forecasted ridership of the HST system in the year 2035. For reasons we present below, however, we do not believe it is likely that such a future transportation network could be fully possible to build. (See Section IV.)

The effects the transportation Alternatives would have on congestion and delay between current conditions and future years with expected accompanying economic growth are considered. In order to show the effects the HST would have, the development Alternatives are projected to 2030 showing what would happen after the HST has been fully operational for eleven years.

Impact on Population and Employment

Under the No-Project Alternative, San Diego County's population is forecast to grow 36.4 percent between 2005 and 2030, adding nearly 1.1 million residents. Because of congestion relief and more induced economic activity, population growth would be higher with the HST being built increasing 41.2 percent, 4.8 percent higher (141,615 additional residents) than with the No-Project Alternative.

Table 1 Projected Population

Area	2005 Population	Projected 2030 No-Project Alternative	Projected 2030 HST Alternative	differ. HST vs. No-Proj
SAN DIEGO	2,936,609	4,005,624	4,147,239	
Change		1,069,015	1,210,630	141,615
Percent		36.4%	41.2%	4.8%
Southern California	16,843,742	20,844,975	20,988,962	
Change		4,001,233	4,145,220	143,987
Percent		23.8%	24.6%	0.9%
California	36,154,147	48,110,671	48,612,439	
Change		11,956,524	12,458,292	501,768
Percent		33.1%	34.5%	1.4%

Source: Cambridge Systematics, Inc., 2007.

Importantly, the modeling results indicate that the additional population growth from the HST Alternative is largely driven by internal job growth rather than population shifting from other areas to San Diego.

Critically, the impact of the HST is greater in San Diego than for the rest of Southern California, as well as the state overall. The relative impact between the No-Project and HST Alternative is 5.6 times greater in San Diego than for Southern California and 3.5 times greater than for all of California.

The HST Alternative also has a positive impact on economic activity. Employment in San Diego is projected to increase 46.9 percent by 2030 under the No-Project Alternative. With a HST, 2.4 percent more jobs are available for San Diegans. This represents a positive difference of 45,250 jobs.

Table 2 Projected Employment

Area	2005 Employ-ment	Projected 2030 No-Project Alternative	Projected 2030 HST Alternative	differ. HST vs. No-Proj
SAN DIEGO	1,895,002	2,783,258	2,828,508	
Change		888,256	933,506	45,250
Percent		46.9%	49.3%	2.4%
Southern California	9,290,841	12,308,179	12,435,533	
Change		3,017,338	3,144,692	127,354
Percent		32.5%	33.8%	1.4%
California	20,903,134	28,617,864	28,938,605	
Change		7,714,730	8,035,471	320,741
Percent		36.9%	38.4%	1.5%

Source: Cambridge Systematics, Inc., 2007.

Here again, it is important to realize that relative employment growth would be stronger in San Diego from HST service than in the rest of Southern California or the state overall. Job growth

under the HST Alternative for San Diego is also relatively greater than in Northern California, including the San Francisco Bay and Central Valley areas, where overall economic benefits are projected to have the most significant impact.

San Diego's greater job growth is expected primarily because of increased market access by San Diego companies rather than job growth fueled by additional population. The modeling still assumed that San Diego's high housing costs would make it difficult for working households to be able to afford to live in the County. The HST Alternative, however, would allow workers living in Riverside County to more easily commute to jobs in San Diego County. In contrast, under the No-Project Alternative, increased congestion on the region's freeways shrinks market access and makes it more difficult for individuals to commute from more affordable housing markets and thus economic activity suffers.

The incremental impact of employment growth with the HST Alternative appears to offer a better solution for distributing employment. This suggests that the HST will not lead to wholesale shifts in residential location, as workers are able to access places of employment without relocating to be near their immediate area of work.

Land Efficiency

One of the most important differences between the No-Project Alternative and the HST Alternative is when one examines forecasts about "land consumed per new job and resident." Essentially, this metric shows the efficiency of each alternative for how growth is accommodated. Since the systems have relatively similar levels of overall growth, the efficiency by which the growth is accommodated is very important.

Table 3 provides the relevant data and resulting metric for the system alternatives. Lower values in the metric suggest greater efficiency or less land used to accommodate both job and population gains.

Table 3 Marginal Land Consumption - San Diego

	No-Project Alternative	HST Alternative
Land Consumption (acres)	169,705	169,730
Residential uses	136,894	138,651
Employment uses	32,811	31,079
Job Growth (2005-2030)	888,256	933,506
Population Growth (2005-2030)	1,069,015	1,210,630
Acres Consumed per New Job and Resident	0.0867	0.0792
"Efficiency Gain" Relative to No-Project Alternative	--	9.5%

Source: Cambridge Systematics, Inc.; San Diego Institute for Policy Research.

The HST Alternative is 9.5 percent more "efficient" at providing an incremental development density than the No-Project Alternative. This result is largely driven by the plausible assumption that a significant portion of the induced economic activity that results from the development of

the HST takes place in close proximity to the systems' stations and that, looking to other areas where high-speed trains have been developed, development is relatively more compact.

Studies of HSTs in Europe and Japan found the impact of a station stop in an area were generally clustered within one-quarter to one-half mile of the station. While impacts fall sharply beyond walking distance from the station, rail sometimes contributes to community development miles from the station. The development effects of HST are expected to be concentrated in the immediate vicinity of the station, with the majority generally located within walking distance of the station.

A study on the impacts to San Diego land values from rail transit services in the county found that overall, appreciable land value benefits were conferred to residential and commercial properties by rail transit services. The 2002 study of San Diego's light rail trolley and Coaster service found relationships varied considerably by type of land use and corridor. In general, the biggest premiums were recorded for commercial properties, notably in downtown San Diego and along the Mission Valley Trolley corridor. The most appreciable benefits were 46 percent premiums for condominiums and 17 percent for single -family housing near Coaster commuter rail stations in the north county; 17 percent and 10 percent premiums, respectively, for multifamily housing near East Line and South Line stations; and for commercial properties, 91 percent premiums for parcels near downtown Coaster stations and 72 percent for parcels near Trolley stations in the Mission Valley area. Positive capitalization impacts were also found for multi-family parcels along all Trolley and Coaster corridors, generally in the range of 2 to 6 percent. Other than the Coaster downtown stations and the Mission Valley corridors, where premiums were very large, commercial properties accrued small or even negative capitalization benefits in other rail-served corridors. [i]

The potential exists for firms to change their location and expansion decisions based upon improved accessibility afforded by the HST or Modal Alternatives. These business attraction effects include new activities that would otherwise be located outside the HST regions, either elsewhere in California, or elsewhere in the U.S. These business attraction effects are driven by improvements in accessibility to customers, workers, and international airports. The improvements have the effect of expanding the effective market areas of HST regions, reducing costs associated with accessing non-local markets, or reducing costs and improving quality of available inputs; and, thus, are key factors in shaping business growth in the area. A business attraction model was applied to capture how incremental improvements in market access and cost interact with the existing local economic base and characteristics to generate new employment in the HST regions.

The HST provides synergistic opportunities combined with regulatory-based development strategies that could limit land consumption to well below that needed for other system alternatives. While the HST Alternative leads to modest increases of employment and population, it channels growth into areas where it can be managed with regulatory-style land use policies and spares the rest of San Diego County from ever greater development. The result is better jobs, housing and needed infrastructure balance reducing sprawl and long-distance commuting.

Municipal efforts to encourage increased density and mixed land uses near rail stations have been found to be even more effective near HST stations than outlying real estate markets created by freeway interchanges under the No-Project and Modal Alternatives. Furthermore, the strong markets around HST stations are likely to attract development that would otherwise be dispersed throughout a suburban region. Therefore, development around HST stations consists of both the consolidation of current projected growth (under the No-Project Alternative) and additional regional employment and population associated with the HST Alternative.

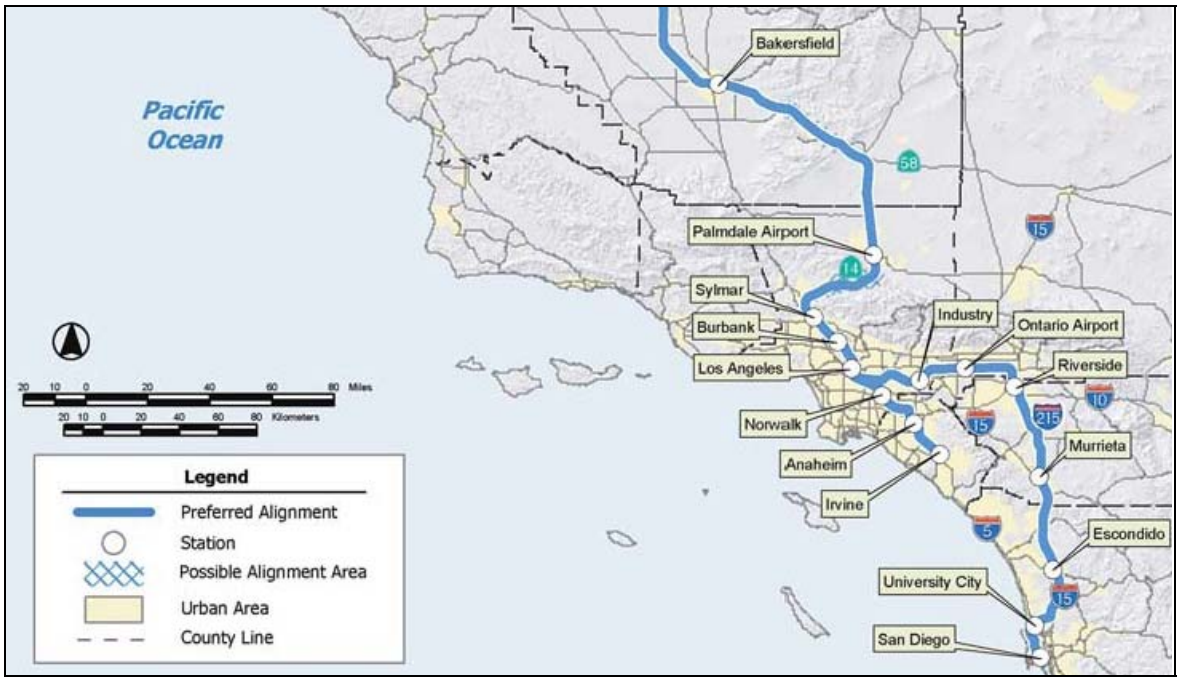
While analysis suggests that the alternate travel options would not create meaningful differences in overall urban area size, experience shows economic rationale for developers to cluster new commercial, industrial, and residential development within easy access to the HST stations. In general, the No-Project and Modal Alternatives provide no such market incentive.

Business Attraction/Development

The three HST stops proposed for San Diego County are at Escondido, University City, and Downtown San Diego. With the southern portion of Riverside County having largely become a "bedroom" community for commuters who live there but work in San Diego, the Murrieta stop could also be considered to have direct ties and dependency upon San Diego as well.

The annual number of boardings projected for the Downtown San Diego Station is approximately 6.5 million, which would make the stop the system's 4th busiest station after the San Francisco-Transbay, Los Angeles Union, and Sacramento stations. The Escondido station is projected to have 3.3 million boardings per year, while University City would serve 2.2 million. Temecula would approach 3.0 million.

San Diego is found to share the statewide average for finance, insurance and real estate jobs (FIRE), as well as service jobs, which account for 45 percent of total employment. This pattern for jobs in San Diego is projected to be "intensified" under the No-Project Alternative. Incremental job growth from an HST Alternative is projected to be even more heavily weighted towards these types of jobs, with 66 percent of San Diego's job growth by these sectors as the system would allow firms in these sectors to serve a greater market area as compared to the market they would be able to serve under the No-Project Alternative.



Benefits of travel time

Another benefit of HST over the No-Project Alternative comes from the time and costs commuters will save as a result of improved traffic conditions. To estimate these savings, commute travel savings time were estimated for the primary commute corridors roughly adjacent to the potential HST alignment of the corridor from Downtown Los Angeles to Downtown San Diego roughly following Interstate 10 and SR 60 from the Los Angeles Union Station (LAUS) to Riverside, and Interstates 15 and 215 between Riverside and San Diego.

As the HST diverts traffic from highways and airports, capacity increases lead to reduced travel times for all travelers. Using urban area commute models for San Diego, it was determined that the HST would lower demand for auto travel in San Diego by 9.1 percent more than the No-Project Alternative, and that there would be a 4.1 percent reduction of travel time among intercity auto trips along the corridors where the HST travels in San Diego.

Measured another way, under the HST Alternative the average freeway capacity increase from the No-Project Alternative is estimated to average 22 percent along the region's major north-south (I-5, I-15, SR 163) freeways. Specific capacity increases estimated for major San Diego north-south freeways are:

- I-5 (Anaheim to San Diego) – 20 to 25 percent capacity increase
- I-15 (Ontario to Miramar) – 20 to 25 percent capacity increase
- I-8/SR 163 (Miramar to I-5) – 25 percent capacity increase.

Airport- Modeling done by the HSRA and Cambridge Systematics in various studies have consistently shown that the HST would lead to a diversion of trips from California's airports to the HST and, consequently, a decrease in delays and congestion at regional airports. These

reductions of air travel time would provide benefits to travelers and the airline industry due to reduced congestion and aircraft operating delays and, in turn, would provide economic value to California.

A summary of the San Diego airport's physical features and operational capacity used for this analysis is presented in Table 4.

Table 4 Airport Characteristics of the System Alternatives

	Airport Physical Features						Annual Service Volumes (Thousands of Operations)		
	Year 2005		Increase over Year 2005						
			No-Project and HST Alternatives		Modal Alternative				
Area	Run-ways	Gates	Run-ways	Gates	Run-ways	Gates	Year 2002	No-Project/ HST	Modal
San Diego	1	41	0	8	1	20	270	322	483

Source: Cambridge Systematics, Inc., 2003.

San Diego International Airport handled 227,329 flight operations in 2007 and capacity is expected to start to be constrained by 2015. Under either the No-Project or HST service scenarios, the maximum volume of service or flights possible at the San Diego Airport with only a single runway, plus eight additional gates, is projected to be 322,000 per year.

With the considerable addition of another 12 gates and a second runway under the Modal Alternative, annual service capacity rises to 483,000 operations per year. While the Modal Alternative would increase airport capacity, there is no feasible room to add another runway, much less the gates, under current airport expansion plans. Expansion of this magnitude would require annexing the Marine Corps Recruit Depot, which is not currently available, bulldozing housing and business structures in surrounding communities, and encroaching upon surrounding areas that would significantly alter the airport's current configuration. Moreover, even that only provides acreage that allows for an "open V" alignment, providing much less capacity than two parallel runways with sufficient distance between them to allow simultaneous landings. The process would also undoubtedly be held up many years in court with an uncertain outcome by any attempt to usurp neighboring properties and the impact it would have from substantially encroaching upon and rearranging the surrounding area. The Modal Alternative for the San Diego Airport appears impossible under any current vision or plans as currently configured.

The HST appears to be a much more feasible solution to alleviate San Diego's airport needs. By diverting airport users to the HST, considerably more reliable time savings for local air operations are possible.

Table 5 Year 2030 Reduction of Aircraft Operations for the San Diego Airport: HST vs. No-Project Alternative

	Time Saved per Aircraft Operation (Min.)	Annual Delay Reduction (Passenger Hours)
HST Alternative	2.09	2,147,000

Source: Cambridge Systematics, Inc., 2007.

Total air travel delay reduction was calculated for aircraft operators and air travelers by multiplying operation savings by the estimated number of aircraft flights and air travel demand, respectively. The more than two minute savings per flight would save San Diego's millions of airline passengers more than 2.1 million hours of delay per year, according to this analysis. This represents a value savings for both business passenger and recreational travelers of $94.7 million in 2008 dollars.

Societal benefits/ Quality of Life/Amenity (accidents, air quality)

Auto travel reductions that result from the development of the HST Alternative would lead to secondary societal benefits, including less highway air pollution and reduced highway crash costs. These benefits were estimated by multiplying reductions in highway vehicle-miles traveled by estimates of the marginal societal cost of auto crashes and air pollution.[ii] In other words, with fewer auto travelers and fewer vehicles on the highways there are fewer crashes,

Table 6 San Diego Year 2030 Traveler Benefit Savings with the HST Alternative

Travel Type	Type of Traveler	*(Millions of 2008 Dollars*)*
Mode Shift Benefits for:	Intercity Business Travelers	$528.4
	Intercity Non-Business Travelers	242.0
	Intra-Regional Travels	18.7
Auto Delay Reduction for:	Intercity Business Travelers	250.2
	Intercity Non-Business Travelers	336.0
	Intra-Regional Travels	467.4
Accident Reduction for:	Business Travelers	51.2
	Non-Business Travelers	58.7
Air Pollution Reduction for:	Business Travelers	6.8
	Non-Business Travelers	7.7
Air Travel Delay Reduction for:	Business Travelers	54.8
	Non-Business Travelers	14.7
	Operators	62.6
TOTAL Travel Benefits		$2,099.1

*Adjusted from original 2005 data by the San Diego Consumer Price Index.

Source: Cambridge Systematics, Inc., 2007; San Diego Institute for Policy Research.

resulting in a savings of 8.6 cents per vehicle mile from fewer auto crashes and 1.1 cents per vehicle mile for less pollution. Again, these figures are in 2008 dollars.

In total, the incremental value of the HST Alternative as a result of auto trip time savings, the benefits from fewer automobile accidents, a reduction in pollution and less airport congestion is estimated to reach nearly $2.1 billion by 2030 as measured in today's (2008) dollars.

IV. Is the Modal Alternative Realistic?

Though we have noted and measured the economic impact of the California High Speed Rail project in relationship to the "No Build" Alternative, we have also considered a "Modal" Alternative, wherein a more ambitious program of highway and airport improvements are implemented to move the same number of people forecast to use the HST. In SDI's analysis, however, the San Diego improvements identified in the Modal Alternative, as discussed in the "California High-Speed Train Final Program EIR/EIS", are unlikely to be completed by 2030.

Most notably, while the No Build Alternative is largely consistent with SANDAG's 2030 San Diego Regional Transportation Plan, the Modal Alternative assumes construction of two additional lanes on Interstate 5 and Interstate 15 in addition to the managed land project currently identified in the 2030 RTP.[iii] Indeed, such an improvement plan is even more ambitious than the 2030 RTP's unconstrained needs forecast.

A similar problem exists in the Modal Alternative's assumptions about improvements to the San Diego International Airport. That alternative assumed that there would be one additional runway in the region by 2035.[iv] That is not currently planned for in the most updated Master plan for SDIA.[v]

Thus in evaluating the HST Alternative, the most instructive comparison is with the "No-Build" Alternative. This Alternative still has a set of ambitious infrastructure improvements (four additional "Managed Lanes" on both Interstates 5 and 15 and eight additional gates at SDIA[vi]) but is, in our estimation, the more realistic forecast for likely infrastructure improvements in San Diego County.

The HST also far outperforms the Modal Alternative because of its lower cost. The increased taxation and user fees that would be needed to fund the higher capital costs in the Modal Alternative results in a slight reduction of economic growth and therefore slower population and employment growth. It is important to recognize that there may be serious constraints to constructing the Modal Alternative in San Diego County, even with spending far more than would be spent for a HST. However, it is also the case that the economic activity generated by the HST Alternative are predicated on ridership and financial forecasts developed by the High-Speed Rail Authority.[vii]

San Diego's Allocation of Construction Costs to Build the HST

The cost of building the HST system in California is estimated to total $40 billion. Two methods were devised to allocate anticipated construction costs among the state's six major regions, with San Diego considered as a single region. The first method uses the mileage of train tracks

to be built in each area based upon an assumption that the construction costs will be distributed by a similar proportion. The second method uses population as a proxy for the urbanization since larger urban centers are more costly to build and the cost should be distributed proportionate to urbanization. Together, the two methods show a plausible range for the construction costs to be allocated to each region.

San Diego's proportion of the cost calculates to a range from $3.3 to $3.6 billion (2008 dollars). Sixty-two miles of track will be built in San Diego County representing 8.2 percent of the total 758 miles of tracks in the state. San Diego's population represents 8.9 percent of the state total, and therefore a larger proportion of the state total.

V. San Diego Policy Challenges and HRT Qualitative Impacts

Impacts of San Diego's overburdened highway system

Southern California is at the crossroads of a transportation crisis. This is particularly true for San Diego, with a regional population projected to reach 4 million by 2030, an increase of one million residents. Along with the increase of population, 465,000 more jobs and 290,000 more homes will also be created.

While there are many appealing reasons to live in San Diego, quality of life is arguably of utmost importance. "While it may mean different things to different people, we can all agree that quality of life encompasses safe and livable communities, affordable housing, competitive job opportunities, a healthy environment, good schools and community facilities, and a *transportation system that provides easy access to work, school, and other activities*." SANDAG 2030 Regional Transportation Plan (italics added for emphasis).

Many would say San Diego's biggest problem is "traffic" and how to accommodate ever growing congestion along with the problems it encompasses. If anything has been learned in California over the past 50 years, however, it is that "we cannot just build our way out of traffic congestion". There is a widely held perception that no matter how much infrastructure is built, population will increase to match that capacity and reach even more congestion. Congestion seems to be the only means limiting unending growth.

Lack of affordable "workforce" housing has also led to urban sprawl and longer commuting distances for San Diegans, as residents seek less expensive housing in outlying areas. This has exacerbated the region's traffic woes. For example, SANDAG's most recent Regional Growth Forecast Update, based on the existing General Plans of the cities and County of San Diego, shows that between 2004 and 2030, some 93,000 households, while working in San Diego County, will live in homes in Riverside and Imperial Counties and in Baja California.[viii]

Overall congestion remains a critical problem. According to the U.S. Census Bureau's "American Community Survey", San Diego's average combined morning and afternoon commute time of 57.0 minutes ranks 14th highest among comparable regions studied. Another company providing traffic information to MapQuest and Microsoft, also ranked San Diego as having the 14th worst traffic congestion among 100 metropolitans across the country.[ix] (In comparison, San

Diego's metropolitan population ranks as the nation's 17th largest.[x]) And although SANDAG has planned an ambitious building program that will add significant new capacity to the region's main highways, overall congestion is projected to hold steady, at best.

High-speed trains would be uniquely suited to improve mobility in a way that is fast, safe, convenient, comfortable, economical and environmentally efficient. Building a high-speed train system would cost two to three times less than the cost of expanding the airports and highways to meet California's expected travel demand. When compared with other transportation modalities delivering equal capacity, high-speed trains move people and goods at a lower cost, with greater environmental benefits and increased safety.

HST ridership between San Diego and Los Angeles is projected to reach nearly 20.1 million per year. Ridership between San Diego and San Francisco would approach 4.5 million per year, and to Sacramento nearly 1.0 million. This represents 27 percent of the state's total projected HST ridership.

Most of the HST riders will be diverted from air and private autos. About 45 percent of the ridership will be diverted from air transportation and 42 percent from private autos. This includes additional travelers as some people who would not otherwise make trips will now do so because of the greater availability of travel with HST service. With the added availability of travel, these additional riders are projected to account for six percent of total ridership.

High-Speed Train Travel Times

SAN DIEGO to/from:	Hrs:Mins
Escondido	:23
Murrieta	:36
Ontario	:45
Los Angeles	1:18
Bakersfield	2:12
Fresno	2:42
Sacramento	3:35
San Francisco	3:56

Source: California High-Speed Rail Authority.

The travel time for the high-speed train from San Diego to Los Angeles would be about 1 hour and 18 minutes, while traveling from San Diego to the Ontario Airport would be 45 minutes. Even auto travel to Orange County would improve 20 percent according to the projected savings because of travelers using the HST. There would be no other, more efficient way to travel through Southern California.

Inadequacy of San Diego's current airport

The San Diego International Airport at Lindberg Field is readily acknowledged to be severely constrained by its downtown location in the City of San Diego. Although the central location within two miles of downtown makes it conveniently accessible for airline users, the surrounding vicinity of the airport is densely developed, making expansion extremely difficult.

SDIA's Lindberg Field consisting of only 661 acres is the smallest major airport site in the U.S. With only a single 9,401-foot-long runway, it is also the busiest single-runway commercial airport in the nation. While air service continues to grow from the growing region's demand for air travel, no changes to the runway configuration or an additional runway are included in the airport's current planning, nor is there a reasonably feasible way to include such plans.

While air service plays an increasingly important role as a facilitator of economic growth in the local and state economy, the Airport's limitations are already constraining San Diego's economic needs and viability. Today, Lindbergh Field offers limited air cargo service, shipping about half of what a comparably sized regional airport exports by air. An estimated 80 percent of the region's air cargo is trucked out of the region to depart from alternative airports, adding to the shipping time and exacerbating San Diego's highway congestion. As Lindbergh experiences increases in passengers, it has not been able to address cargo service improvements.

During 2007, 18.3 million passengers utilized Lindbergh Field, a 5 percent increase over 2006. According to the San Diego County Regional Airport Authority, investments in airport improvements at Lindbergh Field, such as additional gates and taxiway extensions, are needed to meet forecasted increases from 209,000 annual operations in 2004 to 300,000 annual operations expected between 2021 and 2030. The aviation activity forecast prepared by the Airport Authority shows that between 2015 and 2022, existing runway capacity at Lindbergh Field will begin to constrain growth in air traffic, and that sometime between 2021 and 2030, no further air service growth can be accommodated.

The Airport Authority's findings are consistent with Federal Aviation Administration findings. In their March 2008 "Airport Capacity and NextGen" report, the FAA concludes both the San Diego and Los Angeles regions will need additional airport capacity by 2025. Airports operating at maximum capacity generate consequences ranging from annoying to economically damaging.

With the failure of an advisory vote regarding joint military-public use of the Marine Corps Air Station (MCAS) Miramar, which was placed by the Airport Authority on the November 2006 ballot, it has become of critical importance to develop an alternative approach to meet the region's long-term needs for passenger and air cargo service.

Higher airfares are one likely result because of the rising demand for a limited number of airline seats. Higher fares in turn also lead to less travel. San Diego's important tourism industry will undoubtedly suffer. More than one-half of the travelers coming through the SDIA are visitors, according to the San Diego Convention and Visitors Bureau. Nearly 9.2 million visitors to San Diego came through the airport in 2007.

Perhaps the greatest impact will be the 66 daily flights between San Diego and the Los Angeles Airport (LAX) – the crucial connection point for many San Diego passengers going on long-distance trips. It is anticipated that these passengers will experience delays as terminal gates in Los Angeles also back up more often.

Importantly, HST would increase the connectivity between San Diego and the

Estimated Travel Times Between SAN DIEGO and Los Angeles

	Hrs:Mins
Auto - No-Project Alternative	2:49
Air - No-Project Alternative	
Line Haul*	:48
Total	3:00
High-Speed Train Alternative	
Line Haul*	1:13
Total	2:16

*Actual time in plane or train.

Source: California High-Speed Rail Authority.

LA/Ontario Airport, which is 83 miles north of Escondido, up Interstate 15. Completed in 1998 at a cost of $270 million, Ontario has two long runways, 12,200 and 10,200 feet long, as well as two terminals and 35 total gates. Capable of serving 29 million passengers annually – nearly double SDIA's current level of 17.2 million – Ontario has by far the biggest potential for increased capacity among any airport in Southern California.

The HST would enable San Diegans to easily reach Ontario in less than 45 minutes from Downtown San Diego. Stops from University and Escondido would take even less time.

“Ontario is part of San Diego's airport future,” says Steve Erie, a political scientist at the University of California San Diego who studies the region's infrastructure. “Not immediately, but as LAX morphs into an international-destination airport, the connecting flights for long haul that we don't do here (in San Diego), you will see that shift to Ontario.”[xi]

Environmental Impacts

The environmental consequences of escalating dependence on cars and airplanes are also an increasingly important consideration. Electrically propelled, high-speed trains use one-fifth the energy of cars in traffic and one-third the energy of airplanes. High-speed trains would reduce the CO_2 emissions that cause global warming by more than 12 billion pounds per year.[xii] This is the equivalent of removing a million vehicles from state roads annually and reducing oil consumption by some 12.7 million barrels (660.4 million gallons) per year.

VI. Conclusions

The No-Project Alternative, with projects currently programmed for implementation and already in funded programs or financially constrained plans, will not meet intercity travel needs as San Diego’s population continues to grow. Highway capacity will become increasingly more congested with projected growth of one million more residents. Similar problems are experienced at the San Diego Airport, with the airport already near capacity. Worsening air and surface congestion is also increasingly an economic detriment to the economy and harms the region’s quality of life.

Under a Modal Alternative, potentially feasible improvements to existing highways and airports at considerable expense and build-up might be sufficient to serve the growing population. However, implementing the Modal Alternative would require greatly expanding the region’s north-south freeways more than what is currently planned and building new gates and a second runway at the San Diego Airport. Even then, because of the increased population and economic activity in the region, congestion would still increase on highways and at the airport compared to current conditions. The costs of building a Modal Alternative system would be considerably more than currently budgeted, and is projected to cost more than two times the HST Alternative. Additionally, negative environmental impacts result from increased energy use and dependency upon petroleum, increased emissions of air pollutants, impacts on property and land uses, and increased suburban sprawl.

The HST Alternative helps meet the need for intercity travel by offering safer, more reliable transportation. It would help lead to the creation of 45,250 more jobs than the status quo. It would be two-to-three times less costly than expanding highways and airports to serve similar travel demands. As noted above, it is the most efficient alternative when it comes to land consumption and forecasts indicate that it is the most energy efficient of the Alternative systems.

With Californians facing massive travel challenges, by the year 2020, up to 98 million more intercity trips and 11 million more people will add much greater demand to the state's infrastructure, resulting in more congestion, reduced safety, more air pollution, longer travel times, less reliability and less predictability in intercity travel around the state. Rather than forever expanding the state's highway systems and enlarging airport capacity, the proposed statewide high-speed train system appears to be the best alternative for serving California's and San Diego's transportation needs.

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[i] Robert Cervero and Michael Duncan, "Land Value Impacts of Rail Transit Services in San Diego County," *National Association of Realtors Urban Land Institute*, June 2002.

[ii] The analysis relied upon marginal costs assumed in previous HST studies, including $0.07 per VMT (1999 dollars) for auto crashes and $0.009 per VMT (1999 dollars) for pollution. Source: Independent Ridership and Passenger Revenue Projections for High-Speed Rail Alternatives in California, Appendix C, *Charles River Associates*, January 2000.

[iii] See pg. 2-A-10 and pg. 2-20 and 2-21 California High Speed Train Final Program EIR/EIS. Pg. A-25 and A-26 of the "San Diego 2030 Regional Transportation Plan", *San Diego Association of Governments*.

[iv] California High Speed Train Final Program EIR/EIS, *California High Speed Rail Authority*, pg. 2-22.

[v] San Diego International Airport Master Plan, *San Diego County Regional Airport Authority*, May 2008, pg. 9-5.

[vi] California High Speed Train Final Program EIR/EIS, *California High Speed Rail Authority*, pg 2-14.

[vii] Independent Ridership and Passenger Revenue Projections for High-Speed Rail Alternatives in California, Appendix C, *Charles River Associates*, January 2000; Economic Impact and Benefit/Cost of High-Speed Rail for California, Final Report, *Economics Research Associates*, September 1996.

[viii] San Diego 2030 Regional Transportation Plan, *San Diego Association of Governments*, November 2007, sandag.org.

[ix] "Traffic Congestion in the U.S.", *INRIX®*, June 17, 2008, Inrix.com.

[x] "Annual Population Estimates", *U.S. Census Bureau*, July 1, 2007, census.gov.

[xi] "Gridlocked skies", Gordon Smith, *Copley News Service,* June 10, 2007.

[xii] "A Better Option for Southern California", *California High-Speed Rail Authority*, www.cahighspeedrail.ca.gov.