



September 2016

The Economic Impacts of Infrastructure Investment

Forecasting the Effects of VTA's
Traffic Relief and Road Repair Measure

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Authors

Jeff Bellisario - Vice President, Bay Area Council Economic Institute
Micah Weinberg - President, Bay Area Council Economic Institute
Camila Mena - Research Analyst, Bay Area Council Economic Institute
Joanna Franco - Research Intern, Bay Area Council Economic Institute
Adair Rosin - Research Intern, Bay Area Council Economic Institute

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The Economic Impacts of Infrastructure Investment

Forecasting the Effects of VTA's Traffic Relief and Road Repair Measure



SANTA CLARA COUNTY, THE CORE OF THE BAY AREA ECONOMY

76.9%

of Santa Clara County workers resided within the county during 2014.

3 out of 4

Santa Clara County residents drive alone for their commutes, the highest percentage of any Bay Area county.

145% growth

in Caltrain average weekday ridership, from 26,533 daily riders in 2005 to 65,049 in June 2016. Caltrain boardings within Santa Clara County made up 45% of average weekday ridership for 2015.

Santa Clara County is home to more than 1.9 million people, making it the largest county in the region and accounting for just over one-quarter of the Bay Area population in January 2016. The county's population is expected to increase to 2.3 million by 2040, accounting for 30% of the region's projected population growth.

Santa Clara County has total employment that now exceeds 1 million. In the last 12 months, the San Jose metropolitan area's 4.0% job growth trails only Austin, Texas and Orlando, Florida as the fastest growing major metros in the U.S. Fast-growing technology sectors, representing 35% of all Santa Clara County jobs in 2015, have been a major driver of the county's economic strength.

The county has led the region in housing production, accounting for 35.6% of all housing unit production in the Bay Area between 2010 and 2015.



BAY AREA CONGESTION IS AMONG THE WORST

% Change in Hours of Traffic Delay Per Commuter From 2010-2014

37%
San Jose

33%
San Francisco

28%
Los Angeles

27%
San Diego

25%
New York



INVESTMENTS ACROSS TRAVEL MODES CAN STRENGTHEN THE COUNTY'S ECONOMY

Creating more efficient transportation networks can:

- **Improve** access to jobs
- **Increase** attractiveness to new and expanding businesses
- **Extend** the regional labor pool available to employers
- **Improve** travel time reliability
- **Reduce** carbon emissions
- **Provide** opportunities for economic development around new transportation hubs

Through \$6.3 billion in infrastructure investments over 30 years, Santa Clara County will improve its highways, transit systems, local roads, and bicycle and pedestrian networks.

2016 Proposed Ballot Measure



\$6.3 billion in estimated expenditures

Source: VTA Envision Silicon Valley
Analysis: Bay Area Council Economic Institute



ECONOMIC IMPACTS OF PROPOSED TRANSPORTATION PROJECTS

\$6.3 billion*

in estimated spending related to the 30-year Traffic Relief and Road Repair Measure is forecasted to yield

\$15.4 billion

in total business output as a result of transportation expenditures, including

3,942 jobs

supported annually over 30 years across Santa Clara County, the equivalent of 118,263 full-time job-years



BART PHASE II EXTENSION WILL BETTER CONNECT SANTA CLARA COUNTY TO THE REGION

\$1.5 billion

will fund the Phase II extension of BART through San Jose to Santa Clara.

The number of commuters traveling from Santa Clara County to Alameda County has grown from 32,548 in 2011 to 38,453 in 2014, an increase of 18.1% — making a BART extension to Silicon Valley a needed step to seamlessly connect the regional workforce.

VTA's BART Silicon Valley Project will result in a 16-mile extension delivered in two phases. The first 10-mile, two-station Berryessa Extension has been under construction since 2012 and is expected to be operational by Fall 2017.

Phase II will extend from the Berryessa Station further into Santa Clara County, effectively connecting the BART system to the Caltrain system at Diridon Station in San Jose and in Santa Clara across from Santa Clara University. Phase II will also feature stations in downtown San Jose near San Jose State University and at Alum Rock in east San Jose. Service is planned to begin in 2025.

Estimated ridership for the BART Phase II extension is expected to be as high as 55,000 per day by 2035, accounting for as much as 10% of BART's projected future ridership.



LOCAL STREET INVESTMENTS WILL PROVIDE NEEDED INFRASTRUCTURE UPGRADES

\$1.2 billion

will be returned to cities on a formula basis for local street and road improvements, including street maintenance and pothole repair.

According to the Metropolitan Transportation Commission's 2015 Pavement Condition Report, seven of Santa Clara County's 15 cities and towns have a pavement condition index categorized as "Fair" or below. Funds will be used to improve roadway conditions and their use includes a Complete Streets requirement, meaning investments must provide safe travel for people using any mode of travel, including bicycling, walking, riding transit, and driving.



RETURN ON INVESTMENT FOR VTA TRAFFIC RELIEF AND ROAD REPAIR MEASURE

Santa Clara County's 2016 transportation measure is expected to provide

\$6.3 billion*

to transportation projects across the county that address present and future infrastructure needs.

These investments are intended to:

Enhance **Safety**

Provide **Congestion Relief** and Improve Transportation Efficiency

Expand **Transportation Choices** and Improve Travel Experience

Expand **Transit Ridership**

Continue to Promote **Quality Transit**

Promote **Healthy Communities** and Environmental Sustainability

Improve System **Financial Sustainability** and Maintenance

Continue to Support Silicon Valley's **Economic Vitality**

* The \$6.3 billion funding allocation amount is an estimate set forth in the ballot measure itself.

Sales Tax Measure Funding Allocations

Projects	Funding Allocation (in 2017 \$)	Spending Category
BART Phase II	1,500,000,000	Transit
Local Street Maintenance & Pothole Repair	1,200,000,000	Highway/Roads
County Expressways	750,000,000	Highway/Roads
Highway Interchanges	750,000,000	Highway/Roads
Caltrain Grade Separations	700,000,000	Transit
Transit Operations	500,000,000	Transit
State Route 85 Corridor	350,000,000	Transit
Caltrain Corridor Capacity Improvements	314,000,000	Transit
Bicycle/Pedestrian Program	250,000,000	Bicycle and Pedestrian
TOTAL	6,314,000,000	

Business Output and Jobs Derived from Proposed Transportation Expenditures

For 30 Years of Expenditures Covered by the Measure

Industry	Business Output (\$ in millions)	Full-time Equivalent Job Years
Agriculture & Extraction	21.92	118
Utilities	39.86	59
Construction	4,154.11	36,945
Manufacturing	2,305.12	4,907
Wholesale Trade	521.17	2,149
Retail Trade	434.72	6,063
Transportation	133.63	1,588
Postal & Warehousing	22.72	297
Media and Information	429.35	839
Financial Activities	1,151.06	4,988
Professional & Business Services	5,200.48	43,243
Education & Health Services	532.55	7,196
Leisure & Hospitality	473.51	9,786
Government	22.16	87
TOTALS	15,442	118,263

Note: Full-time equivalent job-years represent one year of one job. For example, a full-time construction job lasting for four years would count as four job-years in this table. Additionally, a 50% part-time manufacturing job lasting two years is counted as one job-year.
Data Source: These figures were calculated using TREDIS software
Analysis: Bay Area Council Economic Institute

Introduction

Innovation and technology have been critical pieces to the Bay Area’s recent economic success, and Santa Clara County has been at the heart of this story. As the largest county in the region, Santa Clara County is home to more than 1.9 million people, accounting for just over one-quarter of the Bay Area population in January 2016. Since 2010, the county has added nearly 150,000 residents and produced an annual population growth rate over this period of 1.2%, making it the fastest growing county in California since the recession.¹

Santa Clara County also has total employment that now exceeds 1 million, and it has reached the level of jobs last experienced during the dot-com boom.² In the last 12 months, the San Jose metropolitan area’s 4.0% job growth trails only Austin, Texas and Orlando, Florida as the fastest growing major metros in the U.S.³

These large job and population increases require more resources for housing and transportation. The county has led the region in housing production, accounting for 35.6% of all housing unit production in

the Bay Area between 2010 and 2015. But, Santa Clara County’s rapid growth has resulted in increased traffic flow into, out of, and within the county.

With Santa Clara County’s population expected to grow to 2.3 million by 2040,⁴ the Santa Clara Valley Transportation Authority (VTA) has begun to plan for future projects that are intended to revitalize the transportation infrastructure, improve trip experiences, expand access and mobility, and create a more sustainable network. To fund these projects, VTA has placed a half-cent, 30-year sales tax measure on the November ballot, referred to herein as the Traffic Relief and Road Repair Measure. If passed by voters, the measure is forecasted to generate a present value total of \$6.3 billion in tax revenues to fund transportation projects.

This analysis explores Santa Clara County’s current transportation characteristics, highlights planned projects, and quantifies the economic impacts of the November 2016 ballot measure.

Change in the Number of Cross-County Commuters, 2011-2014

Origin	Destination	Number of Daily Commuters, 2011	Number of Daily Commuters, 2014	Percent Increase 2011-2014
San Francisco	Santa Clara	21,644	27,701	28.0%
San Mateo	Santa Clara	55,044	64,524	17.2%
	San Mateo	41,919	47,893	14.3%
Santa Clara	San Francisco	13,503	16,639	23.2%
	Alameda	32,548	38,453	18.1%

Data Source: 2016 Silicon Valley Index, American Community Survey 2014
 Analysis: Bay Area Council Economic Institute

Transportation Opportunities in Santa Clara County

The county's transportation system and the regional networks it connects to provide the critical infrastructure needed to ensure efficient flows of commuters, on-time delivery of goods, and a high quality of life. While transportation across the Bay Area is critical to the success of the economy, moving people and goods across Santa Clara County presents some distinct challenges and opportunities:

The county's connections with the rest of the Bay Area are growing. Of the five southern Bay Area counties (excluding Marin, Sonoma, Napa, and Solano), Santa Clara County has the highest proportion of its workforce that commutes from within the county. In 2014, 76.9% of Santa Clara workers resided within the

county. At the low end of the spectrum, this number was 55.3% for San Francisco County.⁵ However, cross-county commutes to and from Santa Clara County are rapidly increasing as the workforce of the entire Bay Area becomes more regional in nature, as shown in the chart on the previous page.

Residents show a preference for driving. Santa Clara County residents' commute mode share for transit is the lowest of the major employment centers of the Bay Area at just 3.6% of all residents. Additionally, county residents are very reliant on driving alone, with more than three-quarters of them reporting driving alone as their main means of commuting to work in 2014.

Bay Area Resident Commute Mode Shares by County, 2014

County	Drive Alone	Carpool	Transit	Walked	Other Means	Worked at Home
Alameda	64.4%	10.2%	12.8%	3.7%	3.3%	5.6%
Contra Costa	69.2%	11.8%	9.7%	1.6%	1.8%	5.9%
Marin	66.1%	9.1%	9.0%	3.4%	2.5%	9.9%
Napa	76.3%	11.6%	1.0%	4.2%	1.3%	5.6%
San Francisco	36.2%	7.5%	32.9%	10.3%	6.1%	7.1%
San Mateo	70.2%	11.0%	8.9%	2.5%	2.4%	5.0%
Santa Clara	76.5%	10.3%	3.6%	1.9%	3.0%	4.6%
Solano	76.2%	13.8%	2.6%	2.2%	1.4%	3.9%
Sonoma	76.1%	10.0%	1.8%	3.1%	2.1%	6.9%

Data Source: American Community Survey, 2014
 Analysis: Bay Area Council Economic Institute

Given the county's rapidly growing population, the effects of a more regional workforce, and the limited use of transit, congestion in Santa Clara County has grown. San Jose has the fastest growing traffic congestion of any metropolitan area in the U.S. From 2010 to 2014, the annual number of hours of traffic delay per commuter grew from 37 to 51 hours, a 36.8% increase. The only other metropolitan area to top a 30% increase was San Francisco, where congestion increased by 33.0% over the same period.⁶

Multiple transit lines run through Santa Clara County, and San Jose is a hub for mega-regional travel. A hub-and-spoke system of highways and expressways around San Jose allows for multiple entry points into the city and connections to other Silicon Valley job centers.

Altamont Corridor Express (ACE), Caltrain, and Capitol Corridor trains meet at Diridon Station in San Jose, making the county a key cog in the Northern California transportation system. Additionally, the VTA light rail network provides dedicated transit options to multiple corners of the county.

Economic strength in Santa Clara County creates an opportunity to invest in transportation. With Santa Clara County leading the Bay Area economy out of the recession, investments in transportation infrastructure can alleviate existing traffic bottlenecks, better connect the county's workforce and employers to regional transit networks, and position the county for continued economic growth going forward.

Major Rail Transit, Highway, and Expressway Networks in Santa Clara County

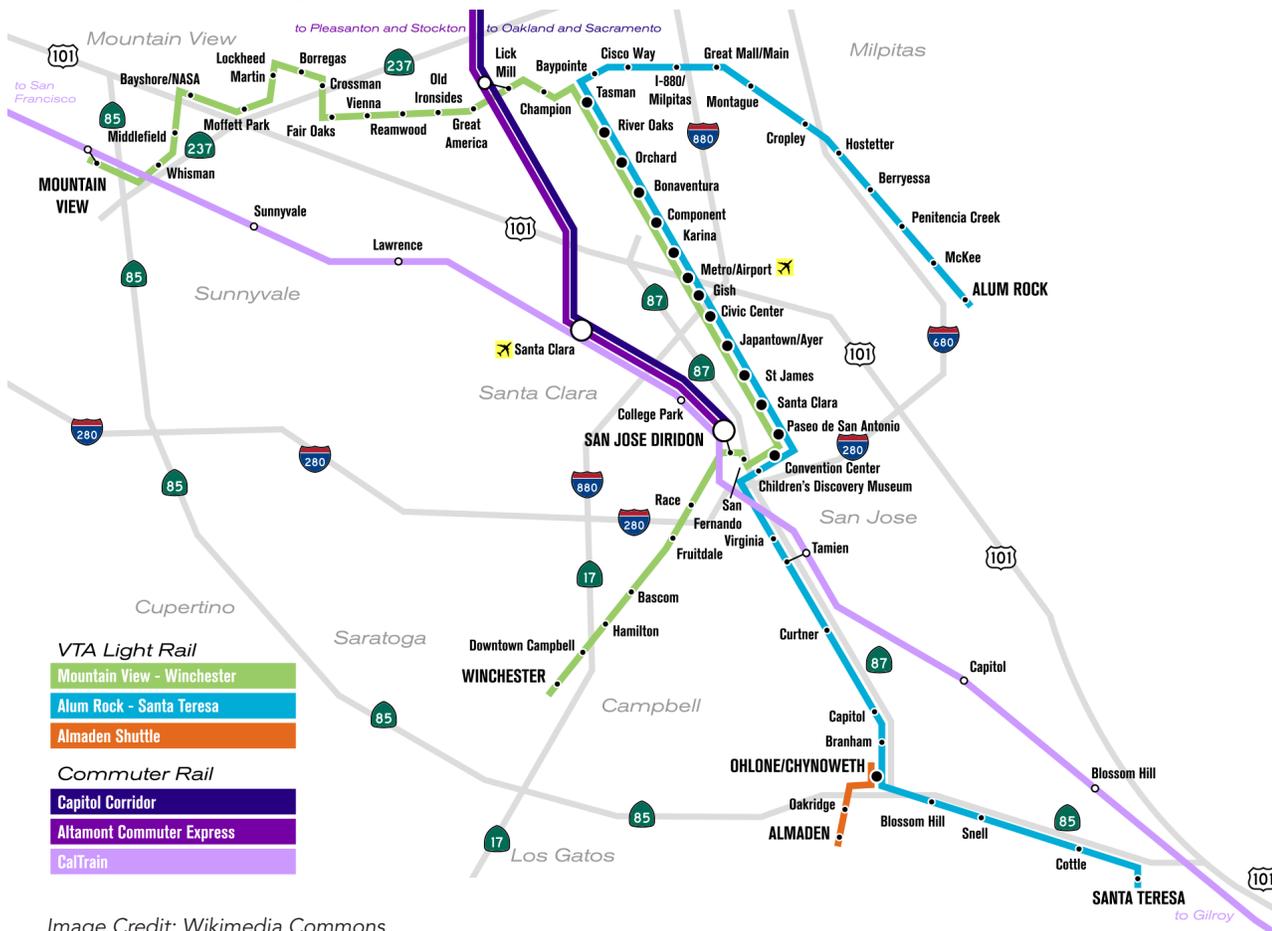


Image Credit: Wikimedia Commons

The 2016 VTA Traffic Relief and Road Repair Measure at a Glance

To identify current and future transportation needs in the county, VTA launched Envision Silicon Valley in 2014. Over an 18-month period, Envision Silicon Valley convened approximately 1,765 individuals at one of 54 public events. Projects chosen through the Envision Silicon Valley process are now included in the county's long-term transportation plan, Valley Transportation Plan (VTP) 2040. This process helped to prepare the expenditure plan for the half-cent sales tax measure, which Santa Clara County residents will vote on in November 2016.

Envision Silicon Valley and the expenditures associated with VTA's Traffic Relief and Road Repair Measure were planned with the following goals and strategies in mind:

- Enhance safety
- Provide congestion relief and improve transportation efficiency
- Expand transportation choices and improve travel experience
- Expand transit ridership and continue to promote transit for everyone
- Promote healthy communities, environmental sustainability, and plan for the next generation
- Improve system financial sustainability and maintenance
- Continue to support Silicon Valley's economic vitality

VTA's Traffic Relief and Road Repair Measure Funding Allocations

Projects	Funding Allocation (in 2017 \$)	Spending Category
BART Phase II	1,500,000,000	Transit
Local Street Maintenance & Pothole Repair	1,200,000,000	Highway/Roads
County Expressways	750,000,000	Highway/Roads
Highway Interchanges	750,000,000	Highway/Roads
Caltrain Grade Separations	700,000,000	Transit
Transit Operations	500,000,000	Transit
State Route 85 Corridor	350,000,000	Transit
Caltrain Corridor Capacity Improvements	314,000,000	Transit
Bicycle/Pedestrian Program	250,000,000	Bicycle and Pedestrian
TOTAL	6,314,000,000	

Analysis: Bay Area Council Economic Institute

In 2017 dollars, the half-cent, 30-year sales tax measure is forecasted to generate approximately \$6.3 billion to fund a menu of transportation projects. These projects are outlined within this section, though it should be noted that the sales tax measure will not provide the sole funding source for these projects. The Traffic Relief and Road Repair Measure will serve as the matching dollars for various regional, state, and federal funding programs.

Phase II of the BART Extension Through San Jose to Santa Clara

\$1.5 billion of the sales tax revenue will fund the expansion of BART through San Jose to Santa Clara. The six-mile, four-station extension would connect with ACE, Capitol Corridor, Caltrain, and future high-speed rail trains at Diridon Station.

Estimated ridership for the BART Phase II extension is expected to be as high as 55,000 per day by 2035. Given the estimates for BART's ridership growth in Plan Bay Area, this level of ridership would account for approximately 10% of annual ridership. BART Phase II will also leverage the tax measure revenue as a local match for \$1.5 billion in federal funds and \$750 million in state funding.

Local Street Maintenance and Pothole Repair

\$1.2 billion in tax revenue will be returned to cities on a formula basis for local street and road improvements. These funds include a Complete Streets requirement to improve bicycle and pedestrian systems. Cities with adequate pavement condition scores will be allowed to use the funding for other congestion relief projects.

County Expressways

\$750 million will be dedicated to expressway improvements across the county. Projects identified as Tier 1 in the County Expressway Plan will be eligible to receive the funding, which includes a Complete Streets requirement to maximize opportunities for bicycle and pedestrian safety.

Highway Interchanges

\$750 million will be put toward a competitive grant program for highway interchange projects. These projects will have a Complete Streets requirement to maximize safety for bicycles and pedestrians.

Caltrain Grade Separations

\$700 million will fund grade separations (changing the level of either the roadway or track at Caltrain rail crossings) in Sunnyvale, Mountain View, and Palo Alto. Grade separations are needed to reduce congestion at popular intersections and improve safety for motorists, pedestrians, and bicyclists.



Workers Construct the BART Phase I Extension to Berryessa
Image courtesy of VTA

Transit Operations

\$500 million will go toward programs that increase ridership, improve efficiency, enhance mobility services for seniors and the disabled, and improve affordability. Other possible uses include enhancing the core bus network, improving amenities at bus stops, and supporting new transit service models to address first- and last-mile connections.

State Route 85 Corridor

\$350 million will fund transit services within the State Route 85 corridor. In addition, VTA will use existing funds to cover the cost of a study on transportation alternatives in the corridor, including bus rapid transit, light rail, and other transportation technologies.

Caltrain Corridor Capacity Improvements

\$314 million will help move forward Caltrain's 2008 Capacity Improvements Program, which sought to prioritize projects that will allow the system to transport more riders efficiently throughout San Francisco, San Mateo, and Santa Clara counties. The sales tax measure will fund station improvements, extended platforms, level boarding, and other service enhancements that will add to capacity. Additionally, funding will go toward increased service to Morgan Hill and Gilroy in South Santa Clara County.

Bicycle and Pedestrian Programs

\$250 million will be put toward bicycle and pedestrian programs that are determined by the cities, county, and VTA. It is estimated that 23% of vehicle trips within the county are two miles or less.⁷ Encouraging these short-trip vehicle users to switch to bicycle use can be successful through building a safer and more streamlined bicycle system.

VTA wishes to increase bicycle use mode share to 10% through the completion of a system that allows bicyclists to travel across Santa Clara County without obstruction and with direct connections to other forms of transit to create a "Bicycle Superhighway." Safety improvements, especially near schools, will also be funded.



Aerial View of the I-280/I-880/Stevens Creek Boulevard Improvements Project

Image courtesy of VTA

The Economic Impacts of VTA's Traffic Relief and Road Repair Measure

Expenditures associated with constructing, maintaining, and operating transportation systems have the potential to generate significant increases in economic output and local employment. The immediate benefits of more efficient transportation are most easily noticed in reduced congestion, expanded transportation options, and travel time savings. However, the long-term benefits of infrastructure investments can shape the region's economy and prepare it for continued economic growth. These benefits are derived from:

- Improving access to jobs for the county's residents;
- Increasing the county's economic attractiveness to new and expanding companies;

- Extending the regional labor pool available to employers;
- Providing opportunities for economic development around new transportation hubs; and
- Enhancing worker productivity.

In total, VTA's Traffic Relief and Road Repair Measure is forecasted to generate \$15.4 billion in business output and support 3,942 jobs annually over 30 years across Santa Clara County, equivalent to 118,263 job-years.

These findings and the industries they impact are detailed below:

Business Output and Jobs Derived from Proposed Transportation Expenditures

For 30 Years of Expenditures Covered by the Measure

NAICS Code	Industry	Business Output (\$ in millions)	Full-time Equivalent Job-Years
111-115, 211-213	Agriculture & Extraction	21.92	118
221	Utilities	39.86	59
230	Construction	4,154.11	36,945
311-339	Manufacturing	2,305.12	4,907
420	Wholesale Trade	521.17	2,149
441-454	Retail Trade	434.72	6,063
481-488	Transportation	133.63	1,588
491-493	Postal & Warehousing	22.72	297
511-519	Media and Information	429.35	839
521-525, 531-533	Financial Activities	1,151.06	4,988
541,551,561-562	Professional & Business Services	5,200.48	43,243
611, 621-624	Education & Health Services	532.55	7,196
711-713, 721-722,811-814	Leisure & Hospitality	473.51	9,786
920	Government	22.16	87
TOTALS		15,442.00	118,263

Note: NAICS Codes are the standard North American Industry Classification System used by federal agencies; Full-time equivalent job-years represent one year of one job. For example, a full-time construction job lasting for four years would count as four job-years in this table. Additionally, a 50% part-time manufacturing job lasting two years is counted as one job-year.

Data Source: These figures were calculated using TREDIS software

Analysis: Bay Area Council Economic Institute

\$15.4 billion



in business output related
to ballot measure expenditures

The \$6.3 billion in total transportation spending over 30 years can stimulate the local economy through local contracting and support ongoing operations and maintenance jobs. Further, this funding will allow Santa Clara County to leverage additional funds for greater investment from other sources and therefore create greater impact. The direct spending will have ripple effects across the economy as dollars change hands and translate into new jobs and new business revenues, totaling \$15.4 billion of total business output.

To further explain the business output impact, the case of spending to extend a rail transit system provides a useful example. First, there is a direct effect: the number of jobs and dollars in tax revenue that are directly linked to the original expenditure. Second, there is an indirect effect: when a contractor is hired to build new tracks, this stimulates activity directly related to this contractor, but also indirectly stimulates activity at the concrete and steel companies that supply the materials. Finally, there is an induced effect that results from the employees at the construction and steel companies spending their increased take-home pay. The \$15.4 billion of total business output includes all three of these categories.

3,942 jobs



supported over 30 years
in Santa Clara County

Expenditures included in the 2016 Traffic Relief and Road Repair measure are forecasted to produce a total of 3,942 jobs over the life of the measure, or 118,263 full-time equivalent job-years. Approximately 60% of these jobs will be a result of direct spending in the fields of construction, manufacturing, and technical engineering services. The remainder of the jobs will be produced from indirect and induced effects of the increased economic output within Santa Clara County.

Other benefits accrue directly to users of the transportation system



With expenditures from the measure including an extension of BART, enhanced bike/pedestrian infrastructure, Caltrain capacity and operational improvements, and infrastructure improvements to highways interchanges, local streets and roads, and other key corridors, the county can address its growing congestion and create new mobility choices and opportunities for traveler savings.

The result of a more efficient transportation system in Santa Clara County can yield the following savings:

- Time and reliability savings from improved mobility and choice
- Safety improvements that result in fewer accidents
- Reduced vehicle operating costs from shorter trips and reduced fuel usage
- Improved environmental factors from the reduction in greenhouse gas emissions

Explaining the Need for Transportation Investments

According to data from the Metropolitan Transportation Commission, more than 22 million daily trips were taken on average in the nine-county Bay Area region in 2013. Nearly 6.5 million of those trips used a Santa Clara County transportation system to travel to, from, or within the county. The transportation systems facilitating many of these trips follow the Silicon Valley Rapid Transit Corridor. Beginning in Fremont in Alameda County, the corridor extends south through the cities of Milpitas, San Jose, and Santa Clara. Major modes and routes include:

- Caltrain commuter rail,
- BART service in Fremont,
- Three VTA light rail lines,
- Interstates I-880, I-280, I-680, US 101, and
- State Routes (SR) 237, 17, 85, and 87.⁸

These systems are described in more depth in this section, with detail on the planned projects that will help to improve transportation in Santa Clara County.

Caltrain

Caltrain provides commuter rail service between San Francisco and Gilroy. The 2015 Passenger Count Report saw a 12% annual increase in Caltrain ridership across all three trip types (Baby Bullet, Limited, and Local trains).⁹ Santa Clara County boardings alone made up 45% of the average weekday ridership for 2015, and June 2016 Caltrain weekday ridership is at an all-time high of 65,049 passengers—which is up significantly from 26,533 average weekday riders during 2005. Ridership is expected to continue to increase with employment growth along the corridor between San Francisco and Santa Clara counties.¹⁰

Three of the four most heavily used stations on the line are in Santa Clara County (Palo Alto, San Jose Diridon, Mountain View). During 2015, those stations witnessed strong growth in ridership as displayed below.

Caltrain Average Weekday Ridership Increases in 2015

Station Name	County	2014 Average Weekday Ridership	2015 Average Weekday Ridership	Percent Change in Ridership
San Francisco	San Francisco	12,160	13,571	11.6%
Palo Alto	Santa Clara	6,156	7,197	16.9%
Mountain View	Santa Clara	4,274	4,570	6.9%
San Jose Diridon	Santa Clara	3,714	4,160	12.0%
Millbrae	San Mateo	3,291	3,536	7.4%
Redwood City	San Mateo	2,947	3,233	9.7%
Sunnyvale	San Mateo	2,655	2,881	8.5%
Hillsdale	San Mateo	2,555	2,706	5.9%
San Mateo	San Mateo	1,851	2,061	11.3%
Menlo Park	San Mateo	1,668	1,762	5.6%

Data Source: Caltrain 2015 Annual Passenger Count

Analysis: Bay Area Council Economic Institute

Bay Area Rapid Transit (BART)

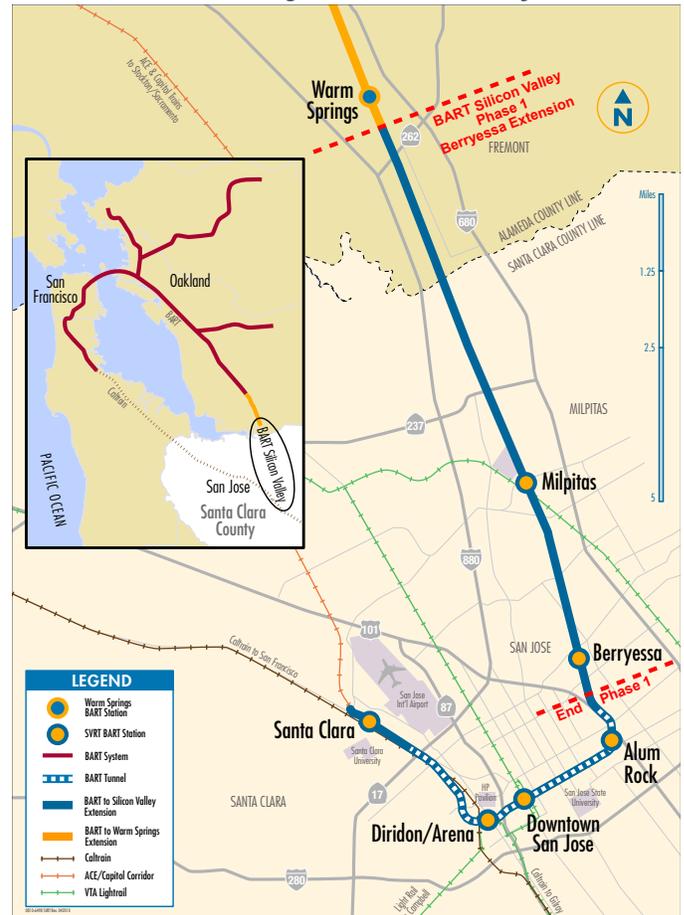
BART currently operates a 107-mile system with 45 stations and 669 vehicles.¹¹ In July 2016, average weekday ridership exceeded 428,000 passengers, an increase from 335,000 average weekday ridership during 2010.

Originally, the routes were never designed to stretch into Santa Clara County, though a growing population and a more interconnected labor market have created the need for the county to become better connected to the regional rail network.

To relieve highway congestion, particularly on I-880 and I-680, efforts to extend BART to Silicon Valley have been underway since 1999. BART Silicon Valley will build a 16-mile extension separated into two main phases:

- Phase I includes the extension of the BART rail from the new Warm Springs station in Fremont and continuing on to two stations, in Milpitas and at Berryessa in San Jose. Phase I has been under construction since 2012, with the Berryessa extension expected to be operational by Fall 2017.
- Phase II will extend the rail at the Berryessa station further into Santa Clara County, effectively connecting the BART system to the Caltrain system at Diridon Station in San Jose and in Santa Clara across from Santa Clara University. Phase II will also see stations constructed in downtown San Jose next to San Jose State University and at Alum Rock. Service is scheduled to begin in 2025.

BART Silicon Valley Extension Project



Source: Santa Clara Valley Transportation Authority

In total, VTA's Traffic Relief and Road Repair Measure is forecasted to generate \$15.4 billion in business output and support 3,942 jobs annually over 30 years across Santa Clara County, equivalent to 118,263 job-years.

VTA Bus and Light Rail

Santa Clara County's light rail system has three lines, which go from Mountain View to Winchester, Alum Rock to Santa Teresa, and Ohlone/Chynoweth to Almaden. The total length of the lines amounts to 42.2 miles. In 2015, Santa Clara County's light rail system served approximately 34,935 passengers per day with a peak fleet of 59 cars. Since 2010, average weekday ridership has grown by 10.3% with 11 additional cars at peak times.

In 2015, Santa Clara County's bus system served 106,214 passengers on an average weekday with a peak fleet of 284 buses. Since 2010, average weekday ridership has grown by 2.5% with 34 additional buses at peak times. VTA Express Bus Service has been particularly successful, growing ridership by 14.0% between 2014 and 2015, according to the Silicon Valley Index.

Highways and Expressways

Santa Clara County has a combined total of 62 miles along its highways that operate at Level of Service (LOS) F during morning peak times (6:15-9:45 a.m.) and 46 miles at LOS F during the evening peak time (3:15-6:45 p.m.). LOS F defines a condition on roads where traffic

substantially exceeds capacity, resulting in stop-and-go conditions for extended periods of time, with speeds below 35 miles per hour.

When compared to 2013, there has been a 30-mile increase in LOS F in the morning, while there has been a 15 mile decrease in LOS F during the evening.¹³ The cause for the increased congestion in the morning is due to the substantial inflow of people into the county during the morning peak periods at all four major gateways. The heaviest flow into Santa Clara County comes from the Peninsula and East Bay gateways, which account for 75% of all vehicles that enter the county.¹⁴

Bicyclists and Pedestrians

VTA's most recent bicycle plan will create efficient and safe corridors for bicyclists to connect to other forms of transit. Between 2000 and 2014, bicycle commutes increased by 72%.¹² Increased bicycle use encouraged individual cities to begin the construction of local bicycle lanes as outlined in the 2008 Santa Clara County Countywide Bicycle Plan. Currently, the cities of Santa Clara County have created a network of 325 miles of on-road bicycle lanes. However, not all of the proposed 43 corridors are complete. The bicycle lanes are somewhat fragmented, preventing a streamlined connection to other forms of transportation.

With Santa Clara County leading the Bay Area economy out of the recession, investments in transportation infrastructure can alleviate existing traffic bottlenecks, better connect the county's workforce and employers to regional transit networks, and position the county for continued economic growth going forward.

Transportation Funding in Santa Clara County

Santa Clara County was the first county in California to implement a sales tax to supplement insufficient state and federal funds. It was also the first county in the state to use local sales taxes for transportation purposes when the county passed Measure A in 1976. The county has continued to use voter-approved sales tax measures to fund operational expenses and capital projects, collecting nearly \$8 billion over 40 years.

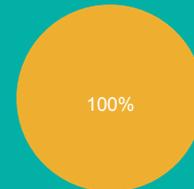
Prior to the passage of Measure A in 1976, approximately 20% of the county's transportation funding was derived from local sources. Today, that percentage has increased to approximately 80% from local sources, as federal and state funding for transportation has decreased.¹⁵

State and federal funding for transportation is closely linked to gasoline taxes. California's gas tax has not been raised since 1994. The federal gas tax has not been raised since 1993, and would need to be increased by over 12 cents per gallon (from 18.4 cents to 30.7 cents) just to restore purchasing power to 1993 levels. In addition, the California State Transportation Agency estimates that by 2030, as much as half of the state revenue that could have been collected from the gas tax will be lost to fuel efficiency.¹⁶

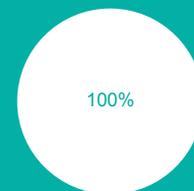
Given this scenario, local governments have taken it upon themselves to create new funding streams. Sales taxes play a key part of that, as they make up 48% of Santa Clara County's transportation funds.¹⁷ These funds support all modes of public transit, local roads and streets, and highway maintenance, as shown by Santa Clara County's history of sales tax related expenditures.



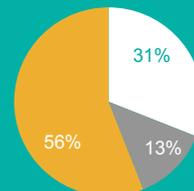
1976 Measure A (Perpetuity)
\$4.3B collected to date (Dec. 2014)



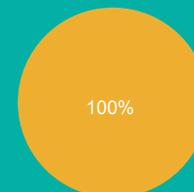
1984 Measure A (1985-1995)
\$845M collected; \$1.2B expenditures



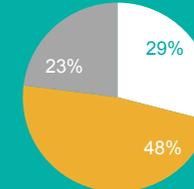
1996 Measure A/B (1997-2006)
\$1.34B collected; \$1.9B expenditures



2000 Measure A (2006-2036)
\$1.4B collected to date (Dec. 2014)



2016 November Ballot Measure
\$6.3B estimated expenditures



Source: VTA Envision Silicon Valley
Analysis: Bay Area Council Economic Institute

Economic Impact Methodology

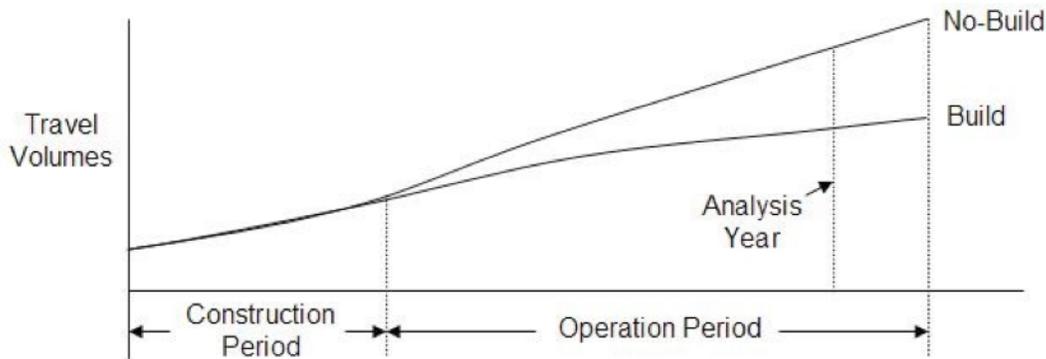
To calculate the economic impacts shown, the Bay Area Council Economic Institute utilized TREDIS transportation modeling software.

TREDIS is a predictive impact model. It uses information about future travel patterns, labor and goods movement market access, and construction spending to estimate the costs, benefits, and economic impacts that flow from them. As such, results are based on comparisons between two alternative futures. These comparisons are built around a specific future snapshot year, or "analysis year," that is used to project differences in benefits, costs, and economic activity in that year. For this

analysis, the comparison is between two policy options: Construct the projects included in the sales tax measure and a no-build option, both are analyzed at 2047.

This approach means that the economic impact results are shown as differences in benefits and economic activity between the "build" and "no-build" scenarios. All monetary values are shown in 2017 dollars, which have been discounted back to the period using a 2.5% discount rate. This rate is approximately equivalent to the recent 30-year U.S. Treasury rate. The following figure demonstrates the concept of economic impact captured in TREDIS:

TREDIS "Build" vs. "No-Build" Scenario



Source: TREDIS

Explanation of Business Output Impacts

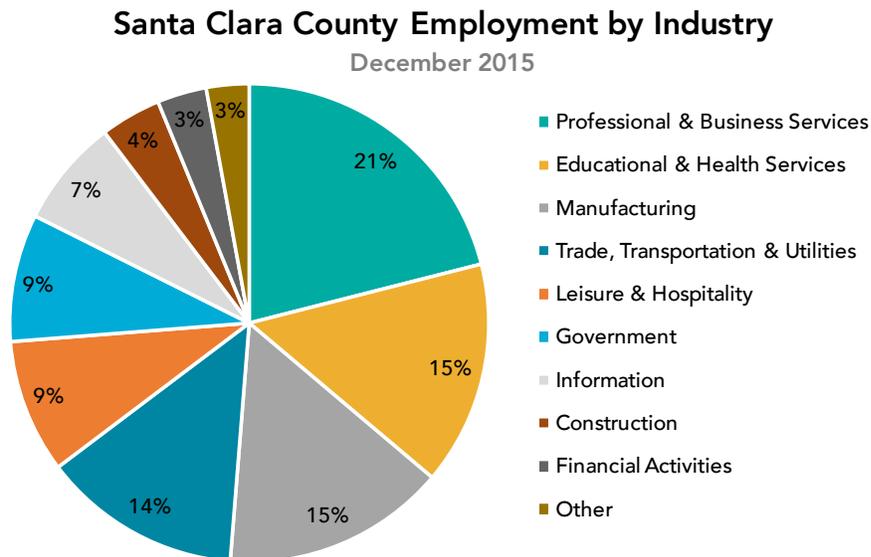
The TREDIS forecasting module is supplied with Moody's Analytics projections, which include employment and value-added forecasts across industries. The Bay Area Council Economic Institute supplemented these projections with the work of the Association of Bay Area Governments, which makes demographic projections out to 2040 as part of Plan Bay Area. The midpoint between the Moody's Analytics projections and ABAG projections was used for future employment projections for Santa Clara County and surrounding jurisdictions. ABAG projections for population by county were also employed in the TREDIS model.

To calculate the impacts of transportation spending on the economy, the TREDIS model employs the IMPLAN modeling system, which combines the US Bureau of

Economic Analysis' Input-Output Benchmarks with other data to construct quantitative models of trade flow relationships between businesses, and between businesses and final consumers.

The IMPLAN input-output accounts capture all monetary market transactions for consumption in a given time period, in this case the 30 years of the sales tax measure. The IMPLAN input-output accounts are based on industry survey data collected periodically by the US Bureau of Economic Analysis and follow a balanced account format recommended by the United Nations.

IMPLAN's Regional Economic Accounts and the Social Accounting Matrices are used to construct region-level multipliers that describe the response of the relevant regional economy to a change in demand or production as a result of the activities and expenditures related to the Santa Clara County transportation projects. The multipliers are weighted based on the existing industry breakdown in Santa Clara County as follows:



Note: "Other" includes other services, farm, and mining and logging jobs.
Data Source: State of California Employment Development Department
Analysis: Bay Area Council Economic Institute

Economic impact studies operate under the basic assumption that any increase in spending then has three effects. First, there is a direct effect on that industry itself. Second, there is a chain of indirect effects on all the industries whose outputs are used by the industry under observation. Third, there are induced effects that arise when employment increases and household spending patterns are expanded.

It is also important to note that different types of capital investment can lead to different multipliers. The reason for this is that a sector can have a large multiplier if it induces economic activity in industries whose employees have a high propensity to spend their take-home pay. Also, if the sector does not import many materials from abroad or outside the region, then its multiplier effect on the local economy will be high. For example, expenses for transit operations and maintenance generally have a higher multiplier when compared to expenses for construction given that a larger portion of the spending remains local.

Explanation of Model Inputs

The primary input into the TREDIS model is a breakdown of annual project spending. For the purposes of this analysis, \$2.8 billion in overall spending was allocated to transit construction, \$3.0 billion was allocated to road and highway construction, and \$500 million was allocated to transit operations. This spending was evenly divided over the sales tax period.

As part of VTA's Long-Range Transportation Plan—the current plan is Valley Transportation Plan 2040 (VTP 2040)—the agency has highlighted various infrastructure projects and operational programs that it plans to conduct with member agencies through 2040. Many of these projects are also listed as candidate projects to be funded by the transportation sales tax measure.

As part of VTP 2040, VTA has created transportation demand models that project total trips by mode, vehicle miles and vehicle hours traveled, and transit ridership. These projections were used as a secondary input to the TREDIS model.

Travel information was allocated across three trip purposes using the following assumption: 50% to commute, 35% to personal/leisure, and 15% to business. These percentages correspond closely to the Metropolitan Transportation Commission's Travel Demand Forecasts for 2012 presented in the Plan Bay Area Environmental Impact Review.

TREDIS uses default cost factors to calculate the benefits associated with mode share changes and reduced vehicle miles/hours traveled. Where possible, default values were overridden with Bay Area-specific values created for the Plan Bay Area 2040 Project Performance Assessment by the Metropolitan Transportation Commission. These take into account:

- Emissions factors based on per mile emissions rates across modes;
- Accident costs based on the value of a statistical life and property damage only crashes from the National Highway Traffic Safety Administration;
- Typical vehicle fuel consumption in free flow and congested conditions;
- Per hour operating costs across vehicle type and mode in free flow and congested condition;
- Costs of travel time variability using a "buffer time index;"
- Freight logistics costs based on the current mix of industries operating in Santa Clara County and distance to rail, ship, and intermodal terminals;
- The value of time, reflecting hourly wages and salary levels for all occupations based on Bureau of Labor Statistics data for the nine-county Bay Area.

Explanation of Employment Impacts

The total number of job-years created by the sales tax was calculated by finding the revenue allocations within three spending categories: bike and pedestrian projects, transit investment, and highway/road improvement.

The number of job-years produced by bike and pedestrian projects was computed as the product of the sales tax allocation for bike and pedestrian projects, in terms of billions of dollars, and 11,128, the average number of job-years produced by bike and pedestrian projects per billion dollars. This number was estimated by taking the average of Inhabit's (13,050), Smart Growth America's (10,333), and the Alliance for Walking and Biking's (10,000) number of job-years per billion dollars of bike and pedestrian investment.

The number of job-years produced by transit investments was calculated as the product of transit spending, in billions of dollars, by 21,800, the American Public Transportation Association's estimate for the number of job-years produced by a billion dollars of transit investment.

The number of job-years produced by highway improvements was found by multiplying the allocation for highway/road improvement, in billions of dollars, by 15,554, the average number of job-years per billion dollars of highway investment. 15,554 is the average of Duke University's (21,800), the US Department of Transportation's (11,992), and the American Association of State Highway and Transportation Officials' (13,000) number of job-years per billion dollars of highway/road spending.

Job-years were divided by 30 (the number of years the measure covers) to arrive at an estimate for the total number of jobs supported in Santa Clara County.

All of these employment numbers include both direct and indirect employment. Direct employment is associated with spending associated with the sales tax measure, while indirect employment is the result of spending associated with the trickle down effects of the initial expenditures. According to IMPLAN calculations, approximately 60% of total employment created by transportation spending is of the direct variety.

ENDNOTES

1. Data taken from California Department of Finance.
2. U.S. Census Bureau, <http://www.census.gov/quickfacts/table/PST045215/06085>.
3. Data taken from the Bureau of Labor Statistics, State and Metro Area Employment.
4. According to California Department of Finance, P-3 Total Population Only by Race/Ethnicity and Age.
5. Data taken from the Census Transportation Planning Product, 2009-2013 estimate.
6. Schrank, David, Bill Eisele, Tim Lomax, Jim Bak. "2015 Urban Mobility Scorecard," The Texas A&M Transportation Institute and INRIX, August 2015.
7. Ibid.
8. Santa Clara Valley Transportation Authority, "Silicon Valley Rapid Transit Corridor."
9. Caltrain, "Annual Passenger Count," 2015.
10. Ibid.
11. Santa Clara Valley Transportation Authority, "Silicon Valley Rapid Transit Corridor."
12. Ibid.
13. Ibid.
14. Santa Clara Valley Transportation Authority, "Santa Clara Countywide Bicycle Plan Update: Public Workshop," 2016. Accessed at: http://vtaorgcontent.s3-us-west-1.amazonaws.com/Site_Content/Workshop_PowerPoint.pdf.
15. Santa Clara Valley Transportation Authority, "Funding Transportation Improvements in Santa Clara County," Board of Supervisors Workshop, August 25, 2015.
16. California State Transportation Agency. "California Transportation Infrastructure Priorities Workgroup Whitepaper: Exploring a Road Usage Charge as an Alternative to the Gasoline Tax." January 2015. Accessed at: http://www.calsta.ca.gov/res/docs/pdfs/2015/Agency/CTIP_RUCWhitepaper01122015.pdf.
17. Santa Clara Valley Transportation Authority, "Introduction to Transportation Funding," 2011.



Bay Area Council Economic Institute

353 Sacramento Street, Suite 1000, San Francisco, CA 94111

Phone: (415) 981-7117 | Fax: (415) 981-6408

www.bayareaeconomy.org | [@bayareaeconomy](https://twitter.com/bayareaeconomy) | bacei@bayareacouncil.org