California High-Speed Rail

Sustainability Report

A transformative climate investment

June 2018

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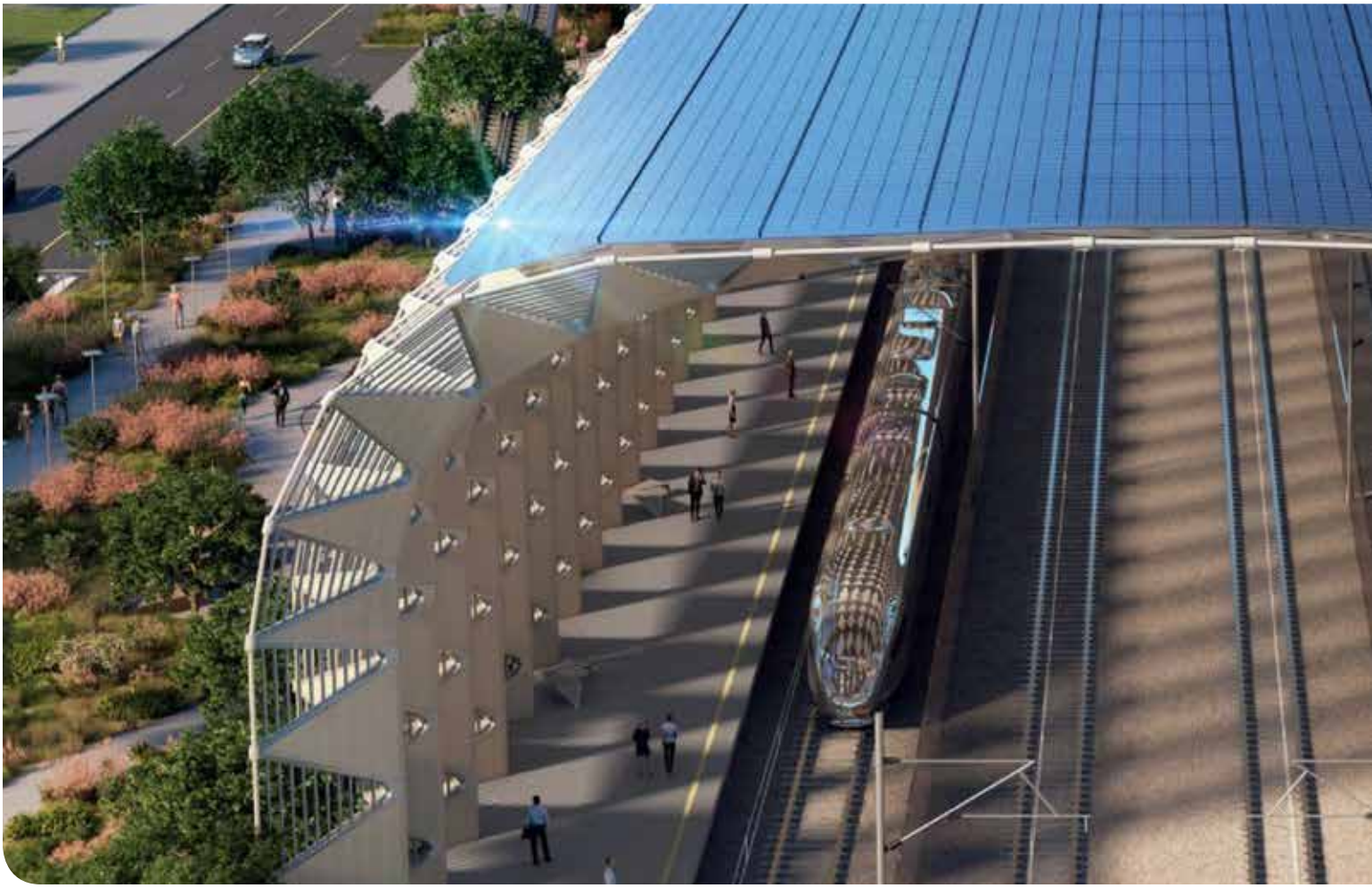

Up Front

MESSAGE FROM THE CEO

Ten years ago, Californians went to the polls to decide whether the state should build a high-speed rail system.

They voted "Yes" because they recognized that a clean, fast and efficient high-speed rail system would fundamentally transform how people move around the state, put people to work, spur economic growth while supporting a low-carbon economy, and help achieve our state's ambitious environmental objectives. In early 2018, I became the Chief Executive Officer of the California High-Speed Rail Authority (Authority) because I share that vision, and I want to help make it a reality.

California is leading the nation – and is recognized globally – for its ambitious and far-reaching policies to address climate change, develop clean energy, curb air pollution and greenhouse gas (GHG) emissions, protect endangered species and transition to a sustainable, low-carbon future. The California Global Warming Solutions Act of 2006 (Assembly Bill 32) created the Cap-and-Trade Program as a critical mechanism to reduce greenhouse gas emissions.

The California Global Warming Solutions Act of 2006 (Senate Bill 32, 2016) set a national standard by establishing a GHG reduction target for California of 40 percent below 1990 levels by 2030, with the ultimate goal to reduce emissions 80 percent by 2050. The transportation investments we are making in California are designed to help achieve these objectives – and high-speed rail embodies this commitment.

Sustainability is at the core of our mission and is one of the six values that guide our work. It is integral to our policies, including our recently adopted 2018 Business Plan, and to how we conduct our day-to-day business. Simply put, our goal is to create the greenest infrastructure project in the nation, both in its operations and its construction. How will we do that?

Our trains – powered by 100 percent renewable energy – will travel up and down the state at speeds of up to 220 miles per hour. Travel times to and from the Central Valley from the Bay Area and the Los Angeles Basin will be slashed in half. Trips between San Francisco and Los Angeles will take less than three hours. This fast, new travel option will inspire millions of people to travel on clean, zero-emissions high-speed rail trains – and every mile traveled on high-speed rail is a mile not traveled by car or airplane. This will save 1.5 million metric tons of carbon per year, equivalent to taking 322,000 cars off the road.

Building a system that inspires sustainable development is also at the core of our mission. To that end, we are working with our partners on stations that are more than stations. They will be community hubs that act as catalysts for infill development and safer, more livable communities. Along with our maintenance facilities, our stations will be net-zero energy, meaning they will produce as much energy on-site as they consume over the course of a year.

We are already putting sustainability into action. With our contractors, we are employing innovative methods to achieve net-zero emissions from construction. One way we are achieving this is through our requirement for our contractors to use equipment that avoids or significantly eliminates

"High-speed rail is essential to our state's success in reducing air pollution, cutting greenhouse gas emissions and addressing the devastating effects of climate change."

- **Brian P. Kelly**
Chief Executive Officer

air pollution during construction. As a result, our construction sites are 50 to 60 percent cleaner than typical California construction sites. And we have already offset both air pollution and direct GHG emissions from construction through local programs including tree-planting and replacing tractors, with special focus on priority communities.

This 2017 Sustainability Report provides more information on the progress we are making in fulfilling those commitments. Specifically, this report:

- Details the characteristics of our program that – based on feedback from the public, state legislators and our internal experts – most clearly express sustainability.
- Outlines the commitments, methodologies, progress and results of our comprehensive approach to designing, constructing and operating high-speed rail in a sustainable manner.
- Reflects the priorities and concerns of our many stakeholders – including community leaders, elected officials, partner organizations, our employees and contractors, sustainability peers and organizations – and the people who will travel on the system.

As this report also shows, our progress has been marked by several achievements, including:

- Being named, for the second year in a row, as the top sustainable infrastructure project in North America by the GRESB Infrastructure Assessment, which benchmarks our environmental, social and governance policies, practices and performance.
- Preserving more than 2,000 acres of natural habitat.
- Partnering with Tree Fresno to plant 2,400 trees in schools and parks in the Fresno area.
- Avoiding more than 50,000 pounds of criteria air pollutants.
- Putting 1,699 people to work across 17 construction sites and generating economic opportunity for hundreds of businesses including small and disadvantaged businesses.
- Launching a process to update our Sustainability Implementation Plan.

Lastly, we made significant strides in 2017 toward advancing our evolution to an organization that is fully focused on program delivery, including our sustainability commitments and targets. These are embodied in our 2018 Business Plan and will be implemented through the 2018 Program Baseline. Going forward, we intend to take a more holistic approach to our sustainability commitments. This will include greater integration of sustainability into all aspects of how we conduct business, as well as developing a sustainability dashboard to provide ongoing and timely monitoring of our performance to our Board of Directors and our stakeholders.

We understand how important it is for us to deliver high-speed rail to California. It will not only keep California moving, it is essential to our state's success in reducing air pollution, cutting GHG emissions and addressing the devastating effects of climate change. It is central to our goal to help spur continued economic prosperity while also advancing important sustainability objectives and ensuring greater economic opportunity for all Californians.

We are ready for the challenge.

Brian P. Kelly
Chief Executive Officer

Board of Directors

Dan Richard
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Nancy Miller

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Honorable Dr. Joaquin Arambula

Honorable Jim Beall

Chief Executive Officer

Brian P. Kelly

CALIFORNIA
High-Speed Rail Authority
www.hsr.ca.gov

ABOUT THIS REPORT

This report was prepared in accordance with the Global Reporting Initiative (GRI) G4 Core Reporting Guidelines, the world's leading and most widely adopted sustainability reporting framework.

It covers the California High-Speed Rail Authority (Authority) and its activities from January 1, 2017, to December 31, 2017. This report is updated on an annual basis; our previous report was published in December 2017 and covered the 2016 calendar year. There have been no significant changes in the reporting scope or boundaries. Restatements of information published in previous reports are identified with footnotes in relevant sections of the report.

The intended audience for this report includes members of the California Legislature, station cities and other stakeholders. The contents of this report have not been externally assured.

This report looks backward when discussing progress and achievements during the reporting period but looks forward when discussing how our policies and practices will affect California into the future.

ACKNOWLEDGMENTS

Thanks to all our federal, state, regional and local partners and to our environmental and community non-profit and advocacy partners who contributed to this report and with whom we are delivering California's high-speed rail system.

CONTACT

We value all feedback. Please send comments and questions to info@hsr.ca.gov.

Statewide High-Speed Rail System

OUR SUSTAINABILITY APPROACH

Sustainability is at the core of our mission. It is one of the six overarching goals that guide our holistic, integrated approach to delivering high-speed rail to California. We aspire to be the greenest infrastructure project in the nation, both in construction and operations.

The investments we are making are critical to helping the state achieve its forward-looking policies to address climate change, develop clean energy, protect the environment and spur economic prosperity and opportunity while transitioning to a low-carbon economy. To that end, we constantly assess the actions we are taking while building the high-speed rail system to make sure that our actions will enable current and future generations to lead healthy and rewarding lives.

OUR POLICY

To guide our activities, we engaged internal and external stakeholders to help us identify five priorities to use as a framework to guide our sustainability objectives, as shown in Exhibit 1. The resulting comprehensive Sustainability

POLICY STATEMENT

The Authority will deliver a sustainable high-speed rail system for California that serves as a model for sustainable rail infrastructure. The Authority has developed and will continue to implement sustainability practices that inform and affect the planning, siting, designing, construction, mitigation, operation, and maintenance of the high-speed rail system.

Policy was established in 2013 and updated in 2016. The policy summarizes our sustainability objectives, identifies specific sustainability commitments and serves as a framework for strategically identifying directed, cost-effective approaches. It applies across all aspects of the design, construction, operations and governance of the high-speed rail program.

To read our Sustainability Policy, see our website at ***https://www.hsr.ca.gov/docs/programs/eto/G_CHSRA_Sustainability_Policy_POLI_PLAN_03_Dated_July_29_2016.pdf.***

We also developed an internal Sustainability Implementation Plan to organize how sustainability priorities will be embedded in future procurement documents, technical memoranda, design criteria, and business planning and operations. The Plan translates the broader aspects of the Policy into itemized, actionable tasks with measurable performance indicators and metrics. For details, see our website at ***http://www.hsr.ca.gov/Programs/Green_Practices/index.html***.

Exhibit 1: California High-Speed Rail Authority's Sustainability Framework

PRIORITY	OBJECTIVES
Energy	▸ Reinforce a clean energy economy through the use of on-site renewable energy systems at stations ▸ Strengthen public health by improving air quality ▸ Maximize the consumption of renewable fuels to the extent feasible ▸ Promote long-term price stability ▸ Reduce Vehicle Miles Traveled (VMT)
Natural Resources	▸ Maximize reductions in greenhouse gas (GHG) emissions ▸ Improve air quality ▸ Conserve, maintain, and restore habitat and wildlife corridors through landscape scale mitigation ▸ Conserve agricultural land ▸ Restore and maintain ecosystem health ▸ Reduce the demand for virgin natural resources through the use of recycled materials
Sustainable Infrastructure	▸ Design, construct, and operate infrastructure in conformance with Authority principles for sustainable infrastructure ▸ Design, construct, and operate facilities that cost-effectively achieve State of California and local energy and sustainability policies ▸ Design, construct, and operate resilient systems and facilities that can adapt to changing climate conditions ▸ Protect employee and customer health during construction and operations
Station Communities, Ridership & Community Benefits	▸ Provide convenient station access to all high-speed rail station areas ▸ Design and construct stations and infrastructure that reinforce Sustainable Community Strategies (Senate Bill 375) ▸ Promote livable development patterns through community partnerships ▸ Reinforce quality of life through design of the built environment ▸ Promote active transportation (e.g., walking and bicycling) ▸ Promote local and regional transit connectivity to high-speed rail stations
Business & Management	▸ Improve the economic value to Californians through increased access and mobility ▸ Achieve a self-sustaining financial structure ▸ Achieve continual improvement of delivery and management ▸ Operate and maintain the system transparently and accountably ▸ Maximize opportunity for private investment ▸ Incorporate adaptation considerations into investment decisions

A LEADING ROLE IN SUSTAINABILITY

California has invested proceeds from its signature Cap-and-Trade program into projects and programs that deliver on the requirements of AB 32 and SB 32. High-speed rail is integral to achieving those objectives, as shown in Exhibit 2.

We have looked to external frameworks, as well, to benchmark performance. The GRESB Infrastructure Assessment is a globally consistent, voluntary framework that benchmarks the environmental, social and governance performance of infrastructure assets and funds. It ranks us in relation to our peers and provides useful insight into the integrity of our sustainability policies, practices and performance.

We were among the first entities to participate in this assessment, demonstrating our broader commitment to setting a new standard in sustainable high-speed rail infrastructure. We participated for the second time in 2017, maintaining our standing among leading infrastructure projects in North America.

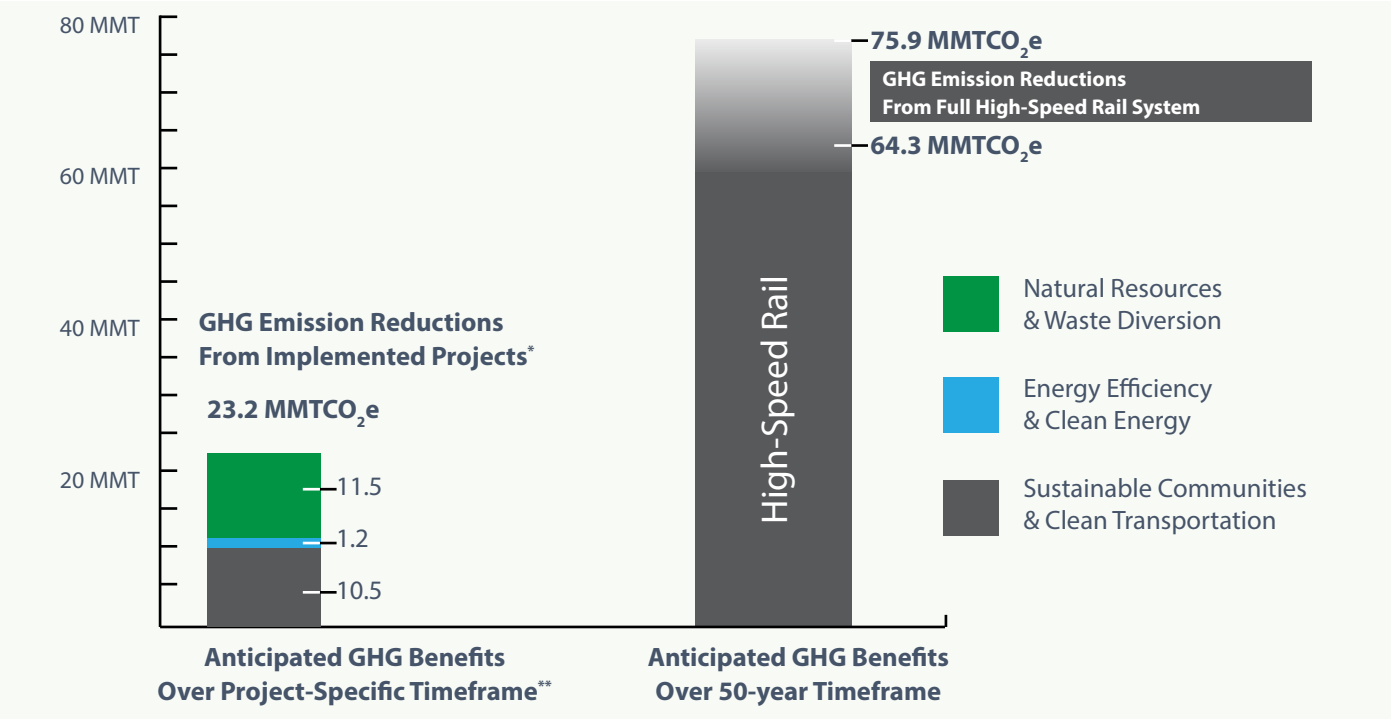
Our participation in the GRESB Infrastructure Assessment is of value as we consider ways to attract private investment. The assessment was developed at the behest of major institutional investors, including CalPERS, PGGM Investments, AIMCo and others collectively representing more than 17 trillion dollars in institutional capital, to evaluate consistent sustainability information concerning the infrastructure investments within their portfolios. Anticipating the information that major investors could seek helps us align our reporting efforts with what investors find most important.

We also used sustainable rating systems, such as LEED® and Envision. These types of third-party assessments help us understand our performance relative to objective standards and peer infrastructure projects and, more importantly, show us areas where we can improve.

To demonstrate our commitment to sustainability, we work with established industry partners, including the:

- American Public Transportation Association (APTA), an international organization that represents the transit industry: By becoming a signatory of APTA's Sustainability Commitment, we committed to a core set of actions that enhance sustainability.
- International Union of Railways (UIC), the world-wide professional association representing the railway sector and promoting rail transport: We signed the UIC's Railway Climate Responsibility Pledge in 2015, committing to taking action to prevent climate change, reduce our carbon footprint and to support a more sustainable balance of transport modes.

Exhibit 2: California Climate Investments and Greenhouse Gas Emissions Reductions ($MMTCO_2e$=million metric tons of carbon dioxide equivalent)



*Estimates for California Climate Investments implemented through 2016 & 2017; does not include benefits from High-Speed Rail Project.
**https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/2018_cci_annual_report.pdf

OUR COMMITMENTS

Our commitment is to not only deliver a high-speed rail system that will contribute significantly to a more sustainable California, but also to employ leading methods during construction to make the country's largest infrastructure program a model for sustainable delivery.

To meet our commitments, we defined sustainable infrastructure principles to guide the system's design, construction and operation and singled out five principles that lay the foundation of our world-leading, comprehensively sustainable approach:

- **Net-Zero Greenhouse Gas and Criteria Pollutant Emissions in Construction:** We commit to minimizing greenhouse gas emissions and to achieve net-zero greenhouse gas and criteria pollutant emissions in construction.
- **Renewable Energy:** We commit to using 100-percent renewable energy for system operation.
- **LEED® Platinum/Net Zero Facilities:** We commit to overseeing design and contract specifications to deliver high-performance facilities that achieve net-zero energy for operations and LEED® Platinum.
- **Climate Adaptation:** We commit to integrating climate adaptation and resilience principles into the design, construction and operation of the system.

FIVE-STAR PROJECT

The California High-Speed Rail program was awarded five stars and ranked as the top infrastructure project in North America, placing first among similar projects, as well as fourth among all global participating infrastructure assets in 2016, in the GRESB Infrastructure Assessment. This achievement provides third-party validation of our leading position against environmental, social and governance measures at North American and international scales.

MATERIALITY ASSESSMENT

Listening to stakeholders is vital. In 2014, we carried out a materiality assessment to ensure that we report on what matters most to our stakeholders. A materiality assessment is a process of stakeholder engagement and analysis undertaken to quantify the relative significance of different environmental, social, and governance issues to the organization or project in question. The assessment provided clarity on how to respond to increasing requests for information related to our sustainability activities, in addition to our traditional reporting. To identify a list of stakeholders to help us conduct this assessment, we used three criteria based on the extent to which each stakeholder group:

- Is interested in, affected by or potentially affected by our activities;
- Has the ability to influence the program's outcomes; and
- Is invested in the success or failure of the program.

We engaged these stakeholders during the materiality assessment:

- California Air Resources Board
- California State Transportation Agency
- California Strategic Growth Council
- Calthorpe Associates
- Peninsula Corridor Joint Powers Board (Caltrain)
- California Department of Transportation (Caltrans)
- Environmental Defense Fund
- Federal Railroad Administration
- Governor's Office of Planning and Research
- Greenlining Institute
- Los Angeles County Metropolitan Transportation Authority
- Southern California Association of Governments
- U.S. Army Corps of Engineers
- U.S. Department of Transportation
- U.S. Environmental Protection Agency

To conduct and implement the findings of the materiality assessment, we:

- Identified relevant topics by conducting industry research and determining how our Sustainability Framework compared to the reporting practices of our peer rail and transit agencies;
- Located the boundary for where the impacts of those topics occurred;
- Conducted interviews with key stakeholders to solicit feedback on which topics were most significant to them;
- Analyzed the feedback to prioritize and focus our reporting efforts;
- Organized the content of this report accordingly; and
- Validated the report content to ensure that it included the outcomes of stakeholder engagement processes and covered significant organizational impacts in a balanced and transparent manner.

Exhibit 3: California High-Speed Rail Authority Material Aspects

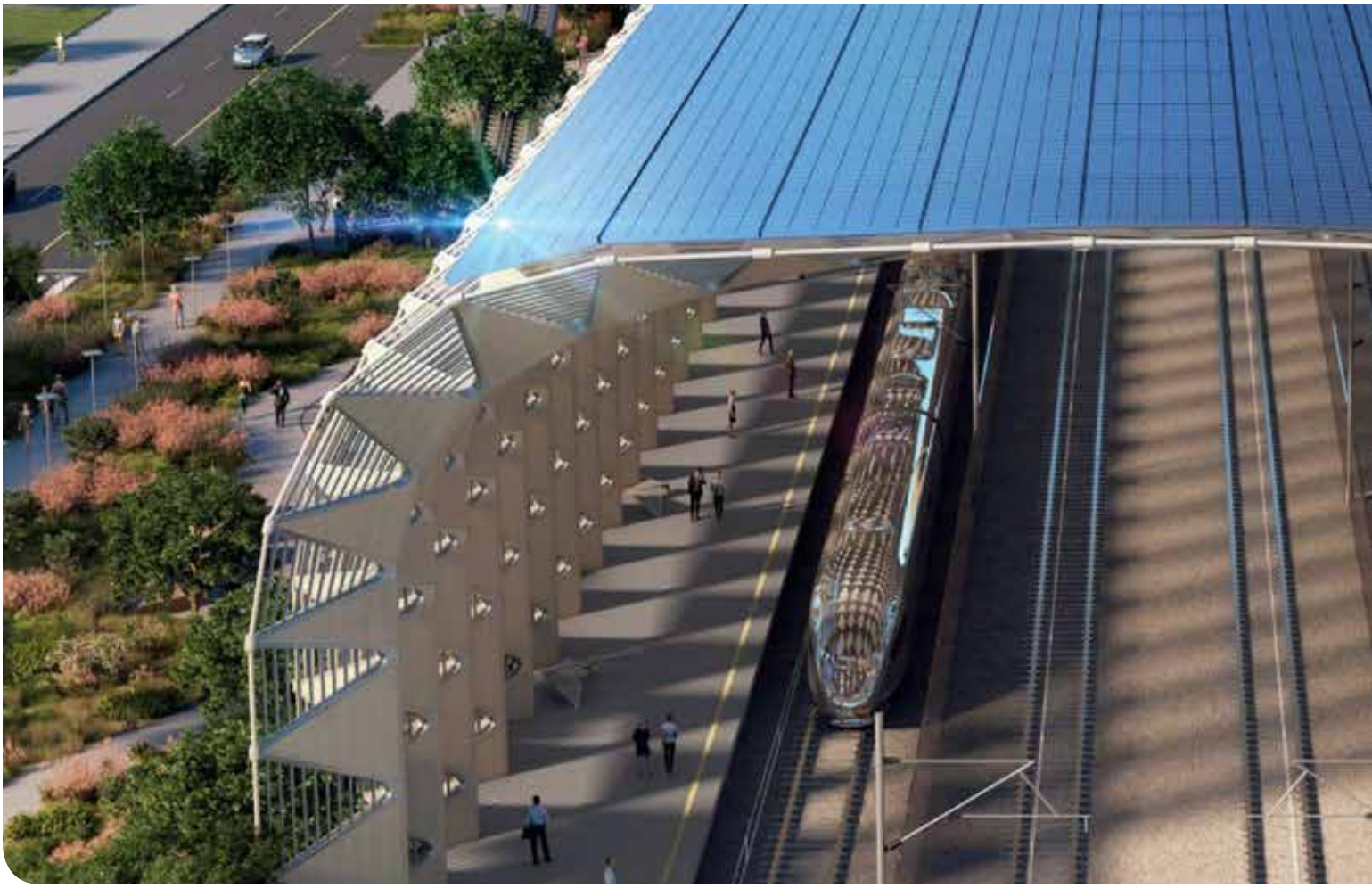
This extensive review revealed the sustainability impacts (shown in Exhibit 3) that matter most to our stakeholders.

Some of these impacts occur internally (for example, our office energy use), but many (for example, running the system on renewable energy) have far-reaching effects external to our own operations. Boundaries for each aspect were determined based on whether their effects occurred within and/or outside of California High-Speed Rail, as shown in Exhibit 4.

We will be updating our materiality assessment in 2018 to conform with Global Reporting Initiative (GRI) Standards.

Exhibit 4: Material Aspect Boundaries

MATERIAL ASPECT	BOUNDARY
GHG Emissions	External (Global)
Procurement Practices Materials Supplier Environmental Assessment	External (USA)
Water Effluents and Waste Biodiversity Indirect Economic Impacts Local Communities	External (California)
Environmental Compliance	Internal (California)
Energy	Internal/External (California)
Economic Performance Training and Education Occupational Health & Safety Employment	Internal/External (California)



Sustainability Framework

BUSINESS & MANAGEMENT

INTRODUCTION

The Authority's purpose is to deliver a functional, certified and commercially viable high-speed rail system in California. To achieve that, we have been making improvements to our business processes and internal structures to enhance our capacity as an effective project delivery organization. We recognize the necessity of planning carefully to achieve future successes, creating a "field oriented" headquarters to be locally agile for contract delivery, and implementing practical solutions to address challenges.

We continue to focus on job creation, economic benefits, continuous improvement, transparency, accountability and maximizing opportunities for private investment while delivering the system because these priorities are encoded into our structure through governing statute and agency policy. Our Sustainability Policy dictates how we and our consultants and contractors tailor the program to deliver economic value to Californians.

HIGHLIGHTS

Notable achievements in 2017 included:

- By the end of 2017, 1,699 construction labor workers had been sent to work at various construction sites along the Central Valley alignment.
- The impact of our total investment in fiscal year 2016-17 was equivalent to more than 13 percent of the 33,700 jobs that the Central Valley economy added over the same period.
- The number of small businesses put to work on the project increased by nearly 35 percent since 2015, and the number of those businesses located in disadvantaged communities grew by 20 percent in the same timeframe.
- Participation by Disabled Veteran Business Enterprises (DVBE) increased to include 51 Certified DVBE working on the program.
- Full expenditure of federal American Recovery and Reinvestment Act (ARRA) funds by the statutory deadline of September 30, 2017, marking a significant milestone for investment in California's economy.

As construction advanced over 119 miles in the Central Valley, so, too, have our investments into the system. From 2006 to mid-2017, our investments generated more than $5 billion in total economic activity in the state.

PRIORITY	2017 PROGRESS
Effective Governance	We created an internal Program Delivery Committee and a Business Oversight Committee to enhance internal decision-making rigor, accountability and transparency for major decisions. This ensures that proposed changes to the program or to projects undergo a comprehensive review through a highly-structured process requiring consideration of the full effects of a proposed change. We enforce requirements on contractors, subcontractors and suppliers to ensure effective governance and transparency in everything we do. In 2017, we received no fines related to these regulations.
Financial Responsibility	We made significant advancements to access and expend state funds to build high-speed rail. Also, we continued annual reporting to the California Air Resources Board in compliance with requirements for California climate investments.
Job Creation	Jobs supported by high-speed rail investment increased significantly as construction ramped up in the Central Valley over the past several years. Investment in California's economy in Fiscal Year 2016-17 yielded 7,900 direct, indirect and induced job-years.
Opportunities for Disadvantaged workers	From mid-2006 through 2017, 60 percent of project expenditures occurred in designated disadvantaged communities, as defined by CalEnviroScreen. This percentage will increase as construction spending expands along the Central Valley alignment.
Fostering Diversity and Equal Opportunity	In 2017, more than 37 percent of our outreach events took place in disadvantaged communities, and nearly 150 disadvantaged workers were dispatched to worksites. By the end of 2017, 139 Disadvantaged Business Enterprises (DBE) and 51 Disadvantaged Veteran Business Enterprises (DVBE) were working on the project.
Worker Protections	All Authority staff and consultants are covered by the Fair Labor Standards Act (FLSA) and/or union bargaining agreements that define labor conditions and wages. All construction workers follow a bargaining unit agreement or are protected by the FLSA.

EFFECTIVE GOVERNANCE

Our oversight philosophy emphasizes stewardship, transparency and accountability. As a public-sector entity, we are governed by regulations that ensure the development of a system that is safe, sustainable and compliant with applicable laws and requirements, including:

- The Safe, Reliable High-Speed Passenger Train Bond Act for the 21st Century (Proposition 1A, 2008)
- AB 32 (Nunez, 2006) Global Warming Solutions Act
- SB 32 (Pavley, 2016) Global Warming Solutions Act, 2006: Emissions Limit
- SB 375 (Steinberg, 2008) Sustainable Communities and Climate Protection Act
- AB 75 (Strom-Martin, 1999) Waste Management for State Agencies
- SB 1029 Budget Act of 2012
- SB 852 Budget Act of 2014
- SB 862 (2013-2014) Greenhouse Gases: Emissions Reduction
- SB 535 (De Leon, 2012)
- AB 1532 (Perez, 2012)
- SB 350 (De Leon, 2015) Clean Energy and Pollution Reduction Act
- SB 379 (Jackson, 2015) Land Use: General Plan: Safety Element: Climate Adaptation
- Executive Order B-18-12
- Executive Order B-30-15
- 2008 California Long-term Energy Efficiency Strategic Plan
- 2008 Air Resources Board Scoping Plan; 2013 Update
- 2016 California Green Building Standards Code (CalGreen Code) Title 24 Part 11
- AB 1550 (Gomez, 2016) Greenhouse Gases: Investment Plan: Disadvantaged Communities

FINANCIAL RESPONSIBILITY

The State of California and the federal government committed significant amounts of funding to implement this program.

As of December 31, 2017:

- The Authority has received funding commitments of $3.5 billion from the federal government, $9.0 billion from Proposition 1A bonds and 25 percent of annual Cap-and-Trade proceeds on a continuous basis plus one-time appropriations, facilitated by California Air Resources Board programs.
- $10.6 billion in federal and state funding will be allocated to the planning and construction of the Central Valley Segment, including $3.1 billion from the federal government, $2.8 billion from Proposition 1A bond proceeds and $4.7 billion in current and future Cap-and-Trade proceeds.
- More than $3 billion was expended on construction in the Central Valley and planning for the wider system. Through a provision in our grant agreement with the Federal Railroad Administration (FRA), we were primarily expending federal ARRA funds to advance the program.
- Last year, AB 398 was approved by the Legislature and signed into law by Governor Brown, strengthening and extending the horizon of the Cap-and-Trade Program by 10 years through December 31, 2030. Through December 2017, the Authority received $1.7 billion in Cap-and-Trade proceeds for high-speed rail.

As of June 2017, we spent $3.5 billion on the program. Of this, 95 percent was spent on California firms and workers. Approximately 70 percent of that was federal funds.

This funding allowed us to execute the contracts necessary to begin construction and to fully fund Central Valley construction. It also allows us to complete environmental planning and other early work for the entire Phase 1 System, consistent with our federal grant agreements. Once operational, the high-speed rail system will be self-sufficient through revenues generated from ticket sales without an operating subsidy.

The following statutes guide our financial decision-making:

- Assembly Bill 115 (Com. on Budget, Chapter 38, Statutes of 2011): Budget Act of 2011
- Senate Bill 1029 (Com. on Budget, Chapter 152, Statutes of 2012): Budget Act 2012
- Senate Bill 852 (Leno, Chapter 25, Statues of 2014): Budget Act of 2014

Finally, our additional financial responsibility activities include:

- Managing our Administrative Budget in conformance with State of California requirements
- 100 percent compliance with all existing financial obligations and tracking mechanisms
- Preparing biannual Business Plans for submittal to the Legislature (even years)
- Preparing biannual Project Update Report for submittal to the Legislature (odd years)
- Board of Director and Finance and Audit Committee public meetings and monthly reports
- Annual reporting to the California Air Resources Board in compliance with requirements for California Climate Investments.

LINKS

- Full details of program funding and financing are available in the 2018 Business Plan (***http://hsr.ca.gov/About/Business_Plans/2018_Business_Plan.html***).
- Monthly Finance and Audit Committee updates to the Board can be found here: ***http://www.hsr.ca.gov/Board/monthly_fa_committee_meeting.html/***.
- Details of funding agreements can be viewed online here: ***http://www.hsr.ca.gov/About/Funding_Finance/funding_agreements.html***.

JOB CREATION

One of the project's signature benefits is the ongoing creation of jobs in designing, planning and constructing the system. Focusing on jobs in disadvantaged communities is a direct result of our governance process and has bolstered local economic development.

High-speed rail construction jobs go to the people who need them most, providing a significant boost to California's economy. The Central Valley has recently faced challenges to economic recovery, including an unemployment rate in the construction industry of more than 30 percent.

In time, permanent jobs will be created for train operators, maintenance yard workers, station managers and others to operate and maintain the system. Additionally, connectivity and bookend projects are providing jobs in Southern and Northern California. These projects, part of the statewide rail modernization program, are designed to strengthen and improve existing rail networks and to connect them to the high-speed rail system.

For more information on the economic effects of the program, visit ***www.buildhsr.com/hsrinvestment***.

DID YOU KNOW?

As reported by the University of the Pacific Eberhardt School of Business, the Fresno economy has experienced reduced unemployment rate to single digits for the fifth year in a row. Fresno unemployment is below 10 percent and continues a downward trajectory, reversing a trend for the past 25 years.

- **Fresno County has been the hub of high-speed rail construction thus far. California's Employment Development Department estimated that 9,400 jobs were added in Fresno County between July 2016 and June 2017.**
- **Over this same period, high-speed rail investment in Fresno County supported 3,100 full-time jobs; the equivalent of more than 30 percent of all new jobs added in the county.**

Exhibit 5: The Economic impacts of High-Speed Rail investments (July 2006-June 2017)

JOB-YEARS OF EMPLOYMENT
28,500 - 33,200

LABOR INCOME
$1.95B - $2.33B

ECONOMIC OUTPUT
$5.1B - $5.9B

Exhibit 6: Workers Dispatched by Construction Package

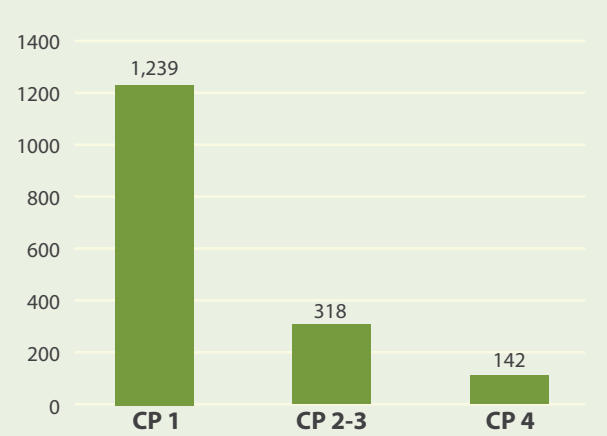


Exhibit 7: Construction Hours by Construction Package

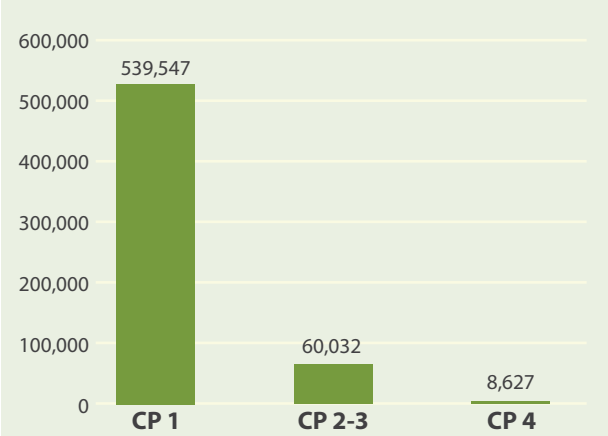
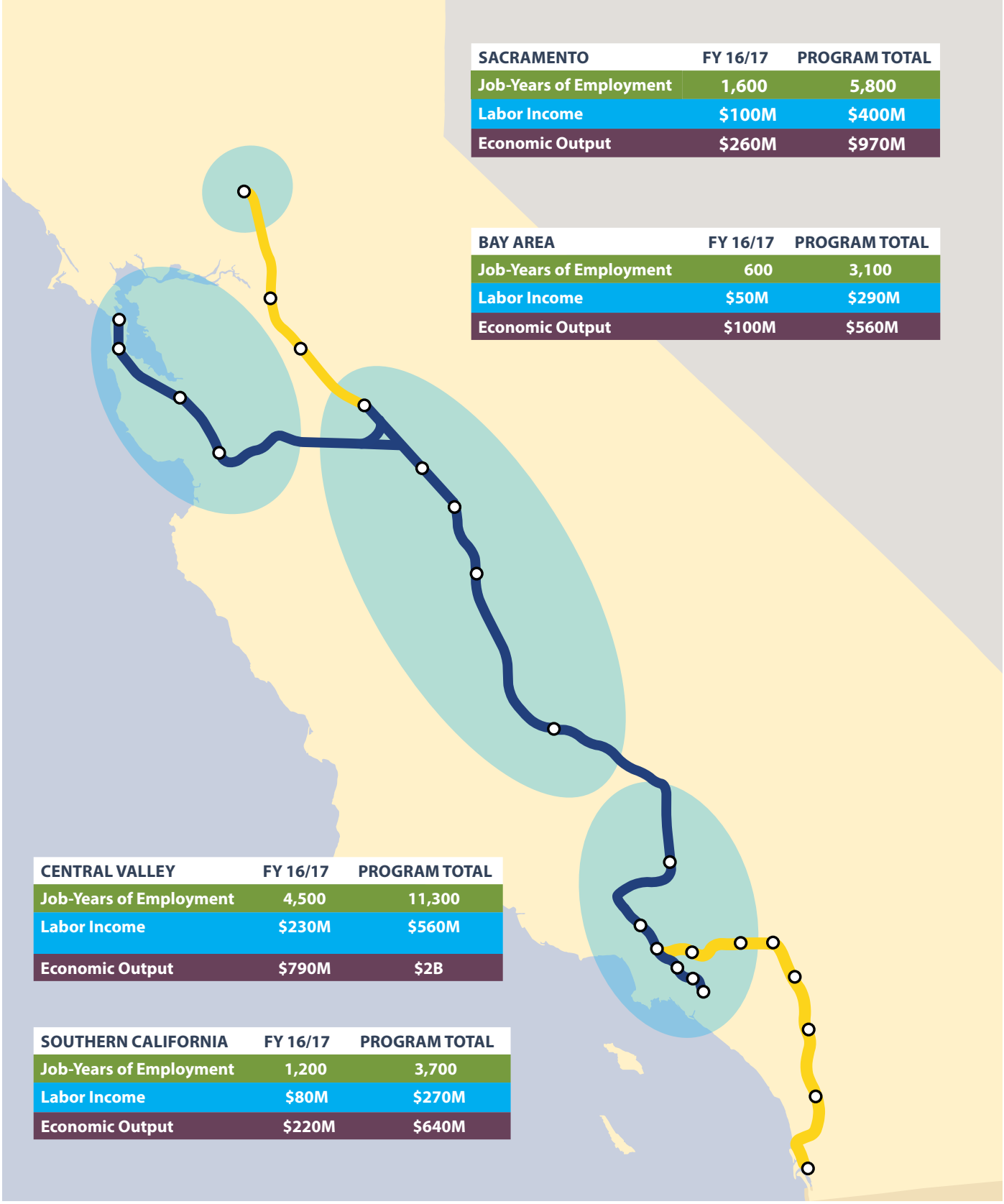


Exhibit 8: Economic Benefits by Region (July 2006-June 2017*)

Including direct, indirect, and induced impacts from Fiscal Year 16/17 and Program Totals



SACRAMENTO	FY 16/17	PROGRAM TOTAL
Job-Years of Employment	1,600	5,800
Labor Income	$100M	$400M
Economic Output	$260M	$970M

BAY AREA	FY 16/17	PROGRAM TOTAL
Job-Years of Employment	600	3,100
Labor Income	$50M	$290M
Economic Output	$100M	$560M

CENTRAL VALLEY	FY 16/17	PROGRAM TOTAL
Job-Years of Employment	4,500	11,300
Labor Income	$230M	$560M
Economic Output	$790M	$2B

SOUTHERN CALIFORNIA	FY 16/17	PROGRAM TOTAL
Job-Years of Employment	1,200	3,700
Labor Income	$80M	$270M
Economic Output	$220M	$640M

*When summed, the total of the four regions shown in this graphic do not equal the total benefits to the state. Exhibit 5, The Economic impacts of High-Speed Rail, shows results for the entirety of California. Exhibit 6 shows results for the four regions only, not including the many counties in California where economic effects have taken place over this time period. For more information on the methodologies used to estimate these impacts, please see this report: *https://www.buildhsr.com/hsrinvestment/pdf/FY1617_CHSRA_Economic_Impact_Technical_Memorandum_FINAL_01122018_v2.pdf*

OPPORTUNITIES FOR DISADVANTAGED WORKERS

We use two mechanisms to ensure that the jobs created by building and operating the high-speed rail system benefit communities most in need.

Under our Community Benefits Policy, we and our contractors adopt and implement programs designed to promote and advance construction employment and training opportunities for all individuals, especially those residing in extremely economically disadvantaged areas and veterans returning from military service.

Our Community Benefits Agreement (CBA) focuses on engaging disadvantaged communities and achieving employment targets for individuals who reside in disadvantaged areas and those individuals designated as "Disadvantaged Workers," including veterans. The CBA, a cooperative partnership between the Authority, skilled craft unions and contractors, is designed to advance and promote training opportunities for all individuals. The job training that people receive through this policy will enable workers to be employed on other construction projects, delivering lifetime benefits.

54% of total project expenditures occurred in disadvantaged communities throughout California, spurring economic activity in these areas.

CASE STUDY

CREATING JOBS IN THE CENTRAL VALLEY AND BEYOND

Since 2006, investments in high-speed rail created significant positive impacts in the Central Valley. Planning, designing and building the system created approximately 11,300 direct and indirect job-years of employment within the valley and generating labor income of $560 million and $2 billion of economic output.

Our efforts to build the Silicon Valley to the Central Valley Line is also expected to create a ripple effect throughout California. Over the construction lifetime of the project, we forecast that almost 240,000 job-years of employment will be created in the state, which will generate a labor income of $15.6 billion and nearly $50 billion of economic output.

The CBA's Targeted Worker Program ensures that 30 percent of all project work hours are performed by "National Targeted Workers," and that at least 10 percent of those work hours are performed by "Disadvantaged Workers."

For more information on Targeted Workers and Disadvantaged Workers, see our Community Benefits Fact Sheet at ***https://www.hsr.ca.gov/docs/newsroom/fact%20sheets/CBA_Factsheet_FINAL_0050415.pdf.***

FOSTERING DIVERSITY AND EQUAL OPPORTUNITY

We believe strongly in equal opportunity for all and strength in diversity. We are committed to ensuring that no person is excluded from participating in any program or activity associated with the design, construction and operation of the high-speed rail system based on that person's race, color, national origin, sex, age or disability. We are committed to ensuring that no person is denied the benefits of participating in the high-speed rail program or is discriminated against under any program or activity of the high-speed rail system.

Title VI of the Civil Rights Act of 1964 prohibits discrimination on the basis of race, color or national origin in programs or activities receiving federal financial assistance. The rights of women, the elderly and the disabled are protected under related statutes.

Exhibit 9: Creating Opportunities for Disadvantaged Workers and Fostering Diversity

	2017
Construction Workers Dispatched	1,699
Disadvantaged Workers Dispatched	149
Small Business Participants - Total	427
Disadvantaged Business Enterprises (DBE)	139
Disabled Veteran Business Enterprises (DVBE)	51
Small Businesses Located in Disadvantaged Communities	115
Local Procurement (U.S.-based businesses)	Nearly 100%
Expenditures in Disadvantaged Communities (FY 16/17)	Nearly 60%

We administer a Title VI Program in accordance with applicable non-discrimination laws and regulations. It is our policy and practice to provide free language assistance whenever individuals with Limited English Proficiency (LEP) request assistance. A LEP individual is a person who does not speak English as their primary language and who has limited ability to read, write, speak or understand English.

We are also committed to upholding Environmental Justice (EJ) – the fair treatment of people of all races, cultures and income levels, including minority and low-income populations, with respect to the development, adoption, implementation and enforcement of environmental laws and policies. We created an EJ program to ensure that our program, policies and activities incorporate EJ principles to mitigate disproportionate adverse impacts, particularly on minority LEP and low-income populations.

More about our Title VI program can be found on our website at ***http://hsr.ca.gov/Programs/title_VI_program.html.***

WORKER PROTECTIONS

The Fair Labor Standards Act (FLSA) and/or union bargaining agreements that define labor conditions and wages cover all Authority staff and consultants. All construction workers follow a bargaining unit agreement or are protected by the FLSA.

ENERGY

INTRODUCTION

Ten years ago, we committed to running the system's trains and facilities entirely on 100-percent renewable energy. To meet this commitment, we work closely with the California Energy Commission, California Public Utilities Commission (CPUC) and the California Independent System Operator (CAISO) to keep abreast of regulatory trends and requirements and with local utilities to reinforce transmission connections to the rail system and strengthen grid connections.

We will design all high-speed rail stations to be high-performance buildings, relying on the Leadership in Energy & Environmental Design (LEED®) rating system and also California's robust green-building requirements. We will design high-speed rail stations and service facilities to be net-zero energy buildings, meaning they will produce at least as much energy on-site as they consume over the course of a year.

We are also developing plans for how excess energy produced at our facilities can spur more restorative development in station districts. Working toward net-positive energy facilities includes partnering with adjacent developments and helping our local partner communities reach important milestones for renewable energy and sustainability.

HIGHLIGHTS

In 2017:

- We progressed toward our net-zero energy and renewable energy goals through continued implementation and refinement of the Sustainability Implementation Plan action items.
- Construction sites reported increases in energy consumption, corresponding to increases in the level of on-site activities and equipment.
- As our staffing levels increased, energy consumption in our offices increased by about 11 percent over 2016 levels.

PRIORITY	2017 PROGRESS
Committing to Renewable Energy	We examined procurement paths and identified potential measures that provide access to the wholesale, renewable energy market.
Designing Net-Zero Energy Stations	Through project requirements and high-performance design criteria, we will continue to develop the path forward to meet key design performance targets.
Energy Use in Construction	Construction activities occurred on more than 100 miles of the system throughout 2017, and we continued monitoring fuel consumed by construction vehicles and equipment.
Energy Use in Authority Offices	As our agency has grown to accommodate the needs of the project, our energy consumption in offices has increased. In 2017, our electricity use to power computers, lights, and heating and cooling systems grew by 11 percent.
Regulatory Compliance	California high-speed rail complied with all applicable policies, laws, standards and regulatory guidelines in 2017.

COMMITTING TO RENEWABLE ENERGY

We commit to using 100 percent renewable energy to operate our trains and facilities. We worked with state partners, such as the California Energy Commission, over the past several years to better understand the use and availability of renewable energy to supply the system's needs over the project's life. According to an Energy Commission analysis of state renewable energy data and trends, California's renewable energy resources provide more than enough capacity to meet the relatively small demands of the high-speed rail system.

In 2016, we signed a renewable energy Memorandum of Understanding with the California Energy Commission. The agreement details our strategy and implementation plan for achieving our renewable energy goal and expresses our willingness to work cooperatively with the commission to expand the use of renewable energy, net-zero energy buildings and zero emission vehicles, including electric vehicle charging and hydrogen fueling infrastructure at rail stations.

DESIGNING NET-ZERO ENERGY STATIONS

We are committed to using clean energy efficiently. We will design all high-speed rail stations to function as high performance buildings that provide low-cost operations by maximizing efficiency. High-speed rail stations and service facilities will be designed to be net-zero energy, meaning they will produce at least as much energy on-site as they consume over the course of a year. Energy could be supplied by building integrated elements, such as solar thermal or photovoltaics. Good passive solar and energy efficiency design will also reduce energy demand.

REVOLUTIONIZING THE ENERGY SUPPLY

Distributed Energy Resources (DER) are a range of electricity resources and loads, such as solar photovoltaics, batteries, electric vehicles, microgrids, and building/home energy management systems and dispatchable appliances (e.g., electric heat pumps), that are connected and controlled locally to support both customer needs/costs and the larger grid.

DER are located close to where the energy is used, so that the supply is delivered and managed with generally less need to rely on the traditional grid infrastructure. This is revolutionizing the energy supply in California and is a key element to meeting the state's renewable energy and climate mitigation and resilience goals. DER can help to reduce the need, in some cases, for costly upgrades to the larger transmission and distribution grid.

These resources can be integrated with traction power as well as stations, and traction and station power systems can also be integrated with each other, either as a predominant power supply or as back-up. This means that the electric power infrastructure downstream of the utility or power grid interconnection point can be designed with an objective to integrate DERs when built, or to support future integration at minimal incremental cost — future-proofing the power investments.

We are working with our state partners and market innovators within the emerging area of DER to understand what role the energy generated at our stations and sites might play in the evolution of DER in California.

The California Energy Commission has taken a close look at DER and estimates that they have reduced transmission grid costs by $2.6 billion in 2017-2018.

http://www.energy.ca.gov/renewables/tracking_progress/documents_transmission_expansion_projects.pdf

ENERGY USE IN CONSTRUCTION

Diesel fuel consumption grew by 66 percent, a significant increase over the previous year that is attributable to significantly increased construction activity. Gasoline fuel consumption grew by an even larger margin of 89 percent, again attributable to the greater range of construction activities, for a total increased energy consumption of 77 percent from vehicles fuels compared to 2016.

ENERGY USE IN AUTHORITY OFFICES

We occupy energy-efficient office spaces that use metered lighting and automatic shut-off of computer monitors to minimize energy use.

REGULATORY COMPLIANCE

All California high-speed rail systems and facilities are or will be subject to the following energy-related policies, laws, standards and regulatory guidelines:

- California High-Speed Rail Authority Policy Directive Poli-Plan-03 on Sustainability
- California 2013 Building Energy Efficiency Standards
- 2010 California Green Building Standards Code (CalGreen Code) Title 24, Part 11
- 2008 California Long-term Energy Efficiency Strategic Plan
- Memorandum of Understanding between the Authority and the California Energy Commission
- SB 350 (De Leon, 2015) Clean Energy and Pollution Reduction Act

Exhibit 10: Energy Consumption

CONSUMPTION SOURCE	2017	UNITS
Office Energy	1,431	Megawatt Hours
Off-Road Diesel	276,556	Gallons
On-Road Diesel	54,524	Gallons
On-Road Gasoline	383,994	Gallons
Energy Content of Fuel	98,846	Gigajoules

ZERO EMISSIONS VEHICLES (ZEV) IN CALIFORNIA

Transforming the way Californians travel to reduce emissions includes creating infrastructure for electrified transportation. California is leading the way with zero emissions vehicle and infrastructure mandates. As noted in the 2016 ZEV Action Plan "California's high-speed rail program represents the backbone of the state's transition to electrified transportation ... [l]inking high-speed rail to ZEV buses and cars is essential to achieve the level of transformation of California's transportation system called for by the Governor and the State Legislature."

https://www.gov.ca.gov/wp-content/uploads/2017/09/2016_ZEV_Action_Plan.pdf

NATURAL RESOURCES

INTRODUCTION

Protecting and enhancing natural resources is foundational for any sustainability program. Our policies and practices help ensure that future generations have the resources necessary to lead meaningful and productive lives. We preserve and enhance natural resources by:

- Maximizing reductions of greenhouse gas (GHG) emissions during construction and operations
- Protecting air quality during construction
- Tracking water use
- Preserving the California environment

HIGHLIGHTS

- Criteria air pollutants were tracked for nitrogen oxide, reactive organic gases, particulate matter and black carbon. The proportion of emissions avoided for each criteria air pollutant held steady for the latter three, while nitrogen oxide emissions were reduced by an additional 20 percent compared to 2016 reductions.
- Our Environmental Impact Report (EIR) on the Fresno to Bakersfield section found that construction activities will use only six percent of the current water consumption along the corridor. Once construction finishes, this project section will use less than two percent of the current water consumption for the project footprint. This represents a net decrease in water use.
- We increased the total area of habitat conserved in 2017 by 26 percent, as compared to the area conserved at the end of 2016.
- In January 2018, California became the first state in the nation to formally apply to the Federal Railroad Administration (FRA) to assume the FRA's responsibilities under the National Environmental Policy Act and other federal environmental laws.

PRIORITY	2017 PROGRESS
Reducing GHG Emissions in Construction and Operations	We applied innovative construction practices, such as the durable concrete mix designs in Construction Package 1 (CP1) that use 25 percent fly ash for cement and 100 percent recycled steel with global warming potential scores below industry average. CP1 concrete supplier, Outback Materials, partnered with CarbonCure to provide concrete with reduced carbon dioxide emissions. Our early investments in upgrading regional rail systems, referred to as "bookend" and "connectivity" projects, will reduce GHG emissions. For example, electrification of some existing rail corridors, upgrades to sensor and signal systems, more energy-efficient equipment and processes, and additional grade separations will reduce emissions and air pollution from idling vehicles.
Protecting Air Quality During Construction	We used best practices for air-quality management to avoid significant quantities of criteria air pollutant emissions in 2017.
Conserving Water Resources	The construction packages continued to comply with water-conservation measures initiated in compliance with state policy. Additionally, environmental review, which identifies the water savings associated with project operation, continued.
Managing Land Use	We developed regional mitigation strategies in 2017 to advance construction in a way that preserves biodiversity. These strategies focus on fostering a better permitting process and promote faster, cheaper delivery of the system through a regional mitigation strategy that prioritizes the conservation and enhancement of larger, higher-value ecological areas and their linkages.

REDUCING GHG EMISSIONS

California continues to be at the national forefront in establishing targets for reducing GHG emissions and transitioning to a sustainable, low-carbon future. The high-speed rail system was planned to shift travel away from automobiles and short-haul air travel and to play a crucial role in California's ambitious plan to reduce statewide GHG emissions to 40 percent below 1990 levels by 2030 (Executive Order B-30-15 and California Global Warming Solutions Act of 2006 (SB 32)).

Consider a future without high-speed passenger rail service; vehicle miles traveled for long-distance trips in California are projected to increase by approximately 11.7 billion miles – to 70 billion miles annually – between 2021 and 2040. As shown in Exhibit 11, from its first year of operation, high-speed rail will reduce GHG emissions in the state by giving travelers a more efficient option for mid- to long-range trips. Every mile traveled on high-speed rail is a mile not traveled by automobile or airplane. The emissions associated with these less-efficient forms of travel will be significantly reduced. On average, annual reductions are projected to be 1.5 million metric tons of carbon dioxide equivalent ($MMTCO_2e$).

Exhibit 11: Projected Annual GHG Emissions Avoided

PROJECTED ANNUAL GHG EMISSIONS AVOIDED ($MMTCO_2e$)		
YEAR	LOW	HIGH
2030	.26	.32
2040	1.2	1.4
2050	1.3	1.5
2079	1.7	1.9

Over the first 50 years of operation, as shown in Exhibit 12, the cumulative reductions are projected to be between 64 and 75 million metric tons of carbon dioxide reduced, just analyzing tailpipe emissions. The GHG emissions reduction scenarios reflect the ridership range expressed in the 2018 Business Plan. Ridership is expressed as both a medium case and as a 75% percentile, which provides the low and high emissions scenarios. This projection informs the baseline case for California's plan to achieve GHG emissions reductions (Final 2017 Scoping Plan). The range of forecasted reductions reflects the two ridership scenarios presented in the 2018 Business Plan.

Exhibit 12: Projected Cumulative GHG Emissions Avoided: Tailpipe

PROJECTED GHG EMISSIONS AVOIDED ($MMTCO_2e$)		
YEAR	LOW	HIGH
2030	.45	.55
2040	9.3	11
2050	21.5	25.5
2079	64.3	75.9

We have consistently reported the projected GHG emissions avoided through mode shift to high-speed rail service using a quantification method developed with the California Air Resources Board. This method relies on emissions factors for gasoline, diesel and jet fuel that are limited to the tailpipe emissions. For more information, see ***https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/hsra_hsr_finalqm_16-17.pdf***.

For this sustainability report, we also analyzed the avoided emissions by assigning an emissions factor that illustrates the full lifecycle impacts of the fuels used for transportation: electricity, gas, diesel and jet fuel. Using this analytic technique enables all fuel types to be evaluated on equal terms. In Exhibit 13, the "well-to-wheels" emissions factors were obtained from GREET and applied to the fossil fuel auto and air fleet. A lifecycle emissions factor was also applied to the electricity required for system operation. The results illustrate the full set of lifecycle emissions that can be avoided through mode shift to high-speed rail over the first 50 years – between 80 and 96 $MMTCO_2e$.

Exhibit 13: Projected Cumulative GHG Emissions Avoided: Well-to-Wheels

PROJECTED GHG EMISSIONS AVOIDED ($MMTCO_2e$)		
YEAR	LOW	HIGH
2030	.56	.69
2040	11.5	13.8
2050	26.7	31.7
2079	80.8	96.1

Projected avoided emissions reflect only riders shifting from automobile and air travel to high-speed rail. They reflect our goal of delivering an interconnected, well-designed system that attracts riders and provides safe, reliable and fast travel between California's population and employment centers. Projections do not account for related direct and indirect benefits, such as the additive effect of compact, infill development in station areas that the system is expected to catalyze. That effect can realize exponentially greater GHG emissions reductions, as illustrated by methodologies associated with California's Climate Investments for Affordable Housing and Community Development, and APTA's Transit Emissions Quantification Tool.

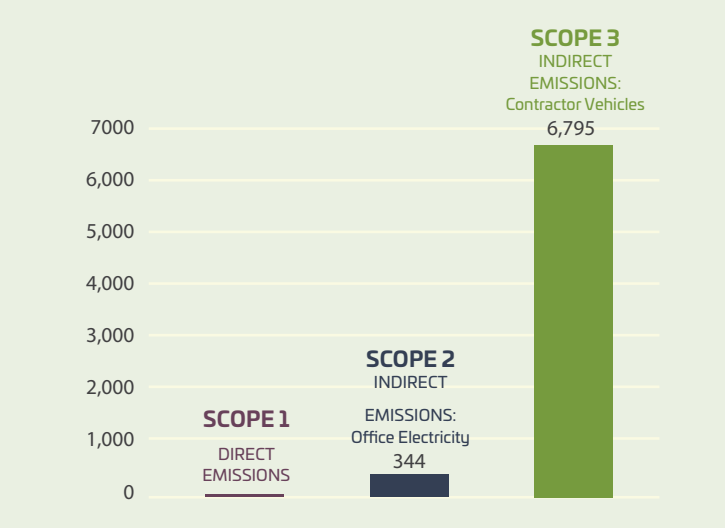
Building and operating the program generates GHG emissions from several sources, including the production of materials used to construct the system, fuel burned in construction vehicles and equipment, electricity consumed in offices, and waste treatment and recycling. Future GHG emissions also come from materials produced for use in rail system operations.

We track GHG emissions across emissions scopes, as shown in Exhibit 14a, per the Greenhouse Gas Protocol and with reference to ISO 14064-2:

- Scope 1 emissions are direct emissions from sources owned by the Authority.
- Scope 2 are indirect emissions associated with electricity purchased for Authority activities.
- Scope 3 are indirect emissions associated with contractor vehicles.

We continuously look for opportunities to reduce emissions, including fuel and energy conservation; recycling and reusing steel, concrete and other materials during construction; specifying use of materials with lower global warming potentials; and using renewable energy. As shown in Exhibit 14b, we also track and report avoided emissions from construction recycling.

Exhibit 14a: 2017 Annual GHG Emissions (in $MTCO_2e$)



METHODOLOGIES AND ASSUMPTIONS

Electricity Emissions Factor: US EPA, 2016, eGRID for California (CAMX); Global Warming Potentials (GWP): Intergovernmental Panel on Climate Change Fourth Assessment Report; electricity consumption estimated from number of staff/consultants, and average electricity consumption and occupant density for a LEED® building.

Contractor vehicle emissions calculated based on EMFAC2011; This analysis included carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6).

Exhibit 14b: 2017 Avoided Emissions From Recycling

METHODOLOGIES AND ASSUMPTIONS

Avoided emissions tracked and reported from construction recycling.
Emissions avoided through recycling calculated based on EPA Waste Reduction Model (WARM).

DID YOU KNOW?

The State of California spends more than $10 billion annually on infrastructure. In 2017, the California Legislature passed AB 262 (Bonta), the Buy Clean California Act. This bill requires state agencies to consider the carbon emissions embedded in major construction materials, such as glass and steel, when contracting for certain state-funded infrastructure projects.

As the Sierra Club notes, AB 262 will directly reduce emissions by requiring the state to seek lower-carbon products, and indirectly by sending a market signal to manufacturers to reduce their emissions. To compete in a "Buy Clean" marketplace, contractors will need to select efficient manufacturers that generate less climate pollution per unit of product to improve their prospects of winning bids with California agencies.

REDUCING AND MANAGING GHG EMISSIONS IN DELIVERY

We use binding contract provisions for construction contractors as the primary way to minimize GHG emissions during construction. These provisions are governed by our Sustainability Policy (***https://www.hsr.ca.gov/Programs/Green_Practices/sustainability.html***).

Our policy details specific measures to decrease our indirect (Scope 3) emissions associated with construction contractors, materials and waste. These measures include:

- Minimizing GHG emissions through design requirements
- Achieving net-zero tailpipe GHG emissions in construction
- Requiring Environmental Product Declarations (EPD) for construction materials, including steel products and concrete mix designs, to improve disclosure of materials information and allowing for the selection of more sustainable products
- Requiring optimized lifecycle scores for major materials, including global warming potential, after satisfying durability and quality requirements
- Adapting existing structures and facilities for reuse whenever feasible
- Integrating climate adaptation and resilience principles into the design, construction and operation of the system

We require contractors to track and report their use of on-site materials, fuel, water and electricity, recycling and reuse volumes, types of on- and off-road equipment, and hours or miles of operation. This information is vital for setting data-driven policy and strategies.

To offset remaining direct (tailpipe) GHG emissions associated with constructing the Central Valley Segment, we are partnering with the California Department of Forestry and Fire Protection on a tree-planting program in rural and urban areas of California. The Urban Forestry program is focused on communities that are near the rail system, with special focus on providing benefits to disadvantaged communities.

The first phase of urban tree planting at West Fresno Middle School kicked off on May 25, 2018, when nearly 200 trees were planted. We expect to eventually plant hundreds of thousands of trees across California, with the goal of improving air quality and quality of life in priority communities, reducing energy use and storm water runoff. The rural tree planting program will also achieve important goals, such as preventing soil erosion and restoring habitats and natural ecosystems by planting native tree species on lands damaged by wildfires. For more information about this program, see our Urban Forestry webpage.
http://www.hsr.ca.gov/Programs/Green_Practices/urban_forestry_program.html

CASE STUDY

TREE PLANTING OFFSETS EMISSIONS

Combating Pollution: Nurturing Young Minds

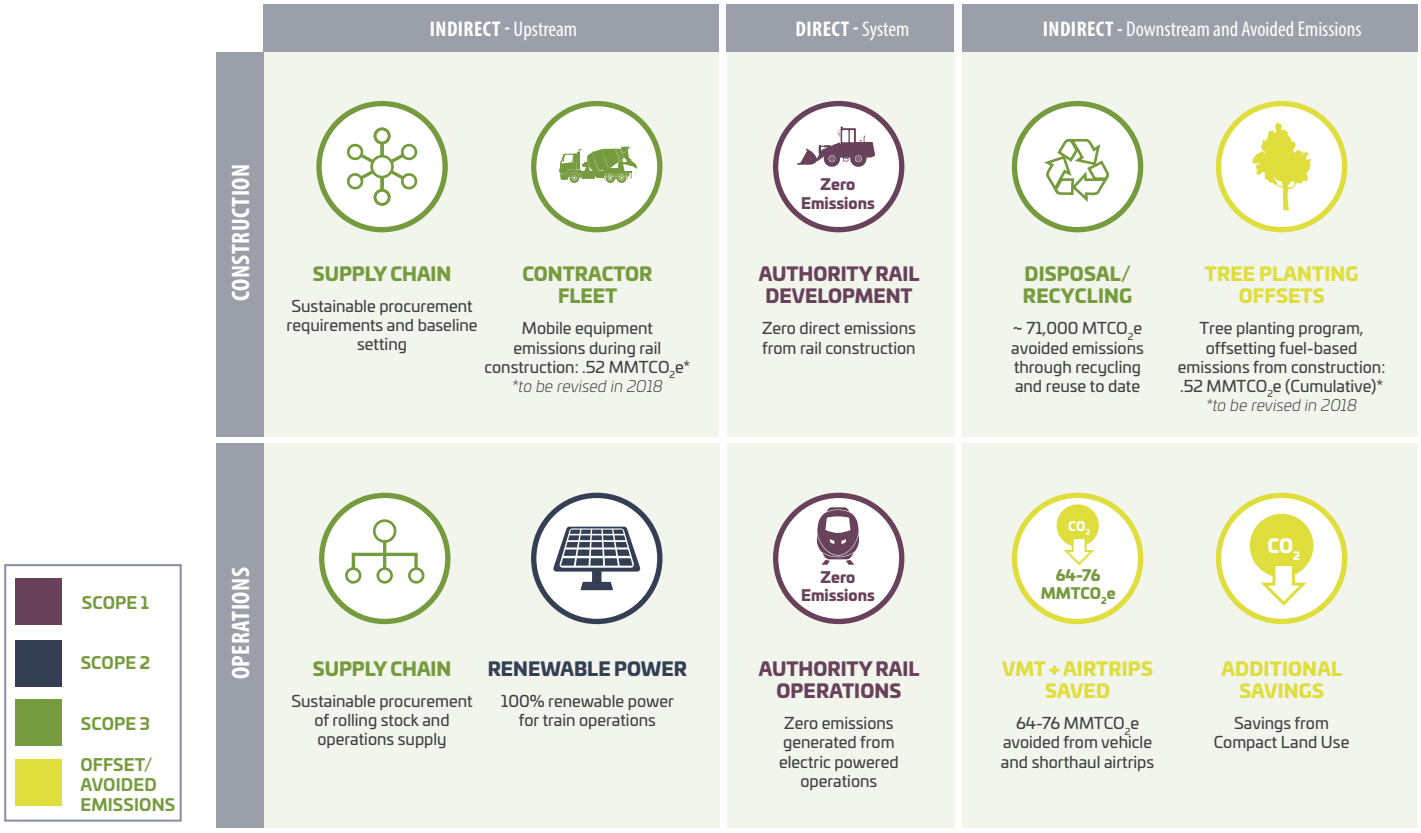
We partnered with Tree Fresno to plant 2,400 trees at schools and parks in the Fresno area. The first phase started at the West Fresno Elementary and Middle Schools, which together serve almost 1,100 students, were selected as locations for one of the first community tree planting programs. The tree planting program will focus on new learning activities in forestry and ecology for the students, and, over its lifetime, the program will oversee the planting of 600 trees in a community heavily burdened by poverty and pollution.

Tree species were selected for their high rates of sequestration, their ability to tolerate the very hot and dry conditions of the San Joaquin Valley, air pollution removal abilities, and the additional environmental and social co-benefits they will provide.

"This tree planting is the result of several years of work, and I can't think of a better place to get started," said Kelaine Ravdin, urban ecologist at Urban Ecos. "The San Joaquin Valley can be a challenging place to live: very hot and very dry, with severe air pollution problems. These 600 beautiful trees will make a great difference for the students and teachers of West Fresno. We can't wait to get started working together with them to get the trees planted!"

Exhibit 15 shows information to date on emissions by scope across the project over the initial six decades. It is a combination of modeled and actual emissions, and is based on the best available information. It is periodically updated. Since January 2016, approximately 11,000 $MTCO_2e$ have been generated during construction, 71,000 $MTCO_2e$ have been avoided through recycling, and 200 trees were planted, which will sequester 600 tons of CO_2 over the trees' lifecycle. In 2018, we will revise projected emissions from contractor fleets to reflect site-actual emissions and updated information on construction scope and duration. We will also revisit our approach to measuring and reporting indirect, upstream emissions from the supply chain for construction.

Exhibit 15: GHG Emissions by Scope: 2015-2079

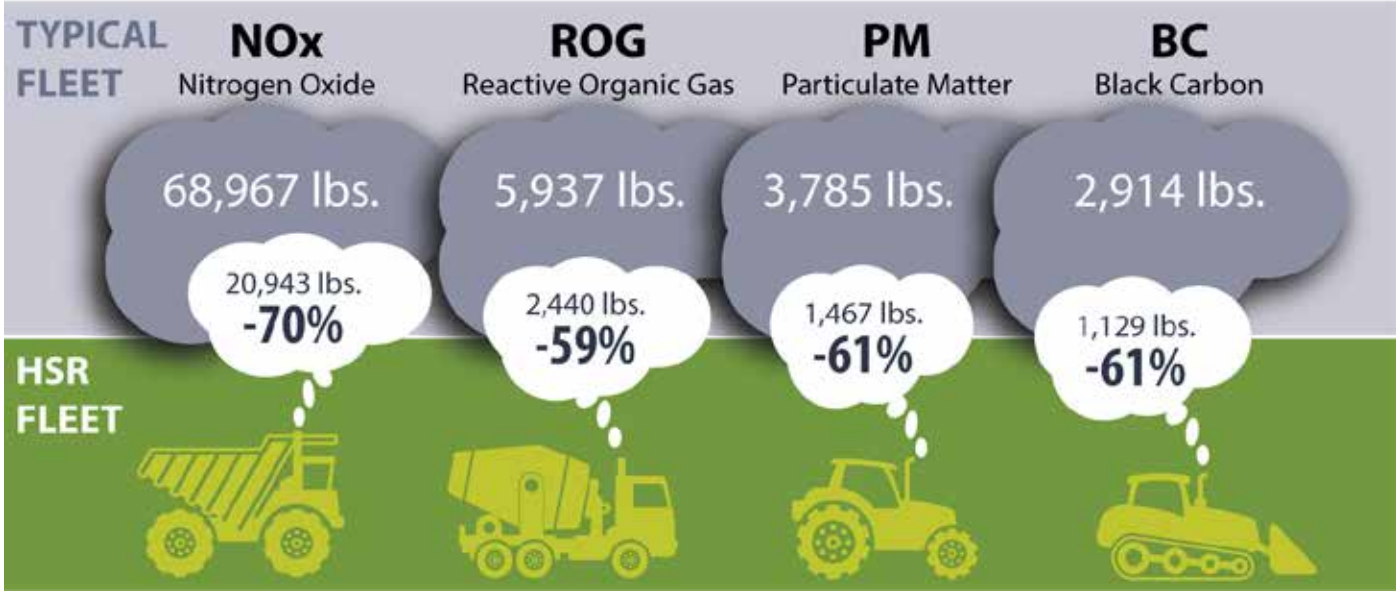


REGULATORY COMPLIANCE

Our role in reducing GHG emissions is detailed in and governed by the following policies and statutes:

- Assembly Bill 32, the California Global Warming Solutions Act of 2006;
- Senate Bill 32 (2016), requiring the California Air Resources Board, in adopting rules and regulations, to ensure that statewide GHG emissions are reduced to 40 percent below the 1990 levels by 2030;
- California Air Resources Board 2008 Scoping Plan and 2013 Scoping Plan Update, which identify the high-speed rail system as a measure for GHG reduction;
- 2013 Greenhouse Gas Emissions Reduction Fund (Cap-and-Trade Auction Proceeds) Investment Plan, in which the system plays a key role;
- Senate Bill 862 (2013-2014), Committee on Budget and Fiscal Review. Greenhouse gases: emissions reduction;
- Assembly Bill 1550 (2015-2016), prescribing GHG reduction fund investment in disadvantaged communities

Exhibit 16: 2017 Criteria Air Pollutants Emitted and Avoided: Typical California Fleet Comparison



PROTECTING AIR QUALITY DURING CONSTRUCTION

We minimize air emissions from the fleets used by our contractors, as shown in Exhibit 16. All contractors working on the high-speed rail system are required to use fleets that comply with California vehicle standards and meet U.S. Environmental Protection Agency standards for the cleanest off-road diesel engines (Tier 4 equipment, as available). This requirement was unique among infrastructure projects and pushed the adoption and use of cleaner off-road diesel engine technology in California in advance of legislated requirements.

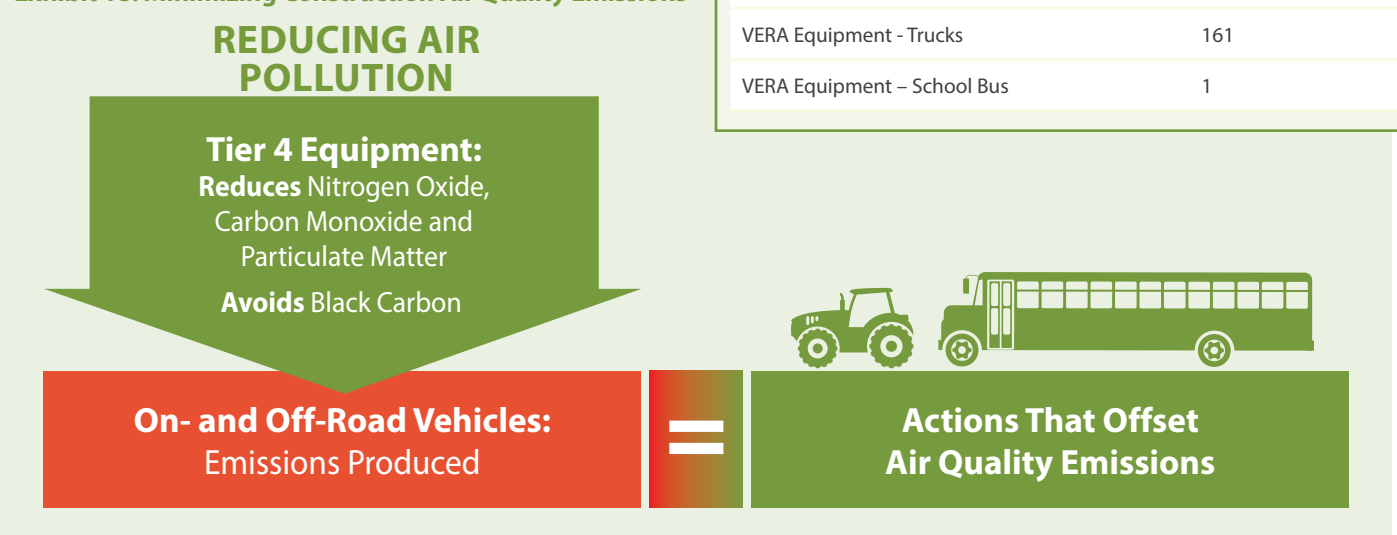
We also enter into air quality agreements with local agencies that are responsible for clean air in their jurisdictions. Our primary tool is the Voluntary Emissions Reductions Agreement (VERA) program. Under a VERA, we pledge to offset each ton of air pollutants emitted during construction within the local air quality district. Our VERA program replaces older, polluting equipment, such as agricultural pumps, diesel bus engines and tractors, in local communities with new, cleaner and more efficient equipment – reducing air pollutants and providing immediate, tangible climate benefits. This offset is illustrated in Exhibit 18. Progress to-date is shown in Exhibit 17.

VERAs are planned for all parts of the system located in districts with poor air quality. These efforts are critically important for Central Valley cities, four of which have been identified by the American Lung Association as being among the top 10 most polluted cities in the United States in terms of air quality.

Exhibit 17. Voluntary Emissions Reduction Agreements

	2017
VERA Offsets: Total Lifetime	1,369 tons
VERA Investment	$13 million
VERA Equipment - Tractors	82
VERA Equipment - Trucks	161
VERA Equipment – School Bus	1

Exhibit 18: Minimizing Construction Air Quality Emissions



CONSERVING WATER RESOURCES

As with energy, we account for water use by our staff in addition to, and separately from, water used in project construction. Tracking water use and applying water conservation guidance remains important; California faces inconsistent rainfall and snowfall and ever-increasing demands on water resources from residential and commercial users.

Several federal, state and local regulations govern water consumption by the high-speed rail program. As construction extends into other parts of the state beyond the Central Valley, local regulations in Southern and Northern California will govern water consumption.

The applicable statutes and regulations that we must comply with include:

- Federal:
  - Clean Water Act of the United States
  - Section 10: Rivers and Harbors Appropriation Act
  - Floodplain Management and Protection and Flood Disaster Protection Act
- State:
  - 2010 California Green Building Standards Code (CalGreen Code)
  - Porter-Cologne Water Quality Act
  - Statewide Stormwater Permits
  - Streambed Alteration Agreement
- Regional and Local:
  - Fresno County General Plan and Ordinances
  - Kern County General Plan and Ordinances
  - Metropolitan Bakersfield General Plan/Update and Environmental Impact Report

We established criteria for our facilities to work toward net-zero potable water consumption through water-use reduction, recycling, capture and storage. To support these efforts, water consumption is prioritized when siting future facility locations. In addition, our facilities will be designed and built using the CalGreen Code for planning, procurement, design, construction, operations and maintenance, including the Code's mandatory and voluntary sections.

Several stakeholders expressed concerns that construction activities could compete with California farmers for water, an issue of significant importance in the Central Valley. We understand these concerns, and to address them, we place high importance on water-conservation efforts during the construction phase of the project.

Once the system is built, it will not require significant water volumes or threaten water security for the region.

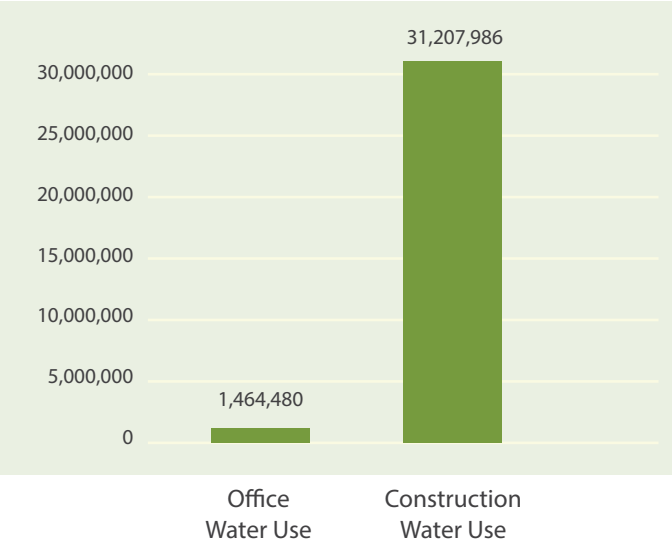
We adopted a Water Conservation Policy in 2015 to establish water conservation as a continuing practice. We also established uniform, program-wide requirements for water conservation during design and construction of high-speed rail projects, and contractors must submit a Water Conservation Plan that clearly describes how they will comply with our requirements.

We are preparing comprehensive Environmental Impact Reports (EIR) and Environmental Impact Statements (EIS) for each project section of the system to comply with the National Environmental Policy Act (NEPA) and California's Environmental Quality Act (CEQA), respectively. Each environmental analysis includes an assessment of water consumption and detailed projections of water required for construction.

At our offices, per-person water use is minimized using low-flow, automatic shut-off sink fixtures and low-flow toilets.

In construction, water use doubled compared to 2016 due to the expanded footprint of construction activities. Water is used on site to compact soil for overpasses, cure concrete, and suppress dust and particulate matter.

Exhibit 19: Water Consumption (in Gallons)



MANAGING LAND USE

We are committed to working with federal, state and local agencies and with local stakeholders to develop a high-speed rail system that preserves California's open spaces and environmental resources. Our Board of Directors created the Transit and Land Use (TLU) Committee to link transportation decisions with land use decisions through interactions with regional and local stakeholders.

The TLU Committee examines the interaction of system decision making and potential land management policies with local land use. Ideally, system stations should incentivize land use toward urban regeneration and important local planning changes, such as allowing mixed land uses, maximizing density and building height, and achieving highest and best land uses associated with a high-speed rail station.

In addition, we have launched mitigation activities associated with conservation and preservation of habitat and open space.

PRESERVING HABITAT

The statewide reach of the project gives us the ideal opportunity to consider broader approaches to habitat preservation. In 2016, we secured a conservation easement with the Lazy K Ranch, a working horse and cattle ranch in Chowchilla, to protect a 530-acre parcel for habitat mitigation. This is a unique parcel that is contiguous with a much larger site, allowing the expansion and connection necessary for quality habitats and providing a matrix of seasonal ponds, thereby improving the overall quality of the mitigation site.

Working through our contractor, Westervelt Ecological Services, we recently secured the rights to establish a conservation easement on 820 acres along Cross Creek in Kings and Tulare Counties.

CASE STUDY

HABITAT CONSERVATION IN THE CROSS CREEK CORRIDOR

With the support of Westervelt Ecological Services, we obtained and preserved more than 1,200 acres in the Cross Creek Corridor to protect valuable natural habitat. The corridor between Cross Creek East and Cross Creek West stretches from approximately 30 miles southeast of Fresno to 10 miles northeast of Hanford. It is one of the last remaining natural stream corridors snaking from the Sierra Nevada to the Southern Central Valley.

"At Cross Creek, the Authority is solving a large-scale conservation problem," said John Hunter, senior permitting specialist. "It's providing a means for animals at risk of extinction to move across a region where their movement for foraging, breeding and dispersing is highly constrained."

The preserved acres include a natural habitat of grasslands and vernal pool complexes for listed vernal pool fairy shrimps, vernal pool tadpole shrimp and California tiger salamanders. The habitat types within the Cross Creek Corridor ecoregion are designated as 'critical habitat' and 'core area' by the U.S. Fish and Wildlife Service for these threatened and endangered species.

Due to extensive agricultural practices within this area, the remaining corridors of natural vegetation are invaluable resources, providing some of the last remnants of high quality habitats and providing for wildlife movement. Tipton kangaroo rats, antelope ground squirrels, San Joaquin kit foxes, Swainson's hawk and even the occasional mountain lion use these wildlife corridors to search for food and refuge.

This conservation easement will preserve in perpetuity some of the last remaining intact parcels of pristine vernal pool grasslands along an important wildlife movement corridor that supports the California tiger salamander, San Joaquin kit fox, and vernal pool invertebrates:

- Approximately 400 acres of existing seasonal ponds and annual grasslands will be preserved to mitigate for impacts on species listed under the federal and state endangered species acts.
- 17 acres of seasonal ponds will be created across an approximately 100-acre area to mitigate impacts on regional waters.
- Three acres adjacent to the Chowchilla River will be planted and enhanced adjacent to one acre of existing vegetation to mitigate impacts on non-wetland stream-side areas.

PRESERVING AGRICULTURAL LAND

Our Board of Directors signed an agreement in 2012 with the Department of Conservation (DOC) for implementing agricultural preservation. The DOC will identify suitable agricultural land for mitigating project impacts and fund the purchase of agricultural conservation easements from willing participants. Solicitation for proposals for agricultural mitigation parcels began in November 2014. The DOC's California Farmland Conservancy Program (CFCP) will secure the easements on behalf of the Authority. To date, a total of 273 deeded acres have been secured.

Exhibit 20: Habitat and Agricultural Land Preservation (in Acres)

	2017
Habitat Preserved and Restored	2,510
Agricultural Land Approved for Conservation	1,200
Agricultural Land Secured	273

West Fresno Elementary and Middle School children planting trees at schools and parks in the West Fresno area helping to offset emissions.

SUSTAINABLE INFRASTRUCTURE

INTRODUCTION

California uses its infrastructure investment to advance sustainable development and we implement infrastructure in a way that enhances well-being across an array of context-specific metrics, of communities, economies and ecosystems. This means we integrate sustainability actions into project development and operations as a strategy for managing risks, including climate risk, and identify opportunities to benefit California's communities and economy.

HIGHLIGHTS

In 2017, we:

- Launched EMMA 2.0, as an updated and customized web-based tool for data collection, review and analysis.
- Began revising our design requirements to incorporate initial results from analyzing the system against climate stressors.
- Undertook external engagement with a range of stakeholders in the materials supply chain for the system to explain our policies and priorities related to materials, and how we seek to minimize environmental and social harm through procurement.

PRIORITY	2017 PROGRESS
Principles for Sustainable Infrastructure	In 2017, we began updating the inward-facing Sustainability Implementation Plan to refine targets, actions and accountable parties that will support adherence to the principles. This update is a positive step toward achievement of the principles, and demonstrates our continued commitment to seeing them through to implementation throughout the lifespan of the project. We will re-examine our sustainable infrastructure principles in 2018, with an eye to refreshing them with regulatory updates and stakeholder input. We will follow a transparent process that will involve other state agencies, including state transit agencies, that are well-versed in sustainability issues and our peer rail partners globally.
Resilience & Climate Change Adaptation	We participated in California's resilience and adaptation planning efforts and contributed to Safeguarding California. We formed a work group focused on developing a climate adaptation plan for the system, in alignment with new state guidance, "Planning and Investing for a Resilient California."
Ensuring Health, Safety, and Security	We implemented a Safety and Security Management Plan for the statewide program that includes the following elements: 1. The safety-assurance portion of the RAMS (Reliability-Availability-Maintainability-Safety) program. 2. A hazard-management program that includes hazard identification and hazard assessment in the form of preliminary hazard analyses, as well as threat and vulnerability assessments. 3. Coordination with fire and life safety agencies, such as the Office of the State Fire Marshal, the Federal Railroad Administration, the Department of Homeland Security and local emergency response agencies. The hazard-assessment effort includes collaboration with the system disciplines (engineering, core systems, high-speed rail trains and operations) to develop safety and security design requirements that mitigate the risk to an acceptable level. The Safety and Security Management Plan also describes process requirements that demonstrate the achievement of Safety and Security Certification, and communication processes administered by the Safety and Security Team, including internal and external committee meetings and stakeholder outreach.

PRINCIPLES FOR SUSTAINABLE INFRASTRUCTURE

Our sustainable infrastructure principles reflect a balance of social, environmental and economic issues relevant throughout the design, construction and operations phases of the program. These principles were developed in consultation with leaders across functional areas of the Authority to represent and reflect California's priorities. They can be found here: ***http://www.hsr.ca.gov/docs/programs/green_practices/sustainability/Sustainability_signed_policy.pdf***

In addition to these principles, we adhere to other commitments and requirements, including:

- All Environmental Impact Reports/Environmental Impact Statements (EIR/EIS) include a Mitigation Monitoring and Reporting Program (MMRP) for implementation. Specifically, the:
  - MMRP for the Statewide Program EIR/EIS has 250 mitigation commitments
  - MMRP for the Bay Area to Central Valley Program EIR/EIS has 290 mitigation commitments
  - MMRP for the Merced to Fresno Project EIR/EIS has 610 mitigation commitments
- Sustainability policy and periodic reporting
- American Public Transportation Association (APTA) sustainability commitment
- International Union of Railways (UIC) Railway Climate Responsibility Pledge

Exhibit 21: 2017 Materials Management (in Tons)

- 64,489 Concrete Recycling
- 38,802 Asphalt Recycling
- 11,063 Mixed Recycling
- 3,311 Metals Recycling
- 2,306 Organics
- 361 Recycled Wood
- 326 Materials Landfilled

REPORTING

EMMA (Environmental Mitigation Management Application) is a custom web-based tool developed by the Authority. We use EMMA as the system of record for environmental and sustainability compliance in project construction. EMMA is a single, uniform platform for the Authority and its Project Construction Managers (PCM) to ensure design-build contractor submittals demonstrate contract compliance. EMMA is meant to greatly enhance and streamline data collection and management, and promote high levels of quality assurance and control.

RECYCLING WASTE RESPONSIBLY

The Authority has required recycling 100 percent of the steel and concrete from construction and demolition and diverting at least 75 percent of all other construction and demolition waste from landfills, unless local regulations specify a higher diversion rate. To measure progress, the Authority tracks the amount of waste produced and diverted from landfills for each construction package.

To date, more than 204,000 tons of material, including concrete, asphalt, wood and organics, have been stockpiled for reuse or recycled as part of the project – this is 99 percent of all waste to date, according to the records reported and confirmed in our data-collection system. Based on contractor data, to-date for 2017, all concrete and metal was recycled or stockpiled and 98 percent of other demolition debris, including organic waste, was recycled, as shown in Exhibit 21.

The Authority's recycling efforts avoided 71,000 metric tons of carbon dioxide. As with water, fuel use, and construction equipment, waste and recycling information is collected directly from contractors. These recycling rates far surpass the 50 percent minimum diversion rate recommended by the California Integrated Waste Management Board and are an indicator that the Authority is performing on par with leading international sustainable construction projects.

The Authority produced no un-remediated hazardous waste in 2017. A small amount of hazardous waste was remediated by the Authority's contractors and disposed of, according to proper procedures.

ENSURING HEALTH, SAFETY AND SECURITY

Safety and security is our highest priority. We are working with local communities, law enforcement and first responders to design and operate a system that will be safe for our customers, drivers, pedestrians and local communities. We will implement the highest levels of safety and security measures to ensure the protection of passengers, employees, emergency responders and the public.

Our comprehensive safety and security program addresses operations and facilities and will also ensure that these measures enhance our passengers' experience. For example, we convened a Seismic Advisory Board that includes nationally and internationally recognized experts in seismic hazards evaluation and seismic design. This panel provides expert advice regarding seismic design of tunnels and reviews our design criteria. It also reviews and provides advice on special conditions that must be addressed in developing California's high-speed rail system, including high seismicity, near-source seismic response and active fault crossings.

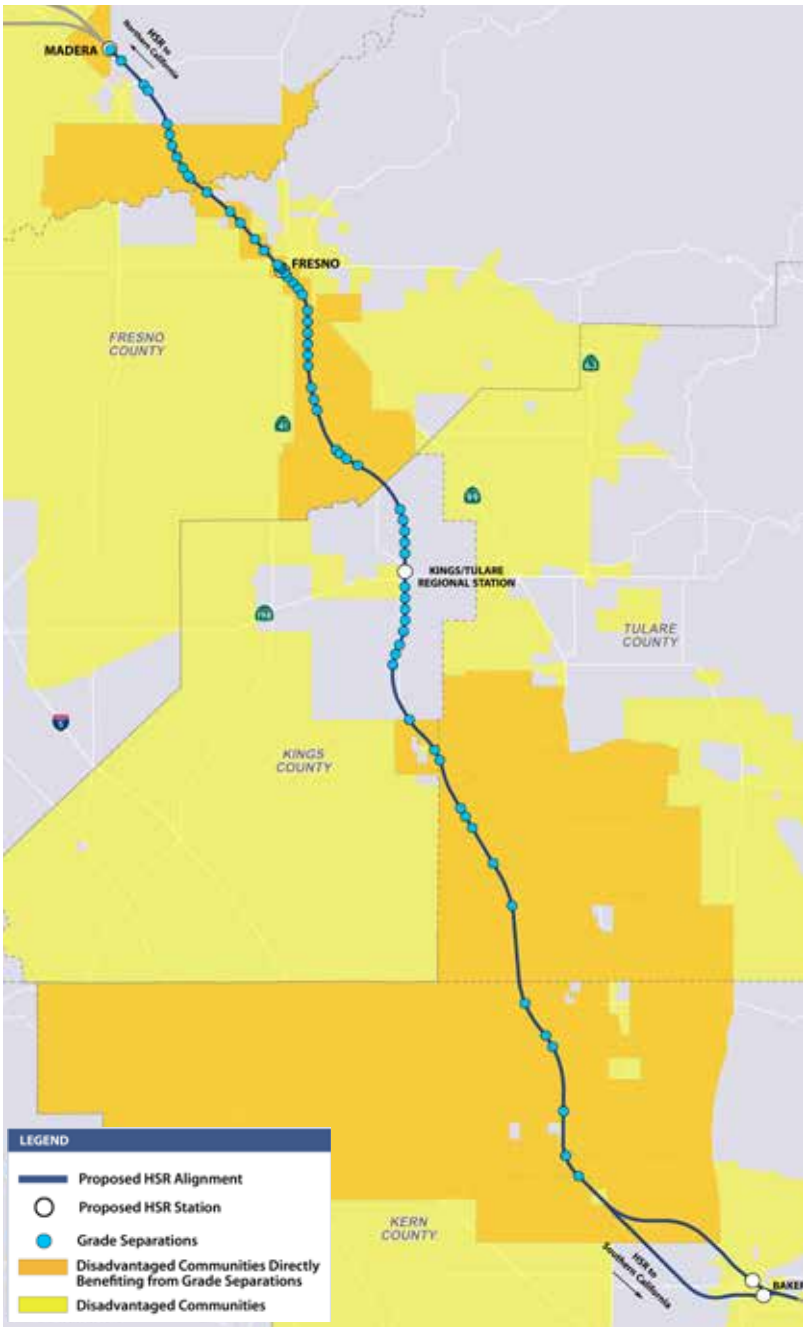
GRADE SEPARATIONS

One of the most significant safety improvements that we are making to rail safety are the new grade separations that we are building to realign the existing roadway to go over or under the railway. High-speed rail is being built to be fully grade-separated in the Central Valley, which is essential to safety because the trains will be traveling at speeds in excess of 200 miles per hour in this region. The program will eliminate 50 existing rail crossings, as shown in Exhibit 22, including all Union Pacific Railroad crossings in Fresno.

We are also planning to upgrade or eliminate grade crossings along the system through Northern and Southern California, improve safety and reliability of train operations and reduce noise (due to less need for trains to sound warnings at crossings). Our goal is to reduce traffic congestion at grade crossings and the GHG emissions from idling vehicles.

In Northern California, to implement blended service for high-speed rail and Caltrain commuter rail service within the existing corridor, we are working with Caltrain to take steps to prepare for service in accordance with the Federal Railroad Administration's High-Speed Passenger Rail Safety Strategy.

Exhibit 22: Safety Improvements at Grade Separations in Disadvantaged Communities in the Central Valley



GRADE SEPARATIONS CREATE BENEFITS

Grade separations create important safety benefits for communities, but they also produce significant practical and economic benefits:

- Pedestrians and bicyclists can easily get from one part of a community to another;
- Improved access to employment centers and jobs; and
- Disadvantaged communities are no longer isolated.

In Southern California, we are working with local agencies to finalize agreements on several critically important grade separations that will improve safety and operations for passenger and freight rail systems in the near term. Eight grade crossings have been identified for improvement, all of which are in or near disadvantaged communities, as shown in Exhibits 23 and 24.

TRAIN OPERATIONS

We take a holistic, layered and risk-based approach for securing the rail system, including:

- Positive Train Control: a state-of-the-art system that monitors speeds and regulates the distances between trains and can automatically slow down or even stop trains to prevent collisions.
- An early earthquake warning system that detects earthquakes before they happen and then stops the trains so that safety measures can be taken.
- Quad gates.
- Intrusion protection barriers.

FACILITIES

- Early engagement with federal, state and local intelligence, and policing agencies during design and construction.
- Ongoing engagement with the same agencies to review current and evolving criminal and terrorist threats, and applying mitigations to minimize vulnerabilities.
- Applying technology, fencing, intrusion protection, surveillance capabilities and other system-hardening techniques.
- Development of security plans, procedures, protocols and a professional security force to monitor, patrol and respond to incidents.

RISK MANAGEMENT AND CLIMATE ADAPTATION PLANNING

In 2017, we finalized a Program Risk Management Plan, which supersedes the June 2013 Project Risk Management Plan. Our approach to risk management is systemic, collaborative and cross-disciplinary and is viewed as essential for successful project management, building upon and extending other project management processes.

Our risk management approach also incorporates the precautionary principle, particularly in the application to climate adaptation planning, which identifies actions to be taken even in the absence of complete certainty concerning a particular climate risk scenario. The actions to be identified in the climate adaptation plan will rely on reasonable evidence of considerable potential risk.

*Exhibits 23 and 24 reflect assumptions made in the 2018 Business Plan.

Exhibit 23*: Safety Improvements at Grade Separations in Disadvantaged Communities Between Burbank and Los Angeles

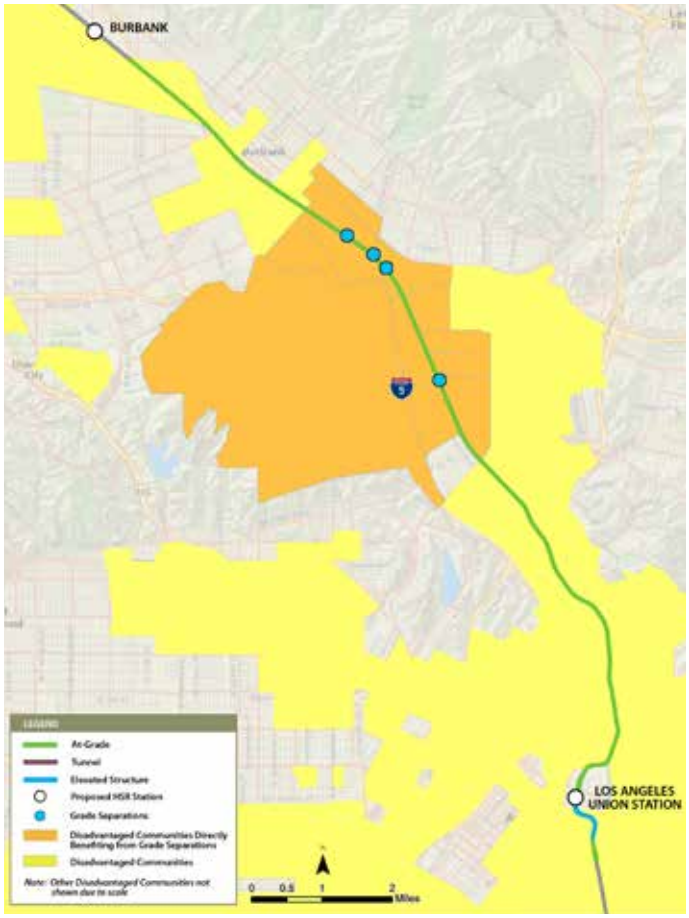
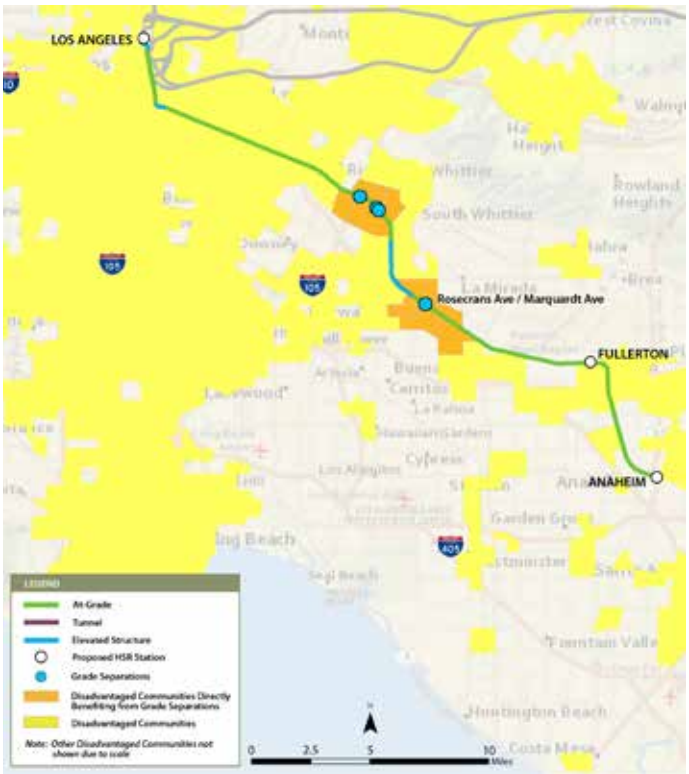


Exhibit 24*: Safety Improvements at Grade Separations in Disadvantaged Communities Between Los Angeles and Anaheim



CASE STUDY

INFRASTRUCTURE DEVELOPMENT

Rosecrans/Marquardt Grade Separation Project

The Rosecrans/Marquardt intersection, located in Santa Fe Springs, is rated the most hazardous at-grade crossing in California by the California Public Utilities Commission. In addition to pedestrian crossing, approximately 52,000 vehicles and 110 trains use this grade crossing every day.

The grade crossing is currently used by the BNSF freight rail, Amtrak passenger rail and Metrolink passenger rail services. It is estimated that the rail crossing causes 45 days of stopped traffic per year, which results in delays and increased GHG emissions from idling vehicles. With high-speed rail trains using the same crossing, the number of daily train trips is expected to nearly double. This would mean higher waiting times for vehicles and passengers crossing the roads, and higher risk for accidents.

We are addressing this issue by funding more than 50 percent of the construction and right-of-way costs for the Rosecrans/Marquardt Grade Separation Project: $76.6 million out of the overall proposed budget of $150 million. Other investors are Caltrans, Metro, BNSF Railway and the City of Santa Fe Springs.

Completing this project will result in increased safety in the surrounding area, allow for higher volume of passenger and freight trains to run without delays, enhance the efficiency of existing rail systems and address the high-speed rail system's future needs between Los Angeles and Anaheim. The project is expected to improve safety of pedestrians at railroad crossings and reduce environmental pollution, while focusing on the mobility and quality of life in the community.

CONSTRUCTION SAFETY

Exhibit 25 shows injury rates and lost days in 2017. These are significantly lower than similar metrics for the construction industry statewide.

Exhibit 25: Worker Health & Safety

	2017	STATE BENCHMARK*
INJURY RATE**		
Injury Rate - CP1	1.76	-
Injury Rate - CP2/3	-	-
Injury Rate - CP4	-	-
Injury Rate - Overall Weighted Average	1.1	4.5
LOST DAYS RATE		
Lost Days Rate - CP1	0.7	-
Lost Days Rate - CP2/3	-	-
Lost Days Rate - CP4	-	-
Lost Days Rate - Overall Weighted Average	0.44	2.8
FATALITIES		
Total Fatalities	0	55[1]

* California Heavy and Civil Construction Industry 2016

** Reported as rate per 200,000 hours of work.

1. Fatal occupational injuries by selected characteristics, by major event or exposure. California, U.S. Bureau of Labor Statistics, 2016

EMPLOYEE PROGRAMS

To facilitate positive health outcomes, State of California employees and their eligible dependents have access to an Employee Assistance Program (EAP). This program is provided by the State of California as part of the state's commitment to promote employee health and well-being.

It is offered at no charge to the employee and provides a valuable resource for support and information during difficult times, as well as consultation on day-to-day concerns. Specially trained customer service representatives and professional EAP counselors are available 24 hours a day, 7 days a week to confidentially talk with employees and get them assistance when needed.

Each department also has an EAP coordinator and there is a Statewide EAP Benefits Manager available. This program is being operated by the California Department of Human Resources and more information is available here: ***http://www.calhr.ca.gov/employees/pages/eap.aspx***

FACES OF HIGH-SPEED RAIL: A FAMILY AFFAIR

Being an ironworker apprentice on the high-speed rail program is a family affair for Desrae Ruiz.

"My dad used to be an ironworker for so many years so now I'm doing it." But that's not where the family connection ends. In fact, Ruiz's husband also works on the project. "My husband does nightshifts."

Ruiz says she was working in retail before she began as an ironworker and it just wasn't enough for the couple to provide for their daughter. She says that's all changed with both her and her husband working on the historic project.

"It's just helping us build for the future," she explains. "As far as my family, being able to be stable and not worrying about moving or worrying about what bills are coming next, we're able to just make a schedule and follow through with it because of how stable this financially is."

She says the family is so stable now they were able to buy a new truck for Christmas and they are looking into buying their first home. She says being a two-income family is also helping her achieve another goal of going back to school at Fresno State.

> "To be able to be part of the high-speed rail is nice. I'm able to walk away and say I helped build that and still continue on to my own goal because of the financial stability it has for me."

STATION COMMUNITIES, RIDERSHIP & COMMUNITY BENEFITS

INTRODUCTION

We worked with local governments over the last several years to prepare for future high-speed rail stations. In partnership with the FRA, we dedicated funding to support station cities in completing station area plans that are consistent with and supportive of local and regional planning efforts required by SB 375 and our Station Area Development Policies. To date, we have executed planning agreements with the cities of Gilroy, Merced, Fresno, San José, Bakersfield, Palmdale and Burbank, and with the Tulare County Association of Governments and the Santa Clara Valley Transportation Authority.

These agreements allow the Authority to work closely with station jurisdictions and other service providers to promote regeneration opportunities and enable more sustainable, district-scale development. These efforts also include working with regional and local transit providers to enhance multi-modal connectivity to high-speed rail stations and surrounding transportation improvements. Ultimately, the work will facilitate adoption of amendments to general plans and zoning codes and will help develop financing and phasing plans to support the station area plans, as well as options to attract private investors.

The vision for station planning is to create community hubs and help transform cities. The goals being advanced through this program include:

- Fostering sustainable development and operations;
- Reducing greenhouse gas (GHG) emissions;
- Helping maximize system performance; and
- Creating economic engines for local communities.

HIGHLIGHTS

- Station area planning advanced in Bakersfield, Fresno, Palmdale, Burbank and San Jose, as well as with the Tulare County Association of Governments.
- The Authority and its partners, the Los Angeles County Metropolitan Transportation Authority and the Los Angeles, San Diego and San Luis Obispo Rail Corridor Agency, kicked off work on a $600,000 grant assessing brownfields in a one-mile area around the Los Angeles Union Station.

PRIORITY	2017 PROGRESS
Enhancing Station Communities	The Authority continued to develop and partner with station communities in 2017 to ensure that community impacts of station design are aligned with the communities' needs and goals.
Connecting Existing Transportation Systems	The 13 connectivity projects identified in SB 1029 are being implemented across the state, and include the Central Subway project in San Francisco, the Regional Rail Connector in Los Angeles, new rail cars for the Bay Area Rapid Transit (BART) system and an upgrade of the Blue Line light-rail system in San Diego. These projects were fully funded in 2015, and we worked with our rail and transit partners on agreements to initiate and/or advance these projects through 2017.
Small Business Program	The small business program continued to grow in 2017, with an additional 10 businesses joining and benefiting from the program.
Engaging Suppliers	We targeted several venues as useful for supplier engagement and participated in a State of California sustainable procurement benchmarking exercise.

PROVIDING STATION ACCESS

We are designing high-speed rail stations to be more than stations; they will create community hubs, anchor intermodal networks and act as catalysts for transit-oriented development as California's major population and employment centers are connected in a new way.

More compact, bike- and pedestrian-friendly development and connecting people to stations via all transportation modes increases access to the high-speed rail system. This is important to increasing ridership on all systems, including the local and regional transit networks that connect to the high-speed rail system. It also furthers our ability to develop a commercially successful high-speed rail system that operates without a subsidy.

Station access that prioritizes active transportation, seamlessly integrates mass transportation modes and nurtures infill development is critical to achieving the state's climate goals through reducing vehicle miles traveled.

COMMUNITY PARTNERSHIPS

Federal, state and local funds allow station cities and their stakeholders to engage in extensive station area planning activities in partnership with the Authority. We have entered into nine Station Area Planning (SAP) agreements with station cities and local agencies to help support land use planning, access and zoning changes to achieve highest and best use of land near the stations.

We use SAP agreements to work closely with station jurisdictions and other mobility service providers to promote urban regeneration and district-scale sustainable development at and around the stations. Intermodal Working Groups (IWG) are making critical station area decisions and allocating funding for first- and last-mile projects that are designed to link nearby sidewalks and cycling paths to stations, as shown in Exhibit 26.

SAP funding is helping stimulate local planning for smart development, updates to local land use plans and zoning codes, and promoting transit-oriented development around high-speed rail stations. These infill efforts align with critical policy objectives of AB 32 and have the potential to reduce millions of tons of GHG emissions.[3] Locating high speed rail stations in existing downtown cores, as envisioned by Proposition 1A, will assist with infill development, stimulate the local economy, reinforce SB 375 regional plans and reduce the pressure on agricultural land.

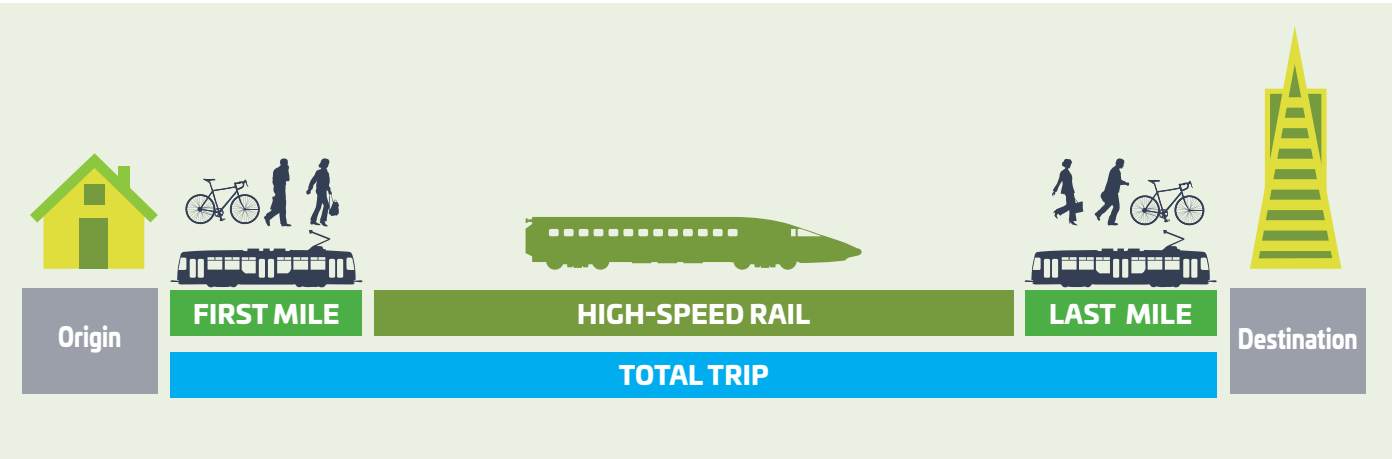
DID YOU KNOW?

First- and last-mile projects are designed to make it easy for passengers to walk, bus or bike to high-speed rail stations.

High-speed rail will provide a clean, energy-efficient mode of transportation to handle the core, or middle, of a person's journey from origin to destination.

Access improvements and parking are focal points for early discussion and investment. We are mindful of delivering the necessary parking infrastructure to advance development, while prioritizing walking, biking and transit over single occupancy vehicle use.

Exhibit 26: End-to-End Journey Solution



ENGAGING COMMUNITIES

We recognize that trust and support are vitally important to what we do. Engaging our many stakeholders from a federal, statewide and local community level provides us with invaluable insight and helps inform and strengthen our decisions. We value community meetings and open houses as opportunities to gather comments and feedback from those communities that may be directly affected by the high-speed rail program.

Engaging with communities and stakeholders enables us to incorporate unique community values and priorities into our project plans and helps to improve community benefits while considering the collective rights of local communities. For example, community meetings on aesthetics have enabled local preferences for unique landmarks to be included in the infrastructure design.

Statewide, we partner with more than 200 local community organizations and elected officials to provide community engagement and public outreach as ways to educate and inform the public about the high-speed rail program.

2B TOT LOT | 4 COMMUNITY GARDENS | 6 DOGPARK | 7 BIOSWALE | 8 GARDENS | 9 11 12 TRAIL | 13 AMPHITHEATER

CASE STUDY

SMALL BUSINESS

Making the Most of Community Engagement

Santa Ana-based Cornerstone Studios, Inc. (CSI) is a certified Disadvantaged Business Enterprise (DBE) that is increasingly becoming a role model in community engagement for designing public places. The architectural firm is responsible for identifying locations for green open spaces, parks and recreation hubs between Burbank and Los Angeles/Anaheim.

Cornerstone designed a park to be constructed in Glendale at a location where houses and storage facilities currently stand near the Glendale Metrolink Station and the proposed high-speed rail alignment. In addition to playgrounds and picnic areas, this park design includes an open play area, jogging and bike trails, landscaped and community gardens, an amphitheater/gathering place, and a dog park/run. The community wanted this park to be environmentally-friendly and of use to future generations to come.

Cornerstone's design includes bioswales, minimal pavement, drought tolerant or native plants, smart irrigation systems, use of recycled water, enhanced groundwater recharge techniques through porous pavements, and water filtering of runoff.

Renie Wong, owner of Cornerstone, explains her vision for the parks:

"Los Angeles is not as green as it can be. I would like to propose more parks and open spaces around the high-speed rail alignment. This will make the city more livable, and it will contribute to a more sustainable planet. In the future, we can link these parks and green spaces with trails and bike paths to facilitate a greener mode of transportation."

We promote public participation through various outreach methods, including, but not limited to:

- Engaging people within their own communities and during existing meeting schedules.
- Participating in public involvement activities (meetings, hearings, advisory groups, workshops and task forces) to help the community understand the project, identify community interests and needs, eliminate misperceptions, and define project goals.
- Hosting tables or booths at community-based events.
- Partnering with community-based organizations that serve underrepresented populations, and minority and women business organizations.
- Encouraging public comments at monthly Board of Directors meetings and quarterly Business Advisory Council meetings.
- Streaming live webcast of the monthly Board of Directors meetings.
- Maintaining a toll-free hotline that includes multiple language options.
- Encouraging collaboration between diverse groups of community leaders.

Exhibit 27: Community Outreach

	2017
Open Houses and Community Meetings	40
Attendees	953
Events in Disadvantaged Communities	15

Along with engaging communities, partnering with the public, stakeholders and oversight agencies is critical to the success of the high-speed rail program. We recently created a new leadership position to focus on stakeholder involvement. The Deputy Director of External Affairs works collaboratively with the regional directors from the north, central valley and south regions, providing a centralized focus on addressing stakeholder interests and concerns related to potential project effects.

The Deputy Director of External Affairs oversees and directs the Authority's public and stakeholder-related activities to ensure consistency and accuracy of information as well as the efficient operation of these functions internally and across the state.

Key topics and issues often raised through stakeholder engagement include:

- Cost;
- Schedule;
- Alignment choices; and
- Compliance with enabling legislation.

These issues are addressed through the publication and regular updates of project information on the Authority website; presentations; information sharing at open-house sessions; responses to information requests; providing technical reports and background data related to business plan development; and specialized reports, including the small business and jobs reports.

CONNECTING EXISTING TRANSPORTATION SYSTEMS

The high-speed rail program is delivering benefits now through early investments in bookend and connectivity projects tied to California's existing urban and state passenger rail systems. These early investments will allow the high-speed rail system to connect with those systems, creating an integrated rail network that will offer a viable alternative to vehicle and air travel.

We will continue to collaborate on these and other projects and continue to coordinate our work with the California State Transportation Agency as it awards state funding to local and regional rail partners. We will look for opportunities to deliver benefits in shared corridors to ensure the highest value for our future integrated services.

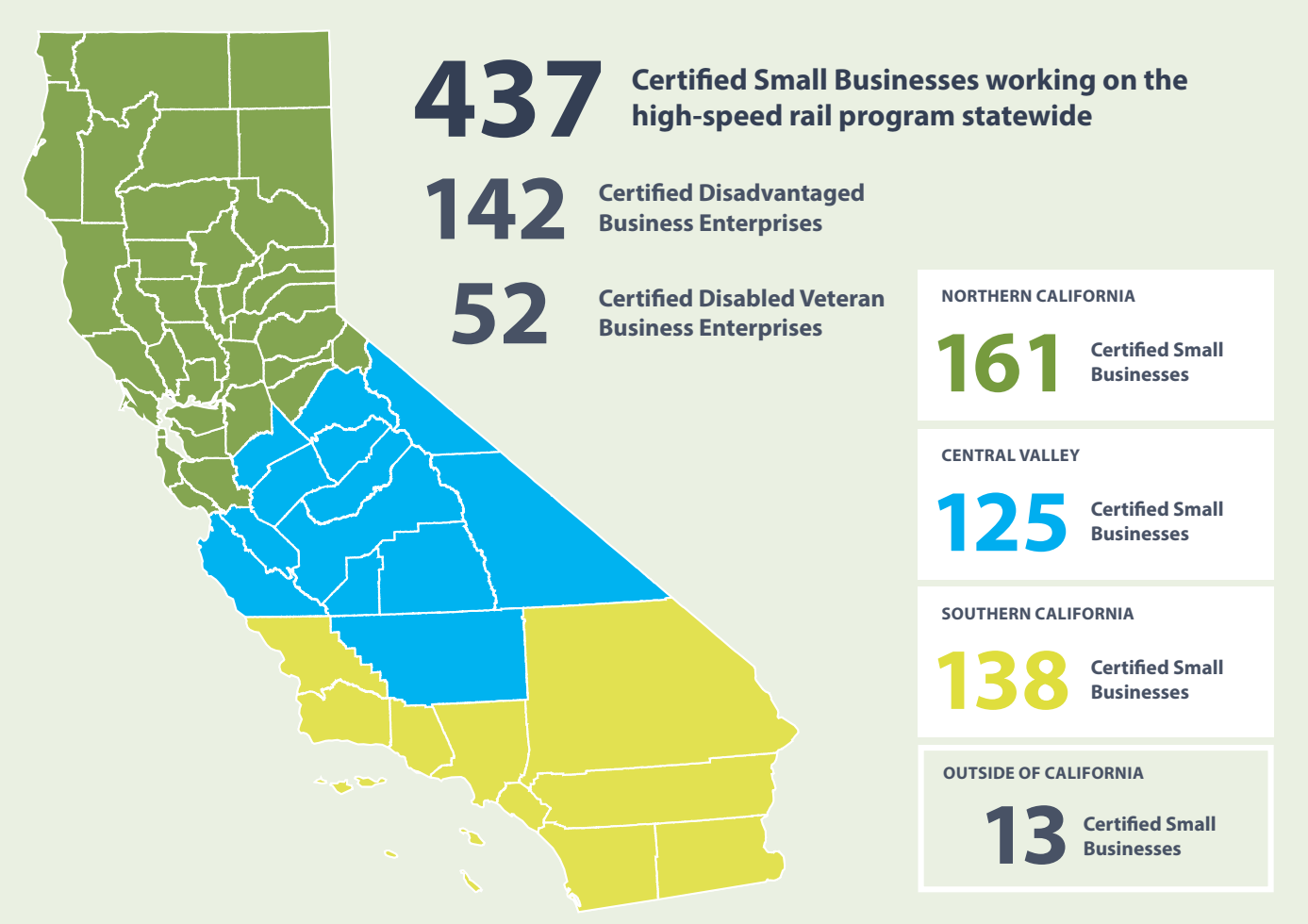
This coordinated strategy will address the state's most heavily congested urban passenger rail corridors in Northern and Southern California. The goal is to ensure significant, near-term direct benefits from expanded capacity, service frequency and reliability, with added benefits of improved safety, air quality and goods movement.

SMALL BUSINESS PROGRAM

We are committed to ensuring that small businesses play an active role in building the high-speed rail program. We created a Small Business Program, spearheaded by our Small Business Advocate, to guide our efforts to meet our aggressive 30 percent small business participation goal. This goal includes 10 percent participation for Disadvantaged Business Enterprises (DBE), and 3 percent for Disabled Veteran Business Enterprises (DVBE) and Micro-Businesses (MB).

For more information, see the Small Business Program page on our website at ***http://www.hsr.ca.gov/Programs/Small_Business.***

Small Business Participation
As of March 21, 2018

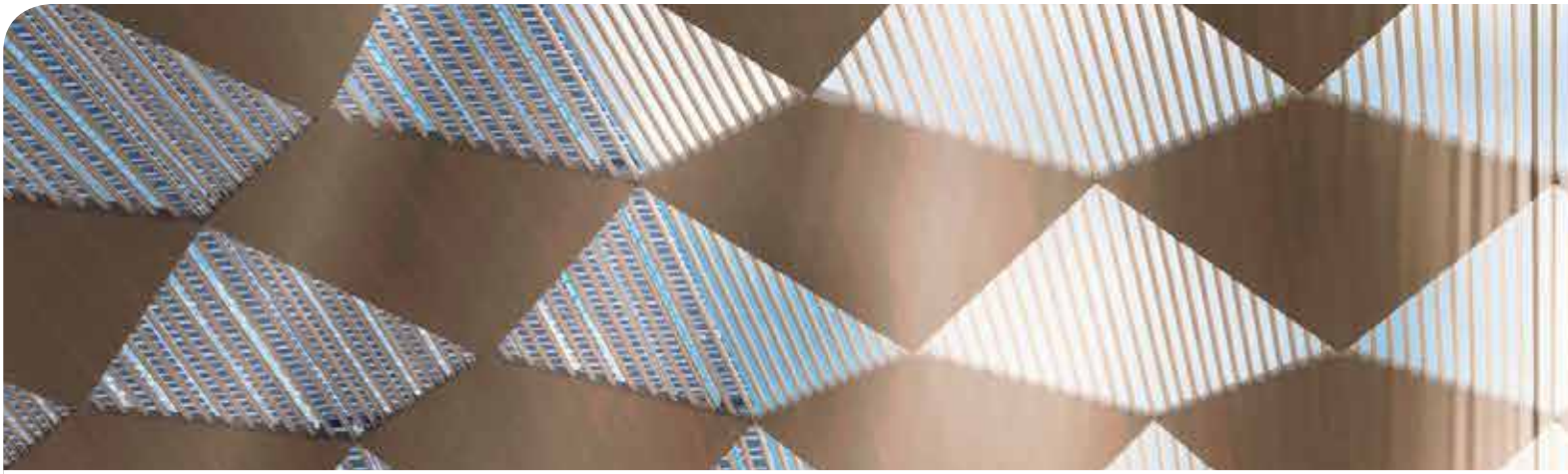


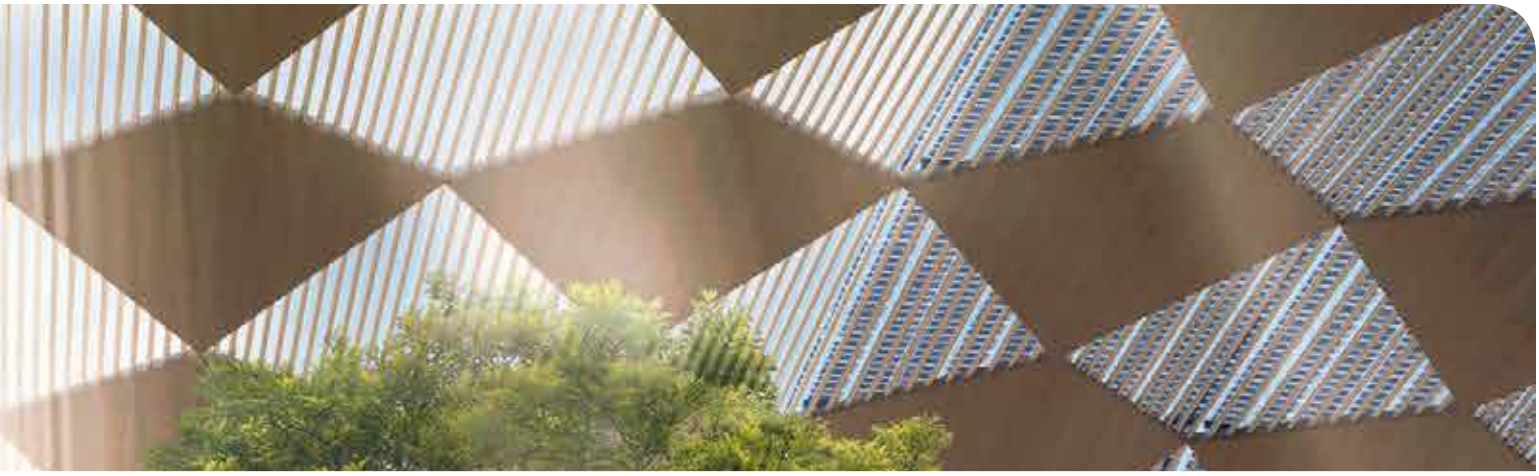
ENGAGING SUPPLIERS

Our Small Business Program goals also apply to our supply chain. Initiatives within the supply chain extend the benefits of the program to local businesses and suppliers, and procurement policies and practices are designed to benefit local, small and disadvantaged businesses. We also monitor the environmental impacts of the purchases we make, and we engage suppliers through procedures, guideline specifications and contract documents to ensure that high-speed rail procurements meet our sustainability criteria.

In 2017, we also participated in several national workshops and meetings for major construction materials suppliers to raise awareness of our priorities and goals related to disclosure and environmental quality for materials.

We also took part in the State of California Cohort Benchmarking exercise managed by the Sustainable Purchasing Leadership Council. We learned where our policies and procedures are making an impact and compared our performance against other state agencies.





Closing Notes

MOVING FORWARD

This report highlights the progress we made in 2017 toward advancing our sustainability policies and commitments.

In 2018, we are working to take an even more integrated and holistic approach, including:

- Revising our Sustainability Implementation Plan, which details how we continue to align sustainability actions and policy with our evolving organizational structure.
- Convening an internal Sustainability Committee to ensure that we integrate sustainability with our actions and activities as we implement the 2018 Business Plan in concert with the 2018 Program Baseline.
- Continuing to assess the risks and opportunities to the sustainability, adaptability and resiliency of the system we are developing, which is vital for delivery of robust, reliable service.
- Finalizing a Sustainability Dashboard with metrics that will supply timely information on our actions and progress.
- Providing continuing transparency through quarterly reporting on sustainability metrics to the Board of Directors.
- Improving how we monitor and evaluate construction impacts by continuing our deployment of the EMMA 2.0 management system to increase timeliness, accuracy, validity and efficiency of our reporting.
- Advancing the high-performance design of our system that will deliver operational cost savings for facilities on the Silicon Valley to Central Valley Line.
- Coordinating with our partners to make concurrent investments that can have early benefits to communities and the environment while also laying the foundation for future high-speed rail operations.
- Identifying an action plan and convening an internal, multidisciplinary working team to continue to advance our demonstrated leadership in sustainable procurement.
- Actively managing sustainability of project materials and activities through our procurement strategy.
- Using our partners (Rail Delivery and Early Train Operator) to leverage worldwide best practices in sustainability, climate adaptation and resiliency.
- Reaching out and listening to external stakeholders to identify social, environmental and economic shocks and stressors that could diminish the resiliency of the system and, consequently, negatively affect priority communities.

All of our actions and activities in 2018 are guided by the recognition that delivering high-speed rail to California is critical to our state's success in achieving its far-reaching policies to address climate change, develop clean energy, curb air pollution and greenhouse gas emissions and protect endangered species. Our goal is also to help spur continued economic prosperity and greater economic opportunity for all Californians as we transition to a sustainable, low-carbon future.

WHO WE ARE

The California High-Speed Rail Authority (Authority) is responsible for planning, designing, building and operating the first high-speed rail system in the nation.

California high-speed rail will connect the megaregions of the state, contribute to economic development and a cleaner environment, create jobs, and preserve agricultural and protected lands. When complete, trains will run from San Francisco to the Los Angeles basin in under three hours at speeds capable of exceeding 200 miles per hour. The system will eventually extend to Sacramento and San Diego, totaling 800 miles and up to 24 stations. In addition, the Authority is working with regional partners to implement a statewide rail modernization plan that will invest billions of dollars in local and regional rail lines to meet the state's 21st century transportation needs.

The Authority is headquartered in Sacramento, California, and operates in the United States of America. The Authority is a California state agency established pursuant to the California High-Speed Rail Act (SB 1420, Chapter 796 of the California Statutes of 1996) to develop and implement high-speed intercity rail service. It is located under the California Department of Transportation (CalSTA) under Transportation Secretary Brian Annis. There were no significant changes in the Authority's structure or ownership during the reporting period.

GOVERNANCE

The Authority's Board of Directors was established in 2003 by California Public Utilities Code 185020 to oversee the planning, construction and operation of the high-speed rail system. During 2017, it consisted of nine members: five members appointed by the governor, two members appointed by the Senate Committee on Rules and two members appointed by the speaker of the Assembly.

Each Board member represents the entire state and serves a four-year term. There is a Board Chair and currently a Vice-Chair. During 2017, the Board included five men and four women.[4] In 2016, Governor Brown signed AB 1813, which added two non-voting, ex-officio members to the Board. Both positions were filled in 2017.

OUR VALUES

SAFETY

COLLABORATION

EXCELLENCE

DIVERSITY

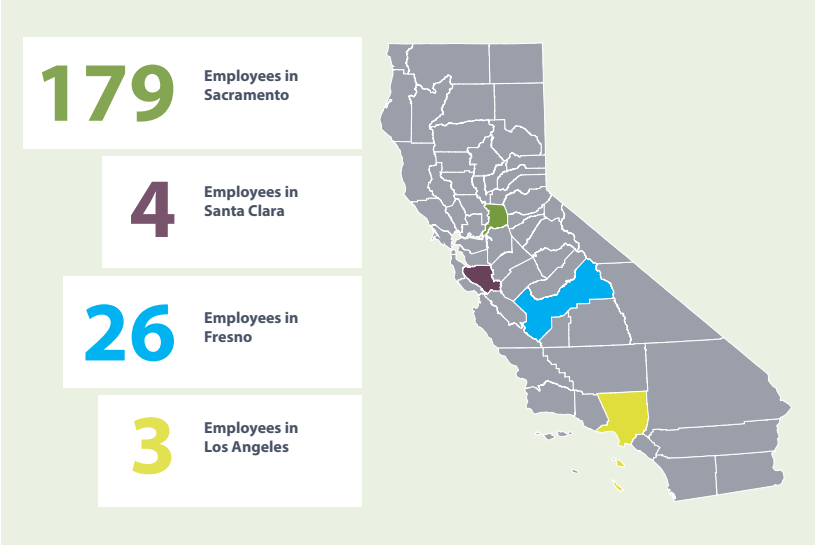
INNOVATION

SUSTAINABILITY

Exhibit 28: 2017 Employee Breakdown by Gender and Seniority[5]

ROLE	MALE	FEMALE
Confidential Employees	0	1
Exempt Employees	13	9
Managerial Employees	30	16
Supervisory Employees	20	26
Rank and File Employees	42	55
Total Employees	**105**	**107**

Exhibit 29: 2017 Employee Breakdown by Region



The Board of Directors is responsible for setting policy directives, and for developing and approving the Authority's key policy documents, including business plans, financial plans and strategic plans. The Authority's Chief Executive Officer and Authority staff report directly to the Board of Directors on ongoing program issues.

The Board of Directors also maintains several sub-committees dedicated to overseeing specific aspects of the high-speed rail program, including the:

- Executive/Administrative Committee
- Finance and Audit Committee
- Operations Committee
- Transit-Land Use Committee

The California State Legislature provides oversight and monitoring of the program through the annual budget cycle and through committees specifically tasked with review of and monitoring of the Authority and progress on the project. The Legislature also receives, biannually, a report on progress (odd years), and a business plan in alternative years (even years).

OUR TEAM

As of December 31, 2017, we had 212 employees on staff, including full-time employees, retired annuitants, part-time employees, student assistants and employees on loan from other state agencies. During the reporting period, the only significant variation in staff numbers was due to the addition of new staff and turnover. In 2017, the Authority hired 57 new employees, for a new hire rate of 27 percent.[6] There was a turnover rate of 27 percent for 2017. The Authority also includes a significant number of private sector consultants integrated with state employees.

We provide state employees with training opportunities designed to increase job proficiency and career advancement with the goal of promoting a capable, efficient and service-oriented workforce. This is done by developing employee's skills and abilities through training programs that meet Government Code Section 19995 and the Authority's Policy Directive POLI-HR-21, entitled Employee Training Policy, and signed in June 2014.[7]

Our policies are consistent with the California Department of Human Resources policies and laws.

OUR SUPPLY CHAIN

We are responsible for procuring services, contractors and materials, as well as coordinating the delivery of the high-speed rail program. Our supply chain includes suppliers providing materials, as well as consultants and contractors providing design and construction services to build the high-speed rail system, with many of these businesses being locally based in California.

Details of supply chain expenditures are available online via the Finance and Audit Committee materials webpage at ***http://www.hsr.ca.gov/Board/monthly_fa_committee_meeting.html***. The outputs of this work include the physical infrastructure (e.g., rail, trains and stations), as well as outcomes of cleaner air, transit-oriented development and a highly-connected California.

Appendices

GRI G4 CONTENT INDEX

This index allows GRI report users to quickly find the disclosure information they are seeking. The GRI indicators listed correspond to the information that the Authority's stakeholders noted was important to disclose. Common to many initial reports, and consistent with the majority of GRI reports, the information presented here was not subject to third-party verification or external assurance. The Authority may consider verification or external assurance of future reports as the high-speed rail program advances.

GENERAL STANDARD DISCLOSURES

STRATEGY AND ANALYSIS	SECTION	EXTERNAL ASSURANCE
G4-1 CEO statement	Message from the CEO, p. 6-7	No
ORGANIZATIONAL PROFILE		
G4-3 Organization name	Who We Are, p. 51	No
G4-4 Primary brands, products, services	Who We Are, p. 51	No
G4-5 Location of headquarters	Who We Are, p. 51	No
G4-6 Number and names of operating countries	Who We Are, p. 51	No
G4-7 Nature of ownership and legal form	Who We Are, p. 51	No
G4-8 Markets served	Who We Are, p. 51	No
G4-9 Organization scale	Business & Management, p. 20-22; Who We Are, p. 52	No
G4-10 Employee demographics	Who We Are, p. 52	No
G4-11 Percentage of employees covered by collective bargaining agreements	Business & Management, p. 24	No
G4-12 Supply chain description	Who We Are, p. 52	No
G4-13 Significant changes during the reporting period	Who We Are, p. 51	No
G4-14 Precautionary approach	Sustainable Infrastructure, p. 40	No
G4-15 External charters and principles endorsed	Our Sustainability Approach, p. 12	No
G4-16 Association memberships	Our Sustainability Approach, p. 12	No
IDENTIFIED MATERIAL ASPECTS AND BOUNDARIES		
G4-17 Entities included in the organization's consolidated financial statements	About this Report, p. 8	No
G4-18 Process for defining report content	Materiality Assessment, p. 13-15	No
G4-19 Material Aspects	Materiality Assessment, p. 14-15	No
G4-20 Aspect Boundaries within the organization	Materiality Assessment, p. 15	No
G4-21 Aspect Boundaries outside the organization	Materiality Assessment, p. 15	No
G4-22 Restatements	About this Report, p. 8	No
G4-23 Significant changes from previous reporting in Scope and Aspect Boundaries	About this Report, p. 8	No
STAKEHOLDER ENGAGEMENT		
G4-24 Stakeholder groups engaged	Materiality Assessment, p. 13; Engaging Communities, p. 45-46	No
G4-25 Basis for stakeholder identification and selection	Materiality Assessment, p. 13-14; Engaging Communities, p. 45-46	No
G4-26 Approach to stakeholder engagement	Materiality Assessment, p. 13-14; Engaging Communities, p. 45-46	No
G4-27 Key topics and concerns raised through stakeholder engagement	Stakeholder Engagement, p. 46	No
REPORT PROFILE		
G4-28 Reporting period	About this Report, p. 8	No
G4-29 Date of most recent previous report	About this Report, p. 8	No
G4-30 Reporting cycle	About this Report, p. 8	No
G4-31 Contact	About this Report, p. 8	No
G4-32 'In accordance' option chosen	About this Report, p. 8	No
STRATEGY AND ANALYSIS		
G4-33 Policy and practice on seeking external assurance	About this Report, p. 8	No

GOVERNANCE		
G4-34 Governance structure	Governance, p. 51-52	No
ETHICS AND INTEGRITY		
G4-56 Values, principles, standards and norms of behavior	Our Sustainability Approach, p. 10-13	No

SPECIFIC STANDARD DISCLOSURES

MATERIAL ASPECT	DMA & INDICATORS	SECTION	OMISSIONS	EXTERNAL ASSURANCE
ECONOMIC PERFORMANCE	G4-DMA Generic Disclosure on Management Approach	Business & Management, p. 18-20	No	No
	G4-EC4 Financial assistance received from government	Business & Management, p. 20; Performance, p. 59	No	No
INDIRECT ECONOMIC IMPACTS	G4-DMA Generic and Specific Disclosure on Management Approach	Business & Management, p. 18-19, p. 21-24	No	No
	G4-EC7 Development and impact of infrastructure investments and services supported	Business & Management, p. 18-24; Station Communities, Ridership & Community Benefits, p. 43-47	No	No
	G4-EC8 Significant indirect economic impacts, including the extent of impacts	Business & Management, p. 18-19, 21-24; Station Communities, Ridership & Community Benefits, p. 43-47	No	No
PROCUREMENT PRACTICES	G4-DMA Generic and Specific Disclosure on Management Approach	Station Communities, Ridership & Community Benefits, p. 47; Who We Are, p. 52	No	No
	G4-EC9 Proportion of spending on local suppliers at significant locations of operation	Business & Management, p. 24; Performance, p. 59	No	No
ENERGY	G4-DMA Generic and Specific Disclosure on Management Approach	Energy, p. 25-27	No	No
	G4-EN3 Energy consumption within the organization	Energy, p. 27; Quantification Methodologies, p. 58; Performance, p. 61	No	No
WATER	G4-DMA Generic Disclosure on Management Approach	Natural Resources, p. 34	No	No
	G4-EN8 Total water withdrawal by source	Natural Resources, p. 34; Quantification Methodologies, p. 58; Performance, p. 61	Yes	No
	G4-EN9 Water sources significantly affected by withdrawal of water	Natural Resources, p. 34	No	No
BIODIVERSITY	G4-DMA Generic and Specific Disclosure on Management Approach	Natural Resources, p. 34-36	No	No
	G4-EN13 Habitats protected or restored	Natural Resources, p. 34-36; Performance, p. 61	No	No
EMISSIONS	G4-DMA Generic and Specific Disclosure on Management Approach	Natural Resources, p. 28-33	No	No
	G4-EN15 Direct greenhouse gas (GHG) emissions (scope 1)	Natural Resources, p. 30, p. 32; Quantification Methodologies, p. 58; Performance, p. 61	No	No
	G4-EN16 Energy indirect greenhouse gas (GHG) emissions (scope 2)	Natural Resources, p. 30, p. 32; Quantification Methodologies, p. 58; Performance, p. 61	No	No
	G4-EN17 Other indirect greenhouse gas (GHG) emissions (scope 3)	Natural Resources, p. 30, p. 32; Quantification Methodologies, p. 58; Performance, p. 61	No	No
	G4-EN19 Reduction of greenhouse gas (GHG) emissions	Natural Resources, p. 29-30; Quantification Methodologies, p. 58; Performance, p. 60-61	No	No
	G4-EN21 NOx, SOx, and other significant air emissions	Natural Resources, p. 33; Quantification Methodologies, p. 58; Performance, p. 61	No	No
EFFLUENTS AND WASTE	G4-DMA Generic Disclosure on Management Approach	Sustainable Infrastructure, p. 38	No	No
	G4-EN23 Total weight of waste by type and disposal method	Sustainable Infrastructure, p. 38; Quantification Methodologies, p. 58; Performance, p. 62	No	No
COMPLIANCE	G4-DMA Generic Disclosure on Management Approach	Business & Management, p. 19	No	No
	G4-EN29 Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations	Business & Management, p. 19	No	No

MATERIAL ASPECT	DMA & INDICATORS	SECTION	OMISSIONS	EXTERNAL ASSURANCE
SUPPLIER ENVIRONMENTAL ASSESSMENT	G4-DMA Generic and Specific Disclosure on Management Approach	Station Communities, Ridership & Community Benefits, p. 43, p. 47	No	No
	G4-EN32 Percentage of new suppliers that were screened using environmental criteria	Station Communities, Ridership & Community Benefits, p. 47	No	No
EMPLOYMENT	G4-DMA Generic and Specific Disclosure on Management Approach	Business & Management, p. 21-24; Who We Are, p. 52	No	No
	G4-LA1 Total number and rates of new employee hires and employee turnover by age group, gender, and region	Who We Are, p. 52	Yes	NO
OCCUPATIONAL HEALTH AND SAFETY	G4-DMA Generic and Specific Disclosure on Management Approach	Sustainable Infrastructure, p. 37, p. 39-42	No	No
	G4-LA6 Type of injury and rates of injury, occupational diseases, lost days, and absenteeism, and total number of work-related fatalities, by region and by gender	Sustainable Infrastructure, p. 42; Performance, p. 62	Yes	No
TRAINING AND EDUCATION	G4-DMA Generic Disclosure on Management Approach	Who We Are , p. 52	No	No
	G4-LA9 Average hours of training per year per employee by gender, and by employee category	Who We Are , p. 52	Yes	No
DIVERSITY AND EQUAL OPPORTUNITY	G4-DMA Generic Disclosure on Management Approach	Business & Management, p. 21-24; Who We Are, p. 52	No	No
	G4-LA12 Composition of governance bodies and breakdown of employees per category according to gender, age group, minority group membership, and other indicators of diversity	Who We Are, p. 51-52	Yes	No
LOCAL COMMUNITIES	G4-DMA Generic and Specific Disclosure on Management Approach	Station Communities, Ridership & Community Benefits, p. 43-46	No	No
	G4-SO1 Percentage of operations with implemented local community engagement, impact assessments, and development programs	Station Communities, Ridership & Community Benefits, p. 43-46	No	No

GLOSSARY

Biodiesel: A diesel replacement fuel made from new and used vegetable oils or animal fats that have been chemically reacted with an alcohol.

Black Carbon: A component of fine particulate matter. It is produced from the incomplete combustion of fossil fuels and biomass burning, particularly from older diesel engines and forest fires. Black carbon warms the atmosphere by absorbing solar radiation, influences cloud formation and darkens the surface of snow and ice, which accelerates heat absorption and melting. Diesel particulate matter emissions are a major source of black carbon and are also toxic air contaminants.

CALGreenCode: The California Green Building Standards Code is Part 11 of the California Building Standards Code, and defines and encourages sustainable construction practices for residential and non-residential buildings.

Carbon Offsets: Emissions reductions that have been made by an entity and retained or sold to a different entity that seeks to reduce its impact.

Criteria Air Pollutants: Six common air pollutants regulated by the US Environmental Protection Agency due to their potentially harmful human health and environmental impacts. These pollutants include particulate matter, ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides and lead.

Direct GHG Emissions: Emissions from sources that are owned or controlled by the reporting entity.

Indirect GHG Emissions: Emissions that are a consequence of the activities of the reporting entity, but occur at sources owned or controlled by another entity.

Disadvantaged Community: Distinguished by higher risk of environmental hazards and/or lower socioeconomic status.

Disadvantaged communities are the target of some high-speed rail programs. Criteria the California Environmental Protection Agency uses to identify disadvantaged communities include but are not limited to:

- Areas disproportionately affected by environmental pollution and other hazards that can lead to negative public health effects, exposure or environmental degradation.
- Areas with concentrations of people that are of low income, high unemployment, low levels of home ownership, high rent burden, sensitive populations, or low levels of educational attainment.

Environmental Product Declaration (EPD): A standardized statement summarizing environmental impacts throughout the product life-cycle. EPDs may include information about global warming potential, ozone depletion, acidification, eutrophication, smog or other environmental impact areas.

Greenhouse Gas (GHG): Greenhouse gases trap energy in the atmosphere and are the primary driver of climate change and global warming. The United Nations Intergovernmental Panel on Climate Change ($IPCC_2$) defines six gases under this category: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs – a family of gases), fluorocarbons (PFCs – another family of gases) and sulfur hexafluoride (SF_6). Carbon emissions are measured in the unit "carbon dioxide equivalent" (CO_2e) and expressed in metric tonnes ($MTCO_2e$).

Leadership in Energy and Environmental Design (LEED®): LEED® certification provides independent, third-party verification that a building, home or community was designed and built using strategies aimed at achieving high performance in the following key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection and indoor environmental quality.

Net-Zero Energy: Refers to a facility or system that produces as much energy as it uses over the course of a year (or other defined period).

Particulate Matter (PM): An air pollutant made up of extremely small particles and liquid droplets. Small particles 10 micrometers (PM10) in diameter or less can be inhaled into the lungs, causing serious respiratory and circulatory health effects. Smaller particles of 2.5 micrometers (PM2.5) in diameter or less are also a significant contributor to haze. A component of particulate matter called black carbon can disrupt climate patterns.

Photovoltaic (PV): Technology using semiconductor material to convert sunlight into electricity. Power is produced when sunlight strikes the semiconductor material and creates an electric current.

Post-consumer Recycled Content: A material or finished product that has served its intended use and has been discarded for disposal or recovery, having completed its life as a consumer item.

Pre-consumer Recycled Content: Material diverted from the waste stream following an industrial process that is capable of being reclaimed within the same process.

Reactive Organic Gases: Carbon-based gases (excluding carbon monoxide and carbon dioxide) that can react with other chemicals and light to produce smog and ozone.

Recycling: Material recovery from the solid waste stream for use in the manufacture of new products.

Renewable Energy: Energy resources such as wind power or solar energy that can be produced indefinitely without being depleted.

Senate Bill 375 (Steinberg, 2008): SB375 sets regional targets for greenhouse gas emissions reductions and requires cities and counties to address GHG reductions through a Sustainable Communities Strategy in the regional transportation plan.

Sustainability: The capacity to endure. Sustainable thinking recognizes how current decisions affect the capacity of current and future generations to lead healthy and rewarding lives.

Sustainable Transportation: Modes of transportation that does not rely on the use of fossil fuels.

Vehicle Miles Traveled (VMT): The total number of miles traveled by vehicles in a given geographic boundary over a specific time.

QUANTIFICATION METHODOLOGIES

Values reported in 2018 Sustainability Report are quantified according to the following methodologies:

ENERGY

Office energy consumption is estimated from the number of Authority employees and consultants, along with the average energy intensity and occupant density of LEED®-certified buildings. Electricity consumption is converted from kilo-BTU (kBTU) to kilowatt hours (kWh) using a conversion factor from EPA Climate Leaders GHG Inventory Protocol, Appendix 2: Unit Conversions.

Fuel consumption is tracked for construction activities, and is converted from gallons to gigajoules (GJ) using conversion factors from EPA Climate Leaders GHG Inventory Protocol, Appendix 2: Unit Conversions.

GHG EMISSIONS

We take the operational control approach to quantifying GHG emissions, and we have adopted 2015 as the baseline year for reporting on emissions changes over time. GHG emissions are quantified using methodologies consistent with the GHG Protocol Corporate Standard, ISO 14064, California Air Resources Board methodologies and U.S. Environmental Protection Agency (EPA) models. All relevant greenhouse gases are included.

Scope 2 GHG emissions are calculated from annual electricity consumption, and emissions factors sourced from the U.S. EPA (2016) and eGRID for California (CAMX).

Scope 3 emissions from contractor vehicles are calculated using EMFAC2011 emissions rates from the California Air Resources Board.

Scope 3 emissions avoided through materials recycling are calculated using the amount of construction materials recycled and the EPA Waste Reduction Model (WARM).

Anticipated GHG emissions reductions during systems operations are calculated according to the methodology available online at: ***www.arb.ca.gov/cci-resources***.

All greenhouses gases relevant to the activities are included (CO_2, CH_4, N_2O). Reductions are reported relative to a scenario without high-speed rail, rather than relative to a baseline year. Emissions reductions occur as a result of the service provided by high-speed rail, so are classified as scope 3 emissions reductions.

AIR POLLUTANT EMISSIONS

Air pollutant emissions from construction vehicles are calculated using the methodology and EMFAC2011 emissions rates from the California Air Resources Board.

Criteria pollutants are the most significant air pollutants related to human health and environmental impacts. Other categories of air emissions, such as persistent organic pollutants, volatile organic compounds and hazardous air pollutants, are not quantified.

WATER

Office water consumption is estimated from the number of Authority employees and consultants, along with the average water intensity and occupant density of LEED®-certified buildings. Construction water consumption is tracked and reported.

WASTE

Waste and recycling information is collected from contractors and tracked using an online data tool. Waste generation and disposal weights are recorded from records received from recycling and waste treatment facilities. Diversion rates are calculated by dividing the weight of materials diverted (through recycling, reuse and stockpiling) by the total materials weight.

JOB CREATION

Hours worked data come from certified payroll submissions while the number of workers is based on monthly submittals from prime contractors in compliance with the National Targeted Hiring Initiative (NTHI).

PERFORMANCE

BUSINESS AND MANAGEMENT

Funding and Investment

	2016	2017
Total Invested	$2.3 billion	$3.5 billion
Investment in California Firms/Workers	94%	97%
Federally Funded Investment	70%	70%

Dispatched Workers by Construction Package

	2016	2017
Dispatched Workers - CP 1	1,089	1,239
Dispatched Workers - CP 2/3	257	318
Dispatched Workers - CP 4	106	142

Construction Hours by Construction Package

	2016	2017
Construction Hours - CP 1	666,033	539,547
Construction Hours - CP 2/3	59,638	60,032
Construction Hours - CP 4	8,219	8,627

Creating Opportunities for Disadvantaged Workers and Fostering Diversity

	2017
Construction Workers Dispatched	1,699
Disadvantages Workers Dispatched	149
Small Business Participants - Total	427
Disadvantaged Business Enterprises (DBE)	139
Disabled Veteran Business Enterprises (DVBE)	51
Small Businesses Located in Disadvantaged Communities	115
Local Procurement (U.S.-based businesses)	Nearly 100%
Expenditures in Disadvantaged Communities (FY 16/17)	Nearly 60%

ENERGY

Energy Consumption

PRIORITY	2016	2017	UNITS
Office Energy Consumption	1287	1431	Megawatt hours
Off-Road Diesel Consumption	172,684	276,556	Gallons
On-Road Diesel Consumption	26,665	54,524	Gallons
On-Road Gasoline Consumption	203,304	383,994	Gallons
Energy Content of Fuel Consumed	55,800	98,846	Gigajoules

NATURAL RESOURCES

Projected Annual GHG Emissions Avoided ($MMTCO_2e$)

YEAR	LOW	HIGH
2030	.26	.32
2040	1.2	1.4
2050	1.3	1.5
2079	1.7	1.9

* The greenhouse gas emissions reduction scenarios reflect the ridership range expressed in the 2018 Business Plan. Ridership is expressed as both a medium case, and a 75 % percentile, which provides the low and high emissions scenarios.

Projected Cumulative GHG Emissions Avoided: Tailpipe ($MMTCO_2e$)

YEAR	LOW	HIGH
2030	.45	.55
2040	9.3	11
2050	21.5	25.5
2079	64.3	75.9

Projected Cumulative GHG Emissions Avoided: Well-to-Wheels*

PROJECTED ANNUAL GHG EMISSIONS AVOIDED ($MMTCO_2e$)		
YEAR	LOW	HIGH
2030	.56	.69
2040	11.5	13.8
2050	26.7	31.7
2079	80.8	96.1

*We have consistently reported the projected GHG emissions avoided through mode shift to high-speed rail service, using a quantification method developed with the California Air Resources Board. This method relies on an emissions factor for gasoline, diesel and jet fuel that is limited to the tailpipe emissions. https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/hsra_hsr_finalqm_16-17.pdf

For this sustainability report, we also analyzed the avoided emissions by assigning an emissions factor that illustrates the full lifecycle impacts of the fuels used for transportation; electricity, gas, diesel and jet fuel. Using this analytic technique enables all fuel types to be evaluated on equal terms. For this chart, "well-to-wheels" emissions factors were obtained from GREET and applied to the fossil fuel auto and air fleet. A lifecycle emissions factor was also applied to the electricity required for system operation.

Greenhouse Gas Emissions Emitted and Avoided in Metric Tons of Carbon Dioxide Equivalent ($MTCO_2e$)

	2016	2017
Office Energy Emissions: Scope 2	381	344
Contractor Vehicle Emissions: Scope 3	4,282	6,795
Recycling Emissions Avoided	19,774	51,665
Bookend & Connectivity Emissions Avoided	142,519	142,519

Criteria Air Pollutant Emissions (Construction Fleet) - Emitted and Avoided

	2016		2017	
	Emissions (Lbs)	Emissions Avoided	Emissions (Lbs)	Emissions Avoided
Nitrogen Oxide	23,024	-51%	20,944	-70%
Reactive Organic Gases	1,715	-58%	2,441	-59%
Particulate Matter	1,082	-60%	1,467	-61%
Black Carbon	833	-60%	1,130	-61%

Voluntary Emissions Reduction Agreements (VERA)

	2016	2017
VERA Offsets: Total Lifetime Emissions in tons	1,006	1,369
VERA Investment - $ million	9	13
VERA Equipment - Tractors	46	82
VERA Equipment - Trucks	104	161
VERA Equipment – School Bus		1

Water Consumption (in Gallons)

	2016	2017
Office Water Use	1,317,600	1,464,480
Construction Water Use	14,500,000	31,207,986

Habitat and Agricultural Land Preservation (in acres)

	2016	2017
Habitat Preserved and Restored	2,000	2,510
Agricultural Land Approved for Conservation	1,200	1,200
Agricultural Land Secured	—	273

2016 and 2017 Recycling and Reuse (in tons)

	2016*	2017
Recycled/Reused Concrete	70,414	64,489
Recycled/Reused Asphalt	10,544	38,802
Recycled Mixed Metals	1,284	3,311
Recycled Wood	513	361
Recycled Organics	2	2,306
Mixed Recycling	4,088	11,063
Materials Landfilled	327	326
Recycled Concrete and Metal	99.9%	100%
Recycled Other Materials	98.2%	99.4%
Overall Recycling Rate	99.6%	99.7%

* Recycling and reuse information for 2016 has been revised to include materials handled between January 1 and December 31, 2016, to create a comparable baseline for consistent annual reporting. Values previously reported for 2016 included additional information up to the preparation and publication of that previous Sustainability Report.

Worker Health & Safety

	2016	2017	CALIFORNIA HEAVY & CIVIL CONSTRUCTION INDUSTRY 2016
INJURY RATE*			
Injury Rate - CP1	1.12	1.76	-
Injury Rate - CP2/3	-	-	-
Injury Rate - CP4	N/A	-	-
Injury Rate - Overall Weighted Average	0.54	1.1	4.5
LOST DAYS RATE			
Lost Days Rate - CP1	0.37	0.7	-
Lost Days Rate - CP2/3	-	-	-
Lost Days Rate - CP4	N/A	-	-
Lost Days Rate - Overall Weighted Average	0.18	0.44	2.8
FATALITIES			
Total Fatalities	0	0	55

*Reported as rate per 200,000 hours of work.

STATION COMMUNITIES

Table 1. Community Outreach

	2016*	2017**
Open Houses and Community Meetings	85	40
Attendees	6,000	953
Events in Disadvantaged Communities	130	15

*2016 saw an increase in meetings related to construction as several sites came online. Work continued on those sites in 2017, but no new meetings were required.

**Although outreach in 2017 was ongoing, we held fewer large-scale community meetings and open houses, due to our focus on other areas of the program.

FOOTNOTES

1. Details of the emissions reduction calculation methodology are available online at: http://www.hsr.ca.gov/docs/programs/green_practices/HSR_Reducing_CA_GHG_Emissions_2013.pdf. All greenhouses relevant to the activities are included (CO_2, CH_4, N_2O). Reductions are reported relative to a scenario without high-speed rail, rather than relative to a baseline year. Emissions reductions occur as a result of the service provided by high-speed rail, so are classified as scope 3 emissions reductions.
2. Fatal occupational injuries by selected characteristics, by major event or exposure, California, US Bureau of Labor Statistics, 2016
3. Vision California; "Charting Our Future: Statewide Scenarios Report", May 2010. https://www.hsr.ca.gov/Programs/Green_Practices/sustainability.html
4. Board member diversity is not reported by age or minority group.
5. Employee diversity is not reported by age or minority group.
6. New hire and turnover rates are not reported by age group, gender or region.
7. Training hours are not reported for 2016.

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