

California High-Speed Rail

Sustainability Report

December 2016





**LEADING THE WAY IN
CLEAN CONSTRUCTION**

In 2015, 99 percent of the approximately 44,000 tons of construction-related waste produced at our construction sites was recycled.

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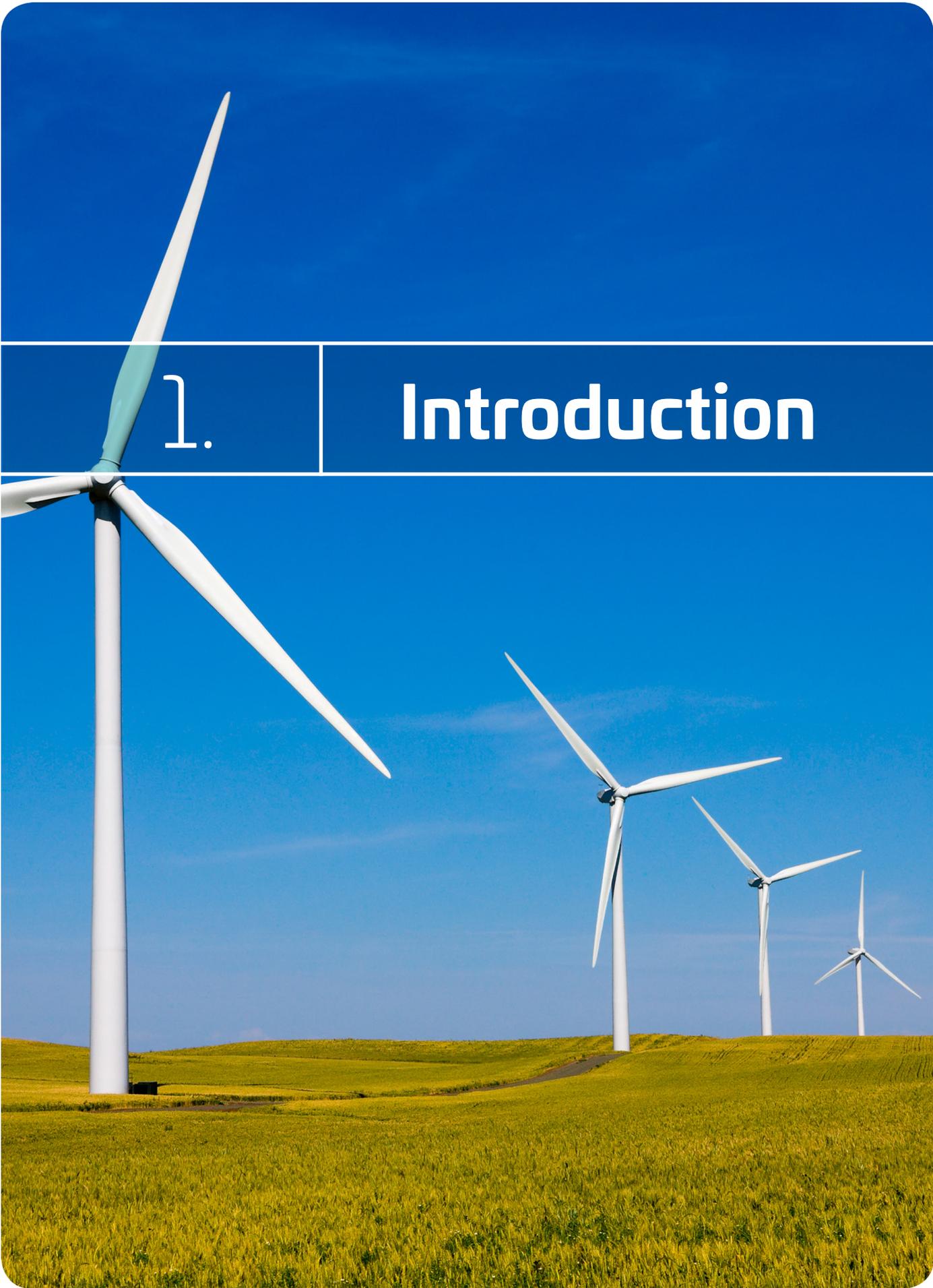
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1.

Introduction

Letter from the CEO

It is my pleasure to present the California High-Speed Rail Authority's first Sustainability Report.

Each year, this report will provide an opportunity for us to share our progress and performance in this area over the past 12 months, and reflect on the opportunities and challenges we face going forward. We are proud of the progress we are making toward building a high-speed rail program that will deliver a new high-quality, zero-emissions transportation option that benefits generations of Californians to come.

The high-speed rail program is one of the most significant initiatives to be implemented in California over the last several decades. Our goal is to be the greenest infrastructure project in the Nation, both in construction and operations. The scale of the project enables both the opportunity and the responsibility to drive change in the supply chains for construction materials and the planning for 21st century infrastructure in California's cities. As we move ahead to deliver on that goal, we are committed to listening to the needs of our stakeholders and ensuring that California benefits from the program every step of the way. Together, we have identified key areas where we are making a positive difference:

- ▶ Reducing greenhouse gas emissions and other air pollutants in the short and long-term
- ▶ Spearheading construction best practices to improve delivery for all California infrastructure projects
- ▶ Creating jobs for the hardest hit sectors and places in the state
- ▶ Working to ensure that disadvantaged communities benefit from the delivery of the system
- ▶ Working with local communities to plan compact, pedestrian-friendly development around our stations
- ▶ Preserving land and protecting the environment
- ▶ For a summary of our other priorities, refer to the Executive Summary

I'm very proud that, in **2016**, we were included in the first international assessment of the environmental, social and governance (ESG) performance of infrastructure assets and real estate portfolios. This assessment was conducted by a group of global infrastructure investors, representing \$1.5 trillion in assets, who are developing a benchmarking tool to provide transparency for investors to make informed decisions regarding which projects and programs demonstrably contribute to infrastructure that is low-carbon, climate resilient and socially inclusive.

This report outlines many of the ways in which we are addressing priorities, such as our community benefits agreement, jobs training program, small business workshops, environmental sustainability and construction activities. But bringing about change is not something one agency, company, industry, government or stakeholder group can do alone. We can achieve much more when we work together to create the California of tomorrow. We are excited to be a key part of that collective effort, and hope you will join us in building a more sustainable future.



Jeff Morales
Chief Executive Officer



"High-speed rail is the most sustainable transportation option for keeping California moving in the 21st Century. It is integral to supporting the State's leading sustainability and climate change policies."



Executive Summary

California High-Speed rail is taking a sustainable approach to the design, construction, and operation of the nation's first high-speed rail system. For us, sustainability leadership is a responsibility that reflects California's historically progressive approach to protecting the environment, advancing social equity, and achieving long-term economic prosperity. We take this responsibility seriously so that *all* Californians will benefit from it.

As the high-speed rail system is built, expanded and integrated with other rail systems around the state, more access and connections will be made possible. Increasing numbers of Californians will choose to switch from driving and flying to traveling by train – *on* trains powered by renewable energy with net-zero emissions. This type of “mode shift” typically occurs when high-speed rail is introduced into travel markets where there is high demand for travel, as is the case between California's major population and employment centers. By 2040, the system will reduce vehicle miles traveled by car in the state by almost 10 million miles every day.

In building the system, we are employing innovative and leading edge construction methods to make the program a national model for sustainable delivery. It will not only meet the needs of future generations of Californians, it is already providing immediate benefits now to communities where it is constructed.

We are making significant progress in delivering the system. In 2015, we:

- ▶ Hosted the official groundbreaking ceremony for the system in Fresno
- ▶ Started a new wave of environmental review and public outreach from San Francisco to Anaheim
- ▶ Partnered with Caltrans to use its QuickMap system to alert the public and public-safety officials of construction-related roadway impacts to keep traffic moving and reduce emissions from idling engines
- ▶ Began construction on the Fresno River Viaduct, our first aerial structure
- ▶ Entered into station and area planning agreements with the Cities of Bakersfield, Palmdale, Merced, and Burbank
- ▶ Awarded a design-build contract for a Construction Package 2-3 the largest construction package we have awarded to date and received proposals for Construction Package 4, both in the Central Valley
- ▶ Collaborated with the California Railroad Museum to open a high-speed rail exhibit to educate and inform the public of the benefits of high-speed rail

Since then we have:

- ▶ Extended active construction at 7 key construction sites along the alignment in the Central Valley
- ▶ Signed a Memorandum of Understanding to support grade separations in the Peninsula corridor and funding for the Caltrain Corridor Electrification Project
- ▶ Adopted the 2016 Business Plan which identified the Silicon Valley to the Central Valley Line as the initial segment for passenger service
- ▶ Signed a Memorandum of Understanding with the California Energy Commission to help explore the latest in green technology and renewable energy

A Transformative Investment in California's Future

High-Speed Rail is connecting and transforming California by delivering an integrated statewide rail modernization program – in partnership with the state, as well as with regional and local partners – with high-speed rail at its core. Linking high-speed rail with intercity and metropolitan rail systems will significantly improve mobility and connectivity throughout the state as it grows to 50 million people. This modern rail network will:

- ▶ Connect all of California's major economic and population centers like never before
- ▶ Keep California competitive in the global economy
- ▶ Shape and revitalize our cities and communities
- ▶ Protect our environment, reduce criteria air pollutants and greenhouse gas emissions, and create a more sustainable future

Building high-speed rail requires a significant commitment of resources. We are committed to following sustainable principles and ensuring that we use these resources responsibly. Through our net-zero commitment, we will limit and offset criteria pollutant emissions and tailpipe greenhouse gas emissions from construction activities. We are also committed to operate the system on renewable energy.

"High-Speed Rail along with statewide rail modernization will move the greatest number of people while minimizing impacts to the natural and built environments and encourage pedestrian-friendly land development around high-speed rail stations. High-speed rail is integral to helping manage major pressing issues such as climate change, traffic and airport congestion, and energy independence."

– Dan Richard, Board Chair

DELIVERING THE SYSTEM

Our 2016 Business Plan laid out our plan for sequencing the system:

- ▶ Delivering initial passenger service on the Silicon Valley to Central Valley Line by 2025
- ▶ Making concurrent investments in the Burbank-Anaheim rail corridor
- ▶ Connecting to Merced, San Francisco and Bakersfield as soon as possible
- ▶ Completing the Phase 1 system between San Francisco/Merced and Los Angeles/Anaheim by 2029

The vehicle miles traveled and air trip savings data presented in this report reflects this sequencing timeline.

Report Information

Board of Directors

Dan Richard

Chair

Thomas Richards

Vice Chair

Lou Correa

Daniel Curtin

Bonnie Lowenthal

Lorraine Paskett

Michael Rossi

Lynn Schenk

Jeff Morales

Chief Executive Officer

To ensure that this report is transparent and presents meaningful information in a credible and consistent way, the Global Reporting Initiative (GRI) Reporting Guidelines – the world’s leading and most widely adopted sustainability reporting framework – was used.

This report is written in accordance with the Global Reporting Initiative (GRI) G4 Core Reporting Guidelines. It covers the period from January 1, 2015 to December 31, 2015 and will be updated on an annual basis. This report also includes highlights and available data for **2016**, as noted in the text and exhibits. The contents of this first report have not been externally assured.

Please send all feedback to info@hsr.ca.gov

Any printed original version of this report will be printed on 30% post-consumer paper, bound with (recycled) bindery material, and delivered to the California State Legislature. To minimize paper use and preserve natural resources, we encourage the sharing of any printed copies and/or the reading this document online. Please print additional copies only when necessary.



What Matters Most

California high-speed rail will meet mobility, economic development, and climate mitigation needs of the present without compromising the future. California High-Speed Rail is the State of California agency responsible for delivering the system which includes engaging with stakeholders and communities, procuring contractors, maintaining and enhancing the natural and built environment, positively influencing economic development, and ensuring financial performance. We report on these and other aspects of the program through a variety of methods and a range of indicators to demonstrate how we are delivering on these broad goals. This report describes our work to advance and achieve our sustainability objectives.

In 2014, we carried out a materiality assessment to ensure that we report on what matters most to our stakeholders¹. The assessment validated our existing sustainability priorities and provided clarity on how to respond to increasing requests for information related to our environmental, social, and economic activities, in addition to our traditional financial reporting. To identify a list of stakeholders to help us conduct this assessment, we used three criteria which were based on the extent to which each stakeholder group:

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

To conduct 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 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

STAKEHOLDERS ENGAGED 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 for Planning and Research**
- ▶ **Greenlining Institute**
- ▶ **Los Angeles County Metropolitan Transportation Authority**
- ▶ **Southern California Association of Governments**
- ▶ **US Army Corps of Engineers**
- ▶ **US Department of Transportation**
- ▶ **US Environmental Protection Agency**



Exhibit 1.1: California High-Speed Rail Authority Material Aspects



- Energy
- Sustainable Infrastructure
- Business Management
- Community & Ridership
- Natural Resources

This extensive review revealed environmental, social, and economic impacts that matter most to our stakeholders which are shown in Exhibit 1.1. We recognize that while some of these impacts occur internally (for example, our office energy use), many also have far-reaching effects external to our own operations

(for example, running the system on renewable energy). 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 1.2.

Exhibit 1.2: 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)

Our Sustainability Approach

Our approach to sustainability ensures actions taken today enable current and future generations to lead healthy and rewarding lives. To focus our efforts, we developed a Sustainability Framework through consultation with and input from key state and federal partners, and our Board of Directors. Exhibit 1.3 shows our priorities from our Sustainability Framework and the short and long-term objectives we have identified to achieve them. Many of these align with topics identified as important during our materiality assessment.

Exhibit 1.3: California High-Speed Rail Authority's Sustainability Framework

PRIORITY	OBJECTIVES
<p>Energy</p> 	<ul style="list-style-type: none"> 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)²
<p>Natural Resources</p> 	<ul style="list-style-type: none"> 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
<p>Sustainable Infrastructure</p> 	<ul style="list-style-type: none"> 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
<p>Station Communities & Ridership</p> 	<ul style="list-style-type: none"> Provide convenient station access to all high-speed rail station areas Design and construct stations and infrastructure that reinforce Sustainable Community Strategies (Senate Bill 375³) 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
<p>Business & Management</p> 	<ul style="list-style-type: none"> 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

INTERNATIONAL UNION OF RAILWAYS: RAILWAY CLIMATE RESPONSIBILITY PLEDGE



The worldwide railway community is aware that a shift towards sustainable transport is essential to achieve the internationally agreed goal of limiting climate change to a rise in average global temperature of no more than 2 degrees Celsius.

The rail sector is the most emissions efficient transport mode, but as a major transport mode we acknowledge our responsibility and that further improvement is needed. This pledge sets out ambitious but achievable goals for the sectors contribution towards the solution to climate change.

As a member of the worldwide community of railway operators and infrastructure managers, we commit to take a leading role in the actions to prevent climate change, by reducing our carbon footprint and supporting a shift towards a more sustainable balance of transport modes. In order to achieve this,

The Authority pledges to:

1. Reduce specific energy consumption and CO₂ emission, and through this contribute to the “UIC Low Carbon Rail Transport Challenge” and its global 2030/2050 targets, presented in 2014 at the UN Climate Summit;
2. Stimulate modal shift to rail in national and international markets, by working in partnership with key stakeholders;
3. Actively communicate climate-friendly initiatives undertaken by our work during the year 2016 and beyond, in order to raise awareness, acceptance and recognition of the role of sustainable transport as a part of the solution to climate change;
4. Report data on our specific energy consumption and CO₂ emissions to UIC on a regular basis, in order to promote and demonstrate the continuous improvement of railway sector at international level.

For more information http://www.uic.org/com/uic-e-news/475/article/negotiators-arrive-in-paris-by?page=thickbox_eneus



The following sections of this Sustainability Report are organized around these priorities.

California High-Speed Rail plays an active part in advancing sustainability through the California State Transportation Agency (CalSTA) and through its contribution to state plans and initiatives. We have also forged new and innovative industry partnerships that ensure we provide a state-of-the art high-speed rail system. Through these partnerships, we are involved with a number of leading initiatives including:

- ▶ American Public Transportation Association (APTA): an industry organization whose mission is to strengthen and improve public transportation through advocacy, innovation and information sharing. Through participation in APTA’s sustainability commitment, we have committed to a core set of actions that enhance sustainability.
- ▶ International Union of Railways (UIC): the worldwide professional association representing the railway sector and promoting rail transport. In August 2015, the Authority has signed onto the UIC’s Railway Climate Responsibility Pledge. (See call out at left)

In 2016, we participated in the newly-launched GRESB Infrastructure Assessment, and assessed the project using other sustainable infrastructure rating systems such as Envision as well as other sustainable infrastructure assessment metrics.

GRESB is a global framework for assessing the sustainability performance of real assets. In 2016, GRESB Infrastructure was launched to provide a systematic assessment, objective scoring, and peer benchmarking for environmental, social, and governance (ESG) performance of infrastructure companies and funds. The Authority was amongst the first entities to participate in this Assessment, demonstrating our commitment to setting a new standard in sustainable high-speed rail. Results of this assessment will rank us against peers on environmental, social and governance policies, practices, and performance.





2.

Delivering Sustainable High-Speed Rail



⚡ ENERGY

DESIGNING NET-ZERO ENERGY STATIONS

We are committed to using clean energy efficiently. All of our stations will be high performance buildings certified using Leadership in Energy & Environmental Design (LEED®). Each will be designed to be net-zero energy, meaning it will, over the course of a year, produce at least as much energy on-site as it consumes. Energy supply may come from integrated photovoltaics and solar thermal applications. Good passive solar and energy efficiency design will also reduce energy demand.

Above and beyond those efforts, we are working with local jurisdictions to determine where it is feasible for excess energy created at our stations to feed into local district energy systems. This could allow our stations to share excess energy with adjacent buildings. Working towards net-positive energy facilities means helping adjacent developments and our local partners also reach important milestones for renewable energy.

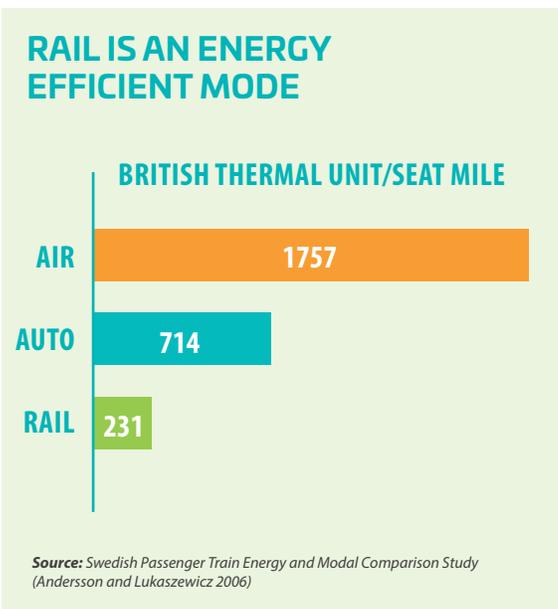
COMMITTING TO RENEWABLE ENERGY

We have committed to using 100 percent renewable energy to operate our trains and facilities. Over the past several years, we have worked with state partners, such as the California Energy Commission (Energy Commission), to better understand the use and availability of renewable energy to supply the system's needs over the life of the project. Energy Commission analysis of state renewable energy data and trends illustrates that California's abundance of renewable energy resources provides sufficient accessible capacity beyond what is needed for California's renewable portfolio standard (RPS) to meet the relatively small demand needed to operate the high-speed rail program. We are also working with the California Public Utilities Commission (CPUC), the California Independent System Operator (CAISO) and local utilities to reinforce the transmission connections to the rail system and strengthen those grid connections.

In **2016**, the Authority will finalize a renewable energy policy which will detail our strategy and implementation plan for achieving our renewable energy goal as well as further collaboration with the Energy Commission.

"High speed rail, powered by 100% renewable energy, will help California lead the way to a clean energy future"

— David Hochschild
Commissioner
California Energy Commission



ENERGY USE IN AUTHORITY OFFICES

We occupy energy-efficient office spaces with metered lighting and computer monitors with automatic shut off functioning. We estimate that, in 2015, our total office energy consumption amounted to approximately 1,036 MWh⁴. This consumption, which represents electricity used to power computers, lights, and heating and cooling, is consistent with other California agencies with offices in LEED certified buildings.

ENERGY USE FOR CONSTRUCTION

In early 2015, we broke ground on construction of the high-speed rail system in the Central Valley and in 2016 construction over 100 miles is under way. Fuel consumption is from vehicles and equipment being monitored and reported throughout the construction process.

In 2015, equipment used to build high-speed rail burned nearly 267,000 gallons of diesel and gasoline fuel, consuming approximately 37,000 GJ of energy⁵. This equals the annual energy use of approximately 250 homes.

Exhibit 2.1: 2015 Construction Equipment Fuel Summary

FUEL TYPE	2015 CONSUMPTION
Diesel – Off-Road Equipment	26,816 gallons
Diesel – On-Road Equipment	116,947 gallons
Gasoline – On-Road Equipment	122,807 gallons

▶▶ As we procure our high-speed rail trains we require best in class energy efficiency



REGULATORY COMPLIANCE

All California high-speed rail systems and facilities are or will be subject to the following energy-related policies, laws, 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
- ▶ California Long-term Energy Efficiency Strategic Plan
- ▶ Memorandum of Understanding between the Authority and the California Energy Commission



POLICIES



LAWS



**REGULATORY
GUIDELINES**

▶▶ High-speed rail supports and shapes compact, sustainable land use that leads to substantially reduced GHG emissions

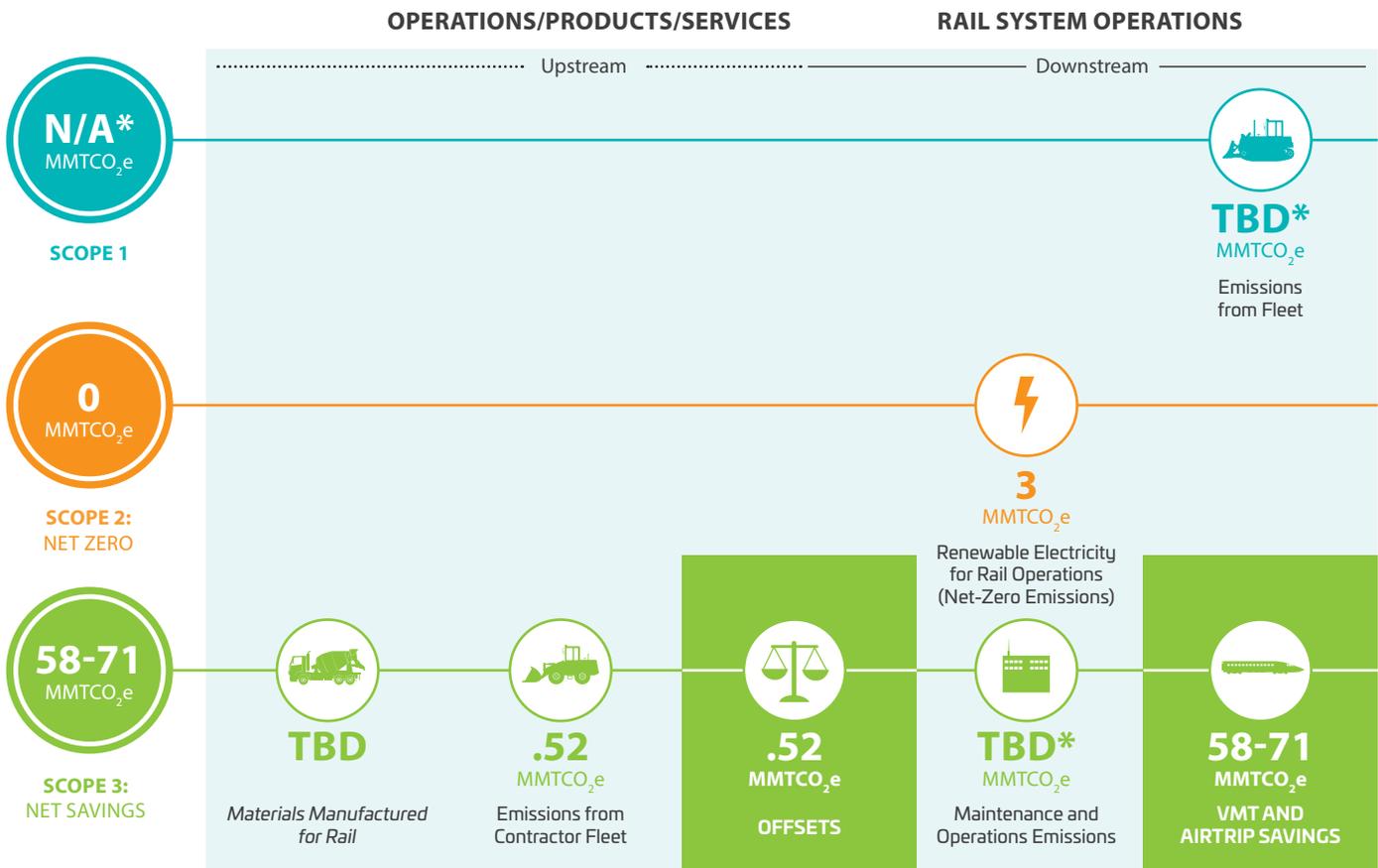


NATURAL RESOURCES

MAXIMIZING GREENHOUSE GAS (GHG) EMISSIONS REDUCTIONS

The State of California is at the national forefront in establishing targets for reducing greenhouse gas emissions and transitioning to a sustainable, low-carbon future. The high-speed rail system will be the backbone of modernized, electrified rail transportation in California. As such, it plays a crucial role in California's ambitious plan to reduce statewide greenhouse gas emissions to 1990 levels by 2020 as embodied in the California Global Warming Solutions Act (Assembly Bill 32) and further reducing these emissions to 40 percent below 1990 levels by 2030 (Executive Order B-30-15 and SB 32). By 2030, high-speed rail is projected to have cumulatively avoided between approximately 2.1 and 2.8 million metric tons of GHG emissions, equivalent to taking half a million cars off the road for one year. While this represents a significant contribution to California's GHG emission reduction goals, it is only the tip of the iceberg in terms of the total impact that high-speed rail will have. High-speed rail will act as a catalyst to more transit and pedestrian-oriented, less auto-dependent land use. More specifically, the synergy between a modern, statewide rail network, with high-speed rail as its backbone, will catalyze more compact land use patterns, the combined effect of which will be even greater reductions in GHG emissions.

Exhibit 2.2: Emissions Generated by Scope: 2015 - 2075



*Operations planning is ongoing and data will be recorded when available. Scope 1 emissions are likely to be captured under Maintenance and Operations.

GHG emissions associated with the program come from a number of sources, including direct emissions from fuel burned in construction vehicles and equipment, indirect emissions from electricity consumed in offices and for operation of the train, and indirect emissions from materials used in construction. Opportunities to reduce emissions include fuel and energy conservation; recycling and reusing steel, concrete and other materials; specifying materials with lower global warming potentials; the use of renewable energy; and direct offset projects such as planting tree, increasing transit service and capturing methane. Exhibit 2.2 summarizes the sources of GHG emissions and savings over time. Exhibit 2.3 provides greater detail on the GHG emissions for 2015, including the amounts, the types of gases involved, and the methodologies used for calculations.

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
- ▶ **2016** Senate Bill 32 requiring the 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
- ▶ Air Resources Board 2008 Scoping Plan and 2013 Scoping Plan Update which identifies 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 (Com. On Budget, Chapter 36, and Statutes of 2014): Greenhouse gases: emissions reduction

In 2015, the Authority emitted 307 MTCO₂e from energy use in our offices and also accounted for 1,400 MTCO₂e of upstream emissions from contractor vehicle fuel use in our GHG inventory. We look for opportunities to avoid emissions, such as through materials recycling. The Authority will adopt 2015 as its baseline year when reporting on reductions in emissions from these sources. We take an operational control approach to reporting our emissions.

GHG EMISSIONS FROM CONSTRUCTION

The Authority’s approach to GHG management begins with minimizing emissions, as shown on Exhibit 2.4. As with any infrastructure project, equipment is required for construction. To minimize the resulting GHG emissions, each construction phase will adhere to strict guidelines implemented through contract provisions governed by the Authority’s Policy Directive Poli-Plan-03 titled, “Sustainability Policy”. This policy includes spe-

▶▶ Over 12,000 metric tons of GHG emissions were avoided by recycling construction materials in 2015 – over 7 times our annual emissions footprint



Exhibit 2.3: 2015 GHG Emissions Summary



SCOPE 1



SCOPE 2
INDIRECT EMISSIONS:
Office Electricity



SCOPE 3
UPSTREAM SERVICES:
Contractor Vehicles

METHODOLOGIES AND ASSUMPTIONS

Electricity Emissions Factor: US EPA, 2012, eGRID; 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; Emissions avoided through recycling calculated based on EPA Waste Reduction Model (WARM)

This analysis included carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆).

ENVIRONMENTAL PRODUCT DECLARATIONS

In 2015, we added a provision to our contract for Construction Package 4 (CP 4) requiring the contractor to submit Environmental Product Declarations (EPDs) for steel and concrete products. This provision is applicable in all future construction contracts, is unique among major infrastructure projects and supports California state policy on life-cycle impacts. EPDs will provide the Authority with the information necessary to select sustainable materials and monitor their collective environmental impact.

cific measures to decrease the Authority's indirect (scope 3) emissions associated with construction contractors, materials, and waste, such as:

- ▶ Minimizing GHG emissions through design requirements
- ▶ Achieving net-zero tailpipe GHG emissions in construction
- ▶ Requiring Environmental Product Declarations (EPDs) 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 life-cycle scores for major materials, including global warming potential, while maintaining durability and quality
- ▶ Adapting existing structures and facilities for reuse whenever feasible, and
- ▶ Integrating climate adaptation and resilience principles into the design, construction, and operation of the system.

Measuring what happens on site is critical for managing and improving the construction process. The Authority requires

contractors to track and report their use of on-site materials, fuel, water, and electricity, recycling and reuse volumes, as well as the type of on and off-road equipment, and hours or miles of operation. The Authority uses this information to inform subsequent construction procurement documents.

When construction began in 2014, the design-build contractors began submitting information about the sources and amounts of construction materials being used. Construction Package 1 (CP1) structures include durable concrete mix designs using 25 percent fly ash for cement and 100 percent recycled steel with global warming potential scores below industry average.

OFFSETTING CONSTRUCTION GHG EMISSIONS

To begin offsetting the direct (tailpipe) GHG emissions associated with constructing the initial segment of the high-speed rail system, the Authority is implementing a tree planting program in rural and urban areas of California.

We expect to plant hundreds of thousands of trees through our urban and

Case Study

Durable Materials Minimize Greenhouse Gases

The Authority has taken important steps through its policy and contract specifications to encourage suppliers of its major materials to minimize their life-cycle impact. Contractors are directed to explore using recycled materials, such as tire-derived aggregate, fly ash, and other aggregates during construction. In 2015, the average mix design for cast in place concrete had a 25% fly ash content. These materials are proven to meet the strength, durability, and maintenance performance requirements of high-speed rail passenger service. Durability is critical to minimizing life-cycle greenhouse gas impacts and enhancing system sustainability. For example, each day that the train does not run results in 2,700 to 3,600 tons of GHG emissions not saved (based on 2030 operations assumptions).



rural tree planting program. We will carry out this program in partnership with the California Department of Forestry and Fire Protection (CalFIRE) and will target communities that are in the vicinity of the rail system, with special focus on providing benefits to disadvantaged communities. In addition to further reducing GHG emissions, these trees will improve urban air quality and quality of life, reduce energy use and stormwater runoff, prevent soil erosion, and restore habitats.

Our rural tree planting program will also be carried out in partnership with CalFIRE. Native tree species will be planted on lands damaged by wildfires to restore natural ecosystems. In 2016, the CalFIRE agreement was finalized and the program is set to begin.

REDUCING GHG EMISSIONS THROUGH PASSENGER RAIL OPERATIONS

High-speed rail’s most significant contribution to sustainability may be its role in reducing California’s GHG emissions. The positive net impact of high-speed rail on GHG emissions is projected to average

at least 1.0 to 1.3 million metric tons of carbon dioxide equivalent per year (MMTCO₂e/year) at full system ridership in 2030. This estimate only reflects the diversions of choice riders from auto and air travel, and does not account for the additive effect of compact, infill development in station areas that the system is expected to catalyze. These projected emissions savings reflect our goal of delivering an interconnected, well-designed system that attracts riders and provides safe, reliable, fast travel between California’s population and employment centers. These savings also reflect our commitment to:

- ▶ Developing, building, and operating infrastructure designed to reduce energy consumption
- ▶ Selecting state-of-art energy-efficient high-speed rail trains
- ▶ Procuring renewable energy for system operations
- ▶ Producing renewable energy on Authority property

URBAN AND RURAL TREE PLANTING PROGRAM

California High-Speed Rail’s urban and rural tree planting program is unique not only in California, but among infrastructure projects nationally. Our urban tree planting program will target communities near the rail system and focus on providing benefits to disadvantaged communities



Exhibit 2.4: Minimizing Construction GHG Emissions

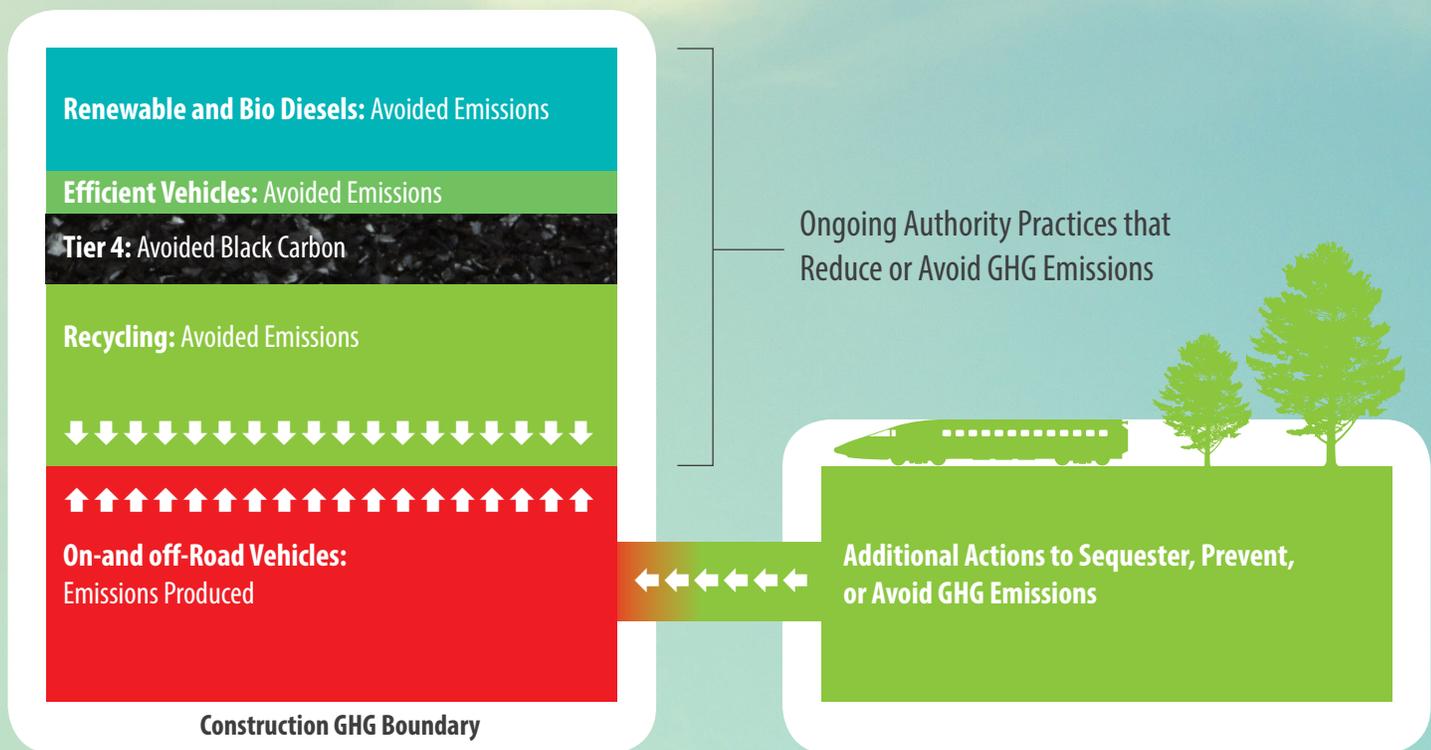


Exhibit 2.5: Forecast of Average Annual Savings for Key Milestones (MMTCO₂e)

	2025 FIRST YEAR OF SILICON VALLEY TO CENTRAL VALLEY SERVICE	2029-2040 PHASE 1 SERVICE	2041-2075 PHASE 1 SERVICE
High Scenario	0.17	1.3	1.8
Low Scenario	0.12	1.0	1.4

Exhibit 2.6: 2015 Forecast of Cumulative Savings (MMTCO₂e)

	2030	2040	2050	2075
High Scenario	2.8	16.8	32.5	71.84
Low Scenario	2.1	13.2	25.7	58.70

MODE SHIFT

Every person who takes high-speed rail would have otherwise taken a car or a plane for their trip. This is a substantial mode shift effect on long-distance travel in the state, and in keeping with international experience. When high-speed rail service is introduced in a travel corridor, many travelers pick it over other modes, like driving or flying because it offers a range of advantages. This is called "mode shift". Today, there are over 18,500 miles of high-speed rail and 1.6 billion annual passengers, with more being added every day. Japan has been operating high-speed rail service for over 50 years, France for the past 33 years, and Germany and Spain for the past 22 years. Service in those countries has continually expanded based on ongoing increases in demand and profitable operations.



To maximize this benefit, the system is being designed with the intent of eliminating GHG emissions from its operation. For example:

- ▶ Because operations emissions are largely a function of energy use, energy efficiency is a priority in the design of all facilities
- ▶ 100 percent renewable energy will be used for operations, including both off-site and on-site generation

Every mile traveled on high-speed rail would have been otherwise been taken in an automobile or an airplane. From the first year of operation, high-speed rail reduces emissions by reducing automobile vehicle miles traveled (VMT), and air trips. VMTs are the total number of miles

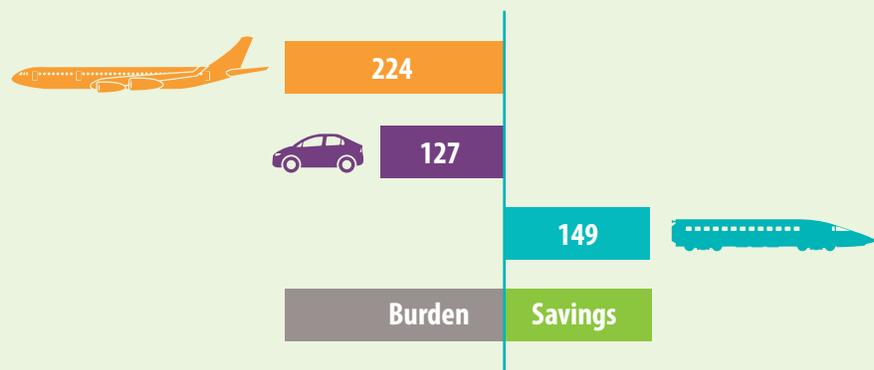
traveled by vehicles in a given geographic area. The emissions associated with these less efficient forms of travel will be significantly reduced.

Exhibit 2.5 and Exhibit 2.6 show forecasts for average annual emission savings and cumulative emission savings at key system implementation milestones as identified in our 2016 Business Plan. These emission savings forecasts are based on the ridership projections presented in the Business Plan, which include a high and low forecast. Estimated GHG emissions reductions are associated with lower VMT and fewer short-haul airplane flights between California's major cities.

Without high-speed passenger rail service in California, the vehicle miles traveled for

MODE COMPARISON

GRAMS OF CO₂ PER PASSENGER MILE*



*Grams per passenger mile were developed based on GHG emissions results developed from the VMT and Air Trip reduction outputs of the ridership and revenue model developed for the 2016 Business Plan. Load factors of 101 passengers per plane, 1.25 passengers per auto, and 265 passengers per train were used.

long distance trips in the state are projected to increase by approximately 11.7 billion miles – to 70 billion miles annually – between 2021 and 2040.

When high-speed rail service has been introduced in other countries, it has been shown to capture significant amounts of the travel market in major travel corridors. For example, within 10 years of beginning high-speed rail service between Madrid and Seville, the mode share for rail in that corridor increased from 16 percent to 61 percent between 1991 and 1994. In the United States, the Acela line, which provides a higher-speed rail service between Washington DC and Boston (although not true high-speed rail service), captures 75% of the travel market between New York and Washington, DC.

In the near-term, there will be GHG savings associated with early investments being made to upgrade regional rail systems as part of the integrated state-wide rail system, which are referred to as “bookend” and “connectivity” projects. Some of these projects will provide important connections to the high-speed rail system; others will lay the foundation for high-speed rail. By 2020, these investments, including the electrification of the Caltrain corridor in the Bay Area and the Rosencrans/Marquardt grade separation project in Southern California, are expected to reduce emissions by 142,519 MTCO₂e, as shown in Exhibit 2.7.

PROTECTING AIR QUALITY DURING CONSTRUCTION

Following best practices that maintain or improve air quality during construction, both for workers and people living in the air basin where the project is being constructed, is a requirement of Authority contracts.

The Authority has already minimized construction air quality emissions through the fleets used by contractors. Specifically, all contractors working on the high-speed rail system are required to use fleets that are compliant with California requirements and Tier 4 equipment that reduces the amount of criteria air pollutants released during construction. The fleets comply with stringent US Environmental Protection Agency (USEPA) limits on air pollutants to the extent that Tier 4 equipment is available. This requirement was unique among infrastructure projects and pushed the adoption and use of cleaner technology in California in advance of legislated requirements. The results in 2015 were a 49 percent reduction in nitrogen oxide, 41 percent reduction in reactive organic gases and particulate matter, and 42 percent reduction in black carbon compared to fleet averages. Reducing particulate matter emissions also mitigates the short-lived climate pollutant called “black carbon” by a further 180 pounds, improving air quality and reducing health risks.



TIER 4 EQUIPMENT

Off-road diesel equipment is regulated by both the US Environmental Protection Agency and the California Air Resources Board. USEPA sets strict emissions limits for equipment, requiring the major manufacturers to achieve specific reduction levels for criteria air pollutants – chemicals and particles that can affect human health and local air quality. Tier 4 equipment meets the strictest US standard, required to reduce emissions of Particulate Matter and Nitrogen Oxide by about 90%.

Exhibit 2.7: Examples of Bookend & Connectivity Project GHG Reductions (MTCO₂e)

PROJECT	GHG REDUCTION BY 2020
Caltrain Electrification (Bay Area)	79,319
Central Subway (San Francisco)	1,200
Regional Rail Connector (Los Angeles)	59,600
SCRIP Run Through Tracks	600
Southern California Grade Separations	1,800
TOTAL:	142,519

Exhibit 2.8: 2015 Fleet Criteria Pollutant Emissions

	CP 1 FLEET	TYPICAL FLEET	% DECREASE
Nitrogen Oxide (NOx) (lbs)	4,006	7,868	-49%
Reactive Organic Gas (ROG) (lbs)	549	940	-41%
Particulate Matter (PM) (lbs)	341	582	-41%
Black Carbon (lbs)	254	435	-42%

Exhibit 2.8 compares the emissions effect of this requirement on equipment fleets used in high-speed rail construction to the emissions from a typical construction equipment fleet.

Criteria pollutant emissions⁶ are quantified using the methodology and emissions factors agreed upon with the San Joaquin Air Pollution Control District per the Voluntary Emission Reduction Agreement (VERA).

VERA is an air quality agreement between the Authority and local jurisdictions responsible for clean air. Under a VERA, each ton of air pollutants emitted during construction of the high-speed rail system is offset within the local air quality district through programs that replace older, polluting equipment

such as agricultural pumps, diesel bus engines, and tractors with new, cleaner and more efficient equipment. The Authority's VERA program benefits local communities with new, efficient equipment while reducing air pollutants and providing immediate, tangible climate benefits.

Under a VERA, the design-build contractor for a given construction package submits a list of equipment, as well as the miles driven and hours used per piece of equipment. The Authority assembles this information into a quarterly report to the local air district along with a payment for the dollar value of the emissions. The air district then funds an offsetting project equal to the emissions, such as paying for the replacement of older diesel engines and farm equipment.

CASE STUDY

New Equipment Reduces Air Pollution

Using new equipment reduces emissions of criteria pollutants including nitrogen oxides, particulate matter, volatile organic compounds and reactive organic gases – and significantly improves local air quality over time. These pollutants contribute to smog and can aggravate respiratory diseases such as asthma. Our current construction contracts require that new equipment must be at least Tier 3, and is typically Tier 4, representing the most stringent limits on nitrogen oxide and particulate matter emissions.

In 2015, our first VERA agreement with the San Joaquin Air Pollution Control District provided offset subsidies to fund the purchase of 20 agricultural tractors, as well as new trucks and irrigation pumps. This equipment stays in the valley for its lifetime, long after construction ends.

“Our agreement will require high-speed rail to mitigate all construction emissions in the San Joaquin Valley by investing in emissions reduction projects throughout the Valley,” says Dave Warner of the San Joaquin Valley Air Pollution Control District.



To date, VERAs have been set up for Construction Package 1 and 2-3 with the San Joaquin Valley Air Pollution Control District, in the Central Valley, where construction is currently underway. VERA arrangements are planned for all parts of the system that are in districts where there is 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 ten most polluted cities in the United States in terms of air quality.

Through this agreement, in 2015, the San Joaquin Valley Air Pollution Control District offset 26 tons of criteria air pollutants for Construction Package 1.

Through April of 2016, the agreement with the Valley Air District has delivered 207 tons of total lifetime reductions of criteria air pollutant emissions. This was done through its Heavy-Duty Engine Program and results in lower levels of criteria air pollutants and black carbon.

CONSERVING WATER RESOURCES

As the drought continues, water scarcity remains a significant risk for Californians. The Authority plays an important role in promoting responsible water use and ensuring conservation is integrated into the design and construction of the high-speed rail system.

Water consumption for the high-speed rail program is governed by a range of federal, state, and local regulations. As construction extends into other parts of the state beyond the Central Valley, it will be governed by local regulations in Southern and Northern California. As of 2015, the statutes and regulations that the Authority is responsible for complying with included:

- ▶ Federal:
 - Clean Water Act of the United States
 - Section 10: Rivers and Harbors 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

▶▶ \$14 million investment in clean agricultural equipment to offset emissions



- ▶ Regional and Local:
 - Fresno County General Plan and Ordinances
 - Kern County General Plan and Ordinances
 - Metropolitan Bakersfield General Plan/Update and EIR

The Authority has established criteria for all of its 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, all Authority facilities will be designed and built using CalGreen Code for planning, procurement, design, construction, operations, and maintenance, including both its mandatory and voluntary sections.

Several stakeholders have expressed concerns that construction activities could be competing with California farmers for water, which is of particular importance in the Central Valley. To address these concerns, the Authority places 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.

The California High-Speed Rail is taking a proactive approach to protecting regional biodiversity and habitat. Regional Advanced Mitigation Planning (RAMP) provides a framework to mitigate the environmental impacts of infrastructure projects at a regional level in advance of construction. Through RAMP, infrastructure and natural resource agencies come together to understand potential impacts on a regional basis rather than at a project-by-project level, resulting in the preservation of more cohesive habitats. Planning for mitigation before construction helps to protect land before it is impacted, facilitates the project approvals process and provides more cost certainty for mitigation activities.



In 2015, the Authority adopted a Water Conservation Policy⁷. In addition, project-specific water conservation requirements were outlined in Book IV, Part C.8 Water Conservation Guidance of the Construction Package 4 Request for Proposal for Design-Build Services. The document outlined Water Conservation Categories based on the State of California's public drinking water resources at any given time and consists of mandatory requirements and conservation techniques for each category. Contractors are required to submit a Water Conservation Plan for construction which adheres to this guidance.

TRACKING WATER USE

OFFICE WATER CONSUMPTION

In 2015, water consumption by High-Speed Rail employees totaled 1,060,560 gallons⁸. The Authority's offices contain low-flow, automatic shut-off sink fixtures and low-flow toilets that minimize water use per person.

CONSTRUCTION WATER USE

In 2015, water consumption for Construction Package 1 totaled 2,571,153 gallons. This equals the annual water use for approximately 90 Californian residents, based on per capita water consumption data from the State Water Resources Control Board. This water was drawn from municipal water supplies. No water source is expected to be significantly affected by this use due to the relatively small volume required and the displacement of water use from the previous land use in the project footprint. In fact, for Construction Package 1, the Fresno firm Color Me Green is sourcing Earthguard, a waterless biodegrad-

able product for dust control and protecting against soil erosion from the Bakersfield firm Terra Novo.

Comprehensive Environmental Impact Reports (EIR) and Environmental Impact Statements (EIS) are being prepared for each project section of the system in compliance 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. To date, two project sections have been completed (Merced-Fresno and Fresno-Bakersfield) and the rest are underway. The EIR for the Fresno to Bakersfield section found that construction activities will use only six percent of the current water consumption along the corridor. Once construction is complete, this section will use less than two percent of the current water consumption for the project footprint. This represents a net decrease in water use.

MANAGING LAND USE

PRESERVING AGRICULTURAL LAND

The Authority is committed to working with local, state and federal agencies, and local stakeholders to develop a high-speed rail system that preserves California's open spaces and environmental resources.

On November 15, 2012, the Authority Board of Directors approved an agreement with the Department of Conservation (DOC) for implementing agricultural preservation. Through this agreement, the DOC will identify suitable agricultural land for mitigating project impacts and fund the purchase of agricul-

tural 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. Established in 1996, the CFCP has funded 172 conservation easements to date, permanently conserving more than 57,000 acres of the high-quality agricultural land.

PRESERVING HABITAT

The statewide reach of the project provides the ideal opportunity to consider broader approaches to habitat preservation. The Authority has contracted with the Lazy K Ranch, a working horse and cattle ranch in Chowchilla, to secure a 446 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.

In addition to the Lazy K Ranch on which a conservation easement was secured, the Authority, working through its contractor Westervelt Ecological Services has recently secured the rights to establish a conservation easement on 822 acres along Cross Creek in Kings and Tulare Counties. This conservation easement will preserve 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.

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

These areas will be protected in perpetuity with the establishment of conservation easements over the property and the assurance that necessary and appropriate long-term management activities are conducted. Additional areas of the site will be used for staging and collection of seasonal pond materials.

Having identified key habitat areas for mitigation in Southwest San Diego County, the Authority is now assessing regionally significant conservation areas statewide. By the end of 2017, the Authority will have regional mitigation strategies in place in order to advance construction in a way that preserves biodiversity.

"With our easement on the Lazy K Ranch, we are preserving at least 400 acres of seasonal ponds and grasslands in perpetuity for wildlife habitat and to protect biodiversity."

— Mark McLoughlin
Director of
Environmental Services



SUSTAINABLE INFRASTRUCTURE

SUSTAINABLE INFRASTRUCTURE PRINCIPLES

The Authority’s sustainable infrastructure principles reflect a balance of social, environmental, and economic issues relevant throughout the design, construction, and operations phases of the program. In line with peer organizations, these principles were developed in consultation with leaders across functional areas of the Authority to represent and reflect California’s priorities.

We will be a leader in delivering sustainable infrastructure in the state of California – and set a national example – through our commitments to:

- ▶ Operate our system on 100 percent renewable energy
- ▶ Develop net-zero energy buildings and water conservation strategies
- ▶ Achieve net-zero greenhouse gas (tailpipe) emissions in construction and recycle 100 percent of the steel scrap and concrete refuse generated in project construction
- ▶ Utilize the most environmentally-friendly construction equipment available to reduce emissions
- ▶ Implement mitigation strategies to create long-term benefits including:
 - ➔ Working with partner agencies to modernize systems that use renewable energy
 - ➔ Enhancing sustainable practices utilized by planning, engineering, and construction teams
 - ➔ Reducing vehicle miles traveled – and subsequently reducing statewide emission levels
 - ➔ Building a sustainable travel alternative to support California’s growing population

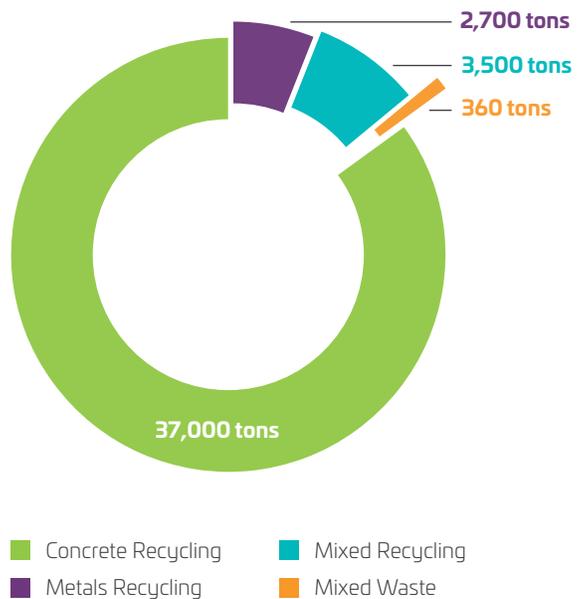
In addition to these principles, the Authority adheres to the following commitments and requirements, including:

- ▶ All Environmental Impact Reports/Environ-

mental 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

Exhibit 2.9: 2015 Materials Management



RECYCLING WASTE RESPONSIBLY

The Authority has committed to recycling 100 percent of the steel and concrete from construction and demolition and to 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 at its sites as show in Exhibit 2.9.

AUTHORITY PRINCIPLES FOR SUSTAINABLE INFRASTRUCTURE

Sustainable infrastructure can refer to a variety of priorities and objectives so California High-Speed Rail has defined its sustainable infrastructure principles, founding them on global best practices, stakeholder priorities, and California state regulations.

The following principles encompass the Authority's commitment to sustainable infrastructure:

- ▶ Make energy efficiency a priority in design.
- ▶ Use 100 percent renewable energy for operation.
- ▶ Design and construct high-performance facilities that achieve net-zero energy for operations and are LEED certified at the Platinum level.
- ▶ Maximize GHG emission reductions through design and requirements and achieve net-zero GHG and criteria pollutant emissions in construction
- ▶ Follow operations practices that maintain or improve air quality.
- ▶ Maximize station access for pedestrians, cyclists, and transit riders.
- ▶ Integrate climate adaptation and resilience principles into the design, construction, and operation of the system.
- ▶ Require Environmental Product Declarations for construction materials, including steel products and concrete mix designs, to improve disclosure of materials information and incentivize the selection of better environmental performing products.
- ▶ Require optimized life-cycle scores for major materials, including global warming potential, while maintaining durability and quality.
- ▶ Make the use of non-hazardous materials a priority and minimize the use of those harmful to human health or the environment.
- ▶ Sequester hazardous material in situ (where feasible and cost effective).
- ▶ Follow construction practices that maintain or improve air quality during construction, both for workers and people living in the air basin in which the project is being constructed. Reduce potable water use in design, construction, and operation.
- ▶ Follow construction-waste practices that divert at least 75 percent from landfill, unless the local regulation is higher.
- ▶ Recycle all steel and concrete in construction.
- ▶ Investigate appropriateness of groundwater recharge along the alignment and make it a priority where appropriate.
- ▶ Make groundwater recharge at sites a priority and/or detain water for reuse in irrigation, while maintaining water quality.
- ▶ Reduce potable water use in design, construction and operation.
- ▶ Make life-cycle performance of components, systems, and materials a priority.
- ▶ Adaptively reuse existing structures and facilities whenever feasible.
- ▶ Progressively refine requirements in design and construction contracts to achieve improved outcomes.

"We are setting a new standard for infrastructure delivery in the state and the nation."

– Jeff Morales
Chief Executive Officer

In 2015, as shown in Exhibit 2.9, the Authority produced approximately 44,000 tons of construction-related waste material, 99 percent of which was recycled. All concrete and metal was recycled or stockpiled for reuse, while 91 percent of other demolition debris, including organics, was recycled. Waste and recycling information is collected from contractors and tracked using an online data tool. These recycling rates far surpass the 50 percent minimum diversion rate recommended by the California Integrated Waste Management Board and is an indicator that the Authority is performing on par with leading international sustainable construction projects. No un-remediated hazardous waste was produced by the Authority in 2015. A small amount of hazardous waste was remediated by the Authority's contractors and disposed according to proper procedures

ENSURING HEALTH, SAFETY AND SECURITY

Safety and security is the Authority's 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 both operations and facilities, and will also ensure that these measures enhance the passenger experience. These include:

TRAIN OPERATIONS

- ▶ A holistic, layered, risk-based approach for securing the rail system
- ▶ 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 to detect earthquakes before they happen to stop the trains and enable safety measures to be taken
- ▶ Grade separations – the dedicated high-speed rail right of way will have no at-grade crossings and early efforts are being made to construct:
 - ➔ 55 freight rail grade separations in the Central Valley where our corridor parallels freight lines

- ➔ Key grade separations in Southern California including State College, Doran Street and Rosecrans Avenue/Marquardt Avenue
- ▶ Four-quadrant gates and intrusion detection along blended corridors and the entire system, which will substantially reduce the risk of people driving onto the tracks

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

In addition to designing a safe high-speed rail system, we are also improving rail safety statewide. One of the most significant safety improvements that the program is implementing consists of grade separations where the existing roadway is realigned to go over or under the railway.

In the Central Valley, high-speed rail is being built to be fully grade-separated, which is essential as the trains will be traveling at speeds in excess of over 200 miles per hour in this region. The program will eliminate 55 existing rail crossings, including all of the Union Pacific Railroad crossings in the City of 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). It will also reduce traffic congestion at grade crossings and the GHG emissions from idling vehicles.

In Northern California, in order to implement blended service for high-speed rail and Caltrain commuter rail service within the existing corridor, the Authority and Caltrain are taking steps to prepare for service in accordance with the Federal Railroad Administration’s High-Speed Passenger Rail Safety Strategy guidance. The strategy identifies four ways in which the Authority will mitigate safety risks:

1. Eliminate all redundant or unnecessary crossings together with any crossings that cannot be safer due to geometry or proximity of complex highway intersections.
2. Install the most sophisticated traffic control/warning devices compatible with the location where train-operating speeds are between 80 and 110 mph (e.g., median barriers, special signage, possible active advanced warning, four-quadrant gates).
3. Protect rail movement with full width barriers capable of absorbing the impact of highway vehicles where train-operating speeds are

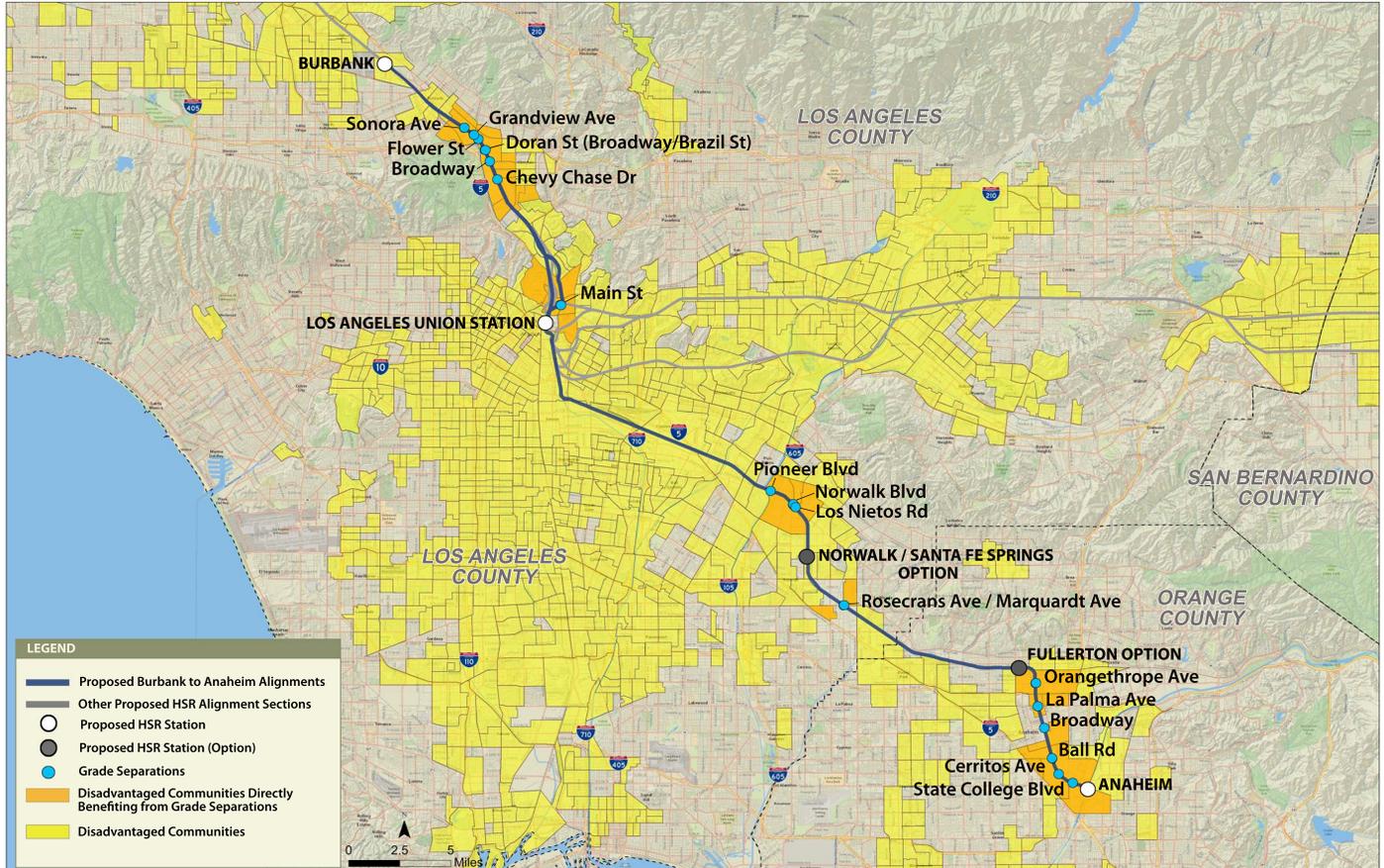
between 111 and 125 mph.

4. Eliminate or grade-separate all crossings where trains travel at speeds above 125 mph.

In Southern California, the Authority is 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. Thirteen grade crossings have been identified for improvement, all of which are located in or near disadvantaged communities as shown in Exhibit 2.11.

One, for example, shown in this link: <https://www.youtube.com/watch?v=GGL2WTHMdqU> is the Rosecrans/Marquardt Avenue Grade Separation Project which the California Public Utilities Commission identified as the most hazardous grade crossing in California – where over 112 freight and passenger trains and 45,000 vehicles converge each day. This volume of rail traffic results in barrier gates down approximately 21 hours per week with a resulting 314

Exhibit 2.10: Safety Improvements at Grade Separations in Disadvantaged Communities in Southern California



The Authority is working with its partners to fund several grade separations at key locations in Southern California. These will provide near term safety and access benefits to adjacent disadvantaged communities as well as local air quality improvements and global greenhouse gas emission reductions.

Exhibit 2.11: 2015 Construction Safety Incidents⁹

Number of Incidents per 200,000 Hours Worked

	CP1	CP2-3	OVERALL WEIGHTED AVERAGE
Injury Rate	3.56	0	2.09
Occupational Disease Rate	0	0	0
Lost Days Rate	0	0	0

metric tons of carbon dioxide produced from idling vehicles waiting to cross.

For the statewide program, the Authority is implementing a Safety and Security Management Plan 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, 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 devel-

op 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.

In 2015, there were no work-related fatalities among employees, contractors, consultants or the general public. Health and safety incidents are recorded and reported according to Occupational Health and Safety Administration (OSHA) regulations. Safety rates during 2015 are presented in Exhibit 2.11.

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>.



STATION COMMUNITIES AND RIDERSHIP

ENHANCING STATION COMMUNITIES

High-speed rail stations will serve as more than just a train stop, they will transform cities, create community hubs and anchor intermodal networks. Connecting California’s major population and employment centers with high-speed rail and providing new access and mobility options at high-speed rail stations will serve as a catalyst for more compact, transit-oriented development around the stations. More compact, bike/pedestrian-friendly development enhances access to the high-speed rail system which not only increases ridership on it, but also on the local and regional transit networks that connect to it. The combined effect reduces VMT which, in turn, reduces emissions and supports broader sustainability objectives and strategies, including reduced water use and more efficient energy use.

The Authority has entered into Station Area Planning agreements with a number of station cities to support and encourage station area development planning including providing funding to those cities. Federal, state and local funds are allowing station cities and their stakeholders to engage in extensive station area planning activities in partnership with the Authority. Exhibit 2.12 below shows the station area planning agreements currently in place and their status.

The station area planning funding is helping stimulate local planning for smart development and for updates to local land use plans and zoning codes as well as promoting transit-oriented development around high-speed rail stations. This infill aligns with critical policy objectives of Assembly Bill 32 and has the potential to reduce millions of tons of GHG emissions¹⁰. 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. In **2016**, the Authority has finalized SAP and other agreements with the City of San Jose, the Tulare County Association of Governments, and the Santa Clara Valley Transportation Authority.

Exhibit 2.12: Station Area Planning Status

CITY	SAP FUNDING AGREEMENT	CONSULTANT TEAM SELECTED	COMMUNITY STATION VISION	SAP SPECIFIC PLAN	SAP GENERAL PLAN UPDATE
Fresno	Yes	Yes	Underway	Underway	2017
Gilroy	Yes	Yes	Complete	Underway	2017
Merced	Yes	No	Underway	2016/2017	2017
Palmdale	Yes	Yes	Underway	2016/2017	2017
Burbank	Yes	No	TBD	TBD	TBD
Bakersfield	Yes	Yes	Underway	2016/2017	TBD
San Jose	2016	No	No	No	No

"There are many examples in Europe and Japan for how a high-speed rail station can be a catalyst to shape the surrounding environment and support a wide range of sustainability objectives,"

– Melissa DuMond
Director of Planning

▶▶ \$2 Billion to rail partners and transit connectivity projects throughout the state for early mobility, safety and environmental benefits

ENGAGING COMMUNITIES

Over the course of 2015, we conducted a number of open houses and community meetings as our work on the environmental review process for the system ramped up. Through this outreach we reached over 6,000 people through 85 public meetings. Community meetings and open houses are a valuable way 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 each community's unique values and priorities into our project plans and helps to improve community benefits. For example, community meetings on aesthetics have enabled local preferences for unique landmarks to be included in the infrastructure design.

In 2015 and 2016, the Authority's design-build contractor for Construction Package 1 in the Central Valley held public meetings in the construction area to keep residents and businesses informed. In addition, the design-build contractor for Construction Package 2-3, also in the Central Valley, held its first series of public meetings in the fall to introduce the team to the community and discuss next steps.

The Authority continued its outreach to individuals and stakeholders through meetings with local community and interest groups, Authority-sponsored community and technical working groups, and other forums to discuss the program and gather feedback.

CONNECTING EXISTING TRANSPORTATION SYSTEMS

The high-speed rail program is delivering benefits now through early investments in California's existing urban and state passenger rail systems. These early investments in bookend and connectivity projects

throughout the state will allow the high-speed rail system to connect with those systems, and provide an integrated rail network that will offer a viable alternative to new vehicle and air travel.

The Authority's 2012 Business Plan outlined early investments in bookend programs in Northern and Southern California, including Caltrain's Peninsula Corridor Electrification Project and enhancements to the Metrolink corridor between Palmdale and Anaheim.

In 2012, Senate Bill 1029, passed by the California Legislature and signed by Governor Brown in July 2012, appropriated almost \$2 billion from the Safe, Reliable, High-Speed Passenger Train Bond Act for the 21st Century (Proposition 1A) funds for these two bookend programs and for 13 connectivity projects which will leverage approximately \$5 billion in additional funding for these projects.

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. In 2015, these projects were fully funded and the Authority continued to work with its rail and transit partners on agreements to initiate and/or advance these projects.

PROVIDING TRAINING AND EDUCATION PRE-APPRENTICESHIP AND JOURNEYMAN UPGRADE PROGRAMS

The Authority's Community Benefits Agreement (CBA) is a cooperative partnership between the Authority, skilled craft unions, and contractors. Under the CBA, training opportunities are advanced and promoted for all individuals. It is based on the Authority's Community Benefit Policy, which promotes employment and business opportunities for small and disadvantaged businesses and workers during the construction of the high-speed rail project. The Policy was approved by the Authority's Board of Directors and signed by the Authority's Chief Executive Officer in December 2012.

As part of the effort to create opportunities for the local workforce, the Fresno County Workforce Investment Board offers Pre-Apprenticeship Training

the purpose of which is to ensure that Central Valley job-seekers are qualified and prepared to work on construction projects such as high-speed rail. Since 2013, 171 students have completed the six-week training session of the Central Valley Infrastructure Employment Project.

Many participants go on to become apprentices and join unions for electrical workers, carpenters, laborers, and the Teamsters. As of November 2015, 214 construction craft laborers were dispatched to work on CP1. In 2015, Alliance Worknet began offering a Multi-Craft Pre-Apprenticeship Training program in Modesto.

SMALL BUSINESS PROGRAM

The Authority is committed to ensuring small businesses play an active role in building the high-speed rail program. The Authority's Small Business Program, spearheaded by the Authority's Small Business Advocate, is responsible for helping the Authority meet its aggressive 30 percent small business participation goal. This goal includes 10 percent participation for Disadvantaged Business Enterprises (DBEs), and 3 percent for Disabled Veteran Business Enterprises (DVBEs) and Micro-Businesses (MB).

Exhibit 2.13: Small Business Participation



CASE STUDY

Building Trades Pre-Apprenticeship Graduation

In June 2014, 22 people completed the first six-week training session of the Building Trades Pre-Apprenticeship Training Program. The initial training focused on operating engineers and laborers who are in demand for rail construction. The program is funded with a \$1.5 million state grant from California's Employment Development Department awarded to workforce investment boards in Fresno, Kern, Merced, and Stanislaus counties. Seven cohorts are planned for 2016. By the end of 2017, officials expect training sessions will be available in eight Central Valley counties.



The Small Business Program consists of robust outreach, networking and match-making opportunities between prime contractors and small business, and the Business Advisory Council that meets bi-monthly to make recommendations for ways that small businesses can participate in the program. The Authority's Small Business Advocate, with support from the regional office, also attends conventions and procurement job fairs, and holds state certification workshops in partnership with the Department of General Services and local entities.

As part of the Small Business Program, the Authority has committed to several plan components. These include prompt payment to contractors, supportive services, and assistance to small businesses to ensure open communication between the Authority and its partners.

The Authority's efforts will help small businesses to grow and expand. "For a small business you don't always know that there is going to be steady work out there. So that is one advantage for myself," says business owner Jill Kroeker. The firm recently moved to a larger office and has plans to hire additional employees as work for the Authority progresses.

ENGAGING SUPPLIERS

Our Small Business Program goals also apply throughout the supply chain. We use initiatives

within the supply chain to extend the benefits of the program to local businesses and suppliers. Procurement policies and practices are designed to benefit local, small, and disadvantaged businesses, and to monitor the environmental impacts of purchases. We engage suppliers through procedures, guideline specifications and contract documents to ensure that high-speed rail procurements meet our sustainability criteria.

The Authority's current design-build procurements include sustainability requirements as part of the general provisions, and all contracts include sustainability requirements. The Authority developed the Environmental Mitigation and Management and Assessment (EMMA) online data tool to collect data and back up information from all contractors and suppliers. This allows performance tracking to meet commitments across various construction packages and program segments.

LOCAL PROCUREMENT

In 2015, 100 percent of the Authority's major spending went to businesses located within the United States. The Authority endeavors to support American businesses and is required to comply with the Buy America Act¹¹ as well as Assembly Bill 16 (Perea, Chapter 413, Statutes of 2012): High-Speed Rail Authority, which encourages the Authority to acquire equipment manufactured in California.

CASE STUDY

Small Business Achieves Big Waste Diversion Results

Through its Small Business Program, the Authority is having a positive impact on small, local businesses while also meeting its environmental goals. J. Kroeker, Inc. is a Fresno-based, woman-owned business that won a contract worth \$9.5 million to provide all demolition services for Construction Package 1. In 2015, as demolition continued in downtown Fresno to make way for the first segment of high-speed rail, Kroeker recycled, reused or stockpiled 44,000 tons of materials for reuse, including more than 37,000 tons of concrete. Kroeker's recycling leadership will help the Authority deliver on its waste management commitments.





BUSINESS AND MANAGEMENT

GOOD GOVERNANCE

In order to build the high-speed rail system, the Authority is entrusted with resources. We take our responsibility to use these resources on behalf of all Californians seriously. The Authority is governed by a number of regulations to ensure the development of a system that is safe, sustainable, and compliant with applicable laws and requirements, including:

- ▶ 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

The Authority extends its reach through contractor, subcontractor, and supplier requirements to ensure good governance and transparency in everything we do. In 2015, the Authority received no fines related to these regulations

FINANCIAL RESPONSIBILITY

A key feature of the high-speed rail system will be self-sufficient operation through revenues generated from ticket sales without a 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

Additional financial responsibility activities undertaken by the Authority include:

- ▶ Managing the Authority's Administrative Budget in conformance with State of California requirements
- ▶ 100 percent compliance with all existing financial obligations and tracking mechanisms

"We're increasingly viewing transit investments not just as a way to move people, but as a means of economic development."

— Eric Eidlin
Federal Transit
Administration

- ▶ Preparing biannual business plans
- ▶ Finance and Audit Committee public meetings and monthly reporting
- ▶ Completing the bi-annual Project Update Report

Capital funding to develop the high-speed rail project comes from federal, state, local, and private sources. These funds will be available to the Authority at different times based on the development timeline of the system.

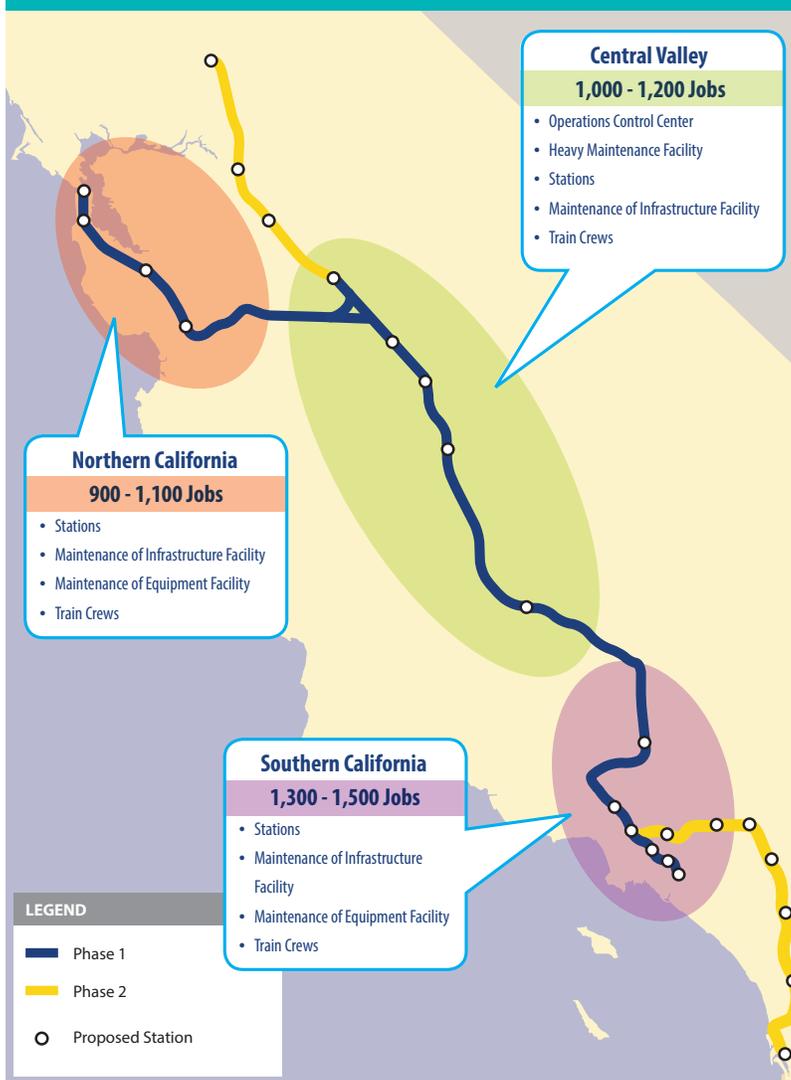
As of 2015, the Authority has received funding commitments of \$3.5 billion from the Federal Government, \$9.9 billion from Proposition 1A bond proceeds, and 25 percent of annual Cap and Trade proceeds on a continuous basis plus one-time appropriations including \$250 million in 2015, facilitated by California Air Resources Board programs.

Of these funds, \$1.05 billion has been identified for planning and environmental activities across the Phase 1 system, including \$315 million from the Federal government, \$675 million from Proposition 1A bond proceeds, and \$59 million from Cap and Trade proceeds.

\$5.8 billion has been allocated to construction in the Central Valley, including \$3.2 billion from the Federal Government and \$2.6 billion from Proposition 1A bond proceeds. Additional Cap and Trade proceeds will fund capital costs for the Silicon Valley to Central Valley line through 2024.

Full details of program funding and financing are available in the 2016 Business Plan (http://www.hsr.ca.gov/docs/about/business_plans/2016_Business-Plan.pdf). 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.

Exhibit 2.14: Estimated Regional Operations and Maintenance Facilities and Jobs



JOB CREATION

A positive benefit of the Authority's governance process is local economic development through job creation. In 2015, the Authority hired 70 new employees, for a new hire rate of 32 percent¹². Current and future job creation and turnover are detailed below.

Construction in the Central Valley is creating thousands of jobs while also employing hundreds of small businesses. This includes, but is not limited to, regional consultants doing environmental work and preliminary engineering, right-of-way teams doing survey and appraisal work, the design-build contractors (and their employees and subcontractors and their employees) doing final design and construction, and utility relocation. As well, permanent jobs for train operators, maintenance yard workers, stations managers, and others will be created in the future to operate and maintain the system.

The Central Valley has recently faced challenges to economic recovery, including an unemployment rate in the construction industry of over 30 percent. High-speed rail construction jobs will go to the people who need them most, providing a significant boost to California's economy as a whole. 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 fourth year in a row Fresno unemployment is below 10 percent reversing a trend for the past 25 years¹³.

Additionally, connectivity and bookend projects, part of the rail modernization to build high-speed rail, will provide jobs in Southern and Northern California.

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).

Once operational, the high-speed rail program will provide improved connectivity between California's major economic regions, providing significantly more transportation capacity for people traveling between them. This will help reduce congestion on freight lines, and along the highway system. As a result, California's economy will become more efficient and competitive as goods move more freely, and less time is wasted in cars and at airports.

OPPORTUNITIES FOR DISADVANTAGED WORKERS

Building and operating the high-speed rail program will directly employ thousands of Californians, while

Exhibit 2.15: Construction Package 1 Hours & Jobs November 2015

NUMBER OF COUNTIES	HOURS WORKED	NUMBER OF WORKERS
27	83,154	214

Exhibit 2.16: Construction Package 1 and 2-3 Hours & Jobs August 2016

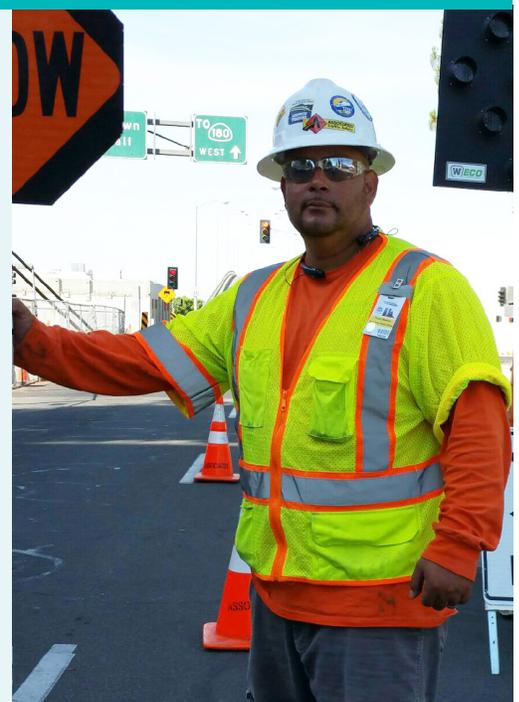
	NUMBER OF COUNTIES	HOURS WORKED	NUMBER OF WORKERS
CP 1	-	203,217	470
CP 2-3	-	12,299	91

indirectly generating tens of thousands more jobs throughout the economy. Construction on the first segment between Madera and Kern County is projected to create thousands of jobs over the next five years. To ensure that these jobs benefit communities most in need, the Authority Board of Directors approved a Community Benefits Policy in 2012 with the goal of promoting the hiring of California community businesses and residents during construction and that supports employment of individuals who reside in Disadvantaged Areas and those designated as Disadvantaged Workers, including veterans.

Our Community Benefits Agreement contains a Targeted Worker Program which ensures that 30 percent

CASE STUDY Pre-Apprenticeship Training Student Lands Job on High-Speed Rail

Students continue to flock to classes and training that can lead to jobs on California's high-speed rail project and other infrastructure projects. Two years ago, Yovani Moreno took Pre-Apprenticeship Training classes at the Construction and General Laborers' Local 294 union hall in Fresno. "I had a felony in my past so it was hard to maintain a job," explained Moreno. "I worked in landscaping, manufacturing and food packing, but only made minimum wage – \$8 an hour." Construction training helped him join the Laborers' Union and make \$17.50 an hour as an apprentice on the high-speed rail project. Currently, Yovani is making \$24 an hour doing traffic control. His pay will jump to \$28 an hour when he becomes a journeyman. The 34-year-old, who has a 5-year-old son and 8-year-old daughter, calls the job a blessing. "I can pay my bills on time. And when my daughter's birthday comes up, I can throw her a birthday party and buy her a nice gift." Moreno hopes one day to become a job superintendent, foreman or a business owner. He said, "It's hard, but I know if I just keep going, my family will get the benefits."



▶▶ Even people who do not use the train will benefit from improved connectivity and transit service, new jobs, improved air quality, and the modal shift away from cars and air travel

of all project work hours are performed by National Targeted Workers, and at least 10 percent of those work hours shall be performed by Disadvantaged Workers.

A Targeted Worker is an individual whose primary place of residence is within an Economically Disadvantaged Area or an Extremely Economically Disadvantaged Area in the United States. A Disadvantaged Worker is an individual who, prior to commencing work on the high-speed rail project, meets the income requirements of a Targeted Worker, and faces at least one of the following barriers to employment:

- ▶ Being a veteran
- ▶ Being a custodial single parent
- ▶ Receiving public assistance
- ▶ Lacking a GED or high school diploma
- ▶ Having a criminal record or other involvement in the criminal justice system
- ▶ Suffering from chronic unemployment
- ▶ Emancipated from the foster care system
- ▶ Being homeless
- ▶ Being an apprentice with less than 15 percent of the required graduating apprenticeship hours in a program

The job training that people will receive through this policy will later permit workers to be employed on other construction projects, delivering lifetime benefits.

FOSTERING DIVERSITY AND EQUAL OPPORTUNITY

The Authority strongly believes in equal opportunity for all and strength in diversity. We are committed to

ensuring that no person shall, on the grounds of race, color, national origin, sex, age, or disability be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity in the design, construction, and operation 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.

To comply with Title VI, the Authority has a specific policy and provides free language assistance whenever Limited English Proficiency (LEP) individuals request assistance. An 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 working to ensure that we provide fair treatment to 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 through our Environmental Justice (EJ) program. We incorporate EJ considerations into our program, policies, and activities to mitigate disproportionate adverse impacts, particularly on minority LEP, and low-income populations.

More about the Authority's Title VI program can be found here: http://hsr.ca.gov/Programs/title_VI_program.html.

The Authority is continually focused on disadvantaged communities through increased engagement and outreach across the small business advocacy and environmental planning work. Activities in 2015 reached more than 8,200 people at approximately 133 events.

WORKER PROTECTIONS

The Authority staff and consultants are covered by the Fair Labor Standard Act (FLSA) and/or union bargaining agreements that define labor conditions and wages. Construction workers follow a bargaining unit agreement or are protected by the FLSA.



3. Engaging our Staff and the Community



WHO WE ARE

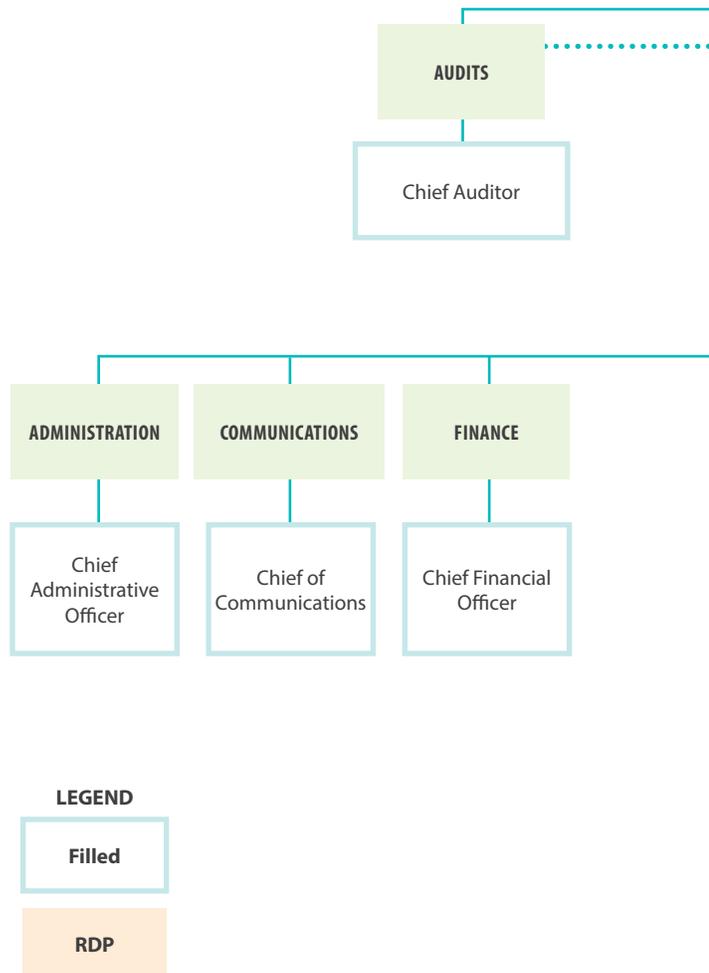
The California High-Speed Rail Authority (Authority) is responsible for planning, designing, building, and operating the first high-speed rail system in the nation. California high-speed rail will connect the mega-regions of the state, contribute to economic development and a cleaner environment, create jobs, and preserve agricultural and protected lands. By 2029, the system will run from San Francisco to the Los Angeles basin in under three hours at speeds of over 220 miles per hour. The system will eventually extend to Sacramento and San Diego, totaling 800 miles and up to 24 stations. In addition, and an essential part of building high-speed rail, 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

Exhibit 3.2: California High-Speed Rail Organization Chart: Executive Staff (November 2016)

Exhibit 3.1: California High-Speed Rail Statewide System



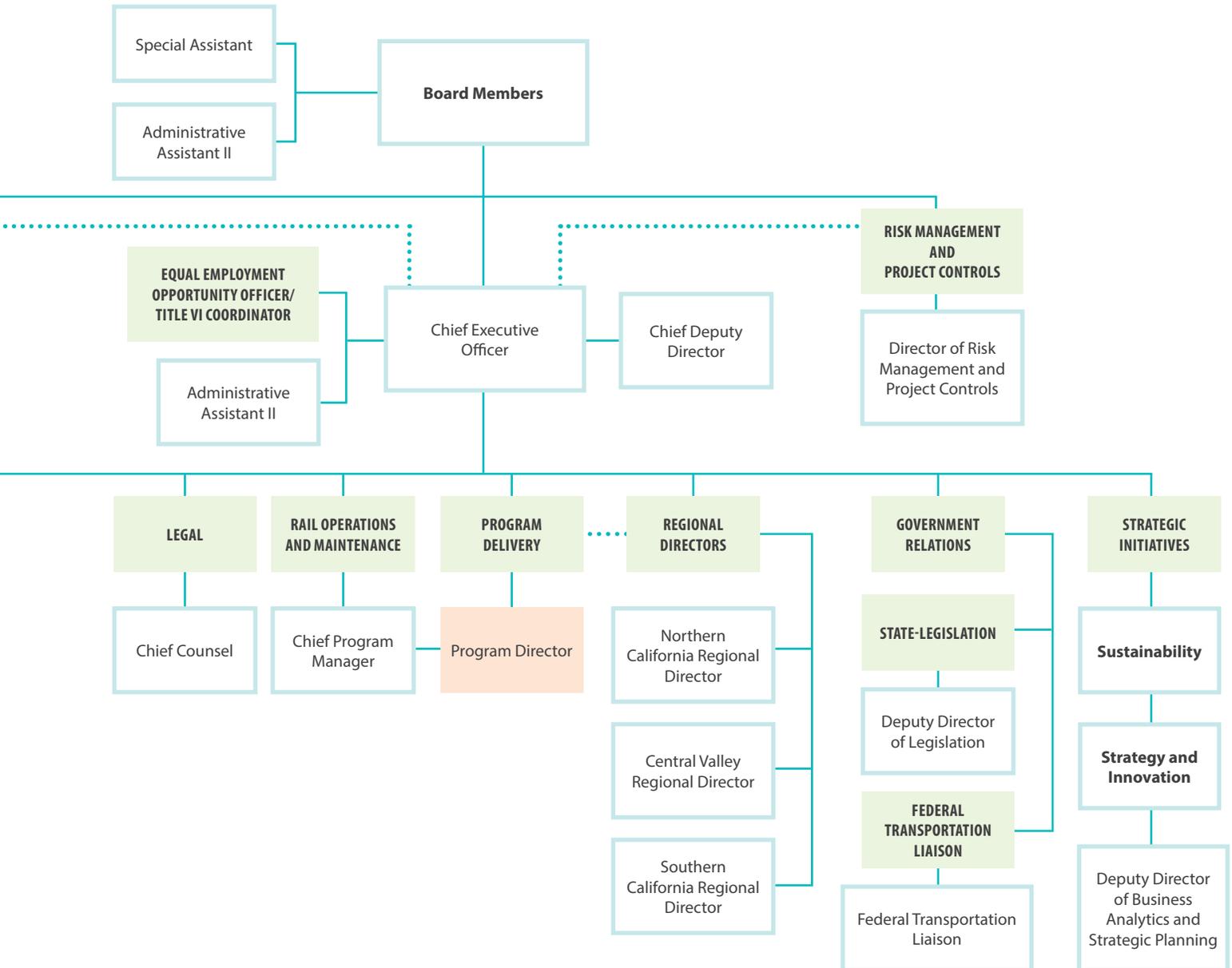
pursuant to the California High-Speed Rail Act (S.B. 1420, Chapter 796 of the California Statutes of 1996) to develop and implement high-speed intercity rail service. It is located under the California Department of Transportation (CaSTA) under Transportation Secretary Brian P. Kelly. There were no significant changes in the Authority's structure or ownership during the reporting period.

ORGANIZATIONAL STRUCTURE

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. It consists 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. As of May 2016, the Board included five men and three women.¹⁴

The Board of Directors is responsible for setting policy directives, and for the development and approval of 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 has several sub-committees dedicated to overseeing specific aspects of the high-speed rail program. These sub-committees are:

- ▶ Executive/Administrative Committee
- ▶ Finance and Audit Committee
- ▶ Operations Committee
- ▶ Transportation and Land Use Committee

GUIDING PRINCIPLES

The Authority will continue to advance the statewide program on multiple fronts throughout the coming years within a flexible framework and guided by the following principles:

- ▶ Fulfill all commitments made to the citizens of California when they approved Proposition 1A to provide a true high-speed rail system
- ▶ Evaluate new opportunities – and adapt to changing circumstances – so that a cost-effective, high-quality system can be delivered as quickly and efficiently as possible
- ▶ Reduce costs and construction time by using a blended implementation strategy in urban areas where appropriate and consistent with mandated performance goals to:
 - ➔ Enhance access and mobility
 - ➔ Minimize impacts
 - ➔ Reduce costs
 - ➔ Improve safety
 - ➔ Expedite implementation
- ▶ Match projects with available funding and deliver them through appropriate business

models:

- ➔ Seek the earliest and best value private-sector participation with appropriate risk management and cost containment
- ➔ Select an initial line for development (as described below), establish a funding plan for it, commit all resources necessary to build it, and begin offering high-speed passenger service as quickly as possible

- ▶ Advance other strategic early investments in collaboration with our partners in order to:
 - ➔ Improve the speed, safety, and efficiency of existing passenger rail services, and prepare the way for high-speed rail
 - ➔ Grow the market for passenger rail travel throughout California
 - ➔ Deliver early economic, environmental, mobility, safety, and community benefits
 - ➔ Promote regional rail and bus connectivity projects
 - ➔ Leverage funding by collaborating with local partners to advance high priority mutually beneficial projects

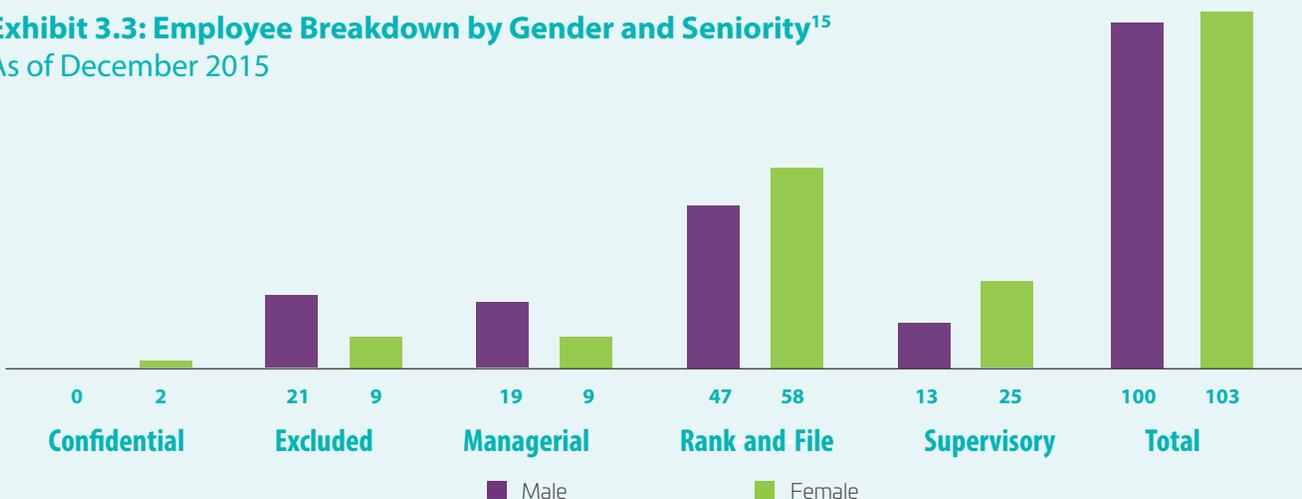
The Authority's core values can be found in Section 2 of our 2016 Business Plan, available online at:

http://hsr.ca.gov/docs/about/business_plans/2016_BusinessPlan.pdf.

OUR TEAM

As of December 31, 2015, the Authority had 203 employees on staff, including full-time employees, retired annuitants, part-time employees, student

Exhibit 3.3: Employee Breakdown by Gender and Seniority¹⁵
As of December 2015



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. The Authority also includes a significant number of private sector consultants integrated with state employees.

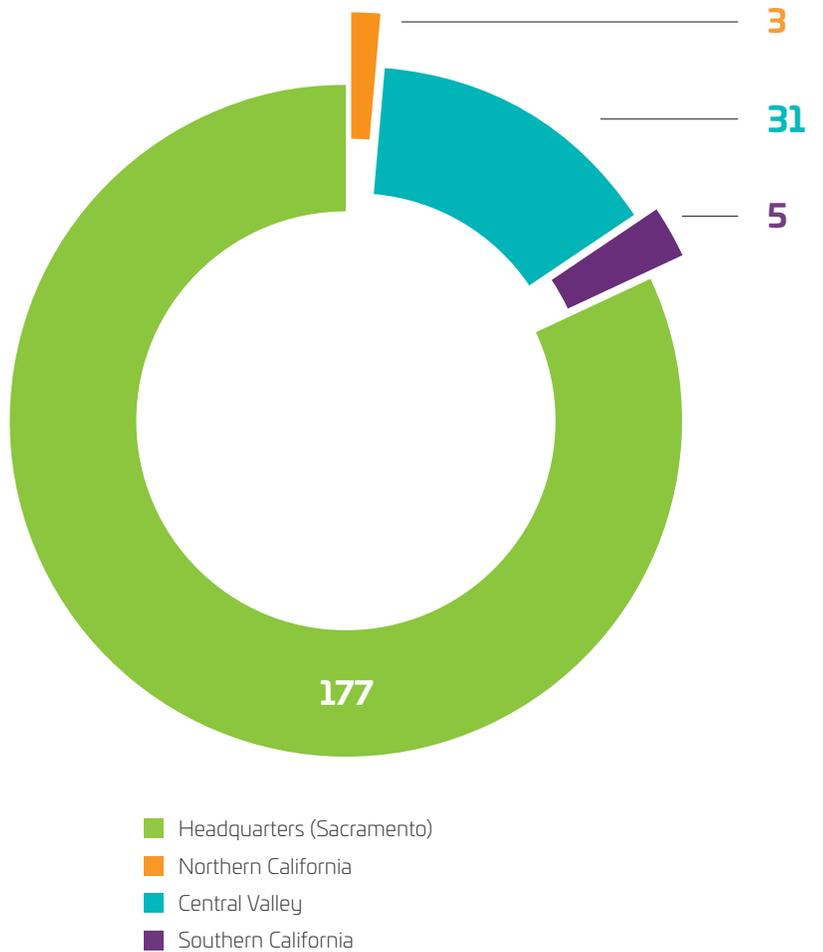
The Authority provides state employees with training opportunities designed to increase job proficiency and advance careers with the goal of promoting a capable, efficient, and service-oriented workforce. This is done by developing employee's skills and abilities through training programs that meet Government Code Section 19995 and the Authority's Policy Directive POLI-HR-21 entitled Employee Training Policy signed in June 2014.¹⁶

The Authority's policies are consistent with the California Department of Human Resources policies and laws.

HOW WE OPERATE

Key beneficiaries of the high-speed rail program include everyone living or traveling in the state of California. The Authority is responsible for procuring services, contractors, and materials, as well as coordinating the delivery of the high-speed rail program. 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.

Exhibit 3.4: 2015 Employee Breakdown by Region



"Sustainability is a core value of our entire team. Everyone working on the project is delivering on this green promise to California's future."

— Margaret Cederoth
Sustainability Manager

STAKEHOLDER ENGAGEMENT

"We engage the public, elected officials and other stakeholders. Their input is helping us design a project that will transform the state of California as we know it today."

— Lisa Marie Alley
Chief of Communications

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 the Authority with invaluable insight, and helps inform and strengthen our key decisions.

The Authority's Office of Communication is responsible for initiating and coordinating outreach throughout the state. The public, our partners and the media are engaged through speaking engagements, meetings, community open houses, and social media.

The Authority's Office of Legislation is responsible for engaging elected officials at the state and federal level. This includes working with legislators and their staff to keep them up-to-date on the high-speed rail program. The Office also works closely with the Authority's federal liaison, who keeps the U.S. Congress and federally-elected officials apprised of the program's progress.

Key topics and issues often raised through stakeholder engagement include:

- ▶ Cost
- ▶ Schedule
- ▶ Alignment choices
- ▶ Compliance with enabling legislation

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

NORTH

In Northern California, the Authority took steps to advance environmentally clearing the high-speed rail alignment from San Francisco to the Central Valley Wye. In August, 2015 the Authority held a pre-bid conference in San Francisco to select a regional consultant. In September and October, the Authority held four open house community meetings in San Francisco, San Jose, Morgan Hill, and Burlingame. The purpose of those meetings was to provide area residents with an opportunity to learn more about the program, ask questions, and provide input and feedback. In addition to these meetings, the Authority also hosted three Small Business Certification workshops in the region.

In **2016**, the Authority is keeping stakeholders in the North updated on project developments. We are working with the existing Local Policy Maker Group and the City/County Staff Coordinating Group, conducting working groups and alignment tours, and implementing additional open house meetings.

CENTRAL VALLEY

In the Central Valley, the Authority continued to prepare for major construction activities within Construction Package 1. The design-build contractor Tutor Perini/Zachry/Parsons held four community open house meetings in areas where construction activities were beginning. Through these meetings, residents were notified of the work and invited to ask questions and speak with staff.

The Authority hosted nineteen Small Business Certification Workshops throughout 2015, and participated in a Central Valley Spring Procurement Fair in March with other state and local agencies.

The Authority held three open house community meetings to introduce the locally-generated alternative route from the City of Shafter through the Bakersfield area, in partnership with the Federal Railroad Administration, and the Cities of Shafter and Bakersfield.

In June 2015, the Authority executed the contract for design-build services for Construction Package 2-3 (2-3) with Dragados/Flatiron, a Joint Venture (DFJV). In November and December, the DFJV Team hosted four open house community meetings within the CP 2-3 area. Attendees were informed about elements of the project, including design, construction schedule, and small business and employment opportunities.

Caltrans, the Authority's contractor for the relocation of State Route 99 in the Fresno area, held an open house community meeting in the fall to notify people about the work and next steps. Staff met with stakeholders and impacted property owners at several events.

The Authority held the November Board of Directors meeting in Fresno, providing an update on progress in the Valley.

In December, the Authority issued a notice that the Tuolumne Street Bridge in downtown Fresno would be demolished starting in January 2016, and that several other heavy construction projects were slated to begin in early 2016.

In 2016, the Authority and DFJV team continues outreach in the areas of CP 2-3 and initiate outreach for Construction Package 4. Our Fresno staff continues to work with property owners and our partners to prepare for construction.

SOUTH

In Southern California, the Authority engaged communities in project sections that will obtain environmental clearance in 2017. The Authority held nine



open house community meetings in May and June to provide residents with the latest on the program and alignment selection. Also in June, the Authority received over ten hours of public testimony at the monthly Board of Directors meeting in Los Angeles.

In the fall, the Authority held 13 open house meetings to alert interested individuals about the Authority's evaluation of proposed alternatives in certain project sections.

Los Angeles staff and consultants continue to meet with stakeholders and impacted property owners, and attend speaking events and conferences to educate members of the public about the program.

In 2016, the Southern California team started environmental documentation and progress updates. We are also implementing a Small Business outreach strategy and events to enhance small business participation.

(above) Small Business Advocate Alice Rodriguez talked to dozens of stakeholders who stopped by an exhibit booth at California Construction Expo 2016 in Long Beach in July. She also sat on a panel and explained how small businesses get involved in the high-speed rail project.



4.

About This Report

PRECAUTIONARY PRINCIPLE

The precautionary approach states that “Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.” (The Rio Declaration on Environment and Development, 1992). The Authority embodies this principle by developing a responsibly-financed high-speed rail system that will mitigate environmental issues in California and more widely. The system is designed to have a positive impact through net-zero energy use station design, air emissions reductions, habitat protection, and responsible material and waste management. The system will follow all applicable state and federal environmental rules and laws, ensuring that potentially negative environmental impacts are considered and mitigated.

ACKNOWLEDGMENTS

Thanks to all our federal, state, regional and local municipality partners as well as our environmental and community non-profit and advocacy partners who contributed to this report and with whom we are delivering the rail system.

GLOSSARY

Bio Diesel: Biodiesel is a diesel replacement fuel made from new and used vegetable oils or animal fats that have been chemically reacted with an alcohol. Biodiesel is also made from canola oils and from waste stream sources including used cooking oils or animal fats.

Black Carbon: Black Carbon is 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 Neutral: No net release of carbon dioxide emissions (CO₂), achieved through identifying, inventorying, and managing emissions of a product, process or action over its life-cycle.

Carbon Offsets: Emissions reductions that have been made elsewhere, which are then sold to the 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.

EcoDistrict: A neighborhood or district with a broad commitment to accelerate neighborhood-scale sustainability. EcoDistricts commit to achieving ambitious sustainability performance goals by guiding district investments and community action, and tracking the results over time.

Embodied Energy/Embodied Carbon: Total primary energy consumed during the lifetime of a product, from extraction of raw materials, including fuels, to the end of a product's lifetime and associated carbon emissions. Possible boundaries include:

- ▶ **Cradle to Grave:** Includes energy used for product manufacturing, transport, installation, deconstruction, demolition, and disposal.
- ▶ **Cradle to Gate:** Energy, used for product manufacturing only.
- ▶ **Cradle to Site:** Energy consumed until the product has reached the point of use.

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.

Fuel Cell: A technology that uses an electromagnetic process to convert chemical energy into electrical power.

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) defines six gases under this category: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs – a family of gases), fluorocarbons (PFCs – another family of gases), and sulfur hexafluoride (SF₆). Carbon emissions are measured in the unit “carbon dioxide equivalent” (CO₂e) and expressed in metric tonnes (tCO₂e).

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.

Life-Cycle Assessment (LCA): Evaluates the environmental effects of a product or activity holistically, by analyzing the entire life-cycle of a particular material, process, product, technology, service or activity.

Life-Cycle Cost: The annual cost of a product, including capital, installation, operation, maintenance, and disposal over the lifetime of the product.

Living Buildings Challenge (LBC): A program of the International Living Future Institute, comprising seven performance areas: Site, Water, Energy, Health, Materials, Equity, and Beauty. These are subdivided into 20 imperatives, each of which focuses on a specific sphere of influence. The emphasis is on absolute performance metrics, such as net-zero water and energy, as a means of assessing performance of a building or neighborhood. This concept is a philosophy, advocacy tool, and certification program that addresses physical development at all scales.

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): Particulate matter is 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 (PM_{2.5}) 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 Diesel: Renewable diesel is produced from non-petroleum renewable resources but is not a mono-alkyl ester. Renewable diesel consists solely of hydrocarbons and meets California Air Resources Board motor vehicle fuel specifications under title 13, California Code of Regulations (CCR), section 2281 et seq; specified aromatic, sulfur, and lubricity standards; and ASTM International standard specification, ASTM D975-12a.6

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

Sustainability: Sustainability is 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: Transportation that does not rely on the use of fossil fuels.

Volatile Organic Compounds: Chemicals that contain carbon molecules and are volatile enough to evaporate from a surface into indoor air at normal room temperatures. Examples of building materials that may contain VOCs include, but are not limited to solvents, paints, adhesives, carpeting, and particle-board.

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 2015 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	Letter from CEO, p. 5 Executive Summary, p. 6	NO
ORGANIZATIONAL PROFILE		
G4-3 Organization name	Title Page	NO
G4-4 Primary brands, products, services	Who We Are, p. 40	NO
G4-5 Location of headquarters	Who We Are, p. 40	NO
G4-6 Number and names of operating countries	Who We Are, p. 40	NO
G4-7 Nature of ownership and legal form	Who We Are, p. 40 - 41	NO
G4-8 Markets served	Who We Are, p. 40	NO
G4-9 Organization scale	Business and Management, p. 36; Who We Are, p. 40, 42	NO
G4-10 Employee demographics	Business and Management, p. 36 - 38; Who We Are, p. 42 - 43	NO
G4-11 Percentage of employees covered by collective bargaining agreements	Business and Management, p. 38	NO
G4-12 Supply chain description	Station Communities and Ridership, p. 34; Business and Management, p. 36-38; Who We Are, p. 43	NO
G4-13 Significant changes during the reporting period	Who We Are, p. 41	NO
G4-14 Precautionary approach	Precautionary Principle, p. 47	NO
G4-15 External charters and principles endorsed	Sustainable Infrastructure, p. 26	NO
G4-16 Association memberships	Our Approach, p.; Sustainable Infrastructure, p. 12	NO
IDENTIFIED MATERIAL ASPECTS AND BOUNDARIES		
G4-17 Entities included in the organization's consolidated financial statements	Footnotes, p. 53	NO
G4-18 Process for defining report content	What Matters Most, p. 9	NO
G4-19 Material Aspects	What Matters Most, p. 10	NO
G4-20 Aspect Boundaries within the organization	What Matters Most, p. 10	NO
G4-21 Aspect Boundaries outside the organization	What Matters Most, p. 10	NO
G4-22 Restatements	N/A*	NO
G4-23 Significant changes from previous reporting in Scope and Aspect Boundaries	N/A*	NO
STAKEHOLDER ENGAGEMENT		
G4-24 Stakeholder groups engaged	What Matters Most, p. 9; Stakeholder Engagement, p. 44 - 45	NO
G4-25 Basis for stakeholder identification and selection	What Matters Most, p. 9; Stakeholder Engagement, p. 44	NO
G4-26 Approach to stakeholder engagement	What Matters Most, p. 9; Stakeholder Engagement, p. 44 - 45	NO
G4-27 Key topics and concerns raised through stakeholder engagement	Stakeholder Engagement, p. XXX	NO
REPORT PROFILE		
G4-28 Reporting period	Report Information, p. 8	NO
G4-29 Date of most recent previous report	N/A*	NO
G4-30 Reporting cycle	Report Information, p. 8	NO
G4-31 Contact	Report Information, p. 8; Contact, p. 54	NO
G4-32 'In accordance' option chosen	Report Information, p. 8; GRI G4 Content Index, p. 50-52	NO

General Standard Disclosures

STRATEGY AND ANALYSIS	SECTION	EXTERNAL ASSURANCE
G4-33 Policy and practice on seeking external assurance	GRI G4 Content Index, p. 50	NO
GOVERNANCE		
G4-34 Governance structure	Who We Are, p. 41 - 41	NO
ETHICS AND INTEGRITY		
G4-56 Values, principles, standards and norms of behavior	Who We Are, p. 42	NO

*This is the first Sustainability Report published by the California High-Speed Rail Authority.

Specific Standard Disclosure

MATERIAL ASPECT	DMA & INDICATORS	SECTION	OMISSIONS	EXTERNAL ASSURANCE
ECONOMIC PERFORMANCE	G4-DMA Generic Disclosure on Management Approach	Business and Management, p. 35 - 36	NO	NO
	G4-EC4 Financial assistance received from government	Business and Management, p. 36	NO	NO
INDIRECT ECONOMIC IMPACTS	G4-DMA Generic and Specific Disclosure on Management Approach	Station Communities and Ridership, p. 31 - 32; Business and Management, p. 36-38	NO	NO
	G4-EC7 Development and impact of infrastructure investments and services supported	Sustainable Infrastructure, p. 28 - 32; Station Communities and Ridership, p. 32	NO	NO
	G4-EC8 Significant indirect economic impacts, including the extent of impacts	Station Communities and Ridership, p. 32 - 34	NO	NO
PROCUREMENT PRACTICES	G4-DMA Generic and Specific Disclosure on Management Approach	Station Communities and Ridership, p. 34	NO	NO
	G4-EC9 Proportion of spending on local suppliers at significant locations of operation	Station Communities and Ridership, p. 34	NO	NO
ENERGY	G4-DMA Generic and Specific Disclosure on Management Approach	Energy p. 15; Business Management, p. 35	NO	NO
	G4-EN3 Energy consumption within the organization	Energy, p.15	NO	NO
WATER	G4-DMA Generic Disclosure on Management Approach	Natural Resources, p. 23 - 24	NO	NO
	G4-EN8 Total water withdrawal by source	Natural Resources, p. 24	NO	NO
	G4-EN9 Water sources significantly affected by withdrawal of water	Natural Resources, p. 24	NO	NO
BIODIVERSITY	G4-DMA Generic and Specific Disclosure on Management Approach	Natural Resources, p. 24	NO	NO
	G4-EN13 Habitats protected or restored	Natural Resources, p. 25	NO	NO
EMISSIONS	G4-DMA Generic and Specific Disclosure on Management Approach	Business and Management, p. 15; Natural Resources, p. 17	NO	NO
	G4-EN15 Direct greenhouse gas (GHG) emissions (scope 1)	Natural Resources, p. 17	NO	NO
	G4-EN16 Energy indirect greenhouse gas (GHG) emissions (scope 2)	Natural Resources, p. 17	NO	NO
	G4-EN17 Other indirect greenhouse gas (GHG) emissions (scope 3)	Natural Resources, p. 17	NO	NO
	G4-EN19 Reduction of greenhouse gas (GHG) emissions	Natural Resources, p. 19 - 20	NO	NO
EFFLUENTS AND WASTE	G4-EN21 NOx, SOx, and other significant air emissions	Natural Resources, p. 22	NO	NO
	G4-DMA Generic Disclosure on Management Approach	Sustainable Infrastructure, p. 26, 28	NO	NO
COMPLIANCE	G4-EN23 Total weight of waste by type and disposal method	Sustainable Infrastructure, p. 26, 28	NO	NO
	G4-DMA Generic Disclosure on Management Approach	Business and Management, p. 35	NO	NO
SUPPLIER ENVIRONMENTAL ASSESSMENT	G4-EN29 Monetary value of significant fines and total number of non-monetary sanctions for non-compliance with environmental laws and regulations	Business and Management, p. 35	NO	NO
	G4-DMA Generic and Specific Disclosure on Management Approach	Station Communities and Ridership p. 34; Business and Management, p. 35	NO	NO
EMPLOYMENT	G4-EN32 Percentage of new suppliers that were screened using environmental criteria	Station Communities and Ridership, p. 34	NO	NO
	G4-DMA Generic and Specific Disclosure on Management Approach	Station Communities and Ridership, p. 32-34; Business and Management, p. 36-38	NO	NO
	G4-LA1 Total number and rates of new employee hires and employee turnover by age group, gender, and region	Business and Management, p. 36 ; Who We Are, p. 42 - 43	YES*	NO

Specific Standard Disclosure

MATERIAL ASPECT	DMA & INDICATORS	SECTION	OMISSIONS	EXTERNAL ASSURANCE
OCCUPATIONAL HEALTH AND SAFETY	G4-DMA Generic and Specific Disclosure on Management Approach	Sustainable Infrastructure, p. 30	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. 28, 30	YES*	NO
TRAINING AND EDUCATION	G4-DMA Generic Disclosure on Management Approach	Who We Are, p. 43	NO	NO
	G4-LA9 Average hours of training per year per employee by gender, and by employee category	Who We Are, p. 43	YES*	NO
DIVERSITY AND EQUAL OPPORTUNITY	G4-DMA Generic Disclosure on Management Approach	Business and Management, p. 38	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. 41 - 42	YES*	NO
LOCAL COMMUNITIES	G4-DMA Generic and Specific Disclosure on Management Approach	Sustainable Infrastructure, p. 28 - 30; Station Communities and Ridership, p. 31 - 32; Business and Management, p. 36 - 38	NO	NO
	G4-S01 Percentage of operations with implemented local community engagement, impact assessments, and development programs	Station Communities and Ridership, p. 31 - 32	NO	NO

*See report section and Footnotes for details of omission.

2016 Statistics Appendix

Updated Recycling Data

Recycling totals as of October 12 2016

MATERIALS	TONS
Concrete	55788.1404
Metals	2822.688
Mixed Recycling	3523.2
Mixed waste	360.83
Organics	0.938
Other	23.821
Wood	3.0485
Grand Total	62522.6659

Updated Water Use

Water Totals as of October 12, 2016



Footnotes

1. Consolidated financial statement: http://www.hsr.ca.gov/docs/about/business_plans/BPlan_2014_Business_Plan_Final.pdf. This report covers all entities included in this statement.
2. Vehicle miles traveled (VMT) is defined as the total number of miles traveled by vehicles in a given geographic boundary over a specific time
3. Senate Bill 375 (Steinberg, 2008) 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.
4. 2015 office electricity 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 was converted from kBtu to kWh using a conversion factor from EPA Climate Leaders GHG Inventory Protocol, Appendix 2: Unit Conversions.
5. Fuel consumption was converted from gallons to GJ using conversion factors from EPA Climate Leaders GHG Inventory Protocol, Appendix 2: Unit Conversions. Total energy consumption in 2015 from office electricity and construction fuel was approximately 407,000 GJ.
6. Criteria pollutants are quantified as 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.
7. Guidance for contractors
https://www.hsr.ca.gov/docs/programs/construction/CP4_executed/P14_32_IR_IVC_08_Water_Conservation_Guidance.pdf
8. 2015 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 (2,160 gallon/employee). Office water consumption is from municipal supplies.
9. Health and Safety rates for Authority staff are not tracked. Health and safety rates for contractors are not tracked by gender, and are tracked by Construction Package in lieu of region. Absentee rates are not tracked.
10. Vision California; "Charting Our Future: Statewide Scenarios Report", May 2010.
https://www.hsr.ca.gov/docs/programs/green_practices/sustainability/Vision%20California%20-%20Statewide%20Scenarios%20report.pdf
11. The Buy America program maximizes the procurement of American-made products by transportation infrastructure projects, supporting American companies and their employees. See also: <https://www.transportation.gov/highlights/buyamerica>
12. New hires are not reported by age, gender or region. Turnover rates for Authority staff are not reported.
13. California and Metro Forecast, May 2016, University of the Pacific.
14. Board members are not reported by age or minority group.
15. Employees are not reported by age or minority group.
16. Training hours are not consistently tracked. Tracking is expected to be improved in 2016.

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