

PLANNING CALIFORNIA CLIMATE INVESTMENTS IN DISADVANTAGED COMMUNITIES



A Guide to Greenhouse Gas Reduction Fund Program Designs, Expenditures, and Benefits

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A Guide to Greenhouse Gas Reduction Fund Program Designs, Expenditures, and Benefits for Disadvantaged Communities

ABOUT

Rapidly growing revenues from California's Cap-and-Trade program, which are deposited into the Greenhouse Gas Reduction Fund (GGRF), represent a major new source of funding for state programs designed to reduce greenhouse gas emissions and provide economic, environmental, and public health co-benefits. This report provides a guide to the GGRF funded programs, focusing on those programs most targeted to benefit disadvantaged communities. First, the report provides an overview of each program and then analyzes program investments based on recent funding levels (inputs) before the GGRF and then with the GGRF. Additionally, the authors put forth a framework to systematically assess program inputs, outputs, outcomes, and impacts. We also make recommendations to enhance benefits from the investments.

The report underscores the importance of the GGRF as a new funding source that is adding to the overall level of funding available for programs that could benefit disadvantaged communities, although in some cases supplementing other historical funding sources. Yet the analysis also highlights that demand still exceeds investment levels. The state is early in its complex and ambitious implementation process for the GGRF, and currently a paucity of data limits attempts to qualitatively assess expected and actual outcomes and impacts of the investments. Over time, hopefully more accessible data will allow for more comprehensive prospective and retrospective analyses to inform strategic and equitable investment decisions.

AUTHORSHIP

Jeffrey L. Rabin is the lead researcher and author of Chapters 2 through 6 of this report. Colleen Callahan, deputy director of the UCLA Luskin Center for Innovation, serves as project manager, editor, and author. J.R. DeShazo, director of the Luskin Center, is the project director.

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Complementary work is being done by the Greenlining Institute to document stories of how climate investments are benefiting specific households in disadvantaged communities across California.

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DISCLAIMER

The UCLA Luskin Center appreciates the contributions of the aforementioned individuals. This paper, however, does not necessarily reflect their views. Any errors are those of the authors. To the best of our knowledge, program information is up-to-date as of report finalization in early August, 2015, but we recognize these programs will evolve over time.

FOR MORE INFORMATION

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I. Executive Summary

I.I Introduction

This study involves a program-level financial analysis of California's new Greenhouse Gas Reduction Fund (GGRF). Rapidly growing revenues from California's Cap-and-Trade program, which are deposited into the Greenhouse Gas Reduction Fund, represent a major new source of funding for state programs. While in some cases displacing funds from other sources, this study finds that the Greenhouse Gas Reduction Fund is exponentially increasing the overall amount of resources available for programs intended to reduce carbon emissions and provide environmental, economic, and public health co-benefits to communities across the state. The study focuses on six GGRF programs that are intended to provide the most significant co-benefits to disadvantaged communities.

The Cap-and-Trade program is a key part of California's landmark effort to cut greenhouse gas (GHG) emissions to 1990 levels by 2020, a goal mandated by Assembly Bill 32 (Nunez), the Global Warming Solutions Act of 2006. The Cap-and-Trade program sets a cap or limit on total GHG emissions that declines over time. Large emitters, such as oil refineries and power plants, can buy, sell, and trade carbon allowances during quarterly auctions.

The State's first two appropriations of Cap-and-Trade auction proceeds, in fiscal years 2013-2014 and 2014-15, totaled over \$900 million. This set in motion a significant expansion of existing climate mitigation programs, as well as the creation of new programs, totaling 11 appropriated programs in the 2014-15 fiscal year. These programs are intended to: promote the transition to zero emission or low carbon cars, trucks, school buses, and transit vehicles; expand intercity rail and transit service; construct affordable housing and sustainable communities; install solar panels and solar water heating on low-income, single-family and multi-family housing; and plant trees in disadvantaged communities; among other types of investments.

On January 1, 2015, the emissions cap was extended to suppliers of transportation fuels, including gasoline.¹ As a result, the quarterly auctions of 2015 (held February 18, 2015 and May 21, 2015) resulted in dramatically higher revenues than previous auctions.

1 California Legislative Analyst's Office (February, 2015). "The 2015-16 Budget, Resources and Environmental Protection." Page 9. <http://www.lao.ca.gov/reports/2015/budget/resources-environmental-protection/Res-Budget-Analysis-021915.pdf>

By June 30, 2015, the end of the 2014-15 fiscal year, the Cap-and-Trade program had generated a total of \$2.2 billion in new revenue to the state. The period began with the first quarterly auction in November 2012 and ended with the 11th quarterly auction in May 2015.²

The Legislature and Governor determine annual appropriations from the Greenhouse Gas Reduction Fund to state agencies and their programs. The GGRF investments that state agencies make are required to further the main regulatory purposes of AB 32. The primary purpose is to reduce greenhouse gas (GHG) emissions. AB 32 also, however, makes clear that climate investments should be directed toward the most disadvantaged communities in California.

Other legal mandates underscore this direction. Assembly Bill 1532 (AB 1532, Perez) furthers AB 32 by requiring that GGRF programs “maximize economic, environmental, and public health benefits” and “direct investment toward the most disadvantaged communities and households in the state.”³

In addition, Senate Bill 535 (SB 535, de León) establishes a framework to direct GGRF investments and their associated benefits to disadvantaged communities. Specifically, SB 535 requires that at least 25 percent of the GGRF investments go to programs that benefit disadvantaged communities, and that at least 10 percent of the investments be spent in disadvantaged communities. This “provides the framework for investments that can meet multiple policy objectives . . . [and] enhances the economic, environmental and public health benefits to a disadvantaged community.”⁴

1.2 Purpose and Methods

This report analyzes the historical opportunity presented by the Greenhouse Gas Reduction Fund (GGRF), focusing on six GGRF programs in five categories most targeted to benefit disadvantaged communities. The authors provide an overview of each program and then comparatively analyze program investments based on recent funding levels (inputs) before the GGRF and then with the GGRF. In Chapter 7, we put forth a framework to systematically assess program inputs, outputs, outcomes, and impacts. We note key challenges, opportunities, and recommendations to enhance economic, environmental, and public health co-benefits in disadvantaged communities.

1.2.1 Process for Selecting Climate Investment Programs to Analyze

As previously mentioned, 11 programs received funding from the Greenhouse Gas Reduction Fund in fiscal year 2014-15. We selected from these 11 programs those most targeted to benefit disadvantaged communities. Specifically, we focused on the programs for which at least 25 percent of the

2 California Air Resources Board (June 17, 2015). “California Cap-and-Trade Program, May 2015 Joint Auction #3, California Post Joint Auction Public Proceeds Report.” Page 3. http://www.arb.ca.gov/cc/capandtrade/auction/may-2015/ca_proceeds_report.pdf

3 Text of Chapter 807, Statutes of 2012 (AB 1532, Pérez), Section 39712. http://leginfo.legislature.ca.gov/faces/billCompareClient.xhtml?bill_id=201120120AB1532

4 California Air Resources Board (June 16, 2015). Cap-and-Trade Auction Proceeds: Funding Guidelines for Agencies that Administer California Climate Investments. Volume 2: Investments to Disadvantaged Communities. Page 3. <http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/auction-proceeds-funding-guidelines-06-16-2015-public-draft.pdf>

investments are targeted to benefit disadvantaged communities. We thus eliminated any programs with a target percent below 25 percent as well as those with uncertainty indicated by a large range of 0-25 percent. As a result, in subsequent chapters we analyze the following programs (in alphabetical order):

- Affordable Housing and Sustainable Communities
- Low Carbon Transportation
- Transit Capital and Operations
- Weatherization and Renewables
- Urban Forestry

See Table 1.

**Table 1: GGRF Appropriated Programs in Fiscal Year 2014-15:
Funding Targets for Disadvantaged Communities⁵**

Program (Agency)	FY 2014-15 Appropriation (\$M)	Potential Funds to Benefit Disadvantaged Communities*			
		Benefiting		Subtotal Located In**	
		%	(\$M)	%	(\$M)
High Speed Rail (HSRA)***	\$250	---	---	---	---
Transit and Intercity Rail Capital Program (CalSTA / CTC)	\$25	25%	\$6	TBD	TBD
Low-Carbon Transit Operations (Caltrans)	\$25	32%	\$8	TBD	TBD
Affordable Housing and Sustainable Communities (SGC)	\$130	50%	\$65	TBD	TBD
Low Carbon Transportation (ARB)	\$200	50%	\$100	TBD	TBD
Low-Income Weatherization / Renewable Energy (CSD)	\$75	100%	\$75	100%	\$75
Energy Efficiency: Public Buildings (DGS)	\$20	TBD	TBD	TBD	TBD
Renewable Energy and Energy Efficiency (UC and CSU)	-	-	-	-	-
Water Action Plan: Water-Energy Efficiency (DWR)	\$30 <small>(AB 91 increase)</small>	TBD	TBD	TBD	TBD
Rebates for Appliances (CEC)	-	-	-	-	-
Water and Energy Technology (CEC)	-	-	-	-	-
Agricultural Energy and Operational Efficiency (CDFA)	\$25 <small>(AB 91 increase)</small>	TBD	TBD	TBD	TBD
Water Action Plan: Wetlands and Watershed Restoration (DFW)	\$25	TBD	TBD	TBD	TBD
Urban Forestry (CAL FIRE)	\$18	100%	\$18	55%	\$10
Forest Health (CAL FIRE)	\$24	TBD	TBD	TBD	TBD
Healthy Solis (CDFA)	-	-	-	-	-
Waste Diversion (CalRecycle)	\$25	10%	\$3	TBD	TBD
Total	\$872		\$275		\$85
			32%		10%

Dollars and percentages rounded up to the nearest whole number.

*TBD indicates that the likely investments within or benefiting disadvantaged communities are “to be determined” in the program development and project selection process.

**Projects that are located in and provide a benefit to disadvantaged communities are a subtotal of, and are included in, the total percent benefiting disadvantaged communities.

***The minimum SB 535 targets can be met without including the High-Speed Rail project, but the project is expected to provide additional benefits for disadvantaged communities beyond those quantified in this table.

5 California Air Resources Board (June 16, 2015). “Cap-and-Trade Auction Proceeds: Funding Guidelines for Agencies that Administer California Climate Investments. Volume 2: Investments to Disadvantaged Communities.” Page 8. <http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/auction-proceeds-funding-guidelines-06-16-2015-public-draft.pdf>

1.3 Background

1.3.1 Cap-and-Trade: A Landmark Program

California's pioneering efforts to reduce greenhouse gas emissions are providing other states and the nation with a roadmap to a low-carbon future. The foundation of California's climate policy leadership is AB 32, the Global Warming Solutions Act of 2006. AB 32 requires the state to reduce greenhouse gas (GHG) emissions to 1990 levels by the year 2020. The Legislature largely delegated to the California Air Resources Board (ARB) the job of establishing programs to achieve this goal. In response, ARB identified and began implementing a suite of programs to reduce GHGs from a variety of sources.

Among the measures that ARB adopted is a Cap-and-Trade Program, which places the nation's first economy-wide cap on carbon emissions and establishes market mechanisms to price carbon credits. The cap limits greenhouse gas emissions from large sources responsible for about 85 percent of the state's GHG emissions. The cap lowers over time to help the state achieve the goal of reducing California's GHG emissions to 1990 levels by 2020. ARB allocates a number of carbon allowances equal to the cap, and each allowance is essentially a permit to emit one metric ton of carbon dioxide or the equivalent amount for other GHGs.⁶ ARB provides some allowances for free, making others available for purchase at quarterly auctions. Large emitters must reduce emissions or obtain allowances. These entities, covered under the Cap-and-Trade program, can 'trade,' i.e. buy and sell, allowances on the open market.

In November 2014, the Canadian province of Quebec joined California to create North America's first international carbon market.

1.3.2 Targeting Investments to Disadvantaged Communities

Cap-and-Trade auction revenues are deposited into the Greenhouse Gas Reduction Fund. Senate Bill 535 requires that at least 10 percent of these dollars be spent on projects located within the state's most disadvantaged communities and that at least 25 percent of climate investments benefit disadvantaged communities.⁷

The California Environmental Protection Agency developed a scientific process, known as the California Communities Environmental Health Screening Tool (CalEnviroScreen 2.0), to identify the top 25 percent of census tracts considered the most disadvantaged communities in the state. The determination was based on data on pollution burden and other environmental indicators as well as population characteristics and socioeconomic indicators.

6 California Legislative Analyst's Office (February, 2015). "The 2015-16 Budget: Resources and Environmental Protection," Crosscutting Issues, Cap-and-Trade." Page 9. <http://www.lao.ca.gov/reports/2015/budget/resources-environmental-protection/Res-Budget-Analysis-021915.pdf>

7 Text of Chapter 830, Statutes of 2012 (SB 535, de León), Section 39713. http://www.leginfo.ca.gov/pub/11-12/bill/sen/sb_0501-0550/sb_535_bill_20120930_chaptered.html

The identified disadvantaged communities are thus:⁸

- 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 homeownership, high rent burden, sensitive populations, or low levels of educational attainment.

See the Appendix for a map of disadvantaged communities as identified by CalEnviroScreen 2.0.

1.4 Summary of Findings

1.4.1 A Large and Exponentially Growing Funding Source

California's Cap-and-Trade auction revenues have increased rapidly since the program began in the fall of 2012. The auction proceeds have soared from \$257 million in the first fiscal year to \$1.49 billion in the third fiscal year. With receipts from the May 2015 quarterly auction, the amount of Cap-and-Trade proceeds deposited into the Greenhouse Gas Reduction Fund exceeded \$1 billion annually for the first time in fiscal year 2014-15.⁹

The state of California received \$1.49 billion of Cap-and-Trade revenue in the 2014-15 fiscal year, 80 percent more than the \$832 million appropriated in the 2014-15 state budget for programs financed by the GGRF.¹⁰ See Tables 2 and 3.

8 Ibid, Section 39711.

9 California Air Resources Board (June 17, 2015). California Cap-and-Trade Program, May 2015 Joint Auction #3, California Post Joint Auction Public Proceeds Report. Page 2. http://www.arb.ca.gov/cc/capandtrade/auction/may-2015/ca_proceeds_report.pdf

10 California Department of Finance, California State Budget 2014-15, Enacted Budget Summary, June 2014, Page 42. <http://www.ebudget.ca.gov/2014-15/pdf/Enacted/BudgetSummary/FullBudgetSummary.pdf>

Table 2: California’s Cap-and-Trade Revenues by Fiscal Years 2012-13 to 2014-15¹¹

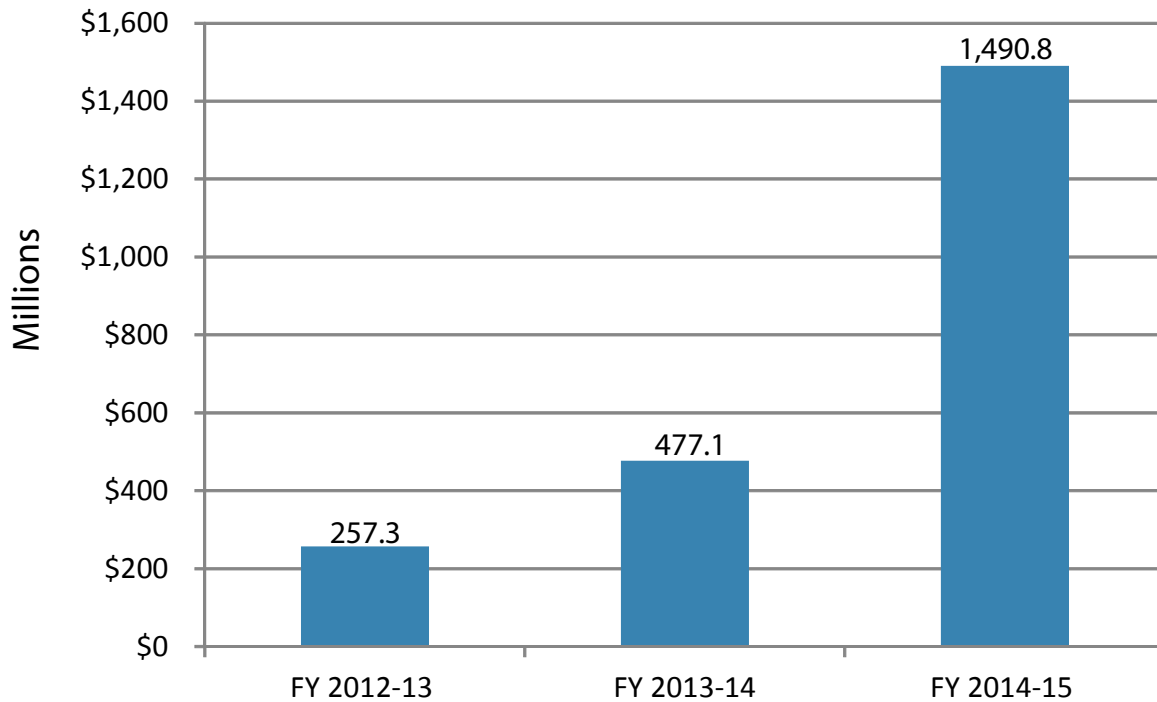
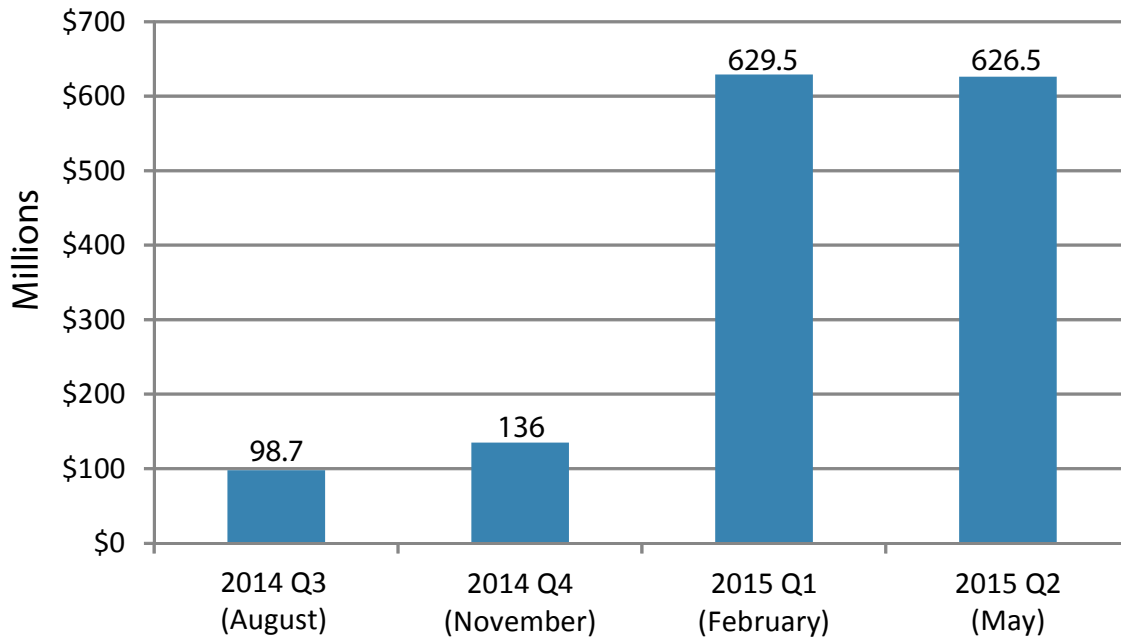


Table 3: California’s Quarterly Cap-and-Trade Revenues Fiscal Year 2014-15¹²



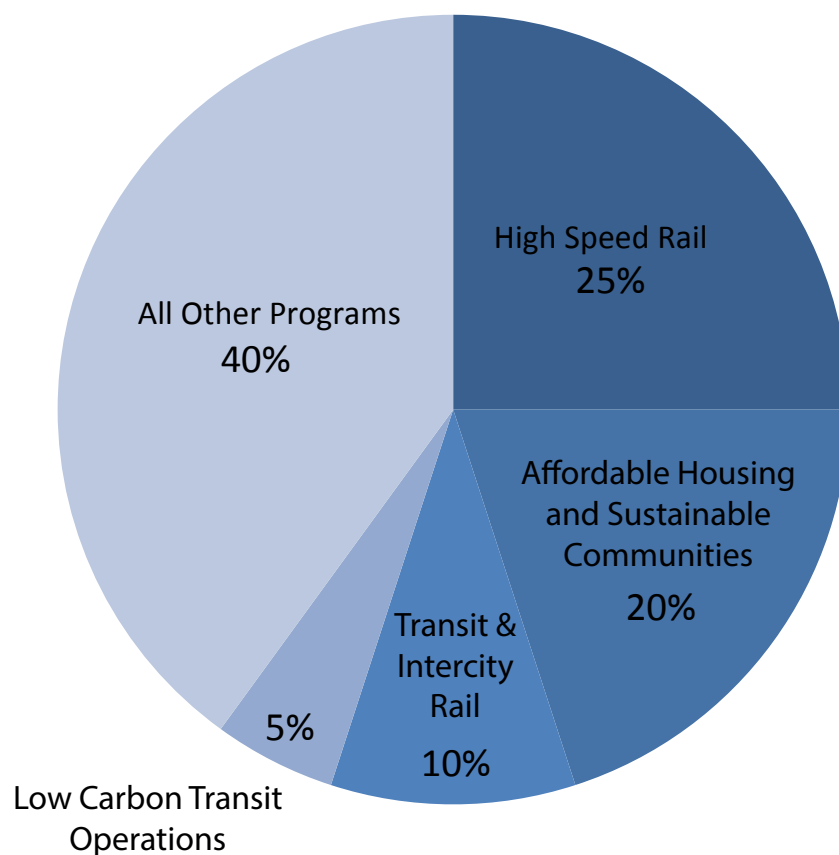
11 California Air Resources Board (June 17, 2015). California Cap-and-Trade Program, May 2015 Joint Auction #3, California Post Joint Auction Public Proceeds Report. Page 3. http://www.arb.ca.gov/cc/capandtrade/auction/may-2015/ca_proceeds_report.pdf

12 California Air Resources Board (June 17, 2015). “California Cap-and-Trade Program, May 2015 Joint Auction #3, California Post Joint Auction Public Proceeds Report.” Page 3.

California Gov. Jerry Brown’s May Revision to his proposed 2015-16 state budget assumes the state will collect \$2 billion in Cap-and-Trade revenue in the fiscal year. Legislative Analyst Mac Taylor believes the \$2 billion estimate is reasonable given significant uncertainty about future auction revenue. The Legislative Analyst’s own estimate is \$2.3 billion.¹³

The California Legislature decided in 2014 that 60 percent of the Cap-and-Trade revenues deposited annually into the GGRF would be continuously appropriated to four major programs beginning with the 2015-16 fiscal year:¹⁴ 25 percent for the state’s High-Speed Rail project; 20 percent for Affordable Housing and Sustainable Communities grants; 10 percent for the Transit and Intercity Rail Capital Program; and 5 percent for the Low Carbon Transit Operations Program (see Graphic 1).

Graphic 1: Greenhouse Gas Reduction Fund Spending¹⁵



13 California Legislative Analyst’s office (June 4, 2015). “Cap-and-Trade: Budget Conference Issues.” Page 4. http://www.lao.ca.gov/handouts/conf_comm/2015/Cap-and-Trade-Conference-Issues-060415.pdf

14 California Legislative Analyst’s Office, “The 2015-16 Budget: Resources and Environmental Protection,” Crosscutting Issues, Cap-and-Trade, February 2015, Page 9. <http://www.lao.ca.gov/reports/2015/budget/resources-environmental-protection/Res-Budget-Analysis-021915.pdf>

15 California Legislative Analyst’s Office (Feb, 2015). The 2015-16 Budget: Resources and Environmental Protection, Crosscutting Issues, Cap-and-Trade. Page 9. <http://www.lao.ca.gov/reports/2015/budget/resources-environmental-protection/Res-Budget-Analysis-021915.pdf>

The Legislature must decide in the annual budget process how to allocate the remaining 40 percent of the Cap-and-Trade revenues from the GGRF. At the time this report was printed, the Legislature had not decided how to allocate the remaining 40 percent (an estimated \$800 million) in GGRF spending for the 2015-16 fiscal year. The following table shows the amount of GGRF money that was appropriated in the 2014-15 state budget. It also includes Gov. Brown's proposed GGRF allocation for the 2015-16 fiscal year. While legislative leaders delayed action on his proposal until later in the summer of 2015, total spending from the GGRF is expected to more than double in 2015-16 compared to 2014-15. The amounts shown in italics in Table 4 on the next page were continuously appropriated for the 2015-16 fiscal year.

**Table 4: Actual/Proposed Appropriations from the Greenhouse Gas Reduction Fund
Comparison of 2014-15 and 2015-16 Fiscal Years¹⁶**

Greenhouse Gas Reduction Fund Programs	GGRF Appropriation 2014-15 (\$M)	Proposed GGRF Allocation 2015-16 (\$M)
Sustainable Communities and Clean Transportation		
Low Carbon Transit Operations Program*	\$25	<i>\$100</i>
Transit and Intercity Rail Capital Program*	\$25	<i>\$200</i>
Affordable Housing and Sustainable Communities*	\$130	<i>\$400</i>
Low Carbon Transportation Program*	\$200	\$350
High-Speed Rail Project	\$250	<i>\$500</i>
Energy Efficiency and Clean Energy		
Energy Efficiency Upgrades/Weatherization*	\$75	\$140
Energy Efficiency for Public Buildings	\$20	\$40
UC/CSU - Renewable Energy/Energy Efficiency Projects	-	\$60
Water and Energy Efficiency	-	\$60
Drought - Rebates for Appliances	-	\$30
Drought - Water and Energy Technology	-	\$30
Agricultural Energy and Operational Efficiency	\$15	\$25
Natural Resources and Waste Diversion		
Forest Health and Urban Forestry Projects*	\$42	\$92
Wetlands and Watershed Restoration	\$25	\$65
Healthy Soils	-	\$20
Waste Diversion	\$25	\$60
Total	\$832	\$2,237

*These programs are the focus of this report

**Numbers in italics indicate continuous appropriations

¹⁶ California Department of Finance, May Revision to the Governor's Proposed 2015-16 State Budget, Cap-and-Trade Expenditure Plan, page 65. http://www.dof.ca.gov/documents/2015-16_May_Revision.pdf

I.4.2 Investments are Increasing in Key Program Areas, but Demand Still Exceeds Funding

The rapid growth in Cap-and-Trade revenues has fueled dramatic increases in appropriations for state programs designed to reduce GHG emissions. This includes five investment categories that are the focus of this study because they are targeted to benefit disadvantaged communities. These five investment categories fund: transit-oriented affordable housing; financial incentives for the purchase or lease of clean cars, trucks, and buses; transit capital and operations; energy efficiency and solar panels for low-income housing units; and community forestry projects. While some of the programs within these categories are new with no historical funding level, others are existing programs updated to meet statutory requirements governing the Greenhouse Gas Reduction Fund. For the existing programs, the average funding levels before the GGRF were a fraction of the amount appropriated in the 2014-15 fiscal year.

The following five graphics illustrate the magnitude of the state funding increases for each of the five investment areas (six programs total). The data underscores the challenge that the state faced to provide financial support for key transportation, housing, and environmental programs during the worst economic recession in California since the Great Depression and before GGRF appropriations began. For the programs that were in existence before the GGRF, the GGRF is either replacing or significantly supplementing other sources of funding. Some of these other funding sources are either drying up or are volatile because they are tied to consumer taxes that fluctuate with the strength of the economy. This report underscores the importance of the GGRF as a source of new revenue to provide local economic, environmental, and public health benefits in disadvantaged communities. Yet, the program-level analysis of this report also highlights that demand still exceeds funding in key program areas.

In the case of transit-oriented development, the GGRF has provided an important source of funding for the new Affordable Housing and Sustainable Communities Program. Yet, the \$130 million appropriated from the GGRF to the AHSC Program in 2014-15 is only a fraction of the demand, as indicated by the number of applications the AHSC Program received from local governments and developers. And the GGRF is replacing another source of funding for transit oriented development rather than more substantially increasing the total amount of state support for transit oriented development. See Graphic 2 for details.

Graphic 3 illustrates that GGRF appropriations to the Low-Carbon Transportation Program (LCTP) means an exponential increase in funding available for LCTP sub-programs, such as the popular Clean Vehicle Rebate Project (CVRP). Several times between 2010 and 2014, before GGRF appropriations to the LCTP, the Air Resources Board ran out of money for the CVRP. At that point the state's main funding source for the CVRP came from fees on new cars, which is a volatile funding source. For six months the state was unable to pay the promised rebates to California residents who bought or leased a battery electric, plug-in hybrid electric, or a hydrogen fuel cell vehicle. To pay the rebates, the ARB eventually had to transfer funds from other programs and seek an emergency appropriation from the new GGRF. Funding for the CVRP went from \$37 million in the 2012-13 fiscal year pre-GGRF to \$121 million in 2014-15, a more than three-fold increase, mainly due to funding from the GGRF.

During this same period, funding for heavy-duty vehicle and equipment projects, which includes the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project, increased approximately 1,900 percent from \$5 million to \$95 million, again mainly due to GGRF dollars. In fact, of all of the programs analyzed in this report, the heavy-duty vehicle programs received the largest total dollar funding increase, comparing the amount before the GGRF with the 2014-15 GGRF appropriation.

On June 25, 2015, the ARB approved a proposed 2015-16 spending plan for the Low Carbon Transportation Program contingent on the Legislature appropriating \$350 million for the program from the GGRF. If provided, that amount would represent an increase of \$150 million or 75 percent in one year. See Graphic 3 for details.

Graphic 4 illustrates the funding amounts allocated to two new programs for transit capital and operations. The historical funding analysis is more convoluted for this investment sector than the others focused on in this report. While there are other state programs that fund transit capital and operations, we were not able to obtain funding appropriations data about them and thus, we are not able to do a historical comparison of funding for this investment category pre- and post-GGRF. We instead focus on the funding levels of the two new GGRF funded transit capital and operations programs.

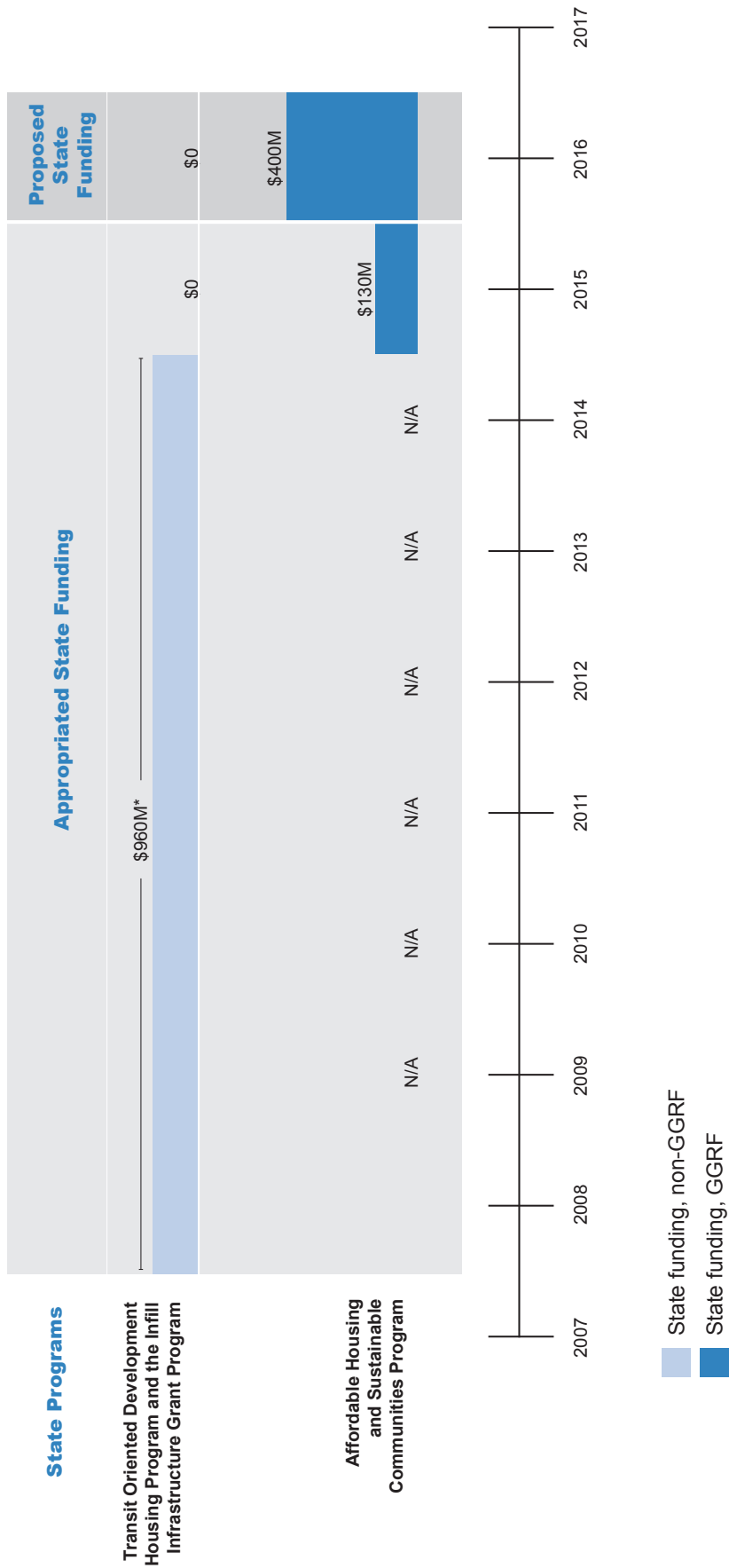
As Graphic 5 shows, the GGRF is dramatically increasing total state funding for weatherization and renewable energy programs targeted for low-income households and disadvantaged communities. We did not include in our analysis programs that receive significant federal funding targeted at such households in California (i.e. the Low Income Home Energy Assistance Program and the Weatherization Assistance Program) because this report focuses on state funding. But the broader context is that the GGRF complements these federally funded programs as well as other state funded programs such as the Multi-Family Affordable Housing Program and the Single-Family Affordable Solar Homes Program.

Graphic 6 illustrates that the GGRF will dramatically increase the size and scope of the state's Urban and Community Forestry programs. Before the Cap-and-Trade program provided a stable source of revenue, the state had to rely on voter approval of bond issues to fund a small Urban Forestry program.¹⁷ The state Department of Forestry and Fire Protection (CAL FIRE) received \$17.8 million from the GGRF for its Urban and Community Forestry Programs in the 2014-15 state budget. After CAL FIRE's administrative costs are taken into consideration (administration and oversight of grantees is important for CAL FIRE to properly invest in projects and ensure that project benefits are being maximized), the State will be able to award \$15.7 million in Urban Forestry grants to disadvantaged urban communities,¹⁸ which is more than double the largest amount of grants awarded in a single year since 2007-08.

17 Data provided by California Urban and Community Forestry Program Manager John Melvin as an attachment to an email dated January 8, 2015.

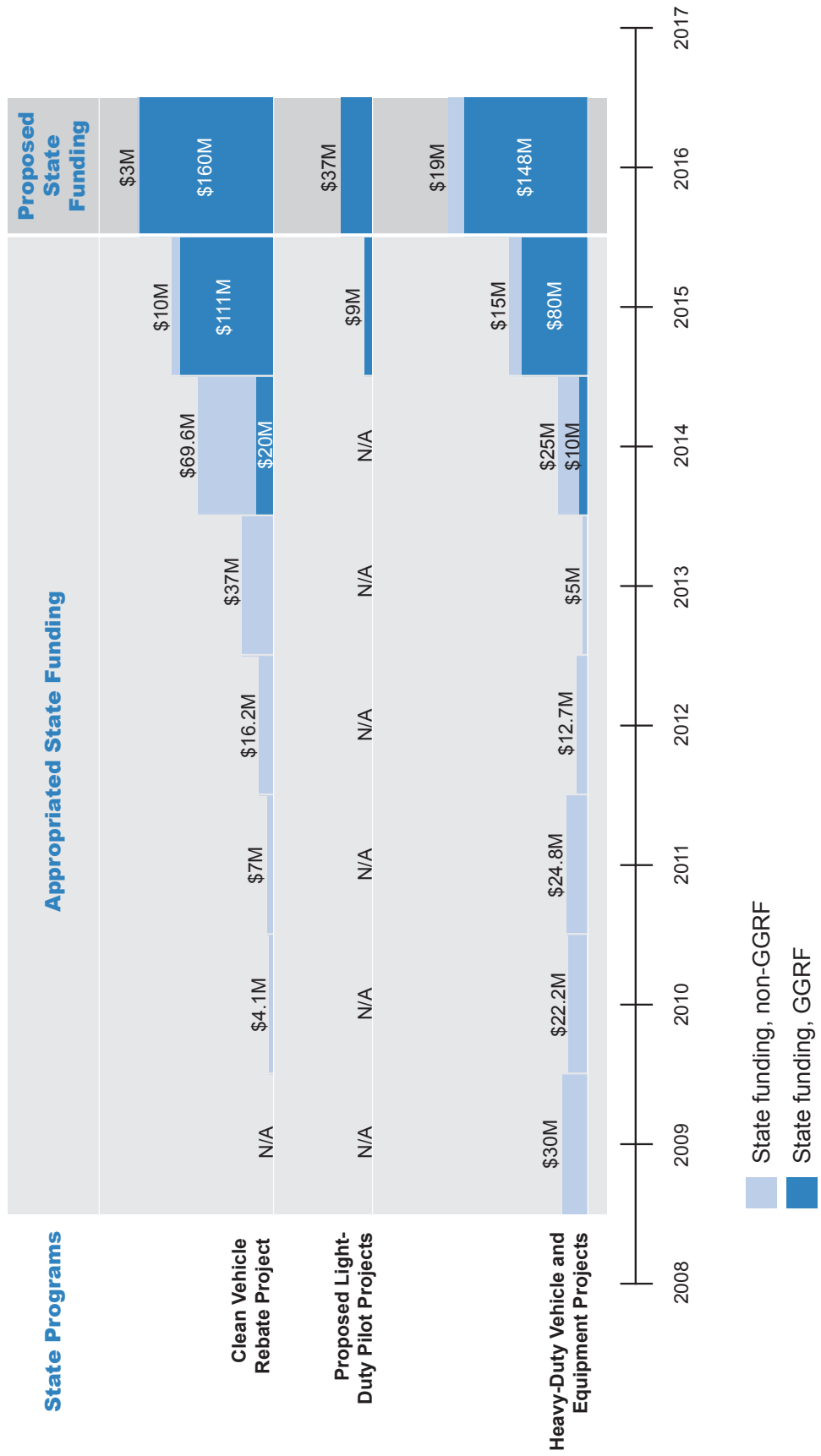
18 Email from California Urban and Community Forestry Program Manager John Melvin, January 15, 2015. Telephone interview with John Melvin, April 22, 2015.

Graphic 2: State Funding for Affordable Housing and Sustainable Communities, Pre and Post GGRF

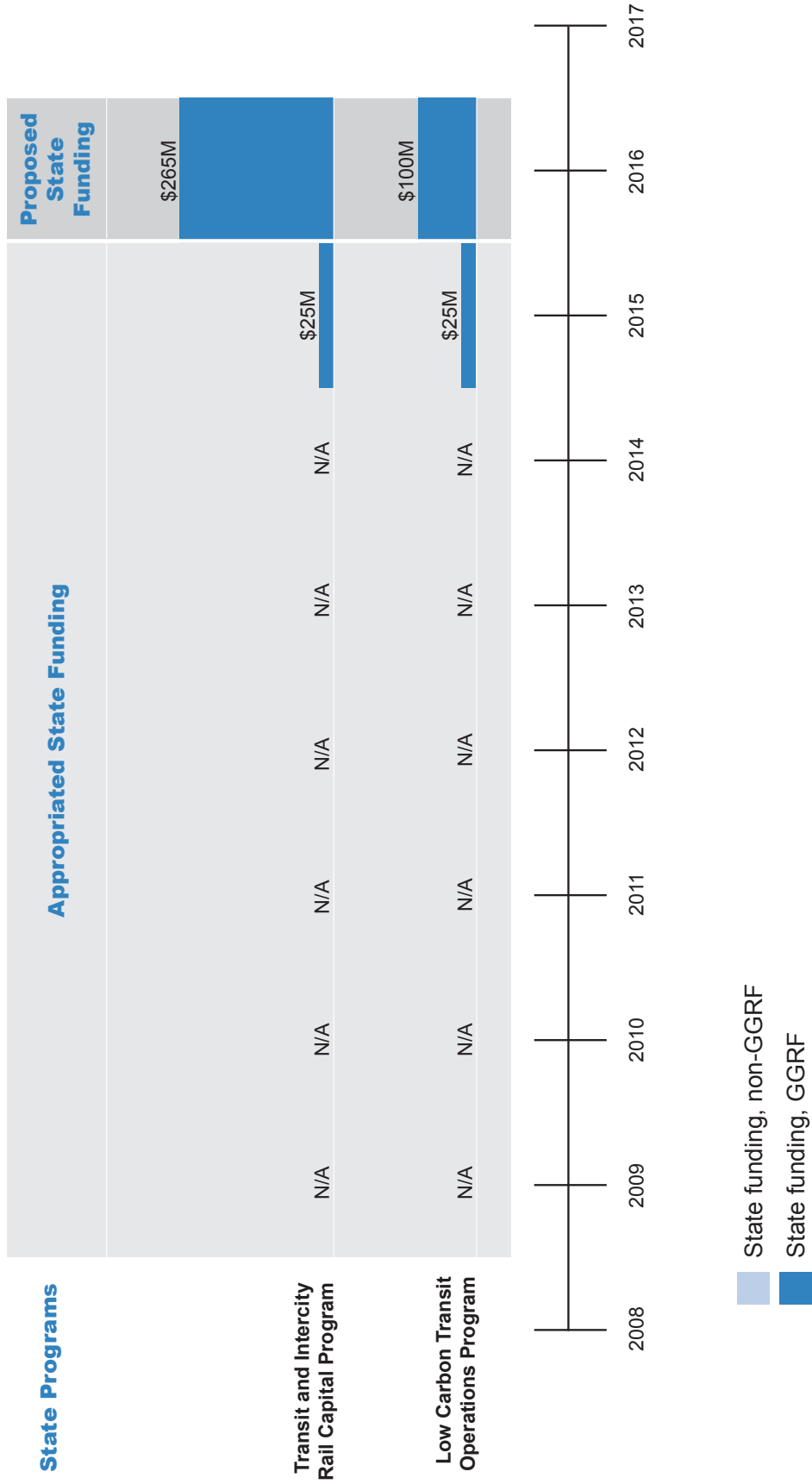


*The cumulative \$960 million from Proposition 1C bonds for the Transit Oriented Housing and Infill Infrastructure Grant programs is spread over a seven-year period for illustrative purposes only. Annual appropriation levels were not available from the California Department of Housing and Community Development.

Graphic 3: State Funding for the Low Carbon Transportation Program, Pre and Post GGRF

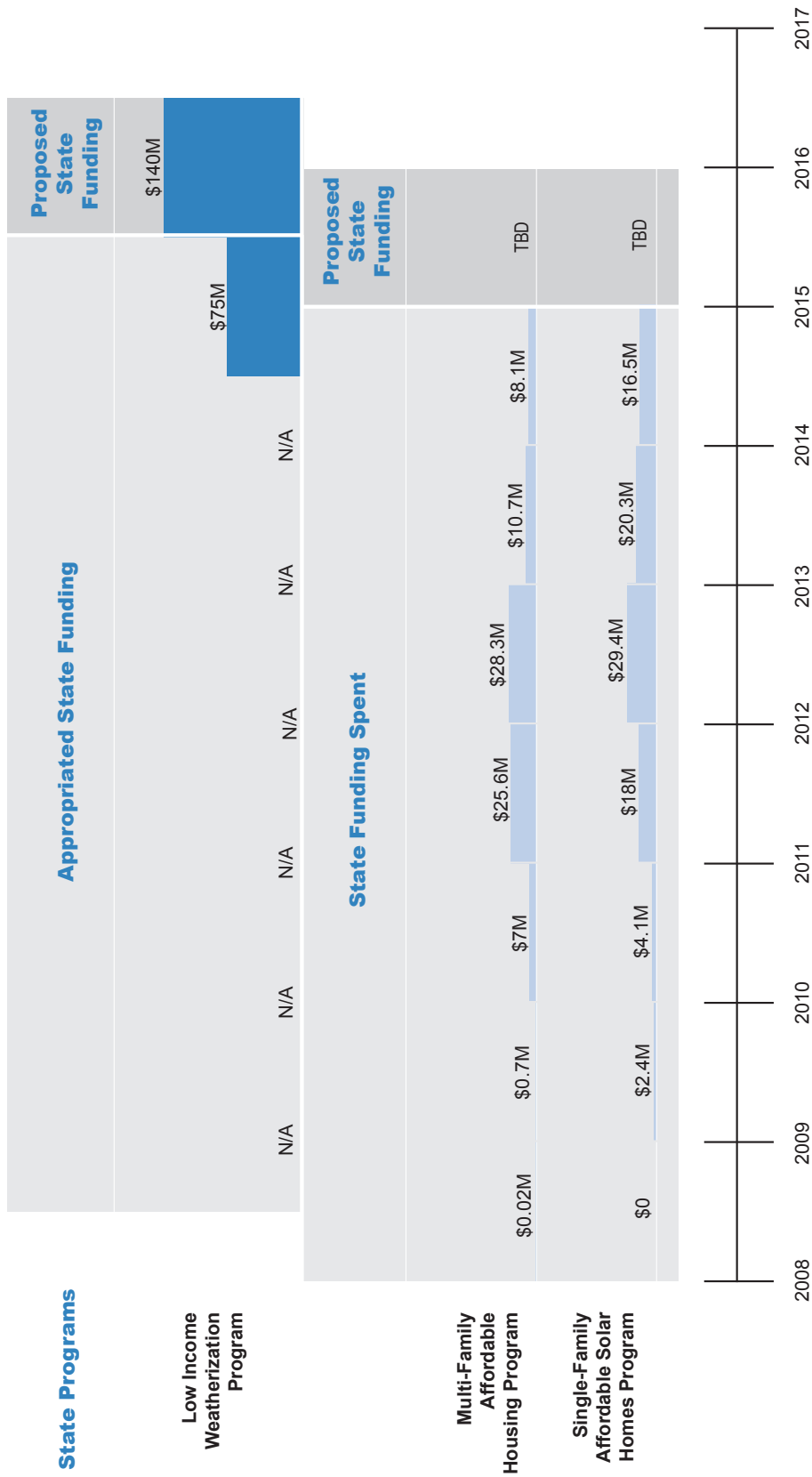


Graphic 4: State Funding for Transit Capital and Operations, Pre and Post GGRF*



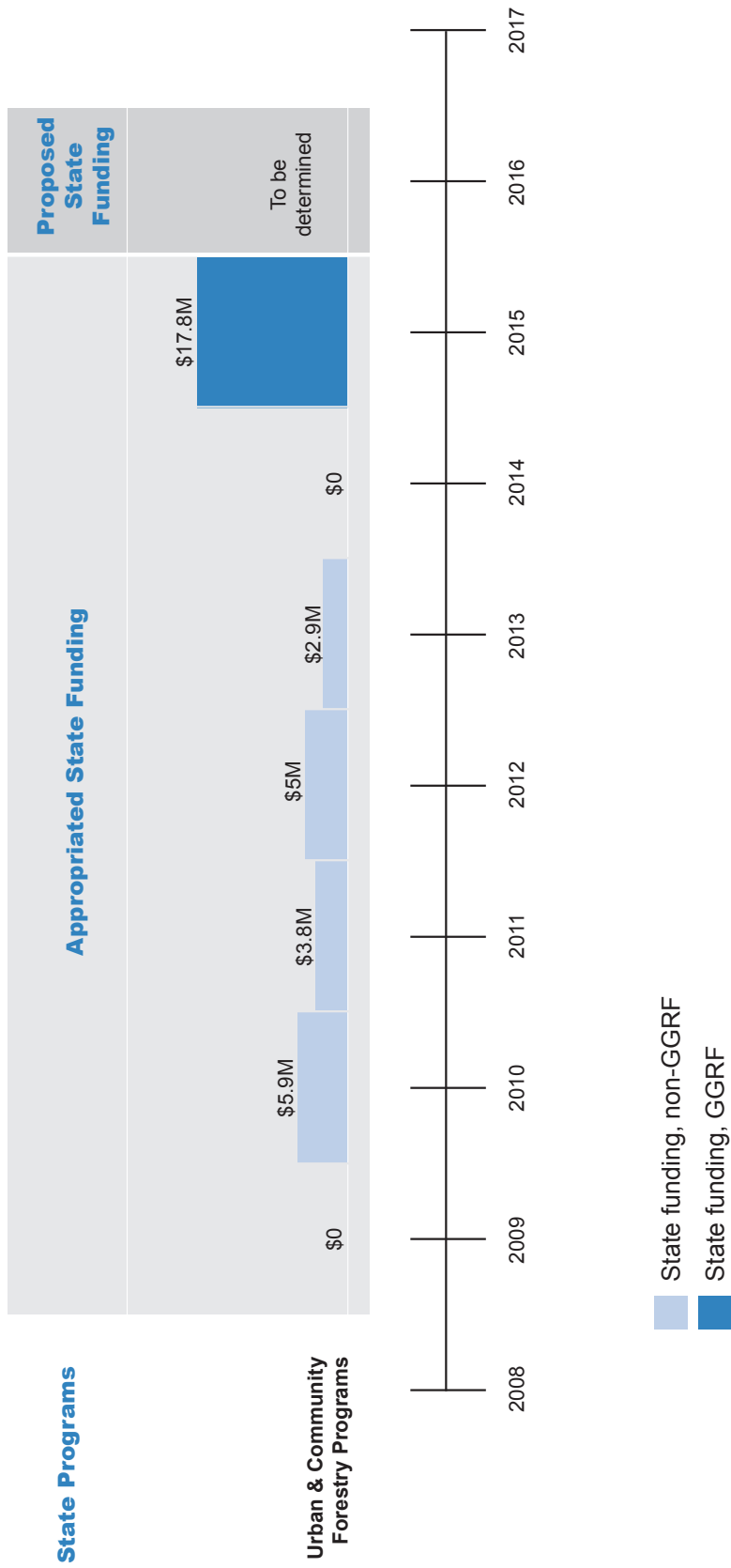
*There are other state programs that fund transit capital and operations but relevant information about their state funding levels was not readily available.

Graphic 5: State Funding for Low Income Home Weatherization and Renewables, Pre and Post GGRF



State funding, non-GGRF
 State funding, GGRF

Graphic 6: State Funding for Urban Forestry, Pre and Post GGRF



I.4.3 More Data Needed to Assess Intended and Actual Program Outcome and Impacts

Our findings also underscore that there is currently limited information provided by the state agencies (and in no one centralized place) to fully assess the expected co-benefits of GGRF investments. While we have information about program inputs and in some cases outputs associated with 2014-15 investments, more data is needed to readily and systematically assess outcomes and impacts from these investments. Chapter 7 identifies expected outputs associated with fiscal year 2014-15 investments, discusses how we would evaluate future outcomes and impacts, and provides recommendations to enhance co-benefits.

I.5 Next Steps

Only a small amount of the \$832 million appropriated from the GGRF in the 2014-15 budget had been spent as that fiscal year drew to a close. (Dollars that have been spent include for clean vehicle rebates to California residents. In addition, the state's new weatherization and energy efficiency program paid for installation of solar panels on a small number of low-income homes, but many more will be installed in the future using 2014-15 dollars.)

Moreover, now in its third year (as of July 1, 2015), guidelines for GGRF expenditures and investments are still not finalized. The Air Resources Board released in June, 2015 the draft Funding Guidelines for Agencies that Administer California Climate Investments. This document is set to be finalized at ARB's board meeting in September, 2015. These over-arching guidelines should then inform each agency's program-level guidelines, which can be updated over time.

The ARB is also working on a three-year plan for Cap-and-Trade proceeds that will flow into the GGRF from July 1, 2016 through June 30, 2019. After a series of public workshops and a public comment period, this second triennial investment plan is scheduled to be sent to the Legislature in 2016. The investment plan will guide annual budget appropriations during the three-year period.

In addition, State lawmakers are considering landmark legislation that would set a much tougher goal: to reduce California's greenhouse gas emissions to a point 40 percent below 1990 levels by 2030. In his Inaugural Address on January 5, 2015, Governor Brown spelled out what it will take to achieve the most ambitious greenhouse gas reduction target in North America:¹⁹

- Increasing from one-third to 50 percent the amount of electricity from renewable sources;
- Reducing today's petroleum use in cars and trucks by up to 50 percent;
- Doubling the efficiency of existing buildings and make heating fuels cleaner;
- Reducing the release of methane, black carbon, and other potent pollutants;
- Managing farm and rangelands, forests and wetlands so they can store carbon.

"All of this is a very tall order," Brown said. "It means that we continue to transform our electrical grid, our transportation system and even our communities."

¹⁹ Office of Governor Edmund G. Brown Jr. (January 5, 2015). Press release of Inaugural Address. <http://gov.ca.gov/news.php?id=18828>

1.6 Challenges and Opportunities

California has set ambitious goals for reducing greenhouse gas emission levels while also addressing local air pollution. The state has long been a world leader in combating air pollution. Now, California's multi-faceted efforts to address climate change are being closely watched by other states and nations. There are tremendous opportunities and big challenges facing the nation's most populous state.

The Greenhouse Gas Reduction Fund represents an historic opportunity to make investments that will help achieve the State's GHG reduction goals while also providing local co-benefits. It is an ambitious and complex process to implement the GGRF, involving over a dozen state agencies and their myriad programs. The process will take time and numerous issues still need to be addressed. The implementing state agencies are breaking new ground and should be commended for their ongoing efforts to improve their program guidelines and be responsive to the public.

One challenge is how to balance multiple goals that are not always perfectly aligned. For instance, in practice there can be trade-offs between maximizing GHG reductions and economic, environmental and public health co-benefits. The ARB and other state agencies should embed in the over-arching and program-level guidelines sufficient incentives for projects to truly do both, without detrimental trade-offs. Such guidance could be the difference between an insufficient effort and a transformative outcome.

Agencies should start now to assess program results and as needed, update their program guidelines to maximize GHG reduction and co-benefits. A previous UCLA Luskin Center report²⁰ lays out a "performance management approach" that involves eligibility criteria, scoring indicators, and metrics that state agencies could use to systematically evaluate investment options (ex-ante) and then track (ex-post) their results. The purpose of this approach is to create the conditions for a race to the top, where project applicants find innovative ways to maximize the benefits that each investment provides.

At the end of each of the following chapters, we analyze how programs targeting disadvantaged communities might more effectively provide local economic, environmental, and public health co-benefits. The following chapters also provide an historical funding analysis of these key programs. The findings underscore the importance of the Greenhouse Gas Reduction Fund as an historic opportunity to combat climate change and provide local co-benefits to vulnerable communities across California. The extent of these benefits will depend on a myriad of factors further discussed in Chapter 7.

20 UCLA Luskin Center for Innovation (June, 2014). "Investment Justice through the Greenhouse Gas Reduction Fund: Implementing SB 535 and Advancing Climate Action in Disadvantaged Communities." <http://innovation.luskin.ucla.edu/content/investment-justice-through-greenhouse-gas-reduction-fund>



2. Affordable Housing and Sustainable Communities Program

2.1 Program Overview

The Affordable Housing and Sustainable Communities (AHSC) Program is a new state program, with implementation beginning in fiscal year 2014-15. There are two elements of the umbrella program:

- The Affordable Housing and Sustainable Communities (AHSC) Program, and
- The Sustainable Agricultural Land Conservation (SALC) Program.

California's Strategic Growth Council (SGC) administers the Affordable Housing and Sustainable Communities Program, in coordination with the state Department of Housing and Community Development (HCD) and the California Air Resources Board. The SGC is composed of cabinet-level Brown administration officials and three public members appointed by the Governor, the Assembly Speaker and the Senate Rules Committee. The council coordinates the activities of state agencies. The HCD implements the transportation, housing, and infrastructure components of the Affordable Housing and Sustainable Communities program. The Sustainable Agricultural Land Conservation Program is implemented by the California Department of Conservation.

The AHSC Program is designed to further the purposes of California's landmark greenhouse gas reduction law, AB 32, and the Sustainable Communities and Climate Protection Act of 2008, known as SB 375. That legislation, authored by then-state Senator Darrell Steinberg, supports the state's goal to reduce GHG emissions through coordinated transportation and land use planning for sustainable communities. Under SB 375, the ARB sets regional targets for reductions in GHG emissions from passenger vehicles. In 2010, ARB established targets for 2020 and 2035 for each region covered by one of the state's metropolitan planning organizations. The ARB will periodically review and update the targets, as needed.²¹

²¹ California Air Resources Board, Sustainable Communities webpage, viewed at: <http://www.arb.ca.gov/cc/sb375/sb375.htm>

The goal of the AHSC Program is to reduce GHG emissions through projects that implement land-use, housing, transportation, and agricultural land preservation practices, which support infill and compact development. Projects funded through the program also support the following public policy objectives:²²

- Reducing air pollution;
- Improving conditions in disadvantaged communities;
- Supporting or improving public health;
- Improving connectivity and accessibility to jobs, housing and services;
- Increasing options for mobility, including active transportation;
- Increasing transit ridership;
- Preserving and developing affordable housing for lower income households;
- Protecting agricultural lands to encourage infill development rather than urban sprawl.

The AHSC Program provides grants and/or low-interest loans to projects that will reduce GHG emissions and benefit disadvantaged communities by increasing the accessibility of affordable housing, employment centers, and key destinations via low-carbon transportation. The goal is fewer vehicle miles traveled (VMT) through reduced vehicle trip length or by shifting modes from a single occupancy vehicle to transit, bicycling, or walking.

The program includes two types of projects:²³

- Transit Oriented Developments (TOD) located within half a mile of “Qualifying High Quality Transit.” Project proposals are required to include affordable housing or housing-related infrastructure and transportation-related infrastructure. The transportation infrastructure could involve transit station area improvements, such as bus stop benches and shelters; or sidewalks and dedicated bicycle paths connecting the housing project and a nearby transit station. Another option is traffic signal technology, which gives transit vehicles a priority over other traffic.
- Integrated Connectivity Projects (ICP) must demonstrate a reduction in vehicle miles traveled through fewer or shorter vehicle trips or a mode shift to transit, bicycling, or walking in areas that lack Qualifying High Quality Transit. The ICP grants can also be used for infrastructure improvements that do not include affordable housing.

At least half of all AHSC Program spending must be in disadvantaged communities. The same proportion must be spent on affordable housing. The two categories can overlap if an affordable housing project is proposed in a disadvantaged community.

22 California Strategic Growth Council. Affordable Housing and Sustainable Communities, Program Overview, Purpose section. http://www.sgc.ca.gov/s_ahscprogram.php

23 California Strategic Council. Affordable Housing and Sustainable Communities Program, Technical Assistance Workshops on Concept Submittal, PowerPoint. http://sgc.ca.gov/docs/AHSC_Technical_Assistance_Workshop_Presentation.pdf

A secondary element of the Affordable Housing and Sustainable Communities Program is a competitive grant program to use agricultural easements to protect a small amount of farm and ranch land from urban sprawl. The Sustainable Agricultural Lands Conservation (SALC) Program is designed to prevent increases in GHG emissions by limiting the opportunities for sprawling, vehicle dependent development in favor of more focused, compact, and transit-oriented development within discreet growth boundaries.²⁴ This chapter focuses on the much larger AHSC element of the program, rather than on the SALC.

2.2 Funding Overview

In the 2014-15 state budget, the California Legislature allocated \$130 million from the Greenhouse Gas Reduction Fund (GGRF) for the first year of the Affordable Housing and Sustainable Communities Program. Of that amount, \$5 million was devoted to the Sustainable Agricultural Land Conservation Program. State lawmakers also voted in June 2014 to dedicate 20 percent of future GGRF spending to the AHSC Program.²⁵ This continuous appropriation is second only to the 25 percent of the GGRF that lawmakers committed to the High-Speed Rail project on an on-going basis.

In May 2015, California Gov. Jerry Brown proposed that the AHSC Program receive \$400 million in the 2015-16 fiscal year. That amount corresponds to 20 percent of the Cap-and-Trade revenues expected during the fiscal year. The amount of funding for the AHSC Program could increase if state lawmakers ultimately adopt a higher estimate for Cap-and-Trade auction proceeds. The SGC is not scheduled to decide the level of funding for the second year of the Sustainable Agricultural Land Conservation Program until this fall, after the current legislative session ends.

2.2.1 The GGRF Provides an Important New Source of Funding for Transit Oriented Development Projects

The closest thing to a predecessor to the AHSC Program is the state's Transit Oriented Development (TOD) Housing Program, together with the Infill Infrastructure Grant (IIG) Program, both administered by the HCD Department. Both the TOD Housing and IIG programs were funded by Proposition 1C (approved by voters in November 2006).²⁶

The Proposition 1C and AHSC programs have many different characteristics and a direct comparison between them is not possible. Yet, common to them is support of transit-oriented development and sustainable communities. During fiscal year 2007-08 through 2013-14, the TOD Housing Program

24 California Strategic Growth Council, Sustainable Agricultural Lands Conservation (SALC) Program Overview, viewed at: http://sgc.ca.gov/s_salcprogram.php

25 The 2014-15 state budget appropriates \$130 million from the Greenhouse Gas Reduction Fund to develop and implement the Affordable Housing and Sustainable Communities Program. Accompanying legislation (SB 862) continuously appropriated 20 percent of the GGRF to the AHSC Program annually, beginning in fiscal year 2015-16. Source: California Strategic Growth Council, Affordable Housing and Sustainable Communities, Program Overview webpage, Statutory Authority section, which can be viewed at: http://www.sgc.ca.gov/s_ahscprogram.php

26 University of California, Berkeley, Institute of Governmental Studies, Proposition 1, Housing and Emergency Shelter Bond Issue, November 2006, viewed at: <https://igs.berkeley.edu/library/elections/proposition-1c-0>

provided grants or loans for an estimated 5,215 housing units in six California counties: San Francisco, Alameda, Santa Clara, Sacramento, Los Angeles and San Diego counties.²⁷ A large portion of the projects funded in the TOD Housing Program also received infrastructure grants from the Infill Infrastructure Grant (IIG) Program administered by the HCD Department.²⁸

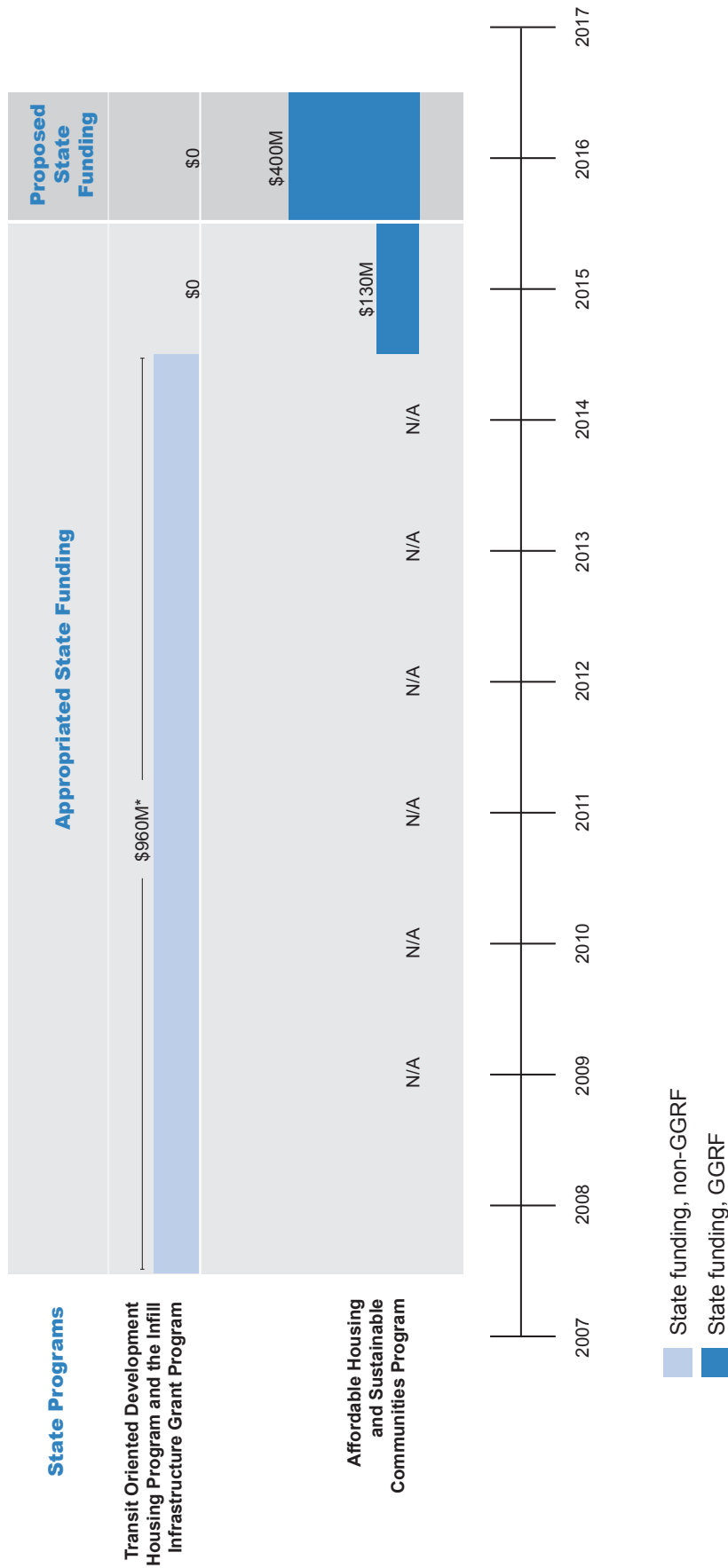
With auction revenues from the Cap-and-Trade program, the Greenhouse Gas Reduction Fund is providing an important new source of local assistance for affordable housing near transit and for infrastructure connecting and leveraging transit ridership. The Prop IC programs did not receive new funding appropriations in fiscal year 2014-15 and so the GGRF is in essence partially filling an important gap.

See Graphic 7 for details.

27 Data provided in an email from Linda M. Wheaton, Assistant Director, Intergovernmental Affairs, California Department of Housing & Community Development. January 30, 2015.

28 Email correspondence with Linda Wheaton, Assistant Director for Intergovernmental Affairs at the Department of Housing and Community Development. July 2, 2015.

Graphic 7: State Funding for Affordable Housing and Sustainable Communities, Pre and Post GGRF



*The cumulative \$960 million from Proposition 1C bonds for the Transit Oriented Housing and Infill Infrastructure Grant programs is spread over a seven-year period for illustrative purposes only. Annual appropriation levels were not available from the California Department of Housing and Community Development.

2.2.2 Despite More Funding, Demands Still Far Exceeds Investment

The \$130 million appropriated to the AHSC Program from the GGRF in 2014-15 is only a fraction of the demand, as indicated by the number of applications the AHSC Program received from local governments and private developers. In fact, during the first round, the state received 147 concept applications requesting over \$760 million for the new, highly competitive program.²⁹ Following recent reduction of federal, state, and local redevelopment funds, there is a pipeline of projects in need of funding.

“We always have demand far exceeding funds available for these programs,” said Linda Wheaton, Assistant Director for Intergovernmental Affairs at the Department of Housing and Community Development.

After reviewing the first round of applications, the Strategic Growth Council and Department of Housing and Community Development invited 54 concept proposal applicants from 22 counties to compete for funding. The proposals, from large urban centers, medium-sized cities, small towns, and rural areas, include a wide range of strategies to avoid or reduce vehicle miles traveled.

On June 30, 2015, the Strategic Growth Council unanimously approved \$122 million in grants and loans for 28 Affordable Housing and Sustainable Communities projects.

2.3 Challenges and Opportunities for an Evolving and Complex Program with Lofty Goals

The AHSC Program has faced challenges in its first year because of very tight timelines for developing the new program’s guidelines. Unlike most existing programs requiring updates to receive money from the GGRF, the AHSC Program is new, with a broad range of stakeholders. Thus, the AHSC Program had to be designed relatively quickly to proceed on the same implementation schedule as other GGRF appropriated programs. Yet, while it incorporated some provisions of existing programs, the AHSC Program is particularly complex with many different and ambitious goals and objectives.

Since the AHSC Program is at an early stage, its guidelines can be revised over time. We recommend doing so in order to better provide incentives for applicants to design truly innovative, transit-oriented, affordable housing projects. Part of this is an issue of timing. The program funds shovel-ready projects. For the first cycle of applications to the AHSC Program (the 2014-15 fiscal year), the core of projects had to be conceived and designed in advance of the initial AHSC Program Guidelines. In subsequent years, applicants should be encouraged to design projects to more specifically meet the program’s objectives, rather than being largely limited to projects that had received their land use entitlements from a local government before the AHSC Program began.

29 California Strategic Growth Council (March 18, 2015). Memorandum to Interested Stakeholders from Strategic Growth Council Staff Regarding Applicants Invited to Submit Full Applications for the Affordable Housing and Sustainable Communities Program. <http://www.hcd.ca.gov/financial-assistance/affordable-housing-and-sustainable-communities/docs/sgc-ahsc-concept-invite-memo031815.pdf>

The program's three-way decision-making process also creates some complications. As previously stated, the Strategic Growth Council administers the AHSC program, while the state Department of Housing and Community Development does most of the day-to-day work. The two agencies must work together to produce a joint recommendation about which projects should be funded. Ultimately, the Strategic Growth Council votes to award the grants or loans.

A third state agency, the Air Resources Board (ARB), has the responsibility to establish and review the methodology to quantify the potential greenhouse gas reduction for each project that applies for an AHSC grant or loan. ARB and the state Department of Finance also provide overall guidance, establishing reporting and other requirements for all state agencies administering GGRF programs. Additionally, metropolitan planning organizations (MPOs) had the option of reviewing and recommending applications from their respective regions, and a number of additional state agency staff participated in application review.

Fully 55 percent of the points needed to receive a grant or loan through the AHSC Program are determined by the ARB's computer model of the project's potential reduction in GHG emissions. These points driven by the "[e]stimated GHG emissions reductions per GGRF dollar spent."³⁰ Yet some applicants anecdotally reported not having adequate information ahead of time about what project types, for example what type of transit-related infrastructure, would provide the most GHG reductions. Another 30 percent of the points are based on achieving other policy objectives and 15 percent are based on a project's feasibility and readiness.

The AHSC Program guidelines could better mitigate the competing objectives of affordability and leveraging GHG reductions per Greenhouse Gas Reduction Fund dollar spent. Currently, the Strategic Growth Council utilizes the California Emissions Estimator Model (CalEEMod) to calculate GHG reductions. While CalEEMod is a rather sophisticated land use computer model that calculates the impacts of many construction projects and operations, including vehicle use, it does not distinguish between the differing carbon outputs of lower-income households, which drive substantially less than other households.³¹ It is estimated that "Extremely Low" and "Very Low-Income" households have 25 percent lower VMT than other households.³² Yet the AHSC Program does not distinguish between the carbon output of households qualifying for "Affordable Housing" at 80 percent of the average median income and far more impoverished residents. This creates a lost opportunity to capitalize on significant carbon reduction possibilities and potentially maximize benefits for low income households.

Additionally, issues of maintaining affordability as project areas gentrify around transit-oriented development are not adequately incentivized. Anti-displacement measures incorporated into proposals qualify for only one of the 30 points for policy objectives other than GHG reductions.

30 California Strategic Growth Council (January 20, 2015). Staff Report: Adoption of Final Guidelines for 2014-15 Affordable Housing and Sustainable Communities Program. Page 29, Figure 9.

31 TransForm and the California Housing Partnership Corporation (May, 2014). Why Creating and Preserving Affordable Homes Near Transit is a Highly Effective Climate Protection Strategy. <http://www.chpc.net/dnld/AffordableTODResearch051514.pdf>

32 Ibid.

Considering the expense of many anti-displacement policies and the negative effect it would have on the carbon-reduction to dollar ratio that drives the 55 points, proposals including any anti-displacement policies could likely be less competitive.

The AHSC Program could also provide greater incentives for projects that limit vehicular parking. Research indicates that, absent mitigating factors, the more high-end, market rate housing there is in a project, the more likely the occupants of those units are to drive rather than use transit. This should be considered in evaluating the project's potential GHG reduction. The program guidelines could also be updated to incentivize projects that incorporate other GHG reduction components, such as high-energy efficiency building ratings and electric vehicle charging stations.

Scaling up the AHSC Program from \$130 million in its first year to \$400 million or more in its second year poses a significant challenge. Gov. Brown, in the May, 2015 revision to his proposed 2015-16 state budget, asked the Legislature to increase the staff the HCD and SGC for the second year of the AHSC Program. This is important. The HCD should have sufficient staff to provide technical assistance to applicants who must complete a complex GHG reduction analysis as part of the application process. The HCD and SGC also should expand culturally-competent outreach efforts to inform potential applicants about the AHSC program, particularly in disadvantaged communities.





3. The Low Carbon Transportation Program

3.1 Program Overview

The Low Carbon Transportation Program run by the California Air Resources Board is one of the largest recipients of Cap-and-Trade revenues. In the 2014-15 state budget, the Legislature allocated \$200 million from the Greenhouse Gas Reduction Fund for the first year of the program. Gov. Jerry Brown has proposed expanding the program to \$350 million in the 2015-16 fiscal year. The Air Resources Board in June 2015 adopted an ambitious plan to spend the 75 percent increase in GGRF money on a broad array of Low Carbon Transportation programs and projects. But first, state lawmakers must allocate the money.

The California Alternative and Renewable Fuel, Vehicle, Technology, Clean Air, and Carbon Reduction Act of 2007 (AB 118) established the ARB's Air Quality Improvement Program (AQIP), a key element of the Low Carbon Transportation Program. Funding for the AQIP comes from motor vehicle fees. This historical funding source has been eclipsed by the GGRF. The AQIP provides financial incentives for projects that improve air quality by reducing emissions of criteria pollutants and diesel particulate pollution; cutting greenhouse gas emissions; promoting development of advanced technology vehicles; encouraging research on alternative fuels; and providing workforce training.

The purpose of the Low Carbon Transportation Program is to accelerate the transition to zero-emission or near-zero emission passenger cars, transit vehicles, and freight transportation. The largest source of California's greenhouse gas emissions is the transportation sector of the state's economy.³³ To meet the 2030 goal proposed by Gov. Brown will require a 40 percent reduction in GHG emissions compared to 1990 levels.

With a growing population and millions of additional vehicles expected in the next 15 years, the Governor and the ARB believe it is critical that California transition to zero-emission or near zero emission vehicles, dramatically lower the amount of fossil fuel we use, reduce the carbon content of our transportation fuels, and use the Cap-and-Trade program to encourage investment in cleaner technology.

³³ California Air Resources Board (June, 2015). California Greenhouse Gas Emissions for 2000 to 2013 – Trends of Emissions and Other Indicators. Pages 2 and 3. http://www.arb.ca.gov/cc/inventory/pubs/reports/ghg_inventory_trends_00-13.pdf

The LCTP functions as an umbrella program encompassing several sub-programs in two main categories: light-duty vehicles such as passenger cars, sport utility vehicles, trucks, and heavy-duty vehicles such as delivery trucks, big-rigs, transit vehicles, and school buses. This chapter will provide an overview and funding analysis of the LCTP's sub-programs and projects within those two categories. Given that many of these sub-programs are new, there is no historical funding information that we can analyze. But we do so for existing sub-programs, such as the Clean Vehicle Rebate Project. The sub-programs in this chapter are organized as follows.

Light-duty vehicle category:

- The Clean Vehicle Rebate Project
- Five new pilot projects to serve disadvantaged communities

Heavy-duty vehicle category:

- Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP)
- New pilot and demonstration projects
- Truck Loan Program

3.2 Funding Overview

Funding for the ARB's light-duty and heavy-duty vehicle projects of the Low Carbon Transportation Program (LCTP) has increased exponentially with the availability of Cap-and-Trade revenues that flow into Greenhouse Gas Reduction Fund. For example, several times between 2010 and 2014, before GGRF appropriations to the LCTP, the Air Resources Board ran out of money for the Clean Vehicle Rebate Project. At that point, the state's main funding source for the Clean Vehicle Rebate Project came from smog fees on new cars, which is a limited source of funding. Funding for the Clean Vehicle Rebate Project went from \$37 million in the 2012-13 fiscal year pre-GGRF to \$121 million in 2014-15, a more than three-fold increase, mainly due to funding from the GGRF.

During this same period, funding for heavy-duty vehicle and equipment projects, which includes the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project, increased approximately 1,900 percent from \$5 million to \$95 million, again mainly due to GGRF dollars. In fact, of all of the programs analyzed in this report, the heavy-duty vehicle programs received the largest total dollar funding increase, comparing the amount before the GGRF with the 2014-15 GGRF appropriation.

On June 25, 2015, the ARB approved a proposed 2015-16 spending plan for the Low Carbon Transportation Program contingent on the Legislature appropriating \$350 million for the program from the GGRF. If provided, that amount would represent an increase of \$150 million or 75 percent in one year.

Of the \$350 million from the GGRF, Gov. Brown and the ARB requested \$160 million for the Clean Vehicle Rebate Project, a 25 percent increase over the 2014-15 fiscal year. In addition, the ARB is seeking another \$37 million to spend on light-duty vehicle pilot projects in disadvantaged

communities, four times more than the \$9 million spent in 2014-15. The money would be used to provide enhanced financial incentives to encourage low to moderate income Californians to trade in an old, gross-polluting car for a cleaner alternative – a battery electric vehicle, a plug-in hybrid electric vehicle, or a conventional gasoline-electric hybrid vehicle less than eight years old. Low to moderate income Californians will also have the option to trade in their old car for transit passes or car-sharing vouchers.

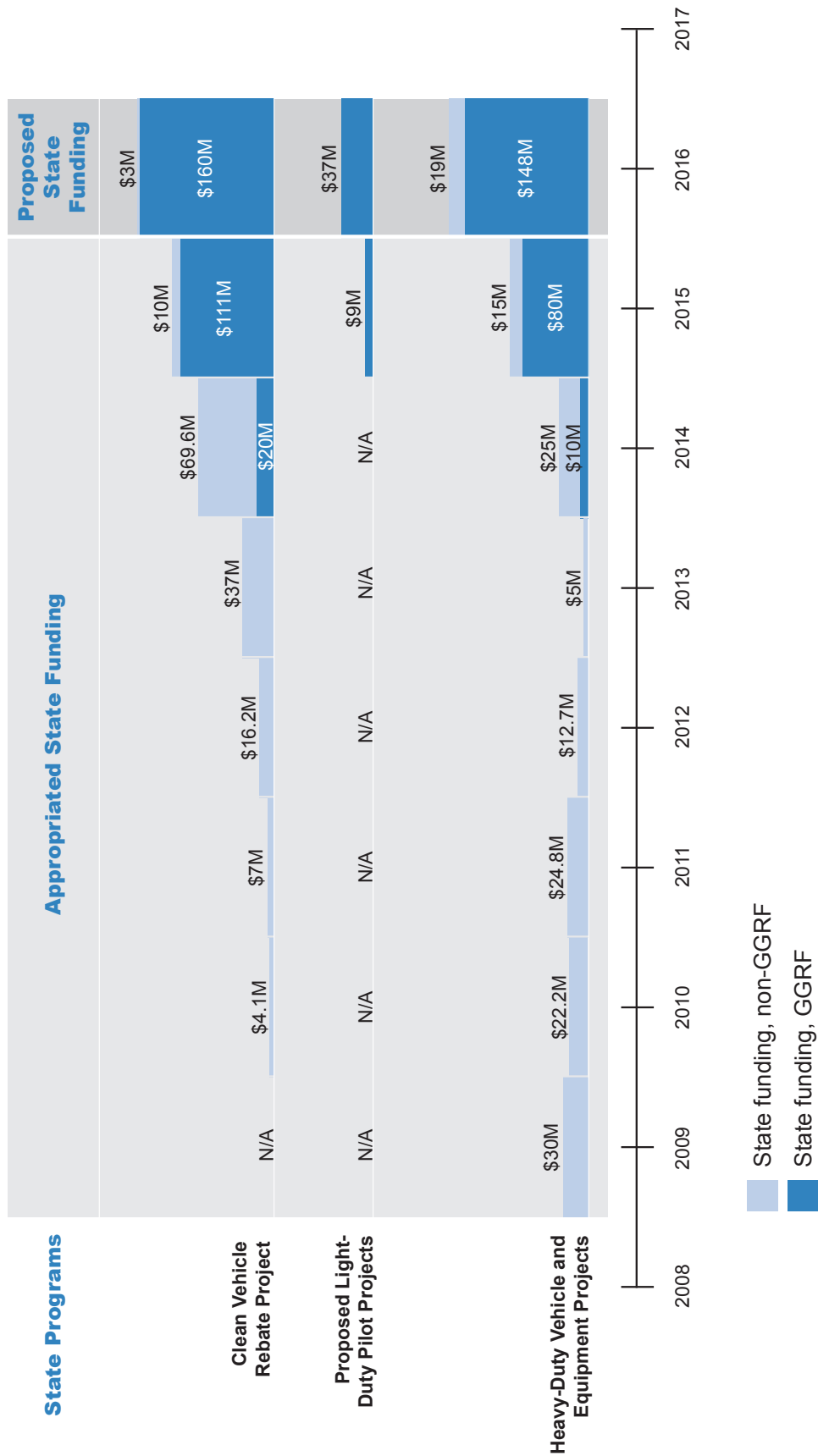
California is also experimenting with pilot projects to offer electric vehicle car-sharing, innovative financing techniques, and special incentives for purchase of electric vehicles for public fleets that operate in disadvantaged communities.

See Graphic 8 for details.



A plug-in hybrid-electric car recharges for free outside a suburban Los Angeles shopping center.

Graphic 8: State Funding for the Low Carbon Transportation Program, Pre and Post GGRF



3.3 Light-Duty Vehicle Projects

3.3.1 Clean Vehicle Rebate Project

Overview

A high profile component of the Low Carbon Transportation Program is the Clean Vehicle Rebate Project, which provides rebates for the purchase or lease of a battery electric vehicle, plug-in hybrid electric vehicle, fuel cell vehicle, a neighborhood electric vehicle, and electric motorcycles.³⁴

The ARB launched the Clean Vehicle Rebate Project (CVRP) in March 2010, two years before the first Cap-and-Trade auction was held. The program is intended to promote the development and commercialization of advanced vehicle technologies, which are necessary to meet California's air quality and climate goals. One of those goals is to help advanced technologies transition from prototype and small-scale production to assembly line production, thereby reducing vehicle costs.³⁵ The program also sends a signal to motor vehicle manufacturers that California's investment in clean vehicle technologies will pay dividends.

To spur the growth of a market for battery electric, hybrid electric, and fuel cell vehicles, California provides a rebate ranging from \$1,500 to \$5,000 for the purchase or lease of a battery electric vehicle, a plug-in hybrid electric vehicle, or a fuel cell vehicle. The number of people seeking and receiving rebates has grown each year since the program began. The Clean Vehicle Rebate Project is an increasingly popular program, and can be coupled with federal tax credits of up to \$7,500. However, the federal tax credits are not a viable option for low-income individuals who do not normally incur the requisite tax liability to benefit from the credit.

These basic rebate levels remain in effect for most, but not all, Californians. In adopting the 2015-16 spending plan, the ARB worked with interested stakeholders and laid the groundwork for additional funding incentives for lower and moderate income consumers. Four to six months after the Legislature appropriateds fiscal year 2015-16 funding for the Low Carbon Transportation Program, the new Clean Vehicle Rebate levels will increase for what the ARB defines as low to moderate income consumers. The higher rebates will be \$6,500 for a fuel cell vehicle, \$4,000 for a battery electric vehicle, and \$3,000 for a plug-in hybrid electric vehicle. To qualify for these higher rebate amounts, the consumer's income cannot exceed 300 percent of the federal poverty level, which is \$47,790 for a two-person household or \$72,750 for a four-person household.³⁶

34 Only California residents, businesses, government agencies, and non-profit organizations are eligible to receive state Clean Vehicle rebates. In most cases, the vehicle must be owned or leased and registered in California for at least 30 months to be eligible. Source: California Air Resources Board, Implementation Manual for the FY 2014-15 Clean Vehicle Rebate Project (CVRP), December 2014. Pages 1, 10, and 11.

35 California Air Resources Board (June 26, 2014). Final Approved Fiscal Year 2014-15 Funding Plan for the Air Quality Improvement Program and Low Carbon Transportation Greenhouse Gas Reduction Fund Investments.

36 California Air Resources Board (Adopted June 25 2015). Proposed Fiscal Year 2015-16 Funding Plan For Low Carbon Transportation Investments and the Air Quality Improvement Program. Table 6: 300 Percent of Federal Poverty Level for 2015. Page 30.

Also, for the first time the ARB has imposed a limit on the amount of adjusted gross income an individual buying or leasing a battery electric or plug-in hybrid electric vehicle can have and still receive a California Clean Vehicle Rebate from the state. Consumers will no longer be eligible for California rebates if they have incomes above:³⁷

- \$250,000 for single filers;
- \$340,000 for head of household filers; and
- \$500,000 for joint filers.

The limits will not apply to a high income individual who wants to buy or lease a hydrogen fuel cell vehicle. Just over 100 fuel cell vehicles had received a California rebate as of early July 2015.

The changes adopted by the ARB were a result of legislation passed in 2014, which directed the ARB to develop a proposal to shift rebate dollars from higher-income consumers to lower-income Californians.

Financial Analysis

By mid-August, 2015, the state had paid or reserved rebates for the purchase or lease of 116,193 zero-emission or near zero-emission vehicles. The rebates cost the state \$245.8 million.³⁸ California now has about 40 percent of all the electric vehicles in the United States.³⁹

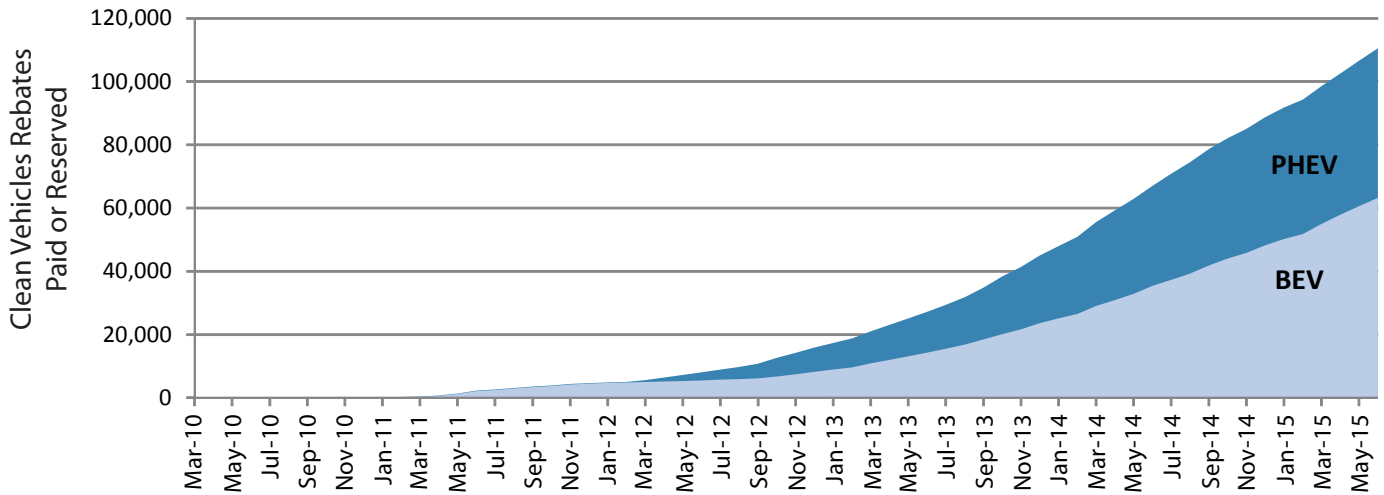


37 California Air Resources Board (June 25, 2017). Proposed Fiscal Year 2015-16 Funding Plan For Low Carbon Transportation Investments and the Air Quality Improvement Program. Page 27.

38 Center for Sustainable Energy, California Air Resources Board, Clean Vehicle Rebate Project, Rebate Statistics. Data updated August 17, 2015 and uploaded from: <https://energycenter.org/clean-vehicle-rebate-project/rebate-statistics>

39 California Air Resources Board (June 25, 2015). Proposed Fiscal Year 2015-16 Funding Plan For Low Carbon Transportation Investments and the Air Quality Improvement Program. Page 20.

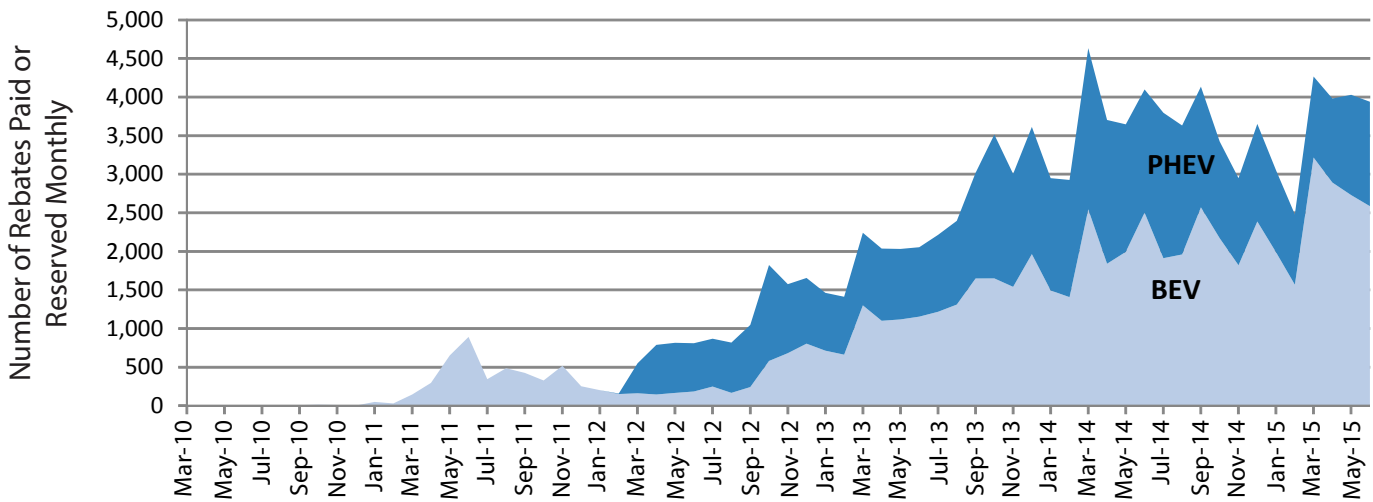
Table 5: California Clean Vehicle Rebates⁴⁰



Individuals received almost 97 percent of the rebates. Businesses accounted for nearly three percent. Local, state, and federal government agencies and non-profit organizations received less than half of one percent of the rebates.⁴¹

In a year and a half from September 2012 to March 2014, the program grew rapidly from just over 1,000 rebates paid or reserved per month to an all-time high of more than 4,600 rebates paid or reserved per month.⁴² See Table 6 below for details about participation in the rebate program.

Table 6: California Clean Vehicle Rebates Paid or Reserved Monthly



40 Center for Sustainable Energy, California Air Resources Board, Clean Vehicle Rebate Project, Rebate Statistics. Data updated July 7, 2015 and uploaded from: <https://energycenter.org/clean-vehicle-rebate-project/rebate-statistics>

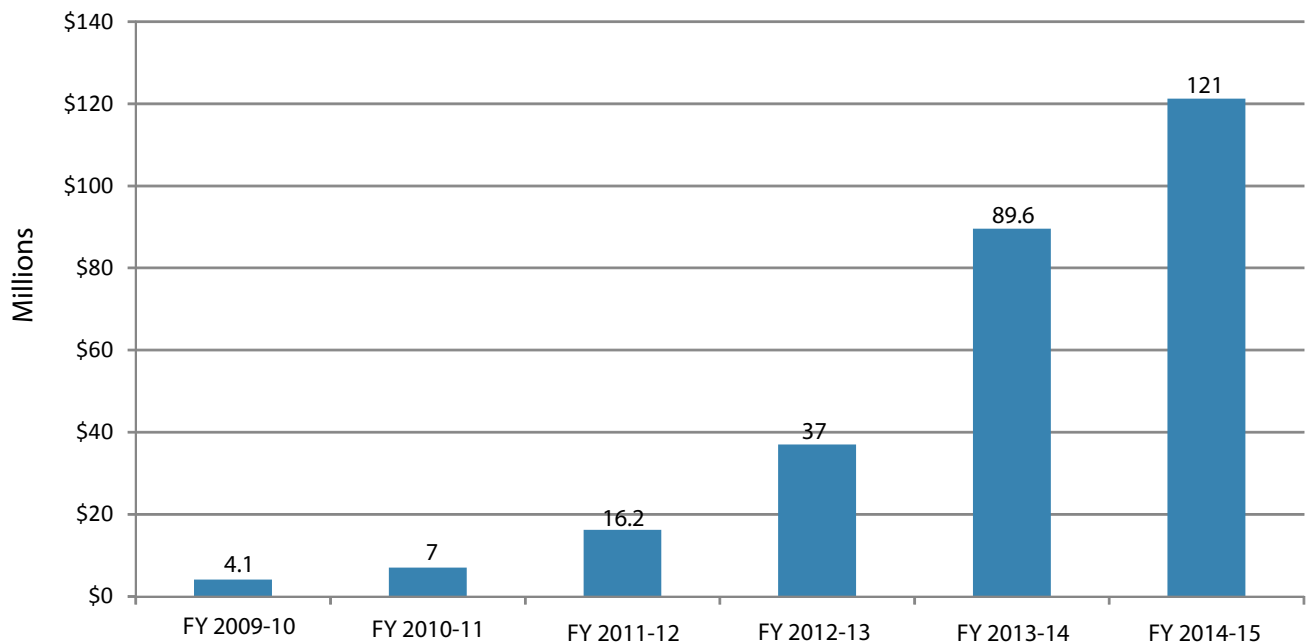
41 Ibid.

42 Center for Sustainable Energy, California Air Resources Board, Clean Vehicle Rebates By Month, viewed at: <https://energycenter.org/clean-vehicle-rebate-project/rebate-statistics>

All-electric vehicles like the Nissan Leaf, Tesla Model S, and Fiat 500e account for 57.5 percent of the clean vehicles receiving rebates. Plug-in hybrids powered by electricity and gasoline, like Chevrolet Volt, Toyota Plug-in Prius, and Ford Fusion, account for 41.9 percent of the rebates. Slightly more than 100 vehicles, one-tenth of one percent of the clean vehicles receiving rebates in California, are powered by hydrogen fuel cells.⁴³ The state provides a \$5,000 rebate to spur the development of fuel cell electric vehicles. Neighborhood electric vehicles and electric motorcycles received one-half of one percent of the rebates.

Cap-and-Trade revenues that flow through the Greenhouse Gas Reduction Fund became the primary source of support for the Clean Vehicle Rebate Project in the 2014-15 fiscal year. The GGRF provided \$111 million for the CVRP, and \$9 million for the four new Light-Duty Vehicle pilot projects. Historically, funding for the rebates came from fees on new vehicles and from the California Energy Commission. The CVRP struggled financially during the Great Recession that gripped the state after the housing bubble burst in 2007.

Table 7: Spending on California’s Clean Vehicle Rebate Project



⁴³ Center for Sustainable Energy, California Air Resources Board, Clean Vehicle Rebate Project, Rebate Statistics. Data updated July 7, 2015 and uploaded from: <http://energycenter.org/clean-vehicle-rebate-project/rebate-statistics>

The infusion of Cap-and-Trade dollars has provided the state with a rapidly growing revenue source to finance programs that will help California reduce greenhouse gas emissions to 1990 levels by 2020.

The Cap-and-Trade dollars, which flow through the state's Greenhouse Gas Reduction Fund, have provided a rapidly growing source of money for low carbon transportation programs.

At the start, the state was offering a \$5,000 rebate for purchase of a new battery electric or plug-in hybrid vehicle. In the midst of the worst recession since the Great Depression, the state temporarily ran out of money for clean vehicle rebates. The maximum rebate for an electric vehicle with an estimated range of 100 miles or more was cut to \$2,500. The rebate for an electric car with a range from 75 to 100 miles was dropped to \$2,000. The rebate for plug-in hybrids was cut to \$1,500.

Even so, the rebate program proved so popular that it ran out of money for six months in 2014 until the project received a total of \$50 million from the GGFR.⁴⁴

The GGFR has almost entirely replaced other funding for the Clean Vehicle Rebate Project. The GGFR provided \$111 million for the CVRP in the 2014-15 fiscal year. An additional \$9 million was reserved for pilot projects involving light-duty vehicles.

Added Incentives to Drive a Clean Vehicle

In the San Joaquin Valley Air Pollution Control District, an additional \$3,000 "Drive Clean" rebate is available for the purchase or lease of an all-electric vehicle and an extra \$2,000 "Drive Clean" rebate is available for a plug-in hybrid vehicle. Additional financial incentives are available for low-income to moderate-income residents of the San Joaquin Valley Air Pollution Control District⁴⁵ and the South Coast Air Quality Management District.⁴⁶ Both districts are designated as extreme non-attainment areas for failure to meet federal air quality standards.⁴⁷

Besides a rebate check, state lawmakers have provided another important and valuable incentive for Californians, no matter where they live in the state, to buy or lease a clean vehicle: single-occupant use of California's carpool lanes. Drivers of certified zero-emission battery electric, hydrogen fuel cell, and compressed natural gas (CNG) vehicles can apply to the Department of Motor Vehicles for a White Clean Air Vehicle sticker. In addition, Green Clean Air Vehicle stickers are available for applicants who buy or lease a plug-in hybrid vehicle, also known as an Advanced Technology Partial Zero Emission Vehicle (AT PZEV). The Legislature recently extended the expiration date to January 1, 2019 for both the green and white stickers.⁴⁸

44 Email from Peter Christensen, Manager, Innovative Heavy-Duty Strategies Section, California Air Resources Board, July 9, 2015.

45 The San Joaquin Valley Air Pollution Control District includes eight counties in California's Central Valley: San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, Tulare, and the San Joaquin Valley portion of Kern County.

46 The South Coast Air Quality Management District includes most of Los Angeles County, all of Orange County, western Riverside and western San Bernardino counties. Click on South Coast Air Basin Map at: <https://www.replaceyourride.com/Eligibility.aspx>

47 The U.S. Environmental Protection Agency has set National Ambient Air Quality Standards for six principal pollutants, which are called "criteria" pollutants. They are: Carbon Monoxide, Lead, Nitrogen Dioxide, Ozone, Particulate Pollution, and Sulfur Dioxide. <http://www.epa.gov/air/criteria.html>

48 California Air Resources Board, Eligible Vehicle List, Single Occupant Carpool Lane Stickers. <http://www.arb.ca.gov/msprog/carpool/carpool.htm>

3.3.2 Pilot Projects Serving Disadvantaged Communities

Car Sharing

The ARB committed up to \$2.5 million in the 2014-15 fiscal year to launch a pilot program to establish hybrid or clean vehicle car sharing or vanpool fleets in disadvantaged communities, which are disproportionately impacted by air pollution. The ARB awarded the car share pilots to the City of Los Angeles and to the San Diego Association of Governments. The ARB's spending plan calls for the GGRF to provide \$5 million for the car sharing pilot project in the 2015-16 fiscal year, double the previous year.

Financing Assistance Programs

ARB devoted up to \$1.5 million in the 2014-15 fiscal year to establish financial assistance programs through financial institutions, auto dealers, community groups, and others to help low-income individuals in disadvantaged communities acquire a used hybrid or a cleaner vehicle. Such assistance could include a reduction in interest rates on a car loan; loan loss guarantees to lenders; or innovative financing options for low-income individuals who would not typically qualify for conventional financing. Funding from the GGRF for the Financing Assistance Programs would jump to \$4 million in the 2015-16 fiscal year.

Enhanced Fleet Modernization Program Plus-Up Pilot Project

The new Enhanced Fleet Modernization Program Plus-Up Pilot Program is a complete makeover of the state's "Cash for Clunkers" program, which paid the owner of a gross-polluting older car to scrap their vehicle. The new program will provide significantly greater financial assistance to low-to moderate-income individuals who scrap their old gross-polluting car and replace it with a more fuel-efficient, zero-emission, near-zero emission, or low-emission vehicle. Enhanced incentives are available for the purchase or lease of a new battery electric or plug-in hybrid electric vehicle. Lower incentives will be provided for the purchase of a conventional gasoline-electric hybrid vehicle up to eight years old. The pilot program also includes assistance with financing and the option of receiving transit passes or car-share subsidies in lieu of purchasing or leasing a newer clean vehicle.⁴⁹

In the 2014-15 fiscal year, the ARB allotted \$2 million from the GGRF to the Enhanced Fleet Modernization Program (EFMP) Plus Up Pilot Project. The GGRF was the sole source of pilot program funding in that fiscal year. The ARB is proposing to increase GGRF support for the EFMP Plus-Up Pilot Project by 10 times to \$20 million in the 2015-16 fiscal year.⁵⁰

Currently the program is only operating in the South Coast Air Quality Management District and the San Joaquin Valley Air Pollution Control District regions. The rebates are paid directly to the new car dealers and then passed on to the buyer.

49 California Air Resources Board (May 27, 2015). Press Release, "Making the Cleanest Cars Affordable," http://www.arb.ca.gov/newsrel/efmp_plus_up.pdf

50 California Air Resources Board, Proposed Fiscal Year 2015-16 Funding Plan For Low Carbon Transportation Investments and the Air Quality Improvement Program, June 25, 2015, Page 36.

For low-income residents in these districts who scrap their old polluting vehicle can buy or lease a previously owned gas-electric hybrid vehicle less than eight years old and get up to \$7,000 if the replacement vehicle gets 35 miles per gallon (mpg) or better. A low-income resident can receive \$9,500 to buy or lease a new plug-in hybrid electric vehicle plus the \$1,500 CVRP rebate for a total of \$11,000. For a new battery electric vehicle, the rebate is \$9,500 plus the \$2,500 CVRP rebate for a total of \$12,000.⁵¹ To qualify, the resident must live in a zip code that includes a disadvantaged community census tract.⁵² This means that someone who does not live in a disadvantaged community (defined at the census tract level) can still qualify.

Moderate-income residents of the South Coast and San Joaquin Valley air districts who scrap their old polluting vehicle can receive \$5,000 for purchase of a used hybrid less than eight years old if the vehicle gets 35 mpg or better. A moderate-income resident can get a \$7,500 rebate to buy or lease a new plug-in hybrid electric vehicle plus the \$1,500 CVRP rebate for a total of \$9,000. A moderate-income resident of the two air districts can receive \$7,500 to buy or lease a new battery electric vehicle, plus the \$2,500 CVRP rebate for a total of \$10,000. The resident must live in a zip code that includes a disadvantaged community Census tract.

Above moderate-income residents who scrap their old car can receive \$5,500 for purchase or lease of a new plug-in hybrid electric vehicle plus the \$1,500 CVRP rebate for a total of \$7,000. An above moderate income resident can receive \$5,500 for the purchase of a battery electric vehicle plus the \$2,500 CVRP rebate for a total of \$8,000. The same caveat applies: The resident must live in a zip code that includes a disadvantaged community census tract.

It is worth noting that the San Joaquin Valley Pollution Control District offers additional incentives of \$2,000 and \$3,000 to purchase a new plug-in hybrid electric vehicle or battery electric vehicle, respectively. By stacking all of these rebates, a low-income San Joaquin valley resident can receive a total of \$14,500 for a new plug-in hybrid electric vehicle and \$16,500 for a new battery electric vehicle. Moderate-income Valley residents can receive a total of \$12,500 and \$14,500 for a new plug-in hybrid electric or new battery electric vehicle, respectively. Valley residents who are above moderate-income can receive \$9,000 and \$11,000 for a new plug-in hybrid electric and new battery electric vehicle, respectively.

Low-income is defined by the Air Resources Board as less than or equal to 225 percent of the federal poverty level. Moderate income is 226 percent to 300 percent of the federal poverty level. Above moderate-income is 301 percent to 400 percent of the federal poverty level.

51 Detailed information on the Enhanced Fleet Modernization Program Plus-Up Pilot Project in the South Coast Air Quality Management District is available at: <https://www.replaceyourride.com/>

52 California Air Resources Board (May 27, 2015). Press Release, "Making the Cleanest Cars Affordable," http://www.arb.ca.gov/newsrel/efmp_plus_up.pdf

Public Fleet Pilot Project

In the spring of 2015, the ARB launched a new \$3 million pilot project with GGRF dollars to encourage the purchase or lease of battery electric, plug-in hybrid electric, or fuel cell vehicles for public fleets, such as government cars and parking enforcement vehicles, which are located in or serve disadvantaged communities. The ARB is proposing to increase funding for the Public Fleet Pilot Project to \$5 million in the 2015-16 fiscal year.

Public fleets are not eligible for certain incentives, like the federal tax credit, which bring down the higher cost associated with advanced clean cars. As a result, very few local and state government fleet vehicles have received California Clean Vehicle rebates. To overcome this barrier, the state is now offering rebates up to \$5,250 for the purchase or lease of a plug-in hybrid electric vehicle, up to \$10,000 for a battery electric vehicle, and up to \$15,000 for fuel cell electric vehicles for public fleets that operate in disadvantaged communities. The rebates are also designed to stimulate local deployment of the next generation of zero-emission and plug-in hybrid electric light-duty vehicles.

Agricultural Worker Vanpools in the San Joaquin Valley

During the 2015-16 fiscal year, ARB staff will work with interested parties to develop a new pilot program to provide incentives for the replacement of old, polluting vans used to transport agricultural workers in the San Joaquin Valley. The incentives would encourage the replacement of agricultural worker vans with newer zero-emission, near-zero emission, or lower emission hybrid vehicles. The ARB is proposing to spend \$3 million from the GGRF for this new pilot project. The money must be spent in disadvantaged communities.

3.4 Heavy-Duty Vehicle Projects

3.4.1 Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project

The Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) is designed to encourage truck and bus manufacturers to offer and California fleets to buy or lease progressively cleaner advanced technology vehicles. The program began in 2010 as part of the Air Quality Improvement Program.

In 2014-15 fiscal year, the HVIP received \$5 million from the Greenhouse Gas Reduction Fund. That investment must benefit disadvantaged communities. The Air Quality Improvement Program provided another \$5 million, bringing total funding for HVIP to \$10 million in the last fiscal year. The ARB spending plan calls for the HVIP to receive \$12 million in 2015-16, if the Legislature provides the money from the GGRF.

The HVIP, the first program of its kind in the nation, attempts to address the high incremental cost of heavy-duty advanced trucks and buses in the early years when production volumes are low. All public and private fleets, regardless of their size, are eligible for financial incentives. Unlike the rebate program for clean cars, HVIP provides a purchase voucher to the dealer to offset about half of the incremental additional cost of eligible hybrid and battery-electric heavy-duty vehicles.

The HVIP vouchers range from \$12,000 to \$110,000 for the purchase of each eligible battery electric or hybrid electric truck or bus. The first three vouchers for a fleet can receive an additional \$2,000 to \$10,000. In the San Joaquin Valley, additional incentives can provide up to \$30,000 more per voucher.

The ARB has concluded that these financial incentives are needed because advanced technology vehicles generally cost more than their diesel-powered, conventional counterparts, which can be a significant deterrent to their purchase. HVIP has provided a meaningful “kick-start” to the low-emission hybrid truck and bus industry, according to the ARB. The program has helped deploy 2,034 vehicles since it was launched.⁵³

3.4.2 Zero-Emission Truck and Bus Pilot Projects

A \$25 million investment from the Greenhouse Gas Reduction Fund in 2014-15 was to be spent on pilot projects that benefit disadvantaged communities. These projects are intended to encourage deployment of zero-emission battery electric or hydrogen fuel cell transit buses, school buses, and freight/delivery trucks. Pending Legislative approval of the funding, the ARB plans to invest \$65 million in the Zero-Emission Truck and Bus Pilot Projects in 2015-16.

The project’s goal is to place a significant number of zero-emission trucks and buses at a handful of strategic truck or bus “hubs.” The ARB’s staff believes the “hub” concept can support economies of scale in manufacturing, infrastructure development, workforce training, and vehicle maintenance and repair functions. The buses and trucks will be required to transmit data about their location and operation, including battery performance. The vehicles will be based in disadvantaged communities and must return to the same bus yard, distribution center or warehouse at the end of the day. One example of this type of project are zero-emission battery electric trucks operated by UPS (United Parcel Service), which have range of about 90 miles before they need to be recharged.

3.4.3 Advanced Technology Freight Demonstration Projects

These Advanced Technology Freight Demonstration Projects are designed to accelerate the introduction of advanced emission reduction technologies, including battery electric and fuel cell vehicles, into the California marketplace. “A public investment in these technologies helps to achieve significant emission reductions of criteria pollutants and toxic air contaminants, as well as greenhouse gases, sooner than would be possible otherwise,” according to the ARB. “This commitment from the state encourages industry to expeditiously invent, develop, test, and introduce cutting edge emission reducing technologies.”⁵⁴

The first five years of funding for the Air Quality Improvement Program’s Advanced Technology demonstration projects was predominantly directed toward off-road equipment, like marine vessels and locomotives. With \$50 million from the Greenhouse Gas Reduction Fund, the ARB will now focus on on-road freight demonstration projects. These projects will be based in disadvantaged

53 California Air Resources Board, June 24, 2015 email from Ryan Murano, Air Pollution Specialist, Innovative Heavy-Duty Strategies Section.

54 California Air Resources Board (June, 2014). Final Approved Fiscal Year 2014-15 Funding Plan for the Air Quality Improvement Program and Low Carbon Transportation Greenhouse Gas Reduction Fund Investments. Page 76.

communities that have historically borne a disproportionate burden of freight movement in the state. All of the demonstration projects will be required to significantly reduce greenhouse gas emissions and air pollution. Two types of demonstration projects are planned:

Zero-Emission Drayage Trucks

Drayage trucks move freight at California ports, distribution centers, warehouses, and intermodal yards. ARB will require all potential projects in this category to completely eliminate truck tailpipe emissions, including greenhouse gas emissions, criteria pollutants, and toxic particulate emissions. Projects will involve a large enough fleet of trucks to help transition the drayage truck industry toward zero-emission technologies.

Multi-Source Facility Projects

These projects will demonstrate zero-emission and near zero-emission technologies at distribution centers, warehouses, and intermodal facilities. Many types of equipment will be involved in the demonstration projects from forklifts to yard vehicles and advanced transportation refrigeration units to trucks that operate regionally. The state also could help pay for installation of electric truck charging facilities and fueling infrastructure. Future projects could focus on reducing emissions from long-haul trucks and locomotives.

3.5 Challenges and Opportunities for a Multi-Faceted Program

The Low Carbon Transportation Program has many elements that are under development or evolving, in part to better serve disadvantaged communities. For instance, the Clean Vehicle Rebate Project has struggled to benefit disadvantaged communities because of the up-front cost needed to purchase or lease a zero emission or near zero emission vehicle. The ARB's new changes to the rebate project, previously discussed in this chapter, seek to address the extremely low level of participation in the project from households in disadvantaged communities.

New pilot programs discussed in this chapter also represent a significant opportunity to reach far more disadvantaged communities than the Low Carbon Transportation Program has historically done. However, given the large number of new and revamped LCTP projects, a challenge will be getting the word out to households in disadvantaged communities. Community-based organizations and ethnic media are yet to have an official role in the State's outreach plans, but could certainly be of significant value to reach that target audience.

Ensuring lower income Californians have access to the enhanced incentives and financing for cleaner vehicles is important to meet GHG reduction goals and provide co-benefits such as reduced local pollution, especially given that poor air quality disproportionately affects disadvantaged communities. Lower income individuals are more likely than affluent individuals to drive older and more polluting cars. While the up-front costs of a newer, cleaner vehicle are a barrier that these programs are seeking to address, another benefit is that the participating Californians will have

reduced operating costs over time compared to their less efficient, previous vehicle, as a result of fuel-cost savings and reduced maintenance costs.

It will be important to track rebates issued in disadvantaged communities. For example, the CVRP sets a goal of \$11 million in rebates qualifying for SB 535 funding. Financing assistance programs may also need to be reevaluated with potential partnerships with local governments and even private sector auto dealership financing departments, that all share a goal of opening up markets for alternative fuel vehicles in lower-income communities.

Another challenge will be providing infrastructure such as charging stations in disadvantaged communities, which disproportionately house low-income individuals. One possible solution to the multi-unit dwelling issue is to incentivize landlords to provide charging stations for their tenants. A solution to the charging infrastructure challenge, overall, might be a more intensive targeting of disadvantaged communities near ports or at freight warehousing terminuses, where multi-source facility projects are funded that include charging infrastructure, provided it is located in an area also accessible to private passenger vehicles.

The previously discussed CalEnviroScreen results underscore that low-income disadvantaged communities are disproportionately impacted by pollution from freight movement in California. The heavy-duty vehicle projects are designed to concentrate benefits for disadvantaged communities. They seek transformative change through zero emission vehicles, a critical objective. However, in the shorter-term, many zero emissions technologies are not available for a large scale. Supporting low emission bridge technologies in addition to more transformative technologies can help achieve much needed emission reductions today while paving the way for a cleaner future.

The governor's climate targets for 2030 will require slashing fuel consumption by 50 percent and reducing the carbon content of fuels. More than half of all GGRF spending is directed at reducing California's dependence on fossil-fueled transportation to move people and goods. Innovation is essential if the state is to shrink our GHG emissions to 40 percent below 1990 levels in the next 15 years. A steadfast commitment to benefit disadvantaged communities will be necessary as the ARB evaluates projects for funding to reduce GHG emissions. Ultimately, results will provide the litmus test for California's commitment to global environmental leadership and investment justice for disadvantaged communities.



4. Transit and Intercity Rail Capital Program and Low Carbon Transit Operations Program

4.1 Program Overview

The Greenhouse Gas Reduction Fund (GGRF) is providing hundreds of millions of dollars for two different, but complementary new transit programs: The Transit and Intercity Rail Capital Program and the Low Carbon Transit Operations Program.

The programs underscore the need to reduce greenhouse gas emissions from the transportation sector of the California economy – by far the largest source of the state’s GHG emissions.

4.1.1 Transit and Intercity Rail Capital Program

The new Transit and Intercity Rail Capital Program provides grants for capital investments and operational improvements that will modernize California’s intercity trains and urban rail and bus systems to reduce greenhouse gas emissions, expand service, improve mobility, and benefit disadvantaged communities.

Grants from the GGRF may be used to acquire rail cars and locomotives, and pay for intercity and commuter rail projects that increase service, improve reliability, or decrease travel time. Funding can also be provided for investments in bus rapid transit or other bus system improvements that boost ridership and reduce GHG emissions. Connecting the state’s existing rail and transit service to the future High-Speed Rail system from San Francisco to Los Angeles is another goal of the capital program.

The 2014-15 state budget established a goal that a minimum of 25 percent of the capital program’s spending go to projects that “provide a direct, meaningful, and assured benefit to disadvantaged communities” consistent with the objectives of SB 535, the 2012 legislation authored by state Sen. Kevin de León.

The California State Transportation Agency and the California Department of Transportation (Caltrans) administer the program.

4.1.2 Low Carbon Transit Operations Program

The new Low Carbon Transit Operations Program was created to provide operating funds and capital assistance for transit agencies to support new or expanded bus or rail service that increases transit ridership, decreases GHG emissions, improves mobility, and makes serving disadvantaged communities a priority. Projects may include equipment acquisition, fueling, maintenance, and other costs to operate bus or rail service or facilities.

At least 50 percent of the funds for the operations program must be spent on projects that benefit disadvantaged communities.

Unlike the competitive Transit and Intercity Rail Capital grant program, the formula-based Low Carbon Transit Operations Program provides direct financial assistance to transit operators and transportation planning agencies that are eligible for State Transit Assistance funds. Local transit agencies are strongly encouraged to use the money for projects that maximize public benefits for transit ridership, reduce GHG emissions, and provide disadvantaged community and other economic, environmental, and public health co-benefits. Recipients of funding from the Low Carbon Transit Operations Program are also encouraged to work closely with their Metropolitan Planning Organization, Regional transportation planning agencies, local governments, and affected communities to achieve such co-benefits as: encouraging infill development, building low-income housing, protecting disadvantaged communities from displacement, promoting active transportation (walking and bicycling), and other environmental and health benefits

Caltrans is responsible for ensuring that the legal requirements of the Low Carbon Transit Operations Program are met in terms of project eligibility, GHG reduction, and disadvantaged community and other co-benefits. Caltrans administers the program with assistance from the Air Resources Board, which must evaluate each project to determine the potential reduction in GHG emissions. The State Controller's office processes payments to the transportation agencies and operators.

4.2 Financial Overview: Rapid Growth in Revenue Makes New Bus and Rail Programs Possible

Expansion of the state's newest transportation programs is possible because of rapid growth in California's Cap-and-Trade revenues, which are deposited in the Greenhouse Gas Reduction Fund (GGRF). In May 2015, California Gov. Jerry Brown asked state lawmakers to invest \$2.2 billion in programs that further reduce California's greenhouse gas emissions, as part of the 2015-16 state budget that begins on July 1, 2015.

Specifically, the governor proposed that the Transit and Intercity Rail Capital Program receive \$265 million in the 2015-16 state budget, ten times more than the \$25 million allocated to the program in the 2014-15 state budget. The governor also proposed \$100 million for the Low Carbon Transit Operations Program in the 2015-16 fiscal year. That's four times more than the program received in the previous fiscal year.

The 2014-15 state budget established a continuous appropriation of 10 percent of the Greenhouse Gas Reduction Fund for the Transit and Intercity Rail Capital Program and 5 percent for the Low Carbon Transit Operations Program each year, beginning July 1, 2015.

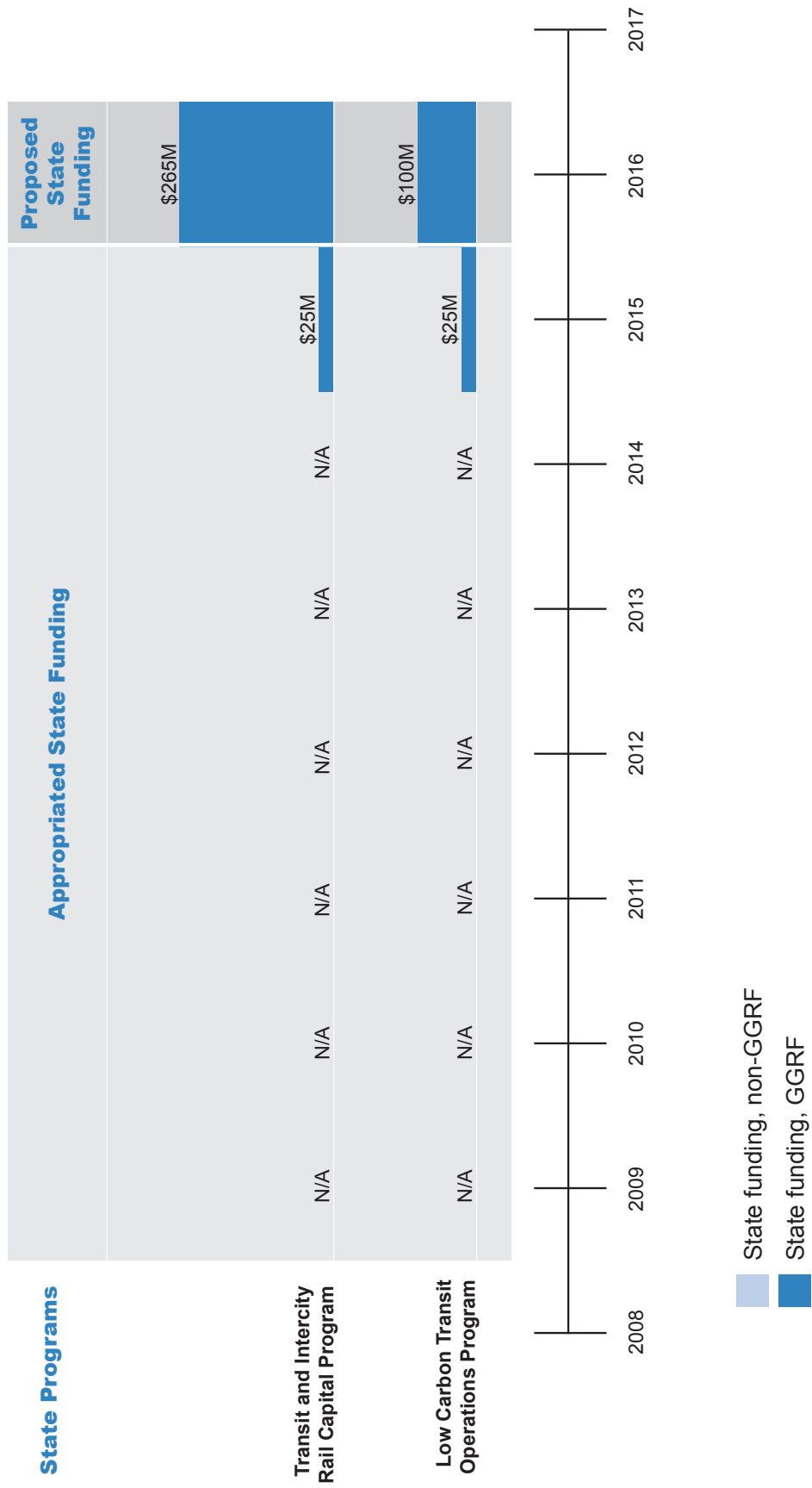
The Governor asked the Legislature to include an additional \$65 million for the Transit and Intercity Rail Capital Program in the 2015-16 state budget above and beyond the \$200 million provided by the continuous appropriation.

Graphic 9 illustrates the funding amounts allocated and proposed to these new programs for transit capital and operations. The historical funding analysis is more convoluted for this investment sector than the other four focused on in this report. While there are other state programs that fund transit capital and operations, we were not able to obtain funding appropriations data about them and thus, we are not able to do a historical comparison of funding for this investment category pre and post GGRF. We instead focus on the funding levels of the two new GGRF funded transit capital and operations programs.



An all-electric transit bus parks beneath a rapid charging unit at the Pomona Transit Center. The bus, operated by Foothill Transit, recharges in 10 minutes thanks to specially designed fast charging lithium titanate batteries.

Graphic 9: State Funding for Transit Capital and Operations, Pre and Post GGRF*



*There are other state programs that fund transit capital and operations but relevant information about their state funding levels was not readily available.

Public agencies that provide bus or rail service or plan to offer future service had to apply for the first round of grants by April 10, 2015. The State Transportation Agency on June 30, 2015 announced 14 grants totaling \$224 million for transit improvement projects across the state. The funding will pay for 16 new and 7 refurbished light rail vehicles, 3 rail cars, 9 locomotives, 20 compressed natural gas buses, 12 hybrid buses, and 30 zero emission electric buses.⁵⁵

The proposed projects were to be evaluated based primarily on how well they would meet the following objectives of the Transit and Intercity Rail Capital Program:

- Reduction in greenhouse gas emissions;
- Increase in ridership through expanded and improved rail and bus transit service;
- Integration of rail and transit operations, including connections with the future High Speed Rail system;
- Improvements in safety.

Secondary criteria include:

- Providing “direct, meaningful, and assured benefits to a disadvantaged community” based on guidance from the ARB.
- Developing project priorities through the collaboration of two or more rail operators and between state agencies, intercity rail joint powers authorities, and local or regional rail operators.
- Geographic equity.
- Consistency with an adopted Sustainable Communities Strategy or a regional plan that includes policies and programs to reduce GHG emissions.
- Improving connections with other modes of transportation at airports, bus and ferry terminals, and subway stations.

Transit capital projects also will be evaluated on the quality of a plan that analyzes the financial viability of the proposed service, including the availability of operating funds.

In some cases it could take years to spend the capital funds. By contrast, the \$25 million allocated to the Low Carbon Transit Operations Program in the 2014-15 state budget will be quickly distributed to transit agencies. A transportation planning agency or county transportation commission’s share of the allocation is determined by a formula based on the ratio of the population of the area under its jurisdiction to the state’s total population

A transit operator, including a transportation planning agency or a county transportation commission that is already eligible for State Transit Assistance funds is eligible for allocations from the GGRF based on a ratio of the revenue of the transit operator’s jurisdiction to the total revenue of all operators in the state.

55 California State Transportation Agency (June 30, 2015.) News Release, “Transportation Agency Backs \$224 Million In Transit And Intercity Rail Grants.” http://calsta.ca.gov/res/docs/pdfs/2015/Agency/TIRCPGrants_NewsRelease06302015.pdf

The first round of capital projects selected to receive grants are to be presented to the California Transportation Commission on August 26, 2015. The Commission has until June 30, 2016 to award the funds from the 2014-15 state budget. Agencies that receive those grants have until June 30, 2020 to spend the money.

4.3 Challenges and Opportunities for Two New Programs

Implementing the Transit and Intercity Rail Capital Program and the Low Carbon Transit Operations Program represents both a challenge and an opportunity for the agencies involved. Both programs are new. The goals and objectives for each program were developed and refined quickly after public workshops. It remains to be seen how the process of evaluating the grant applications was handled. Did the ARB have sufficient time, staff, and tools to determine whether the projects proposed would indeed reduce greenhouse gas emissions? The May Revision to the governor's proposed 2015-16 state budget includes more money and staff for the ARB to refine its methods of quantifying the reduction in GHG emissions. Time will tell if additional staff at state transportation agencies can handle the rapid growth in the Transit and Intercity Rail Capital Program and the Low Carbon Transit Operations Program.

Already there are signs of potential conflict between the goal of reducing greenhouse gas emissions and the SB 535 requirements that the GGRF continue California's implementation of AB 32 "by achieving additional emission reductions and mitigating direct health impacts on California's most impacted and disadvantaged communities."⁵⁶

For example, the state plans to purchase the most advanced Tier 4 diesel locomotives for California's intercity Amtrak passenger trains and Metrolink commuter trains. While Tier 4 diesel locomotives are designed to meet the newest federal locomotive emissions standards, even the newest and cleanest diesel locomotives still emit diesel exhaust, which the state of California classifies as a toxic air contaminant linked to cancer, premature death, and other health problems. The ARB found that "those most vulnerable are children whose lungs are still developing and the elderly who may have other serious health problems."⁵⁷ In addition, diesel soot causes visibility reduction and is a potent global warmer.⁵⁸

Purchasing advanced diesel locomotives for California's intercity and commuter rail service is a long-term capital investment. The question arises: Is such an investment consistent with GGRF requirements at a time when the ARB is devoting hundreds of millions of dollars to rebates, grants, and incentives that accelerate the transition to zero or near zero emission cars and light, medium, and heavy-duty trucks?

56 California State Senate, Senate Bill 535 (de León), Passed by the State Senate on August 31, 2012, Enrolled September 10, 2012, Section 1(h). http://www.leginfo.ca.gov/pub/11-12/bill/sen/sb_0501-0550/sb_535_bill_20120910_enrolled.html

57 California Air Resources Board, Diesel & Health Research, Background on Diesel Health Effects, webpage viewed at: <http://www.arb.ca.gov/research/diesel/diesel-health.htm>

58 Ibid.

In the adopted 2014-15 Funding Plan for the Air Quality Improvement Program and Low Carbon Transportation Greenhouse Gas Reduction Fund Investments, the ARB makes the case for strategic investments in advanced emission reduction technologies, including battery electric and fuel cell vehicles. “A public investment in these technologies helps to achieve significant emission reductions of criteria pollutants and toxic air contaminants, as well as greenhouse gases, sooner than would be possible otherwise,” according to the ARB. “This commitment from the state encourages industry to expeditiously invent, develop, test, and introduce cutting edge emission reducing technologies.”⁵⁹

The Low Carbon Transit Operations Program faces different challenges. Historically, California’s support for transit operations has been cut during the periodic recessions that affect the state’s economy. The challenge in the years ahead will be to protect the new and expanded bus and rail service supported by the GGRF from the impact of future economic downturns. Transit operators should be required to keep the GGRF dollars separate from operating subsidies they receive from other sources. That way transit operators would be less inclined to cut GGRF-supported transit services in disadvantaged communities when other operating subsidies are reduced.



A Metro Gold Line light rail train heads for Union Station in Downtown Los Angeles.

59 California Air Resources Board (Approved June 26, 2014). Final Approved Fiscal Year 2014-15 Funding Plan for the Air Quality Improvement Program and Low Carbon Transportation Greenhouse Gas Reduction Fund Investments. Page 76.



5. Low-Income Weatherization Program

5.1 Program Overview

California's Low-Income Weatherization Program is a new, multi-faceted program supported by the Greenhouse Gas Reduction Fund. To cut energy use and reduce greenhouse gas emissions, the program installs 1) weatherization and energy efficiency measures, 2) rooftop solar panels, and 3) solar water heating systems on the residences of qualifying low-income households. The program also is designed to provide co-benefits such as lower energy bills, less water consumption, reduced air pollution, improved public health, employment opportunities, and job training.

The California Department of Community Services & Development (CSD) administers the Low-Income Weatherization Program (LIWP). CSD partners with local service providers already contracted through one of CSD's existing federally funded energy assistance programs to provide weatherization and energy efficiency services. Single-family residential solar installations are performed statewide through a contract with GRID Alternatives, a nonprofit solar installation company. The State recently issued a request for proposals for multi-family residential solar installations, with companies submitting competitive bids for the right to conduct statewide installations multi-unit dwellings. All funds appropriated for the LIWP will be spent to serve low-income households below 200 percent of the federal poverty level, in disadvantaged communities.⁶⁰

LIWP pays for an array of energy efficiency measures, including insulation, weather-stripping, energy-efficient appliances, and other energy-saving measures. In some cases, solar panels and solar water heating systems are installed on single-family and multi-family low-income housing units in disadvantaged communities.

The first year funding of \$75 million from the GGRF is expected to make more than 21,600 low-income housing units more energy efficient through weatherization.⁶¹ Weatherization is the process of improving the energy efficiency of a home by installing weather stripping, insulation, caulking, window repair or replacement, refrigerator replacement, water heater repair or replacement, and

60 California Department of Community Services and Development, Low-Income Weatherization Program (LIWP) Program Guidelines, Effective Date: January 13, 2015. Page 7.

61 California Department of Community Services & Development, Allocation of LIWP Funds, Estimated Number of Dwellings to be served, provided by email, June 24, 2015.

heating and cooling system repair or replacement.⁶² Some elements of the weatherization program are paid for with federal funds. Other elements are paid for with state funds from the GGRF.

Funding from the GGRF for the first year of the program is expected to pay for installation of rooftop solar systems for an estimated 1,780 low-income single-family households statewide, according to CSD.⁶³ Although the money was appropriated in the 2014-15 state budget, CSD's contractors will have approximately three years to finish installing the solar systems.

CSD officials say LIWP will reduce greenhouse gas emissions, save energy, and put money back in the pockets of low-income Californians.⁶⁴ "Our program is bringing solar power to households who otherwise would be priced out of the benefits of renewable energy," said CSD Director Linné Stout. "These low-income households will now see the benefits of clean energy, including significantly reduced energy bills."

5.2 Funding Overview: GGRF Begins to Address Unmet Demand

The California Legislature allocated \$75 million for the Low-Income Weatherization Program in the 2014-15 state budget. LIWP does not have a continuous appropriation from the Greenhouse Gas Reduction Fund. Instead, state legislators determine each year how much money the program will receive. In May 2015, Gov. Jerry Brown proposed that LIWP receive \$140 million from the GGRF for the fiscal year that began July 1, 2015. It remains to be seen if the program will get that level of funding when lawmakers decide how to appropriate the remaining 40 percent of the GGRF for 2015-16.

The program's budget is divided into three main components: 1) weatherization and energy efficiency measures, 2) installation of solar photovoltaic panels and 3) solar water heating systems for single-family structures, small multi-family buildings, and large multi-family buildings.⁶⁵

The Low-Income Weatherization Program is the newest energy efficiency program to be offered by the state of California, which adds to the portfolio of solar incentive programs. The California Solar Initiative has existed for many years and will continue to exist in parallel to the LIWP. The California Solar Initiative is funded by a surcharge on the bills of customers of the state's three major investor-owned utilities. Ten percent or \$216.8 million of the funding generated was dedicated to two sub-programs that provide incentives for installation of solar systems on low-income residential units in

62 California Air Resources Board (March, 2015). Annual Report to the Legislature on Investments of Cap-and-Trade Auction Proceeds (Greenhouse Gas Reduction Fund Monies). Table 2: GGRF Appropriations, page 9. <http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/2015ggrf-annual-report-to-legislature.pdf>

63 California Department of Community Services and Development (May 7, 2015). Press Release, "Benefits of State's Growing Climate Investments Highlighted at Rooftop Solar Installation in Fresno Disadvantaged Community." <http://www.csd.ca.gov/Newsroom/NewsReleases/May7,2015.aspx>

64 Ibid.

65 Email from Jason Wimbley, Chief Deputy Director of the California Department Of Community Services and Development, dated January 7, 2015.

the service area of the three major investor-owned utilities:

- The Single-Family Affordable Solar Homes Program (SASH), which provides free or low-cost solar photovoltaic systems on the homes of low-income residents; and
- The Multifamily Affordable Solar Housing Program (MASH), which provides incentives for installation of solar systems on existing multi-family affordable housing.

The recipients of these incentives must live in the service area of the state's three major investor-owned utilities – Pacific Gas and Electric, Southern California Edison, and San Diego Gas and Electric.

Each program initially received \$108.3 million (for direct incentives as well as administrative, marketing, and evaluation costs). SASH was established in November 2007.⁶⁶ MASH was established in October 2008.⁶⁷

On October 7, 2013, Gov. Brown signed legislation (AB 217) to extend both programs until December 31, 2021 or until a second round of funding is exhausted. The legislation directed the PUC to divide \$108.3 million between the MASH and SASH programs.⁶⁸

Customer interest in MASH and SASH programs is one indication of the demand for investment in energy efficiency measures, including weatherization and installation of solar photovoltaic panels and solar water heating systems on low-income housing units in California.

In addition to MASH and SASH, the state Department of Community Services & Development administers two federally funded energy assistance programs in California:

- The Low-Income Home Energy Assistance Program (LIHEAP) of the U.S. Department of Health & Human Services.
- The Weatherization Assistance Program (WAP) of the U.S. Department of Energy.

Both of the federally funded programs provide energy assistance to low-income residents regardless of where they live in California. The federally funded Low-Income Home Energy Assistance Program also paid for two pilot programs in California that installed solar photovoltaic panels on 1,482 low-income housing units and solar water heating on 267 low-income housing units.⁶⁹

Graphic 10 illustrates how the GGRF is dramatically increasing total state funding for weatherization and renewable energy programs targeted for low-income households and disadvantaged communities. We did not include in this graphic programs that receive significant federal funding targeted at such households in California (i.e. the Low Income Home Energy Assistance Program and the Weatherization Assistance Program) because this report focuses on state funding. But the

66 California Public Utilities Commission (Nov 16, 2017). Press Release: "PUC Adopts Low-Income Solar Incentive Program For Single-Family Homes." http://docs.cpuc.ca.gov/PUBLISHED/NEWS_RELEASE/75286.htm

67 Southern California Edison Company, on behalf of the California Solar Initiative Program Administrators (Jan. 30 2015). Multifamily Affordable Solar Housing, Semiannual Progress Report.

68 Ibid.

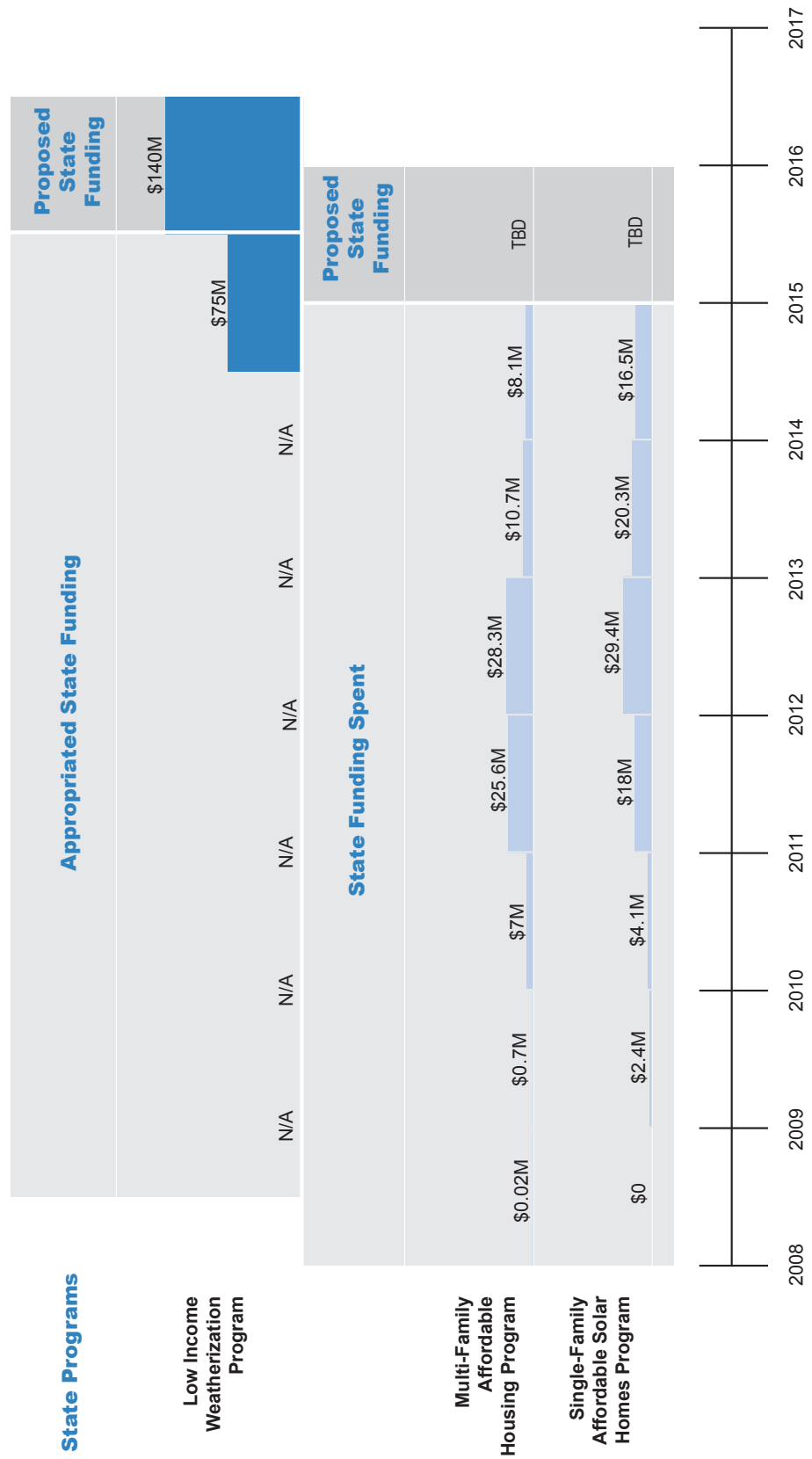
69 Email from Jason Wimbley, Chief Deputy Director of the California Department of Community Services and Development, dated January 9, 2015.

broader context is that the GGRF complements these federally funded programs as well as other state funded programs such as the Multi-Family Affordable Solar Housing Program and the Single-Family Affordable Solar Homes Program.



Team of workers from GRID Alternatives install solar panels on the rooftop of a Los Angeles house.

Graphic 10: State Funding for Low Income Home Weatherization and Renewables, Pre and Post GGRF



State funding, non-GGRF
 State funding, GGRF

5.3 Challenges and Opportunities for an Expanding Program

In the 2015-16 year, the Legislature will determine the amount of money that LIWP receives from the Greenhouse Gas Reduction Fund in the 2015-16 fiscal year. The Community Services & Development Department will also expand the scope of the weatherization program and the number of entities it uses to install energy efficiency measures and solar systems. This will involve selecting an additional provider to administer the solar program for large multi-family residential buildings.

In the years ahead, CSD should consider expanding its outreach to more community-based organizations that operate in disadvantaged communities and that have the strong connections with and the established trust of community members. This is especially important for maximizing employment opportunities that are one of the core benefits for disadvantaged communities cited in CSD's program guidelines. Weatherization and energy efficiency services are currently provided by existing local service providers (LSPs) already under contract through the LIHEAP program. This was a choice made by CSD to use organizations already integrated into their system. However, the LIHEAP program does not include a local hiring component, CSD provides no specific guidance or requirements for how employment programs should be conducted and it is unclear how much, if any, experience LSPs have with local hires or whether they have existing ties to the communities they serve. This can be especially problematic as is the case in the City of Los Angeles which has only three LSPs to cover the large municipal area. With such a broad territorial base, LSPs could surely benefit from some direction or specific expectations as to what a local hiring program looks like.

Given the many factors that will affect energy efficiency outcomes, some degree of ex post verification at the project and housing unit level would be necessary to accurately gauge actual impacts. However, project verification is not currently funded through the GGRF or complementary funding sources. UCLA Luskin Center researchers do hope, however, that sufficient data will be publicly available and detailed enough to allow for ex post assessment of outcomes. The Department should provide timely reports on project inputs, outputs, and ultimately outcomes from the completion of weatherization projects and installation of solar energy and solar water heating systems.

With program oversight and direction provided by the California Air Resources Board, the Community Services & Development Department and its network of LIWP providers will offer services to reduce GHG emissions and provide important co-benefits to qualifying low-income households in disadvantaged communities.



6. Urban and Community Forestry Programs

6.1 Programs Overview

“Urban forestry means the cultivation and management of trees and associated vegetation in urban areas for their present and potential contribution to the physiological, sociological, and economic well-being of urban society.”⁷⁰

– California Urban Forestry Act

With new appropriations from the Greenhouse Gas Reduction Fund, the state Department of Forestry and Fire Protection (CAL FIRE) has repackaged six of its previous Urban and Community Forestry grants programs into five new grant programs.⁷¹ The programs are:

- Green Trees for the Golden State Program
- Green Innovations Program
- Woods in the Neighborhood Program
- Urban Wood and Biomass Utilization Program
- Managing Urban Forests For GHG Reduction Program

The chapter provides a financial analysis of the programs as a whole and then a summary of each of the five programs. Most, but not all of the programs involve tree planting. Planting trees can reduce greenhouse gas emissions by sequestering carbon that otherwise would be released into the atmosphere. Urban forestry projects also can reduce stormwater runoff, provide shade, lower energy consumption, improve air quality, and provide jobs.

70 California Department of Forestry and Fire Protection. Webinar: Urban and Community Forestry Program, Greenhouse Gas Reduction Fund Grants 2014/2015. http://calfire.ca.gov/resource_mgt/downloads/CAL%20FIRE_GGRF_UCF_Workshops_14-15.pdf

71 California Department of Forestry and Fire Protection. Urban and Community Forestry Program, Greenhouse Gas Reduction Fund (GGRF) Grants webpage. http://calfire.ca.gov/resource_mgt/resource_mgt_urbanforestry_grants.php#

For these, the following criterion is used to prioritize and select funded projects:

- The project provides urban forest resources to areas where such resources are absent, or replenishes such resources where they are badly depleted.
- The number of trees to be planted is high in relation to the grant requested.
- The project utilizes the largest canopied tree possible for the selected sites.
- If the tree planting takes place in a disadvantaged community, the state will waive the requirement that a local government, special district, or non-profit group provide 25 percent of the project's cost. Tree planting projects that benefit a disadvantaged community, but are located outside the boundaries of a designated census tract would be required to pay 10 percent of the project's cost.

Urban forestry projects that are located in or serve disadvantaged communities will be given the highest preference when the final applications are reviewed. Projects must have a commitment from local residents, local business, a local non-profit group, or a local government.

All projects must strongly consider the drought when determining tree species and the timing of plantings. Native and non-native trees are acceptable as long as they are not invasive and are drought tolerant.

6.2 Funding Overview: Nourishing the Growth of California's Urban Forestry Programs

California's Cap-and-Trade program will soon spur unprecedented growth in tree planting in disadvantaged urban areas of the state. The infusion of money from the Greenhouse Gas Reduction Fund (GGRF) will dramatically increase the size and scope of the state's Urban and Community Forestry programs. Before the Cap-and-Trade program provided a stable source of revenue, the state had to rely on voter approval of bond issues to fund a small Urban Forestry program.⁷²

The state Department of Forestry and Fire Protection (CAL FIRE) received \$17.8 million from the GGRF for its Urban and Community Forestry Programs in the 2014-15 state budget. After CAL FIRE's administrative costs are taken into consideration (administration and oversight of grantees is important for CAL FIRE to properly invest in projects and ensure that project benefits are being maximized) the State will be able to award \$15.7 million in Urban Forestry grants to disadvantaged urban communities by.⁷³ That is more than double the largest amount of grants awarded in a single year since 2007-08.

Graphic 11 illustrates the surge in funding with the GGRF compared to this most recent historical period. Table 10 illustrates similar information but with a longer timeframe.

72 California Department of Forestry & Fire Protection, Urban and Community Forestry Program Grants, 10-Year History By Proposition Number and Grant RFP Type; Spreadsheet provided by California Urban and Community Forestry Program Manager John Melvin as an attachment to an email dated January 8, 2015. The spreadsheet, which provides details on all grants awarded during state fiscal years 2000-01 through 2012-13, is an exhibit in the Appendix to this report.

73 Email from California Urban and Community Forestry Program Manager John Melvin dated January 15, 2015. Telephone interview with John Melvin held on April 22, 2015.

Graphic 11: State Funding for Urban Forestry, Pre and Post GGRF

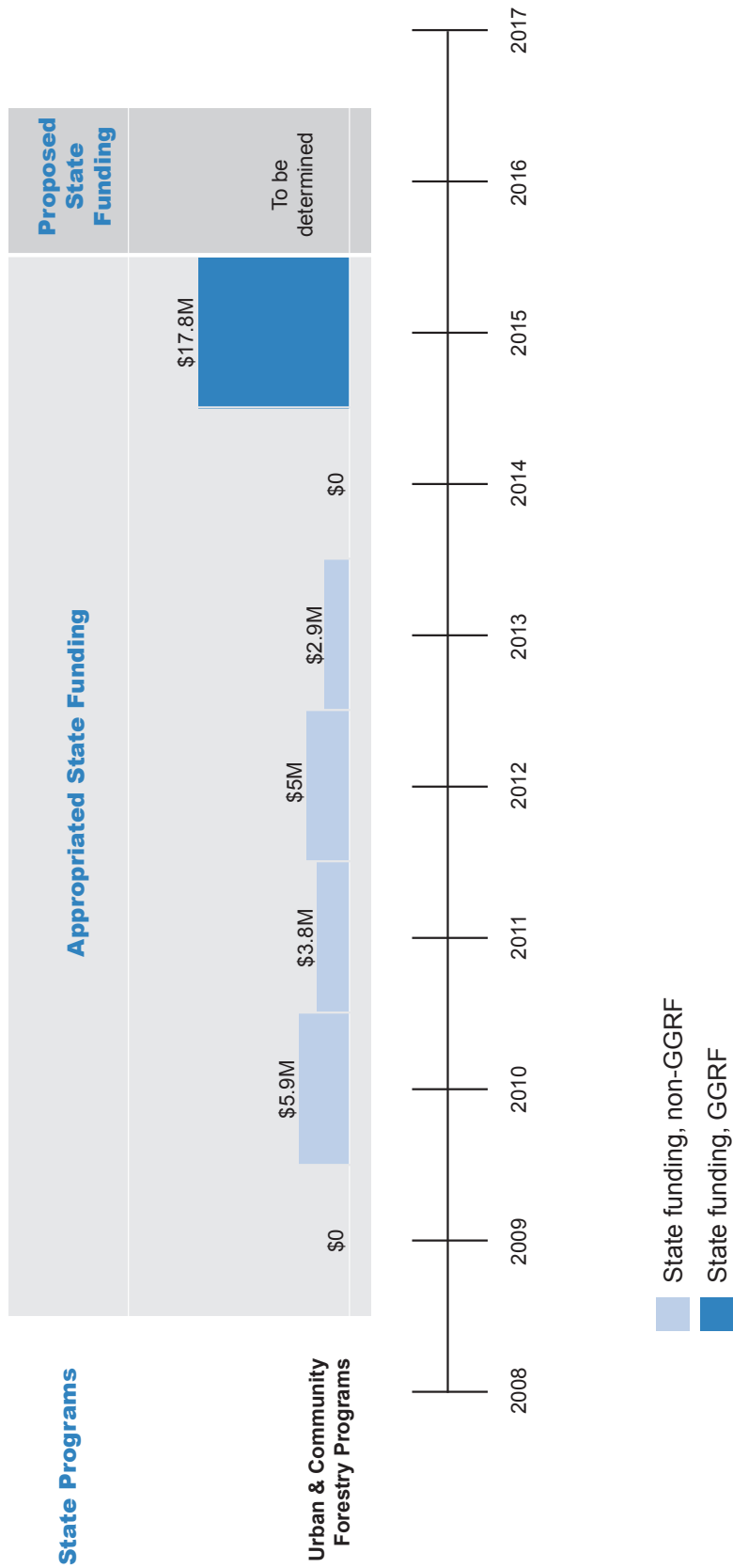
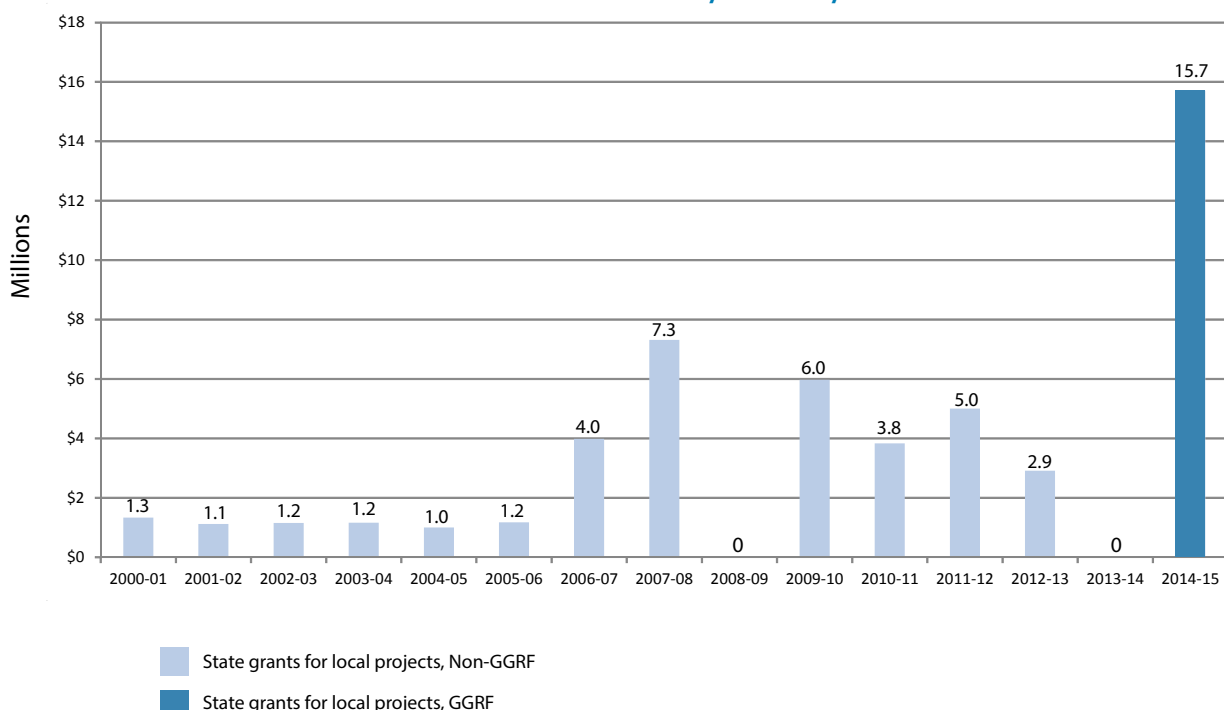


Table 8: Urban and Community Forestry Grants⁷⁴



6.2.1 More Funding but Demand Still Far Exceeds Appropriations

Considering California’s size, relatively little was spent on Urban and Community Forestry programs until recently. As the table above shows, grants for Urban Forestry projects suffered during the state’s periodic recessions and prolonged budget crises. No Urban Forestry grants were available in the 2008-09 and 2013-14 state budgets.⁷⁵ Support from the Greenhouse Gas Reduction Fund has given Urban Forestry programs a dramatic boost.

John Melvin, manager of the state’s Urban and Community Forestry program, said he did not know what to expect when CAL FIRE sought proposals for how to spend the Cap-and-Trade money. The pent-up demand was soon apparent as local governments, school systems, park districts, and non-profit organizations responded with 169 preliminary proposals seeking a total of \$107 million. After reviewing them, state officials invited 62 applicants to submit more detailed applications.⁷⁶

With Cap-and-Trade revenues soaring, Gov. Jerry Brown in May, 2015 proposed an additional \$20 million in GGRF spending for Urban Forestry projects in the 2015-16 fiscal year. If the Legislature agrees, the total amount devoted to the Urban Forestry programs in the 12 months beginning July 1, 2015 would reach \$37.8 million, only \$3.2 million less than the \$41 million spent for such programs during a 14-year period from July 1, 2000 through June 30, 2014.⁷⁷

74 California Department of Forestry & Fire Protection, Urban and Community Forestry Program Grants, 10-Year History By Proposition Number and Grant RFP Type; Spreadsheet provided by California Urban and Community Forestry Program Manager John Melvin as an attachment to an email dated January 8, 2015.

75 Ibid.

76 Telephone interview with John Melvin held on April 22, 2015.

77 Ibid.

6.3 A Multi-program Investment Strategy

As previously noted, the state has repackaged six previous Urban Forestry grants programs into five new grant programs.⁷⁸ They are the:

1. Green Trees for the Golden State Program
2. Green Innovations Program
3. Woods in the Neighborhood Program
4. Urban Wood and Biomass Utilization Program
5. Managing Urban Forests For GHG Reduction Program

6.3.1 Green Trees for the Golden State Program

The new “Green Trees for the Golden State” program will provide grants to plant trees in urban areas and pay for up to five years of tree care. All projects awarded grants in the 2014-15 fiscal year must be completed by the end of 2019.⁷⁹

Preference will be given to projects that provide multiple benefits, including:

- Sequestration of significant amounts of greenhouse gas and/or avoidance of significant amounts of GHG emissions over a 40-year period;
- Improvements in air quality;
- Greater energy conservation.

Additional benefits that may be taken into consideration when evaluating grant applications include:

- Reduction in stormwater runoff;
- Improvement in stormwater quality;
- Job creation and training;
- Improvement in public health;
- Expansion of recreational opportunities;
- Revitalization of urban areas;
- Production of useful products such as bio-fuel, clean energy, and high quality wood.

Projects shall include an educational program that develops public awareness of the need to manage and expand urban forest resources.

78 California Department of Forestry and Fire Protection (CAL FIRE), Urban and Community Forestry Program, Greenhouse Gas Reduction Fund (GGRF) Grants, Webpage viewed at: http://calfire.ca.gov/resource_mgt/resource_mgt_urbanforestry_grants.php#

79 California Department of Forestry & Fire Protection, Urban and Community Forestry Program, Greenhouse Gas Reduction Fund Grants, “Green Trees for the Golden State” Tree Planting Grant Program, Request for Proposals 2014/2015, viewed at: http://calfire.ca.gov/resource_mgt/downloads/CALFIRE_UFGrants_GreenTreesRFP2014_2015.pdf

Applicants must agree to maintain all trees planted (including replacement) for at least three years after project completion. Evidence of long-term care for the trees must be shown. Disadvantaged communities may qualify to receive funds for maintenance when the project is completed.

6.3.2 Green Innovations Program

The purpose of the new “Green Innovations” grant program is to fund the development and implementation of “forward-thinking” green infrastructure projects that will reduce greenhouse gas emissions and help improve greening in disadvantaged urban communities.⁸⁰

Green Innovation projects will:

- Arrest the decline of urban forest resources;
- Address climate change adaptation;
- Facilitate urban tree planting;
- Improve the quality of the urban environment through improved management of urban vegetation;
- Stimulate urban forestry or urban greening jobs.

Practices that can be funded include designing and implementing projects with a positive GHG benefit that give special attention to:

- Energy conservation;
- Air quality improvement;
- Storm water management and/or water quality;
- Improvement of public health outcomes.
- Other non-traditional urban forest-based infrastructure projects. For example: green roofs, bio-remediation projects, edible landscaping and/or community gardens and orchards, and other green infrastructure projects that have a positive GHG benefit.

6.3.3 Woods in the Neighborhood Program

These grants would help local entities purchase, reclaim, and restore abandoned land in disadvantaged urban communities. “Woods in the Neighborhood” grant applicants must demonstrate how their project will



Volunteers plant trees in a residential neighborhood.

⁸⁰ California Department of Forestry & Fire Protection (CAL FIRE), Urban and Community Forestry Program, Greenhouse Gas Reduction Fund Grants, Green Innovations Grant Program, Request for Proposals 2014/2015, viewed at: http://calfire.ca.gov/resource_mgt/downloads/CALFIRE_UFGreen%20InnovationsRFP2014_2015.pdf

reduce GHG emissions by helping to:⁸¹

Improve urban forests;

- Arrest the decline of urban forest resources;
- Address climate change mitigation and/or adaptation;
- Facilitate urban tree planting;
- Improve the quality of the urban environment through improved establishment of and/or improved management of urban vegetation;
- Develop community awareness of the benefits of expanding and managing California’s urban forests.

Projects that advance urban forestry, urban greening, or the management of urban natural resources may be eligible for funding. Examples include:

- Urban forestry education centers;
- Bio-remediation projects;
- Edible landscaping and/or community gardens and orchards;
- Other green infrastructure projects that have a positive GHG benefit.

6.3.4 Urban Wood and Biomass Utilization Program

This grant program would pay for the development and implementation of an Urban Wood or Urban Biomass Utilization program or project in disadvantaged communities. The goal is to improve the management of urban trees and vegetation rather than sending the material to landfills where it would decay and release greenhouse gases. This would avoid GHG emissions and potentially sequester GHG in wood products. The projects would stimulate urban forestry job creation by using urban wood and biomass while having a positive GHG benefit. Trees would be removed only if replacement trees were planted.⁸²

6.3.5 Managing Urban Forests for GHG Reduction Program

This program would provide grants to cities, counties, or special districts to develop and implement a holistic, long-term approach to manage the urban forest ecosystem in that community. The goal is to reduce greenhouse gas emissions and maximize the benefits of the urban forest. The grants could help pay for a jurisdiction-wide tree inventory, urban forest mapping, analysis, training, and/or an educational program.⁸³

81 California Department of Forestry & Fire Protection (CAL FIRE), Urban and Community Forestry Program, Greenhouse Gas Reduction Fund Grants, Urban Forestry: Woods in the Neighborhood Grant Program, Request for Proposals 2014/2015, viewed at: http://calfire.ca.gov/resource_mgt/downloads/CALFIRE_UF_WoodsInNeighborhoodRFP2014_2015.pdf

82 California Department of Forestry & Fire Protection, Urban and Community Forestry Program, Greenhouse Gas Reduction Fund Grants, Urban Wood and Biomass Utilization Grant Program, Request for Proposals 2014/2015, viewed at: http://calfire.ca.gov/resource_mgt/downloads/CALFIRE_UrbanWood-BiomassRFP2014_2015.pdf

83 California Department of Forestry & Fire Protection. Urban and Community Forestry Program, Greenhouse Gas Reduction Fund Grants, Urban Forest Management For GHG Reduction, Request for Proposals 2014/2015, viewed at: <http://calfire>.

6.4 Challenges and Opportunities for a Multi-program Investment Strategy

The California Department of Forestry and Fire Protection could fund more urban forestry projects in disadvantaged communities if the program had additional staff. Because the program has only nine employees assigned to the entire state, the size of the grants offered in the first year were large – anywhere from \$150,000 to \$1.5 million. Although some limited sub-contracting is occurring, the process could deter smaller, community-based organizations and their projects from applying if they need less than \$150,000 in grant funding.

The governor has proposed doubling the amount of funding for Urban Forestry grants in the 2015-16 fiscal year. While credit should be given to its current staff of responsive and dedicated public servants, more staff would enable CAL FIRE to reach smaller disadvantaged communities, provide technical assistance to all applicants, process and evaluate applications for more projects, and to effectively monitor the progress of projects that have already received state grants.

The program should also have sufficient resources to ensure that Urban Forestry projects are being maintained and achieving desired results. The program should assess on an on-going basis whether the projects are reducing greenhouse gas emissions and providing the myriad of promised co-benefits to disadvantaged communities.

At this point, however, it is difficult to assess many of the challenges faced by CAL FIRE when administering the Urban Forestry grants nor the intended benefits of the grants because of limited public information. While CAL FIRE did post its list of 33 awarded projects for the 2014-15 fiscal year, the posting was not done in a very public way compared to other GGRF programs. (CAL FIRE only issued a press release but did not link it to their Urban Forestry website nor do they have an Urban Forestry listserv.) Additionally, CAL FIRE's process of selecting projects to advance for funding consideration has been opaque to the public, with limited information about specific selection criteria and ranking systems used for each of its five programs. Understanding what types of projects have been approved and why will give a far greater understanding of what the strengths and challenges of the program might be.

ca.gov/resource_mgt/downloads/CALFIRE_UF_ManagementActivitiesRFP2014_2015.pdf

7. Assessing Program Outputs and Improving Program Designs

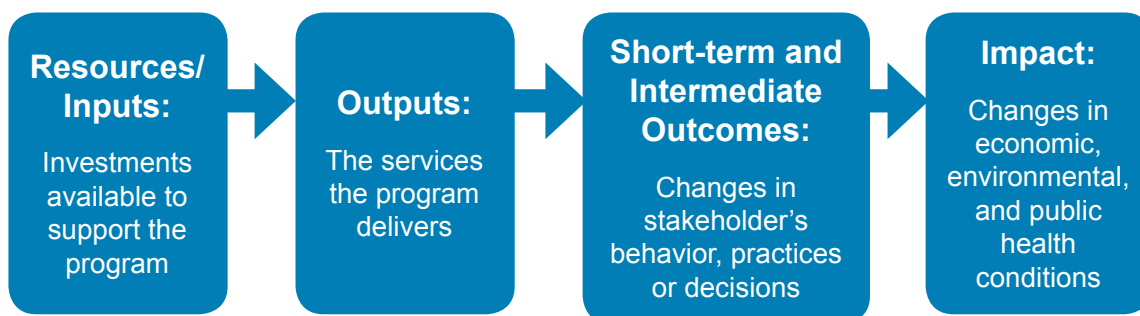
7.1 Introduction

This chapter identifies expected outputs associated with the Greenhouse Gas Reduction Fund (GGRF) programs described earlier in this report, discusses how we would evaluate the programs' future outcomes and impacts,⁸⁴ and provides recommendations to enhance these outcomes and impacts. In terms of our analysis, we focus on economic, environmental, and public health co-benefits rather than greenhouse gas reductions. The state has made a strong effort to assess GHG emission reduction benefits from its climate investments. This same level of guidance and tools is not yet available to assess co-benefits. As discussed earlier, state law requires that GGRF investments not only reduce GHG emissions but also provide co-benefits with a focus on disadvantaged communities.

We first offer a specific framework to assess a program's intended and actual benefits, and then begin to evaluate selected GGRF programs using this framework. Programs have resources, outputs, outcomes, and impacts; a logical model illustrates the casual relationships among these program elements and communicates the path toward a desired result. Ideally we would evaluate every link in the logic model chain, but currently we are only able to assess the first links for the selected GGRF programs. Graphic 12 illustrates the full logic model that we recommend using for more complete prospective and retrospective analyses of GGRF program benefits in the future, which would build upon this chapter's initial assessment.

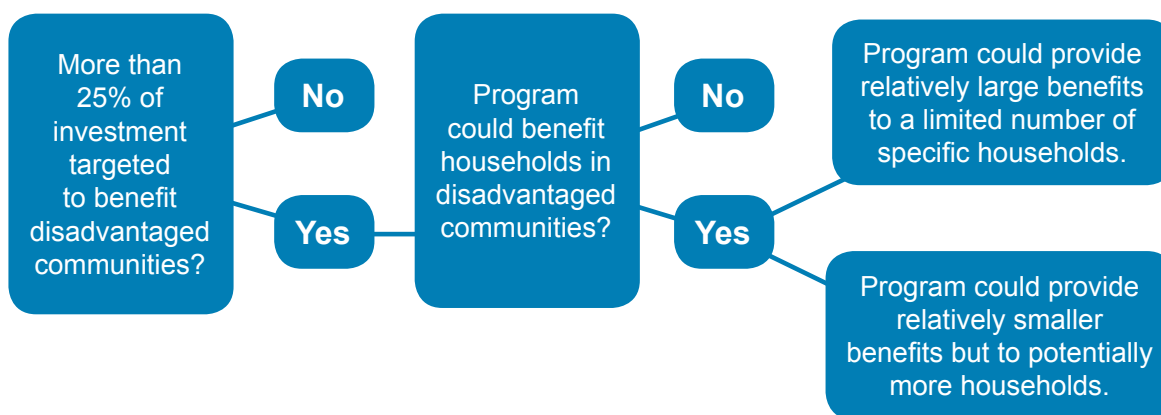
84 We use the following definitions. Outputs: The tangible results of a program or project; the products and services delivered by the project or program. For example, installations of energy efficiency measures in *X number of residences*. Outcome: This refers to the responses of targeted stakeholders to the program or project outputs; the impact of the outputs on behavior. For example, households reduce their electricity consumption by an average of *X percent*. Impact: This describes the consequences of the behavioral change, including immediate, intermediate and long term economic, environmental, public health impacts. Example: *X dollars* saved by low-income households through lower electricity consumption and *X pounds* of greenhouse gas emissions are reduced.

Graphic 12: Logic Model⁸⁵



As earlier in this report, we again focus on the GGRF programs for which at least 25 percent of the program’s investments are targeted to benefit disadvantaged communities. We assess and categorize the selected programs (those described earlier in this report) based on the projected numbers of households/residents likely to benefit and the magnitude and characteristics of that benefit. The following figure illustrates our process.

Graphic 13: Assessing Outputs for Selected GGRF Programs



This process revealed that three programs are likely to have relatively significant and direct benefits for a limited number of specific households while three other types of investments could provide relatively smaller/diffused benefits but to potentially more residents in a widespread way.

85 Adopted from the Environmental Protection Agency (March, 2009). “Guidelines for Evaluating an EPA Partnership Program”. www.epa.gov/evaluate/pdf/tools/guidelines-eval-epa-partnership-programs.pdf

Programs with Financial Benefits to Specific Households in Disadvantaged Communities:

- Affordable Housing and Sustainable Communities Program, administered by the Strategic Growth Council
- Low Carbon Transportation Program, light-duty vehicle projects, administered by the California Air Resources Board
- Low-Income Weatherization Program/Renewable Energy, administered by the California Department of Community Services and Development

Programs with Diffused Financial Benefits to Households in Disadvantaged Communities:

- Low Carbon Transportation Program, heavy-duty vehicle projects, administered by the California Air Resources Board
- Transit Capital and Operation Programs, administered by the California State Transportation Agency and the California Department of Transportation
- Urban and Community Forestry Programs, administered by the California Department of Forestry and Fire Protection

The state of California is still early in its multi-year process for implementing climate investments from the GGRF and currently data is limited and/or challenging to use to assess specific, quantifiable outcomes and impacts expected from fiscal year 2014-15 investments. When the GGRF implementation process is further along, hopefully more accessible information will allow for more sophisticated prospective (ex-ante) and then retrospective (ex-post) analyses of intended and actual results.

7.2 Programs with Benefits to Specific Households in Disadvantaged Communities

7.2.1 Affordable Housing and Sustainable Communities Program

The Strategic Growth Council (SCG) awarded \$121,955,460 in projects from the Affordable Housing and Sustainable Communities (AHSC) Program during the 2014-15 fiscal year. Over three-quarters (77 percent) will be spent on affordable housing—\$94 million—with \$32 million for transit, walking, and biking infrastructure.⁸⁶ The funding will go toward 28 projects in 21 cities. More than half of the projects (17 of the projects) are located within a disadvantaged community and about 20 percent (4 projects) are located within a half mile of a disadvantaged community. Of the 28 projects, 26 contain affordable housing expected to result in a total of 2,003 affordable units near transit.⁸⁷ The depth and level of housing affordability is described in the following table.

86 Strategic Growth Council (June 20, 2015). "Recommendation of Awards for 2014-15 Affordable Housing and Sustainable Communities Program." http://www.sgc.ca.gov/docs/AHSC_Presentation.pdf

87 *Ibid.*

Table 9: Depth and Level of Affordable Housing Funded by the Affordable Housing and Sustainable Communities Program, FY 2014-15

Extremely Low Income (>30% AMI*)	528 units
Very Low Income (30-50% AMI)	1,014 units
Low Income (50-60% AMI)	451 units
Total Affordable Units	2,003 units

*Area Median Income

Implementation of these projects will occur after this report was finalized. Thus, at the time this report was written, we do not have implementation data quantifying the actual benefits associated with the 2014-15 appropriations. But using the State’s projections, we are able to highlight some of the expected outputs. See Table 10. The following section provides recommendations for enhancing outcomes and impact.

Table 10: Intended Benefits from the Affordable Housing and Sustainable Communities Program with FY 2014-15 Funding⁸⁸

Resources/Inputs	Output	Outcome	Impact
\$122 million	2,003 affordable housing units.	To be determined	To be determined.
	These units will be located within 1/2 mile of transit. Most projects involve adding new, or making improvements to existing, bike, pedestrian, and transit infrastructure.		

Enhancing Outcomes and Impact

The actual amount a low-income household could save by living in a subsidized transit-oriented development will vary widely and is dependent on a myriad of factors, some of which the Affordable Housing and Sustainable Communities Program can only indirectly influence. To maximize GHG reductions and household-level savings on gasoline, housing units would be occupied by families whose residency would allow them to qualitatively reduce their household-level vehicle miles traveled (VMT), for example, by living closer to their jobs and taking transit, biking, or walking to work and other destinations. While the AHSC Program and its funded projects cannot require tenants to have such transportation profiles, there are ways to actively encourage this type of VMT reduction.

⁸⁸ *Ibid.*

The supply of vehicle parking is an important factor that could affect GHG outcomes and associated VMT and gasoline cost savings for households. It can be argued that reducing the number of parking spaces provided is logical given the intent of the AHSC Program and the proximity of the associated housing to transit and other alternative forms of transportation, as well as fair to the residents of the housing. Because housing developers are first in line to pay for parking as part of their overall project construction costs, reducing the cost of parking can increase funding available for other project elements that would benefit residents, such as increasing the affordable housing units constructed, decreasing the cost of housing offered to buyers or renters, and constructing more and better bike and pedestrian infrastructure.

The cost trade-offs can be significant, even for just one parking space. The average cost of a parking space in Los Angeles is \$27,000 for an above-ground space and \$35,000 for a subterranean space.⁸⁹ Bike racks, by comparison, can secure two bikes for as little as \$75 and bike lockers as low as \$500 per bicycle.⁹⁰ Additionally, bicycles require less than nine square feet of parking compared to a standard residential parking space, which in the city of Los Angeles is a minimum of 153 square feet. Bike racks can also be placed in smaller, unused spaces to maximize the utilization of floor space without incurring costs for setting aside additional space for storage.

One of the basic principles of economics is that there is no free lunch, which also extends to there is no such thing as free parking. Even if tenants do not directly pay to lease a parking space in their building, they indirectly pay through higher housing costs, which could be said to be unfair to tenants or owners who choose not to have a car or might choose to have one instead of multiple cars if incentivized to do so. By unbundling the cost of parking from housing prices, only those who need or want a car will be required to pay for it, which will reduce both housing costs and transportation related costs for households. Such a policy in a housing development will help attract tenants who will utilize the transit, bike, and pedestrian infrastructure that the AHSC Program requires and supports.

Given the well documented link between parking policies and VMT,⁹¹ the AHSC Program could do more within its funding guidelines to incentivize projects that most actively substitute parking space construction for the construction of more affordable housing units and better transit, bike, and pedestrian related infrastructure as well as other GHG reduction elements such as green infrastructure, transit passes, and car and/or bike sharing.

For an example of a project that reduces parking in favor of other these other beneficial project elements we can look at an approved housing development at 4700 Telegraph Road in Oakland. While not a AHSC project, it is an example of a model type of project for which the AHSC program could better incentivize over time. This project is located near transit and will have only .5 parking

89 Rider Levett Bucknall, Quarterly Construction Cost Report, Third Quarter (2012). Cited in Shoup, Donald. (2014). "The High Cost of Minimum Parking Requirements. Parking Issues and Policies." Transport and Sustainability, Volume 5. Emerald Group Publishing Limited, 5, 87-113.

90 Federal Highway Administration. (July, 2006). University Course on Bicycle and Pedestrian Transportation, Lesson 17: Bicycle Parking and Storage. <http://www.fhwa.dot.gov/publications/research/safety/pedbike/05085/pdf/lesson17lo.pdf>

91 Shoup, Donald (June, 2011). The High Cost of Free Parking, Updated Edition. American Planning Association.

spaces per unit. To make this feasible the developer included two transit passes per unit for 40 years, one on-site car-share vehicle, 48 bicycle parking spaces, and one annual bike-share pass per unit. As a result of all of these amenities each household is projected to generate only 15 vehicle miles travelled per day and received TransForm's GreenTRIP Platinum Certification.

The SGC did recently announce funding for the Camino 23 project in Oakland, which plans to provide transit passes to residents. Free or discounted transit passes for residents could serve as a significant financial incentive to use transit instead of driving. However, given what has been publicly released about the other projects funded in 2014-15 by the AHSC Program, the vast majority appear not to be planning to offer this incentive to encourage transit ridership and reduce VMTs. While many transit agencies may first need to authorize bulk purchases, the state (albeit beyond the purview of the AHSC program) could consider how to overcome that barrier by incentivizing local transit agencies to do so.

The AHSC Program requires a link to transit, bicycle, and pedestrian infrastructure. Safe and pleasant access to transit, biking, and biking infrastructure can be very important to encourage such modes of transportation, but the incentive is less direct (and thus arguably less powerful) than financial incentives such as unbundled parking costs and free transit passes. These strategies should not work in a vacuum and would be more powerful as part of an integrated strategy to encourage reduced VMT through shorter trips and by shifting modes to transit, bicycling, or walking.

Toward this end, the SGC sets a moderate amount of scoring criteria for projects in proximity to qualified employment areas (5.5 points) and those that emphasize walkable corridors (5.5 points) and encourage bicycling (3 points). Additionally, the SGC awards up to 6.5 points for projects that address up to three co-benefits. However, with a strong prioritization of GHG reductions in the scoring system (55 points) and with a high ratio to the amount of funding requested, the AHSC Program might unintentionally de-incentivize deeper affordability of housing units, which requires more public funding compared to projects offering less affordable housing. This is somewhat mitigated by the program's scoring system that awards up to 6.5 points progressively to projects providing rental units at 50 percent to 20 percent of the area median income (AMI). But the scoring system does not address what could still be a lesser GHG reduction-to-investments ratio.

As such, the AHSC Program guidelines could better mitigate the competing objectives of affordability and leveraging GHG reductions per Greenhouse Gas Reduction Fund dollar spent. Currently, the Strategic Growth Council utilizes the California Emissions Estimator Model (CalEEMod) to calculate GHG reductions. While CalEEMod is a rather sophisticated land use computer model that calculates the impacts of many construction projects and operations, including vehicle use, it does not distinguish between the differing carbon outputs of lower-income households, which drive substantially less than other households.⁹² It is estimated that "Extremely Low" and "Very Low-Income" households have 25 percent lower VMT than other households.⁹³ Yet the AHSC Program

92 TransForm and the California Housing Partnership Corporation (May, 2014). "Why Creating and Preserving Affordable Homes Near Transit is a Highly Effective Climate Protection Strategy." <http://www.chpc.net/dnld/AffordableTODResearch051514.pdf>

93 *Ibid.*

does not distinguish between the carbon output of households qualifying for “Affordable Housing” at 80 percent AMI and far more impoverished residents. This could create a lost opportunity to maximize carbon reductions as well as benefits for disadvantaged communities.

Additionally, issues of maintaining affordability as project areas gentrify around transit-oriented development could be more strongly incentivized. Instead, anti-displacement measures incorporated into proposals currently qualify for only one of the 30 points for policy objectives other than GHG reductions. Considering the expense of many anti-displacement policies and thus the negative effect it would have on the 55 points for carbon-reduction that relies on a high ratio to dollars requested, proposals including any anti-displacement policies could be less competitive.

In addition, it should be noted that the AHSC guidelines could better differentiate between, and specifically address, both physical/direct displacement and economic displacement. Direct/physical displacement can occur with the removal of affordable housing units for the redevelopment of any particular parcel(s) for less affordable units or a change in usage from residential to commercial or vice versa. Economic displacement can occur in the surrounding areas of a particular development through increased land values as the result of improvements to the area. The guidelines currently fall short of directly addressing economic displacement.

The state and academic partners may want to survey residents of AHSC supported transit oriented developments to compare their travel patterns before and after moving in. Assessing actual (vs. projected) VMT reductions from AHSC supported projects would be challenging but important to ensure that the program is working as intended and to inform changes to the program over time to maximize effectiveness.

7.2.2 Low Carbon Transportation Program: Light-Duty Sector Projects

The Low Carbon Transportation Program (LCTP) administered by the California Air Resources Board (ARB) functions as an umbrella program encompassing several sub-programs in two main categories: light-duty vehicles such as passenger cars, and heavy-duty vehicles such as delivery trucks, big-rigs, transit vehicles, and school buses. The six projects in the light-duty category are expected to provide direct benefits to certain California households in disadvantaged communities.

The projects in the light-duty category consist of the updated Clean Vehicle Rebate Project and five new pilot projects: a Car Sharing Pilot Program, Clean Vehicle Financing Assistance Programs, the Enhanced Fleet Modernization Program, the Public Fleet Pilot Project, and Agricultural Worker Vanpools in the San Joaquin Valley. Given that the pilot projects are in an early stage of development, it is not possible to assess their expected benefits at this time.

The Clean Vehicle Rebate Project, on the other hand, has existed since 2010. Historically, funding for the Clean Vehicle rebates came from motor vehicle fees and the California Energy Commission, but in 2013-14, the Greenhouse Gas Reduction Fund became a new source of revenue. While most state programs starting receiving funding from the GGRF in 2014-15, the fact that the CVRP was included in the earliest round of funding from the GGRF means that we have some post implementation data versus only ex-ante projections about outputs. See Table 11 for details.

**Table 11: Clean Vehicle Rebates using GGRF Funds
(As of January 31, 2015 for FY 2013-14 and 2014-15)⁹⁴**

Located Within & Benefiting Disadvantaged Communities		Total Benefiting Disadvantaged Communities	
Input: Amount (\$M)	Output: # of Rebates	Input: Amount (\$M)	Output: # of Rebates
\$5.1 million	2,579	\$31.2 million	15,517

The CVRP awarded 40,491 rebates using GGRF dollars as of January 31, 2015 for the 2013-14 and 2014-15 fiscal years.⁹⁵ The above table indicates that only six percent (2,579 of the 40,491) rebates went to residents of a disadvantaged community, during a period when the GGRF as a major funding source for the CVRP should facilitate the targeting of investment benefits in disadvantaged communities. In addition, 38 percent (15,517 of the 40,491) of the rebates awarded during this period benefited disadvantaged communities, according to the ARB’s definition. The ARB considers it a benefit to a disadvantaged community if a non-low income person receives a rebate if that person lives anywhere in a zip code that contains a census tract disadvantaged community.

Enhancing Outcomes and Impact

The Clean Vehicle Rebate Project has struggled to benefit disadvantaged communities. Historically, the vast majority of CVRP rebates have not gone to lower income car buyers. One key factor is the up-front cost to purchase or lease a zero emission or near zero emission vehicle. In general, this poses a larger challenge for lower income car buyers than the more affluent. Yet CVRP’s historical flat-rate incentive structure did not seek to overcome such challenges by providing additional incentives to low and moderate income participants.

Recent changes to the CVRP spurred by state law SB 1274 (de León), however, seek to make clean vehicles more widely accessible to disadvantaged, low-income, and moderate-income communities and consumers. In adopting the 2015-16 spending plan, the ARB worked with interested stakeholders and laid the groundwork for additional funding incentives for lower and moderate income consumers. Four to six months after the Legislature appropriates fiscal year 2015-16 funding for the Low Carbon Transportation Program, the new Clean Vehicle Rebate levels will increase for what the ARB defines as low to moderate income consumers. The higher rebates will be \$6,500 for a fuel cell vehicle, \$4,000 for a battery electric vehicle, and \$3,000 for a plug-in hybrid electric vehicle. To qualify for these higher rebate amounts, the consumer’s income cannot exceed 300 percent of the federal poverty level, which is \$47,790 for a two-person household or \$72,750 for a four-person household.⁹⁶

⁹⁴ California Air Resources Board (March, 2015). “Annual Report to the Legislature on Investments of Cap-and-Trade Auction Proceeds (Greenhouse Gas Reduction Fund Monies).” Page 33. <http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/2015ggrf-annual-report-to-legislature.pdf>

⁹⁵ Ibid, Page 27.

⁹⁶ California Air Resources Board (Adopted June 25 2015). Proposed Fiscal Year 2015-16 Funding Plan For Low Carbon Transportation Investments and the Air Quality Improvement Program. Table 6: 300 Percent of Federal Poverty Level for 2015. Page 30.

Also, for the first time the ARB has imposed a limit on the amount of adjusted gross income an individual buying or leasing a battery electric or plug-in hybrid electric vehicle can have and still receive a rebate from the state. Consumers will no longer be eligible for California rebates if they have incomes above:⁹⁷

\$250,000 for single filers;

\$340,000 for head of household filers; and

\$500,000 for joint filers.

It will be important to track where the rebates are going after the CVRP revisions go into effect, with a focus on how the changes are affecting the number of rebates going to disadvantaged communities.

In addition, the ARB may want to reevaluate whether the CVRP criteria for benefiting disadvantaged communities should be narrowed. The ARB considers it a benefit to a disadvantaged community if a non-low income person receives a rebate if that person lives anywhere in a zip code that contains a census tract disadvantaged community. For example, a Beverly Hills zip code qualifies. This may overstate such benefits. While air pollution travels, there may be more cost effective ways to incentive cleaner air and benefit disadvantaged communities than provide rebates to affluent customers who live in a mixed-income zip code.

Academic partners can help the state analyze how the changes affect the efficiency of the program in terms of incentivizing customers looking for a car to choose a clean vehicle. Prior research by the UCLA Luskin Center, funded by the ARB, explored proposed designs for rebates that include both means-tested eligibility and price caps to improve on the efficiency of the rebate policy. The research underscores that goals of equity and efficiency can be aligned. The recent changes should support these mutual goals but more ex-ante data and analysis will be critical to measure success and inform any future revisions.

The other LCTP pilot projects available to low and moderate income individuals present both opportunities and challenges to help households in disadvantaged communities reduce their gasoline costs and associated VMT and GHG emissions. For example, the predecessor project of the Enhanced Fleet Modernization Program Plus-Up historically struggled to reach low and moderate income individuals. The revised program is designed to provide greater incentives and options to such households.

Given the large number of new and revamped programs, however, a challenge will be getting the word out to households in disadvantaged communities. Community-based organizations are yet to have an official role in the state's outreach plans, but could be of significant value in reaching that target audience.

It will also be important for ARB to evaluate the program's progress over time and make changes to program/sub-program design if the data warrants such adjustments. The LCTP funding plan for fiscal

97 California Air Resources Board (June 25, 2017). Proposed Fiscal Year 2015-16 Funding Plan For Low Carbon Transportation Investments and the Air Quality Improvement Program. Page 27.

year 2015-16 lays out evaluative components that include research to measure clean vehicle adoption rates, assess financial incentive program structures, and evaluate funding levels for low- and moderate-income consumers.⁹⁸

7.2.3 Low-Income Weatherization Program

In terms of the number of program recipients, the Low-Income Weatherization Program (LIWP), administered by the California Department of Community Services and Development (CSD), may provide the largest direct financial benefit to households in disadvantaged communities of any program receiving support from the Greenhouse Gas Reduction Fund.

The CSD expects that the \$75 million appropriated from the GGRP for the LIWP in the 2014-15 fiscal year will pay for weatherizing 17,700 low-income housing units across the state. In addition, an estimated 1,780 of these low-income single-family households are also expected to receive rooftop solar systems through LIWP.⁹⁹ Implementation of these measures began with the \$75 million allocated for 2014-15 year, but could continue for the next couple of years (the providers have up to three years to spend the first tranche of \$75 million). Thus, at the time this report was written, we do not have post implementation data quantifying the actual benefits associated with the 2014-15 appropriated monies. But using the State’s projections, we are able to highlight the following expected outputs and outcomes, with caveats described later in this section.

Table 12: Projected Benefits of the Low-Income Weatherization Program, From FY 2014-15 Funding¹⁰⁰

Resources/Inputs	Output	Outcome	Impact
\$75 million	Weatherization of 17,700 housing units.	Households could reduce their electricity consumption by up to 35% and save more than \$400 on their heating and cooling bills in the first year alone.	To be determined.
	1,780 solar systems on single-family homes.	\$981 is the average electrical utility saving per household from solar PV in the first full year of installation.	To be determined.

Whatever the ultimate outcomes and impact may be from LIWP, they are expected to increase over time because more funding is expected to be added in subsequent fiscal years. At the time this report was written, the Governor’s proposed budget would give \$140 million to CSD in the 2015-16 fiscal year for the LIWP.

98 California Air Resources Board (May 21, 2015). “Proposed Fiscal Year 2015-16 Funding Plan for Low Carbon Transportation Investments and the Air Quality Improvement Program.”

99 California Department of Community Services and Development (May 21, 2015). “Low-Income Weatherization Program Fact Sheet”. www.csd.ca.gov/Portals/0/Documents/Fact%20Sheets/LIWP%20Fact%20Sheet%2005.21.2015.pdf

100 *Ibid.*

Enhancing Outcomes and Impact

The actual amount a household could save from weatherization will vary depending on many factors, including local climate and local utility rates. What is installed and how it is installed can also make a very significant difference in electricity consumption outcomes. Household behavior will also impact energy efficiency outcomes. It is also important to be aware of “rebound effects” from energy programs. That is, when a participant faces lower energy bills as a result of a solar installation and/or energy efficiency improvements, they face less incentive to conserve energy and behavior tends to change. A robust debate in the professional literature exists about the magnitude of the rebound effect. Suffice it to say that a consequence of the rebound effect can be a smaller beneficial effect, both environmental and economic, than what the energy project models might predict.

For example, a program that replaces an old, inefficient air conditioning unit in a hot area may lead to a family using their new air conditioner more often than they would have otherwise due to cost concerns. Thus, even with a new, more efficient system, the family may actually end up using more electricity, albeit enjoying a corresponding increase in their quality of life and maybe even health. Mortality rates related to heat stroke decrease with access to air conditioning. It is important to take a holistic view of the range of co-benefits and recognize that disadvantaged communities on average use less energy and other resources than more affluent communities.

Given the many factors that will affect energy efficiency outcomes, some degree of ex-post verification at the project/housing unit level would be necessary to accurately determine actual impacts. However, project verification is not currently funded through the GGRF or complementary funding sources. UCLA Luskin Center researchers do hope, however, that sufficient data will be publicly available and detailed enough to allow for ex post assessment of outcomes.

LIWP also could create particularly significant job creation benefits. How much of those benefits will accrue in disadvantaged communities is an open question. In general, job creation benefits are difficult to assess, especially at the current time considering the lack of data on hiring processes and career outcomes. Providers of weatherization services, determined by their existing enrollment in CSD’s LIHEAP program, may not have local hiring experience, and may lack relationships within disadvantaged communities to identify qualified candidates, especially those from hard-to-employ populations. Consider the large city of Los Angeles, where two service providers cover the entire area. It is unclear how effective local hiring programs could be on such a scale. Opening up contracts to service providers with already established disadvantaged workforce development capacity should be a strategy explored by CSD to more effectively target successful local hiring outcomes in disadvantaged communities.

Training is also important to ensure the labor force is well equipped to effectively conduct energy efficiency work. Yet not all workforce training is the same. It is important to distinguish between short, one-off certificate programs and robust workforce development systems.

7.3 Programs with Diffused Benefits to Households in Disadvantaged Communities

Compared to the three programs profiled above, some of the other GGRF funded programs are likely to result in relatively smaller/diffused financial benefits to lower income households, but to potentially more households in a widespread way. Three program types are particularly relevant in this category: Heavy-duty Vehicle projects within the Low Carbon Transportation Program, Transit Capital and Operations programs, and Urban Forestry programs.

The state has not yet provided information to quantitatively forecast expected outcomes and impacts of these programs. Instead in this section we introduce these program types, describe what we know about their inputs and outputs associated with 2014-15 funding, and consider ways to enhance their outcomes and impacts.

7.3.1 Low Carbon Transportation Program: Heavy-Duty Vehicle Projects

The heavy-duty vehicle projects component of the Low Carbon Transportation Program (LCTP) administered by the California Air Resources Board (ARB) could result in significant reductions in criteria and toxic pollution linked to health care costs borne both by households and society at large, especially for disadvantaged communities. The previously discussed CalEnviroScreen results underscore that low-income disadvantaged communities are disproportionately impacted by pollution from freight movement in California. Local environmental benefits via reductions in heavy-duty vehicle related air pollution could therefore also be associated with significant public health and financial benefits for disadvantaged communities.

The magnitude of these outcomes and impacts, however, cannot yet be projected. In fact, even output data is not yet available because the ARB had not announced project awards at the time this report was written.

The LCTP's heavy-duty vehicle projects are designed to concentrate benefits for disadvantaged communities and seek transformative change through zero emission vehicles. While transformative change through zero emission vehicles is a critical objective, in the shorter-term, many zero emissions technologies are not available for a large scale. Supporting low emission bridge technologies in addition to more transformative technologies can help achieve much needed emission reductions today while paving the way for a cleaner future.

7.3.2 Transit Capital and Operations Programs

The Greenhouse Gas Reduction Fund is providing hundreds of millions of dollars for two separate, but complementary new transit programs: The Transit and Intercity Rail Capital Program and the Low Carbon Transit Operations Program.

The California Department of Transportation has recently released the list of 86 projects awarded funding by the Low Carbon Operations Transit Program with fiscal year 2014-15 appropriations¹⁰¹ and a list of the 14 projects awarded funding by the Transit and Intercity Rail Capital Program in 2014-15.¹⁰² However, the information about these funded projects is not particularly conducive to assessing expected outputs, outcomes and impacts for disadvantaged households. While the project title, project lead, cost amount, and a brief project description is provided, there is no summary of the cumulative outputs across all funded projects. In addition, while the agency lists whether each of the funded projects is expected by the project proponent/lead to benefit a disadvantaged community/communities, no detail is provided about how this will be the case and to what extent.

Based on Funding Guidelines,¹⁰³ we do know that the Transit and Intercity Rail Capital Program and the Low Carbon Transit Operations Program should result in improved transit or intercity rail service for stations or stops in and near a disadvantaged community. To meet the “in a disadvantaged community criteria” a project could provide more transit lines, more frequent service, greater capacity on existing lines that are nearing capacity, improved reliability, or bus rapid transit service in disadvantaged communities. Eligible projects could also improve connectivity at stations or stops in a disadvantaged community (e.g. better links between transit and active transportation), among other eligible related project types.

For a project to qualify as providing “benefits to” disadvantaged communities (vs. being located in disadvantaged communities), the Funding Guidelines¹⁰⁴ allow for a larger eligible geographic limit, going beyond the census tract boundaries of identified disadvantaged communities. For example, a project could meet disadvantaged community eligibility criteria if it improves bus transit service for riders using stations or stops that are accessible by walking within ½ mile of a disadvantaged community. Or, a project could qualify if it improves transit connectivity for riders using stations or stops in a zip code that contains a disadvantaged community census tract, or if it will increase transit ridership with at least 25 percent of new riders from disadvantaged communities, among other eligible project types.

Given the myriad of eligible project types and their geographic and ridership related criteria, it will be critical that transit agencies conduct careful route and ridership planning. Exactly how transit agencies should do so for projects funded by the GGRF is not clear at this point. For example, a transit project located in a zip code containing a disadvantaged census tract should be required to demonstrate that it predominantly benefits disadvantaged households through careful analysis of transit ridership. Yet, detail at this level does not appear to be currently required.

101 California Department of Transportation (2015). LCOPT Fiscal Year 2014-15 Cycle 2 Project List. http://www.dot.ca.gov/hq/MassTrans/Docs-Pdfs/LCTP_14-15_Final_Projects.pdf

102 California Department of Transportation (June 30, 2015). Transit and Intercity Rail Capital Program, First Round Selected Projects. <http://www.dot.ca.gov/hq/MassTrans/Docs-Pdfs/TIRCPAwardSummary06302015.pdf>

103 California Air Resources Board (June 16, 2015). Cap-and-Trade Auction Proceeds: Funding Guidelines for Agencies that Administer California Climate Investments. Volume 2: Investments to Disadvantaged Communities. Appendix 2.A-8. <http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/auction-proceeds-funding-guidelines-06-16-2015-public-draft.pdf>

104 Ibid. Appendix 2.A-9.

7.3.3 Urban and Community Forestry Programs

With funding from the Greenhouse Gas Reduction Fund, the California Department of Forestry and Fire Protection (CAL FIRE) has repackaged six of its previous Urban Forestry grants programs into five new grant programs.¹⁰⁵ The programs are:

- Green Trees for the Golden State Program
- Green Innovations Program
- Woods in the Neighborhood Program
- Urban Wood and Biomass Utilization Program
- Managing Urban Forests For GHG Reduction Program

These programs are designed to sequester carbon while providing local environmental benefits through reduced stormwater runoff and improved air quality, economic benefits through job creation, financial benefits to households and businesses by potentially increasing property values and providing shade that can reduce energy consumption costs, and public health benefits related to reducing the urban heat island effect.

CAL FIRE posted on July 7, 2015 its list of 33 awarded projects for the 2014-15 fiscal year, but information about these projects was limited and the posting was not done in a very public way compared to other GGRF programs.¹⁰⁶ (CAL FIRE issued a press release, but did not link it to their Urban Forestry website nor widely publicize the release.) Moreover, information about the projects is particularly lacking compared to other GGRF programs. Information is available about the inputs (funding amounts per project) and brief project descriptions are given, but there is no summary of what this means for cumulative outputs. Thus, the limited data stymies a systematic assessment of expected outcomes and impacts.

CAL FIRE's process of selecting projects to advance through stages of funding consideration has been opaque to the public, with limited information about specific selection criteria and ranking systems used for each of its five programs. Due to the paucity of data, specifically how rankings were determined, and limited project details (both those awarded funding and those that failed to advance), determining specific program elements in need of improvement is problematic. As information is released for both awarded projects and those failing to advance, understanding how the programs may be improved will be possible.

Several of the grants are quite open-ended in what types of projects are eligible, particularly the Green Innovations grant. This grant calls for forward-thinking green infrastructure, which can include a wide range of projects. Exactly what is funded and the details of the project, such as the type of

105 California Department of Forestry and Fire Protection. Urban and Community Forestry Program, Greenhouse Gas Reduction Fund (GGRF) Grants webpage. http://calfire.ca.gov/resource_mgt/resource_mgt_urbanforestry_grants.php#

106 California Department of Forestry & Fire Protection (July 7, 2015). Urban Forestry Forest Legacy Greenhouse Gas Reduction Fund Grants—2014–15. http://www.fire.ca.gov/grants/downloads/GHG_Grants.pdf

trees used, will significantly affect the co-benefits that can be expected to be realized from the projects. For example, planting and maintaining trees with a large canopy near residences could offer shade and thus energy efficiency benefits for those nearby residences. Other types of vegetation will not have the same effect.

Like all of the Greenhouse Gas Reduction Fund programs, more staff resources could enhance program outcomes and impacts. But staff resources may be a particularly salient issue for the Urban Forestry programs because currently there are only nine employees assigned to the entire state. In the 2014-15 fiscal year, the agency did not have the ability to process as many projects as it might otherwise if there was more staff for outreach, technical assistance, contracting, etc. Thus, the size of the grants offered in the first year were large – anywhere from \$150,000 to \$1.5 million. Although some limited sub-contracting is occurring, the process could deter smaller, community-based organizations and their projects from applying if they need less than \$150,000 in grant funding. Smaller community-based organizations may also not have the technical staff to complete all steps in the competitive grant proposal process, including conducting the GHG modeling.

The governor has proposed doubling the amount of funding for Urban Forestry grants in the 2015-16 fiscal year. More staff would enable CAL FIRE to reach smaller disadvantaged communities, provide technical assistance to all applicants, process and evaluate applications for more projects, and to effectively monitor the progress of projects that have already received state grants. The program should have sufficient resources to ensure that Urban Forestry projects are being maintained. The program also needs to assess on an on-going basis whether the projects are reducing greenhouse gas emissions and providing the myriad of promised co-benefits to disadvantaged communities.

8. Conclusion

This report underscores the importance of the Greenhouse Gas Reduction Fund (GGRF) as an historic opportunity to combat climate change and provide local benefits to vulnerable communities across California. Cap-and-Trade auction revenues going into the GGRF are enabling exponential increases in funding for programs designed to reduce greenhouse gas emissions and provide economic, environmental, and public health co-benefits. As illustrated throughout this report, we see these funding increases in all of five of the investment sectors most targeted to disadvantaged communities.

Our findings also underscore that there is currently limited information provided by the state agencies (and in no one centralized place) to assess the expected economic, environmental, and public health co-benefits of GGRF investments. While we have information about program inputs and in some cases outputs associated with 2014-15 investments, more data is needed to readily and systematically assess outcomes and impacts from these investments.

The world will be watching for data on the impact of California's climate investments. It is critical that the State has the processes and tools in place to ensure that agencies receiving GGRF appropriations can accurately assess investment options to maximize benefits and then track their results. In other words, it is important for the State to plan ahead and with enough specificity in order to have the data to demonstrate exactly how the investments meet statutory requirements, including to fulfill the goals of AB 32. Incentivizing co-benefits to disadvantaged communities is also necessary to meet state law, SB 535, and other climate change legislation. In fact, AB 1532 mandates that GGRF investments maximize to the extent feasible economic, environmental, and public health co-benefits.

This report provided program-level recommendations to enhance co-benefits for disadvantaged communities. But these program-level recommendations cannot happen in a vacuum.

Program-level guidelines are impacted by the State's over-arching Funding Guidelines for Agencies that Administer California Climate Investments,¹⁰⁷ including those focused on benefits to disadvantaged communities per SB 535. The current eligibility criteria could go further to more explicitly require state agencies to seek more than one co-benefit per project.¹⁰⁸ This is just one

¹⁰⁷ California Air Resources Board (June 16, 2015). Cap-and-Trade Auction Proceeds: Funding Guidelines for Agencies that Administer California Climate Investments. Volume 2: Investments to Disadvantaged Communities. <http://www.arb.ca.gov/cc/capandtrade/auctionproceeds/auction-proceeds-funding-guidelines-06-16-2015-public-draft.pdf>

¹⁰⁸ Ibid. Volume 2, Appendix 2.A.

example of how the current guidelines contain many important principles, yet fall short of laying out a robust approach for how to operationalize these principles. Although the SB 535 guidelines need built-in flexibility for agencies, there is more that can be done to set baseline expectations, incentivize multiple co-benefits, and ensure agencies enumerate strategies to benefit disadvantaged communities germane to their program.

Another UCLA Luskin Center report seeks to address this issue. To maximize the benefits provided by SB 535 projects, this previous report called “Investment Justice through the Greenhouse Gas Reduction Fund,”¹⁰⁹ lays out a performance management approach to create the conditions for a race to the top, where project applicants find innovative ways to maximize the benefits that each investment provides. This approach involves eligibility criteria, ranking/scoring indicators and metrics that agencies could use to systematically evaluate investment options (ex-ante) and then track (ex-post) their results. We recommend continuously assessing inputs, outputs, outcomes, and impacts.

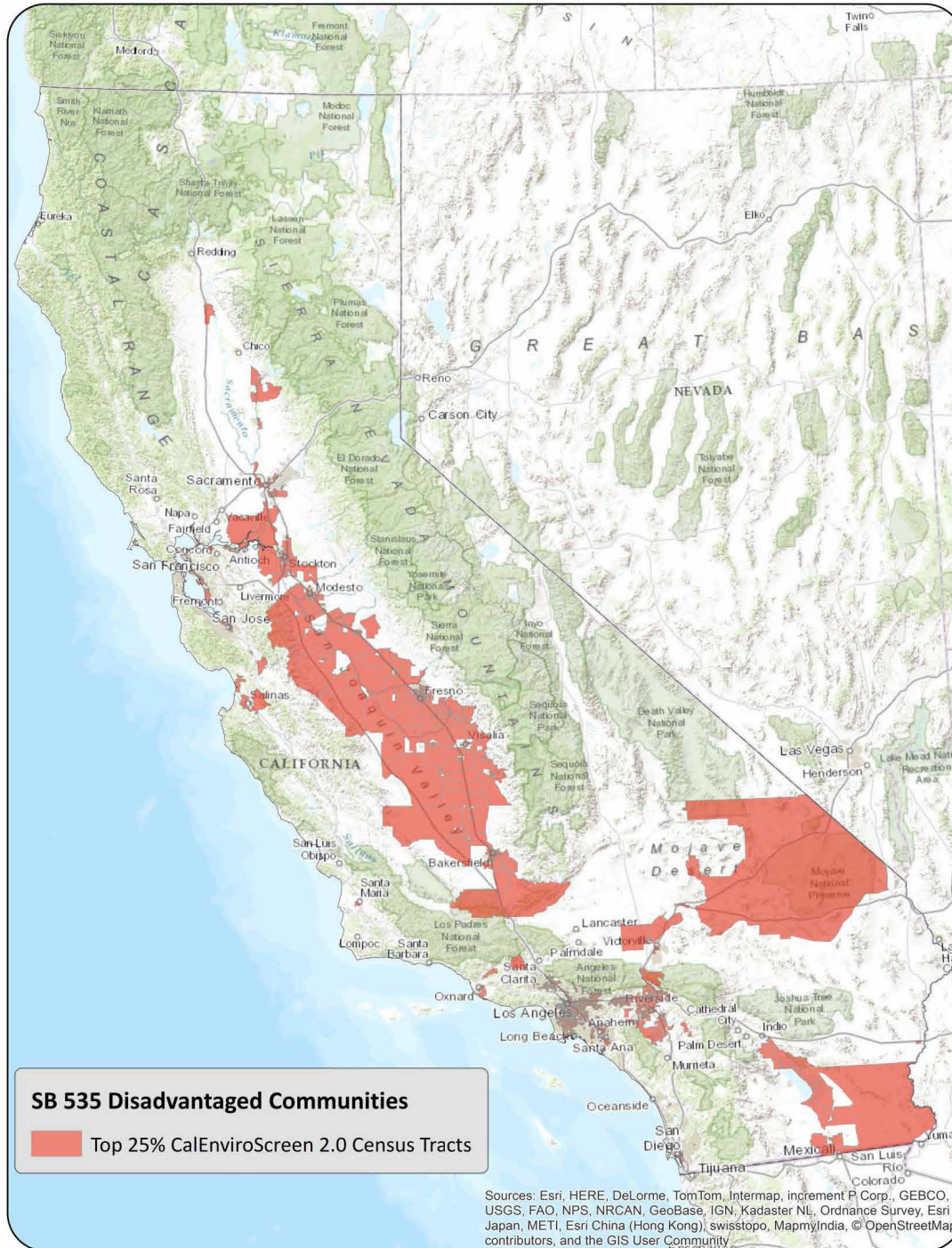
The UCLA reports underscore the importance of the Greenhouse Gas Reduction Fund as an historic opportunity to combat climate change and provide local benefits to vulnerable communities across California while recognizing that the actual benefits will depend on a myriad of factors. These factors include the over-arching process and tools that the State and its agencies uses to evaluate and make informed decisions about climate investments, monitor and track results, and then make data-based investment adjustments over time.

Implementation of the Greenhouse Gas Reduction Fund will require time, resources, and collaborations across a myriad of government agencies and with academia, the private sector, civil society, and impacted communities. We hope the UCLA Luskin Center can continue to help advance strategic and equitable climate investments that maximize benefits for the most vulnerable Californians.

109 UCLA Luskin Center for Innovation (June, 2014). Investment Justice through the Greenhouse Gas Reduction Fund: Implementing SB 535 and Advancing Climate Action in Disadvantaged Communities. <http://innovation.luskin.ucla.edu/content/investment-justice-through-greenhouse-gas-reduction-fund>

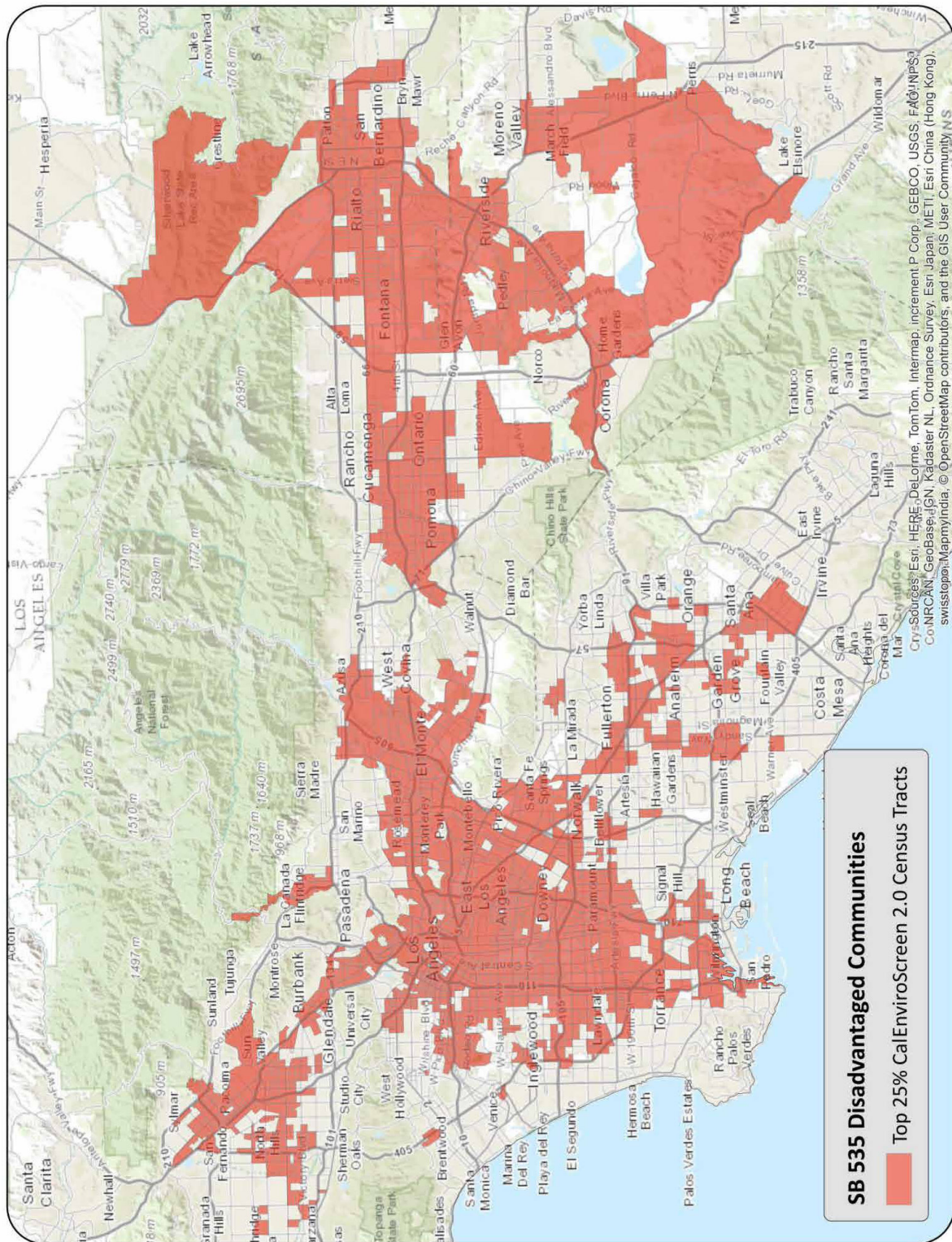
9. Appendix

9.1 SB 535 Disadvantaged Communities in California

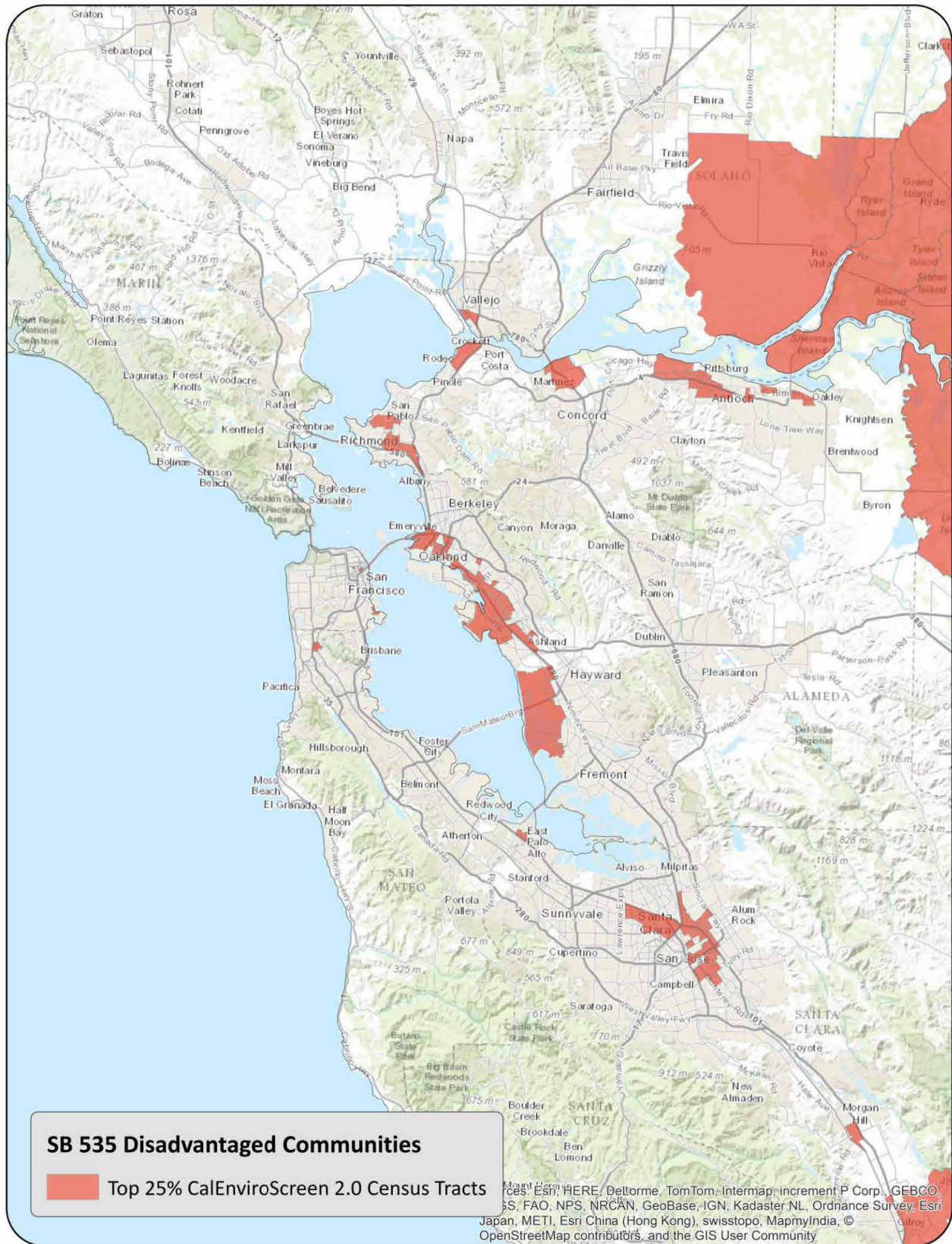


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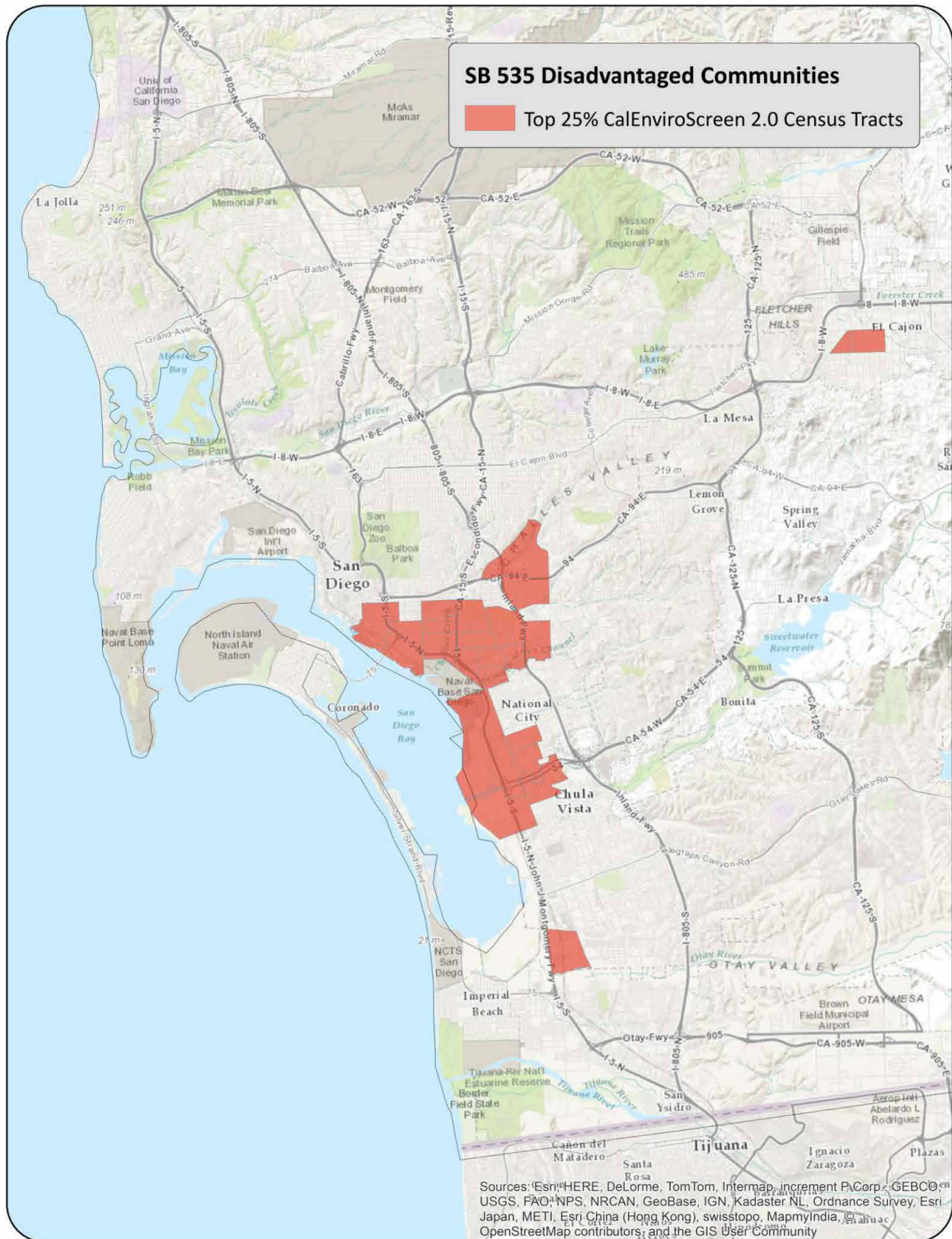
9.2 Los Angeles Area Map



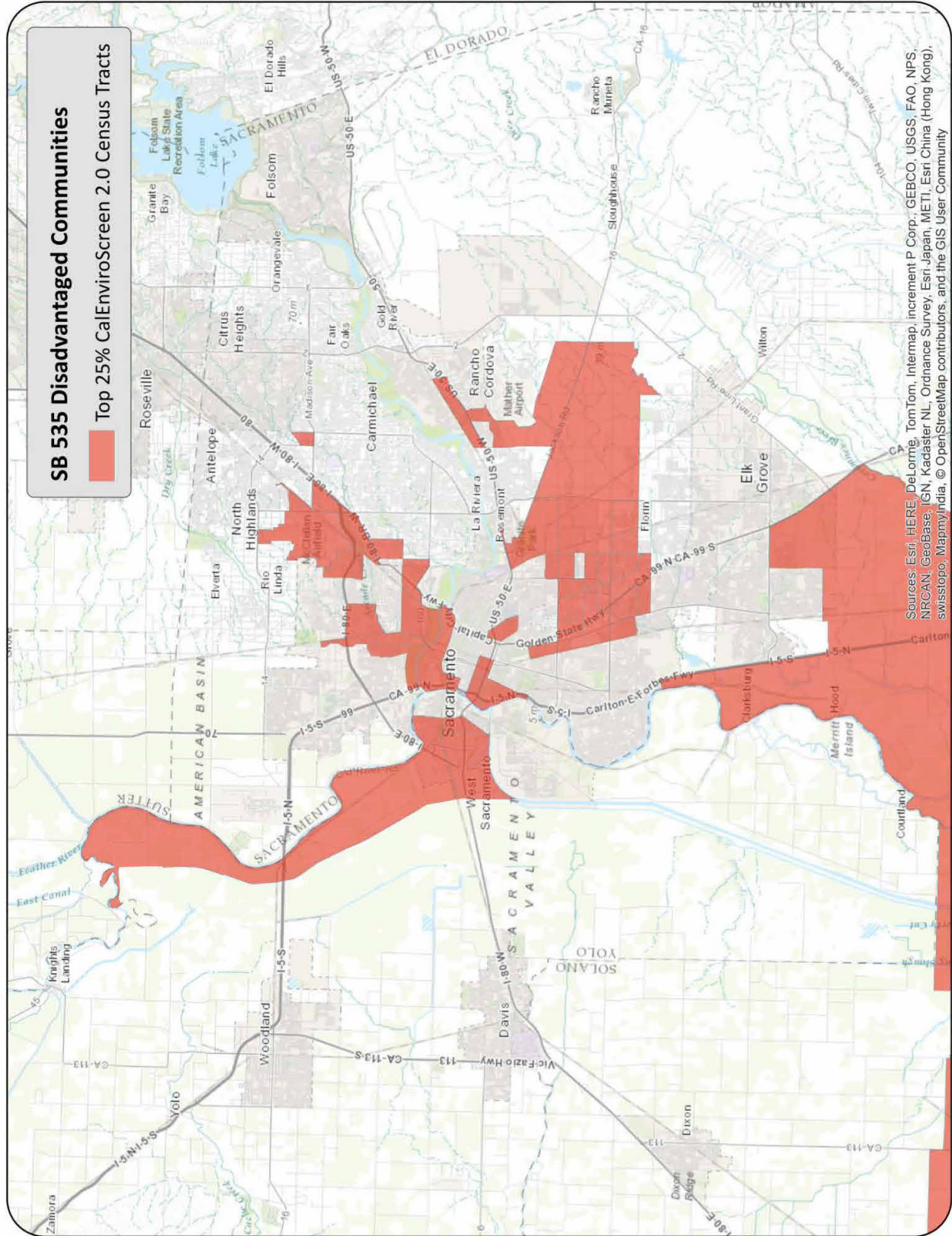
9.3 San Francisco Area Map



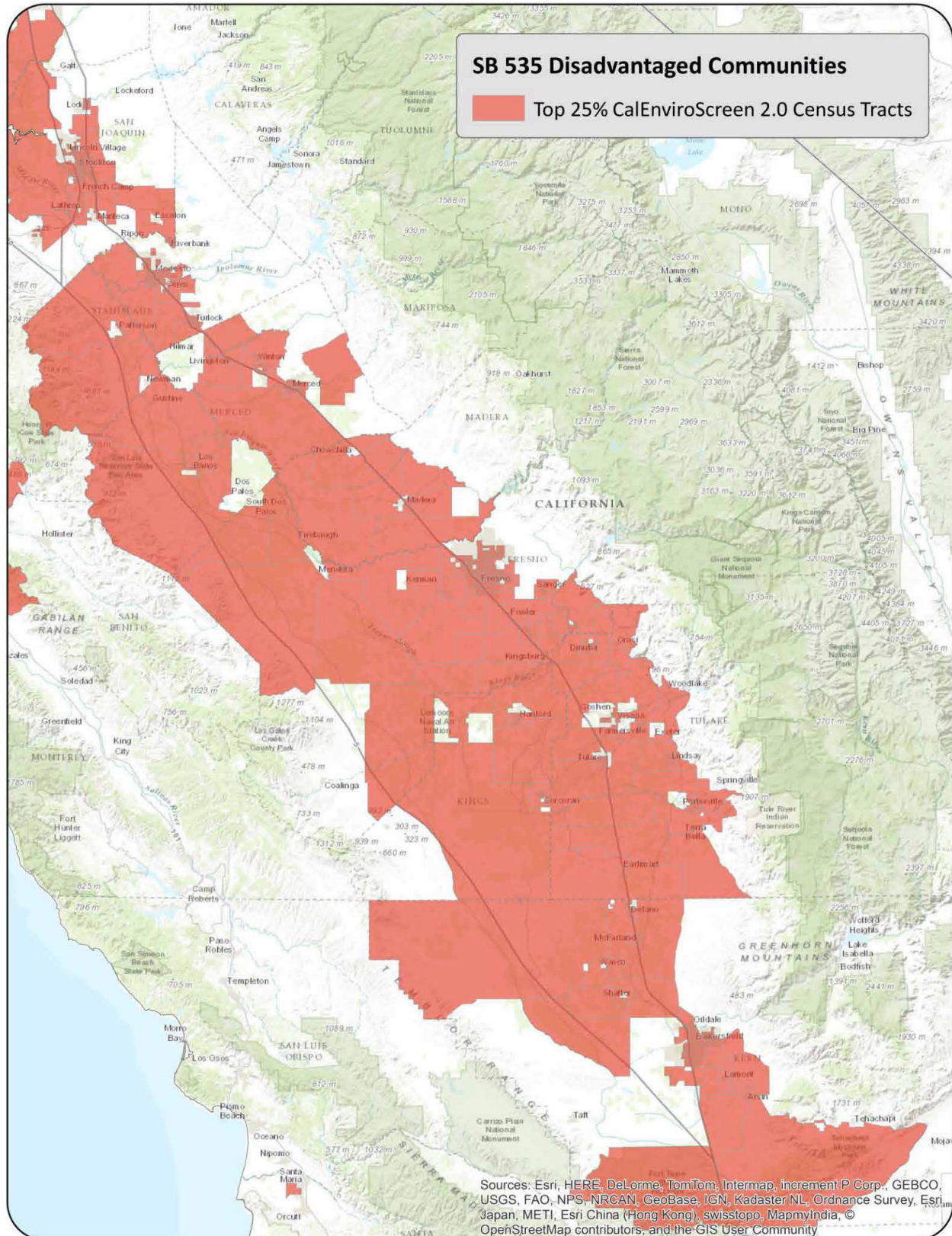
9.4 San Diego Area Map



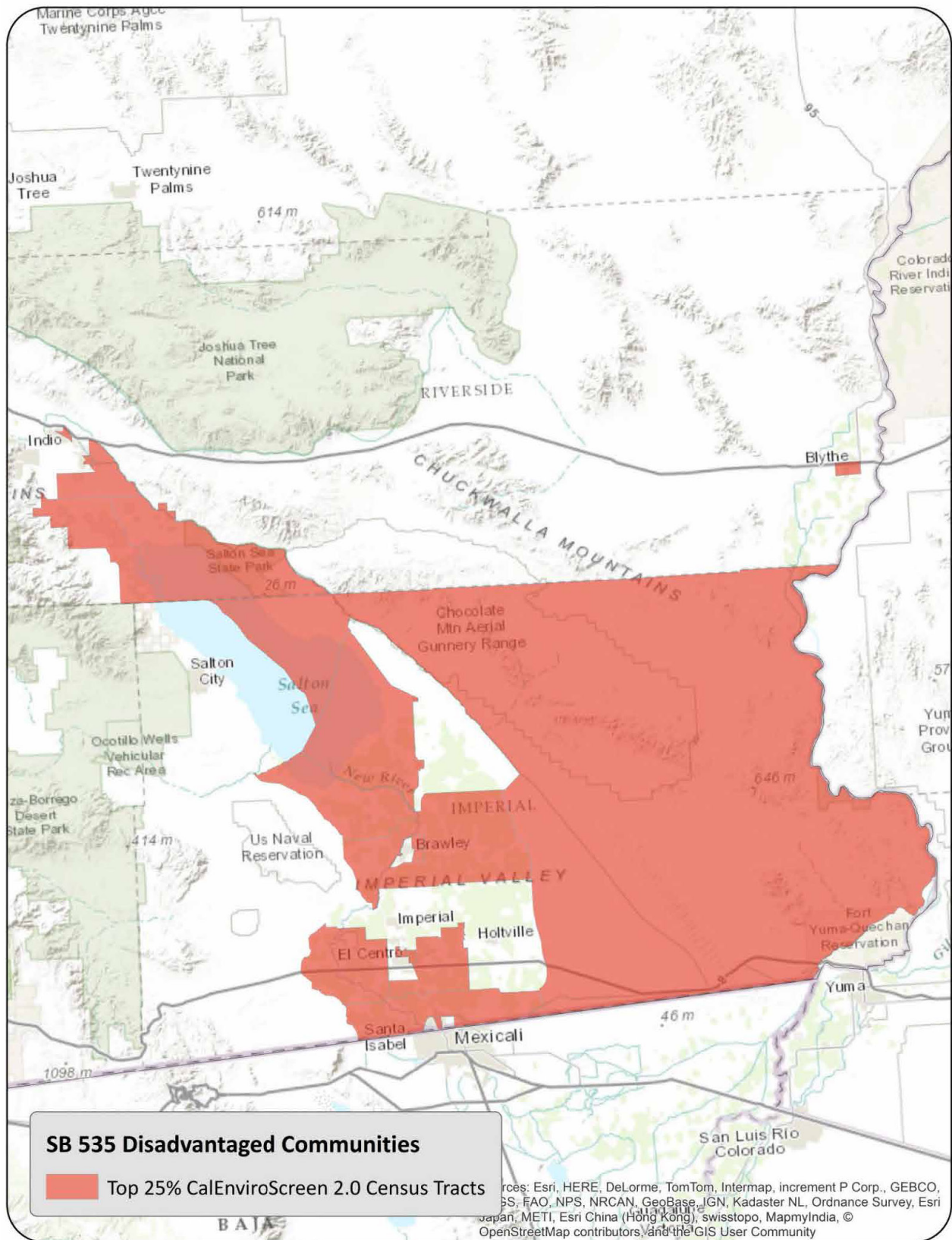
9.5 Sacramento Area Map



9.6 San Joaquin Valley Map



9.7 Coachella & Imperial Valleys Map



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