

**Appendix F:  
Update on the Audit of CARB's Greenhouse Gas Related  
Transportation Program**

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## Introduction

The California State Auditor (CSA) reviewed the California Air Resources Board's (CARB) transportation programs designed to reduce greenhouse gas (GHG) emissions in 2020 and early 2021 as directed by the Joint Legislative Audit Committee. CSA issued its findings in *Report 2020-114 California Air Resources Board: Improved Program Measurement Would Help California Work More Strategically to Meet Its Climate Change Goals* in February 2021.<sup>1</sup>

Many of the auditor's recommendations focused on areas where additional data collection and analysis would help CARB more strategically implement its GHG reduction programs. The recommendations acknowledge the emission reductions that California is realizing while underscoring the need for further analysis to refine how those reductions and related benefits are attributed to the various programs. These include recommendations to evaluate the interactions between regulations and incentives as well as evaluate the quantification methodologies and document the behavioral, socio economic, and jobs benefits of CARB's incentive programs, among others.

Having more data is beneficial when designing, implementing, and evaluating California's emission control strategies, and CARB is in the process addressing the auditor's recommendations. CARB is required to provide an update on its progress implementing the report recommendations after 60 days, 6 months, 1 year, and annually thereafter until all the recommendations are fully implemented. CARB's most recent submittal to CSA was its 1 year status update, submitted in February 2022. Based on CSA's review of the 1 year update, CAS has determined at that time that CARB had fully implemented 6 of the 15 recommendations contained in CSA's Report 2020-114. A status report on each recommendation as of CARB's February 2022 update to CSA is presented below.

## Recommendation 1

To improve its ability to isolate each of its incentive programs' additional GHG reductions, by February 2022 CARB should establish a process to formally identify its incentive programs' overlap with other programs that share the same objectives. As part of that process, CARB should document how it will attempt to account for the overlap to allow the most accurate program measurement possible.

### **CARB Status Update for Recommendation1: Partially Implemented**

Meeting California's ambitious climate targets requires a mix of policy approaches, including mandates, incentives, consumer education, and infrastructure investment. These policies induce further GHG emission reductions, advance environmental justice, and concurrently address multiple environmental and social goals. However, their interrelated operation and the complexity of consumer behaviors make it challenging to attribute emissions reductions to individual programs. Addressing this challenge requires additional

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<sup>1</sup>Report 2020-114 California Air Resources Board: Improved Program Measurement Would Help California Work More Strategically to Meet Its Climate Change Goals, February 2021: <http://auditor.ca.gov/reports/2020-114/index.html>

data and analysis to separate the impacts of CARB's existing incentives on consumer behavior from regulations and other programs.

To address CSA's recommendation, CARB executed a contract with a team of researchers at the University of California who specialize in technological innovation systems theory, behavioral research, and environmental policy. The objective of this contract is to better define GHG emission benefits of individual CARB incentive programs. The researchers are reviewing California's portfolio policy approach related to transportation and assess the effectiveness of incentives in changing consumer behavior, achieving further GHG emissions reductions, and advancing social equity. The researchers will also develop quantification methods for existing consumer-based incentive programs and provide recommendations for long-term data collection methods and analysis tools to quantify the emission benefits of incentive programs. The contract was executed in December 2021 and will take approximately 2 years to complete. CARB began meeting with the researchers biweekly in January 2022 to discuss CARB's programs and provide regulatory and incentive program data necessary for the researchers' analysis. CARB expects to receive interim results later in 2022.

## Recommendation 2

As part of its work to measure both incentive and regulatory programs' additional GHG reductions, by February 2022 CARB should begin collecting and analyzing the data it needs to assess the extent to which the requirements in its regulatory programs are being exceeded by manufacturers. To the extent applicable, that analysis should focus on the components of the requirements that overlap with CARB's incentive programs, such as the extent to which manufacturers comply with regulations for heavy-duty vehicles via low- and zero-emission vehicles (ZEV).

### **CARB Status Update for Recommendation 2: Fully Implemented**

For CARB's light-duty ZEV Regulation, CARB staff began disclosing additional public data starting with the 2020 reporting year to help identify manufacturer over compliance. These data can be found in CARB's 2020 ZEV credits annual disclosure report ([https://ww2.arb.ca.gov/sites/default/files/2021-12/2020\\_zev\\_credit\\_annual\\_disclosure\\_ac.pdf](https://ww2.arb.ca.gov/sites/default/files/2021-12/2020_zev_credit_annual_disclosure_ac.pdf)), which was released in December 2021. Disclosures for this reporting year and subsequent years include a more comprehensive overview of manufacturer compliance. Updates include: the regulatory credit requirement by manufacturer, the number of eligible vehicle sales and associated credits generated by make and model, a complete accounting of each manufacturer's credit generation and balance from the prior reporting year to the current year, and the industry-aggregated requirement and credits earned from 2014 through the current reporting year. This public disclosure and related data will allow stakeholders (including contracted researchers) to better understand how manufacturers are complying with the ZEV Regulation in terms of vehicles and regulatory credits relative to the regulation requirements for each year.

For CARB's heavy-duty GHG regulations, CARB staff has begun analyzing data to assess over-compliance with the California Phase 1 GHG regulation for 2019 and 2020 model

year heavy-duty vehicles. Findings include, but are not limited to, the number of vehicles produced in California, and the number of certified manufacturers that generated conventional and advanced technology credits due to producing heavy-duty battery electric, fuel cell, and hybrid-electric vehicles. CARB will continue to do this annually. This information will be used to inform CARB's work in isolating benefits of our incentive programs.

### Recommendation 3

To improve its ability to identify the effectiveness of each of its incentive programs in reducing GHG emissions, by August 2021 CARB should develop a process to define, collect, and evaluate data on the behavioral changes that result from each of its incentive programs. Having done so, by February 2022 CARB should collect and analyze relevant survey information for all consumer-focused incentive programs, as well as information about the behavioral effects of programs that other entities offer, such as the federal tax credit.

#### **CARB Status Update for Recommendation 3: Partially Implemented**

CARB staff developed a draft process to define, collect, and evaluate data related to behavioral changes associated with projects funded in the Funding Agricultural Replacement Measures for Emission Reductions (FARMER), Low Carbon Transportation, and Assembly Bill 617 Community Air Protection (CAP) Programs, as required by August 2021.

In the FARMER Program, CARB is including in the fiscal year (FY) 2021-22 funding cycle grants with the administering air districts a requirement to survey funding recipients on the behavioral impacts of these incentives in order to evaluate program effectiveness. CARB expects to start receiving these survey data later in 2022 as part of air districts' semi-annual reports to CARB once air districts start spending their FY 2021-22 FARMER funds.

For the consumer-based projects, staff continues to develop a streamlined survey that can be administered and managed by CARB. One survey is currently in development for the vehicle purchase incentive projects, including the Clean Vehicle Rebate Project, Financing Assistance Program, and Clean Cars 4 All, and another survey is being developed for CARB's suite of mobility projects. CARB is coordinating with internal and external researchers for feedback and guidance on these surveys, and coordinating across projects to ensure data can be compared, where appropriate. Staff is also in the process of acquiring appropriate technology to deploy the survey. Staff aims to begin collecting and analyzing relevant survey information by mid-2022, to help inform project development going forward.

### Recommendation 4

To better assist the State in achieving its GHG goals, CARB should use the information we describe above to refine its GHG emissions estimates for its incentive programs in its annual reports to the Legislature, the funding plans approved by its board, and any longer-term planning documents or reports.

#### **CARB Status Update for Recommendation 4: Partially Implemented**

Work to address this recommendation is contingent on the outcome of CARB's efforts to address recommendations 1 through 3, including the research contract described in CARB's response to recommendation 1. That work is currently under contract, and interim results are expected starting in Summer 2022. The outcomes of these analyses will determine how CARB will address this recommendation.

#### **Recommendation 5**

To promote transparency and inform stakeholders, beginning in December 2021, CARB should prepare an annual report for its board and the Legislature on its progress in isolating the GHG emissions reductions attributable to each of its regulatory and incentive programs. As a part of this report, CARB should identify any measurement challenges that persist and highlight any administrative barriers that prevent it from obtaining the information it needs to perform better analysis.

#### **CARB Status Update for Recommendation 5: Fully Implemented**

CARB is committed to maintaining a transparent process for informing stakeholders on progress made toward isolating the emission benefits of regulatory and incentive programs. To report progress made in 2021, CARB prepared a memo for the CARB Board and a letter for the Joint Legislative Audit Committee and submitted them on December 17, 2021. CARB will continue reporting on an annual basis its progress in quantifying the benefits of CARB programs to the CARB Board and the Legislature.

#### **Recommendation 6**

To strengthen the accuracy and integrity of its emissions reduction reporting, CARB should immediately begin retaining all supporting documentation it uses to perform calculations of GHG reductions for its cap-and-trade-funded incentive programs for a period of at least five years. In conjunction with this change, CARB should also document the justification for any instances in which the underlying data it uses to compile its annual reports vary from the information it publishes in those reports.

#### **CARB Status Update for Recommendation 6: Fully Implemented**

Policies and procedures that outline the steps taken to prepare and report GHG reductions for Low Carbon Transportation, FARMER, and CAP incentives have been expanded and updated to include the requirement that all supporting documentation, including any documentation necessary to perform GHG calculations, shall be maintained for at least five years. The procedures include a step-by-step guide for reporting emission reductions, as well as instructions for documentation of each step taken at the time of emission reduction reporting. Finally, the procedures address how to document variances between the underlying data used to compile the annual reports and the information published in those reports.

## Recommendation 7

To better ensure the accuracy of its program data, by August 2021, CARB should develop a formal schedule and procedures for reviewing the supporting documentation maintained by its program administrators. These procedures, which CARB should begin using with the 2022 annual report, should specify a minimum number of records to review in relation to the program's size, should specify how staff will collect and maintain evidence to support conclusions, and should be standardized across all of CARB's incentive programs.

### **CARB Status Update for Recommendation 7: Fully Implemented**

Policies and Procedures for the Low Carbon Transportation, FARMER, and CAP Incentive Programs have been developed to include procedures on how staff will conduct and maintain evidence of program oversight by the program administrator/grantee; which staff refer to as desk reviews. These policies and procedures have been recently updated to include more clearly defined formal review schedules and minimum numbers of records to be reviewed for each program.

Though each incentive program is unique in appropriation amount, administration process, maximum incentive level per project, etc., the procedures for conducting reviews are standardized across all programs where feasible. Additionally, reviews for all applicable funding programs will be combined when a review is conducted on administrators of multiple CARB incentive programs.

CARB will begin using these updated policies and procedures prior to the 2022 annual report.

## Recommendation 8

To ensure that the State is positioned to assess the status of its Sustainable Communities Program, by April 2021 CARB should report to the Legislature whether it will have a usable source for measuring regional GHG emissions in time for the 2022 report. If CARB believes it may not, it should identify any administrative or bureaucratic barriers it faces in accessing data it needs for the estimates and request relevant action by the Legislature to make those data available.

### **CARB Status Update for Recommendation 8: Fully Implemented**

Since completing the 2018 Progress Report on California's Sustainable Communities and Climate Protection Act, CARB initiated efforts to better measure and track Senate Bill 375 progress at a regional level. One of these efforts is tracking additional region-specific metrics in each metropolitan planning organization's (MPO) Sustainable Community Strategy (SCS) starting with third-round SCSs. While these metrics are not direct measures of GHG emissions or vehicle miles traveled (VMT), they provide additional context on progress toward expected plan outcomes to meet GHG targets set by CARB.

Additionally, CARB is exploring using retail fuel sales data from the California Energy Commission in conjunction with statewide fuel sales data from the California Department of Tax and Fee Administration to estimate regional VMT and GHG emissions. Early

analysis indicates that this could be a useful approach for MPOs whose VMT is relatively contained within the region. Results from this approach will not provide a complete picture for all regions, but it will be an improvement to CARB's previous analysis. This is the approach CARB will use for the 2022 Progress Report.

For future reports, CARB is exploring the viability of using big data. Big data could provide a complete accounting of VMT and where it is occurring, and an insight on travel behavior and trends through the consolidation of location data from millions of mobile devices. CARB anticipates needing new staff and contract resources to acquire and analyze big data for this purpose.

CARB notified Assembly member Rudy Salas, Chair of the Joint Legislative Audit Committee, of this work on April 20, 2021.

## Recommendation 9

To ensure that it communicates clearly to the Legislature about the extent to which programs benefit low-income households as the Legislature intended, by March 2022 CARB should begin reporting its spending in low-income communities at the household level wherever possible in its annual report to the Legislature.

### **CARB Status Update for Recommendation 9: Fully Implemented**

There are three projects where financial incentives are paid directly to individual households: the Clean Vehicle Rebate Project, Clean Cars 4 All, and Financing Assistance for Lower-Income Consumers. These are the projects for which CARB has determined it is possible to report low-income spending at the household level. CARB already collects household income information from participants in each of these projects, and CARB now reports low-income benefits at the household level into the California Climate Investments Reporting and Tracking System (CCIRTS) for all three projects. CARB will also report this information for any additional, future projects that provide financial benefits directly to individual households.

To fully address CSA's recommendation, CARB reported the spending that benefits low-income households for each of these projects in the FY 2021-22 Funding Plan for Clean Transportation Incentives, published on October 8, 2021, and approved by CARB's Board on November 19, 2021. For the most recent reporting period, the percent of funding that went to low-income households was 21 percent for CVRP, 98 percent for Clean Cars for All, and 91 percent for financing assistance as shown on pages 50, 64, and 68 of the Funding Plan, respectively ([https://ww2.arb.ca.gov/sites/default/files/2021-10/fy21-22\\_fundingplan.pdf](https://ww2.arb.ca.gov/sites/default/files/2021-10/fy21-22_fundingplan.pdf)). CARB will continue to report this information each annual Funding Plan moving forward. (See chapter 3 of the Funding Plan for this year's update on low-income household benefits.)

## Recommendation 10

To better define incentive programs' impacts beyond GHG emissions reductions, by August 2021 CARB should review its incentive programs to ensure that it has clearly designated which programs focus primarily on socioeconomic benefits. As a result of this



process, by February 2022 it should ensure that it includes the benefits expected for each program in its funding plan or other public documents, such as its annual report and individual grant agreements.

### **CARB Status Update for Recommendation 10: Partially Implemented**

CARB staff has reviewed its incentive programs and identified six clean transportation equity projects that focus primarily on socioeconomic benefits. These projects are: Clean Cars 4 All, Financing Assistance for Lower-Income Consumers, Clean Mobility Options, Clean Mobility in Schools, the Sustainable Transportation Equity Project, and the Agricultural Workers Vanpool Project (currently inactive). CARB identified and reported the expected project benefits, corresponding metrics and evaluation methods for each of the projects (aside from inactive Agricultural Workers Vanpool Project) in the FY 2021-22 Funding Plan for Clean Transportation Incentives, published on October 8, 2021, and approved by CARB's Board on November 19, 2021 ([https://ww2.arb.ca.gov/sites/default/files/2021-10/fy21-22\\_fundingplan.pdf](https://ww2.arb.ca.gov/sites/default/files/2021-10/fy21-22_fundingplan.pdf)).

CARB will re-evaluate and refine project benefits for these projects and for any new projects that focus primarily on socioeconomic benefits in each annual Funding Plan moving forward.

## **Recommendation 11**

To better demonstrate the socioeconomic benefits that its incentive programs achieve, by February 2022 CARB should do the following:

- Identify clear and measurable metrics it will use to assess each of the socioeconomic benefits it intends its programs to achieve.
- Develop a process to collect data, or use existing data, to measure and report on each metric.
- In its funding plans and annual reports, CARB should report to the Legislature and its board on the metrics.

### **CARB Status Update for Recommendation 11: Partially Implemented**

In the FY 2021-22 Funding Plan for Clean Transportation Incentives published on October 8, 2021, and approved by CARB's Board on November 19, 2021, CARB identified clear and measurable metrics for projects mentioned in Recommendation 10. CARB and project grantees are developing standardized socioeconomic benefit metrics and implementing data collection processes through participant surveys and testimonials and vehicle telematics. Examples of metrics for each project identified in CARB's response to Recommendation 10 include:

Clean Cars 4 All – increased vehicle reliability measured by future disruptions of service based on the model year of the retired vehicle and that of the incentivized vehicle, and improved access to employment and goods and services based on user surveys and testimonials.

Financing Assistance for Lower-Income Consumers – increased number of clean vehicles in disadvantaged communities based on the increased number of cleaner vehicles purchased by disadvantaged community residents utilizing the program.

Clean Mobility Options – improved access to goods and services and workforce training and development opportunities measured through participant surveys and vehicle telematics data.

Clean Mobility in Schools – improved visibility and acceptance of zero-emission mobility options based on school district staff feedback and vehicle telematics.

Sustainable Transportation Equity Project – travel cost savings based on number of subsidies, value of each subsidy, and average fare of each clean transportation service.

These are described further in the FY 2021-22 Funding Plan. In future Funding Plans starting with the FY 2022-23 Funding Plan, staff will report on the analysis of these metrics for each project. (See chapter 3 of the Funding Plan.)

## Recommendation 12

To provide transparency to the Legislature and other stakeholders, beginning in 2022, using the metrics and data described above, CARB should make funding and design recommendations in its funding plans and annual reports based on which programs are effective in producing socioeconomic benefits and at what cost.

### **CARB Status Update for Recommendation 12: Partially Implemented**

As noted in CARB's updates for recommendations 10 and 11, CARB has already identified clear and measurable metrics for each of its incentive projects that focus primarily on socioeconomic benefits as well as the process to collect data to measure and report on each metric. These are described in the FY 2021-22 Funding Plan for Clean Transportation Incentives published on October 8, 2021, and approved by CARB's Board on November 19, 2021. CARB staff is developing a draft cost valuation methodology that it will use to start evaluating the socioeconomic benefits on a cost basis. CARB will start making funding and design recommendations based on this analysis starting in the FY 2022-23 Funding Plan.<sup>2</sup> CARB expects this approach to be refined and expanded over multiple funding cycles. For projects in the early stages of implementation where data are not yet available, staff will include in the FY 2022-23 Funding Plan the process by which metrics and data will be folded into the funding and design decision making process when sufficient data do become available.

## Recommendation 13

To ensure that the State has reliable information about the extent to which cap-and-trade-funded programs create and support jobs, by August 2021 CARB should

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<sup>2</sup> After submitting its February 2022 status update to CSA, CARB staff determined that the draft cost valuation methodology mentioned here is not yet suitably robust for use in making funding and design recommendations, so the FY 2022-23 Funding Plan does not rely on it.

begin collecting data on the jobs produced by each of its incentive programs. Where needed, CARB should pursue amendments to its agreements with its program administrators to make reporting this information mandatory. CARB should include an analysis of these jobs data in its annual reports to the Legislature beginning in 2022.

**CARB Status Update for Recommendation 13: Partially Implemented**

For the 36 project grant solicitations released since August 2017, 21 already include jobs reporting requirements, 13 are in the process of being amended to include these requirements, and just 2 projects will not include them (one of which is already closed, and the other closes soon). CARB staff is now in the process of coordinating the collection and reporting of these data and will commence reporting jobs data from these projects by utilizing the CCIRTS, as it has already been doing for the FARMER and CAP Programs. At the start of 2022, CARB released a memo reminding project grantees of the need to report jobs data for this purpose. CARB plans to publish the Low Carbon Transportation project data as part of the 2022 update of the Annual Report to the Legislature on California Climate Investments. This recommendation will be fully implemented once the 2023 Annual Report to the Legislature on California Climate Investments is published.

**Recommendation 14**

To ensure that its incentive programs promote effective and equitable job training, by August 2021 CARB should develop a process to assess which programs should include a job training element. For those programs it identifies, by February 2022 CARB should direct its staff or its external program administrators to collect and report on the quality of job trainings and outcomes experienced by participants, including who received training, the credentials participants received as a result, any actual or expected wages they received as a result of participating in the training or for developing the relevant expertise, and the number of participants from disadvantaged communities or low-income communities and households.

**CARB Status Update for Recommendation 14: Partially Implemented**

CARB approved the FY 2021-22 Funding Plan for Clean Transportation Incentives on November 19, 2021. Through the Funding Plan development process, CARB identified projects that will include a workforce or jobs training element. The Funding Plan highlights high level details on the types of data to be collected during the life of the project to ensure that job training goals are well defined. Specific details on the data to be collected will be determined as part of the subsequent public process through the building out of competitive solicitations, developing the implementation manual, or updating existing implementation manuals. These requirements will be detailed in grant agreements upon execution.

The FY 2021-22 Funding Plan also includes a Workforce Training and Development project. This project, in addition to incorporating metrics such as jobs, jobs training sessions, networking workshops, as well as capacity building metrics, will also report on increases in workforce training and development in priority populations. It will include

requirements for program administrators to identify direct and measurable community benefits, such as socioeconomic, job access, zero-emission technology, environmental literacy, and other quality of life and social impact improvements. This evaluation effort will be done in parallel with CARB's other clean transportation and mobility investments to determine relevant data and lessons that can be applied across programs. This includes soliciting and evaluating ideas on how CARB and its partners should measure and report workforce training and development benefits and providing strong feedback loops for policy and program adjustments based on findings.

## Recommendation 15

To ensure that it can account for the total costs of its transportation programs, beginning with FY 2021-22 CARB should develop and implement processes to track the administrative costs it incurs to operate each of its transportation programs. After doing so, it should begin including those costs as part of the cost-effectiveness measurements in its annual reports to the Legislature.

### **CARB Status Update for Recommendation 15: Partially Implemented**

To better account for the total costs of its transportation programs, including administrative costs, CARB's Administrative Services Division (ASD) requested employee timekeeping and item coding information from each of CARB's Divisions and established 100+ new timesheet and item codes for use beginning with FY 2021-22. Additionally, all new contracts, purchase orders, labor on timesheets, etc. will record costs specific to each program to provide the total costs of transportation programs. The codes were established in FISCAL and the Tempo timekeeping program used by CARB on July 30, 2021, and were used beginning with the July 2021 timesheets. ASD runs monthly reports for Divisions with transportation programs so they can see program costs and that staff are charging time appropriately. Additional timekeeping and item codes can be developed if necessary. Divisions will use information from the new coding structure when reporting to the Legislature in the Fall of 2022 for the FY 2023-24 budget cycle.