PROCEDURAL EQUITY IN IMPLEMENTING CALIFORNIA'S
CLEAN CARS 4 ALL PROGRAM

May 2021

Gregory Pierce, Rachel Connolly, and Isabella Blanco

UCLA Luskin Center for Innovation

AUTHORSHIP

This report was produced by the Luskin Center for Innovation:

» **Gregory Pierce, associate director**
» **Rachel Connolly, graduate student researcher**
» **Isabella Blanco, undergraduate student researcher**

ACKNOWLEDGMENTS

DISCLAIMER

The views expressed herein are those of the authors and not necessarily those of the University of California, Los Angeles as a whole. The authors alone are responsible for the content of this report.

FOR MORE INFORMATION:

Contact: Gregory Pierce, gpierce@luskin.ucla.edu

TABLE OF CONTENTS

Left: During the COVID-19 pandemic, a family living in the San Joaquin Valley was excited to replace their older, higher-emitting vehicle with an electric vehicle through the Clean Cars 4 All program. Photo credit: Valley Clean Air Now

On the cover: The GRID Alternatives team provides support to community residents at a public event focused on clean vehicle replacement. Photo credit: GRID Alternatives

EXECUTIVE SUMMARY

TO ACHIEVE ITS AIR QUALITY and climate change goals, California must rapidly electrify its light-duty vehicle fleet, as exemplified by Governor Newsom's executive order (N-79-20) mandating the sale of only zero-emission light-duty vehicles by 2035. One of the enduring challenges in widespread adoption of clean light-duty vehicles in the state has been overcoming the financial obstacle of vehicle purchase faced by lower-income households, many of which rely heavily on cars. To meet this need, in June 2015 the California Air Resources Board (CARB) introduced the Clean Cars 4 All (CC4A, previously called the Enhanced Fleet Modernization Program [EFMP] Plus-Up pilot) program. CC4A was designed to better integrate vehicle retirement and replacement incentive programs and to provide a larger benefit to low- and moderate-income households. The program has now been operating for six years and extended to five air quality management districts, during which time districts have been allocated over $90 million in funding to distribute directly to program participants, and placed over 11,000 vehicles with eligible households.

The intent and efficacy of outreach to potential CC4A participants is crucial to ensure both procedural and distributive equity in program outcomes. These two aspects assess the equitable involvement of communities impacted by an environmental process or event, and the allocation of environmental benefits, respectively. This is particularly true for this program given that districts have discretion in implementation, there has been limited state funding for the program, and the program offers a large benefit for a relatively complex technology to those who successfully apply. It is thus important to analyze strategies used by the districts and program partners to provide both information about the program opportunity as well as support to help navigate the program enrollment process to interested participants, given the limited benefit dollars available compared to the pool of income-eligible and interested households in each region.

Using a conceptual framework derived from procedural justice and equity studies, in this report we analyze the means of and extent to which various district CC4A program implementation strategies have achieved procedural equity outcomes, with a secondary focus on distributive equity outcomes. Our scope includes the efforts in three districts that have been operating CC4A for more than a year: the South Coast Air Quality Management District (SCAQMD), the San Joaquin Valley Air Pollution Control District (SJVAPCD), and the Bay Area Air Quality Management District (BAAQMD). To this end, we conducted interviews with program staff from the three districts, as well as contractors that have assisted with program implementation and case management for each district, as well as local community-based organizations (CBOs).

We first report findings on common successes and challenges across districts, including the consistent popularity of the program among potential and active participants, and the evolution of support strategies employed by each district and its contractors. We then present our core procedural equity findings, with an emphasis on three procedural attributes as they were expressed in different district approaches. Broadly, much of the effort by districts and partners was shaped in reaction to the challenge of the limited funding but high per-household benefit available. In terms of the procedural equity aspect of participation and inclusiveness, we find that the extent of outreach, variation in outreach approaches employed, and effort through partnerships with local CBOs varied widely across the districts. Second and relatedly, capacity building was accomplished by some districts in terms of synchronizing offering CC4A benefits along with other assistance programs, involving and compensating CBO staff in outreach, and in providing direct application assistance to potential participants throughout the enrollment process. Finally, districts expressed forms of respect and recognition by the degree of their responsiveness to participant feedback and active efforts to help interested households overcome barriers to apply for and utilize clean vehicles.

To complement these procedural equity findings, we used data readily provided to us by CARB via a public records act request to present a snapshot of CC4A distributive equity outcomes through 2020 across the three districts. We examined distributive equity across a variety of Senate Bill (SB) 535 disadvantaged community and Assembly Bill (AB) 1550 household income status metrics. Keeping in mind key demographic and socioeconomic differences across California's regions, there remain notable trends in the number and proportion of incentives distributed, as well as access to those incentives among the absolute and relatively most disadvantaged and lowest income communities. We conclude by discussing the implications of our findings for future CC4A expanded implementation, and outline future research directions for assessing equity in clean vehicle access programs more broadly.

1. INTRODUCTION

TO ACHIEVE ITS AIR QUALITY and climate change goals, California must electrify its light-duty vehicle fleet, as exemplified by Governor Newsom's executive order (N-79-20) mandating the sale of only zero-emission light-duty vehicles by 2035. One of the enduring challenges of widespread adoption of clean light-duty vehicles in the state is overcoming the financial challenges of vehicle purchase faced by lower-income households who rely heavily on cars (Martens et al., 2012).

Clean vehicle transportation initiatives in California have operated for more than a decade in the form of the Clean Vehicle Rebate Project (CVRP), a program that distributes rebates for the purchase or lease of new zero-emission or plug-in hybrid vehicles meeting program criteria. However, barriers to accessing rebates exist among lower-income households, as more than 80 percent of CVRP recipients (2010 – 2015) reported annual incomes of more than $100,000 (Rubin & St-Louis, 2016), a finding echoed by a more recent analysis (Ju et al., 2020). While low-income households

have participated in the vehicle retirement rebate element of the California Air Resources Board's (CARB) Enhanced Fleet Modernization Program (EFMP) since 2010, few participants initially chose to take advantage of the replacement rebate for lower-emitting vehicles (California Air Resources Board, 2013; Ju et al., 2020). These issues were formally recognized with the passage of California Senate Bill (SB) 350 (2015), which required CARB to address specific barriers to accessing clean transportation for low-income households (California Air Resources Board, 2018).

To meet the associated need, in June 2015, CARB introduced the EFMP Plus-Up pilot program, which was designed to better integrate vehicle retirement and replacement incentive programs which could be accessed by low- and moderate-income households. After several years of growth, Assembly Bill (AB) 630 (2017) formally codified the pilot project as a stand-alone program and changed the name to Clean Cars 4 All (CC4A).[1] A recent assessment found that CC4A benefit distribution, in contrast to CVRP, was significantly positively associated with increased vulnerability and disadvantage as measured by various metrics, including California disadvantaged community status (DACs, as identified by SB 535 [2012]), (Ju et al., 2020).

The CC4A program has now been operating for nearly six years, during which time regional air quality management districts have been allocated more than $90 million in funding to distribute directly to program participants, and placed over 11,000 vehicles with eligible households (see Figure 1 for a map of incentive distribution alongside environmental justice vulnerability). Based on the broad appeal of and demand for expansion of the program, the initial pilot has recently expanded from two regions, the San Joaquin Valley and South Coast, to five. A branch of the program launched in the Bay Area in 2019 and in Sacramento in late 2020, with San Diego intending to launch in 2021.

---

[1] The state also introduced the Clean Vehicle Assistance grant program (CVAP) as a parallel program to CC4A. CVAP provides grants for new or used clean vehicles and charging infrastructure to income-eligible California residents. Households are not eligible to participate in both CC4A and CVAP.

While the CC4A program maintains common eligibility and benefit criteria across the state, each operating district has been granted and exercises discretion in implementation of the program regionally, particularly around outreach strategies. Moreover, analogous in some ways to solar and turf replacement incentive programs, CC4A offers access to a relatively complex environmental benefit with a high per-household benefit level (up to $9,500) to those who successfully enroll. This environmental benefit program design stands in contrast to entitlement programs such as monthly utility bill assistance offered through California Alternate Rates for Energy (CARE); the CARE program enrolls over 80% of eligible households in California (Pierce et al., 2020). The result has been, since the outset of the CC4A program, that there has been higher demand for incentives than supply of incentive funds (Pierce & DeShazo, 2017).

These design aspects make the nature and efficacy of outreach implementation even more crucial to ensure equity in program outcomes. Strategies used by the districts and program partners to provide both information about the program opportunity as well as support to help navigate the enrollment process to interested participants are critical, given the limited benefit dollars available compared to the pool of income-eligible households in each region.

Our previous studies have analyzed both distributional and procedural elements of program administration of various phases of CC4A implementation and provided evidence of distinct outreach approaches employed in the various districts, and by the same districts over time (Pierce & Connolly, 2019; Pierce & Connolly, 2020; Pierce & DeShazo, 2017). Compared to the newest generation of environmental equity efforts in California, CC4A is thus a relatively mature program with about six years of operation at scale, and merits an assessment of equity in its regionally distinct implementation.

In this study, we build on our own previous research, as well as research conducted by other scholars, to apply a procedural justice framework to assess procedural equity in CC4A implementation.[2] Procedural justice encompasses the fair involvement of populations or communities who are impacted by an environmental process or event, including respecting and elevating community perspectives, facilitating participation, and involving them in decision-making, to the extent the latter is possible. While there has been a historical focus on the distributive impacts of environmental condition (Bell & Carrick, 2017; Reed & George, 2011), which encompass the allocation of environmental benefits, or conversely, proximity to environmental risks, it is important to consider justice in procedures regardless of the distribution of outcomes. Procedural justice is thus an independent aspect of environmental justice, but achieving procedural justice, or in our case, equity, can also lead to fairer distributional outcomes (Bell & Carrick, 2017; Domingue & Emrich, 2019).

The concept of procedural equity has wide applicability in the environmental policy field – within local decision-making processes, such as the siting of industrial facilities, but also in the development and implementation of environmental programs. For instance, scholars have outlined barriers to achieving procedural equity in sustainability organizations, which include the need for professionalization of environmental and other groups in order to attain funding, as well as a historical organizational focus on sustainability and environmental priorities, without making efforts to directly incorporate social and environmental justice aspects (George & Reed, 2017).

In this study, we analyze whether and how implementing districts' strategies have achieved procedural equity outcomes, and include a supplementary focus on distributive equity. Our analysis focuses on the three districts that have been operating CC4A for more

---

[2] CC4A is a state government-run and designed program with uniform eligibility requirements, a design which has certain advantages. However, this setup makes achieving justice goals of equal representation and treatment less plausible. Accordingly, since certain dimensions of justice are not applicable to this type of program and associated assessment, we focus our evaluation on equity, in terms of both procedures and distribution, which can be feasibly achieved through CC4A. We discuss distinctions between justice and equity in more detail in Section 3.2 of the report.

FIGURE 1.

CC4A STATEWIDE INCENTIVE DISTRIBUTION THROUGH 2020 (LEFT), AND CALENVIROSCREEN 3.0 PERCENTILES (RIGHT)
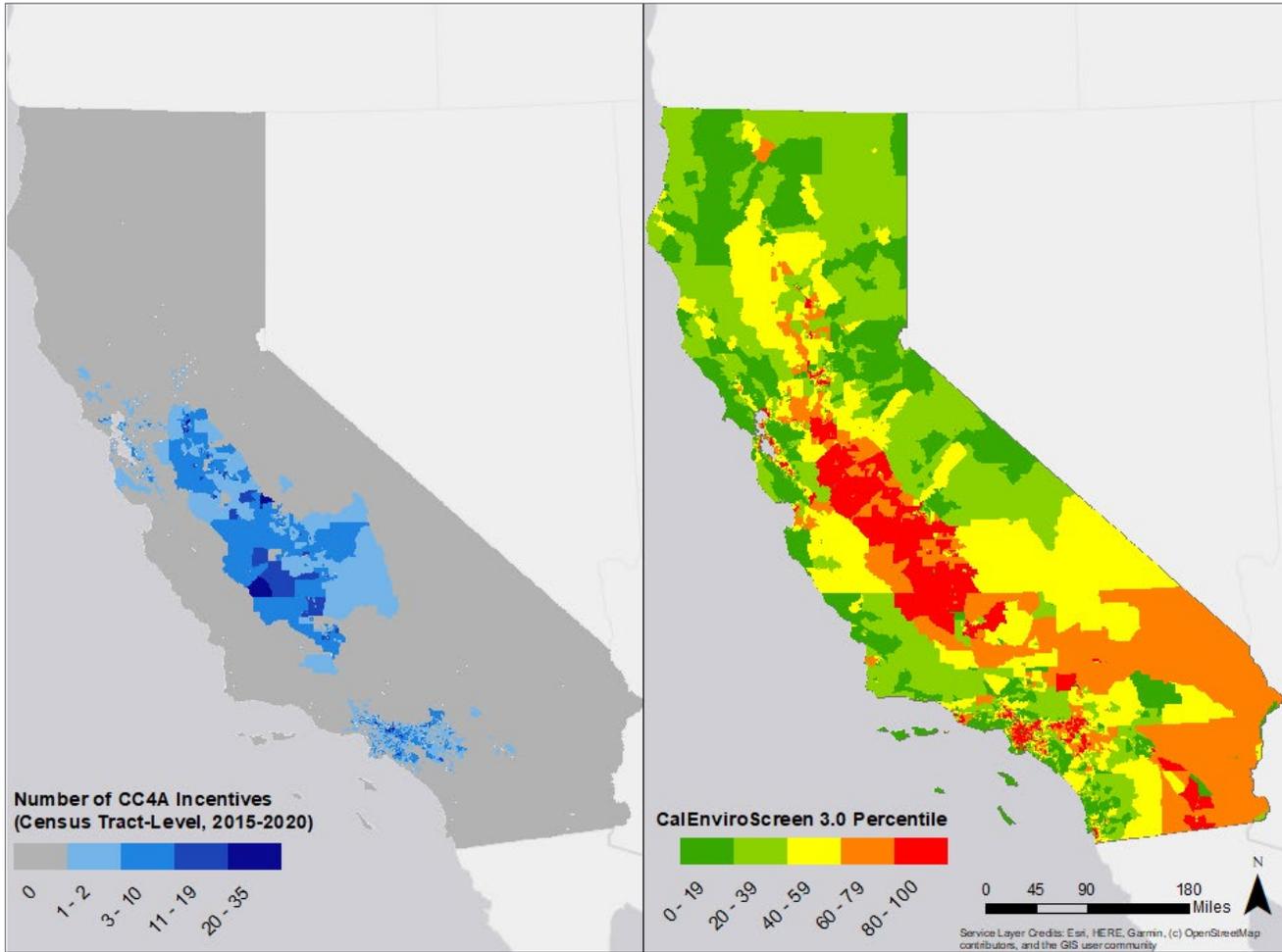
than a year: the South Coast Air Quality Management District (SCAQMD, which calls the program "Replace your Ride" locally), the San Joaquin Valley Air Pollution Control District (SJVAPCD), and the Bay Area Air Quality Management District (BAAQMD).

Drawing from academic literature, we consider the following aspects in assessing CC4A procedural equity across districts and over time: (1) participation and inclusiveness, (2) capacity building, (3) respect and recognition, and (4) shared decision-making. To inform our analysis, we use qualitative data from interviews we conducted with program staff and publicly available literature and data, considering program features such

as the geographic extent of outreach, quantifiable community partnerships, and the offering of direct assistance to residents to support enrollment. We quantitatively analyze distributional outcomes by air district, reporting on the characteristics of CC4A incentive recipients and the census tracts in which they reside, and spatial distribution of incentives. Using the two analyses, we then qualitatively explore the relationship between the procedural equity aspects and distributive equity outcomes, and using these collective findings, we characterize the evolution of each program model and assess the resulting implications for equity.

The remainder of the report is organized as follows:

» Section 2 outlines the data collected and methodology employed.

» Section 3 presents the results of the analysis. We first synthesize findings on general program successes and challenges (3.1). Then we report our main procedural equity findings, organized in terms of each of the four aspects listed previously (3.2). We then present a snapshot of distributive equity outcomes through 2020 (3.3).

» Section 4 discusses the implications of our findings for CC4A implementation and future research directions for assessing equity in clean vehicle access programs.

2. DATA AND RESEARCH METHODOLOGY

To carry out this study, we primarily took a qualitative research approach since there are a limited number of implementing air districts, and the process of CC4A program implementation is complex and has varied over time. While we have previously analyzed program enrollment and outcome data, we supplement the procedural focus here with a broad look at benefit distribution at the census tract level using the most recent participant data available.

2.1. Qualitative analysis: Semi-structured interviews

To ground our analysis of interview responses, we developed a conceptual procedural equity framework based on the academic literature. This framework uses four procedural equity elements through which we consider the interview results: (1) participation and inclusiveness, (2) capacity building, (3) respect and recognition, and (4) shared decision-making. Due to the top-down nature of decision-making for this particular statewide program, aspect (4) is less applicable for this analysis, and we only briefly discuss it within the CC4A context.

We aimed to triangulate information and perspectives from different stakeholders involved in the implementation process in each district. Accordingly, we conducted semi-structured interviews in January and February 2021 with program staff from the three districts,[3] as well as contractors that have assisted with program implementation and case management for each district: Green Paradigm Consulting (Green Paradigm) for the SCAQMD,[4] Valley Clean Air Now (Valley CAN) for the SJVAPCD, and GRID Alternatives for the BAAQMD. We asked questions across six implementation element themes:

» **program structure and roles of stakeholders in outreach;**

» **outreach methods;**

» **in-person outreach events;**

» **partnerships;**

» **case management and direct assistance to participants; and**

» **program strengths and challenges, and feedback reported by program participants.**

We also conducted interviews with community-based organizations (CBOs) in two district regions: Active San Gabriel Valley in the South Coast region and Lideres Campesinas in the San Joaquin Valley. The questions we posed in these interviews were focused on their organizations' and members' knowledge of CC4A and direct experience with the program, and their perspectives on equitable clean transportation program outreach and implementation more broadly.

We recorded and transcribed the interviews and closely reviewed the transcripts. Then, we synthesized general lessons learned about strengths and challenges of CC4A implementation, using both interview data and existing literature, in Section 3.1. We next qualitatively synthesized the responses to interview questions under each of the procedural equity aspects and

---

[3] We also informally interviewed a representative from the Sacramento Metropolitan Air Quality Management District and had conversations with CARB staff which informed our understanding of program implementation and participant data.

[4] The SCAQMD has three contractors for case management. We only interviewed one of those three contractors (Green Paradigm Consulting). The SJVAPCD and the BAAQMD each only have one main contractor.

subcategories, which were developed based on interview results (Section 3.2).

2.2. Quantitative analysis: CC4A expenditures and incentive distribution

Although this report is focused on equity in procedural elements, we also conducted a distributive equity analysis. To assess distributional outcomes within the three districts, we analyzed anonymized, participant-level data (n = 11,307) for each CC4A incentive recipient through December 2020. These data were acquired through CARB's public records act (PRA) process. The dataset includes:

» each participant's census tract of residence;

» year of incentive provision;

» household income level;

» low-income household and community status;

» incentive amount; and

» funding source.

Accessing this data enabled us to conduct a more precise analysis than if we had used readily available California Climate Investments (CCI) data.[5] We joined the detailed participation data with other publicly available data on SB 535 CalEnviroScreen 3.0 DAC status and AB 1550 low-income community (LIC) status to enhance our analysis.

To descriptively summarize the distributive equity impacts from the CC4A program in relationship with the various outreach strategies employed, we quantified the following outcomes of the program in each air district:

» average CalEnviroScreen 3.0 percentile of participants' tracts;

» percent of incentives distributed to DAC census tracts;

» percent of incentives distributed to top 10% DAC census tracts (highest level of CalEnviroScreen vulnerability);

» percent of DAC tracts that have not received incentives;

» percent of incentives distributed to LIC census tracts;

» percent of incentives distributed to households under 225% of the Federal Poverty Level (FPL); and

» percent of incentives distributed to low-income households (low-income designation based on county-specific thresholds).

We used ESRI's ArcMap tool to assess spatial trends in funding distribution. We also developed time-series charts to show the evolution of state-designated program funding. We outline our findings regarding distributive equity outcomes in Section 3.3.

3. RESULTS

3.1. Program Overview

Many of the successes and challenges associated with CC4A implementation have been discussed previously in our published studies on the program's design, rollout and evolution, including the additional barriers to serving communities with clean transportation needs during the height of the COVID-19 pandemic (Pierce & Connolly, 2020a). Here we present an overview of this existing research as well as information gleaned from our interviews with contractors, districts, and CBOs regarding CC4A implementation equity.

3.1.1. Successes

As previously documented, there continues to be high demand among low- and moderate-income households for clean vehicle incentive programs such as CC4A that offer upfront incentives to participants (Pierce et al., 2019; Pierce & DeShazo, 2017). As a result, CC4A program funding has been nearly or entirely exhausted in several of the districts across several funding cycles, as reported in every district interview. This is both a success, in terms of getting vehicles to participants quickly, and a challenge, since it leads to pauses in program offerings.

One of the other common strengths of CC4A program implementation is a dedication to experimentation and adaptation in pursuing the most effective ways to reach

---

[5] We cleaned the data, removing all income levels <$100 from this analysis (n = 238 entries). However, we do not report on household income levels explicitly in the report, due to uncertainty about the accuracy of reporting.

participants and replace vehicles as needs evolve. Over the years since program inception, the SJVAPCD and its contractor, Valley CAN, have focused on innovating and adapting to reach targeted DACs in the San Joaquin Valley, for CC4A as well as its smog repair program, Tune In & Tune Up (TI&TU) (Pierce & Connolly, 2019, 2020a). Valley CAN has utilized and evolved its TI&TU network approach and outreach methods to reach participants for CC4A in a multifaceted fashion (Pierce & Connolly, 2019; Pierce & DeShazo, 2017). Though the BAAQMD has been distributing incentives for a shorter period, it is also making efforts to adapt the program, actively using the demographic data it collects to identify gaps in program participation and modify its outreach approach. In recent years, the SCAQMD recognized program demand was routinely outpacing supply, so staff incorporated a tailpipe emissions test into the district's eligibility criteria to target vehicles retired through CC4A which are particularly high emitters.

Another commonality in implementation is that each of the organizations we interviewed has received consistent, positive feedback from participants who have completed the process and received their vehicle. Staff from the organizations report that participants appreciate the opportunity and encourage their friends and family to pursue the incentives as well. This coheres with our previous participant interview findings (Pierce et al., 2019). The contractor associated with the SCAQMD went so far as to state that they "believe that [the statewide CC4A program] is one of the best social justice as well as air quality programs" available.

3.1.2. Challenges

There are several common challenges identified with CC4A implementation thus far as well. Funding constraints were identified as far back as a 2017 CARB study on the first year of the pilot program (which later became CC4A) (Pierce & DeShazo, 2017). Reducing funding constraints is even more imperative now given the transition to electrification in California; the provision of CC4A incentives is essential to ensure the inclusion of vulnerable populations and help to facilitate a just transition. Additionally, funding uncertainty and

delays result in the use of waiting lists for CC4A. This is particularly concerning given that the low-income households that the program aims to reach usually have fewer mobility and financial flexibility (Blumenberg & Agrawal, 2014) and thus waiting for several months to receive a vehicle has more of an adverse impact for potential program participants than it would for the broader population.

Another well-established challenge associated with CC4A, and environmental benefit programs more broadly (Pierce & Connolly, 2020b), is high levels of distrust of government programs in low-income communities and communities of color. Along these lines, the CBOs we interviewed both highlighted a disconnect in terms of community members' understanding of the financial considerations of program enrollment, as well as how these vehicles can fit into their lifestyles. Many potential participants still consider electric vehicles to be a "luxury" (Pierce & Connolly, 2020b) that they cannot afford to incorporate into their budget, and the organizations cited recurring resident concerns regarding electric vehicle limitations such as mileage range and charging infrastructure (see also Section 3.2.3). GRID Alternatives mentioned that in-person events were incredibly important for "breaking down barriers and misconceptions about driving electric."

Language-related barriers to the general vehicle search and purchase process have been established in previous studies (Pierce et al., 2019), and unsurprisingly are a challenge in CC4A implementation as well. Language is one of several barriers faced by potential CC4A participants, and can be addressed through provision of translation services for case management support and developing outreach materials in languages other than English.

Additionally, our interviews highlighted challenges associated with identifying the individuals most in need of CC4A incentives, among the much broader pool of eligible households. To make enrollment straightforward, program administrators generally aim

to simplify the participation process as much as possible. However, as a result, there is no method applied to account for household wealth as opposed to income, and several districts cited concerns that individuals who have significant wealth separate from their income are receiving CC4A incentives but may not be the most in need.

On the other hand, an added barrier to full realization of the program benefit for CC4A recipients in some regions is the requirement to treat the benefit as taxable income. IRS 1099 tax forms are currently required in both the South Coast and Bay Area regions, but not the San Joaquin Valley, because CARB has advised each air district to consult their own legal counsel in determining whether the 1099 forms are necessary. We note that a California Attorney General letter to CARB from early 2015 concluded that CVRP rebates should not constitute gross income for federal income tax purposes, suggesting further consideration of whether this determination also applies to CC4A benefits (Deputy Attorney General [Jeffrey A. Rich] & Attorney General [Kamala D. Harris], personal communication, January 20, 2015).

Finally, a theme prevalent throughout our interviews was the challenge of COVID-19, which has inevitably completely changed implementation processes for these type of benefit programs (Pierce & Connolly, 2020a). The restriction of in-person contact, and the associated transition largely (if not entirely) to phone and online services, presents more challenges in reaching already hard-to-reach populations. Several of the district contractors previously relied on in-person case management to ensure participants had all the necessary documentation and walk them through the application process. There were also occasional "ride and drive" events hosted within the districts, where participants could test drive the vehicles. Valley CAN was also holding regular weeknight clinics in cities rotating throughout the San Joaquin Valley to educate community members about the program and begin the sign-up process (Pierce & Connolly, 2019). At the same time, as discussed throughout the report, the necessary transition due to COVID-19 has also resulted in considerable innovation in outreach approaches within several districts.

3.2. Procedural Equity

Regional air districts are not a traditional "service provider" with regular interaction with households such as a utility or housing authority. The CC4A program also only provides a one-time benefit. Both of these factors lead to residents not being familiar with the air districts and services they provide unless the districts take active steps to ensure otherwise. This unfamiliarity also motivates the close review and evaluation of equity aspects of program implementation procedures.

There are several existing environmental justice frameworks with multiple dimensions of justice to be considered depending on circumstances. Figure 2 depicts a common representation of environmental justice concepts. In this study, we adapt established procedural justice concepts into a procedural equity framework. While the concept of environmental justice refers to a systemic state of fair treatment and access to environmental benefits and involvement in decision-making, equity generally refers to fair outcomes. As a government-run program with specific eligibility requirements, certain equity goals can be achieved through CC4A, but realizing justice goals of equal representation and treatment is less plausible. Accordingly, since certain dimensions of justice are not applicable to this type of program and associated assessment, we focus our evaluation on equity, in terms of both procedural elements in the main analysis, and distribution in the supplementary analysis.

Below, we analyze our interview results within a procedural equity framework adapted from the academic literature. The four aspects we analyze are (1) participation and inclusiveness, reflecting the extent to which program outreach and participation are equitable; (2) capacity building, or community empowerment through program implementation; (3) respect and recognition, involving the support and elevation of community perspectives on program implementation; and (4) shared decision-making, which is the

involvement of stakeholders (in this case, community members) in program decision-making processes.

We order the discussion of each aspect according to its relevance within the CC4A program framework, starting with the most relevant and ending with the least. As noted above, while aspect 4 is less applicable to CC4A due to the top-down nature of the program, we still include brief perspectives on this element.

3.2.1. Aspect 1: Participation and inclusiveness

We first assess the themes of participation and inclusiveness in program implementation, as expressed in interview responses. Drawing from an academic framework on the justice of hazardous waste siting facilities (Hunold & Young, 1998), as stated in the Routledge Handbook of Environmental Justice, "'inclusiveness' requires equal recognition for all and a concerted effort to reach out" to vulnerable communities that face organizing challenges (Bell & Carrick, 2017). This aspect is where we found that the most notable differences in program implementation across districts lie, with each district adopting a unique perspective on the necessity of targeted outreach and optimal methods to reach eligible participants.

Maximizing incentive distribution. As discussed briefly in Section 3.1, the utilization of all available funding is a significant metric of program participation, independent of all other facets of participation. As of this writing, program funding is exhausted in the South Coast, and the district is not currently accepting new applications.[6] This theme has been recurring since the first year of implementation in this region. In the Bay Area, the BAAQMD was able to contribute $10 million of local funding to keep its program operating and "avoid losing momentum." Similarly, while this has not always been the case, the SJVAPCD reported "getting more people to participate than funding can support." Applications continue to be accepted at this time, though depending on funding capacity, applicants may

need to join a waiting list. While the lack of extending participation to all interested households clearly reflects a constraint in state-level funding (see Section 3.1.2 for associated limitations), it is also a testament to the success of the program in maximizing participation and incentive distribution within funding constraints throughout the three districts.

Outreach approach. Each district's approach for outreach, including which communities are targeted and via which methods – such as events, social media, and radio – directly impacts the populations reached and resulting equity or inequity in inclusion. Preliminary findings from our report on in the pilot stage of CC4A identified two distinct outreach approaches adopted by the SCAQMD and the SJVAPCD (Pierce & DeShazo, 2017). These differences have largely persisted with time, with the newer BAAQMD approach falling in the middle.

As explicitly stated by both the district and Valley CAN, the primary goal of program implementation in the San Joaquin Valley is reaching DACs. Valley CAN uses its preexisting community relationships and fine-tuned outreach strategies to reach populations that would otherwise not learn about CC4A. Prior to COVID-19, Valley CAN was holding weeknight clinics rotating throughout the sub-regions of the San Joaquin Valley, with a goal to reach communities in less populated regions [see also (Pierce & Connolly, 2019)]. During these clinics held at local restaurants, the Valley CAN team educated community members on the program and helped them walk through the initial stages of their applications. They also held large bimonthly smog repair events throughout the San Joaquin Valley, where they would advertise about CC4A as well. In terms of outreach methods, Valley CAN highlighted the value of "being everywhere" – this means swap meets, radio interviews, and outreach through word of mouth at churches, by meeting with city officials, and even reaching out to homeless shelters.
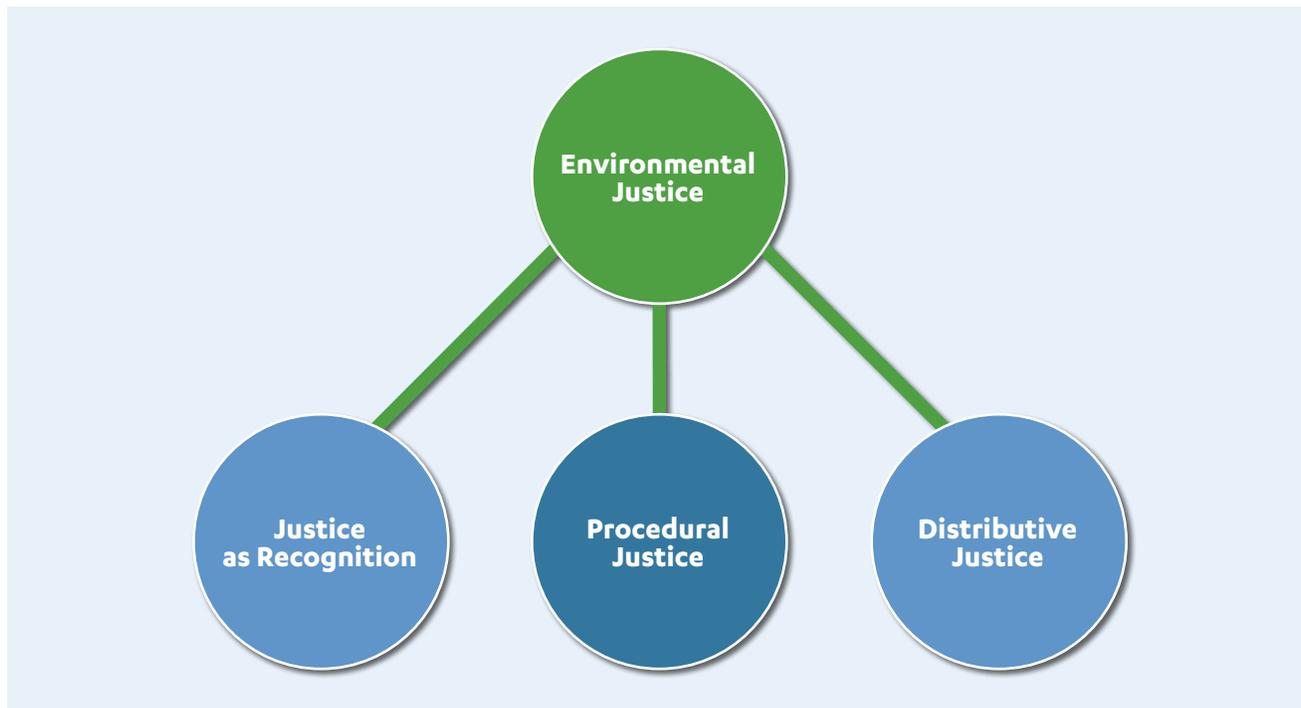
SJVAPCD staff stated that "we have learned through

---

[6] The program already has a waitlist of several hundred applicants, and they will be processed in the order they were received once new funding arrives.

FIGURE 2

ASPECTS OF ENVIRONMENTAL JUSTICE

our partnership with Valley CAN that in order to reach the community in the Valley driving older vehicles eligible for this program, traditional media and outreach methods [like] old school paid advertising doesn't really work, so we work closely with them to make sure we are getting to the communities." They rely on social media as well, which has been particularly useful during the pandemic period; Valley CAN has shifted from holding events to adjusting online outreach to get potential participants to call a designated phone bank to begin the application process. The district highlighted the value of this targeted community outreach performed by Valley CAN, stating that it is "providing true emission reductions in those communities in the San Joaquin Valley where we are really focused, which are some of our CalEnviroScreen communities where we see the biggest need."

Green Paradigm highlighted that the district is most focused on emission reductions, so expending funding toward such reductions is the main objective.

Accordingly, the SCAQMD reports taking a different approach to outreach, electing not to conduct targeted outreach due to (1) high program demand and (2) success in passing through incentive dollars to participants. The district staff stated that while they always accept outreach invitations to promote the program and participate in annual events for Earth Day and car shows, the district has not actively implemented a formal CC4A outreach campaign for the last 2-3 years.

This was echoed by Green Paradigm as well. When the district first started the program, it contracted with an outreach organization for a few years and conducted targeted outreach to communities of color and low-income communities. Given the oversubscription, however, they have not continued active outreach. There have been some informal outreach efforts; in 2020 the SCAQMD conducted an online campaign as a response to interest from its Board. This involved a news release and social media outreach campaign, which "completely exploded the number of applicants."

It also occasionally sent out program fliers to various nonprofits in recent years. The SCAQMD does not routinely hold outreach events, but prior to COVID-19 the district and contractors did host weekend workshops where participants could get their vehicle emissions tested (free of charge) and receive assistance from staff in completing their applications online. Green Paradigm stated that increasing targeted outreach, and doing so through local CBOs, is an opportunity for improvement in CC4A implementation.

The BAAQMD reported a varied approach to outreach since the program started in 2019. It began with a strategic focus on AB 617 communities, DAC, and LICs, but eventually broadened its focus to more of the Bay Area. More recently, the district realized it was not getting high participation from disadvantaged and low-income tracts, and thus decided to focus back on targeted outreach to DACs with a goal to gain higher participation from these communities. In terms of outreach methods, it has used mailers, social media, and events; the BAAQMD has hosted several "ride and drives" and other events advertising multiple program offerings, including CC4A, with two events held in AB 617 communities. It has found the most success in events hosted by CBOs and other groups, such as farmers markets. Similar to the SJVAPCD, the Bay Area team has found significant value in word of mouth or referrals. They also noticed that radio programs (Spanish, Vietnamese, and English radio) advertised the program opportunity independently, without any funded ad placement. This increased participation rates in predominantly Spanish-speaking and Vietnamese communities.

Community partnerships and involvement in outreach. We highlight CBO representation in several procedural equity aspects throughout this report, since these collaborations increase equity in a multitude of ways. Within this particular aspect, partnering with local CBOs reflects a concerted effort from the air districts to increase equitable participation. There are multiple benefits associated with such partnerships. CBOs have strong pre-existing connections with their communities,

presenting an opportunity to increase participation and inclusivity from those populations.

The SJVAPCD and Valley CAN rely on community partnerships, often using CBOs and other local organizations such as churches and foundations as an essential outreach mechanism. This is a mutually beneficial partnership; Valley CAN also often has CBO representatives join their team at events, where the CBOs can help with program outreach, but also utilize Valley CAN's existing network to advocate and advertise for other causes and opportunities. We expand on these benefits in Section 3.2.2 as well. The BAAQMD and GRID Alternatives also partner with similar types of community organizations, such as churches, CBOs, and city representatives, and leverage the existing partnerships that GRID Alternatives has in place; it is a well-established organization and has strong community relationships and existing trust, which help reduce barriers to participation. In South Coast, since the district is not actively conducting outreach, it does not have existing community partnerships, but Green Paradigm suggested that engaging with community organizations is an important opportunity for growth.

Innovation and adaptation. As discussed in Section 3.1.1, the air districts have each made efforts to innovate and adapt to improve CC4A implementation, even before the massive shift due to the COVID-19 pandemic led to drastic adjustments in program operation.

In South Coast, the district implemented a tailpipe emissions test, aiming to identify high emitters and thus further restrict eligibility, with emission thresholds based on statewide and historical data from the program. The district recently adjusted the thresholds to eliminate approximately 15% of the cleanest cars from qualifying, with the goal to remove the highest emitters and maximize emission reductions in the air basin.

Contrastingly, the SJVAPCD and Valley CAN have made consistent efforts to adjust outreach to more broadly reach targeted communities throughout the region, instead of just targeted vehicles. Since Valley CAN has been operating its smog repair voucher program

(TI&TU) for almost 10 years, staff have fine-tuned their outreach approach to increase inclusivity, particularly to the most rural areas in the region. As mentioned previously, they have recognized the importance of community partnerships in local areas for increasing inclusivity in participation, and they continue to build those relationships. They have explored various social media channels to find the most effective one to use to communicate with customers, ultimately emphasizing the use of Facebook. Additionally, they have fine-tuned their follow-up process to ensure participants are able to get all of their application documents completed, implementing a system that involves emailing and text messaging participants on a specific schedule following their CC4A clinics, and thus reducing attrition (Pierce & Connolly, 2019). The district itself stated that "as the landscape of outreach changes, we just need to continue to be flexible and understand how we can reach folks in these communities where there is the greatest need."

As mentioned previously, although operating for a shorter period, the BAAQMD has also evolved its outreach processes based on initial results of its outreach which suggested room for improvement in the diversity of communities accessing program benefits. GRID Alternatives echoed this perspective, and also reported making significant shifts in its case management as its team recognized how to most efficiently work with the program participants and help them complete applications, including more active outreach to in-process applicants to walk them through each step of the application, and thus avoid attrition. GRID Alternatives reports subsequently receiving significant positive feedback on its case management, particularly regarding the availability of support from case managers throughout the pandemic.

3.2.2. Aspect 2: Capacity building

In addition to delivering direct benefits, program implementation procedures can also indirectly but more broadly engage communities and enhance their capacity for economic and environmental resilience.

Within CC4A, there are several implementation aspects where this capacity building opportunity applies.

Synergies with other programs. Providing CC4A participants with opportunities to sign up for other programs is beneficial from a financial as well as environmental standpoint. Districts and contractors can support benefit "bundling" (the tendency to enroll in more than one assistance program [Frank et al., 2006; Higgins & Lutzenhiser, 1995; Murray & Mills, 2014]) by enabling participants to sign up for more than one incentive program at a time, through providing additional opportunities either through their organization or offerings from partnering organizations.

With respect to the South Coast region, Green Paradigm expressed interest in bundling opportunities through online tools, similar to CARB's One-Stop-Shop tool under development, and mentioned that the case managers are aware of such tools. The SCAQMD also financially supported a small portion of the implementation of the emPOWER campaign, which was developed by Liberty Hill Foundation and operates in the South Coast region (Pierce & Connolly, 2020b). Using this tool, participants can learn about and apply for more than 45 environmental benefit programs offered in the region, including CC4A, at the same time.

In the San Joaquin Valley, Valley CAN operates multiple clean vehicle related programs, including CC4A, as well as its longstanding smog repair voucher program, TI&TU, providing an opportunity for vehicle repair for individuals who will not be replacing their vehicle. It is also currently operating a pilot program with Southern California Edison (SCE) in Kings and Tulare counties, using the previously mentioned emPOWER tool. Using this tool, participants can sign up for a range of benefit programs available through SCE. Valley CAN is leveraging its existing network and community partnerships to sign participants up for these programs alongside CC4A and TI&TU.[7]

The BAAQMD also leverages GRID Alternatives' existing

---

[7] Additionally, at Valley CAN's large TI&TU smog repair events (with capacities around 500 vehicles), they include other organizations and community groups, providing a variety of opportunities outside of bundling environmental incentive programs.

solar energy program, Energy for All, to get participants signed up for as many programs as they are eligible for and interested in. GRID Alternatives mentioned that it relies heavily on cross-referrals from the solar program; if an individual happens to not be eligible for solar specifically, the organization provides information on other clean mobility programs, including CC4A. Their team also conducts cross referrals through CARB's One-Stop-Shop pilot as appropriate.

Provision of direct assistance to participants.
Through direct case management, the districts and contractors can further provide community members with the tools to follow through with the application process, as well as help them gain a broader understanding of how to apply for these types of programs, which can support them in the future. All three of the districts employ contractors to perform case management, with varying strategies.

The SCAQMD currently has three different contractors for case management, of which we only interviewed one for this project. Once an application is submitted to the program, it is sent to one of the three contractors, which then communicates with the participant to let them know what is missing from their application. Green Paradigm mentioned that the current case management process is sufficient for helping most applicants complete their applications, but there is still some attrition. The weekend workshops case managers used to hold before the pandemic were very helpful, since they could help applicants with issues that are difficult to manage over the phone, such as uploading documents to the website, and providing guidance on how to complete the vehicle purchase process. They aim to transition back to that in-person format once it is safe, unless the team finds a preferred alternative approach involving community partnerships.

In the San Joaquin Valley, the SJVAPCD does help with direct assistance occasionally when participants reach out, but as the contractor, Valley CAN primarily handles the case management process. After initial contact with potential applicants, either after an event or a

preliminary phone call, staff follow up with participants with an application in process on a specific schedule, via text messaging and email (for additional details, see Pierce & Connolly, 2019). They have significantly shifted their case management processes during the pandemic to meet community needs and aim to be available via phone and email within and outside regular business hours. Valley CAN mentioned that each participant has different needs, whether scanning and emailing documents, or requiring translation services, and the team does their best to meet those needs. Valley CAN highlighted that it is "focused on helping people overcome any burden that would prevent them from attaining our incentives."

Similarly, BAAQMD staff mentioned occasionally helping with direct assistance as needed but highlighted the importance of GRID Alternatives in providing direct case management support. The GRID Alternatives team stated they do face inherent challenges associated with the volume of applicants, but they aim to respond to participants within two days to a week. As the other districts have experienced as well, some participants are not comfortable navigating online applications. Staff invited participants into the office to help with the application process as needed (before COVID-19). During the pandemic era, they have also made significant efforts to be flexible and adjust their case management to meet participant needs. They have been able to streamline some processes, such as transitioning to the use of a video call for verifying retirement vehicles are still operating, which used to require a visit to the dismantler. As previously mentioned, GRID Alternatives reported receiving substantial positive feedback from participants on the case management process during the pandemic.

Support for communities through established partnerships. We highlight CBO representation in several procedural equity aspects throughout this report, as mentioned in Section 3.2.1. Community partnerships can not only enhance CC4A implementation and increase participation in targeted communities, but also support the partnering

organizations (Pierce & Connolly, 2020b). Within this aspect, we briefly highlight the associated district approaches within the context of supporting capacity building through such partnerships. In the San Joaquin Valley, Valley CAN has established partnerships with many community organizations, and these organizations assist them with outreach as mentioned previously, but also often reach directly back out to Valley CAN for direct assistance with signing community members up for the program. Valley CAN held their weeknight clinics at local restaurants, which was a mutually beneficial partnership as well. Several local organizations attend their larger TI&TU events, and are able to reach community members about their organization's other focuses as well; Lideres Campesinas highlighted that it helps with promotion of Valley CAN's events, but is also able to provide community members with information on domestic violence, one of its main initiatives, through this channel. As reported previously, the BAAQMD partners with similar types of organizations as Valley CAN, and (pre-COVID) attended events hosted by CBOs, as well as events such as farmers markets, to promote CC4A, while also supporting local communities. Also reported previously, the SCAQMD supported a small part of the implementation of the emPOWER tool. The emPOWER campaign more broadly funds CBOs to conduct outreach to their communities to help enroll residents in a much wider variety of environmental benefit programs.

3.2.3. Aspect 3: Respect and recognition

'Justice as recognition' is often considered one of the main components of environmental justice, along with procedural and distributive justice (Bell & Carrick, 2017), as shown in Figure 2. Here, we simply report on the respect and recognition of communities through procedures, which does not encompass the entirety of 'justice as recognition'.[8] To analyze this aspect in the CC4A program, we connect back to themes throughout the interviews related to the respect and recognition of

stakeholder (community) perspectives.

Similar to aspect (4) regarding decision-making, this aspect is not as applicable to a program that is operated in a top-down manner, but we still identified several areas where the program implementation approach intersects with this aspect, creating opportunities to increase procedural equity.

Responsiveness to participant feedback.[9] Apart from significant positive feedback from participants, as discussed in Section 3.1.1, the districts and contractors have occasionally received constructive or negative feedback on the CC4A process from participants. For the SCAQMD, this feedback mostly involved frustration and anxiety around time on the waiting list and the wait time for purchasing a vehicle once the process is underway. There have also been frustrations voiced from dealerships in the South Coast region around delays in the process and a general incompatibility with how the dealerships typically do business.

In the San Joaquin Valley, Valley CAN has received feedback surrounding its use of certain languages in outreach (e.g., running an ad on a specific language radio station but not others), to which staff always explain the circumstances, whether it involves a budget constraint or otherwise. Since the Valley CAN team conducts online outreach and has a substantial online presence, they do often receive feedback through their online platform, to which they always try to reply and provide answers to any questions in order to increase transparency in the process. The BAAQMD and GRID Alternatives did not report receiving significant constructive feedback from participants.

Efforts to overcome recognition and trust barriers. As mentioned in Section 3.1.2, there are several community-related barriers faced by potential CC4A participants. These include language barriers within outreach materials and case management support, as

---

[8] 'Justice as recognition' conceptually intersects with both procedural and distributive justice, and all forms of injustices can "maintain and reinforce each other." Injustices in procedures and distribution can be interpreted as "misrecognition or lack of respect" (Bell & Carrick, 2017).
[9] We plan to conduct additional participant interviews in the future, enabling us to expand the discussion on whether community members feel their perspectives are respected and elevated.

well as community mistrust of government programs, and misconceptions about electric vehicles. Each district and contractor can increase equity by recognizing these disproportionate challenges and undertaking efforts to reduce these barriers.

Overcoming language barriers means ensuring that materials and translations are available in as many languages as possible. The SCAQMD has recently contracted with a translation company due to district staff lacking fluency in some languages, and Green Paradigm mentioned that language barriers could be reduced through CBO partnerships as well. SCAQMD has also brought district and contractor staff with multilingual skills to weekend workshops prior to COVID-19 to support the case management process. The SJVAPCD has case management in Spanish through Valley CAN, relies heavily on Spanish language outreach, and also involves CBOs when Asian-language translation is needed. Valley CAN mentioned that its team has "translated a lot of our materials to be able to cater to the first-generation communities we have [many] of in the Valley, to help with our [application] process." The BAAQMD has case management in Spanish, and offers support in other languages as needed as well.

To reduce community mistrust and misconceptions about electric vehicles more broadly, interventions can include experiential testimonials offered by respected local partners, as well as more generic education through outreach materials and events. Along with simply reducing language barriers, advertisements in languages other than English are also "very successful because [they give] credibility to the program; inherently there is distrust from non-English speaking communities toward government programs...[the ads] really boosted credibility and trust," as stated by GRID Alternatives. Each of the contractors expressed the opportunity CC4A presents as far as increasing education on this type of program to reduce these barriers. Public events in the San Joaquin Valley and Bay Area, as well as the case management conducted in all three districts, are each an opportunity for potential participants to ask questions, increase comfort with the

program, and learn more about clean vehicles. These issues remain an opportunity for growth statewide; the CBOs highlighted existing gaps in community knowledge on the accessibility of clean vehicles, citing that many community members are confused about whether and how these vehicles could fit into their budgets and lifestyles.

CBO representation. Not only are the CBO partnerships related to participation and capacity building, they are also important when considering the involvement of CBOs in CC4A program implementation. Meaningful involvement can take place through direct partnerships, bringing CC4A representation to community events, or including CBOs in public CC4A events such as "ride and drives," and demonstrates respect for community preferences. These organizations serve as stakeholders to represent the community and get the information out to them, and can also provide valuable perspectives on ways to improve the program. Here, we provide a brief overview of CBO involvement in each district's implementation process as it relates to community engagement and respect.

The SJVAPCD stated that it "keeps and builds relationships with leaders in the community, and makes sure those relationships are strong." Valley CAN echoed this sentiment, declaring that the success of its partnerships in the Valley "boils down to community trust...once you gain the trust of leaders and organizations, you overcome a huge step in the outreach process." The Valley CAN team reports that this community trust and associated partnerships took years to build and are a key factor in the success of their outreach.

The BAAQMD has partnered with several CBOs as well, mentioning specific nonprofits in the San Jose area that engage with Latinx communities. Its team also works with churches in the area and leverages the existing relationships that GRID Alternatives has in the region.

The SCAQMD does not currently have any collaborations with CBOs, but the contractor highlighted that as an important goal for the program

in the future, stating that "there is a lot more that can and needs to be done [including] engaging with local community organizations."

3.2.4. Aspect 4: Shared Decision-making

Shared decision-making is the least relevant aspect of procedural equity for the CC4A program. As mentioned previously, the design and funding for the CC4A program is top-down in many ways. Accordingly, in this section, we do not include interview results, but we briefly discuss opportunities and challenges associated with shared decision-making for a program such as CC4A. There are certain benefits to a top-down approach, such as maintaining uniform eligibility requirements and common reporting practices for equity purposes. If certain aspects of decision-making were delegated entirely to districts or shared with communities at a local level, this could lead to less accountability at the state level to meet broader CCI goals. More broadly, scholars have identified that shared decision-making authority is typically not achieved in the environmental context, so a shift to considering power and influence is often appropriate (Bell & Carrick, 2017). The CC4A program is unlikely to transform into a community-led or co-designed program, but it may be feasible to provide opportunities for communities and other stakeholders to formally provide feedback on the program and more readily incorporate ideas for improvement. This type of adjustment presents an opportunity to increase the attainment of procedural equity goals.

3.3. Distributive Equity

To support implementation, each district receives funding from the state, and some districts pool or contribute minor amounts of local funding at their discretion as well. Using program participant data provided to us by CARB from the outset of the initial pilot in 2015 through December 2020, we find that the state has distributed more than $90 million in incentive funding (80% from the Greenhouse Gas Reduction Fund [GGRF]), with approximately $1 million in local funding going toward incentives. There are large differences in funding distribution across districts, reflective of both their relative size and time implementing the program. As seen in Figure 5, approximately 60% of state funding has been distributed through the SCAQMD, 28% through the SJVAPCD, 11% through the BAAQMD, and 0.6% through the Sacramento Metropolitan Air Quality Management District (SMAQMD) thus far (not shown in Figures 4 and 5 since this is <1% of all funding). Two-thirds of all incentives have been distributed to state-identified LICs, and almost half (48%) of all incentives have been distributed to residents in state-identified DACs.[10]

We next present different ways of looking at CC4A distributive equity outcomes across the three districts, using both a variety of DAC (see Table 1) and household income status (Table 2) metrics. We include multiple metrics so as to share a multi-faceted perspective on distributional outcomes, and potential tradeoffs between outcomes, that a single or handful of metrics can represent. Keeping in mind key demographic and socioeconomic differences across California's regions, there remain notable trends in the number and proportion of incentives, and access to those incentives among the absolute and relatively most disadvantaged and lowest income communities.

As of December 2020, more than 11,300 incentives had been distributed to households, with more than half of all incentives distributed in the South Coast region. Table 1 below shows variation in distribution patterns by district, with respect to DAC-related metrics. Here, we compare incentive distribution to socioeconomic and environmental vulnerability. We would expect variation amongst the districts, since each region is comprised of different amounts of DAC tracts. In fact, almost 90% of the state's DAC tracts are in the South Coast and San Joaquin Valley regions, with a considerably smaller amount in the Bay Area. While the San Joaquin

---

[10] We do not report household income levels in the main text due to some uncertainty about the reporting of extremely low incomes, including negative values. After incomes less than $100 were removed, mean household income is $27,985 and median household income is $24,000.

TABLE 1

**INCENTIVE DISTRIBUTION AND PARTICIPANT CHARACTERISTICS
BY AIR DISTRICT: DISADVANTAGED COMMUNITY (DAC) METRICS**

District	Total # Incentives	Average CES 3.0 Percentile of Participant Tracts	Percent of Tracts in Region That Are DACs (SB 535)	Percent of Incentives to DAC Tracts	Percent of Incentives to Top 10% DAC Tracts	Percent of DAC Tracts: No Incentives Received
SCAQMD	6,896	69%	38%	43%	17%	28%
SJVAPCD	3,185	81%	56%	72%	30%	5%
BAAQMD	1,154	48%	7%	15%	2%	32%
All Districts	11,307	70%	25%	48%	19%	30%

TABLE 2

**INCENTIVE DISTRIBUTION AND PARTICIPANT CHARACTERISTICS
BY AIR DISTRICT: INCOME-RELATED METRICS**

District	Total # Incentives	Percent of Tracts in Region That Are LICs (AB 1550)	Percent of Incentives to LICs (AB 1550)	Percent of Incentives to Households Below 225% FPL	Percent of Incentives to "Low-Income" Households (Cost of Living Adjusted)	Percent of DAC Tracts: No Incentives Received
SCAQMD	6,896	52%	67%	89%	96%	28%
SJVAPCD	3,185	57%	69%	91%	83%	5%
BAAQMD	1,154	36%	52%	79%	96%	32%
All Districts	11,307	48%	66%	88%	93%	30%

Valley also has the largest percentage of tracts within any region that are considered DACs, it has by far the highest percentage of incentives distributed to DAC tracts (72%, compared to 43% in the South Coast), and by far the least funding distributed to non-DAC tracts. It also has nearly double the proportion of CC4A funding distributed to the most disadvantaged (top 10% DAC) tracts than any other region.

Table 2 displays outcomes with respect to pure income rather than broader disadvantage-related metrics. Again, each region is comprised of different amounts of LIC tracts. We find the distribution of CC4A funding to LICs is nearly identical in the San Joaquin Valley and South Coast (69 and 67%, respectively), and slightly lower in the Bay Area (52%). The percent of CC4A participants below 225% of the Federal Poverty Line, the lowest income bracket in the CC4A program, is high in all three of the districts, with 88% of all participants throughout the state meeting that threshold. We also find that all three of the districts have relatively high distribution to low-income households, using a county-specific, cost of living adjusted "low-income" threshold, with 96% of incentives distributed to such households for the SCAQMD and the BAAQMD, and 83% for the SJVAPCD, which reflects its comparatively lower cost of living.

Figure 4 shows CC4A funding distribution to DAC census tracts and non-DAC tracts over time. The amount distributed has grown significantly over time as the program matured, with a relatively steady distribution to DAC versus non-DAC tracts, though the DAC allocation dropped slightly in 2020.

In Figure 5, the funding allocation is stratified by district.

FIGURES 3A-C depict incentive provision alongside CalEnviroScreen 3.0 percentiles in each census tract, where red indicates a higher environmental justice vulnerability. This demonstrates relatively widespread incentive distribution, but also differences in concentration of the distribution in the South Coast and San Joaquin Valley. From the Bay Area map, it is evident that the program and incentive distribution is still in early stages in the region.

DISTRIBUTION OF CC4A INCENTIVES THROUGH DECEMBER 2020 UNDER JURISDICTION OF THE SCAQMD
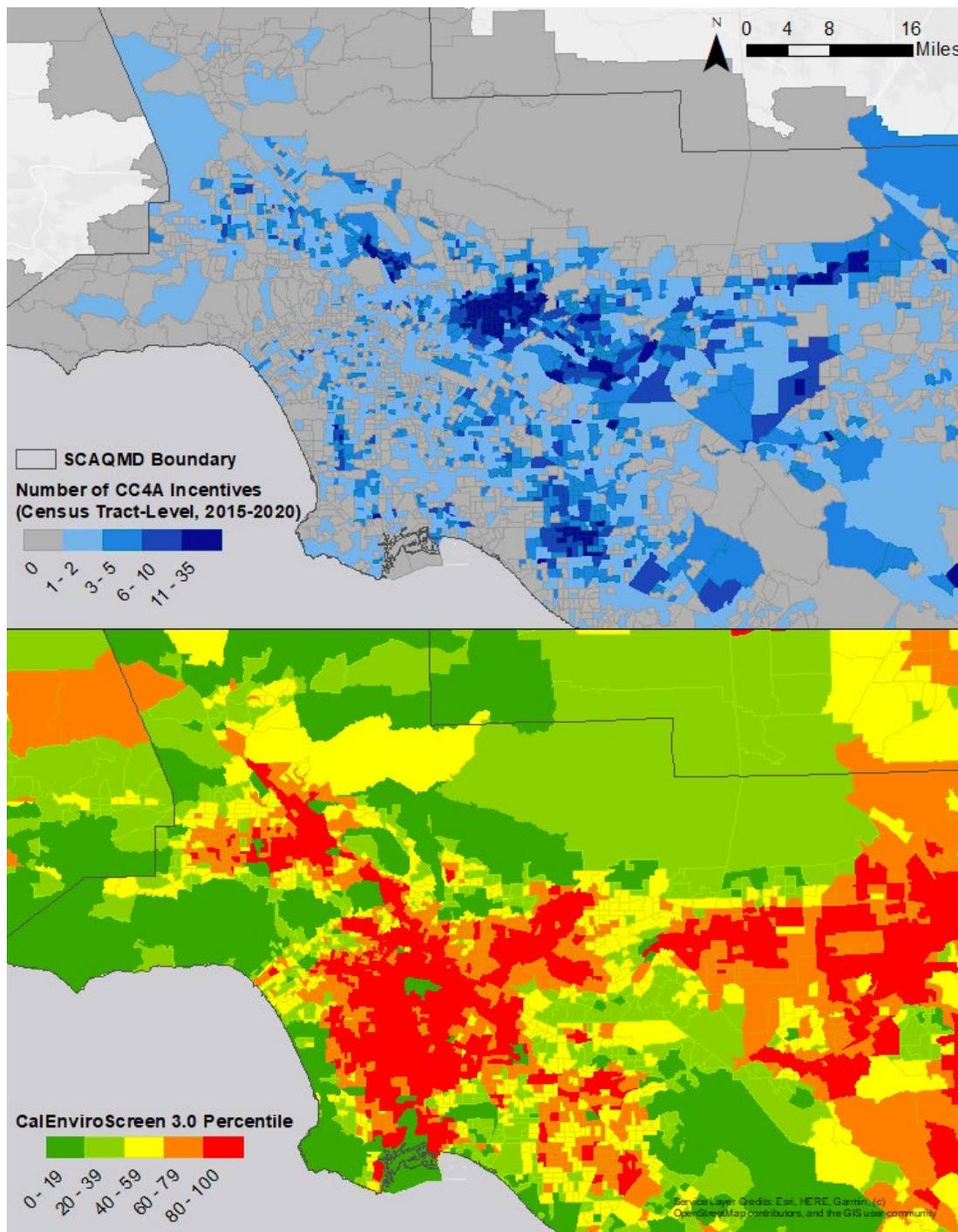
DISTRIBUTION OF CC4A INCENTIVES THROUGH DECEMBER 2020
UNDER JURISDICTION OF THE SJVAPCD
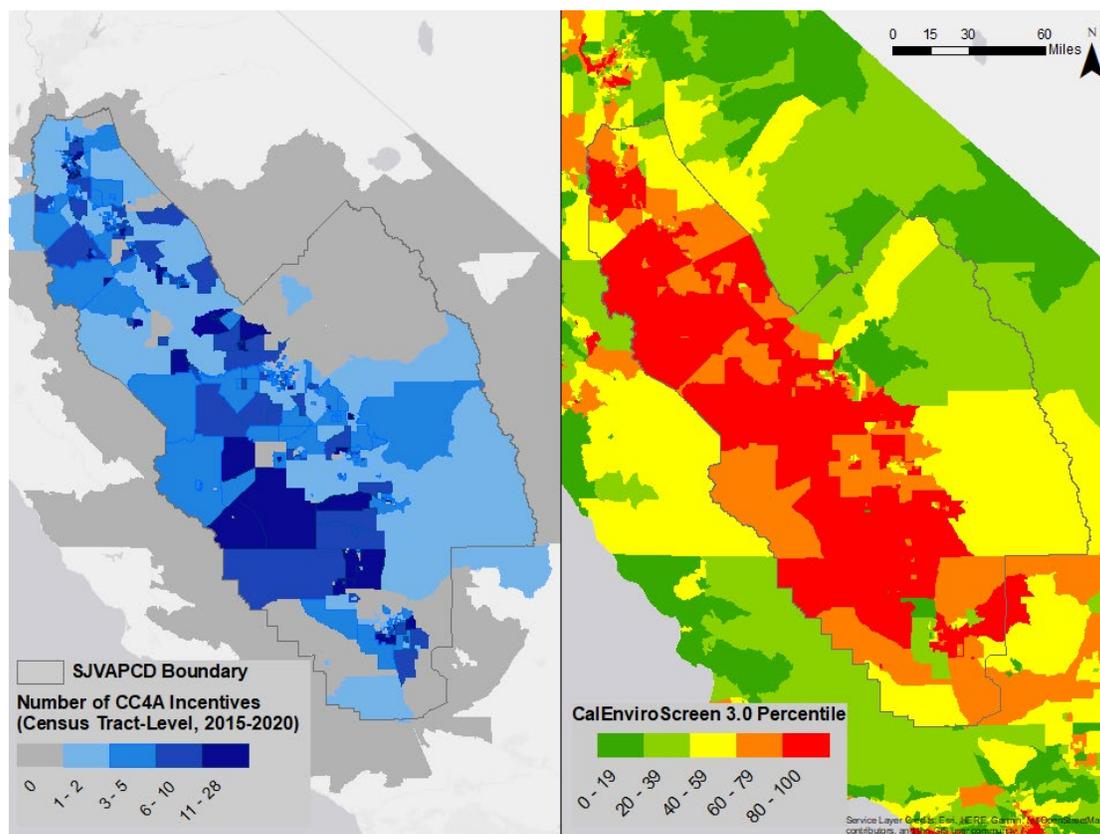
Here we can see that funding through the SCAQMD (right) has rapidly grown in recent years, with a peak of greater than $16 million in 2019 (in incentive funding only, not including administrative costs). The BAAQMD and the SJVAPCD distributed similar amounts of state incentive funding in 2020. There is a considerably smaller proportion of DAC census tracts comprising the Bay Area region (Table 1), and the percent allocation of incentive funding to DACs is accordingly much smaller in this region.

# 4. FURTHER REALIZING EQUITY IN CC4A AND SIMILAR PROGRAMS

More funding must be routed to clean vehicle incentives, among other climate mitigation interventions, through state and federal programs to meet near and intermediate term emissions goals. In this process of scaling climate efforts, it is more important than ever to ensure a just transition. As emphasized throughout the study, procedural equity is an individual component of environmental equity, standing alongside distributive equity. It is a particularly important consideration for programs such as CC4A, which need to target relatively large per-household benefits to those who truly need them. Procedural inequities can also contribute to distributive inequities. Though we do not draw quantitative conclusions regarding the relationship between implementation methods and distributional outcomes in this report, we discuss trends observed through our analysis and assess implications and opportunities for increasing equity in program implementation.

Some of the major differences in program implemen-

DISTRIBUTION OF CC4A INCENTIVES THROUGH DECEMBER 2020
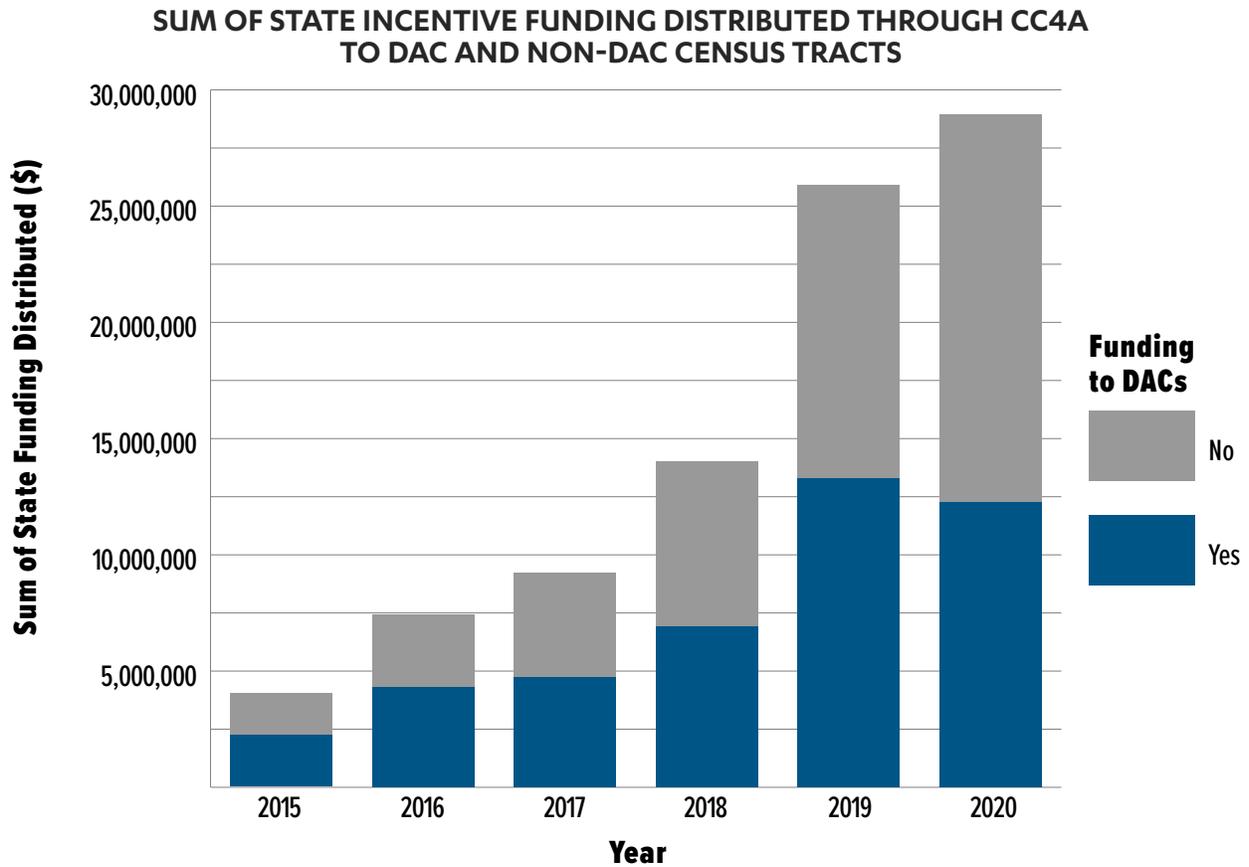## UNDER JURISDICTION OF THE BAAQMD
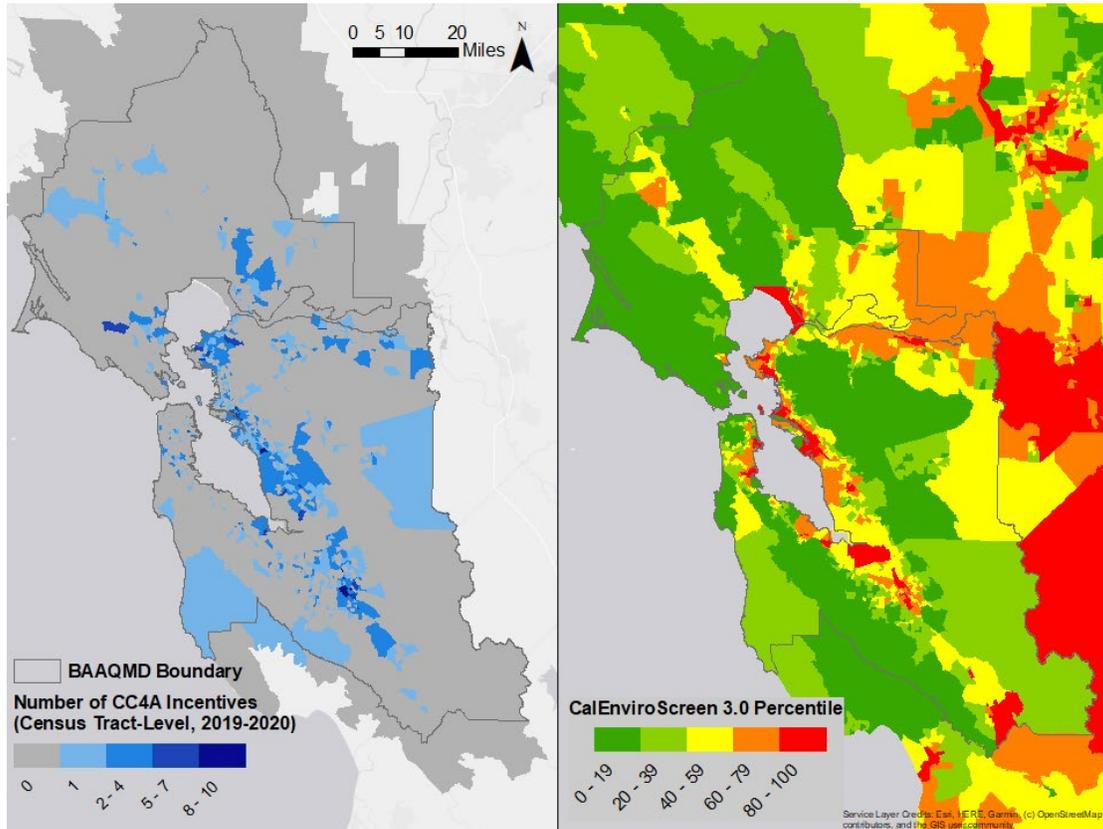
tation procedures in South Coast and the San Joaquin Valley, first mentioned in our 2017 EFMP report (Pierce & DeShazo, 2017), have persisted, with resulting distinctions in the extent to which different procedural equity measures have been attempted and achieved in each region. These differences appear to be reflective of diverse priorities adopted in the two regions regarding program objectives, beyond those which are laid out in state guidance and met by both districts.

These two regions contain almost 90% of the DAC census tracts in the entire state. The efforts of the SCAQMD appear largely focused on maximizing incentive spending and emission reductions in the basin, by ensuring that individuals with high-emitting vehicles are participating in CC4A, while also meeting participant income eligibility criteria. Meanwhile, the efforts of the SJVAPCD appear largely focused on reaching low-

income communities and communities of color through a variety of outreach approaches, while still attaining emission reductions. The SCAQMD has successfully distributed more than half of all CC4A incentives, but reached significantly fewer DAC tracts proportionally. Almost one-third of DAC tracts in the region have not received any incentives (Table 1), compared to only 5% for the San Joaquin Valley.

Program implementation is also expanding to other areas of the state. In the Bay Area, a region with fewer DACs and LICs to consider and with a much shorter timeframe of implementation, it is more challenging to make equivalent comparisons. The district is currently adjusting its outreach approach with an explicitly stated goal to reach more individuals living in DACs. CC4A implementation has just begun in Sacramento and will reportedly commence in San Diego in 2021; it will

FIGURE 4

SUM OF STATE INCENTIVE FUNDING DISTRIBUTED THROUGH CC4A TO DAC AND NON-DAC CENSUS TRACTS

*This figure includes funding distributed to census tracts under the jurisdiction of the SCAQMD, SJVAPCD, and BAAQMD, but does not include funding distributed through the SMAQMD.

FIGURE 5

SUM OF STATE INCENTIVE FUNDING DISTRIBUTED THROUGH CC4A TO DAC AND NON-DAC CENSUS TRACTS, BY AIR DISTRICT
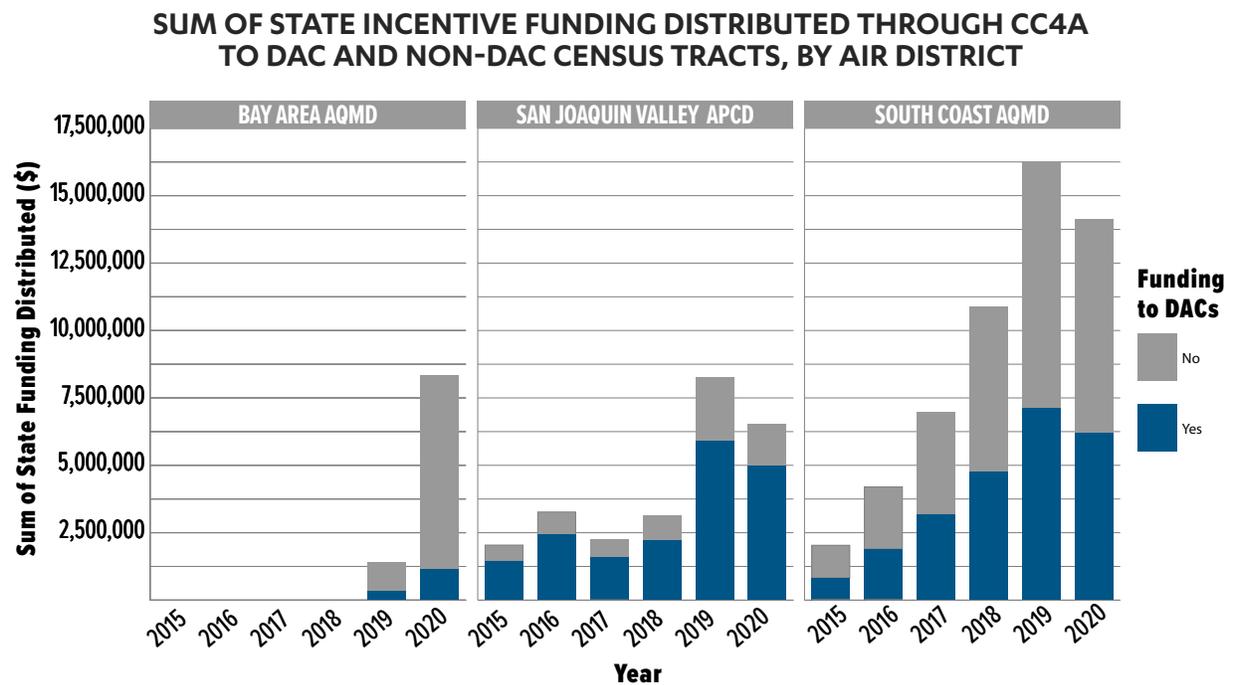
be important to assess the various regions' outreach strategies in the pilot stage and for districts to adjust their procedures as needed to ensure equity.

We have presented and discussed several district-level policy implications stemming from the findings in this report. Here, however, we identify three important matters for further action at the state level which apply across all implementing regions. First, it would be beneficial (to both districts and program participants) for the state to provide more guidance and certainty around the timing and extent of funding to districts. Relatedly, guidance should be developed around the maintenance of regional waiting lists, and their associated equity implications. Second, the state should consider the least burdensome, but still rigorous means of instituting eligibility verification procedures to ensure that the households that are the intended beneficiaries of the program are those who benefit most easily and extensively from it in practice. Finally, and particularly if funding gaps persist and program demand remains elevated, the state should consider instituting additional, evidence-based targets for advancing distributive equity beyond those currently used as eligibility standards.

There is also a necessity for further research in this space. First, while our team conducted 19 structured interviews with participants in 2018 as part of a larger study (Pierce et al., 2019), conducting additional interviews with CC4A participants in various districts to directly inform program design would help advance procedural equity goals. Moreover, a study which directly measures the impact of vehicle replacement on travel and broader livelihood outcomes for CC4A participants should be conducted. Based on initial research, we expect that such a study would only underscore the benefits of the program to the state and its residents.

California has been a national leader in advancing climate change policy and progress in environmental equity. As the state continues to set necessarily ambitious environmental targets, including a rapid transition from gasoline-powered vehicles to zero-emission vehicles, demand for clean vehicle incentive programs will grow. Instituting equitable program implementation procedures will help ensure that the most in-need households have the greatest opportunity and access to clean vehicle incentive dollars, and more broadly, will be crucial in enabling a just transition.

REFERENCES

Bell, D., & Carrick, J. (2017). Procedural environmental justice. R. Holifield, J. Chakraborty &G. Walker.(Eds.), The Routledge Handbook of Environmental Justice, Abingdon: Routledge.

Blumenberg, E., & Agrawal, A. W. (2014). Getting Around When You're Just Getting By: Transportation Survival Strategies of the Poor. Journal of Poverty, 18(4), 355–378. https://doi.org/10.1080/10875549.2014.951905

California Air Resources Board. (2013). Staff Report: Enhanced Fleet Modernization Program Assessment. California Air Resources Board. https://ww3.arb.ca.gov/msprog/aqip/efmp_update_staff_report_november_2013.pdf

California Air Resources Board. (2018). Low-Income Barriers Study, Part B: Overcoming Barriers to Clean Transportation Access for Low-Income Residents. California Air Resources Board. https://ww2.arb.ca.gov/sites/default/files/2018-08/sb350_final_guidance_document_022118.pdf

Deputy Attorney General (Jeffrey A. Rich), & Attorney General (Kamala D. Harris). (2015, January 20). Whether Seeking an IRS Private Letter Ruling for the Clean Vehicle Rebate Project is Warranted [Personal communication].

Domingue, S. J., & Emrich, C. T. (2019). Social Vulnerability and Procedural Equity: Exploring the Distribution of Disaster Aid Across Counties in the United States. American Review of Public Administration, 49(8), 897–913. https://doi.org/10.1177/0275074019856122

Frank, D. A., Neault, N. B., Skalicky, A., Cook, J. T., Wilson, J. D., Levenson, S., Meyers, A. F., Heeren, T., Cutts, D. B., Casey, P. H., Black, M. M., & Berkowitz, C. (2006). Heat or Eat: The Low Income Home Energy Assistance Program and Nutritional and Health Risks Among Children Less Than 3 Years of Age. Pediatrics, 118(5), e1293. https://doi.org/10.1542/peds.2005-2943

George, C., & Reed, M. G. (2017). Revealing inadvertent elitism in stakeholder models of environmental governance: Assessing procedural justice in sustainability organizations. Journal of Environmental Planning and Management, 60(1), 158–177. https://doi.org/10.1080/09640568.2016.1146576

Higgins, L., & Lutzenhiser, L. (1995). Ceremonial Equity: Low-Income Energy Assistance and the Failure of Socio-Environmental Policy. Social Problems, 42(4), 468–492. JSTOR. https://doi.org/10.2307/3097042

Hunold, C., & Young, I. M. (1998). Justice, Democracy, and Hazardous Siting. Political Studies, 46(1), 82–95. https://doi.org/10.1111/1467-9248.00131

Ju, Y., Cushing, L. J., & Morello-Frosch, R. (2020). An equity analysis of clean vehicle rebate programs in California. Climatic Change. https://doi.org/10.1007/s10584-020-02836-w

Martens, K., Golub, A., & Robinson, G. (2012). A justice-theoretic approach to the distribution of transportation benefits: Implications for transportation planning practice in the United States. Transportation Research Part A: Policy and Practice, 46(4), 684–695. https://doi.org/10.1016/j.tra.2012.01.004

Murray, A. G., & Mills, B. F. (2014). The impact of low-income home energy assistance program participation on household energy insecurity. Contemporary Economic Policy, 32(4), 811–825. https://doi.org/10.1111/coep.12050

Office of Environmental Health Hazard Assessment. (2018). CalEnviroScreen 3.0. https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30

Pierce, G., Chow, N., & DeShazo, J. R. (2020). The case for state-level drinking water affordability programs: Conceptual and empirical evidence from California. Utilities Policy, 63, 101006. https://doi.org/10.1016/j.jup.2020.101006

Pierce, G., & Connolly, R. (2019). Initial Assessment of Valley Clean Air Now's Clean Car Community Clinic Initiative. UCLA Luskin Center for Innovation.

Pierce, G., & Connolly, R. (2020a). Lessons From San Joaquin Valley's Smog Repair Program: Adapting Outreach Methods to Ensure Household Transportation Benefits. A COVID-19 Response Innovation Case Study. UCLA Luskin Center for Innovation. https://innovation.luskin.ucla.edu/wp-content/uploads/2020/06/Lessons-From-San-Joaquin-Valleys-Smog-Repair-Program.pdf

Pierce, G., & Connolly, R. (2020b). EmPOWER: A Scalable Model for Improving Community Access to Environmental Benefit Programs in California. UCLA Luskin Center for Innovation. https://innovation.luskin.ucla.edu/wp-content/uploads/2020/07/A_Scalable_Model_for_Improving_Community_Access_to_Environmental_Benefit_Programs_in_CA.pdf

Pierce, G., & DeShazo, J. R. (2017). Design and Implementation of the Enhanced Fleet Modernization Plus-Up Pilot Program: Lessons Learned from the San Joaquin Valley and South Coast Air Districts' First Year of Operation. UCLA Luskin Center for Innovation. https://innovation.luskin.ucla.edu/wp-content/uploads/2019/03/Design_and_Implementation_of_the_Enhanced_Fleet_Modernization_Plus-Up_Pilot_Program.pdf

Pierce, G., DeShazo, J. R., Sheldon, T., McOmber, B., & Blumenberg, E. (2019). Designing Light-Duty Vehicle Incentives for Low- and Moderate-Income Households. UCLA Luskin Center for Innovation. Prepared for CARB. https://innovation.luskin.ucla.edu/wp-content/uploads/2019/06/Designing_Light-Duty_Vehicle_Incentives_for_Low-and_Moderate_Income_Households.pdf

Reed, M. G., & George, C. (2011). Where in the world is environmental justice? Progress in Human Geography, 35(6), 835–842. https://doi.org/10.1177/0309132510388384

Rubin, D., & St-Louis, E. (2016). Evaluating the Economic and Social Implications of Participation in Clean Vehicle Rebate Programs: Who's In, Who's Out? Transportation Research Record, 2598(1), 67–74. https://doi.org/10.3141/2598-08

UCLA Luskin Center for Innovation
innovation.luskin.ucla.edu