

## Cleaning the Air: Electrifying the Transportation Sector in the Central Valley An Analysis of Policy Options for the California Governor's Office

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## Abstract

Transportation is the number one source of greenhouse gas (GHG) emissions and hazardous air pollution in California.<sup>1</sup> In order to decrease greenhouse gas emissions and improve air quality, California needs to reduce drastically the number of miles driven in old and high polluting vehicles, and quickly ramp up of use of near-zero and zero-emission vehicles (ZEVs). Despite considerable state investment, the Central Valley has very low ZEV adoption rates, particularly among its population of agricultural workers who drive long distances in high polluting cars.

California state agencies can reduce the miles driven in old polluting vehicles and increase use of ZEVs in the Central Valley by prioritizing the following measures:

- 1) Electrifying the public vanpool fleet;
- 2) Creating a low-income low-interest auto loan program;
- 3) Modifying the current Enhanced Fleet Modernization Program; and
- 4) Establishing a low-income EV car-sharing program.

This paper describes the barriers to vehicle retirement and ZEV adoption in the Central Valley and recommends state policies and programs that can help low-income people, particularly agricultural workers, access cleaner and more affordable forms of transportation. The findings are based primarily on interviews with transportation experts and agricultural workers, and analysis of data from the California Air Resources Board and other sources.

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<sup>1</sup> California Air Resources Board, 2012 GHG Inventory, [http://www.arb.ca.gov/cc/inventory/inventory\\_current.htm](http://www.arb.ca.gov/cc/inventory/inventory_current.htm)

## Table of Contents

Introduction.....	5
Why ZEV adoption lags in the Central Valley.....	6
Why ZEV adoption is important in the Central Valley.....	8
How to accelerate adoption of ZEVs in the Central Valley.....	9
Electrify vanpool fleet.....	9
Create a low-interest car loan program.....	13
Modify state incentives for ZEVs and advanced vehicles.....	17
Create a ZEV-car sharing program.....	21
Recap of potential CO2 savings and cost effectiveness of policy recommendations.....	25
Recap of potential reduction in criteria pollutants from recommended policies.....	26
Methods.....	27
Closing Remarks.....	27
Appendix I: Pollution from vehicles in the Central Valley.....	29
Appendix II: Comparison of financial assistance programs for vehicle ownership.....	32

## Figures, Tables, and Charts

Figure 1: Proportion of California Rebates for ZEVs Issued to Drivers in Central Valley.....	6
Figure 2: Charging stations in Central Valley.....	7
Figure 3: Air Resource Board Low Carbon Transportation budget.....	17

Table 1: CO2 emissions from the transportation of farmworkers in 1 electric van vs. business as usual methods.....	11
Table 2: Reduction in criteria air pollution from replacing light duty passenger cars and pick up trucks with electrified vanpools.....	11
Table 3: Cost-effectiveness of replacing traditional transportation methods with electric vanpools.....	12
Table 4: Potential CO2 benefits and cost effectiveness of a \$1.5 million car loan program.....	16
Table 5: Potential air quality savings benefits of ZEV loan program.....	16
Table 6: CO2 savings and cost effectiveness of replacing 240 Honda Accords with advanced vehicle models.....	18
Table 7: Reduction in criteria pollution from replacing old passenger cars with PHEVs.....	18
Table 8: CO2 savings and cost effectiveness of a larger and streamlined low-income vehicle retirement program.....	19
Table 9: Reduction in criteria pollutants from retiring old passenger cars and pick-up trucks.....	19
Table 10: CO2 savings and cost effectiveness of including pick-up trucks in EFMP-Plus Up.....	20
Table 11: Air pollution savings from including pick-up trucks in EFMP-Plus Up.....	21
Table 12: Potential CO2 savings from a pilot EV car-sharing program.....	23
Table 13: Potential reduction in criteria pollutants from a pilot EV car-sharing program.....	23
Table 14: Recap of potential CO2 savings and cost effectiveness	

of policy recommendations .....	25
Table 15: Recap of potential reduction in criteria pollutants from recommended policies.....	26
Chart 1: Air pollution from Pre-OBDIIs in the Central Valley.....	29
Chart 2: California air pollution from Central Valley’s Pre-OBDII fleet.....	30
Chart 3: Proportion of California’s Pre-OBDIIs located in Central Valley.....	30
Chart 4: Pre-OBDIIs in the Central Valley produce most of the pollution from Pre-OBDIIs state-wide.....	30

## Introduction

Transportation is the number one source of greenhouse gas (GHG) emissions and hazardous air pollution in California.<sup>2</sup> Air pollution from vehicles causes immediate and lifelong health problems.<sup>3</sup> In order to decrease greenhouse gas emissions and improve air quality in California, significant changes need to occur within the transportation sector. Two things need to occur: (1) a large reduction in miles driven in old and high polluting vehicles, and (2) a fast ramp-up of use of near-zero and zero-emission vehicles (ZEVs).<sup>4</sup> Despite considerable state effort and investment in both vehicle retirement and replacement with ZEVs, some regions in California have been slow to adopt.

The Central Valley has very low ZEV adoption rates, particularly among its population of agricultural workers who drive long distances in high polluting cars on a daily basis. Electrification of transport is important in the Valley. The region is notorious for having some of the most polluting vehicles in California's fleet<sup>5</sup> and the worst air quality in both the state and in the nation.<sup>6</sup> In order to achieve state climate and air quality goals, considerable barriers to EV penetration need to be overcome in the Central Valley. These challenges cannot be surmounted without strategic investment of state transportation funding in the Valley.

In order to decrease miles driven in inefficient cars and improve access to ZEVs in the Central Valley, California should prioritize 4 policies:

- 1) Electrifying the public vanpool fleet;
- 2) Creating a low-income low-interest auto loan program;
- 3) Modifying the current Enhanced Fleet Modernization Program; and
- 4) Establishing a low-income EV car-sharing program.

This paper describes the barriers to vehicle retirement and ZEV adoption in the Central Valley and recommends state policies and programs that can help low-income people, particularly agricultural workers, access cleaner forms of transportation. The findings are based primarily on interviews with transportation experts and agricultural workers, and analysis of data from the California Air Resources Board and other sources.

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<sup>2</sup> California Air Resources Board, 2012 GHG Inventory, [http://www.arb.ca.gov/cc/inventory/inventory\\_current.htm](http://www.arb.ca.gov/cc/inventory/inventory_current.htm)

<sup>3</sup> American Lung Association, "The Road to Clean Air: Public Health and Global Warming Benefits of Advanced Clean Car Standards," <http://www.calcleancars.org/docs/the-road-to-clean-air.pdf>

<sup>4</sup> Zero emission vehicles refer to plug-in hybrid electric vehicles (PHEVs), battery electric vehicles (BEVs), and hydrogen fuel cell vehicles (FCEVs).

<sup>5</sup> See Appendix I for details

<sup>6</sup> American Lung Association, State of the Air database, <http://www.stateoftheair.org/>

## Why ZEV adoption lags in the Central Valley

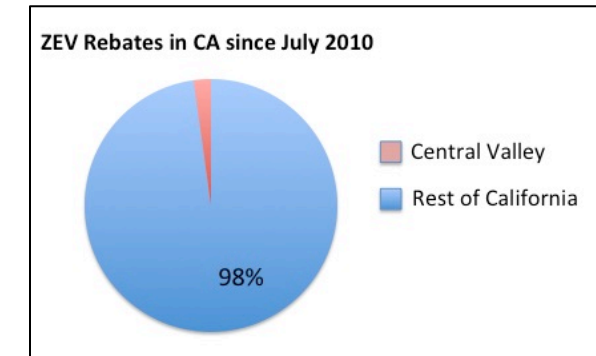
ZEV adoption is slow in the Central Valley due primarily to the following barriers: poverty, lack of access to affordable loans, insufficient infrastructure, lack of ZEVs in dealerships, little ZEV awareness or interest, and ZEV operational limitations.

### Barriers to ZEV adoption

**Poverty:** Despite the fact that the Central Valley is the most productive agricultural region with the highest farming revenue in the U.S., there is widespread poverty. In 2009, more than one-fifth of households in the San Joaquin Valley had incomes below the federal poverty level.<sup>7</sup> Fresno, Modesto, and Bakersfield-Delano are among the top five U.S. regions with the highest percentage of residents living below the poverty line.<sup>8</sup> Low-income people are understandably unable to purchase new cars, let alone advanced technology vehicles like ZEVs.

The scarcity of ZEV ownership among low-income people is reflected in statewide records of who receives rebates. According to the Center for Sustainable Energy and the California Air Resources Board (ARB), of the 99,570 ZEV rebates issued to individuals for the purchase of ZEVs in the last five years, only six percent went to disadvantaged communities and only two percent went to individuals in the Central Valley.<sup>9</sup> If current trends continue, one would expect a penetration rate of only 460

“The Valley’s socioeconomic diversity, vast rural regions between major metropolitan areas, and longer-than-average commute distances are some of the main contributing factors to the low adoption rate [of ZEVs]...The large number of disadvantaged communities poses unique challenges to...adoption in much of the region and precludes a one-size-fits-all approach.” -*San Joaquin Valley Plug-in Electric Vehicle Readiness Plan Final Report*. California Energy Commission. August 2014.



ZEVs/year for the next ten years in the Central Valley, with 120 ZEVs/year being located in disadvantaged communities in the Valley—far below what is needed to clean the transportation fleet in the Valley.

**Lack of access to affordable loans:** Just as Central Valley residents have little access to capital to purchase ZEVs, they also lack access to affordable loans. Many residents do not have a bank account and either have a poor credit history or no credit at all. Even in Fresno, the biggest city

in the Valley, 17% of residents are “unbanked,” which is the second highest rate in the nation.<sup>10</sup> Low-income people without credit can face loans with interest rates of 30% or higher.<sup>11</sup> Without access to low-interest loans, low- and moderate-income people will need to maintain their old and high-

<sup>7</sup> “Place Matters for Health in the San Joaquin Valley: Ensuring Opportunities for Good Health for All,” Joint Center for Political and Economic Studies, March 2012,

<https://www.fresnostate.edu/chhs/cvhipi/documents/cvhipi-jointcenter-sanjoaquin.pdf>

<sup>8</sup> Gosia Wozniacka, “California Poverty: Three Metro Areas In Central Valley Rank Among The Poorest In The Nation,” Associated Press, September 20, 2014.

<sup>9</sup> Center for Sustainable Energy (2015). California Air Resources Board Clean Vehicle Rebate Project, Rebate Statistics. Data last updated April 30, 2015. Retrieved May 2, 2015 from <http://energycenter.org/clean-vehicle-rebate-project/rebate-statistics>

<sup>10</sup> Scarborough Research, “A Look Into Atypical American Banking,” May 7, 2012.

<sup>11</sup> Ken Bensinger, “A Vicious Cycle in the Used Car Business,” LA Times, October 30, 2011.

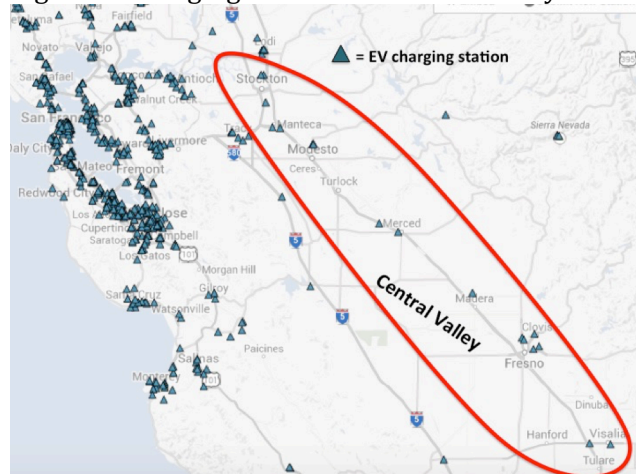


polluting cars, purchase 3<sup>rd</sup> or 4<sup>th</sup> generation cars that are also high-polluting, or risk defaulting on high monthly interest rates. Affordable loans are a pre-requisite for people to be able to choose from a variety of cars and to be able to afford ZEVs.

**Insufficient infrastructure:** The Central Valley is an expansive region, stretching 3000 miles with vast rural stretches between cities. Given the lack of population density<sup>12</sup> and the sprawling nature of driving destinations, strategic placement of charging stations is required to make driving an electric vehicle (EV) feasible.<sup>13</sup> Since there are only a handful of urban hubs and few people own EVs, there is little economic incentive to install charging stations throughout the Valley as they will not get much use or return on investment.

Progress in installing charging stations is slow and not adequate to support the needed EV penetration rates. Based on the Department of Energy (DOE) Plug-in Electric Vehicle (PEV) Readiness Assessment, only 15% of Valley cities or counties surveyed have begun considering how to adopt electric vehicle supply equipment (EVSE) code requirements and 55% have not started the process.<sup>14</sup> Many Valley commuters are “mega-commuters,” meaning they travel at least 50 miles to work one way,<sup>15</sup> which makes workplace charging a necessity. The DOE PEV Readiness Assessment indicates a lack of workplace charging at most Valley work sites.<sup>16</sup> Figure 2 shows the scarcity of EV chargers in the Valley compared with neighboring counties. While residential Level 1 charging may be sufficient for plug-in hybrid electric vehicles (PHEVs) that can charge at night and run partially on gas during the day, it won’t do the trick for pure battery electric vehicles. Given the fact that the CPUC and CEC are currently focused on the infrastructure side, this paper does not recommend policies on placement of charging stations.

Figure 2: Charging stations in Central Valley



**Lack of ZEVs in dealerships:** Car dealers in the Central Valley rarely have ZEVs in stock. Their business model relies on fast turnover of cars, so dealers carry vehicles that they believe will sell as quickly as possible. ZEVs require additional staff time, client education, and also take longer to sell due to their higher price.<sup>17</sup> If dealers do not carry or promote ZEVs, then it is hard for potential buyers to become familiar enough with the vehicles to purchase them.

**Little ZEV awareness or interest:** Understandably, ZEVs are not on the radar of most low- and moderate-income drivers. There is little interest in ZEVs as a potential car to own or lease in the Valley since the vehicle seems out of reach financially. ZEVs are seen as a vehicle for affluent people in urban

<sup>12</sup> The overall population density in the San Joaquin Valley is 248.8 people per square mile, but it ranges by county and zip code from 71.7 per square mile in Madera County to 487.4 in San Joaquin County (“Place Matters for Health in the San Joaquin Valley: Ensuring Opportunities for Good Health for All,” Joint Center for Political and Economic Studies, March 2012, <https://www.fresnostate.edu/chhs/cvhipi/documents/cvhipi-jointcenter-sanjoaquin.pdf>)

<sup>13</sup> National Renewable Energy Laboratory, “California Statewide Plug-In Electric Vehicle Infrastructure Assessment,” prepared for California Energy Commission, May 2014, <http://www.energy.ca.gov/2014publications/CEC-600-2014-003/CEC-600-2014-003.pdf>

<sup>14</sup> Ibid.

<sup>15</sup> Rapino et. al., “Mega Commuters in the U.S.” United States Census Bureau, Fall 2013, [http://www.census.gov/newsroom/releases/pdf/paper\\_mega\\_%20commuters\\_us.pdf](http://www.census.gov/newsroom/releases/pdf/paper_mega_%20commuters_us.pdf)

<sup>16</sup> National Renewable Energy Laboratory, “California Statewide Plug-In Electric Vehicle Infrastructure Assessment,” prepared for California Energy Commission, May 2014, <http://www.energy.ca.gov/2014publications/CEC-600-2014-003/CEC-600-2014-003.pdf>

<sup>17</sup> Interview with Peter Kilde, Executive Director, West Central Wisconsin Community Action Agency and Jumpstart, April 7, 2015

centers like Los Angeles or San Francisco. Similarly, there is also little awareness of state and local air district ZEV incentives and customer rebates.<sup>18,19</sup>

**Operation limitations:** While there are some ZEV pick up trucks and commercial vehicles, most of the more affordable ZEV models are light duty passenger vehicles.<sup>20</sup> Many agricultural workers in the Valley rely on pick-up trucks and medium- or heavy-duty trucks for which there are limited or no ZEV replacement models.<sup>21</sup>

**Take-away:** The above list of challenges suggests that a ZEV market will not naturally develop in a timely manner without state investment and support in the Central Valley. In order to meet state climate and energy goals and to ensure that disadvantaged communities have clean transportation options, the state will need to invest directly in innovative ZEV programs in the Central Valley. Many of the above challenges are possible to overcome with a concerted, well-informed, and sustained effort.

## Why ZEV adoption is important in the Central Valley

Accelerated retirement of old and high polluting vehicles and replacement with ZEVs are essential not only to meet longer-term climate goals, but also to reduce hazardous air pollution in the near-term.

The Central Valley suffers from some of the worst air pollution in the nation. Five cities in the Central Valley are among the top 10 worst cities in the U.S. for air quality.<sup>22</sup> The health impacts of air pollution should not be taken for granted.

- A recent study found that ozone levels above the federal standard in the San Joaquin Valley cause 460 premature deaths per year.<sup>23</sup>
- One in six children in the San Joaquin Valley is diagnosed with asthma before the age of 18, an epidemic level and one of the highest rates in U.S.<sup>24</sup>

Improving air quality in the Central Valley is a priority for California and a prerequisite for compliance with federal air quality standards in the next eight years.

The largest sources of air pollution in the Valley are agriculture and transportation. Transportation alone accounts for 80% of the smog in the region.<sup>25</sup> The geography of the Valley certainly doesn't help: surrounded on three sides by mountain ranges, the Central Valley acts as a pool for air pollutants produced by the region's vehicles, industry and large agricultural community. These emissions get trapped in the valley by an inversion layer of warm air.

The transportation habits of agricultural workers in particular contribute to significant levels of criteria pollutants (particulate matter, ground-level ozone, carbon monoxide, sulfur oxides, nitrogen

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<sup>18</sup> Interviews with Antonio Cortex, Juan Martinez-Garcia, Amparo Nava, and Francisco Lopez, farmworkers in the Central Valley, April 29, 2015

<sup>19</sup> California Energy Commission, "IEPR 2014 Energy Update," <http://www.energy.ca.gov/2014publications/CEC-100-2014-001/CEC-100-2014-001-CMF.pdf>

<sup>20</sup> Plug-In Electric Resource Center

[http://www.driveclean.ca.gov/searchresults\\_pev.php?tech=15,42&year=All&make=make&model=model&x=19&y=10](http://www.driveclean.ca.gov/searchresults_pev.php?tech=15,42&year=All&make=make&model=model&x=19&y=10)

<sup>21</sup> National Renewable Energy Laboratory, "California Statewide Plug-In Electric Vehicle Infrastructure Assessment," prepared for California Energy Commission, May 2014, <http://www.energy.ca.gov/2014publications/CEC-600-2014-003/CEC-600-2014-003.pdf>

<sup>22</sup> Nate Berg, "Why Does California's Central Valley Have Such Bad Air Pollution?" *The Atlantic*, September 28, 2011, <http://www.citylab.com/weather/2011/09/behind-pollution-californias-central-valley/207/>

<sup>23</sup> "Place Matters for Health in the San Joaquin Valley: Ensuring Opportunities for Good Health for All," Joint Center for Political and Economic Studies, March 2012, <https://www.fresnostate.edu/chhs/cvhipi/documents/cvhipi-jointcenter-sanjoaquin.pdf>

<sup>24</sup> Ibid.

<sup>25</sup> ZEV Interagency Action Plan (Draft 4/24/15)



oxides) mostly from tailpipe emissions. Agricultural workers travel some of the furthest distances to work<sup>26</sup> in the oldest and highest-polluting cars.

Vehicles built before 1996, which are commonly referred to as “Pre-OBDIIs” are a major source of the air pollution from transportation in the Central Valley. In fact, even though these old vehicles only account for 10% of the Valley’s vehicle population, they produce up to 44% of the air pollutants from transportation. See Appendix I for a breakdown of pollution by vehicle category.

**Take-away:** The bottom line is that driving long distances in old vehicles poses a major hindrance to meeting air quality goals. In order to improve air quality in the Valley, the daily miles driven *and* use of inefficient vehicles need to be reduced. Given the sprawling rural nature of the Central Valley, improving public transportation is an important strategy, but not sufficient by itself to improve air quality. Old vehicles need to be retired and replaced by public transit, newer vehicles (i.e. vehicles built in the last eight years, commonly referred to as “LEVIIs”), hybrids, and ZEVs.

## How to accelerate adoption of ZEVs in the Central Valley

What method for accelerating adoption of ZEVs, particularly among low-income agricultural workers, will create the most substantial reductions of GHG and hazardous air pollution?

### (1) Electrify vanpool fleet

The primary recommendation is to electrify CalVans’ vanpool fleet.

The CalVans vanpool system is the only Valley-wide public transit service that provides low cost, safe, and reliable transportation for getting over 2000 agricultural employees to work on a daily basis. In 2001, CalVans staff helped to create the first farmworker vanpool project in the nation. Since then, the project has grown to provide 239 vanpools for farmworkers in the San Joaquin, Salinas and Imperial Valleys.<sup>27</sup> The CalVans program is an \$8.5 million operation that is currently self-funded solely from its users with a safety record that’s used as a model by other agencies.<sup>28</sup>

CalVans serves a unique role and fills a void in public transit. The biggest difference between CalVans and other traditional public transit models is that the volunteer farmworker drivers determine their routes on a daily basis. Fixed route buses, on the other hand, generally stop at their county line whereas vanpools cross those lines during the course of their daily work trips. The 15-passenger Chevrolet vans are specially equipped to accommodate farmworker needs: they carry tools and water containers, tow a porta-potty, and serve as a cooling station for farmworkers in the afternoon as well. As an added bonus, as a result of CalVans’ staff transportation data gathering and reporting work, local transit agencies get approximately \$5 million annually from Federal 5307 funds.

Each vanpool eliminates the transportation needs of up to 14 individual cars.

<sup>26</sup> Data on agricultural workers’ transportation habits is insufficient, so it is not possible to state their exact contribution to air quality pollution. However, U.S. Census data provides some helpful data at the county and regional level that highlights the long commutes of Valley residents. The percent of people in the Central Valley with “super commutes” (90 minutes driving one-way) is double the national average. San Joaquin County “mega commuters” travel on average 61.5 miles each way to work. This ranks in the top 10 “mega county commuter flows by frequency” list in the nation. The handful of agricultural workers that I spoke with reported driving at least 60-80 miles a day.

<sup>27</sup> CalVans does not operate in Stockton despite the large potential demand and need there

<sup>28</sup> Ronald Hughes, “CalVans 2-Year Update.”

The vanpools provide significant environmental benefits by reducing the number of passenger vehicles and pick-up truck commuters. The fleet travels approximately 2.95 million miles per year. In fiscal year 2014-2015, CalVans vanpools avoided 29 million miles of solo driving by agricultural workers.<sup>29</sup> A more conservative estimate that encapsulates the carpooling habits of agricultural workers is 6 million miles of driving reduced per year.

The vanpools also save agricultural workers money on fuel and transportation costs. Agricultural employers provide vouchers for over 900 farmworkers to cover all or part of the daily transit costs. In Salinas, nearly all agricultural workers who ride CalVans have vouchers from employers. Employers provide transit vouchers to insure they have enough workers throughout the season. The vanpool vouchers are a large benefit for agricultural workers as vouchers for \$45/week mean a savings of approximately \$200/month or \$2,000/ year. For someone who makes \$30,000 a year, the vouchers result in a substantial tax-free savings.

**Recommendation: California should invest in the expansion and electrification of the CalVans vanpool fleet.**

CalVans needs funding to expand its vanpool fleet in a manner that maximizes the potential environmental benefits, i.e. with plug-in electric vans rather than conventional vans. CalVans has experienced a 10% growth rate in ridership per year for the last four years.<sup>30</sup> The combination of growing farmworker ridership, paired with the limited 150,000 mile lifespan of the vans means that at least 50 new vans are needed every year. To provide clean transport for more farmworkers, CalVans needs 30 new plug-in hybrid electric vans as soon as possible, and 50 new plug-in hybrid vans could be added to the fleet each year for the next 4 years, totaling 230 vans. To meet projected demand, the fleet could be doubled over the next five years.

Expanding the vanpool fleet with electric vans can save up to 146,000 MtCO<sub>2</sub> over the estimated 6-year life of 230 vehicles.

The CO<sub>2</sub> savings from using electric vans are large. Table 1 shows the CO<sub>2</sub> emissions of using 1 electric van compared with a conventional van, or several commonly used cars in the Valley (Chevrolet Suburbans, Honda Accords, and Ford F-150 pick-up trucks). These CO<sub>2</sub> savings grow to significant numbers if you electrify a large portion of the vanpool fleet. For instance, 230 electric vans creates approximately 50,000 – 146,000 MtCO<sub>2</sub> of savings over the estimated 6-year life of the vehicles. Table 2 shows the reduction in criteria pollutants from replacing light duty passenger cars and pick up trucks with 230 electrified vanpools over their estimated 6-year life.

<sup>29</sup> Calculation of VMT savings= (# of passengers x # of miles driven by van) – # of miles driven by van

<sup>30</sup> Interview with Ron Hughes, Executive Director, CalVans, February 24, 2015.

Table 1: CO2 emissions from the transportation of farmworkers in 1 electric van vs. business as usual methods<sup>31</sup>

Vehicle	Fuel consumption (miles/gallon)	Number of people per vehicle	CO2 emissions per year (metric tons)	CO2 emissions (metric tons) over 6 year life of electric van
Ford F150 pick-up truck (1985)	15	2	114	682
Chevrolet Suburban (1995)	12	4	72	426
Honda Accord (1991)	26	3	44	262
Chevrolet 15-person van (2011)	12	15	19	114
Via Hybrid-EV 15-person van (2015)	35 mile range on battery; 15 mpg otherwise	15	8	45

Table 2: Reduction in criteria air pollution from replacing light duty passenger cars and pick up trucks with 230 electrified vanpools<sup>32</sup>

Scenario	Air pollution reduction over 6-years (metric tons)					
	ROG	CO	NOx	PM10	PM2.5	SOx
Replace light-duty vehicles with electric vans	113	1690	153	12	6	0.6
Replace pick-up trucks with electric vans	292	3359	540	17	10	1.4

Electric vans are expensive. To meet the needs of the farmworkers (i.e., carry tools, tow a porta-potty, etc), Ron Hughes, Executive Director of CalVans, recommends that Via plug-in hybrid electric vans be used. These vans cost approximately \$60,000 per vehicle. At this point CalVans is not in the position to invest in electric vanpools and needs outside financing. The fees charged to farmworkers cover the cost of operating and maintaining the vehicles but not the replacement.<sup>33</sup>

<sup>31</sup> The calculations assume that if a farmworker does not ride in a vanpool than he/she would carpool with three other people in a 1995 Chevrolet Suburban, carpool with 2 other people in a 1991 Honda Accord, or carpool with one other person in a 1985 Ford F150 pick-up truck. Average VMT is 80 miles per day. Vehicle models and years are the average cars or pick up trucks driven in the Central Valley. Vehicle data from Tune In & Tune Up events.

<sup>32</sup> The calculations assume that if a farmworker does not ride in a vanpool than he/she would carpool with 2 other people in a 1990 light duty vehicle or carpool with one other person in a 1990 pick-up truck. Kevin Eslinger at ARB provided the pollution rates per 80-mile trip assuming the average 1990-vehicle was used in San Joaquin Valley and that there were 6 starts/day. The calculation assumes that cars are driven 330 days/year for 6 years. Assumes the Via gets 30 electric-battery miles.

<sup>33</sup> Staff believe that increasing the fee would not be affordable to riders

If the State of California bears the full cost of procuring 230 electric vans, it would cost approximately \$3.45 million per year for four years. This does not include the costs of installing charging infrastructure, but it is recommended that residential charging be considered for most vanpools, which both minimizes costs and could be very convenient for vanpool drivers.

California state agencies should collaborate with PG&E to increase investment in accelerating deployment of electric vanpools. In PG&E’s February 2015 Infrastructure application to the CPUC, the utility stated that 10% of charging infrastructure would be installed in disadvantaged communities and \$5 million would be invested in “innovative programs” in disadvantaged communities. If PG&E’s proposal is approved by the CPUC then it is important for state agencies and CalVans to advise PG&E on the placement of infrastructure and use of the seed funding. Abigail Tinker, EV Program Manager at PG&E, explained that PG&E has not thought through how the funds would be invested and that she had not heard of or discussed CalVans vanpool fleet as an investment option. The utility needs to be briefed on strategic investments like CalVans.

Within this van electrification strategy, the most cost effective CO2 reduction is from replacing pick-up trucks with electric vanpools. Table 3 shows the cost effectiveness of replacing different types of private vehicles and conventional vanpools with hybrid-electric vans. It is not cost-effective to replace working conventional vans with new electric vans. Rather, funding should be used to (a) supplement working vans with additional electric vans, and (b) replace old vans when they reach the end of their lifespan with electric vans.

Table 3: Cost-effectiveness of replacing traditional transportation methods with electric vanpools

Vehicle	\$/MtCO2 saved
Chevrolet Suburban (1995)	\$171
Honda Accord (1991)	\$300
Ford F150 pick-up truck (1985)	\$102
Chevrolet vanpool (2011)	\$953

The main value of this strategy lies not only in cost-effective GHG and air pollution reductions, but also in supporting the introduction of EV technology in a manner that it is sure to be fully utilized.

Beyond the expected CO2 and air pollution reductions, investing in electric vans is a **strategic way to introduce EVs** to farmworkers and low-income communities in the Valley. Since CalVans is a trusted and respected institution, it is more likely that electric vanpools will be accepted and valued by the agricultural community if CalVans—rather than an “outside” group— introduces them.<sup>34</sup> This strategy of vanpool electrification could potentially expose well over 2000 farmworkers to EV technology and ensure that the technology is utilized on a daily basis.

Electrifying the vanpool fleet has **excellent prospects to scale up.**

Given the newness of the hybrid-electric van technology, it is prudent to start small with 30 electric vans for the first year. If the technology proves reliable and meets the needs of agricultural workers then CalVans could put 50 new electric vans in operation each year, creating a fleet of 230 electric vans in 5 years. Hughes states that the number of vanpools could easily double in size in the next five years, if funding is available. Doubling this electric vanpool fleet to a total of around 500 vans would displace the need for up to 7,5000 private commuter cars.

<sup>34</sup> In an interview (4/7/15) with transportation expert Susan Shaheen of UC Berkeley, Shaheen emphasized the difficulty “outside” groups have gaining trust and collaboration in the Valley, and that community connections are important for successful collaboration.

**Implementation and roll out of the electric vanpools should be relatively simple.** Introduction of the EVs will begin in the greater Fresno area due to greater farmworker density there. Hughes describes that drivers that have the oldest conventional vans will be given the option to have an electric van instead. CalVans staff are confident that drivers will jump at this opportunity. CalVans will teach drivers how to charge the van. Word of mouth about electric vans is expected to spread quickly among farmworker vanpool drivers.

**Charging stations should not be a major barrier.** Drivers will charge the electric vans at night using standard household electric outlets. CalVans will pay drivers upfront for the estimated projected charging costs. This should ease the concerns of those who are worried about high electricity bills. Charging stations can also be installed at central public locations or in multi-unit dwellings where the drivers live. If CEC funding is available for this purpose, then it may be possible for ChargePoint or another company to install the charging facilities in a timely manner. If PG&E’s infrastructure proposal is approved by the CPUC, then the utility may also be a resource for charging station installation for vanpools in years to come.

Although scaling up CalVans would greatly ease and green the commute of many agricultural workers, it will not on its own achieve the vehicle turnover needed in the Valley to meet state climate and air quality goals. Many agricultural workers may not use CalVans vanpool because of geographical limitations -- CalVans does not currently operate in Stockton and many other areas for example—or for other reasons like if farmworkers’ schedules don’t match the driver’s schedule. Additionally, agricultural workers who do use CalVans may still want to have a private car for personal and family use.

State policy and investment needs to help clean up the *existing* private passenger fleet as well. Registered old (pre-1996) light-duty passenger vehicles make up only eight percent of the Valley’s light-duty passenger vehicle stock, yet they contribute up to 48% the Valley’s air pollution from that fleet category.<sup>35</sup> These old cars are also very expensive to maintain, causing workers to often send between 20-50% of their income on transportation.<sup>36</sup> The maintenance and gas costs often prevent car owners from being able to save enough money to replace the vehicles. Agricultural workers and low-income drivers continue to invest in old and high polluting cars because they do not have access to capital or affordable loans to retire their cars for a cleaner model. To help drivers overcome this barrier, California needs to create a low-interest loan program so people can afford to retire old and high polluting cars and replace them with advanced technology vehicles like ZEVs.

## **(2) Create a low-interest car loan program**

It is widely understood that agricultural workers and low-income people in the Central Valley have little access to capital and often have no credit history or bad credit, making it difficult or impossible for them to buy or lease vehicles. In order for residents to replace polluting cars with ZEVs and achieve statewide climate and air quality goals, low- and

“A customer deciding to replace their high-emitting vehicle is the result of weeks or months of community organizing to get the customer to the [Tune In & Tune Up] event, and then hours of screening and verification at the event. That customer has had the chance to ask a lot of questions and really consider whether vehicle replacement makes sense for them. Delay at this point starts to take the process in the wrong direction – it introduces doubt and concern into the customers mind, and it starts to erode their confidence. We’ve seen through experience that a quick answer on vehicle financing is a critical step in completing an EFMP transaction.”- Tom Knox, Executive Director of Valley CAN/Tune In & Tune Up

<sup>35</sup> See Appendix I for breakdown of pollution from Pre-OBDII in the Central Valley

<sup>36</sup> Lisa Margonelli, “Driving Out of the Red with Greener Cars,” New America Foundation, March 2014.

moderate-income drivers need to have access to car loans with reasonable interest rates (i.e. under 15%).

Lack of access to affordable loans limits the success of existing ZEV adoption programs in California. For example, in order for Valley CAN's Tune In & Tune Up events to connect retire-and-replace candidates with ARB's EFMP-Plus Up incentives, a lender needs to offer a loan promptly (within 24 hours) at rates that low-income people can afford. Tom Knox, Executive Director of Valley CAN, explains that a "quick answer on vehicle financing is a critical step in completing an EFMP transaction" and that delay in loan approval can create a barrier to car retirement and replacement opportunities.

Due to the ubiquitous nature of financing problems for low-income people, there are many financial assistance models to learn from nationwide. There are about 160 nonprofit programs in both cities and rural communities across the U.S. that help employed low-income people obtain cars. Most programs also provide financial education to help loan recipients maintain a budget, avoid predatory lenders, and develop other financial tools to become economically self-sufficient.<sup>37</sup>

Through a literature review and interviews with experts, three programs—Ways to Work, KEYs, and JumpStart—emerged as possible models to expand to the Central Valley. Ways to Work and KEYs provides small car loans (under \$8000) at very low interest rates and financial education for low-income people who are employed. JumpStart is an amalgamation of a loan program, car owner assistance program, and a car dealership in rural Wisconsin. JumpStart offers low-income people a car loan that can cover the full price of a vehicle, and a discounted vehicle sales price. JumpStart also helps the loan recipient maintain the vehicle for the length of the five-year loan. See the chart in Appendix II for more detailed descriptions of the three programs. These programs have been very successful in both helping low-income get access to affordable loans and cars, and maintaining low default rates. This financing service is also correlated with a broad range of important positive results, including higher rates of housing, healthcare, school, community involvement, and jobs. Program participants credit having access to a car as a key contributor to these benchmarks.<sup>38</sup>

However, research<sup>39</sup> revealed that these programs cannot expand and scale up in a cost-effective or timely manner to meet the sizeable ZEV adoption targets. These programs are largely geared to first-time car owners and have more administrative support services and costs than are needed to serve the target population in the Valley. See Appendix II for description of why these programs are not recommended as a way to increase ZEV adoption in the Central Valley.

### **Recommendation: California should create a new loan loss reserve program facilitated by the California Pollution Control Finance Authority.**

A state-run loan loss reserve program is recommended because it is:

1. **Easy to implement** as the California Pollution Control Finance Authority already has experience running a similar program (CalCAP) for small business trucking companies;
2. **Cost efficient** since there is lower overhead due to less staffing requirements;
3. **Scalable** because it is financed by major banks instead of credit unions;
4. **Geared to the target population** (i.e. owners of high polluting cars that should be retired) as opposed to people who don't have a car;

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<sup>37</sup> "Affordable Car Ownership Programs: Transporting Families toward Financial Stability and Success" The Annie Caisey Foundation, 2006.

<sup>38</sup> Interview with Peter Kilde, Executive Director, Western Central Wisconsin Community Action Agency and JumpStart, April 7, 2015.

<sup>39</sup> Research entailed meetings with program directors across the U.S., transportation experts in the Valley, and finance experts in Sacramento.



5. **Timely in issuance of loans** (i.e. loan decisions made within 24 hours) which maximizes the number of successful loans and advanced vehicles purchased;
6. **Easy to link with other state programs** and grants, including community-based events like Tune In & Tune Up; and,
7. **Easy to ramp up and down** if needed because the program is part of a larger state agency partnering with qualified financial institutions, and not a separate organization with staff.

The California Pollution Control Finance Authority currently runs the CalCAP program, which is a good model for a low-income ZEV loan program. CalCAP currently offers a CARB-funded program to help small businesses purchase cleaner heavy-duty trucks. Under the current CalCAP program, a major bank issues loans to small businesses for new cleaner trucks. The borrower pays a fee (around two percent of loan) which California and the lender match, creating a loan loss reserve account that is equivalent to approximately eight percent of all loans. This reserve pool enables lenders to offer lower interest rates since there is less risk. The lender also benefits by being able to expand their business model through gaining experience with a new clientele (truckers). California benefits as the state leverages funding 27:1—i.e. for every \$1 spent, \$27 is leveraged—for cleaning up the heavy-duty truck fleet. Small businesses benefit by getting more advanced trucks with lower maintenance and fuel costs, and better credit scores for loans in other parts of their business. Since 2011, CalCAP’s \$7 million in investments leveraged over 4,600 loans totaling nearly \$200 million.

Although both small business truckers and low- and moderate-income people are usually considered as “undesirable” from a lending perspective, the lending program actually works. For the most part, these populations lack credit because they do business in cash, not because they are fiscally irresponsible. Lenders could also be wary because the collateral (i.e. the trucks or ZEVs) are mobile and could be stolen and go out of state. Despite these challenges, the CalCAP loans have been very successful. The demand for CalCAP loans exceeded the available supply and the California Pollution Control Finance Authority only had to use the reserve pool to repay 3.5% of loans. Staff at the California Pollution Control Finance Authority are optimistic about branching out to a low- and moderate-income ZEV loan program and feel that the state subsidy and EFMP Plus-Up will help make the low-interest loan program a success.

This financial assistance program for hybrid and ZEV ownership should operate similarly to the CalCAP model with a few tweaks. The main tweak is that for the low-income ZEV program, the borrower and lender should not pay the 1-3.5% fee for the reserve pool. Instead, funding from ARB should be used to create the loan loss reserve pool. When funding from ARB expires, the lending bank will hopefully have gained enough experience and comfort making car loans to low- and moderate-income people that they can contribute to the reserve pool as they do with CalCAP.<sup>40</sup>

The California Pollution Control Financing Authority, under the State Treasury, has applied to ARB for \$1.5 million in funding from the AQIP Low-Income Vehicle Finance Assistance Program. At least this level of funding is needed to show the potential lender that there is adequate funding available for the loan loss reserve pool. A reserve pool of \$1.5 million would enable at least 650 large loans for cars. The average car loan will be around \$12,000 with an interest rate capped at 15 percent. The loan program will entail a simple financial literacy training. Based on data collected at Tune In & Tune Up events, it is likely that this loan program will be oversubscribed (like CalCAP) and all loans will be issued within a year of getting the program up and running. Staff predict the default rate to be low (i.e. under 3-5%). Even in these circumstances of failure to repay car loans, the lender can recoup funds by repossessing and selling the car and not draw down the reserve pool.

A loan loss reserve program could save nearly 16,000 MtCO<sub>2</sub> and cost only \$94/MtCO<sub>2</sub>.

<sup>40</sup> With CalCAP, it took about 5 years for lenders to say they are confident making the loans with state support

The benefits of 650 car loans for hybrids and ZEVs are substantial. Replacing 650 Honda Accords (1991) with a Prius PHEV could save nearly 16,000 MtCO<sub>2</sub> over the lifetime of the vehicle fleet (Table 4). The cost effectiveness at \$94/ton, which is good relative to other EV strategies. This will also contribute to large reductions in criteria pollution (Table 5).

Table 4: Potential CO<sub>2</sub> benefits and cost effectiveness of a \$1.5 million car loan program

Scenario	CO <sub>2</sub> savings <sup>41</sup> (metric tons) over 150k-mile life-time of replacement car	Cost effectiveness (\$/metric ton of CO <sub>2</sub> saved)
Replace 650 Honda Accords (1991 model) with Prius PHEVs	15,900	\$94

Table 5: Potential air quality savings benefits of ZEV loan program<sup>42</sup>

Scenario	Air pollution reduction over life of car (metric tons)					
	ROG	CO	NO <sub>x</sub>	PM10	PM2.5	SO <sub>x</sub>
Replace 650 light duty vehicles (1990 model) with PHEVs	60	886	80	6	3	0.14

To be successful, the loan program needs to be integrated into community car clean-up events like Tune In & Tune Up, local air districts, and dealerships. There are strong prospects for community support and use of this program. Valley CAN is enthusiastic about the potential for scalability and ease of collaboration at Tune In & Tune Up events.

This loan program stacked with current ZEV incentives (i.e. CVRP and EFMP-Plus Up) makes purchasing a ZEV or a hybrid more feasible for low-income people in the Central Valley and should hopefully translate into dealerships being more willing to sell them. However, this loan program does not guarantee that dealers will comply and stock their franchises with ZEVs. Concerted outreach to dealers and possible use of incentive mechanisms may be needed to convince dealers that they will not lose profit by offering ZEVs.

**If dealers do not begin to offer ZEVs then it may be necessary to launch a JumpStart pilot program.** The main benefit of JumpStart is that it enables a community action agency to control which vehicles are being sold. This creates a workaround to roadblocks from obstinate car dealers. However, launching JumpStart should be carefully considered with input by community groups in the Valley, and possibly be an investment of last resort. The concern is that while JumpStart is a truly innovative program and very successful in rural areas of Wisconsin and Minnesota, it is a new

<sup>41</sup> Assumes 26,000 miles driven per year and a 150,000 mile lifetime of vehicle

<sup>42</sup> Assumes 150,000 mile vehicle lifetime. Pollution rates are based on data provided by Kevin Eslinger at ARB for average 1990 cars in San Joaquin Valley and a PHEV that gets 35 miles on the battery. Based on six starts/day.

program to California and would require significant capital, staffing, and time in order to establish, roll out, and ramp up the program.

Assuming dealers adjust and begin to offer more ZEVs, the low-interest loan program could suffice. The loan program will improve the usage rate and effectiveness of existing state incentives like CVRP and EFMP-Plus Up among low-income people. However, in order to truly optimize the impact of state incentives, several cost effective modifications should be made. The adjustments recommended below will help the state accelerate adoption of ZEVs and cleaner vehicles in the Central Valley.

### (3) Modify state incentives for ZEVs and advanced technology vehicles

California has multiple programs and an annual budget of over \$200 million to incentivize drivers to buy ZEVs and advanced technology vehicles (Figure 3). Staff from state agencies and community-based organizations have stated that it is difficult to ensure that funding for clean transportation actually reaches and helps disadvantaged communities. Several program modifications should be made in order to maximize the impact of state funds to clean up the transportation sector and improve air quality in disadvantaged communities in the Central Valley as well as in California as a whole.

#### Recommendations:

#### 1) California should increase the number of opportunities for disadvantaged communities to learn about and use state incentives like EFMP.

Figure 3: Air Resource Board Low Carbon Transportation budget

Low Carbon Transportation Allocations	Total (million)
<b>Light-Duty Vehicle Projects</b>	
Clean Vehicle Rebate Program (CVRP)	\$111.0
Public Fleets Increased Incentives Pilot	\$3.0
Car Sharing and Mobility Options Pilot	\$2.5
Vehicle Retirement and Replacement Plus-up Pilot	\$2.0
Financing Assistance Pilot	\$1.5
<b>Heavy-Duty Vehicle and Equipment Projects</b>	
Hybrid & Zero-Emission Truck and Bus Vouchers (HVIP)	\$5.0
Zero-Emission Truck and Bus Pilot	\$25.0
Advanced Technology Freight Demonstrations	\$50.0
<b>TOTAL</b>	<b>\$200.0</b>

In order to help more low-income people retire and replace old vehicles, California should support the expansion of the number and frequency of Valley CAN's Tune In & Tune Up events in the Valley. Tune In & Tune Up is the primary means for low-income Valley residents to learn about vehicle retirement and replacement opportunities. While standard education and outreach strategies (i.e. websites, flyers, billboards, etc) may work for many California residents, these outreach strategies have little impact in the Valley where there is minimal internet use, low literacy, and general

apprehension towards government programs.

California should help Tune In & Tune Up operate at full capacity in order to maximize the number of low-income drivers reached in the Valley. Every year, the Valley Air District funds 22 Tune In & Tune Up events across the Valley, reaching approximately 10,000 drivers of old and high polluting cars. By increasing the number of events per year by 35% to a total of 30 events, Tune In & Tune Up could reach approximately 3,000 additional drivers in the Valley. Tom Knox, Executive Director of Valley CAN, estimates that with the roll out of EFMP-Plus Up, 30-40 cars will get retired and replaced per Tune In & Tune Up event. Knox believes that hybrids and PHEVs could make up a minimum of 50% of the replaced cars, with the remaining cars purchased being LEVIs. This means approximately 240-320 additional retirement and replacement vehicles, including at least 120-160 additional hybrids and PHEVs owned by low-income people in the Central Valley each year. Table 6 below shows the potential CO2 savings from increasing the number of Tune In & Tune Up Events. The cost for the expansion of Tune In & Tune Up is approximately \$1,000,000 per year, which includes funding for full staffing, smog repairs, and other expenses. However, the Valley Air District does not currently have

funding for this expansion, so alternative funding sources including GGRF should be considered. Table 7 shows the reduction in hazardous air pollution from replacing old passenger cars with more modern models and PHEVs.

Table 6: CO2 savings and cost effectiveness of replacing 240 Honda Accords with advanced vehicles

Scenario	CO <sub>2</sub> savings <sup>43</sup> (metric tons) over 150-mile life-time of replacement car	Cost effectiveness (\$/metric ton of CO <sub>2</sub> saved)
Replace 240 Honda Accords (1991) with 50% Toyota Camry (1996), 40% Hybrids, 10% Prius PHEVs	3,700	\$267

Table 7: Reduction in criteria pollution from replacing old passenger cars with PHEVs<sup>44</sup>

Scenario	Air pollution reduction over life of car (metric tons)					
	ROG	CO	NO <sub>x</sub>	PM10	PM2.5	SO <sub>x</sub>
Replace 240 old passenger cars (1990) with 50% passenger cars (2012) and 50% PHEVs	22	325	29	1.4	1	0.04

In 2014, Tune In & Tune Up carried out a pre-pilot of EFMP with the San Joaquin Valley Air Pollution Control District. In six months, they helped 108 drivers to use \$5,000 rebates from the Valley Air District to retire high polluting pre-OBDII vehicles and replace them with advanced vehicles under 8 model years. Of the recipients, 98% resided in disadvantaged communities and 80% classified as low-income.<sup>45</sup>

Tune In & Tune Up succeeds through deep connections to the community. Their community-based approach helps drivers weigh vehicle options and guide drivers through the vehicle retirement and replacement process. Bilingual Tune In & Tune Up staff help drivers understand the gains to be made by retiring old cars, select a qualified EFMP vehicle that suits their individual needs, answers questions about financing, and accompanies them at the document signing at CarMax. Tune In & Tune Up staff makes sure that a vehicle dismantler arrives at the CarMax showroom to collect the retired vehicle and recycle it according to state guidelines. Tune In & Tune Up is a no-regrets strategy to clean transportation in the Valley and should be expanded as soon as possible.

## 2) California should make it easier for low-income people to retire cars

<sup>43</sup> Assumes 20,000 miles driven per year, and a 150,000 mile lifetime of vehicle (i.e. 7.5 years)

<sup>44</sup> Assumes 150,000 mile vehicle lifetime. Pollution rates are based on data provided by Kevin Eslinger at ARB for average 1990 and 2012 cars in San Joaquin Valley and a PHEV that gets 35 miles on the battery. Based on six starts/day.

<sup>45</sup> "Program Results and Testimonials: San Joaquin Valley Replacement Pre-Pilot," San Joaquin Valley Air Pollution Control District, Tune In & Tune Up, Valley CAN.

The state's current early vehicle retirement programs --the Consumer Assistance Program and the Enhanced Fleet Modernization Program-- are successful in providing incentives for residents to scrap old polluting cars. The programs are typically oversubscribed as funds run out several months before they are replenished each year. Two changes are needed to maximize the number of cars retired by low-income people in the Valley and across the state: (1) the budget should be increased for vehicle retirement for low-income drivers; and, (2) the lengthy documentation-heavy process should be streamlined for low-income drivers.

Additional funding is needed to maximize the number of old polluting cars retired by low-income people in the Valley and across California. An additional \$500,000 for retirement (with the standard incentive of \$1,000 - \$1,500 per car) would allow 300 – 500 more low-income drivers to retire high polluting cars each year. Current funding for state retirement programs comes from AB118 fees. Since these vehicles are being crushed instead of continuing to run and produce GHG emissions, the vehicle retirement creates quantifiable GHG emission reductions and should be a strong candidate for GGRF funds.

Increasing funds available for low-income vehicle retirement in the San Joaquin Valley by \$500,000 could produce between 5,000 -11,000 metric tons of CO2 savings each year. Relatively speaking, it is very cost effective as well, ranging from \$44/MtCO2 - \$100/MtCO2 (Table 8). The hazardous air pollution savings from vehicle retirement are significant as well (Table 9).

Table 8: CO2 savings and cost effectiveness of a larger and streamlined low-income vehicle retirement program<sup>46</sup>

Vehicles retired	CO <sub>2</sub> savings (metric tons)	Cost effectiveness (\$/metric ton of CO <sub>2</sub> saved)
Chevrolet Suburban (1995)	10,800	\$44
Honda Accord (1991)	5,000	\$100
Ford F150 pick-up truck (1985)	8,600	\$58

Table 9: Reduction in criteria pollutants from retiring old passenger cars and pick-up trucks<sup>47</sup>

Vehicles retired	Air pollution reduction (metric tons)					
	ROG	CO	NO <sub>x</sub>	PM10	PM2.5	SO <sub>x</sub>
Light-duty passenger cars (1990)	9	140	13	1	0.5	0.06
Pick-up trucks (1990)	16	185	30	1	0.5	0.08

The vehicle retirement program for low-income people should have streamlined requirements in order to maximize the number of people served and cars retired. The streamlined process could be administered at Tune In & Tune Up Events or at participating smog shops. The current vehicle retirement process is lengthy and documentation-heavy and deters participation from many low-income people who would likely qualify for the program. The streamlined process should give people

<sup>46</sup> CO2 savings assume 300 vehicles retired of which 25% would have operated for one more year, 25% for two more years, 25% for three more years, and 25% for four years. Assumes 20,0000 vehicle-miles travelled per year.

<sup>47</sup> CO2 savings assume 300 vehicles retired of which 25% would have operated for one more year, 25% for two more years, 25% for three more years, and 25% for four years. Assumes 20,0000 vehicle-miles travelled per year. Air pollution rates provided by Kevin Eslinger at ARB for average 1990 vehicles in the San Joaquin Valley. Assumes 6 starts/day.

a rebate when they surrender their vehicle (rather than weeks or months later) and allow for pre-qualification of people at Tune In & Tune Up events. “Simple retirement” should provide \$1,500 for customers who have documentation on hand to establish low-income eligibility and vehicle ownership, and \$1,000 for people who don’t have proof of income eligibility. To prevent fraud, Tune In & Tune Up would rely on the same functionality guidelines as is used for EFMP, i.e. the cars drive under their own power to the event, stop and start a few times over the 3-6 hours at the event, and are able to drive through the maze at the event under their own power. CarFax records or other verified odometer readings can be used to show 5,000 miles of vehicle use over the past three years.

### 3) California should offer other non-cash benefits for car retirement

In addition to providing the cash incentives for vehicle retirement, ARB should collaborate with other state and local agencies to provide additional incentives, including 6-month public transit vouchers, subsidized car-share membership, and information about public transit bus routes. It is important to support people’s use of the limited public transit and future car-sharing programs in order to ease the transition away from dependence on personal vehicles. Provision of vouchers for alternative transit options would serve as a helpful off-ramp for drivers who cannot afford vehicle replacement but want to get rid of their problematic car. Helping these low-income customers out of their unreliable and expensive to maintain cars can provide household savings and reduce air pollution.

### 4) Pick-up truck replacement with a lower MPG requirement should be allowed within EFMP-Plus Up

EFMP-Plus Up only allows vehicle replacement incentives for cars built in the last 8-years with 20+ MPG fuel economy. These standards make sense to incentivize cleaning the fleet for light-duty passenger vehicles. However, a large opportunity is missed when it comes to getting old and high polluting inefficient pick-up trucks off the roads and replaced with cleaner models. Agricultural workers rely on pick-up trucks for their livelihood and are not going to retire their trucks for small ZEVs. The next best option is to get farmworkers out of old pick-ups built before 1996 into newer, cleaner, and more efficient LEV-II models. A new EFMP-Plus Up category should be added for pick-up trucks. At the most basic level, the requirements for this incentive should be (1) retirement of a working Pre-OBD II pick-up truck that fails a smog check, and (2) replacement with a pick-up truck no older than 8 model years that averages 18 mpg or better. Table 10 below shows the CO2 savings from replacing old pick-up trucks with newer models. Table 11 shows the hazardous air pollution savings from replacing old pick-up trucks with newer models.

Table 10: CO2 savings and cost effectiveness of including pick-up trucks in EFMP-Plus Up<sup>48</sup>

Scenario is for 200 trucks	CO <sub>2</sub> savings (metric tons)	Cost effectiveness (\$/metric ton of CO <sub>2</sub> saved) <sup>49</sup>
Retire 1985 Ford F150 pick-up truck and replace it with 2011 Ford F150 pick-up trucks	1,900	\$413

<sup>48</sup> Assumes trucks are driven 20,000 miles a year. Savings are based on 4 years of driving 200 new pick-up trucks.

<sup>49</sup> Based on a \$4000 incentive for retired and replaced pick-up truck



Table 11: Air pollution savings from including pick up trucks in EFMP-Plus Up<sup>50</sup>

Scenario	Air pollution reduction over 4-year remaining life of truck (metric tons)					
	ROG	CO	NO <sub>x</sub>	PM10	PM2.5	SO <sub>x</sub>
Retire 1990 pick-up trucks and replace with 2012 pick-up trucks	17	191	31	0.3	0.3	0.02

Even with the above changes to state programs and the proposed provision of low-interest loans, low-income people may still not be able to purchase a ZEV. For those who cannot or choose not to participate, it is important to ensure that they can still opt to retire older cars and have access to clean and affordable forms of transportation. A ZEV car-sharing program could allow people without access to a private vehicle to meet their personal transportation needs.

#### (4) Create a ZEV-car sharing program

The establishment of low-income EV car-sharing programs could benefit agricultural workers and low-income communities in the Central Valley. *Traditional* car-sharing programs are spreading throughout the country and are correlated with a wide number of benefits, including: decreased use of cars, increased sale or permanent retirement of personal cars,<sup>51</sup> reduced miles driven per person, decreased or delayed purchase of vehicles,<sup>52</sup> cost savings for drivers,<sup>53</sup> energy savings, and reduction in air pollution.<sup>54,55</sup> The California Air Resources Board

*Susan Shaheen, a transportation expert, on low-income EV car-sharing programs:*  
 “Disadvantaged populations are specialized and it is really important to work with community-based organizations and the people themselves. The services need to reflect the interests of that community. ...There is a high degree of distrust about outsiders coming in with these solutions... That shows the need for community buy in and getting trust...Need to have the community on board.”

<sup>50</sup> Assumes trucks are driven 20,000 miles a year. Savings are based on 4 years of driving 200 new pick-up trucks. Air pollution rates provided by Kevin Eslinger at ARB for average 1990 and 2012 pick-up trucks in the San Joaquin Valley. Assumes 6 starts/day.

<sup>51</sup> A study by Transportation Sustainability Research Center at the University of California, Berkeley of 9,500 participants in carsharing programs in U.S. and Canada showed that 25 percent of members sold a vehicle and 25 percent postponed a vehicle purchase due to carsharing across the study population (Joel Espino, “Electric Carsharing in Underserved Communities,” Greenlining Institute, January 2015)

<sup>52</sup> A study by Transportation Sustainability Research Center at the University of California, Berkeley of 9,500 participants in carsharing programs in U.S. and Canada showed that each carsharing vehicle replaces between nine to 13 vehicles (including both sold vehicles and postponed car purchases) (Joel Espino, “Electric Carsharing in Underserved Communities,” Greenlining Institute, January 2015)

<sup>53</sup> Other research has indicated that households save between \$154 and \$435 monthly per member after joining carsharing. These savings have profound benefits for families that spend a disproportionate share of their incomes on transportation. (Joel Espino, “Electric Carsharing in Underserved Communities,” Greenlining Institute, January 2015)

<sup>54</sup> A study by Transportation Sustainability Research Center at the University of California, Berkeley of 9,500 participants in carsharing programs in U.S. and Canada showed that Carsharing participants reduced both vehicle miles traveled and greenhouse gas emissions by up to 43 percent, considering both vehicles sold and postponed purchases. (Joel Espino, “Electric Carsharing in Underserved Communities,” Greenlining Institute, January 2015)

<sup>55</sup> University California, Berkeley. Transportation Sustainability Research Center. <http://tsrc.berkeley.edu/carsharingiversityof>

recognizes the potential of car-sharing programs to help introduce EV technology to disadvantaged communities and is soliciting proposals for pilot programs to fund with a \$2.5 million dollar annual budget.

### **Recommendation: Fund CalVans' proposed EV car sharing pilot program**

The California Air Resources Board should fund CalVans to create EV-car sharing pilot programs in target communities in the Valley. CalVans has successfully provided transportation services for over a decade, understands the transportation needs of Valley residents, and is trusted and respected by residents, community-based organizations, and local government. Staff from the San Joaquin Valley Clean Cities Coalition, which is a member of the San Joaquin Valley Plug-in Electric Vehicle Coordinating Council, is supportive of CalVans expanding its services into EV car sharing.<sup>56</sup> The San Joaquin Valley Air Pollution Control District and the Fresno County Rural Transit Agency also endorse CalVans' proposal.

Typically, it would be most efficient to replicate successful California car sharing programs (like Zipcar, Enterprise CarShare, or CityCarShare) in a new cities and counties. However, given the unique characteristics and needs of the Valley, direct replication would be a mistake. The common brand name car sharing companies and models are geared to serve well-educated, technologically savvy, and upwardly mobile 20 to 30 year-olds,<sup>57</sup> i.e., a very different population than agricultural workers and low-income people in the Central Valley. Those models would also not be profitable in the Valley and would not likely earn the revenue needed to continue operations. Rick Hutchinson, CEO of City Car Share described that car sharing models—whether they are one-way, round trip, or peer-to-peer models— don't work in the Valley because of the lack of population density, insufficient public transit, and participation costs above most households' means.<sup>58</sup> He emphasized that state or federal subsidies is required to create and sustain a car sharing system that is both profitable for the host company and affordable for participants in the Valley.

If selected, the CalVans proposed pilot program will place three electric cars in five communities in Fresno, Kings, and Madera counties<sup>59</sup> where there is a large need to lessen the use of gross polluting vehicles. All low-income people will be eligible to participate in car-sharing as long as they have a driver's license with a good driving history. Once a member, they will be able to become drivers for the vanpool system as well. Current vanpool drivers will automatically be able to participate in the car-share program. Members will get a passcode and will be billed 10% of the program operating costs (equivalent to the fee for conventional bus service), with the remaining 90% covered by the ARB grant. A bill would be generated at the end of the trip and sent to the car share member. Abuse of the program or non-payment would result in the person being denied future trips.

To use the program and reserve a car, an approved driver would call the already established toll-free number at the Hanford office and speak with bilingual staff. If approved, the driver's passcode would immediately be transmitted to the vehicle onboard computer, allowing the driver to start and drive the vehicle. Keys to the vehicles would be available in a lock box at the charging site. The onboard GPS will track the vehicles' movement and show who is driving and driver speed. This allows CalVans staff the ability to ability to monitor driving habits and promote roadway safety by immediately addressing problem drivers.

Implementation will be relatively straight forward, as CalVans will use many existing systems. CalVans would purchase and maintain the vehicle as it does for the 550 vehicles it presently operates.

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<sup>56</sup> Interview with Linda Urata, Coordinator, San Joaquin Valley Clean Cities Coalition, April 16, 2015

<sup>57</sup> Joel Espino, "Electric Carsharing in Underserved Communities," Greenlining Institute, January 2015

<sup>58</sup> Interview with Rick Hutchinson, CEO of City Car Share, 4/20/15.

<sup>59</sup> Target cities include Avenal, Coalinga, Firebaugh, Kerman, and Mondota.

Emergency service would be provided by CalVans' 24/7 emergency response. CalVans insurance will cover car-share participants. CalVans will use ChargePoint's current billing system, which will keep start up time to a minimum. Each EV car-sharing placement will require the installation of up to 5 dual port Level 2 charging stations in central locations that are open 24 hours a day to allow for full use at any time. It will take ChargePoint a few months to install the charging systems.

Outreach will occur largely by word of mouth, which is effective in the Valley. Traditional methods that common car-sharing services use like social media, internet, and promotional deals are less suitable for the Valley. CalVans' outreach method will focus on local Hispanic support groups, outreach on weekend and evenings when residents are not working, and getting the word out to the vanpool drivers and riders in the community. Promotion of the program will rely heavily on personal contacts with farmworkers, growers and organizations representing the local communities.

The model is likely to be very accessible for low-income residents as well. Traditional programs may be out of reach of low-income residents with weak or no credit history and limited payment options. CalVans however will tailor the operations of the EV-car sharing program to meet the abilities and needs of the residents. Instead of car reservation and payment being entirely based on web-based interfaces and credit cards as most California and national programs are, CalVans will use a simple method: clients will call a number and reserve the van on the phone or by visiting a local office. They can pay in cash if needed. This is important because many low-income residents don't have easy access to internet, smart phones, or credit cards. The drivers will never need to possess a credit card or complete a credit application to qualify to use these vehicles.

The car-sharing program has large potential to scale-up based on community demand and budget. CalVans staff believe that as the program increases in popularity and program objectives are met, they could easily double the size of the CalVans Car Share fleet yearly, funds permitting.<sup>60</sup> The potential CO2 reductions are meager for the pilot program and the costs are *very* high (Table 12). However, there could be large potential savings and economies of scale with a larger car-sharing fleet. Reduction in hazardous air pollution for the 15-ZEV fleet is shown in Table 13.

Table 12: Potential CO2 savings from a pilot EV car-sharing program<sup>61</sup>

Scenario	CO2 savings (metric tons)	Cost effectiveness (\$/metric ton of CO2 saved)
Car-sharing 15 PHEV pilot program	521	\$2877

Table 13: Potential reduction in criteria pollutants from a pilot EV car-sharing program<sup>62</sup>

Scenario	Air pollution reduction over life of cars (metric tons)					
	ROG	CO	NOx	PM10	PM2.5	SOx
Car-sharing 15 PHEV pilot program	2	29	3	0.2	0.1	0.005

<sup>60</sup> CalVans Car-Share Pilot Project Application to ARB, April 18, 2015.

<sup>61</sup> Assumes 35,000 miles a year and that cars last for 6-years, based on CalVans Application to ARB.

<sup>62</sup> Assumes 35,000 miles a year and that cars last for 6-years, based on CalVans Application to ARB. Air pollution rates provided by Kevin Eslinger at ARB for using PHEVs instead of 1990 passenger cars in the San Joaquin Valley. Assumes 6 starts/day.

Theft and vandalism at the EV-charging site is a risk, but CalVans' EV cars are much more likely than the average car to be protected from vandalism and theft since they are seen as a community resource.<sup>63</sup>

The main challenge with a low-income EV car-sharing program is making ends meet. Electric vehicles can cost 50% more for car-sharing companies because of the upfront cost of the car. EVs also require 6-8 hours of charging, which limits the time it can be used to get a return on investment. The primary cost would be the vehicle acquisition costs, installation of charging stations, and staffing for program administration. If PG&E's infrastructure proposal is approved by the CPUC, then future charging station installation costs could be covered by the utility. In PG&E's infrastructure application to CPUC, it earmarked 10% of charging stations to be located in disadvantaged communities. PG&E will look to state agencies and community-based organizations for guidance on where to install charging stations. After CPUC issues a decision on PG&E's application, which is expected occur in late 2015 or early 2016, PG&E could be a potential partner to support the construction of Level 2 charging stations in strategic locations. This type of partnership would lower the costs to CalVans, thus resulting in more affordable rates and uptake by residents. However, in the short-term, it may be necessary for CalVans to pay ChargePoint for installation.

### ***Other potential models***

Beyond supporting community-driven pilot programs like CalVans, there is an additional model called a "fractional" system that could be valuable to residents in the Valley.

Car-sharing transportation expert Susan Shaheen of UC Berkeley recommends a fractional model of car-sharing. Under a fractional model, up to four households co-lease a car and split access to the vehicle. This is common in urban Brazil and could work well for the Valley in areas where there are close networks of people that know and trust each other. It is a family or community based approach to car ownership that Shaheen believes is well-suited for low-income communities. Although Shaheen does not know of any currently operational fractional models in the U.S., she designed and tested the system for 10 months in her research. The economic savings for participants were impressive, so much so that it could be a gateway to entry of EVs into low-income communities. However a multi-year grant is needed to kick this model into action. The recommendation is for ARB to begin to or continue to look into the model and consider funding in it future grant solicitation cycles.

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<sup>63</sup> Interview with Tom Knox, Executive Director, Valley CAN, April 26, 2015

**Table 14: Recap of potential CO2 savings and cost effectiveness of policy recommendations**

Policy	Scenario	CO2 savings (MtCO2)	Cost effectiveness (\$/MtCO2 saved)
Electrify vanpool fleet	Replace informal carpools in old Chevrolet Suburbans, Ford pick-up trucks, and Honda Accords with 230 hybrid electric vans	50,000 – 146,000	\$100-\$300
Low-interest loan program	Replace 650 Honda Accords (1991 model) with Prius PHEVs	15,900	\$94
Increase # of Tune In Tune Up Events	Replace 240 Honda Accords (1991) with 50% Toyota Camry (1996), 40% Hybrids, 10% Prius PHEVs	3,700	\$267
Increase budget for low-income vehicle retirement	Retire 300 old cars (Chevrolet Suburbans, Ford pick-up trucks, and Honda Accords)	5,000 – 10,800	\$44 - \$100
Include pick-up trucks in EFMP-Plus Up	Retire and replace 200 pick-up trucks	1,900	\$413
Car-sharing pilot program	15 PHEV pilot project	521	\$2877

**Table 15: Recap of potential reduction in criteria pollutants from recommended policies**

Policy	Scenario	Air pollution reduction over life of EVs (metric tons)					
		ROG	CO	NO <sub>x</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub>
Electrify vanpool fleet	Replace informal carpools light-duty passenger cars and pick-up trucks built in 1990 with 230 hybrid electric vans	113 - 292	1690 - 3359	153 - 540	12 - 17	6 - 10	0.6 - 1.4
Low-interest loan program	Replace light-duty passenger cars built in 1990 with PHEVs	60	886	80	6	3	0.1
Increase # of Tune In Tune Up Events	Replace 240 light-duty passenger cars built in 1990 with 50% light-duty passenger cars built in 2012 and 50% PHEVs	22	325	29	1	1	0.04
Increase budget for	Retire 300 cars built	9 - 16	140 - 185	13 - 30	1	.5	.06 - .08



low-income vehicle retirement	in 1990 (passenger cars and pick-up trucks)						
Include pick-up trucks in EFMP-Plus Up	Retire and replace 200 pick-up trucks	17	191	31	.3	.3	0.02
Car-sharing pilot program	15 PHEV pilot project	2	29	3	0.2	0.1	0.005

## Methods

The above recommendations are the product of interviews with experts and data analysis.

The following organizations were interviewed, often on multiple occasions.

- Agricultural workers
- California Air Resources Board (CARB)
- California Energy Commission (CEC)
- California Governor’s Office
- California Treasury Office/California Pollution Control Finance Authority
- CalVans
- CityCarShare
- JumpStart
- Keeping Employment Equals Your Success (KEYS)
- Pacific Gas & Electric (PG&E)
- San Joaquin Valley Clean Cities Coalition (SJVCCC)
- The Greenlining Institute
- The Natural Resources Defense Counsel (NRDC)
- Tune In & Tune Up
- United Farm Workers (UFW)
- University of California, Berkeley – Energy and Resources Group
- University of California- Transportation Sustainability Research Center
- Valley Clean Air Now (Valley CAN)
- Ways to Work

## Closing Remarks

Through speaking with stakeholders about strategies to clean the vehicle fleet in the Central Valley, I repeatedly heard three messages. I include them here for future discussion and consideration.

- Policies and programs that may work for most counties in California don’t necessarily work in the Valley. Community buy-in and participation can take years in the Valley. It is important to

build upon and expand existing successful models rather than replicate “outside” programs in the Valley.

- While replacement of old vehicles with ZEVs is the end goal, it is important to not lose sight of the large air quality benefits that can be obtained by replacing old cars (pre-OBDIIs) with cleaner cars built in the last eight years (LEVIIIs). Getting low-income people in advanced vehicles, such as LEVIIs and basic hybrids, may be the first step in a longer-term transition to ZEVs.
- There are strong prospects for cleaning up the transportation sector and improving air quality in the Valley given the involvement of CalVans, Valley CAN’s Tune In & Tune Up program, and the San Joaquin Valley Air Pollution Control District. The South Coast is a much more challenging region that lacks these established programs. For California to meet climate and air quality goals, attention needs to also be focused on how to clean up the transportation fleet in the South Coast.

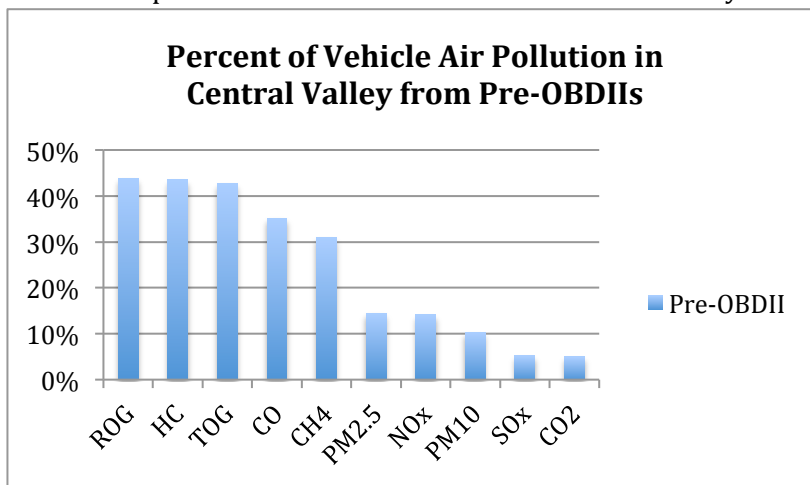
# Appendix I

## Pollution from Vehicles in the Central Valley

Air pollution<sup>64</sup> from vehicles is disproportionately high in the Central Valley, compared to California as a whole. The higher pollution levels are primarily due to Valley resident's large number of agricultural and medium/heavy duty trucks, poorer overall efficiency of vehicles, and higher mileage (measured in "vehicle miles travelled" (VMTs)). The bulk of hazardous air pollution in the Central Valley comes from Pre-OBDII vehicles, i.e. vehicles built before 1996. Many Pre-OBDII vehicles are not registered with the Department of Motor Vehicles (DMV) because they fail smog tests and therefore do not comply with the required minimum air quality standards to stay registered. For instance, in the close to 100 Tune In & Tune Up Events that have occurred in the Central Valley since 2011, 45% of the participating cars were not registered. Since the EMFAC data that CARB and other agencies and organizations use only accounts for registered vehicles, the following statistics likely understate the pollution problem.

Although registered Pre-OBDII vehicles make up less than 10% of the Valley's vehicle fleet and less than 5% of the Valley's vehicle miles travelled (VMTs), they produce disproportionately high levels of hazardous emissions. One would expect that if these cars make up ~5% of the Valley's daily driven miles, then they should contribute to only ~5% of the Valley's daily air emissions. However, Chart 1 below shows the larger than expected levels of pollution from these vehicles, climbing up to nearly 44% of the regions' reactive organic gas (ROG) emissions.

Chart 1: Air pollution from Pre-OBDIIs in the Central Valley



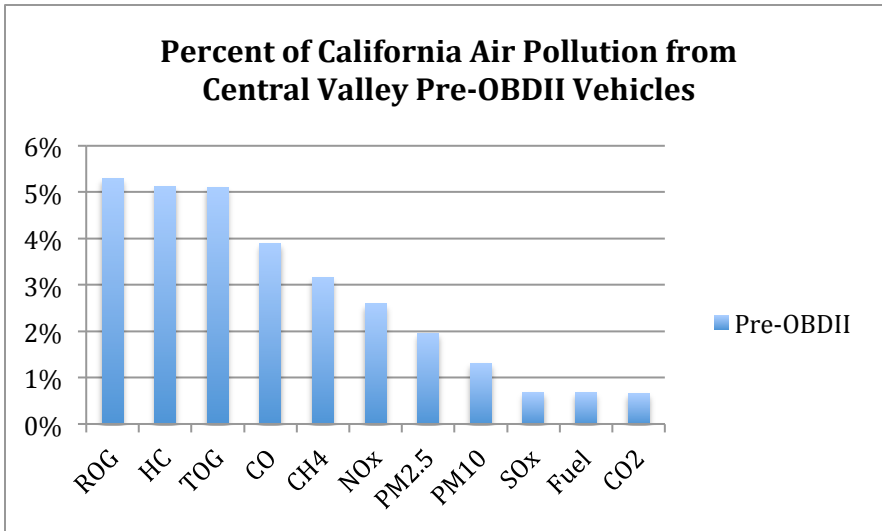
Similarly, the Central Valley's Pre-OBDIIs also produce a considerable proportion of California's air pollution from cars. Central Valley's Pre-OBDIIs make up only 1% of the state's fleet and only 0.5% of the state's VMTs. Despite these minute levels, the Valley's Pre-OBDIIs contribute to up to 5.3% of the state's air pollution from vehicles (Chart 2)

<sup>64</sup> Air pollution analyzed for this report includes:

- Hydrocarbons (HC). HC can be expressed as TOG (total organic gases), ROG (reactive organic gases, i.e. EPA's volatile organic compounds), THC (total hydrocarbon), or CH4 (methane)
- Carbon monoxide (CO)
- Nitrogen oxides (NOx)
- Carbon dioxide (CO2)
- Particulate matter (PM). PM estimates are provided for total suspended particulate, particulate matter 10 microns or less in diameter (PM10), and particulate matter 2.5 microns or less in diameter (PM2.5).
- Fuel consumption. Although, this is not a pollutant, fuel consumption is calculated based on the emissions of CO, CO2 and THC using the carbon balance equation.
- Oxides of sulfur (SOx). Emissions of oxides of sulfur are a function of the sulfur content of fuel. The model calculates these emissions by multiplying the fuel consumption by the weight fraction of sulfur in a gallon of fuel.

<http://www.arb.ca.gov/msei/emfac2011-ldv-users-guide-final.pdf>

Chart 2: California air pollution from Central Valley's Pre-OBDII fleet



By homing in on California's Pre-OBDII fleet, it is evident that the Pre-OBDIIs located in the Valley make up a large portion of the state's air pollution. Chart 3 below shows that only 11% of the state's Pre-OBDII vehicles are located in the Central Valley. Central Valley's Pre-OBDII vehicles proportionately make up 11% of the state's VMTs from Pre-OBDIIs. However, the Pre-OBDIIs in the Central Valley contribute to over 54% of emissions of the state-wide Pre-OBDII fleet (Chart 4). One would expect a linear relationship, i.e. air pollution hovering around

11%. However the high rates of air pollution suggest that some of the Pre-OBDIIs in the Valley are disproportionately dirtier than the state-wide average Pre-OBDII fleet.

Chart 3: Proportion of California's Pre-OBDIIs located in Central Valley

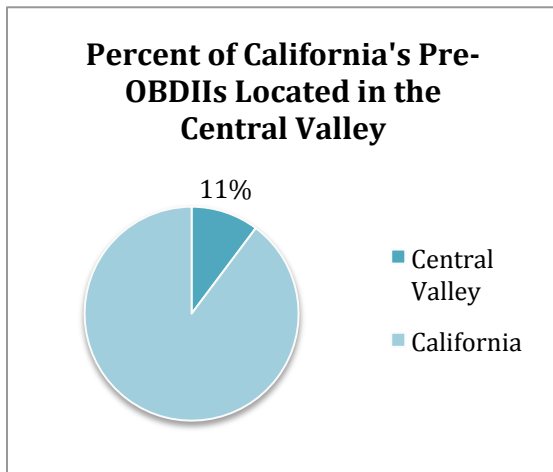
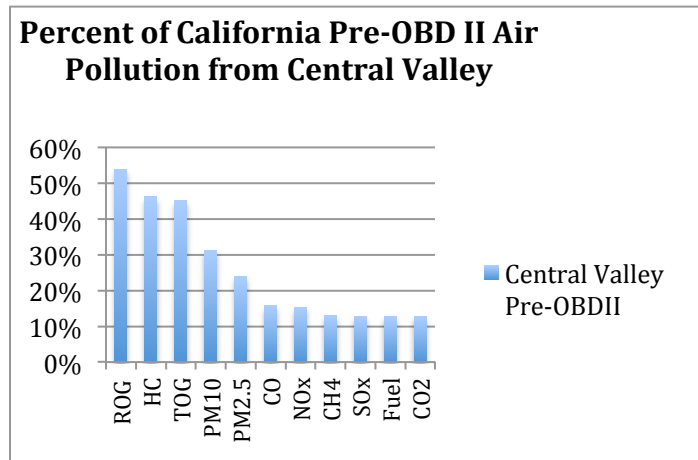


Chart 4: Pre-OBDIIs in the Central Valley produce most of the pollution from Pre-OBDIIs state-wide



This data raises the questions: *Why are the Central Valley's Pre-OBDIIs more polluting than the average CA Pre-OBDIIs? Which types of Pre-OBD II vehicles in Central Valley's fleet are the most polluting?*

The largest polluters in the Pre-OBDII fleet in the Valley are: passenger cars (LDA), medium-heavy duty diesel public fleet trucks (T6 Public), medium-heavy duty diesel agricultural trucks (T6 Ag), light duty trucks (LDT2), heavy-heavy duty diesel drayage trucks (T7 Other Port), heavy-heavy duty diesel CA International Registration Plan Construction trucks (T7 CAIRP), school busses (SBUS), heavy-heavy duty diesel non-neighboring out-of-state trucks (T7NNOS), and medium duty trucks (MDV).

Light duty passenger vehicles are the largest contributor of all vehicles to Central Valley's air pollution, mostly due to the fact that these cars make up ~45% of the Valley's fleet and VMTs. In fact light duty passenger vehicles are the top contributor of the following pollutants in the Valley: CO2, CO, SOx, CH, CH4, PM 10, PM 2.5, ROG and total organic gasses (TOG).

This data analysis helped to narrow the focus of the report to light duty passenger vehicles and pick-up trucks.

1. Given the substantial role of light duty passenger vehicles in GHG and hazardous air pollution, the bulk of the report focuses on programs and policies to replace the most polluting light duty vehicles (i.e. Pre-OBDIII passenger cars) with more advanced vehicles like PHEVs.
2. Light duty trucks (i.e. Pre-OBDIII pick-up trucks) also emit significant air pollution and are largely relied on as a work vehicle for agricultural workers. The report addresses policy changes needed to incentivize retirement of older pickup trucks and replacement with more advances and cleaner vehicles (i.e. LEVIIs).
3. As noted above, a significant portion of the pollution is from heavy duty trucks. The report notes that there are technological limits to what kind of trucks can be replaced with cleaner models. There are several programs funded by ARB and other state agencies to help clean up the portion of the fleet where cleaner models exist. The report also acknowledges that replacement of highly polluting heavy duty trucks with cleaner models when available brings a large air quality gain. Analysis of the potential for heavy duty truck retirement and replacement is beyond the scope of this report.

## **Appendix II**

### **Comparison of financial assistance programs for vehicle ownership**

Program	Location	Size and terms of loans	# of loans per year	Criteria for loans	Cars purchased	Other program components	Annual Budget	Default Rate	Outreach
Ways to Work	National. California: Alameda, San Mateo, San Diego, and Contra Costa	1) Max loan is \$8,000 2) 8% interest 3) If loan amount is increased, interest rate can go up to 15% 4) Payments under \$270/month	~50 in Alameda	1) CA driver's license 2) car insurance 3) not be on parole or probation	Affordability, reliability, and fuel efficiency are a priority	Participants undergo a three-hour in-person financial education class.  Program coordinator calls or emails the loan recipients every month to help people stay on track with loan repayment.  A local loan committee decides on the loan applications. The committee is made up of staff from social services and the lending	\$150,000 in Alameda for program administration and reserve pool	11%  After 120 days of nonpayment, Ways to Work pulls the car to sell in order to recoup losses. If they sell it at a loss the reserve pool covers the difference.	There is active community outreach to attract new loan recipients. Outreach is focused on social workers, heads of food banks, and directors of social services. Ways to Work has information about the program in 2-1-1 and reaches out to businesses as well.

						banks. The loan committee gets together once a month to decide who is approved deferred or declined.			
KEYS	Contra Costa County	1) \$4000 loan 2) 7% interest 3) 2-year payback	15	1) 3 months of employment at 32 hours/week 2) CalWorks eligibility (need county assistance and have to have a child in household); 3) CA drivers license with 3 years DMV records of no more than 1 point 4) Car	The affordability of the car is the priority.  Beginning in 2006, loan recipients were permitted to buy a vehicle from the county's retired fleet that were inspected and approved by an independent mechanic.	The loan committee that is staffed by the department and credit union lending partner. The committee approves or denies the application.  A 1 hour money management class and an auto maintenance class are required to receive a loan.	\$35,000	Default rate is 6%  If anyone defaults on a loan, the credit union pays it and the car is repossessed.	The program is embedded within the county. Referrals are made to KEYS through a county social worker



				insurance					
JumpStart	7 rural counties in WI and MN	1) Credit union gives loan for 100% of vehicle (i.e. no down payment) 2) 6% interest 3) 5-year pay back	~40	1) Bad credit or no credit history 2) Employed and able to pay loans (about \$200/month) 3) Below ~250% of poverty line  1 in 8 applicants gets a car loan.	2-4 year old cars from their own dealership.  Cars must be economical and have good mileage & low repair costs.  3 hybrids were purchased and more will be if they come on market at affordable rates.  Cars are sold below retail rate but at a slight mark up from wholesale rate.	5-year commitment made to loan recipient that JumpStart will repair the car if there is a major mechanical problem.  \$500 program participation fee to cover warranty pool for everyone for major repairs. 20% of payment is escrowed for minor maintenance, oil repair, etc. so when new owners do minor repairs, Jumpstart signs off on	\$140,000 for staff and dealership	Repossession of car rate: 9%  They are happy with this rate as it is similar to commercial car loans and they feel that taking risk is doing their job.  In cases of loan payment default, Jumpstart pays off the loan to credit union and resells the vehicle. This lowers risk to credit union.	They've existed for 50 years and are well known. They are oversubscribed so there is no need for outreach. Sometimes they advertise the dealership in regional papers, but in general there is no need for outreach.

						that payment.			
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The central reasons Ways to Work and KEYS are not recommended for the state to expand are as follows:

1. They **cannot quickly scale** to the number of loans that are needed (i.e. several hundred loans right away). These programs take about a year to set up and expansion would require additional staff and formation of a new volunteer loan committee.
2. The programs are very “high touch,” requiring staff to keep in touch with loan recipients over the years and requiring lengthy in-person financial and/or car maintenance trainings. This means **higher administrative budgets** and a lower limit on the number of people who can receive loans based on staff capacity.
3. The loan committee in these programs make **infrequent loan decisions** (i.e. only once per month). This is too long a time frame for a people who are on the fence and not determined to get a ZEV to wait. Decisions are needed on a much shorter time frame (i.e. under 24 hours) in order to not lose peoples’ interest in retiring their cars and replacing with ZEVs.
4. These programs are **very costly per loan** made. For instance, Ways to Work estimates that expansion to the Central Valley with a loan rate of 100 car loans at \$8,000 a piece per year would cost the state around \$500k/year, i.e. \$5,000 per loan in state support. This means that \$5000 in state support only leverages \$3,000 in additional funds.
5. The **loan amounts offered are too low** (i.e. \$4,000-\$8000) and may not be enough to purchase a ZEV.
6. These programs **target a different population** than the state would for ZEVs. The programs’ main mode of outreach is through county services to clients who don’t have cars. The people who are targets for ZEVs in the Central Valley may not use county services (like social workers and food banks) and they already have cars that are old and high-polluting. The best mechanism for outreach may be through participating in Tune In & Tune Up events.

JumpStart is an interesting model that ARB should become familiar with and keep in its back pocket as it ramps up EV programs in the Valley. If dealers continue to be slow to stock their outlets with EVs, then JumpStart may be a necessary model to consider. ARB can consider funding a multi-year pilot program like JumpStart to ensure that EVs are available in the Valley. JumpStart staff recommends using a non-profit like a community action agency to host the program since they are used to ramping up programs.

The main benefits of the JumpStart model are:

- 1) The host organization can control the type of vehicles that are available for sale
- 2) Loans can be issued at a low rate for 100% of the vehicle
- 3) Default rates are low
- 4) The program can scale up to +100/loans and vehicle purchases per year
- 5) Collaboration with existing programs like Valley CAN is feasible

The main drawbacks and reasons why JumpStart is not a priority recommendation are:

- 1) It will require significant start up time to lease a site, establish a dealership, staff up, etc
- 2) Large upfront capital needed
- 3) Not geographically flexible—i.e. there will only be one or two Jumpstart locations. They Valley is vast so the JumpStart ZEVs may only benefit the residents in close enough proximity
- 4) If dealers begin to stock dealerships with ZEVs in earnest and a low-interest loan program is established, then JumpStart will not be needed in the Valley