

2021

Mitigation Plan

Report to Achieve Zero Net Carbon Emissions and
Reduce Vehicle Miles Traveled

*California Air Resources Board (CARB)
Southern California Headquarters*



Report Prepared by:
CARB Staff

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Mitigation Plan: Report to Achieve Zero Net Carbon Emissions and Reduce Vehicle Miles Traveled

Report Prepared By

- Sustainable Transportation and Communities (STC) Division
- Administrative Services Division

Executive Officer

Richard W. Corey

Deputy Executive Officers

Annette Hebert

Edie Chang

Division Chiefs

Jennifer Gress

Edna Murphy

Primary Author

Dana Papke Waters

Co-Authors

Bob Fletcher

Shannon Hatcher

Annalisa Schilla

Tianyang (Tony) Wang

Lana Wong

Contributors

Analisa Bevan

Nicole Dolney

Vicky Hanks

Nesamani Kalandiyur

Elise Keddie

Tola Perkins

Sabina Wiley

Mark Williams

Zhuo Yao

Disclaimer: The COVID-19 pandemic creates uncertainties. There are uncertainties related to the analysis of employee commute patterns (e.g., more telecommuting; less commute miles) and CARB plans to implement a local mitigation program. These uncertainties will likely not be clear until mid-2022 at the earliest

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Overview: Purpose of the Mitigation Plan

The California Air Resources Board (CARB) is a world leader dedicated to protecting public health and natural resources while effectively reducing air pollution and mitigating the impacts of climate change. CARB is building a new motor vehicle and engine emissions testing and research facility in southern California, which will be recognized as CARB's Southern California Headquarters (Facility). CARB has committed to achieve a zero-net increase in greenhouse gas (GHG) emissions for the construction and operation of the Facility (Dudek, 2017). This Mitigation Plan (Plan) provides supporting technical documentation of the zero-net carbon pathway.

GHG Target

CARB has committed to achieve a zero net increase in GHG emissions associated with the construction and operation of CARB's Southern California Headquarters. Prior to Covid-19, Figure 1 indicates that year 2021 emissions may total approximately 1,840 metric tons CO₂e (MtCO₂e). Over a 30-year time frame, CARB anticipates a need to mitigate approximately 32,584 MtCO₂e total.

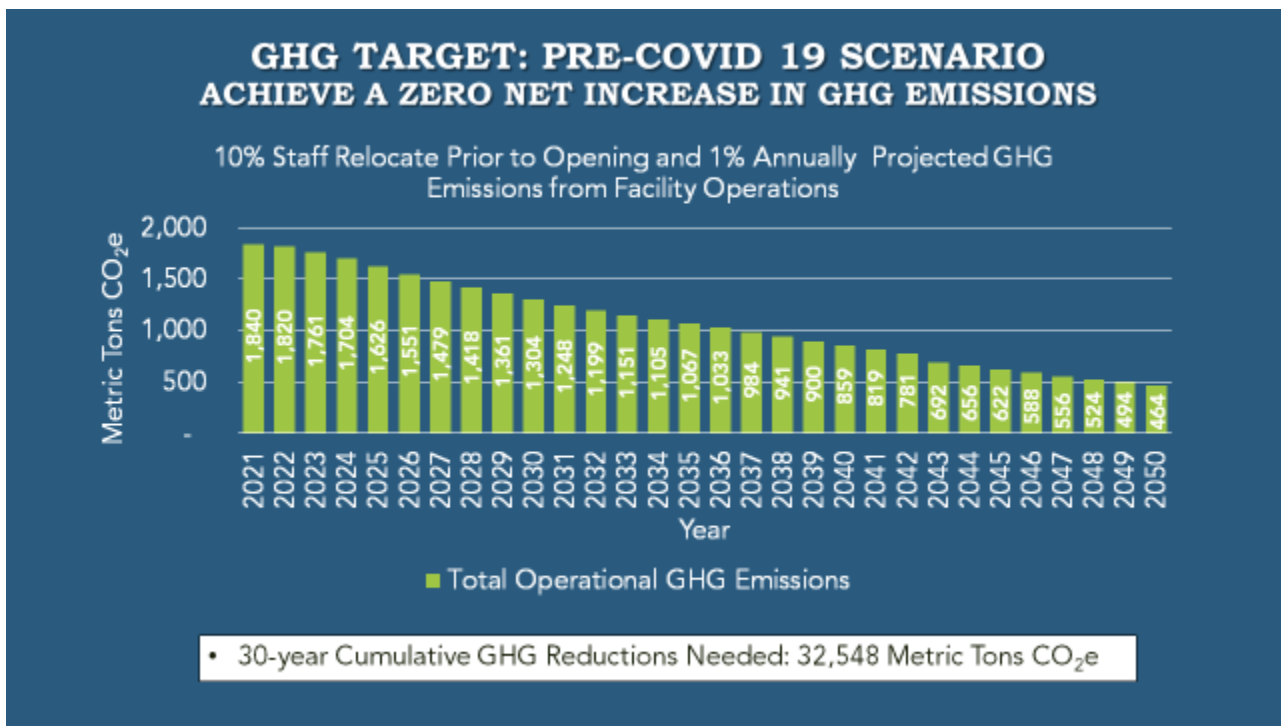


Figure 1. Pre-Covid 19 Projections of Business as Usual GHG Emissions of Facility Operations

Given the stay at home order due to the Covid-19 pandemic and how it may affect future work policies, CARB staff developed updated estimates of projected GHG emissions over time. When it's safe to return to work, CARB estimated that all staff would telework two days per week. In this scenario, Figure 2 indicates that year 2021 GHG emissions may total

approximately 840 MtCO₂e. Over a 30-year time frame, CARB anticipates a need to mitigate a projected total of 12,299 MtCO₂e if all staff telework two days per week through 2050.

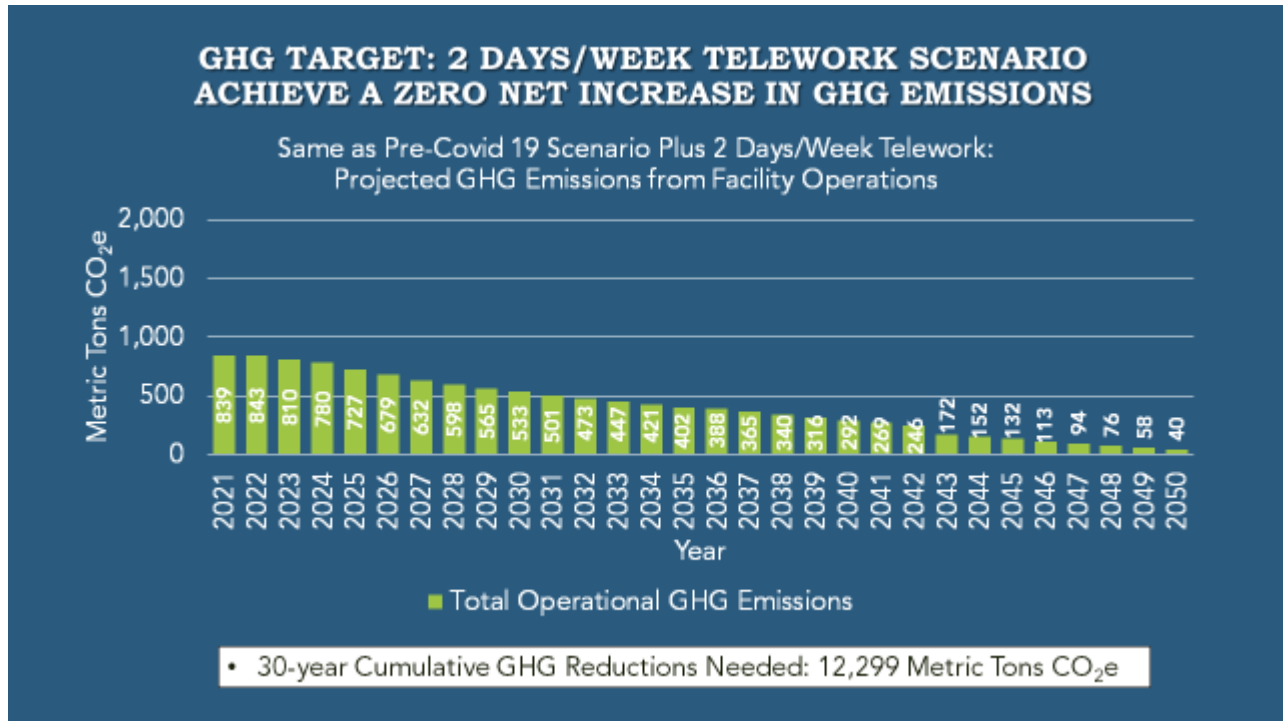


Figure 2. Updated Projections for Business as Usual GHG Emissions of Facility Operations based on Assumption that All Staff Telework Two Days per Week

Additional VMT Reduction Goal

In 2018, Senate Bill 743 revised the process for projects to analyze transportation impacts (California Natural Resources Agency, 2018). The Governor’s Office of Planning and Research Technical Advisory recommends that office projects adopt a target to reduce vehicle miles traveled (VMT) associated with employee commute to a level that is 15 percent below the regional average (Governor’s Office of Planning and Research, 2018). While this recommendation for projects to adopt a VMT target was implemented after the certification of CARB’s Final EIR, CARB supports achievement of this goal for the Facility.

Regional average employee commute in Riverside is reported as 13.5 miles per day using the Riverside County Transportation Analysis Model (RIVTAM) and 19.0 miles per day using the Southern California Association of Governments (SCAG) model (Fehr and Peers, 2019). Since the RIVTAM Model is more specific to the Riverside region, CARB adopted an employee commute target of 11.5 miles per worker per day to reduce daily commute VMT by 15 percent below the regional VMT. Assuming that all staff telework two days per week, Figure 3 indicates that a total daily VMT reduction of 12,641 miles is needed in the year 2021 to achieve the VMT target. Projected reductions in VMT over time are affected by employee relocation to the Riverside area and employee attrition.

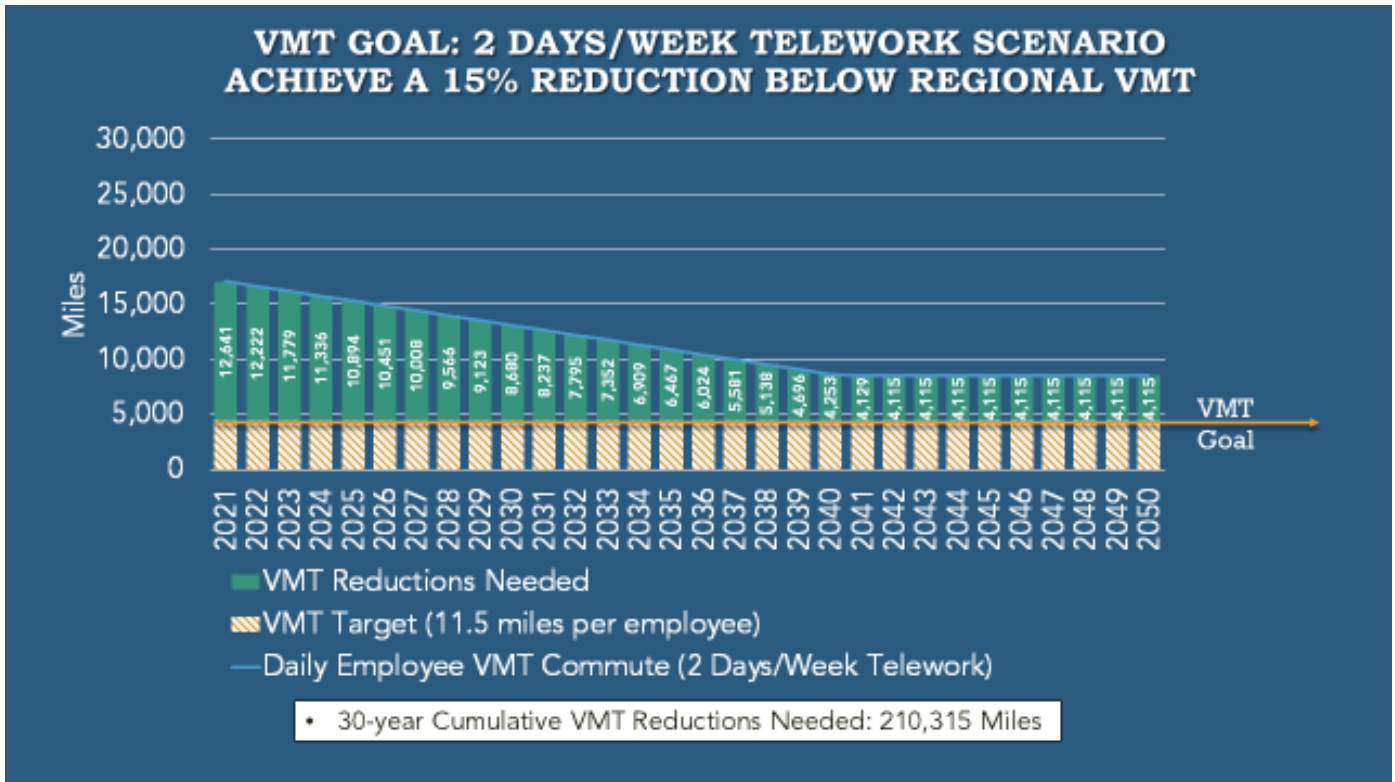


Figure 3. Projected Daily Vehicle Miles Traveled (VMT) Reductions Needed to Achieve a 15% Reduction Below Regional VMT Target

Prioritized Mitigation Measures

In order of implementation, CARB prioritized three categories of mitigation measures to fulfill the commitment for a zero-net increase in GHG emissions and meet the goal to reduce VMT by 15% below regional VMT.

- 1) Design Features
- 2) Voluntary Carbon Credits
- 3) Local GHG Mitigation/Direct Reduction Activities

Design features are the highest priority of mitigation; the Facility is an all-electric facility designed to achieve LEED Platinum certification, Zero Net Energy (ZNE) performance, and operate a robust network of electric vehicle chargers. Second, voluntary carbon credits were used to mitigate construction emissions and will be important for at least the first year or two of operation. Third, CARB plans to pursue local mitigation such as direct activities to implement employee-based and community-based programs. A discussion of each of these categories is provided below.

1) Design Features

CARB's Southern California Headquarters is an all-electric facility designed and constructed to achieve LEED Platinum green building certification and zero net energy (ZNE)

performance. ZNE buildings are designed to use as little energy as possible and generate enough on-site renewable energy to equal the amount of energy used over the course of a year. CARB’s Southern California Headquarters will be the largest ZNE building of its kind in the United States and one of the largest in the world. The building’s design incorporates 3.75 MW of on-site renewable energy generation, 1.5 MW of battery storage, and numerous energy saving features.

The Final EIR estimated a total of 3,116 MtCO₂e would be emitted annually due to facility operations. By going all-electric and eliminating fuel cells in the final design, CARB was able to avoid 1,577 MtCO₂e of emissions annually. Based on the final design, CARB staff adjusted energy related GHG emissions to total approximately 2,090 MtCO₂e annually. CARB staff also revised GHG savings due to on-site solar PV using current emission factors. CARB staff estimate a total GHG emission reduction of 2,078 MtCO₂e for the 3.75 MW PV system in the first year of operations. Additionally, the electric vehicle (EV) chargers installed in the staff and fleet parking supplied with 100 percent green power can reduce approximately 656 MtCO₂e annually. As a result, CARB staff estimate that first year operational GHG emissions is approximately 1,840 MtCO₂e. CARB is committed to mitigate annual GHG emissions to zero for at least the first 30 years of operations. Cumulatively, CARB expects to mitigate approximately 32,584 MtCO₂e. However, if all staff telework two days per week, first year operational GHG emissions would be reduced to approximately 839 MtCO₂e. In a two day telework per week scenario, CARB anticipates mitigating an estimated 12,299 MtCO₂e over the 30-year life of the facility.

Table 1. GHG Estimates for Facility Operations in Year 2021 (Metric Tons CO₂e)

Source	Final EIR	Final Design	
		Pre-Covid 19 Scenario	2 Days/Week Telework Scenario
Area	0.02	0.02	0.02
Energy	2,390	2,092	2,092
Mobile	1,834	1,468	467
Vehicle Testing	825	825	825
Fuel Cells	1,577	0	0
Emergency Generator	9	9	9
Solid Waste	96	96	96
Water Supply and Wastewater Treatment	84	84	84
Solar PV	-3,703	-2,078	-2,078
EV Chargers On-Site	None Counted	-656	-656
Projected Total	3,116	1,840	839

2) Purchase Voluntary Carbon Credits

Prior to the start of construction, CARB mitigated a total of 3,687 MtCO₂e construction-related emissions through the purchase of voluntary carbon credits. At the end of

construction, CARB staff will update GHG emission estimates using actual data collected during construction. Based on this data, CARB will determine if additional carbon credits must be purchased or whether there are extra carbon credits that can be used to help mitigate operational emissions.

Prior to moving into the Facility, CARB purchased a total of 840 MTCO₂e voluntary carbon credits to mitigate projected first year (2021) operational GHG emissions. For both construction-related and first year operational emissions, CARB purchased credits from a California-based livestock project that were third-party verified and undergone review by the Climate Action Reserve (Reserve). CARB staff plans to collect data over the course of the first year of operations. At the end of 2021, CARB plans to true up the first year operational GHG emissions. CARB will purchase additional voluntary carbon credits to cover any deficit or apply any excess credits purchased to future GHG obligations.

3) Implement a Local Mitigation Program

CARB staff evaluated three local mitigation program options to meet the GHG target and VMT goal. While each of these measures had the potential to mitigate GHG emissions to zero, not all of the programs evaluated would assist with reducing VMT. As a result, CARB is planning to implement a transportation demand management (TDM) program to achieve both future year GHG obligations and the VMT reduction target.

Table 2. Proposed Local Mitigation Program and Alternatives Considered

Priority	Program	Cumulative Reductions (MtCO ₂ e)	Comments
Proposed	Transportation Demand Management (TDM) Program	45,997 – 70,975	Reduces both VMT and GHG
Alternative 1	Residential Building Retrofit ¹	26,932 – 37,917	Does not reduce VMT
Alternative 2	Community Scale EV Charging ²	52,450 – 52,744	Does not reduce VMT

CARB’s TDM program is focused on four key measures: active transportation, bike share, vanpool, and trip reduction outreach.

Active Transportation: The active transportation measure is focused on providing additional bicycle infrastructure including 5 to 8 miles of bike lanes around the University of California, Riverside (UCR) campus and 10 to 16 on-street bike racks. These types of site and

1 Assumes 250 homes retrofit per year over 5 years for 1,250 homes.
 2 Assumes 55-110 Level 2 chargers installed and replaced every 10 years/3 times total. GHG reduction estimates are similar due to wide range of assumed utilization rates.

surrounding enhancements can improve connectivity, safety, and encourage the use of alternative modes of transportation (e.g., biking) for employee commute trips and other trips, such as going to lunch. It can also improve pedestrian and bicycle infrastructure to the UCR campus and for the Riverside community as a whole. CARB staff estimates that the active transportation measure may reduce about two percent daily VMT.

Bike-Sharing: The bike-sharing measure includes providing and maintaining a fleet of bicycles for employee and/or community use. This supports bicycle use on an as-needed basis, and may introduce bicycling as a form of transportation to those who do not regularly bike. This program could be created through a local partnership or through one of many existing bike-share companies. This measure encourages the use of alternative modes of transportation for local trips. Implementing both the active transportation measure and bike-sharing measure will together allow employees to travel from and to nearby bus and train stations more easily and encourage more employees to take public transit to work. CARB's staff estimates that bike-sharing may reduce between two and seven percent daily VMT.

Vanpools: The vanpool program is designed to provide vanpool service between the former El Monte facilities, employees homes and the new Riverside facility, to reduce commute VMT for existing employees. This program would require the purchase or lease of vans for employee use or a third-party vendor. The frequency of the vanpool program service is intended to serve trips at the beginning and end of the workday. Vanpools shift single occupancy vehicle (SOV) trips to pooled trips reducing the number of vehicles on the road. Based on 2016 survey³, 162 employees were interested in joining a vanpool when the lab moves to Riverside. CARB staff estimate that between 10 to 35 percent⁴ of the existing employees may participate in the vanpool program. This may reduce daily VMT⁵ between eight and 30 percent.

Trip Reduction Outreach: The trip reduction outreach measure is a marketing campaign to both CARB employees and the general public in the local community (e.g., UCR community or City/County of Riverside) to promote the use of public transit, active transportation and other available alternative transportation modes to reduce their daily VMT and GHG emissions. Trip reduction outreach would be conducted through a partnership with UC Riverside, the City/ County of Riverside, or a local Transportation Management Association/ Organization. This measure could benefit the local community by providing them useful transportation information and promoting general environmental awareness. Marketing strategies for employees may include: new employee orientation of trip reduction and alternative mode options, event promotions (e.g. bike to work day, transportation fairs, etc.), and publications (newsletters and Inside Page advertising). In the low range

3 Internal CARB Survey of El Monte Staff, 2016.

4 CARB assumed low and high ranges for adoption of TDM measures. Low assumes low level of outreach and participation and high assumes aggressive outreach and participation.

5 Daily VMT means the daily commute VMT for all CARB employees at the Riverside facility.

participation rate, CARB staff estimates that trip reduction outreach would reduce 1% of VMT in UCR and the nearby community. In the high participation rate, CARB staff estimate that the strategy would reduce 1% of total employee commute trip VMT.

Achievement of GHG Obligation and VMT Goal

In the 2 days per week telework scenario, annual GHG emissions are estimated to total nearly 900 MtCO₂e in the early years. CARB estimates that the TDM program would reduce approximately 900 to 1,800 MtCO₂e in the early years of implementation. Cumulatively, CARB expects the TDM program to reduce approximately 26,000 to 51,000 MtCO₂e by 2050. Figure 4 indicates that the GHG target would be met in the early years even with a low participation rate in the TDM Program.

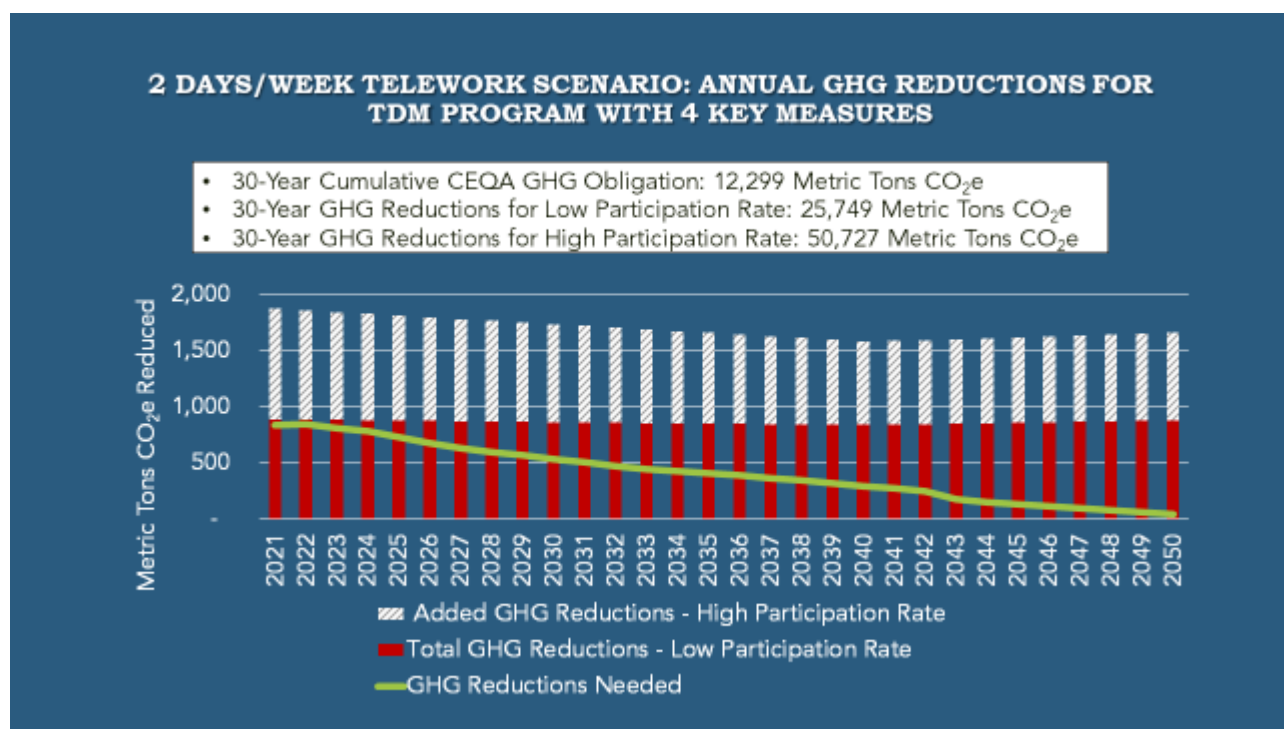


Figure 4. Annual GHG Reductions Projected for a TDM Program with 4 Key Measures: Active Transportation, Bike-Sharing, Vanpools, and Trip Reduction Outreach

In the 2 days per week telework scenario, daily VMT is projected to total nearly 13,000 miles in the early years. CARB estimates that the TDM program would achieve approximately 9,000 to 15,000 daily VMT reductions in the early years of implementation. Cumulatively, CARB expects the program to achieve over 280,000 to 416,000 VMT reductions by 2050. Figure 5 indicates that the VMT goal may not be achieved in the early years of implementation. However, CARB expects to achieve the VMT goal over the 30-year life of the program even with a low participation rate.

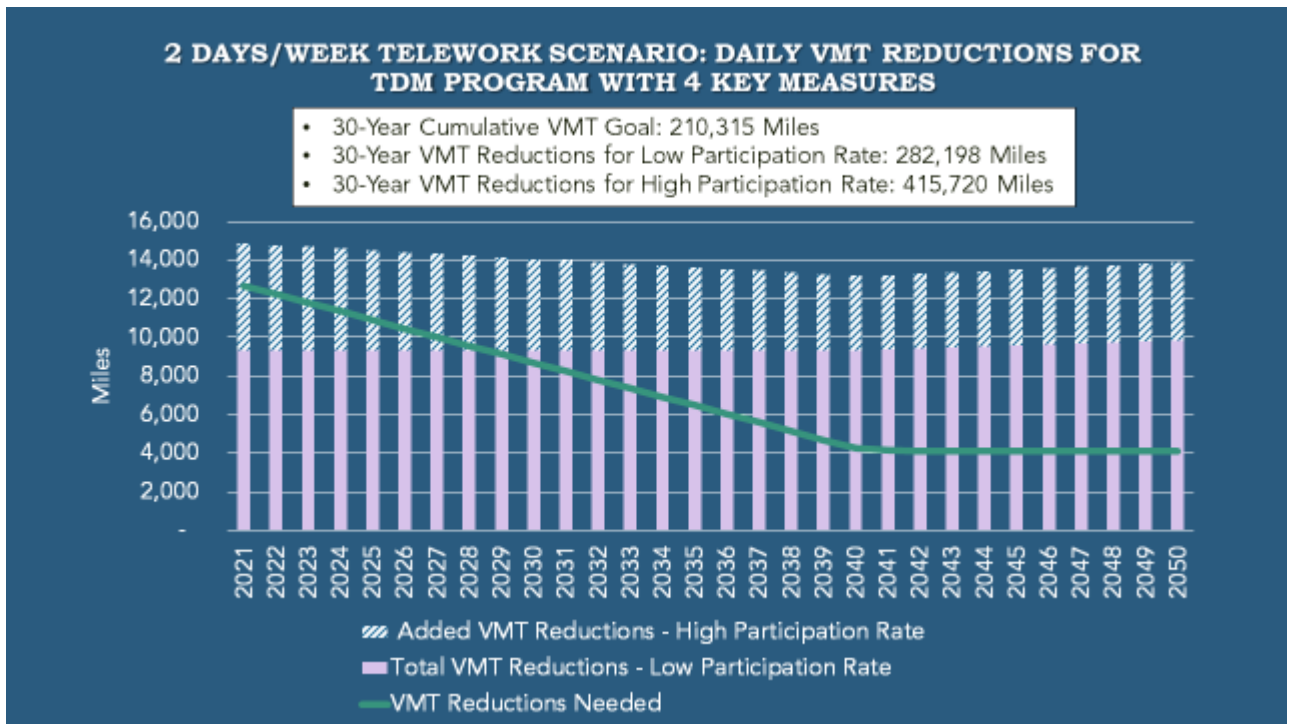


Figure 5. Daily VMT Reductions Projected for a TDM Program with 4 Key Measures: Active Transportation, Bike-Sharing, Vanpools, and Trip Reduction Outreach

Conclusion

Final design of CARB’s Southern California Headquarters has already helped the Facility to achieve significant GHG emission reductions. CARB plans to achieve a zero-net carbon pathway for the first year or two of operational GHG emissions through the purchase of voluntary carbon credits. To mitigate future year GHG emissions and achieve the VMT goal, CARB plans to implement a TDM Program with four key measures: active transportation, bike share, vanpools, and trip reduction outreach. CARB does not plan to claim any GHG or VMT reductions from the TDM Program until it has been implemented for at least a year to quantify actual reductions. The TDM program will be tracked and benefits documented over time. In addition, employee commutes will be tracked on an ongoing basis. If sufficient progress is not being made, then additional strategies will be considered. Even with projections for a low participation rate in the TDM Program, CARB expects to exceed both the GHG target and VMT goal by 2050.

PROJECTED ZERO NET CARBON PATHWAY CARB'S SOUTHERN CALIFORNIA HEADQUARTERS

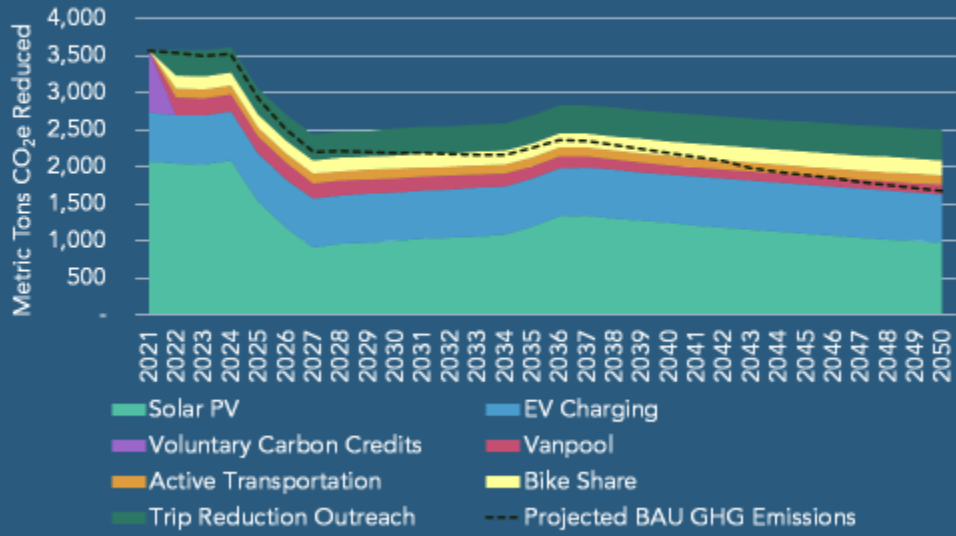


Figure 6. Projected Zero Net Carbon Pathway for CARB's Southern California Headquarters

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