

APPENDIX V

Opportunities for Local Carbon Offset Credits in the On-Road Transportation Category

A Preliminary Review of Regulations and Protocols Related to Light-duty, Medium-duty, and Heavy-duty Vehicles

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About EPIC

The Energy Policy Initiatives Center is a research center of the USD School of Law that studies energy policy issues affecting California and the San Diego region. Energy Policy Initiatives Center's mission is to increase awareness and understanding of energy- and climate-related policy issues by conducting research and analysis to inform decision makers and educating law students.

For more information, please visit the Energy Policy Initiatives Center website at www.sandiego.edu/epic.

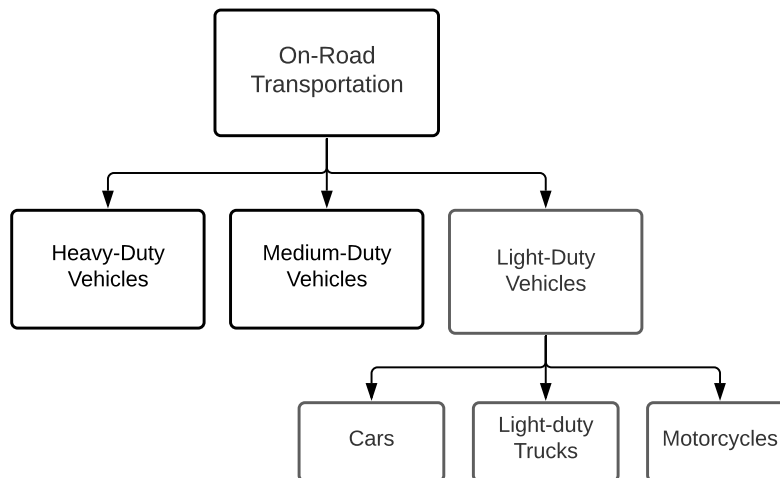
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1 INTRODUCTION

The on-road transportation emissions category has three subcategories: heavy-duty, medium-duty, and passenger vehicles. (Figure 1). This framework is based on the California Air Resources Board (CARB) statewide greenhouse gas (GHG) inventory. The on-road transportation category accounts for over 40% of regional emissions.¹ Of this total, nearly 90% of emissions are associated with passenger cars and other light-duty vehicles.² The approximate remaining 10% is associated with heavy-duty vehicles.^{3,4}

Figure 1 Transportation Emissions Framework



1.1 Project Purpose and Methods

The goal of this project is to identify project opportunities to reduce or remove GHG emissions in the San Diego region that could be used to generate carbon offset credits (offset credits). To support this overall goal, the Energy Policy Initiatives Center (EPIC) identified categories of GHG emissions in the San Diego region; identified activities to reduce or remove emissions; identified related regulations that require such activities; identified related offset credit protocols; evaluated these protocols based on applicability to conditions in the San Diego region and the number of projects developed in the United States (U.S.), California, and the San Diego region; and,

¹ San Diego Association of Governments, San Diego Forward: The Regional Plan, Appendix D 2012 Regional Greenhouse Gas Emission Inventory for the San Diego Region and Projections, 2015, p. 3 & 7: https://www.sdfoward.com/pdfs/RP_final/AppendixD-2012GreenhouseGasEmissionsInventoryfortheSanDiegoRegionandProjections.pdf. (Note this is the last publicly available estimate of regional emissions.)

² *Ibid.*

³ *Ibid.*

⁴ Note: The SANDAG regional GHG inventory and CARB statewide GHG inventory do not include the impact of the Low Carbon Fuel Standard under on-road transportation (i.e., on-road transportation category only covers tailpipe emissions not the life cycle emissions of the fuel). The emissions from the production of the fuel is included in other sectors under CARB's statewide GHG inventory, but not included in the SANDAG regional GHG inventory.

determined whether the offset credit protocols and related activities would be considered additional to what would have happened otherwise. The additionality determination is based on a two part test. The legal requirement test determines whether the activity is required by legislation or regulation, or otherwise legally mandated. The common practice test determines whether the project activity is considered a common practice and would have happened otherwise for financial or technological reasons. A more detailed discussion of the project approach is provided in Section 3 of the main project report.

This report summarizes the findings of this analysis for the on-road transportation category.

1.2 Key Findings for On-Road Transportation Category

California's on-road transportation emissions category is heavily regulated in terms of emission sources, fuel types, and vehicle class and weight, and as a result, there are limited opportunities for offset credits in the San Diego region. The following describes these key findings:

- **There are Viable but Limited Opportunities for Local Offset Credit Projects in the On-Road Transportation Category** - There are limited opportunities using existing protocols for additional offset credits in the on-road transportation emissions category in the San Diego region. This is due to high levels of regulation and common practices around emissions, fuel use, and ownership issues and competition with Low Carbon Fuel Standard (LCFS) credits.
- **The California and Federal Government Regulate Most Aspects of On-Road Transportation** - On-road transportation is a highly regulated sector of the economy by both the state and federal governments. California operates under various mandates, including the LCFS, Clean Air Act and more stringent state emission standards, and targeted regulations at specific vehicle classes, weights, and types of engines (e.g., heavy-duty, drayage trucks, buses, fleets, etc.) that capture or will capture most of the emission reductions from this sector. California is in the process of implementing regulations for new vehicle standards that are zero-emission by 2035 for passenger cars and trucks and also seeks to address implementation of zero-emission standards for all medium- and heavy-duty vehicles with target dates dependent on the vehicle class, weight, and use.
- **Four of the Carbon Offset Credit Protocols Reviewed are Considered Additional** - Four protocols related to fuel switching, electric vehicle charging, carpooling, and use of lightweight pallets are considered additional, though there is only one related project in California (Table 1). California's regulation of on-road transportation limits what types of offset credit projects can be developed in the state. For example, the Truck Stop Electrification protocol is considered not additional because idling is limited to five minutes for heavy-duty diesel trucks.⁵ In addition, the LCFS regulation can make determining ownership of transportation-related GHG reduction activities challenging, particularly for residential charging where credits are earned by the incumbent distribution electric utility. Projects may be additional, but ownership is unclear or expressly limited by the policy of the offset credit program.

Consequently, there is only one on-road transportation-related offset project located in California that uses a protocol or method identified for this project, ACR Truck Stop

⁵ 13 CCR § 2485: Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling; 13 CCR § 2480: Airborne Toxic Control Measure to Limit School Bus Idling and Idling at Schools.

Electrification. This project stopped earning offset credits in 2008 in light of California’s Diesel Idling Regulation.⁶ As LCFS credits become more widespread, it is possible that the VCS VM0038 Methodology for Electric Vehicle Charging Systems, currently considered additional, could also have limited opportunities for offset credits as California reaches an electric vehicle market penetration of 5% or greater⁷ of the total fleet or that offset credits will become difficult to earn when compared with the significantly higher value LCFS credits. While this relative lack of related projects in California is not definitive, it is indicative of the potential challenge of meeting protocol eligibility requirements.

Table 1 Projects Using Active and Applicable Protocols in the On-Road Transportation Category

GHG Reduction Activity/Protocol	US	CA	San Diego Region	Additionality Determination
Alternative Fuels	35	1	0	
ACR Truck Stop Electrification	33	1	0	Not Additional
VCS VM0019 Fuel Switch from Gasoline to Ethanol in Flex-Fuel Vehicle Fleets	0	0	0	Likely Additional
VCS VM0038 Methodology for Electric Vehicle Charging Systems	2	0	0	Additional
Carpooling	0	0	0	
VCS VM0028 Methodology for Carpooling	0	0	0	Additional
Transportation Efficiency	0	0	0	
VCS VM0020 Transport Energy Efficiency from Lightweight Pallets	0	0	0	Additional
Total	35	1	0	

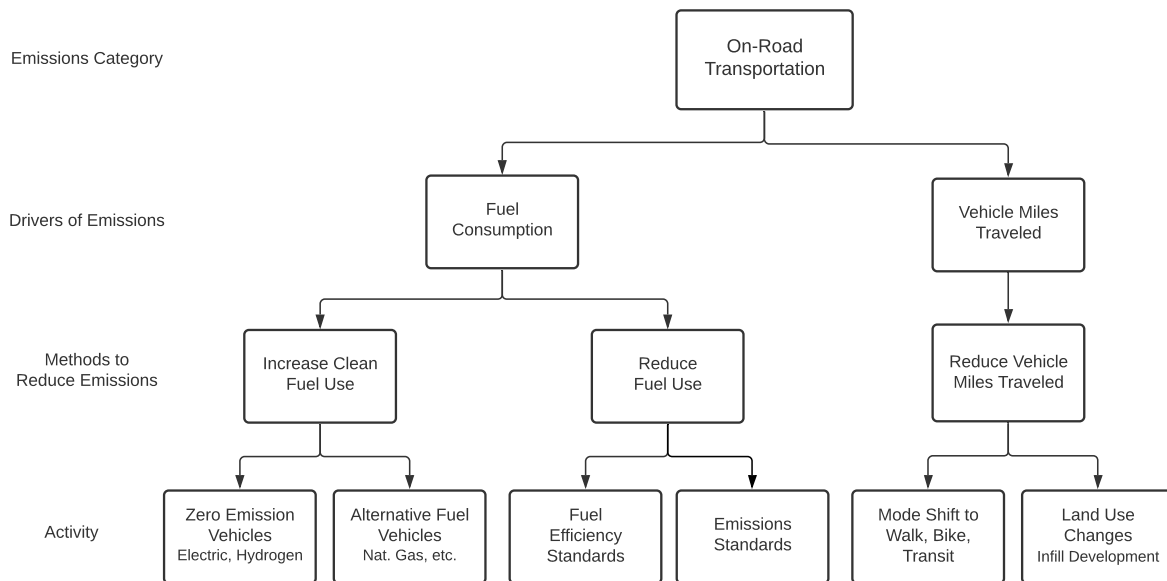
⁶ Ruby Canyon Engineering, Verification Report for IdleAir Truck Stop Electrification Project, ACR 130–159, 263–264, May 24, 2016, p. 4 (See ACR 133) & p. 8 (“Starting in 2008, California does not have exemptions for idling during rest periods.”).

⁷ Note that this Protocol defines market penetration on a National Basis per [VMD0049 Activity Method for Determining Additionality of Electric Vehicle Charging Systems](#), Version 1.0, p. 4. However, California by law and regulation is a separate vehicle market from the rest of the United States, primarily in light of California’s Clean Air Act Preemption Waiver that allows it to set higher tail pipe emission standards and CAFE standards as well as direct regulation of fuel carbon intensity under the LCFS as well as refineries under its Cap-and-Trade Program.

2 METHODS TO REDUCE EMISSIONS

Figure 2 summarizes some of the methods to reduce emissions in On-Road Transportation. Emission reduction activities can focus on alternative fuels, emission reductions, reduction of miles traveled (VMT), and specific vehicle classes and types of engines. Reducing fuel use lowers the total quantity of fuel used in on-road vehicles and thus lowers emissions. Increasing use of clean fuel use lowers the GHG emissions intensity of on-road vehicle use. Reducing VMT eliminates fuel use and attendant emissions regardless of the source.

Figure 2 Framework for Methods to Reduce GHG Emissions in the On-Road Transportation Category



This framework for methods to reduce emissions provides context to the discussion below of regulation and protocols related to on-road transportation.

3 LEGISLATION AND REGULATION

On-road emissions are regulated at both the federal and state level. State regulations build off and fill gaps in federal regulations with regards to emissions, vehicle types, fuel consumed, and the carbon intensity of fuel resulting in a high level of regulation for specific engine type, vehicle type by weight, and fuel consumed.

3.1 Federal Fuel Regulation, Emissions Standards, and Mileage Standards

The Energy Independence and Security Act of 2007 created the Renewable Fuel Standard (RFS) and set requirements for the volume of renewable fuel, including ethanol, to be blended in gasoline sold in the United States.⁸ The RFS requires a specified volume of renewable fuel to replace or reduce the quantity of petroleum-based transportation fuel, heating oil, or jet fuel.⁹

The U.S. EPA regulates mobile sources of emissions under the Clean Air Act (CAA) for new engines and equipment sold or distributed in the United States. These regulations are divided by vehicle type: light-duty (passenger vehicles); commercial truck and buses (heavy-duty); and motorcycles (light-duty). These regulations address GHG emissions for light-duty and heavy-duty as well as regulations on smog, soot, and other air pollutants for light-duty vehicles, light-duty motorcycles, and heavy-duty vehicles with further implementation by the states under State Implementation Plans (SIPs).¹⁰

The Department of Transportation's (DOT) National Highway Traffic Safety Administration (NHTSA) sets and enforces Corporate Average Fuel Economy (CAFE) Standards for passenger cars and light duty trucks (model years 2017–2021 and 2021–2026¹¹), medium-duty vehicles (model years 2014–2018), and heavy-duty vehicles (model years 2014–2018¹² and 2018–2027¹³ (currently stayed)). CAFE standards used to be harmonized with U.S. EPA GHG emission regulations through the issuance of a joint Final Rule for Corporate Average Fuel Economy and Greenhouse Gas emissions regulations for passenger cars and light duty trucks.¹⁴ It is likely that a Joint Final rule will return under the Biden Administration.

⁸ Summary of Energy Independence and Security Act, <https://www.epa.gov/laws-regulations/summary-energy-independence-and-security-act>; see also Regulations and Volume Standards for RFS: <https://www.epa.gov/renewable-fuel-standard-program/regulations-and-volume-standards-renewable-fuel-standards>.

⁹ See Overview of RFS, Volume Standards as Set Forth in EISA: <https://www.epa.gov/renewable-fuel-standard-program/overview-renewable-fuel-standard>.

¹⁰ See U.S. EPA Regulations of On-road Vehicles and Engines: <https://www.epa.gov/regulations-emissions-vehicles-and-engines/regulations-onroad-vehicles-and-engines>.

¹¹ 40 CFR Parts 531, 531.5(d) and 533.

¹² 40 CFR Parts 85, 86, 600, 1033, 1036, 1037, 1039, 1065, 1066, and 1068 (U.S. EPA) and 40 CFR Parts 523, 534, and 535 (NHTSA); partially withdrawn in 2013 under 40 CFR Part 1037, 1039, 1042, and 1068 (U.S. EPA) and 40 CFR Parts 535 (NHTSA).

¹³ Final Rule for Phase 2 fuel efficiency and GHG emissions standards for medium- & heavy-duty vehicles, MY2018–2027 is currently stayed pursuant to an order of the United States Court of Appeals for the District of Columbia Circuit issued on September 29, 2020 in case No. 16-1430.

¹⁴ See NHTSA CAFE Standards: <https://www.nhtsa.gov/laws-regulations/corporate-average-fuel-economy>.

3.2 State

California heavily regulates and impacts the on-road transportation sector through more stringent regulation of emissions than federal regulation from all types of vehicles (e.g., heavy-, medium-, and light-duty vehicles), including the carbon intensity of fuel, type of fuel, and mandates around fleet vehicle purchases and engine types offered by manufacturers. The following provides an overview of requirements in California.

3.2.1 Emissions Standards

Emission standards range by engine type, vehicle type, and emission of the vehicle type. California continues to implement more stringent emission standards for new motor vehicles per Clean Air Act (CAA) Section 209 Waiver, preemption of which occurred under the adoption of the 2019 SAFE I Rule, currently being litigated by California. The Biden Administration recently proposed to restore California's authority under the recently proposed reinstatement of its Waiver Authority.¹⁵ This will continue California's ongoing regulatory activity of requiring more stringent standards under its Clean Air Act SIP, which sets California apart from the rest of the United States' new vehicle market.

The following discusses California's general regulation by vehicle type:

- **Light-Duty** - Collectively called the Advanced Clean Cars (ACC) program, this regulation addresses both smog-causing pollutants and GHG emissions under a single set of regulations. The most recent actions include: adopting GHG standards for 2022 through 2025 model years, requiring zero emission vehicles (ZEVs) be developed and sold by manufacturers, developing regulations for model years 2026 and beyond (Advanced Clean Cars II and LEV IV), and enforcing particulate matter standards.¹⁶ There are other requirements that include the Clean Miles Standard and Incentive Program per Senate Bill 1014 (Skinner, Chapter 369, Statutes of 2018), which requires CARB to establish annual targets and goals starting in 2023 for the reduction, under the baseline established by CARB, in GHG emissions per passenger-mile driven on behalf of a transportation network company (e.g., Uber and Lyft).
- **Medium- and Heavy-Duty** - Defined as vehicles with a gross weight rating (GVWR) greater than 8,500 pounds (lbs.) but less than or equal to 14,001 lbs. for medium-duty and greater than 14,001 lbs. for heavy-duty, these requirements regulate vehicles in a number of ways including, but not limited to: prohibitions on diesel idling for both heavy-duty long-haul trucks¹⁷ and school buses,¹⁸ the LEV III standards as part of the ACC program, GHG emission control through Phase 1 and Phase 2 GHG standards,¹⁹ Advanced Clean Trucks regulation,²⁰ Truck and Bus Regulation,²¹ Tractor-Trailer Greenhouse gas (TTGGH)

¹⁵ See proposed April 22, 2021 NHSTA CAFE Preemption Rule, 49 CFR Parts 531 and 533:

https://www.eenews.net/assets/2021/04/23/document_gw_02.pdf.

¹⁶ See [Low-Emission Vehicle \(LEV\) Regulation, LEV III Criteria & LEV III GHG, ZEV Regulation, and ACC II & LEV IV](#); see 13 California Code of Regulations (CCR) § 1360 et seq.

¹⁷ 13 CCR § 2485: Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling.

¹⁸ 13 CCR § 2480: Airborne Toxic Control Measure to Limit School Bus Idling and Idling at Schools.

¹⁹ 13 CCR § 1956.8.

²⁰ See 13 CCR § 1963 et. seq.: <https://ww3.arb.ca.gov/regact/2019/act2019/fro2.pdf>.

²¹ See Truck and Bus Regulation information: <https://ww2.arb.ca.gov/our-work/programs/truck-and-bus-regulation>.

regulation,²² the Heavy-Duty Omnibus Regulation,²³ among other by specific class or use cases.²⁴

3.2.2 Fuel Carbon Intensity (CI) and Type of Fuel Consumed

The LCFS²⁵ serves as the primary mechanism to reduce the carbon intensity of transportation fuel in California.²⁶ The LCFS is designed to reduce the carbon intensity (CI) of fuel by at least 20% by 2030 from a 2010 baseline. The program sets CI benchmarks for gasoline, diesel, and replacements (e.g., electricity, renewable diesel, hydrogen, etc.) by calculating the complete CI of the lifecycle of the fuel. Fuels and fuel blendstocks introduced into the California fuel system that have a CI higher than the benchmark generate deficits. Fuels and fuel blendstocks with CIs below the benchmark generate a credit. Credits can be generated from electric vehicle charging equipment, among other less carbon intensive fuels. Annual compliance is achieved when a regulated party uses credits to match deficits.

This program is further supported by specific regulations and funding to develop and build alternative fuel infrastructure. Examples include the Alternative Diesel Fuel Regulation,²⁷ Assembly Bill 8 (Perea, Chapter 401, Statutes of 2013) funding 100 hydrogen fueling stations, and funding for electric vehicle charging infrastructure under the Clean Transportation Program, California Electric Vehicle Infrastructure projects (CALeVIP), various California Public Utility Commission regulated programs for investor owned utilities (IOUs) per Senate Bill 350 (De León, Chapter 547, Statutes of 2015),²⁸ and the Volkswagen settlement to build ZEV infrastructure from \$800 million in settlement funds.

There are other specific regulations that determine what types of refined fuels are sold in California. The Low-Emission Diesel Requirement, both in its current form and as underdevelopment, sets low emission standards for diesel fuel by increasing the use of Low Emission Diesel (LED) fuels and reducing NOx and PM emissions relative to the use of conventional fuel.²⁹ This is supported by the Standards for Diesel Fuel, which sets standards for the amount of certain chemicals to be allowed in diesel fuel for sale in California.³⁰ Specific to gasoline, California sets oxygenate requirements for gasoline sold in California. Though ethanol is not required by California in gasoline blends, most gasoline sold in California contains approximately 10% ethanol by volume.³¹

²² See TTGHG Regulation Information: <https://ww2.arb.ca.gov/our-work/programs/ttghg>.

²³ See Heavy-Duty OBD Regulation and Rulemaking: <https://ww2.arb.ca.gov/resources/documents/heavy-duty-obd-regulations-and-rulemaking>.

²⁴ See Zero-Emission Transport Refrigeration Units Regulation: 13 CCR §§ 2477.1 - 2477.6; 13 CCR § 2477.13; 13 CCR §§ 2477.17–2477.19; see Zero-Emission Powertrain Certification Regulation: 13 CCR § 1956.8; see Zero-Emission Drayage Truck Regulation: 13 CCR § 2027.

²⁵ 17 CCR §§ 95480–95503.

²⁶ See CARB LCFS Program Information: <https://ww2.arb.ca.gov/our-work/programs/low-carbon-fuel-standard>.

²⁷ 13 CCR §§ 2293–2293.9.

²⁸ See CPUC D.18-01-024 & D.18-05-040.

²⁹ 13 CCR §§ 2281–2285, 2299–2299.5; 17 CCR §§ 93114, 93117, 93118, 93118.2, 93118.3, 93118.5.

³⁰ 13 CCR §§ 2281–2285; 2299–2299.5.

³¹ Gasoline Frequently Asked Questions, <https://ww2.arb.ca.gov/resources/fact-sheets/gasoline-frequently-asked-questions>.

3.2.3 Mandates on New Vehicles Purchased

The California Air Resources Board (CARB) is implementing Governor Newsom's Executive Order N-79-20 that established 100% in-state sales of new zero-emission passenger cars and trucks by 2035. This effort also supports Executive Order B-48-18 requirement to support actions related to electric vehicle charging infrastructure to deploy 5 million ZEVs by 2030 and B-16-12 to develop ZEV and related supply chains and infrastructure in California.

CARB developed the Innovated Clean Transit (ICT) regulation³² to drive ZEV in the heavy-duty fleet, requiring all public transit agencies to gradually transition to a 100-percent zero-emission bus fleet and encouraging these agencies to provide innovative first and last-mile connectivity and improved mobility for transit riders. CARB also adopted an Advanced Clean Trucks (ACT) regulation that sets a ZEV sales requirement and one-time reporting requirement for large entities and fleets.^{33,34} The Zero-Emission Airport Shuttle regulation³⁵ requires private and public airport shuttle fleet owners with fixed routes serving California's 13 largest airports to fully transition their fleet to zero-emission shuttles by 2035 and is a companion to NOx and other criteria pollution reductions as well as GHG emission reductions from airport shuttles.³⁶ It is expected that similar types of programs will be implemented for light-duty vehicles post 2026 model years.

There are also mandates on the California-owned fleets. Assembly Bill 739 (Chau, Chapter 739, Statutes of 2017) requires that beginning December 31, 2025, at least 15% of newly purchased vehicles with a gross vehicle weight rating of 19,000 pounds or more purchased by the Department of General Services and other state entities for the state fleet be zero emission. This transitions to a higher requirement beginning December 31, 2030, at which time 30% of newly purchased vehicles are required to be ZEV.

3.2.4 Targets for Regional GHG Reductions

Senate Bill 375 (Steinberg, Chapter 728, Statutes of 2008) requires CARB to set regional GHG reduction targets that are implemented through regional government Sustainable Community Strategies (SCS) with the intent to align local government GHG reduction activities for: (1) land use (include housing needs assessment and habitat conservation plans); (2) transportation networks; (3) transportation demand management (TDM) strategies; and (4) transportation system management programs and policies. This is achieved by decreasing commutes (e.g., vehicles miles traveled (VMT)), increasing use of low-carbon fuel, increasing the number of cleaner vehicles, and improved

³² 13 CCR § 2023 et seq.

³³ See Advanced Clean Trucks Information: <https://ww2.arb.ca.gov/our-work/programs/advanced-clean-trucks>; 13 CCR §§ 1963; 1963.1, 1963.2, 1963.3, 1963.4, 1963.5, 2012, 2012.1, & 2012.2.

³⁴ Note: Forthcoming Zero-Emission Vehicle Truck Regulation will require well-suited fleets to begin purchasing zero-emission trucks and may require large entities to hire fleets that have zero emission vehicles. Using data reported through Advanced Clean Trucks, this potential new ZEV Truck Regulation will identify operations where ZEV duty cycles meet fleet operational needs. The main goal of the Advanced Clean Trucks and the ZEV Truck Regulation, is to gradually increase the number of zero-emission trucks on the road over the next decade. Development was set to begin in 2020 but has not begun as of 10/31/2020.

³⁵ 17 CCR §§ 95690.1, 95690.2, 95690.3, 95690.4, 95690.5, 95690.6, 95690.7, and 95690.8.

³⁶ 17 CCR §§ 95690.1, 95690.3, 95690.5, and 95690.6.

transportation choices (e.g., mass transit). CARB has set more aggressive regional targets³⁷ to support the 2017 Scoping Plan with SCSs plans expected to achieve, in the aggregate, a 19% reduction in statewide per capita GHG emission relative to a 2005 baseline by 2035 from passenger vehicles.³⁸ CARB is required to update regional targets in support of statewide reduction targets at least every eight years with the last update occurring in 2018.³⁹

In the San Diego region, San Diego Association of Governments (SANDAG) serves as both San Diego's regional metropolitan planning organization and council of governments and is charged with implementing Senate Bill 375 (2008). SANDAG develops a SCS long-range plan under the 2050 Regional Transportation Plan (RTP) that aligns the region's transportation, housing, and land use around CARB GHG reduction targets. CARB's targets call for the San Diego region to reduce GHG emissions 15% by 2020 and 19% by 2035 from a 2005 baseline.⁴⁰ The regional SCS is updated every four years⁴¹, with SANDAG having updated the SCS multiple times since 2008. Understanding which strategies are implemented by local and regional governments is relevant in determining what emission reduction activities are considered additional (See Section 3.3.3).

3.2.5 Title 24 Building Code Requirements for Electric Vehicle (EV) Charging and Local Government Requirements

The 2019 code cycle of the California Green Building Standards Code (Title 24, Part 11) includes mandatory standards for electric vehicle charging infrastructure for residential and nonresidential buildings. These include:

- Residential (4.106.4.1): New one- and two-family must be wired for EVs (EV Ready);
- Multi-Family (5.106.4.2): New dwellings must include 10% of the total number of parking spaces if residential parking is available, EV charging spaces capable of supporting future EV spaces (rounded to the nearest whole number);
- Motel/Hotel (4.106.4.3): New build require EV charging spaces per Table 4.106.4.3.1; and
- Nonresidential (5.206.5.3): New must be EV ready with EV charging spaces compliant with Table 5.106.5.3.3.
-

3.3 Local

Local governments are taking additional actions to reduce GHG emissions from transportation. The following discusses examples of these types of actions.

³⁷ See CARB SB 375 Regional Plan Climate Targets by MPO: <https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-program/regional-plan-targets>.

³⁸ See CARB: What Are Sustainable Communities Strategies?, Last accessed on May 14, 2021: <https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-program/what-are-sustainable-communities-strategies>.

³⁹ California Government Code § 65080 (b)(2)(A)(iv).

⁴⁰ See CARB SB 375 Regional Plan Climate Targets by MPO: <https://ww2.arb.ca.gov/our-work/programs/sustainable-communities-program/regional-plan-targets>.

⁴¹ California Government Code § 65080(b)(2)(A)(iv).

3.3.1 Local Government Title 24 Additional Requirements for EV Charging

The 2019 code cycle of the California Green Building Standards Code (Title 24, Part 11) are included under local because local governments adopt or amend the standards, and they are implemented by local development and planning departments. Local governments may require more stringent regulations by mandating additional CalGreen Code standards through their authority to amend Title 24. Examples include the Cities of Carlsbad and Encinitas. The City of Carlsbad requires the following for new nonresidential projects:

- 10% of parking spaces, or a minimum of one space, must be electric vehicle capable.
- 50% of the electric vehicle capable spaces, or a minimum of one space, must be equipped with electric vehicle charging stations.⁴²

The City of Encinitas requires:

- New one- and two-family dwellings, including townhouses with private garages: each unit must be pre-wired with a dedicated 208/240-volt branch circuit rated to 40 amperes minimum;
- New multi-family: at least 15% of the total number of parking spaces, but in no case less than one parking space, must be equipped with electric vehicle charging stations; and
- New nonresidential and alterations and additions of nonresidential buildings of 10,000 sq. ft. or more: at least 8% provided for all types of parking facilities, but in no case less than one space, must be equipped with electric vehicle charging stations.⁴³

These actions are largely driven by Climate Action Plans (CAPs) to reduce GHG emissions from the transportation sector. Local governments are also taking action to encourage further development of electric vehicle service equipment in their jurisdictions.

3.3.2 Municipal Fleet Requirements

A number of local jurisdictions in the region are transitioning their fleets or mandating procurement of alternative fueled vehicles. These measures range from transitioning trash haul fleets or bus fleets to natural gas to procuring electric vehicles or hybrid vehicles. The Cities that include this type of mitigation measures in their CAPs include: City of San Diego, City of Encinitas, City of Carlsbad, City of Del Mar, City of Chula Vista, City of Imperial Beach, City of El Cajon, City of La Mesa, City of Lemon Grove, City of National City, City of San Marcos, City of Santee, City of Solana Beach, and the City of Vista. Whether and to what degree these measures have been implemented would need to be reviewed on a case-by-case basis.

3.3.3 Carpooling

As noted above, Senate Bill 375 (2008) requires the creation of Sustainable Communities Strategies for, among other things, transportation demand management (TDM) strategies. Because there is a

⁴² City of Carlsbad EVSE Nonresidential Requirements:

<https://cityadmin.carlsbadca.gov/services/depts/pw/environment/cap/evnonres.asp>; City of Carlsbad EVSE Residential Requirements: <https://cityadmin.carlsbadca.gov/services/depts/pw/environment/cap/evres.asp>.

⁴³ City of Encinitas EVSE Requirements:

<https://encinitasca.gov/LinkClick.aspx?fileticket=lqKIHTFoUk8%3D&portalid=0>.

protocol for carpooling, it is important to determine what is captured by the transportation demand management strategy as it relates to carpooling per SB 375 requirements. SANDAG's current Regional Transportation Plan and TDM strategies do include carpooling in meeting SB 375 requirements, but as part of the off-model⁴⁴ program. Carpooling is therefore outside of VMT calculations.⁴⁵ SB 375 Sustainable Communities Strategies measures count as regional regulations that capture regional mitigation measures with exceptions, like with carpooling, that allows local governments to include carpooling as a climate action plan measures because it is calculated off-model in regional planning GHG analysis. A determination must be made for each local jurisdiction as to whether that jurisdiction includes a carpooling measure in relation with SANDAG's RTP and TDM strategies and GHG calculations.

⁴⁴ Note: Off-model means off the travel demand model.

⁴⁵ See SANDAG Appendix C Sustainable Communities Strategy Documentation and Related Information, 2015, Attachment 2, p. 37: https://www.sdfoward.com/pdfs/Final_PDFs/AppendixC.pdf.

4 PROTOCOLS

EPIC identified six protocols to reduce on-road transportation emissions (Table 2). These activities include use of alternative fuels, carpooling, increasing transportation efficiency, and vehicle efficiency. When excluding inactive protocols and those that include activities or geographical requirements not applicable to the San Diego region, five protocols remain. One protocol, ACR's Improved Efficiency of Vehicle Fleets, is inactive. Four protocols are considered additional.

Table 2 Protocols in the On-Road Transportation Emissions Category

Protocol Category	All Protocols	Active, Applicable	And Additional
Alternative Fuels	3	3	2
Carpooling	1	1	1
Transportation Efficiency	1	1	1
Vehicle Efficiency	1	0	0
Total	6	5	4

Of the five active and applicable protocols, there are 35 projects in the U.S. and one in California (Table 3). Nearly all of the projects related to alternative fuels, including the one in California, are associated with the ACR Truck Stop Electrification protocol. As previously discussed and discussed below, the ACR Truck Stop Electrification protocol has not been generating offsets or considered additional since 2008 in light of California's anti-idling regulations going into effect.

Table 3 Projects Using Active and Applicable Protocols in the On-Road Transportation Category

GHG Reduction Activity/Protocol	US	CA	San Diego Region
Alternative Fuels	35	1	0
ACR Truck Stop Electrification	33	1	0
VCS VM0019 Fuel Switch from Gasoline to Ethanol in Flex-Fuel Vehicle Fleets	0	0	0
VCS VM0038 Methodology for Electric Vehicle Charging Systems	2	0	0
Carpooling	0	0	0
VCS VM0028 Methodology for Carpooling	0	0	0
Transportation Efficiency	0	0	0
VCS VM0020 Transport Energy Efficiency from Lightweight Pallets	0	0	0
Total	35	1	0

5 ADDITIONALITY

This section evaluates whether the protocols listed above or similar activities would lead to GHG reductions that would not have occurred otherwise. In the context of offset credits, it is important to determine whether a project and associated GHG reductions or removals would have happened in the absence of any benefit derived from creating a offset credit; that is, whether the reduction or removal is in addition to what would have otherwise happened. Additionality is a defining characteristic of offset credits, and there are several different ways to determine, or test, whether a project is additional.

California regulation defines “additional” to mean “greenhouse gas emission reductions or removals that exceed any greenhouse gas reduction or removals otherwise required by law, regulation or legally binding mandate, and that exceed any greenhouse gas reductions or removals that would otherwise occur in a conservative business-as-usual scenario.”⁴⁶ This definition creates a two-part test of additionality: a legal requirement test and a common practice test (sometimes called performance test). Even though this test is developed in the context of CARB’s compliance offsets, it is similar to that used by offset credit programs and thus can serve as a reasonable framework to evaluate whether offset credit protocols and resulting GHG emission reductions or removals would be considered additional.

Additionality must be determined on a project-by-project basis. For our purposes here, we consider a preliminary screen of protocols and project types (e.g., transportation electrification and vehicle efficiency) to determine whether, as a group, they could be considered additional. The additionality determination provided here is intended as a preliminary determination, and specific additionality screening would have to be applied to a specific project to determine whether the associated GHG reductions or removals are additional.

A more detailed discussion of additionality is provided in Section 5.1 and 5.2 below.

⁴⁶ 17 CCR § 95802(a).

Additionality Tests

There are several different tests to determine additionality. This report uses two common tests.

- **Legal Requirement Test** – This test determines whether there are any laws, regulations, policies, or legally-binding mandate that would have required the activity. If the activity does not exceed requirements, related emissions reductions would fail the legal requirement test and be considered not additional.
- **Common Practice Test** – This test determines whether in the absence of a requirement the activity would have happened anyway due to technological, financial, or other considerations. For example, if the activity is cost effective without the proceeds from carbon offset credits or represents a common practice, it could be considered not additional.

5.1 Legal Requirement Test

The legal requirement test, sometimes called the regulatory surplus test, determines whether the activity exceeds regulations in place at the time a project begins. On-road transportation is heavily regulated but there are clear limits to the regulation. Of the five active protocols evaluated, ACR Truck Stop Electrification offset activities is directly regulated by CARB's anti-idling regulation that restricts diesel vehicles from idling more than five minutes and prohibits all idling in school zones, with limited exceptions.⁴⁷

Electric vehicle charging raises several issues related to local mandates and the LCFS. VCS VM0038 Methodology for Electric Vehicle Charging Systems is limited by local mandates for electric vehicle charging installation in the Cities of Encinitas and Carlsbad as well as Title 24, Part 11 requirements that impact the viability of these activities generating offsets. While there is no statewide mandate to install electric vehicle charging infrastructure, there is regulation of offset credits generated under the LCFS that captures all residential electric vehicle service equipment in all electrical distribution utility (EDU) territories for base metered and un-metered single- and multi-family charging, unless another party opt-ins to generate the credit.⁴⁸ There is also the ability to generate additional credits for residential EV charging above the base credit by demonstrating incremental additional emission reductions through the use of low-carbon intensity electricity (e.g., onsite renewable energy generation used to serve EV load) or smart charging.⁴⁹ Nonresidential EV charging allows credit generation through the "opt-in" of the equipment to voluntarily generate credits with approved low-carbon or zero-carbon intensive electricity.⁵⁰ In all instances, the LCFS captures the offset activity for compliance in the LCFS program. Where a project generates LCFS credits, an issue of ownership and double counting is raised.

VCS VM0028 Methodology for Carpooling must be evaluated on an individual local jurisdiction basis and against SANDAG's RTP to account for whether the local government is using carpooling

⁴⁷ 13 CCR § 2485: Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling; 13 CCR § 2480: Airborne Toxic Control Measure to Limit School Bus Idling and Idling at Schools.

⁴⁸ 17 CCR § 95483 (c)(1)(B).

⁴⁹ *Ibid.*

⁵⁰ 17 CCR § 95483 (c)(2)–(3).

as a climate action plan GHG mitigation measure, as discussed in Section 3.3.3. While there are no state or regional mandates for carpooling, local governments may implement mandates through local ordinance to reduce transportation GHG emissions via decreases in VMT.

There are no mandates or regulations related to switching to flex-fuel vehicles or use of light weight pallets. It should be noted that California is moving to regulations that will regulate emissions in a way that limits or prohibits the sale of new vehicles that are not zero-carbon from a direct emissions standpoint. This will eventually eliminate the additionality of flex-fuel vehicles in the state.

5.2 Common Practice Test

A project that passes the legal requirement test may be considered not additional for other reasons. The Common Practice Test, also sometimes called the Performance Test, is an industry or sector specific analysis that requires the individual project to either achieve emission reductions in excess of what would have occurred otherwise based on whether there is widespread deployment of the particular project, technology, or practice or whether there is performance achievement that is greater than average within a relevant geographical area.⁵¹ This determines what is a common practice in the geographical region. A project-by-project analysis of what is a common practice to determine whether the applicable project would pass the common practice test was beyond the scope of this document for the San Diego Region. However, the following discusses general considerations for on-road transportation sector common practices.

The rate and penetration of electric vehicle service equipment installation should be evaluated to determine if a common practice exists. For example, certain local jurisdictions have significant EV penetration in the region resulting in both private and public charging infrastructure build out. New construction may also begin to standardize the build out of this infrastructure and charging networks to serve the growing number of EV. Also, the adoption of EVs, as well as mandates by California and local governments regarding procurement of ZEVs for fleets and other uses, should be evaluated.

5.3 Additional Considerations

Protocol project activity and viability should be evaluated based on other competition mandates and revenue options in the on-road transportation sector. For example, the LCFS credit value is significantly higher than the value of voluntary GHG offset, averaging over \$100 per credit. While a cap on LCFS credit value was put in place it will remain significantly higher than the voluntary market.⁵² Figure 3 shows prices and volumes from the LCFS credit transfer activity report for the week of April 19–25, 2021.

⁵¹ See The America Carbon Registry Standard, Version 7.0, December 2020, at p. 27–28: https://americancarbonregistry.org/carbon-accounting/standards-methodologies/american-carbon-registry-standard/acr-standard-v7-0_final_dec2020.pdf.

⁵² See Weekly LCFS Credit Transfer Activity Report: <https://ww3.arb.ca.gov/fuels/lcfs/credit/lrtweeklycreditreports.htm>.

Figure 3 Weekly LCFS Credit Transfer Activity Report Showing 4/19–4/25/21 Average Transfer Activity

LCFS Weekly Snapshot	19 th April 2021 - 25 th April 2021	
	All Non Zero	Type 1
Transfer Type	All Non Zero	Type 1
Average Price [3] (\$/MT)	\$191.87	\$177.28
Price Range (\$/MT)	\$174.50 - \$208.00	\$174.50 - \$195.00
Total Volume (MT)	520,137	139,770
Total Value (\$)	\$99,800,684	\$24,917,716

This limits the viability of related GHG offset projects under the protocols because the emission reduction has a much higher monetary value in the LCFS.

There are also state and local programs designed to decrease the cost of owning and installing electric vehicle service equipment that will impact common practices in the region. One local example is operated through SANDAG, the San Diego County Air Pollution Control District (SDAPCD), and California Energy Commission as part of the RTP and SB 375 Sustainable Communities Strategy. SANDAG committed to allocating \$30 million over 30 years for charging infrastructure and combined funding with SDAPCD and the CEC to fund this program, known as the CALeVIP San Diego County Incentive program.⁵³ This types of regional programs supplement ongoing work on electric vehicle infrastructure at the state level and should be accounted for when discussing additionality.

Finally, the continuing evolution of ZEV laws and regulations in California likely would further limit opportunities to use these protocols in the next 10–15 years. The pace and uptake based on these requirements must be evaluated individually and tracked over time to determine prospective additionality.

5.4 Summary of GHG Opportunities

Four of the five On-Road Transportation protocols are considered additional, though ongoing state regulation and implementation to reduce transportation GHG emission would limit the viability of projects under these protocols. Project proponents seeking to implement one of the GHG emissions reduction activities in the San Diego region would have to determine how, if at all, current local requirements relate to the project. It is not clear whether such GHG reductions would be considered common practice or part of a conservative BAU scenario for activities like carpooling. Also, the significant value of LCFS credit values competes directly with protocol project offsets as well as complicate ownership and double counting evaluations. Any evaluation to determine whether such activities are additional would have to be project-specific and focus on the specific type of GHG reduction activity undertaken.

⁵³ See SANDAG Electric Vehicle Rebates: CALeVIP San Diego County Incentive Project:

Figure 4 summarizes the additionality determination of the identified protocols:

Figure 4 Summary of Additionality Determination for Protocols Related to On-Road Transportation

GHG Reduction Activity/Protocol	Additionality Determination
Alternative Fuels	
ACR Truck Stop Electrification	Not Additional
VCS VM0019 Fuel Switch from Gasoline to Ethanol in Flex-Fuel Vehicle Fleets	Likely Additional
VCS VM0038 Methodology for Electric Vehicle Charging Systems	Additional
Carpooling	
VCS VM0028 Methodology for Carpooling	Additional
Transportation Efficiency	
VCS VM0020 Transport Energy Efficiency from Lightweight Pallets	Additional

6 LIMITATIONS

This appendix provides a snapshot of regulations and protocol in place at the time of its publication. There is an ongoing dynamic process around the regulation of On-Road Transportation category emissions that will continue to change and evolve over the coming decades at the Federal, state, and local levels. This report was unable to evaluate all potential changes, particularly potential future changes at the local level. It also does not address specific evaluation of common practices for activities covered by each individual protocol. More work is required to identify all current and proposed new state requirements specific to vehicle class and age, local ordinances related to on-road transportation GHG emissions categories, and on-road transportation GHG reduction activities in the region.

7 CONCLUSION

The On-Road Transportation category accounts for over 40% of regional emissions.⁵⁴ Of this total, nearly 90% of emissions are associated with passenger cars and other light-duty vehicles. The remaining 10% is associated with heavy-duty vehicles. The On-Road Transportation emission category is highly regulated, but there are four viable existing protocols. However, these protocols are subject to a dynamic and changing regulatory environment that may eliminate their viability in the future. There is also existing competition between LCFS credits that have much higher monetary value compared to the lower value voluntary protocol offset credits for electric vehicle charging and create emission reduction ownership questions.

⁵⁴ San Diego Association of Governments, San Diego Forward: The Regional Plan, Appendix D 2012 Regional Greenhouse Gas Emission Inventory for the San Diego Region and Projections, 2015, p. 26: https://www.sdforward.com/pdfs/RP_final/AppendixD-2012GreenhouseGasEmissionsInventoryfortheSanDiegoRegionandProjections.pdf. (Note this is the last publicly available estimate of regional emissions.)