Title 13. California Air Resources Board

Notice of Public Hearing to Consider Proposed In-Use Locomotive Regulation

The California Air Resources Board (CARB or Board) will conduct a public hearing at the date and time noted below to consider the proposed In-Use Locomotive Regulation.

Date: November 17, 2022

Time: 9:00 A.M.

In-Person Location:

California Air Resources Board
Byron Sher Auditorium
1001 I Street, Sacramento, California 95814

Remote Option:

Zoom

This public meeting may continue at 8:30 a.m., on November 18, 2022. Please consult the public agenda, which will be posted ten days before the November 17, 2022, Board Meeting, for important details, including, but not limited to, the day on which this item will be considered, how to participate via Zoom, and any appropriate direction regarding a possible remote-only Board Meeting if needed.

Written Comment Period and Submittal of Comments

In accordance with the Administrative Procedure Act, interested members of the public may present comments orally or in writing during the hearing and may provide comments by postal mail or by electronic submittal before the hearing. The public comment period for this regulatory action will begin on September 23, 2022. Written comments not submitted during the hearing must be submitted on or after September 23, 2022, and received **no later than November 7, 2022**. Comments submitted outside that comment period are considered untimely. CARB may, but is not required to, respond to untimely comments, including those raising significant environmental issues. The Board also encourages members of the public to bring to the attention of staff in advance of the hearing any suggestions for modification of the proposed regulatory action. Comments submitted in advance of the hearing must be addressed to one of the following:

Postal mail: Clerks' Office, California Air Resources Board
1001 I Street, Sacramento, California 95814

Electronic submittal: *https://www.arb.ca.gov/lispub/comm/bclist.php*

Please note that under the California Public Records Act (Gov. Code, § 6250 et seq.), your written and oral comments, attachments, and associated contact information (e.g., your

address, phone, email, etc.) become part of the public record and can be released to the public upon request.

Additionally, the Board requests but does not require that persons who submit written comments to the Board reference the title of the proposal in their comments to facilitate review.

Authority and Reference

This regulatory action is proposed under the authority granted in California Health and Safety Code, sections 38597, 39600, 39601, 39658, 39659, 39666, 39667, 39674, 39675, 41511, 42400, 42400.1, 42400.2, 42400.3.5, 42402, 42402.2, 42410, 43008.6, 43013, 43016, 43018, and 43019.1. This action is proposed to implement, interpret, and make specific sections 39650, 39659, 41511, 43013, and 43018, Health and Safety Code.

Informative Digest of Proposed Action and Policy Statement Overview (Gov. Code, § 11346.5, subd. (a)(3))

Sections Affected:

Proposed adoption to California Code of Regulations, title 13, section 2478.

Background and Effect of the Proposed Regulatory Action:

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Staff are proposing the In-Use Locomotive Regulation (Proposed Regulation) to achieve emission reductions from diesel-powered locomotives operating in California. Emission reductions from locomotives are needed to better protect communities from near-source pollution impacts, contribute to meeting the current health-based ambient air quality standards, and further California's climate goals.

Background

In 2020, California's locomotive sector was responsible for ten percent of statewide oxides of nitrogen (NOx) emissions from mobile sources and are projected to grow to over 15 percent in 2035 without regulation.[1] While most other mobile sectors are expected to significantly reduce emissions by 2035 as cleaner technologies are adopted, the locomotive sector's relative contribution is expected to increase without the Proposed Regulation.

The Proposed Regulation will reduce emissions from locomotives operating in California by requiring locomotive operators to fund a spending account based on the public health costs to Californians from locomotive emissions and activity levels. Locomotive operators may use funds held in the spending account to purchase cleaner locomotive technologies. The Proposed Regulation would prohibit locomotive with engine build dates 23 years and older from operating in California starting in 2030. The Proposed Regulation, starting in 2030, also

[1] CARB, Appendix G, CARB's 2022 In-Use Locomotive Emission Inventory: Regulation Proposal and Scenarios.

requires that switch, industrial and passenger locomotives with original engine build dates of 2030 or later operate in a zero emission (ZE) configuration in California. Additionally, in 2035, line haul locomotives with original engine build dates of 2035 or later will need to operate in a ZE configuration in California.

The Proposed Regulation will achieve emission reductions that will minimize health risk associated with exposure to toxic and criteria pollutants, help meet federal air quality standards, and support California's greenhouse gas (GHG) reduction goals. The Proposed Regulation would also increase the use of ZE technology in the off-road sector and support the goals of Executive Order N-79-20.[2,3]

Effects of the Proposed Regulation

The Proposed Regulation is designed to achieve public health, air quality, and climate benefits by requiring the transition of the oldest diesel-powered locomotives to cleaner technologies including ZE technology. Key elements of the Proposed Regulation include the following:

1. *Spending Account.* For each locomotive operated in California, locomotive operators will deposit funds into a spending account annually. The amount deposited in the account is calculated by using the locomotive's annual usage in megawatt hours (MWh) or per gallon of fuel and the locomotive's emission factors. Emission factors reflect estimates of the health cost burden on Californians due to these locomotive emissions. Funds in the Spending Account may only be used for:

    a. The purchase, lease, or rental of Tier 4 or cleaner locomotives, or for the remanufacture or repower to Tier 4 or cleaner locomotive until January 1, 2030.

    b. The purchase, lease, or rental of ZE locomotives, ZE capable locomotive(s), ZE rail equipment, or to repower to ZE locomotive(s) or ZE capable locomotive(s). A ZE capable locomotive is one that can be operated in a zero emission capacity when in California.

    c. The purchase of ZE infrastructure intended to support ZE locomotives, ZE capable locomotives or ZE rail equipment.

    d. The pilot or demonstration of ZE locomotives or ZE rail equipment.

2. *In-Use Operational Requirements.* Starting January 1, 2030, only locomotives with original engine build dates less than 23 years may operate in California. Additionally, on January 1, 2030, all switch and passenger and industrial locomotives with an original engine build date of 2030 or later must operate in a ZE configuration in

[2] Executive Order N-79-20, State of California Executive Order signed by Governor Gavin Newsom, September 23, 2020. (weblink: *https://www.gov.ca.gov/wp-content/uploads/2020/09/9.23.20-EO-N-79-20-Climate.pdf*).
[3] Executive Order N-79-20 set a goal for 100 percent ZE off-road vehicles and equipment by 2035.

California. Starting January 1, 2035, all line haul locomotives with an original engine build date of 2035 or later must operate in a ZE configuration in California. As part of these requirements, in 2027 and 2032, staff will assess the progress made in ZE technologies for use with switch, industrial, passenger and freight line haul locomotives, as well as the status of infrastructure improvements that may be needed to support ZE and ZE capable locomotives.

3. *Idling Requirements.* The Proposed Regulation specifies that locomotives cannot idle in California for more than 30 minutes before the engine must be shut down. Certain exemptions permit idling in excess of 30 minutes consistent with those found in 40 C.F.R. Part 1033.

4. *Recordkeeping and Reporting.* The Proposed Regulation requires operators to submit annual reports on locomotive operations by California Air District for each locomotive operated in the state.

Objectives and Benefits of the Proposed Regulatory Action:

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Objectives

The main objectives of the Proposed Regulation are to: (1) achieve fine particulate matter (PM2.5), NOx, and GHG emission reductions needed to protect communities from near-source pollution impacts, contribute toward meeting the current health based ambient air quality standards across California, and contribute toward achieving the state's climate goals; (2) transition diesel-powered locomotives to ZE technology, as directed by Executive Order N-79-20, which set a goal for 100 percent ZE off-road vehicles and equipment by 2035; (3) address multiple state policies and plans directing CARB to achieve additional diesel emission reductions; and (4) collect payment from diesel-powered locomotive operators to cover CARB's reasonable costs associated with the implementation and enforcement of the Proposed Regulation, as allowed by Health and Safety Code sections 38597 and 43019.1.

Benefits

The primary benefits of the Proposed Regulation are PM2.5, NOx, and GHG emission reductions from diesel-powered locomotives that operate in California. Staff estimates that cumulatively, from 2024 to 2050, the Proposed Regulation will reduce statewide emissions by approximately 7,450 tons of PM2.5, 389,600 tons of NOx, and 21.9 million metric tonnes of GHGs, relative to the baseline. These emission reductions will benefit California residents by reducing cancer risk to individual residents and off-site workers near facilities where locomotives operate, including those located in and near disadvantaged communities; improving air quality and resulting ozone exposure from reductions in NOx; providing GHG emission reductions needed to combat climate change; and reducing non-cancer health impacts such as premature deaths, hospital visits for cardiovascular and respiratory illnesses, and emergency room visits for asthma, especially in sensitive receptors including children, the elderly, and people with chronic heart or lung disease. The total statewide valuation of

avoided adverse health outcomes as a result of the Proposed Regulation from 2024 to 2050 is approximately $31.9 billion. Emission reductions will also reduce occupational exposure and benefit on-site workers, including, but not limited to locomotive operators and other individuals who work at facilities where locomotives operate.

The Proposed Regulation will provide an opportunity to increase ZE technology in the off-road locomotive sector. As more ZE and ZE capable locomotives are operated in California as a result of the Proposed Regulation, industry acceptance of advanced technologies will improve. The state of ZE locomotive technologies will progress, starting with shorter ranged locomotives such as switchers, and expand into extended range locomotives such as line haul locomotives.

Operators may choose to retrofit existing locomotives to be able to operate in a ZE capacity some (or all) of the time (referred to here as a ZE capable locomotive) or may instead purchase new or used ZE locomotives as they become commercially available. Retrofitting existing locomotives may benefit various businesses in the ZE locomotive supply chain, including those involved in battery and fuel cell technology throughout the state. Purchases of ZE locomotives may benefit ZE locomotive manufacturers, as well as various businesses in the ZE locomotive supply chain, including those involved in battery and fuel cell technology throughout the state. Supporting infrastructure installations will provide opportunities for design, engineering, construction, and project management firms to design new and expanded infrastructure, as well as benefit suppliers, equipment installers, and electricians. The expansion of electric charging infrastructure will also increase the amount of electricity supplied by utility providers and help the state's investor-owned utilities meet the goals of Senate Bill 350 (De León, Stats. 2015, ch. 547), which requires the state's investor-owned utilities to develop programs to accelerate widespread transportation electrification with goals to reduce dependence on petroleum, increase the uptake of ZE vehicles and equipment, help meet air quality standards, and reduce GHGs.

Lastly, the Proposed Regulation will result in noise reduction benefits. Diesel-powered locomotives can produce a substantial amount of noise, which also results in adverse health impacts. This is of concern when locomotives operate in and near places where people live, work, and play. Staff have received several noise complaints regarding locomotive activity near schools, hospitals, elder care facilities, and residential neighborhoods. The Proposed Regulation will transition diesel locomotives to ZE technology, which can produce little to no noise. The Proposed Regulation will eventually lead to the elimination of use of diesel-powered locomotives and reduce noise levels.

Public Process

To ensure an open and transparent rulemaking, staff have engaged in an extensive public process since development of the Proposed Regulation began in 2019. Staff conducted four public workshops to discuss regulatory concepts, methodology and data used to develop the proposed regulatory concepts, infrastructure considerations, compliance and enforcement mechanisms, as well as solicit stakeholder feedback. Staff posted information regarding these

workshops and any associated materials on the CARB locomotive webpage[4] and distributed notice of these meetings through several public list serves that include over 129,600 recipients.[5]

As of July 2022, staff have conducted more than 250 informal meetings, phone calls, and site visits with a broad group of stakeholders to discuss the Proposed Regulation and gather input and information. This includes members of impacted communities, environmental justice advocates, air districts, locomotive owners and operators, trade associations, locomotive manufacturers and other interested parties. A detailed summary of all stakeholder outreach activities is included in section XI of the Initial Statement of Reasons (ISOR).

Comparable Federal Regulations:

The United States Environmental Protection Agency (U.S. EPA) sets new locomotive emission standards under 40 C.F.R. Part 1033. There are no comparable federal regulations which address the same issues as CARB's Proposed Regulation, as the federal government has not adopted regulations for in-use locomotives. Therefore, the Proposed Regulation does not conflict with nor duplicate any current federal regulations.

Section 209(e) of the Clean Air Act prohibits states from adopting standards to control emissions from new locomotives or new engines used in locomotives (42 U.S.C. § 7543(e)(1)(B).) The Proposed Regulation does not prescribe any emission standards for new locomotive engines but instead only requires that locomotive operators meet certain operational requirements. While operators could meet these requirements by purchasing new locomotives that outperform current U.S. Environmental Protection Agency (U.S. EPA) emission standards, that is not necessary to meet the requirements of the Proposed Regulation. In other words, the Proposed Regulation does not require the purchase of any new locomotive that would outperform current U.S. EPA emission standards.

An Evaluation of Inconsistency or Incompatibility with Existing State Regulations (Gov. Code, § 11346.5, subd. (a)(3)(D)):

During the process of developing the proposed regulatory action, CARB conducted a search of any similar regulations on this topic and concluded these regulations are neither inconsistent nor incompatible with existing state regulations.

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[4] California Air Resources Board, Reducing Rail Emissions in California, accessed August 2, 2022. (weblink: *https://ww2.arb.ca.gov/our-work/programs/reducing-rail-emissions-california*).

[5] Number of subscribers for the following CARB lists as of June 29, 2022, AB32 Public Health Workgroup; Cargo Handling Equipment Regulatory Activities; Climate Change; Environmental Justice ChERRP, Commerce; Environmental Justice Stakeholders Group; Port and Rail Plan; Goods Movement Emission Reduction Program; Harbor Craft; Harbor Communities Monitoring; Tractor-Trailer GHG Regulation; Locomotive Emission Reduction Program; Environmental Justice ChERRP, Mira Loma; Truck and Bus Regulation; Port Truck; Railyard Emission Reduction Program; Reduction of GHG Emissions from Refrigerated Shipping Containers; Sustainable Freight Transport Initiative; Shore Power for Ocean Going Vessels; State Implementation Plan; Transport Refrigeration Units; Vessel Speed Reduction for Ocean Going Ships; West Oakland Risk Assessment; Environmental Justice ChERRP, Wilmington.

Disclosure Regarding the Proposed Regulation

Fiscal Impact/Local Mandate Determination Regarding the Proposed Action (Gov. Code, § 11346.5, subds. (a)(5)&(6)):

The determinations of the Board's Executive Officer concerning the costs or savings incurred by public agencies and private persons and businesses in reasonable compliance with the proposed regulatory action are presented below.

Under Government Code sections 11346.5, subdivision (a)(5) and 11346.5, subdivision (a)(6), the Executive Officer has determined that the proposed regulatory action would create costs or savings to any state agency, would create costs or savings in federal funding to the state, would create costs or mandate to any local agency or school district, whether or not reimbursable by the State under Government Code, title 2, division 4, part 7 (commencing with section 17500), or other nondiscretionary cost or savings to state or local agencies.

Cost to any Local Agency or School District Requiring Reimbursement under section 17500 et seq.:

Pursuant to Government Code sections 11346.5, subdivision (a)(5) and 11346.5, subdivision (a)(6), the Proposed Regulation is a mandate that would create costs and cost-savings to local agencies and school districts. However, these costs to local agencies are not reimbursable by the state under Government Code, title 2, division 4, part 7 (commencing with section 17500) because costs associated with the Proposed Regulation apply generally to all locomotive operators, including local agencies and school districts. Therefore, the Proposed Regulation does not constitute a "Program" imposing any unique requirements on local agencies or school districts as set forth in Government Code section 17514.

Cost or Savings for State Agencies:

The estimated costs to CARB as a result of the Proposed Regulation include the direct and indirect labor costs for the additional positions needed to successfully implement and enforce the Proposed Regulation as described below and operational costs (e.g., surveillance systems and data storage).

- 0.5 Air Resources Supervisor II position, 4.0 Air Pollution Specialist (APS) positions, 1.0 Staff Services Analyst position and 4.0 Air Resources Technician (ART) II positions in Fiscal Year 2023-2024.

Implementation duties include assisting locomotive operators with reporting and applicable registration, providing technical assistance, and issuing exemptions and waivers. Enforcement duties include conducting inspections and issuing and processing citations. The need for additional CARB staff is due to the addition of responsibilities for a new program.

The Proposed Regulation will also have a fiscal impact on state government agencies that operate locomotives. Staff determined state government agencies own approximately 27 locomotives, or less than 1 percent of the total number of locomotives operating in California. Staff applied this percentage to the total equipment-related direct costs to estimate the costs incurred by state government locomotive operators.

The Proposed Regulation will increase the number of ZE locomotives operating in California. Displacing diesel with electricity will decrease the total amount of diesel fuel dispensed in the state, resulting in a reduction in diesel fuel tax revenue collected by state government. For this analysis, staff used the combined state and local sales tax rate of 8.6 percent, which is a weighted average based on county-level output, with 3.94 percent[6] going towards state sales tax and 4.67 percent[7] going towards local sales tax.

The Energy Resources Fee is a $0.0003/kilowatt-hour surcharge levied on consumers of electricity purchased from electrical utilities.[8] The revenue collected is deposited into the Energy Resources Programs Account of the General Fund which is used for ongoing energy programs and projects deemed appropriate by the Legislature, including but not limited to, activities of the California Energy Commission.

The Proposed Regulation includes annual administrative payments of $175 for each diesel-powered and ZE capable locomotive that is operated in California. The proposed payment will result in revenue to the state to offset costs to CARB to implement and enforce the Proposed Regulation.

Sales tax is levied in California to fund a variety of programs at the local and state levels. The Proposed Regulation will result in the sale of more expensive locomotives and infrastructure in California, which will result in a direct increase in sales tax revenue collected by the state. However, overall, state sales tax revenue may increase less than the direct increase from locomotive and infrastructure sales if overall business spending does not increase. Staff used a combined state and local sales tax rate of 8.6 percent, which is a weighted average based on county-level output, with 3.94 percent[9] going towards state sales tax and 4.67 percent[10] going towards local sales tax.

From 2023 to 2050, staff estimated the cost to state government due to the Proposed Regulation to be $470 million, from locomotives operated by state government; and approximately $68 million in costs to CARB. State government will also see a direct increase in revenue from Energy Resources Fees, annual administrative payments and state sales tax of $228 million; as well as a decrease in sales tax from diesel fuel of $1.3 billion. Staff estimated the net cost to state government to be $1.59 billion from 2023 to 2050. CARB will seek authorization to use collected annual administrative payments to offset costs incurred to implement and enforce the Proposed Regulation.

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[6] California Department of Tax and Fee Administration, Detailed Description of the Sales & Use Tax Rate, accessed August 2, 2022. (weblink: *https://www.cdtfa.ca.gov/taxes-and-fees/sut-rates-description.htm*).
[7] California Department of Tax and Fee Administration, California City & County Sales & Use Tax Rates, accessed August 2, 2022. (weblink: *https://www.cdtfa.ca.gov/taxes-and-fees/sales-use-tax-rates.htm*).
[8] California Department of Tax and Fee Administration, 2020 Electrical Energy Surcharge Rate, December 2019. (weblink: *https://www.cdtfa.ca.gov/formspubs/l725.pdf*).
[9] California Department of Tax and Fee Administration, Detailed Description of the Sales & Use Tax Rate, accessed August 2, 2022. (weblink: *https://www.cdtfa.ca.gov/taxes-and-fees/sut-rates-description.htm*).
[10] California Department of Tax and Fee Administration, California City & County Sales & Use Tax Rates, accessed August 2, 2022. (weblink: *https://www.cdtfa.ca.gov/taxes-and-fees/sales-use-tax-rates.htm*).

Other Non-Discretionary Costs or Savings on Local Agencies:

The Proposed Regulation would cost local government agencies that own locomotives (e.g., Metrolink, Caltrain) approximately $515 million. Using the locomotive inventories[115] created for the Proposed Regulation, staff calculated direct costs incurred by local government locomotive owners. In attributing costs for local government, based on data from the Federal Transit Administration's National Transit Summaries and Trends 2019,[11] staff allocated local governments a 46 percent share of capital costs and 69 percent of maintenance costs associated with the Proposed Regulation. State funding provided 23 percent of capital costs, and federal funding providing 31 percent of capital costs and maintenance costs.

Several cities and counties in California levy a utility user tax on electricity usage. This tax varies from city to city and ranges from no tax to 11 percent. For this analysis, staff used a value of 3.53 percent, representing a population-weighted average. Since switcher locomotives are modeled to transition to battery-electric locomotives and therefore increase the amount of electricity used, there would be an increase in the amount of utility user tax revenue collected by cities and counties. Line haul and passenger locomotives are assumed to be hydrogen fuel cell, and therefore do not affect utility user taxes.

Off-road diesel locomotive use is exempt from on-road diesel taxes, but it does incur sales tax.[116] Displacing diesel with electricity or hydrogen would decrease the total amount of diesel fuel dispensed in the state, resulting in a reduction in tax revenue collected by local governments. For this analysis, staff used the combined state and local sales tax rate of 8.6 percent, which is a weighted average based on county-level output, with 3.94 percent[117] going towards state sales tax and 4.67 percent[118] going towards local sales tax.

Sales tax is levied in California to fund a variety of programs at the local and state levels. The Proposed Regulation will result in the sale of more expensive locomotives and infrastructure in California, which will result in a direct increase in sales tax revenue collected by local governments. However, overall, local sales tax revenue may increase less than the direct increase from locomotive and infrastructure sales if overall business spending does not increase. Staff used a combined state and local sales tax rate of 8.6 percent, which is a weighted average based on county-level output, with 3.94 percent[12] going towards state sales tax and 4.67 percent[13] going towards local sales tax.

From 2023 to 2050, staff estimated the cost to local governments due to the Proposed Regulation to be $515 million, resulting from locomotives operated by local governments. Local governments will also see a direct increase in utility user and local sales tax revenue of $220 million and a decrease in sales tax from diesel fuel of $490 million. Staff estimated the total fiscal cost to local governments to be $1.0 billion from 2023 to 2050.

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[11] Federal Transit Administration, National Transit Summaries and Trends 2019, accessed August 2, 2022. (weblink: *https://www.transit.dot.gov/funding/grants/urbanized-area-formula-grants-5307*).
[12] California Department of Tax and Fee Administration, Detailed Description of the Sales & Use Tax Rate, accessed August 2, 2022. (weblink: *https://www.cdtfa.ca.gov/taxes-and-fees/sut-rates-description.htm*).
[13] California Department of Tax and Fee Administration, California City & County Sales & Use Tax Rates, accessed August 2, 2022. (weblink: *https://www.cdtfa.ca.gov/taxes-and-fees/sales-use-tax-rates.htm*).

Cost or Savings in Federal Funding to the State:

The Proposed Regulation would have a small fiscal impact to federal government agencies that provide funding for state and local locomotives, relative to the total estimated cost of the Proposed Regulation. The cost to the federal government is estimated to be approximately $362 million from 2023 to 2050.

Housing Costs (Gov. Code, § 11346.5, subd. (a)(12)):

The Executive Officer has also made the initial determination that the proposed regulatory action will not have a significant effect on housing costs.

Significant Statewide Adverse Economic Impact Directly Affecting Business, Including Ability to Compete (Gov. Code, §§ 11346.3, subd. (a), 11346.5, subd. (a)(7), 11346.5, subd. (a)(8)):

The Executive Officer has made an initial determination that the proposed regulatory action would not have a significant statewide adverse economic impact directly affecting businesses, including the ability of California businesses to compete with businesses in other states, or on representative private persons.

Results of The Economic Impact Analysis/Assessment (Gov. Code, § 11346.5, subd. (a)(10)):

Major Regulation: Statement of the Results of the Standardized Regulatory Impact Analysis (SRIA) (Gov. Code, § 11346.3, subd. (c)):

11346.3(c)(1) Each state agency proposing to adopt, amend, or repeal a major regulation on or after November 1, 2013, and that has prepared a standardized regulatory impact assessment (SRIA) in the manner prescribed by the Department of Finance pursuant to section 11346.36. The standardized regulatory impact analysis shall address **all** of the following:

(A) The creation or elimination of jobs within the state.

The Proposed Regulation is estimated to result in a decrease in employment growth in California most years of the assessment. These changes in employment represent less than 0.01 percent of baseline California employment in 2025, grow to represent a decrease of 0.05 percent of baseline California employment in 2035, and diminishes to be approximately 0.01 percent of baseline California employment by 2050. The patterns of decreasing employment growth closely track the annual costs of the Proposed Regulation as the direct impacts of the Proposed Regulation more broadly impact businesses and individuals in California. In 2023, 2024 and 2025, the modeled results show an increase in employment. This is primarily associated with an increase in revenue from the sale and scrappage of locomotives and the associated decrease in maintenance costs in those years.

The rail transportation industry in California bears the greatest direct cost of the Proposed Regulation and is also estimated to see the greatest impact to employment growth. The Proposed Regulation would result in a decrease in employment growth in 2025 of 8 jobs, a decrease in employment growth in 2040 of 249 jobs, and a decrease in employment growth in 2050 of 64 jobs; a decrease of about two percent in the years of greatest impact.

(B) The creation of new businesses or the elimination of existing businesses within the state.

The Proposed Regulation does not directly result in business creation or elimination and the Regional Economic Models, Inc. (REMI) model cannot directly estimate the creation or elimination of businesses. However, based on the modeling of changes in output and employment, businesses involved in the manufacture and installation of hydrogen infrastructure, as well as hydrogen manufacturing, may see expansions in business. To the degree that any California businesses are involved in the manufacture of new locomotives, these businesses may also expand to meet demands. The greatest impacts to output and employment could occur in the rail transportation industry. A large portion of the costs will be borne by Class I operators. The Class I operators are large national corporations and are not anticipated to experience business elimination because of the Proposed Regulation.

While changes in jobs for the California economy cannot directly estimate the broader impacts of business creation and elimination, job changes can be used to understand some of the potential impacts to businesses. The overall job impacts of the Proposed Regulation are small relative to the total California economy. The changes in statewide employment represent, at most, a 0.05 percent change relative to baseline California employment in any given year.

(C) The competitive advantages or disadvantages for businesses currently doing business within the state.

There could be indirect competitive disadvantages to California businesses that depend primarily on rail transport. California producers and their products compete with producers and products from other states and nations. The extent and nature of that competition depends on commodity type. For example, some California products are differentiated by source or brand, such as Napa Valley wines, California raisins, or Tesla autos. Since customers may not see wines, raisins, or autos from elsewhere as perfect substitutes, differentiated products can often command a somewhat higher price and have a greater ability to absorb transportation cost differences without losing market share. Other California products dominate their industry due to production volume and are somewhat shielded from competition because other sources cannot satisfy the market demand. However, California products that are not differentiated by source or brand must compete on delivered price and reliability of supply. Some California businesses may therefore face increased competition to the extent that their product prices are affected by increased shipping costs associated with the Proposed Regulation.

(D) The increase or decrease of investment in the state.

Gross domestic private investment consists of purchases of residential and nonresidential structures and of equipment and software by private businesses and nonprofit institutions. It

is used as a proxy for impacts on investments in California because it provides an indicator of the future productive capacity of the economy.

Under the Proposed Regulation, private investment is anticipated to decrease by $7 million in 2025, decrease by $673 million in 2040, and decrease by $96 million in 2050. These impacts to private investment range between a decrease of less than 0.01 percent to a decrease of about 0.11 percent.

(E) The incentives for innovation in products, materials, or processes.

The Proposed Regulation would initiate the transition to ZE for locomotives operating in California. In the short term, locomotive switchers (Class I, Class III, and industrial) provide a unique opportunity to accelerate the deployment of ZE technology in the off-road sector. Unlike line haul locomotives, which may travel throughout the country and return to a base only for periodic maintenance, switchers are generally used for railyard operations or local and regional delivery, returning to a railyard or home base each night. Due to their daily operational characteristics and the operating range of current ZE technologies, switchers are well suited for ZE pilots in California. Passenger operators are also beginning to implement ZE technology and are expected to have access to commercially available ZE locomotives by 2030 (see Locomotive Technology Feasibility Assessment within the ISOR for further details). Even with line haul locomotives, Union Pacific and BNSF Railway have committed to integrating ZE technology. As use of ZE technologies expands, technical capabilities will improve, and they are expected to operate comparably with diesel technology. Additionally, as ZE switchers are increasingly adopted, industry acceptance of advanced technologies is improving. The current state of ZE locomotive technology is expected to progress and expand into extended range applications, as well as other off-road sectors.

Additionally, the Proposed Regulation would increase the installation of electric charging and hydrogen fueling infrastructure needed to support the use of ZE locomotives. Currently, ZE technologies are underutilized due, in part, to limited access to supporting infrastructure at facilities where locomotives operate. Installations of electric charging and hydrogen fueling infrastructure will support the use of these technologies, as well as other advanced technology equipment and vehicles.

(F) The benefits of the regulations, including, but not limited to, benefits to the health, safety, and welfare of California residents, worker safety, and the state's environment and quality of life, among any other benefits identified by the agency.

The Proposed Regulation is designed to reduce toxic air contaminant, criteria pollutant, and GHG emissions by transitioning old, highly polluting locomotives to the cleanest diesel-powered locomotives available and ZE locomotives. Cumulatively, from 2023 to 2050, the Proposed Regulation is expected to reduce statewide locomotive emissions by approximately 7,450 tons of PM2.5 and 389,600 tons of NOx relative to the baseline. The total statewide valuation of avoided health outcomes from 2023 to 2050 is approximately $31.96 billion. The cost-savings associated with reduced fuel and maintenance costs as well as sold and salvaged locomotives to all locomotive operators is about $11.4 billion. The operator cost-savings are in part offset by about $1.8 billion in lost tax and fee revenue at the state and local governments.

(G) Department of Finance Comments and Responses.

Department of Finance (DOF) comment (1): "…the SRIA assumes that railroads will replace their entire fleets and continue their current practice of sending any available long-haul locomotives to California. However, the SRIA also estimates that the required hydrogen locomotives would cost about 70 percent more than diesel locomotives and that operators will spend more on hydrogen fuel than on diesel fuel, so railroads may have an incentive to replace only the locomotives that run in California and to continue running diesel locomotives in other states. The SRIA should include a sensitivity analysis to show how impacts may vary under different compliance scenarios or provide justification for the current assumption."

CARB Response: CARB agrees it is probable that California Class I locomotive operators would not replace their entire national line haul fleet to comply with the Proposed Regulation. Absent more granular data specific to Union Pacific and BNSF Railway operations, staff utilized trends observed from annually reported data collected by the 1998 Memorandum of Mutual Understanding and Agreements (MOU), South Coast Locomotive Fleet Average Emissions Program (98MOU). The 98MOU data suggests that Class I locomotive operators prioritized cleaner locomotives in the South Coast Air Basin (SCAB) in the early years of the agreement. Once enough early reduction credits were obtained to achieve the minimum fleet average emissions, the Class I locomotive operators stopped being selective about the SCAB locomotive fleet. From 2010 through 2012, 65 percent of SCAB locomotive activity was done with Tier 2/2+ and cleaner locomotives, with Tier 1/1+ and dirtier locomotives accounting for around 30 percent. By 2017, Tier 1/1+ and dirtier locomotives accounted for 43 percent of Class I SCAB activities and have since remained close to that level. This shows that operators have switched from prioritizing certain locomotives for use in California to dispatching locomotives without considering emission levels when possible. Absent Class I input that could inform the fleet operational characteristics, staff provided analysis on both situations.

The SRIA provides separate modeling outputs for a California specific fleet and a national fleet turnover. The Proposed Regulation and alternatives reflect the cost to California, to provide values for comparison to the California specific health benefits presented. Since operations in California represent ten percent of Class I national operations, operators could either send the ten percent of their fleet with the cleanest emissions, similar to their early actions under the 98MOU, or could send locomotives without consideration of their emissions, similar to their current actions. Either way, the cost to California is the same and is based on ten percent of their national operations used to calculate California benefits. Staff separately provided a sensitivity analysis of the national costs if Class I operators chose to turn over 100 percent of their line haul locomotives.

Also, the Proposed Regulation does not require hydrogen locomotives and is neutral to the technology that achieves ZE or a hybrid ZE-capable locomotive. Using currently available technology as a guide, staff assumes hydrogen fuel cell locomotives to be the current preferred ZE locomotive option for line haul locomotives; however, this may change during the span of the Proposed Regulation based on technology advancements.

The SRIA currently assumes yard switchers and road switchers operated by Class I, Class III, and industrial operators will eventually transition to battery-electric ZE locomotives. Class I line haul and passenger locomotives are presumed to use hydrogen fuel cell locomotives due

to their increased operational range needs. In 2016, CARB published a report analyzing economic impacts of operating locomotive exchange points outside California to swap out battery-electric ZE locomotives with diesel locomotives. The report concluded that operation of exchange points would cause delays that may lead to mode shift to trucks, and railroads could lose approximately $1.1 billion in revenue. Hydrogen fuel cell locomotives can meet Class I line haul operational needs better than battery-electric locomotives without locomotive exchange points due to their longer range. As mentioned previously, it is possible Class I operators could choose to have a designated California fleet of cleaner locomotives and continue to use diesel elsewhere. However, discussions with Class I operators have not indicated whether this was a viable option. Additionally, CARB could not determine what the California fleet would be comprised of, whether battery-electric or hydrogen, and thus absent input from Class I operators more analysis is not likely to yield an improved impact assessment.

DOF comment (2): "The SRIA assumes that incidence-per-ton factors calculated for the period from 2014 to 2016 will hold in the future, while it may be that additional years of data might change these factors and/or causal relationships and hence change the estimated benefits. The SRIA should explain why the period from 2014 to 2016 was used or update the analysis with additional years of data."

CARB Response: The SRIA uses the most updated incidence-per-ton (IPT) factors available to estimate future health benefits. CARB will be updating the IPT factors and underlying data in the future, but additional analyses are needed to ensure that the IPT factors for human-made sources of air pollution are not affected by events such as the occurrence of high wildfire seasons after 2016. There is a strong body of epidemiological research supporting the causal and likely causal relationships between PM2.5 exposure and the adverse health outcomes CARB evaluated, and this research has grown over the years. Additionally, recent studies continue to show that exposures to even low PM2.5 concentrations, below the levels of current air quality standards, can lead to adverse health outcomes. Therefore, the causal and likely causal relationships reflect the most recent science.

DOF comment (3): "The SRIA evaluates cancer risk impacts for only the population living within a mile of a railyard. As moving from just inside the 1-mile radius to just outside may not eliminate the cancer risk, the SRIA should include a sensitivity analysis to show how health benefits may vary for different proximities or explain why the 1-mile rule is the best approximation to evaluate changes in cancer risk from reduced locomotive emissions."

CARB Response: Between 2007 and 2009, CARB conducted railyard health risk assessments (HRA) for 17 major railyards in California. The railyard HRAs showed that the diesel PM (DPM) emission from locomotives operating within a railyard resulted in elevated cancer risks in the communities adjacent to the railyards, and beyond. The HRAs also indicated that the zone of impact can extend to an area of several miles from the boundary of the railyard. DPM has been identified as a toxic air contaminant by CARB and there is no acceptable level of exposure for all communities either adjacent to or around the railyards.

For the Proposed Regulation, staff updated the 2007-2009 HRAs. The updated Health Risk Characterization (HRC) averaged the cancer risk, with a region extending out one mile from the railyard boundary as a reference area to evaluate the relative reduction in cancer risk that would result from the Proposed Regulation. Staff further broke down the one-mile area into

bands of 0-0.25, 0.25-0.5, and 0.5-1.0 miles, and the estimated average cancer risks within these areas. The results showed a strong association between the cancer risk level and the distance from emission sources, which is consistent with the findings of previous HRAs.

As presented in the HRC, the locomotive DPM emission reductions from the Proposed Regulation indicate that there would be substantial reductions of health impacts within communities near railyards. The residents exposed to the elevated cancer risks within areas beyond one-mile from the railyard boundaries would also have similar risk reductions from the Proposed Regulation. Using the one-mile boundary to show that cancer risk from DPM emitted by locomotives directly correlates with the distance from the emission source, means that additional analysis of boundaries beyond one mile was not necessary for the Proposed Regulation.

Business Report (Gov. Code, §§ 11346.5, subd. (a)(11); 11346.3, subd. (d)):

In accordance with Government Code sections 11346.5, subdivisions (a)(11) and 11346.3, subdivision (d), the Executive Officer finds the reporting requirements of the proposed regulatory action which apply to businesses are necessary for the health, safety, and welfare of the people of the State of California.

Cost Impacts on Representative Private Persons or Businesses (Gov. Code, § 11346.5, subd. (a)(9)):

In developing this regulatory proposal, staff evaluated the potential economic impacts on representative private persons or businesses. The total direct cost for locomotive operators to comply with the Proposed Regulation is estimated to be approximately $23.4 billion from 2023 to 2050. These costs include all capital, maintenance, fuel, administrative, and opportunity costs and savings incurred by all parties. The estimated cost savings from 2023 to 2050 is $10.9 billion. The total net cost of the Proposed Regulation from 2023 to 2050 is estimated to be $13.8 billion, which is less than the approximate $31.9 billion in expected monetized health benefits.

The Proposed Regulation could result in indirect costs to individuals to the extent that affected businesses pass compliance costs through to consumers. If the total direct cost of the Proposed Regulation is fully passed through to consumers, the cost per California household from total impact of the Proposed Regulation from 2023 to 2050 is estimated to be an average of $58 per household yearly.

Passenger locomotive operators that incur increased costs after pursuing local, state, and federal funding may decide to pass on costs to individuals, through changes in service or fares. However, government grant funding could reduce or eliminate the additional capital costs of the Proposed Regulation. To the extent that passenger locomotive operators are successful in offsetting the upfront incremental costs, fares could be unaffected for individuals and could lead to potential fare reductions in later years due to operational cost savings. However, CARB calculated the cost to individuals if fares could not be offset with government funding. The hypothetical impact to fares if passenger operators passed through 100 percent of their costs to riders would be local passenger fares could increase by

approximately 39 cents and state passenger fares could increase by $2.27 on average, assuming 1.5 percent growth in ridership year-over-year.

Effect on Small Business (Cal. Code Regs., tit. 1, § 4, subds. (a) and (b)):

The Executive Officer has also determined under California Code of Regulations, title 1, section 4, that the proposed regulatory action would affect small businesses. To identify small businesses and model their estimated costs of compliance with the Proposed Regulation, staff reviewed locomotive populations and fuel usage for Class III and industrial locomotive operators. Among the locomotive operators reviewed, staff identified that those with an average annual revenue over $5 million have 7 or more locomotives and are already buying new locomotives using their revenue and, in some cases, grants. Small businesses (companies with less than $5 million in revenue per year) rarely, if ever, purchase new locomotives. They primarily operate pre-Tier 0 engines which have the highest emissions and therefore would also incur the highest Spending Account funding requirements.

The cost for small businesses to comply with the Proposed Regulation from 2023 to 2050, ranges from approximately $25,000 to $1,262,000. At maximum, this is approximately 97 percent of small businesses annual revenue. Recognizing that the Proposed Regulation requirements may challenge some small businesses, especially those operating Pre-Tier 0 locomotives, staff has included a Small Business Hardship Extension provision in the Proposed Regulation. For more information on this provision see Appendix A of the ISOR.

Consideration of Alternatives (Gov. Code, § 113f46.5, subd. (a)(13)):

Before taking final action on the proposed regulatory action, the Board must determine that no reasonable alternative considered by the Board, or that has otherwise been identified and brought to the attention of the Board, would be more effective in carrying out the purpose for which the action is proposed, would be as effective and less burdensome to affected private persons than the proposed action, or would be more cost-effective to affected private persons and equally effective in implementing the statutory policy or other provisions of law.

Staff considered five alternatives to the Proposed Regulation. As explained in section IX of the ISOR, no alternative proposal was found to be less burdensome and equally effective in achieving the purposes of the Proposed Regulation in a manner that ensures full compliance with the authorizing law. Staff has not identified any reasonable alternatives that would lessen any adverse impact on small business.

State Implementation Plan Revision

If adopted by CARB, CARB plans to submit the proposed regulatory action to the U.S. EPA for approval as a revision to the California State Implementation Plan (SIP) required by the federal Clean Air Act. The adopted regulatory action would be submitted as a SIP revision because it adopts regulations intended to reduce emissions of air pollutants in order to attain and maintain the National Ambient Air Quality Standards promulgated by U.S. EPA pursuant to the Clean Air Act.

Environmental Analysis

CARB, as the lead agency for the Proposed Regulation, has prepared a draft environmental analysis (Draft EA) under its certified regulatory program (Cal. Code Regs., tit. 17, §§ 60000 through 60008) to comply with the requirements of the California Environmental Quality Act (CEQA; Pub. Resources Code § 21080.5). The Draft EA concluded implementation of the Proposed Regulation, could result in: beneficial impacts to air quality, GHG emissions and climate change; less than significant impacts to air quality, energy demand, energy resources, GHG emissions, land use and planning, mineral resources, population and housing, public services, recreation, and wildfire; and potentially significant adverse impacts to aesthetics, agriculture and forest resources, air quality, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, mineral resources, noise, transportation and traffic, tribal cultural resources, and utilities and service systems.

Beneficial impacts are related to reductions in PM, NOx, and GHG emission as well as decreased use of diesel fuel. The potentially significant and unavoidable adverse impacts are primarily related to short-term, construction-related activities. This explains why some resource areas are identified above as having both less-than-significant impacts and potentially significant impacts. The Draft EA, included as Appendix D to the ISOR, is entitled "Draft Environmental Analysis for the Proposed Regulation for In-Use Locomotives." Written comments on the Draft EA will be accepted during a 45-day public review period starting on September 23, 2022, and ending at 12:00 am on November 7, 2022.

Special Accommodation Request

Consistent with California Government Code section 7296.2, special accommodation or language needs may be provided for any of the following:

- An interpreter to be available at the hearing;
- Documents made available in an alternate format or another language; and
- A disability-related reasonable accommodation.

To request these special accommodations or language needs, please contact the Clerks' Office at *cotb@arb.ca.gov* or (916) 322-5594 as soon as possible, but no later than ten business days before the scheduled Board hearing. TTY/TDD/Speech to Speech users may dial 711 for the California Relay Service.

Consecuente con la sección 7296.2 del Código de Gobierno de California, una acomodación especial o necesidades lingüísticas pueden ser suministradas para cualquiera de los siguientes:

- Un intérprete que esté disponible en la audiencia;
- Documentos disponibles en un formato alterno u otro idioma; y
- Una acomodación razonable relacionados con una incapacidad.

Para solicitar estas comodidades especiales o necesidades de otro idioma, por favor llame a la oficina del Consejo al *cotb@arb.ca.gov* o (916) 322-5594 lo más pronto posible, pero no menos de 10 días de trabajo antes del día programado para la audiencia del Consejo.

TTY/TDD/Personas que necesiten este servicio pueden marcar el 711 para el Servicio de Retransmisión de Mensajes de California.

Agency Contact Persons

Inquiries concerning the substance of the proposed regulatory action may be directed to the agency representative Layla Gonzalez, Staff Air Pollution Specialist, Freight Systems Section, at *layla.gonzalez@arb.ca.gov* or at (279) 208-7827 or Ajay Mangat, Manager, Freight Systems Section, at *ajay.mangat@arb.ca.gov* or at (279) 208-7136.

Availability of Documents

CARB staff has prepared a Staff Report: Initial Statement of Reasons (ISOR) for the proposed regulatory action, which includes a summary of the economic and environmental impacts of the proposal. The report is entitled: Public Hearing to Consider the Proposed In-Use Locomotive Regulation, Staff Report: Initial Statement of Reasons.

Copies of the ISOR and the full text of the proposed regulatory language may be accessed on CARB's website listed below, on September 20, 2022. Please contact Bradley Bechtold, Regulations Coordinator, at *bradley.bechtold@arb.ca.gov* or (279) 208-7266 if you need physical copies of the documents. Because of current travel, facility, and staffing restrictions, the California Air Resources Board's offices have limited public access. Pursuant to Government Code section 11346.5, subdivision (b), upon request to the aforementioned Regulations Coordinator, physical copies would be obtained from the Public Information Office, California Air Resources Board, 1001 I Street, Visitors and Environmental Services Center, First Floor, Sacramento, California, 95814.

Further, the agency representative to whom nonsubstantive inquiries concerning the proposed administrative action may be directed is Bradley Bechtold, Regulations Coordinator, (279) 208-7266. The Board staff has compiled a record for this rulemaking action, which includes all the information upon which the proposal is based. This material is available for inspection upon request to the contact persons.

Hearing Procedures

The public hearing will be conducted in accordance with the California Administrative Procedure Act, Government Code, title 2, division 3, part 1, chapter 3.5 (commencing with section 11340).

Following the public hearing, the Board may vote on a resolution directing the Executive Officer to: make any proposed modified regulatory language that is sufficiently related to the originally proposed text that the public was adequately placed on notice and that the regulatory language as modified could result from the proposed regulatory action, and any additional supporting documents and information, available to the public for a period of at least 15 days; consider written comments submitted during this period; and make any further modifications as may be appropriate in light of the comments received available for further public comment. The Board may also direct the Executive Officer to: evaluate all comments received during the public comment periods, including comments regarding the Draft

Environmental Analysis, and prepare written responses to those comments; and present to the Board, at a subsequently scheduled public hearing, the final proposed regulatory language, staff's written responses to comments on the Draft Environmental Analysis, along with the Final Environmental Analysis for action.

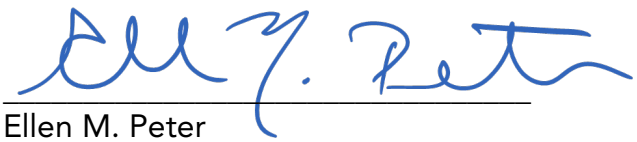
Final Statement of Reasons Availability

Upon its completion, the Final Statement of Reasons (FSOR) will be available and copies may be requested from the agency contact persons in this notice, or may be accessed on CARB's website listed below.

Internet Access

This notice, the ISOR and all subsequent regulatory documents, including the FSOR, when completed, are available on CARB's website for this rulemaking at *https://ww2.arb.ca.gov/rulemaking/2022/locomotive*

California Air Resources Board



Ellen M. Peter
Acting Executive Officer

Date: September 6, 2022

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see CARB's website (www.arb.ca.gov).