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DATE: **December 11, 2017**

TO: **California Department of Transportation (Caltrans)**
Division of Rail and Mass Transportation
2018 California State Rail Plan
Rail Planning Branch
1120 N Street, MS 74
Sacramento, CA 95814

Filed electronically to: RailPlan@dot.ca.gov

FROM: **Center for Sustainable Energy®**

RE: **Center for Sustainable Energy's Response to the 2018 Plan Draft (2018 Plan)**

Dear Caltrans Division of Rail and Mass Transportation:

The Center for Sustainable Energy® (CSE) is pleased to provide these comments in response to the 2018 State Rail Plan (2018 Plan). As a mission-driven, nonprofit organization, CSE is committed to accelerating the transition to a sustainable world powered by clean energy, including the diversification of transportation technologies focused on air quality improvements and greenhouse gas (GHG) emissions reductions.

CSE administers the California Air Resources Board's (CARB's) Clean Vehicle Rebate Project (CVRP)[1] and the California Energy Commission's (Energy Commission) California Electric Vehicle Infrastructure Project (CALeVIP).[2] In addition, CSE has managed a variety of Energy Commission-funded alternative fuel vehicle (AFV) projects, including Zero-Emission Vehicle (ZEV) readiness projects in the San Diego and San Joaquin Valley regions. CSE provides these comments based on its diverse experiences in support of the deployment of California's ZEVs and ZEV transportation infrastructure, and its in-depth knowledge of the AFV landscape. CSE comments in support of accelerated clean technology integration into the 2018 Plan, specifically in the following areas:

I. Zero-Emission Technology Integration Strategies
II. Energy
III. Collaboration

[1] *CVRP Website Access: https://cleanvehiclerebate.org/eng*
[2] *Block Grant for Electric Vehicle Charger Incentive Projects; Docket Number: 17-EVI-01; Website Access: http://www.energy.ca.gov/altfuels/zev/2017-EVI-01/*

IV. Research
V. Data and Transparency

I. Zero-Emission Technology Integration Strategies

CSE commends the 2018 Plan's Zero-Emission Technology (ZET) strategies and the goal to "electrify or deploy other ZEV technology on as much of the intercity passenger rail network as possible."[3] This approach makes major advancements towards achieving first-of-kind, clean technology integration policies in California's rail sector, the importance of which is compounded as the 2018 Plan serves as both a state and federal document. To strengthen these strategies, CSE recommends the following:

a. **Expand discussions of the ZEV ecosystem.** The plan should include a more direct discussion of the ZEV technology ecosystem and, more specifically, the role of electric and hydrogen light duty ZEVs and zero-emission buses (electric and hydrogen) as part of the emergent ZET ecosystem. This approach would support California's 2013[4] and 2016[5] ZEV Action Plans, as well as Senate Bill (SB) 350's policy framework, which also encourages mass and widespread transportation electrification.

b. **Prioritize Electric Vehicle Supply Equipment (EVSE) deployment at rail stations.** To strengthen the linkage between ZET policies and intermodal infrastructure, the 2018 Plan should prioritize EVSE deployment in and around high-density, highly-trafficked, intermodal areas (e.g., transit depots, passenger rail stations, etc.), as well as hubs that feed these locations (e.g., park-and-rides, airport connectors, and parking lots). This will support PEV drivers that may not have access to home charging, address PEV range anxiety concerns, and promote the deployment of public charging that can be used by complementary service providers, such as PEV taxis and Transportation Network Company (TNC) operators. Moreover, it is highly likely that there will be "points of shared compatibility", where PEV charging can be used across a wide range of vehicle classes and fleets, which will encourage widespread utilization of the EVSE in and

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[3] 2018 California State Rail Plan (Draft); States: "Electrification and Zero Emission Technology (ZET). The 2040 Vision recognizes opportunities to electrify or deploy other zero emission vehicle (ZEV) technology on as much of the intercity passenger rail network as possible, which allows the system to be operated in a more efficient, cost-effective, and cleaner manner than is possible with existing diesel-powered locomotive technology. Electrification for some parts of the statewide rail network will mean traditional catenary-based systems. For other services, this will mean other zero or near-zero emissions technologies. This definition of electrification provides considerable opportunities to increase system efficiencies and performance, and improve air quality. This means longer trains can be deployed and accelerated faster and the rail network supports the State's efforts to reach its GHG emissions"; Website Access: http://www.dot.ca.gov/californiarail/docs/CSRP_PublicReleaseDraft_10112017.pdf
[4] http://opr.ca.gov/docs/Governor's_Office_ZEV_Action_Plan_(02-13).pdf
[5] https://www.gov.ca.gov/docs/2016_ZEV_Action_Plan.pdf

around station locations. This approach complements existing policy, including the development of "mobility hubs,"[6] the prioritization of "infrastructure co-location opportunities,"[7] and the prioritization of more compact development patterns that reduce Vehicle-Miles-Traveled (VMT) and demand less energy per capita.[8] Moreover, this prioritization has the potential to encourage seamless connections between ZEVs and rail transit infrastructure, presenting a "win-win" scenario.

c. **Prioritize solar photovoltaic (PV) and energy storage, and evaluate their applicability in right-of-way (ROW).[9]** To enhance the 2018 Plan's corridor electrification initiatives, a focus on solar PV and energy storage (and its use in ROW) is recommended. This would complement existing ZET initiatives underway, as various transit agencies are testing avenues of clean technology integration. Examples include the Bay Area Rapid Transit District,[10] Los Angeles Metro,[11] [12] and Santa Clara Valley Transportation Authority.[13] [14] In addition, this approach would complement Caltrans 2016 Sustainability Implementation Action Plan, which sets goals to "incorporate solar technology into transportation infrastructure", and focuses on "system energy generation [e.g., solar] infrastructure [to i]ncorporate energy generation technology into transportation infrastructure and on ROW."[15] Moreover, there remains federal interest in solar in ROW, which has been

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[6] As outlined in California Transportation Plan 2040; California Transportation Plan 2040; Website Access:http://www.dot.ca.gov/hq/tpp/californiatransportationplan2040/Final%20CTP/FINALCTP2040-Report-WebReady.pdf

[7] 2016 ZEV Action Plan, Goal to: "Consider infrastructure co-location opportunities that can support light-duty, medium-duty and heavy-duty electric vehicle charging and hydrogen fueling station applications in connector site stations (stations along major routes that connect distinct areas of high potential for PEV and FCEV adoption)." page 29; Website Access: https://www.gov.ca.gov/docs/2016_ZEV_Action_Plan.pdf

[8] Discussion Draft, 2030 Target Scoping Plan, Table IV-1. Cross-Sector Relationships, January 20, 2017, Website Access: https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf

[9] Federal Highway Administration, Office of Planning, Environment, & Realty (HEP); Website Access: https://www.fhwa.dot.gov/real_estate/right-of-way/corridor_management/alternative_uses.cfm

[10] With solar power and more, Warm Springs may be BART's greenest station yet, 04.04.2017; Website Access: https://www.bart.gov/news/articles/2017/news20170327

[11] Metro has invested over $17 million in renewable energy projects since 2005. Metro's current installed capacity of solar is 2.4 megawatts (MW), with an additional 1.7 MW planned by the end of 2018. Website Access: http://media.metro.net/projects_studies/sustainability/images/report_sustainability_energyandresource_2016.pdf

[12] Los Angeles Metro uses Wayside Energy Storage systems, which has resulted in the research, development, production, and installation of systems that use flywheel technology to recycle power generated from rail cars; Website Access: https://www.calnetix.com/newsroom/press-release/vycon-wins-36-million-contract-decrease-energy-consumption-los-angeles-metro

[13] http://www.vta.org/sfc/servlet.shepherd/version/download/068A0000001FbqG

[14] NREL Partners with California's Santa Clara Valley Transportation Authority on Electric Bus Grid Integration Project; Website Access: https://www.nrel.gov/news/program/2017/nrel-partners-with-california-valley-transportation-authority-on-electric-bus-grid-integration-project.html

[15] Caltrans 2016 Sustainability Implementation Action Plan, First Edition, Final Approval, Caltrans Executive Board, September 20, 2016; Website Access:

recently reinforced through research conducted at the Volpe Center. Volpe's research has highlighted, among other things, the duel benefits of solar in ROW for both energy generation and sound mitigation.[16]

d. **Merge goods movement, warehousing, distribution centers, and intermodal facility policies with ZEV policies.** CSE agrees with the 2018 Plan's focus on intermodal facilities and appreciates that the plan will "look to incorporate clean technological practices in future project proposals."[17] To strengthen this approach, CSE recommends the following:

   i. **Prioritize ZEV Logistics Vehicles.** ZEV logistics vehicles should be included as an integral part of the 2018 Plan's facilities ecosystem. Specific variants, such as refrigeration units, ZEV cargo cranes, ZEV stackers, ZEV yard hostlers, and other ZEV material handling equipment pivotal in the logistics and distribution process have the propensity to contribute significantly to increased system efficiency in facilities and lead to GHG emissions and pollution reductions. This approach would be consistent with the current SB 350 TE policy framework, which encourages utilities to tests innovative TE projects, including the freight sector, complement CARB's emergent Zero- and Near Zero-Emission Warehouse Program,[18] would align with the California Sustainable Freight Action Plan (CSFAP) that sets the goal to deploy 100,000 fleet vehicles,[19] and will complement existing CSFAP pilot activities.[20]

   ii. **Electric locomotives.** CSE agrees that short-haul trains can serve as efficient transportation between ports and distribution centers[21] and contends that fully-electric locomotives (which operate using only electric miles and are common throughout Europe and Japan) are ideal for this purpose. To encourage fuel-

http://www.dot.ca.gov/sustainability/docs/2016_Sustainability_Implementation_Action_Plan_First_Ed_092016.pdf

[16] Highway Renewable Energy: Photovoltaic Noise Barriers (Published August 2017); Highway photovoltaic noise barriers (PVNBs) represent the combination of noise barrier systems and photovoltaic systems in order to mitigate traffic noise while simultaneously producing renewable energy. This report provides evidence suggesting that noise barriers can be designed to produce renewable energy without compromising their abilities to reduce noise and do so safely. It also estimates the potential for PVNB deployment in the United States; Website Access: https://www.fhwa.dot.gov/environment/sustainability/energy/publications/photovoltaic/index.cfm

[17] 2018 California State Rail Plan, Page 88.

[18] This program includes $50 million for Zero/near ZEVs, and equipment Infrastructure and efficiency improvements; Website Access: https://www.arb.ca.gov/msprog/aqip/fundplan/1718_draft_funding_plan_workshop_100417.pdf

[19] CSFAP, Frequently Asked Questions; Website Access: http://www.casustainablefreight.org/faq.html

[20] CSFAP, Pilot Projects; Website Access: http://www.casustainablefreight.org/pilotprojects.html

[21] 2018 California State Rail Plan, Page 110.

switching practices, the 2018 Plan should include waste-to-energy strategies, such as "renewable biogas-to-renewable transportation fuels or electricity" strategies. This approach would complement CARB's emergent 2030 Scoping Plan,[22] Low Carbon Fuel Standard (LCFS) Regulation,[23] short-lived climate pollutants policies per SB 1383,[24] and mobile source strategy goals for federal and state air quality standards.

e. **Hydrogen.** The 2018 Plan should discuss hydrogen as a component of the future ZET ecosystem. Hydrogen can serve as a fuel source for both vehicles that support the passenger and freight system, as well as a potential propulsion source for trains.[25] In addition, hydrogen trains may present a more cost-effective, near-term solution to electrified trains without the need to construct overhead catenary lines.

   Hydrogen investments are consistent with guidance under the ZEV Action Plan[26] and emergent LCFS provisions.[27] Its technologies can act as a controllable grid asset and are a highly promising future electric technology. Renewably-sourced hydrogen is ideal for a grid-operation scenario with high penetrations of renewables, and as grid penetration of renewables increase, the large-scale production of hydrogen via electrolysis may become an important outlet during times of excess generation. It is also notable that there are more than 30 operational hydrogen facilities in California,[28] with recent developments of a multi-megawatt fuel cell power plant located at the Port of Long

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[22] The draft 2030 Scoping Plan, Released October 27, 2017, states the goal to: 'the increase organics markets which complement and support other sectors, citing examples which include renewable energy (biogas to renewable transportation fuels or electricity)', Page 135, https://www.arb.ca.gov/cc/scopingplan/revised2017spu.pdf

[23] Currently, CARB is evaluating the inclusion of provisions which provide credits for: "[h]ydrogen produced from: (1) reforming of biomethane, or (2) electrolysis powered by solar or wind electricity"; See: Preliminary Draft of Potential Regulatory Amendments, Page 82; Website Access: https://www.arb.ca.gov/fuels/lcfs/lcfs_meetings/092217_draftregtext.pdf

[24] SB 1383 by Senator Lara, among other things, directs dairy farmers to reduce methane emissions from manure to 40 percent below their 2013 levels by 2030.

[25] Notably, the first hydrogen-powered passenger train has been deployed in Europe; Alstom; Coradia iLint regional train can run at 140 km/h (87 mph), has a 600 to 800 km (372 to 497 mile) range, and the ability to accommodate up to 300 passengers; Website Access: http://www.alstom.com/products-services/product-catalogue/rail-systems/trains/products/coradia-ilint-regional-train-/

[26] 2016 ZEV Action Plan; Pages 4-5; Website Access: https://www.gov.ca.gov/docs/2016_ZEV_Action_Plan.pdf

[27] Currently, CARB is evaluating the inclusion of provisions which provide credits for: "[h]ydrogen produced from: (1) reforming of biomethane, or (2) electrolysis powered by solar or wind electricity"; See: Preliminary Draft of Potential Regulatory Amendments, Page 82; Website Access: https://www.arb.ca.gov/fuels/lcfs/lcfs_meetings/092217_draftregtext.pdf

[28]http://californiaarb.maps.arcgis.com/apps/webappviewer/index.html?id=99be905d3127405e81851fd60b19cda2

Beach that will produce hydrogen from waste.[29] These are signals of a growing sector. For these reasons, hydrogen should be should be included as a ZET in the 2018 Plan.

II. Energy

CSE strongly supports the 2018 Plan's goal to "transform to a clean and energy efficient transportation system."[30] To strengthen this goal, CSE recommends the following:

a. **Develop targeted 100% renewable electricity, zero carbon strategies.** To meet California's more aggressive, widespread, and long-term GHG emissions reduction goals, it is imperative to develop policies targeting deep GHG reductions, including 100% renewable electricity options. This is not necessarily accomplished through rail electrification practices alone, as approximately 20% of California's GHG emissions are from electricity power generation.[31] As such, the 2018 Plan should develop policies that prioritize rail activities that showcase the use of electricity carbon intensity well below set thresholds or California averages.[32] This approach would reinforce current renewable energy priorities.

b. **Develop smart-grid planning policies.** "Deploying ZEV technology on as much of the intercity passenger rail network as possible"[33] suggests that the 2018 Plan will—to the extent feasible—pursue a comprehensive statewide rail electrification initiative. CSE supports this initiative; however, electrifying the entire rail system alone does not create a comprehensive environmental solution. Notably, electricity generation has variable emissions factors during different times of use,[34] and the periods of highest electricity demand for rail systems (i.e., 7 to 9 a.m. and 5 to 6 p.m.—during commute hours) generally coincide with natural gas electricity production. As such, the 2018 Plan's electrification policies will need to be fortified with policies and practices that optimize the benefits of clean technology integration, take into account the complexity

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[29] Toyota To Turn Cow Manure Into Hydrogen To Back Its Fuel Cell Vehicle Push; https://www.forbes.com/sites/alanohnsman/2017/11/30/toyota-to-turn-cow-manure-into-hydrogen-to-back-its-fuel-cell-vehicle-push/#6b1057c45892

[30] 2018 California State Rail Plan, Page 116.

[31] 2014 GHG Emission Inventory (2016 Edition). Website Access: https://www.arb.ca.gov/cc/inventory/pubs/reports/2000_2014/ghg_inventory_trends_00-14_20160617.pdf

[32] As Reported in LCFS Regulation, Table 6, the average mixture for California Electricity is 105.16 gCO2e/MJ); Website Access: http://www.arb.ca.gov/regact/2015/lcfs2015/lcfsfinalregorder.pdf

[33] 2018 Plan, Page 105.

[34] This is evidenced in part by the "Duck Curve" which showcases shortage/excess patterns for renewable energy during the day. Website Access: https://www.caiso.com/Documents/FlexibleResourcesHelpRenewables_FastFacts.pdf

of managing electrified rail system as a preferred resource,[35] and potentially treat each rail system as a regionally-distinct microgrid.[36] As such, CSE encourages the 2018 Plan reference a goal to develop rail-specific smart-grid planning policies in support of its comprehensive electrification strategy.

III. Collaboration

CSE supports the collaborative efforts of the 2018 Plan. To strengthen the coordination around electrification, there should be expanded coordination with the following sister agencies:

a. **California Public Utilities Commission (CPUC)**. The 2018 Plan sufficiently scopes the CPUC's traditional rail sector-specific safety role.[37] However, this partnership would be significantly strengthened by developing synergy with the rapidly-accelerating TE ecosystem[38] and specifically around the CPUC's initiatives to support the accelerated adoption of ZEVs.[39] Notably, the TE programs are guided by CPUC's decision to permit the utilities to "experiment in diverse market segments to inform the eventual design of scaled programs that will be crucial to address substantial reductions in criteria air and GHG pollutants from the on-road light, medium and heavy duty, off-road, maritime, aviation, and rail sectors in the near term,[40] which suggests an opportunity for rail-specific, cross-agency collaboration on TE matters.

b. **California Energy Commission.** The 2018 Plan should expand coordination with the Energy Commission. The Energy Commission's annual Integrated Energy Policy Report (IEPR) Transportation Energy Demand Forecast provides state regulators and a wide range of stakeholders with annual updates on TE, including the rail sector.[41] Notably,

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[35] That is, given the vastness of the state's rail infrastructure, it can be assumed that statewide electrification will be operationally managed as discrete subsections, or as microgrids, which—to create flexible grid resources—should be managed by smart-grid technologies, and smart-grid control systems that ensure system safety.
[36] https://energy.gov/articles/how-microgrids-work
[37] 2018 California State Rail Plan, Page 91.
[38] See Transportation Electrification Activities Pursuant to Senate Bill 350; Website Access: http://www.cpuc.ca.gov/sb350te/
[39] Notably, SB 350 (Stats. 2015; ch. 547) redefines Transportation Electrification (TE), places TE as a third stand-alone category on equal footing with energy efficiency and renewables, and establishes provisions through which utilities can be evaluated for expanded roles in TE though CPUC rulemaking.
[40] Assigned Commissioner's Ruling Regarding the Filing of the Transportation Electrification Applications Pursuant to Senate Bill 350, page 19. Website Access: http://docketpublic.energy.ca.gov/PublicDocuments/17-IEPR-07/TN221475_20171012T155129_Assigned_Commissioner's_Ruling_Regarding_the_Filing_of_the_Tran.PDF
[41] 2017 Integrated Energy Policy Report; Transportation Energy Demand Forecast; (Draft); Website Access; http://docketpublic.energy.ca.gov/PublicDocuments/17-IEPR-05/TN221377_20171004T145544_FINAL_STAFF_REPORT_Transportation_Fuel_Supply_Outlook_2017.pdf

the Energy Commission recently signed an Memorandum of Understanding (MOU) with the California High-Speed Rail Authority (CHSRA), setting the goal to "help achieve the state's energy policy goals by increasing collaboration and information exchange related to expanding the use of renewable energy, zero net energy buildings, and ZEVs in California.[42] These and other initiatives by the Energy Commission would be fortified by explicit linkage to the 2018 Plan, which would maximize cross-agency learning and promote resource and knowledge sharing.

c. **ZEV/Zero Emission Technology (ZET) Technical Working Group.** To accelerate the linkage between rail and energy policy, the 2018 Plan should consider advocating for the establishment of a ZEV/ZET Technical Working Group. From CSE's perspective, such a working group would be ideal to support the collaborative initiatives required to achieve the proposed ZEV/ZET objectives. There is also an opportunity to coordinate across and gain international inspiration from the Netherlands[43] and other international stakeholders.[44] CSE contends that the ZEV/ZET should be coordinated with the Energy Commission.[45] Topics covered by the ZEV/ZET Technical Working Group should include:

   i. **Development** of ZEV-focused intermodal plans with an emphasis on EVSE deployment in high-density, highly-trafficked, intermodal areas (see: Section I.b.);

   ii. **Exploration** of cross-cutting ZEV/ZET deployment challenges and opportunities for the rail sector (passenger and freight) from the energy perspective, (e.g., rail traction power to support power for on-road vehicles, tactics to manage rail energy load, other methods to explore clean energy solutions, etc.); and

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[42] Memorandum of Understanding between the Energy Commission and the California High Speed Rail Authority; Website Access: http://www.energy.ca.gov/business_meetings/2016_packets/2016-05-17/Item_01a_MOU-15-005.pdf.

[43] Notably, there is an E-Mobility cooperation between California and The Netherlands; Website Access: http://www.pevcollaborative.org/sites/all/themes/pev/files/docs/meetings/presentations/van_Deventer_July28.pdf

[44] Examples include the Cooperative Agreements and MOUs established between the California High-Speed Rail Authority and multiple international partners; See: California High-Speed Rail Partnerships; Website Access: http://www.hsr.ca.gov/About/partnerships.html

[45] CSE has previously suggested the assembly of the ZEV/ZET to the Energy Commission. See: CSE's Response to the November 7, 2017 Meeting and Public Workshop discussing the 2018- 2019 Investment Plan Update for the ARFVTP November 17, 2017; Docket No. 17-ALT-01 Meeting and Public Workshop RE: Alternative and Renewable Fuel and Vehicle Technology Program; Website Access: https://energycenter.org/sites/default/files/docs/nav/policy/proposed/Center-for-Sustainable-Energy-Comments-on-ARFVTP-11-17-2017.pdf

iii. **Identification** of opportunities to connect the 2018 State Rail Plan's ZEV/ZET activities and policies with California's rapidly-accelerating ZEV policy ecosystem.

d. **California High-Speed Rail Authority (CHSRA).** The 2018 Plan acknowledges the CHSRA's energy vision statement, noting "the statewide HSR network included in the 2040 Vision will be powered entirely from renewable energy sources, providing a growing market for clean energy providers."[46] CSE agrees with this inclusion, as the CHSR system will require a substantial amount of electricity projected at approximately 40 gigawatt hours by 2030 timeframe,[47] with upward scaling trends as the system expands. This inclusion also complements the CHSR's growing station community initiatives, which will transform cities and create community hubs across the state[48] and support the CHSR's goals to operate as California's largest ZEV and as a 100% renewable energy-powered Net-Zero Energy system.[49] To maximize the benefits of this collaboration, CSE recommends that the 2018 Plan include the goal to sign on to the Energy Commission and CHSRA's MOU that will explore the path to achieving 100% renewable, Net-Zero Energy objectives.[50]

e. **Strategic Growth Council's (SGC's) Transformative Climate Community (TCC) Program.[51]** CSE agrees with the 2018 Plan's goal to support research of regional rail and integrated needs to communities between Fresno and Bakersfield[52] and objective to discuss the barriers faced by communities. Notably, through SGC's TCC Program, these and other geographic areas will soon be the center of investment for $140 million in program funding.[53] It is highly likely that this high-profile program will continue to be oversubscribed with a diverse array of "shovel ready" community-level projects. Many of these unfunded projects will have clean technology touchpoints related to the 2018

[46] 2018 California State Rail Plan, Page 116.
[47] Figure 5-17: High-Speed Rail Electricity Demand Forecast; Website Access: http://docketpublic.energy.ca.gov/PublicDocuments/17-IEPR-05/TN221893_20171204T085928_Transportation_Energy_Demand_Forecast_20182030.pdf
[48] CHSR Authority; Station Communities; Website Access: https://www.hsr.ca.gov/Programs/Station_Communities/index.html
[49] California High-Speed Rail Policy Directive: Poli Plan-03, August 19, 2013, page 7; Website Access: http://www.hsr.ca.gov/docs/programs/green_practices/sustainability/Sustainability_signed_policy.pdf
[50] Details of this memo are discussed in section III (c); Website Access: Memorandum of Understanding between the Energy Commission and the California High Speed Rail Authority; Website Access: http://www.energy.ca.gov/business_meetings/2016_packets/2016-05-17/Item_01a_MOU-15-005.pdf
[51] Strategic Growth Council; Transformative Climate Communities Program; Website Access: http://sgc.ca.gov/Grant-Programs/Transformative-Climate-Communities-Program.html
[52] 2018 California State Rail Plan, 2022 Short-Term Plan, Regional Goals Page 129.
[53] Strategic Growth Council; Transformative Climate Communities Program; Website Access: http://sgc.ca.gov/Grant-Programs/Transformative-Climate-Communities-Program.html

Plan's ZET objectives (e.g., ZEV transportation, smart grid technologies, and energy storage). [54]

f. **California Independent System Operator (CAISO).** As discussed in Section 2.b. (prioritize smart-grid planning), it may be in the interest of the state to manage rail electrification as a preferred resource and as distinct microgrids. If this approach is adopted, there will be a need for expanded coordination between CAISO and the state's electrified rail agencies. Notably, the California High-Speed Rail Strategic Energy Plan has highlighted this need.[55] As such, CSE encourages the 2018 Plan to set goals to expand CAISO and utility relationships to ensure that the 2018 Plan's load, transmission, and interconnection needs will be met to achieve the plan.

IV. Research

While the 2018 Plan is informed by a wide range of research areas and initiatives, to strengthen the development of a specific ZEV/ZET policy framework, CSE recommends following:

a. ***Develop a ZEV/ZET research plan***. Such research would be well-positioned to leverage various funding streams that are developing across state agencies to support transportation and infrastructure, including SGC's emergent Climate Change Research Program.[56] As such, CSE suggests that the 2018 Plan consider prioritizing pioneering research in areas that:

   i. ***Analyze*** the state's rail electricity utilization patterns (e.g., daily, weekly, monthly, yearly, etc.) across current and emergent electrified rail systems;

   ii. ***Quantify*** the associated electricity's carbon intensity (e.g., based on energy procurement portfolios, power content labels, hours of electricity usage, etc.);

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[54] Transformative Climate Communities Draft Scoping Guidelines, page 6. Website Access: http://sgc.ca.gov/resource%20files/20161123-TCCDraftScopingGuidelines.pdf

[55] The California High-Speed Rail Strategic Energy Plan notes the following: "Action Item: Work with the California Independent System Operator (CAISO) and utilities to ensure CHSRA's load, transmission, and interconnection needs are met"; Website Access: http://www.hsr.ca.gov/docs/programs/green_practices/operations/The%20Use%20of%20Renewable%20Energy%20Sources%20to%20Provide%20Power%20to%20Californias%20High%20Speed%20Rail.pdf

[56] Climate Change Research Program; FY 2017-2018; DRAFT Research Investment Plan; November 15, 2017 Website Access: http://sgc.ca.gov/pdf/D-RIP-2017-11-15.pdf

iii. ***Forecast*** anticipated energy needs triggered by rail system expansion strategies as stipulated in the 2018 Plan, and other interrelated plans;[57]

iv. ***Conduct*** power reliability assessments that explores vehicle-to-grid strategies (e.g., emergency backup strategies, scenarios during power outage from the grid, etc.);[58] and

v. ***Explore*** the nexus between rail stations and TE, with a focus on solutions in and around station areas (see Section 1.b.).

V. Data and Transparency

CSE has worked with many stakeholders to provide public data in both comprehensive and easily-accessible formats, while maximizing the amount of data made available to the public while ensuring confidentiality and privacy protections. Based on the success from these experiences, CSE recommends that the 2018 Plan develop similar data and transparency approaches.

a. ***Develop a data and transparency plan.*** CSE is impressed by the interactive map that is being developed in support of the 2018 Plan.[59] However, to maximize the potential impact of the 2018 Plan, a more comprehensive and concerted effort to harmonize available data with existing policies (e.g., SB 350 policy, ZEV Action Plans, etc.) is strongly recommended. This will especially help the 2018 Plan's alignment with Federal policies, which have "shifted toward the application of performance-based planning principles, which rely on data and analytics to support policy decisions that help achieve desired outcomes."[60] In this regard, CSE encourages the 2018 Plan to prioritize the collection of data sources with the following characteristics:

i. **Uniform data.** Uniformity supports data collection efficiencies, ensures the program metrics and evaluations are comparable, and promotes quality assurance and control of the data;

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[57] *2018 California State Rail Plan, Page 105.*

[58] *Vehicle - Grid Integration A Vision for Zero-Emission Transportation Interconnected throughout California's Electricity System; Energy Division California Public Utilities Commission March 2014; ; Website Access: http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy/Energy_Programs/Demand_Side_Management/EE_and_Energy_Savings_Assist/CPUCEnergyDivisionVehicleGridIntegrationZEVSummit.pdf*

[59] *2018 Rail Plan Interactive Map; Website Access: http://csrpmap.dot.ca.gov/projects/CSRP/*

[60] *2018 California State Rail Plan, Page 46*

ii. **Data with a defined purpose.** Data collection should be oriented to address specific questions, such as cost-effectiveness, diffusion rates, low-income participation, technology/system performance, and durability;

iii. **Streamlined data reporting.** Data reporting requirements should be based on program requirements and should be easy for programs to track. These efforts in turn reduce administrative costs and support the collection of good data;

iv. **Deeply-granular data.** Reporting data in census designations makes it easier for researchers to associate data with specific locational impacts. In this regard, CSE encourages the 2018 Plan to consider leveraging the CalEnviroScreen Tool,[61] which provides data at this level of granularity;

v. **Geographical data.** The 2018 Plan should use geographical information system (GIS) tools to track the locations of infrastructure installations, consistent with the objectives of the 2018 Plan. Notably, the CHSRA is developing such a GIS resource,[62] which seems especially pertinent to note given the CHSRA's economic and energy goals that overlap with this plan;

vi. **Categorical data.** Data reporting requirements should support measurement not only of basic information to comply with the 2018 Plan, but also of other priorities, such as GHG emissions reductions, energy utilization by rail systems, health benefits, and other data;

vii. **Easily disseminated data.** Data should be published via an easily accessible online portal and be made available in easily-usable formats (such as Excel, Access, etc.) and standards GIS formats (such as Keyhole Markup Language/KMZ, ArcGIS shape files, etc.). This data should be updated often to expeditiously inform stakeholders regarding the implementation of the 2018 Plan.

[61] *California EPA; CalEnviroScreen 3.0; Website Access: https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30*

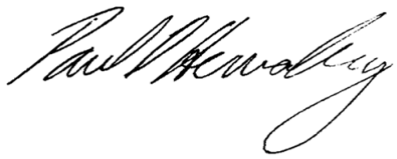
[62] *CHSRA; Economic Impacts of High-Speed Rail Interactive Map; Website Access: https://www.buildhsr.com/hsrinvestment/*

Conclusion

CSE appreciates the opportunity to provide these comments in response to the 2018 Plan and stands in strong support of the plan. With our suggested changes, the plan will further strengthen its alignment with the effort to accelerate clean technology in the rail transportation ecosystem, which will increase its efficacy as a GHG emissions reductions tool.

Please continue to consider CSE a resource on these and other matters, and feel free to contact Paul D. Hernandez, CSE's Sustainable Transportation Infrastructure Policy Manager to clarify these comments or with any questions you may have.

Respectfully Submitted,



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CC:

- Amy Mesrobian, California Public Utility Commission
- California High-Speed Rail Authority Board
- Caltrans Office of Sustainability
- Carson Poe, Volpe Center
- Leslie Baroody, Energy Commission
- Noel Crisostomo, Energy Commission
- Randall Winston, Strategic Growth Council
- Tyson Eckerle, Governor's Office of Business and Economic Development