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U.S. Department of Transportation
Docket Operations, M-30
West Building Ground Floor, Room W12-140
1200 New Jersey Avenue
Washington, DC 20590

RE: Docket No. FHWA-2017-0025; RIN 2125-AF76
Comments on MAP-21 Notice of Proposed Rulemaking for the National Performance Management Measures: Assessing Performance of the National Highway System, Freight Movement on the Interstate System, and Congestion Mitigation and Air Quality Improvement Program (82 Fed. Reg. 46,427 (Oct. 5, 2017))

To Whom It May Concern:

The California Department of Transportation and the California Air Resources Board respectfully submit the enclosed comments on the MAP-21 Notice of Proposed Rulemaking for the National Performance Management Measures: Assessing Performance of the National Highway System, Freight Movement on the Interstate System, and Congestion Mitigation and Air Quality Improvement Program. We strongly urge the Federal Highway Administration (FHWA) to retain the measures, as they are consistent with FHWA's statutory obligations to properly assess the performance of the national highway system, are well supported by the record, and produce substantial benefits at negligible cost.

California agrees with FHWA's determinations of several months ago that implementation of the GHG performance measure is an important and necessary step which will contribute to states' efforts to reduce transportation's contribution to climate change by creating transparency and clarity in tracking total emissions from the sector. In the intervening months since FHWA published the final rule, including the GHG measure, the evidence supporting the utility and necessity of the rule has only grown stronger.

Sincerely,

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Director
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RICHARD W. COREY
Executive Officer
California Air Resources Board

Enclosure:
Comments on MAP-21 Notice of Proposed Rulemaking for the National Performance Management Measures: Assessing Performance of the National Highway System, Freight Movement on the Interstate System, and Congestion Mitigation and Air Quality Improvement Program

ENCLOSURE

California Department of Transportation and California Air Resources Board Comments on the MAP-21 Notice of Proposed Rulemaking for the National Performance Management Measures: Assessing Performance of the National Highway System, Freight Movement on the Interstate System, and Congestion Mitigation and Air Quality Improvement Program

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As a leader in addressing the challenges presented by anthropogenic climate change, California supports the existing measure as a valuable, effective, and low-cost tool that will provide decisionmakers with better information about the transportation system's greenhouse gas (GHG) emissions, thereby facilitating the analysis necessary to support decarbonizing the system.

California strongly supports FHWA retaining the greenhouse gas (GHG) performance measure established in the third performance measure final rule. As FHWA correctly recognized when it adopted the rule now proposed to be repealed, the GHG performance measure is an important and robustly supported mechanism appropriately designed to achieve critical policy goals. The United States must continue to take steps to reduce GHG emissions in order to avoid the worst of the projected impacts of climate change.

As discussed in further detail below, California's view is that the GHG performance measure is important and not duplicative, that implementation of the measure is unlikely to be burdensome, and that the benefits of retaining and implementing the measure are likely to outweigh its costs. On this basis California opposes repealing the measure, and recommends that the Federal Highway Administration (FHWA) leave the Final Rule unchanged. In view of FHWA's statutory mandates and the extensive record supporting this program, it would be arbitrary and capricious for FHWA to abandon this well-supported measure.

I. The Effects of Climate Change on the National Highway System and on the Country Demonstrate the Appropriateness and Necessity of the GHG Performance Measure

In MAP-21 and the FAST Act, Congress made clear that the FHWA was to establish appropriate performance measures for the national highway system (NHS) to guide state and federal planning. Few considerations are more important for that exercise than climate change, including the role of vehicles travelling the NHS in contributing to the problem. Climate change poses a substantial threat

to the NHS, and must be accounted for in proper planning. It is critical that FHWA continue to collect the information under this performance measure, and to call for state DOTs to set appropriate targets.

The evidence that the climate is changing is undeniable, and the scientific record only becomes more definitive. Climate scientists agree that global warming and other shifts in the climate system observed over the past century are caused by human activities. These recorded changes are occurring at an unprecedented rate.[1] In California, as in the rest of the world, climate change is contributing to an escalation of serious problems, including raging wildfires, coastal erosion, disruption of water supply, threats to agriculture, spread of insect-borne diseases, continuing health threats from air pollution, and adverse impacts on transportation infrastructure.

A. Climate Change Poses a Major Threat to the NHS

GHG emissions and climate change are disrupting existing transportation networks and effecting the performance of the NHS.

As acknowledged by the FHWA, the transportation system is at increasing risk from climate change impacts associated with increasing levels of GHG emissions. California's State Highway System represents 50,000+ lane miles of infrastructure that requires continual monitoring and repair. The system extends through deserts, mountains, coastal areas and floodplains and will therefore experience a range of impacts as the climate changes. Climate change will increase the stress this infrastructure will experience, which will likely require more frequent repairs and upgrades to use more durable materials. California is especially concerned with extreme weather events – consecutive days of high temperature, heavy rainstorms, storm surges, and high winds. While infrastructure is often designed to withstand certain types and frequencies of extreme weather, climate change will likely increase the severity and duration of these events thereby necessitating a State Highway System capable of withstanding harsher conditions. Since California's economy depends on a well-functioning highway system, the State is currently working to identify and strengthen areas that are vulnerable to climate change and extreme weather impacts.

Shifts in weather patterns associated with anthropogenic climate change are already causing significant damage to the NHS. Over the last year alone, California has incurred over $1.2 billion in emergency orders to repair storm damages. Extended drought followed by record rainstorms created mudslides and slip outs that damaged bridges, culverts, and roadways throughout California. Wildfires in 2017 have already burnt nearly double the average number of acres burnt in the last five years and create

[1] Cook, J., et al. 2016. Consensus on consensus: A synthesis of consensus estimates on human-caused global warming. *Environmental Research Letters* 11:048002 doi:10.1088/1748-9326/11/4/048002. iopscience.iop.org/article/10.1088/1748-9326/11/4/048002.

significant system delays and closures. The damages and costs of the increasing frequency and scale of climate change impacts directly obstructs the progress of the State Department of Transportation (State DOT) on each of the goals stated in 23 U.S.C § 150(b) that support the purpose of the National Highway Performance Program (NHPP)(23 U.S.C. § 119(b)) of improving infrastructure condition, safety, congestion reduction, system reliability, freight movement, environmental sustainability, and reduced project delivery delays on the NHS. These storm damages have directly threatened the safety of the traveling public and State DOT maintenance workers, have caused months of congestion, prohibited efficient freight movement out of the ports of Los Angeles and San Diego, and forced the State DOT and local governments to redirect funds that would otherwise be spent achieving the existing performance measures. Therefore, the ability of State DOTs, and by extension FHWA, to meet the targets set for each performance measure is dependent on reducing the impacts of climate change by tracking and reducing GHG emissions.

Intense storms may cause flooding of roadways and washout of transportation infrastructure. Sea level rise is already affecting some of California's roads and bridges by undermining (scouring) the supports. Roads along the coast are also vulnerable to damage from flooding. As wildfires increase, slopes near transportation networks can become more unstable and prone to landslides during rainstorms. Higher temperatures and longer heat spells will likely increase the buckling and rutting of roads, warping of rails, and difficulty in maintaining and constructing roads during the day. Sea ports and low lying airports (San Francisco, Oakland, and San Diego) are also susceptible to sea level rise associated with the warming climate. Many ports and airports have begun taking action to protect against sea level rise by strengthening their barriers.

In short, infrastructure planning and climate change adaptation and mitigation are inseparable. It would be contrary to Congress's intent to further appropriate planning to ensure proper development and maintenance of the NHS, and prudent use of public funds, to neglect this issue. The performance measure thus represents a critical metric that must be retained, as the record before FHWA and the law make clear.

B. Climate Change Poses Acute Threats Including Threats to Public Health and Welfare

In addition to impacts on infrastructure, climate change poses a serious threat to public health and welfare. The FHWA's proposed metric, including its GHG reduction targets, are an important step towards addressing that threat, and must be retained for that reason as well. California is already feeling the effects of climate change, and projections show that these effects will continue and worsen over the coming centuries. In addition to the U.S. EPA's well-supported endangerment finding and the extensive findings of international and national scientific bodies, California has developed considerable information on the threat to our state, which the FHWA must also consider.

The impacts of climate change have been compiled by the Office of Environmental Health Hazard Assessment (OEHHA) in the Indicators of Climate Change Report, which details the following changes occurring already:[2]

- A recorded increase in annual average temperatures, as well as increases in daily minimum and maximum temperatures.
- An increase in the occurrence of extreme events, including wildfire and heat waves.
- A reduction in spring runoff volumes, as a result of declining snowpack.
- A decrease in winter chill hours, necessary for the production of high-value fruit and nut crops.
- Changes in the timing and location of species sightings, including migration upslope of flora and fauna, and earlier appearance of Central Valley butterflies.

In addition to these trends, the State's current conditions point to a changing climate. California's recent historic drought incited land subsidence, pest invasions that killed over 100 million trees, and water shortages throughout the State. Recent scientific studies show that such extreme drought conditions are more likely to occur under a changing climate.[3,4] The total statewide economic cost of the 2013–2014 drought was estimated at $2.2 billion, with a total loss of 17,100 jobs.[5] In the Central Valley, the drought cost California agriculture about $2.7 billion and more than 20,000 jobs in 2015, which highlights the critical need for developing drought resilience.[6] Last winter, the drought was broken by record-breaking rains, which led to flooding that tore through freeways, threatened rural communities, and isolated coastal areas. This year, California experienced a week of the deadliest wildfires in its history. Climate change is making events like these more frequent, and more costly. Climate change impacts all Californians, and the impacts are often disproportionately borne by the State's most vulnerable and disadvantaged populations.

A warming climate also causes sea level to rise; first, by warming the oceans which causes the water to expand, and second, by melting land ice which transfers water to the ocean. Even if storms do not become more intense or frequent, sea level rise itself will magnify the adverse impact of any storm surge and high waves on the California coast. Some observational studies report that the largest

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[2] Office of Environmental Health Hazard Assessment, Indicators of Climate Change (website): oehha.ca.gov/climate-change/document/indicators-climate-change-california

[3] Diffenbaugh, N., D. L. Swain, and D. Touma. 2015. Anthropogenic Warming has Increased Drought Risk in California. *Proceedings of the National Academy of Sciences* 112(13): 3931–3936.

[4] Cayan, D., T. Das, D. W. Pierce, T. P. Barnett, M. Tyree, and A. Gershunov. 2010. Future Dryness in the Southwest US and Hydrology of the Early 21st Century Drought. *Proceedings of the National Academy of Sciences* 107(50): 21272–21276.

[5] Howitt, R., J. Medellin-Azuara, D. MacEwan, J. Lund, and D. Summer. 2014. Economic Impacts of 2014 Drought on California Agriculture. watershed.ucdavis.edu/files/biblio/DroughtReport_23July2014_0.pdf.

[6] Williams, A. P., et al. 2015. Contribution of anthropogenic warming to California drought during 2012–2014. *Geophysical Research Letters* doi:onlinelibrary.wiley.com/doi/10.1002/2015GL064924/abstract.

waves are already getting higher and winds are getting stronger.[7] Further, as temperatures warm and GHG concentrations increase more carbon dioxide dissolves in the ocean, making it more acidic. More acidic ocean water affects a wide variety of marine species, including species that people rely on for food. Recent projections indicate that if no significant GHG mitigation efforts are taken, the San Francisco Bay Area may experience sea level rise between 1.6 to 3.4 feet, and in an extreme scenario involving the rapid loss of the Antarctic ice sheet, sea levels along California's coastline could rise up to 10 feet by 2100.[8] This fundamental change is likely to have substantial ecological and economic consequences in California and worldwide.

Together, historical data, current conditions, and future projections provide a picture of California's changing climate, with two important messages:

- Change is already being experienced and documented across California, and some of these changes have been directly linked to changing climatic conditions.
- Even with the uncertainty in future climate conditions, every scenario estimates further change in future conditions.

Climate change itself is already affecting the health of our communities and is exacerbating existing health inequities. Those facing the greatest health burdens include low-income individuals and households, the very young and the very old, communities of color, and those who have been marginalized or discriminated against based on gender or race/ethnicity.[9] Economic factors, such as income, poverty, and wealth, are among the strongest determinants of health. Addressing climate change presents an important opportunity to improve public health for all of America's residents and to further our work toward making our Country the healthiest in the world.

California's transportation system underpins our economy. The extensive freight system moves trillions of dollars of goods each year and supports nearly one-third of the State economy and over 5 million jobs. The way we plan our communities impacts everything from household budgets to infrastructure needs, productivity lost to congestion, protection of natural and working landscapes, and our overall health and well-being.

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[7] National Research Council of the National Academy of Sciences. 2012. Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future, National Academies Press.

[8] California Ocean Protection Council. Rising Seas in California: An Update On Sea-Level Rise Science. www.opc.ca.gov/webmaster/ftp/pdf/docs/rising-seas-in-california-an-update-on-sea-level-rise-science.pdf nce.iop.org/article/10.1088/1748-9326/11/4/048002.

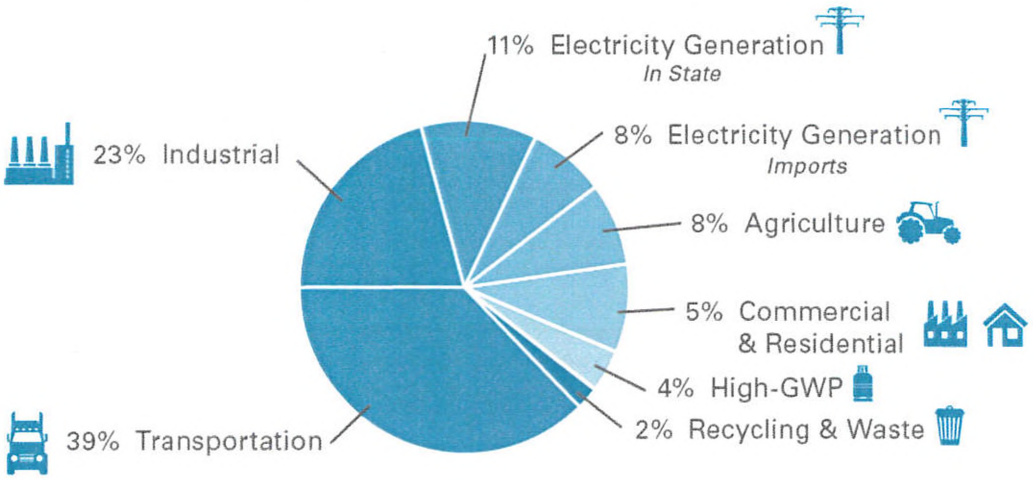
[9] California Department of Public Health (CDPH). 2015. The Portrait of Promise: The California Statewide Draft Plan to Promote Health and Mental Health Equity. A Report to the Legislature and the People of California by the Office of Health Equity. Sacramento, CA: California Department of Public Health, Office of Health Equity.

C. Transportation Sector Emissions Exacerbate Climate Change and Must be Measured and Addressed.

Transportation is the largest source of GHG, criteria, and toxic diesel particulate matter emissions in the State, and among the largest in the country. Thus, the performance measure produces large public benefits (which we note, with concern, FHWA has improperly failed to quantify) by helping states and the federal government plan to reduce these emissions.

Figure I below illustrates that transportation, primarily on-road travel, is the single largest source of GHG emissions in California. When emissions from the operation of these vehicles, and the production and delivery of fuel is included, transportation makes up about 50 percent of emissions making it by far the largest source of emissions in the State.

Figure I: Emissions Contribution by Sector in California



II. The Performance Measure is Authorized, and Required, by Law

The FHWA has clear statutory authority and explicit policy direction to establish a GHG performance measure, especially in view of the climate change concerns discussed above. As FHWA explained in the MAP-21 Performance Management 3 Final Rule, FHWA adopted the GHG performance measure under 23 U.S.C. § 150(c)(3), which calls for performance measures that the States can use to assess performance of the Interstate and non-Interstate NHS.[10]

[10] 23 U.S.C. 150(c)(3)(A)(ii)(IV)–(V).

Section 150(c)(3) does not impose any limitation on what type of NHS performance may be measured in rules promulgated under 23 U.S.C. § 150(c)(3)(A)(ii)(IV)–(V). Even more significantly, 23 USC § 150(b)(6) explicitly directs FHWA to focus the Federal-aid Highway Program on the national goal of environmental sustainability "[t]o enhance the performance of the transportation system while protecting and enhancing the natural environment." Reducing GHG emissions in the transportation sector would accomplish both of these directives. Moreover, the MAP-21 Performance Management 3 Final Rule cites several FHWA strategic policy documents to demonstrate FHWA's longstanding consideration of environmental sustainability and GHG emissions reduction in discussing system performance. Establishing a GHG performance measure is consistent with FHWA policy concerning system performance, and supported by several title 23 provisions that clarify that environmental concerns are an integral part of the Federal-aid Highway Program.[11]

Thus, the FHWA not only clearly has statutory *discretion* to establish unenumerated performance criteria under the Act, it also has the *duty* to do so when such measures are appropriate or necessary to further Congress's purposes. On the record before the FHWA, climate change-causing emissions are clearly a critical aspect of NHS performance – among the most critical in the coming years. It would clearly be contrary to the statute, and to the record, for the FHWA to decline to exercise its discretion to include these measures. And it is even more patently contrary to the Congress's direction for the FHWA, having properly established a GHG metric, to retreat from that metric on the basis of the improper and incomplete analysis provided in the Notice of Proposed Rulemaking.

Federal law gives FHWA a mandate to work with state DOTs and MPOs to create a *"performance-driven, outcome based approach"* to transportation decision making. FHWA has clear authority to establish a GHG performance measure in the final rule for performance.

III. The Utility of the GHG Performance Measure Demonstrates Why It Must Be Retained

The FHWA does not appear to dispute the critical threat of climate change, or the extent of its authority to address this issue as a performance measure. However, it proposes to repeal the measure nonetheless based upon an incomplete and arbitrary understanding of its utility. In fact, the measure is highly useful and imposes few, if any, costs.

[11] 82 Fed. Reg. 5993-96 (January 18, 207) (Addressing FHWA's legal authority to establish a GHG performance measure). We note, and appreciate, that the FHWA has not retreated from its understanding of its legal authority; it would be improper for it to do so.

Initially, we note that the FHWA has wholly failed to articulate a rational basis for its proposed repeal – even if such a repeal was legally proper, which it is not. The FHWA's extensive existing record, which must be a part of this proposed repeal proceeding, demonstrates that the proposed metric is cost-effective and prudent. The FHWA has failed to explain why it is considering changing position, and the evidence it does cite does not support its position.

Performance-based decisionmaking helps ensure that transportation investment decisions are made based on their ability to achieve established goals in an environment of limited financial resources. A performance-based approach improves resource allocation since information about current and forecasted system performance is used to inform how transportation programs and projects are selected. Performance-based decisionmaking is further enabled by improvements in data collection and analysis techniques, resulting in increased robustness and transparency.

Performance measures provide meaningful utility for environmental, economic and equity decision-making and are not overly burdensome to State DOTs and MPOs. The benefits of utilizing these measures far outweigh any burden.

Implementing a federal GHG performance measure now is a critical step toward securing nationwide emissions reductions from the transportation sector to mitigate the climate impacts already being experienced within California (and nationally and globally) as well as to mitigate anticipated future impacts. Several states have already adopted policies to reduce GHG emissions in the transportation sector; California and many of these states recently declared their interest in nationwide measures that will achieve reductions of GHGs from on-road surfaces from all states.[12]

The GHG performance measure will help transportation decisionmakers understand the connection between greenhouse gas emissions and transportation investments and projects. The FHWA is proposing to *repeal* the measure. This means that the baseline for its current analysis is incorrect, as it appears to treat the measure as a new cost. It is not: It is law. The proper analytic question for the FHWA concerns the costs of repeal. Such a repeal would result in significant costs and risks to public health and welfare.

MPOs and DOTs in the United States utilize greenhouse gas performance measures to ensure transportation dollars are spent on projects that actually reduce greenhouse gases, and this framework is consistent with the federal requirements for performance (23 USC §134(c)(1); 49 USC § 5303(c)(1), 23

[12] https://oag.ca.gov/sites/all/files/agweb/pdfs/press/filed-complaint-417-cv-05439.pdf

USC §134(h)(2); 49 USC §5303(h)(2), and 23 USC §135(d)(2); 49 USC §5304(d)(2)). By incorporating GHG outcomes into decisionmaking for transportation, states can align transportation funding with achieving greenhouse gas reduction goals. However, in order to do this, a GHG performance measure is necessary.

The existing national GHG performance measure will not be duplicative or burdensome on existing state and local efforts to reduce GHG, but will reinforce and enhance efforts already underway. Repeal, by contrast, will heighten the risk of misinvestment of public funds in high-emission projects, and is likely to impair NHS maintenance and performance – a cost which the FHWA must disclose and fully consider.

To achieve long-term GHG reduction goals from the transportation sector, planners across the nation must track and account for GHG emissions from on-road sources in a manner that allows them to compare the progress of different mitigation policies and transportation funding decisions. Given the ubiquitous nature of GHGs, nationwide measures will benefit California and other states by enhancing their own ability to achieve their own GHG reduction targets. Climate change is a cumulative impact that is not caused by only certain states; it should be addressed nationally. Nationwide efforts, such as FHWA's GHG performance measure, are essential to adequately lessen or slow the effects of climate change.

The measure and methodology adopted provide meaningful utility of environmental performance of the NHS by States and MPOs because it sufficiently accounts for GHG emissions attributed to the use of the NHS and will show progress States make in reducing these emissions. As stated by FHWA in the final rule, "reducing GHG emissions from the U.S. transportation sector will reduce the sector's impact on climate change, promote environmental sustainability, and help to protect the NHS from damage caused by climate change." FHWA's 2013 Conditions and Performance Report and its publication, A Performance-Based Approach to Addressing GHG Emissions through Transportation Planning, identifies that there are two main types of climate change risk affecting transportation infrastructure: Continued emissions of GHGs, such as CO2, that adversely affect the atmosphere, leading to climate change effects, and threats to the transportation system posed by climate change impacts (e.g., damaged or flooded facilities). In other words, the transportation system both contributes to climate change and suffers from the impacts of climate change (e.g., flooding, sea level rise).

The utility of the measure in accomplishing the goals of 23 USC §150(b) extends beyond environmental performance; all of the performance goals are threatened by the increasing frequency and scale of damages caused by weather events associated with climate change. The dependence of the "infrastructure condition" goal on reducing GHG emissions is clearly illustrated in the Long Term Bridge Performance Program (enacted under SAFETEA-LU, Pub. L. 109-59, 119 Stat. 1144 (August 10, 2005)). The program defines bridge performance, in part, as a multifaceted issue that involves multiple components and depends on multiple factors, including varying conditions of climate, air quality, and

soil properties. Measuring, setting targets, and aggressively reducing GHG emissions from the transportation system is critical to creating predictable environmental conditions upon which engineers can design the NHS to meet the performance targets. The safety of the traveling public is also dependent on limiting climate change impacts since traffic disruptions caused by flooding, wildfire, and storm surge can cause injuries on public roads. Ultimately, in severe cases national economic resources will be diverted toward recovery operations. Such operations can help regions rebuild following disasters, but they cannot replace those whose lives are lost. We have seen devastating examples of this in just the past few weeks, from Hurricanes Harvey, Irma, and Maria, and the wildfires in Northern and Southern California. Individual states might pursue actions to mitigate or adapt to a changing climate and increased extreme weather events, but ultimately each major incident will become a new national burden. This challenge is not a local, regional, or state issue. It needs a concerted, proactive, national-level response in both policy and action.

IV. Implementation of the Measure as Designed is Unlikely to be Burdensome

In explaining its reasoning for adopting the MAP-21 Performance Management 3 Final Rule, FHWA acknowledged that the GHG performance measure chosen – the percent change in tailpipe CO2 emissions on the NHS compared to the calendar year 2017 level – is not a perfectly precise methodology, but considered it to be the best option on balance. The FHWA's October 5, 2017 Notice of Proposed Rulemaking (NPRM) requests comments on whether the degree of imprecision inherent to the methodology markedly impedes the ability of State DOTs and Metropolitan Planning Organizations (MPOs) to use the measure and associated targets in evaluating the system performance and making investment decisions. In addition, FHWA encourages commenters to provide information regarding whether the measure, including the methodology adopted in the final rule, provides meaningful utility for assessment of environmental performance by the NHS by States and MPOs.

FHWA's required calculation method in the MAP-21 Performance Management 3 Final Rule is an effective measurement for the stated purposes of the measure. California strongly supports the existing measure, methodology, and data sets (including the U.S. EIA emission factors) specified in the established final rule.

The GHG measure and methodology established by the final rule create a standard national methodology with a level of accuracy that ensures consistency and comparability between each state without burdening state agencies. The measure, as finalized, is capable of informing investment decisions because it provides a consistent and reliable metric upon which policymakers can evaluate each state's progress in reducing GHG emissions. Where further analysis and specificity in GHG emissions is desired, MPOs may voluntarily report CO2 emissions using alternative methods, including

those referred to in the existing final rule, and attach them as supplemental information in FHWA's online reporting portal.

FHWA's October 5, 2017 NPRM requests information on whether data are available to more directly measure GHG emissions effects on NHS projects undertaken by States or MPOs. The NPRM notes that FHWA is responsible for establishing the data elements that are necessary to collect and maintain the standardized data to carry out a performance-based approach under 23 U.S.C. § 150(c)(3)(A)(iv), therefore FHWA requests comments on whether the data used to calculate the measure is precise enough to meet these goals.

The data and methodology established in the MAP-21 Performance Management 3 Final Rule is precise enough to be a useful performance measure for tracking progress of policy and investment decisions that reduce the transportation sector's GHG emissions. Other methods can be used to add more precision to emissions data, but they are not essential to accomplishing the stated goals of the measure. Since some states do not currently report GHG emissions from transportation, requiring State DOTs to use more precise methods would cost more and take longer to implement without providing significant benefit for the stated purposes.

The degree of precision in the proposed methodology does not impede the ability of State DOTs and MPOs to use the measure in evaluating system performance and making investment decisions.

FHWA has chosen a measure that relies on existing data and is straightforward to calculate. Limiting the measure to CO_2 simplifies calculations (since unlike the other GHGs, it is emitted in direct proportion to the amount of fuel burned), while still capturing 95 percent of transportation GHGs. Limiting the measure to on-road emissions rather than full life cycle also simplifies analysis. The overall potential burden on State DOTs and MPOs is further minimized in the final rule by the elimination of certain measures that had been included in the MAP-21 Performance Management 3 proposal (two NHPP peak hour performance measures and the truck congestion measure).

V. Benefits of the Measure Outweigh its Negligible Costs

The NPRM notes that the GHG performance measure was adopted under the National Highway Performance Program, which involves significant progress determinations for State DOTs that fail to achieve their targets, and additional reporting requirements for any that fail to make significant progress. FHWA requests comments on any costs to States that may be associated with the NHPP significant progress determination for the GHG measure.

The potential costs associated with an NHPP significant progress determination are negligible, because the final rule provides State DOTs and MPOs with the flexibility to establish GHG performance targets that can realistically be achieved. Additionally, while the costs of reporting GHG emissions and any potential regulatory ramifications of missing GHG emission targets are minimal, the potential damage caused by continually increasing GHG emissions may be catastrophic. FHWA's Order 5520 states that "climate change and extreme weather events are a significant and increasing risk to the safety, reliability, effectiveness, and sustainability of transportation infrastructure and operations." The Order points to the costly and recurring damage to infrastructure from climate change effects including sea level rise, resulting in a need to reduce emissions in order to protect the integrity of the transportation system and to ensure the sound investment of taxpayer dollars.

California has become a national leader in its efforts to reduce GHG emissions and mitigate the harmful effects of climate change. This experience has given California a thorough understanding of the benefits and challenges of measuring and reducing GHGs from transportation. The benefits of including GHG emissions as a performance measure far outweigh the costs.

California relies on the social cost of carbon ($SC\text{-}CO_2$) to support estimates of the benefit of GHG reductions. Since 2008, federal agencies have been incorporating the social costs of GHGs, including carbon dioxide, methane, and nitrous oxide, into the analysis of their regulatory actions. Agencies including the U.S. Environmental Protection Agency (U.S. EPA), Department of Transportation (DOT), and Department of Energy (DOE) are subject to Executive Order 12866, which directs agencies "to assess both the costs and benefits of the intended regulation...." In 2007, the National Highway Transportation Safety Administration (NHTSA) was directed by the U.S. 9th Circuit Court of Appeals to include the social cost of carbon in a regulatory impact analysis for a vehicle fuel economy rule. The Court stated that "[w]hile the record shows that there is a range of values, the value of carbon emissions reduction is certainly not zero."[13]

The potential costs of implementation of this measure are negligible, and the benefits of this measure far outweigh the costs.

In 2009, the Council of Economic Advisors and the Office of Management and Budget convened the Interagency Working Group on the Social Cost of Greenhouse Gases[14] (IWG) to develop a methodology for estimating the $SC\text{-}CO_2$. This methodology relied on a standardized range of assumptions and could be used consistently when estimating the benefits of regulations across agencies and around the world. The IWG, comprised of scientific and economic experts, recommended the use

[13] *Center for Biological Diversity v National Highway Traffic Safety Administration* 06-71891 (9th Cir, November 15 2007)
[14] Originally titled the Interagency Working Group on the Social Cost of Carbon, the IWG was renamed in 2016.

of SC-CO_2 values based on three integrated assessment models (IAMs) developed over decades of global peer-reviewed research.[15]

California utilizes the current IWG supported SC-CO_2 values to consider the social costs of actions to reduce GHG emissions. This approach is in line with Executive Orders including 12866 and the OMB Circular A-4 of September 17, 2003, and reflects the best available science in the estimation of the socio-economic impacts of carbon.[16] California is aware that the current federal administration has recently withdrawn certain social cost of GHG reports as no longer representative of federal governmental policy.[17] However, this determination does not call into question the validity and scientific integrity of federal social cost of carbon work, or the merit of independent scientific work. Indeed, the IWG's work remains relevant, reliable, and appropriate for use for these purposes.

The IWG describes the social costs of carbon as follows:

> *The social cost of carbon (SC-CO_2) for a given year is an estimate, in dollars, of the present discounted value of the future damage caused by a 1-metric ton increase in carbon dioxide (CO_2) emissions into the atmosphere in that year, or equivalently, the benefits of reducing CO_2 emissions by the same amount in that year. The SC-CO_2 is intended to provide a comprehensive measure of the net damages – that is, the monetized value of the net impacts- from global climate change that result from an additional ton of CO_2.*
>
> *These damages include, but are not limited to, changes in net agricultural productivity, energy use, human health, property damage from increased flood risk, as well as nonmarket damages, such as the services that natural ecosystems provide to society. Many of these damages from CO_2 emissions today will affect economic outcomes throughout the next several centuries.*[18]

Table 1 presents the range of IWG SC-CO_2 values used in regulatory assessments including the California Air Resources Board Scoping Plan.[19]

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[15] Additional technical detail on the IWG process is available in the Technical Updates of the Social Cost of Carbon for Regulatory Impact Analysis – Under Executive Order 12866. Iterations of the Updates are available at: https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/for-agencies/Social-Cost-of-Carbon-for-RIA.pdf, https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/scc-tsd-final-july-2015.pdf, and https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/scc_tsd_final_clean_8_26_16.pdf.

[16] OMB circular A-4 is available at: https://www.transportation.gov/sites/dot.gov/files/docs/OMB%20Circular%20No.%20A-4.pdf.

[17] See Presidential Executive Order, March 28, 2017, sec. 5(b).

[18] From The National Academies, Valuing Climate Damages: Updating Estimation of the Social Cost of Carbon Dioxide, 2017, available at: http://www.nap.edu/24651

[19] The SC-CO_2 values are of July 2015 are available at: https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/scc-tsd-final-july-2015.pdf

Table 1. SC-CO_2, 2015-2030 (in 2007$ per Metric Ton)

Year	5 Percent Discount Rate	3 Percent Discount Rate	2.5 Percent Discount Rate
2015	$11	$36	$56
2020	$12	$42	$62
2025	$14	$46	$68
2030	$16	$50	$73

It would be appropriate for the FHWA to use these measures in its own analysis. Whatever well-supported social cost of carbon figures the FHWA does eventually use, it must account for the significant costs that are likely to be incurred as a result of deficient planning in the wake of a repeal. These costs include incremental emissions costs associated with the loss of the measure. The failure to include these costs further renders FHWA's analysis arbitrary and capricious, and incapable of supporting the proposed repeal.

In sum, the FHWA's proposed repeal clearly does not comply with EO 13563's cost and benefit requirements. The FHWA's analysis uses an improper baseline, overstates costs, understates benefits, and fails to account for important costs of repeal, including the effects of climate change.

VI. The FHWA Has Failed to Comply with Other Critical Analytic Requirements

Because transportation emissions are a critically important contributor to climate change, the FHWA may not repeal its emissions-reducing performance measure without considering the implications of such a repeal on many affected resources and communities. It has failed to do so.

The required analytic considerations, include, but are not limited to the following:

- A full environmental impact statement pursuant to the National Environmental Policy Act. Repealing the GHG performance measure would result in increased GHG emissions, resulting in direct, indirect, and cumulative impacts worsening the already significant impacts of climate change. The FHWA must fully disclose these impacts and alternatives to them – including leaving the measure in place or (if the analysis can support such a step) merely modifying compliance schedules or methodologies to reduce any perceived burden. The FHWA may not use a categorical exclusion, as it has proposed.
- Analysis and consultation under the Endangered Species Act. The ESA requires federal agencies to avoid jeopardy to endangered species or adverse modification of their habitat. Climate change clearly poses these threats, and the proposed repeal would exacerbate climate change. Consultation is therefore required.

- Review under the National Historic Preservation Act (NHPA). The NHPA requires review for federal undertakings that would affect historic and cultural resources. Climate change is a significant threat to these resources; once again, the FHWA must fully disclose and mitigate these impacts.
- Review under Executive Order 13211. Use of motor fuels is clearly germane to national energy policy. Failure to implement the performance measure is likely to lead to wasteful and unnecessary use of these fuels as a result of poor NHS planning and design that encourages additional vehicle miles travelled. Executive Order 13211 requires careful consideration of these matters, and the proposal is a "significant energy action" under that Order.
- Review under Executive Order 12898. Minority and low-income populations are especially sensitive to climate change and are also disproportionately located near to elements of the NHS, as a general matter. Thus, repeal of the performance measure would plainly have disproportionate and adverse effects on these communities, requiring EO 12898 review.

VII. Further Procedural Matters

The FHWA should abandon this ill-advised proposal. However, if it proceeds, it must publish a full proposed rule to effectuate the repeal and seek notice and comment, providing a full record for review. It may not rely solely on this proposed repeal notice to proceed. Instead, further notice and comment will be necessary.

We also note that the FHWA has, in a separate matter, illegally postponed implementation of the measure. Although the FHWA has since formally withdrawn this delay in response to litigation filed by California, other states, and non-governmental organizations, it is critical that it vigorously implement the measure as it now stands. California will be closely monitoring the FHWA to ensure that it is faithfully executing Congress's direction and its own rules.

Recommendation: Retain the Current Measure

FHWA proposes to repeal the requirement for the GHG performance measure based on stated concerns over the utility, costs, potential duplication, and burdens of implementing the rule. In adopting the measure, FHWA has already carefully considered these questions, and determined, based on a robust public process and consideration of the evidence, that the potential costs and limitations of the rule are outweighed by its benefits. As FHWA stated in the preamble to the existing Final Rule:

> "FHWA decided to establish a GHG emissions performance measure in this rule to measure environmental performance in accordance with 23 U.S.C. 150(c)(3). Doing so will incorporate an important environmental aspect of system performance into the set of national performance measures, be responsive to public comments, improve transparency, and support the national transportation goal of environmental sustainability in the Federal-aid

> Highway Program and the national performance management program established in 23 U.S.C. 150 ... Reducing GHG emissions from the U.S. transportation sector will reduce the sector's impact on climate change, promote environmental sustainability, and help to protect the NHS from damage caused by climate change."

California agrees with FHWA's determinations of several months ago that implementation of the GHG performance measure is an important and necessary step which will contribute to states' efforts to reduce transportation's contribution to climate change by creating transparency and clarity in tracking total emissions from the sector. In the intervening months since FHWA published the final rule, including the GHG measure, the evidence supporting the utility and necessity of the rule has only grown stronger.