

Assessing Performance of the National Highway System, Greenhouse Gas Emissions Measure

Notice of Proposed Rulemaking

August 23 and 24, 2022

Webinar Transcript

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Hello, everyone. My name is Gina Filosa with the U.S. DOT's Volpe Center, and I'd like to welcome you to today's webinar to provide information about the Notice of Proposed Rulemaking to establish a greenhouse gas performance measure as part of the National Transportation Performance Management Program.

We will have three speakers during today's webinar. Mike Culp and John Davies of FHWA's Office of Natural Environment, and Alexis Kuklenski of the Office of Stewardship, Oversight and Management.

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A few housekeeping items before we get started.

All participants are in listen only mode, and we will not be taking questions during today's session. You should submit all questions or comments on the proposed rule to the rulemaking docket at www.regulations.gov using docket number FHWA-2021-0004.

A copy of today's presentation slides and a transcript will be posted on FHWA's Transportation Performance Management website in the near future.

I'll now turn it over to Mike Culp to get us started.

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Thank you Gina.

This slide includes some thoughts from Secretary Buttigieg and Deputy FHWA Administrator Pollack about climate change and the challenge that lies ahead.

As noted by Secretary Buttigieg we don't have a moment to waste in tackling the climate challenge.

The proposed greenhouse gas performance measure would help the United States confront the increasingly urgent climate crisis.

- The Sixth Assessment Report by the Intergovernmental Panel on Climate Change, which was released in August 2021, confirms that human activities are increasing greenhouse gas concentrations that have warmed the atmosphere, ocean, and land at a rate that is unprecedented in at least the last 2000 years
- According to the report, global mean sea level has increased since the start of the 20th century, and changes in extreme events such as heatwaves, heavy precipitation, hurricanes, wildfires, and droughts have intensified since the last assessment report in 2014. These changes in extreme events, along with anticipated future changes in these events due to climate change, threaten the reliability, safety and efficiency of our country's transportation system.

States have a critical role to play as we work to reduce the nation's greenhouse gas emissions.

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The Biden-Harris Administration has established an ambitious goal of cutting greenhouse gas emissions by 50-52 percent relative to 2005 levels by 2030, and achieving net-zero emissions economywide by 2050.

As you can see on the pie chart, transportation is the leading source of greenhouse gas emissions in the U.S., which means that transportation sector will also need to be part of the solution.

The Biden-Harris Administration has put forward an integrated approach to reducing emissions from the transportation sector while ensuring our economy works for all Americans. This holistic approach includes the National Highway Traffic Safety Administration's Corporate Average Fuel Economy standards, which are in place to make driving more affordable for everyday Americans by increasing fuel efficiency, as well as funding from the Bipartisan Infrastructure Law to support programs that help state and local governments reduce transportation related GHG emissions.

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The proposed GHG performance measure is another element of this integrated approach. As a matter of transportation policy, the USDOT considers the proposed greenhouse gas performance measure essential not only to improve transportation sector greenhouse gas performance, but also to demonstrate Federal leadership in the assessment and disclosure of climate pollution from the transportation sector.

First, the proposed rulemaking would position the transportation sector to take a leading role in reducing emissions by providing states and MPOs flexibility to set their own declining emissions targets.

It would also establish a national framework to standardize estimation and reporting practices, making data comparable across state lines and metropolitan areas. Estimating and reporting complete, consistent, and timely information on greenhouse emissions from on-road mobile source emissions is necessary so that all levels of government can make more informed choices about the role of transportation investments and other strategies in reducing greenhouse gas emissions.

States and metropolitan areas will need resources to achieve their declining GHG emission targets. Through the Bipartisan Infrastructure Law, States will have access to more than \$27 billion in funding over five years through various programs that are directly orientated to reducing GHG emissions.

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Programs funded through BIL that can support GHG emission reduction activities include:

- A new Carbon Reduction Program, which provides \$6.4 billion in formula funding to states and local governments to develop carbon reduction strategies and fund a wide range of projects designed to reduce carbon emissions from on-road highway sources.
- There is another \$7.5 billion to support Electric Vehicles through the new National Electric Vehicle Infrastructure Formula Program and a Discretionary Grant Program for Charging and Fueling Infrastructure.
- BIL includes several competitive funding programs to reduce congestion in metropolitan areas, reduce truck idling and emissions at ports, and increase use of low or no emission transit vehicles.
- BIL also includes \$7.2 billion for the Transportation Alternatives Set-Aside that can help state and local governments carry out environmentally friendly pedestrian and bicycle infrastructure projects.

In addition to these new funding sources that states can access from the Bipartisan Infrastructure Law, new and existing formula programs provide states and local governments critical access to funding to encourage public transportation and other integrated land use and transportation projects and strategies that reduce air pollution by giving Americans more climate-friendly options for travel, and help state and local governments meet the emissions reduction targets this proposed rule would require them to set for themselves.

Now I'll turn it over to Alexis.

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Thank you, Mike. Now, let's review the outline for today's presentation, which includes 5 parts.

- Part 1 will focus on the key concepts of the proposed greenhouse gas performance measure and associated target requirements.
- Part 2 will cover how to calculate the proposed GHG measure.
- Part 3 will provide an overview of the proposed requirements pertaining to establishing and reporting on targets, and the significant progress determination.
- Part 4 will discuss the regulatory impact analysis conducted on the proposed rule.,
- Finally, part 5 will address the request for public comments.

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Ok, let's get started with Part 1.

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In 23 USC 150, Congress established national transportation goals of safety, infrastructure condition, congestion reduction, system reliability, freight movement and economic vitality, environmental sustainability and reduced project delivery delays.

Through a series of rulemakings in 2016 and 2017, FHWA established the Transportation Performance Management or TPM program, which provides a strategic approach that uses system information to make investment and policy decisions to achieve the suite of national performance goals. As part of the TPM program, FHWA established consistent national measures that are being used by all 52 State Departments of Transportation to track performance and make investment decisions. There are 17 existing measures across seven performance areas.

To support the environmental sustainability national goal, FHWA is proposing to establish a greenhouse gas performance measure to measure environmental performance.

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The proposed GHG measure is being implemented within the existing TPM framework established in 23 CFR 490. While there are nuances unique to the proposed measure, many of the proposed requirements are similar to other TPM measures for the NHPP and will be familiar to State DOTs and MPOs.

As with other measures, FHWA has proposed that State DOTs would set statewide 2- and 4-year targets, while MPOs would set 4-year targets for their metropolitan planning area. As with other TPM measures, the MPOs could establish targets by either supporting the state target or establishing their own target.

FHWA is proposing that the GHG measure would have the same 4-year performance period as the other NHPP measures, and State DOTs would follow the same October 1 biennial reporting schedule.

State DOTs would report on targets and performance through Baseline, Mid, and Full Performance Period reports. MPOs would report established targets to their respective State DOT in a manner that is documented and mutually agreed upon by both parties. MPOs would also include information on targets and performance their Metropolitan Transportation Plans.

Lastly, FHWA has proposed to use the same approach to determine significant progress as it uses for the other NHPP measures.

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The proposed greenhouse gas performance measure is the percent change in tailpipe carbon dioxide emissions on the National Highway System compared to the reference year. The reference year is defined as calendar year 2021. The proposed greenhouse gas measure would apply to the mainline highways of the Interstate and non-Interstate National Highway System.

The proposed metric for this measure is annual total tailpipe carbon dioxide emissions on the National Highway System.

Targets established for the GHG measure would be required to be declining – meaning that the level of carbon dioxide emissions is anticipated to decrease.

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Just to remind everyone, within FHWA's TPM Framework, a target is defined as a quantifiable level of performance or condition that is expected to be achieved within a defined timeframe.

For the greenhouse gas performance measure, FHWA has proposed that all targets represent a decline in tailpipe CO₂ emissions on the NHS relative to the reference year - calendar year 2021, and that the target demonstrate reductions toward net-zero emissions. FHWA's *proposed definition of "net zero" is in section 490.101 and reads, "Net-zero as used in this part means that human activities produce no more greenhouse gases than they remove from the atmosphere"*.

In the first performance period, State DOT and MPO targets would be required to represent an anticipated reduction in CO₂ emissions from the reference year 2021. In subsequent performance periods, targets would be required to indicate a reduction in CO₂ emissions relative to the previous performance period, as well as from the reference year 2021. In addition, targets set by State DOTs and MPOs would need to align with the Administration's net-zero targets as outlined in the national policy established under section 1 of Executive Order 13990, "Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis", and E.O. 14008, "Tackling the Climate Crisis at Home and Abroad."

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Here is a summary of the proposed target expectations. Under the NPRM, all State DOTs would establish declining 2-year and 4-year targets for their state geographic boundary. Again, declining targets must demonstrate reductions from the reference year of 2021 and toward the national net-zero targets.

Under the NPRM, MPOs would establish declining 4-year targets for their metropolitan planning area boundaries. As with other TPM measures, the MPOs could establish targets by either:

- Agreeing to plan and program projects so that they contribute toward the achievement of the relevant State DOT targets; or
- Committing to unique, quantifiable targets for their metropolitan planning area.

As with other TPM measures, MPOs would establish targets no later than 180 days after the respective State DOT(s) establishes their targets.

The proposed rule would also require MPOs serving urbanized areas with multiple MPOs to collectively establish a single joint 4-year target for the urbanized area. This joint target would be established in addition to each MPO's target for their metropolitan planning area. This requirement would help ensure a coordinated approach to GHG emission reductions in areas where multiple MPOs serve a single urbanized area.

As with the other TPM performance measures, State DOTs and MPOs would be required to coordinate when setting targets to ensure consistency to the maximum extent practicable.

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This slide shows an example of a single UZA overlapped by two MPOs. The term "urbanized area" means a geographic area with a population of 50,000 or more, as designated by the Bureau of the Census.

In this scenario, the two MPOs would need to establish a single joint 4-year target for the urbanized area. The proposed rule specifies that only one target would be established for the entire urbanized area regardless of roadway ownership and that each MPO would report the joint target for the urbanized area. The proposed rule would also require the joint target established for an urbanized area to be a quantifiable target for that urbanized area.

This joint target would be established in addition to each MPO's target for their metropolitan planning area.

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I'll now turn it over to John Davies to talk through the method for calculating the proposed GHG measure.

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Thanks, Alexis. As mentioned earlier, the proposed GHG performance measure is the percent change in tailpipe carbon dioxide emissions on the NHS compared to the reference year, which is calendar year 2021.

State DOTs would calculate the percent change in tailpipe CO₂ emissions on the NHS by:

- First determining the difference between tailpipe CO₂ emissions on the NHS in the calendar year, and tailpipe CO₂ emissions on the NHS in the reference year, which is calendar year 2021;
- They would then divide that amount by tailpipe CO₂ emissions on the NHS in the reference year, calendar year 2021;
- Last, they would multiply the total by 100 so that the result is expressed as a percent change from the reference year, which again is calendar year 2021.
- One last observation: tailpipe CO₂ emissions are to be computed in million metric tons and rounded to the nearest hundredth.

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The proposed rule specifies data sources to use in calculating the proposed greenhouse gas measure:

- The source for state-level fuel use data would be FHWA's Fuels and Financial Analysis System-Highways, referred to as the FUELS/FASH system. The FUELS/FASH system is a national, established, and validated data source for total fuel use this is already being reported annually

by state agencies to FHWA, and it is the most accurate and up-to-date source known for fuel use information. FHWA would extract fuel use data contained within FUELS/FASH on August 15 of the year in which the significant progress determination is made. This data would represent fuel use in the previous calendar year.

- VMT data used in the metric calculation would come from the Highway Performance Monitoring System, or HPMS, which includes estimates of both NHS VMT and total VMT. As with the FUELS and FASH data, FHWA would pull the HPMS VMT data entered as of August 15 for the year in which a significant progress determination is being made, and this data would represent travel activity for the previous calendar year.
- Finally, FHWA would supply the emissions factors for amount of CO₂ per gallon of fuel. FHWA would post on its website, no later than August 15th of each year, the CO₂ factor for each on-road fuel type that would be used to calculate the GHG metric for the GHG measure. For these factors, FHWA is considering using information from EPA's MOVES model, Argonne National Laboratory's GREET model, CO₂ coefficients published by the Energy Information Administration, or other U.S. Government published data sources.

As discussed earlier, MPOs would have the flexibility to use additional data sources to calculate the GHG measure.

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This slide shows calculation of the GHG metric, which is tailpipe CO₂ emissions on the NHS. FHWA proposes a simple, fuels-based method for this calculation, using data that is already reported and readily available for all states. Let me walk you through the calculation steps.

As shown in the first box, the proposed State-level calculation would start with estimates from Fuels and FASH of fuel use by fuel type, such as gallons of gasoline and gallons of diesel.

Next, these fuel use estimates would then be multiplied by FHWA-provided CO₂ emissions factors for the corresponding fuel types. The estimates of CO₂ emissions for each fuel type would then be summed as part of this step, providing an estimate of total on-road tailpipe CO₂ emissions.

Moving onto the third box, HPMS data would then be used to estimate the fraction of total State VMT occurring specifically on the NHS (so in other words, NHS VMT divided by total VMT). This fraction would be multiplied by the estimate of total on-road tailpipe CO₂ emissions (from the second box). The resulting value is tailpipe CO₂ emission on the NHS.

As noted in the bullets below this calculation is simple and uses data that's readily available for all states. The approach is also nationally consistent for all states.

Let me make a couple observations about the fourth bullet. The proposed GHG performance measure is specific to the performance of the NHS. However, existing data does not distinguish between gallons of fuel burned on the NHS versus the gallons of fuel burned on other roads. Therefore, as noted in this bullet, the NPRM proposes States use the proportion of the State's total VMT occurring on the NHS (the value from the third box) as a proxy for the proportion of the State's on-road CO₂ emissions occurring from travel on the NHS. A key assumption in using this proportion is that the CO₂ emissions per VMT traveled on the NHS is similar to the CO₂ emissions per VMT on non-NHS facilities.

The last bullet notes that MPOs may use other methods to calculate tailpipe CO₂ emissions on the NHS, and this is because fuel sales volumes, such as those from Fuels and FASH, are not generally available at the metropolitan level. So MPOs would have additional flexibility, compared to State DOTs, in how they calculate the GHG metric. Several options are identified in the NPRM. As a simple approach, an MPO

could use its share of total State VMT as a proxy to estimate the MPO share of CO₂ emissions. As a more analytically detailed approach, an MPO could use results from travel demand modeling along with EPA's MOVES emissions model. Or they could use FHWA's Energy and Emissions Reduction Policy Analysis tool (or EERPAT), which is another model for estimating GHG emissions. The NPRM indicates that MPOs can use any alternative method to calculate tailpipe CO₂ emissions on the NHS, provided the MPO can demonstrate the method has valid and useful results for CO₂ measurement, and the method is mutually agreed upon by both the State DOT and MPO.

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I'll turn in back to Alexis to discuss the proposed reporting requirements, and significant progress determination.

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Thanks John. The TPM requirements in 23 CFR 490 have specific provisions describing how targets and progress toward meeting targets should be documented and the NPRM proposes the same requirements apply to this measure. There is a State DOT report due every two years, on October 1 of each even year. Through these biennial reports State DOTs provide the basis for their targets and discuss their progress toward meeting targets. The MPOs are required report their targets to the State DOT in a manner that is mutually agreed upon, and report on progress in their system performance report in the metropolitan plan.

In addition to the existing reporting requirements, for the proposed GHG measure, the NPRM would require State DOTs and MPOs to report two related CO₂ emissions calculations. The first of these is a calculation of total tailpipe CO₂ emissions from on-road sources traveling on all roadways, which is a component of the calculation of the proposed GHG metric. The second of these is a calculation of the proposed GHG metric itself, which is tailpipe CO₂ emission on the NHS. FHWA is proposing to require the reporting of total tailpipe CO₂ emissions on all roadways to ensure a consistent basis for monitoring tailpipe CO₂ emissions trends, since year-over-year variation in NHS mileage could impact the calculation of the metric. Reporting on this data is not believed to add burden since State DOTs and MPOs would need to perform this calculation as part of calculating the metric. MPOs would also need to report their metric calculation method.

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For the proposed GHG measure, State DOTs would be subject to the same biennial reporting cycle as the existing NHPP performance measures, and the reporting requirements would be similar.

However, the NPRM would add the requirement to report tailpipe CO₂ emissions on the NHS and all public roads for the reference year and the two calendar years preceding the report.

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As with the other NHPP measures, MPOs would report their targets to the State DOT in a manner that is documented mutually agreed upon and would report progress toward their targets in their system performance report in the metropolitan plan.

In the System Performance Report in the Metropolitan Plan, MPOs would report on baseline and ongoing performance, and progress towards their targets. For this measure only, MPOs would also report on any joint 4-year targets they were required to establish for an urbanized area served by multiple MPOs. MPOs would also need to report their metric calculation method, and tailpipe CO₂ emissions for the NHS and all public roads.

As we discussed on slide 18, MPOs would have several ways to calculate the metric while State DOTs only have one option. Because of this flexibility, MPOs would need to report the metric calculation used. As a reminder, the metric calculation method would need to be mutually agreed upon by both the State DOT and the MPO.

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This slide shows the proposed timeline for State DOT biennial reporting for the proposed GHG measure. FHWA has proposed that the performance reporting for the proposed GHG measure aligns with the existing reporting requirements and schedule in 23 CFR Part 490.

Per the NPRM, State DOTs would be required to submit their first baseline performance period report containing information for the proposed GHG measure by October 1, 2022. The first mid Performance Period Progress Report for the GHG measure would be due October 1, 2024 and the full Performance Period Progress Report would be due October 1, 2026.

FHWA requests comment on what the due date should be in the event a final rule is not effective in advance of the October 1, 2022, reporting date.

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As with other NHPP performance measures, FHWA would biennially assess whether the State DOT has achieved or made significant progress toward achieving the GHG performance target after the mid- and full performance period reports are submitted.

FHWA would determine that significant progress has been made if either (1) the actual performance level is better than the baseline performance, or (2) when the actual performance level is equal to or better than the established target.

MPOs would not be subject to the significant progress determination, which is consistent with all other TPM measures.

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This slide provides an illustrative example of a significant progress determination. As we go through these examples, I just want to note that the targets and measures are a percentage change value, and a decrease in emissions is represented by a negative number.

In the NPRM, FHWA has proposed that State DOTs establish 2 and 4-year targets in the baseline report due October 1, 2022. Therefore, in this example, the baseline data reported in 2022 and reference year – 2021 - would be the same. The 2-year target would represent anticipated performance reported in CY 2024, and the 4-year target would represent 2026.

Let's start with the 4-year target and actual performance. In this example, the state DOT established a 4-year target of reducing CO₂ emissions by 4% below 2021 levels. The actual 4-year emission reductions achieved were 6%. This would be BOTH a reduction from the baseline value and a greater reduction than targeted, so this State DOT made significant progress.

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In this second example, the state DOT again established a 4-year target of reducing CO₂ emissions by 4% below 2021 levels. However, the actual 4-year emission reductions achieved were only 3% below 2021 levels. While this State DOT did not achieve its target, it would still be deemed as making significant progress because the actual performance level is better than the baseline performance - emissions declined by 3 percent from the baseline.

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Consistent with the existing regulations for other NHPP performance measures, the proposed rule would require that if significant progress is not made, the State DOT must document the actions it will take to achieve that target no later than its next biennial report. However, State DOT's are encouraged to do so as soon as possible, and not wait until the next biennial report.

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Next John will discuss the regulatory impact analysis that was conducted on the proposed rule.

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Thanks, Alexis. To estimate the costs of this proposed rule, FHWA assessed the level of effort that would be needed to comply with each applicable section in Part 490 with respect to the proposed greenhouse gas measure, including labor hours by labor category. The level of effort estimates, which cover a 10-year study period from 2022–2031, encompass the following activities:

- target establishment by State DOTs and MPOs
- reporting by State DOTs and MPOs
- the assessment of significant progress toward State DOT targets and action plans by State DOTs that do not make significant progress
- calculation of the GHG metric and
- calculation of the GHG measure

The left side of the scale shows the expected costs of implementing the proposed rule, which would be \$11.0 million at a 7 percent discount rate and \$12.9 million at a 3% discount rate.

Benefits of the rule are not quantified since FHWA is unable to reasonably forecast the number and extent of actions of State DOTs and MPOs would take in response to this rule. However, it is anticipated that the measure will influence transportation decisions and result in significant reductions in GHG emissions. Accordingly, the RIA estimates the tons of transportation-related CO₂ emissions that would need to be reduced for the proposed rule to be cost beneficial, which is sometimes called a break-even analysis.

The break-even estimates were developed by dividing implementation costs by interim social cost of CO₂ values published by the Interagency Working Group on the Social Cost of Greenhouse Gases. The break-even estimates are not intended justify the proposed rule but are provided as context to illustrate the magnitude of CO₂ reductions required to equal estimated compliance costs.

At a discount rate of 7 percent, the proposed rule would break even with a total reduction of between 75,669 to 835,044 tons of CO₂ over the total 10-year analysis period, representing 0.0004 percent to 0.005 percent of total transportation CO₂ emissions. Similarly, at a discount rate of 3 percent, the proposed rule would break even with a reduction of between 88,772 to 983,896 tons over the total 10-year analysis period, representing 0.0005 percent to 0.006 percent of total transportation CO₂ emissions.

One final observation is that the RIA also notes a range of potential benefits associated with the proposed measure, including more informed decision-making, more comprehensive performance and practices, greater accountability and progress on national transportation goals.

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And last, a few additional words about the request for public comments.

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All public comments on the NPRM must be submitted to the docket at www.regulations.gov, using docket number FHWA-2021-0004. Comments should be submitted by October 13, 2022.

Also be sure to check FHWA's website and FHWA Office of TPM website for additional materials.

If you have questions about accessing the docket or need additional information, please contact the TPM Rulemaking mailbox listed on this slide.

And as Gina mentioned, today's presentation and a transcript will be posted on FHWA's TPM website.

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Thank you for your attention. That concludes today's webinar.