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Guiding Principles and
Potential Areas of Improvement
for the
Regional Haze Program, Third Planning Period

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*Western Visibility Planning and Protection Initiative
Outcomes Report*

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Introduction, Purpose, and Context

1. Introduction and Purpose

This report summarizes suggested guiding principles and potential areas of improvement (PAIs) for the Regional Haze Program and its implementation in the Western U.S. during its third planning period. The suggested principles and PAIs seek to create options to allow state, federal, Tribal, and local agencies to cooperatively continue improving visibility at Class I areas across the western region. This report is designed to inform discussions of the WESTAR Council of State Air Directors and to support their development of recommendations to the U.S. Environmental Protection Agency (EPA) and other partners for improving the Regional Haze Program and its future implementation.

These principles and PAIs were collaboratively developed in 2022 and early 2023 by the Western Visibility Planning and Protection Initiative (WVPPI), an initiative sponsored by the Western States Air Resources Council (WESTAR) and the Western Regional Air Partnership (WRAP). The WVPPI has convened representatives from state, Tribal, and local air agencies, as well as individuals from federal land management agencies, including the National Park Service, the Bureau of Land Management, the U.S.D.A. Forest Service, and the U.S. Fish & Wildlife Service. The purpose of the WVPPI has been to:

- Build a strong shared understanding of the current state and anticipated future needs for visibility protection efforts, with a focus on the Western region of the U.S.
- Share information regarding current regional haze-related practices in the participating states.
- Explore how state, federal, Tribal, and local air agencies can cooperatively continue improving visibility at Class I areas across the U.S. Western region.
- Develop options for planning and implementation of the third planning period under the Regional Haze Rule, including potential changes to the Regional Haze Rule and agency guidance, and options for WESTAR/WRAP's planning process.

2. Context and Background

WESTAR was founded in 1988 by eight western state air agencies. The Council has since grown to fifteen states, extending from Alaska to New Mexico and from Hawaii to North and South Dakota. WESTAR was formed to promote the exchange of information between the states, serve as a forum to discuss western regional air quality issues of common concern and share resources for the common benefit of the member states. WESTAR administratively houses the Western Regional Air Partnership (WRAP), a voluntary partnership of states, Tribes, federal land managers, local air agencies, and the EPA whose purpose is to understand current and evolving regional air quality issues in the West.

One of the key issues in the Western region is haze—a form of air pollution that reduces visibility in cities and across scenic landscapes. EPA promulgated the Regional Haze Rule (RHR) in 1999 to address regional haze, consistent with requirements in Section §169a of the Clean Air Act, which states “Congress hereby declares as a national goal the prevention of any future, and the remedying of any existing impairment of visibility in mandatory Class I areas which impairment results from manmade air pollution.” The rule requires state and federal agencies to work together to develop plans (state implementation plans, or SIPs) to improve visibility in 156 national parks and wilderness areas identified as Class I federal areas. The first SIPs identifying sources contributing to regional haze and how states planned to address these

sources were due to EPA in December 2007. States, Tribes, and multi-jurisdictional regional planning organizations (such as WRAP) worked together to develop the technical basis for these plans. Comprehensive periodic revisions to these initial plans are required, with the most recent plan revisions due in 2021, then 2028 and every 10 years thereafter.¹

In 2021, after the second planning period submission deadline passed², WESTAR/WRAP initiated the WVPPI to take a comprehensive look at the practices and process associated with planning and implementing the RHR, and to identify needs and opportunities for improvement for the third planning period. Any changes in the RHR, EPA guidance, or WESTAR/WRAP planning timelines and practices would need to occur in a timely manner to allow states³ and agencies time to implement and adapt their processes.

While the RHR applies across U.S. states, there may not be a good one-size-fits-all approach for visibility protection across all states, given unique contexts, challenges, and opportunities in different regions. Though substantial progress has been made in improving visibility in Class I areas in the western states over the past 30 years⁴, many Class I areas in western states may be experiencing visibility impairment from sources outside of state control (e.g., wildfire smoke, international transport) to an extent that is not common in non-western states. In fact, EPA has conducted modeling analyses which indicate that natural emissions (including wildfire smoke) and prescribed fire smoke are anticipated to be important factors affecting visibility in many Class I areas in the West in the future.⁵

3. Process for developing Guiding Principles and Potential Areas of Improvement

WESTAR/WRAP has a history of working collaboratively with EPA, FLMs, Tribes, and other partners to collaboratively and proactively identify and support implementation of opportunities to improve and enhance air quality management in western states. In 2022, WESTAR/WRAP launched the WVPPI and retained Ross Strategic to provide neutral third-party support for the initiative. The Ross team conducted 17 virtual one-hour individual and group interviews with 26 representatives from key organizations participating in the WVPPI, including WESTAR/WRAP member states, federal land managers, EPA headquarters, and Tribal representatives.

Based on the interview findings, WESTAR/WRAP staff and Ross Strategic prepared a document titled “WVPPI Synthesis of Interview Findings” (Synthesis Report) in Fall 2022. The Synthesis Report outlined the progress in improving visibility in Western Class I areas, highlighted what has and has not been working well with the implementation of the RHR and provided an outlook on the future of visibility protection efforts in the west based on interviewee perspectives. The report also included a working draft set of

¹ <https://www.epa.gov/visibility/regional-haze-program>

² Note: Not all state plans from the first and second planning period have been approved, due to extensions, adverse findings, and ongoing litigation.

³ References to “states” throughout this document also includes the City of Albuquerque, New Mexico, which maintains its own air agency for planning, monitoring, and compliance associated with the Regional Haze Rule.

⁴ WVPPI Interview Synthesis Report; U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards [OAQPS]

⁵ *ibid*

Guiding Principles based on interview findings which were designed to serve as a foundation and guide for future rounds of the RHR. The report informed participant discussions at the WVPPI Workshop.

As the finalization of the WVPPI Synthesis Report was underway, WESTAR/WRAP staff assembled a small planning team⁶ composed of representatives from western states, federal land managers, and EPA to provide guidance to WESTAR/WRAP and Ross Strategic on planning the November 2022 WVPPI workshop. WESTAR/WRAP convened the WVPPI Workshop November 15-16, 2022, in San Diego, California. The objectives of the workshop were to build a shared understanding of perceived needs and opportunities among partners, and develop principles and potential areas of improvement for improving visibility protection activities in the western states in the third RHR planning period. The interactive, hybrid workshop engaged more than 100 key stakeholders in person and online from state, Tribal, and local air agencies, EPA, and federal land managers.

Following the workshop, and at the suggestion of workshop participants, Ross Strategic, with guidance from the planning team, established four small workgroups, each centered around an important focus area identified by workshop participants. The workgroups continued refining the concepts that surfaced during the WVPPI workshop discussions. Starting with the outcomes from the workshop, each workgroup was tasked with drafting one or more suggested potential areas of improvement to the Regional Haze program (i.e., potential changes to the RHR, to EPA guidance, and/or to WESTAR/WRAP planning processes).

- Workgroup 1—Approach to modeling, monitoring, emissions reduction and establishing reasonable progress.
- Workgroup 2—Addressing emissions in Class I areas.
- Workgroup 3—Third planning period timeline/milestones.
- Workgroup 4— Programs outside of regional haze that contribute to visibility goals.

Participants in the Western Visibility Protection and Planning Initiative are listed in [Appendix 1](#), along with their affiliations. Participation may have occurred through the assessment process, as a member of the Planning Team, through virtual or in-person attendance at the November 2022 Western Visibility Protection and Planning Initiative Workshop in San Diego, California, participation in a small workgroup following the November workshop, and/or by providing review and comment on draft initiative products. Regardless of the method of participation, participants provided valuable and substantive insight that informed the development of the guiding principles and potential areas of improvement (PAIs) described in this report. It is important to note that federal land managers participated in the initiative and contributed important insights and constructive review of draft documents throughout the process. Federal land managers participated as advisors, but maintain their independence as a federal partner.

Workgroup outcomes provided a substantial basis for the Potential Areas of Improvement (PAI) section of this report. Additional refinement of the PAIs resulted from iterative WVPPI participant review and comment. Participation in the WVPPI doesn't imply consensus agreement on its outcomes—the guiding principles and potential areas of improvement identified in this report represent general areas of

⁶ Planning Team members are noted in Appendix 1, WVPPI Participants

agreement among WVPPI participants, and areas that merit further consideration; exceptions to this are noted in the report. They are presented to the WESTAR Council of State Air Directors to inform their recommendations to EPA for the third planning period.

Guiding Principles

This section presents the principles that WVPPI participants helped create to guide future visibility protection programs and activities in western states. The Guiding Principles provide the framework for the Potential Areas of Improvement (PAIs). Principles denoted with a ♦ were drawn or adapted from WESTAR/WRAP's 2018 Regional Haze Principles of Engagement⁷.

1. Roles

- 1.1. Ensure that the **roles and responsibilities are clearly articulated** for the third planning period for all partners, including WESTAR/WRAP, state and local air agencies, Tribes, federal land managers, and EPA.
- 1.2. Recognize a **shared interest and responsibility** for improving visibility and explore and pursue collaborative approaches to address sources of visibility impairment.

2. Clarity and Consistency

- 2.1. Create **clear and concise rule revisions** that resolve key areas of uncertainty and anticipate emerging issues.
- 2.2. Strive for a **streamlined and efficient process** that addresses core needs and values while decreasing burden across the full range of process steps and partners.
- 2.3. Strive for **consistency** in the Regional Haze Rule planning approach, state improvement plan (SIP) and Tribal implementation plan (TIP) development, and review process.
- 2.4. **Balance** an aligned and **consistent approach** for western regional planning with the need for **flexibility** within the regional haze planning process for states and Tribes to craft SIP/TIPs that address unique state/Tribal needs and conditions and the need for innovation. ♦

3. Funding

- 3.1. Ensure **Tribes have equitable funding and support** to participate in the regional haze planning process in a meaningful way. ♦
- 3.2. Recognize the resource constraints facing many state and local air agencies and their visibility programs and work to **reduce level of effort and costs where feasible**.

4. Timing

- 4.1. **Incentivize early and genuine stakeholder engagement and consultation** to reduce rework, and review and comment period delays.
- 4.2. Ensure that EPA regional haze **rule revisions and guidance are finalized and made available early** in the third planning period process to provide a stable framework for the SIP/TIP development process. ♦

⁷ https://www.wrapair2.org/pdf/RH%20principles%20ofengagement_WRAP_Board_final_adopted_April4_2018.pdf

- 4.3. Ensure that EPA **technical tools, data, and assistance are available in a timely manner**, given their value in supporting efficient and effective planning activities. ♦

5. Collaboration and Coordination

- 5.1. Ensure **close coordination between states, Tribes, local governments, EPA, and federal land managers** to provide transparency and ensure efficient and effective program administration and implementation. ♦
- 5.2. Ensure that **states, Tribes, federal agencies, and local governments (as appropriate) participate significantly in the entire planning process** to create shared expectations and prevent surprises, rework, and added expense later in the SIP/TIP process.
- 5.3. Enhance and **clearly define expectations and approaches for collaboration and coordination** between the states, federal land managers, EPA, and Tribal partners.

Guidelines: Specific Expressions of Convergence/Divergence

General: One state disagreed with some of the guiding principles, and felt these should be better integrated with the potential areas of improvement that follow this section.

3.1 & 3.2: One state suggested combining these two into one principal to ensure all entities (state and local air agencies and Tribes) are sufficiently funded.

Potential Areas of Improvement (PAIs)

PAIs include a short title, the mechanism(s) WVPPI participants believe may be required for future implementation, an expanded definition, and rationale for the PAI. The options are organized by topical groups, and are not in any order of importance:

Potential Change Mechanisms

- EPA Regional Haze Rule change
- New or revised WESTAR/WRAP planning process
- Additional Funding

Group 1. [Approach to modeling, monitoring, emissions reduction and establishing reasonable progress](#)

- 1.1. Focus modeling work on identifying the emissions sources that impair visibility.
- 1.2. Base Reasonable Progress Goals (RPGs) on planned emissions reductions and four-factor analyses.
- 1.3. Eliminate the modeled visibility glidepath.
- 1.4. Develop clear and reasonable guidance for applying four-factor analyses to new types of emissions sources.

Group 2. [Addressing emissions in and near Class I areas](#)

- 2.1. Develop guiding principles and explore mechanisms to understand and account for emission reductions in and near Class I areas.
- 2.2. Investigate potential emission sources and consider opportunities to reduce emissions in and near Class I areas.
- 2.3. Refine the process of early engagement between states and federal land managers to include an intentional engagement approach at the start of the planning process.

Group 3. [Third planning period timeline/milestones](#)

- 3.1. Extend the regulatory deadline for SIPs in the Third Planning Period beyond 2028 to allow for further consideration and incorporation of other WESTAR/WRAP WVPPI potential areas of improvement.
- 3.2. Allow extra time and flexibility for states to finalize their regulatory mechanisms that make emission reduction measures federally enforceable or allow submission of their final regulatory mechanism as supplements to the SIP.

Group 4. [Accounting of programs outside of regional haze that contribute to visibility goals](#)

- 4.1. Consider all ongoing pollution control programs as a component of a state's strategy towards reaching visibility goals.

Group 5. [Collaborative Engagement](#)

- 5.1. Provide adequate funding to Tribes to enable them to actively participate in the Regional Haze Rule planning process and to take steps to reduce emissions contributing to visibility impairment within their jurisdiction.
- 5.2. Explore opportunities to reduce emissions from other source categories affecting visibility in Class I areas that EPA is uniquely positioned to address and that states do not have jurisdiction to control.

PAI Group 1: Approach to modeling, monitoring, emissions reduction and establishing reasonable progress

Note: Due to the nature of the subject matter, there is a certain amount of overlap between PAIs 1.1-4. Readers are encouraged to read through all four PAIs and the specifically identified areas of convergence and divergence for each at the end of Group 1.

1.1. Focus modeling resources on identifying the impact of all emissions sources and source sectors that impair visibility

Potential Change Mechanism(s): WESTAR/WRAP planning process.

Description: Photochemical modeling has limitations in predicting the future, especially over large geographically diverse regions, and should not be required to predict future visibility.

Modeling (e.g., source apportionment) is an effective way to identify the potential for emissions sources and source categories to contribute to visibility impairment at Mandatory Class I areas, though it should be noted that the quality of the model depends a great deal on the quality of inputs like emissions inventories. Improving inventories should be a focus of any type of modeling used for visibility improvement planning. In general, modeling is most useful in identifying sources for the four-factor analysis and other sources that contribute to visibility impairment. However, using photochemical modeling to predict visibility in deciviews for establishing reasonable progress goals is expensive, time-consuming, and burdensome, especially on smaller state programs that do not have readily available interpretive analysts for this level of complex modeling.

Rationale: The Regional Haze Rule (RHR) requires states to establish reasonable progress goals (RPGs) for mandatory Class I areas, expressed in deciviews, which reflect projected visibility improvements achieved by the end of the current 10-year implementation period. EPA provides guidance to calculate RPGs using the relationship between two photochemical grid-model scenarios: the base case and the future case, the latter of which includes emissions reductions listed in the long-term strategy. The modeled scenarios are used to calculate relative response factors, which are factors applied to the measured baseline period concentrations at the IMPROVE sites, resulting in the RPGs. There are several sources of uncertainty in the modeling used to calculate RPGs:

1. The measured baseline includes five years of monitoring data, but the modeling scenarios are only based on one year. This has shortcomings related to real variance in meteorology, anthropogenic emissions, and natural emissions.
2. There are limitations and inconsistencies in how visibility is reconstructed from modeled aerosol concentrations. Sources of uncertainty include generalizations that the model makes to represent aerosols in both emissions and chemistry, as well as the methods used to construct visibility from model species concentrations, and inconsistencies between measured and modeled species.
3. The emissions inventory used for modeling has several shortcomings, including:
 - a. Large uncertainties in fire emissions and plume rise.
 - b. Temporal profiles are used to set hourly emissions from annual estimates, which can be inaccurate on the monthly, daily, or hourly basis.

- c. Spatial surrogates are used to set gridded emissions from county estimates, which has large uncertainty and generalizations.
 - d. Emissions used to represent a single year actually come from a mix of years, especially for nonpoint sources and international sources.
 - e. All emissions except major point sources are estimated using general methods that may not be accurate or appropriate.
4. The effects of complex terrain, especially around Class I areas, are poorly represented in the modeled meteorology and concentrations, which can lead to large uncertainties.

The computational and staffing requirements needed to conduct photochemical grid-modeling for RPG calculation are immense. For the third Regional Haze Planning period, the Comprehensive Air Quality Model with extensions (CAMx) modeling is projected to cost \$300,000-\$500,000 and include several years of planning and computation, including many staff-hours from multiple state, local, and Tribal air agencies, and multi-jurisdictional organizations (MJOs). By contrast, a Weighted Emissions Potential/ Area of Influence (WEP/AOI) analysis would likely cost \$30,000-\$50,000. Furthermore, complex modeling products can be difficult to interpret and explain to the public and other stakeholders.

The time needed to plan, conduct, and finalize photochemical grid modeling adds significant time to the SIP preparation process. The source apportionment from photochemical grid modeling could be useful in the source-selection/screening processes and in determining international anthropogenic source contributions to visibility but is generally not available soon enough to be of practical use in the planning process. After two rounds of Regional Haze planning, most major point sources will be shut down or be well controlled, leaving states to rely more on emissions reductions from nonpoint, on-road, nonroad, and sources outside their jurisdictional control for visibility improvements in the future. The modeling results for those source categories are much more problematic than for point sources since both emissions and locations can be highly uncertain.

Source apportionment determined from WEP/AOI is computationally much cheaper and quicker to produce. A form of “enhanced” WEP/AOI analysis could include similar features used in the 2nd Round Technical Support System (TSS) platform but include additional features that would add to its usefulness as a screening and assessment tool for interstate emissions impacts including but not limited to:

- Wildfire and prescribed fire emissions.
- Year to year variability in the AOI over the 3–5-year period of meteorological data used.
- More source type sub-categories.
- Showing sources beyond state jurisdiction such as airports, facilities under Tribal jurisdictions, interstate diesel trucks, and other sources under federal and/or Tribal jurisdictions.

Enhancements to WEP/AOI could include a discussion with federal land managers and EPA on what types of additional products might be most useful in their early-stage consultations with states. WEP/AOI could also, in a beneficial way, replace Q/d source selection. This PAI does not suggest a consistent, uniform break point to establish a candidate list of sources. For previous Regional Haze planning rounds, states had the prerogative to vary from a Q/d of 10 as the break point--to choose

their own break point and provide justification. States prefer retaining flexibility based on location and topographical differences. Using a WEP/AOI screening method would also fit in with the use of emission reductions, along with monitoring to show progress.

1.2. Base Reasonable Progress Goals (RPGs) on planned emissions reductions and four-factor analyses.

Potential Change Mechanism(s): Regional Haze Rule, EPA guidance, WESTAR/WRAP planning process.

Description: Reasonable Progress Goals (RPGs) should be based on planned emissions reductions and four-factor analyses. While this is already a requirement of the current Regional Haze Rule, many participants expressed the need to include it as a PAI as a way to shift focus away from the nonregulatory glidepath.

Basing RPGs on emissions reductions and four-factor analyses would require less time and resources than funding contractors to develop photochemical model predictions of visibility. It would then allow more resources and time to be focused on implementation of the SIP planning process. If converting RPGs to deciviews remains a requirement in the rule, there should be discussions on more economically feasible ways to do this rather than using photochemical grid modeling.

Rationale: The fundamental way to improve visibility impairment from anthropogenic sources is to reduce anthropogenic emissions. State, local, and Tribal air agencies must consider various sources for emissions reductions as well as various control methods. Planning, coordination, and collaboration with internal and external stakeholders to reduce emissions is a continuous process that requires flexibility and considerable time. Modeling predicted visibility improvements can take several years, has many inaccuracies (see Option 1.1), and constrains SLTs from including a variety of scenarios or updating scenarios later in the process. Therefore, RPGs should be focused on emissions reductions and four factor analysis, not modeled visibility.

1.3. Eliminate the modeled visibility glidepath.

Potential Change Mechanism(s): Regional Haze Rule.

Description: Encourage EPA to work with state, local, and Tribal air agencies to develop an alternative method to estimate visibility improvements, such as an emission trend line paired with monitoring. Such a collaboration would be similar to the process used to develop the Most Impaired Days (MID) metric for the revised 2017 RHR. In that process, EPA used a committee of representatives from SLTs and Federal Land Management agencies to discuss and evaluate potential alternatives to the previous rule that used the 20% worst days to measure improvement. The new progress measurement method should meet the following criteria:

- Be based on emission reductions, rather than projected visibility.
- Minimize uncertainty and assumptions.
- Be easily explained to the general public.

Some considerations and suggestions for an alternative method to demonstrate a uniform rate of progress include:

1. A standard percent emission reduction per planning period could be set.
 - a. The value of the percent reduction is a topic for discussion, and it may be difficult to arrive at a technically defensible value. A specific percent reduction may not be feasible for states with stringent existing controls on stationary sources where mobile sources, federal sources, and/or buildings are the dominant contributors to anthropogenic emissions. In those states, adoption of measures for mobile sources, federal sources, or buildings might achieve significant reductions long-term, but it is difficult to achieve fleet turnover or replacement of existing building equipment within a specific 10-year period.
 - b. If states cannot compile a list of reductions that achieve the percent reduction goal, they could provide a narrative justification for why the reductions they have achieved are reasonable; this would be similar to how states that are above the glidepath are required to provide a justification for why their proposed reductions demonstrate reasonable progress.
2. An emissions trend line with no 2064 “endpoint” that would simply portray progress based on emissions reductions. The trendline would not likely be linear but would at least show a decline in emissions over time. The Clean Air Act makes no mention of a date at which the visibility goal should be met. In fact, Section §169A of the Clean Air Act states the visibility goal for Class I areas as the “prevention of any future, and the remedying of any existing, impairment⁸” which indicates a continued effort.
3. If the requirement to convert RPGs to deciviews is not removed from the rule, guidance should be developed to provide an alternative approach to calculate visibility using a single base-case source apportionment model scenario and offline emissions reductions scenario analysis. This would allow states to theorize multiple emissions reduction scenarios without doing multiple photochemical modeling runs. A new approach could be developed to use extinction weighting coefficients at each Interagency Monitoring of Protected Visual Environments (IMPROVE) monitor for each chemical emissions species and emissions source. Base-case source apportionment modeling would be used to determine the various extinction relationships and the international anthropogenic component of visibility at each IMPROVE monitor. The projected visibility value (calculated in deciviews) would be based on the most recent monitoring baseline and the emissions-scenario extinction reductions within the area of influence.

Rationale: In the second planning period, using a modeled deciview to depict a uniform rate of progress and as a “measurement stick” for the adequacy of reasonable progress goals was time-consuming. In some cases, it was confusing to the public when modeled deciview improvements were compared to the glidepath because of the glidepath’s nonregulatory nature.

⁸ Section §169A, Clean Air Act Amendments of 1977

The Clean Air Act does not define a specific end date for achieving the visibility goal. Removing the pre-defined endpoint in the rule may better align with the Clean Air Act goals of a program of ongoing reductions in anthropogenic emissions that contribute to existing visibility impairment, along with prevention of additional future impairment. This would be easier to track with an emissions inventory table, which is part of a suggestion in Group #4, and much easier for the public to understand than deciviews which is a logarithmic scale. Emission reductions and visibility improvement have a nonlinear relationship, which is masked by a linear “glide path.”

An anthropogenic emission reductions approach to tracking progress, with no natural conditions endpoint would eliminate the need to adjust the endpoint for international and smoke emissions. States could focus more on detailed inventories submitted to the regional process and better account for international and smoke emissions at the beginning of the process. The National Emissions Inventory (NEI) would be the starting point.

Tracking progress based on emission reductions would be easier to explain to the public and would involve fewer assumptions. If the RHR was revised to remove modeled deciviews to depict progress, each SIP would include emission reduction strategies (which could be new for the RH SIP or could be adopted for another program) to achieve ongoing emission reductions of haze forming pollutants. Emission reductions could be tracked via an emission reductions glidepath with tons of reductions/year, or % of baseline emissions, or some other quantified emission reduction target. The Progress Reports would demonstrate whether the state was on track to achieve the reductions estimated in the SIP and it would show the benefits of those reductions via monitoring data.

Eliminating the projected deciview requirement would need to be addressed through formal rule changes. However, should EPA decline to revise that part of the rule, we strongly request that guidance be developed with state input to provide an alternative approach for future visibility projection calculations, such as suggested in #3 of the description section.

1.4. Develop clear guidance for applying four-factor analyses to new types of emissions sources.

Potential Change Mechanism(s): EPA guidance.

Description: Section 169A(g)(1) of the Clean Air Act lists four factors that must be taken into consideration in determining reasonable progress and states are required to consider those four factors in the control analysis step. The four-factor analysis involves assessing potential emission control technologies for identified emissions sources against four statutory factors: (1) the cost of compliance, (2) time necessary for compliance and/or to install controls, (3) energy and non-air quality impacts, and (4) the remaining useful life of the source. The visibility benefit of an emission reduction measure is not listed as a required factor, but neither the Clean Air Act nor the Regional Haze Rule prohibits a state from considering visibility benefits when it determines what emission control measures are required for a source to make reasonable progress at a Class I area. Therefore, a state may consider the visibility benefits of potential control measures when determining what is necessary to make reasonable progress. A state may also consider one or more of the five additional factors listed in section 51.308(f)(2)(iv) of the Regional Haze Rule. States have flexibility to decide how to characterize the factors, but a state’s approaches must be reasonable.

While application of the four-factor analysis methodology is relatively clear for electric generating units (EGUs) and other large stationary sources, it is less clear how the four-factor analysis method should be reasonably applied to other types of sources, such as area sources, agricultural emissions sources, oil and gas emissions sources, and other types of emissions sources. EPA should work with western states and Tribal and local air agencies to identify priority source types where guidance may be needed, and then develop such guidance for use during the third RHR planning period.

Rationale: As progress is made in reducing emissions from larger point sources of emissions that contribute to visibility impairment, air agencies may need to consider pursuing emissions reductions from area and mobile sources sectors and smaller point sources. For some types of sources, guidance may be needed to assist air agencies and sources in applying four-factor analyses to these newly considered sources to prevent potential rework and delays during the SIP and TIP review process.

PAI Group 1: Specific Expressions of Convergence/Divergence

PAI 1.1:

- NPS reviewers generally agree that modeling products, such as the WEP AOI analysis, are helpful tools for identifying emission sources that contribute to visibility impairment in Class I areas. This type of product would be an improvement over simple Q/d in the source selection process.
- In addition, NPS reviewers commented that future year projections from a consistent, nationwide model (e.g., CAMx source apportionment) may provide efficiencies and reduce time and expense associated with modeling RPGs. A robust emissions inventory would be needed to provide confidence in both this modeling and WEP AOI style products identifying emission sources that are most impactful to visibility in Class I areas.
- A BLM reviewer noted that the break points used to populate a candidate list for the four-factor test for either Q/d or WEP/AOI methods should be consistent and technically justifiable. In the past, break points varied by states and multi-jurisdictional organization--levels were difficult to explain and justify, and were often subject to question by external partners (EPA/FLMs). A consistent and technically justifiable break point that is agreed upon by all parties involved would enhance the viability of PAI 1.1.
- Some states do not support targeting emissions reductions without a clear understanding of how emissions are affecting visibility, as determined through monitoring.
- States generally agreed with trying to streamline/simplify the modeling effort, mainly due to the cost. However, EPA input and approval would be essential. Some states noted they could choose their own modeling approach without conflicting with RHR.
- Some participants questioned how to establish an RPG in deciviews that projects the visibility conditions/improvement without visibility modeling. It would be helpful to have further discussion with EPA about other methods to project visibility improvements.
- As models improve over time, the uncertainty should reduce and provide better estimates. Even with the model limitations, some states prefer to continue using visibility (and modeling) as the tools to determine visibility conditions.

- Some states would prefer to see more effort on identifying emissions in and near Class 1 areas, and believe PAI 1.1 should be included under PAI Group 2.

PAI 1.2:

- The primary concern expressed for PAI 1.2 for is that this is already a requirement. However, many participants expressed the need to include it as a PAI as a way to shift focus away from the nonregulatory glidepath.
- Some states believe RPGs should be based on determining the visibility conditions needed to show reasonable progress while considering the four statutory factors, where these factors indicate potentially feasible emissions reductions for states to consider. Some states have suggested that visibility be a fifth factor for determining RPGs.

PAI 1.3

- Federal land management reviewers found the considerations and suggestions for an alternative method to demonstrate a uniform rate of progress interesting ideas and expressed commitment to participating in future discussions exploring these concepts. They expressed the need to focus on: 1) emission reductions within the current planning period, 2) from the sources (and sectors) that contribute most to impairment in Class I areas, and 3) incorporate consideration of the four statutory factors. Additional methods for identifying sources and tracking progress should be explored.
- Some states do not support using a standard percent emission reduction per planning period as an alternative method to demonstrate a uniform rate of progress. These states believe progress should be measured using visibility metrics rather than emission reductions, and partners should prioritize, and resolve, the largest contributors to visibility impairment in order of significance.
- Using “easily communicated to the public” as a criterion for choosing a suitable metric for demonstrating progress can be challenging. As noted in one state’s SIP, “There is no distinction between a diminished visual experience caused by anthropogenic sources or natural events, as visual experiences can be impacted by either, or both.” Use of tools such as Wind Haze and other visual graphics can be helpful for illustrating potential visibility changes to the public.
- Some states noted support for transitioning regional haze into a “monitor and maintain the significant success we've had” program.

PAI 1.4:

- Federal land management reviewers agreed that identification of and guidance with respect to four-factor analysis methods for other source sectors would be beneficial.
- Federal land manager reviewers expressed concern with reliance on a single-source visibility attribute when determining reasonable controls. Reasonable progress is determined by identification of cost-effective controls as determined by a four-factor analysis; visibility improvement is the result of the cumulative effect of controls. Although the EPA 2019 Regional Haze Guidance allows states to consider visibility when determining their long-term strategy, the guidance did not intend for visibility improvement to be used as a fifth factor to reject controls that would otherwise be determined reasonable. Reasonable progress is achieved by requiring the technically feasible and cost-effective controls identified through four-factor analysis.

PAI Group 2: Addressing emissions in and near Class I areas

2.1. Develop guiding principles and explore mechanisms to understand and account for emission reductions in and near Class I areas.

Potential Change Mechanism(s): WESTAR/WRAP planning process.

Description: Initiate collaboration among EPA, federal land managers, states, and Tribes to develop guiding principles that account for emission reductions in and near Class I areas in regional haze planning and explore mechanisms to assure enforceability that may extend beyond traditional direct, command-control regulations.

This potential area of improvement would provide mechanisms states could rely on to account for additional reasonably foreseeable emission reductions within their borders, especially in Class I areas, and areas such as gateway communities near Class I areas. This would supplement regulations on private industry by accounting for other real and often unregulated emission reductions.

The RHR has established the ability of regional planning organizations (RPOs) and multijurisdictional organizations (MJOs) to consult with federal land managers regarding emission reductions for Class I areas. Further collaboration would include federal land managers and states working together to develop guiding principles that EPA could then incorporate into guidance as part of the Federal Land Manager Consultation or Long-Term Strategy section of the RHR, as appropriate.

Rationale: To rely on emission reductions in the regional haze planning process, such reductions must be enforceable through regulations at the state or local level. While this is reasonable for dealing with point sources of emissions, such as power plants, natural gas compressor stations/processing plants, oil refineries, cement plants, lime manufacturing plants, steel or non-ferrous metal plants, pulp/paper mills, glass manufacturing plants, etc., this approach may not be the best or most efficient way to account for emission reductions from federal land managers, Tribes, or other government entities.

An illustrative example of this is how national parks handle visitors. Some national parks have implemented visitor management strategies that reduce use of privately owned vehicles, thereby reducing emissions within the park boundary. These strategies are usually implemented to address safety and visitor experience with a co-benefit of reduced emissions. Other federal land managers, Tribes, or local governments may have plans to pave certain road sections during the planning period to reduce haze created by dust. Under current rules, the Regional Haze plan cannot rely on these changes without an enforcement regulation.

2.2. Investigate potential emission sources and consider opportunities to reduce emissions in and near Class I areas.

Potential Change Mechanism(s): EPA guidance, WESTAR/WRAP planning process.

Description: Collaborate among EPA, Tribes, and federal land managers to investigate potential emission sources in and near Class 1 areas, and consider opportunities to develop and implement meaningful strategies to reduce emissions for sources under their influence and/or jurisdiction.

For the past two regional haze planning periods, the planning process has focused on stationary source emissions under state jurisdiction. Moving into the third planning period, it is necessary to acknowledge that limited opportunities exist for further reductions from these sources. Emission control considerations need to include other sectors and jurisdictions.

Protecting visibility is a shared responsibility and future planning efforts would be improved with a better understanding among all state and federal partners of potential emission sources within and adjacent to Class I areas. Investigating and sharing information about such potential sources could be a focus of the early engagement process, described in Option 2.3. Partners could use the early engagement process to identify data gaps and confer about opportunities for EPA, federal land managers, and Tribal agencies to develop and implement emission reduction strategies for sources under their influence and/or jurisdiction.

Rationale: Visitation to Class I areas has increased markedly since a national visibility protection goal was established by Congress. In some cases, annual visitation has increased by an order of magnitude. While increasing visitation numbers are certainly cause for celebration, they also raise the notion that accommodation of large numbers of visitors necessitates significant infrastructure and land management efforts, which present opportunities to consider practices that can reduce haze-contributing emissions occurring within and near Class I areas.

In prior RHR planning periods, opportunities to reduce emissions in Class I areas themselves may not have been directly or thoroughly addressed. Considering such emission reductions will accelerate ongoing efforts to make progress towards the national goal.

Opportunities to reduce emissions that contribute to haze can extend beyond the traditional command-control regulatory approach. These opportunities may include measures aimed at Class I area management approaches, including policies related to motorized vehicle use, campfire use, fleet management, grounds maintenance, recreational vehicle use, idling vehicles, and policies for concessionaires. Such measures could serve to incentivize practices by staff and visitors that reduce visibility-impacting emissions.

Furthermore, visibility should continue to be an important factor in determining when and how prescribed burning is managed. It is important to note that prescribed burning is a crucial practice for maintaining an ecosystem's health and reducing wildfires. However, impacts to visibility from increased prescribed fire emissions should be considered within Class I areas.

Coordinated approaches to management that acknowledge and embrace a shared responsibility to work towards the national goal can reduce emissions that contribute to haze more effectively and efficiently than siloed efforts.

2.3. Refine the process of early engagement between states and federal land managers to include an intentional engagement approach at the start of the planning process.

Potential Change Mechanism(s): WESTAR/WRAP planning process.

Description: Refine the “opportunity for early consultation” to “meaningfully inform the State’s long-term strategy” to include an intentional engagement approach in the beginning stages of planning that would help states and federal land managers learn more about potential emission sources and reduction measures occurring within or near the Class I area much earlier in the planning timeline.

Examples of items to be discussed in an early engagement process include:

- Identification of sources within Class I area boundaries.
- Identification of policies, procedures, and practices implemented in Class I areas that control or prevent air pollution.
- Identification of state regulations that control sources within the Class I area.

Rationale: States have a responsibility to protect and restore air quality and visibility through rules and statutes. States may require rulemaking, permit modification or additional legal agreements with facilities in order to make control decisions enforceable in the SIP.

Federal land managers have a critical role in protecting air quality in national parks, wilderness, and other federally protected areas, and have an affirmative responsibility to protect air quality related values, including visibility, in all Class I areas (40 CFR Section 51.166(p)(2)). Within the Regional Haze rule, Federal land managers hold the role of consultation with the states. FLMs are responsible for providing feedback on state plans including assessments of visibility impairment in Class I areas and recommendations on the development and implementation of strategies to address visibility impairment (CFR 51.308(i)(2)). Increased awareness of federal land manager activities and operations, along with each state’s process for making emission reductions enforceable can result in more meaningful engagement.

Therefore, a more deliberate engagement process would allow for joint development of some elements of the long-term strategy, acknowledging the contributions and investments of federal land managers and state and local partners.

PAI Group 2: Specific Expressions of Convergence/Divergence

PAI 2.1:

While there is general concurrence with PAI 2.1, some state participants noted that each regional planning organization (RPO) and multijurisdictional organization (MJOs) already have the ability to consult with federal land managers directly. These states commented that nothing prevents states from engaging with federal land managers earlier in the process (or vice versa). They are not supportive of any regulatory change in this matter.

PAI 2.2:

- Some state participants expressed their preference for PAI Group 2 to focus on and address sources specifically within Class I areas because states are already looking at sources ‘near’ Class 1 areas.
- A BLM reviewer noted that 40 CFR 51.308 (f)(vi)(B) allows for adjustment of the URP to account for wildland prescribed fire. URP adjustment for prescribed fire that is conducted in accordance with maintenance of ecosystem health and wildfire reduction purposes where basic smoke management practices are applied are eligible for consideration for URP adjustment. States should consider this approach given the wildfire crisis in the West rather than treatment as an anthropogenic source of emissions to be controlled within Class I areas given the purpose of its application to the landscape.

PAI 2.3:

Some federal land manager reviewers agreed that the early engagement and consultation process could be refined and improved. They expressed that opportunities for improvement should not be limited by an exclusive focus on emissions in and near Class I areas.

PAI Group 3: Third planning period timeline/milestones

3.1. Extend the regulatory deadline for SIPs in the Third Planning Period beyond 2028 to allow for further consideration and incorporation of other WVPPI potential areas of improvement.

Potential Change Mechanism(s): Regional Haze Rule, WESTAR/WRAP planning process.

Description: Extend the 2028 deadline for the Third Planning Period to allow EPA to more fully consider and incorporate other WVPPI potential areas of improvement into potential rule revisions.

Rationale: Revisions to the Regional Haze Rule need to be finalized before state agencies begin their planning process for SIPs so they can meet the regulatory deadline. The past two rounds of Regional Haze planning have required significant time for regional coordination and state SIP preparation. WESTAR/WRAP members began work for the second regional haze planning period in 2017 so that states could submit SIPs by the July 2021 deadline (and some states were still unable to make the 2021 deadline).

There is precedent for changing the submittal deadline. One of the 2017 revisions to the rule extended the submittal deadline for second round SIPs from 2018 to 2021. EPA’s rationale for extending the timeline was to “allow states to consider planning for other federal programs.”⁹ The timeline above does not adequately depict how each step of the regional haze planning process depends on previous steps. But it is important to note that the work outlined in the second and third years (2025, 2026) is when decisions about control measures, and reasonable progress goals occur. Making changes to control measure analyses, control measure decisions, reasonable progress determinations, and long-term strategies is very difficult after this point. If any rule or guidance

⁹ EPA Regional Haze Rule Fact Sheet (2016): https://www.epa.gov/sites/default/files/2016-12/documents/final_regional_haze_rule_fact_sheet_12_14_16_final_0.pdf

revisions happened during this time it would lengthen the planning process by one to two years and not allow states to meet the current 2028 regulatory deadline.

3.2. Allow extra time and flexibility for states to finalize their regulatory mechanisms that make emission reduction measures federally enforceable or allow submission of their final regulatory mechanism as supplements to the SIP.

Potential Change Mechanism(s): Regional Haze Rule, WESTAR/WRAP planning process.

Description: Add text in the rule that allows for extensions to the Regional Haze SIP submission deadline when the sole reason for the request is to accommodate a state's regulatory process. If this is not feasible, then the process for supplemental SIP submissions needs to be very clear and agreed upon between the state and their regional office.

Rationale: States have a number of ways to create federally-enforceable conditions for incorporation in Regional Haze SIPs. These ways may include:

1. Promulgating rules.
2. Issuing Board Orders.
3. Issuing Consent Decrees.
4. Modifying preconstruction permits to include emission reduction conditions, and, if applicable, modify Title V permit to include the new/modified conditions.

States have discretion in deciding the mechanism for codifying reduction measures, so long as they are federally-enforceable. If the SIP needs to be preceded by any one of the processes listed above, it may impact the timeframes. Each state has a different process and timing will vary. Examples include:

- Utah (similar to many western states) must propose SIPs and accompanying enforceable language to their Air Quality Board for a public comment period. After which they must propose it to the Board again for final adoption upon addressing all comments. Only after this process can the state submit their SIP to the EPA.
- Colorado has a similar process but with a major addition. Once a SIP revision is approved by the Air Quality Control Commission, it must be approved by the state legislature. Depending on the timing of board approval, the legislative approval could take an extra year to complete and could substantially extend the timeline.

Therefore, it is important the rule allows for extensions to the SIP submission deadline when the sole reason for the request is to accommodate a state's regulatory process. If this is not feasible, then the process for supplemental SIP submissions needs to be very clear and documented in a written agreement between the state and their regional office.

PAI 3.1:

While there appears to be general concurrence with PAI 3.1 to extend the regulatory SIP/TIP submission deadline beyond 2028 to allow time to further explore, negotiate, and implement potential areas of improvement that require rule revision, some state participants expressed concern with revising the rule at all, due to concerns that states may not be allowed adequate or meaningful involvement in EPA rule revision efforts.

PAI 3.2: None expressed.

PAI Group 4: Accounting of programs outside of regional haze that contribute to visibility goals

4.1 Consider all ongoing pollution control programs as a component of a state's strategy towards reaching visibility goals.

Potential Change Mechanism(s): EPA Regional Haze Rule change, WESTAR/WRAP planning process.

Description: Consider all ongoing pollution control programs, including those programs initiated outside of the regional haze program, a primary component of a state's long-term strategy towards reaching visibility goals. Accounting for these programs should be an integral part of the regional haze SIP development, rather than a "check-the-box" add-on element.

Regional haze is the cumulative impact of emissions of visibility-impairing particles and emissions from varied sources and activities occurring over a broad geographic area. Visibility-impairing particles and emissions can be transported great distances, sometimes hundreds or thousands of miles. One single emission source may not have a perceptible impact on haze by itself, but the cumulative impact of emissions from many sources across a broad geographic area can add up to perceptible haze. Besides natural sources of haze such as dust, water vapor, volcanic activity, and wildfire, regional haze can be attributed to a variety of human-caused emissions from industrial point, area, and mobile sources.

To improve visibility, states look to control anthropogenic emissions of the pollutants that contribute to haze. As described above, the visibility-impairing particles that cause haze come from a wide variety of sources.

Clean air agencies have accelerated efforts to develop and implement air pollution control programs to protect human health, protect environmental resources, address environmental justice, improve air quality in disproportionately impacted communities, and mitigate the impacts of climate change. These programs coincidentally contribute to improved visibility and should be leveraged and tracked in state improvement plans. The goal is to highlight the strategies that are included in the LTS, but not analyzed in a four-factor analysis in the current RH SIP, which achieve quantifiable emission reductions for RH and possibly for NAAQS attainment or climate change strategies.

The following is an example of how emissions could be tracked. First, the state would create a separate emission inventory table for nitrogen oxides and sulfur oxides (NO_x and SO_x). The example

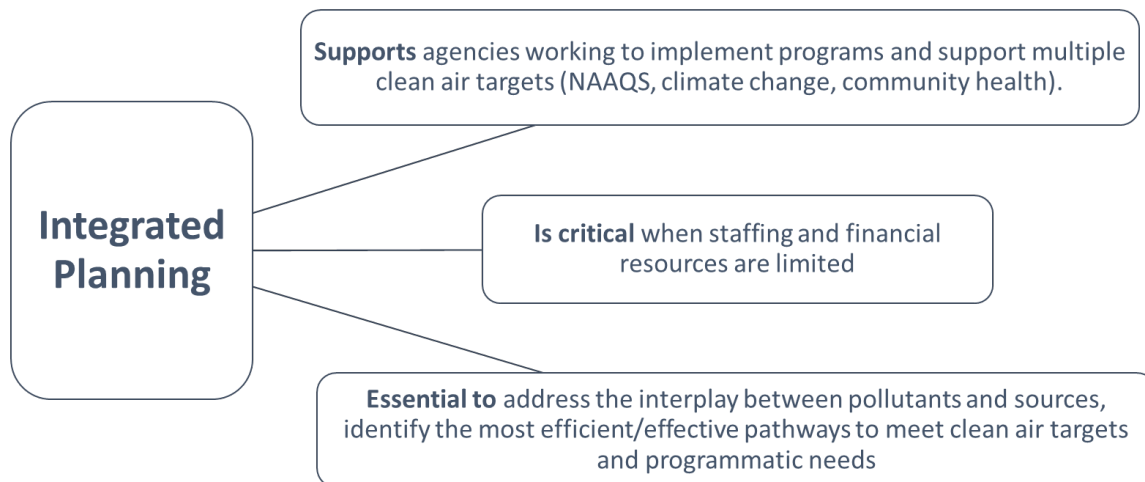
below shows the NO_x emission inventory. The table lists baseline year emissions by source category. The next column lists the total estimated reductions for that source category from all emission reduction strategies included the SIP. The third column shows the percentage change (Post-Reductions – Baseline)/Baseline from all emission reduction strategies. Depending on the sources located in each state/region, the source categories may differ from those shown below. Because the Regional Haze Rule focuses on reducing anthropogenic emissions, the table below only includes anthropogenic source categories. Some states may choose to include a separate inventory table for natural emissions (biogenic, wildfires, etc.) as a point of reference for the scale of anthropogenic versus natural emissions, but this table would be entirely optional. It's unlikely that states would have emission reduction strategies for natural emission sources so the last two columns could be eliminated from the natural source inventory table.

Appendix 2 contains a bulleted list that summarizes the emission control strategies for each source category that the state is relying on to demonstrate ongoing emission reductions in its SIP. These strategies can include sources analyzed through a four-factor analysis in the current SIP as well as emission reduction strategies adopted for National Ambient Air Quality Standards (NAAQS) attainment, state-specific climate change programs, air toxics control measures with NO_x/SO_x co-benefits, and even federal programs such as federal motor vehicle emission standards. For each strategy, the state will identify 4 items: the adoption date for the strategy, estimated emission reductions from the strategy, references to regulatory analysis that address the four factors (cost of control, time to install controls, energy and non-air quality impacts, remaining useful life), and the current enforceability mechanism for the regulation (ex. A nonattainment SIP, a state-only regulation, a federal program). Note that if a state is relying on a state-only emission reduction strategy in its Regional Haze SIP, that strategy must be federally enforceable. After EPA approval of the Regional Haze SIP, any state-only strategies will become federally enforceable. In identifying the regulatory analysis for a specific emission reduction strategy, states should specifically call out each of the four factors and provide a link to the relevant analysis. The example below assumes that the four-factor analysis is spread across multiple documents with some overlap/redundancy which would result in a single document being referenced for multiple factors. In some cases, a state agency may analyze all four factors in a single (large) document and the link would be the same document for every factor. In either case it's helpful to provide a link for each factor to make it clear to EPA and the public that the existing analysis meets the requirements of a four-factor analysis even if the formatting is different.

Rationale: The Clean Air Act (as amended in 1977) established a national goal to prevent any future and remedy any existing impairment of visibility in Class I areas that arises from human-caused air pollution and directed EPA to promulgate regulations to assure reasonable progress towards the national goal. The direction provided to the EPA administrator is broad in terms of how states achieve reasonable progress; however, implementation of the Regional Haze Rule over the last couple of decades has been relatively narrow with an emphasis on accounting for only those programs initiated for regional haze purposes. This narrow approach unnecessarily silos the regional haze program.

Given the current diverse landscape of regulatory programmatic responsibilities and increasingly limited staffing and financial resources, opportunities to facilitate integrated planning are increasingly important. As shown in the figure below, integrated planning supports agencies in their

efforts to meet multiple clean air targets, recognizes resource limitations, and provides opportunities to address the interplay between pollutants and sources while identifying the most efficient and effective pathways to meet programmatic needs and clean air targets.



With intentional changes to guidance and the regional planning process, there is an opportunity to consider a holistic approach whereby states can account for air pollution control programs that have been initiated outside of the regional haze program that are expected to lead to significant reductions in visibility-impairing pollutants.

A potential approach to tracking and quantifying these emission reductions from ongoing pollution control programs is outlined in an example also found in [Appendix 2](#).

PAI Group 4: Specific Expressions of Convergence/Divergence

PAI 4.1:

- While federal land managers are supportive of PAI 4.1, they believe existing EPA guidance and the RHR already allow for states to consider ongoing pollution control programs. They encourage states to help attain their reasonable progress goals (RPGs) by including all emission reductions that: 1) occur within the planning period, 2) are from emission sources that affect Class I areas, and 3) address the four statutory factors in their Regional Haze SIPs. They noted that states are not limited by federal programs (for example, North Carolina documented benefit from its Clean Stacks rule in its first planning period SIP).
- In their review of the report, USDA Forest Service representatives expressed interest in continuing to engage in wildland prescribed fire accounting.

- 5.1 Provide adequate funding to Tribes to enable them to actively participate in the Regional Haze Rule planning process and to take steps to reduce emissions contributing to visibility impairment within their jurisdiction.

Potential Change Mechanism(s): Funding.

Description: Provide adequate funding to Tribal organizations in the Western U.S. to enable Tribes and Tribal organizations to invest in staff capacity, travel, and other needs to ensure their effective participation and engagement in Regional Haze Rule planning processes.

Rationale: During the first RHR planning period, Tribes had substantial resources to actively participate in the planning process. Federal funding was significantly reduced during the second planning period, which resulted in a substantial reduction in Tribal engagement and participation. Adequate federal funding is needed to support Tribal participation in visibility protection and planning activities.

- 5.2. Explore opportunities to reduce emissions from other source categories affecting visibility in Class I areas that EPA is uniquely positioned to address and that states do not have jurisdiction to control.

Potential Change Mechanism(s): EPA guidance, WESTAR/WRAP planning process.

Description: While Option 2.2 recommends collaborative steps with states, federal land managers, and EPA to reduce emissions in and near Class I areas, there are likely additional types of emissions sources that EPA is uniquely positioned to address. Analyses commissioned by U.S. EPA show that projected future emissions sources affecting visibility in many Western Class I areas will include emissions sources that states do not have jurisdiction to regulate and control. EPA has a range of regulatory tools and other mechanisms to secure emissions reductions from these sources which can directly reduce visibility impairment in Class I areas.

Relevant emissions sources include rail yards and locomotives, ships and ports, on-road and off-road mobile sources, wildfire management on federal lands¹⁰, and international transport of air pollutants, among other sources. EPA could consider and pursue opportunities to reduce emissions from these types of sources that affect Western Class I areas using regulatory and/or non-regulatory mechanisms. For example, EPA and its partners could collaborate to reduce rail and heavy-duty mobile source emissions by targeting federal funding, such as grant funding provided under the Diesel Emissions Reduction Act (DERA), to address sources near selected Class I areas. In addition, the federal government could enhance its partnerships with Canada and Mexico to reduce emissions from these countries that affect visibility in selected U.S. Class I areas.

¹⁰ Visibility should continue to be an important factor in determining when and how prescribed burning is managed, especially with the current administrative goals to increase Rx fires.

Rationale: Sustaining public support for visibility protection activities and the regional haze program will be easier if visibility in Class I areas continues to improve in the decades ahead. To the extent that sources outside of state, Tribal, and local air agencies control are contributing to visibility impairment, these sources undermine progress in actual observed visibility. As states and other partners make progress in reducing the contribution of emissions sources under their jurisdictional control, the potential impact of other sources outside of their control may grow. Concerted efforts by EPA and its federal agency partners to work to reduce emissions from these other sources will contribute to the collaborative effort to improve visibility in Class I areas.

PAI Group 5: Specific Expressions of Convergence/Divergence

Federal land managers expressed support for the PAI Group 5 Collaborative Engagement potential areas of improvement.

PAI 5.1:

- Some states expressed the view that WESTAR should not comment on issues related to Tribes or characterizations of their reasons for engaging, or not engaging, in WESTAR/WRAP visibility protection and planning activities¹¹.
- One state suggested broadening this PAI to include adequate funding for all Tribes, state and local air agencies to implement the Regional Haze Rule.

PAI 5.2

One state objected to the appearance that WESTAR would support adverse federal actions, such as targeting federal funding under the Diesel Emissions Reduction Act (DERA), on rail and heavy-duty mobile sources.

Next Steps

Addressing the regional haze and visibility challenges across the American West will require new approaches in the years and decades to come, beginning with the upcoming third planning period. The approaches used during the first two planning periods under the Regional Haze Rule are not well suited to address the needs and challenges ahead. This report summarizes the insights and ideas from the WVPPI, a collaborative process involving individuals from Western state, Tribal, and local air agencies and from FLMs and EPA.

This report will be submitted to the WESTAR Council of State Air Directors and distributed to WVPPI participants at the end of March 2023. The outcomes described in this report will inform recommendations WESTAR develops and submits to EPA for the third planning period. Several of the potential areas of improvement identified in this report would require additional exploration, discussion, and negotiation to work out the essential implementation details. The aspirations of the WVPPI will be served if it catalyzes subsequent discussions and implementation actions involving EPA, federal land managers, Western states, and Tribal and local air agencies and, ultimately, improves visibility in Class I areas.

¹¹ Potential areas of improvement concerning Tribal engagement are consistent with interviews conducted with Tribal representatives at the start of the WVPPI process and reported in the WVPPI Synthesis Report (September 2022).

Appendices

Appendix 1: Western Visibility Protection and Planning Initiative Participants

Participants in the WVPPI process included those who: 1) were interviewed as part of the assessment process, 2) participated as a member of the Planning Team, 3) participated virtually or in-person in the November 2022 Western Visibility Protection and Planning Initiative Workshop in San Diego, California, 3) participated in a small workgroup following the November workshop, 4) and/or provided review and comment on draft initiative products.

Participants provided valuable and substantive insight that informed the development of the guiding principles and potential areas of improvement (PAIs) described in this report. Inclusion on this participant list doesn't imply consensus on each guiding principle and potential areas of improvement described in this report.

Name (* denotes planning team member)	Affiliation
Morgan Frank	Alaska Dept of Environmental Conservation
Elias Toon	AZ Dept of Environmental Quality
Mike Sonenberg	AZ Dept of Environmental Quality
Bret Anderson	Bureau of Land Management
Geraldina Grunbaum	Bay Area Air Quality Management District
Rebekka Fine*	CA Air Resources Board
Jeremy Avise	CA Air Resources Board
Araceli Pruet	Clark County Dept of Environment and Sustainability
Tom Moore	CO Air Pollution Control Division
Weston Carloss	CO Air Pollution Control Division
Kevin Briggs	CO Air Pollution Control Division
Randy Ashley	Confederated Salish & Kootenai Tribes
Michael Madsen	HI Dept of Health-Clean Air Branch
Mary Anderson	ID Dept of Environmental Quality
Aislinn Johns	ID Dept of Environmental Quality
Carl Brown	ID Dept of Environmental Quality
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Bo Wilkins	MT Dept of Environmental Quality
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Melanie Peters*	National Park Service
Kirsten King	National Park Service
John Vimont	National Park Service
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Angela Raso	NMED Air Quality Bureau
Michael Baca	NMED Air Quality Bureau
Mark Jones	NMED Air Quality Bureau
Neal Butt	NMED Air Quality Bureau
Robert Spillers	NMED Air Quality Bureau
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Steven McNeece	NV Division of Environmental Protection
Jason Walker	Northwestern Band of the Shoshone Nation
Jeffrey Stocum	OR Dept of Environmental Quality
Michael Orman*	OR Dept of Environmental Quality
Karen Williams*	OR Dept of Environmental Quality
Jonathan Klassen	San Joaquin Valley Air Pollution Control District
Bobby Rogers	SD Dept of Agriculture and Natural Resources
Tanner Turk	SD Dept of Agriculture and Natural Resources
Melissa Maestas	South Coast AQMD

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Rachel Bauer	US EPA
Khoi Nguyen	US EPA
Brian Timin	US EPA Office of Air Quality Planning and Standards
Elizabeth (Beth) Palma	US EPA Office of Air Quality Planning and Standards
Vera Kornylak	US EPA Office of Air Quality Planning and Standards
Scott Mathias	US EPA Office of Air Quality Planning and Standards
Bob Kotchenruther	US EPA Region 10
Katie Walther	US EPA Region 4
Alisa Liu	US EPA Region 5
Jennifer Huser	US EPA Region 6
Jaslyn Dobrahner	US EPA Region 7
Clayton Bean*	US EPA Region 8
Gail Tonnesen	US EPA Region 8
Anita Lee	US EPA Region 9
Michael Dorantes	US EPA Region 9
Amber Ortega	USDA Forest Service
Andrea Nick	USDA Forest Service
Anita Rose	USDA Forest Service
Jill Webster*	USDA Forest Service
Peter Lahm	USDA Forest Service
Pleasant McNeel	USDA Forest Service
Rick Graw	USDA Forest Service
Scott Copeland	USDA Forest Service/Colorado State University
Tim Allen*	US Fish and Wildlife Service
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Chelsea Cancino*	UT Division of Air Quality

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Amber Potts	WY Dept of Environmental Quality-Air Quality Division
Darla Potter	WY Dept of Environmental Quality-Air Quality Division
Nancy Vehr	WY Dept of Environmental Quality-Air Quality Division
Laura Ballard	WY Dept of Environmental Quality-Air Quality Division

Appendix 2: PAI 4.1 Accounting Example

With intentional changes to guidance and the regional planning process, there is an opportunity to consider a holistic approach whereby states can account for air pollution control programs that have been initiated outside of the regional haze program that are expected to lead to significant reductions in visibility-impairing pollutants.

WESTAR/WRAP's recommended approach to tracking and quantifying these emission reductions from ongoing pollution control programs is outlined in an example below.

Accounting Examples:

Major Sources of Anthropogenic NO_x Emissions in Colorado

Source Description	RepBase2 Emissions (TPY)	Estimated Emissions post- reduction strategies	% Change in Emissions
On-Road (Mobile)	89,776		
Oil & Gas (Non-Point)	26,987		
EGUs (Point)	19,854		
Industrial & Non-EGU (Point)	17,686		
Oil & Gas (Point)	17,226		
Non-Road (Mobile) *	13,463		
Rail (Mobile) **	9,833		
Remaining (Non-Point)	7,209		
Wildland Prescribed Fire	517		
Residential Wood Combustion (Non-Point)	446		
<i>Total Emissions from 10 Largest Source Sectors</i>	<i>202,997</i>		

* Includes airplane takeoff/landing emissions which are federally regulated with state preemption

** Federally-regulated source with state preemption

- 1) On-Road (Mobile) Emission Reduction Strategies (**Total Estimated Reductions: X,XXX TPY in 2028**)
 - a) LEV Light/Medium-Duty Standards.
 - i) Adoption Date.
 - ii) Estimated Reductions Per Year.
 - iii) Link to Applicable Control Strategy Analysis.
 - (1) **Identification of technically feasible control options:** (future link to a website where the Technical Support Document is located).
 - (2) **Analysis of cost of selected control:** (future link to Technical Support Document and Economic Impact Analysis (EIA)).
 - (3) **Discussion of time necessary to install control:** (future link to Technical Support Document and Economic Impact Analysis (EIA)).
 - (4) **Discussion of energy and non-air quality impacts:** (future link to Technical Support Document).
 - (5) **Discussion of remaining useful life of source:** (future link to Technical Support Document and Economic Impact Analysis (EIA)).
 - iv) Enforceability Mechanism: State or Local Agency Rule/Regulation, NAAQS SIP measure, new or previously adopted RH SIP measure.
 - b) ZEV Light/Medium-Duty Standards.
 - i) Adoption Date.
 - ii) Estimated Reductions Per Year.
 - iii) Link to Applicable Control Strategy Analysis.
 - iv) Enforceability Mechanism: State or Local Agency Rule/Regulation, NAAQS SIP measure, new or previously adopted RH SIP measure.
 - c) Advanced Clean Trucks (ACT) & Heavy-Duty (HD) Low-NOx Omnibus.
 - i) Adoption Date.
 - ii) Estimated Reductions Per Year.
 - iii) Link to Applicable Control Strategy Analysis.
 - iv) Enforceability Mechanism: State or Local Agency Rule/Regulation, NAAQS SIP measure, new or previously adopted RH SIP measure.
 - d) Advanced Clean Cars II.
 - i) Adoption Date.
 - ii) Estimated Reductions Per Year.
 - iii) Link to Applicable Control Strategy Analysis.
 - e) Federal Light-Duty/Medium-Duty Standards for MY2027 and later.
 - i) EPA Final Rule Adoption Date.
 - ii) Estimated Reductions Per Year.
 - iii) Link to Applicable Control Strategy Analysis.
 - (1) Identification of technically feasible control options: future link to EPA website that contains the docket with EPA technical analysis.
 - (2) Analysis of cost of selected control: future link to docket with EPA cost-benefit analysis.

- a) Smoke Management Plan.
 - i) Adoption Date.
 - ii) Estimated Reductions Per Year: N/A, Smoke-management plans are intended to ensure prescribed burns, primarily conducted by federal land managers, are performed safely with minimal short-term visibility and health impacts. Prescribed fires are intended to promote ecosystem health and reduce available fuel sources for large-scale wildfires with more serious health and visibility impacts. The smoke-management plan is not intended to reduce the number of acres treated through prescribed fires as a long-term visibility improvement strategy.
 - iii) Link to Applicable Control Strategy Analysis.
- 2) Oil & Gas (Non-Point) Emission Reduction Strategies **(Total Estimated Reductions: X,XXX TPY in 2028)**.
 - a) Strategy 1-5 similar structure to On-Road Mobile section above.
- 3) EGU (Point) Emission Reduction Strategies **(Total Estimated Reductions: X,XXX TPY in 2028)**.
 - a) Strategy 1-5 similar structure to On-Road Mobile section above.
- 4) Industrial & Non-EGU (Point) Emission Reduction Strategies **(Total Estimated Reductions: X,XXX TPY in 2028)**.
 - a) Strategy 1-5 similar structure to On-Road Mobile section above.
- 5) Oil & Gas (Point) Emission Reduction Strategies **(Total Estimated Reductions: X,XXX TPY in 2028)**.
- 6) Wildland Prescribed Fire Emission Reduction Strategies **(Total Estimated Reductions: N/A)**.

Enforceability Mechanism: State or Local Agency Rule/Regulation, NAAQS SIP measure, new or previously adopted RH SIP measure.