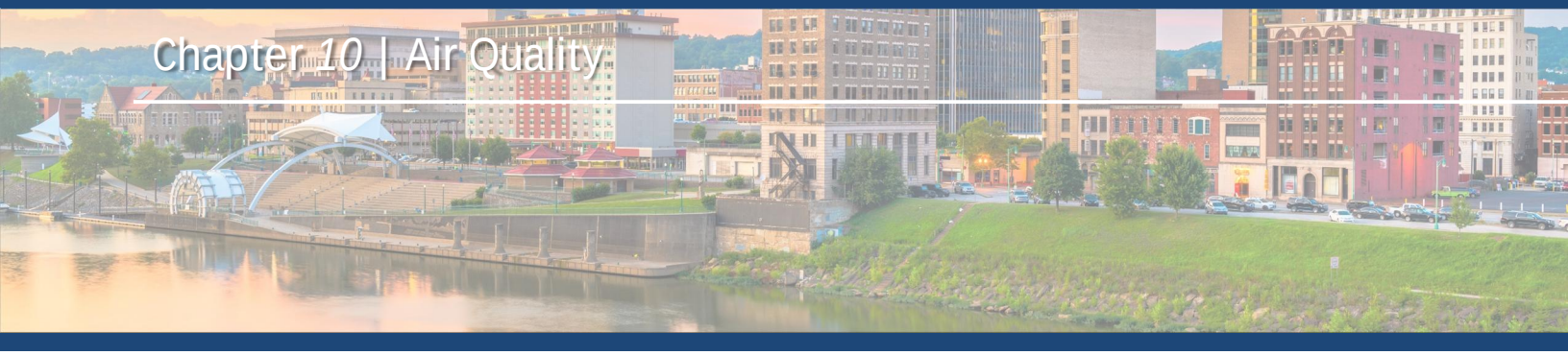


Chapter 10 | Air Quality

Introduction

Transportation air quality conformity is a way to ensure that federal funding and approval are awarded to those transportation activities that are consistent with air quality goals. Under the Clean Air Act (CAA), transportation and air quality modeling procedures must be coordinated to ensure that the TIP and MTP are consistent with the State Implementation Plan (SIP). The SIP is a federally required document that provides a comprehensive assessment of regional air quality conditions (motorized and non-motorized) and desired targets if applicable. The purpose of the SIP is to ensure that the State and its member jurisdictions will be able to attain or maintain the levels of the National Ambient Air Quality Standards (NAAQS).

In order to receive transportation funding from the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA), state and local transportation agencies in nonattainment or maintenance areas must demonstrate that all transportation air quality conformity requirements of the CAA are being met as set forth in the transportation conformity rule. As such, transportation plans are expected to conform to the SIP.

The integration of transportation and air quality planning is intended to ensure that transportation plans, programs, and projects will not:

- Cause or contribute to any new violation of any standard in any area;
- Increase the frequency or severity of any existing violation of any standard in any area; or
- Delay timely attainment of any standard or any required interim emissions reductions or other milestones in any area.

National Ambient Air Quality Standard Designations

The CAA requires the EPA to set NAAQS for pollutants considered harmful to public health and the environment. A nonattainment area is any area that does not meet the national primary or secondary NAAQS. A maintenance area is any area that the EPA previously designated as a nonattainment area for one or more pollutants, and subsequently redesignated as an attainment area subject to the requirement to develop a maintenance plan under section 175A of the CAA. The Charleston area has previously been designated maintenance under the ozone and fine particulate matter ($PM_{2.5}$) NAAQS. Transportation conformity requires nonattainment and maintenance areas to demonstrate that all future transportation projects will not hinder the area from reaching its attainment goals. Currently, the Charleston area is in attainment for all criteria pollutants. Additional

information is provided about the background and history of the region's previous nonattainment and maintenance status.

Ozone

Ozone is formed by chemical reactions occurring under specific atmospheric conditions. Two of the important classes of compounds in these reactions are hydrocarbons (including VOC) and oxides of nitrogen (NOx). Both of these are components of vehicular exhaust. Additionally, the hydrocarbons may be produced by evaporation from vehicle fuel system components and by displacement of vapors in the gas tank during refueling. By controlling these emissions, ozone formation can be controlled.

Effective June 15, 2004, EPA finalized ground-level ozone designations under the 1997 8-hour ozone NAAQS. Under this standard, a region was designated as being in nonattainment of the 1997 8-hour ozone standard if the 3-year average of the individual fourth highest air quality monitor readings, averaged over 8 hours throughout the day, exceeded the NAAQS of 0.08 parts per million (ppm).

The Charleston area, comprising Kanawha and Putnam counties, was designated as nonattainment for the 8-hour ozone standard in the April 30, 2004 Federal Register (69FR23858). However, the area was reclassified to attainment on August 10, 2006. As a provision of this attainment designation, the area was required to adhere to a maintenance plan that establishes motor vehicle emission budgets (MVEBs) for NOx and VOCs. Estimates of vehicle emissions were compared against these budgets to determine regional conformity for the ozone precursors.

On March 12, 2008, EPA revised its NAAQS for ozone by strengthening the standard to 0.075 ppm. This revised 2008 8-hour ozone NAAQS is calculated in the same manner as the 1997 ozone NAAQS. Kanawha and Putnam counties were designated as attainment areas per the 2008 8-hour ozone standard. To accompany the 2008 standard, EPA established air quality designations (77 FR 30088). The rule provides for the revocation of the 1997 ozone NAAQS for transportation conformity purposes to occur 1 year after the effective date of the designations for the 2008 ozone NAAQS (July 20, 2012). Transportation conformity no longer applies to those areas that have been redesignated to attainment for the 1997 ozone NAAQS that are also classified as attainment for the 2008 ozone NAAQS. However, it was the finding of *South Coast Air Quality Management District v. EPA* in February of 2018 that the requirements for maintenance areas under the 1997 8-hour ozone standard should be retained.

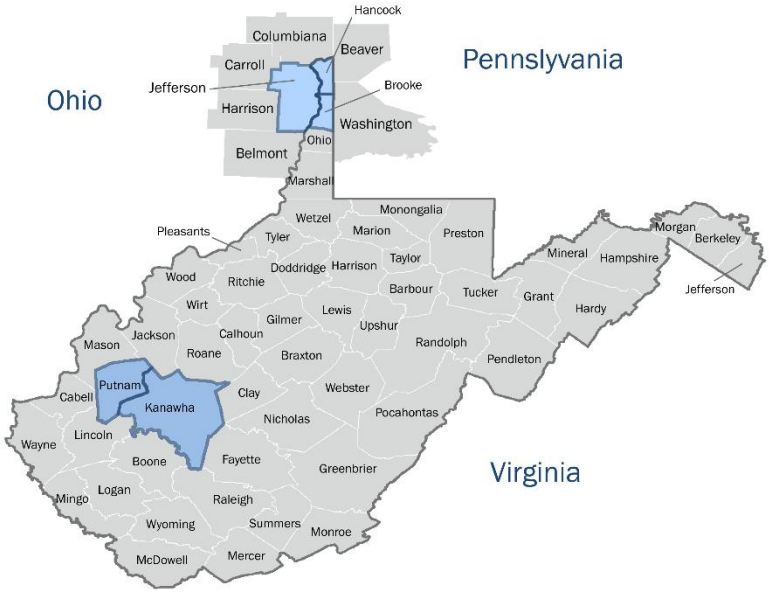
The 8-hour ozone standard was further strengthened to 0.070 ppm on December 28, 2015 (80 FR 65292). The previous 2008 standard was not revoked and remained in effect for designated areas. The Kanawha-Putnam region is in attainment for the 2015 8-hour ozone standard.

In summary, the Charleston region is currently in attainment for the currently applicable 8-hour ozone standards, but continues to be subject to the qualitative conformity reporting requirements from its previous maintenance designation under the 1997 standards as a result of the *South Coast v. EPA* finding. The most recent quantitative air quality conformity analysis for the Charleston region was prepared by RIC and the West Virginia Department of Transportation (WVDOT) and adopted on September 13, 2018.

$PM_{2.5}$

Fine particle pollution can be emitted directly into the atmosphere or formed in the atmosphere. For example, sulfates and nitrates are two types of secondary particles. The former is a result of power plant and industry emissions, while the latter results from automobiles, power plants, and other combustion emission sources. Scientific studies have found a significant association between the exposure to fine particulates and such severe health issues as heart disease, lung disease, and premature death.

PM2.5 24-Hour Standard:
Maintenance Areas with Insignificant Highway Source Emissions



$PM_{2.5}$ Annual Standard

In 1997, the EPA issued the PM2.5 fine particulate NAAQS in order to protect public health. The annual standard was set at 15 micrograms per cubic meter (µg/m3) and was based on a 3-year average of annual mean PM2.5 concentrations. The Charleston area, including Kanawha and Putnam counties, was designated as a nonattainment area under the 1997 annual PM2.5 NAAQS. However, the area was redesignated to an attainment area on April 30, 2014.

On January 15, 2013, the EPA issued updated annual and 24-hour PM2.5 standards. Known as the 2012 PM2.5 standard, the threshold for annual PM2.5 is set at 12 µg/m3 and is assessed in the same manner as the 1997 annual PM2.5 NAAQS. The Charleston area was designated as an attainment area for the 2012 annual PM2.5 standard. The rule provides for the revocation of the 1997 annual PM2.5. Transportation conformity no longer applies to those areas that have been redesignated to attainment for the 1997 annual PM2.5 NAAQS that are also classified as attainment for the 2012 annual PM2.5 NAAQS. As a result, no air quality analysis for the annual PM2.5 standard is required for the Kanawha-Putnam area.

$PM_{2.5}$ 24-Hour Standard

On December 18, 2006, the EPA issued the 2006 PM2.5 standard that tightened the 24-hour fine particle standard from 65 µg/m3 to 35 µg/m3. The Charleston area (Kanawha and Putnam counties) was designated as a nonattainment area under the 2006 24-hour PM2.5 standard. However, the area was redesignated to an attainment area on April 30, 2014. As part of the 2012 PM2.5 standard (issued January 15, 2013), the EPA affirmed the 24-hour PM2.5 threshold set in 2006, maintaining a value of 35 µg/m3.

In 2012, the West Virginia Department of Environmental Protection (WVDEP) initiated the process to redesignate the Kanawha- Putnam area to reflect a finding of insignificance for highway sources of the 2006 24-hour PM2.5 standard. The redesignation request for a finding of mobile source insignificance was approved.

The federal requirements—40 CFR 93.109(f)—stipulate that areas designated as attainment with SIP insignificant motor vehicle emissions findings are not required to satisfy a regional emissions analysis for §93.118 and/or §93.119 for a given pollutant/precursor and NAAQS. Instead, areas with SIP insignificance findings adopt qualitative conformity determination for regional transportation plans and TIPs.

Although the area is designated as attainment and there is a finding of insignificance, this does not preclude RIC from complying with the other still-effective requirements of the transportation conformity rule, such as interagency consultations, hot spot analyses as necessary, latest planning assumptions, public participation, etc.

Climate Change and Resiliency

The natural environment and transportation planning are undeniably intertwined. A variety of trends will influence the future of transportation planning including shifting environmental factors, advancing technologies, and changing society dynamics. West Virginia's economy is heavily dependent on the efficient movement of people and goods in and out of the state. It is imperative to understand the current climactic trends in the state and across the nation to determine long-term strategies for transportation.

What is Climate Change?

Climate change is defined as the long-term change in average weather patterns due—in large part—to human activities.[1] Climate change poses a threat to the capacity and reliability of transportation infrastructure. These naturally occurring events will take place more frequently and with more drastic consequences on existing systems. Several examples of these events could include extreme temperatures, severe storm events, and rising sea levels. An impact of climate change that is most pertinent to West Virginia is more frequent flash flooding during intense precipitation.[2] While this is one example, the impact of severe flooding on the durability and life cycle of transportation infrastructure like roads or bridges will be a challenge to overcome. Not only will climate change impact the life-cycle costs associated with existing transportation infrastructure, but it will also increase like likelihood of traffic delay, disruptions of peak-hour travel, and the failure of transportation systems. Table 11-1 shows the potential weather-related impacts to transportation infrastructure.[3]

[1] NASA, https://climate.nasa.gov/resources/global-warming-vs-climate-change/
[2] West Virginia Statewide Standard Hazard Mitigation Plan, https://emd.wv.gov/MitigationRecovery/Documents/2013%20WV%20Statewide%20Hazard%20Mitigation%20Plan%20Update.pdf
[3] Trends, Drivers, and Opportunities: https://transportation.wv.gov/highways/programplanning/LRTP/Documents/Environment_Research%20Paper.pdf

Table 11-1: Weather-Related Impacts on Transportation Infrastructure

WEATHER RELATED EVENT	TRANSPORTATION IMPACT
Increase in average temperature	• Expands and softens pavement causing potholes • Increases stress on bridge joints • Increase life-cycle costs of roads, highways, and bridges • Increases precipitation causing freezing in winter months • Expands rail tracks requiring track repairs
Increase in drought event	• Increases likelihood of wildfires • Reduces permeability of soil
Increase in severe storm event	• Disrupts traffic flow • Delays construction • Weakens soil that support bridges and roads

Addressing Climate Change

The development of a long-range plan should consider strategies to create resilient transportation infrastructure. As described in Chapter 1, the onset of the RIC MTP consisted of an alignment matrix comparing the plan's guiding statements with federal goals. Several of the FAST Act federal goals could be interpreted to address climate change. While the RIC MPO has addressed all of the federal goals through the creation of the plan's guiding statements, RIC should continue to find creative ways to incorporate resiliency into transportation planning to combat climate change proactively. There are several strategies or investments that the RIC MPO could make to better prepare for the impacts of climate change:

- Invest in Transit-Oriented Development
- Construct Sustainable Street Designs
- Prepare an Emergency Management Planning Strategy

Transit-Oriented Development

Transit-Oriented Development—or TOD—creates walkable and livable communities for people of all ages and abilities. Not only does TOD create walkable communities, but it also provides a wider variety of transportation choices like biking or taking transit. TOD can relieve the cost of transportation on lower income households, bolster public transportation ridership, and reduce emissions that are associated with driving a personal vehicle.

Sustainable Street Design

As outlined in Chapters 5 and 6, mode choice plays a crucial component to addressing air quality and, more generally, climate change. Street designs that focus on protected and dedicated alternative modes of transportation will not only enhance the community's quality of life, but it will also encourage biking, walking, or

taking transit as opposed to driving. The strategic planning of street design can also impact stormwater runoff, water quality, and mitigate the heat island effect. All of these benefits address some adverse effects of climate change. A sustainable street design is both a proactive and strategic investment into a variety of transportation infrastructure. By creating a diverse, resilient transportation system will only better position the RIC MPO in the long-term.

Emergency Management Planning

To effectively combat the adverse effects of climate change, creating a strategy to plan for hazardous weather conditions is essential. The West Virginia Statewide Hazard Mitigation Plan begins to consider what the impacts of climate change might or will be on the state as a whole. Despite the plan being updated in 2013, it sets the foundation for municipalities to start considering a strategy to assess and plan for new or potentially unseen impacts. Continual monitoring of natural hazards or aging infrastructure through a variety of existing data sources can help inform emergency planning efforts on an MPO scale.

Challenges

While there are several challenges associate with addressing climate change, the largest barrier is funding. As outlined in Chapter 9, there are already a limited number of financial resources available to RIC. By leveraging the prioritization process, the RIC MPO can demonstrate that projects not only fulfill capacity projects and performance-based needs, but also outline the benefits of a resilient transportation system.

Conclusion

As discussed in Chapter 2, resiliency and climate change should be considered during the decision-making process during transportation planning and construction. The RIC MPO should continue to consider the regional impacts of climate change on transportation systems. By continuing to understand the challenges of climate change and resiliency, the MPO will be better positioned to adapt to the dynamic, environmental landscape.

Conformity Determination

Financial Constraint

The planning regulations, Sections 450.322(b)(11) and 450.324(e), require the transportation plan to be financially constrained while the existing transportation system is being adequately operated and maintained. Only projects for which construction and operating funds are reasonably expected to be available are included. The RIC MPO, in conjunction with WVDOT, has developed an estimate of available funds for “capacity increasing” transportation projects within the region. A project selection process was used to identify the projects that improve regional traffic congestion and fall within the overall available funding estimates.

Public Participation

The *RIC Metropolitan Transportation Plan* (MTP) has undergone the public participation requirements set forth in the Final Conformity Rule and Final Statewide / Metropolitan Planning Rule. The draft document was made available for 30 days of public review and comment beginning on August 9, 2021. Any comments received on the RIC MTP and conformity determination will be considered for incorporation prior to a request for approval from the RIC Policy Board.

Interagency Consultation

Members of the region's interagency consultation group—consisting of FHWA, FTA, US EPA, WVDOT, and WV DEP-DAQ—were engaged in discussions about the status of the region's air quality and its relation to the MTP. Based on the current attainment status of the region, as well as the feedback of the interagency consultation group, it has been concluded that the RIC MTP conforms to federal and state air quality requirements. This chapter represents the qualitative air quality conformity process that is required for the preparation of this plan.