

State Department of Transportation (DOT) Best Practices to Address Air Quality Planning Needs

TECHNICAL MEMORANDUM - FINAL

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LIST OF ABBREVIATIONS

AASHTO	American Association of State Highway and Transportation Officials
BIL	Bipartisan Infrastructure Law
CAA	Clean Air Act
CAP	Criteria Air Pollutants
CBSA	Core-Based Statistical Area
CMAQ	Congestion Mitigation and Air Quality
CO	Carbon Monoxide
DEQ	Department of Environmental Quality
ENV	Environmental Affairs Division
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
FTE	Full-time equivalent
GHG	Greenhouse gas
MARC	Mid-America Regional Council
MDT	Montana Department of Transportation
MOA	Memorandum of Agreement
MPO	Metropolitan Planning Organization
MSA	Metropolitan Statistical Area
MSAT	Mobile Source Air Toxic
MTP	Metropolitan Transportation Plan
NAAQS	National Ambient Air Quality Standards
NCHRP	National Cooperative Highway Research Program

NCTCOG	North Central Texas Council of Governments
NEPA	National Environmental Policy Act
NO _x	Nitrogen oxides
PM	Particulate Matter
PM _{2.5}	PM under 2.5 microns
PM ₁₀	Particulate Matter under 10 microns
PPM	Parts Per Million
RGVMPO	Rio Grande Valley Metropolitan Planning Organization
RTP	Regional Transportation Plan
SIP	State Implementation Plans
SO ₂	Sulfur Dioxide
TAPCD	Tennessee Air Pollution Control Division
TCEQ	Texas Commissions on Environmental Quality
TCM	Transportation Control Measures
TIP	Transportation Improvement Program
TPP	Transportation Planning and Programming
TWG	Technical Working Group for Mobile Source Emissions
TxDOT	Texas Department of Transportation

1 BACKGROUND

State Department of Transportations (DOTs) play a central role in planning, designing, constructing, and maintaining projects for all modes of travel within the state. They distribute resources from different federal-aid programs and assess the effects of transportation activities within the state. State DOTs have significant responsibilities in ensuring adherence to federal, state, and local environmental laws, regulations, and permits applicable to transportation projects. This includes requirements related to air quality, water quality, wetlands protection, endangered species, historic preservation, noise control, and others.

In terms of air quality, state DOTs across the U.S. are subject to various requirements that govern their activities and the transportation projects they implement. They must adhere to the regulations and guidelines set by their respective state and federal agencies, including:

- Ensuring compliance with Clean Air Act (CAA) provisions and regulations, including the attainment and maintenance of the National Ambient Air Quality Standards (NAAQS) which involves demonstrations of transportation conformity to air quality goals:
 - Transportation conformity applies to Metropolitan Transportation Plan (MTP), Transportation Improvement Program (TIP), and Federal Transit Administration (FTA) and/or Federal Highway Administration (FHWA) approved or funded projects in areas that do not meet the NAAQS.
 - Transportation conformity ensures federal funding is assigned to those projects where transportation activities are consistent with the air quality goals [1].
- Conducting or coordinating conformity analyses for transportation plans and projects [2] to include:
 - Collaborating with agencies throughout the conformity determination process,
 - Performing regional conformity analyses on projects outside metropolitan areas, guided by interagency collaboration,

- In carbon monoxide (CO) and particulate matter (PM) nonattainment and maintenance areas, conducting "hot-spot" analyses as needed for project-level conformity determination,
 - Facilitating public involvement and address significant comments,
 - Ensuring prompt implementation of Transportation Control Measures (TCMs),
 - Evaluating and endorsing staff regional and hot-spot emissions analyses,
 - Consulting on the development of the State Implementation Plans (SIP) and motor vehicle emissions budgets,
 - Engaging in the TCM substitution process,
 - Providing concurrence on TCM substitutions in isolated rural areas.
- Collaborating with state environmental agencies to ensure that transportation-related emissions are appropriately considered and addressed in the SIP,
- Conducting environmental impact assessments for major transportation projects under National Environmental Policy Act (NEPA):
 - Under NEPA, the state DOT must comply with all applicable federal environmental laws, as well as FHWA and NEPA regulations, policies, and guidance [3].
- DOTs are responsible for implementing measures to control and reduce emissions from transportation sources, including vehicles, construction equipment, and maintenance activities. This may involve adopting cleaner technologies, promoting alternative fuels, and enforcing vehicle emission standards.
- Encouraging/implementing state air agency-mandated measures to reduce emissions from mobile sources, such as the introduction of low-sulfur diesel to reduce nitrogen oxide (NOx) emissions from motor vehicles and non-road equipment¹.

¹ More information on the Texas Low Emission Diesel (TxLED) program is available at <https://www.tceq.texas.gov/airquality/mobilesource/txled>.

- Maintaining records, preparing reports, and documenting compliance with environmental requirements throughout the project lifecycle. This documentation is crucial for regulatory compliance, project monitoring, and accountability.
- Investing in research and development of innovative technologies and practices to further reduce emissions from transportation sources. This includes testing and piloting new technologies, evaluating their feasibility and effectiveness, and promoting their adoption within transportation projects.

In summary, State DOTs play a crucial role in meeting air quality standards. The CAA requires transportation conformity in nonattainment and maintenance areas, with the primary objective of ensuring that projects with FHWA and FTA funding and approvals do not lead to new violations of the NAAQS, escalate the frequency or severity of NAAQS violations, or impede the timely attainment of the NAAQS or any required interim milestone [1]. In metropolitan areas, the Metropolitan Planning Organization (MPO) policy board is responsible for determining conformity within nonattainment and maintenance areas for MTPs and TIPs. State DOTs support this process by providing technical assistance and consultation to ensure smooth conformity determinations. In areas without MPOs, State DOTs assume this responsibility. Furthermore, State DOTs are also responsible for conducting project-level conformity analyses. Therefore, State DOTs must allocate adequate resources to meet air quality requirements in nonattainment or maintenance areas, including counties lacking an MPO.

1.1 STUDY OBJECTIVES

State DOT staff working on environmental-related tasks are responsible for a broad range of topics beyond air quality. In addition to air quality-related tasks, they also address issues related to soil, water quality, and noise pollution, covering all significant aspects of the natural environment. Using the U.S. DOT's environmental team as a reference, U.S. DOT staff are tasked with several major topics including assisting in coordinating the implementation of NEPA across the DOT, supporting initiatives that are related to energy and transportation (i.e., alternative fuel), and developing and providing guidance on other DOT policies related to the environment, such as air, water, noise [4]. As such, the DOT environmental staff are being pulled for multiple important tasks making it challenging for them to allocate sufficient time and attention to specific projects or initiatives.

Specific air quality requirements can vary from state to state. The state DOTs work closely with state environmental agencies (i.e., Texas Commissions on Environmental Quality [TCEQ] in Texas), federal agencies (i.e., FHWA, EPA), MPOs, and local governing bodies to comply with air quality requirements and promote environmentally responsible transportation systems. State DOTs allocate resources, including professionals with air quality expertise, data collection and analysis, technical tools, and software, to meet these air quality requirements and to ensure compliance. The resources required by the state DOT vary based on the size of the state, the complexity of transportation systems, the severity of air quality challenges, and their specific air quality regulations. An understanding of the best practices, staff resource allocation, and mechanisms conducted elsewhere can help the Texas Department of Transportation (TxDOT) review its current practices in relation to its peer DOTs across the nation.

The TTI study team was contracted by TxDOT to perform the following tasks:

- Perform a literature review to understand the air quality-related roles that the state DOT performs,
- Review and report the number of air quality staff at each state DOT and their organizational structure,
- Review the resources available to state DOTs to perform air quality-related tasks,
- Conduct interviews or surveys with selected state DOTs to acquire more accurate information on their agency's operations, staffing, and best practices,
- Summarize the results of the study to develop a framework that TxDOT can refer to in preparation for future needs.

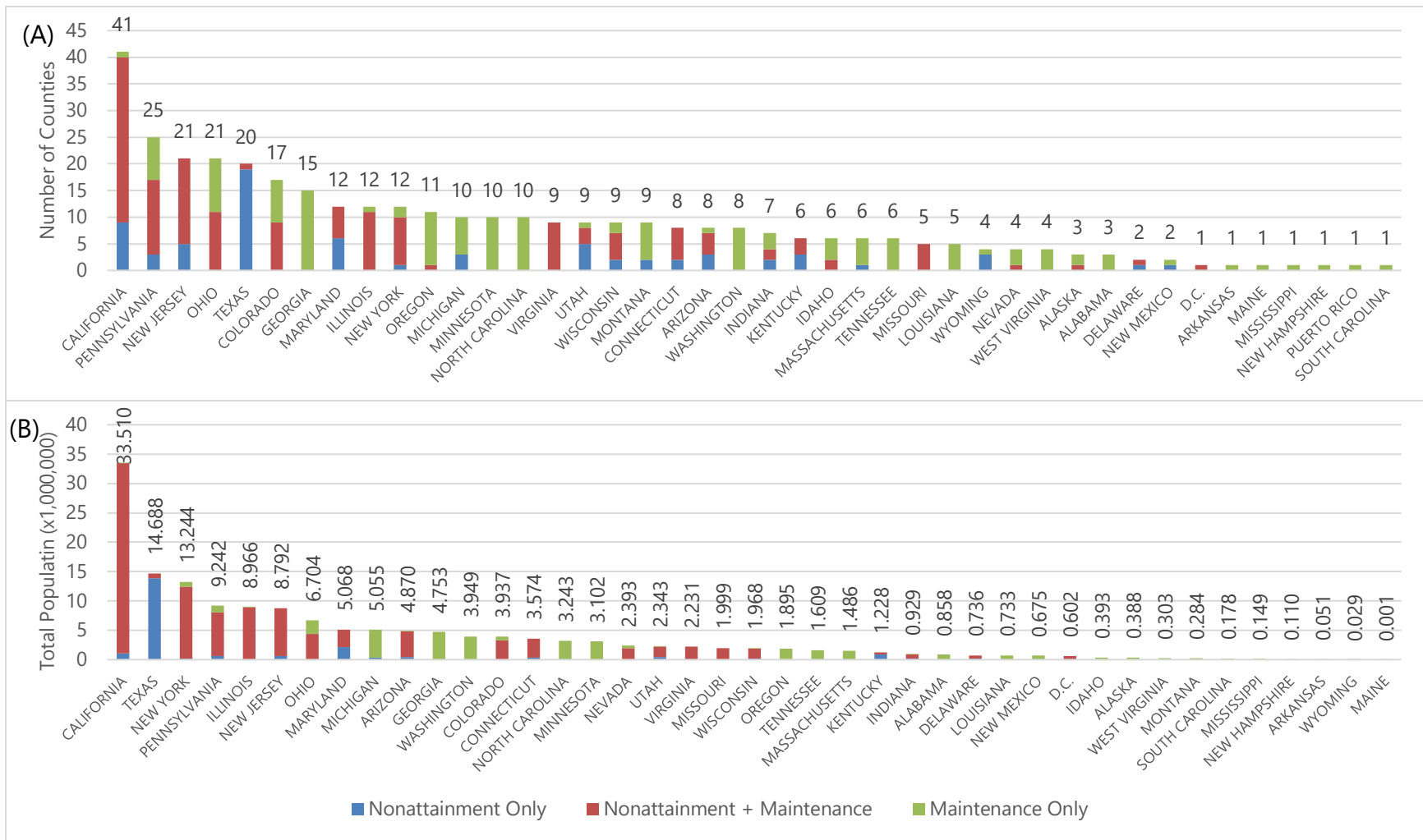
2 LITERATURE REVIEW

The TTI study team conducted an initial screening of states purely under the lens of transportation conformity. Some of the state DOTs have divisions and staff dedicated to greenhouse gas (GHG) and climate, but the TTI study team focused this effort only on conformity-related tasks. Based on the June 2023 update of the EPA Green Book², the TTI study team reviews were performed on the states with counties that are in nonattainment or are in maintenance of the ozone, PM_{2.5}, and/or CO NAAQS. The TTI study team did not include limited maintenance counties in this review. In total, the TTI study team reviewed the practices and structures of 39 state DOTs concerning their available resources and allocation (in terms of the number of staff assigned versus the number of nonattainment and/or maintenance areas), organizational reporting structure of their air quality group, and transportation conformity practices, and compared them to TxDOT's.

2.1 CURRENT AIR QUALITY CHALLENGES

Figure 1(A) shows the total number of ozone, PM, and CO nonattainment and maintenance counties in each state and Figure 1(B) shows the total population in those counties. California and New Jersey are the only states with more nonattainment counties than Texas, and California is the only state with more people living in nonattainment counties than Texas. California has 23 nonattainment and 13 maintenance counties that are classified under Serious, Severe, or Extreme, whereas Texas and New Jersey have 18 and 12 nonattainment counties that are under those classifications, respectively. Texas and New Jersey nonattainment counties with Serious and above classifications are entirely composed of ozone nonattainment whereas California has nonattainment counties for ozone and PM_{2.5}. For CO, Texas only has one maintenance area under the Moderate classification under the 1971 CO NAAQS, which is a portion of El Paso County. Since the most severe cases of nonattainment in Texas are for ozone, for the rest of this study, ozone nonattainment will be the focus.

² The EPA Green Book provides detailed information about area NAAQS designations, classifications and nonattainment status. The Green Book is available at: <https://www.epa.gov/green-book>.



Source: EPA. Nonattainment Areas for Criteria Pollutants (Green Book).

Figure 1. Total Number of Nonattainment and Maintenance Counties (for ozone, PM, and CO) and their Total Population, by State.

As a condition of federal aid, an MPO must be designated for each urbanized area with a population of more than 50,000 people. TTI downloaded the latest shapefile of MPOs across the country³ and spatially combined them with NAAQS nonattainment and maintenance area shapefiles available on the EPA's website⁴. Table 1 shows the number of NAAQS nonattainment and/or maintenance counties with and without MPOs, by state, while Figure 2 shows the population that resides in these nonattainment and/or maintenance counties without an MPO. For each county/area without an MPO that is in nonattainment of the NAAQS, the state DOT has to assume the role of an MPO and perform transportation conformity determination. States with nonattainment counties outside of MPOs include Arizona (2), California (2), Massachusetts (1), Montana (2), Oregon (1), Utah (2), and Wyoming (3). There are about 58,902 Arizonians living in PM under 10 microns (PM₁₀) nonattainment areas without MPOs; the majority of which are from Santa Cruz County, with a population of 30,359. Oregon and Utah both have around 47,000 residents that live in PM_{2.5} (2006) and ozone (2015) nonattainment areas without MPOs, respectively. The bulk of of these residents from Utah are from Uintah County (31,979) while Oregon's Klamath County contributed to all of these residents (46,969). Thus, the DOTs in these states are responsible for performing conformity determinations for areas with an average population per county of: Arizona (14,726), California (2,922), Massachusetts (16,535), Montana (1,227), Oregon (11,472), Utah (23,659), and Wyoming (2,875).

Table 1. Number of Nonattainment and/or Maintenance Counties with or without MPOs, by State

State	NA only with MPO	NA + MA with MPO	MA only with MPO	NA only without MPO	NA + MA without MPO	MA only without MPO
Alabama	0	0	3	0	0	0
Alaska	0	1	1	0	0	1
Arizona	3	2	1	1	1	0
Arkansas	0	0	1	0	0	0
California	10	28	1	2	0	0
Colorado	0	8	3	0	0	6
Connecticut	2	2	4	0	0	0
Delaware	1	1	0	0	0	0

³ The MPO Shapefiles (updated on July 24, 2023) are available here: <https://data-usdot.opendata.arcgis.com/datasets/usdot::metropolitan-planning-organizations/about>

⁴ The NAAQS maintenance and nonattainment area shapefiles (updated on January 17, 2023) are available here: <https://www.epa.gov/green-book/green-book-gis-download>

State	NA only with MPO	NA + MA with MPO	MA only with MPO	NA only without MPO	NA + MA without MPO	MA only without MPO
D.C.	0	1	0	0	0	0
Georgia	0	0	15	0	0	0
Idaho	0	2	2	0	0	2
Illinois	0	11	0	0	0	0
Indiana	2	2	3	0	0	0
Kentucky	6	0	0	0	0	0
Louisiana	0	0	5	0	0	0
Maine	0	0	0	0	0	1
Maryland	8	2	1	0	0	0
Massachusetts	0	0	5	1	0	0
Michigan	3	0	7	0	0	0
Minnesota	0	0	10	0	0	0
Mississippi	0	0	1	0	0	0
Missouri	0	5	0	0	0	0
Montana	0	0	3	2	0	4
Nevada	0	1	3	0	0	0
New Hampshire	0	0	1	0	0	0
New Jersey	5	14	2	0	0	0
New Mexico	1	0	1	0	0	0
New York	1	9	2	0	0	0
North Carolina	0	0	10	0	0	0
Ohio	5	6	10	0	0	0
Oregon	0	0	7	0	1	3
Pennsylvania	3	13	9	0	0	0
Puerto Rico	0	0	1	0	0	0
South Carolina	0	0	1	0	0	0
Tennessee	0	0	6	0	0	0
Texas	19	1	0	0	0	0
Utah	4	2	1	2	0	0
Virginia	7	2	0	0	0	0
Washington	0	0	8	0	0	0
West Virginia	0	0	4	0	0	0
Wisconsin	3	4	0	0	0	2
Wyoming	0	0	0	3	0	1

NA – nonattainment area; MA – maintenance area; NA + MA – areas that are in nonattainment and maintenance for different criteria air pollutants.

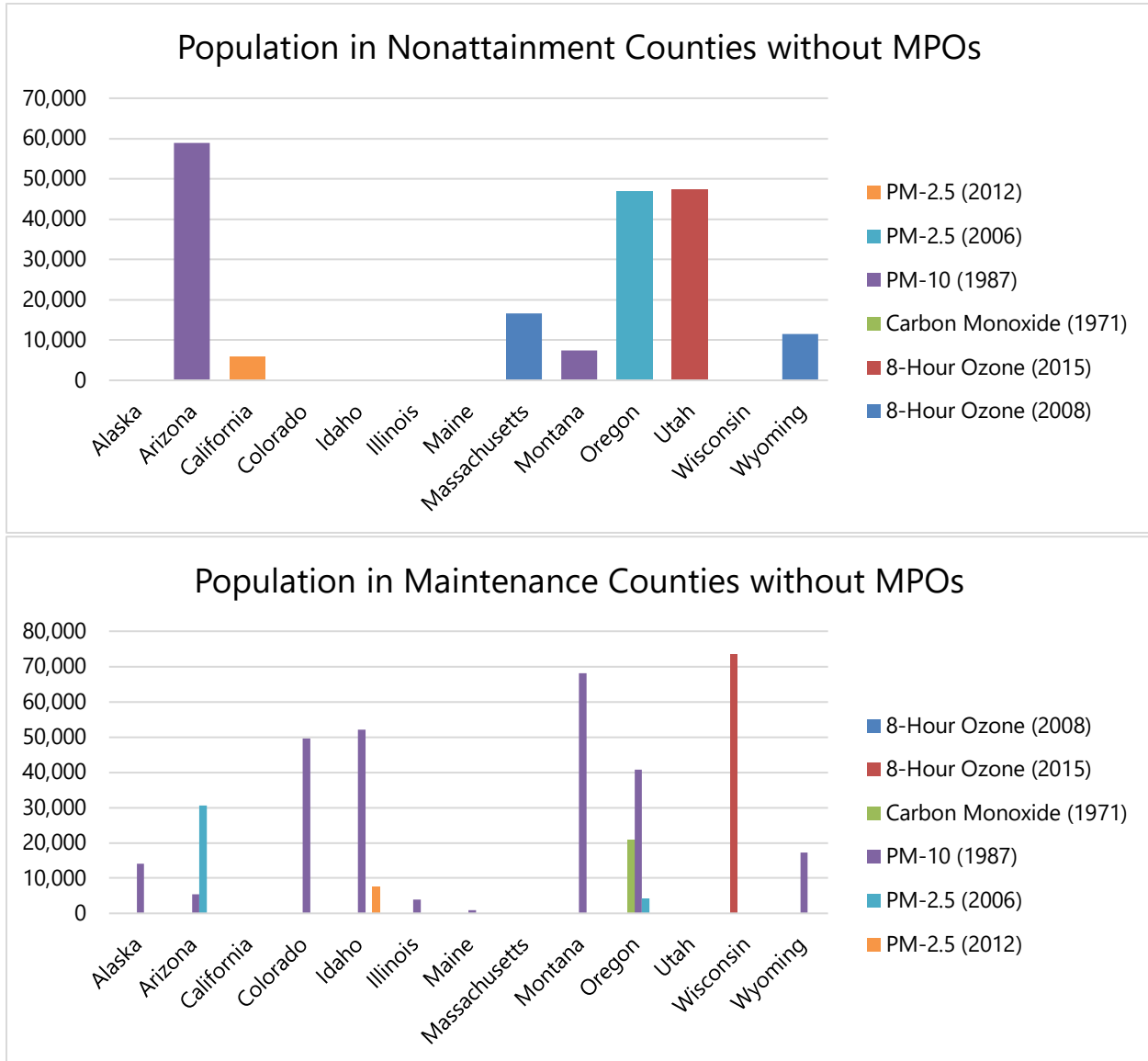


Figure 2. Population in Nonattainment and Maintenance Counties without MPOs, by State

2.2 IMPENDING NAAQS AMENDMENTS

This section focuses on analyzing and reporting on impending NAAQS amendments and designations based on the latest available design values. The TTI study team is focusing this chapter on the two criteria air pollutants (CAPs): PM and ozone. While CO also triggers project-level conformity determinations, it is largely not a concern as CO levels had decreased significantly for the past couple of decades.

2.2.1 PM NAAQS Amendment and Its Potential Impacts

On February 7, 2024, the U.S. Environmental Protection Agency (EPA) released an amendment to the primary annual-level NAAQS for PM under 2.5 microns (PM_{2.5}). This amendment tightens the primary annual standards from 12 µg/m³ to 9 µg/m³, effective May 6, 2024 [5].

At the time of this report's writing, the 2021-2023 PM_{2.5} design values were still being prepared by the EPA. Thus, the TTI study team reviewed the latest available PM_{2.5} design values from EPA, which are the 2020-2022 values, published on May 23rd, 2023 [6]. Based on these design values, a total of 98 counties that were previously in attainment with the 12 µg/m³ standard would fall under nonattainment under the new 9 µg/m³ standard. Among them, California, Texas, Illinois, Pennsylvania, Georgia, and Indiana accounted for more than half of these counties. For example, based on the 12 µg/m³ standard, 14 counties in California are in nonattainment status, whereas the number increases to 29 with the new 9 µg/m³.

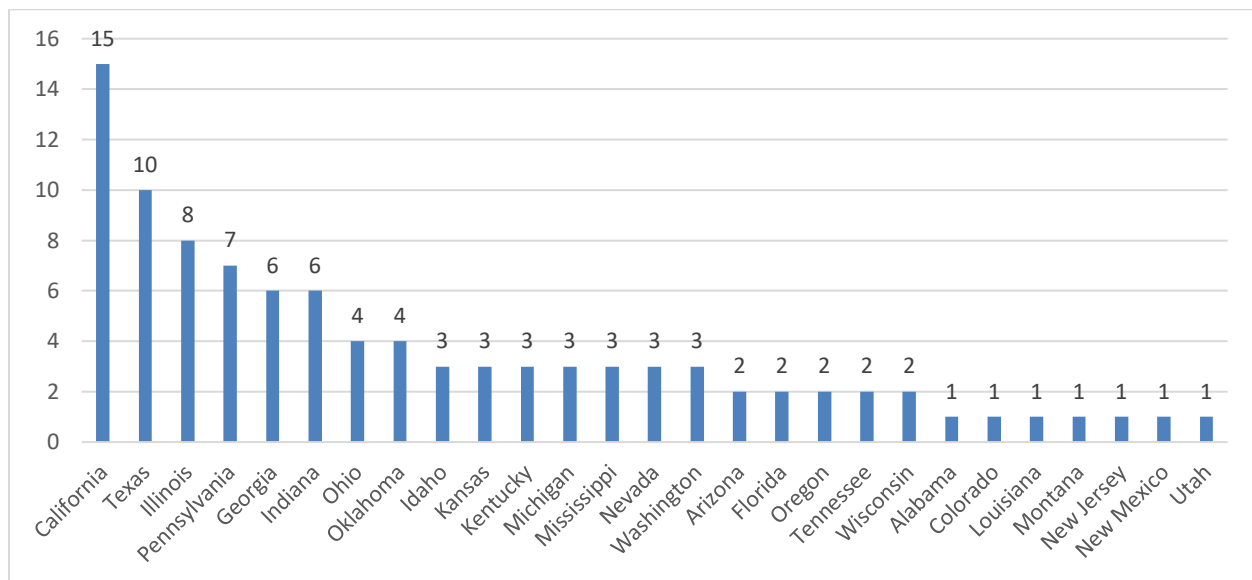


Figure 3. Increase in Number of PM_{2.5} Nonattainment Counties due to NAAQS Amendment by State (2020 – 2022 Design Value)

Table 2 provides an overview of the number of MPOs, by state, that will have new PM_{2.5} nonattainment counties designated based on the 2020-2022 design values. It also lists how many of those MPOs previously did not have any PM_{2.5} nonattainment counties and the number of PM_{2.5} nonattainment counties without MPOs by state. Based on the 2020-2022 design values, most of the PM_{2.5} nonattainment designations will be in

counties with MPOs, with exceptions in Georgia, Idaho, Kansas, Oklahoma, and Oregon. For most states, this would be their first PM_{2.5} nonattainment counties.

Table 2. Summary of New PM_{2.5} Nonattainment Designations based on the 2020-2022 Design Values by State

State	The number of MPOs with new PM _{2.5} nonattainment counties due to the PM _{2.5} NAAQS amendment	The number of MPOs with new PM _{2.5} nonattainment counties due to the PM _{2.5} NAAQS amendment that previously have none	Number of Counties with new PM _{2.5} nonattainment designation with no MPOs
Alabama	1	1	0
Arizona	2	1	0
California	6	3	0
Colorado	1	1	0
Florida	2	2	0
Georgia	6	6	1
Idaho	2	2	1
Illinois	4	4	0
Indiana	5	5	0
Kansas	3	3	1
Kentucky	3	3	1
Louisiana	1	1	0
Michigan	3	3	0
Mississippi	3	3	0
Montana	1	1	0
Nevada	3	3	0
New Jersey	1	1	0
New Mexico	1	1	0
Ohio	4	4	0
Oklahoma	3	3	1
Oregon	2	1	2
Pennsylvania	6	6	0
Tennessee	2	2	0
Texas	8	8	0
Utah	1	1	0
Washington	3	3	0
Wisconsin	1	1	0

Please note that the analysis in this section is based on the 2020-2022 design values, and the EPA is currently developing the 2021-2023 PM_{2.5} design values. The first batch of PM_{2.5} nonattainment counties based on the amended NAAQS will likely be designated based on the 2022-2024 PM_{2.5} design values.

2.2.2 Ozone Nonattainment Designation

The TTI study team reviewed the latest available 2021-2023 ozone design values [6], and focused the analysis on monitoring sites with design values that exceeded the 0.07 parts per million (ppm) standard in the latest 2021-2023 design values but were in attainment in the 2020-2022 design values. In total, eleven counties that were in attainment of the 2015 8-hour ozone NAAQS exceeded the 0.07 ppm in the 2021-2023 design values, as shown in Table 3. Lea County in New Mexico and Kewaunee County in Wisconsin do not belong under the jurisdiction of any MPOs.

Table 3. 8-hour Ozone Design Value Trends for the Counties that Were Previously in Attainment until 2021-2023

State	County	2017-2019	2018-2020	2019-2021	2020-2022	2021-2023
Arkansas	Crittenden	0.066	0.067	0.068	0.07	0.072
Illinois	Jersey	0.068	0.067	0.065	0.066	0.073
Illinois	Randolph	0.064	0.062	0.062	0.064	0.071
Illinois	Winnebago	0.066	0.067	0.066	0.066	0.071
Indiana	Marion	0.068	0.067	0.064	0.066	0.071
Louisiana	Iberville	0.067	0.069	0.069	0.069	0.072
Missouri	Clay	0.068	0.066	0.066	0.068	0.071
Missouri	Perry	0.064	0.062	0.062	0.064	0.071
Nebraska	Knox	0.064	0.063	0.065	0.067	0.071
New Mexico	Lea	0.071	0.068	0.066	0.066	0.071
Oklahoma	McClain					0.071
Oklahoma	Oklahoma	0.069	0.069	0.068	0.07	0.071
Oklahoma	Osage	0.067	0.066	0.064	0.067	0.071
Oklahoma	Tulsa	0.066	0.065	0.064	0.066	0.073
Tennessee	Shelby	0.069	0.067	0.066	0.069	0.072
Texas	Bell	0.069	0.067	0.066	0.067	0.071
Texas	Hood	0.067	0.066	0.064	0.069	0.075
Texas	Travis	0.069				0.071
Washington	King	0.075	0.063	0.064	0.07	0.073
Wisconsin	Kewaunee	0.066	0.065	0.064	0.067	0.071
Wisconsin	Rock	0.064	0.066	0.065	0.067	0.071

Figure 4 shows the number of counties within each state with 2021-2023 design values higher than the 0.07 ppm 8-hour ozone standards that are not within any designated ozone nonattainment areas. In total, 31 counties meet these conditions, and over half of these counties are in New Mexico, Oklahoma, Illinois, Texas, and Wisconsin.

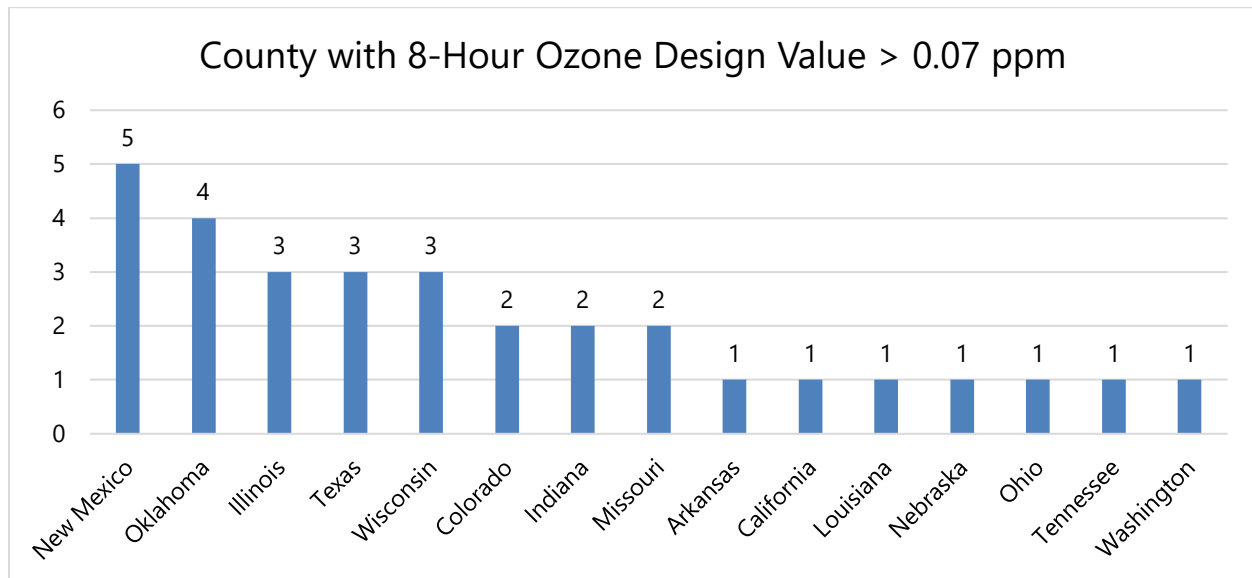


Figure 4. Number of Counties Not Within Any Ozone Designated Areas with Design Values Greater than 0.07 ppm by State

2.3 FUNDING AVAILABLE

The TTI study team looked at three sources of funding available for state DOTs that can potentially be used for air quality purposes: the FTA's annual allocations to states, revenue from motor fuel taxes, and Congestion Mitigation and Air Quality (CMAQ) funding allocated through the Biden Administration's Bipartisan Infrastructure Law (BIL). The summary, sorted by "total available dollars," is available in Table 4. The TTI study team added up the FTA's annual allocations and the revenues from motor fuel taxes for each state and divided them by the state's population to estimate the dollar amount available for each person in the state. On average, both these funding sources would yield \$120.45 per person. Looking only at the top 10 states with the highest populations, the average funding available for each person is about \$137.42 per person. Texas's \$94.32 per person is the lowest among the top 10 despite having the second largest population, only behind California.

Table 4. Selected Funding Available for the State

State	FTA Allocation (\$-million) ¹	Motor Fuel Tax Revenue (\$-million) ²	Population in the State	Total Available Dollar per Capita (\$)	CMAQ Funding (\$-million) ³	Population in Nonattainment/Maintenance Area	Total Available Dollar per Capita in Nonattainment/Maintenance Area (\$)
California	\$2,007	\$4,972	38,965,193	\$179.11	\$516	33,509,883	\$15.40
New York	\$2,187	\$902	19,571,216	\$157.83	\$204	13,243,559	\$15.40
Texas	\$663	\$2,214	30,503,301	\$94.32	\$194	14,687,832	\$13.21
Illinois	\$868	\$1,606	12,549,689	\$197.14	\$122	8,965,703	\$13.61
Pennsylvania	\$624	\$1,035	12,961,683	\$127.99	\$116	9,242,156	\$12.55
Ohio	\$264	\$1,289	11,785,935	\$131.77	\$106	6,704,464	\$15.81
New Jersey	\$868	\$227	9,290,841	\$117.86	\$116	8,791,894	\$13.19
North Carolina	\$180	\$1,388	10,835,491	\$144.71	\$57	3,242,855	\$17.58
Georgia	\$287	\$1,027	11,029,227	\$119.14	\$76	4,753,017	\$15.99
Michigan	\$202	\$845	10,037,261	\$104.31	\$82	5,055,023	\$16.22
Massachusetts	\$551	\$406	7,001,399	\$136.69	\$70	1,485,643	\$47.12
Washington	\$378	\$857	7,812,880	\$158.07	\$41	3,949,368	\$10.38
Virginia	\$242	\$599	8,715,698	\$96.49	\$61	2,230,623	\$27.35
Indiana	\$132	\$787	6,862,199	\$133.92	\$52	929,037	\$55.97
Maryland	\$359	\$414	6,180,253	\$125.08	\$60	5,067,669	\$11.84
Tennessee	\$126	\$729	7,126,489	\$119.97	\$41	1,609,167	\$25.48
Arizona	\$180	\$397	7,431,344	\$77.64	\$58	4,870,246	\$11.91
Colorado	\$186	\$400	5,877,610	\$99.70	\$47	3,936,702	\$11.94
Minnesota	\$169	\$513	5,737,915	\$118.86	\$36	3,102,234	\$11.60
Wisconsin	\$118	\$616	5,910,955	\$124.18	\$30	1,968,044	\$15.24
Connecticut	\$255	\$180	3,617,176	\$120.26	\$49	3,574,097	\$13.71
Oregon	\$156	\$397	4,233,358	\$130.63	\$22	1,894,811	\$11.61

State	FTA Allocation (\$-million) ¹	Motor Fuel Tax Revenue (\$-million) ²	Population in the State	Total Available Dollar per Capita (\$)	CMAQ Funding (\$-million) ³	Population in Nonattainment/ Maintenance Area	Total Available Dollar per Capita in Nonattainment/ Maintenance Area (\$)
Alabama	\$78	\$558	5,108,468	\$124.50	\$13	857,680	\$15.16
South Carolina	\$72	\$517	5,373,555	\$109.61	\$15	177,819	\$84.36
Missouri	\$143	\$310	6,196,156	\$73.11	\$26	1,998,958	\$13.01
Kentucky	\$77	\$465	4,526,154	\$119.75	\$15	1,228,482	\$12.21
Louisiana	\$93	\$361	4,573,749	\$99.26	\$13	732,587	\$17.75
Utah	\$129	\$308	3,417,734	\$127.86	\$14	2,342,666	\$5.98
Nevada	\$91	\$89	3,194,176	\$56.35	\$36	2,393,395	\$15.04
Arkansas	\$47	\$331	3,067,732	\$123.22	\$14	50,902	\$275.04
West Virginia	\$39	\$269	1,770,071	\$174.00	\$16	303,294	\$52.75
Mississippi	\$43	\$256	2,939,690	\$101.71	\$12	148,923	\$80.58
D.C.	\$307		678,972	\$452.15	\$11	601,723	\$18.28
Alaska	\$79	\$22	733,406	\$137.71	\$31	387,713	\$79.96
Idaho	\$37	\$177	1,964,726	\$108.92	\$14	392,926	\$35.63
Maine	\$48	\$105	1,395,722	\$109.62	\$11	972	\$11,316.87
New Hampshire	\$25	\$72	1,402,054	\$69.18	\$12	109,565	\$109.52
Montana	\$32	\$6	1,132,812	\$33.54	\$17	283,610	\$59.94
New Mexico	\$75		2,114,371	\$35.47	\$13	675,239	\$19.25
Delaware	\$37		1,031,890	\$35.86	\$13	735,624	\$17.67
Wyoming	\$18		584,057	\$30.82	\$12	28,798	\$416.70

¹FTA (January 28, 2023). FY 2023 Full Year Apportionments State Totals. Available at: <https://www.transit.dot.gov/funding/apportionments/fy-2023-full-year-apportionments-state-totals>

²US Census Bureau (September 7, 2023). Selected Monthly State Tax Collections. <https://www2.census.gov/data/experimental-data-products/selected-monthly-sales-tax-collections/selected-monthly-sales-tax-collections-data.xlsx>.

³FHWA (January 25, 2023). Infrastructure Investment and Jobs Act (Bipartisan Infrastructure Law). Table 7: Congestion Mitigation & Air Quality Improvement Program (CMAQ). Available at: <https://www.fhwa.dot.gov/bipartisan-infrastructure-law/comptables/table7p1.cfm>

Then, the TTI study team took the CMAQ allocations for each state and divided them by the state's population in nonattainment or maintenance areas. On average, about \$318.26 of CMAQ funding is available for each person living in a nonattainment or maintenance area. The CMAQ funding per person for Maine is a significant outlier as the number of people living in nonattainment or maintenance areas in that state is very low. Looking just at the top 10 states in terms of population in nonattainment or maintenance areas, the average CMAQ funding available for each person is \$13.91. Texas's CMAQ funding per capita in nonattainment or maintenance areas (\$13.31) is slightly lower than this average.

2.4 ORGANIZATIONAL STRUCTURES

The TTI study team reviewed the information available on the state DOT webpages and the state's conformity reports for air quality work either under their environment or planning division/branch. State DOTs are also responsible for performing conformity determinations in rural regions and/or those areas without an MPO; the state DOTs that had listed performing this task include Arizona, Indiana, and Montana DOTs.

TTI first identified air quality/environmental task roles. The TTI study team then looked up the organizational structures⁵ of the DOTs to identify the chain of command for the air quality/environmental roles. As shown in Table 5, twenty state DOTs have either dedicated air quality or air and noise programs; the rest either have an environmental program or a planning division that is in charge of transportation conformity or air quality-related works.

Table 5. State DOT Air Quality/Environmental Programs and Organization Structure

State	State DOT	Program	Organization Structure
Alabama	ALDOT	Environmental Planning and Permitting	Transportation Director > Chief Engineer > Assistant Chief Engineer (Policy and Planning)
Alaska	Alaska DOT and Public Facilities	Statewide Environmental Office	DOT and PF > Statewide Design and Engineering Services > Statewide Environmental Office
Arizona	Arizona DOT	Air Quality	Director > Deputy Director State Engineer > Environmental Planning > Air Quality
Arkansas	Arkansas DOT	Environmental division	Director > Deputy Director and Chief Operating Officer > Deputy Director and Chief Engineer > Assistant Chief

⁵ The latest (updated on July 25, 2023) state DOT Organizational Charts Information is available at: <https://transportation.libguides.com/statedotorgcharts>

State	State DOT	Program	Organization Structure
			Engineer (Planning) > Transportation Planning and Policy > Environmental Division
California	Caltrans	District Office Environmental and Planning staff	Director/Chief Deputy Director > Deputy Director of Project Delivery/Chief Engineer > Environmental Analysis > Air Quality
		Headquarters Air Quality Branch	Director/Chief Deputy Director > Deputy Director of Project Delivery/Chief Engineer > Environmental Analysis > Air Quality
Colorado	Colorado DOT	Air Quality Regulations and Guidance	Executive Director > Division of Engineering> Division of Transportation Development (DTD)> Environmental Programs Branch>Air and Climate Section
		Transportation Planning	Executive Director > Division of Engineering> Division of Transportation Development (DTD)> Multimodal Planning Branch (MPB)
Connecticut	Connecticut DOT	Travel Demand and Air Quality Modeling	Bureau of Policy and Planning > Office of Program Development and Forecasting > Travel Demand and Air Quality Modeling unit
Delaware	Delaware DOT	Environmental Stewardship Section	Secretary of Transportation > Planning Director > Environmental Stewardship Section
District of Columbia	District DOT	Project Development and Environment	Director > Deputy Director > Chief Transportation Engineer > Infrastructure Project Management > Project Development and Environment Division
Georgia	Georgia DOT	Air and Noise	Commissioner > Chief Engineer > Deputy Chief Engineer > Division of Engineering > Office of Environmental Services > State Environmental Administrator>Assistant State Environmental Administrator>Air and Noise Section Manager
Idaho	Idaho Transportation Department	Air Quality	Environmental Division > Environmental > Human and Physical Environment > Air Quality
Illinois	Illinois DOT	Air Quality	Secretary of Transportation > Chief of Staff > Deputy Secretary > Office of Highways Project and Implementation > The Bureau of Design and Environment> Coordination Unit
Indiana	Indiana DOT	Air Quality Conformity Modeling	Technical Planning and Programming Division > Technical Modeling Section > Air Quality Modeling
		Document Review	Environmental Services Division and District Environmental Teams > Environmental Policy Office
Kentucky	Kentucky Transportation Cabinet (KTC)	Air Quality	Department of Highways > Office of Project Development > Division of Environmental Analysis
Michigan	Michigan DOT	Statewide and Urban Travel Analysis Section (SUTA)	MDOT > Bureau of Transportation Planning > SUTA
Minnesota	Minnesota DOT	Air Quality	Commissioner > Deputy Commissioner and Chief Engineer > Assistant Commissioner Engineering Services > Environmental Stewardship > Pre-

State	State DOT	Program	Organization Structure
			Construction section > Environmental modeling and test unit
Montana	Montana Department of Transportation (MDT)	Air Quality	MDT > Environmental Services Bureau > Remediation and Assessment Section
Nevada	Nevada DOT	Air Quality and Traffic Noise Analysis	Department of Transportation > Division of Engineering > Environmental Division > Air Quality and Traffic Noise Analysis
New Hampshire	New Hampshire DOT	Air Quality	Division of Project Development> Bureau of Environment
		CMAQ program	Division of Project Development> Bureau of Community Assistance
New Jersey	New Jersey DOT	Planning Unit	Bureau of Evaluation and Planning > Planning Unit
		Toxics Evaluation Unit	Bureau of Evaluation and Planning > Toxics Evaluation Unit
New Mexico	New Mexico DOT	CMAQ Program	Planning Division > Multimodal Planning and Programs Bureau > Active Transportation and Recreational Programs > Congestion Mitigation and Air Quality Improvement Program
New York	New York State DOT	Air Quality/Asbestos/Energy	Commissioner > Assistant Commissioner and Chief Engineer > Engineering Division > Environment > Air Quality/Asbestos/Energy
North Carolina	North Carolina DOT	Air Quality	Department of Transportation > Secretary of Transportation > Chief Operating Officer > Division of Highways > Environmental Analysis Unit > Traffic Noise and Air Quality
Ohio	Ohio DOT	Air Quality Manual and Guidance	Director > Chief Operating Officer > Assistant Director of Transportation Policy/Chief Engineer > Planning > Environmental Services
Oregon	Oregon DOT	Air Quality and Energy	Director > Assistant Director for Operations > Office of Maintenance and Operation > Geo-Environmental Section
Pennsylvania	Pennsylvania DOT	Air Quality	Secretary > Executive Deputy Secretary > Deputy Secretary for Highway Administration > Chief Executive > Bureau of Design and Delivery > Environmental Policy and Development > Air Quality
Texas	TxDOT	Environmental Affairs	Transportation Commission > Executive Director > Deputy Executive Director (Program Delivery) > Director Project Development > ENV
		Transportation Planning and Programming (TPP)	Transportation Commission > Executive Director > Deputy Executive Director (Planning and Administration) > Director Planning and Modal Programs > TPP
Tennessee	Tennessee DOT	Planning	Commissioner > Deputy Commissioner, Chief of Environment and Planning > Environmental Division > Environmental Technical Studies Office > Air Quality and Noise
Utah	Utah DOT	Planning Division	Executive Director > Deputy Director of Planning and Investment > Director of Program Development > Planning > Air Quality Modeling

State	State DOT	Program	Organization Structure
Virginia	Virginia DOT	Air Quality	Commissioner of Highways > Chief Deputy Commissioner > Chief of Policy > Environmental Division > Environmental Programs > Air Quality
Washington	Washington State DOT	Air quality, energy, and greenhouse gas emissions	Secretary of Transportation > Deputy Secretary > Assistant Secretary Multimodal Development and Delivery > Deputy Assistant Secretary Multimodal Development and Delivery > Multimodal Planning and Data Division > Environmental Services Office
Wisconsin	Wisconsin DOT	Environmental programs	Design Bureau > Assistant Bureau Chief-Preliminary Engineering > Environmental Coordination Engineering

2.5 AIR QUALITY WORK CATEGORIES

The TTI study team broadly categorized the work performed by the state DOT's dedicated air quality staff as "Regional Conformity", "Project-Level Conformity", "Regulatory Activities" (including NEPA and assistance provided to state environmental agencies on their SIP), and "Other Air Quality Works" (including providing technical guidance on air quality-related topics, air modeling, and updating air quality tools).

Table 6 summarizes the responsibilities listed for air quality or environmental staff on each state DOT's website, along with information that the TTI study team identified through a review of conformity reports from each state. As previously listed in Table 1, there are NAAQS nonattainment and/or maintenance areas in Arizona, California, Massachusetts, Montana, Oregon, Utah, and Wyoming outside the jurisdiction of any MPOs. Thus, the state DOTs in these states must also perform conformity determinations. While MPOs are responsible for conformity determinations for all nonattainment and/or maintenance areas in the other states, state DOTs must still assist in the process.

Table 6. Responsibilities as listed on the State DOT webpage or Conformity Report from the State

State	Responsibilities
Arizona	Administer and review project-level analyses; Administer and review regional conformity analyses; Assist with CMAQ application; Guide regional conformity; Guide project-level conformity; Interagency consultation; Prepare air quality plans for the EPA; Provide information and data on air quality, when requested
Arkansas	Provide information and data on air quality, when requested.
California	Administer and review project-level analyses; Assist with regional and project-level conformity; Develop/maintain/streamline air quality analyses tools/guidelines/processes; Facilitate/engage in interagency consultation; Guide project-level conformity; Guide regional transportation conformity; Manage air quality analysis related to transportation issues; Perform QA on all RTP/FTIP updates, formal amendments, and project-level non-CE conformity submittals

State	Responsibilities
Colorado	Administer and review project-level analyses; Administer research regarding transportation air quality-related issues; Assist with regional and project-level conformity; Develop/maintain/streamline air quality analyses tools/guidelines/processes; Facilitate/engage in interagency consultation; Implementing SIP strategies; Make initial regional/project-level conformity determinations; Manage air quality analysis related to transportation issues; Perform outreach and public involvement during project development/planning; Perform QA on all RTP/FTIP updates, formal amendments, and project-level non-CE conformity submittals; Perform transportation planning related to air quality; Provide guidance for project-level conformity
Connecticut	Administer and review project-level analyses; Administer and review regional conformity analyses; Assist with application process for CMAQ funding
Delaware	Administer and review project-level analyses; Provide assistance for issues related to transportation modeling (TDM-related)
District of Columbia	Review and approve transportation projects, TIP, and MTP
Georgia	Assist with application process for CMAQ funding; Facilitate/engage in interagency consultation; Provide information and data on air quality, when requested; Provide information and data on environmental subjects, when requested (NEPA, SEQRA)
Idaho	Develop/maintain/streamline air quality analyses tools/guidelines/processes; Promote emission reduction strategies; Provide guidance to ensure transportation projects comply with laws and regulations
Illinois	Perform transportation planning related to air quality; Promote emission reduction strategies; Provide guidance on departmental policy and procedures (state DOT, EPA, FHWA, etc.); Provide information and data on environmental subjects, when requested (NEPA, SEQRA)
Indiana	Administer and review regional conformity analysis; Determine air quality conformity budgets; Provide assistance for issues related to transportation modeling (TDM-related); Provide guidance for transportation-related subjects; Provide guidance to ensure transportation projects comply with laws and regulations; Provide technical support and assistance regarding transportation-related air quality issues
Kentucky	Administer and review project-level analyses; Perform air quality modeling; Provide guidance to ensure transportation projects comply with laws and regulations
Michigan	Administer and review project-level analyses; Administer and review regional conformity analysis
Minnesota	Perform air quality modeling
Missouri	Provide guidance to ensure transportation projects comply with laws and regulations
Montana	Administer and review regional conformity analysis; Analyze and evaluate Mobile Source Air Toxic (MSAT); Provide guidance to regional conformity
Nevada	Prepare or review NEPA documentation
New Hampshire	Assess air quality issues with state air agency; Assist with application process for CMAQ funding; Provide guidance to ensure transportation projects comply with laws and regulations
New Jersey	Analyze and evaluate MSAT; Assist with SIP development; Provide information and data on environmental subjects, when requested (NEPA, SEQRA)
New Mexico	Assist with application process for CMAQ funding; Provide guidance on transportation-related subjects
New York State	Administer and review project-level analyses; Provide guidance for project-level conformity; Provide guidance for regional conformity; Provide guidance for transportation-related subjects (TIP, STIP); Provide information and data on air quality, when requested; Provide information and data on environmental subjects, when requested (NEPA, SEQRA); Perform air quality modeling; Perform air quality monitoring; Perform emissions modeling
North Carolina	Administer and review regional conformity analysis; Develop/maintain/streamline air quality analyses tools/guidelines/processes
Ohio	Administer and review project-level analyses
Oregon	Administer and review regional conformity analysis; Provide guidance for project-level conformity; Provide guidance for regional transportation conformity

State	Responsibilities
Pennsylvania	Administer and review project-level analyses; Administer and review regional conformity analysis
Tennessee	Administer and review project-level analyses; Analyze and evaluate MSAT
Utah	Administer and review regional conformity analysis; Distribute information regarding departmental policy and procedures (state DOT, EPA, FHWA, etc.); Provide guidance for project-level conformity
Virginia	Collect and provide traffic data, when requested; Provide information and data on air quality, when requested;
Washington	Administer and review project-level analyses; Administer and review regional conformity analysis; Provide information and data on air quality, when requested; Provide guidance for transportation-related subjects; Provide transportation modeling assistance (TDM-related); Review and approve transportation projects, TIP, and MTP
Wisconsin	Administer and review regional conformity analysis; Develop/review regionally significant projects and changes; Facilitate/engage in interagency consultation; Provide information and data on air quality, when requested; Provide transportation modeling assistance (TDM-related); Review and approve transportation projects, TIP, and MTP
Texas	Administer and review project-level analyses; Collect and provide traffic data, when requested; Develop/maintain/streamline air quality analysis tools/guidelines/processes; Provide guidance on departmental policy and procedures (state DOT, EPA, FHWA, etc.); Perform outreach and public involvement during project development/planning; Provide guidance to ensure transportation projects comply with laws and regulations; Perform transportation planning related to air quality

2.6 COORDINATION MECHANISM

In Texas, representatives from the EPA, FHWA, TCEQ, TxDOT, and MPOs in nonattainment and/or maintenance areas, who comprise the Technical Working Group for Mobile Source Emissions (TWG), perform interagency consultation quarterly. From the literature review, TTI identified that most but not all state DOTs participate in conformity determination interagency consultation groups, regardless of MPO jurisdiction. The exceptions are as follows:

- Missouri – Interagency consultation occurs between members of the Mid-America Regional Council (MARC) working group, which consists of MARC, the Missouri Highway and Transportation Department, KDOT, the Missouri Department of Natural Resources, the Kansas Department of Health and Environment, FHWA, and EPA.
- Montana – The MDT is not involved in the interagency consultation group if the project falls under the jurisdiction of an MPO. If a project falls under MPO jurisdiction, the interagency consultation group consists of the Montana Department of Environmental Quality (DEQ), the affected MPOs, FHWA, and EPA. If a project falls outside MPO jurisdiction, then, the interagency consultation group will consist of the MDT Planning Division, DEQ, FHWA, EPA, and local entities.
- New Jersey – Conformity determination within nonattainment areas is made jointly by the FHWA and FTA, instead of NJDOT. Their Regional Air Quality Consultation and

Coordination process consists of members from the US EPA, FHWA, and FTA, as well as the MPO where the project falls.

- Tennessee - The Tennessee Air Pollution Control Division (TAPCD) is the agency responsible for transportation conformity activity in Tennessee. The Interagency consultation group members consist of TAPCD, the MPO, EPA, FHWA, and FTA.
- Virginia – The interagency consultation workgroup members include FHWA, EPA, the Virginia DEQ, and other local agencies.

2.7 DEDICATED AIR QUALITY STAFF

This section covers the number of dedicated air quality staff at each state DOT. However, it must be noted that a large majority of state DOTs do not include a full list of their staff on organization charts, and most of their employee directories are on the intranet only. The number of air quality staff listed here is based on information available on each state DOT's home page.

Many of the position titles provided list "environmental" or "air and noise" rather than just "air quality", thus, the TTI study team assigns full-time equivalent (FTE) factors according to the title. For example, an "air quality specialist" would be given an FTE of 1, an "air and noise program manager" would be given an FTE of 0.5, and an "environmental specialist" would be given an FTE based on the number of roles the environmental division lists on their website (i.e., air, noise, water, etc.), assuming equal distribution.

Table 7 shows the number of dedicated air quality staff (on an FTE basis) per nonattainment county and MPO, by state. California has the highest number of dedicated staff on an FTE basis, which equates to about one dedicated staff per 2.86 Counties and 1.2 dedicated staff per MPO. On average, the state DOTs have enough dedicated staff to assign one staff person per 4.45 nonattainment counties and 1.28 MPOs.

Table 7. Number of Air Quality Staff per Nonattainment County and MPO, by State

State	Dedicated Staff on an FTE basis	MPO in Nonattainment Area	Nonattainment County	Staff per MPO	Staff per County
California	14	12	40	0.86	2.86
Idaho	6	1	2	0.17	0.33
Colorado	4	1	9	0.25	2.25

State	Dedicated Staff on an FTE basis	MPO in Nonattainment Area	Nonattainment County	Staff per MPO	Staff per County
Indiana	3	2	4	0.67	1.33
Texas	2	4	20	0.50	10.00
Michigan	2	3	3	1.50	1.50
Arizona	1	3	7	3.00	7.00
Connecticut	1	3	8	3.00	8.00
Montana	1	0	2	0.00	2.00
Nevada	1	1	1	1.00	1.00
New Mexico	1	1	1	1.00	1.00
New York	1	4	10	4.00	10.00
Ohio	1	2	11	2.00	11.00
Oregon	1	0	1	0.00	1.00
Utah	1	1	8	1.00	8.00
Virginia	1	1	9	1.00	9.00
Average				1.25	4.45

Upon interviewing CalTrans staff, as well as acquiring survey results from CDOT and VDOT (more to be discussed in Chapter 3), we found that the number of staff at CalTrans and VDOT exceeded our estimations, whereas we slightly overestimated the number of staff at CDOT (3 versus 4). The TTI study team concluded that the data available online were too limited and/or outdated as most state DOTs only list the program managers or division chiefs and not their entire air quality staff on their web pages. Therefore, the estimations in Table 7 should be taken with caution, and any firsthand survey or interview data supersedes them.

3 SURVEY AND INTERVIEWS

As discussed in the previous chapter, the TTI study team experienced significant difficulties finding information on each state DOT's air quality work and staffing. To address this, the TTI study team used the information collected in the previous chapter to identify several notable state DOTs to interview, including: CalTrans (California), NYSDOT (New York State), CDOT (Colorado), and VDOT (Virginia). The agency staff that were contacted are listed in Table 8. Only CalTrans and VDOT was available to meet with the TTI study team before July 16th, 2024.

Table 8. DOT Staff Contacted for Interview

Agency	Staff	Response Date	Interview Date
CalTrans	Rodney Tavitias (rodney.tavitas@dot.ca.gov); Karishma Becha (karishma.becha@dot.ca.gov); Erika Espinosa Araiza (erika.espinosa.araiza@dot.ca.gov)	6/25/2024	7/2/2024
NYSDOT	Stephanie L. DeLano (Stephanie.Delano@dot.ny.gov)	6/25/2024	Not Responded
CDOT	Chris Laplante (christopher.laplante@state.co.us)	6/27/2024	7/22/2024
VDOT	Christopher Voight (Christopher.Voigt@VDOT.Virginia.gov)	7/9/2024	7/16/2024

The TTI study team sent the state DOT staff contact a list of questions, which is available in Appendix A. While they were not able to meet with the TTI study team before July 16th, 2024, the contacted CDOT and VDOT staff were able to provide their responses to the questionnaires.

3.1 SUMMARY OF CALTRANS INTERVIEW

3.1.1 Overview

Most of the areas under CalTrans' jurisdiction are in nonattainment or maintenance status for one or more CAPs under the NAAQS, including CO, ozone, PM₁₀, and PM_{2.5}. There are 18 districts with MPOs within CalTrans' region, and 14 of them are subject to transportation conformity.

CalTrans staff noted that among the CAPs, PM_{2.5} poses the biggest challenge as a nonattainment region triggers the requirement for project-level conformity determinations. The biggest issue that CalTrans faces regarding project-level conformity determinations is the lack of consistency between the regional transportation plan (RTP),

TIP, and other environmental documents. They also noted that the FHWA is very concerned about project funding sources and a lack of funding description or financial plan in the RTP or TIP has frequently resulted in project-level conformity determinations being rejected by the FHWA.

3.1.2 CalTrans Air Quality Staff

CalTrans has about **25 full-time** air quality staff around the state of California, with seven of them located at headquarters. These air quality staff are primarily in the Division of Planning and are supported by engineers from the Division of Environmental Analysis, who perform technical work such as modeling.

These staff members perform the following tasks:

- Administering and reviewing project-level analyses for NEPA,
- Assisting with regional conformity determinations,
- Administering transportation air quality research,
- Coordinating with state air agencies in SIP development,
- Performing CMAQ analysis, providing training, and assisting with transportation air quality requests from districts, MPOs, and local governments.

Additionally, as California is a NEPA assignment state, CalTrans also assists the FHWA with quality assurance reviews of any regional conformity determinations. For conformity assessments, CalTrans staff are most concerned about ensuring the analyses are performed according to agreed-upon procedures and resolving any inconsistencies between documents.

For every project-level conformity assessment, 4 to 20 hours of staff time are required. This is because CalTrans has a scoping document that helps frame the conformity assessments, and all the scope in the document must be met before CalTrans submits the review to FHWA. Staff must review the assessment under the same scopes whenever any amendments are made to the RTP or TIP, which CalTrans noted is the primary source of project delays. Additionally, NEPA documents must include conformity language, or else FHWA may sometimes request that any public announcements made without conformity language be redone.

Lastly, while CalTrans does not use outside consultants, most districts use consultants for air quality modeling, such as build and no-build scenarios.

3.1.3 CalTrans' Response to the PM_{2.5} NAAQS Amendment

For counties that may potentially be designated nonattainment for PM_{2.5} due to the recent NAAQS amendment, CalTrans voiced concerns about counties under the jurisdiction of MPOs that previously did not need to perform project-level conformity for PM_{2.5}, specifically San Diego and Shasta Counties. To meet the increased workloads, CalTrans is planning on hiring 1 to 2 new staff members to cover San Diego and Shasta Counties. They also noted that the most important matter is to provide both MPO and state DOT staff with appropriate training for project-level conformity assessments.

3.1.4 CalTrans Best Practices

Based on their experience, CalTrans staff were adamant that a modeling protocol, where all parties must concur on the details of the model, must be in place before performing any hot-spot analysis for projects of air quality concern. This ensures that the modeling does not stray from what was requested, such as producing area source emissions instead of the requested volume source emissions, and also protects state DOTs and their consultants from sudden changes from EPA and the federal level.

CalTrans receives between 20 to 30 project-level conformity reviews per year. They have developed an FHWA submittal package for project-level conformity which, if followed, will guarantee the determination gets approved by the FHWA⁶. CalTrans highly recommended that Texas MPOs follow the template they had already prepared when submitting a project-level conformity determination, as rejection from FHWA may cause delays of up to a year, especially if the project is determined to be of air quality concern.

For isolated rural counties that fall outside the jurisdiction of any MPOs, CalTrans typically only performs project-level conformity assessments for those counties once every five or six years. For project-level conformity in MPO areas, the project must be under a conformity plan or TIP. However, isolated rural areas do not follow the same planning guidelines as they do not have a conformity plan or TIP. Therefore, CalTrans is actively requesting FHWA to release guidelines for projects that fall under these isolated

⁶ The CalTrans FHWA Submittal Package is available at: <https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/ser/fhwa-submittal-package-a11y.docx>.

rural areas, as with the new PM_{2.5} standard adjustments, many isolated rural areas will fall under nonattainment status.

3.2 SUMMARY OF CDOT QUESTIONNAIRE ANSWERS

There are currently 15 counties in Colorado that are in nonattainment status for either CO, ozone, or PM₁₀. These counties are Adams, Arapahoe, Archuleta, Boulder, Broomfield, Denver, Douglas, Fremont, Jefferson, Larimer, Pitkin, Prowers, Routt, San Miguel, and Weld. Five of these counties (Archuleta, Fremont, Prowers, Routt, and San Miguel) do not fall under the jurisdiction of any MPOs.

Based on current monitoring data, CDOT is not anticipating any counties to be designated as nonattainment for PM_{2.5} with the February 2024 PM_{2.5} NAAQS amendment.

3.2.1 CDOT Air Quality Staff

CDOT provides the following air quality support:

- Administering research regarding transportation air quality-related issues,
- Providing CMAQ analysis and reporting,
- Providing air quality-related training,
- Scoping air quality resource analysis and supporting interagency collaborations,
- Reviewing air quality technical reports under NEPA, and
- Administering and reviewing project-level analyses for NEPA.
 - This task is mostly performed by technical experts outside of CDOT, as they have a memorandum of agreement (MOA) with the Colorado Air Pollution Control Division modeling staff.

There are two dedicated air quality staff in CDOT's Environmental Unit; one focuses on air quality and the other on GHG. Aside from these two dedicated air quality staff, the agency also uses outside consultants to perform air quality-related support. CDOT estimates that their agency normally dedicates three staff to support air quality-related work. As the state is not expecting any new PM_{2.5} nonattainment areas, there is no need for the DOT to hire more staff for this matter.

3.3 SUMMARY OF VDOT INTERVIEW AND QUESTIONNAIRE ANSWERS

According to VDOT staff, there is only one area in Virginia that is currently in nonattainment status: the Borthern Virginia area, which is in nonattainment for the ozone NAAQS, as shown in Figure 5. However, VDOT staff also noted that under the 2018 South Coast II court decision, three other areas (Fredericksburg, Richmond-Petersburg, and Hampton Roads) are subject to transportation conformity even though they are considered in attainment, as the applicable 1997 ozone NAAQS has been revoked by the EPA [7].

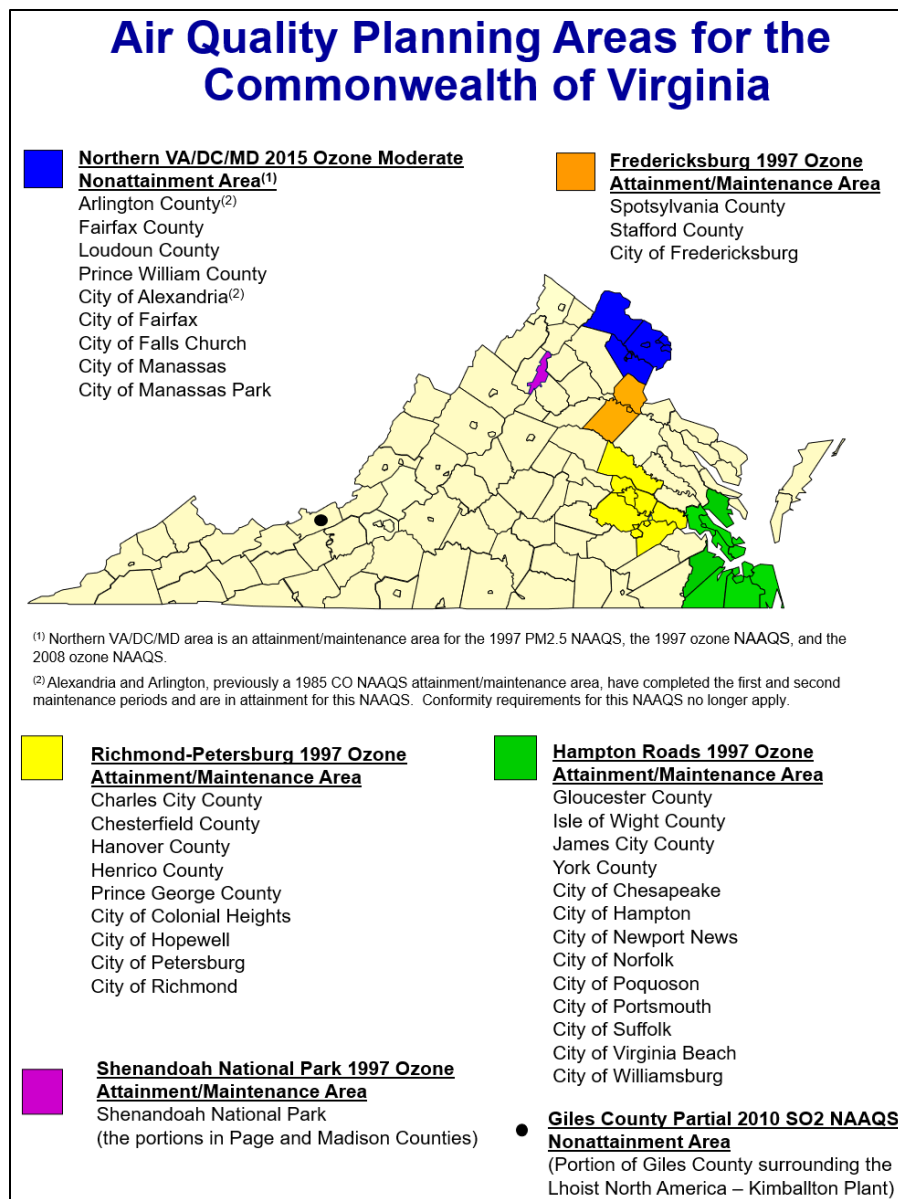


Figure 5. Commonwealth of Virginia Air Quality Planning Areas

Additionally, VDOT noted that three counties with nonattainment NAAQS status are outside the jurisdiction of any MPOs. However, two of these counties, Page and Madison, are nonattainment under the revoked 1997 ozone NAAQS, so they may be considered in attainment, whereas a portion of Giles County is in nonattainment for sulfur dioxide (SO₂), which does not trigger any conformity actions. Thus, VDOT does not perform any conformity determinations for these counties.

According to VDOT's monitoring data, all counties in Virginia do not exceed the new 9.0 µg/m³ standard based on 2022 through 2024 design values for PM_{2.5}. Thus, VDOT is not expecting any counties to be designated nonattainment for PM_{2.5}.

3.3.1 VDOT Air Quality Staff

The air quality support that VDOT provides includes:

- Administering and reviewing project-level analyses for NEPA,
 - This includes discretionary CO hotspot analysis, as well as mobile source air toxic (MSAT) and GHG or climate change analysis,
- Assisting with regional conformity determinations,
- Supporting research regarding transportation air quality-related issues,
- Coordinating with Virginia's state air agency in developing SIPs,
- Providing CMAQ analysis and reporting,
- Providing air quality-related training,
- Providing support to districts, MPOs, and local government regarding transportation air quality issues, and
- Working with the air quality subcommittee in the American Association of State Highway and Transportation Officials (AASHTO) on air quality-related issues.

Currently, there is a program manager and two air quality staff members in VDOT's Air and Noise Section within the Environmental Division. VDOT's Transportation and Mobility Planning Division will handle work related to traffic modeling if needed. The only district with air quality staff is the Northern Virginia-D.C.-Maryland ozone nonattainment area, and the staff in this district take their leads from the headquarter staff. VDOT mostly use outside consultants to perform most of their air quality-related

support, and a major part of the staff's role is to review the consultant's work. On a FTE basis, VDOT normally dedicates three staff to air quality support.

For conformity determinations, VDOT staff currently do not perform any emissions analysis, which falls under the responsibility of the MPO; VDOT only provides support on fiscal constraints assessments.

3.3.2 VDOT Best Practices

VDOT provides mandatory training for consultants to ensure they are aware of Virginia-specific data and procedures, as well as the federal requirements for project-level air quality analysis. VDOT provides consultants with three guidance documents: Scoping Guidelines, Resource Document (which includes an associated online data repository for modeling inputs), and a Template Report⁷. The goal of these documents is to get the FHWA, EPA, MPOs, and others involved in the conformity determinations to agree on the assumptions and default values used, such as the monitor that will be used to determine background concentrations.

As there are no government regulations on how CMAQ analysis must be performed or how accurate the analysis must be, VDOT encourages its districts, especially smaller ones without experienced air quality staff, to use the CMAQ spreadsheet they developed. This spreadsheet is simpler to use compared to the FHWA CMAQ spreadsheet and uses default values from the national database.

VDOT staff noted that emission rates from available databases and average speeds are suitable for project-level conformity analysis, rather than using microsimulation models. Microsimulation models are resource-intensive and only produce results for a very small area, which may not be suitable for PM_{2.5}.

3.4 SUMMARY FINDINGS

Two of the three state DOTs (CalTrans and VDOT) that the TTI study team interviewed/surveyed provide training to DOT, district, MPO, or local government staff, as well as the consultants that they use. Both of these DOTs also noted the use of scoping guidelines and reporting templates (CalTrans calls its template the FHWA

⁷ These documents, along with the National Cooperative Highway Research Program (NCHRP) 25-25 Task 96 report on generating traffic data and forecasts for project-level air quality analyses, are available on the VDOT website at: <https://www.vdot.virginia.gov/doing-business/technical-guidance-and-support/environmental/> (under the Air subsection).

Submittal Package) for project-level air quality analysis and conformity determinations. Along with the challenges that CalTrans staff noted for project-level analysis, which are inconsistencies in RTP, TIP, and other environmental documents and not submitting all of the required documentation during submittal, the TTI study team can conclude that establishing a template, either by using one of the other state DOT's templates or developing a Texas-specific one, is paramount, as it ensures that all necessary components of the analysis are present and in the required format. According to VDOT, having these documents also ensures that all agencies involved in the conformity determinations agree with the assumptions and default values used (i.e., the monitor that will be used to determine background concentrations).

CalTrans has around 25 air quality staff (seven at headquarters and one for each of the eighteen districts) supporting 14 districts, while VDOT has three air quality staff supporting between one and four areas. Note that none of the areas in VDOT's jurisdiction are subject to project-level conformity. During the interview with CalTrans, Mr. Rodney Tavitas, the Air Quality Planning Branch Chief, noted that three to four air quality staff would provide sufficient coverage if the state does not need to perform project-level conformity regularly, as is evident at VDOT. CalTrans has dedicated air quality staff for every district, indicating that for areas requiring project-level conformity, a dedicated air quality staff member is needed.

According to CalTrans, which has the most experience working with PM_{2.5} nonattainment counties and project-level conformities, it takes about 4 to 20 hours of staff time to review these project-level conformity documents. CalTrans, along with VDOT, has scoping guidelines available for DOT, district, MPO, or local agency staff who are preparing and reviewing the project-level conformity analysis. Even with these resources, CalTrans still experiences significant delays due to inconsistencies in documentation or steps within the analysis not being followed thoroughly. Both CalTrans and VDOT were adamant about providing training for personnel involved in project-level conformity. Thus, based on the interviews/surveys, TxDOT or a contractor should develop and provide training to all personnel involved with PM_{2.5} project-level conformity on an annual or on-demand basis.

4 SUMMARY

Based on the literature review and interviews/surveys, most state DOTs are actively involved in various responsibilities related to transportation air quality. These include administering and reviewing project-level analyses for NEPA, assisting with regional conformity determinations, supporting research on transportation air quality issues, coordinating with state air agencies on SIPs, conducting CMAQ analysis and reporting, providing air quality-related training, and offering support to districts, MPOs, and local governments regarding air quality issues.

In states where nonattainment counties or areas are not within MPO jurisdictions, the state DOT assumes the responsibility for regional and project-level conformity determinations. However, rural and isolated areas lacking RTP or TIP structures pose challenges. CalTrans has highlighted these issues to FHWA, advocating for new standard guidelines.

Organizational structures reveal that dedicated air quality staff at state DOTs typically operate within environmental or planning branches. Based on CalTrans' insights, FHWA prefers that personnel handling conformity issues be under the planning branch.

The current staffing levels at TxDOT for air quality support may suffice, particularly since only El Paso County currently requires project-level conformity determination for PM₁₀ and CO. However, impending changes to the PM_{2.5} NAAQS could designate up to thirteen Texas counties as nonattainment within a year, affecting eight MPOs. Many of these MPOs have not previously handled conformity determinations, including Atascosa County, which falls outside any MPO jurisdiction and thus falls under TxDOT's purview.

Given the challenges faced by CalTrans and VDOT regarding project-level conformity determinations—such as inconsistency between RTP, TIP, and environmental documents, as well as procedural discrepancies—both agencies have developed scoping guidelines and templates. The TTI study team recommends that TxDOT or its contractors adopt similar scoping guidelines and templates for Texas. Training should be provided annually or on-demand to all personnel involved in PM_{2.5} project-level conformity.

Furthermore, TxDOT's resources must support MPOs in conducting regional conformity demonstrations, especially in light of current and potential nonattainment areas for Ozone NAAQS. Thus, based on CalTran's example (one dedicated air quality staff per district), the TTI study team does not believe the current number of air quality-related staff at TxDOT is sufficient to meet the current and potential nonattainment area needs.

4.1 IMPENDING NONATTAINMENT DESIGNATION IN TEXAS

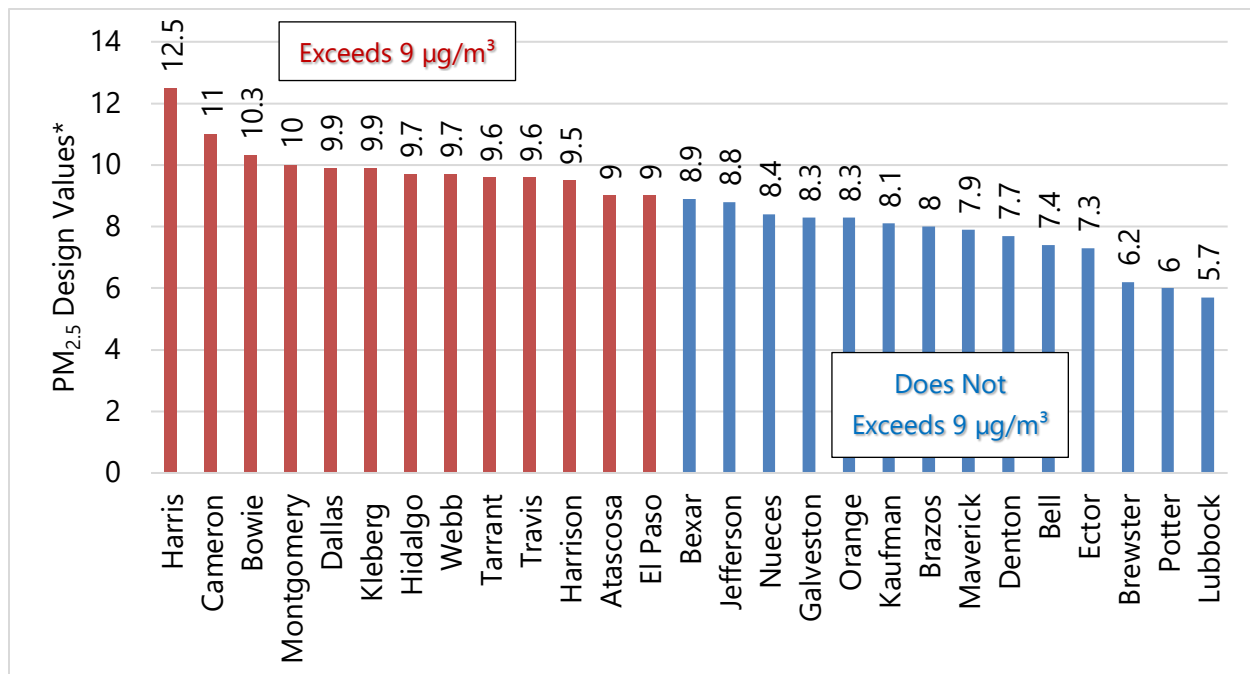
Based on the latest available design values for ozone and PM_{2.5}, coupled with the amendment in the PM_{2.5} NAAQS, Texas could potentially see up to two new ozone nonattainment areas and thirteen new PM_{2.5} nonattainment areas designated. More to be discussed in this section.

If a county is designated as nonattainment, conformity determinations for MTPs, TIPs, and non-exempt projects with FHWA and FTA funding must be demonstrated twelve months after the designation becomes effective. TxDOT would need to provide air quality support in these conformity determinations, either in the form of analysis, reviews, or training, in addition to the tasks already at hand.

4.1.1 Particulate Matter (PM)

Currently, there are no counties in Texas under nonattainment for particulate matter under 2.5 microns (PM_{2.5}). However, based on preliminary 2021-2023 annual design values for PM_{2.5}⁸, up to thirteen counties that were in attainment of the previous 12 µg/m³ standards are now at risk of being designated nonattainment under the new 9 µg/m³ standards if values do not improve at the monitors. These include: Atascosa, Bowie, Cameron, Dallas, Harris, Harrison, Hidalgo, Kleberg, Montgomery, Tarrant, Travis, and Webb Counties [8], as shown in Figure 6.

⁸ Calculated using Texas monitoring data. As of July 16th, 2024, the EPA is still working to finalize the 2023 PM_{2.5} design values. Upon finalization, the values will be available at <https://www.epa.gov/air-trends/air-quality-design-values>.



*Values based on EPA's Air Quality System (AQS) data; data are preliminary, have not been screened for completeness, and are subject to change.

Figure 6. Preliminary 2023 PM_{2.5} Design Values in Texas Counties [8]

Among the thirteen counties, the only county that currently needs to conduct project-level conformity determination is El Paso County, as it is nonattainment for PM₁₀ and in maintenance for CO⁹. Dallas and Tarrant Counties are under the jurisdiction of the North Central Texas Council of Governments (NCTCOG), while Harris and Montgomery Counties are under the jurisdiction of the Houston-Galveston Area Council (H-GAC). Both of these MPOs currently have counties in ozone nonattainment and thus need to perform regional conformity; however, neither MPO currently needs to perform any project-level conformity determinations. The rest of the counties fall under the jurisdictions of MPOs that do not currently have any nonattainment counties and thus do not need to perform conformity determination. These MPOs include Texarkana MPO, Corpus Christi MPO, Longview MPO, Rio Grande Valley MPO, Capital Area MPO, and the Laredo-Webb Area MPO. Significantly, Atascosa County, which is part of the San Antonio-New Braunfels Metropolitan Statistical Area (MSA), is not under the jurisdiction of any MPO.

⁹ El Paso County's current nonattainment and maintenance status are available at: <https://www.tceq.texas.gov/airquality/sip/elp/elp-status>.

Two years from the NAAQS promulgation date (around February 2026), the EPA will designate all areas of the country as either in attainment, nonattainment, or unclassifiable. As per the Clean Air Act (CAA), all PM_{2.5} nonattainment areas will initially be designated as “moderate” [5]. Counties designated as nonattainment for PM_{2.5} will need to perform project-level hot-spot analysis for new highway and transit projects that involve significant diesel emissions (dubbed “projects of air quality concern”). The important dates pertaining to the NAAQS amendment is shown in Figure 7.

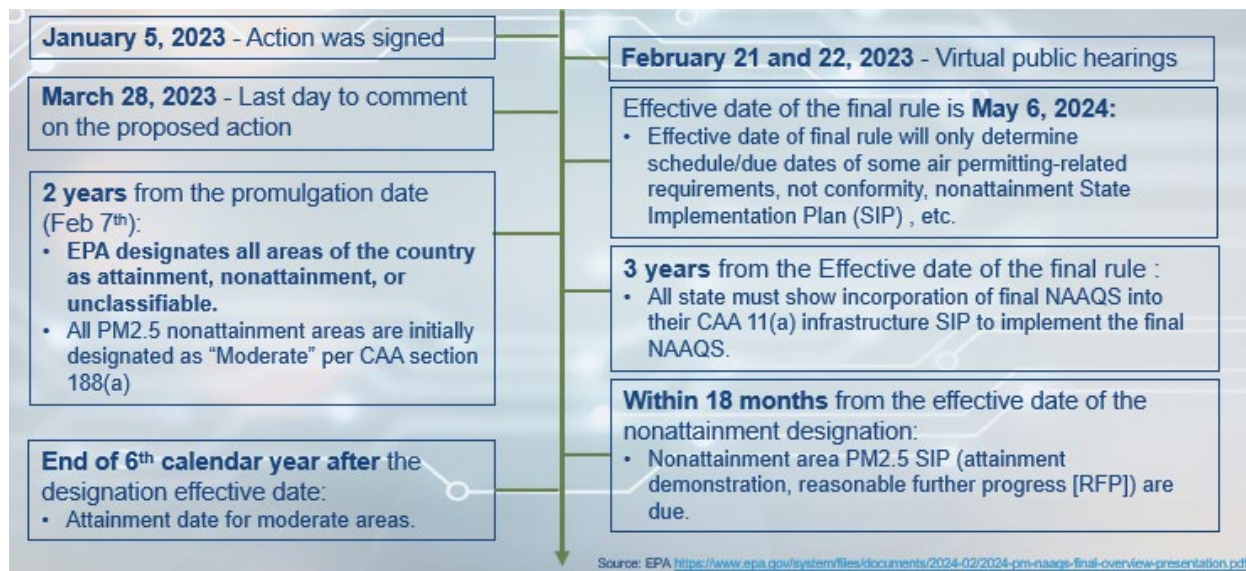


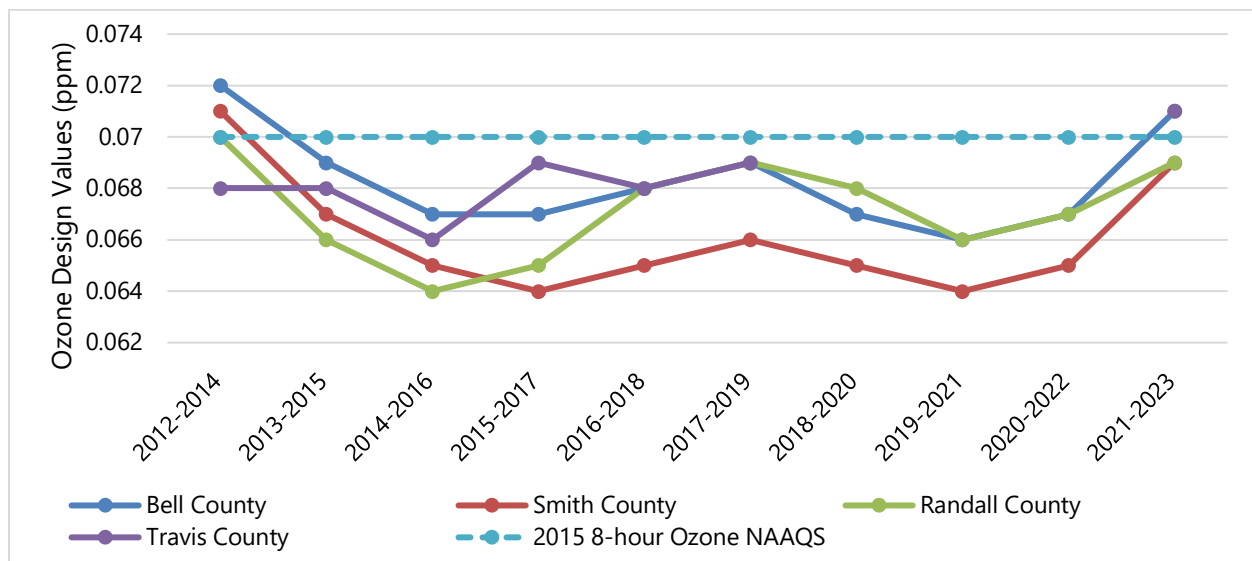
Figure 7. PM_{2.5} NAAQS Amendment Timeline

4.1.2 Ozone

For ozone, the current level of the 2015 8-hour ozone NAAQS is 0.070 ppm and the design value is the 3-year average of the annual 4th highest daily maximum 8-hour ozone concentration. Currently, there are four designated areas in Texas that are in nonattainment of the 2015 8-hour ozone NAAQS: Dallas-Fort Worth (moderate nonattainment), Houston-Galveston-Brazoria (moderate nonattainment), San Antonio (moderate nonattainment), and El Paso-Las Cruces (marginal nonattainment)¹⁰.

¹⁰ The El Paso-Las Cruces is a multi-state area that encompasses the Sunland Park in New Mexico and El Paso in Texas. In June 2023, the D.C. Circuit Court issued a decision to reverse the multi-state nonattainment area designation and reverted El Paso to its prior attainment designation. For more information: <https://www.epa.gov/ozone-designations/ozone-designations-regulatory-actions>.

The TTI study team downloaded the latest available (June 2024) 2021 through 2023 ozone design values from the EPA's website¹¹ and analyzed the highest design values for each county and area. Table 9 shows the 2021 through 2023 ozone design values for Texas counties with regulatory ozone monitoring. Monitoring stations in the Austin and Waco Districts, in Travis and Bell Counties respectively, saw their 8-hour ozone design values exceeding 0.070 ppm. In addition, the Amarillo and Tyler Districts both have monitoring stations with design values very close to the standard, at 0.069 ppm. The ozone design value trends for these four counties are shown in Figure 8, where the three counties with available data showed a continuous increasing trend between 2021 and 2023. These four districts do not have any counties designated as ozone nonattainment. If the trends persist, it may be inevitable that Texas will see additional nonattainment areas designated, which would trigger the need for regional conformity determinations.



Monitoring data not available at the Travis County site in 2020; thus, the 2018-2020, 2019-2021, and 2020-2022 design values were not available.

Figure 8. Ozone Design Values Trends for Bell, Smith, Randall, and Travis Counties

¹¹ The latest 2023 ozone design values are available for download from <https://www.epa.gov/air-trends/air-quality-design-values>.

Table 9. 2021 through 2023 Ozone Design Value (2015) by County and CBSA

District	County Name	FIPS	Core-Based Statistical Area (CBSA)	MPO	2021-2023 Design Value (ppm)	AQS Site ID
Amarillo	Randall	48381	Amarillo, TX	Amarillo	0.069	483819991
Atlanta	Harrison	48203	Marshall, TX	Longview	0.063	482030002
Austin	Travis	48453	Austin-Round Rock, TX	Capital Area	0.071*	484530014
Beaumont	Jefferson	48245	Beaumont-Port Arthur, TX	SETRPC	0.065	482450102
Beaumont	Orange	48361	Beaumont-Port Arthur, TX	SETRPC	0.063	483611001
Corpus Christi	Nueces	48355	Corpus Christi, TX	Corpus Christi	0.063	483550025
Dallas	Collin	48085	Dallas-Fort Worth-Arlington, TX	NCTCOG	0.078	480850005
Dallas	Dallas	48113	Dallas-Fort Worth-Arlington, TX	NCTCOG	0.075	481130075
Dallas	Denton	48121	Dallas-Fort Worth-Arlington, TX	NCTCOG	0.081	481211032
Dallas	Ellis	48139	Dallas-Fort Worth-Arlington, TX	NCTCOG	0.066	481391044
Dallas	Kaufman	48257	Dallas-Fort Worth-Arlington, TX	NCTCOG	0.067	482570005
Dallas	Navarro	48349	Corsicana, TX		0.065	483491051
Dallas	Rockwall	48397	Dallas-Fort Worth-Arlington, TX	NCTCOG	0.064	483970001
El Paso	Brewster	48043			0.063	480430101
El Paso	El Paso	48141	El Paso, TX	El Paso	0.074	481411021
Fort Worth	Hood	48221	Dallas-Fort Worth-Arlington, TX	NCTCOG	0.075	482210001
Fort Worth	Johnson	48251	Dallas-Fort Worth-Arlington, TX	NCTCOG	0.077	482510003
Fort Worth	Parker	48367	Dallas-Fort Worth-Arlington, TX	NCTCOG	0.073	483670081
Fort Worth	Tarrant	48439	Dallas-Fort Worth-Arlington, TX	NCTCOG	0.08	484391002
Houston	Brazoria	48039	Houston-The Woodlands-Sugar Land, TX	H-GAC	0.077	480391004
Houston	Galveston	48167	Houston-The Woodlands-Sugar Land, TX	H-GAC	0.074	481671034
Houston	Harris	48201	Houston-The Woodlands-Sugar Land, TX	H-GAC	0.083	482010055
Houston	Montgomery	48339	Houston-The Woodlands-Sugar Land, TX	H-GAC	0.071	483390078
Lufkin	Polk	48373			0.059	483739991

District	County Name	FIPS	Core-Based Statistical Area (CBSA)	MPO	2021-2023 Design Value (ppm)	AQS Site ID
Paris	Hunt	48231	Dallas-Fort Worth-Arlington, TX	NCTCOG	0.066	482311006
Pharr	Cameron	48061	Brownsville-Harlingen, TX	Rio Grande Valley	0.057	480611023
San Antonio	Bexar	48029	San Antonio-New Braunfels, TX	Alamo Area	0.076	480290052
Tyler	Gregg	48183	Longview, TX	Longview	0.065	481830001
Tyler	Smith	48423	Tyler, TX	Tyler	0.069	484230007
Waco	Bell	48027	Killeen-Temple, TX	Killeen-Temple	0.071*	480271047
Waco	McLennan	48309	Waco, TX	Waco	0.068	483091037
Yoakum	Victoria	48469	Victoria, TX	Victoria	0.06	484690003

SETRPC: South East Texas Regional Planning Commission; H-GAC: Houston-Galveston Area Council; NCTCOG: North Central Texas Council of Governments

*CBSA outside of existing designated areas that exceeded 0.07 ppm.

4.2 NEXT STEPS

The TTI study team is scheduled to conduct interviews with CDOT staff on July 22nd, 2022, to gather additional information. Following these interviews, the team will update the information documented in this report to reflect any significant changes.

Subsequently, the TTI study team will prepare a presentation based on the study's findings. They will collaborate with the TTI-TxDOT interagency contract (IAC) manager to determine an appropriate date for delivering this presentation to the TxDOT leadership team.

Based on a comprehensive review and the findings from surveys and interviews, we propose developing a Texas-specific modeling protocol document for hotspot analysis. This document will outline critical details such as data requirements, models utilized, default data, and underlying assumptions. Additionally, we recommend creating a training program tailored for potential nonattainment areas to prepare for future nonattainment designations. The TTI study team will consult with the TxDOT IAC manager to assess the urgency of implementing these elements.

The TTI study team has already developed draft questionnaires, which were distributed to select state DOTs during previous interviews. Following discussions with the TxDOT IAC manager, the team intends to propose conducting a comprehensive survey involving all state DOTs using the Qualtrics platform through AASHTO communication channels.

5 REFERENCES

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APPENDIX A – INTERVIEW QUESTIONNAIRS FOR STATE DOT

This appendix includes a PDF file of the interview questionnaires that were sent to the state DOTs, as discussed in Chapter 3. This appendix is only available electronically.