

2025 AIR QUALITY CONFORMITY ASSESSMENT

Overview

The Regional Transportation Plan must demonstrate conformity with federal Clean Air Act requirements as set forth in U.S. Environmental Protection Agency regulations. Without conformity, the Plan cannot be fully adopted and the advancement of transportation projects is severely limited.

In order to demonstrate conformity, an assessment of air quality in the SJTPO region was performed. The purpose of the assessment was to show that the improvements proposed in the Plan would result in the generation of emissions that are below the applicable emissions budgets, thereby demonstrating conformity.

Computer models were used to generate estimates of mobile source emissions resulting from the highway system. Conformity was determined by testing estimated emission levels against applicable emission budgets for the required test years. These years included: 2002, the anticipated milestone year under the upcoming Rate of Progress Plan; 2005, the Ozone attainment year; 2007, the CO budget test year; 2015, the interim year; and 2025, the RTP's horizon year.

As the SJTPO region is designated non-attainment for ozone, emissions of volatile organic compounds and oxides of nitrogen, precursors of ozone, were evaluated. Portions of the SJTPO region have also been designated as maintenance areas for carbon monoxide. Therefore, carbon monoxide emissions were evaluated in Salem and Atlantic Counties.

- **METHODOLOGY**
- **TESTING RESULTS**
- **ASSESSMENTS**

Methodology

Ozone (O₃) is a colorless gas associated with smog or haze conditions. Ozone is not a direct emission, but a secondary pollutant formed when precursor emissions, volatile organic compounds (VOCs), also known as hydrocarbons (HC), and oxides of nitrogen (NO_x), react in the presence of sunlight. Carbon monoxide (CO) is a colorless gas formed by the incomplete combustion of fuel. Anywhere combustion takes place (i.e. industrial processes, home heating, vehicle engines, etc.) high concentrations of CO can develop.

As part of the Clean Air Act Amendments of 1990, federal officials grouped areas into air quality control regions (AQCR) based on Census Metropolitan Statistical Areas (CMSA) for the purpose of air quality planning. In the SJTPO region, Atlantic and Cape May Counties were grouped into the Atlantic City AQCR. Cumberland and Salem Counties, along with Burlington, Camden, Cumberland, Gloucester, and Mercer Counties, were included in New Jersey's portion of the Philadelphia AQCR. Both of these AQCR were designated as Non-attainment Areas for ozone. However, in order to assist in the evaluation of air quality conformity in the SJTPO region, emission budgets for VOCs and NO_x were established for the SJTPO region as a whole. Two areas, Atlantic City and part of Penns Grove, are also now considered maintenance areas for CO. For the purposes of evaluating CO emissions, budgets were established for all of Atlantic County and Salem County, which encompass the maintenance areas.

A combination of computer programs centered around MOBILE5a and PPAQ (Post Processor for Air Quality) were used to assess air quality in the SJTPO region. MOBILE5a is a software package developed by the USEPA to calculate mobile source emissions. PPAQ is a software package used to pre-format and post-format data to and from MOBILE5a. It provides a linkage between MOBILE5a and the transportation model, the South Jersey Travel Demand Model (SJTDM).

Emissions are calculated for three categories of pollutants: volatile organic compounds, oxides of nitrogen, and carbon monoxide.

Test and Analysis Years

The first required analysis year, the anticipated milestone year under the upcoming Rate of Progress Plan, is 2002. The next is the ozone attainment year, 2005, when tests for VOC and NO_x are required. The next year of concern is the CO budget year, 2007, when tests are required for CO only. Since a full analysis is required only every 10 years, the 2007 CO tests may be done by interpolating between the results for analysis years. This was done using the 2005 and 2015 runs. The next analysis is for the year 2015 because it provides an interim year that is not more than 10 years from the 2005 analysis or from the Plan's horizon year of 2025. The Plan's horizon is the last analysis year required.

Applicable Tests and Budgets

The SJTPO region has emission budgets for all relevant pollutants, and as such, only budget tests are required to demonstrate conformity. The SJTPO regional budgets anticipated under the State's currently proposed Rate of Progress Plan State Implementation Plan (SIP) Revision were used for VOC and NOX tests. These budgets reflect new vehicle registration data that SJTPO must now incorporate in its assessment. Under the proposed SIP Revision, 17.49 tons per day of VOC and 33.02 tons per day of NOX are the budget levels for the year 2002. For 2005 and later, 13.36 tons per day of VOC and 26.42 tons per day of NOX are the budget levels for the SJTPO region. VOC and NOX budget levels corresponding to the analysis years of 2002, 2005, 2015 and 2025 are listed in Table 7-1 below. The values correspond to emissions generated for a July weekday, the prescribed analysis day/period for the VOC and NOX emission testing in the SJTPO region.

Table 7 - 1 - Budgets for VOC and NO_x (tons per day) for SJTPO

Budgets:	2002 (tons)	2005 (tons)	2015 (tons)	2025 (tons)
VOC	17.49	13.36	13.36	13.36
NO_x	33.02	26.42	26.42	26.42

*Budgets proposed December 31, 2000 – from Rate of Progress Plan SIP Revision.

CO budgets under the maintenance plan are evaluated at the county level to account for Atlantic City and part of Penns Grove maintenance areas. For the year 1997, 80.38 tons per day of CO was the budget level established for Atlantic County. For 2007, 59.13 tons of CO per day is the budget level. In Salem County, the 1997 budget for CO was 41.50 tons per day. The budgeted amount will fall to 31.33 tons per day in 2007. CO budgets for 1997, 2007, 2015, and 2025 are listed in Table 7-2 below. The test for CO was performed on a winter weekday.

Table 7-1 - Budgets for CO (tons per day) for SJTPO

Maintenance Areas

Budgets:	2002 (tons)	2005 (tons)	2007 (tons)	2015 (tons)	2025 (tons)
Atlantic County	80.38	80.38	59.13	59.13	59.13
Salem County	41.50	41.50	31.11	31.11	31.11

*Budgets effective December 7, 1995 – from attainment demonstration and maintenance plan submitted June 9, 1995.

Planning Assumptions

The latest planning assumptions must be used in the conformity analysis. Key elements utilized in the conformity assessment follow.

Population & Employment

Population and employment forecasts (as endorsed by the SJTPO TAC on May 5, 2000) were used to forecast future year traffic conditions in the SJTPO area. The assumptions for population and employment provide for three additional casinos, including the Borgata, but are lower than previously used.

Travel & Congestion

For all analysis years, VMT and VHT are calculated by the South Jersey Travel Demand Model. Base year VMT was adjusted based on NJDOT's Highway Performance Monitoring System (HPMS) estimates.

Transit Operation Policy and Fare Changes

NJTRANSIT, the statewide public transportation agency, has not had a fare increase in over 10 years. Transit ridership has continued to grow, providing a favorable effect on emissions.

Transportation Control Measures (TCMs)

Transportation Control Measures that were implemented in the region, as identified in previous SIPs, are included in the base network. The current SIP does not include any Transportation Control Measures. Therefore, neither the budgets nor the conformity analysis reflects any additional Transportation Control Measures.

Models and Inputs

There are several requirements for travel demand models for severe ozone areas. They are:

- General Model Requirements
- Consistency with the Highway Performance Monitoring System (MPMS)
- Vehicle Miles Traveled (VMT) estimates
- Reasonable Methods to Estimate Off-Network VMT
- Capacity and Volume Sensitive Speed and Delay Estimates
- Consistency with SIP Emissions Modeling Assumptions

The South Jersey Travel Demand Model (SJTDM) was used along with PPAQ (Post Processor for Air Quality). This model has been accepted and was used to establish the current 2005 budgets, as well as the proposed new budgets in the Rate of Progress Plan. The latest emissions model for New Jersey (Mobile 5.0a_h) was used to prepare the proposed Rate of Progress budgets and was used for the conformity analysis. The now available 1999 vehicle age and distribution data were used in the analysis process. Since the current version of Mobile 5.0a_h does not go beyond 2020, conformity for 2025 was based on 2025 SJTDM/PPAQ outputs and Mobile 5.0a_h emission factors for 2020.

Control measures included reflect those used to prepare the proposed Rate of Progress budgets. These include taking Tier 2/Low Sulfur credits for analysis years after 2004 when the program becomes effective.

Interagency Consultation

Requirements for interagency consultation were met primarily through an in-person meeting on conformity issues in the SJTPO region held on February 7, 2001. An informal pre-meeting was also held on December 19, 2000. Follow-up correspondence to the February 7 meeting completed the classification of exempt projects, which confirmed the list of projects for inclusion in the conformity analysis. In addition, this chapter of the draft RTP will be distributed to the participating agencies and further consultation will be conducted if needed.

Public Involvement Procedure

This chapter of the draft RTP summarizes the conformity determination and is subject to a 30-day comment period, in accordance with the SJTPO Public Involvement Policy. This will include extensive public notice, copies available for review, and a public meeting. Any questions on technical backup will be addressed upon request to the SJTPO.

Projects Analyzed

Categories of projects analyzed for the conformity determination included all non-exempt projects that had a sufficiently defined design concept and scope and that could be modeled, including non-federal projects (usually from transportation authorities), as follows:

- Most projects analyzed for the FY 2000 Conformity Update. These included projects from the FY 2001-2005 Project Pool and many non-federal projects. Differences reflected changes between this RTP and the previous one.
- All additional non-exempt projects that could be modeled from the FY 2000-2006 Project Pool and Study and Development Program.
- All additional expected non-exempt, non-federal projects that were identified through the Interagency Consultation process.

As agreed by the interagency group, some projects were modeled even though they may not be regionally significant, as defined for conformity. Regionally significant projects are the minimum that must be modeled, but including more provided a fuller perspective on emissions. It also allowed agreement on the projects to be analyzed before the interagency group could complete the difficult task of distinguishing which projects were regionally significant. The list of projects included in the action scenarios by analysis year is in Attachment 1.

Table 7-3 – Regional Travel Summary

	2000	2002 ACTION	2005 ACTION	2015 ACTION	2025 ACTION
Population	552,146	562,273	578,550	639,131	702,203
Employment	274,980	279,606	309,020	331,713	361,696
VMT Winter	29,131,102	29,985,731	32,204,843	36,824,356	41,414,674
VHT Winter	701,591	722,502	784,298	907,497	1,051,913
VMT Summer	39,416,847	40,354,430	43,594,850	48,695,072	54,545,220
VHT Summer	1,038,666	1,082,473	1,209,839	1,376,725	1,815,835

Testing Results

Demographic forecasts were input to the modeling process to generate future travel demand values. Network changes resulting from the addition of improvement projects were used to define the action scenarios based on the year the proposed improvement would likely be constructed. The combination of demographic changes and network changes were ran through the modeling process, and resulted in the overall estimates of VMT, VHT, and emissions generated in the SJTPO region. A summary of the population, employment, VMT, and VHT values generated in the SJTPO region is found in Table 7-3 below. The VMT and VHT data is summarized by analysis period, winter or summer, and is presented for comparative purposes.

Table 7-2 – Regional Travel Summary

	2000	2002 ACTION	2005 ACTION	2015 ACTION	2025 ACTION
Population	552,146	562,273	578,550	639,131	702,203
Employment	274,980	279,606	309,020	331,713	361,696
VMT Winter	29,131,102	29,985,731	32,204,843	36,824,356	41,414,674
VHT Winter	701,591	722,502	784,298	907,497	1,051,913
VMT Summer	39,416,847	40,354,430	43,594,850	48,695,072	54,545,220
VHT Summer	1,038,666	1,082,473	1,209,839	1,376,725	1,815,835

Assessments

Action Scenarios

The conformity assessment depicts the results of the Action Scenarios testing versus the budgets established for each emission level for the analysis years. To develop the action scenarios, the base year highway network, the highway system as it existed in the model in the year 2000, is used as the starting point. For each analysis year, the highway network is modified based on the projects to be analyzed, as identified in Attachment 1. For each analysis year, the SJTDM is re-run with the appropriate future year demographic inputs and the modified, “action” highway network assumed in place by the analysis year. The corresponding emissions generated are a result of both the future year demographic inputs and the new projects, or actions, added to the base network in the appropriate year. The emissions from these “action” scenarios are then compared to the corresponding analysis year emission budgets.

Plan Conformity Determination

As all tests passed for all required years, and all related requirements were met as reviewed above, the Regional Transportation Plan complies with federal Clean Air regulations and is a conforming plan.

Budget Tests

As was previously stated, SJTPO regional budgets anticipated under the proposed Rate of Progress Plan are used for VOC and NOX. Budgets for the analysis years for VOC and NOX, previously stated as 2002, 2005, 2015, and 2025, are listed below. CO budgets under the maintenance plan are evaluated at the county level to account for Atlantic City and part of Penns Grove. CO budgets are also listed below for years 2002, 2005, 2007, 2015, and 2025.

Budget tests were performed for VOC and NOX for the SJTPO region. The tests show whether improvement actions, or the action scenarios, keep emissions within budget. Results are determined by subtracting projected emissions from the budgeted amounts. The VOC and NOX budget tests for analysis years 2002, 2005, 2015, and 2025 all passed, as seen in the Tables 7-4 and 7-5 below.

Table 7-4 – VOC Budget Test, SJTPO (tons per day)

	2002	2005	2015	2025
Budget	17.49	13.36	13.36	13.36
Action	17.18	13.05	11.47	13.01
Budget-Action	0.31	0.31	1.89	0.35
Pass/Fail	Pass	Pass	Pass	Pass

Table 7-5 – NOx Budget Test, SJTPO (tons per day)

	2002	2005	2015	2025
Budget	33.02	26.42	26.42	26.42
Action	31.89	25.15	18.36	18.48
Budget-Action	1.13	1.27	8.06	7.94
Pass/Fail	Pass	Pass	Pass	Pass

The CO budget tests for the analysis years 2002, 2005, 2007, 2015, and 2025 also passed and are shown in the Tables 7-6 and 7-7 below.

Table 7-6 – CO Budget Test, SJTPO Maintenance Areas - Atlantic County (tons per day)

	2002	2005	2007*	2015	2025
Budget	80.38	80.38	59.13	59.13	59.13
Action	50.75	45.93	45.85	45.51	51.07
Budget-Action	29.63	34.45	13.28	13.62	8.06
Pass/Fail	Pass	Pass	Pass	Pass	Pass

Table 7-7 – CO Budget Test, SJTPO Maintenance Areas - Salem County (tons per day)

	2002	2005	2007*	2015	2025
Budget	41.50	41.50	31.11	31.11	31.11
Action	20.48	16.90	16.94	17.11	18.91
Budget-Action	21.02	14.21	14.17	14.00	12.20
Pass/Fail	Pass	Pass	Pass	Pass	Pass

* Interpolated between 2005 and 2015