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16



Air Quality Conformity

2012

REGIONAL TRANSPORTATION PLAN

16 Air Quality Conformity

The 1990 Clean Air Act Amendments (CAAA) require Metropolitan Planning Organizations within ozone nonattainment areas to perform air quality conformity determinations prior to the approval of Regional Transportation Plans (RTPs) and Transportation Improvement Programs (TIPs). Conformity is a way to ensure that federal funding and approval goes to those transportation activities that are consistent with air quality goals. This section presents information and analyses for the air quality conformity determination for the 2012 Regional Transportation Plan of the Franklin Regional Transportation Planning Organization (TPO), as required by Federal Regulations 40 CFR Parts 51 and 93, and the Massachusetts Conformity Regulations (310 CMR 60.03). This information and analyses include: regulatory framework, conformity requirements, planning assumptions, emissions budgets, and conformity consultation procedures.

Background

The Commonwealth of Massachusetts is classified as serious nonattainment for ozone, and is divided into two nonattainment areas. The Eastern Massachusetts ozone nonattainment area includes Barnstable, Bristol, Dukes, Essex, Middlesex, Nantucket, Norfolk, Suffolk, and Worcester counties. Berkshire, Franklin, Hampden, and Hampshire counties comprise the Western Massachusetts ozone nonattainment area. With these classifications, the 1990 Clean Air Act Amendments (CAAA) required the Commonwealth to reduce its emissions of volatile organic compounds (VOCs) and nitrogen oxides (NO_x), the two major precursors to ozone formation to achieve attainment of the ozone standard.

A prior conformity determination for all RTPs occurred in 2007, when the Federal Highway Administration (FHWA) – in consultation with the Environmental Protection Agency (EPA New England) and the Massachusetts Department of Environmental Protection (DEP) – confirmed that all

13 of the RTPs for the year 2007 in Massachusetts were in conformity with the Massachusetts State Implementation Plan (SIP). A summary of major conformity milestones in recent years is as follows:

Between 2003 and 2006, several new conformity determinations were made that were triggered by various events, including: The 2003 regional transportation plans, a change in designation from the one-hour ozone standard to an eight-hour ozone standard, and various changes to regional TIPs that involved reprogramming transportation projects across analysis years.

In 2007, air quality analyses were conducted on behalf of all the 2007 Regional Transportation Plans (RTPs), the purposes of which were to evaluate the RTPs' air quality impacts on the SIP. Conformity determinations were performed to ensure that all regionally significant projects were included in the RTPs. The Massachusetts Department of Transportation found the emission levels from the 2007 Regional Transportation Plans to be in conformance with the SIP.

On April 2, 2008, EPA found that the 2008 and 2009 motor vehicle emissions budgets (MVEBs) in the January 31, 2008 Massachusetts 8-hour ozone State Implementation Plan revision were adequate for transportation conformity purposes. The submittal included 2008 and 2009 MVEBs for the Boston-Lawrence-Worcester (Eastern Massachusetts) and Springfield (Western Massachusetts) 8-hour ozone nonattainment areas. Massachusetts submitted these budgets as part of the 8-hour ozone attainment demonstration and reasonable further progress plan for both nonattainment areas, and as a result of EPA's adequacy finding, these budgets were required to be used for conformity determinations. EPA later determined (in 2010) that only the most recent MVEBs - 2009 - be used for future conformity determinations.

In 2010, air quality analyses were conducted on behalf of all the 2011-2014 Regional Transportation Improvement Programs (TIPs), the purposes of which were to evaluate the TIPs' air quality impacts on the SIP. Conformity determinations were

performed to ensure that all regionally significant projects were included in the TIPs. The Massachusetts Department of Transportation found the emission levels from the 2011-2014 TIPs to be in conformance with the SIP. On November 15, 2010, EPA confirmed that both the Eastern and Western Massachusetts Non-Attainment areas collectively demonstrated transportation conformity, with concurrence from Massachusetts DEP on 11/23/10. On December 22, 2010, FHWA and FTA determined that the TIPs were in conformity with the Clean Air Act and the EPA conformity regulations (40 CFR Part 51).

Conformity Regulations

The CAAA revised the requirements for designated MPOs to perform conformity determinations by ozone non-attainment area for their RTPs and TIPs.

Section 176 of the CAAA defines conformity to a State Implementation Plan to mean conformity to the plan's purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards (NAAQS) and achieving expeditious attainment of the standards. The Franklin County TPO must certify that all activities outlined in the 2012 Franklin Regional Transportation Plan:

- Will not cause or contribute to any new violation of any standard in any area
- Will not increase the frequency or severity of any existing violation of any standard in any area
- Will not delay the timely attainment of any standard or any required interim emission reductions or other milestones in any area

The federal conformity regulations from EPA set forth requirements for determining conformity of Transportation Plans, Transportation Improvement Programs, and individual projects. The requirements of the conformity analysis are summarized below and will be explained in detail in this conformity determination:

- **Conformity Criteria**
 - Horizon Years
 - Latest planning assumptions
 - Latest emission model used

- Timely implementation of transportation control measures (TCMs)
- Conformity in accordance with the consultation procedures and SIP revisions
- Public Participation Procedures
- Financially Constrained Document

- **Procedures for Determining Regional Transportation Emissions**

- **The Conformity Test**

- Consistent with emission budgets set forth in SIP
- Contribute to reductions in CO nonattainment areas

In addition, the regulations set specific requirements for different time periods depending on the timeframe of the Commonwealth's SIP submittals to EPA. These periods are defined as follows:

- **Control Strategy Period:** Once a control strategy SIP has been submitted to EPA, EPA has to make a positive adequacy determination of the mobile source emission budget before such budget can be used for conformity purposes. The conformity test in this period is consistency with the mobile source emission budget.
- **Maintenance Period** is the period of time beginning when the Commonwealth submits and EPA approves a request for redesignation to an attainment area, and lasting for 20 years. The conformity test in this period is consistency with the mobile source emission budget.

Horizon Year Requirements

Horizon years for regional and state model analyses have been established following 40 CFR 93.106(a) of the Federal Conformity Regulations. The years for which the regional and state transportation models were run for ozone precursor emission estimates are shown below:

- **2010:** Milestone Year – This year is now being used by the statewide travel demand model as the new base year for calculation of emission reductions of VOCs and NOx.

- **2016:** Milestone Year and Analysis Year: This year is used to show conformity with the existing emission budgets for ozone precursors in Western Massachusetts.
- **2020:** Analysis Year
- **2025:** Analysis Year
- **2035:** Horizon Year – last forecast year of the regional transportation plan

Latest Planning Assumptions

Section 93.110 of the Federal Conformity Regulations outlines the requirements for the most recent planning assumptions that must be in place at the time of the conformity determination. Assumptions must be derived from the estimates of current and future population, households, employment, travel, and congestion most recently developed by the TPO. For the 2012 Franklin Regional Transportation Plan and other regional plans, the MassDOT developed a series of forecasts – in cooperation with all the MPOs – that represent the most recent planning assumptions for all of Massachusetts.

Assumptions are based on U.S. Census data, data from the Massachusetts Executive Office of Labor and Workforce Development, MassDOT forecasts, and other sources of information (used directly and indirectly), including the U.S. Bureau of Labor Statistics (BLS).

Transit Operating Policy Assumptions

For the Franklin County TPO, the transit operating policies are the continued primary responsibility of the Franklin Regional Transportation Authority (FRTA), and estimates of present and future ridership are developed by FRTA and MassDOT, using similar methods in place at the time of the last conformity determination.

Latest Emissions Model

Emission factors used for calculating emission changes were determined using MOBILE 6.2, the model used by DEP in determining motor vehicle emission budgets. Emission factors for motor vehicles are specific to each model year, pollutant type, temperature, and travel speed. MOBILE 6.2 requires a wide range of input parameters including inspection and maintenance program information and other data such as anti-

tampering rates, hot/cold start mix, emission failure rates, vehicle fleet mix, fleet age distribution, etc. The input variables used in this conformity determination were received from DEP and approved by EPA.

Timely Implementation of Transportation Control Measures

Transportation Control Measures (TCMs) have been required in the SIP in revisions submitted to EPA in 1979 and 1982. All SIP TCMs have been accomplished through construction or through implementation of ongoing programs.

DEP submitted to EPA its strategy of programs to show Reasonable Further Progress of a 15% reduction of VOCs in 1996 and the further 9% reduction of NOx toward attainment of the National Ambient Air Quality Standards (NAAQS) for ozone in 1999. Within that strategy there are no specific TCM projects. The strategy does call for traffic flow improvements to reduce congestion and, therefore, improve air quality. Other transportation-related projects that have been included in the SIP control strategy are listed below:

- Enhanced Inspection and Maintenance Program
- California Low Emission Vehicle Program
- Reformulated Gasoline for On- and Off-Road Vehicles
- Stage II Vapor Recovery at Gasoline Refueling Stations
- Tier I Federal Vehicle Standards

Consultation Procedures

The final conformity regulations require that the MPO make a conformity determination according to consultation procedures set out in the federal and state regulations, and the MPO must also follow public involvement procedures established under federal metropolitan transportation planning regulations. The consultation requirements of both the state and federal regulations require that the (Region) MPO (and all other MPOs), MassDOT, Mass. DEP, US EPA - Region 1 and FHWA – Massachusetts Division, consult on the following issues:

- Selection of regional emissions analysis models including model development and assessment of project design factors for modeling
- Selection of inputs to the most recent EPA-approved emissions factor model
- Selection of CO hotspot modeling procedures, as necessary
- Identification of regionally significant projects to be included in the regional emissions analysis
- Identification of projects which have changed in design and scope
- Identification of exempt projects
- Identification of exempt projects that should be treated as non-exempt because of adverse air quality impacts
- Identification of the latest planning assumptions and determination of consistency with SIP assumptions

These issues have all been addressed through consultation among the agencies listed above.

Public Participation Procedures

Title 23 CFR Section 450.322 and 310 CMR 60.03(6)(h) require that the development of the Regional Transportation Plan, TIP, and related certification documents provide an adequate opportunity for public review and comment. Section 450.316(b) also establishes the outline for MPO public participation programs.

Section 450.316(b) establishes the outline for MPO public participation programs. The Franklin Regional Council of Governments' public participation program was formally adopted in July 1994. The development and adoption of this program conforms to the requirements of this section. It guarantees public access to the 2012 Franklin Regional Transportation Plan and all supporting documentation, provides for public notification of the availability of the 2010 Franklin Regional Transportation Plan and the public's right to review the document and comment thereon, and provides a 30-day public review and comment period prior to the adoption of the 2012 Franklin Regional Transportation Plan and related certification documents by the Franklin County TPO.

On **July XX, 2011** a public notice was advertised in the *Greenfield Recorder* informing the public of its right to comment on the document. On **August XX, 2011**, the Franklin County TPO voted to approve the 2012 Franklin Regional Transportation Plan and its conformity determination. This allowed ample opportunity for public comment and Franklin County TPO review of the draft document. These procedures comply with the associated federal requirements.

Financial Consistency

Title 23 CFR Section 450.322 and 40 CFR 93.108 require the 2012 Franklin Regional Transportation Plan to "be financially constrained by year and include a financial plan that demonstrates which projects can be implemented using current revenue sources and which projects are to be implemented using proposed revenue sources."

The 2012 Plan is financially constrained to projections of federal and state resources reasonably expected to be available during the appropriate time frame. Projections of federal resources are based upon the estimated apportionment of the most recent federal authorizations, as allocated to the region by the state or as allocated among the various MPOs according to federal formulae or MPO agreement. Projections of state resources are based upon the allocations contained in the current Transportation Bond Bill and historic trends. Therefore, the 2012 Plan substantially complies with the federal requirements relating to financial planning.

Model Specific Information

40 CFR Part 93.111 of the federal regulations outlines requirements to be used in the network-based transportation demand models. These requirements include modeling methods and functional relationships to be used in accordance with acceptable professional practice and reasonable for purposes of emission estimation. MassDOT, on behalf of the Franklin County TPO, has used the methods described in the conformity regulations in the analysis of this 2012 Regional Transportation Plan.

Highway Performance Monitoring System Adjustments

As stated in EPA guidance, all areas of serious ozone and carbon monoxide nonattainment must use FHWA’s Performance Monitoring System (HPMS) to track daily vehicle-miles of travel (VMT) prior to attainment to ensure that the state is in line with commitments made in reaching attainment of the ambient air quality standards by the required attainment dates. MassDOT provided HPMS information to DEP. DEP used this information in setting mobile-source budgets for VOC, NOx, and CO in all SIP revisions prior to 1997. DEP has since revised its VOC and NOx budgets using transportation-demand model runs. However, the models must still be compared to HPMS data since HPMS remains the accepted tracking procedure as outlined in the regulations.

The conformity regulations require that all model-based VMT be compared with the HPMS VMT to ensure that the region is in line with VMT and emission projections made by DEP. An adjustment factor that compares the 2010 HPMS VMT to the 2010 transportation model VMT has been developed. This adjustment factor is then applied to all modeled VOC and NOx emissions for the years 2016 through 2035 to ensure consistency with EPA-accepted procedures.

2010 HPMS VMT

Adjustment factor = 2.434 for Franklin County
2010 Modeled VMT for VOC and NOx

HPMS adjustment factors, calculated on a regional basis, are applied to the model output of future scenarios, and they change as base-year models are updated or improved, or as HPMS data is revised or updated.

The latest factors for Western Massachusetts are contained in Table 16-1.

Changes in Project Design since the Last Conformity Determination Analysis

The Commonwealth requires that any change in project design from the previous conformity determination for the region is

identified. Changes that have occurred since the last conformity determination in 2010 are as follows:

- The modeled base year has changed from 2007 to 2010.
- A new analysis year has been included in the conformity determination. An air quality analysis has been completed for 2016. This complies with EPA’s Transportation Conformity Rule Restructuring Amendments (40 CFR Part 93.118, expected to become effective August 2011) which states that “if the attainment date has not yet been established, the first analysis year must be no more than five years beyond the year in which the conformity determination is being made.” (2011 base to 2016 analysis year).
- Emission factors have been developed for 2010, 2016, 2020, 2025, and 2035 using Mobile 6.2 with inputs approved by MassDEP and US EPA.
- New HPMS adjustment factors have been developed for the new 2010 base year.

Procedures for Determining Regional Transportation Emissions

The federal conformity regulations set specific requirements for determining transportation emissions, which are estimated from a combination of emission rates, HPMS volume data, and travel demand model projections. Travel demand models use estimates of population, households, and employment to project future travel volumes and patterns. Chapter 4 of the Plan presents these estimates as part of the existing and future regional transportation system.

Only “regionally significant” projects are required to

Table 16 -1: HPMS Adjustment Factors

REGION	2010 HPMS	Travel Demand	HPMS/ Model
	VMT (miles)	Model VMT (miles)	Adjustment Factor
Berkshire	5,168,000	2,150,783	2.403
Franklin	3,541,000	1,454,902	2.434
Pioneer Valley	15,229,000	10,085,310	1.510
Western MA	23,938,000	13,690,995	1.749
State Total	149,481,000	142,159,733	1.052

be included in the travel demand modeling efforts. The final federal conformity regulations define regionally significant as follows:

- **Regionally significant:** a transportation project (other than an exempt project) that is on a facility which serves regional transportation needs (such as access to and from the area outside of the region, major activity centers in the region, major planned developments such as new retail malls, sport complexes, etc., or transportation terminals as well as most terminals themselves) and would be included in the modeling of a metropolitan area's transportation network, including at a minimum all principal arterial highways and all fixed guideway transit facilities that offer an alternative to regional highway travel.

In addition, specific classes of projects have been exempted from regional modeling emissions analysis. The categories of exempt projects include:

- Intersection channelization projects
- Intersection signalization projects at individual intersections
- Interchange reconfiguration projects
- Changes in vertical and horizontal alignment
- Truck size and weight inspection stations
- Bus terminals and transfer points

Previous conformity amendments now allow traffic signal synchronization projects to be exempt from conformity determinations prior to their funding, approval or implementation. However, once they are implemented, they must be included in conformity determinations for future plans and TIPs.

The milestone and analysis year transportation model networks are composed of projects proposed in this RTP. Projects in these networks consist of all in-place regionally significant projects that can reasonably be expected to be completed by a given analysis/horizon year with consideration of available funding commitments. This project group would include, but not be limited to, regionally significant projects where at least one of

the following steps has occurred within the past three years:

- Comes from the first year of a previously conforming TIP,
- Completed the NEPA process, or
- Currently under construction or are undergoing right-of-way acquisition

A complete listing of future regionally significant projects for the entire Western Massachusetts Ozone Non-Attainment Area is provided in Table 16-2.

The emissions from the following MPOs have been combined to show conformity with the SIP for the Western Massachusetts Nonattainment Area:

- Berkshire Region MPO
- Franklin Regional Council of Governments*
- Pioneer Valley MPO

* This region does not contain any official urbanized areas, but is considered to be an MPO for planning purposes.

Using the latest planning assumptions, the Massachusetts Department of Transportation, Office of Transportation Planning, estimated the emissions for VOC and NO_x for all areas and all MPOs through a combination of the statewide and selected regional travel demand models (and with assistance from MPO staff). The VOC mobile source emission budget for 2009 for the Western Massachusetts Nonattainment Area has been set at 10.73 tons per summer day and the 2009 mobile source budget for NO_x is 27.73 tons per summer day. The results of the air quality analysis demonstrate that the VOC and NO_x emissions from all Action scenarios are less than the VOC and NO_x emissions budgets for the Western Massachusetts Nonattainment Area are shown in Tables 16-3 and 16-4.

Air Quality Conformity Analysis

The emissions from the following MPOs have been combined to show conformity with the SIP for the Western Massachusetts Nonattainment Area:

- Berkshire Region MPO

Table 16-2: Future Regionally Significant Projects for the Western Massachusetts Ozone Non-Attainment Area

Analysis Year	Community	Project Description – Pioneer Valley Region
2016	Chicopee	Deady Bridge signal coordination: Broadway/Montgomery, Main, and Belcher Streets
2016	Hadley	Route 9 widening Home Depot to Lowes.
2016	Holyoke, W.Springfield	Route 5 signal coordination from Ashley Ave. to Main St.
2016	Springfield, Wilbraham	Boston Rd. signal coordination Pasco Rd. to Stony Hill Rd.
2016	Westfield	Route 10/202 Great River Bridge - two bridges acting as one-way pairs.
2016	West Springfield	Improve the Union Street Railroad Underpass. Construct a truck bypass road.
2016	Through Region	Additional "Vermont" passenger rail service
2020	Chicopee/ South Hadley	Route 33 signal coordination and upgrades from Abbey St. to Fuller Rd.
2020	Hadley	Route 9 widening Middle Street to Lowes.
2020	Ludlow	Route 21 Center Street reconstruction and widening with center turn lane
2020	Northampton	Damon Rd. widening, improvements from Rte 9 to King St.
2020	Through Region	New Commuter Rail Service: Hartford, CT to Greenfield, MA
2025	Agawam	Connector, Route 5 to Route 57, eliminate rotary.
2025	Holyoke	Linden St. signal coordination and improvements at 5 intersections.
2025	Longmeadow	Route 5 signal coordination, improvements Converse St to Springfield city line.
2025	Westfield	Route 10/202 Elm Street, North Elm Street signal coordination.
2035	Agawam, Longmeadow, Springfield	South End Bridge improvements, including related work on I-91 between Exits 1-3.
2035	Agawam, West Springfield	Improvement to Route 5 access ramps for truck routing, route into CSX railyard.
		Project Description – Berkshire Region
2016	Great Barrington	Main St. intersection improvements, signalization upgrades and add turning lanes
2020	Pittsfield	Intersection widening, turning lane improvements First/Tyler & Tyler/Stoddard Ave
2025	Great Barrington	Realign & widen State Rd., including new bridge to replace the current Brown Bridge
2025	Lanesboro/Cheshire	Construct passing lanes on Route 8 between Mall Road and truck weighing station
2025	Pittsfield	Safety and capacity improvements on East St. between Elm St. and Merrill Road
2035	Pittsfield	Construct connector street from W. Housatonic St. to West St. near CSX yard
		Project Description - Franklin Region
2016	Through Region	Additional "Vermont" passenger rail service
2020	Greenfield, Deerfield, Whately	New Commuter Rail Service: Hartford, CT to Greenfield, MA

- Franklin Regional Council of Governments*
- Pioneer Valley MPO

* This region does not contain any official urbanized areas, but is considered to be an MPO for planning purposes.

Using the latest planning assumptions, the Massachusetts Department of Transportation, Office of Transportation Planning, estimated the emissions for VOC and NOx for all areas and all MPOs through a combination of the statewide and selected regional travel demand models (and with assistance from MPO staff). The VOC mobile source emission budget for 2009 for the Western Massachusetts Nonattainment Area has been set at 10.73 tons per summer day and the 2009 mobile source budget for NOx is 27.73 tons per summer day. The results of the air quality analysis demonstrate that the VOC and NOx emissions from all Action scenarios are less than the VOC and NOx emissions budgets for the Western Massachusetts Nonattainment Area are shown in Tables 16-3 and 16-4.

The Franklin County TPO has conducted an air quality analysis of the 2012 Franklin Regional Transportation Plan and its latest conformity determination. The purpose of the analysis is to evaluate the air quality impacts of the Plan on the SIP. The analysis evaluates the change in ozone precursor emissions (VOCs, and NOx) due to the implementation of the 2012 Franklin Regional Transportation Plan. The modeling procedures and assumptions used in this air quality analysis follow guidance from EPA and the Commonwealth and are consistent with all present and past procedures used by the Massachusetts DEP to develop and amend the SIP.

MassDOT has found the emission levels from all MPOs in Western Massachusetts – including from the 2012 Franklin Regional Transportation Plan – to be in conformance with the SIP according to conformity criteria. Specifically, the following conditions are met:

Table 16-3: VOC Emissions Estimates for the Western Massachusetts Ozone Nonattainment Area (all emissions in tons per summer day)

Year	Franklin County Action Emissions	Western MA Action Emissions	Budget	Difference (Action – Budget)
2010	n/a	10.947	n/a	n/a
2016	1.0069	6.832	10.73	-3.898
2020	0.8876	5.979	10.73	-4.751
2025	0.8204	5.534	10.73	-5.196
2035	0.8606	5.602	10.73	-5.128

Table 16-4: NOx Emissions Estimates for the Western Massachusetts Ozone Nonattainment Area (all emissions in tons per summer day)

Year	Franklin County Action Emissions	Western MA Action Emissions	Budget	Difference (Action – Budget)
2010	n/a	27.736	n/a	n/a
2016	1.7615	11.751	27.73	-15.979
2020	1.1442	7.732	27.73	-19.998
2025	0.8521	5.774	27.73	-21.956
2035	0.8902	5.018	27.73	-22.712

- The VOC emissions for the Action (build) scenarios are less than the 2009 VOC motor vehicle emission budget for analysis years 2016 through 2035.
- The NOx emissions for the Action (build) scenario are less than the 2009 NOx motor vehicle emission budget for analysis years 2016 through 2035.

In accordance with Section 176(c)(4) of the Clean Air Act as amended in 1990, the TPO for the Franklin County Region has completed its review and hereby certifies that the 2012 Franklin Regional Transportation Plan and its latest conformity determination satisfies the conformity criteria where applicable, and therefore conditionally conforms with 40 CFR Parts 51 and 93, and 310 CMR 60.03, and is consistent with the air quality goals in the Massachusetts State Implementation Plan.