

# **Draft Transportation/Air Quality Conformity Determination for the Orange County Portion of the NY-NJ-CT PM<sub>2.5</sub> Non-Attainment Area**

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**October 3, 2011**

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## **1.0 Introduction**

The US Environmental Protection Agency (EPA) requires that transportation/air quality conformity be demonstrated by metropolitan planning organizations (MPOs) in air quality non-attainment areas whenever transportation projects that may significantly impact air quality are planned and programmed. The Orange County Transportation Council (OCTC) is the MPO for OC responsible for ensuring that federal transportation dollars (highway and transit) are programmed through a locally driven, comprehensive planning process, involving the development of a Metropolitan Transportation Plan (MTP) (25-year plan), a Transportation Improvement Program (TIP), and a Unified Planning Work Program (UPWP). OC is also part of NY-NJ-CT non-attainment area for fine particulate matter (PM<sub>2.5</sub>) along with New York City, Long Island, Westchester and Rockland Counties. All air quality non-attainment areas are subject to a measure known as “transportation conformity,” which requires transportation and air quality officials to coordinate and ensure that transportation projects, such as road construction, do not affect an area's ability to reach its clean air goals. Federal transportation conformity regulations promulgated by the US Environmental Protection Agency (EPA) require transportation conformity to be demonstrated for the entire nonattainment whenever significant changes occur to certain transportation projects that might significantly affect air quality in any portion of an air quality nonattainment area. This conformity determination is being issued because OCTC is updating its Metropolitan Transportation Plan and removing transportation projects from the regional emission analysis that are no longer financially feasible given current and foreseeable future fiscal constraints. This narrative documents the process and analyses undertaken by OCTC to demonstrate compliance with EPA regulatory criteria for the OC portion of the NY-NJ-CT PM<sub>2.5</sub> Non-Attainment Area.

## **2.0 Background**

Fine particulate matter, also called PM<sub>2.5</sub>, is a mixture of microscopic solids and liquid droplets suspended in the air less than 2.5 micrometers (about one-thirtieth the diameter of a human hair) in size. Fine particles can be emitted directly (such as smoke from a fire, or as a component of automobile exhaust) or be formed indirectly in the air from power plant, industrial and mobile source gas emissions such as sulfur dioxide and nitrogen oxides.

The health effects associated with exposure to fine particulate matter may be significant. Scientific studies have shown a strong relationship between elevated fine particulate matter and decreased lung function, asthma attacks, as well as certain cardiovascular problems such as heart attacks and cardiac arrhythmia (as indicated by increased hospital admissions, emergency room visits, absences from school or work, and restricted activity days). While fine particulate matter is unhealthy for anyone to breathe, people with already compromised heart or lung function, as well as older adults and children are particularly at risk.

In July 1997, EPA issued National Ambient Air Quality Standards (NAAQS) for fine particulate matter (PM<sub>2.5</sub>) to protect the public from exposure to levels of PM<sub>2.5</sub> that may cause health problems. The 24-hour standard for PM<sub>2.5</sub> is set at 35 micrograms.<sup>1</sup> The annual standard for PM<sub>2.5</sub> is set at 15 micrograms per cubic meter based on the 3-year average of annual mean PM<sub>2.5</sub>

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<sup>1</sup> (When the NAAQS were first established, the 24-hour standard for PM<sub>2.5</sub> was set at 65 micrograms per cubic meter. In 2006, the standard was lowered to 35 micrograms per cubic meter by the EPA to further protect public health.)

concentrations. Regions not meeting PM<sub>2.5</sub> NAAQS or that contribute to violations of the standard in other regions are deemed to be part of non-attainment areas by the EPA. Non-Attainment areas are subject to a measure known as “transportation conformity,” which requires local transportation and air quality officials to coordinate planning efforts to ensure that transportation projects, such as road construction, do not affect an area’s ability to reach its clean air goals.

On April 5<sup>th</sup>, 2005, the United States Environmental Protection Agency (EPA) designated Orange County (OC) to be part of the NY-NJ-CT PM<sub>2.5</sub> Non-Attainment Area that includes New York City, Rockland and Westchester Counties, Long Island, Northern New Jersey and Southwestern Connecticut. As a result of this designation, OC and all the metropolitan planning organizations (MPOs) responsible for planning transportation improvements for these areas are required to demonstrate compliance with the Transportation Conformity Regulations promulgated by the EPA for PM<sub>2.5</sub>.

In September 2006, the EPA revised the 1997 fine particle standard. The 2006 standard strengthened the 24-hour PM<sub>2.5</sub> standard from 65 micrograms per cubic meter (µg/m<sup>3</sup>) to 35 µg/m<sup>3</sup>, and retained the current annual PM<sub>2.5</sub> standard at 15 µg/m<sup>3</sup>. On December 14, 2009, the NY-NJ-CT metropolitan area was classified non-attainment for the new 2006 24-hour PM<sub>2.5</sub> standard. Transportation conformity for those areas designated as non-attainment under the new standard applies one year after the effective date of the designations (i.e. December 14, 2010). The boundary of the non-attainment area for the 2006 24-hour PM<sub>2.5</sub> standard is identical to the boundary of the 1997 annual PM<sub>2.5</sub> non-attainment area. Accordingly, NYMTC and OCTC are demonstrating conformity to the new 2006 24-hour PM<sub>2.5</sub> standard and reaffirming conformity to the 1997 annual PM<sub>2.5</sub> standard at this time.

The New Jersey and Connecticut PM<sub>2.5</sub> motor vehicle emissions budgets (MVEB) for the 1997 annual PM<sub>2.5</sub> standard were found to be adequate by USEPA on and June 26, 2006 and June 20, 2007, respectively. The MVEB for the New York State portion of the NY-NJ-CT PM<sub>2.5</sub> area including Orange County and all NYMTC counties (except Putnam) was found adequate by USEPA on December 1, 2010. Thus, in accordance with the federal transportation conformity regulations, conformity to the annual PM<sub>2.5</sub> standard is being demonstrated by passing the annual budget test for both direct PM<sub>2.5</sub> emissions and nitrogen oxides (NO<sub>x</sub>).

Until a motor vehicle emissions budget for the New York State portion of the NY-NJ-CT 2006 24-hour PM<sub>2.5</sub> non-attainment area is found to be adequate by USEPA, the federal transportation conformity regulations at 40 CFR Part 93.109(k)(3)(i) require conformity to the SIP for the 2006 24-hour PM<sub>2.5</sub> standard to be demonstrated by passing the motor vehicle emissions budget that was established for the 1997 annual PM<sub>2.5</sub> standard.

### **3.0 Interagency Consultation & Coordination**

As part of EPA’s Transportation Conformity Regulations, interagency consultation and coordination are required. The NYS Interagency Consultation Group (ICG) is comprised of representatives from the U.S. Department of Transportation (Federal Highway and Transit Administrations), EPA – Region 2, NYS Department of Environmental Conservation (NYSDEC), the NYS Department of Transportation-Environmental Science Bureau (NYSDOT-

ESB) and OCTC. The group provides multi-agency guidance concerning the conformity process, as well as concurrence on the assumptions and methodology used to forecast vehicle miles traveled (VMT) and vehicular speeds with the OCTC Travel Demand Model. Generally, these outputs (VMT and vehicular speeds) form the basis for the “regional emissions analysis” using the most current version of EPA’s vehicle emissions model, *MOBILE6.2* to calculate vehicle emissions and the air quality impact of nonexempt projects in the OCTC Metropolitan transportation plan (MTP) and OCTC Transportation Improvement Program (TIP) for Federal Fiscal Year (FFY) 2011-2015.

#### **4.0 Format**

The format of this conformity determination follows the required subject matter that must be addressed pursuant to the transportation conformity regulations promulgated by the EPA to protect air quality and public health.

- 5.0 Latest Planning Assumptions**
- 6.0 Latest Emissions Model**
- 7.0 Consistency with each Metropolitan transportation plan**
- 8.0 Identification of Exempt/Non-Exempt & Regionally Significant Projects**
- 9.0 Timely Implementation of TCMs**
- 10.0 Documentation of Interagency Consultation Requirements**
- 11.0 Public Involvement**
- 12.0 Results of Emissions Analysis**
- 13.0 Evidence of MPO resolutions**

#### **5.0 Latest Planning Assumptions**

Federal and State regulations require that a conformity determination be based on the latest planning assumptions available at the time the regional emissions analysis begins. Specifically, information on demographic data, transit operating policies, transit service levels, transportation control measures and other key assumptions used to forecast vehicle miles traveled (VMT) and vehicular speeds by functional classification must be the latest information that is available. The VMT forecasts for Orange County are calculated with *Visum* modeling software based on assumptions involving future housing and employment in OC, the vehicular trips generated therefrom and future transportation improvements planned.

<p><b>Vehicle Miles Traveled:</b> used to measure vehicular travel in miles regardless of the number of persons in the vehicle.</p>
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- 5.1 Population, Housing, Employment and Travel Data.** In order to accurately duplicate existing traffic conditions and forecast future VMT, travel demand models rely on population, housing, employment and travel data to measure how the transportation system envisioned in a and/or Transportation Improvement Program and/or Metropolitan Transportation Plan will operate in the future. The OCTC Travel Demand Model does this by first incorporating important characteristics of the existing

transportation system such as road network, intersection and road capacities, traffic control devices, posted speeds and functional classification. Then housing and employment data are incorporated along with trip generation rates and trip length frequency parameters to replicate current travel patterns. These travel characteristics are used to forecast future traffic conditions and future travel demand based upon increases in housing, employment, vehicular trips and the likely routes people will take from place to place.

**Functional Classification:**

A means of grouping streets and highways into classes (e.g. interstates, arterials, collectors or locals) according to the type of service they provide (i.e. long distance vs. local) and the degree of land access permitted.

Housing and employment projections were made for each analysis year being evaluated (i.e. 2014, 2020, 2030, 2035, 2040) as part of PM<sub>2.5</sub> Conformity based on historic growth trends in OC. These projections are used to forecast future VMT in the OC Travel Demand Model and were revised for the update of the OCTC Metropolitan Transportation Plan (MTP). Overall, the projections used to demonstrate conformity are consistent with 2010 Census population and housing for OC and recent forecasts made by NYMTC. Table 1 below shows the projections for Orange County.

- 5.1.1 Population.** Source: Census 2010. Population and housing information from the 2010 Census together with building permit data and population growth trends over the past 20 years were used as the basis for determining the population and housing forecasts in the OC Travel Demand Model for future analysis years.
- 5.1.2 Employment.** Source: NYS Department of Labor. Employment information indicating the type, location and employment levels of all businesses in OC was updated for this conformity determination. This information was separated into six categories (retail, mall, non-retail, office, school and institutional) and aggregated by type and location to determine peak hour trips for each TAZ in the OCTC Travel Demand Model. Employment projections were based upon expected employment from approved development projects since the year 2009, as well as average growth rates in commerce throughout OC. The basic underlying premise is that future employment levels will be directly related to the influx of new people and increased demand for products and services created by the future growth in population.
- 5.1.3 Housing Units.** Source: NYS Office for Real Property Services (ORPS) Land use information for each parcel in OC was obtained for the year 2010 and aggregated by type and location to determine peak hour trips generated for both single-family and multifamily housing in each TAZ of the OC Travel Demand Model. Future single-family and multifamily housing units were projected based upon: proposed residential projects yet to be constructed in each TAZ, average growth rates in housing by municipality and the availability of sewer and water facilities.

**5.1.4 Households.** Source: Census 2010. Household information from the 2010 Census was used as a means of checking and verifying the housing data and occupancy information from the NYS Office of Real Property.

**Table 1. Demographic Forecasts for Orange County**

Orange	2010	2014	2020	2030	2035	2040	% Annual Growth	% Total Growth
<b>Population</b>	372,813	390,300	408,606	449,126	470,192	492,247	1.08	32
<b>Employment</b>	139,728	146,166	154,212	170,305	178,351	186,379	1.11	33
<b>Housing Units</b>	137,025	144,565	152,600	167,860	175,490	183,120	1.12	34
<b>Households</b>	125,925	133,000	140,000	154,000	161,000	168,000	1.11	33

**5.2 Transit Operating Policies.** Coach USA, MTA-MetroNorth Railroad, Newburgh-Beacon Bus Company, Middletown Transit, Monroe Bus Company and Kiryas Joel Transit provide the majority of mass transit services in Orange County along with 9 local dial-a-bus operators. According to Census Journey-to-Work information, only 4.7% of work related travel in OC had a mass transit component, with a majority of this travel involving vehicular trips to and from OC park and ride lots. While park and ride lots are included in the OC Travel Demand Model as trip generators, transit service is not modeled given the low rate of utilization in OC.

**5.3 Transit Service Levels.** The travel demand model does not incorporate significant changes in travel attributable to increased future transit service in Orange County. Significant changes in economic and/or environmental conditions together with steep increases in fuel costs that may significantly impact vehicular travel are also not forecast as part of future development scenarios.

**5.4 Transportation Control Measures.** No transportation control measures (TCMs) are identified for Orange County as part of the applicable NYS SIP. Therefore, the TCM implementation conformity criteria do not apply. There are also no transportation projects in the OCTC MTP and TIP that will interfere with the timely implementation of TCMs in other areas.

**5.5 Key Assumptions.**

**5.5.1 Demographics.** It is assumed that OC will experience near constant levels of growth over the next 30 years similar to those experienced over the past 30 years.

**5.5.2 Transportation System.** The OC Model further assumes that the regional transportation network will retain its ability to adjust to changes in travel demand with regard to vehicular traffic and mass transit services. This assumes that future transportation funding rates will be maintained and that technological advances in Intelligent Transportation Systems (ITS) will further improve the efficiency of the transportation system. In addition, the **Clean Air NY** program

funded in part by OCTC encourages all New Yorkers to make smart travel choices part of their daily routine. These choices have been demonstrated to result in less driving and air pollution. Per the concurrence of the ICG, a 1.39% reduction in daily vehicle miles traveled is incorporated into the OC “build” scenario travel demand modeling runs in the regional emissions analysis.

### 5.5.3 Projects Evaluated with an “Off-model” Process

Vehicle emissions reductions attributable to the **Enhanced Commuter Choice** non-exempt program in the OCTC TIP were calculated using methodology from EPA’s Commuter Model (Release 2) and applied to the emissions totals in the build scenarios of each future analysis year.

**Enhanced Commuter Choice** is a program being used by NYMTC, OCTC, PDCTC and NYSDOT in the Downstate region to increase awareness and use of commuting alternatives such as carpooling, vanpooling and walking. The program also looks to increase “employer support” for programs such as alternative work schedules and the use of pre-tax income to pay for transportation expenses such as TransitChek. Per the recommendation of USEPA, OCTC utilized the EPA COMMUTER model (Release 2) to estimate the impact of this program on commuter trips and VMT in Orange County. Local emission factors were applied to the averted trip VMT to estimate the total emissions reductions achieved by the program as indicated in the emissions calculations detailed in the appendix of this document.

## 6.0 Latest Emissions Model

**6.1 General.** The overall goal of transportation conformity is to ensure that transportation projects and the transportation system as a whole do not create new air quality violations or exacerbate existing violations. Travel demand modeling provides a means of quantifying vehicle miles traveled (VMT) and average vehicular speeds by functional classification of roadway. These outputs are utilized to calculate vehicular emissions using the most current version of the motor vehicle emissions model, *MOBILE6.2*, specified by the EPA.

**6.2 OCTC Travel Demand Model.** The traditional gravity modeling process incorporated within *Visum* software by PTV of America was utilized to forecast future travel demand and the impact of transportation projects in the OCTC MTP and TIP on air quality. The OC Travel Demand Model incorporates housing, employment, highway, along with trip generation and Census 2000 Journey-to-Work information to replicate existing travel patterns. Trips are distributed and assigned to the least time travel paths between traffic analysis zones based primarily on the methodology recommended in National Cooperative Highway Research Program Report 365 (NCHRP 365), Travel Estimation Techniques for Urban Planning. Using the trip generation and trip length parameters of the calibrated base year model, future travel conditions, vehicle

miles traveled (VMT) and vehicular emissions were forecast using projected increases in housing, employment and vehicle trips therefrom in OC for each analysis year being evaluated. Transit was not modeled given that transit service does not comprise a significant portion of travel in OC.

- 6.2.1 Land Use Patterns & TAZs.** Traffic Analysis Zones (TAZ's) serve to divide an area geographically into units describing different land use types and intensities. Centroids are the points within TAZs where, for modeling purposes, trips commence and terminate based upon the land use activities therein. To accurately replicate base year traffic conditions, it is necessary to accurately describe the location of land use activities relative to where traffic actually enters and leaves the highway network. Not every driveway need be represented, however, only the significant local and collector roads channeling traffic to the roads and intersections being evaluated. The OCTC model incorporates a total of 550 TAZs, 515 internal zones and 35 external zones connecting OC with surrounding counties. The 515 internal TAZ's were created by first delineating limited access highways, rights-of-way (rail and power lines), state lands (Stewart Properties and Parks) and natural features (rivers and mountains) which divide OC by restricting directional traffic flow. These districts were then further subdivided into TAZs bounding residential neighborhoods and centers of activity (e.g. Malls and Central Business Districts) where vehicle trips tend to start and end.
- 6.2.2 Analysis Years.** Consistent with 40 CFR Part 93, VMT and vehicular speeds were forecasted by functional classification for the years 2014, 2020, 2030, 2035 and 2040, complying with the federal requirements for PM<sub>2.5</sub> non-attainment areas with motor vehicle emissions budgets that: the first analysis year be no more than five years from the year in which the conformity determination is being made, that the attainment year for the 2006 24-hour PM<sub>2.5</sub> standard is analyzed, that consecutive analysis years be no more than ten years apart, and that the horizon year of each affected MPO's MTP be incorporated into the regional emissions analysis. Analysis year 2014 meets the requirement that the first analysis year be no more than five years from the date the conformity determination is being made and also is the attainment year for the 2006 24-hour PM<sub>2.5</sub> standard. Analysis year 2035 corresponds to the horizon year of the NYMTC MTP, while 2040 is the horizon year of the OCTC and PDCTC MTPs. The years 2020 and 2030 are intermediate years between 2014 and 2040, satisfying the conformity requirement that consecutive analysis years be no more than ten years apart.
- 6.2.3 Trip Generation.** Trip generation is the means of quantifying the number and type of trips to and from each TAZ in the OC Travel Demand Model based upon the type and amount of land use activity therein. Essentially, the purpose of trip generation is to have the model accurately reflect the average trip making characteristics of people within a specific timeframe. In this case, the average trip making characteristics of people in OC were determined for the PM (peak hour, the time of day when traffic congestion tends to be the

heaviest. Trips in the OC Travel Demand Model were first calculated for each TAZ and then separated into different types based upon purpose. The reason for separating trips by purpose is to account for variable trip lengths. Numerous travel surveys indicate that people are willing to drive farther between home and work than they are between home and shopping. Thus, the purpose of a trip determines its length; trip length, together with the number of trips generated in a model, determine traffic volumes and vehicle miles traveled.

**6.2.3.1 External Trips.** External trips to and from areas outside OC were determined by the directional split of traffic on each major highway and road segment (external links) connecting Orange with the surrounding counties. Trips traveling through OC between external links were estimated using journey-to-work information from the Census 2000 Transportation Planning Package.

**6.2.4 Trip Distribution.** Trip distribution is the process by which trip origins are apportioned throughout a study area based on the number of trip destinations in each TAZ and the distance/travel time impedance between them. The underlying premise is that people tend to interact more when the time to do so is less. Thus, there are a greater number of trips between places that are densely developed and located near one another than those less densely developed miles apart. Accordingly, vehicles in the OC Travel Demand Model are routed on the shortest distance/time paths in the OC highway network between TAZs first, and then to other more circuitous routes as traffic congestion makes the shorter distance routes more time consuming.

**6.2.5 Model Calibration.** Generally, model calibration is the process by which the travel parameters of a model are adjusted to reflect actual base year traffic counts. Traffic volumes assigned by the model are compared to actual traffic counts through regression analysis. The differences between the counts and the assignment volumes are used to modify trip generation rates, trip length exponents and, in some instances, land use quantities where errors become evident. One or two variables are modified followed by a model run to determine the effect of such modifications. This is repeated, iteratively, until volumes assigned by the model meet acceptable error deviation levels as defined in National Cooperative Highway Research Report 255, Highway Traffic Data for Urbanized Area Project Planning and Design.

**6.3 MOBILE6.2.** The USEPA developed the MOBILE emissions model, with the latest revision occurring on January 27, 2002 through the official release of MOBILE6.2; this version has been required of all states (except California) since January 27, 2004. The emissions model predicts gram per mile emissions of Hydrocarbons (HC), Carbon Monoxide (CO), Nitrogen Oxides (NO<sub>x</sub>), Carbon Dioxide (CO<sub>2</sub>), and Particulate Matter (PM) under various seasonal and operating conditions. Emission factors developed by NYSDOT-ESB based on MOBILE 6.2 were used to measure the air quality impacts of implementing the proposed projects in the Metropolitan

Transportation Plan and TIP. The modeling inputs used to develop the emission factors are the most recent inputs that have been established in consultation with the New York State Department of Environmental Conservation (NYSDEC) and the New York State Air Quality Conformity Interagency Consultation Group (ICG). As described in the section below, these model inputs include the latest existing and future emissions control programs included in the SIP, and the latest MOBILE 6.2 input assumptions on characteristics of the existing and future vehicle fleets traveling on roadways in Orange County.

### **Latest Emissions Model**

In order to conduct the required regional PM<sub>2.5</sub> emissions analyses for Orange County, emission factors developed by the NYSDOT Environmental Science Bureau in September 2010 were used. The emission factors were generated using the EPA motor vehicle emissions model, MOBILE6.2. The modeling inputs and parameters used to develop the emission factors are the most recent inputs for Orange County established in consultation with the New York State Department of Environmental Conservation (NYSDEC) and the New York State Air Quality Conformity Interagency Consultation Group (ICG). Specific modeling inputs and parameters used to develop the emission factor tables for Orange County are described below:

Evaluation Months – To meet the requirements of an annual emissions budget test, emissions in each of the month of the year were estimated in this regional emissions analysis and summed to an annual emissions total.

Vehicle Registration Distribution - Year 2007 registration data were used to model all future analysis years.

Vehicle Mileage Accumulation Rate - The EPA default mileage accumulation rate data (provided with the MOBILE6.2 model) was used for all modeling years.

I/M Programs - NYSDEC inspection and maintenance (I/M) program data were used in the emission modeling. The NYSDEC file, NYVIPup.d, contains data for the Upstate NY I/M program. This file was used for modeling all future analysis years.

Anti-Tampering Program – The anti-tampering program data described in the table below was used to model all analysis years:

<b>ANTI-TAMPERING PROGRAM DATA</b>	
<b>Parameter</b>	<b>Years 2002 – 2035</b>
Beginning calendar year	1984
Earliest model year	(Current yr – 25 yrs)
Final model year	(Current yr – 2 yrs)

**Draft Orange County Conformity Determination for the NY-NJ-CT PM<sub>2.5</sub> Non-Attainment Area,  
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Light-duty vehicles subject to inspection	LDGV, LDGT1, LDGT2, LDGT3, LDGT4
Heavy-duty vehicles subject to inspection	HDGV2B, HDGV3, HDGV4
Annual or biennial	Annual
Compliance rate	98%
Component inspections (see MOBILE6.2 User's Guide)	All except tailpipe lead deposit test

Fuel Program and Fuel RVP- Average and maximum fuel sulfur levels and fuel Reid Vapor Pressure (RVP) levels were specified in the input files (as listed in the below).

<b>FUEL SULFUR AND RVP LEVELS</b>				
<b>Dutchess, Orange and Putnam Counties</b>				
Year(s)	Months	Fuel Sulfur Levels (ppm)		RVP (psi)
		Average	Maximum	
2002	Jun, Jul, Aug	85	1000	6.8
	Mar, Apr, May, Sept, Oct, Nov	137	1000	12.5
	Dec, Jan, Feb	111	1000	9.7
2014 - 2035	Jun, Jul, Aug	30	80	6.8
	Mar, Apr, May, Sept, Oct, Nov	30	80	12.5
	Dec, Jan, Feb	30	80	9.7

Gasoline fuel oxygenate data were also specified in the input files (as listed in the Table below).

<b>GASOLINE FUEL OXYGENATE DATA</b>				
<b>Dutchess, Orange and Putnam Counties (Reformulated Gasoline Program)</b>				
Year(s)	Months	Oxygenate Type	Oxygenate Content (% by volume)	Market Share Fraction of Oxygenate
2002	Jun, Jul, Aug	MTBE	10.4%	0.98
		TAME	1.01%	0.02
	Mar, Apr, May, Sept, Oct, Nov	MTBE	9.55%	0.97
		TAME	0.63%	0.03
	Dec, Jan, Feb	MTBE	8.7%	0.96
		TAME	0.3%	0.04
2014 - 2035	All Months	Ethanol	5%	1.00

Temperature and Humidity - County-specific hourly temperatures and relative humidity levels for each month of the year as verified by NYSDEC in Summer 2010 were used in the modeling.

Diesel Sale Fractions - Diesel sale fractions for NYSDOT Region 8 were used in the modeling. Year 2007 diesel sale fractions were used to model all future analysis years.

Vehicle Start Distribution - County-specific vehicle start distribution data as received from NYSDEC in Spring 2007 were used in the modeling.

VMT by Hour - County-specific VMT data (allocated by hour of day) as verified by NYSDEC in Spring 2007 were used in the modeling.

Low-Emission Vehicle (LEV) Standards - The following files were used to model the effects of implementing California's LEV I/LEV II programs in New York State:

- L2CERT.d – Specifies the LEV II 50,000-mile certification standards
- L2EVAP.d – Specifies the phase-in schedule for the LEV II evaporative emission standards
- L2EXH.d – Specifies the phase-in schedule for the LEV II exhaust emission standards
- LEV2.d – Provides fleet penetration fractions for light-duty gasoline vehicles under the LEV I/LEV II programs

Weighted emissions by vehicle type - The emission factors for each individual vehicle type were weighted according to the NYSDOT Region 8 vehicle distributions by roadway functional class and then summed to obtain composite emission factors. NYSDOT developed the vehicle distribution data in 2004 using the most recently available traffic count data. These vehicle distributions were based on the results of the 1995 and 2001 National Household Transportation Survey (NHTS) Data. A new NHTS is underway and the results of the revised NHTS survey will be considered in the development of future vehicle distributions.

These model inputs include the latest existing and future emissions control programs included in NYSDEC's statewide mobile source emission inventory, and the latest MOBILE6.2 input assumptions for the existing and future vehicle fleets traveling on roadways in Orange County. The MOBILE6.2 input and external data files are available by contacting the NYSDOT Environmental Science Bureau.

## **7.0 Consistency with Metropolitan Transportation Plans (MTP)**

The transportation projects proposed in the OCTC 2011-2015 TIP and OCTC Metropolitan Transportation Plan (MTP) adhere to the goals and objectives of SAFETEA as listed below:

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity and efficiency
- Increase the safety and security of the transportation system for motorized and non-motorized users
- Increase the accessibility and mobility options available to people and for freight
- Protect and enhance the environment, promote energy conservation, and improve quality of life

- Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight
- Promote efficient system management and operation
- Emphasize the preservation of the existing transportation system.

The OCTC MTP expands upon the planning factors of SAFETEA by integrating the smart growth and sustainable development principles in the Orange County Comprehensive Plan (OCCP), *Strategies for Quality Communities* that promote:

- Neo-traditional, mixed-use development
- Workforce housing near centers of employment
- Compact development in and around already built environments
- Open space, farmland & environmentally sensitive land preservation
- Pedestrian and bicycle friendly design
- Connectivity between activity nodes
- Access management along arterials and collectors
- Traffic calming to reduce vehicular speeds
- Adequate but not excessive parking
- Transit services and multi-modal centers
- Advances in technology (e.g. Intelligent Transportation Systems)

Generally, the projects in the OCTC 2011-2015 TIP can be categorized into six areas: 1) replacement and rehabilitation of existing highway and transit infrastructure and facilities; 2) safety improvements; 3) mobility enhancements promoting alternative travel modes; 4) operations and systems management increasing the efficiency of the existing transportation system; 5) studies identifying potential transportation improvements and, lastly; 6) capacity projects expanding highway and transit infrastructure and services. Thus, the projects in the OCTC 2011-2015 TIP are consistent with the policies in OCTC MTP, SAFETEA and the OCCP.

## 8.0 Identification of Exempt, Non-exempt and Regionally Significant Projects

**8.1 General.** An important part of transportation conformity involves identifying transportation projects that may affect regional air quality. The transportation conformity regulations promulgated by the EPA provide guidance on classifying transportation projects as either exempt, nonexempt or regionally significant. **Exempt** transportation projects are those that enhance the safety of the transportation system, promote existing ridesharing programs, improve bicycle and pedestrian modes of travel, and/or involve the operation/replacement of existing transit facilities. **Nonexempt** transportation projects are those, for the most part, that increase the capacity of the transportation system. Examples include the construction of new roads, highway interchanges and train stations, as well as the widening of existing roads and the expansion of transit services and facilities such as park and ride lots. **Regionally significant** projects are those that serve regional transportation needs and that would normally be included in the modeling of a metropolitan area's transportation network.

They include all principal arterial highways and all fixed guideway transit facilities that offer an alternative to regional highway travel.

**8.2 Project Listing.** All of the projects in the draft OCTC MTP and OCTC 2011-2015 TIP were classified as either exempt, nonexempt or regionally significant, and sent to the NYS ICG for review and concurrence. The resulting nonexempt and regionally significant transportation projects included in OCTC Regional Emissions Analysis are indicated in Table 2 below.

**Table 2. OCTC Nonexempt Transportation Projects**

<b>PIN</b>	<b>Project</b>	<b>Agency</b>
<b>814522</b>	Schutt Rd. – Construction, Dunning Rd. to North Galleria Dr.	T/Walkill
<b>881054</b>	Clean Air New York (AKA Ozone Action Days)	NYSDOT
<b>882038</b>	Metropool Ridesharing Program to Van & Carpool Commuters	NYSDOT
<b>882383</b>	Enhanced Commuter Choice	NYSDOT

## **9.0 Timely Implementation of TCMs**

Transportation control measures (TCMs) are not identified for Orange County as part of the applicable NYS SIP. Therefore, the TCM implementation conformity criteria do not apply. There are also no transportation projects in the OCTC MTP and TIP that will interfere with the timely implementation of TCMs in any other areas.

## **10.0 Documentation of Interagency Consultation Requirements**

The approval of emissions budgets for both New Jersey and Connecticut relieved MPOs from these states the necessity of coordinating transportation conformity with each other as well as with OC and NYMTC. Essentially, the former Multi-State Interagency Consultation Group now consists of the agencies comprising the NYS-ICG (EPA, USDOT, NYSDOT-EAB, NYSDEC, NYMTC, OCTC). OCTC relied on a high degree of consultation and coordination among these agencies. Periodic conference calls were conducted to inform and update the NYS-ICG on the status and methodologies used in the OCTC regional emissions analysis during the entire transportation conformity process. OCTC’s revised “monthly” annual PM<sub>2.5</sub> analysis approach is consistent with the approach used by NYMTC that was approved by the ICG on January 19, 2010.

## **11.0 Public Involvement**

Recognizing the importance of public involvement in the transportation planning process, OCTC Operating Procedures stipulate that private citizens, including public and private agencies, be afforded the opportunity to review and comment on conformity determinations prior to OCTC action. Accordingly, OCTC members were informed that this conformity determination was on the OCTC website at [www.co.orange.ny.us/planning/octc](http://www.co.orange.ny.us/planning/octc) for public review during a 30-day period starting October 3, 2011 and ending on November 1, 2011. Comments received during the comment period will be addressed in the final conformity determination and supporting documentation.

## 12.0 Results of Emissions Analyses

**12.1 General.** OCTC in cooperation with NYSDOT-ESB calculated PM<sub>2.5</sub> emissions for nonexempt and regionally significant projects in the OCTC MTP and TIP using the latest version of the EPA *MOBILE 6.2* Vehicle Emissions Model.

**12.2 Methodology.** The emissions analysis was based on speed specific emission factors generated by *MOBILE 6.2* for each link in the OCTC Travel Demand Model network for the morning peak hour, mid-day peak hour, afternoon peak hour and night off-peak hour. Vehicle miles traveled and emissions for each of the four peak hours were factored into peak period values using hourly VMT percentages for OC from the NYS SIP. The resulting peak period VMT and emissions were then adjusted to account for monthly fluxes in traffic developed by the NYSDOT Highway Data Services Bureau and that are identical to the monthly seasonal adjustment factors used in the PM<sub>2.5</sub> State Implementation Plan by NYSDEC. Daily total emissions for each month were summed to establish total monthly emissions. These monthly emission totals were summed to estimate a full year of PM<sub>2.5</sub> and NO<sub>x</sub> emissions. As discussed in Section 6.3, the inputs of the emissions model are traffic volume and speed data provided by OCTC and the most recent fleet characteristics, seasonal meteorological factors and assumptions concerning reformulated fuel and other control programs established by NYSDEC and through consultation and agreement with the Interagency Consultation Group in New York State. The final product calculated annual direct PM<sub>2.5</sub> emissions and NO<sub>x</sub> precursor emissions for the future analysis years of 2014, 2020, 2030, 2035 and 2040.

**12.3 Regional Analysis.** Tables 3 and 4 summarize the results of the regional emissions analysis for the OCTC and NYMTC portions of the NY-NJ-CT PM<sub>2.5</sub> Non-Attainment Area. The analysis confirms that the required budget test is passed. In addition, the analysis shows that the MTP and TIP build scenarios will produce lower emissions than the no-build scenario for each future analysis year.

**Table 3: Regional Emissions Analysis Summary (Motor Vehicle Emissions Budget Test)**

New York Metropolitan PM <sub>2.5</sub> Non-Attainment Area						
Emission Budget Test Results in Tons Per Year						
Pollutant	2009 Budget	Future Analysis Year Annual Emissions				
		2014	2020	2030	2035	2040
		Build	Build	Build	Build	Build
PM <sub>2.5</sub>	1,750	1,058.00	919.77	927.79	949.05	980.50
NO <sub>x</sub>	77,571	36,719.61	20,760.36	13,888.71	13,418.70	13,900.85
<b>Conclusion</b>		<b>Pass</b>	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>

**Table 4: Regional Emissions Analysis Summary (Build vs. No-Build Test) For Informational Purposes**

Direct PM <sub>2.5</sub>	Future Analysis Years – Build vs. No-Build Results in Tons Per Year									
	2014		2020		2030		2035		2040	
	Build	No-Build	Build	No-Build	Build	No-Build	Build	No-Build	Build	No-Build
<b>MPO</b>										
<b>OCTC</b>	78.94	81.46	71.89	74.55	74.66	76.99	78.59	80.66	85.79	86.13
<b>NYMTC</b>	979.06	1,004.68	847.88	876.63	853.13	881.12	870.45	900.36	894.71	926.2
<b>TOTALS:</b>	1,058.00	1,086.14	919.77	951.18	927.79	958.11	949.04	981.02	980.50	1,012.33
<b>Conclusion</b>	<i>Pass</i>		<i>Pass</i>		<i>Pass</i>		<i>Pass</i>		<i>Pass</i>	

Indirect NO <sub>x</sub>	Future Analysis Years – Build vs. No-Build Results in Tons per year									
	2014		2020		2030		2035		2040	
	Build	No-Build	Build	No-Build	Build	No-Build	Build	No-Build	Build	No-Build
<b>MPO</b>										
<b>OCTC</b>	3,215.46	3,316.87	1,893.63	1,967.51	1,194.72	1,232.25	1,167.51	1,199.14	1,273.87	1,280.59
<b>NYMTC</b>	33,504.15	33,992.47	18,866.73	19,216.04	12,693.99	12,957.24	12,251.19	12,531.87	12,626.98	12,914.58
<b>TOTALS:</b>	36,719.61	37,309.34	20,760.36	21,183.55	13,888.71	14,189.49	13,418.70	13,731.01	13,900.85	14,195.17
<b>Conclusion</b>	<i>Pass</i>		<i>Pass</i>		<i>Pass</i>		<i>Pass</i>		<i>Pass</i>	

**12.4 Conclusions.** The results of the OCTC regional emissions analysis indicate that the OCTC MTP and transportation projects in the OCTC 2011-2015 TIP will not degrade air quality, that the build scenarios result in emissions of direct PM<sub>2.5</sub> and NO<sub>x</sub> that are less than the proposed motor vehicle emissions budgets in the New York State Implementation Plan for PM<sub>2.5</sub> in the New York Metropolitan Area. In addition, the build scenarios will result in an overall reduction in PM<sub>2.5</sub> and NO<sub>x</sub> emissions in comparison to the no-build scenarios. Therefore, transportation conformity for the OCTC MTP and transportation projects in the OCTC 2011-2015 TIP has been demonstrated for the OC portion of the NY-NJ-CT Non-Attainment Area in accordance with EPA transportation conformity regulations, and both the MTP and OCTC 2011-2015 TIP conform with the existing New York State Implementation Plan to improve air quality (SIP).

### 13.0 Evidence of MPO Resolutions

The final MPO resolutions approving this conformity determination will be included in the final documentation after the satisfactory conclusion of the public comment period. Specific MPO actions included in this conformity analysis:

<b>MPO Product</b>	<b>MPO Approval Date</b>	<b>FHWA/FTA Approval</b>
NYMTC MTP	September 17, 2009	October 1, 2009
NYMTC MTP conformity update	September 17, 2009	December 19, 2011*
NYMTC 2011-2015 TIP	August 4, 2011	December 19, 2011*
OCTC MTP	November __, 2011*	December 19, 2011*
OCTC 2011-2015 TIP, as amended	November __, 2011*	December 19, 2011*
PDCTC MTP	November 18, 2011*	December 19, 2011*
PDCTC 2011-2015, as amended	November 18, 2011*	December 19, 2011*

\* - denotes anticipated approval dates

**Conformity Determination Statement:**

The results of the regional emissions analysis demonstrate that both the **updated OCTC Metropolitan Transportation Plan, 2040** and the **OCTC 2011-2015 Transportation Improvement Program** comply with National Ambient Air Quality Standards for PM<sub>2.5</sub>, as required by the Clean Air Act Amendments of 1990 and the New York State Implementation Plan to improve air quality.

**Additional Information:** The conformity document and regional emissions analysis for the OC portion of the NY-NJ-CT PM<sub>2.5</sub> Non-Attainment Area can be found at the following Website:  
[www.co.orange.ny.us/planning/octc](http://www.co.orange.ny.us/planning/octc)

# Appendix Emissions Calculations

Regional Emissions Analysis Results: OCTC MTP Update, October, 2011

<b>Orange County Annual NOx Emissions (tons)</b>												
	<b>No Build</b>					<b>Build</b>					<b>ECC</b>	<b>Build w/ECC</b>
<b>Year</b>	<b>AM</b>	<b>MD</b>	<b>PM</b>	<b>NT</b>	<b>Total</b>	<b>AM</b>	<b>MD</b>	<b>PM</b>	<b>NT</b>	<b>Total</b>	<b>reduction</b>	<b>Annual</b>
<b>2014</b>	222.71	137.02	330.90	74.94	<b>3316.87</b>	217.86	131.93	326.52	70.37	3216.23	0.77	<b>3215.46</b>
<b>2020</b>	132.50	81.81	193.11	45.01	<b>1967.51</b>	127.80	77.96	191.54	41.70	1894.06	0.43	<b>1893.63</b>
<b>2030</b>	82.35	50.79	123.73	27.83	<b>1232.25</b>	80.26	49.21	121.88	26.02	1195.06	0.34	<b>1194.72</b>
<b>2035</b>	79.82	49.14	122.69	26.58	<b>1199.14</b>	77.75	47.63	121.68	25.19	1167.84	0.33	<b>1167.51</b>
<b>2040</b>	84.81	52.37	130.92	28.77	<b>1280.59</b>	84.69	52.34	129.03	28.74	1274.20	0.33	<b>1273.87</b>

<b>Orange County Annual PM2.5 Emissions (tons)</b>												
	<b>No Build</b>					<b>Build</b>					<b>ECC</b>	<b>Build w/ECC</b>
<b>Year</b>	<b>AM</b>	<b>MD</b>	<b>PM</b>	<b>NT</b>	<b>Total</b>	<b>AM</b>	<b>MD</b>	<b>PM</b>	<b>NT</b>	<b>Total</b>	<b>reduction</b>	<b>Annual</b>
<b>2014</b>	5.44	3.30	8.43	1.80	<b>81.46</b>	5.31	3.18	8.30	1.69	78.97	0.03	<b>78.94</b>
<b>2020</b>	5.00	3.03	7.63	1.66	<b>74.55</b>	4.82	2.90	7.54	1.55	71.92	0.03	<b>71.89</b>
<b>2030</b>	5.16	3.13	7.91	1.71	<b>76.99</b>	5.03	3.03	7.80	1.60	74.69	0.03	<b>74.66</b>
<b>2035</b>	5.41	3.27	8.35	1.76	<b>80.66</b>	5.27	3.17	8.31	1.67	78.62	0.03	<b>78.59</b>
<b>2040</b>	5.77	3.49	8.90	1.90	<b>86.13</b>	5.76	3.49	8.81	1.90	85.81	0.03	<b>85.79</b>

All detailed emissions files are available by request from the OC Department of Planning (OCDP) by calling Senior Planner Fred Budde at (845) 615-3848.