Draft Transportation/Air Quality Conformity Determination for the Orange County Portion of the NY-NJ-CT $PM_{2.5}$ Non-Attainment Area

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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 Long-Range Transportation Plan (LRTP) (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 ($PM_{2.5}$) 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. This draft conformity determination is being issued in response to amendments being made to transportation projects in the NYMTC TIP[1]. There are no changes in the design, schedule or scope of transportation projects in the OC Transportation Council's (OCTC's) TIP or LRTP that might impact air quality. As a result, this determination documents the transportation conformity process undertaken by OCTC to demonstrate compliance with the regulatory criteria stipulated in the EPA Transportation Conformity Regulations for the OC portion of the NY-NJ-CT $PM_{2.5}$ Non-Attainment Area solely because of the update of the NYMTC LRTP and amendments being made to transportation projects in the NYMTC TIP.

2.0 Background

Fine particulate matter, also called $PM_{2.5}$, 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 are 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 ($PM_{2.5}$) to protect the public from exposure to levels of $PM_{2.5}$ that may cause health problems. The 24-hour standard for PM2.5 is set at 35 micrograms.[2] The annual standard for $PM_{2.5}$ is set at 15 micrograms per cubic meter based on the 3-year average of annual mean $PM_{2.5}$

[1] (NYMTC is the MPO for New York City, Long-Island, Westchester, Rockland and Putnam Counties)

[2] (When the NAAQS were first established, the 24-hour standard for $PM_{2.5}$ was set at 65 micrograms per cubic meter. Since then the standard has been lowered to 35 micrograms per cubic meter by the EPA to further protect public health.)

concentrations. Regions not meeting $PM_{2.5}$ 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 5th, 2005, the United States Environmental Protection Agency (EPA) designated Orange County (OC) to be part of the NY-NJ-CT $PM_{2.5}$ Non-Attainment Area along 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 fine particulate matter ($PM_{2.5}$).

In September 2006, the EPA revised the 1997 fine particle standards. The 2006 standards strengthened the 24-hour PM2.5 standard from 65 micrograms per cubic meter (µg/m3) to 35 µg/m3, and retained the current annual PM2.5 standard at 15 µg/m3. On December 14, 2009, the NY-NJ-CT metropolitan area was classified non-attainment for the new 2006 24-hour PM2.5 standard. Transportation conformity will apply for those areas designated as non-attainment under the new standard one year after the effective date of the designations (i.e. December 14, 2010). Thus, the conformity requirements for the new standard do not yet apply. NYMTC and OCTC plan to demonstrate conformity to the 2006 24-hour PM2.5 standard in Fall 2010.

Generally, MPOs are responsible for ensuring that federal transportation dollars (highway and transit) are programmed through a locally driven, comprehensive planning process, involving the development of a Long-Range Transportation Plan (LRTP) (25-year plan), a Transportation Improvement Program (TIP), and a Unified Planning Work Program (UPWP). The nine (9) MPOs responsible for transportation planning in the NY-NJ-CT $PM_{2.5}$ Non-Attainment Area are:

Connecticut:	Central Naugatuck Valley (COGCNV)
	Greater Bridgeport and Valley Regional Planning (GB&VMPO)
	Housatonic Valley Council of Elected Officials (HVCEO)
	South Central Regional Council of Governments (SCRCOG)
	South Western Regional Planning Agency (SWRPA)
New Jersey:	Delaware Valley Regional Planning Commission (DVRPC)
	North Jersey Transportation Planning Authority (NJTPA)
New York:	New York Metropolitan Transportation Council (NYMTC)
	Orange County Transportation Council (OCTC)

After extensive coordination, traffic forecasting, emissions analyses, documentation and public outreach by all 9 MPOs in the $PM_{2.5}$ Non-Attainment Area, the US Department of Transportation in consultation with the EPA found on April 4th, 2006 that OCTC and the 8 other MPOs in the

NY-NJ-CT $PM_{2.5}$ Non-Attainment Area demonstrated that transportation projects in their TIPs and LRTPs would not cause new air quality violations, worsen existing conditions, or delay timely attainment of the NAAQS in accordance with applicable SIPs to improve air quality. As a result, transportation conformity was demonstrated for $PM_{2.5}$ in accordance with EPA regulations and the Clean Air Act.

Since transportation conformity was first demonstrated on April 4th, 2006, motor vehicle emissions budgets for $PM_{2.5}$ were approved by the EPA for New Jersey and Connecticut, excluding the MPOs in these states from demonstrating transportation/air quality conformity whenever NY counties program new or make changes to existing transportation projects that might significantly impact air quality**.** Therefore, only OCTC and NYMTC in New York State need to coordinate and demonstrate transportation conformity for $PM_{2.5}$ when there are amendments to transportation projects in their capital programs and long range plans that may significantly affect air quality.

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 Long-Range Transportation Plan (LRTP) and OCTC Transportation Improvement Program (TIP) for Federal Fiscal Year (FFY) 2008-2012.

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 Long-Range 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.

Vehicle Miles Traveled: used to measure vehicular travel in miles regardless of the number of persons in the vehicle.

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 Long-Range 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 then 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. 2012, 2020, 2030, 2035) as part of $PM_{2.5}$ Conformity based on historic growth trends in OC. These projections are used to forecast future VMT in the OC Travel Demand Model and were recently revised with the last update of the OCTC Long Range Transportation Plan (LRTP) adopted by OCTC on November 29, 2007. The corresponding transportation/air quality conformity determination for the OCTC LRTP was certified by USDOT on December 19, 2007 and most recently on October 1st, 2009. Overall, the projections used to demonstrate conformity are consistent with current Census population estimates for OC and recent projections made by *Urbanomics* issued by NYMTC.

Table 1 below shows the projections for Orange County.

5.1.1 Population. Source: Census 2000, Summary File 1. Population and housing information from the 2000 Census together with Census population and housing estimates (July 2006), building permit data and population growth trends over the past 20 years where 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 and location of all businesses in OC along with the number of employed persons in each was obtained from the NYS Department of Labor for the year 2002. 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 2002, 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 2002 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 2000, Summary File 3. Household information from the 2000 Census was used as a means of checking and verifying the housing data and occupancy information from the NYS Office of Real Property.

5.1.5 Vehicles Available. Source: Census 2000, Summary File 3. Vehicle availability data by household was used to refine the number of trips generated in each TAZ. This was done for TAZ's primarily in cities where the rate of vehicular trips generated per occupied housing unit is less than average rates because people there tend to rely more on mass transit for mobility than other areas of OC.

Table 1. Demographic Forecasts for Orange County

Orange	2000	2002	2012	2020	2030	2035	% Annual Growth	% Total Growth
Population	341,367	346,987	395,026	421,133	465,125	482,045	1.18	41
Employment	110,242	123,372	144,878	155,362	173,293	182,259	1.56	54
Housing Units	122,754	124,787	142,896	154,317	171,000	177,417	1.27	45
Households	114,788	116,689	133,623	144,303	159,903	165,903	1.27	45
Vehicles	200,879	204,206	233,840	266,180	279,830	290,330	1.27	45

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 park and ride lots in OC. 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 are 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 LRTP and TIP that will interfere with the timely implementation of TCMs in other areas.

5.5 Key Assumptions.

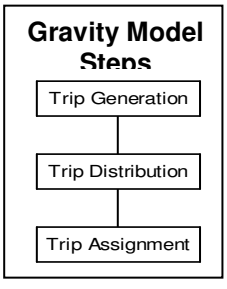
5.5.1 Demographics. It is assumed that OC will experience near constant levels of growth over the next 25 years similar to those experienced over the past 30 years.

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.

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 LRTP 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 in OC. 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 (2002) 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.

The four time period approach was utilized to calculate vehicle miles traveled (VMT) for each analysis year being evaluated. With this approach, VMT for the morning, midday and nighttime hours is estimated as a proportion of that occurring during the PM peak hour and then factored into VMT by time period based upon the VMT percentages used to determine emissions budgets in the OC portion of NY SIP.

The functional classification of roads in the OC Travel Demand Model was also updated, reflecting changes in area (urban/rural) and function of roads as depicted on the functional classification maps approved by the Federal Highway Administration on June 26, 2006. The urban/rural split of roads under the old classification was 38% urban and 62% rural. With the new classification, 30% of the roads in OC are classified as rural while 70% are classified as urban.

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 2012, 2020, 2030, and 2035, complying with the federal requirements for non-attainment areas without 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 (2010), that consecutive analysis years be no more than ten years apart and that

the horizon year of each MPO's LRTP be incorporated into the regional emissions analysis. The analysis year 2035 corresponds to the horizon year of the OCTC LRTP, while the year 2030 is the horizon year of NYMTC's LRTP. The year 2020 is an intermediate year between the years 2012 and 2030, 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 (NOx), Carbon Dioxide (CO2), and Particulate

Matter (PM) under various seasonal and operating conditions. Emission factor tables 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 factor tables 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). 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 PM2.5 emissions analyses for Orange County, emission factors developed by the NYSDOT Environmental Science Bureau in April 2008 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 factor tables 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 Month - The month of July (i.e., summertime conditions) was specified in the ozone precursor and summer direct PM2.5 input files. The month of January was specified in the winter NOX and winter direct PM2.5 input files.

Vehicle Registration Distribution - Year 2002 registration data were used to model the 2002 base year. 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. No I/M program was in place in Orange County in the 2002 base year.

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

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

FUEL SULFUR AND RVP LEVELS				
Dutchess, Orange and Putnam Counties				
Year(s)	Season	Fuel Sulfur Levels (ppm)		RVP (psi)
		Average	Maximum	
2002 - 2003	Summer	85.0	1000.0	6.8
	Winter	137.0	1000.0	12.5
2004	Summer	85.0	303.0	6.8
	Winter	120.0	303.0	12.5
2005	Summer	90.0	303.0	6.8
	Winter	90.0	303.0	12.5
2006 - 2007	Summer	30.0	87.0	6.8
	Winter	30.0	87.0	12.5
2008 - 2009	Summer	30.0	80.0	6.8
	Winter	30.0	87.0	12.5
2010 - 2035	Summer	30.0	80.0	6.8
	Winter	30.0	80.0	12.5
	Winter	30.0	80.0	12.5

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

GASOLINE FUEL OXYGENATE DATA				
Dutchess, Orange and Putnam Counties (Reformulated Gasoline Program)				
Year(s)	Season	Oxygenate Type	Oxygenate Content (% by volume)	Market Share Fraction of Oxygenate
2002 - 2003	Summer	MTBE	10.4%	0.98
		TAME	1.01%	0.02
	Winter	MTBE	8.7%	0.96
		TAME	0.3%	0.04
2004 - 2035	Summer/Winter	Ethanol	10%	1.00

Temperature and Humidity - For the summer season, county-specific hourly temperatures and relative humidity levels as verified by NYSDEC in Spring 2007 were used in the modeling.

Diesel Sale Fractions - Diesel sale fractions for NYSDOT Region 8 were used in the modeling. Year 2002 diesel fractions were used to model the 2002 base year. 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 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 Long-Range Transportation Plans

The transportation projects proposed in the OCTC 2008-2012 TIP and recently approved OCTC Long-Range Transportation Plan (LRTP) 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 LRTP expands upon the planning factors of SAFETEA by integrating the smart growth and sustainable development principles promoted through the Orange County Comprehensive Plan (OCCP), *Strategies for Quality Communities* for:

- 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 2008-2012 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, a comparison of the projects in the OCTC 2008-2012 TIP with the OCTC LRTP indicates that both are consistent with one another, 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 LRTP and OCTC 2008-2012 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

PIN	Project	Agency
814522	Schutt Rd. – Construction, Dunning Rd. to North Galleria Dr.	T/Walkill
848723	Reconstruct I-84 Interchange with Route 208	NYSDOT
848744	Route 208/Route 17K Intersection Improvements	NYSDOT
848746	RT 208 – Construct continuous left turning lane, I-84 to Route 17K	NYSDOT
875916	Park-n-Ride Lot – Mobility, Village of Kiryas Joel	V/Kiryas Joel
881054	Ozone Action Days	NYSDOT
882038	Metropool Ridesharing Program to Van & Carpool Commuters	NYSDOT
882383	Enhanced Commuter Choice	NYSDOT
8ATS06	Advanced Transportation Management Systems (ATMS): Route 17	NYSDOT
8ATS07-09	Advanced Transportation Management Systems (ATMS)	NYSDOT
H0308	I-84 & I-87 Direct Interchange	NYSTA
H1021	Woodbury Toll Barrier High Speed EZ Pass	NYSTA
I0096 **M502-03**	Installation of Traffic Monitoring Devices & Dynamic Message Signs MTA-MetroNorth station Parking Improvements	NYSTA MTA-MetroNorth

Table 2. OCTC Nonexempt Transportation Projects *(Continued)*

PIN	Project	Agency
LRTP	NYS Thruway (I-87) – Construction of interchange at Route 17A	NYSTA
LRTP	Route 17A – Widening, Route 17 to Route 94	NYSDOT
LRTP	Rte 17(Future I86) - Widening, Exit 131 to Exit 120 (NYS Rte 211)	NYSDOT
LRTP	Route 17M – Widening, Route 17 (Exit 123) to I-84	NYSDOT
LRTP	Route 17M – Widening, Route 17 to Route 208	NYSDOT
LRTP	Route 17M – Widening, South St. to CR13 (Kings Highway)	NYSDOT
LRTP	Route 9W – Widening, I-84 to Ulster County Line	NYSDOT
LRTP	CR 67 (East Main St.) – Widening, Route 17 to Dunning Rd	OCDPW
LRTP	Broadway St. – Widening, West St. to Newburgh Town/City Line	C/Newburgh
LRTP	Construction of new arterial road, Route 17M to Main St.	C/Middletown

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 LRP 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 monthly meetings and biweekly 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.

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 is on the OCTC website at *www.co.orange.ny.us/planning/octc* for public review during a 30-day period starting March 8th, 2010 and ending on April 7th, 2010.

12.0 Results of Emissions Analyses

12.1 General. OCTC in cooperation with NYSDOT-EAB calculated $PM_{2.5}$ emissions for nonexempt and regionally significant projects in the OCTC LRTP 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 adjust to account for seasonal fluxes in traffic during the summer ozone season (June, July & August) and summed to establish total daily VMT and precursor ozone emissions. Annual direct $PM_{2.5}$ and NO_X Emissions were calculated based on 182 days under winter conditions (October 1 – March 31) and 183 under summer conditions (April 1 – September 30). 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 Multi-State Interagency Consultation Group for the NY-NJ-CT $PM_{2.5}$ Non-Attainment Area. The final product calculated annual direct $PM_{2.5}$ emissions and NOx precursor emissions for the future analysis years of 2012, 2020, 2030 and 2035.

12.3 Regional Analysis. The EPA requires that one of two interim emission tests be used to demonstrate $PM_{2.5}$ conformity. They are either the less than 2002 baseline year test or the build/no-build test. To pass the less than 2002 baseline year test, vehicle emissions for future analysis years must be no greater than emissions for the 2002 baseline year. With the build/no-build test, vehicle emissions for "build" scenarios of each future analysis year must be no greater than emissions from the "no-build" scenario to pass conformity. Regardless of the test selected, the Multi-State Interagency Consultation Group for the NY-NJ-CT $PM_{2.5}$ Non-Attainment Area agreed that the same test must be utilized by all MPOs to demonstrate transportation/air quality conformity.

Since conformity was originally demonstrated on April 4th, 2006, motor vehicle emissions budgets for $PM_{2.5}$ were approved by the EPA for New Jersey and Connecticut, excluding the MPOs in these states from demonstrating transportation/air quality conformity whenever NY counties program new transportation projects that might potentially impact air quality**.** Both OCTC and NYMTC have chosen the build/no-build test to demonstrate conformity for the New York portion of the NY-NJ-CT $PM_{2.5}$.

Table 3 summarizes the results of the regional emissions analysis for the OCTC and NYMTC portions of the NY-NJ-CT $PM_{2.5}$ Non-Attainment Area. It shows that build scenarios will produce less emissions than the no-build scenario for each future analysis year.

Table 3: Regional Emissions Analysis Summary

Direct PM2.5	Future Analysis Years - Results in Tons per year							
	2012		2020		2030		2035	
MPO	Build	No-Build	Build	No-Build	Build	No-Build	Build	No-Build
OCTC	90.02	91.66	74.54	77.04	80.72	83.21	84.54	86.18
NYMTC	1,172.00	1,219.77	955.68	996.24	1,000.95	1,047.94	1,007.96	1,079.74
TOTALS:	1,262.02	1,311.43	1,030.22	1,073.28	1,081.67	1,131.15	1,092.50	1,165.92
Conclusion		*pass*		*pass*		*pass*		*pass*

Indirect NOx	Future Analysis Years – Results in Tons per year							
	2012		2020		2030		2035	
MPO	Build	No-Build	Build	No-Build	Build	No-Build	Build	No-Build
OCTC	3,726.85	3,781.86	1,788.46	1,847.34	1,147.68	1,186.26	1,125.85	1,154.35
NYMTC	44,331.44	45,944.90	20,156.46	20,983.26	13,849.22	14,566.50	12,955.29	13,876.71
TOTALS:	48,058.29	49,726.76	21,944.92	22,830.60	14,996.90	15,752.76	14,081.14	15,031.06

12.4 Conclusions. The results of the OCTC regional emissions analysis indicate that the transportation projects in the 2008-2012 TIP and LRTP will not degrade air quality and that the build scenarios will result in an overall reduction in $PM_{2.5}$ emissions in comparison to the no-build scenarios. Therefore, transportation conformity for projects in the OCTC 2008-2012 TIP and LRTP 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 OCTC 2002-2012 TIP and LRTP conform with the existing NY State Implementation Plan to improve air quality (SIP).

13.0 Evidence of MPO Resolutions

The Orange County Transportation Council approved the OCTC 2008-2012 TIP on September 25th, 2007 and approved its Long-Range Transportation Plan along with the required transportation conformity determinations for ozone and PM2.5 on November 27th, 2007. US DOT last certified OCTC transportation/air quality conformity determinations on October 1st, 2009

Specific MPO actions included in this conformity analysis:

MPO Product	MPO Approval	USDOT Certifications
OCTC TIP FFY 2008-2012 & LRTP 2035 Ozone Conformity	27-Nov-07	19-Dec-07, 1-Oct-08, 1-Oct-09
OCTC TIP FFY 2008-2012 & LRTP 2035 PM2.5 Conformity	27-Nov-07	19-Dec-07, 1-Oct-08, 1-Oct-09

Conformity Determination Statement:

The results of the regional emissions analysis demonstrate that both the **OCTC 2008-2012 Transportation Improvement Program and the OCTC Long-Range Transportation Plan 2035** comply with National Ambient Air Quality Standards for PM2.5, 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 PM2.5 Non-Attainment Area can be found at the following Website:
www.co.orange.ny.us/planning/octc

Appendix

Emissions Calculations

OCTC REGIONAL EMISSIONS ANALYSIS
ORANGE COUNTY PORTION OF THE NY-NJ-CT PM2.5 NON-ATTAINMENT AREA

2012 ANALYSIS YEAR
Link-By-Link Totals (grams)

			Peak Hour		Peak Period	
Pollutant	**Season**	**Time**	**No Build**	**Build**	**No Build**	**Build**
PM2.5	Summer	AM	16,272	16,077	53,861	53,215
		MD	9,840	9,634	79,016	77,362
		PM	25,258	25,132	74,259	73,887
		NT	5,355	5,128	36,200	34,668
	Winter	AM	14,188	14,000	46,963	46,338
		MD	8,582	8,392	68,915	67,386
		PM	22,021	21,883	64,742	64,336
		NT	4,671	4,467	31,573	30,199
NOx	Summer	AM	611,988	607,336	2,025,680	2,010,282
		MD	375,001	367,732	3,011,261	2,952,888
		PM	927,580	930,188	2,727,086	2,734,753
		NT	205,060	196,377	1,386,205	1,327,509
	Winter	AM	645,661	639,618	2,137,137	2,117,137
		MD	396,406	387,980	3,183,144	3,115,476
		PM	974,138	975,408	2,863,966	2,867,700
		NT	216,869	207,288	1,466,037	1,401,265

2012 NO BUILD		**2012 BUILD**	
243,336	**Summer PM2.5 g/day**	**239,132**	**Summer PM2.5 g/day**
49.1	**Summer PM2.5 tons/year**	**48.2**	**Summer PM2.5 tons/year**
9,150,232	**Summer NOx g/day**	**9,025,431**	**Summer NOx g/day**
1,845.8	**Summer NOx tons/year**	**1,820.6**	**Summer NOx tons/year**
212,193	**Winter PM2.5 g/day**	**208,259**	**Winter PM2.5 g/day**
42.6	**Winter PM2.5 tons/day**	**41.8**	**Winter PM2.5 tons/day**
9,650,283	**Winter NOx g/day**	**9,501,578**	**Winter NOx g/day**
1,936.0	**Winter NOx tons/day**	**1,906.2**	**Winter NOx tons/day**
91.7	**ANNUAL PM2.5 tons/year**	**90.0**	**ANNUAL PM2.5 tons/year**
3,781.9	**ANNUAL NOx tons/year**	**3,726.8**	**ANNUAL NOx tons/year**

OCTC REGIONAL EMISSIONS ANALYSIS
ORANGE COUNTY PORTION OF THE NY-NJ-CT PM2.5 NON-ATTAINMENT AREA

2020 ANALYSIS YEAR
Link-By-Link Totals (grams)

			Peak Hour		Peak Period	
Pollutant	**Season**	**Time**	**No Build**	**Build**	**No Build**	**Build**
PM2.5	Summer	AM	13,819	13,449	45,742	44,517
		MD	8,365	8,067	67,168	64,777
		PM	21,461	21,026	63,095	61,816
		NT	4,557	4,297	30,808	29,047
	Winter	AM	11,762	11,441	38,934	37,871
		MD	7,121	6,865	57,181	55,123
		PM	18,275	17,891	53,728	52,600
		NT	3,880	3,657	26,226	24,718
NOx	Summer	AM	306,698	299,032	1,015,170	989,795
		MD	189,239	182,155	1,519,591	1,462,708
		PM	461,652	454,325	1,357,256	1,335,715
		NT	103,857	97,440	702,073	658,697
	Winter	AM	306,521	298,866	1,014,585	989,246
		MD	189,204	182,104	1,519,306	1,462,297
		PM	460,195	453,459	1,352,973	1,333,170
		NT	103,833	97,420	701,913	658,557

2020 NO BUILD		**2020 BUILD**	
206,814	**Summer PM2.5 g/day**	**200,158**	**Summer PM2.5 g/day**
41.7	**Summer PM2.5 tons/year**	**40.4**	**Summer PM2.5 tons/year**
4,594,090	**Summer NOx g/day**	**4,446,915**	**Summer NOx g/day**
926.7	**Summer NOx tons/year**	**897.0**	**Summer NOx tons/year**
176,069	**Winter PM2.5 g/day**	**170,313**	**Winter PM2.5 g/day**
35.3	**Winter PM2.5 tons/day**	**34.2**	**Winter PM2.5 tons/day**
4,588,777	**Winter NOx g/day**	**4,443,271**	**Winter NOx g/day**
920.6	**Winter NOx tons/day**	**891.4**	**Winter NOx tons/day**
77.0	**ANNUAL PM2.5 tons/year**	**74.5**	**ANNUAL PM2.5 tons/year**
1,847.3	**ANNUAL NOx tons/year**	**1,788.5**	**ANNUAL NOx tons/year**

OCTC REGIONAL EMISSIONS ANALYSIS
ORANGE COUNTY PORTION OF THE NY-NJ-CT PM2.5 NON-ATTAINMENT AREA

2030 ANALYSIS YEAR
Link-By-Link Totals (grams)

			Peak Hour		Peak Period	
Pollutant	**Season**	**Time**	**No Build**	**Build**	**No Build**	**Build**
PM2.5	Summer	AM	14,950	14,579	49,484	48,258
		MD	9,053	8,757	72,697	70,320
		PM	23,245	22,821	68,339	67,094
		NT	4,942	4,670	33,407	31,571
	Winter	AM	12,655	12,338	41,887	40,839
		MD	7,664	7,413	61,543	59,523
		PM	19,699	19,331	57,915	56,834
		NT	4,183	3,953	28,279	26,723
NOx	Summer	AM	194,743	190,430	644,599	630,322
		MD	119,722	115,950	961,366	931,076
		PM	303,517	293,409	892,339	862,622
		NT	65,792	62,123	444,753	419,950
	Winter	AM	195,966	191,831	648,647	634,961
		MD	120,719	116,946	969,374	939,073
		PM	301,724	293,652	887,068	863,338
		NT	66,367	62,678	448,642	423,701

2030 NO BUILD

223,927	**Summer PM2.5 g/day**
45.2	**Summer PM2.5 tons/year**
2,943,057	**Summer NOx g/day**
593.7	**Summer NOx tons/year**
189,624	**Winter PM2.5 g/day**
38.0	**Winter PM2.5 tons/day**
2,953,730	**Winter NOx g/day**
592.6	**Winter NOx tons/day**
83.2	**ANNUAL PM2.5 tons/year**
1,186.3	**ANNUAL NOx tons/year**

2030 BUILD

217,243	**Summer PM2.5 g/day**
43.8	**Summer PM2.5 tons/year**
2,843,970	**Summer NOx g/day**
573.7	**Summer NOx tons/year**
183,919	**Winter PM2.5 g/day**
36.9	**Winter PM2.5 tons/day**
2,861,074	**Winter NOx g/day**
574.0	**Winter NOx tons/day**
80.7	**ANNUAL PM2.5 tons/year**
1,147.7	**ANNUAL NOx tons/year**

OCTC REGIONAL EMISSIONS ANALYSIS
ORANGE COUNTY PORTION OF THE NY-NJ-CT PM2.5 NON-ATTAINMENT AREA

2035 ANALYSIS YEAR
Link-By-Link Totals (grams)

			Peak Hour		Peak Period	
Pollutant	**Season**	**Time**	**No Build**	**Build**	**No Build**	**Build**
PM2.5	Summer	AM	15,477	15,270	51,227	50,543
		MD	9,378	9,170	75,301	73,638
		PM	24,129	23,941	70,941	70,387
		NT	5,124	4,896	34,639	33,099
	Winter	AM	13,074	12,902	43,274	42,705
		MD	7,921	7,749	63,607	62,227
		PM	20,416	20,257	60,023	59,557
		NT	4,328	4,138	29,257	27,970
NOx	Summer	AM	188,642	186,049	624,404	615,821
		MD	115,611	113,248	928,357	909,382
		PM	299,596	289,746	880,813	851,853
		NT	63,600	60,759	429,933	410,732
	Winter	AM	189,995	187,774	628,884	621,532
		MD	116,836	114,532	938,196	919,690
		PM	296,900	289,777	872,886	851,945
		NT	64,304	61,476	434,692	415,575

2035 NO BUILD		**2035 BUILD**	
232,108	**Summer PM2.5 g/day**	**227,667**	**Summer PM2.5 g/day**
46.8	**Summer PM2.5 tons/year**	**45.9**	**Summer PM2.5 tons/year**
2,863,508	**Summer NOx g/day**	**2,787,789**	**Summer NOx g/day**
577.6	**Summer NOx tons/year**	**562.4**	**Summer NOx tons/year**
196,162	**Winter PM2.5 g/day**	**192,460**	**Winter PM2.5 g/day**
39.4	**Winter PM2.5 tons/day**	**38.6**	**Winter PM2.5 tons/day**
2,874,658	**Winter NOx g/day**	**2,808,743**	**Winter NOx g/day**
576.7	**Winter NOx tons/day**	**563.5**	**Winter NOx tons/day**
86.2	**ANNUAL PM2.5 tons/year**	**84.5**	**ANNUAL PM2.5 tons/year**
1,154.4	**ANNUAL NOx tons/year**	**1,125.9**	**ANNUAL NOx tons/year**