

**CONFORMITY OF THE
1994-98
TRANSPORTATION IMPROVEMENT PROGRAM
WITH THE AMENDMENTS
TO THE 1990 CLEAN AIR ACT**

DADE COUNTY, FLORIDA

METROPOLITAN PLANNING ORGANIZATION

This report was prepared by the Dade County MPO in collaboration with
the Florida Department of Transportation District VI, and the
Dade County Department of Environmental Resources Management.

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Executive Summary
May, 1993

This report documents the conformity determination for the approved 1994 Dade County Transportation Improvement Program in fulfillment of the requirements of the 1990 Federal Clean Air Act Amendments.

To establish conformity, the Metropolitan Planning Organization (MPO) has followed the Florida Department of Transportation Directive No. 525-010-014-a, "Interim Guidance for District Review of Conformity Determinations by Metropolitan Planning Organizations in Nonattainment Areas" of April 29, 1993. The FDOT Directive addresses the transportation and air quality planning methodology to be employed by the State's urban areas using the Florida Standard Urban Transportation Model Structure (FSUTMS) and the Mobile Emissions Series Models to assess the status of air quality compliance efforts.

In 1979, Dade County was designated as a Moderate nonattainment area for ozone by EPA. This meant that Dade County would be among those areas that needed to demonstrate attainment of nationally mandated ozone standards.

A Transportation Control Plan for Ozone was adopted by the Dade MPO in 1979 as part of the Florida State Implementation Plan (SIP). The current State Implementation Plan is in stages of revision. Until the SIP can be finalized and approved, urban area conformity analysis must be based on the most recent local estimates of transportation-related emissions.

In cooperation with the Central Office of FDOT in Tallahassee and District Six office in Miami, the Dade MPO conducted the appropriate transportation assessment and analyzed the emissions impact of the projects listed in the adopted 1994 Transportation Improvement Program (TIP). This Conformity Determination Report documents that implementation of the projects listed in the Dade County TIP will contribute to emissions reductions at a level that establishes compliance with prescribed federal requirements for ozone.

DADE COUNTY CONFORMITY DETERMINATION REPORT

BACKGROUND

The rapid growth in Dade County's population over the last two decades, coupled with an associated increase in motor vehicle use, and commercial activities, has placed a significant strain on its air quality. Dade County is fortunate to have a proactive County Commission that has taken the initiative to introduce programs that have later been required in the Clean Air Act Amendments. This along with the excellent meteorological and climatological conditions, has helped Dade County to continue to enjoy better air quality than most metropolitan areas of the nation.

The purpose of this report is to comply with the requirements of the Clean Air Act Amendment of 1990 (Section 176 (c) (1), (2) and (3)) and requirements of the Intermodal Surface Transportation Efficiency Act of 1992 (ISTEA); and to demonstrate the conformity of both the TIP and the Long Range Plan qualitative analysis with the SIP through analysis of the transportation network and emissions. All federally funded projects for areas designated by the EPA as air quality nonattainment areas must come from a conforming MPO TIP and long range plan.

The Metropolitan Planning Organization (MPO) has been designated as the air quality organization for the determination of the conformity of the TIP and Long Range Plan for the Miami urbanized area. The MPO was designated by the Governor on March 2, 1977. Together with the State, for urban transportation planning under the Federal-Aid Highway Act (23 USC S101 et seg), and the Urban Mass Transportation Act (49 USC 160 et seg), the MPO is the forum for cooperative decision making by principal elected officials of general purpose local governments (23 CFR S450.104 (b)).

The Governing Board of the Metropolitan Planning Organization for the Miami Urbanized Area on January 29, 1979 passed and adopted resolution No. MPO 3-79 authorizing and approving "an agreement concerning a transportation control plan for the Miami area" between itself, the Dade County Board of County Commissioners, the Florida Department of Transportation and the Florida Department of Environmental Regulation.

In 1979, Dade County was designated as a Moderate nonattainment area for ozone by the Environmental Protection Agency (EPA). This meant that Dade County would be among those areas that needed to demonstrate attainment of nationally mandated air quality standards. The MPO supports implementation of the goals and objectives of the State Implementation Plan (SIP). The goal is to have a 15% reduction in emissions by the end of 1996 and no ambient air quality exceedances for any of the air pollutants to attain National Ambient Air Quality Standards (NAAQS). The approved TIP supports the SIP in achieving and maintaining those National Ambient Air Quality Standards.

To establish conformity, the MPO has followed the FDOT Directive No. 525-010-014-a, "Interim Guidance for District Review of Conformity Determinations by MPOs in Nonattainment Areas"

issued on April 29, 1993 which was based on the Environmental Protection Agency/U.S. Department of Transportation (EPA/USDOT) Interim Conformity Guidance issued jointly on June 7, 1991. The Department submitted a draft directive on conformity determination to FHWA and EPA for approval on August 23, 1991. The FHWA and EPA concurred with the directive which was extended until August 19, 1993.

A Transportation Control Plan for Ozone was adopted by the MPO in 1979 as part of the Florida's State Implementation Plan. A plan revision was adopted by the MPO in January, 1983. The current State Implementation Plan was submitted to EPA on November 14, 1992 and is expected to be finalized and approved by mid-year 1994. The Dade County Department of Environmental Resources Management (DERM), the local air agency is in charge of compiling and submitting the emissions inventory and the emissions budget (emissions projections) to the Florida Department of Environmental Regulation (FDER). On May 11th, 1993 DERM participated in the Public Hearing held in Miami for the Southeast Florida Region soliciting public comments on the emissions inventory as prepared on November 14th, 1992.

Dade County is committed to cooperating fully in efforts to address air quality problems as well as educating the public and helping industry to understand and comply with new regulations. Dade County, on its own initiative, was the first local jurisdiction in the United States to implement a Stage II vapor recovery program aimed at significant reduction of ozone-producing volatile organic compounds after the enactment of the Clean Air Act Amendment of 1990.

Conformity is a dynamic process to be fully coordinated within the traditional 3-C process, that is, the "continuing, cooperative and comprehensive transportation planning". Critical elements of the 3-C process include the development of a Unified Planning Work Program (UPWP) and of a multi-modal Long Range Transportation Plan, both leading to the development of a Transportation Improvement Program (TIP). The TIP and the Long Range Plan contribute to the emission reductions required by the Clean Air Act Amendment through the inclusion of projects which help relieve congestion, improve transit service, reduce reliance on SOVs, and improve non-motorized transportation facilities. The Long Range Plan also included 6 corridors to serve the most highly developed areas of the county with transit and eliminate the need to expand highways for SOVs. Section 176(c) addresses the requirements that must be met for projects to be approved by an MPO or USDOT. The requirements state that a project must come from a conforming transportation plan and TIP and that the scope and concept of the project have not changed significantly since the conformity finding of the plan and program. Other key criteria that must be addressed in the process are:

- (1) The use of the most recent mobile source emissions estimates;
- (2) The expeditious implementation of TCMs; and
- (3) The contribution to the annual reduction of ozone emissions.

Under Section 176(c) of the Clean Air Act Amendments of 1990 Conformity means "conformity to an implementation plan's purpose of eliminating or reducing the severity and number of

violations of the national ambient air quality standards (NAAQS) and achieving expeditious attainment of such standards".

The 1994 TIP will contribute to emission reductions by means of implementation of the TCM's (see TCM list in Appendix I, page 13). The TCMs are intended to reduce single occupant vehicles (SOV), reduce traffic congestion and increase transit usage and the use of high occupancy vehicles (HOVs). Existing TCM activities include Metrobus (72 routes), Metrorail (21 miles), Metromover (1.9 miles), Motor vehicle control program, Park-and-Ride and HOV Parking Lots, Exclusive Bus and Carpool Lanes, Metro-Dade Traffic Control System, Bikeways, Transportation System Management (TSM), Intelligent Corridor System (ICS), Incident Management, Transportation Demand Management Activities (TDM), Motor Vehicle Emissions Control Inspection and Maintenance (I/M) Programs, Stage II Vapor Recovery Ordinance, Stationary Source Permitting and Compliance Programs and Ambient Air Quality Monitoring, No TCMs have been included in the SIP.

The 1994 TIP also contributes to emission reductions with Congestion Management and Air Quality (CMAQ) projects (see appendix II on page 14).

The most recent population, employment, travel and congestion estimates were obtained from the Dade County Planning Department, Demographics Section. The 1986 base year transportation network for the Dade County Urbanized Area is the latest validated network, which was projected from the 1980 Census. Subsequent networks have reflected projected 1990 data based on Census control figures. Current work has focused on updating the transportation network data files to a 1990 base line condition.

This conformity report and emissions analyses were developed in cooperation with the FDOT Central and District Six Offices, and the Metro-Dade Department of Environmental Regulation (DERM). It was endorsed by the Citizen's Transportation Advisory Committee (CTAC) on May 26, 1993. The conformity determination report is scheduled for endorsement by the MPO Board on July 8th, 1993. The Transportation Planning Technical Advisory Committee (TPTAC) and the Transportation Planning Council (TPC) endorsements will include representatives from State and local air quality agencies. This Conformity Determination Report documents that Dade County's TIP will achieve the annual emission reductions identified in the SIP. The LRP was developed with 6 network corridors to serve the most highly developed areas of the county with transit and eliminate the need to expand highways for SOVs.

During the years 1991 and 1992, there were no exceedances reported at the monitoring sites in the whole area of Dade County as opposed to the one ozone exceedance reported at Thompson Park Monitoring Station during the year 1990.

COORDINATION WITH THE LONG RANGE PLAN

In November of 1990, the Governing Board of the MPO for the Miami Urbanized Area adopted the Year 2010 Long Range Plan. Every November thereafter, the Year 2010 Long Range Plan has been updated and amended to reflect changes in project priorities and implementation schedules based upon the desires of the Board and citizenry. The most recent date of MPO approval of the Long Range Plan was November 17, 1992.

The Long Range Plan consists of four five-year groupings of roadway and transit improvement projects throughout the County. These projects contribute to meeting the emissions reductions required by the Clean Air Act Amendment of 1990.

Relevance to the Clean Air Act Amendments of 1990

According to the Clean Air Act Amendments of 1990 (CAAA 90), every nonattainment area's Long Range Plan must conform to their State Implementation Plan (SIP). In a qualitative context, the Long Range Plan is to be addressed in the Conformity Determination process so as to abide with the CAAA.

In the case of the Conformity Determination Report on the 1994 TIP, the following statements are made a part of this document in order to fulfill this requirement:

1. The MPO for the Miami Urbanized Area fully endorses Florida's SIP. The Year 2010 Long Range Plan, as endorsed by the Board, is consistent with and furthers the goals of the SIP as they pertain to achieving and maintaining the National Ambient Air Quality Standards (NAAQS);
2. No goals, directives or recommendations contained within the adopted Long Range Plan are in conflict with the goals and intent of the SIP.
3. The Long Range Plan includes a written commitment that it will incorporate all federally assisted transportation projects that improve air quality committed to in the SIP; "achieve increased traffic safety and the efficient management of traffic flow, provide an integrated system which includes ease of transfer between all modes, and develop a transportation system that preserves the integrity of urban communities, environmentally sensitive areas, and conserves energy and natural resources."

ANALYTICAL METHODOLOGY

Assumptions:

- * All highway and transit projects funded through construction and included as part of 1996 Build Network will be in place.
- * Climatological and meteorological conditions in the area won't experience a dramatic change within the 8 year period between 1993 and the year of 2001.

Data Preparation:

The latest validated base year transportation network available for the Dade County urbanized area is for the year 1986. FDOT District staff and MPO staff worked to compile roadway capacity improvement projects that had been completed by 1990. These changes were then coded into what became a 1990 Base Year network. This network was then saved and later built upon to create the two 1996 and two 2001 networks.

The 1990 base year hydrocarbon (HC) emission value is based on socioeconomic data that has been derived from the 1980 census (the 1990 census data is not available in the required format at this time). Also the HC value is not based on Highway Performance Monitoring System (HPMS) vehicle miles traveled (VMT). The HC value is not to be used as the 1990 Baseline reference point against which future emissions will be measured. The 1990 Baseline reference point will not be available until the 1990 Census data is incorporated into the network models and these models have been validated. FDOT staff interpolated from the year 2010 projected productions and attractions (P's and A's) to derive P & A files for 1996 (year of attainment) and 2001.

In order to evaluate the reduction being achieved, a "Base Year" Transportation network (1990) is established from which 'baseline' and 'new TIP' scenarios are developed for each analysis year. Transportation networks consisting of the 'baseline' and 'new TIP' scenarios are projected to the appropriate attainment year (1993 or 1996), the last year of committed funding in the TIP, and the year 2001 for moderate nonattainment areas. Trips will be developed based on the most recent valid base year and by using a mathematical calculation of the productions and attractions for each analysis year. Since the analysis year encompasses the last year funded in the TIP, and emissions model should be run using July of the analysis year as the Mobile 5 model input date.

Two 1996 and two 2001 networks were coded. These were referred to as the "Baseline" (No-Build) and "New TIP" (Build) scenarios. First, the 1996 Baseline scenario was coded. It was developed by adding annual element of the 1993 TIP to the 1990 Network. (See Appendix III, pages 15 to 16 for a detailed project listing). Second, the 1996 New TIP was developed by adding all capacity improvements included in the 1994 adopted TIP that would be open to traffic by December 31, 1996 to the 1996 Baseline Network. (See Appendix IV, page 17 for a detailed project listing).

Third, the 2001 Baseline scenario was coded. It was basically developed by adding to the already coded 1996 Baseline network, those capacity improvement projects from the first year of the

1994 adopted TIP that could be open to traffic by December 31st, 2001. (See Appendix V, page 18 for a detailed project listing). And fourth and lastly, the 2001 New TIP scenario was coded. It was developed from the 1996 New TIP network by adding those projects which could be open to traffic by December 31st, 2001 (See Appendix VI, page 19 for a detailed project listing).

Highway Network Scenarios:

* A 1990 Base Year highway network was built from the existing validated 1986 network that was used for the 2010 Long Range Transportation Plan update. A list of primary and secondary roadway improvements completed by calendar 1990 was identified and added to the 1986 network. Productions and Attractions were computed and adjusted to the 1990 baseline, by interpolating 1986 and 2010 data. The 1990 base-year network was run.

* A 1996 Baseline scenario (no build) was developed. It included all projects with any phase funded in the Annual Element of the 1993 TIP which will be completed by December 31, 1996 and all projects which are under construction (as of today) that will be complete by December 31, 1996. The 1996 baseline was run.

* A 1996 New TIP scenario (Build) was developed. It was composed of all those projects included in the 1996 Baseline network plus those projects included in the FY 1994 TIP which will be completed and open to service by December 31, 1996. No transit projects were considered for this run (although the Brickell and Omni Legs of the Metromover will be completed by then). The 1996 New TIP run was successfully completed.

* A 2001 Baseline scenario (no build) was developed. The 2001 Baseline scenario is composed of the 1996 Baseline Network plus those projects with any phase funded in the Annual Element of the 1992/93 TIP which will be completed after December 31, 1996 but before December 31, 2001, and also, those projects which are under construction as of today that will be complete after December 31, 1996 and before December 31, 2001. All federally and non-federally funded projects were considered and were included in the coding of the 2001 baseline. The 2001 baseline was run.

* A 2001 New TIP scenario (Build) was developed. It was composed of the 2001 baseline network plus those projects included in the 1993/94 adopted TIP which will be complete by December 31, 1996; and also included those projects from the 1993/94 adopted TIP which will be complete after December 31, 1996 but before December 31, 2001. All federally and non-federally funded projects were considered and were included in the coding of the 2001 New TIP. No transit projects were considered for this run (although the Brickell and Omni Legs of the Metromover will be completed by then). A highway-only run was successfully completed.

Steps followed for Emission Analysis:

Please refer to Appendix VII on page 20 illustrating the general steps used to determine vehicle emissions output.

Tools Used for Emission Analysis:

EPA/FHWA have accepted these models for use in analyzing conformity with the CAAA of 1990.

Florida Standard Urban Transportation Model Structure (FSUTMS)

FSUTMS is a series of integrated, menu-driven programs designed to provide transportation tools for use in multimodal urban systems planning to include the latest population and employment figures. FSUTMS was used to simulate traffic conditions in the Dade County urbanized area for the 1990 and the 1996 and 2001 Baseline and New TIP scenarios. Average speeds and total vehicle miles were calculated and utilized by Mobile 5 to estimate emissions.

Mobile Source Emission Factor Model (MOBILE 5)

Mobile 5 is an integral set of FORTRAN routines for use in the analysis of the air pollution impact of gasoline-fueled and diesel-fueled highway mobile sources. The program calculates emission factors for hydrocarbons (HC), carbon monoxide (CO), and oxides of nitrogen (NO_x). Mobile 5 has the ability to model emission factors for the Year 1960 through 2020 inclusive. Mobile 5 emission estimates depend on various conditions such as ambient air temperature, Reid vapor pressure, traffic speed, and vehicle mileage accrual rates. MOBILE 5.0 is the currently accepted MOBILE emissions model for emissions analysis.

Temperature calculations are accomplished by requiring the user to input three temperature values: minimum daily temperature, maximum daily temperature, and ambient temperature. There are up to six emission factors that are corrected for temperature on Mobile5: exhaust HC, exhaust CO, exhaust NO_x, diurnal evaporative HC, hot soak evaporative HC, and running loss HC. Standard input parameters for Inspection/Maintenance and anti-tampering programs credits in the Mobile5 emissions programs were used in the emissions analysis along with the National default values of the mileage accrued and vehicle registration. Appendix VIII on pages 21 - 23 reflects these input stream values for 1990, 1996 and 2001.

Mobile5 results were calculated by FDOT Central Office for the 1990, 1996 and 2001 Analysis years. These results include the HC total and component emission factors. When the user requests that the component emission factors constituting the total HC emission factor be printed in the output, there are four components. The components are exhaust emissions, evaporative (hot soak and diurnal emissions including crankcase emissions), refueling emissions, and running loss emissions.

EMIS

A customized utility program supplied by FDOT which applies the Mobile 5.0 output factors to the vehicle miles of travel from FSUTMS.

Overview of Activities Conducted

The Conformity Determination Directive for the 1993 cycle was received by the MPO Office from the FDOT Central Office on April 29th, 1993.

The Highway Systems Planning Office of FDOT assisted the urbanized areas in completing the technical and analytical tasks in the Conformity Determination process. Specialists in both transportation and air quality modeling were on hand to assist others in running FSUTMS and MOBILE 5.0 models for conformity purposes.

Both the 1996 and 2001 Baseline and New TIP networks were coded by MPO staff and reviewed by the staff of the FDOT District Six Office. The interpolations for the Productions and Attractions for 1996 and 2001 were conducted at the District 6 Office. The actual runs of the networks under FSUTMS were performed at the District 6 Office as well as the EMIS interface for obtaining emission results due to the fact that EMIS is OS/2-based and the MPO has a different operating platform (which is the AIX/UNIX for the IBM-RS6000).

Emission Analysis Run Results

Estimated area-wide Volatile Organic Compounds (VOC) for the Base Year 1990 and for the 1996 and 2001 "Baseline" and "New TIP" scenarios are reported in Table 1, on page 11. The emission results are shown in Tons per day for Volatile Organic Compounds (column 1), carbon monoxide (column 2) and oxides of nitrogen (column 3). The emissions output printouts are listed as follows: 1990 Baseline Network Scenario (Appendix IX, pages 24), 1996 Baseline Network Scenario (Appendix X, page 25), 1996 New TIP Network Scenario (Appendix XI, page 26), 2001 Baseline Network Scenario (Appendix XII, page 29), and the 2001 New TIP Network Scenario (Appendix, page 28). The findings below demonstrate emissions reduction consistent with those reflected in the SIP.

Projected results obtained in the County for all five networks show a consistent trend toward reduction of all emission levels for VOCs, CO and NO_x from 1990 through 1996 and 2001. Implementation of proposed projects in the TIP will positively contribute to emission reductions.

FINDINGS

The 1996 New TIP Mobile source emission results show a reduction in VOC of 39.11% when compared to the 1990 Base Year Network. The 1996 New TIP also shows a reduction in VOC of 0.08 tons per day when compared to the 1996 Baseline scenario. The CO emissions are reduced 34.39% when comparing the 1990 Base Year Network to the 1996 New TIP network. The CO emissions are again reduced an additional 1.37 tons/day for the 1996 New TIP scenario as compared to the 1996 Baseline. The NO_x emissions are reduced 6.65% when comparing the

1990 Base Year Network to the 1996 New TIP Network. The NOx emissions are again reduced an additional 0.02 tons/day for the 1996 New TIP as compared to the 1996 Baseline.

The 2001 New TIP Mobile source emission results show a reduction in VOC of 44.41% when compared to the 1990 Base Year Network. The 2001 New TIP also shows a reduction in VOC of 1.54 tons per day when compared to the 2001 Baseline scenario. The CO emissions are reduced 39.24 % when comparing the 1990 Base Year Network to the 2001 New TIP network. The CO emissions are again reduced an additional 13.07 tons/day for the 2001 New TIP scenario as compared to the 2001 Baseline. The NOx emissions are reduced 10.71% when comparing the 1990 Base Year Network to the 2001 New TIP Network. The NOx emissions are again reduced an additional 0.32 tons/day for the 2001 New TIP as compared to the 2001 Baseline.

All findings reported above exclude refueling emissions from the calculated VOC emissions.

Conclusions

Implementation of the adopted 1994 Transportation Improvement Program will contribute to annual emission reductions when compared to the 1990 Base Year Network. This is true for both the 1996 and 2001 New TIP scenarios. The level of emission reductions is shown in Table 1 on page 9. Conformity is achieved when the New TIP scenario for emissions is less than the Baseline scenario for the attainment years 1996 and 2001. Achievement of this emissions reduction was noted in the Findings section above. The reduction in emissions demonstrates conformity with emission reduction goals of the MPO and with the goals of the SIP. Conformity means that the TIP has achieved its intended purpose of eliminating or reducing the severity and number of violations of the national ambient air quality standards (NAAQS), and expeditiously attaining and maintaining those standards.

Implementation of the TCMs programmed in the 1994 TIP will further reduce mobile source hydrocarbon emissions even though these projects are not included in the modeling analysis. Therefore, it is clearly demonstrated that the 1994 Metro-Dade County TIP is in conformance with the SIP and with the Clean Air Act Amendments of 1990.

TABLE 1

EMISSION RESULTS

	1	2	3
YEAR	Volatile Organic Compounds VOC (Tons per day)	Carbon Monoxide CO (Tons per day)	Oxides of Nitrogen NOX (Tons per day)
1990	160.65	1208.87	112.33
1996 BASELINE	97.89	794.40	104.88
1996 NEW TIP	97.81	793.03	104.86
2001 BASELINE	90.83	747.48	100.61
2001 NEW TIP	89.29	734.41	100.29

TABLE 2

POPULATION AND VEHICLE MILES TRAVELLED

YEAR	DADE COUNTY POPULATION	Vehicle Miles Travelled (VMT's) using Volumes
1990	1,937,094	31,563,010
1996 BASELINE	2,134,086	35,243,320
1996 NEW TIP	2,134,086	35,242,680
2001 BASELINE	2,291,042	38,545,040
2001 NEW TIP	2,291,042	38,490,230

