SUBMITTED TO:
FLORIDA DEPARTMENT OF TRANSPORTATION
CONTACT: MS. AMY DATZ
605 Suwannee St.- MS 37
Tallahassee, Florida 32301

ESTIMATION OF VEHICLE FLEET AGE AND CHARACTERISTICS IN FLORIDA - FINAL REPORT

SUBMITTED BY:
DR. ROGER L. WAYSON, P.E.
MR. SURESH V. REDDY
MR. ANDREW EDWARDS
MS. MARTI MARTIN
MS. MARTA BRENNER
UNIVERSITY OF CENTRAL FLORIDA
CIVIL & ENVIRONMENTAL ENGINEERING DEPT.
P.O. Box 162450
Orlando, Florida 32816-2450

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I. INTRODUCTION

The Florida Department of Transportation (FDOT) is charged with making multi-million dollar decisions related to highway projects based upon the results of air quality modeling predictions. Other state agencies and Metropolitan Planning Organizations in the State face some of the same decisions. Accordingly, it is important that these air quality predictions be as accurate as possible. This is especially true since a conservative approach is most often employed by using "worst case" assumptions for weather inputs during predictions. Additional errors, such as may occur from inaccurate input values, could result in a project being altered or even stopped although it may not violate established criteria in reality. This requires that the modeling procedure be as accurate as possible. As such, a primary consideration is the accuracy of inputs used during the prediction process to reduce uncertainty in the predicted values, (garbage in = garbage out). FDOT has recognized this fact and has started research to better quantify inputs to the modeling practice.

II. BACKGROUND

One important step in the air quality prediction process, is the estimate of emissions. For motor vehicles, the U.S. Environmental Protection Agency (EPA) has developed a methodology

to determine appropriate emission factors. The EPA methodology is based on a basic emission rate, by vehicle type, derived during a 7.5 mile (12.1 Kilometer) driving cycle that averages 19.6 miles-per-hour (31.5 kilometers-per-hour)[1]. The basic cycle, named the Federal Test Procedure (FTP), has a total cycle time of 1,372 seconds and includes transient and stabilized portions.

The basic emission rates for each vehicle type are then adjusted as needed for other speeds and vehicle parameters. A composite emission factor for the overall fleet is also derived based on vehicle type emission rates and vehicle-miles-traveled. The composite emission factor represents the entire fleet of vehicles to be modeled. This method, based upon a series of adjustments, has been published in the EPA promulgated document, "A Compilation of Air Pollutant Emission Factors"[2]. The document is commonly called AP-42, based upon the given report number. EPA has issued a series of computer programs based on this process called MOBILE. The latest version is MOBILE5a[3].

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[1] U.S. Environmental Protection Agency, Determination of Percentages of Vehicles Operating in the Cold Start Mode, EPA-450/3-77-023, Office of Air Quality Planning and Standards, Research Triangle Park, NC, August, 1977.

[2] U.S. Environmental Protection Agency, Compilation of Air Pollutant Emission Factors, (2) Mobile Sources, Report No. AP-42-ED-4-VOL-2, Ann Arbor, MI, 1985.

[3] U.S. Environmental Protection Agency, User's Guide to MOBILE5a (Mobile Source Emission Model), EPA-AA-TEB-93-01, Ann Arbor, 1993.

The MOBILE5a computer software allows predictions of highway vehicle emission factors used for a myriad of purposes; from macroscale emissions inventories to microscale project evaluations. As such, the emission factor accuracy is of extreme importance to state and local transportation agencies.

When adjustments are made to the basic emission rates, it becomes extremely important to supply the most accurate inputs to reduce uncertainties. Vehicle mix is a required input and is quite significant in the overall accuracy of the predicted emission factors since each vehicle type emits various pollutants at a much different rate. The age of the vehicle also is important and used to determine the efficiency of emission controls.

Vehicle mix in the MOBILE5a model is defined by providing vehicle-miles-traveled (VMT) as an input. VMT must be supplied for eight defined vehicle types. These are:

- light-duty gasoline-fueled vehicle (LDGV)
  - passenger cars;
- light-duty gasoline-fueled trucks 1 (LDGT1)
  - gross vehicle weight (GVW) less than 6000 lbs.
  - lighter pick-up trucks and vans;
- light-duty gasoline-fueled trucks 2 (LDGT2)
  - GVW over 6000 lbs. but less than 8500 lbs.
  - heavier pick-up trucks and vans including many commercial trucks;
- heavy-duty gasoline fueled vehicles (HDGV)
  - heavier commercial trucks including highway hauling trucks;
- light-duty diesel-fueled vehicles (LDDV)
  - passenger cars;
- light-duty diesel-fueled trucks (LDDT)
  - less than 8500 lbs GVW including many commercial trucks;

- heavy-duty diesel-fueled vehicles (HDDV)
  - over 8500 lbs GVW
  - heavier trucks, including commercial and highway hauling trucks; and,
- motorcycles (MC).

Past practices in many areas, including Florida, have called for the use of "default" VMT values for each vehicle type. These default VMT fractions are provided by EPA internally in the MOBILE5a model and are based on national averages. Other States such as Texas, Pennsylvania, California and New York have derived locally specific input, which vary from the national averages. Florida's vehicle mix was also thought to be quite different from national averages currently used in MOBILE5a due to regional impacts such as the large rental fleets brought about due to tourist trade. The research described in this report was conducted to determine the correct proportion of VMT for each defined vehicle type. Later, as will be described, the scope of the project was expanded to include local values for mileage accumulation by age, vehicle type registration by age, and diesel sales fractions.

III. METHODOLOGY

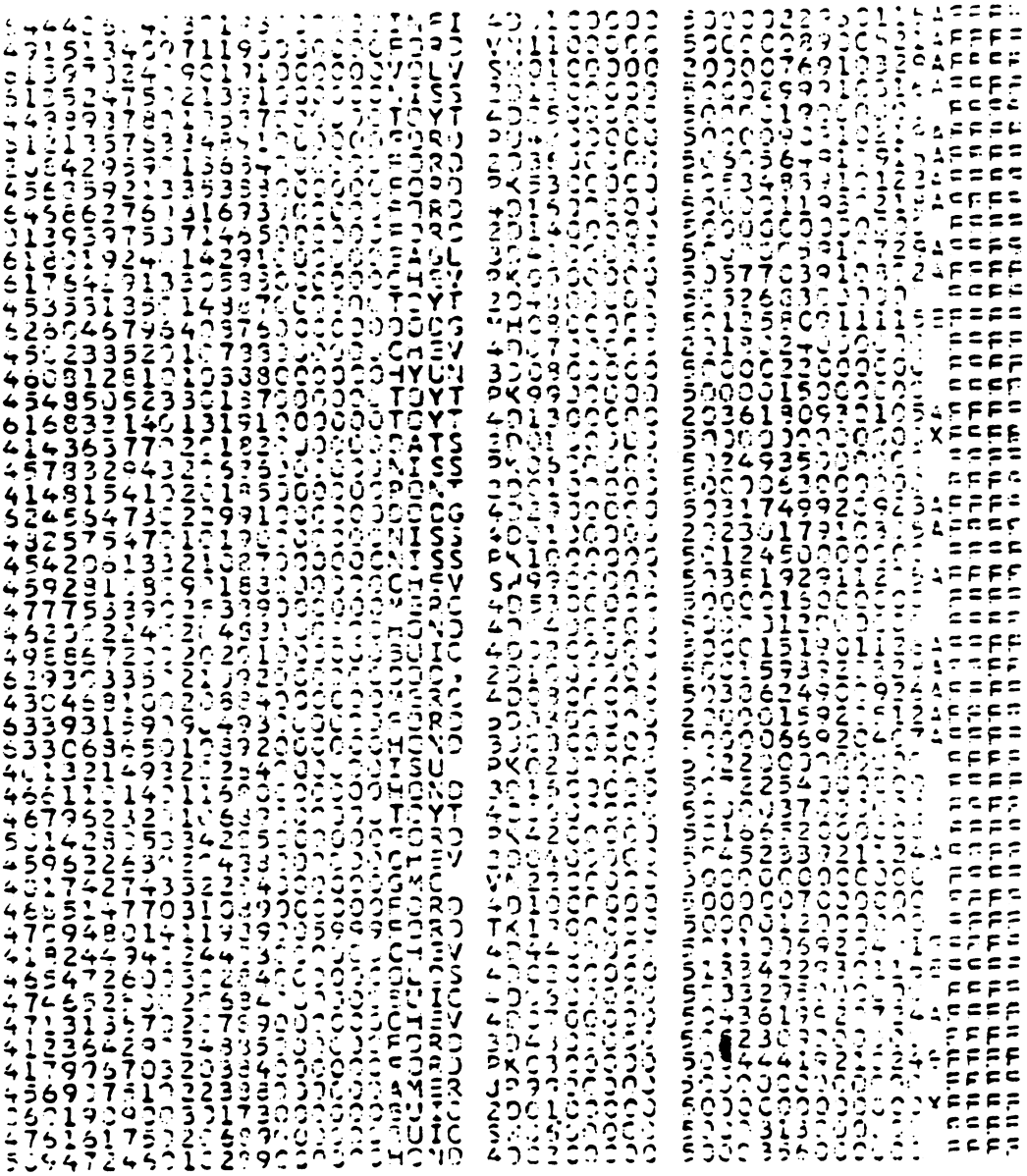
The method of analysis used to describe the statistical distribution of vehicles in Florida was to sample data contained the State Vehicle Registration Database. The University of Central Florida (UCF), under the direction of Dr. Roger L.

Wayson, analyzed the 1992 data base which contained 11,883,021 active vehicles in Florida. Of course, some data were missing preventing the inclusion of each vehicle in the data base, but 11,881,198 were included (99.985%). Cooperating with the FDOT, the Florida Department of Highway Safety and Motor Vehicles (FDHSMV) provided magnetic computer tapes to the UCF containing requested data, such as vehicle type, activity county, and year of make. The registration files, as used in this project, each had twenty defined variable fields. To maintain individual privacy, vehicle properties such as owner names and license numbers were not requested or included in the data.

However, as research progressed, it became apparent that additional registration information was required and a second request to FDHSMV was made. Contents of the second set of tapes, containing the needed data, are listed in Figure 1 (**DATA AS SUPPLIED ON MAGNETIC TAPE FROM THE FLORIDA DEPARTMENT OF HIGHWAY SAFETY AND MOTOR VEHICLES**). The additional information allowed not only the original work to be completed more accurately but led to further findings than originally proposed. The additional findings included development of inputs for the vehicle mileage accumulation rates by age, registration distribution by age, and diesel percentages. Each of these parameters are used by MOBILE5a and as developed are specific for the State of Florida.

FIGURE 1

DATA AS SUPPLIED ON MAGNETIC TAPE FROM THE FLORIDA DEPARTMENT OF HIGHWAY SAFETY AND MOTOR VEHICLES



This added some cost and time to the research. The time extension was graciously awarded by the FDOT and the UCF absorbed the cost.

The following discussion describes the analysis methodology required to develop MOBILE5a specific inputs from the raw data tapes.

Formatting and Sorting of Data. One of the major tasks in this project was data handling. On the whole, almost 12 million vehicles were analyzed for multiple variables resulting in a very large data base. Well over one billion pieces of information were sorted! The data were obtained from the FDHSMV on ten 6250 bits-per-inch (bpi) tapes for the first request, and twelve 6250 bpi tapes for the second request. Some data, due to ease of formatting by FDHSMV, were obtained beyond what was requested and were not used. The variables of significant interest and analyzed for this project included:

- vehicle class code,
- activity county for the vehicle,
- the year the vehicle was manufactured,
- gross weight,
- vehicle make,
- vehicle body style,
- residence county for the vehicle,
- license tag type,

- vehicle use,
- vehicle identification code,
- odometer mileage, and
- odometer mileage date.

It should be noted that not all of these data were available for each vehicle in the data base due to reporting errors and differences in accounting processes by vehicle type. This is true of data such as odometer mileage, which is only recorded during vehicle transfer and only for certain vehicle types.

The data format as received is listed in Figure 2 (**VEHICLE ELEMENT DATA LISTING AS SUPPLIED BY KIRKMAN DATA CENTER FLORIDA DEPARTMENT OF HIGHWAY SAFETY AND MOTOR VEHICLES FOR TAPES SHIPPED FEBRUARY 23, 1994**). The raw data consisted of a constant string of characters (see Figure 1), where various vehicle characteristics were indicated by different data fields (columns).

The first analysis step was to load the tapes and verify the inputs were as described in the element characteristics format description (Figure 2). This created some minor difficulties and delays. Since the data base was provided on more than one tape, it was first assumed that complete compatibility would occur for each tape. In reality, slight format differences caused delays in processing each tape.

Once the format of each tape was confirmed, the commercial

FIGURE 2

VEHICLE ELEMENT DATA LISTING AS SUPPLIED BY KIRKMAN DATA CENTER FLORIDA DEPARTMENT OF HIGHWAY SAFETY AND MOTOR VEHICLES FOR TAPES SHIPPED FEBRUARY 23, 1994

KIRKMAN DATA CENTER

FILE/RECORD DESCRIPTION

SYSTEM NAME: OUT REQUEST FOR INFORMATION

FILE NAME (GENERIC): DEPT OF TRANSPORTATION SELECTED DATA

FILE ID (LABEL): DHS.DMV.MTG107A

INPUT TO (PROGRAMS): MTG107

RECORDING MEDIUM: TAPE-6250 BPI RECORDING FORMAT: FIX

REC/BLK SIZE: 100 X 2500 DATE: 02-10-

ELEMENT CHARACTERISTICS

A = ALPHABETIC N = NUMERIC A/N = ALPHANUMERIC B = BINA

P = PACKED C = 6 BIT L = LEFT JUSTIFIED R = RIGH JUSTIFIE

ELEMENT NUMBER	FROM-THRU	SIZE	ELEM. CHAR.	DATA ELEMENT NAME AND/OR DESCRIPTION
1	1-8	8	N	TITLE NUMBER
2	9-10	2	N	VEH CLASS CODE
3	11-12	2	A/N	ACTIVITY COUNTY
4	13-16	4	N	VEH YEAR MAKE
5	17-20	4	N	VEH GROSS WEIGHT
6	21-25	5	A	VEH MAKE
7	26-27	2	A/N	VEH BODY STYLE
8	28-29	2	A/N	RESIDENCE COUNTY
9	30-31	2	N	VEH LENGTH
10	32-34	3	N	VEH [illegible]
11	35-35	1	A/N	TAG TYPE
12	36-36	1	A	VEH USE
13	37-42	6	N	[illegible] MILEAGE
14	43-48	6	N	[illegible] DATE (YYMMDD)

FIGURE 2 (CONTINUED)

VEHICLE ELEMENT DATA LISTING AS SUPPLIED BY KIRKMAN DATA CENTER FLORIDA DEPARTMENT OF HIGHWAY SAFETY AND MOTOR VEHICLES FOR TAPES SHIPPED FEBRUARY 23, 1994

KIRKMAN DATA CENTER

FILE/RECORD DESCRIPTION

SYSTEM NAME	DOT REQUEST FOR INFORMATION
FILE NAME (GENERIC)	DEPT OF TRANSPORTATION SELECTED DATA
FILE ID (LABEL)	DHS.D4V.MTG107A
INPUT TO (PROGRAMS)	MTG107
RECORDING MEDIUM	TAPE-6250 BPI RECORDING FORMAT FIX
REC/BLK SIZE	100 X 2500 DATE 02-10-

ELEMENT CHARACTERISTICS

A = ALPHABETIC N = NUMERIC A/N = ALPHANUMERIC B = BINA

P = PACKED C = 6 BIT L = LEFT JUSTIFIED R = RIGHT JUSTIFIE

ELEMENT NUMBER	FROM-THRU	SIZE	ELEM. CHAR.	DATA ELEMENT NAME AND/OR DESCRIPTION
15	49-49	1	A	ODOMETER STATUS CODE
16	50-50	1	A	REBUILT FLAG
17	51-51	1	A	ASSEMBLED KIT FLAG
18	52-52	1	A	REPLICA FLAG
19	53-53	1	A	GLIDER KIT FLAG
20	54-70	17	A/N	VEH ID NUMBER
21	71-100	30	A/N	FILLER

program SAS[4] was used for further processing on the UCF's IBM 4381 main frame computer. The SAS software requires development of a Data Step (DataStep) and a Process Step (ProcStep) during statistical analysis. These "steps" are small input files used by SAS during program execution to control processing. The DataStep is used to convert the raw data (the FDHSMV tapes, Figure 1) supplied in standard IBM format (the format in which the tapes were obtained) to SAS format data files. Also during the DataStep, data is quality controlled by deleting invalid data records. The SAS "Dataset", created using DataStep, was then stored on a single IBM cartridge system tape.

A typical DataStep File used during this execution step is shown in Figure 3 (**TYPICAL DATA STEP FILE NEEDED TO FORMAT REGISTRATION FILES**). As can be seen by reviewing the DataStep file in Figure 3, column location of variables (e.g., CLASCODE, ACTCNTY) were identified, allowing proper formatting in a SAS input file. This new file was named, ALLDATA.CNTYS. Correct execution of this step is indicated by an appropriate output message from SAS.

Data Analysis. Analysis of the necessary information from the SAS formatted database required development of exact SAS procedure statements as previously mentioned. Because of a need

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[4] Copyright (c) 1989 by SAS Institute Inc., Cary, NC, USA. SAS (r) Proprietary Software Release 6.07, licensed to the UNIVERSITY OF CENTRAL FLORIDA, Site 0005569001.

FIGURE 3

TYPICAL DATA STEP FILE NEEDED TO FORMAT REGISTRATION FILES

```
DATA ALLDATA.CNTYS;
INFILE TAPES;
INPUT TITLENO 1-8 CLASCODE 9-10 ACTCNTY $ 11-12 YEAR 13-14 WEIGHT
15-20
MAKE $ 21-25 STYLE $ 26-27 RESCNTY $ 28-29 LENGTH 30-31 HPOWER
32-34
TAGTYPE $ 35 USE $ 36 MILEAGE 37-42 ODODATE 43-48 ODOSTAT $ 49
RBLTFLAG $ 50 ASBLDFLG $ 51 REPFLAG $ 52 GLDRFLAG $ 53 FILLER
$54-100;
OUTPUT ALLDATA.CNTYS;
RUN;
```

to analyze the database in different ways and problems encountered during analysis, several procedure step (ProcStep) files were developed. Only those steps directly related to the conclusions presented in this report are discussed in this report.

A first step ProcStep file was used to segregate the vehicles based on the vehicle type. This sort was based on vehicle type use, class code and weight of the vehicle. This allowed a very quick check of the assumption that rental cars significantly affect the fleet mix in Florida. As expected, certain counties (e.g., Dade and Orange) had very high rental car rates.

Because the rental car analysis had shown such high rates in Orange and Dade Counties, it became apparent that significant differences from national averages do occur in Florida regarding

the overall vehicle fleet. Further work was now justified to determine the extent of these differences.

Next, the data base was sorted by using class groups (CLAGRP) and vehicle weight using another ProcStep. This allowed the first sort of vehicles related to the EPA classifications. The sort was done without regard to the type of fuel used (diesel or gasoline) by each vehicle because other information was planned to be used to subdivide the determined groups by fuel use. Accordingly, the vehicles were not grouped as diesel or gasoline vehicles, rather they were grouped as light duty vehicles (LDV), light duty trucks 1 (LDT1), light duty trucks 2 (LDT2), heavy duty vehicles (HDV) and motorcycles (MC). Table 1 (**PERCENTAGES OF VEHICLES DETERMINED BY BODY STYLE, WEIGHT AND USAGE CATEGORY**) shows the overall Florida values derived for these defined vehicle types. Since MOBILE5a requires eight vehicle categories, these preliminary groups had to be further subdivided into the EPA defined types by fuel used determination.

TABLE 1

PERCENTAGES OF VEHICLES DETERMINED BY BODY STYLE, WEIGHT AND USAGE CATEGORY

CLASS GROUP	VEHICLES	% PERCENTAGE
LDV	9,386,808	79.0
LDGT1	1,926,307	16.2
LDGT2	116,720	1.0
HDV	244,795	2.1
MC	206,568	1.7
TOTAL	11,881,198	100.0

In an effort to keep project costs low, computer sorts were kept to a minimum because of the cost (each sort was quite time consuming and costly). To this end, vehicle type distribution by fuel use was first attempted by using diesel fuel sales compared to gasoline sales. Appendix A (**SAMPLING OF DATA RECOVERED FRO DIESEL SALES**) shows a sample of data recovered based upon diesel sales. This approach is recommended in the MOBILE5a manual for light duty vehicles. However, determination using this method led to large uncertainties. Accordingly, this approach was thought to be inappropriate even though considerable effort had been expended.

Next, estimates were attempted using literature searches of both fuel use and types of vehicles sold using Federal and State vehicle data bases. This sample of this search is shown in Appendix B (**SAMPLING OF DATA RECOVERED FOR DIESEL FRACTIONS FROM FEDERAL AND STATE DATA BASES**). The results of this type of approach led to possible large uncertainties in the opinion of the UCF research team because of classification conflicts (e.g., differences in weight limits set for defining vehicle types than EPA). Again, a different method of analysis was determined to be needed.

Since the first two methods led to large uncertainties, and to limited yearly data, it was decided to review the registration data once again for other identifying listings in regard to fuel

use. It was determined that vehicle manufacturers may include details on engine fuel type on the engine identification code. For the vehicle makes, Chevrolet, Ford, Lincoln and Mercury these values were determined to always occur in the same location of the engine identification code and indicated by the same letter designation. This meant that a defined character in the engine identification code denoted fuel use and that specific character could be used to identify diesel vehicles (D for Chevrolet, H for the other types). During this SAS sort, vehicles could be sorted into the defined EPA types using the same techniques as previously discussed (Data and Proc Steps).

These four vehicle makes rank first (Ford), second (Chevrolet), eighth (Mercury), and fifteenth (Lincoln) in total volumes in Florida. The total volumes of the four vehicle makes include about 38.4% of the total vehicles in Florida and as such, provide a representative sample of vehicles. It was realized that some makes such as Mercedes, about one percent of the total volume, would include many diesel vehicles. But this was considered to be overshadowed by makes such as Honda, Nissan, Toyota, etc. that do not produce diesel vehicles. Overall, it was concluded that the four defined vehicle types provided a very representative indication of the vehicle fleet fuel use in Florida. Based on this analysis, the next step in the process required sorting by vehicle make and checking the engine identification code to classify the vehicles as diesel or

gasoline vehicles. Unfortunately, as previously described, this led to project delays as another data set had to be requested from FDHSMV. These new tapes were received in February of 1994, formatted to SAS files as before, and ProcStep files developed.

Using the execution sort, two variables, CLASGRP and FUELGRP, were created. CLASGRP is the EPA defined categories and FUELGRP was used to subdivide these groups based upon fuel usage. It was now feasible to further classify the vehicle types into the eight EPA categories. LDVs were subdivided into LDGV or LDDV. LDT1 and LDT2 were subdivided into LDGT1, LDGT2, and LDDV. HDV were subdivided into HDGV and HDDT.

The final derived vehicle fractions by EPA defined categories for the entire state of Florida were:

TYPE	Vehicle Fractions
LDGV =	0.775 (0.782)
LDGT1 =	0.164 (0.083)
LDGT2 =	0.003 (0.047)
HDGV =	0.002 (0.042)
LDDV =	0.021 (0.002)
LDDT =	0.006 (0.000)
HDDV =	0.029 (0.035)
MC =	0.008 (0.009)

It can be seen that these vehicle counts compare favorably with the EPA default VMT percentages (shown in parenthesis). Also, when compared to Appendix A and B, the developed vehicle

fractions compare favorably to the historic data and fuel use data as well. These other two sources of data then tended to verify the sorting routine results.

But, the vehicle fractions do not represent input as needed by MOBILE 5a. The EPA fractions are based on vehicle-miles-traveled (VMT) and not just vehicle fractions. EPA defines the VMT fractions as[5]:

$$\%VMT_i = VMT_i/VMT_t$$

where:

$\%VMT_i$ = percent of VMT by vehicle class

VMT_i = total VMT by vehicle class

VMT_t = VMT for all vehicle classes

VMT = (vehicle volume) x (miles traveled).

To complete the analysis to determine VMT for each vehicle class, the vehicle fractions had to be multiplied by their respective mileage accumulation rates. These mileage accumulation rates had to be determined. The registration data could once again be used for this purpose. When title transfers occur in Florida, the date and odometer mileage are recorded. This permits the age of the vehicle (years in operation) and the miles traveled during that time period to be determined. Care was taken to review the odometer code to make sure actual mileage

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[5] U.S. Environmental Protection Agency, Procedures for Emission Inventory Preparation; Volume IV: Mobile Sources, EPA-450/4-81-026d, Emission Planning and Strategies Division, Office of Mobile Sources and Technical Support Division, Ann Arbor, MI.

was used and that the odometer had not been replaced. Since considerable transactions have occurred in Florida, substantial random events were available to allow characterization of vehicle mileage accumulation rates. By also sorting as before, it was possible to develop vehicle mileage accumulation rates for each EPA vehicle classification.

A final sort using required DataSteps and ProcSteps files provided a complete analysis of the mileage accumulation rates for each EPA classification by year of vehicle and county.

Because MOBILE5a includes all vehicles after 25 years of age into a single age category, it was decided that the vehicles made prior to 1967 should be grouped into a single category while analyzing the data for the vehicle miles traveled and the type of fuel used. Another Data and Proc Step was performed on the data set to accomplish this.

Using the derived vehicle type classifications, it was necessary to determine the miles traveled by each vehicle type since:

$$VMT_i = Type_i * MT_i$$

where:

VMT_i = Vehicle-Miles-Traveled by Vehicle Type

$Type_i$ = Specific Vehicle Type

MT_i = Miles Traveled by Vehicle Type

This was accomplished by using commercially available spreadsheets and the data previously determined. Because of the shear bulk of data, this was a very time consuming process.

During the project quality control of data, the mileage accumulation for HDDV became suspect. This is because it does not reflect the heavy shipping that occurs in Florida from vehicles registered in most other states. A review of the HDDV fractions by count revealed a reasonable agreement (previously shown) with the EPA, VMT fractions. This led to the conclusion that Florida's fraction of HDDV would be very similar to the national averages. The national averages also take into account the shipping that occurs. It was decided to fix the HDDV, VMT fractions to be equal to the EPA national default values. The rest of the VMT fractions could then be derived.

In addition to the use of EPA values for HDDV, motorcycle values were also used as EPA defaults (national averages). This is because data for mileage was not recorded in the State data files. The small percentage of motorcycles in the fleet makes the impact of this assumption acceptable.

The final VMT fractions for Florida statewide values are:

TYPE	VMT Fractions
LDGV =	0.745 (0.782)
LDGT1 =	0.168 (0.083)
LDGT2 =	0.003 (0.047)
HDGV =	0.002 (0.042)

LDDV = 0.032 (0.002)

LDDT = 0.006 (0.000)

HDDV = 0.035 (0.035)

MC = 0.009 (0.009)

It should be noticed that the Florida VMT fractions are similar to the EPA national default values as should be expected. However, some significant changes do occur. The fraction of LDGV, LDGT2, and HDGV are significantly less. The fraction of LDGT1, LDDV and LDDT are significantly higher. This will make substantial differences in the predicted emission factors and lead to significant differences in emission inventories and possibly in dispersion modeling.

To determine if the base year used for this analysis (1992) was a typical year, tax roles were reviewed for the years 1987 to 1991 and compared to 1992 for verification. Figure 4 (**COMPARISON OF VEHICLE VOLUMES STATEWIDE FOR LDGV AND TOTAL VEHICLES**) shows the trends established over the analyzed years. Figure 4 shows that 1992 was indeed a typical year. Growth is shown, but the relative percentages of LDGV compared to total vehicles remains relatively constant.

Mileage Accumulation Rates and Diesel Fractions by Year and Vehicle Type. The analysis described up to this point completed the original work tasks. However, FDOT and UCF realized that other components used in the MOBILE5a modeling process could be

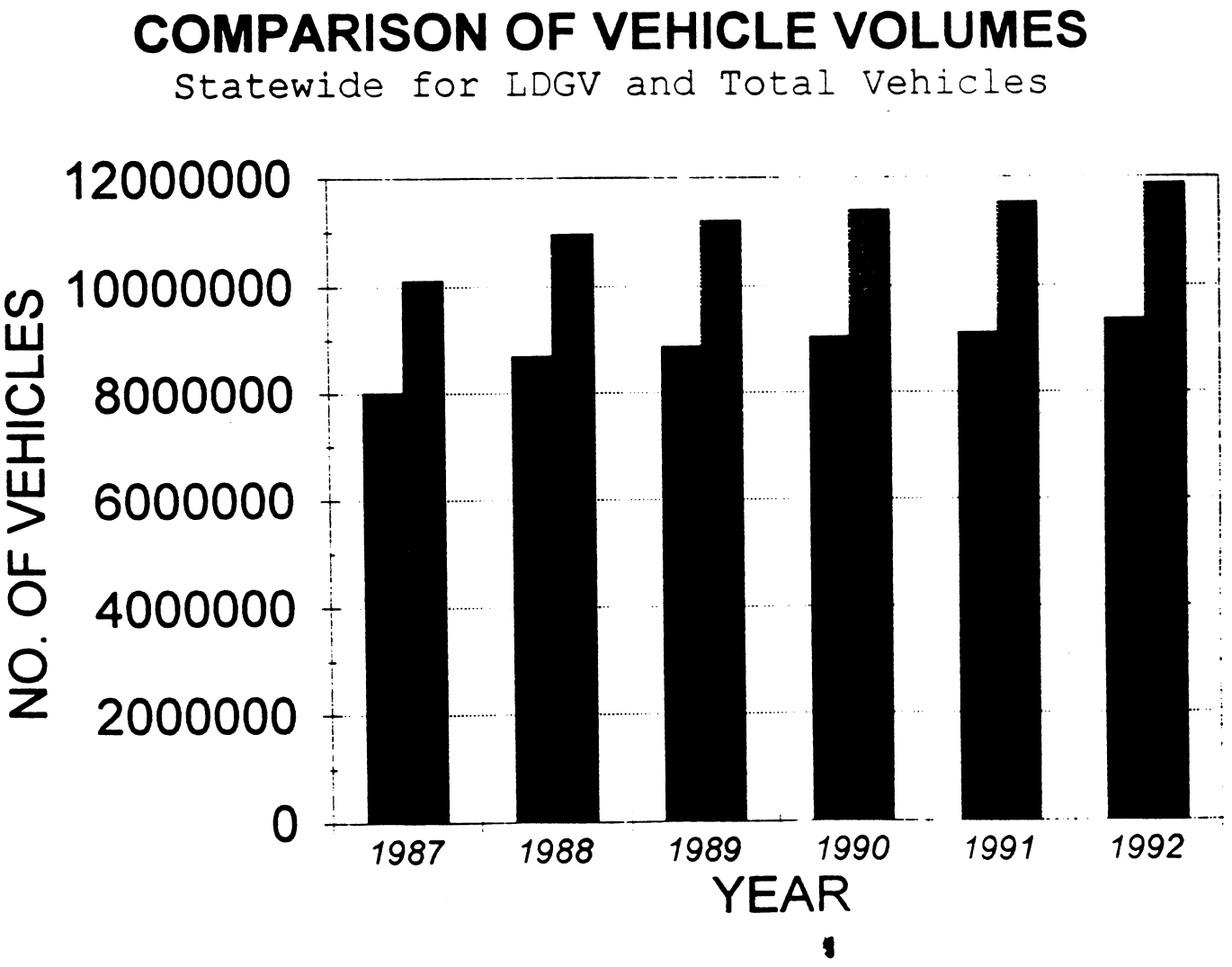
determined at this time and were significant. The valuable insight of FDOT allowed the project to continue past the contract end date. UCF absorbed the costs.

Additional MOBILE5a inputs that were decided to be determined included specifying mileage accumulation rates by year, determination of registration vehicle types by year, and percentages of diesel vehicles by vehicle type.

The data needed for these additional inputs had been generated during the previous analysis, but had to be derived in the proper format and tested. Massive MOBILE5a inputs files had to be developed, checked, and tested. While this sounds simple, it is long and time consuming due to the complexity of MOBILE5a and the way in which data is reported. Also, quality control is needed to check data to insure errors did not occur during the analysis process. This quality assurance required manually checking each piece of data in very large files. As previously stated, the additional work resulted in mileage accumulation rates and diesel fraction determination by EPA vehicle classification and by vehicle year. As will be discussed, a total of 1000 input values were determined for mileage accumulation rates, 1000 input determined for yearly fractions by vehicle type, and 250 input values for diesel fractions. Mileage accumulation is shown in Appendix C (**MILEAGE ACCUMULATION RATES**). Appendix D (**VEHICLE TYPE FRACTIONS FROM REGISTRATION FILES**)

FIGURE 4 (SOURCE - TAX ROLES)

COMPARISON OF VEHICLE VOLUMES STATEWIDE
FOR LDGV AND TOTAL VEHICLES



includes registration vehicle types by percentages. Diesel sales fractions for LDVs and LDTs are included in Appendix E (**DIESEL SALES FRACTIONS**). The values developed were both for statewide data and for counties as will be discussed in the next section of this report.

County Specific Data. A decision had to made on spatial variability. For this data analysis, and all subsequent analysis, data was sorted for the entire State and by county. Counties in the data base from FDHSMV are designated by a number. There are 67 counties in Florida. Table 2 (**FLORIDA COUNTIES BY NAME AND STATE NUMBER DESIGNATION**) lists the counties by name and number designation used in the vehicle registration data base.

Since the vehicle counts and mileage accumulation rates had been determined by county during the SAS analysis, differences could be evaluated. Table 3 (**VMT ANALYSIS BY COUNTY**) shows the vehicle volumes, VMT, and VMT fraction for each county. The VMT fraction of each county shows interesting results. It can be seen that the county containing the most vehicle activity is Dade County. The county with the second and third most vehicles are Broward and Palm Beach Counties. These three, southern Florida counties, comprising the greater area between West Palm Beach and Miami, contain well over one-fourth (29%) of all vehicle activity counties in Florida. Other counties with large vehicle

TABLE 2

FLORIDA COUNTIES BY NAME AND STATE NUMBER DESIGNATION

1	Dade	34	Desoto
2	Duval	35	Madison
3	Hillsbrough	36	Walton
4	Pineallas	37	Taylor
5	Polk County	38	Monroe
6	Palm Beach	39	Levy
7	Orange	40	Hernando
8	Volusia	41	Nassau
9	Escambia	42	Martin
10	Broward	43	Okaloosa
11	Alachua	44	Sumter
12	Lake	45	Bradford
13	Leon	46	Jefferson
14	Marion	47	Citrus
15	Manatee	48	Hendry
16	Sarasota	49	Washington
17	Seminole	50	Holmes
18	Lee	51	Baker
19	Brevard	52	Charlotte
20	St. Johns	53	Dixie
21	Gadsden	54	Gilchrest
22	Putnam	55	Hamilton
23	Bay	56	Okeechobee
24	St. Lucie	57	Calhoun
25	Jackson	58	Franklin
26	Osceloa	59	Galdes
27	Highlands	60	Flager
28	Pasco	61	Lafayette
29	Columbia	62	Union
30	Hardee	63	Collier
31	Suwanee	64	Wakulla
32	Indian River	65	Gulf
33	Santa Rosa	67	Liberty

TABLE 3

VMT ANALYSIS BY COUNTY

VMT ANALYSIS BY COUNTY

county	nc mileage	volumes	vmt	vmt fract.
1	13965	1679002	2.345E+10	0.1493
2	15012	581554	8.730E+09	0.0556
3	13297	709491	9.434E+09	0.0601
4	11733	728724	8.550E+09	0.0545
5	13612	355946	4.845E+09	0.0309
6	11871	766643	9.101E+09	0.0580
7	13789	657558	9.067E+09	0.0577
8	12725	344992	4.390E+09	0.0280
9	13874	237897	3.301E+09	0.0210
10	12641	997984	1.262E+10	0.0803
11	13624	161662	2.202E+09	0.0140
12	12970	149368	1.937E+09	0.0123
13	14616	176705	2.583E+09	0.0164
14	12580	188048	2.366E+09	0.0151
15	12474	294486	3.673E+09	0.0234
16	12006	279584	3.357E+09	0.0214
17	13591	288173	3.917E+09	0.0249
18	12340	327412	4.040E+09	0.0257
19	12690	394471	5.006E+09	0.0319
20	13783	84367	1.163E+09	0.0074
21	14768	25341	3.742E+08	0.0024
22	13050	52843	6.896E+08	0.0044
23	13395	123840	1.659E+09	0.0106
24	13113	134327	1.761E+09	0.0112
25	14311	36693	5.251E+08	0.0033
26	13648	115609	1.578E+09	0.0100
27	13278	64951	8.624E+08	0.0055
28	11814	265885	3.141E+09	0.0200
29	14622	37985	5.554E+08	0.0035
30	13803	18340	2.531E+08	0.0016
31	15224	24302	3.700E+08	0.0024
32	12759	90325	1.152E+09	0.0073
33	14036	76522	1.074E+09	0.0068
34	13018	19784	2.575E+08	0.0016
35	16092	11938	1.921E+08	0.0012
36	13295	19846	2.639E+08	0.0017
37	14062	14807	2.082E+08	0.0013
38	11852	74414	8.820E+08	0.0056
39	14263	23885	3.407E+08	0.0022
40	12155	91765	1.115E+09	0.0071
41	14444	38769	5.600E+08	0.0036
42	12823	113163	1.451E+09	0.0092
43	13800	156444	2.159E+09	0.0138
44	13020	27086	3.527E+08	0.0022
45	15391	19574	3.013E+08	0.0019
46	14411	8890	1.281E+08	0.0008
47	12506	90754	1.135E+09	0.0072
48	14409	104273	1.502E+09	0.0096
49	14071	25169	3.542E+08	0.0023
50	14136	13002	1.838E+08	0.0012
51	14211	12707	1.806E+08	0.0012
52	20340	16690	3.395E+08	0.0022
53	12236	111384	1.363E+09	0.0087
54	14678	8583	1.260E+08	0.0008
55	14577	8748	1.275E+08	0.0008
56	14781	7165	1.059E+08	0.0007
57	12739	27362	3.486E+08	0.0022
58	14888	7377	1.098E+08	0.0007
59	15060	7193	1.083E+08	0.0007
60	13240	3859	5.109E+07	0.0003
61	13525	33226	4.494E+08	0.0029
62	15650	4107	6.427E+07	0.0004
63	17123	6643	1.137E+08	0.0007
64	11966	166342	1.990E+09	0.0127
65	14714	12255	1.803E+08	0.0011
66	13896	10218	1.420E+08	0.0009
67	14598	4443	6.486E+07	0.0004
68	20319	84982	1.727E+09	0.0110
69	13421	23321	3.130E+08	0.0020
AVERAG	13865.6	172191.28	2.276E+09	1.449E-02
MIN	11733	3859	5.109E+07	3.254E-04
MAX	20340	1679002	2.345E+10	1.493E-01
RANGE	8607	1675143	2.340E+10	1.490E-01
TOTAL		11881198	1.57E+11	

populations include Pineallas (6.1%), Hillsborough (6.0%), Orange (5.5%), Duval (4.9%), Brevard (3.3%), Polk (3.0%), Volusia (2.9%), Lee (2.8%), Manatee (2.5%), Sarasota (2.4%), Seminole (2.4%), Pasco (2.2%), and Escambia (2.0%). These counties represent the large cities in Florida. No other county represented more than 1.6% of the state vehicle count by activity county. These sixteen counties represent three-quarters (75.0%) of the vehicles in the State.

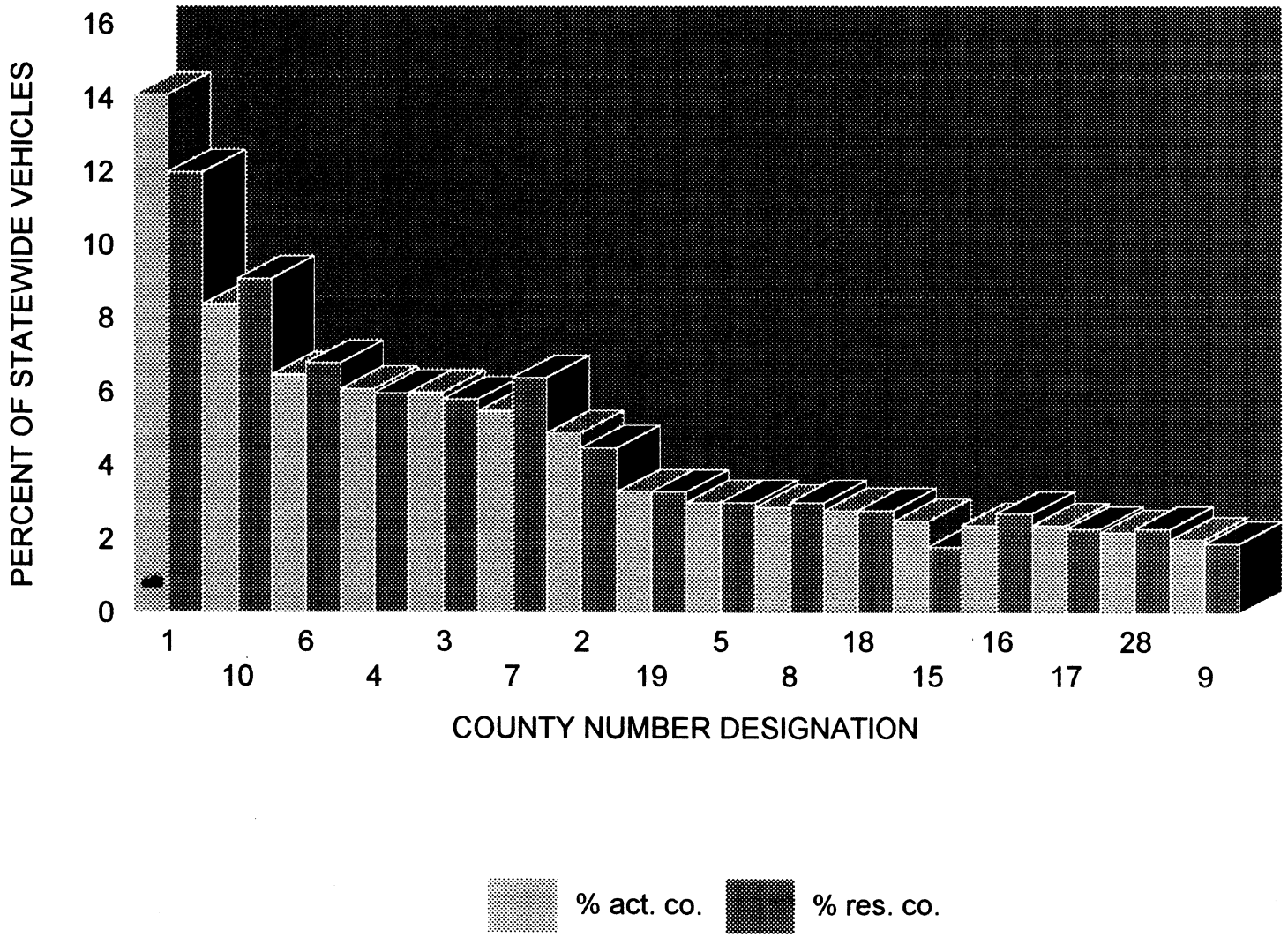
When the county vehicle populations were generally compared to population distributions in the State, differences were observed, such as Duval county which has a very large population but is seventh in vehicle activity as measured by VMT. This would lead to different emission densities due to highways sources in various cities. To take another look at this data characteristic, vehicles were also sorted by residence county. Percentages were compared for the residence county and the activity county and found to be quite similar. The data comparison is listed in Table 4 (**COMPARISON OF VEHICLE VOLUMES; ACTIVITY VS. RESIDENCE COUNTY**) and shown graphically by Figure 5 (**VEHICLE DISTRIBUTION BY COUNTY**). As shown in Table 4, the sixteen counties that contain 75 percent of the vehicles registered in the State by activity county contain 73.7% of the vehicles as registered by residence county. Also, as can be seen by Figure 5, the trends are quite similar, with only minor

TABLE 4

COMPARISON OF VEHICLE VOLUMES; ACTIVITY VS. RESIDENCE COUNTY

Rank	County	vmt estimates cnty no.	% act. co.	% res. co	mileage per year	Urban Area
1	Dade	1	14.1	12.0	13965	Miami
2	Broward	10	8.4	9.1	12640	Miami
3	Palm Beac	6	6.5	6.8	11870	Miami
4	Pineallas	4	6.1	6.0	11734	Tampa
5	Hillsboroug	3	6.0	5.8	13613	Tampa
6	Orange	7	5.5	6.4	13789	Orlando
7	Duval	2	4.9	4.5	15012	Jacksonville
8	Brevard	19	3.3	3.3	12690	Melbourne
9	Polk	5	3.0	3.0	13874	Lakeland
10	Volusia	8	2.9	3.0	12726	Daytona Bc
11	Lee	18	2.8	2.8	12340	Ft. Myers
12	Manatee	15	2.5	1.8	12474	Sarasota
13	Sarasota	16	2.4	2.7	12006	Sarasota
14	Seminole	17	2.4	2.3	13591	Orlando
15	Pasco	28	2.2	2.3	11814	Tampa
16	Escambia	9	2.0	1.9	13874	Pensacola
17	Marion	14	1.6	1.6	12580	Ocala
18	Leon	13	1.5	1.5	14616	Tallahassee
19	Wakulla	64	1.4	1.4	11966	Tallahassee
20	Alachua	11	1.4	1.3	13624	Gainesville
21	Okaloosa	43	1.3	1.2	13800	Ft. Walton B
22	Lake	12	1.3	1.3	12970	Orlando
23	St. Lucie	24	1.1	1.1	13113	Fort Pierce
24	Bay	23	1	1	13395	Panama Cit
25	Osceola	26	1	0.9	13648	Orlando
26	Martin	42	1.0	0.9	12823	Port Salerno
	TOTAL %		87.6	85.9		

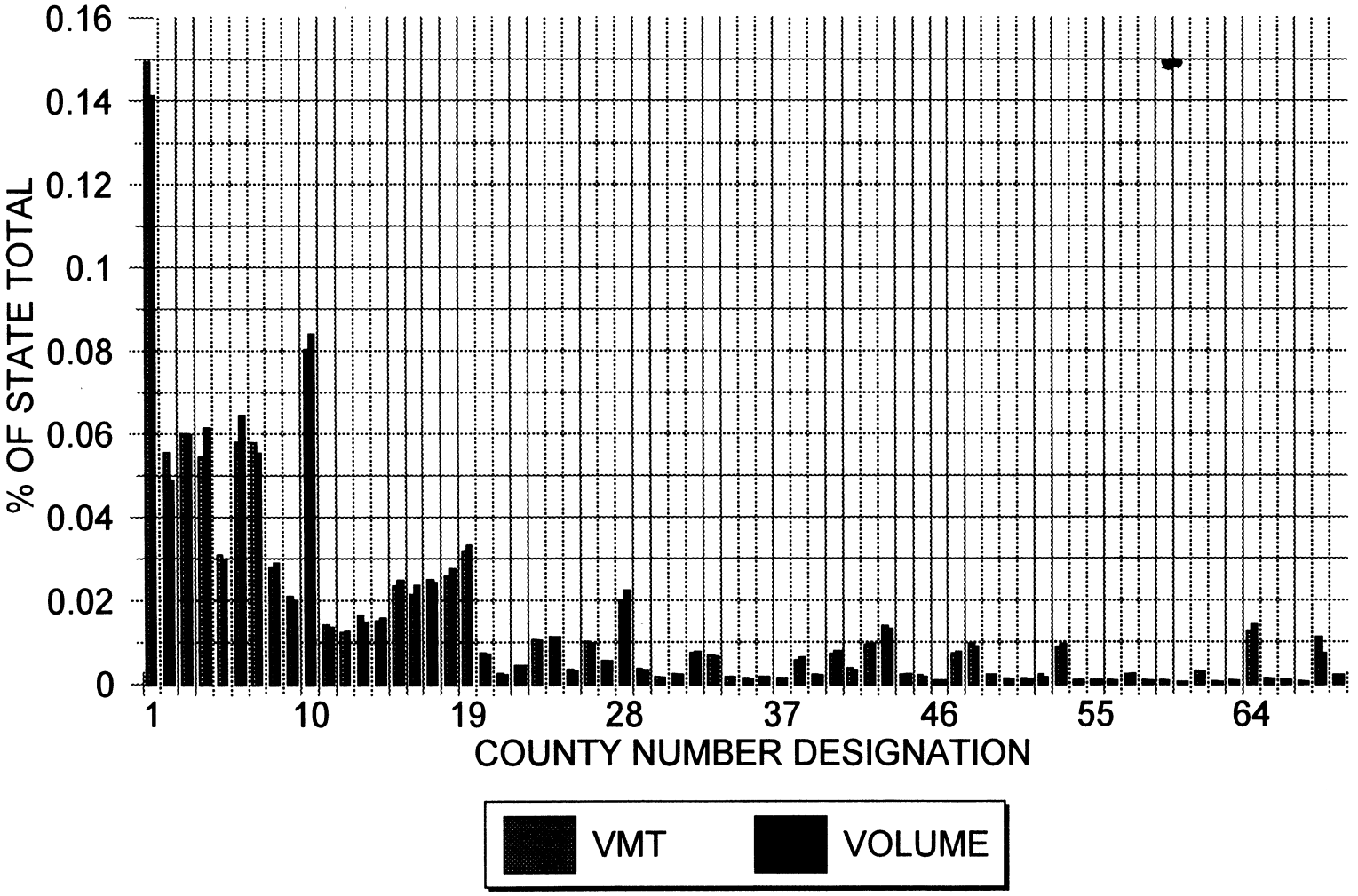
FIGURE 5 -- VEHICLE DISTRIBUTION BY COUNTY



variations. Since the trends were so similar, and because emissions should be predicted where activity occurs, the activity county was used in all subsequent analysis for this report.

Further insight occurs when the counties VMT or mileage accumulation rates (miles-of-travel / year)are plotted. Figure 5 shows the rank of vehicle percentage by county number while Figure 6 (**VOLUME AND VMT RATES BY COUNTY**)shows the volume and VMT rates by county. It becomes obvious that seven counties have much higher VMT fractions of traffic than the others and may require individual analysis of data. This is emphasized as these counties correspond to the Miami (Dade, Broward and West Palm Counties), Tampa (Hillsborough and Pineallas Counties), Orlando (Orange County) and Jacksonville (Duval County) greater metropolitan areas. In addition, during the evaluation of vehicle classifications, the heavy rental car fleet became obvious in these counties as well (especially Dade and Orange). These differences by urban areas lead to changes in the VMT mix and mileage accumulation rates by year. For example, rental car fleets are typically less than two years old and have been driven less than 25,000 miles. This means that the actual emissions vary considerably from those that would be predicted using default imput parameters. These findings led to these seven counties being evaluated separately and all other areas evaluated by state-wide values.

FIGURE 6 -- VOLUME AND VMT RATES BY COUNTY



Vehicle fractions were required by area to perform this analysis. To do this, areas relating to counties (as defined previously) were evaluated. The results by area are shown in Table 5 (**VEHICLE FRACTIONS FOR THE LARGER METROPOLITAN AREAS AND STATEWIDE LISTED IN MOBILE5a CATEGORIES**). Complete files from which the data was extracted are shown in the Appendicies. It should be noted that HDDV and MC fractions were not calculated. This is because HDDV and MC were "fixed" at the EPA default values as previously defined. As with development of the statewide factors, the next step was to develop vehicle miles traveled by vehicle type for the specified urban areas, by including only the appropriate counties. VMT fractions were developed as before (miles traveled per county and vehicle type multiplied by the vehicle type count per county). This resulted in the values shown in Table 6 (**FRACTION OF VEHICLE MILES TRAVELED FOR THE LARGE METROPOLITAN AREAS AND STATE LISTED IN MOBILE5a CATEGORIES**).

It can be seen by observation that the large urban areas in Florida have less LDGV, LDGT2, and HDGVs than the EPA national averages. As a result, the fraction of LDGT1, LDDV and LDDT are greater than the EPA national fractions.

The last part of the county analysis was to develop the mileage accumulation vehicle type distribution, and diesel fractions for the statewide data. These two tasks were

TABLE 5

VEHICLE FRACTIONS FOR THE LARGER METROPOLITAN AREAS AND STATEWIDE

LISTED IN MOBILE5a CATEGORIES

AREA	LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC
Miami	.751	.166	.017	.002	.012	.008	.035	.009
Tampa	.732	.204	.003	.002	.008	.007	.035	.009
Orlando	.715	.216	.004	.001	.012	.008	.035	.009
Jacksonville	.695	.239	.003	.001	.011	.007	.035	.009
Statewide	.775	.164	.003	.002	.021	.006	.035	.009

TABLE 6

FRACTION OF VEHICLE MILES TRAVELED FOR THE LARGE METROPOLITAN AREAS AND STATE LISTED IN MOBILE5a CATEGORIES

AREA	LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC
Miami	.727	.185	.015	.002	.021	.005	.035	.009
Tampa	.718	.212	.002	.002	.016	.005	.035	.009
Orlando	.706	.218	.004	.001	.021	.005	.035	.009
Jacksonville	.703	.233	.002	.001	.014	.004	.035	.009
Statewide	.745	.168	.003	.002	.032	.006	.035	.009
Nat'l Averages	.782	.083	.047	.042	.002	.000	.035	.009

accomplished by sorting the data by the EPA vehicle classification light duty vehicles and by fuel type as has been previously described during the state-wide analysis. The derived information is shown in Appendix C (mileage accumulation) and Appendix E (diesel sales fractions).

IV. RESULTS AND RECOMMENDATIONS

Development of more accurate MOBILE5a inputs was the driving force behind this research. Based on state registration records, more exact input values were derived. The impact on emissions predicted using the newly developed input paraemters were then compared to predictions using current default input values. A significant decrease in predicted emissions occurred.

The overall goal to develop the proper inputs to allow changes in emission factor estimation, based on the differences between the Florida fleet and the national averages was accomplished. These derived values should now be used in place of the MOBILE5a default inputs for vehicle categories to provide more accurate emission factors.

A review of the MOBILE5a user manual reveals that changes in vehicle mix and miles traveled from the national averages can be accomplished by "setting flags" in the CONTROL and SCENARIO sections[6]. A "flag" determines what data is required when using

[6] See Chapter 2 of MOBILE5a User Manual, referenced in foot note number 3 for exact definition.

MOBILE5a and how this data will be processed. The reader is referred to Chapter 2 of the MOBILE5a User Manual which includes the pertinent sections and explains in detail the changes required to input files when the vehicle parameters are changed in MOBILE5a.

To change the VMT mix and mileage accumulation rates by vehicle type, the VMTFLAG and MYMRFG flags must be "set", respectively, in the CONTROL section. As a result, additional information will be required in the ONE-TIME and/or the SCENARIO data section. In addition, the DSFLAG, found in the Local Area Parameter (LAP) record in the SCENARIO section will also change if diesel fractions are different than national averages.

VMT Flag (VMFLAG) and Required Input. The VMFLAG may be set to 1, 2 or 3. If set to 1, MOBILE5a default values are assigned to vehicle miles traveled (VMT) for each of the defined vehicle types. As previously noted, the VMT represents the product of the vehicle fraction and the miles traveled by each of the eight vehicle types. If the VMFLAG is set to 2, a user defined VMT fraction must be supplied for each of the eight vehicle types, in each scenario. If the VMFLAG is set to 3, the same VMT information must be supplied only once, for all scenarios. The results of this research could be used with the VMFLAG set either to 2 or 3, according to user preference.

The developed data as previously described, had to be

formatted into the exact form required of input files used by MOBILE5a. The exact input file format for each county and state-wide values are shown in Appendix F (**MOBILE5a INPUT FILES FOR VMT CHANGES ONLY**). Exact columns should be determined by the reader from the MOBILE5a user manual but computer floppy disk files have also been supplied to help the analyst. These computer disk contain example MOBILE5a input files that may be altered by the user as needed. It should be noted that these files will require additional input, such as inspection maintenance details, before actual use. Care should be taken for these inputs since some data, again such as inspection maitenance input, change annually.

In an effort to estimate the effect of changing the VMT fraction, MOBILE5a was exercised using EPA national default VMT fractions and the derived Florida specific VMT fractions. Input files were kept simple to avoid masking of impact. As such, details such as Inspection Maintenance were not included. The generated results are too extensive to include in the body of this report and so are included in Appendicies for better organization and understanding. Figures are included in Appendix G (**FIGURES DISPLAYING RESULTS OF USING VMT FLAG**) which show the results on the three pollutants for changes in the VMT mix only. It can be seen from these figures that a slight decrease in emissions occur when the more correct VMT inputs are used in place of the EPA default values. This occurs for the Statewide

values and all cities. Some cities show more reduction that others and there are varying amounts of reductions for CO and THC than for NOx. For example, the CO and THC reductions are less in the Jacksonville area than for the other cities. Also, in Jacksonville, NOx shows a slightly greater percent reduction. In summation, the EPA default values lead to over prediction in Florida.

It is crucial that the new input values for VMT be used. This will lead to more accurate predictions and evaluations of both individual projects and overall area emissions. The exact reduction amount will depend on the other variables that will be used such as Inspection Maintenance inputs.

The Mileage Accumulation Flag (MYMRFG). Another flag affected by vehicle mix changes is the MYMRFG flag. This flag, in the CONTROL section of the MOBILE5a input, determines if national default values or user supplied mileage accumulation rates will be used. The flag may be set to values of 1, 2, 3, or 4. If a value of 1 is supplied, the MOBILE5a default values are used. A value of 2 indicates that mileage accumulation rates will be supplied for each vehicle type, but the MOBILE5a vehicle type distribution by age will be used. A value of 3 indicates that the user will supply the vehicle type distribution by age, but annual mileage accumulation rates used will be the MOBILE5a default values. Finally, if the user sets the flag to 4, both

user supplied mileage accumulation rates by age and vehicle type distribution by age are to be used. If the flag is set to 2, 3, or 4, additional input is required in the ONE-TIME section of the MOBILE5a input file.

This research was extensive and both mileage accumulation rates and age distribution were determined. As such, the analyst could set the MYMRFG flag to either 3 or 4. It should be noted that LDGV and LDDV must have the same values. Also, LDGTI and LDDT must have the same values. Variances from these values by fuel type are taken into account by use of the DSFLAG flag, and will be discussed later.

As previously described, the data needed for this optional input includes, mileage accumulation by vehicle category (eight defined MOBILE5a vehicle types)by year and the number of vehicles of each category by year. These values must be specified for each year for the past 24 years and all earlier years combined into a twenty-fifth value. As such, 400 inputs are needed for this option if the MYMFLG flag is set to 4. Appendix H (**MOBILE5a INPUT FILES FOR ALL CHANGES**) shows the input file configuration for MOBILE5a input files using this option for statewide and the four urban areas. This new option was evaluated in conjunction with the VMT changes and diesel sales fraction and is discussed later.

The Diesel Sales Flag (DSFLAG). Also important when vehicle

mixes are changed is another flag for diesel sales, the DSFLAG. This flag may be included in the SCENARIO section of the MOBILE5a input file. Use of this flag sets the fraction of diesel sales by model year for light duty vehicles and trucks (LDGV, LDGT1, LDGT2, LDDV) by model year. Two input values are possible for this flag, 1 or 2. If a 1 is used (or if the flag is omitted) the MOBILE5a default values will be used. If a 2 is supplied by the user, diesel sales fractions must be supplied for LDVs and LDTs, by year, in the SCENARIO section of the MOBILE5a input file. The input files shown in Appendix H include the diesel sales input for MOBILE5a (along with the mileage accumulation and vehicle accumulation inputs). To evaluate the effect of all three changes, a comparison was made of the composite emission factor developed using the EPA national default input values and the Florida specific values. Table 7 (**COMPARISON OF NATIONAL DEFAULT VALUES TO USE OF ALL DERIVED INPUT VALUES**) and the figures included in Appendix I (**FIGURES DISPLAYING RESULTS OF USING ALL DERIVED OPTIONAL INPUTS**) show the results for CO, NOx and HC.

It can be seen from these figures that the statewide emission factors are less when the more accurate vehicle inputs are used. This follows the same trend when just VMT was used as previously discussed. Emission factors from the individual cities are also generally less, although not always. For

TABLE 7

COMPARISON OF NATIONAL DEFAULT VALUES TO USE OF ALL DERIVED INPUT VALUES

	Default			Florida		
Speed, mph	THC	CO	NOx	THC	CO	NOx
2.5	24.81	233.29	4.61	20.88	224.35	4.10
10	6.86	68.44	3.47	5.94	62.71	3.03
15	5.00	48.24	3.23	4.34	44.31	2.82
25	3.36	31.58	3.08	2.97	29.30	2.72
35	2.63	24.05	3.13	2.32	22.42	2.77
45	2.23	20.35	3.28	1.96	18.78	2.87
55	2.11	19.90	4.18	1.88	18.06	3.71
65	2.97	51.59	5.61	2.76	47.81	4.99

Emission Factors, gm/mile

	Tampa			Miami		
Speed, mph	THC	CO	NOx	THC	CO	NOx
2.5	21.50	234.39	4.08	23.33	252.65	4.22
10	6.17	65.21	3.03	6.60	69.49	3.13
15	4.52	45.90	2.83	4.81	48.66	2.93
25	3.11	30.37	2.76	3.29	32.18	2.84
35	2.44	23.24	2.82	2.57	24.80	2.90
45	2.07	19.54	2.93	2.18	20.95	3.02
55	1.99	18.83	3.78	2.08	20.21	3.91
65	2.93	50.89	5.08	3.13	55.50	5.26

Emission Factors, gm/mile

	Jacksonville			Orlando		
Speed, mph	THC	CO	NOx	THC	CO	NOx
2.5	26.48	284.96	4.51	23.50	253.51	4.22
10	7.48	78.82	3.35	6.68	70.02	3.13
15	5.45	55.30	3.15	4.87	49.17	2.94
25	3.72	36.53	3.08	3.33	32.46	2.86
35	2.89	27.93	3.16	2.59	24.78	2.92
45	2.45	23.51	3.28	2.19	20.82	3.04
55	2.34	22.67	4.25	2.10	20.07	3.93
65	3.53	62.17	5.69	3.14	55.10	5.28

Emission Factors, gm/mile

example, in Jacksonville, the NOx predicted emission factors using the new, more correct vehicle inputs are less until about 25 miles-per-hour when compared to the predicted values using the EPA default values. Then the new input values predict slightly higher NOx values. For CO and THC, the new vehicle inputs cause a slightly higher emission factor to be predicted. In Miami, the new prediction factors, using the new vehicle inputs, always show reductions when compared to the values predicted using the EPA default vehicle inputs. The reduction for NOx is fairly substantial. In Orlando, the reduction for NOx is again substantial, but at speeds over 55 miles-per-hour, slightly higher CO and THC are predicted. In Tampa, a substantial reduction occurs for NOx, and a small reduction occurs for CO and THC. To confirm these results for the four cities, input files, values and all analysis were checked and then re-checked.

As before, when only VMT changes were evaluated, exact percentages of reductions or increases in the predicted emission factors will depend on all inputs (i.e., Inspection Maintenance).

V. CONCLUSIONS

In sum, the data required to determine the VMT fractions, mileage accumulation rates by age, vehicle type distribution by age, and diesel sales fractions included:

- vehicle counts for the eight MOBILE5a categories by

year and county;

- •2 miles driven for each vehicle category by year and county;
- •3 miles driven for each vehicle category by vehicle year and county;

and,

- •4 diesel sales fractions for LDVs and LDTs, by year and county.

These data were extracted from FDHSMV registration files and Florida specific inputs were developed for MOBILE5a. Diesel sales fractions were also validated by using other sources. Historic trends were used to validate VMT fractions.

It is felt by the author that the use of the derived MOBILE5a input files will result in more accurate determination of emission factors in Florida. The test results show that statewide emission estimates will decrease when the more accurate vehicle inputs are used. This is somewhat expected because of the newer vehicles in use in Florida because of factors such as the high percentage of rental vehicles. When all inputs are included, individual areas show predicted emission factors to be generally less than those predicted using the EPA default vehicle imputs. In some cases however, slight increases of the emission factors using the more accurate vehicle inputs are shown when compared to the predicted values using the EPA default vehicle parameters. The exact percentage of change will depend on the

final MOBILE5a files with all input values included.

Based upon this work, future year analysis should be easy and straight-forward. Care should be used to request the data from FDHSMV that includes all necessary inputs as described in this report. This allows the options for VMT, mileage accumulation, vehicle type distribution and diesel sales fractions to be included during project analysis.

Specific MOBILE5a inputs were defined in this report and preliminary results developed. Sample files are shown and discussed and input files have been submitted to FDOT on 3.5 inch computer floppy disk.

VI. IMPLEMENTATION

This report should be submitted to FHWA and EPA for their concurrence. This should not be a difficult situation since EPA recommends this approach in the MOBILE5a User Guide. As a minimum, the use of the VMT fractions should be requested. The varying results from the more extensive inputs should be evaluated by FDOT to determine if these inputs meet the goals and desires of the State. After this is achieved, the results should be implemented for air quality analysis in the State of Florida. This can be done by sending the determined input values developed in this report along with sample MOBILE5a input files and floppy disk files to FDOT District Offices, other state agencies, and

interested consultants. This should lead to more accurate emission estimates.

It should also be noted that as different years of evaluations are selected, changes will occur. Future projections should be accomplished for determination of design year evaluations. The values reported are specific for 1992. Small changes will occur with time. The derived values are considered adequate for five years (until 1998). Future scenarios may need to be adjusted or corrected. The U.S. EPA has recognized this problem area and has published guidelines and computer programs to correct for this problem under the title of "Dynamic Registration Preprocessor".[7,8] This process would allow the data to be interpolated for future cases. To insure continued accuracy, the registration data base should be reviewed with a study similar to this one, at regular intervals. This interval is recommended to be five years.

EPA has also recently released MOBILE5b. The vehicle inputs are unchanged in this model and all results presented here are still directly applicable.

UCF is committed to assisting FDOT in this endeavor. Dr. Wayson offers his help during this implementation.

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[7] U.S. EPA, "MOBILE5, Information Sheet #4, Dynamic Registration Preprocessor", NVFEL, AQAB, Ann Arbor, MI, December 1, 1994.

[8] U.S. EPA, "MOBILE5, User's Guide, Dynamic Registration Preprocessor", NVFEL, AQAB, Ann Arbor, MI, December 1, 1994.

APPENDIX A

SAMPLING OF DATA RECOVERED FOR DIESEL SALES

STATE MOTOR-VEHICLE REGISTRATIONS - 1990 [1]

COMPILED FOR THE CALENDAR YEAR FROM REPORTS OF STATE AUTHORITIES AND OTHER SOURCES 2/

TABLE MV-1
SEPTEMBER 1991

STATE	MOTOR VEHICLES															MOTORCYCLES	
	AUTOMOBILES			BUSES			TRUCKS			ALL MOTOR VEHICLES			COMPARISON OF TOTAL MOTOR-VEHICLE REGISTRATIONS, 1989-1990				
	PRIVATE AND COMMERCIAL (INCLUDING TAXICABS)	PUBLICLY OWNED 3/	TOTAL	PRIVATE AND COMMERCIAL 4/	PUBLICLY OWNED 3/	TOTAL	PRIVATE AND COMMERCIAL	PUBLICLY OWNED 3/	TOTAL	PRIVATE AND COMMERCIAL	PUBLICLY OWNED 3/	TOTAL	TOTAL 1990 REGISTRATIONS	INCREASE OR DECREASE 1990	PERCENTAGE CHANGE	PRIVATE AND COMMERCIAL	PUBLICLY OWNED 3/
ALABAMA	2,719,357	13,314	2,733,068	1,867	6,267	8,234	979,270	23,913	1,003,191	3,700,497	43,894	3,744,491	3,823,204	121,287	3.3	43,396	475
ALASKA	294,459	2,662	307,121	1,005	339	2,144	166,346	7,714	173,060	460,610	10,715	477,376	443,743	113,682	31.2	11,512	9
ARIZONA	1,906,596	15,140	2,001,736	1,433	2,966	4,399	803,555	15,422	818,977	2,701,584	33,528	2,026,112	2,735,270	49,842	1.8	70,817	737
ARKANSAS	925,283	9,064	934,347	1,131	4,048	5,179	497,963	10,181	508,144	1,424,377	23,283	1,447,660	1,433,068	14,592	1.0	14,537	19
CALIFORNIA	18,812,806	159,045	18,971,863	25,151	14,976	40,127	4,700,566	213,332	4,913,898	21,538,525	387,353	21,926,878	21,671,133	254,745	1.2	628,860	11,694
COLORADO	2,270,974	9,145	2,300,119	1,465	4,861	6,326	877,367	22,369	849,736	3,119,798	36,875	3,155,371	3,153,838	1,533	0.0	108,375	58
CONNECTICUT	2,460,701	10,803	2,471,504	1,856	760	8,716	5/ 170,172	22,674	142,746	2,680,029	34,137	2,672,966	2,651,143	-20,177	-1.1	51,153	290
DELAWARE	401,053	5,187	406,240	1,601	683	2,284	115,284	2,441	117,845	517,068	8,231	526,069	521,591	4,490	0.9	8,843	24
DIST. OF COL.	241,004	3,875	244,879	2,462	361	2,813	8,862	5,377	14,238	252,328	9,603	261,931	258,934	2,997	1.2	2,109	451
FLORIDA	8,612,020	82,832	8,684,852	4,847	31,999	36,846	2,090,266	118,842	2,210,108	10,716,133	234,673	10,949,806	11,206,904	-257,098	-2.3	280,511	6,318
GEORGIA	3,813,593	20,322	3,833,915	3,200	11,887	14,577	1,596,436	50,616	1,646,052	5,407,309	81,836	5,489,144	5,270,487	218,657	4.1	73,610	853
HAWAII	666,411	5,616	671,026	3,354	897	4,251	89,194	8,107	88,301	758,959	12,619	771,478	736,383	35,095	4.8	20,179	745
IDAHO	631,017	5,233	636,250	1,283	2,582	3,825	392,850	20,619	413,483	1,025,130	28,460	1,069,830	1,039,845	14,493	1.4	41,822	162
ILLINOIS	6,235,258	64,418	6,299,676	14,973	2,126	17,099	1,635,901	20,433	1,656,414	7,788,212	86,977	7,873,189	8,021,695	-148,506	-1.9	179,769	193
INDIANA	5,177,816	18,757	5,196,673	9,122	12,371	21,493	1,114,788	32,828	1,147,884	6,301,788	64,084	6,365,968	6,322,302	43,458	1.0	96,298	414
IOWA	1,870,199	18,169	1,888,368	1,343	7,734	9,077	717,883	24,845	742,529	2,589,425	42,648	2,631,873	2,583,270	48,703	1.9	173,201	166
KANSAS	1,397,648	7,897	1,404,743	1,648	2,223	3,771	587,888	18,753	603,838	1,988,288	28,873	2,012,363	1,986,863	25,708	1.3	75,405	291
KENTUCKY	1,893,006	22,885	1,915,891	1,882	8,145	10,027	937,182	47,188	984,298	2,831,998	77,418	2,909,488	2,869,033	68,375	2.3	34,416	93
LOUISIANA	1,973,633	24,525	1,998,158	16,186	4,880	19,066	958,945	17,794	976,739	2,947,764	46,999	2,994,763	2,976,097	18,666	0.6	29,658	407
MAINE	730,046	3,751	741,797	837	2,239	2,876	223,582	8,436	231,937	962,185	14,425	976,610	939,301	37,309	4.0	37,735	60
MARYLAND	2,968,340	11,980	2,970,320	6,803	4,434	10,937	606,571	19,092	625,283	3,570,414	30,186	3,600,870	3,527,427	73,003	2.2	85,878	148
MASSACHUSETTS	3,210,147	13,712	3,223,859	10,614	426	10,940	462,186	28,083	490,088	3,682,787	43,031	3,725,798	3,804,458	-78,660	-2.1	65,710	70
MICHIGAN	5,670,216	42,662	5,812,877	13,906	13,080	27,086	1,505,623	67,852	1,573,475	7,084,823	124,394	7,209,217	7,138,583	70,634	1.0	179,275	1,249
MINNESOTA	2,731,557	10,206	2,741,763	8,421	6,067	14,488	729,109	22,877	761,688	3,469,087	40,868	3,509,037	3,283,292	224,845	6.8	122,207	269
MISSISSIPPI	1,426,623	7,488	1,434,111	3,113	5,662	8,675	419,786	12,993	432,889	1,849,582	25,843	1,876,445	1,867,081	8,364	0.4	26,089	1
MISSOURI	2,752,697	9,121	2,769,818	4,298	7,565	11,863	1,118,203	12,795	1,132,998	3,876,198	29,481	3,904,679	3,843,982	61,697	1.6	87,714	37
MONTANA	452,370	4,886	457,263	1,092	1,263	2,355	311,016	12,519	323,535	764,498	18,667	783,163	741,197	41,956	5.7	21,812	82
NEBRASKA	903,399	9,209	912,688	1,061	3,965	5,026	452,874	14,060	466,132	1,356,634	27,312	1,383,846	1,361,724	22,122	1.6	21,904	201
NEVADA	582,827	9,291	592,118	1,611	246	1,767	247,108	12,481	259,589	831,448	21,990	853,444	825,723	27,721	3.4	18,815	442
NEW HAMPSHIRE	747,998	3,349	751,347	1,397	278	1,675	5/ 183,494	9,227	192,721	5/ 931,492	12,854	945,743	935,642	10,101	1.1	39,533	.
NEW JERSEY	5,124,320	55,191	5,179,511	10,951	3,053	13,004	5/ 374,778	80,089	454,867	5,514,049	138,335	5,652,382	5,636,330	16,052	0.3	85,227	1,212
NEW MEXICO	794,639	11,560	806,207	2,548	867	3,416	473,982	17,677	491,659	1,271,149	30,112	1,301,261	1,294,521	6,740	0.5	33,257	207
NEW YORK	8,756,991	74,325	8,831,316	19,823	12,833	32,656	5/ 1,260,901	71,480	1,332,381	10,037,615	158,638	10,196,153	10,020,539	175,614	1.8	196,937	988
NORTH CAROLINA	3,649,517	27,268	3,676,785	8,947	25,613	34,560	1,396,935	53,725	1,450,660	5,055,399	106,606	5,162,005	5,113,224	48,781	1.0	56,799	280
NORTH DAKOTA	368,791	3,252	371,643	517	1,644	2,161	248,458	7,877	256,135	617,248	12,573	629,839	636,197	-6,358	-1.0	20,111	83
OHIO	6,787,848	30,127	6,817,973	10,796	19,885	30,681	1,504,876	56,936	1,561,812	8,303,610	106,948	8,410,466	9,411,918	1,103,452	-11.8	229,997	411
OKLAHOMA	1,701,267	9,460	1,710,717	1,799	11,398	13,197	888,221	30,918	925,137	2,591,287	57,764	2,649,051	2,748,454	80,597	3.1	80,548	297
OREGON	1,819,011	19,984	1,838,995	3,661	6,951	10,612	572,748	23,140	595,888	2,396,412	50,074	2,445,487	2,178,751	66,736	2.8	63,433	657
PENNSYLVANIA	6,345,308	38,813	6,384,121	24,197	6,644	30,841	5/ 1,603,563	82,845	1,686,408	7,873,068	98,402	7,971,470	7,909,379	62,091	0.8	172,359	942
RHODE ISLAND	560,395	2,938	563,333	1,587	10	1,607	5/ 101,379	5,488	106,867	663,371	8,436	671,807	670,576	1,231	0.2	23,511	94
SOUTH CAROLINA	1,868,858	8,852	1,877,588	4,380	8,649	13,029	807,889	20,711	828,600	2,688,925	30,017	2,719,737	2,668,940	50,797	2.1	30,896	181
SOUTH DAKOTA	422,441	2,344	424,785	694	1,369	2,063	765,733	11,205	776,938	1,188,868	14,918	703,786	705,386	-1,600	-0.2	29,903	56
TENNESSEE	3,535,404	17,424	3,552,828	3,138	10,728	13,867	834,651	42,762	877,413	4,373,194	70,914	4,444,108	4,315,702	128,406	3.0	80,299	139
TEXAS	8,565,860	148,294	8,714,154	15,081	46,205	61,286	3,822,877	201,498	4,024,375	12,403,818	396,997	12,799,815	12,564,555	235,260	1.9	170,601	3,833
UTAH	780,782	8,665	789,347	403	761	1,164	402,815	12,191	415,006	1,184,000	21,617	1,205,617	1,174,861	30,656	2.6	28,000	177
VERMONT	339,475	2,877	341,552	830	801	1,631	114,673	4,140	118,813	454,778	7,818	461,596	461,604	192	0.0	17,590	.
VIRGINIA	3,747,962	32,748	3,775,728	2,418	14,382	16,810	1,113,518	32,800	1,148,624	4,860,918	79,146	4,938,082	4,859,728	78,334	1.6	81,527	367
WASHINGTON	2,963,752	16,117	2,979,869	2,759	4,305	7,064	1,237,493	32,940	1,270,433	4,203,864	53,362	4,256,868	4,090,130	166,738	4.1	110,594	724
WEST VIRGINIA	733,951	18,811	752,762	981	2,002	3,703	431,874	36,428	488,402	1,166,906	56,84.	1,224,947	1,213,950	10,997	0.9	21,404	734
WISCONSIN	2,745,081	11,933	2,756,994	8,106	4,206	12,312	865,900	36,665	902,553	3,619,157	52,782	3,671,059	3,471,000	200,851	6.8	188,482	620
WYOMING	303,524	5,207	308,731	963	1,450	2,413	210,130	7,147	217,277	514,617	13,804	528,421	486,589	41,832	8.6	20,251	59
TOTAL	142,391,229	1,158,398	143,549,627	276,493	351,494	628,987	42,731,738	1,747,110	44,478,848	186,388,480	3,257,002	188,655,482	187,760,547	1,394,915	0.7	4,222,987	36,475

1/ FOR ADDITIONAL DETAILS OF PUBLICLY OWNED VEHICLES AND OF TRUCKS, BUSES, AND TRAILERS REGISTERED, SEE TABLES MV-7, 9, 10, AND 11, RESPECTIVELY. EXCLUDES 13,400 DIPLOMATIC CORPS VEHICLES ISSUED LICENSE PLATES BY THE UNITED STATES DEPARTMENT OF STATE.

2/ WHERE THE REGISTRATION YEAR IS NOT MORE THAN ONE MONTH REMOVED FROM THE CALENDAR YEAR, REGISTRATION-YEAR DATA ARE GIVEN. WHERE THE REGISTRATION YEAR IS MORE THAN ONE MONTH REMOVED, REGISTRATIONS ARE GIVEN FOR THE CALENDAR YEAR.

3/ INCLUDES FEDERAL, STATE, COUNTY, AND MUNICIPAL VEHICLES. VEHICLES OWNED BY THE MILITARY SERVICES ARE NOT INCLUDED.

4/ THE NUMBERS OF PRIVATE AND COMMERCIAL BUSES GIVEN HERE ARE ESTIMATES BY THE FEDERAL HIGHWAY ADMINISTRATION OF THE NUMBERS IN OPERATION, RATHER THAN THE REGISTRATION COUNTS OF THE STATES.

5/ THE FOLLOWING FARM TRUCKS, REGISTERED AT A NOMINAL FEE AND RESTRICTED TO USE IN THE VICINITY OF THE OWNER'S FARM, ARE NOT INCLUDED IN THIS TABLE: CONNECTICUT, 7,743; NEW HAMPSHIRE, 3,162; NEW JERSEY, 6,730; NEW YORK, 25,072; PENNSYLVANIA, 22,400; AND RHODE ISLAND, 1,010.

Marta Brenner
February 2, 1994

Vehicle Mix FLORIDA 1990

	Actual	Percentages
Automobiles	3,694,852	77.8%
Trucks	2,218,100	19.9%
Buses	36,800	0.33%
Motorcycles	205,827	1.85%
Total	11,155,579	100.0%

Trucks**	Actual	Percentage* of trucks	Percentage Overall
Light	2,093,886	94.4%	18.8%
Medium	37,708	1.7%	0.3%
Light-Heavy	22,181	1.0%	0.2%
Heavy-Heavy	64,325	2.9%	0.6%
Total	2,218,100	100.0%	19.9%

All of these figures include Federal, State, County, and Municiple vehicles as well as private, public and commercial vehicles.
Military vehicles are not included.

* The percentages for the breakdown of the trucks was given in the 1987 Census of Transportation Truck Inventory and Use Survey for the state of Florida. These percentages were applied to the 1990 data given by the Highway Statistics data provided by the U. S. Department of Transportation.

** Weight Ranges

Light	0 - 10,000 lbs
Medium	10,001 - 19,500 lbs
Light-Heavy	19,501 - 26,000 lbs
Heavy-Heavy	+ 26,000 lbs

APPENDIX B

SAMPLING OF DATA RECOVERED FOR DIESEL FRACTIONS FROM FEDERAL AND STATE DATA BASES

Table 2. Trucks, Truck Miles, and Average Annual Miles: 1987—Con.

(Data relate to State of registration. Detail may not add to total because of rounding. For meaning of abbreviations and symbols, see introductory text)

Vehicular and operational characteristics	Trucks and truck miles			Trucks and truck miles, excluding pickups, panels, utilities, and station wagons			Relative standard error of estimate (percent) for column—					
	Trucks (thousands)	Truck miles (millions)	Average miles per truck (thousands)	Trucks (thousands)	Truck miles (millions)	Average miles per truck (thousands)						
	A	B	C	D	E	F	A	B	C	D	E	F
ENGINE TYPE AND SIZE												
Engine	1 924.0	24 498.1	12.7	156.6	3 922.3	25.0	.4	2.6	2.6	2.9	2.8	2.7
Gasoline	1 782.3	20 581.7	11.6	85.0	1 031.0	12.1	.9	3.1	3.0	5.5	7.5	4.8
Diesel	141.0	3 898.4	27.6	71.3	2 885.4	40.4	8.9	7.2	6.7	2.7	3.0	2.6
LPG or other	.5	7.1	14.3	.2	5.0	20.0	70.5	75.8	28.0	99.8	99.8	(Z)
Not reported	.2	.8	(S)	.2	.8	(S)	79.4	99.9	106.6	79.4	99.9	106.6
Cylinders[1]	1 924.0	24 498.1	12.7	156.6	3 922.3	25.0	.4	2.6	2.6	2.9	2.8	2.7
4	446.2	5 604.5	12.6	3.5	69.7	20.0	6.9	8.9	5.7	26.2	30.8	16.2
6	561.6	7 942.9	14.2	50.5	1 900.9	37.6	5.8	6.4	4.2	9.2	5.0	6.7
8	836.2	9 928.1	11.9	84.5	1 019.0	15.8	4.3	6.2	4.5	4.0	6.4	5.1
Other	.6	9.4	14.6	.6	9.4	14.6	51.7	61.2	58.1	51.7	61.2	58.1
Not reported	80.3	1 213.2	13.4	37.8	823.3	24.5	13.2	8.7	10.1	5.3	5.8	5.3
Cubic inch displacement	1 923.8	24 497.2	12.7	156.6	3 921.4	25.0	.4	2.6	2.6	2.9	2.8	2.7
Gasoline engines	1 782.3	20 581.7	11.6	85.0	1 031.0	12.1	.9	3.1	3.0	5.5	7.5	4.8
Less than 200	581.8	7 589.9	12.8	.5	8.7	17.5	5.8	7.5	4.8	70.5	71.2	10.1
200 to 299	241.8	2 468.0	10.2	14.7	166.1	11.3	10.1	13.0	8.2	29.7	34.5	12.5
300 to 349	481.7	5 861.4	12.2	13.3	149.8	11.2	6.8	8.7	5.5	12.5	19.2	14.5
350 to 399	348.8	3 674.2	10.5	42.0	548.1	13.1	7.9	10.6	7.5	5.9	8.7	6.5
400 or more	70.2	701.8	10.0	6.7	66.9	12.9	18.1	22.3	12.9	17.8	23.0	13.8
Not reported[3]	48.4	306.3	6.3	7.8	71.4	9.1	22.0	28.0	18.9	16.6	25.4	19.2
Diesel engines	141.0	3 898.4	27.6	71.3	2 885.4	40.4	8.9	7.2	6.7	2.7	3.0	2.6
Less than 400	98.9	1 143.7	19.4	13.5	361.3	26.8	19.4	22.4	14.2	10.6	11.7	7.1
400 to 599	27.3	762.5	27.9	17.9	640.2	35.8	18.6	12.7	12.4	8.2	9.1	6.2
600 to 799	17.9	742.5	41.5	17.9	742.5	41.5	8.2	6.8	4.8	6.2	6.8	4.8
800 or more	13.6	886.0	65.6	13.6	886.0	65.6	5.8	6.3	4.3	5.8	6.3	4.3
Not reported[3]	23.3	364.7	15.2	8.5	246.5	29.1	28.6	17.2	17.4	10.4	11.8	9.5
Other engines	.5	7.1	14.3	.2	5.0	20.0	70.5	75.8	28.0	99.8	99.8	(S)
Less than 400	.5	7.1	14.3	.2	5.0	20.0	70.5	75.8	28.0	99.8	99.8	(S)
400 or more	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)
Not reported[3]	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)
Horsepower	1 923.8	24 497.2	12.7	156.6	3 921.4	25.0	.4	2.6	2.6	2.9	2.8	2.7
Gasoline engines	1 782.3	20 581.7	11.6	85.0	1 031.0	12.1	.9	3.1	3.0	5.5	7.5	4.8
Less than 100	388.2	3 788.4	11.5	.5	4.3	8.7	8.5	11.2	7.3	70.5	97.5	67.4
100 to 199	1 301.3	15 480.5	11.9	62.1	788.8	12.4	2.5	4.2	3.4	7.8	8.7	5.6
200 to 249	93.2	868.8	9.3	11.5	158.1	13.7	16.2	20.0	13.0	13.5	17.8	11.8
250 or more	5.9	36.0	6.9	3.0	20.5	6.9	51.3	47.4	19.9	28.1	39.5	30.7
Not reported[3]	53.8	463.2	8.6	7.9	79.4	10.0	21.2	30.0	21.5	16.6	23.8	17.2
Diesel engines	141.0	3 898.4	27.6	71.3	2 885.4	40.4	8.9	7.2	6.7	2.7	3.0	2.6
Less than 250	91.7	1 974.3	21.5	37.1	1 071.0	28.8	13.6	13.8	9.2	5.0	6.3	4.4
250 to 349	19.9	1 107.6	55.8	19.9	1 107.6	55.8	4.5	5.1	3.5	4.5	5.1	3.5
350 to 449	6.2	486.5	80.0	6.2	486.5	80.0	8.3	9.3	5.1	8.3	9.3	5.1
450 or more	.2	13.6	57.4	.2	13.6	57.4	44.2	53.4	30.0	44.2	53.4	30.0
Not reported[3]	23.0	307.5	13.4	7.9	197.8	25.0	28.1	20.0	16.7	13.7	15.0	10.3
Other engines	.5	7.1	14.3	.2	5.0	20.0	70.5	75.8	28.0	99.8	99.8	(S)
Less than 250	.5	7.1	14.3	.2	5.0	20.0	70.5	75.8	28.0	99.8	99.8	(S)
250 or more	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)
Not reported[3]	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)
TRUCK TYPE AND AXLE ARRANGEMENT												
Single-unit trucks	1 871.9	22 236.3	11.9	113.7	1 775.5	15.6	.5	2.9	2.9	4.0	5.0	3.8
2 axles	1 867.8	21 952.0	11.8	99.5	1 422.2	14.3	.5	3.0	2.9	4.7	5.9	4.2
3 axles	12.3	305.7	24.8	12.3	305.7	24.8	9.3	12.7	9.7	9.3	12.7	9.7
4 axles or more	1.8	47.6	26.7	1.8	47.6	26.7	26.6	29.8	16.3	26.6	29.8	16.3
Combinations	52.1	2 282.7	43.4	43.2	2 146.7	49.7	10.2	4.5	7.7	3.0	3.2	3.2
Single-unit truck with trailer	.9	21.5	24.3	.9	21.5	24.3	44.7	38.3	38.7	44.7	38.3	38.7
4 axles	.3	7.4	21.6	.3	7.4	21.6	74.9	57.8	55.7	74.9	57.8	55.7
5 axles or more	.5	14.1	28.1	.5	14.1	28.1	55.7	51.7	51.1	55.7	51.7	51.1
Single-unit truck with utility trailer	14.1	198.4	14.1	5.2	82.4	15.9	37.1	38.2	19.1	19.3	21.0	13.5
3 axles	8.7	128.8	14.8	2.7	27.6	10.1	48.2	58.3	18.6	28.6	34.9	19.8
4 axles	4.6	45.0	9.8	1.8	30.1	16.5	65.7	40.8	35.1	33.9	35.6	20.2
5 axles or more	.8	24.7	30.0	.8	24.7	30.0	39.1	39.7	22.6	39.1	39.7	22.6
Truck-tractor with single trailer	37.0	2 038.1	55.1	37.0	2 038.1	55.1	2.2	3.3	2.8	2.2	3.3	2.8
3 axles	3.3	94.2	28.5	3.3	94.2	28.5	11.4	15.9	11.1	11.4	15.9	11.1
4 axles	12.2	578.9	47.3	12.2	578.9	47.3	6.3	8.2	5.9	6.3	8.2	5.9
5 axles or more	21.5	1 365.0	63.6	21.5	1 365.0	63.6	3.6	4.6	3.0	3.6	4.6	3.0
Truck-tractor with double trailers	.1	4.7	50.2	.1	4.7	50.2	99.9	71.3	13.9	99.9	71.3	13.9
5 axles	.1	4.7	50.2	.1	4.7	50.2	99.9	71.3	13.9	99.9	71.3	13.9
6 axles	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)
7 axles or more	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)
Truck-tractor with triple trailers	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)
7 axles	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)
8 axles or more	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)	(S)
Trailer not specified	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Powered axles	1 924.0	24 498.1	12.7	156.6	3 922.3	25.0	.4	2.6	2.6	2.9	2.8	2.7
1	1 803.5	19 758.1	12.3	121.6	2 331.3	19.2	1.7	3.4	3.0	3.8	4.3	3.4
2	316.5	4 652.6	14.7	31.2	1 504.5	48.2	8.4	8.1	5.5	4.5	4.6	3.9
3 or more	4.0	86.5	21.5	4.0	86.5	21.5	19.5	21.9	17.4	19.5	21.8	17.4
Not reported	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)

See footnotes at end of table.

Table 2. Trucks, Truck Miles, and Average Annual Miles: 1987—Con.

[Data relate to State of registration. Detail may not add to total because of rounding. For meaning of abbreviations and symbols, see introductory text]

Vehicular and operational characteristics	Trucks and truck miles			Trucks and truck miles, excluding pickups, panels, utilities, and station wagons			Relative standard error of estimate (percent) for column—					
	Trucks (thousands)	Truck miles (millions)	Average miles per truck (thousands)	Trucks (thousands)	Truck miles (millions)	Average miles per truck (thousands)						
	A	B	C	D	E	F	A	B	C	D	E	F
HAZARDOUS MATERIALS CARRIED—Con.												
Types of hazardous materials[1]—Con.												
Corrosive solids	.2	5.4	22.9	.2	5.4	22.9	44.2	46.9	15.6	44.2	46.9	15.6
Explosives, A or B	S	S	S	S	S	S	S	S	S	S	S	S
Blasting agents	S	S	S	S	S	S	S	S	S	S	S	S
Radioactive materials	S	S	S	S	S	S	S	S	S	S	S	S
ORM-A, B, or C	S	S	S	S	S	S	S	S	S	S	S	S
ORM E	S	S	S	S	S	S	S	S	S	S	S	S
Hazardous materials not listed	S	S	S	S	S	S	S	S	S	S	S	S
Not reported	7.5	153.3	20.6	1.6	56.8	36.2	56.2	58.1	38.6	28.4	24.9	19.7
No hazardous materials carried	1 887.6	23 598.1	12.5	144.6	3 514.9	24.3	.6	2.7	2.7	3.2	3.1	2.9
Not reported	25.3	563.0	22.3	7.0	156.9	22.4	28.9	36.1	18.7	15.9	16.7	12.3
TRUCK FLEET SIZE[2]												
1	1 244.3	14 041.6	11.3	43.6	903.5	20.7	2.7	4.5	3.7	8.7	7.4	6.2
2 to 5	488.5	6 880.9	12.8	41.4	734.6	17.7	8.7	8.4	5.3	9.1	9.5	6.0
6 to 19	89.8	1 784.6	17.7	27.7	675.9	24.4	14.4	15.6	9.6	7.3	8.5	8.6
20 or more	121.8	2 840.8	23.4	44.0	1 608.3	36.5	12.3	8.5	5.9	4.9	4.7	4.2
MILES PER GALLON												
Less than 5	14.2	543.2	38.4	14.2	543.2	38.4	8.2	8.6	6.7	8.2	8.6	6.7
5 to 6.9	83.4	1 926.6	36.1	53.1	1 926.3	36.2	4.1	4.0	3.9	4.1	4.0	3.9
7 to 8.9	78.9	881.5	11.2	26.6	464.2	16.3	15.5	16.4	10.6	7.7	10.0	7.5
9 to 11.9	308.7	3 288.3	10.6	26.6	466.6	17.4	8.6	11.4	7.9	7.7	8.7	7.3
12 to 14.9	468.6	5 288.8	11.3	20.3	314.1	15.5	6.8	9.2	6.3	17.2	18.8	8.5
15 to 19.9	516.9	6 072.6	11.8	8.0	136.9	16.1	6.4	8.1	5.1	36.1	28.7	16.9
20 or more	462.1	6 861.2	13.3	2.2	43.0	19.2	6.6	8.5	5.3	38.9	42.6	27.0
Not reported	4.0	S	S	1.0	S	S	76.9	S	S	41.0	S	S
EQUIPMENT TYPE[4]												
Braking system	186.8	3 822.3	25.0	186.8	3 822.3	25.0	2.9	2.8	2.7	2.9	2.8	2.7
Hydraulic	37.4	460.3	12.9	37.4	460.3	12.9	6.5	8.9	7.6	6.5	8.9	7.6
Hydraulic (power)	47.0	721.1	15.4	47.0	721.1	15.4	5.4	7.8	5.7	5.4	7.8	5.7
Air	98.5	2 443.4	43.3	98.5	2 443.4	43.3	2.6	3.1	3.0	2.6	3.1	3.0
Not reported	16.0	277.4	17.3	16.0	277.4	17.3	27.2	22.0	11.1	27.2	22.0	11.1
Power steering[5]	886.4	10 901.0	12.6	6.6	110.3	16.6	4.0	5.8	4.1	63.0	48.9	20.4
Air conditioning[5]	758.8	9 623.4	12.7	3.5	64.9	18.5	4.6	6.4	4.5	85.1	49.4	42.0
Engine retarder[5]	.1	13.9	96.2	.1	13.9	96.2	57.1	57.5	7.3	57.1	57.5	7.3
Reflective materials[5]	1.6	136.0	85.3	1.6	136.0	85.3	21.7	20.2	15.6	21.7	20.2	15.6
Electronic vehicle management system[5]	S	4.7	100.4	S	4.7	100.4	98.9	98.9	S	98.9	98.9	S
Electronic vehicle identification device (transponder, etc.)[5]	S	S	S	S	S	S	S	S	S	S	S	S
Trip recorders[5]	S	S	S	S	S	S	S	S	S	S	S	S
Navigational systems[5]	S	S	S	S	S	S	S	S	S	S	S	S
FUEL CONSERVATION EQUIPMENT[3,4]												
Aerodynamic features	14.2	598.7	42.2	14.1	595.9	42.4	10.3	8.9	8.1	10.3	8.9	8.1
Axle or drive ratio	8.6	357.1	53.9	8.6	356.9	54.3	13.5	11.5	11.4	13.5	11.5	11.4
Fuel economy engine	4.9	328.4	66.1	4.9	328.4	66.1	13.2	12.2	9.9	13.2	12.2	9.9
Radial tires	1 151.5	14 288.4	12.4	7.8	218.9	28.0	3.0	4.7	3.6	53.1	27.3	31.3
Road speed governor	1.2	85.0	70.8	1.2	85.0	70.8	28.3	24.7	20.1	28.3	24.7	20.1
Variable fan drives	.8	68.0	80.1	.8	68.0	80.1	24.5	29.4	16.2	24.5	29.4	16.2
Other fuel conservation devices	.4	28.6	70.3	.4	28.6	70.3	34.9	37.4	13.6	34.9	37.4	13.6
MAINTENANCE[3]												
General maintenance:												
Owner	1 033.8	12 566.4	12.2	52.6	1 058.4	20.1	3.5	5.0	3.8	9.2	7.7	5.9
Company's maintenance facilities	196.9	3 772.2	19.2	68.7	2 041.9	29.7	9.6	8.8	6.0	3.8	4.0	3.5
Dealership's service department	291.3	3 868.8	13.4	12.8	366.2	28.7	8.0	10.7	6.4	11.4	12.1	8.3
Leasing company	5.0	88.4	17.6	2.0	73.5	36.1	60.2	25.1	44.4	25.7	22.5	17.0
Independent garage	583.1	7 607.0	12.8	29.6	678.0	22.9	5.6	7.1	4.6	7.3	8.5	6.5
Component distributorship	28.7	355.3	12.4	2.1	53.7	26.1	30.8	32.1	15.4	28.3	28.4	22.2
No one	27.5	106.2	3.8	.7	2.8	4.1	32.2	44.6	31.0	52.9	71.6	78.1
Other	15.3	186.7	12.1	.5	10.5	19.8	43.1	79.6	67.7	51.4	43.4	43.5
Not reported	78.1	619.6	8.1	5.7	118.4	20.6	18.4	24.0	17.8	18.6	21.9	13.4
Major overhauls:												
Owner	220.8	2 634.8	11.9	17.0	388.2	22.9	10.4	13.9	10.0	9.6	10.5	9.3
Company's maintenance facilities	108.8	2 361.6	21.7	46.5	1 471.1	31.6	12.4	11.1	8.6	5.0	4.9	4.3
Dealership's service department	208.8	3 208.3	15.4	18.5	604.0	32.6	10.7	11.1	5.8	8.8	9.1	6.4
Leasing company	1.7	65.5	37.8	1.7	65.5	37.8	28.3	23.7	18.1	28.3	23.7	18.1
Independent garage	366.0	5 160.0	13.1	32.7	775.9	23.7	7.4	8.8	5.5	6.7	7.8	5.9
Component distributorship	61.7	968.3	15.7	5.1	161.7	31.7	20.6	24.1	15.3	17.8	16.9	12.9
No one	115.9	1 219.8	10.5	6.1	120.2	19.6	15.2	17.6	9.7	49.4	41.2	18.0
Other	21.5	254.1	11.8	.9	14.6	16.5	36.1	60.3	49.0	44.7	36.5	34.6
Not reported	661.9	9 736.7	11.4	40.2	661.7	17.0	4.2	5.9	4.2	9.4	8.8	6.9

See footnotes at end of table.

Table 2. Trucks, Truck Miles, and Average Annual Miles: 1987—Con.

[Data relate to State of registration. Detail may not add to total because of rounding. For meaning of abbreviations and symbols, see introductory text]

Vehicular and operational characteristics	Trucks and truck miles			Trucks and truck miles, excluding pickups, panels, utilities, and station wagons			Relative standard error of estimate (percent) for column—					
	Trucks (thousands)	Truck miles (millions)	Average miles per truck (thousands)	Trucks (thousands)	Truck miles (millions)	Average miles per truck (thousands)						
	A	B	C	D	E	F	A	B	C	D	E	F
OPERATOR CLASSIFICATION												
Not for hire	1 888.0	22 868.4	12.1	130.4	2 481.4	19.0	.5	2.8	2.8	3.6	4.0	3.3
Business use	607.5	9 981.1	16.7	118.8	2 370.8	20.0	5.3	6.4	4.1	2.0	3.8	3.2
Personal transportation	1 236.3	12 375.1	10.0	11.1	108.4	9.8	2.7	4.5	3.6	38.8	50.2	18.5
Mixed—business use/personal transportation	45.2	922.3	20.4	.5	1.3	2.5	25.1	31.1	17.9	70.5	99.4	70.0
For hire	24.0	1 320.2	54.9	23.3	1 309.0	56.2	5.8	5.2	4.4	5.7	5.2	4.3
Motor carrier	14.8	888.4	60.1	14.8	888.4	60.1	6.9	6.5	5.0	6.9	6.5	5.0
Owner/operator	9.3	430.8	46.6	8.5	419.6	49.3	11.1	10.0	8.2	11.1	10.1	8.1
Independent	6.2	236.2	38.0	5.4	223.9	41.2	15.1	13.9	11.5	15.3	14.3	11.7
Leased to a company	3.1	195.6	63.8	3.1	195.6	63.8	15.0	14.9	8.5	15.0	14.9	8.5
Not reported	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Daily rental	11.8	318.7	27.0	3.0	131.1	43.3	43.0	38.6	19.7	19.0	18.1	10.4
Mixed—not for hire/for hire	.2	.8	5.0	.2	.8	5.0	99.7	99.7	(Z)	99.7	99.7	(Z)
For-hire jurisdiction:												
Interstate	8.6	660.2	60.6	8.6	660.2	60.6	7.2	7.6	4.5	7.2	7.6	4.5
Intrastate	6.3	380.4	60.2	6.3	380.4	60.2	9.4	9.8	5.8	9.4	9.8	5.8
Local	9.1	249.7	27.4	8.4	238.4	28.5	13.0	14.3	8.3	13.3	14.7	9.5
Not reported	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	99.9	(Z)	(Z)	99.9	(Z)	(Z)
Type of carrier (interstate only):												
Contract	2.7	198.7	74.8	2.7	198.7	74.8	15.4	15.2	11.7	15.4	15.2	11.7
Common	5.0	408.3	82.6	5.0	408.3	82.6	9.1	10.1	4.5	9.1	10.1	4.5
Exempt	.8	54.6	68.8	.8	54.6	68.8	27.3	28.2	10.4	27.3	28.2	10.4
Not reported	.3	27.7	83.8	.3	27.7	83.8	37.3	38.8	13.9	37.3	38.8	13.9
PRODUCTS CARRIED												
Farm products	28.2	566.9	20.1	13.1	363.8	28.2	24.0	20.1	16.4	11.1	11.6	10.4
Live animals	2.1	62.1	30.2	1.8	59.8	33.0	39.1	25.2	24.0	30.2	26.9	25.0
Mining products	.2	10.7	46.2	.2	10.7	46.2	44.2	51.3	28.2	44.2	51.3	28.2
Logs and other forest products	3.2	90.1	28.5	3.2	90.1	28.5	20.9	20.0	17.5	20.9	20.0	17.5
Lumber and fabricated wood products	10.5	239.5	22.9	4.8	108.0	23.8	41.0	40.7	13.5	20.4	20.8	16.8
Processed foods	19.0	643.4	33.8	16.1	606.2	37.8	17.1	8.9	12.0	8.8	8.8	7.5
Textile mill products	19.4	335.3	17.3	1.5	23.4	15.8	37.0	50.6	34.3	38.0	41.4	38.8
Building materials	65.7	1 308.3	19.9	24.1	698.4	28.5	16.9	15.8	10.3	7.2	7.2	6.1
Household goods	6.6	148.9	22.2	6.6	148.9	22.2	17.4	18.3	10.7	17.4	18.3	10.7
Furniture or hardware	10.1	134.7	13.4	4.2	77.3	18.6	43.5	38.9	22.2	22.6	24.4	16.0
Paper products	2.9	62.6	27.2	2.9	62.6	27.2	27.0	25.3	20.0	27.0	25.3	20.0
Chemicals	34.6	572.8	16.6	4.9	169.1	32.4	27.0	25.6	12.8	16.8	17.0	14.1
Petroleum	7.5	348.1	33.4	4.5	189.8	35.7	41.2	37.1	9.2	14.8	15.2	13.4
Plastics and/or rubber	6.7	93.0	8.4	.8	22.3	28.4	62.6	64.5	48.3	43.6	38.1	38.5
Primary metal products	6.8	100.1	14.7	.9	28.6	30.2	61.7	61.2	33.7	38.6	37.2	31.8
Fabricated metal products	16.3	368.7	22.5	4.2	113.6	26.8	36.6	40.2	21.2	21.4	24.4	18.1
Machinery	17.1	188.6	10.9	5.4	80.8	15.0	34.6	31.9	14.5	17.7	20.0	13.5
Transportation equipment	10.6	192.5	18.2	7.6	185.2	24.3	29.9	17.8	20.4	15.4	18.1	11.4
Glass products	3.5	42.9	12.3	.5	7.7	14.1	64.9	82.7	7.3	64.9	58.8	42.1
Miscellaneous products of manufacturing	12.1	181.4	15.0	3.0	78.3	26.8	42.9	36.3	17.3	26.0	29.9	17.2
Industrial water	.5	8.8	16.1	.5	8.8	16.1	64.9	70.4	13.6	64.9	70.4	13.6
Scrap, refuse, or garbage	10.3	142.3	13.8	7.3	112.5	15.4	31.2	27.4	16.0	16.4	22.3	17.7
Hazardous waste	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Mixed cargoes	22.5	516.3	22.9	10.2	360.2	35.3	28.7	22.2	21.3	11.8	11.1	8.4
Craftsman's equipment	158.9	2 336.6	14.7	10.1	128.4	12.6	12.6	16.5	8.7	14.6	19.4	12.5
Personal transportation	1 236.3	12 378.1	10.0	11.1	112.3	10.1	2.7	4.5	3.6	38.6	48.9	17.4
No load carried	186.3	3 248.8	16.6	5.4	65.4	12.1	11.5	14.3	8.3	19.4	24.7	16.2
Not in use	2.2	(Z)	(Z)	1.8	(Z)	(Z)	29.5	99.8	84.5	32.4	99.8	95.8
Other	16.8	330.6	19.3	1.0	46.0	46.0	39.3	38.1	13.8	41.0	38.9	23.8
Not reported	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
HAZARDOUS MATERIALS CARRIED												
Hazardous materials carried	11.2	347.0	31.0	5.3	250.4	47.3	37.8	27.3	24.8	13.2	12.4	8.8
Less than 10 percent of time	1.9	76.0	39.8	1.9	76.0	39.8	20.4	19.8	14.6	20.4	19.8	14.6
10 to 25 percent of time	.4	20.6	47.6	.4	20.6	47.6	43.4	46.8	17.0	43.4	46.8	17.0
26 to 49 percent of the time	.1	4.2	46.2	.1	4.2	45.2	69.9	73.7	23.2	69.9	73.7	23.2
50 to 74 percent of the time	.5	29.2	60.7	.5	29.2	60.7	40.3	36.7	22.5	40.3	36.7	22.5
75 to 100 percent of the time	1.8	87.2	48.8	1.8	87.2	48.8	23.6	20.8	18.2	23.6	20.8	18.2
No percent reported	6.5	129.8	20.0	[illegible]	33.2	56.5	64.5	70.0	46.3	51.8	45.9	20.5
Types of hazardous materials[3]:												
Flammable liquids	3.7	193.7	52.0	3.7	193.7	52.0	14.6	14.5	8.9	14.6	14.5	8.9
Combustible liquids	2.0	92.8	47.4	2.0	92.8	47.4	20.0	21.9	9.5	20.0	21.9	9.5
Corrosive liquids	1.3	51.1	39.7	1.3	51.1	39.7	25.6	30.7	14.2	25.6	30.7	14.2
Poison B solids	.5	11.4	24.1	.5	11.4	24.1	31.1	32.1	7.7	31.1	32.1	7.7
Poison B liquids	.5	11.4	24.1	.5	11.4	24.1	31.1	32.1	7.7	31.1	32.1	7.7
Flammable solids	.5	11.4	24.1	.5	11.4	24.1	31.1	32.1	7.7	31.1	32.1	7.7
Oxidizers	.5	11.4	24.1	.5	11.4	24.1	31.1	32.1	7.7	31.1	32.1	7.7
Flammable gas	.5	11.4	24.1	.5	11.4	24.1	31.1	32.1	7.7	31.1	32.1	7.7
Nonflammable gas	.5	11.4	24.1	.5	11.4	24.1	31.1	32.1	7.7	31.1	32.1	7.7
Poison A	.2	5.4	22.9	.2	5.4	22.9	44.2	46.9	15.8	44.2	46.9	15.8

See footnotes at end of table.

Table 2. Trucks, Truck Miles, and Average Annual Miles: 1987—Con.

[Data relate to State of registration. Detail may not add to total because of rounding. For meaning of abbreviations and symbols, see introductory text]

Vehicular and operational characteristics	Trucks and truck miles			Trucks and truck miles, excluding pickups, panels, utilities, and station wagons			Relative standard error of estimate (percent) for column—					
	Trucks (thousands)	Truck miles (millions)	Average miles per truck (thousands)	Trucks (thousands)	Truck miles (millions)	Average miles per truck (thousands)						
	A	B	C	D	E	F	A	B	C	D	E	F
VEHICLE SIZE												
Light	1 816.9	21 284.5	11.7	55.9	731.1	13.1	.5	3.0	3.0	6.6	10.2	5.9
Medium	32.1	438.4	13.3	25.9	364.0	14.8	14.7	12.4	10.1	8.3	11.2	7.5
Light-heavy	18.5	287.5	16.0	18.5	287.5	16.0	8.8	12.9	9.3	9.8	12.9	9.3
Heavy-heavy	56.4	2 508.7	44.5	56.4	2 508.7	44.5	2.4	3.1	2.6	2.4	3.1	2.6
AVERAGE WEIGHT (POUNDS)												
Less than 6,001	1 732.2	20 284.0	11.7	23.0	288.6	12.6	.8	3.2	3.1	19.7	21.6	9.5
6,001 to 10,000	84.7	1 000.5	11.8	32.9	437.3	13.3	14.5	17.3	10.9	7.1	10.3	7.4
10,001 to 14,000	16.7	223.3	11.9	12.8	184.8	14.5	24.0	18.4	15.2	12.6	16.4	10.9
14,001 to 16,000	5.8	83.2	14.4	5.5	79.5	14.4	19.5	27.3	19.0	20.0	28.3	19.9
16,001 to 19,500	7.6	118.9	15.7	7.6	118.9	15.7	17.1	20.5	10.8	17.1	20.5	10.8
19,501 to 26,000	18.5	287.5	16.0	18.5	287.5	16.0	8.8	12.9	9.3	9.8	12.9	9.3
26,001 to 33,000	8.8	198.8	22.3	8.8	198.8	22.3	11.6	16.1	12.2	11.6	16.1	12.2
33,001 to 40,000	4.5	169.9	36.5	4.5	169.9	36.5	13.5	17.1	14.0	13.5	17.1	14.0
40,001 to 60,000	8.1	253.7	31.2	8.1	253.7	31.2	10.1	12.6	8.2	10.1	12.6	8.2
60,001 to 80,000	7.1	239.3	33.6	7.1	239.3	33.6	11.0	13.9	8.3	11.0	13.9	8.3
80,001 to 90,000	27.6	1 666.9	60.9	27.6	1 666.9	60.9	3.9	4.0	3.2	3.9	4.0	3.2
90,001 to 100,000	.3	3.5	12.4	.3	3.5	12.4	40.3	51.9	32.7	40.3	51.9	32.7
100,001 to 130,000	.1	2.0	31.6	.1	2.0	31.6	66.9	94.3	65.0	66.9	94.3	65.0
130,001 or more	(Z)	1.5	32.4	(Z)	1.5	32.4	66.9	66.9	(Z)	66.9	66.9	(Z)
Not reported	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
TOTAL LENGTH (FEET)												
Less than 13.0	241.8	3 004.4	12.4	8.4	67.8	12.6	10.2	13.2	8.4	66.3	48.9	21.6
13.0 to 15.9	571.0	7 088.2	12.3	8.2	73.8	12.7	5.9	7.5	4.6	16.2	24.8	16.1
16.0 to 19.9	882.5	10 918.5	11.1	28.7	342.8	13.3	3.7	5.8	4.4	14.0	17.2	8.4
20.0 to 27.9	62.1	774.7	14.9	62.1	774.7	14.9	5.0	7.3	5.5	5.0	7.3	5.5
28.0 to 35.9	39.9	864.8	21.3	39.9	864.8	21.3	7.4	9.6	6.9	7.4	9.6	6.9
36.0 to 40.9	12.8	208.3	16.8	3.9	57.2	22.3	40.5	38.4	20.4	20.6	21.1	18.0
41.0 to 44.9	2.5	86.1	34.2	2.5	86.1	34.2	19.2	16.8	12.9	19.2	16.8	12.9
45.0 or more	36.0	1 690.9	66.1	36.0	1 690.9	66.1	2.9	3.5	3.0	2.9	3.5	3.0
Not reported	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
YEAR MODEL												
1988	18.3	94.9	5.2	.6	20.8	33.0	39.3	42.5	29.1	38.7	37.2	24.2
1987	229.8	3 072.3	13.4	13.8	360.5	26.5	10.3	12.4	7.9	11.7	12.8	8.9
1986	257.4	3 975.9	15.4	13.7	420.8	30.8	9.7	10.8	5.7	23.6	15.2	13.9
1985	198.3	3 221.8	16.4	12.2	404.9	33.1	11.3	12.3	8.4	11.5	11.0	8.3
1984	166.5	2 667.2	16.8	11.4	428.4	37.6	11.8	12.0	5.8	12.0	11.1	7.0
1983	122.3	1 664.9	13.5	8.3	216.0	34.4	14.7	18.1	12.1	16.5	14.4	11.9
1982	88.5	1 474.6	16.3	10.4	280.1	24.1	16.4	19.9	13.0	30.2	16.8	19.1
1981	100.7	1 234.7	12.3	8.9	276.2	30.9	16.0	16.1	8.7	14.0	14.7	11.6
1980	54.7	851.7	16.1	7.2	228.8	31.9	21.5	19.2	14.1	13.8	14.5	11.9
1979	133.5	1 704.3	12.8	10.7	276.3	25.7	13.8	14.8	8.1	12.2	11.8	9.4
1978	73.8	876.4	11.9	8.3	208.4	24.8	18.5	22.3	15.6	14.0	12.9	11.3
Pre-1978	464.5	3 688.2	8.1	53.5	634.1	15.8	6.6	6.8	6.6	4.8	6.2	5.4
Not reported	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
VEHICLE ACQUISITION												
Purchased new	973.4	13 587.7	14.0	82.3	2 325.7	28.3	3.7	4.7	3.3	6.0	4.5	4.3
Purchased used	908.1	10 238.2	11.3	66.7	1 381.6	20.3	4.0	5.8	4.4	3.9	4.9	4.3
Leased from someone else	24.4	480.1	18.8	3.6	144.4	40.4	31.8	28.5	13.3	21.1	20.4	14.8
Not reported	17.1	212.0	12.4	2.3	80.5	28.7	36.8	41.7	27.4	29.6	32.5	25.8
LEASE CHARACTERISTICS[1] [2]												
Leased without driver	36.4	729.7	20.8	14.5	434.6	30.0	22.4	19.0	12.7	10.4	10.0	8.6
Leased with driver	5.6	158.2	28.1	2.6	108.6	41.9	54.6	34.0	26.3	23.8	21.7	21.3
Leased with owner-operator	20.2	479.1	23.7	2.5	123.7	49.3	35.7	32.1	11.6	20.3	16.5	14.2
Not reported	.9	25.0	28.3	.6	25.0	39.4	44.7	41.1	46.8	48.5	41.1	44.2
Provisions of lease:												
Financing	24.2	402.5	16.7	3.3	82.2	25.3	32.3	31.8	13.6	22.8	22.1	14.8
Full maintenance	3.7	148.2	40.5	3.7	148.2	40.5	19.0	18.5	11.8	19.0	18.5	11.8
Maintenance on specific parts	.5	19.0	38.4	.5	19.0	38.4	60.3	58.0	29.6	60.3	58.0	29.6
Payment of taxes	5.3	161.8	30.6	2.3	100.0	42.7	56.5	40.2	19.3	23.2	20.8	15.0
Obtaining licenses and permits	6.2	213.5	34.3	3.3	178.3	54.2	47.9	21.8	31.6	17.1	17.1	10.5
Record keeping for leased trucks	2.7	133.7	50.2	2.7	133.7	50.2	16.3	19.0	13.6	16.3	19.0	13.6
Other	1.2	52.4	44.8	1.2	52.4	44.8	36.3	32.7	36.0	36.3	32.7	36.0

See footnotes at end of table.

Table 2. Trucks, Truck Miles, and Average Annual Miles: 1987

[Data relate to State of registration. Detail may not add to total because of rounding. For meaning of abbreviations and symbols, see introductory text]

Vehicular and operational characteristics	Trucks and truck miles			Trucks and truck miles, excluding pickups, panels, utilities, and station wagons			Relative standard error of estimate (percent) for column—					
	Trucks (thousands)	Truck miles (millions)	Average miles per truck (thousands)	Trucks (thousands)	Truck miles (millions)	Average miles per truck (thousands)						
	A	B	C	D	E	F	A	B	C	D	E	F
Total trucks	1 934.0	24 496.1	12.7	186.8	3 822.3	25.0	.4	2.6	2.6	2.9	2.8	2.7
MAJOR USE												
Agriculture	66.8	1 117.8	16.7	12.9	263.6	20.4	18.7	22.4	13.6	11.5	13.5	11.7
Forestry and lumbering	3.2	109.8	34.3	3.0	108.0	35.9	21.1	19.7	14.0	21.4	20.2	14.2
Mining and quarrying	.8	28.6	36.6	.8	28.6	36.6	47.3	40.4	27.3	47.3	40.4	27.3
Construction	309.9	4 736.6	15.6	36.8	666.6	17.0	6.5	10.3	5.9	6.1	7.7	5.9
Manufacturing	12.6	246.1	19.4	6.5	169.8	26.2	34.1	27.5	25.4	16.0	17.2	14.5
Wholesale trade	47.5	937.2	19.7	18.1	480.7	26.6	19.6	19.1	11.8	9.2	10.3	7.5
Retail trade	51.9	674.2	13.0	16.0	278.3	17.4	19.8	19.5	10.3	10.7	12.2	8.4
For-hire transportation	24.1	1 321.0	54.8	23.3	1 308.7	56.1	5.8	5.2	4.4	5.7	5.2	4.3
Utilities	33.1	448.2	13.6	6.2	72.8	11.7	26.9	31.9	16.8	19.0	25.1	16.7
Services	126.9	2 099.9	16.5	11.4	224.7	19.7	14.0	17.6	11.0	13.0	16.0	10.2
Daily rental	11.8	316.7	27.0	3.0	131.1	43.3	43.0	38.6	19.7	19.0	18.1	10.4
One way rental	4.1	83.9	20.5	4.1	83.9	20.5	24.0	24.8	12.0	24.0	24.8	12.0
Personal transportation	1 236.1	12 378.1	10.0	16.8	112.3	10.4	2.7	4.5	3.8	38.4	48.9	16.9
Other	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Not in use	2.2	(Z)	(Z)	1.8	(Z)	(Z)	29.5	99.8	94.5	32.4	99.8	99.8
Not reported	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
BODY TYPE												
Pickup	1 078.8	12 078.4	11.2	(Z)	(Z)	(Z)	1.1	4.2	4.1	(Z)	(Z)	(Z)
Mini-van	100.1	1 201.3	12.0	(Z)	(Z)	(Z)	16.8	16.7	9.9	(Z)	(Z)	(Z)
Panel or van	368.3	4 530.4	12.3	(Z)	(Z)	(Z)	6.2	8.4	7.0	(Z)	(Z)	(Z)
Utility	154.1	2 116.1	13.7	(Z)	(Z)	(Z)	12.3	15.1	8.8	(Z)	(Z)	(Z)
Station wagon	64.9	648.6	10.0	(Z)	(Z)	(Z)	20.3	24.5	13.7	(Z)	(Z)	(Z)
Multistop or walk-in	24.8	315.2	12.7	24.8	315.2	12.7	18.4	19.8	8.2	18.4	19.8	8.2
Platform with added devices	6.4	88.3	13.8	6.4	88.3	13.8	17.5	22.8	16.3	17.5	22.8	16.3
Low boy or depressed center	2.9	57.4	19.7	2.9	57.4	19.7	16.3	20.1	15.4	16.3	20.1	15.4
Basic platform	36.3	767.7	21.1	36.3	767.7	21.1	6.4	7.1	5.8	6.4	7.1	5.8
Livestock truck	.2	21.0	88.8	.2	21.0	88.8	44.2	61.2	28.9	44.2	61.2	28.9
Insulated nonrefrigerated van	1.3	46.3	34.1	1.3	46.3	34.1	38.5	37.0	25.1	38.5	37.0	25.1
Insulated refrigerated van	7.5	460.8	61.8	7.5	460.8	61.8	12.3	10.9	6.8	12.3	10.9	6.8
Drop-frame van	1.9	111.0	57.9	1.9	111.0	57.9	22.8	23.1	11.0	22.8	23.1	11.0
Open-top van	.8	21.8	26.2	.8	21.8	26.2	27.3	33.9	20.2	27.3	33.9	20.2
Basic enclosed van	24.8	824.5	33.2	24.8	824.5	33.2	7.4	7.3	5.8	7.4	7.3	5.8
Beverage	3.6	75.7	20.8	3.6	75.7	20.8	17.3	24.1	16.3	17.3	24.1	16.3
Public utility	4.4	41.7	9.4	4.4	41.7	9.4	22.2	28.4	18.2	22.2	28.4	18.2
Winch or crane	3.0	54.9	18.4	3.0	54.9	18.4	25.2	32.9	20.6	25.2	32.9	20.6
Wrecker	3.9	78.4	20.1	3.9	78.4	20.1	22.8	28.4	18.4	22.8	28.4	18.4
Pole or logging	1.3	46.1	36.0	1.3	46.1	36.0	25.6	25.7	18.8	25.6	25.7	18.8
Auto transport	.9	41.6	46.7	.9	41.6	46.7	33.3	27.9	28.6	33.3	27.9	28.6
Service truck	3.5	40.6	11.6	3.5	40.6	11.6	28.2	36.8	24.3	28.2	36.8	24.3
Yard tractor	.1	.3	2.0	.1	.3	2.0	57.1	69.8	40.3	57.1	69.8	40.3
Oilfield truck	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
Grain body	.2	3.9	15.7	.2	3.9	15.7	99.9	97.0	99.9	99.9	97.0	99.9
Garbage hauler	2.0	53.8	26.3	2.0	53.8	26.3	28.4	33.9	23.3	28.4	33.9	23.3
Dump truck	16.4	368.8	22.9	16.4	368.8	22.9	9.8	10.3	8.2	9.8	10.3	8.2
Tank truck (liquids or gases)	5.8	232.3	39.8	5.8	232.3	39.8	15.3	13.9	12.3	15.3	13.9	12.3
Tank truck (dry bulk)	1.5	93.4	61.8	1.5	93.4	61.8	17.2	18.9	7.8	17.2	18.9	7.8
Concrete mixer	2.8	44.0	16.8	2.8	44.0	16.8	22.4	25.2	11.8	22.4	25.2	11.8
Other	1.4	38.1	25.2	1.4	38.1	25.2	37.1	46.4	28.3	37.1	46.4	29.3
Not reported	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)	(Z)
ANNUAL MILES												
Less than 5,000	398.6	842.8	2.1	28.9	51.5	1.9	7.4	9.3	5.5	7.9	10.5	7.0
5,000 to 9,999	446.3	3 042.8	6.8	23.1	160.4	7.0	6.9	7.1	1.7	8.8	9.0	2.0
10,000 to 19,999	694.1	8 772.3	12.6	43.7	579.7	13.3	5.1	5.2	1.2	10.9	10.7	2.3
20,000 to 29,999	271.2	6 079.4	22.4	19.3	436.0	22.5	9.4	9.4	1.2	9.0	8.9	1.1
30,000 to 49,999	97.6	3 027.4	34.8	19.7	723.7	36.8	16.0	15.8	2.2	8.6	8.5	1.4
50,000 to 74,999	26.9	1 468.7	54.5	11.9	707.2	59.4	24.8	23.0	2.0	8.7	8.5	1.2
75,000 or more	12.3	1 264.8	102.8	12.3	1 264.8	102.8	5.7	5.9	1.9	5.7	5.9	1.9
RANGE OF OPERATION												
Local	1 513.4	17 638.9	11.8	100.1	1 606.2	16.0	2.0	3.7	3.2	4.9	5.4	3.8
Short-range	236.6	3 943.8	16.2	29.0	1 144.8	39.4	9.9	9.6	5.7	6.2	5.9	4.5
Long-range	108.8	2 157.6	20.2	14.6	1 013.2	69.2	15.0	13.2	11.0	7.5	6.5	5.4
Off-the-road	52.1	574.0	11.0	7.4	75.1	10.2	21.9	26.5	14.5	16.6	25.2	18.4
Not reported	15.2	83.9	5.5	5.7	83.9	14.8	34.6	24.8	39.2	19.6	24.8	15.9
BASE OF OPERATION												
Percentage of miles traveled outside base-of-operation State:												
Less than 25 percent	1 580.7	19 113.3	12.1	121.5	2 546.2	21.0	1.8	3.3	2.9	3.1	3.8	3.1
25 to 49 percent	58.7	911.1	15.2	3.1	135.0	43.9	21.2	25.4	16.5	21.8	18.5	13.6
50 to 74 percent	63.5	1 132.6	17.8	6.9	283.9	42.6	20.3	21.3	13.7	43.3	15.3	33.5
75 to 100 percent	62.5	1 263.4	20.5	9.2	561.7	58.8	19.7	17.5	13.1	11.4	8.7	8.8
Not reported	157.5	2 057.7	13.1	16.1	395.5	24.6	12.4	15.1	10.2	10.3	10.0	7.0

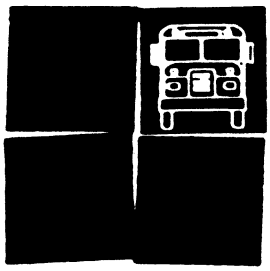
See footnotes at end of table.

Table 1. Trucks—Comparative Summary: 1987 and Earlier Years

(Percent. Data relate to State of registration. Detail may not add to total because of rounding. For meaning of abbreviations and symbols, see introductory text)

Vehicular and operational characteristics	1987	1982	1977	1972
Total	100.0	100.0	100.0	100.0
MAJOR USE				
Agriculture	3.5	6.0	9.3	10.2
Forestry and lumbering	.2	.2	.8	1.6
Mining and quarrying	(Z)	.1	.3	(Z)
Construction	15.8	14.8	9.5	11.7
Manufacturing	.7	.9	1.0	2.0
Wholesale and retail trade	5.2	7.3	10.5	13.6
For-hire transportation	2.1	1.6	3.0	4.1
Utilities and service	8.3	12.3	11.9	14.1
Personal transportation	64.2	53.6	52.1	40.8
Other	.1	1.0	1.5	2.1
BODY TYPE				
Pickup, panel, or mini-van[1]	91.8	87.9	84.2	71.1
Platform and stakerack	2.4	3.3	4.7	9.2
Van	1.9	3.0	4.5	8.2
Public utility	.2	.8	1.1	(Z)
Multistop or walk-in	1.3	.9	1.1	2.6
Dump	.8	1.8	1.3	2.0
Tank for liquids or dry bulk	.4	.5	1.0	1.4
Other	1.2	1.9	1.9	4.4
VEHICLE SIZE				
Light	94.4	91.4	89.3	88.3
Medium	1.7	3.8	4.8	21.4
Light-heavy	1.9	1.6	3.4	3.1
Heavy-heavy	2.9	3.5	6.7	7.2
ANNUAL MILES				
Less than 5,000	20.6	18.0	14.1	16.9
5,000 to 9,999	23.1	25.6	34.2	27.7
10,000 to 19,999	35.6	38.6	40.7	35.6
20,000 to 29,999	14.1	11.5	12.0	10.4
30,000 miles or more	6.6	6.1	9.1	9.4
YEAR MODEL				
1 to 2 years old	26.3	11.0	14.3	20.1
3 to 4 years old	19.8	22.7	16.7	22.0
Over 4 years old	53.8	66.4	68.9	57.8
VEHICLE ACQUISITION				
Purchased new	50.6	52.9	51.7	59.0
Purchased used	47.2	46.2	45.6	40.1
Leased from someone and not reported	2.2	1.0	2.7	.9
TRUCK FLEET SIZE				
1	64.7	76.9	69.2	59.4
2 to 5	23.8	9.3	14.0	17.2
6 to 19	5.2	6.0	6.8	10.6
20 or more	6.3	7.8	7.9	12.8
TRUCK TYPE				
Single-unit trucks	97.3	95.1	95.8	94.6
2 axles	96.6	94.2	94.6	91.7
3 axles or more	.7	.9	1.2	2.9
Combination	2.7	4.9	4.1	5.4
3 axles	.8	.8	.1	.5
4 axles	.9	2.5	2.0	2.8
5 axles or more	1.2	1.5	2.0	2.1
Trailer not specified	(Z)	(Z)	(Z)	(Z)
RANGE OF OPERATION				
Local	76.7	82.1	86.3	80.2
Short-range	12.3	7.3	6.9	8.2
Long-range	8.6	4.6	3.0	3.0
Off-the-road and not reported	3.5	6.1	4.8	8.6
FUEL TYPE				
Gasoline	92.6	94.0	94.7	86.2
Diesel and LPG	7.4	6.0	5.3	6.1
Not reported	(Z)	(Z)	(Z)	7.7

[1]Vans similar to panel trucks are included in pickup, panel, and mini-vans.



School Buses Lead the Pack In Registrations for 1989

School buses were once again leaders in overall bus registrations for 1989.

Of the total 625,040 registered buses in the U.S., 507,628, or 81.2 percent, were school buses.

Seven states showed school bus registrations in excess of 20,000, with Florida, North Carolina and Texas registering 32,326, 32,414 and 57,130 units, respectively.

MOTOR BUS REGISTRATIONS BY STATE, 1989

State	Private and Commercial		Publicly Owned		Total School Buses	Total Buses
	Commercial Buses[1]	School and Other[2]	Federal	School[3]		
Alabama	1,932	180	35	6,223	6,403	8,370
Alaska	1,253	539	67	259	798	2,118
Arizona	1,164	215	337	2,583	2,808	4,309
Arkansas	42	1,106	26	4,088	5,194	5,282
California	14,859	9,176	417	14,402	23,578	38,854
Colorado	613	842	38	4,022	4,864	5,515
Connecticut	2,583	5,498	11	710	6,208	8,812
Delaware	332	1,278	5	100	1,378	1,715
Florida	3,736	1,142	185	31,184	32,326	36,247
Georgia	1,146	2,184	94	15,272	17,456	18,696
Hawaii	2,646	891	25	884	1,555	4,226
Idaho	849	399	133	2,251	2,650	3,632
Illinois	5,161	10,148	76	2,275	12,423	17,680
Indiana	4,156	5,195	49	11,824	17,019	21,224
Iowa	1,099	271	12	7,680	7,951	9,062
Kansas	381	1,177	11	2,191	3,368	3,760
Kentucky	1,147	728	141	7,800	8,528	9,816
Louisiana	838	14,101	22	4,605	18,706	19,566
Maine	176	441	11	2,207	2,648	2,835
Maryland	2,618	4,008	135	4,252	8,260	11,013
Massachusetts	3,478	7,144	74	348	7,492	11,044
Michigan	2,484	6,481	69	13,672	20,153	22,706
Minnesota	2,237	3,835	7	7,136	10,971	13,215
Mississippi	805	2,340	70	5,467	7,807	8,682
Missouri	1,076	2,976	32	7,492	10,468	11,576
Montana	405	677	17	868	1,545	1,967
Nebraska	530	579	9	3,810	4,389	4,928
Nevada	1,342	161	126	115	276	1,744
New Hampshire	349	1,004	2	315	1,319	1,670
New Jersey	5,291	9,442	51	3,000	12,442	17,784
New Mexico	554	2,025	275	573	2,598	3,427
New York	12,449	6,855	197	10,592	17,447	30,093
North Carolina	1,992	7,072	49	25,342	32,414	34,455
North Dakota	102	448	58	1,574	2,022	2,183
Ohio	7,809	2,967	75	22,169	25,136	33,020
Oklahoma	348	1,467	122	11,021	12,488	12,958
Oregon	1,508	2,167	62	6,524	8,691	10,261
Pennsylvania	8,318	15,911	110	6,479	22,390	30,818
Rhode Island	290	1,253	5	6	1,259	1,554
South Carolina	882	3,728	29	9,234	12,962	13,853
South Dakota	294	395	106	1,254	1,649	2,049
Tennessee	1,742	1,382	71	9,996	11,378	13,191
Texas	3,057	12,366	224	44,764	57,130	60,411
Utah	325	76	34	722	798	1,157
Vermont	93	547	4	791	1,338	1,435
Virginia	2,228	243	218	14,408	14,651	17,097
Washington	783	2,022	176	4,620	6,642	7,581
West Virginia	900	65	40	2,818	2,883	3,823
Wisconsin	1,504	6,814	21	4,145	10,959	12,484
Wyoming	806	126	9	1,438	1,566	2,381
District of Columbia	2,292	146	245	98	244	2,781
TOTAL	112,994	162,045	4,418	345,583	507,628	625,040

- Includes municipally owned transit buses.
(2) In some instances church, industrial and other private buses are included here; in other instances privately owned school buses could not be segregated from commercial buses, and are included with the latter.
(3) This column consists primarily of publicly owned school buses but includes a few privately owned school, institutional, and industrial buses registered free or at reduced fee.

SOURCE: U.S. Department of Transportation, Federal Highway Administration, Table MV-10

APPENDIX C

MILEAGE ACCUMULATION RATES

STATEWIDE VALUES

(HDDT and MC are held constant)

LDGV

Statewide Mileage Accumulation

	Mean	
67	3455.4	
68	4614.51	0.036439
69	4580.68	0.045807
70	5114.11	0.051141
71	5381.18	0.053812
72	5065.65	0.050657
73	6263.12	0.062631
74	6143.57	0.061436
75	6269.64	0.062696
76	6806.64	0.068066
77	7174.23	0.071742
78	7587.78	0.075878
79	7939.56	0.079396
80	8574.79	0.085748
81	9413.81	0.094138
82	10340.68	0.103407
83	10638.33	0.106383
84	11185.37	0.111854
85	12074.01	0.12074
86	12934.71	0.129347
87	13940.83	0.139408
88	14904.35	0.149044
89	16175.35	0.161754
90	16259.11	0.162591
91	16068.58	0.160686
92	12765.88	0.127659

LDGT1

Statewide Mileage Accumulation

	Mean			
67	502455	5024.55	313	
68	560250	5602.5	87	0.051503
69	666298	6662.98		0.06663
70	657903	6579.03		0.06579
71	572769	5727.69		0.057277
72	620636	6206.36		0.062064
73	699961	6999.61		0.069996
74	742806	7428.06		0.074281
75	749439	7494.39		0.074944
76	841483	8414.83		0.084148
77	830215	8302.15		0.083022
78	832338	8323.38		0.083234
79	880530	8805.3		0.088053
80	961382	9613.82		0.096138
81	1009880	10098.8		0.100988
82	1094087	10940.87		0.109409
83	1126595	11265.95		0.11266
84	1218446	12184.46		0.121845
85	1323527	13235.27		0.132353
86	1456867	14568.67		0.145687
87	1553353	15533.53		0.155335
88	1658894	16588.94		0.165889
89	1714908	17149.08		0.171491
90	1690775	16907.75		0.169078
91	1664603	16646.03		0.16646
92	1046772	10467.72		0.104677

LDGT2

Statewide Mileage Accumulation

		Mean			
67	302352	3023.52	9		
68	305726	3057.26	2	0.030297	
69	1469607	14696.07		0.146961	
70	400243	4002.43		0.040024	
71	1182986	11829.86		0.118299	
72	476490	4764.9		0.047649	
73	616223	6162.23		0.061622	
74	515961	5159.61		0.051596	
75	513014	5130.14		0.051301	
76	470912	4709.12		0.047091	
77	1047184	10471.84		0.104718	changed
78	1122139	11221.39		0.112214	
79	958853	9588.53		0.095885	
80	1220532	12205.32		0.122053	
81	1121980	11219.8		0.112198	
82	1307401	13074.01		0.13074	
83	1495923	14959.23		0.149592	
84	1326811	13268.11		0.132681	changed
85	1304445	13044.45		0.130445	
86	1547161	15471.61		0.154716	
87	1492389	14923.89		0.149239	
88	1460853	14608.53		0.146085	
89	1889031	18890.31		0.188903	
90	1851756	18517.56		0.185176	
91	1570353	15703.53		0.157035	
92	1511991	15119.91		0.151199	

HDGV

Statewide Mileage Accumulation

		Mean		
67	448704	4487.04	27	
68	606105	6061.05	3	0.046444
69	652975	6529.75		0.065298
70	764436	7644.36		0.076444
71	1074102	10741.02		0.10741
72	602075	6020.75		0.060208
73	640060	6400.6		0.064006
74	1234612	12346.12		0.123461
75	1057489	10574.89		0.105749
76	1000690	10006.9		0.100069
77	904631	9046.31		0.090463
78	1039251	10392.51		0.103925
79	1081981	10819.81		0.108198
80	1331678	13316.78		0.133168
81	1213053	12130.53		0.121305
82	1429840	14298.4		0.142984
83	1490571	14905.71		0.149057
84	1393941	13939.41		0.139394
85	1915154	19151.54		0.191515
86	1867662	18676.62		0.186766
87	1987189	19871.89		0.198719
88	1989415	19894.15		0.198942
89	1772577	17725.77		0.177258
90	1695476	16954.76		0.169548
91	2645377	26453.77		0.264538
92	2881062	28810.62		0.288106

LDDV

Statewide Mileage Accumulation

	Mean		
67	4425.7	20	
68	22428.48	7	0.090931
69	6221.54		0.062215
70	12413.8		0.124138
71	17124.51		0.171245
72	10067.87		0.100679
73	11007.05		0.110071
74	14221.42		0.142214
75	9928.72		0.099287
76	20060.7		0.200607
77	19777.07		0.197771
78	17392.37		0.173924
79	21112.12		0.211121
80	24324.46		0.243245
81	24013.61		0.240136
82	22462.25		0.224623
83	26596.74		0.265967
84	27180.95		0.27181
85	27330.65		0.273307
86	28229.15		0.282292
87	35448.78		0.354488
88	41059.41		0.410594
89	37103.78		0.371038
90	24000.77		0.240008
91	28704.93		0.287049
92	15709.97		0.1571

LDDT

Statewide Mileage Accumulation

	Mean	
67	0	0
68	0	0
69	0	0
70	0	0
71	0	0
72	0	0
73	0	0
74	0	0
75	0	0
76	1963.81	0.019638
77	0	0
78	0	0
79	0	0
80	4604.08	0.046041
81	8051.77	0.080518
82	8485.44	0.084854
83	9978.37	0.099784
84	11518.14	0.115181
85	12657.2	0.126572
86	13609.58	0.136096
87	14659.07	0.146591
88	18236.4	0.182364
89	20166.71	0.201667
90	17567.74	0.175677
91	20076.38	0.200764
92	9961.95	0.09962

JACKSONVILLE VALUES

(HDDT and MC are held constant)

LDGV

Jacksonville area Mileage Accumulation

	Mean 2	
67	4278.39	
68	9825.35	0.053649
69	3862.99	0.03863
70	8703.3	0.087033
71	13719.3	0.137193
72	10550.57	0.105506
73	12132.46	0.121325
74	10132.38	0.101324
75	10503	0.10503
76	7951.23	0.079512
77	1042.56	0.010426
78	11159.53	0.111595
79	10171.82	0.101718
80	10675.13	0.106751
81	11707.55	0.117076
82	11891.27	0.118913
83	12582.55	0.125826
84	12944.45	0.129445
85	14232.02	0.14232
86	14402.4	0.144024
87	15707.29	0.157073
88	17005.19	0.170052
89	18292.48	0.182925
90	18126.8	0.181268
91	17617.84	0.176178
92	13313.85	0.133139

LDGT1

Jacksonville area Mileage Accumulation

	Mean 2	
67	8015.35	
68	4276.81	0.072676
69	16873.73	0.168737
70	4020.15	0.040202
71	3209.21	0.032092
72	3743.28	0.037433
73	8847.27	0.088473
74	10506.03	0.10506
75	5564.92	0.055649
76	5938.61	0.059386
77	13533.76	0.135338
78	12271.67	0.122717
79	14457.25	0.144573
80	9029.84	0.090298
81	11546.86	0.115469
82	14022.42	0.140224
83	12425.77	0.124258
84	14259.32	0.142593
85	14300.08	0.143001
86	18288.34	0.182883
87	16813.9	0.168139
88	16216.51	0.162165
89	16852.27	0.168523
90	18179.61	0.181796
91	17622.31	0.176223
92	9980.38	0.099804

LDGT2

Jacksonville area Mileage Accumulation

	Mean 2	
67	0	
68	0	0
69	0	0
70	0	0
71	0	0
72	0	0
73	7927.12	0.079271
74	0	0
75	0	0
76	0	0
77	14207.69	0.142077
78	14501.77	0.145018
79	2094.18	0.020942
80	8618.96	0.08619
81	0	0
82	17159.93	0.171599
83	7855.56	0.078556
84	8938.65	0.089387
85	12940.36	0.129404
86	20829.18	0.208292
87	13489.5	0.134895
88	15312.11	0.153121
89	32250	0.3225
90	15668	0.15668
91	0	0
92	0	0

HDGV

Jacksonville area Mileage Accumulation

	Mean 2	
67	0	
68	0	0
69	0	0
70	0	0
71	0	0
72	3146.9	0.031469
73	0	0
74	3498.22	0.034982
75	4226.67	0.042267
76	0	0
77	3700	0.037
78	9968.96	0.09969
79	6156.18	0.061562
80	12738.4	0.127384
81	9151.85	0.091519
82	42668.16	0.426682
83	10156.21	0.101562
84	17648.13	0.176481
85	13736.23	0.137362
86	18440.17	0.184402
87	25288.52	0.252885
88	20056.85	0.200569
89	12361.25	0.123613
90	17229.4	0.172294
91	19468.75	0.194688
92	18479	0.18479

LDDV

Jacksonville area Mileage Accumulation

	Mean 2	
67	0	
68	0	0
69	0	0
70	5753.95	0.05754
71	0	0
72	0	0
73	0	0
74	0	0
75	0.13	1.3E-06
76	9380.47	0.093805
77	26157.36	0.261574
78	1825.25	0.018253
79	6797.25	0.067973
80	15819.22	0.158192
81	19245.37	0.192454
82	13769.38	0.137694
83	24394.41	0.243944
84	27205.58	0.272056
85	24326.75	0.243268
86	37556.43	0.375564
87	37003.84	0.370038
88	71340.79	0.713408
89	22998.38	0.229984
90	20072.9	0.200729
91	11154.84	0.111548
92	16714.5	0.167145

LDDT

Jacksonville area Mileage Accumulation

	Mean 2	
67	0	
68	0	0
69	0	0
70	0	0
71	0	0
72	0	0
73	0	0
74	0	0
75	0	0
76	0	0
77	0	0
78	0	0
79	0	0
80	0	0
81	8628.89	0.086289
82	11486.94	0.114869
83	9348.99	0.09349
84	13731.98	0.13732
85	22987.64	0.229876
86	15202.88	0.152029
87	13258.1	0.132581
88	20750.78	0.207508
89	17428.15	0.174282
90	17350.55	0.173506
91	10971.75	0.109718
92	2401.67	0.024017

MIAMI VALUES

(HDDT and MC are held constant)

LDGV

Miami Area

	Mean 1	Mean 6	Mean 10	N,1	N,6	N,10	
67	4288.29	2697.27	3228.7	211	229	211	
68	5957.16	4170.75	6292.02	43	48	32	0.043662
69	5416.15	3912.77	5397.02	59	54	50	0.049122
70	4928.05	3930.17	6204.11	68	65	66	0.050253
71	5200.11	4061.17	4814.35	90	67	61	0.047421
72	6332.96	3938.15	4462.11	108	100	98	0.049512
73	9810.65	5116.25	5308.56	151	139	113	0.069291
74	8400.27	5907.41	5266.11	163	129	103	0.067689
75	8313.86	5364.16	5547.4	175	114	126	0.066636
76	8302.84	6051.74	6679.81	320	245	212	0.071502
77	8359.46	5976.5	7768.56	598	377	407	0.075354
78	8760.35	6096.19	8305.1	998	567	604	0.079371
79	9565.81	6497.17	7763.32	1316	790	852	0.082271
80	10332.36	7339.5	8731.8	1757	802	888	0.092237
81	10819.31	7668.51	9358.8	2567	1010	1255	0.097814
82	11840.3	9101.38	10276.91	4038	1364	2008	0.109125
83	11851	9534.36	11234.31	6902	2299	3326	0.112621
84	12398.54	10069.52	11639.92	10508	3405	4844	0.117798
85	12969.18	10900.94	11859.21	10509	3676	5140	0.122805
86	13925.61	11876.59	12329.55	10152	3888	5341	0.130747
87	14924.04	12628.33	13027.88	9432	3990	5393	0.138937
88	15537.86	13427.48	13747.3	8255	4029	5249	0.145168
89	16684.96	14607.81	14837.36	6523	3879	4553	0.155837
90	16129.75	14588.82	14941.19	4460	3115	3251	0.153295
91	16338.32	13788.32	14766.93	3227	1995	2059	0.151952
92	12201.11	10269.93	10844.21	1611	851	585	0.114012

LDGT1

Miami Area

	Mean 1	Mean 6	Mean 10	N,1	N,6	N,10		
67	6043.14	6677.26	3855.49	17	25	19		
68	2543.66	6044.31	2492.16	5	17	4	0.052231	
69	11750.79	4036.06	6125.02	14	9	17	0.07624	
70	14211.65	4390.76	4677.68	18	7	2	0.109593	
71	5968.66	4698.07	9810.2	15	16	9	0.063248	
72	9826.29	7545.34	5725.73	27	30	18	0.079298	
73	10049.72	5645.85	5799.7	57	40	21	0.078005	
74	7750.85	7184.87	8481.88	76	56	41	0.077409	
75	7748.64	7399.4	9246.24	49	24	21	0.07994	
76	8711.77	5500.22	11148.7	86	56	42	0.082906	
77	8826.85	7187.91	8478.38	141	101	93	0.08236	
78	9846.99	6965.84	9035.4	192	128	115	0.087846	
79	8795.58	8030.91	8733.7	279	167	152	0.085663	
80	13289.04	8257.56	10417.21	193	131	101	0.110557	
81	10654.87	10120.56	12837.3	316	154	159	0.110757	changed
82	11226.04	9503.23	12398.54	473	202	213	0.111154	
83	12477.22	11367.77	11989.55	672	253	368	0.121213	
84	13070.2	11861.75	12207.83	1123	386	538	0.126157	
85	14131.04	13588.62	14450.45	1259	429	580	0.141101	
86	15050.15	14125.28	14380.37	1430	548	703	0.146855	
87	16590.68	15646.21	16992.03	1143	484	631	0.165004	
88	17892.05	15738.97	16502.2	1118	506	652	0.170152	
89	17932.4	16569.48	18066.6	822	447	543	0.176364	
90	19912.3	16105.21	17332.47	552	298	342	0.182203	
91	16235.06	13835.75	15547.46	336	197	187	0.154	
92	10738.95	5676.98	6174.71	133	73	78	0.081843	

LDGT2

Miami Area

	Mean 1	Mean 6	Mean 10	N,1	N,6	N,10		
67	6785.71	0	1142.86	1	0	1		
68	0	4181.82	0	0	1	0	0.040731	
69	25768.76	0	1678.61	2	0	1	0.177387	
70	0	1989.56	4062.63	0	2	3	0.032334	
71	23685.32	7892.19	7631.58	2	2	1	0.141573	
72	3489.34	0	4727	2	0	2	0.041082	
73	8823.53	6488.41	5641.4	2	5	4	0.06605	
74	7783.59	6613.94	1078.25	1	3	1	0.057407	
75	3744.37	3155.12	0	2	2	0	0.034497	
76	4790.78	4616.25	3432.64	3	1	2	0.04309	
77	7362.87	4507.9	15855.06	10	2	6	0.098764	
78	18494.11	5459.01	8115.36	7	3	5	0.124275	
79	8392.71	8699.64	7076.07	9	6	6	0.081042	
80	21852.89	16275.8	7761.15	5	8	3	0.164221	
81	19232.68	10213.82	14356.67	9	4	11	0.154947	
82	7290.93	6829.6	5864.74	8	1	6	0.066897	
83	18368.09	23243.17	20085.72	11	7	8	0.202091	
84	11720.23	12631.22	10988.07	17	3	10	0.115673	
85	13405.34	10027.46	10782.61	15	7	9	0.118812	
86	15486.26	13422.02	12697.04	7	8	10	0.1371	
87	14226.73	17316.55	14806.85	9	2	5	0.147942	
88	14543.94	13958.31	14944.25	9	7	5	0.14444	
89	16728.36	34721.25	13995.04	7	2	6	0.180341	
90	21052.92	18385	22290.38	4	1	4	0.213065	
91	20	543.5	33502.5	2	2	2	0.113553	
92	8500	0	20556	2	0	1	0.125187	

HDGV

Miami Area

	Mean 1	Mean 6	Mean 10	N,1	N,6	N,10	
67	3310.65	2329.59	4760.04	7	2	3	
68	0	0	0	0	0	0	0.035095
69	5281.26	3932.07	3673.59	2	4	2	0.042047
70	5257.02	17800.18	3680.17	6	5	3	0.093988
71	7932.74	52631.53	8152.57	4	1	1	0.154192
72	6613.46	6419.53	4420.41	6	2	2	0.061361
73	11169.21	3755.84	5403.03	8	8	6	0.069008
74	20393.72	20271.6	10712.04	8	3	8	0.162979
75	26066.91	4705.74	5336.55	9	4	5	0.155616
76	11576.87	12424.02	5136.38	11	3	2	0.109306
77	9521.71	5763.49	5439.2	13	7	3	0.078454
78	8451.87	17384.67	11068.02	15	7	7	0.112395
79	7958.73	9577.72	14497.46	25	11	15	0.102311
80	14239.87	7456.02	6161.35	16	14	7	0.101446
81	13262.49	7645.38	18146.05	18	10	10	0.130695
82	12138.8	18063.11	9763.03	21	8	10	0.127449
83	19116.41	10977.87	17068.47	31	14	12	0.166863
84	15454.71	17128.72	13607.48	38	12	14	0.153645
85	13918.64	23024.71	12537.81	47	21	21	0.157414
86	22736.9	15184.31	13135.88	42	13	25	0.185093
87	18728.71	22573.03	17019.89	43	8	12	0.188914
88	23307.31	11329.37	15267.03	40	8	13	0.200229
89	15685.06	13881.92	20437.34	24	10	12	0.165328
90	14533.27	17051.63	16694.5	20	8	11	0.156594
91	19946.22	0	50755.33	9	0	3	0.276485
92	27685.67	0	30440	3	0	2	0.287874

LDDV

Miami Area

	Mean 1	Mean 6	Mean 10	N,1	N,6	N,10	
67	7607.74	2214.22	400	3	2	1	
68	0	27542.25	0	0	2	0	0.160754
69	8695.65	8321.77	521.3	1	3	1	0.068365
70	12623.33	6651.55	0	5	1	0	0.11628
71	23011.58	4347.62	0	4	2	0	0.167903
72	10552.94	7000	9276.4	6	1	4	0.097657
73	10681.06	4659.51	12186.76	8	3	4	0.098783
74	18573.8	17977.73	5308.63	16	3	1	0.178211
75	14471.58	789	12312.25	8	1	5	0.127231
76	14190.02	35167.63	8034.6	6	4	5	0.177322
77	18562.76	27188.17	8379.16	14	4	6	0.174544
78	20743.8	9874.03	14895.96	18	8	8	0.168102
79	16304.11	27410.32	28004.1	17	7	8	0.216586
80	30739.3	9580.05	25334.78	14	8	8	0.236556
81	21476.75	20343.46	29469.51	32	14	8	0.22367
82	30575.64	21984.17	9179.14	21	9	7	0.244378
83	19401.76	15863.82	32220.21	41	12	14	0.214466
84	20844.72	24469.75	22686.64	88	22	36	0.218451
85	20664.83	20461.67	28113.99	104	33	47	0.225312
86	23580.73	18981.62	25431.32	104	35	52	0.232418
87	25374.93	19559.3	29581.12	80	22	38	0.256027
88	32968.46	24213.69	31814.64	88	23	33	0.313057
89	23670.83	25127.54	21559.2	84	26	46	0.23291
90	18929.19	12165.84	14670.76	95	41	49	0.163024
91	16085.34	17834.24	29573.79	37	19	17	0.196817
92	13262.88	11642.6	8812.6	17	5	5	0.121387

LDDT

Miami Area

	Mean 1	Mean 6	Mean 10	N,1	N,6	N,10	
67	0	0	0	0	0	0	0
68	0	0	0	0	0	0	0
69	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0
73	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0
81	10888.95	8105.41	9178.13	7	9	4	0.092942
82	5907.62	1893.6	10942.75	4	2	2	0.061629
83	11186.85	10413.35	11271.92	49	21	22	0.110306
84	11561.46	10996.72	9834.09	83	28	34	0.110474
85	11481.19	22176.09	10788.63	53	17	25	0.132128
86	15158.9	14159.81	12990.65	54	22	26	0.143907
87	19517.77	15394.16	11202.73	38	19	20	0.163405
88	14384.94	15373.5	31331.6	22	27	24	0.203221
89	18897.94	20733.65	16443.56	35	16	26	0.184506
90	19785.62	18204.22	17496.9	23	15	20	0.185874
91	20986.25	16002.5	12088.1	8	6	5	0.170708
92	19561.25	13837.67	11195.25	1	3	4	0.132319

ORLANDO VALUES

(HDDT and MC are held constant)

LDGV

Orlando Area Mileage Accumulation

	Mean 7	
67	3666.3	
68	3094.34	0.035746
69	4829.59	0.048296
70	3605.86	0.036059
71	4665.32	0.046653
72	5710.19	0.057102
73	5992.2	0.059922
74	6610.97	0.06611
75	6953.03	0.06953
76	6340.5	0.063405
77	7354.36	0.073544
78	7073.35	0.070734
79	8845.11	0.088451
80	7592.9	0.075929
81	8748.48	0.087485
82	10009.22	0.100092
83	10242.26	0.102423
84	10727.59	0.107276
85	12010.65	0.120107
86	13261.9	0.132619
87	14196.71	0.141967
88	15579.27	0.155793
89	17227.32	0.172273
90	17964.32	0.179643
91	17876.38	0.178764
92	12297.1	0.122971

LDGT1

Orlando Area Mileage Accumulation

	Mean 7	
67	4138.43	
68	2545.22	0.03926
69	4095.37	0.040954
70	3115.19	0.031152
71	5053.81	0.050538
72	3958.64	0.039586
73	4884.36	0.048844
74	4526.37	0.045264
75	14920.37	0.149204
76	10137.48	0.101375
77	5692.35	0.056924
78	10203.66	0.102037
79	7760.11	0.077601
80	10381.67	0.103817
81	7608.21	0.076082
82	10168.79	0.101688
83	10306.05	0.103061
84	11148	0.11148
85	12388.13	0.123881
86	14304.11	0.143041
87	15483.29	0.154833
88	16173.51	0.161735
89	17205.72	0.172057
90	16313	0.16313
91	17771.63	0.177716
92	7309.75	0.073098

LDGT2

Orlando Area Mileage Accumulation

	Mean 7	
67	0	
68	1932.7	0.019327
69	0	0
70	5100	0.051
71	0	0
72	4753.11	0.047531
73	0	0
74	0	0
75	0	0
76	0	0
77	76923	0.76923
78	2124.15	0.021242
79	0	0
80	0	0
81	5583.41	0.055834
82	8057.5	0.080575
83	11157.93	0.111579
84	16371.46	0.163715
85	13234.98	0.13235
86	32058.78	0.320588
87	11540.88	0.115409
88	6169.4	0.061694
89	24622.33	0.246223
90	17020	0.1702
91	23898.25	0.238983
92	11	0.00011

HDGV

Orlando Area Mileage Accumulation

	Mean 7	
67	823.55	
68	0	0.008236
69	0	0
70	0	0
71	0	0
72	0	0
73	3509.74	0.035097
74	3267.35	0.032674
75	35073.17	0.350732
76	4443	0.04443
77	6402.98	0.06403
78	2921.45	0.029215
79	10017.17	0.100172
80	6978.14	0.069781
81	20258.51	0.202585
82	10483.02	0.10483
83	9695.47	0.096955
84	15677.85	0.156779
85	26119.92	0.261199
86	24018.39	0.240184
87	11166.1	0.111661
88	19041.19	0.190412
89	29360.55	0.293606
90	18379.89	0.183799
91	15327.5	0.153275
92	0	0

LDDT

Orlando Area Mileage Accumulation

	Mean 7	
67	0	
68	0	0
69	0	0
70	0	0
71	0	0
72	0	0
73	0	0
74	0	0
75	0	0
76	0	0
77	0	0
78	0	0
79	0	0
80	0	0
81	8226.87	0.082269
82	9746.53	0.097465
83	4801.25	0.048013
84	11125.24	0.111252
85	12400.73	0.124007
86	16345.44	0.163454
87	15227.12	0.152271
88	17057.62	0.170576
89	17106.03	0.17106
90	19417.31	0.194173
91	14861.67	0.148617
92	25989	0.25989

TAMPA VALUES

(HDDT and MC are held constant)

LDGV

Tampa Area Mileage Accumulation

	Mean 3	Mean 4	N,3	N,4				
67	3160.78	2892.59	84	144	0.029914			
68	3650.21	2588.29	17	40	0.02905	0.029482	changed	
69	3334.89	4225.91	19	40	0.03939	0.03939		
70	5382.91	3344.85	22	36	0.041179	0.041179		
71	4063.22	6142.04	25	54	0.054842	0.054842		
72	4201.28	4131.05	31	71	0.041524	0.041524		
73	5384.86	4293.17	50	102	0.046523	0.046523		
74	4240.36	4429.15	47	101	0.043692	0.043692		
75	4533.36	4379.28	42	83	0.044311	0.044311		
76	5666.38	5330.59	59	163	0.054198	0.054198		
77	6112.03	5540.16	147	296	0.057299	0.057299		
78	6121.18	6027.7	217	443	0.060584	0.060584		
79	7534.66	6867.16	301	499	0.071183	0.071183		
80	6996.02	7011.4	389	524	0.070048	0.070048		
81	8390.95	7517.72	667	833	0.07906	0.07906		
82	9778.4	8786.83	1245	1289	0.09274	0.09274		
83	9882.31	9022.91	2382	2164	0.094732	0.094732		
84	10853.46	9630.78	3794	3357	0.102795	0.102795		
85	11849.03	10531.24	3694	3619	0.111969	0.111969		
86	12951.08	11566.48	3693	3766	0.12252	0.12252		
87	13921.42	12583.62	3512	3721	0.132332	0.132332		
88	15497.06	13530.38	3521	3738	0.144843	0.144843		
89	16700.76	15252.43	3282	3461	0.159574	0.159574		
90	17037.3	14692.37	2505	2786	0.158026	0.158026		
91	16240.33	14849.6	1558	1782	0.154983	0.154983		
92	12878.4	11720.34	491	581	0.122508	0.122508		

LDGT1

Tampa Area Mileage Accumulation

	Mean 3	Mean 4	N,3	N,4				
67	2457.78	3063.41	20	18	0.027447			
68	4001.28	3916.46	4	3	0.039649	0.033548	chang	
69	7798.55	10673.26	10	6	0.088766	0.088766		
70	2889.44	4551.8	6	8	0.038394	0.038394		
71	3149.18	6735.65	10	7	0.04626	0.04626		
72	4084.88	4317.26	9	13	0.042222	0.042222		
73	4968.56	6971.41	13	25	0.062862	0.062862		
74	5158.31	4913.46	17	22	0.050202	0.050202		
75	5492.99	8775.24	10	15	0.074623	0.074623		
76	7702	6448.45	22	41	0.068862	0.068862		
77	9417.7	5976.16	33	51	0.073282	0.073282		
78	5730.88	5196.05	37	64	0.05392	0.05392		
79	7578.91	6466.85	55	72	0.069485	0.069485		
80	7606.74	6742.79	43	63	0.070933	0.070933		
81	9636.11	9127.17	125	106	0.094026	0.094026		
82	10228.58	9528.06	186	153	0.099124	0.099124		
83	10015.51	9556.71	358	292	0.098094	0.098094		
84	11224.09	10669.15	567	456	0.109767	0.109767		
85	12702.86	11754.62	565	495	0.1226	0.1226		
86	15159.34	13025.74	671	505	0.142431	0.142431		
87	14737.96	14267.9	554	474	0.145212	0.145212		
88	16158.82	14473.3	533	428	0.154081	0.154081		
89	16133.69	15750.47	449	404	0.159522	0.159522		
90	16526.71	12720.14	365	225	0.150751	0.150751		
91	14739.02	12965.68	214	177	0.139363	0.139363		
92	8592.68	7903.2	79	59	0.082979	0.082979		

LDGT2

Tampa Area Mileage Accumulation

	Mean 3	Mean 4	N,3	N,4	
67	0	0	0	0	
68	0	0	0	0	0
69	0	0	0	0	0
70	0	6750	0	1	0.0675
71	0	192.57	0	1	0.001926
72	0	30.65	0	1	0.000307
73	2161.16	0	1	0	0.021612
74	0	0	0	0	0
75	0	6788.43	0	3	0.067884
76	0	0	0	0	0
77	0	7502.95	0	3	0.07503
78	8592.01	2759.31	2	2	0.056757
79	0	4522.39	0	2	0.045224
80	0	8228.41	0	3	0.082284
81	8944.44	6374.87	1	4	0.068888
82	5943.67	9911.11	3	2	0.075306
83	8673.31	2627.25	3	2	0.062549
84	7674.63	11505.65	2	5	0.104111
85	9678.39	8114.01	8	4	0.091569
86	17124.14	23400.75	6	2	0.186933
87	19551.1	15196.22	2	4	0.166478
88	7794.63	26800	2	1	0.141298
89	14813	15272	2	1	0.14966
90	15500	0	1	0	0.155
91	180.5	11152	2	2	0.056663
92	192	0	1	0	0.00192

HDGV

Tampa Area Mileage Accumulation

	Mean 3	Mean 4	N,3	N,4	
67	0	0	0	0	
68	0	0	0	0	0
69	0	5189.19	0	1	0.051892
70	0	0	0	0	0
71	3.68	0	1	0	3.7E-05
72	0	0	0	0	0
73	2618.79	3194.82	2	1	0.028108
74	2819.58	2824.19	3	2	0.028214
75	8687.1	6069.47	2	2	0.073783
76	9089.28	4718.94	2	3	0.064671
77	6071.67	64946.44	6	2	0.207904
78	7007.26	7925.72	7	4	0.073412
79	9103.75	6123.46	5	4	0.077792
80	7509.81	34305.15	4	5	0.223961
81	6560.45	41640.57	18	3	0.115719
82	12031.08	8915.21	9	6	0.107847
83	7290.72	10721.17	9	9	0.090059
84	13502.39	9684.63	21	13	0.120427
85	14100.55	15864.5	22	5	0.144272
86	14062.69	13225.94	19	12	0.137388
87	18711.68	16951.47	11	3	0.183345
88	19142.5	18424.22	13	5	0.18943
89	19183.32	19123.67	5	3	0.19161
90	21429.42	2242.5	6	2	0.166327
91	42013	12528	1	1	0.272705
92	17126	0	1	0	0.17126

LDDV

Tampa Area Mileage Accumulation

	Mean 3	Mean 4	N,3	N,4		
67	7587.48	0	1	0		
68	39681.91	29545.45	1	1	0.346137	
69	10767.76	0	1	0	0.107678	
70	0	8179.9	0	1	0.081799	
71	0	0	0	0	0	
72	0	14407	0	1	0.14407	
73	9653.68	0	2	0	0.096537	
74	9712.44	4222.34	2	2	0.069674	
75	15938.76	0	1	0	0.159388	
76	29920.39	768.43	6	1	0.257558	
77	10444.55	2784.7	7	2	0.087424	
78	68347.13	25062.29	2	2	0.467047	
79	43595.39	0	6	0	0.435954	
80	5834.15	0	4	0	0.058342	
81	16971.59	46003.89	15	1	0.187861	
82	25717.63	14461.23	10	7	0.210826	
83	20938.82	19778.54	23	14	0.204998	
84	23690.03	18948.97	35	23	0.2181	
85	22332.54	23440.8	44	23	0.22713	
86	26422.06	16974.31	27	19	0.225197	
87	26599.61	18770.56	26	9	0.245864	
88	30062.14	20680.18	28	15	0.267894	
89	30207.66	14433.94	26	17	0.239715	
90	15505.91	17687.59	44	37	0.165025	
91	21974.71	13926.5	14	18	0.174476	
92	10126	22654.67	8	6	0.154954	

LDDT

Tampa Area Mileage Accumulation

	Mean 3	Mean 4	N,3	N,4	
67	0	0	0	0	
68	0	0	0	0	0
69	0	0	0	0	0
70	0	0	0	0	0
71	0	0	0	0	0
72	0	0	0	0	0
73	0	0	0	0	0
74	0	0	0	0	0
75	0	0	0	0	0
76	1963.81	0	1	0	0.019638
77	0	0	0	0	0
78	0	0	0	0	0
79	0	0	0	0	0
80	0	0	0	0	0
81	10155.47	1440.96	3	3	0.057982
82	8097.84	7266.44	4	5	0.07636
83	9917.98	6792.38	11	9	0.085115
84	8941.58	8660.29	30	20	0.088291
85	10606.84	12424.5	23	12	0.1123
86	9945.17	14220.82	19	13	0.116822
87	13339.47	10284.25	13	6	0.123747
88	16610.93	23763.9	9	8	0.19977
89	22139.77	29181.2	13	5	0.240957
90	9911.03	21693.73	10	5	0.138386
91	19860	20466	1	1	0.20163
92	24870.5	9352.33	2	3	0.155596

APPENDIX D

VEHICLE TYPE FRACTIONS FROM REGISTRATION FILES

STATEWIDE VALUES

(HDDT and MC remain constant, all areas)

LDGV and LDDV

Vehicle Class 1 Left Column
Statewide values

	N				
67	14749				
68	2654	8701.5	2.5	8704	0.014539
69		2845	1	2846	0.004754
70		2644	0	2644	0.004417
71		2618	0	2618	0.004373
72		3729	0	3729	0.006229
73		4548	0	4548	0.007597
74		4271	0	4271	0.007134
75		4495	0	4495	0.007509
76		8373	0	8373	0.013987
77		13817	1	13818	0.023082
78		19817	1	19818	0.033105
79		23022	1	23023	0.038458
80		17172	0	17172	0.028685
81		18522	60	18582	0.03104
82		18442	59	18501	0.030905
83		22319	105	22424	0.037458
84		37591	459	38050	0.06356
85		38645	489	39134	0.065371
86		41646	358	42004	0.070165
87		39062	264	39326	0.065692
88		48711	441	49152	0.082105
89		51506	744	52250	0.08728
90		39292	1670	40962	0.068424
91		49346	1636	50982	0.085162
92		68559	2661	71220	0.118968
				598646	1

LDGT1 and LDDT1 and LDDT2

Vehicle Class 2 Left Column
Statewide values

	N				
67	4173				
68	1218	2695.5	2.5	2698	0.004581
69		1710	0	1710	0.002903
70		2644	0	2644	0.004489
71		2618	0	2618	0.004445
72		3729	1	3730	0.006333
73		4548	0	4548	0.007722
74		4271	1	4272	0.007253
75		4495	0	4495	0.007632
76		8373	1	8374	0.014218
77		13817	0	13817	0.02346
78		19817	0	19817	0.033648
79		23022	2	23024	0.039093
80		17172	1	17173	0.029158
81		18522	302	18824	0.031961
82		18442	170	18612	0.031602
83		22319	648	22967	0.038996
84		37591	1179	38770	0.065828
85		38645	667	39312	0.066748
86		41646	662	42308	0.071835
87		39062	463	39525	0.06711
88		48711	523	49234	0.083595
89		51506	601	52107	0.088473
90		39292	508	39800	0.067577
91		49346	311	49657	0.084313
92		68559	364	68923	0.117025
				588959	1

LDT2

Vehicle Class 3 Left Column
Statewide values

N			
67	114		
68	36	75	0.00013
69	54	54	9.3E-05
70		2644	0.004572
71		2618	0.004527
72		3729	0.006448
73		4548	0.007865
74		4271	0.007386
75		4495	0.007773
76		8373	0.014479
77		13817	0.023893
78		19817	0.034269
79		23022	0.039811
80		17172	0.029695
81		18522	0.03203
82		18442	0.031891
83		22319	0.038596
84		37591	0.065005
85		38645	0.066828
86		41646	0.072018
87		39062	0.067549
88		48711	0.084235
89		51506	0.089068
90		39292	0.067947
91		49346	0.085333
92		68559	0.118558
		578276	1

HDGV

Vehicle Class 5 RIGHT Column
Statewide values

N			
67	0		
68	0	0	0
69		0	0
70		0	0
71		0	0
72		0	0
73		0	0
74		0	0
75		0	0
76		0	0
77		0	0
78		0	0
79		1	0.001002
80		0	0
81		31	0.031062
82		20	0.02004
83		80	0.08016
84		115	0.11523
85		172	0.172345
86		165	0.165331
87		109	0.109218
88		95	0.09519
89		84	0.084168
90		51	0.051102
91		29	0.029058
92		46	0.046092
			1
		998	

JACKSONVILLE VALUES

(HDDT and MC remain constant, all areas)

LDGV and LDDV

Vehicle Class 1 LEFT COLUMN
JACKSONVILLE AREA
NEED COUNTY 2

	N,2				
67	718				
68	127	422.5	0	422.5	0.015346
69		141	0	141	0.005121
70		130	0	130	0.004722
71		124	0	124	0.004504
72		183	0	183	0.006647
73		232	0	232	0.008426
74		222	0	222	0.008063
75		214	0	214	0.007773
76		377	0	377	0.013693
77		631	0	631	0.022918
78		855	0	855	0.031054
79		961	0	961	0.034904
80		739	0	739	0.026841
81		759	1	760	0.027604
82		900	1	901	0.032725
83		1029	5	1034	0.037556
84		1965	21	1986	0.072133
85		1888	15	1903	0.069118
86		2036	9	2045	0.074276
87		1970	8	1978	0.071842
88		2671	13	2684	0.097485
89		2454	58	2512	0.091238
90		1830	86	1916	0.06959
91		2193	109	2302	0.08361
92		2190	90	2280	0.082811
				27532.5	1

LDT1and LDDT1 and LDDT2

Vehicle Class 2 LEFT COLUMN

JACK AREA

NEED COUNTY 2

	N,2				
67	244				
68	70	157	0.5	157.5	0.016429
69		98	0	98	0.010223
70		122	0	122	0.012726
71		120	0	120	0.012518
72		168	0	168	0.017525
73		203	0	203	0.021176
74		219	0	219	0.022845
75		127	0	127	0.013248
76		230	0	230	0.023992
77		337	0	337	0.035154
78		455	0	455	0.047463
79		434	0	434	0.045272
80		286	0	286	0.029834
81		350	12	362	0.037761
82		344	4	348	0.036301
83		457	32	489	0.051009
84		575	46	621	0.064779
85		590	21	611	0.063735
86		623	24	647	0.067491
87		503	21	524	0.05466
88		688	28	716	0.074688
89		584	23	607	0.063318
90		521	27	548	0.057164
91		558	11	569	0.059354
92		572	16	588	0.061336
				9586.5	1

LDT2

Vehicle Class 3 LEFT COLUMN
JACK AREA
NEED COUNTY 2

	N,2		
67	5		
68	1	3	0.021739
69		2	0.014493
70		0	0
71		1	0.007246
72		1	0.007246
73		4	0.028986
74		2	0.014493
75		3	0.021739
76		5	0.036232
77		10	0.072464
78		15	0.108696
79		13	0.094203
80		9	0.065217
81		6	0.043478
82		11	0.07971
83		3	0.021739
84		9	0.065217
85		14	0.101449
86		8	0.057971
87		6	0.043478
88		3	0.021739
89		4	0.028986
90		5	0.036232
91		0	0
92		1	0.007246
		138	1

HDGV

Vehicle Class 5 RIGHT COLUMN
JACK AREA
NEED COUNTY 2

	N,2		
67	0		
68	0	0	0
69		0	0
70		0	0
71		0	0
72		0	0
73		0	0
74		0	0
75		0	0
76		0	0
77		0	0
78		0	0
79		1	0.019608
80		0	0
81		1	0.019608
82		1	0.019608
83		7	0.137255
84		9	0.176471
85		10	0.196078
86		3	0.058824
87		5	0.098039
88		2	0.039216
89		5	0.098039
90		3	0.058824
91		1	0.019608
92		3	0.058824
		51	1

MIAMI VALUES

(HDDT and MC remain constant, all areas)

LDGV and LDDV

Vehicle Class 1 Left Column
MIAMI AREA
NEED Counties 1,6,10

	N,1	N,6	N,10					
67	1327	789	1067	3183				
68	260	146	170	576	1879.5	2	1881.5	0.010496
69	345	144	186		675	0	675	0.003765
70	350	138	186		674	0	674	0.00376
71	287	111	177		575	0	575	0.003208
72	439	154	283		876	0	876	0.004887
73	638	239	306		1183	0	1183	0.006599
74	622	193	319		1134	0	1134	0.006326
75	583	199	293		1075	0	1075	0.005997
76	1082	377	542		2001	0	2001	0.011162
77	1954	651	1027		3632	0	3632	0.02026
78	3311	908	1405		5624	0	5624	0.031372
79	3941	1144	1756		6841	1	6842	0.038167
80	3301	874	1275		5450	0	5450	0.030402
81	3424	999	1388		5811	11	5822	0.032477
82	3093	1012	1424		5529	7	5536	0.030881
83	3560	1422	1754		6736	34	6770	0.037765
84	5806	2332	2878		11016	97	11113	0.061992
85	5558	2487	3331		11376	113	11489	0.064089
86	5515	2938	3385		11838	96	11934	0.066571
87	4818	2909	3237		10964	77	11041	0.06159
88	5385	3790	4155		13330	128	13458	0.075073
89	4932	4210	4819		13961	196	14157	0.078972
90	3905	3203	3622		10730	353	11083	0.061824
91	7456	3389	3842		14687	360	15047	0.083936
92	21413	3485	3963		28861	1333	30194	0.168431
							179266.5	1

LDGT1 and LDDT1 and LDDT2

Vehicle Class 2 Left Column
MIAMI AREA
NEED Counties 1,6,10

	N,1	N,6	N,10					
67	227	158	188	573				
68	86	41	59	186	379.5	0.5	380	0.009128
69	152	60	77		289	0	289	0.006942
70	197	76	93		366	0	366	0.008792
71	183	65	92		340	0	340	0.008167
72	308	102	164		574	0	574	0.013788
73	466	127	167		760	0	760	0.018256
74	602	161	227		990	0	990	0.023781
75	335	84	111		530	0	530	0.012731
76	649	189	240		1078	0	1078	0.025895
77	751	270	337		1358	0	1358	0.032621
78	1258	408	546		2212	0	2212	0.053135
79	1557	495	617		2669	1	2670	0.064136
80	930	303	336		1569	0	1569	0.037689
81	1194	386	470		2050	62	2112	0.050733
82	931	362	391	changed	1684	33	1717	0.041244
83	976	420	511		1907	222	2129	0.051141
84	1161	532	573		2266	310	2576	0.061878
85	1465	713	743		2921	177	3098	0.074417
86	1346	701	756		2803	189	2992	0.071871
87	1052	581	630		2263	160	2423	0.058203
88	1232	836	833		2901	153	3054	0.073361
89	958	786	698		2442	163	2605	0.062575
90	678	545	577		1800	146	1946	0.046745
91	618	449	551		1618	83	1701	0.04086
92	832	590	603		2025	136	2161	0.05191
							41630	1

LDT2

Vehicle Class 3 Left Column
MIAMI AREA
NEED Counties 1,6,10

	N,1	N,6	N,10			
67	18	6	4	28		
68	11	4	3	18	23	0.019608
69	11	2	8		21	0.017903
70	8	6	9		23	0.019608
71	6	3	6		15	0.012788
72	9	3	9		21	0.017903
73	25	9	16		50	0.042626
74	25	5	17		47	0.040068
75	15	8	8		31	0.026428
76	24	8	13		45	0.038363
77	37	10	22		69	0.058824
78	50	22	24		96	0.081841
79	63	21	27		111	0.094629
80	36	14	17		67	0.057118
81	38	15	25		78	0.066496
82	21	10	17		48	0.040921
83	20	9	15		44	0.037511
84	27	10	22		59	0.050298
85	23	8	22		53	0.045183
86	24	17	20		61	0.052003
87	14	7	6		27	0.023018
88	16	7	10		33	0.028133
89	17	7	12		36	0.030691
90	8	4	5		17	0.014493
91	12	4	5		21	0.017903
92	66	4	7		77	0.065644
					1173	1

HDGV

Vehicle Class 5 RIGHT Column
MIAMI AREA
NEED Counties 1,6,10

	N,1	N,6	N,10			
67	0	0	0	0		
68	0	0	0	0	0	0
69	0	0	0		0	0
70	0	0	0		0	0
71	0	0	0		0	0
72	0	0	0		0	0
73	0	0	0		0	0
74	0	0	0		0	0
75	0	0	0		0	0
76	0	0	0		0	0
77	0	0	0		0	0
78	0	0	0		0	0
79	0	0	0		0	0
80	0	0	0		0	0
81	5	1	0		6	0.015957
82	1	6	1		8	0.021277
83	16	2	7		25	0.066489
84	27	8	3		38	0.101064
85	40	11	16		67	0.178191
86	35	6	19		60	0.159574
87	30	5	16		51	0.135638
88	19	13	7		39	0.103723
89	20	5	6		31	0.082447
90	10	7	5		22	0.058511
91	6	4	2		12	0.031915
92	9	2	6		17	0.045213
					376	1

ORLANDO VALUES

(HDDT and MC remain constant, all areas)

LDGVand LDDV

Vehicle Class 1 LEFT COLUMN
ORLANDO AREA
NEED COUNTY 7

N,7

67	781				
68	153	467	0	467	0.017546
69		167	0	167	0.006275
70		127	0	127	0.004772
71		131	0	131	0.004922
72		177	0	177	0.00665
73		227	0	227	0.008529
74		205	0	205	0.007702
75		214	0	214	0.008041
76		398	0	398	0.014954
77		676	1	677	0.025437
78		934	1	935	0.035131
79		1127	0	1127	0.042345
80		795	0	795	0.02987
81		831	5	836	0.031411
82		891	4	895	0.033628
83		1078	2	1080	0.040579
84		1847	18	1865	0.070073
85		1898	25	1923	0.072252
86		210	17	227	0.008529
87		1949	14	1963	0.073755
88		2534	23	2557	0.096074
89		2722	45	2767	0.103964
90		1948	110	2058	0.077325
91		2445	97	2542	0.09551
92		2179	76	2255	0.084727
				26615	1

LDT1and LDDT1 and LDDT2

Vehicle Class 2 LEFT COLUMN
ORLANDO AREA
NEED COUNTY 7

	N,7				
67	241				
68	80	160.5	0	160.5	0.018254
69		101	0	101	0.011487
70		92	0	92	0.010463
71		105	0	105	0.011942
72		168	0	168	0.019107
73		161	0	161	0.018311
74		208	0	208	0.023657
75		131	0	131	0.014899
76		222	0	222	0.025249
77		309	0	309	0.035144
78		476	0	476	0.054137
79		535	0	535	0.060847
80		275	0	275	0.031277
81		357	21	378	0.042991
82		306	15	321	0.036508
83		411	22	433	0.049247
84		513	57	570	0.064828
85		591	33	624	0.07097
86		602	30	632	0.071879
87		395	21	416	0.047313
88		596	17	613	0.069719
89		450	32	482	0.054819
90		410	24	434	0.04936
91		409	23	432	0.049133
92		498	16	514	0.058459
				8792.5	1

LDT2

Vehicle Class 3 LEFT COLUMN
ORLANDO AREA
NEED COUNTY 7

N,7			
67	6		
68	1	3.5	0.021807
69		2	0.012461
70		2	0.012461
71		4	0.024922
72		4	0.024922
73		6	0.037383
74		10	0.062305
75		5	0.031153
76		10	0.062305
77		9	0.056075
78		16	0.099688
79		16	0.099688
80		8	0.049844
81		9	0.056075
82		6	0.037383
83		5	0.031153
84		11	0.068536
85		5	0.031153
86		6	0.037383
87		2	0.012461
88		6	0.037383
89		5	0.031153
90		2	0.012461
91		1	0.006231
92		7	0.043614
		160.5	1

HDGV

Vehicle Class 5 RIGHT COLUMN
ORLANDO AREA
NEED COUNTY 7

	N,7		
67	0		
68	0	0	0
69	0	0	0
70		0	0
71		0	0
72		0	0
73		0	0
74		0	0
75		0	0
76		0	0
77		0	0
78		0	0
79		0	0
80		0	0
81		2	0.040816
82		0	0
83		3	0.061224
84		5	0.102041
85		9	0.183673
86		7	0.142857
87		3	0.061224
88		6	0.122449
89		5	0.102041
90		3	0.061224
91		2	0.040816
92		4	0.081633
		49	1

TAMPA VALUES

(HDDT and MC remain constant, all areas)

LDGV and LDDV

Vehicle Class 1 LEFT COLUMN
TAMPA AREA
NEED Counties 3,4

	N,3	N,4					
67	939	1107	2046				
68	193	228	421	1233.5	0.5	1234	0.018344
69	171	233		404	0	404	0.006006
70	172	210		382	0	382	0.005679
71	157	241		398	0	398	0.005916
72	259	296		555	0	555	0.00825
73	297	365		662	0	662	0.009841
74	283	311		594	0	594	0.00883
75	238	317		555	0	555	0.00825
76	463	582		1045	0	1045	0.015534
77	781	859		1640	0	1640	0.024379
78	1145	1129		2274	0	2274	0.033804
79	1323	1195		2518	0	2518	0.037431
80	983	905		1888	0	1888	0.028066
81	1124	1022		2146	10	2156	0.03205
82	1083	1027		2110	8	2118	0.031485
83	1297	1279		2576	10	2586	0.038442
84	2308	2168		4476	31	4507	0.066999
85	2392	2394		4786	44	4830	0.0718
86	2505	2525		5030	32	5062	0.075249
87	2329	2385		4714	26	4740	0.070462
88	2837	2915		5752	47	5799	0.086205
89	2985	3098		6083	64	6147	0.091378
90	2271	2479		4750	169	4919	0.073123
91	2304	2648		4952	144	5096	0.075754
92	2623	2380		5003	158	5161	0.076721
						67270	1

LDGT1and LDDT1 and LDDT2

Vehicle Class 2 LEFT COLUMN
TAMPA AREA
NEED Counties 3,4

	N,3	N,4					
67	319	230	549				
68	104	47	151	233.3333	0	233.3333	0.012151
69	103	93		196	0	196	0.010207
70	141	122		263	0	263	0.013696
71	187	94		281	0	281	0.014634
72	247	155		402	0	402	0.020935
73	277	177		454	0	454	0.023643
74	314	210		524	0	524	0.027288
75	174	129		303	0	303	0.015779
76	289	249		538	1	539	0.02807
77	407	290		697	0	697	0.036298
78	560	434		994	0	994	0.051765
79	569	460		1029	0	1029	0.053587
80	392	274		666	0	666	0.034683
81	433	302		735	25	760	0.039579
82	401	295		696	20	716	0.037287
83	521	387		908	55	963	0.05015
84	706	529		1235	126	1361	0.070877
85	699	623		1322	75	1397	0.072752
86	733	547		1280	62	1342	0.069887
87	649	409		1058	49	1107	0.057649
88	706	489		1195	58	1253	0.065252
89	629	456		1085	56	1141	0.05942
90	471	309		780	43	823	0.042859
91	504	370		874	20	894	0.046557
92	479	349		828	36	864	0.044995
93	266	243		509		19202.33	1

LDGT2

Vehicle Class 3 LEFT COLUMN
TAMPA AREA
NEED Counties 3,4

	N,3	N,4			
67	5	5	10		
68	2	1	3	6.5	0.020155
69	1	6		7	0.021705
70	1	4		5	0.015504
71	6	5		11	0.034109
72	3	7		10	0.031008
73	10	11		21	0.065116
74	10	5		15	0.046512
75	8	6		14	0.043411
76	7	5		12	0.037209
77	9	8		17	0.052713
78	21	10		31	0.096124
79	20	13		33	0.102326
80	5	6		11	0.034109
81	13	5		18	0.055814
82	9	3		12	0.037209
83	10	2		12	0.037209
84	10	7		17	0.052713
85	12	7		19	0.058915
86	9	4		13	0.04031
87	1	9		10	0.031008
88	3	5		8	0.024806
89	3	2		5	0.015504
90	7	0		7	0.021705
91	1	0		1	0.003101
92	5	2		7	0.021705
				322.5	1

HDGV

Vehicle Class 5 RIGHT COLUMN
TAMPA AREA
NEED Counties 3,4

	N,3	N,4			
67	0	0	0		
68	0	0	0	0	0
69	0	0		0	0
70	0	0		0	0
71	0	0		0	0
72	0	0		0	0
73	0	0		0	0
74	0	0		0	0
75	0	0		0	0
76	0	0		0	0
77	0	0		0	0
78	0	0		0	0
79	0	0		0	0
80	0	0		0	0
81	6	2		8	0.05
82	1	0		1	0.00625
83	12	2		14	0.0875
84	14	4		18	0.1125
85	15	3		18	0.1125
86	21	7		28	0.175
87	23	1		24	0.15
88	19	1		20	0.125
89	17	0		17	0.10625
90	3	3		6	0.0375
91	1	1		2	0.0125
92	4	0		4	0.025
				160	1

APPENDIX E

DIESEL SALES FRACTIONS

DIESEL SALES FRACTIONS -- BASED ON VEHICLE IDENTIFICATION CODES

YEAR	LDV (fraction)	LDT (fraction)
1992	0.024	0.034
1991	0.031	0.041
1990	0.028	0.022
1989	0.034	0.052
1988	0.010	0.049
1987	0.008	0.046
1986	0.005	0.044
1985	0.006	0.046
1984	0.009	0.053
1983	0.007	0.091
1982	0.004	0.056
1981	0.004	0.027
1980	0.005	0.032
1979	0.000	0.000
1978	0.000	0.000
1977	0.000	0.000
1976	0.000	0.000
1975	0.002	0.000
1974	0.000	0.000
1973	0.000	0.000
1972	0.000	0.000
1971	0.000	0.000
1970	0.000	0.000
1969	0.000	0.000
1968	0.000	0.000

APPENDIX F

MOBILE5a INPUT FILES FOR VMT CHANGES ONLY

```
1          PROMPT
 Run without Florida Vehicle Mix for Project
1          TAMFLG
1          SPDFLG
1          VMFLAG
1          MYMRFG
1          NEWFLG
1          IMFLAG
1          ALHFLG
1          ATPFLG
1          RLFLAG
2          LOCFLG - LAP record will appear once, in one-time data section.
2          TEMFLG
4          OUTFMT - 80-column descriptive format.
4          PRTFLG - Print exhaust HC, CO and NOx results.
1          IDLFLG
1          NMHFLG - Calculate emissions for Total Hydrocarbons.
1          HCFLAG - Print sum of all HC component emissions.
Scenario title.  C  41.  61. 11.5 9.0 90 1 1 1
1 93  2.5 51.0 20.6 27.3 20.6 01                    Scenario description record
1 93 10.0 51.0 20.6 27.3 20.6 01
1 93 15.0 51.0 20.6 27.3 20.6 01
1 93 25.0 51.0 20.6 27.3 20.6 01
1 93 35.0 51.0 20.6 27.3 20.6 01
1 93 45.0 51.0 20.6 27.3 20.6 01
1 93 55.0 51.0 20.6 27.3 20.6 01
1 93 65.0 51.0 20.6 27.3 20.6 01
```

```
1          PROMPT
 Run with Florida Vehicle Mix for Project
1          TAMFLG
1          SPDFLG
3          VMFLAG - Supply one VMT mix for all scenarios
1          MYMRFG
1          NEWFLG
1          IMFLAG
1          ALHFLG
1          ATPFLG
1          RLFLAG
2          LOCFLG - LAP record will appear once, in one-time data section.
2          TEMFLG
4          OUTFMT - 80-column descriptive format.
4          PRTFLG - Print exhaust HC, CO and NOx results.
1          IDLFLG
1          NMHFLG - Calculate emissions for Total Hydrocarbons.
1          HCFLAG - Print sum of all HC component emissions.
.745.168.003.002.032.006.035.009
Scenario title.  C  41.  61. 11.5 9.0 90 1 1 1        Local Area Parameter record
1 93  2.5 51.0 20.6 27.3 20.6 01                      Scenario description record
1 93 10.0 51.0 20.6 27.3 20.6 01
1 93 15.0 51.0 20.6 27.3 20.6 01
1 93 25.0 51.0 20.6 27.3 20.6 01
1.93 35.0 51.0 20.6 27.3 20.6 01
1 93 45.0 51.0 20.6 27.3 20.6 01
1 93 55.0 51.0 20.6 27.3 20.6 01
1.93 65.0 51.0 20.6 27.3 20.6 01
```

```
1          PROMPT
 Run with Jacksonville Vehicle Mix for Project
1          TAMFLG
1          SPDFLG
3          VMFLAG - Supply one VMT mix for all scenarios
1          MYMRFG
1          NEWFLG
1          IMFLAG
1          ALHFLG
1          ATPFLG
1          RLFLAG
2          LOCFLG - LAP record will appear once, in one-time data section.
2          TEMFLG
4          OUTFMT - 80-column descriptive format.
4          PRTFLG - Print exhaust HC, CO and NOx results.
1          IDLFLG
1          NMHFLG - Calculate emissions for Total Hydrocarbons.
1          HCFLAG - Print sum of all HC component emissions.
.702.233.002.001.014.004.035.009
Scenario title.  C  41.  61. 11.5 9.0 90 1 1 1        Local Area Parameter record
1 93  2.5 51.0 20.6 27.3 20.6 01                      Scenario description record
1 93 10.0 51.0 20.6 27.3 20.6 01
1 93 15.0 51.0 20.6 27.3 20.6 01
1 93 25.0 51.0 20.6 27.3 20.6 01
1.93 35.0 51.0 20.6 27.3 20.6 01
1 93 45.0 51.0 20.6 27.3 20.6 01
1 93 55.0 51.0 20.6 27.3 20.6 01
1.93 65.0 51.0 20.6 27.3 20.6 01
```

```
1           PROMPT
 Run with Miami Vehicle Mix for Project
1           TAMFLG
1           SPDFLG
3           VMFLAG - Supply one VMT mix for all scenarios
1           MYMRFG
1           NEWFLG
1           IMFLAG
1           ALHFLG
1           ATPFLG
1           RLFLAG
2           LOCFLG - LAP record will appear once, in one-time data section.
2           TEMFLG
4           OUTFMT - 80-column descriptive format.
4           PRTFLG - Print exhaust HC, CO and NOx results.
1           IDLFLG
1           NMHFLG - Calculate emissions for Total Hydrocarbons.
1           HCFLAG - Print sum of all HC component emissions.
.728.185.015.002.021.005.035.009
Scenario title.  C  41.  61. 11.5 9.0 90 1 1 1        Local Area Parameter record
1 93  2.5 51.0 20.6 27.3 20.6 01                      Scenario description record
1 93 10.0 51.0 20.6 27.3 20.6 01
1 93 15.0 51.0 20.6 27.3 20.6 01
1 93 25.0 51.0 20.6 27.3 20.6 01
1.93 35.0 51.0 20.6 27.3 20.6 01
1 93 45.0 51.0 20.6 27.3 20.6 01
1 93 55.0 51.0 20.6 27.3 20.6 01
1.93 65.0 51.0 20.6 27.3 20.6 01
```

```
1          PROMPT
 Run with Orlando Vehicle Mix for Project
1          TAMFLG
1          SPDFLG
3          VMFLAG - Supply one VMT mix for all scenarios
1          MYMRFG
1          NEWFLG
1          IMFLAG
1          ALHFLG
1          ATPFLG
1          RLFLAG
2          LOCFLG - LAP record will appear once, in one-time data section.
2          TEMFLG
4          OUTFMT - 80-column descriptive format.
4          PRTFLG - Print exhaust HC, CO and NOx results.
1          IDLFLG
1          NMHFLG - Calculate emissions for Total Hydrocarbons.
1          HCFLAG - Print sum of all HC component emissions.
.707.218.004.001.021.005.035.009
Scenario title.  C  41.  61. 11.5 9.0 90 1 1 1        Local Area Parameter record
1 93  2.5 51.0 20.6 27.3 20.6 01                      Scenario description record
1 93 10.0 51.0 20.6 27.3 20.6 01
1 93 15.0 51.0 20.6 27.3 20.6 01
1 93 25.0 51.0 20.6 27.3 20.6 01
1.93 35.0 51.0 20.6 27.3 20.6 01
1 93 45.0 51.0 20.6 27.3 20.6 01
1 93 55.0 51.0 20.6 27.3 20.6 01
1.93 65.0 51.0 20.6 27.3 20.6 01
```

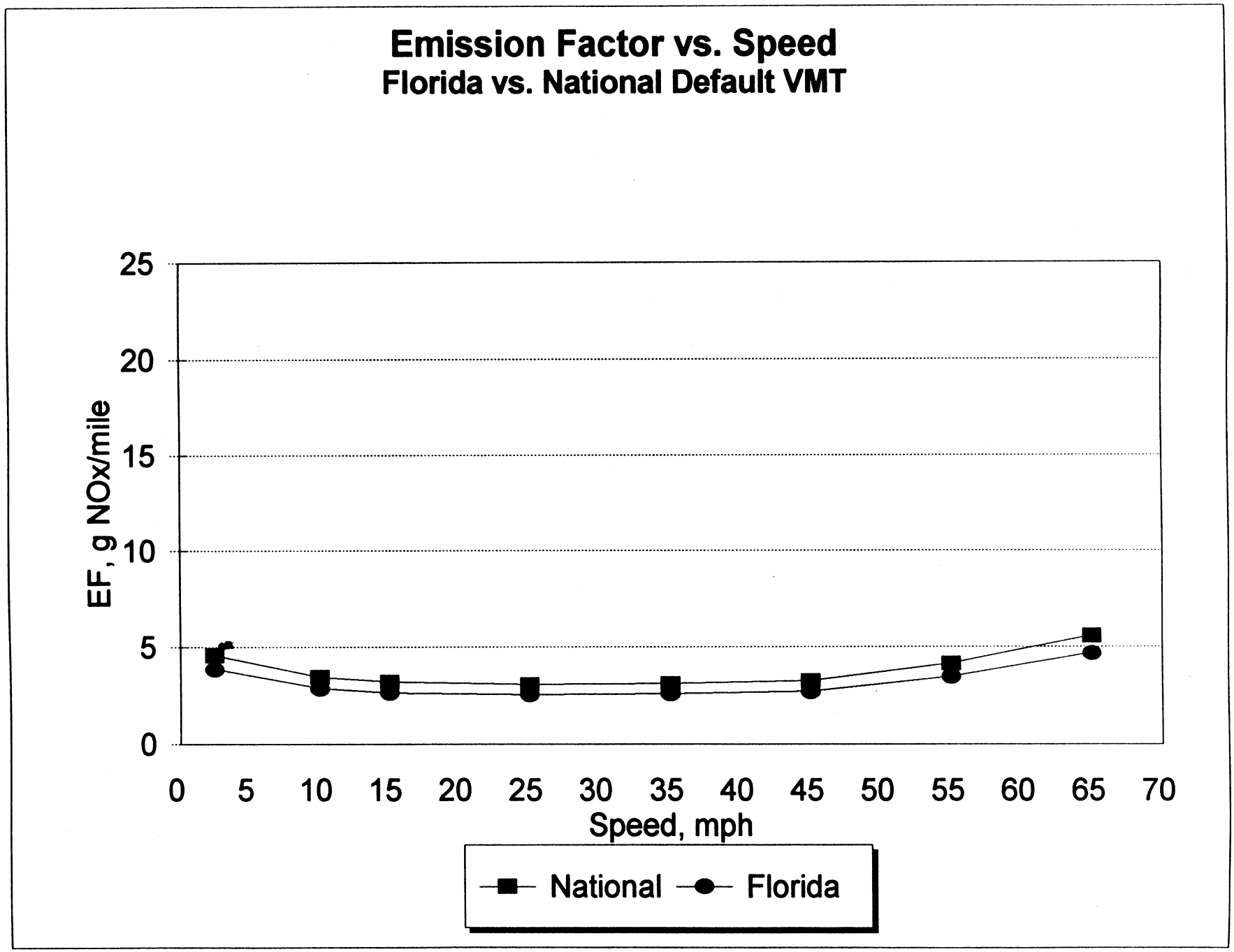
```
1          PROMPT
 Run with Tampa Vehicle Mix for Project
1          TAMFLG
1          SPDFLG
3          VMFLAG - Supply one VMT mix for all scenarios
1          MYMRFG
1          NEWFLG
1          IMFLAG
1          ALHFLG
1          ATPFLG
1          RLFLAG
2          LOCFLG - LAP record will appear once, in one-time data section.
2          TEMFLG
4          OUTFMT - 80-column descriptive format.
4          PRTFLG - Print exhaust HC, CO and NOx results.
1          IDLFLG
1          NMHFLG - Calculate emissions for Total Hydrocarbons.
1          HCFLAG - Print sum of all HC component emissions.
.719.212.002.002.016.005.035.009
Scenario title.  C  41.  61. 11.5 9.0 90 1 1 1        Local Area Parameter record
1 93  2.5 51.0 20.6 27.3 20.6 01                      Scenario description record
1 93 10.0 51.0 20.6 27.3 20.6 01
1 93 15.0 51.0 20.6 27.3 20.6 01
1 93 25.0 51.0 20.6 27.3 20.6 01
1.93 35.0 51.0 20.6 27.3 20.6 01
1 93 45.0 51.0 20.6 27.3 20.6 01
1 93 55.0 51.0 20.6 27.3 20.6 01
1.93 65.0 51.0 20.6 27.3 20.6 01
```

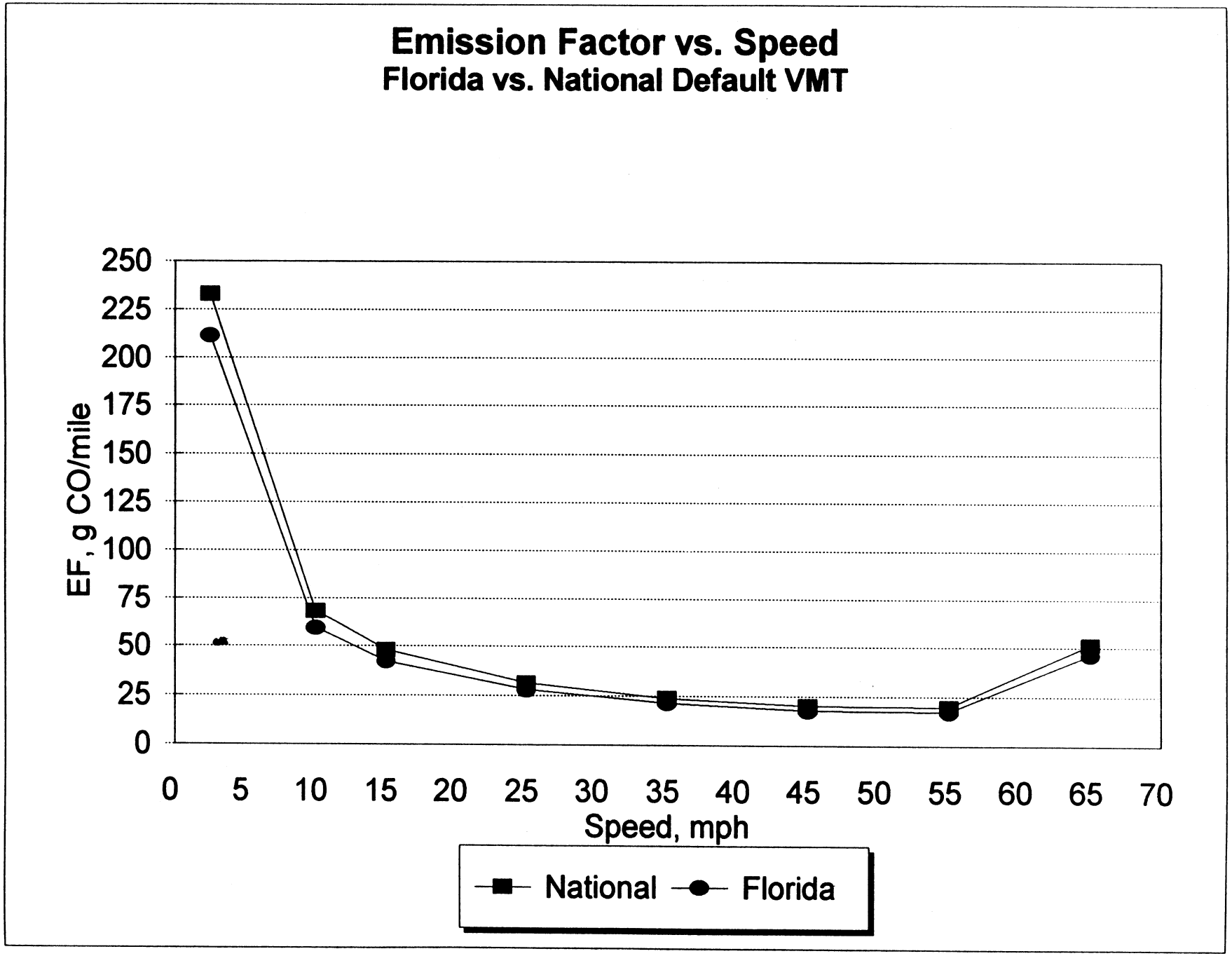
APPENDIX G

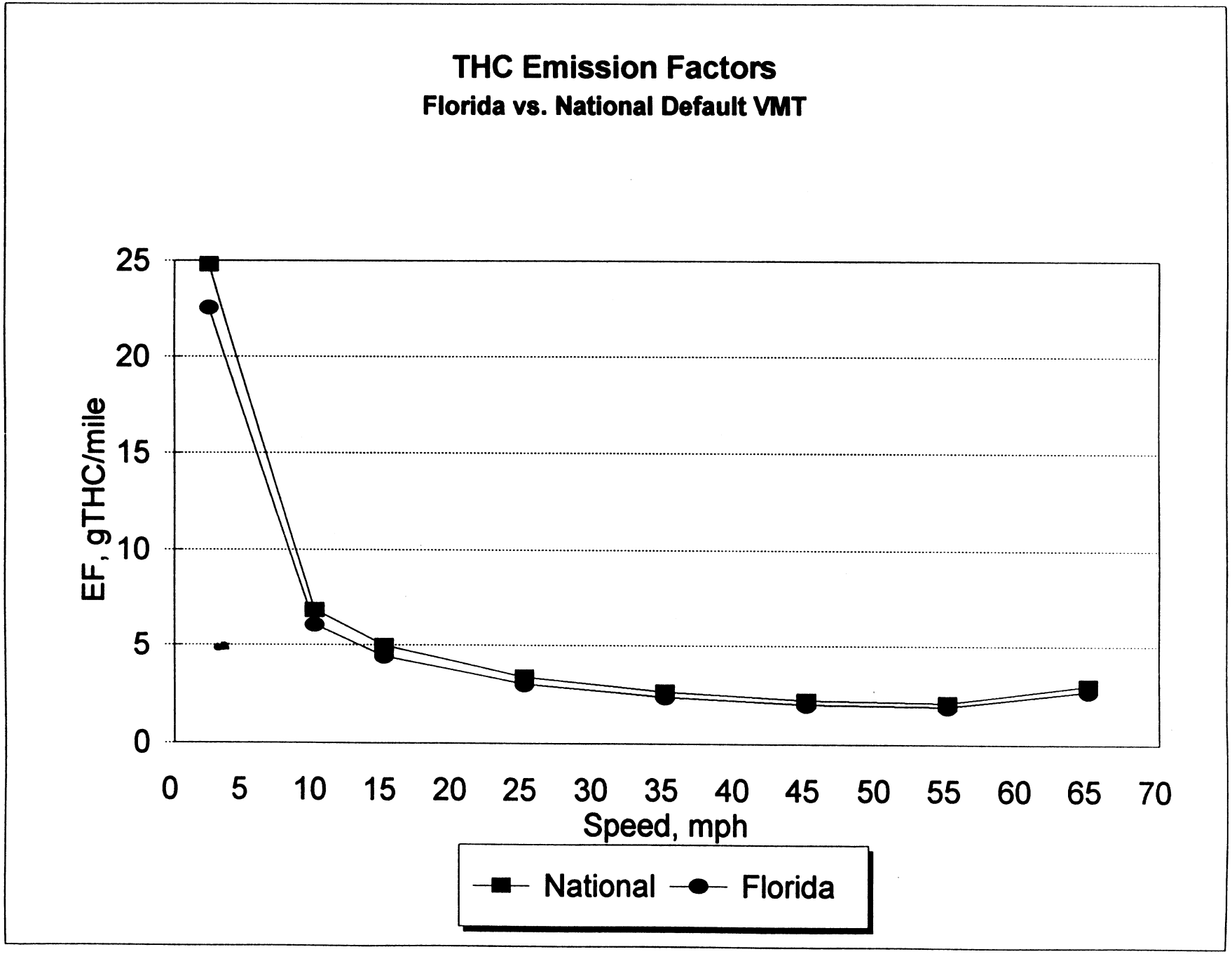
FIGURES DISPLAYING RESULTS OF USING VMT FLAG

GRAPHS OF STATEWIDE COMPARISON

DEFAULT VMT TO FLORIDA SPECIFIC VMT

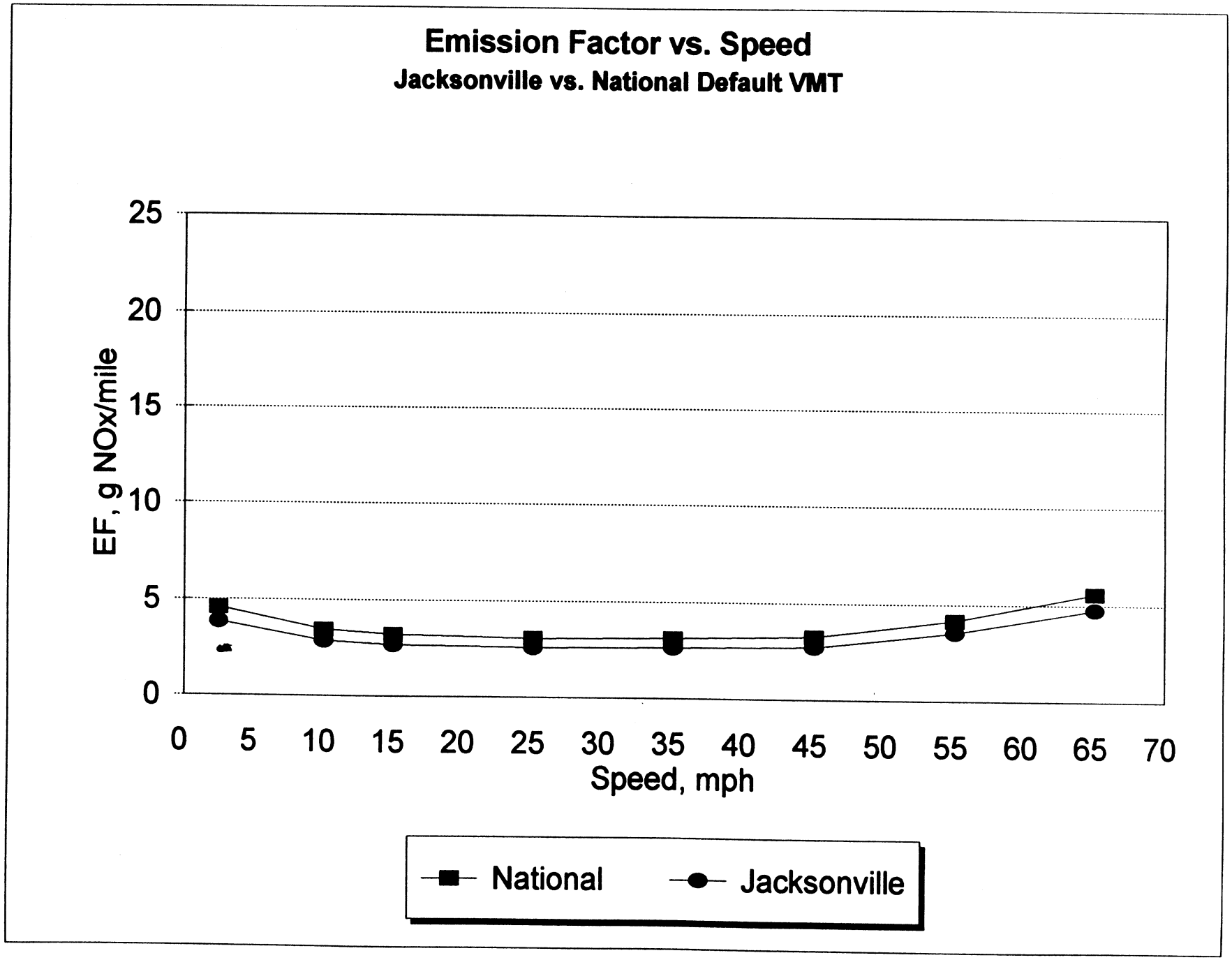

Emission Factor vs. Speed
Florida vs. National Default VMT
EF, g NOx/mile
25
20
15
10
5
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70
Speed, mph
National
Florida

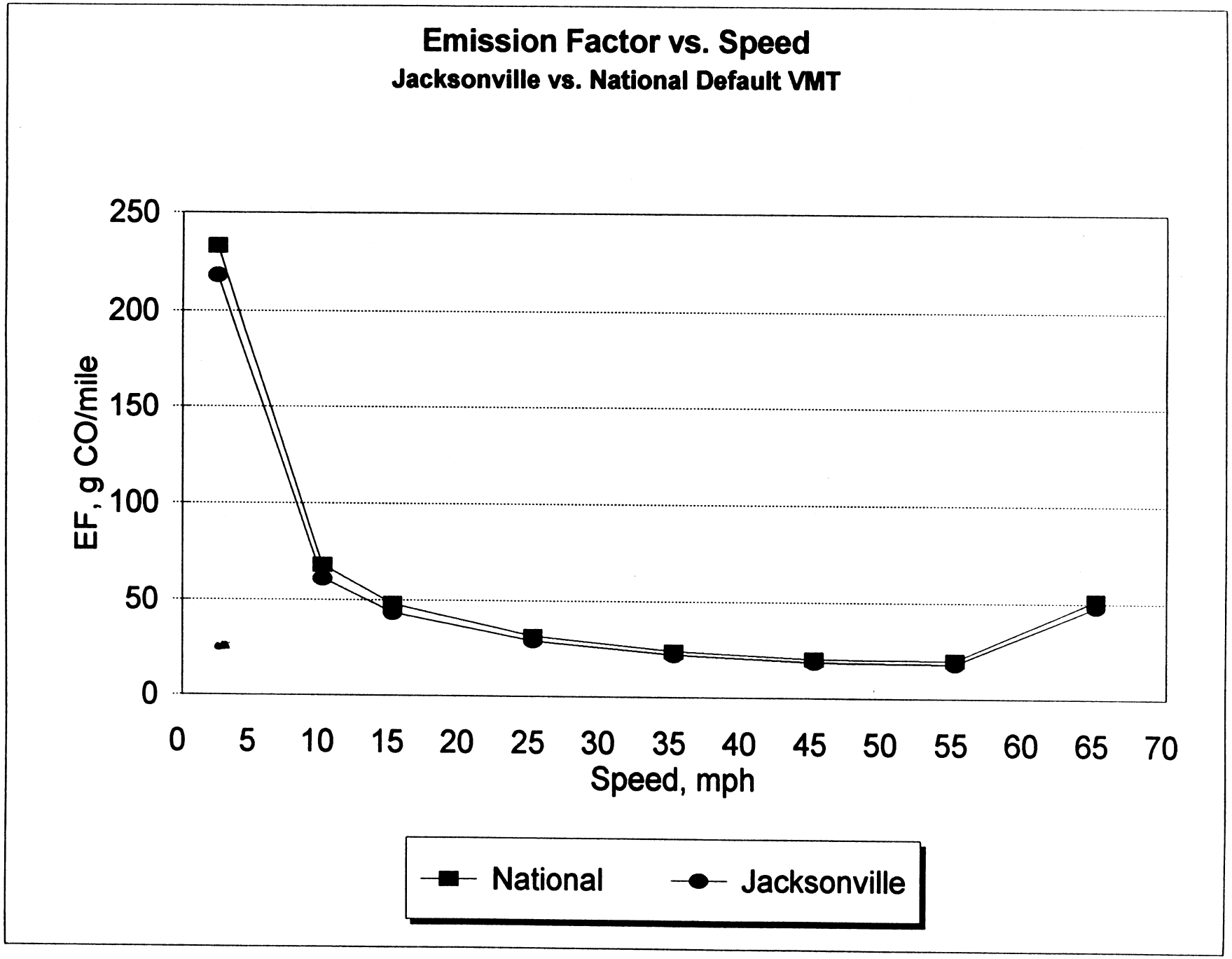

Emission Factor vs. Speed
Florida vs. National Default VMT
EF, g CO/mile
250
225
200
175
150
125
100
75
50
25
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Speed, mph
National
Florida

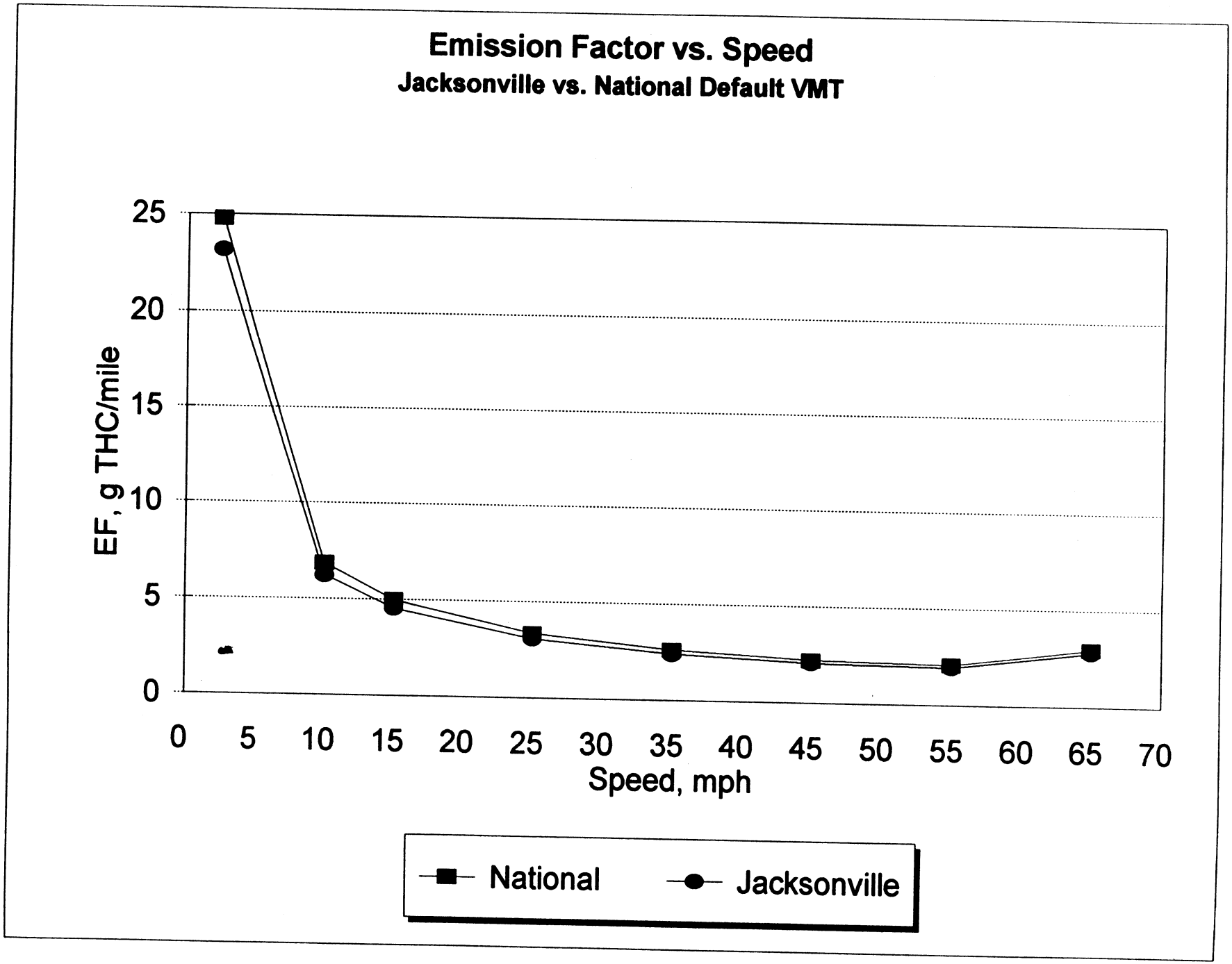

THC Emission Factors
Florida vs. National Default VMT
EF, gTHC/mile
25
20
15
10
5
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Speed, mph
National
Florida

GRAPHS OF JACKSONVILLE COMPARISON

DEFAULT VMT TO FLORIDA SPECIFIC VMT

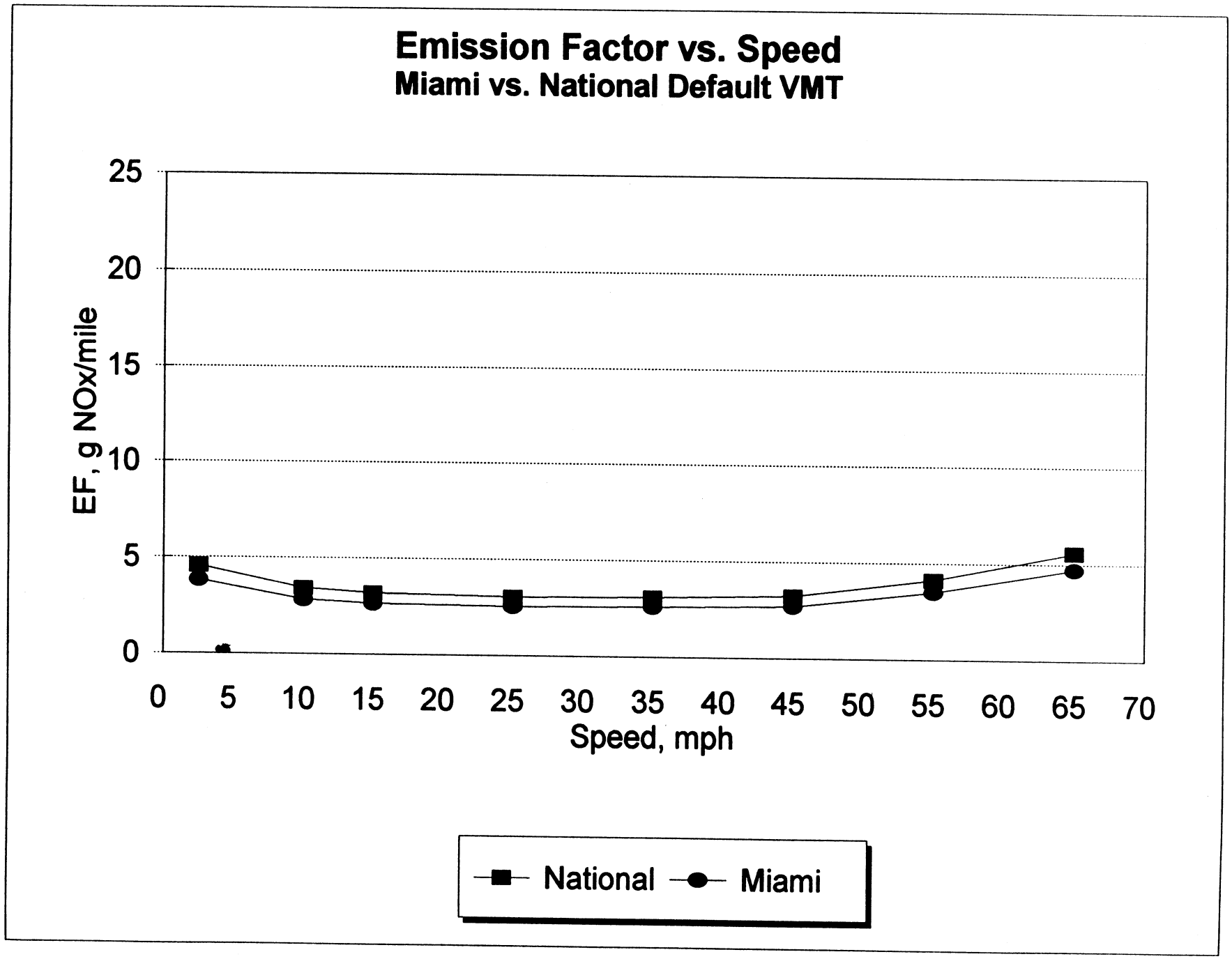

Emission Factor vs. Speed
Jacksonville vs. National Default VMT
EF, g NOx/mile
25
20
15
10
5
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Speed, mph
National
Jacksonville

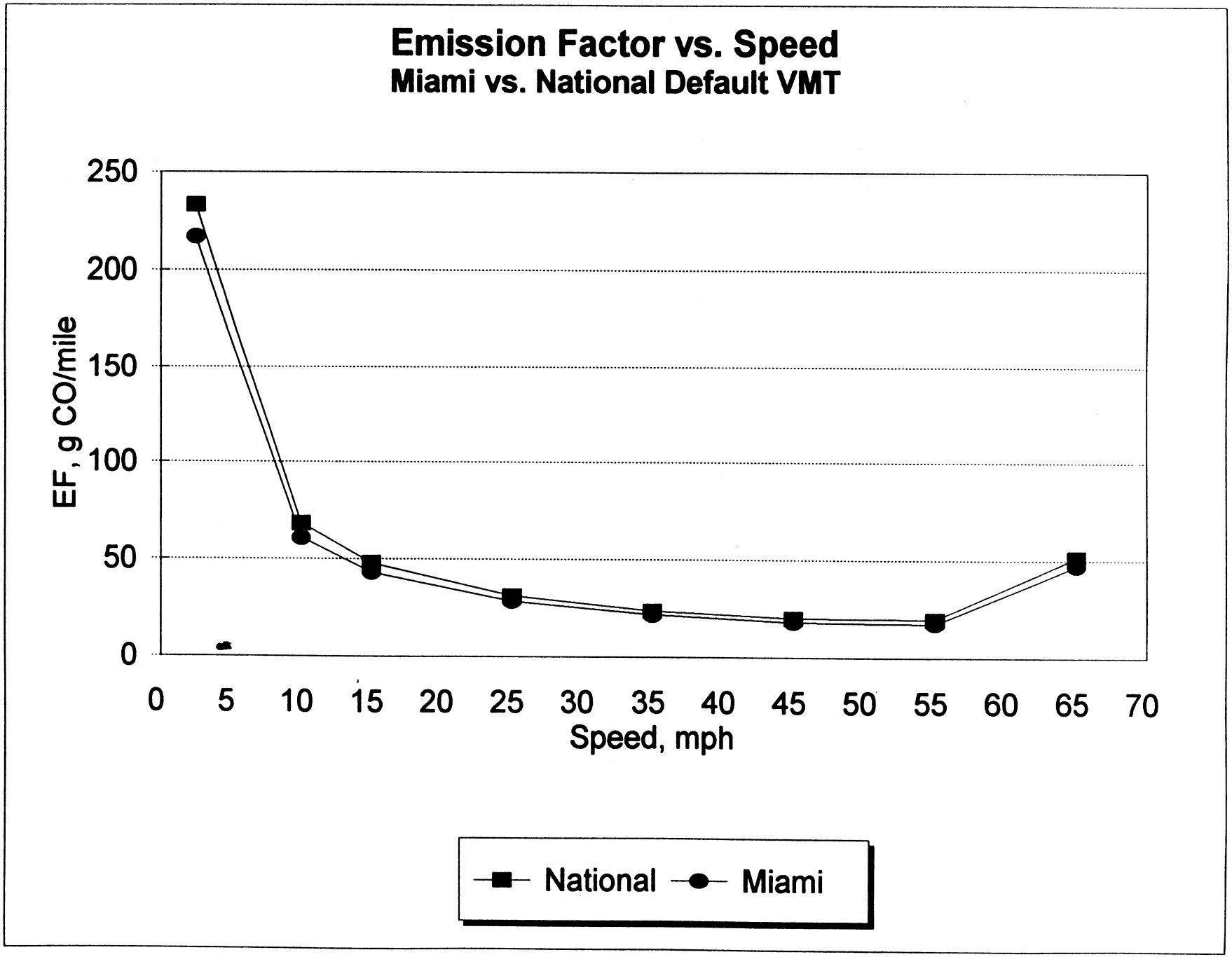

Emission Factor vs. Speed
Jacksonville vs. National Default VMT
EF, g CO/mile
250
200
150
100
50
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Speed, mph
National
Jacksonville

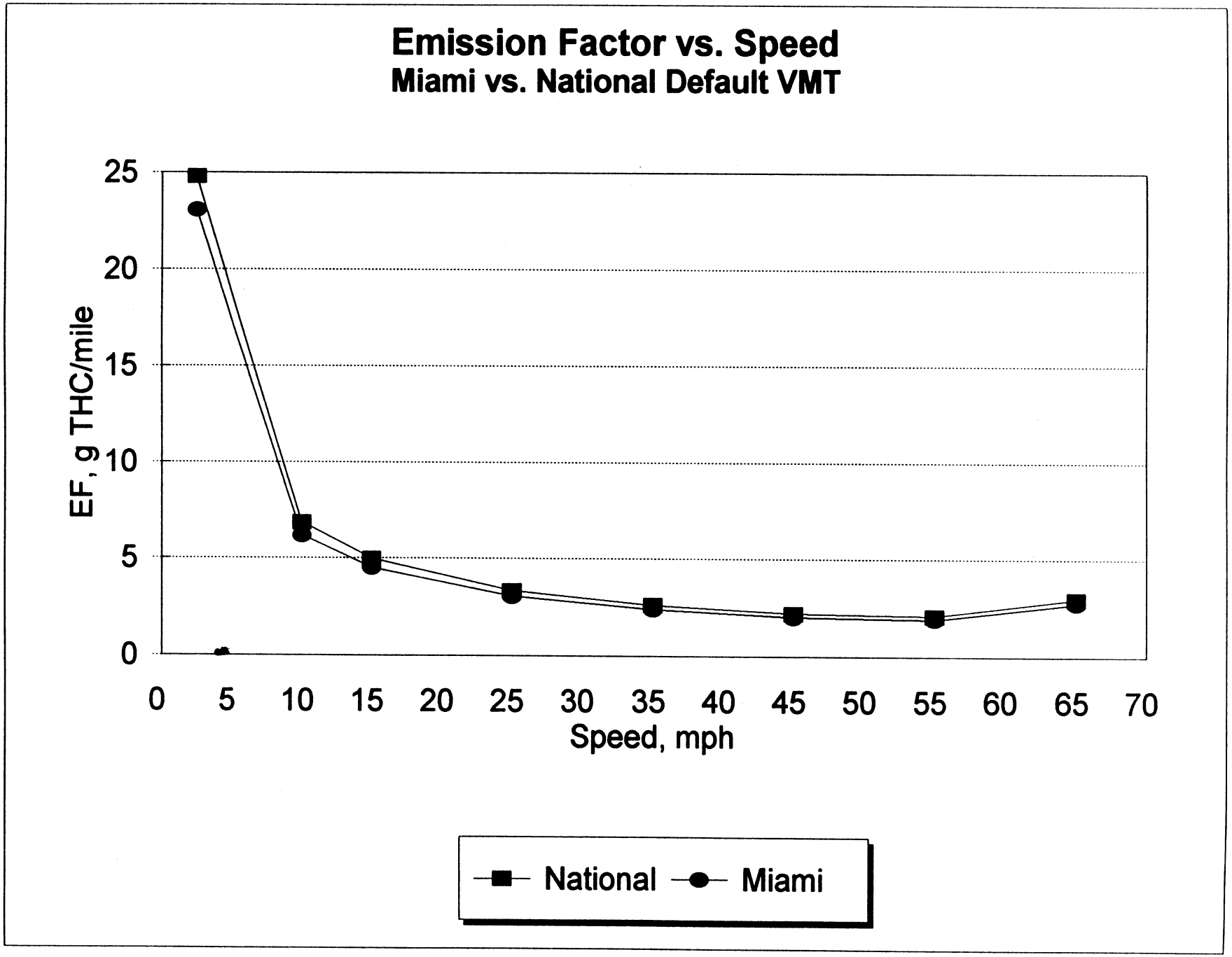

Emission Factor vs. Speed
Jacksonville vs. National Default VMT
EF, g THC/mile
25
20
15
10
5
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Speed, mph
National
Jacksonville

GRAPHS OF MIAMI COMPARISON

DEFAULT VMT TO FLORIDA SPECIFIC VMT

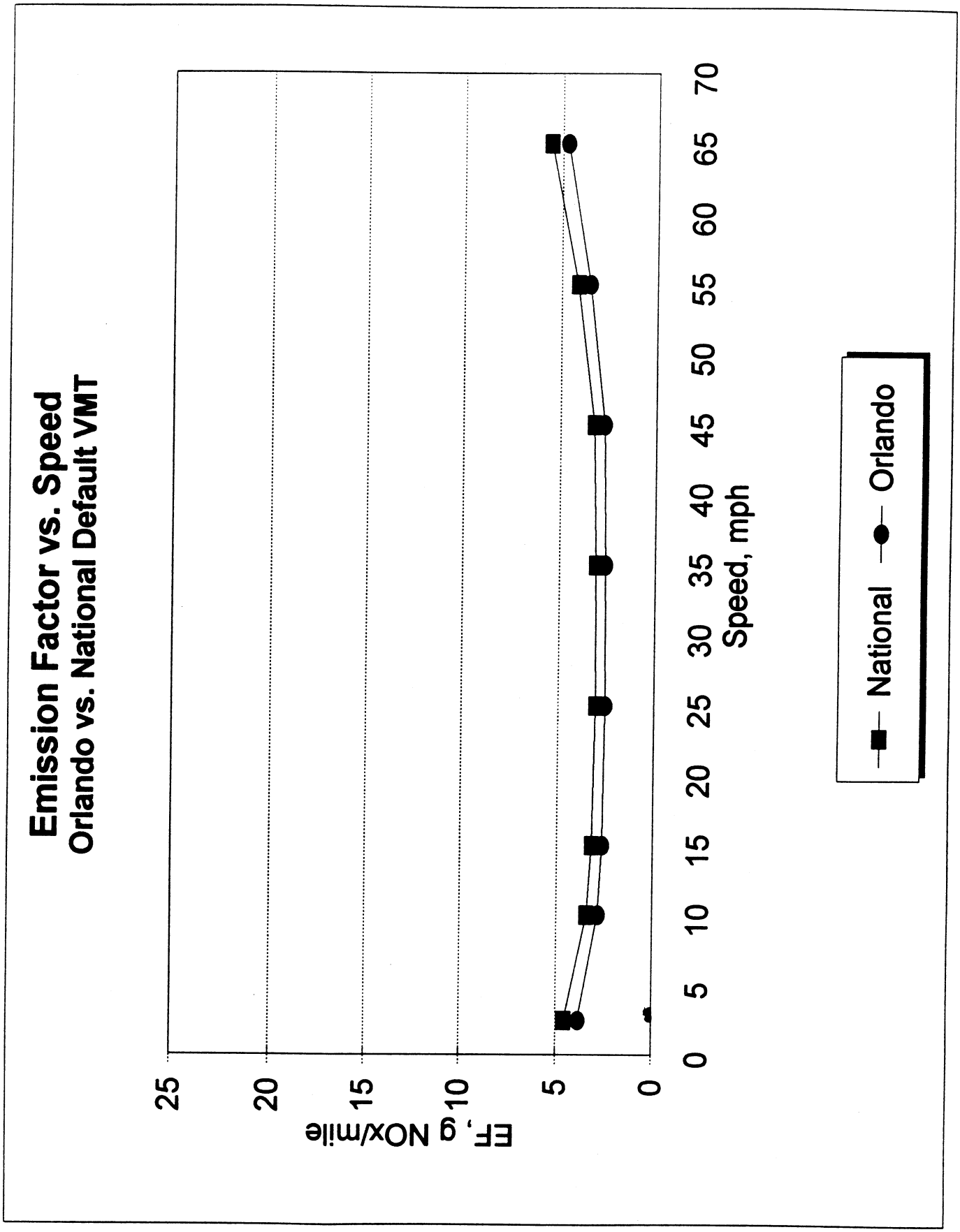

Emission Factor vs. Speed
Miami vs. National Default VMT
EF, g NOx/mile
25
20
15
10
5
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Speed, mph
National
Miami

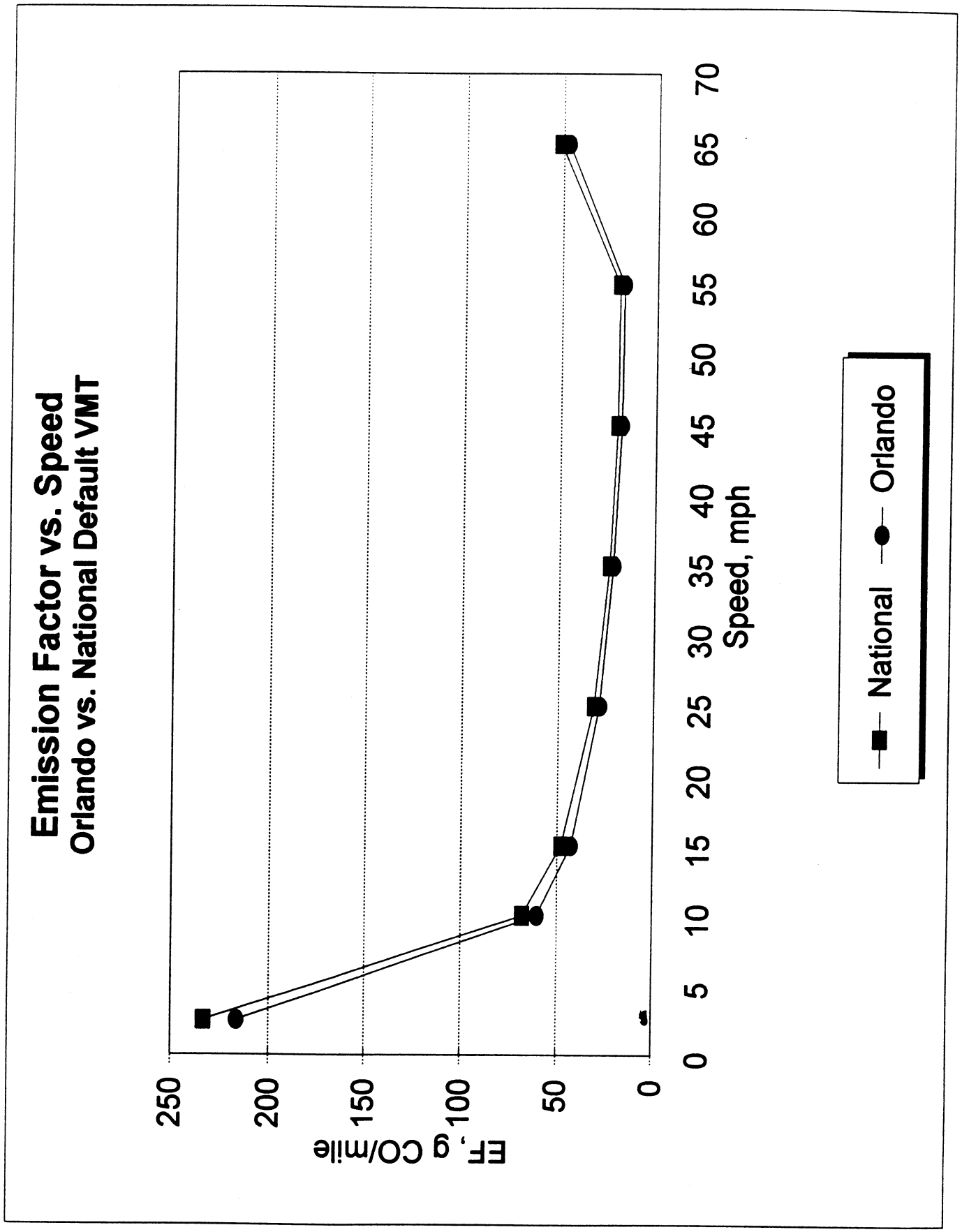

Emission Factor vs. Speed
Miami vs. National Default VMT
EF, g CO/mile
250
200
150
100
50
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Speed, mph
National
Miami

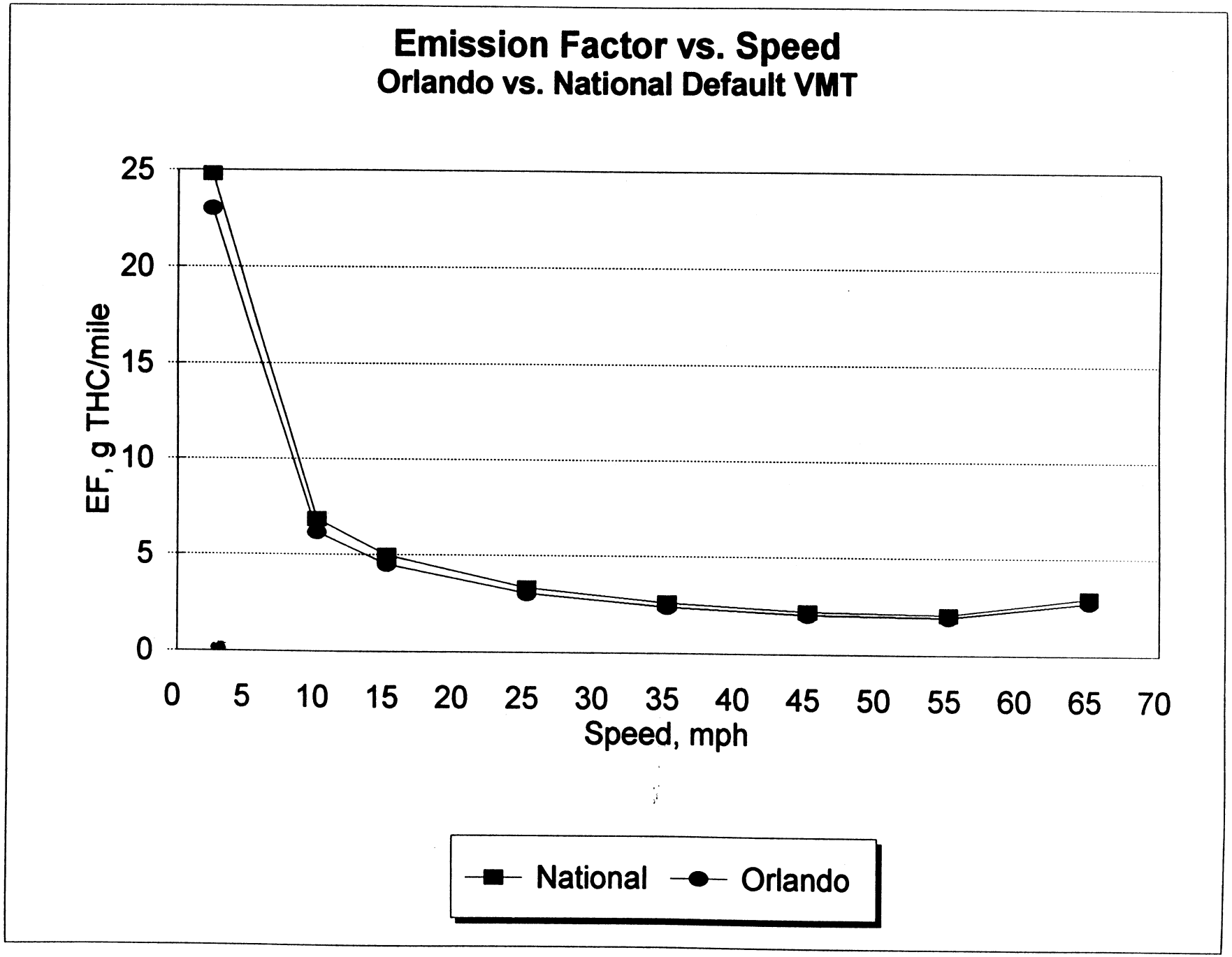

Emission Factor vs. Speed
Miami vs. National Default VMT
EF, g THC/mile
25
20
15
10
5
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Speed, mph
National
Miami

GRAPHS OF ORLANDO COMPARISON

DEFAULT VMT TO FLORIDA SPECIFIC VMT

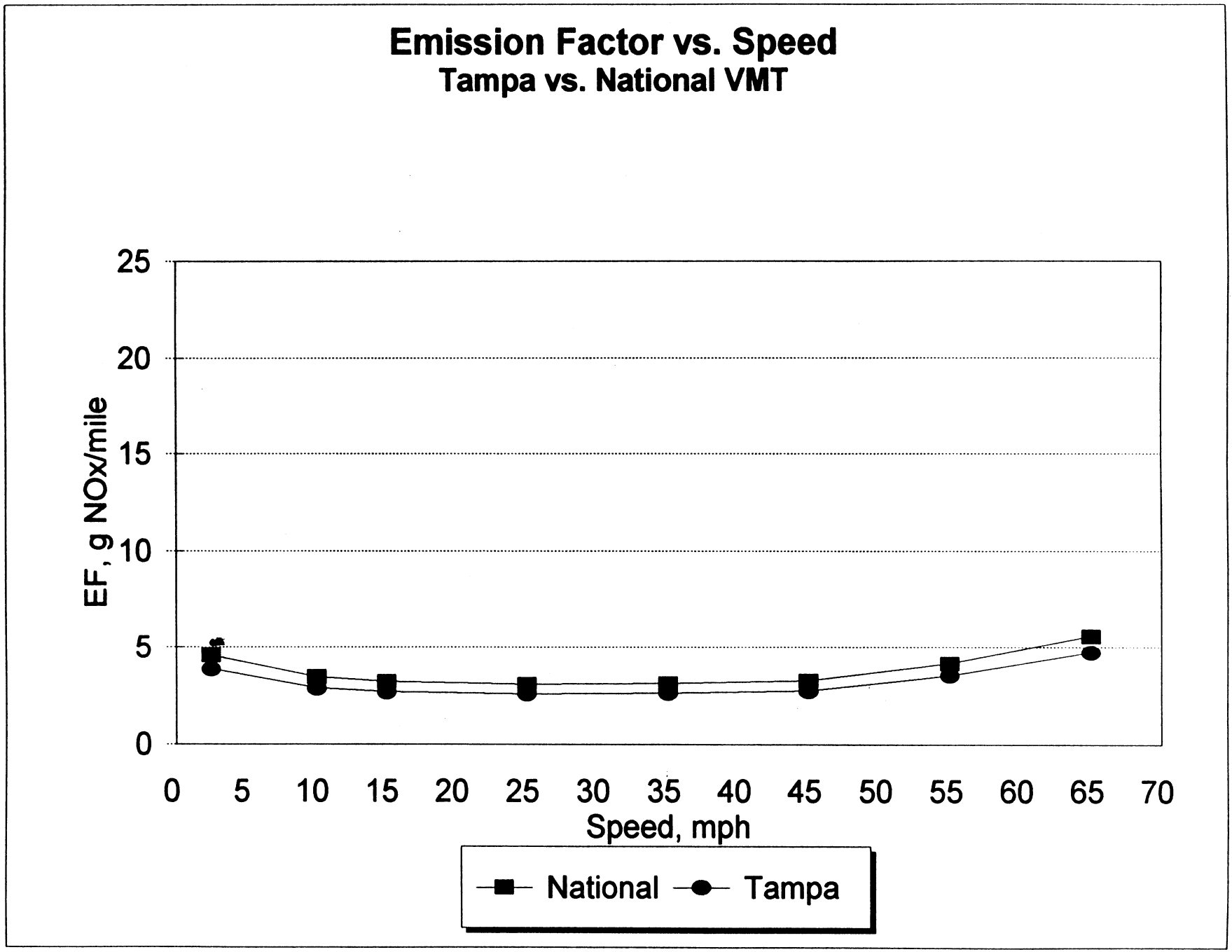

Emission Factor vs. Speed
Orlando vs. National Default VMT
EF, g NOx/mile
0
5
10
15
20
25
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Speed, mph
National
Orlando

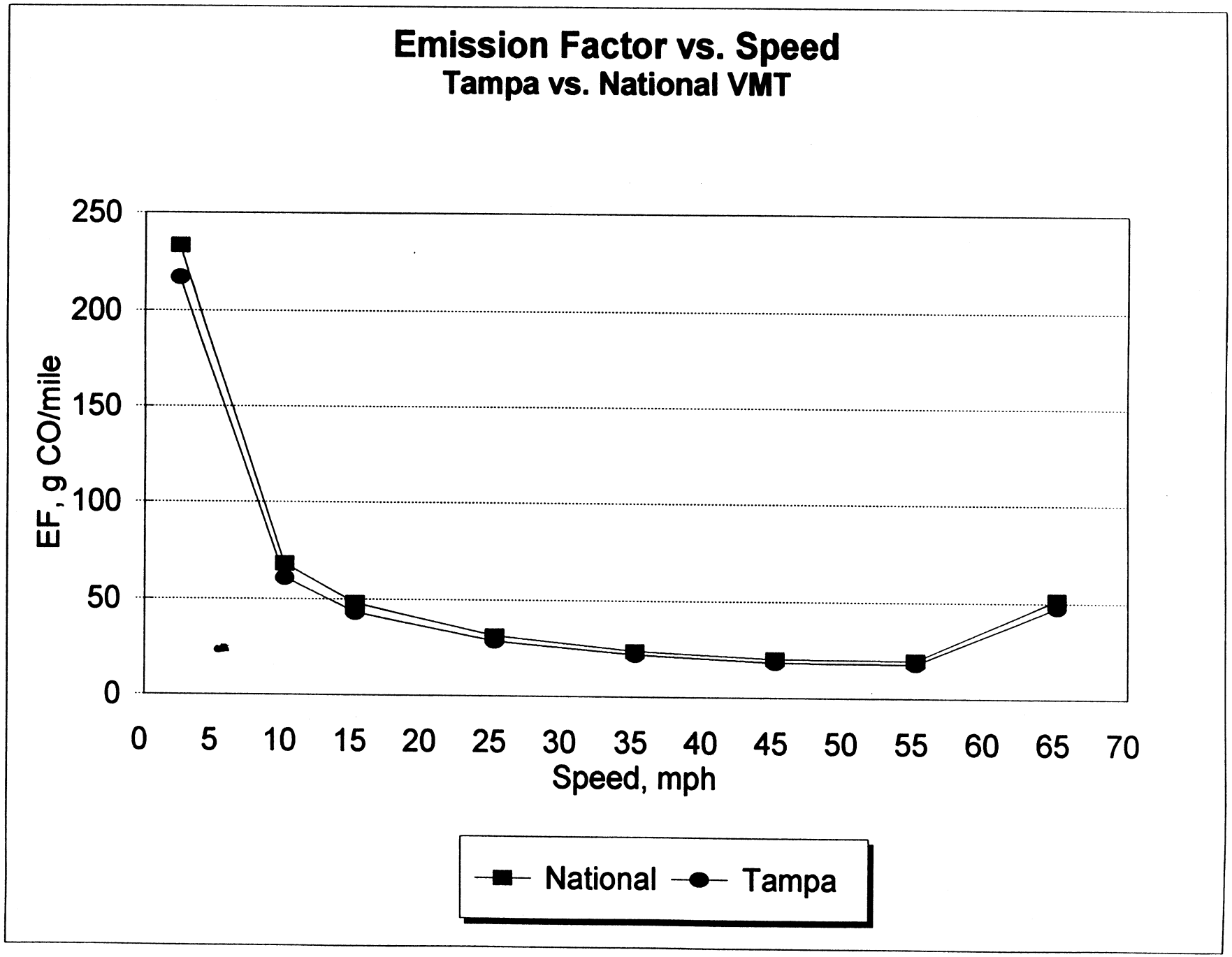

Emission Factor vs. Speed
Orlando vs. National Default VMT
EF, g CO/mile
250
200
150
100
50
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70
Speed, mph
National
Orlando

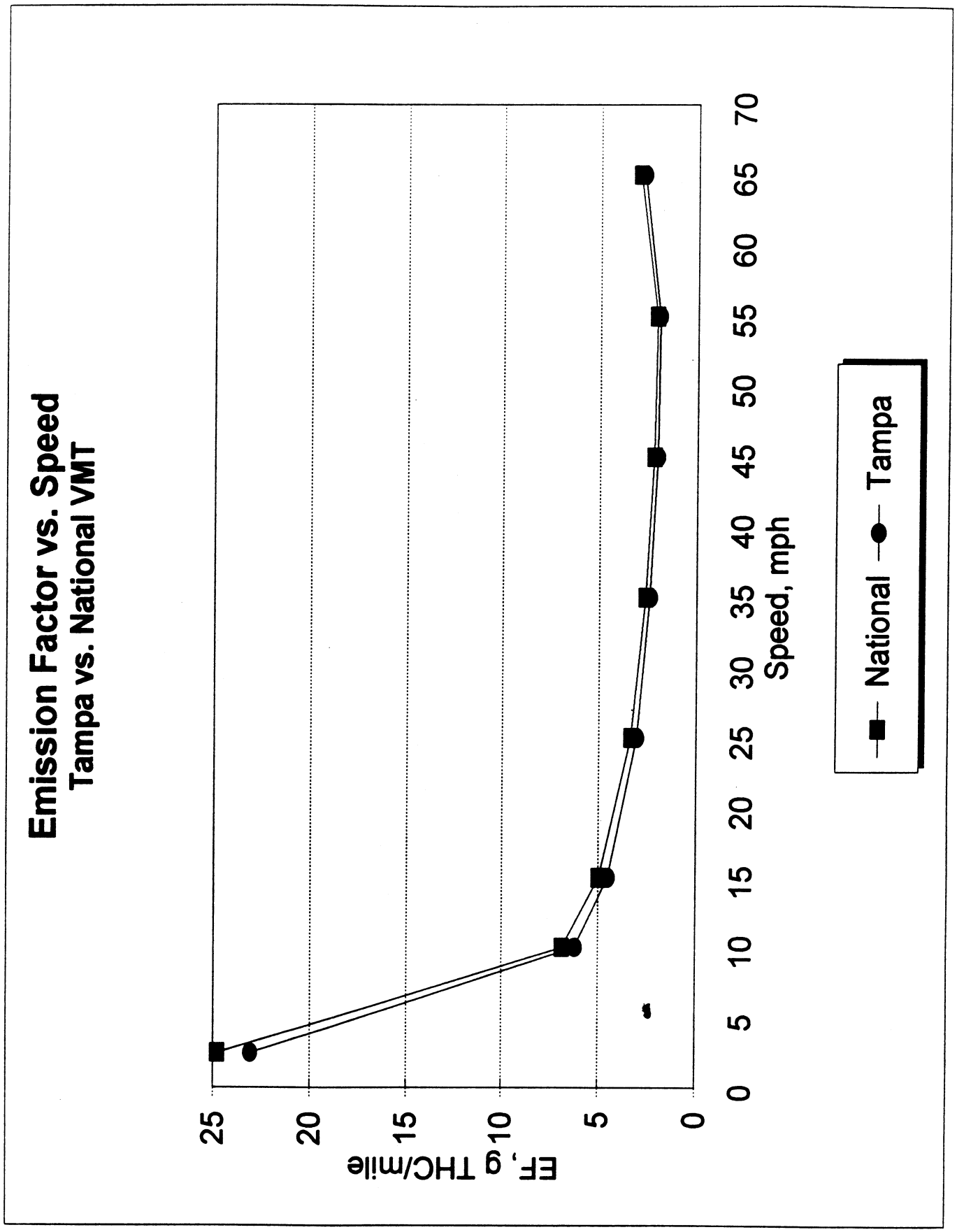

Emission Factor vs. Speed
Orlando vs. National Default VMT
EF, g THC/mile
25
20
15
10
5
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70
Speed, mph
National
Orlando

GRAPHS OF TAMPA COMPARISON

DEFAULT VMT TO FLORIDA SPECIFIC VMT


Emission Factor vs. Speed
Tampa vs. National VMT
EF, g NOx/mile
25
20
15
10
5
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70
Speed, mph
National
Tampa


Emission Factor vs. Speed
Tampa vs. National VMT
EF, g CO/mile
250
200
150
100
50
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70
Speed, mph
National
Tampa


Emission Factor vs. Speed
Tampa vs. National VMT
EF, g THC/mile
0
5
10
15
20
25
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Speed, mph
National
Tampa

APPENDIX H

MOBILE5a INPUT FILES FOR ALL CHANGES

STATEWIDE VALUES

(HDDT and MC remain constant, all areas)

```
1          PROMPT
 Run with Florida Vehicle Mix for Project, all parameters
1          TAMFLG
1          SPDFLG
3          VMFLAG - Supply one VMT mix for all scenarios
4          MYMRFG
1          NEWFLG
1          IMFLAG
1          ALHFLG
1          ATPFLG
1          RLFLAG
1          LOCFLG - LAP record will appear once, in one-time data section.
2          TEMFLG
4          OUTFMT - 80-column descriptive format.
4          PRTFLG - Print exhaust HC, CO and NOx results.
1          IDLFLG
1          NMHFLG - Calculate emissions for Total Hydrocarbons.
1          HCFLAG - Print sum of all HC component emissions.
.745.168.003.002.032.006.035.009
 .12766 .16069 .16259 .16175 .14904 .13941 .12935 .12074 .11185 .10638     LDGV miles
 .10341 .09414 .08575 .07940 .07588 .07174 .06807 .06270 .06144 .06263
 .05066 .05381 .05114 .04581 .03644
 .10468 .16646 .16908 .17149 .16589 .15534 .14569 .13235 .12185 .11266     LDGT1
 .10941 .10099 .09614 .08805 .08323 .08302 .08415 .07494 .07428 .07000
 .06206 .05728 .06579 .06663 .05150
 .15120 .15704 .18518 .18890 .14609 .14924 .13268 .13045 .01326 .14959     LDGT2
 .13074 .11220 .12205 .09589 .11221 .01047 .04709 .05130 .05160 .06162
 .04765 .11830 .04002 .14696 .00000
 .28811 .26454 .16955 .17726 .19894 .19872 .18677 .19152 .13939 .14906     HDGV
 .14298 .12131 .00000 .10392 .00000 .00000 .00000 .00000 .00000 .00000
 .00000 .00000 .00000 .00000 .00000
 .15710 .28705 .24000 .37104 .41059 .35448 .28229 .27330 .27181 .26596     LDDV
 .22462 .24013 .24324 .21112 .17392 .19777 .20067 .09928 .14221 .11007
 .10067 .17124 .12414 .06221 .09093
 .09962 .20076 .17568 .20167 .18236 .14659 .13610 .12657 .11518 .09978     LDDT
 .08485 .08052 .04604 .00001 .00001 .00001 .01964 .00001 .00001 .00001
 .00001 .00001 .00001 .00001 .00001
 .18903 .36634 .34377 .32281 .30334 .28525 .26841 .25272 .23810 .22446     HDDT
 .21171 .19981 .18866 .17824 .16847 .15932 .15072 .14266 .13508 .12797
 .12126 .11496 .10903 .10344 .10415
 .00000 .04475 .04164 .03853 .03543 .03232 .02921 .02611 .02300 .01989     MC
 .01678 .01368 .00000 .00000 .00000 .00000 .00000 .00000 .00000 .00000
 .00000 .00000 .00000 .00000 .00000
 .119 .085 .068 .087 .082 .066 .070 .065 .064 .037       LDGV registration
 .031 .031 .029 .038 .033 .023 .014 .008 .007 .008
 .006 .004 .004 .005 .016
 .117 .084 .068 .088 .084 .067 .072 .067 .066 .039       LDGT1
 .032 .032 .029 .039 .034 .023 .014 .008 .007 .008
 .006 .004 .004 .003 .005
 .119 .085 .068 .089 .084 .068 .072 .067 .065 .039       LDGT2
 .032 .032 .030 .040 .034 .024 .014 .008 .007 .008
 .006 .005 .004 .000
 .046 .029 .051 .084 .095 .109 .165 .172 .115 .080       HDGV
 .020 .031 .000 .003 .000 .000 .000 .000 .000 .000
 .000 .000 .000 .000 .000
 .119 .085 .068 .087 .082 .066 .070 .065 .064 .037       LDDV
 .031 .031 .029 .038 .033 .023 .014 .008 .007 .008
 .006 .004 .004 .005 .016
 .117 .084 .068 .088 .084 .067 .072 .067 .066 .039       LDDT
 .032 .032 .029 .039 .034 .023 .014 .008 .007 .008
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 .006 .004 .004 .003 .005
 .106 .099 .093 .087 .089 .070 .043 .042 .049 .048        HDDT
 .057 .044 .044 .033 .013 .015 .017 .014 .009 .006
 .005 .002 .002 .006 .007
 .000 .257 .193 .145 .108 .079 .058 .042 .030 .021        MC
 .015 .052 .000 .000 .000 .000 .000 .000 .000 .000
 .000 .000 .000 .000 .000
1 93  2.5 51.0 20.6 27.3 20.6 01                          Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1          Local Area Parameter record2
.035.037.037.058.032.052.041.039.014.043.009.049.007.050.009.100.012.069.012.023
.005.037.003.000.003.000.000.000.000.000.000.000.000.000.000.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.001
1 93 10.0 51.0 20.6 27.3 20.6 01                          Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1          Local Area Parameter record2
.035.037.037.058.032.052.041.039.014.043.009.049.007.050.009.100.012.069.012.023
.005.037.003.000.003.000.000.000.000.000.000.000.000.000.000.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.001
1 93 15.0 51.0 20.6 27.3 20.6 01                          Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1          Local Area Parameter record2
.035.037.037.058.032.052.041.039.014.043.009.049.007.050.009.100.012.069.012.023
.005.037.003.000.003.000.000.000.000.000.000.000.000.000.000.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.001
1 93 25.0 51.0 20.6 27.3 20.6 01                          Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1          Local Area Parameter record2
.035.037.037.058.032.052.041.039.014.043.009.049.007.050.009.100.012.069.012.023
.005.037.003.000.003.000.000.000.000.000.000.000.000.000.000.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.001
1 93 35.0 51.0 20.6 27.3 20.6 01                          Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1          Local Area Parameter record2
.035.037.037.058.032.052.041.039.014.043.009.049.007.050.009.100.012.069.012.023
.005.037.003.000.003.000.000.000.000.000.000.000.000.000.000.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.001
1 93 45.0 51.0 20.6 27.3 20.6 01                          Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1          Local Area Parameter record2
.035.037.037.058.032.052.041.039.014.043.009.049.007.050.009.100.012.069.012.023
.005.037.003.000.003.000.000.000.000.000.000.000.000.000.000.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.001
1 93 55.0 51.0 20.6 27.3 20.6 01                          Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1          Local Area Parameter record2
.035.037.037.058.032.052.041.039.014.043.009.049.007.050.009.100.012.069.012.023
.005.037.003.000.003.000.000.000.000.000.000.000.000.000.000.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.001
1 93 65.0 51.0 20.6 27.3 20.6 01                          Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1          Local Area Parameter record2
.035.037.037.058.032.052.041.039.014.043.009.049.007.050.009.100.012.069.012.023
.005.037.003.000.003.000.000.000.000.000.000.000.000.000.000.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.001
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JACKSONVILLE VALUES

(HDDT and MC remain constant, all areas)

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1          PROMPT
 Run with Jacksonville Vehicle Mix for Project, with all parameters
1          TAMFLG
1          SPDFLG
3          VMFLAG - Supply one VMT mix for all scenarios
4          MYMRFG
1          NEWFLG
1          IMFLAG
1          ALHFLG
1          ATPFLG
1          RLFLAG
1          LOCFLG - LAP record will appear once, in one-time data section.
2          TEMFLG
4          OUTFMT - 80-column descriptive format.
4          PRTFLG - Print exhaust HC, CO and NOx results.
1          IDLFLG
1          NMHFLG - Calculate emissions for Total Hydrocarbons.
1          HCFLAG - Print sum of all HC component emissions.
.702.233.002.001.014.004.035.009
 .13314 .17618 .18127 .18293 .17005 .15707 .14402 .14232 .12945 .12583  LDGV miles
 .11891 .11708 .10675 .10172 .11160 .01043 .07951 .10503 .10132 .12133
 .10551 .13719 .08703 .03863 .05365
 .09980 .17622 .18180 .16852 .16217 .16814 .18288 .14300 .14259 .12426  LDGT1
 .14022 .11547 .09030 .14457 .12272 .13534 .05939 .05565 .10506 .08847
 .03743 .03209 .04020 .16874 .07268
 .00001 .00000 .15668 .32250 .15312 .13490 .20829 .12940 .08939 .07856  LDGT2
 .17160 .00001 .08619 .02094 .14502 .14208 .00001 .00001 .00001 .07927
 .00001 .00001 .00000 .00001 .00000
 .18479 .19469 .17229 .12361 .20057 .25289 .18440 .13736 .17648 .10156  HDGV
 .42668 .09152 .00000 .06156 .00000 .00000 .00000 .00000 .00000 .00000
 .00000 .00000 .00000 .00000 .00000
 .16715 .11155 .20073 .22998 .71331 .37004 .37556 .24327 .27206 .24394  LDDV
 .13769 .19245 .15819 .06797 .01825 .26157 .09381 .00001 .00001 .00001
 .00001 .00001 .05754 .00001 .00001
 .02402 .10972 .17351 .17428 .20751 .13258 .15203 .22988 .13732 .09349  LDDT
 .11487 .08629 .00001 .00001 .00001 .00001 .00001 .00001 .00001 .00001
 .00001 .00001 .00001 .00001 .00001
 .18903 .36634 .34377 .32281 .30334 .28525 .26841 .25272 .23810 .22446  HDDV
 .21171 .19981 .18866 .17824 .16847 .15932 .15072 .14266 .13508 .12797
 .12126 .11496 .10903 .10344 .10415
 .00000 .04475 .04164 .03853 .03543 .03232 .02921 .02611 .02300 .01989  MC
 .01678 .01368 .00000 .00000 .00000 .00000 .00000 .00000 .00000 .00000
 .00000 .00000 .00000 .00000 .00000
 .083 .084 .070 .091 .097 .072 .074 .069 .072 .038  LDGV registration
 .033 .028 .027 .035 .031 .023 .014 .008 .008 .008
 .007 .005 .005 .005 .013
 .062 .059 .057 .063 .075 .055 .067 .064 .065 .051  LDT1
 .036 .038 .030 .045 .047 .035 .024 .013 .023 .021
 .018 .013 .013 .010 .016
 .007 .000 .036 .029 .022 .043 .058 .101 .065 .022  LDT2
 .080 .043 .065 .094 .109 .072 .036 .022 .014 .029
 .007 .007 .000 0.014.025
 .059 .020 .059 .098 .039 .098 .059 .196 .176 .137  HDGV
 .020 .020 .000 .019 .000 .000 .000 .000 .000 .000
 .000 .000 .000 .000 .000
 .083 .084 .070 .091 .097 .072 .074 .069 .072 .038  LDDV
 .033 .028 .027 .035 .031 .023 .014 .008 .008 .008
 .007 .005 .005 .005 .013
 .062 .059 .057 .063 .075 .055 .067 .064 .065 .051  LDDT
 .036 .038 .030 .045 .047 .035 .024 .013 .023 .021
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 .018 .013 .013 .010 .016
 .106 .099 .093 .087 .089 .070 .043 .042 .049 .048  HDDV
 .057 .044 .044 .033 .013 .015 .017 .014 .009 .006
 .005 .002 .002 .006 .007
 .000 .257 .193 .145 .108 .079 .058 .042 .030 .021  MC
 .015 .052 .000 .000 .000 .000 .000 .000 .000 .000
 .000 .000 .000 .000 .000
1 93  2.5 51.0 20.6 27.3 20.6 01                        Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1        Local Area Parameter record
.024.034.039.027.047.019.045.049.023.038.005.039.004.040.004.037.008.034.011.073
.005.065.001.011.001.033.000.000.000.000.000.000.000.000.000.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.001
1 93 10.0 51.0 20.6 27.3 20.6 01                        Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1        Local Area Parameter record
.024.034.039.027.047.019.045.049.023.038.005.039.004.040.004.037.008.034.011.073
.005.065.001.011.001.033.000.000.000.000.000.000.000.000.000.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.001
1 93 15.0 51.0 20.6 27.3 20.6 01                        Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1        Local Area Parameter record
.024.034.039.027.047.019.045.049.023.038.005.039.004.040.004.037.008.034.011.073
.005.065.001.011.001.033.000.000.000.000.000.000.000.000.000.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.001
1 93 25.0 51.0 20.6 27.3 20.6 01                        Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1        Local Area Parameter record
.024.034.039.027.047.019.045.049.023.038.005.039.004.040.004.037.008.034.011.073
.005.065.001.011.001.033.000.000.000.000.000.000.000.000.000.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.001
1 93 35.0 51.0 20.6 27.3 20.6 01                        Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1        Local Area Parameter record
.024.034.039.027.047.019.045.049.023.038.005.039.004.040.004.037.008.034.011.073
.005.065.001.011.001.033.000.000.000.000.000.000.000.000.000.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.001
1 93 45.0 51.0 20.6 27.3 20.6 01                        Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1        Local Area Parameter record
.024.034.039.027.047.019.045.049.023.038.005.039.004.040.004.037.008.034.011.073
.005.065.001.011.001.033.000.000.000.000.000.000.000.000.000.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.001
1 93 55.0 51.0 20.6 27.3 20.6 01                        Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1        Local Area Parameter record
.024.034.039.027.047.019.045.049.023.038.005.039.004.040.004.037.008.034.011.073
.005.065.001.011.001.033.000.000.000.000.000.000.000.000.000.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.001
1 93 65.0 51.0 20.6 27.3 20.6 01                        Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1        Local Area Parameter record
.024.034.039.027.047.019.045.049.023.038.005.039.004.040.004.037.008.034.011.073
.005.065.001.011.001.033.000.000.000.000.000.000.000.000.000.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.001
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MIAMI VALUES

(HDDT and MC remain constant, all areas)

```
1          PROMPT
 Run with Miami mix, all parameters
1          TAMFLG
1          SPDFLG
3          VMFLAG - Supply one VMT mix for all scenarios
4          MYMRFG
1          NEWFLG
1          IMFLAG
1          ALHFLG
1          ATPFLG
1          RLFLAG
1          LOCFLG - LAP record will appear once, in one-time data section.
2          TEMFLG
4          OUTFMT - 80-column descriptive format.
4          PRTFLG - Print exhaust HC, CO and NOx results.
1          IDLFLG
1          NMHFLG - Calculate emissions for Total Hydrocarbons.
1          HCFLAG - Print sum of all HC component emissions.
.728.185.015.002.021.005.035.009
0.11401 .15195 .15330 .15584 .14517 .13894 .13078 .12281 .11780 .11262  LDGV miles
0.10912 .09781 .09224 .08227 .07937 .07535 .07150 .06663 .06768 .06929
0.04951 .04742 .05025 .04912 .04366
0.08184 .15400 .18220 .17636 .17015 .16500 .14685 .14110 .12616 .12121  LDT1
0.11115 .11076 .11056 .08566 .08785 .08236 .08291 .07994 .07741 .07800
0.07929 .06325 .10959 .07624 .05223
0.12518 .11355 .21306 .18034 .14444 .14794 .13710 .11881 .11567 .20209  LDT2
0.06662 .15494 .16422 .08104 .12427 .09876 .04309 .03449 .05740 .06605
0.04108 .14157 .03233 .17738 .04073
0.28787 .27648 .15659 .16533 .20022 .18891 .18509 .15741 .15364 .16686  HDGV
0.12745 .13069 .00000 .00000 .00000 .00000 .00000 .00000 .00000 .00000
0.00000 .00000 .00000 .00000 .00000
0.12139 .19682 .16302 .23291 .31306 .25603 .23242 .22531 .21845 .21446  LDDV
0.24437 .22367 .23656 .21658 .16810 .17454 .17732 .12723 .17821 .09878
0.09766 .16790 .11628 .06836 .16075
0.13232 .17071 .18587 .18451 .20322 .16340 .14391 .13213 .11047 .11031  LDDT
0.06162 .09294 .00001 .00001 .00001 .00001 .00001 .00001 .00001 .00001
0.00001 .00001 .00001 .00001 .00001
0.18903 .36634 .34377 .32281 .30334 .28525 .26841 .25272 .23810 .22446  HDDT
0.21171 .19981 .18866 .17824 .16847 .15932 .15072 .14266 .13508 .12797
0.12126 .11496 .10903 .10344 .10415
0.000000.044750.041640.038530.035430.032320.029210.026110.023000.01989  MC
0.016780.013680.000000.000000.000000.000000.000000.000000.000000.00000
0.000000.000000.000000.000000.00000
 .168 .084 .062 .079 .075 .062 .067 .064 .062 .038                    LDGV registration
 .031 .032 .030 .038 .031 .020 .011 .006 .006 .007
 .005 .003 .004 .004 .011
 .052 .041 .047 .063 .073 .058 .072 .074 .062 .051                    LDT1
 .041 .051 .038 .064 .053 .033 .026 .013 .024 .018
 .014 .008 .009 .007 .007
 .066 .018 .014 .031 .028 .023 .052 .045 .050 .038                    LDT2
 .041 .066 .057 .095 .082 .059 .038 .026 .040 .043
 .018 .013 .020 .018 .019
 .045 .032 .059 .082 .104 .136 .160 .178 .101 .066                    HDGV
 .021 .016 .000 .000 .000 .000 .000 .000 .000 .000
 .000 .000 .000 .000 .000
 .168 .084 .062 .079 .075 .062 .067 .064 .062 .038                    LDDV
 .031 .032 .030 .038 .031 .020 .011 .006 .006 .007
 .005 .003 .004 .004 .011
 .052 .041 .047 .063 .073 .058 .072 .074 .062 .051                    LDDT
 .041 .051 .038 .064 .053 .033 .026 .013 .024 .018
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  .014 .008 .009 .007 .007
  .106 .099 .093 .087 .089 .070 .043 .042 .049 .048                    HDDT
  .057 .044 .044 .033 .013 .015 .017 .014 .009 .006
  .005 .002 .002 .006 .007
  .000 .257 .193 .145 .108 .079 .058 .042 .030 .021                    MC
  .015 .052 .000 .000 .000 .000 .000 .000 .000 .000
  .000 .000 .000 .000 .000
1 93  2.5 51.0 20.6 27.3 20.6 01                        Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1        Local Area Parameter record
.023.043.043.063.023.043.033.073.013.063.013.053.003.063.003.063.013.053.003.113
.003.103.003.013.003.023.003.003.003.003.003.003.003.003.003.003.003.003.003.003
.003.003.003.003.003.003.003.003.003.003
1 93 10.0 51.0 20.6 27.3 20.6 01                        Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1        Local Area Parameter record
.023.043.043.063.023.043.033.073.013.063.013.053.003.063.003.063.013.053.003.113
.003.103.003.013.003.023.003.003.003.003.003.003.003.003.003.003.003.003.003.003
.003.003.003.003.003.003.003.003.003.003
1 93 15.0 51.0 20.6 27.3 20.6 01                        Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1        Local Area Parameter record
.023.043.043.063.023.043.033.073.013.063.013.053.003.063.003.063.013.053.003.113
.003.103.003.013.003.023.003.003.003.003.003.003.003.003.003.003.003.003.003.003
.003.003.003.003.003.003.003.003.003.003
1 93 25.0 51.0 20.6 27.3 20.6 01                        Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1        Local Area Parameter record
.023.043.043.063.023.043.033.073.013.063.013.053.003.063.003.063.013.053.003.113
.003.103.003.013.003.023.003.003.003.003.003.003.003.003.003.003.003.003.003.003
.003.003.003.003.003.003.003.003.003.003
1 93 35.0 51.0 20.6 27.3 20.6 01                        Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1        Local Area Parameter record
.023.043.043.063.023.043.033.073.013.063.013.053.003.063.003.063.013.053.003.113
.003.103.003.013.003.023.003.003.003.003.003.003.003.003.003.003.003.003.003.003
.003.003.003.003.003.003.003.003.003.003
1 93 45.0 51.0 20.6 27.3 20.6 01                        Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1        Local Area Parameter record
.023.043.043.063.023.043.033.073.013.063.013.053.003.063.003.063.013.053.003.113
.003.103.003.013.003.023.003.003.003.003.003.003.003.003.003.003.003.003.003.003
.003.003.003.003.003.003.003.003.003.003
1 93 55.0 51.0 20.6 27.3 20.6 01                        Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1        Local Area Parameter record
.023.043.043.063.023.043.033.073.013.063.013.053.003.063.003.063.013.053.003.113
.003.103.003.013.003.023.003.003.003.003.003.003.003.003.003.003.003.003.003.003
.003.003.003.003.003.003.003.003.003.003
1 93 65.0 51.0 20.6 27.3 20.6 01                        Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1        Local Area Parameter record
.023.043.043.063.023.043.033.073.013.063.013.053.003.063.003.063.013.053.003.113
.003.103.003.013.003.023.003.003.003.003.003.003.003.003.003.003.003.003.003.003
.003.003.003.003.003.003.003.003.003.003
```

ORLANDO VALUES

(HDDT and MC remain constant, all areas)

```
1          PROMPT
 Run with Orlando, all vehicle parameters
1          TAMFLG
1          SPDFLG
3          VMFLAG - Supply one VMT mix for all scenarios
4          MYMRFG
1          NEWFLG
1          IMFLAG
1          ALHFLG
1          ATPFLG
1          RLFLAG
1          LOCFLG - LAP record will appear once, in one-time data section.
2          TEMFLG
4          OUTFMT - 80-column descriptive format.
4          PRTFLG - Print exhaust HC, CO and NOx results.
1          IDLFLG
1          NMHFLG - Calculate emissions for Total Hydrocarbons.
1          HCFLAG - Print sum of all HC component emissions.
.707.218.004.001.021.005.035.009
0.122970.178760.179640.172270.155790.141970.132620.120110.107280.10242  LDGV miles
0.100090.087490.075930.088450.070730.073540.063410.069530.066110.05992
0.057100.046650.036060.048300.03575
0.073100.177720.163130.172060.161740.154830.143040.123880.111480.10306  LDGT1
0.101690.076080.103820.077600.102040.056920.101380.149200.045260.04884
0.039590.050540.031150.040950.03926
0.000010.238980.170200.246220.061690.115410.320590.132350.163720.11158  LDGT2
0.080580.055830.000010.000010.021240.769230.000010.000010.000010.00001
0.047530.000010.051000.000010.01933
0.000010.153280.183800.293610.190410.111660.240180.261200.156780.09696  HDGV
0.104830.000000.069780.000000.000000.000000.000000.000000.000000.00000
0.000000.000000.000000.000000.00000
0.200230.142610.202670.349890.310260.232610.324260.187170.234850.16272  LDDV
0.164390.238770.250000.142260.074150.154190.000010.472570.285140.15165
0.052090.000010.000010.000010.11955
0.259890.148620.194170.171060.170580.152270.163450.124010.111250.04801  LDDT
0.097470.082270.000010.000010.000010.000010.000010.000010.000010.00001
0.000010.000010.000010.000010.00001
 .18903 .36634 .34377 .32281 .30334 .28525 .26841 .25272 .23810 .22446  HDDV
 .21171 .19981 .18866 .17824 .16847 .15932 .15072 .14266 .13508 .12797
 .12126 .11496 .10903 .10344 .10415
 .00000 .04475 .04164 .03853 .03543 .03232 .02921 .02611 .02300 .01989  MC
 .01678 .01368 .00000 .00000 .00000 .00000 .00000 .00000 .00000 .00000
 .00000 .00000 .00000 .00000 .00000
0.085 .096 .077 .104 .096 .074 .009 .072 .070 .041                    LDGV registration
0.034 .031 .030 .042 .035 .025 .015 .008 .008 .009
0.007 .005 .005 .006 .016
0.058 .049 .049 .055 .070 .047 .072 .071 .065 .049                    LDT1
0.037 .043 .031 .061 .054 .035 .025 .015 .024 .018
0.019 .012 .010 .011 0.020
0.044 .006 .012 .031 .037 .012 .037 .031 .069 .031                    LDT2
0.037 .056 .050 .100 .100 .056 .062 .031 .062 .037
0.025 .025 .012 .012 .025
0.082 .041 .061 .102 .112 .061 .143 .184 .102 .061                    HDGV
0.082 .000 .041 .000 .000 .000 .000 .000 .000 .000
0.000 .000 .000 .000 .000
0.085 .096 .077 .104 .096 .074 .009 .072 .070 .041                    LDDV
0.034 .031 .030 .042 .035 .025 .015 .008 .008 .009
0.007 .005 .005 .006 .016
0.058 .049 .049 .055 .070 .047 .072 .071 .065 .049                    LDDT
0.037 .043 .031 .061 .054 .035 .025 .015 .024 .018
```

```
0.019 .012 .010 .011 0.020
 .106 .099 .093 .087 .089 .070 .043 .042 .049 .048                    HDDV
 .057 .044 .044 .033 .013 .015 .017 .014 .009 .006
 .005 .002 .002 .006 .007
 .000 .257 .193 .145 .108 .079 .058 .042 .030 .021                    MC
 .015 .052 .000 .000 .000 .000 .000 .000 .000 .000
 .000 .000 .000 .000 .000
1 93  2.5 51.0 20.6 27.3 20.6 01                    Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1     Local Area Parameter record
.043.019.034.031.038.053.053.055.016.066.009.027.007.050.008.047.013.052.010.098
.002.050.004.046.006.054.000.000.000.000.001.000.001.000.000.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.001
1 93 10.0 51.0 20.6 27.3 20.6 01                    Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1     Local Area Parameter record
.043.019.034.031.038.053.053.055.016.066.009.027.007.050.008.047.013.052.010.098
.002.050.004.046.006.054.000.000.000.000.001.000.001.000.000.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.001
1 93 15.0 51.0 20.6 27.3 20.6 01                    Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1     Local Area Parameter record
.043.019.034.031.038.053.053.055.016.066.009.027.007.050.008.047.013.052.010.098
.002.050.004.046.006.054.000.000.000.000.001.000.001.000.000.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.001
1 93 25.0 51.0 20.6 27.3 20.6 01                    Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1     Local Area Parameter record
.043.019.034.031.038.053.053.055.016.066.009.027.007.050.008.047.013.052.010.098
.002.050.004.046.006.054.000.000.000.000.001.000.001.000.000.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.001
1 93 35.0 51.0 20.6 27.3 20.6 01                    Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1     Local Area Parameter record
.043.019.034.031.038.053.053.055.016.066.009.027.007.050.008.047.013.052.010.098
.002.050.004.046.006.054.000.000.000.000.001.000.001.000.000.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.001
1 93 45.0 51.0 20.6 27.3 20.6 01                    Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1     Local Area Parameter record
.043.019.034.031.038.053.053.055.016.066.009.027.007.050.008.047.013.052.010.098
.002.050.004.046.006.054.000.000.000.000.001.000.001.000.000.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.001
1 93 55.0 51.0 20.6 27.3 20.6 01                    Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1     Local Area Parameter record
.043.019.034.031.038.053.053.055.016.066.009.027.007.050.008.047.013.052.010.098
.002.050.004.046.006.054.000.000.000.000.001.000.001.000.000.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.001
1 93 65.0 51.0 20.6 27.3 20.6 01                    Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1     Local Area Parameter record
.043.019.034.031.038.053.053.055.016.066.009.027.007.050.008.047.013.052.010.098
.002.050.004.046.006.054.000.000.000.000.001.000.001.000.000.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.001
```

TAMPA VALUES

(HDDT and MC remain constant, all areas)

```
1          PROMPT
           PROJID   Run with Tampa mix, all vehicle parameters
1          TAMFLG
1          SPDFLG
3          VMFLAG - Supply one VMT mix for all scenarios
4          MYMRFG
1          NEWFLG
1          IMFLAG
1          ALHFLG
1          ATPFLG
1          RLFLAG
1          LOCFLG - LAP record will appear once, in one-time data section.
2          TEMFLG
4          OUTFMT - 80-column descriptive format.
4          PRTFLG - Print exhaust HC, CO and NOx results.
1          IDLFLG
1          NMHFLG - Calculate emissions for Total Hydrocarbons.
1          HCFLAG - Print sum of all HC component emissions.
.719.212.002.002.016.005.035.009
 .12251 .15500 .15803 .15957 .14484 .13233 .12252 .11197 .10280 .09473    LDGV miles
 .09274 .07906 .07005 .07118 .06058 .05730 .05420 .04431 .04369 .04652
 .04152 .05484 .04118 .03939 .02948
 .08298 .13936 .15075 .15952 .15408 .14521 .14243 .12260 .10977 .09809    LDGT1
 .09912 .09403 .07093 .06949 .05392 .07328 .06886 .07462 .05020 .06286
 .04222 .04626 .03839 .08876 .03354
 .00192 .05666 .15500 .14966 .14130 .16648 .18693 .09157 .10411 .06255    LDGT2
 .07531 .06889 .08228 .04522 .05676 .07503 .00001 .06788 .00001 .02161
 .00031 .00193 .06750 .00001 .00001
 .17126 .27271 .16633 .19161 .18943 .18335 .13739 .14427 .12043 .09006    HDGV
 .10785 .11571 .22396 .00000 .00000 .00000 .00000 .00000 .00000 .00000
 .00000 .00000 .00000 .00000 .00000
 .15495 .17448 .16503 .23972 .26789 .24586 .22520 .22713 .21810 .20500    LDDV
 .21083 .18786 .00583 .43595 .46705 .08742 .25759 .15939 .06967 .09654
 .14407 .00001 .08180 .10768 .34614
 .15560 .20163 .13839 .24096 .19977 .12375 .11682 .11230 .08829 .08512    LDDT
 .07636 .05798 .00001 .00001 .00001 .00001 .01964 .00001 .00001 .00001
 .00001 .00001 .00001 .00001 .00001
 .18903 .36634 .34377 .32281 .30334 .28525 .26841 .25272 .23810 .22446   HDDT
 .21171 .19981 .18866 .17824 .16847 .15932 .15072 .14266 .13508 .12797
 .12126 .11496 .10903 .10344 .10415
 .00000 .04475 .04164 .03853 .03543 .03232 .02921 .02611 .02300 .01989    MC
 .01678 .01368 .00000 .00000 .00000 .00000 .00000 .00000 .00000 .00000
 .00000 .00000 .00000 .00000 .00000
 .077 .076 .073 .091 .086 .070 .075 .072 .067 .038   LDGV registration
 .031 .032 .028 .037 .034 .024 .016 .008 .009 .010
 .008 .006 .006 .006 .020
 .045 .047 .043 .059 .065 .057 .070 .073 .071 .050   LDGT1
 .037 .040 .035 .054 .052 .036 .028 .016 .027 .024
 .021 .015 .014 .010 .011
 .022 .003 .022 .016 .025 .031 .040 .059 .053 .037   LDGT2
 .037 .056 .034 .102 .096 .053 .037 .043 .047 .065
 .031 .034 .016 .022 .020
 .025 .013 .038 .106 .125 .150 .175 .113 .113 .088   HDGV
 .006 .048 .008 .000 .000 .000 .000 .000 .000 .000
 .000 .000 .000 .000 .000
 .077 .076 .073 .091 .086 .070 .075 .072 .067 .038   LDDV
 .031 .032 .028 .037 .034 .024 .016 .008 .009 .010
 .008 .006 .006 .006 .020
 .045 .047 .043 .059 .065 .057 .070 .073 .071 .050   LDDT1
 .037 .040 .035 .054 .052 .036 .028 .016 .027 .024
```

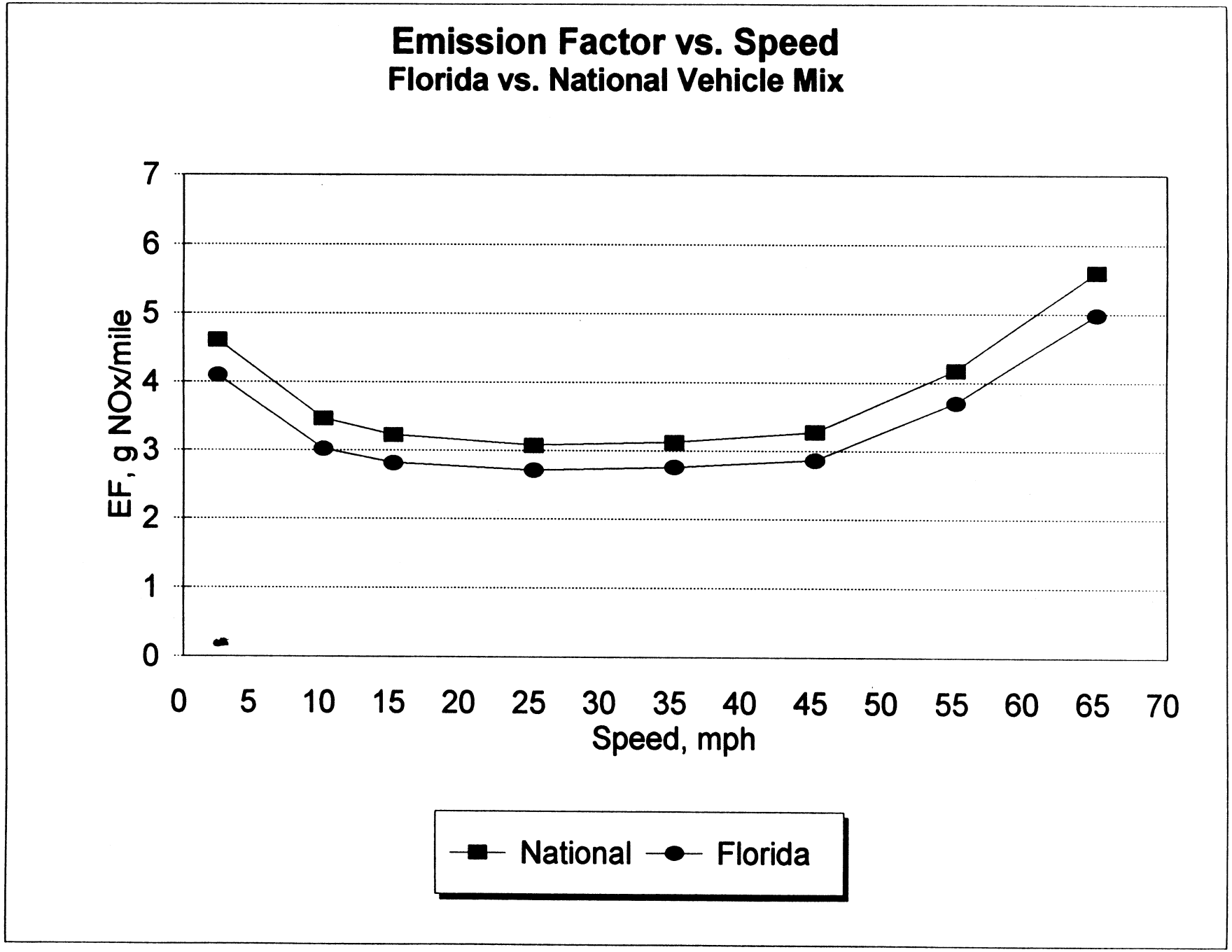
```
 .021 .015 .014 .010 .011
 .106 .099 .093 .087 .089 .070 .043 .042 .049 .048    HDDV
 .057 .044 .044 .033 .013 .015 .017 .014 .009 .006
 .005 .002 .002 .006 .007
 .000 .257 .193 .145 .108 .079 .058 .042 .030 .021    MC
 .015 .052 .000 .000 .000 .000 .000 .000 .000 .000
 .000 .000 .000 .000 .000
1 93  2.5 51.0 20.6 27.3 20.6 01                      Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1       Local Area Parameter record
.024.034.031.041.028.022.034.052.010.049.008.046.005.044.006.046.009.053.007.091
.004.056.004.027.005.032.000.000.000.000.000.000.000.000.002.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.000
1 93 10.0 51.0 20.6 27.3 20.6 01                      Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1       Local Area Parameter record
.024.034.031.041.028.022.034.052.010.049.008.046.005.044.006.046.009.053.007.091
.004.056.004.027.005.032.000.000.000.000.000.000.000.000.002.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.000
1 93 15.0 51.0 20.6 27.3 20.6 01                      Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1       Local Area Parameter record
.024.034.031.041.028.022.034.052.010.049.008.046.005.044.006.046.009.053.007.091
.004.056.004.027.005.032.000.000.000.000.000.000.000.000.002.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.000
1 93 25.0 51.0 20.6 27.3 20.6 01                      Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1       Local Area Parameter record
.024.034.031.041.028.022.034.052.010.049.008.046.005.044.006.046.009.053.007.091
.004.056.004.027.005.032.000.000.000.000.000.000.000.000.002.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.000
1 93 35.0 51.0 20.6 27.3 20.6 01                      Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1       Local Area Parameter record
.024.034.031.041.028.022.034.052.010.049.008.046.005.044.006.046.009.053.007.091
.004.056.004.027.005.032.000.000.000.000.000.000.000.000.002.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.000
1 93 45.0 51.0 20.6 27.3 20.6 01                      Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1       Local Area Parameter record
.024.034.031.041.028.022.034.052.010.049.008.046.005.044.006.046.009.053.007.091
.004.056.004.027.005.032.000.000.000.000.000.000.000.000.002.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.000
1 93 55.0 51.0 20.6 27.3 20.6 01                      Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1       Local Area Parameter record
.024.034.031.041.028.022.034.052.010.049.008.046.005.044.006.046.009.053.007.091
.004.056.004.027.005.032.000.000.000.000.000.000.000.000.002.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.000
1 93 65.0 51.0 20.6 27.3 20.6 01                      Scenario description record
Scenario title.  C  41.  61. 11.5  9.0 90 1 2 1       Local Area Parameter record
.024.034.031.041.028.022.034.052.010.049.008.046.005.044.006.046.009.053.007.091
.004.056.004.027.005.032.000.000.000.000.000.000.000.000.002.000.000.000.000.000
.000.000.000.000.000.000.000.000.000.000
```

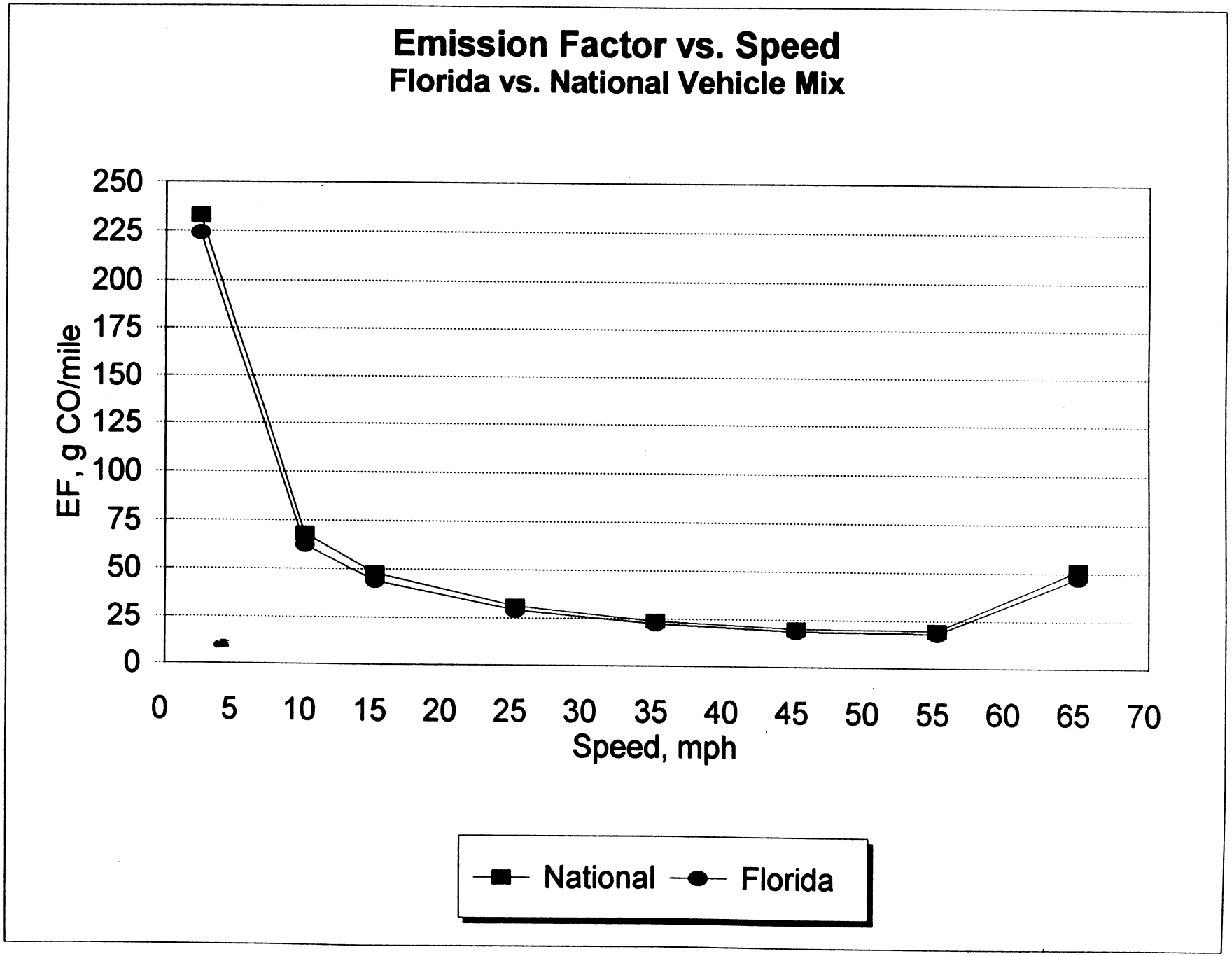
APPENDIX I

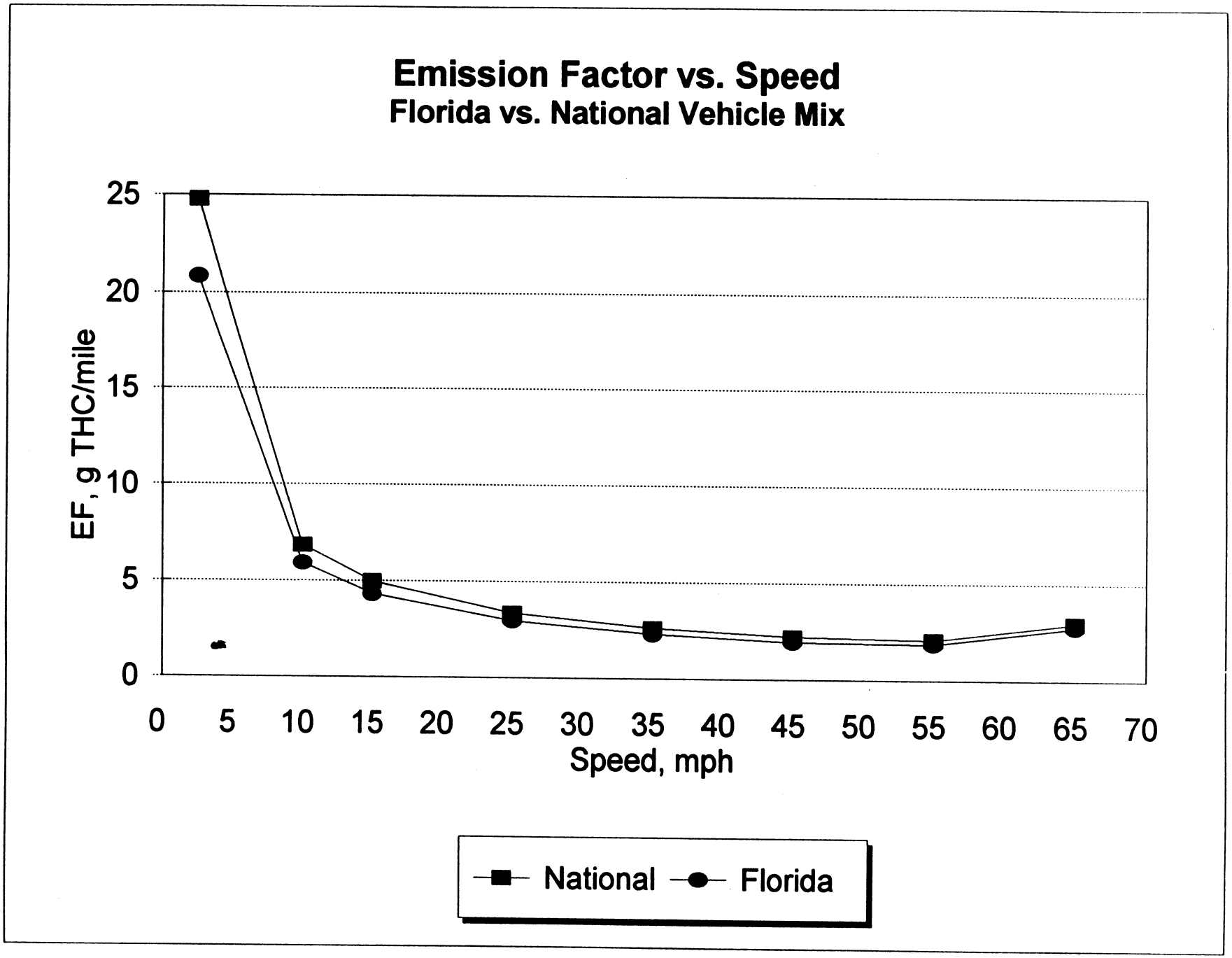
FIGURES DISPLAYING RESULTS OF USING ALL DERIVED OPTIONAL INPUTS

COMPARISON TO DEFAULT VALUES

FLORIDA SPECIFIC VALUES

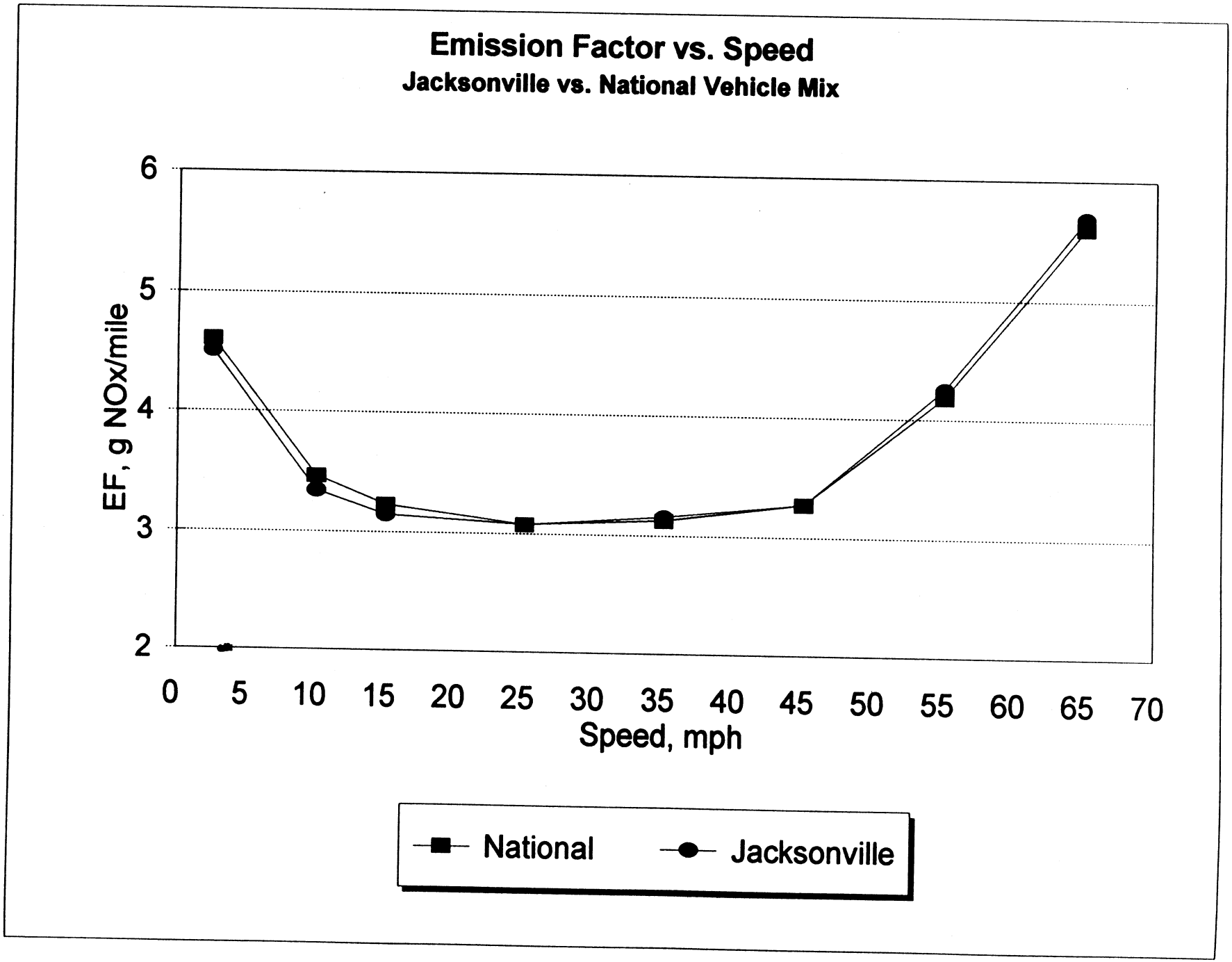

Emission Factor vs. Speed
Florida vs. National Vehicle Mix
EF, g NOx/mile
0
1
2
3
4
5
6
7
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Speed, mph
National
Florida

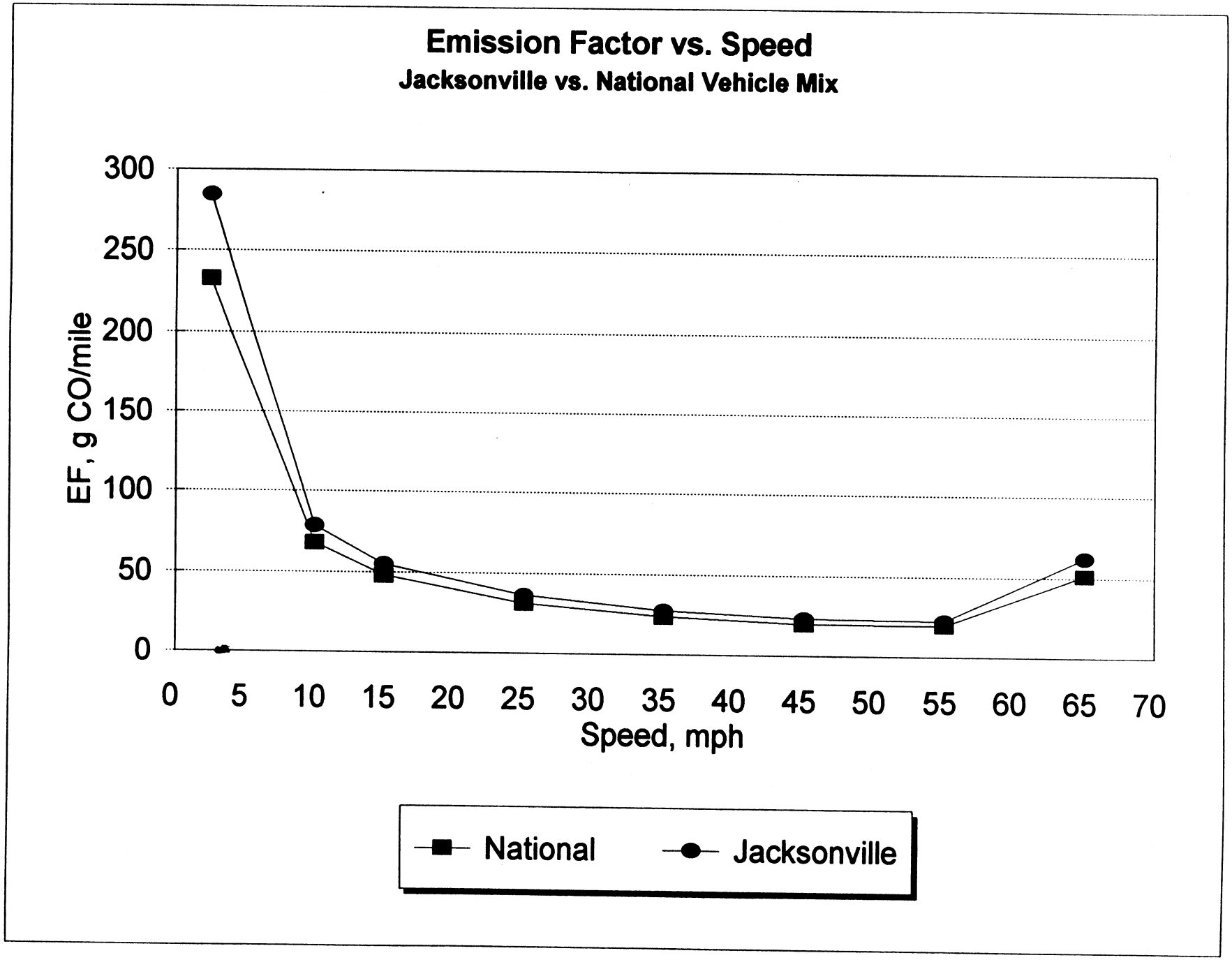

Emission Factor vs. Speed
Florida vs. National Vehicle Mix
EF, g CO/mile
250
225
200
175
150
125
100
75
50
25
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Speed, mph
National
Florida

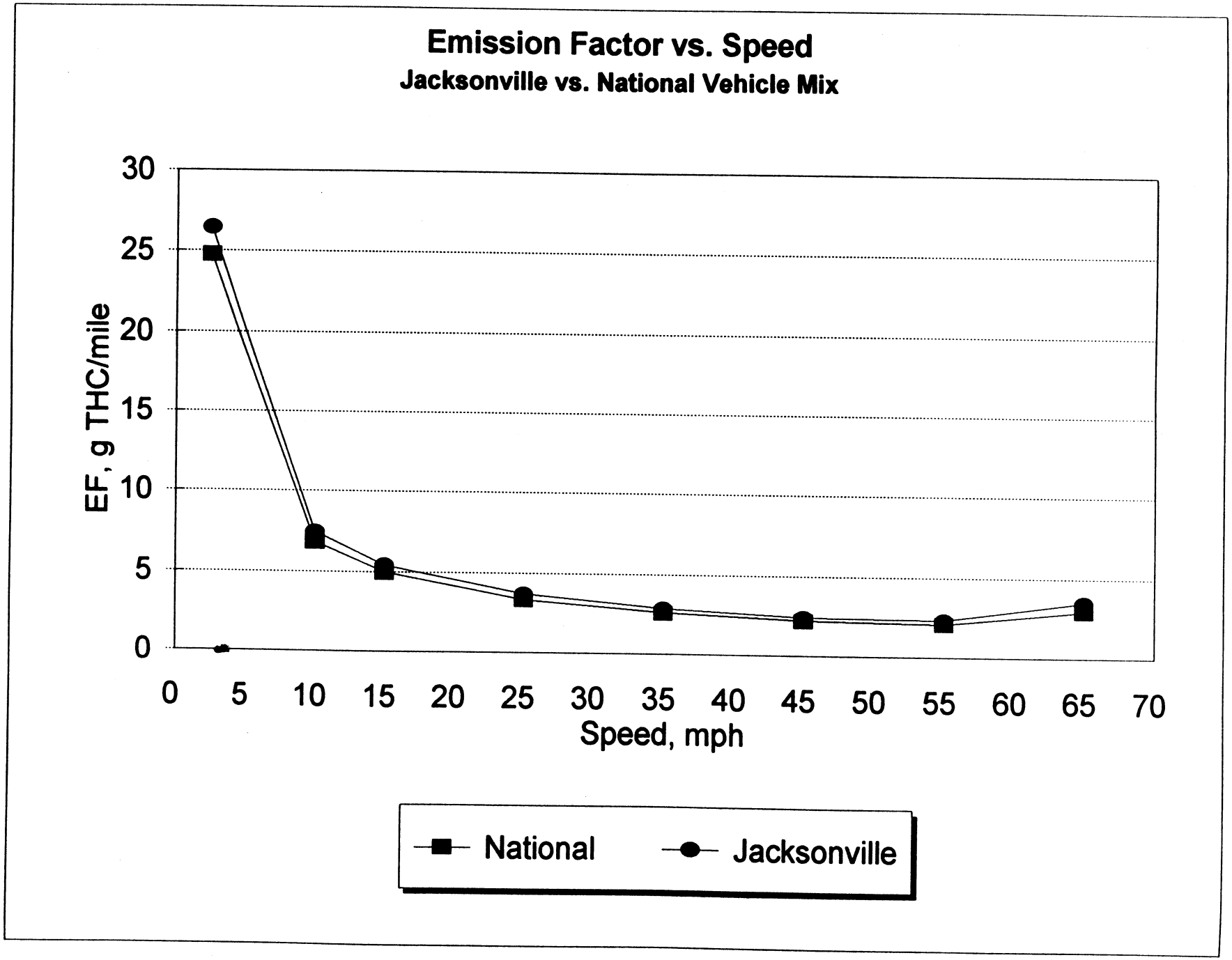

Emission Factor vs. Speed
Florida vs. National Vehicle Mix
EF, g THC/mile
25
20
15
10
5
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Speed, mph
National
Florida

COMPARISON TO DEFAULT VALUES

JACKSONVILLE SPECIFIC VALUES

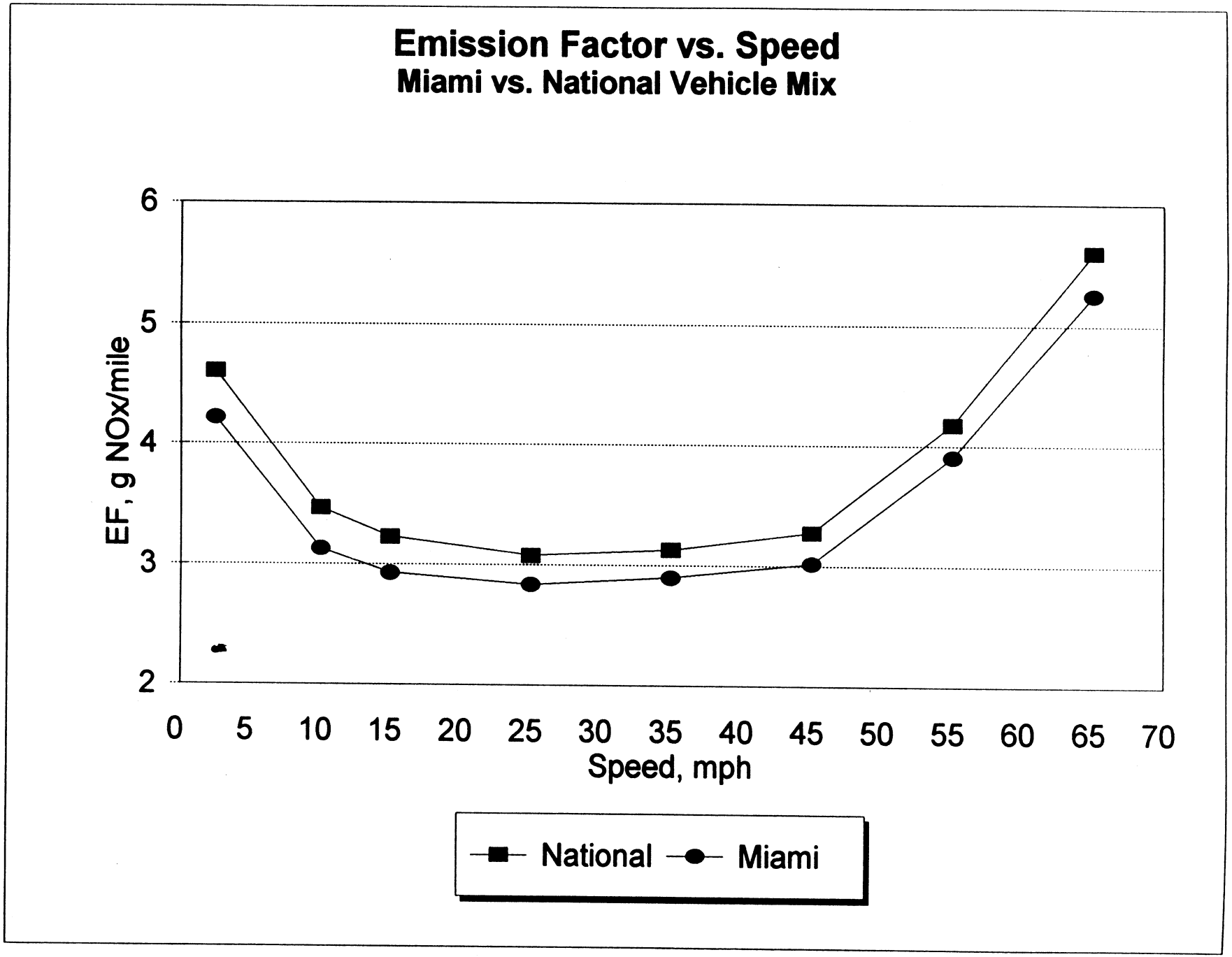

Emission Factor vs. Speed
Jacksonville vs. National Vehicle Mix
EF, g NOx/mile
6
5
4
3
2
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Speed, mph
National
Jacksonville

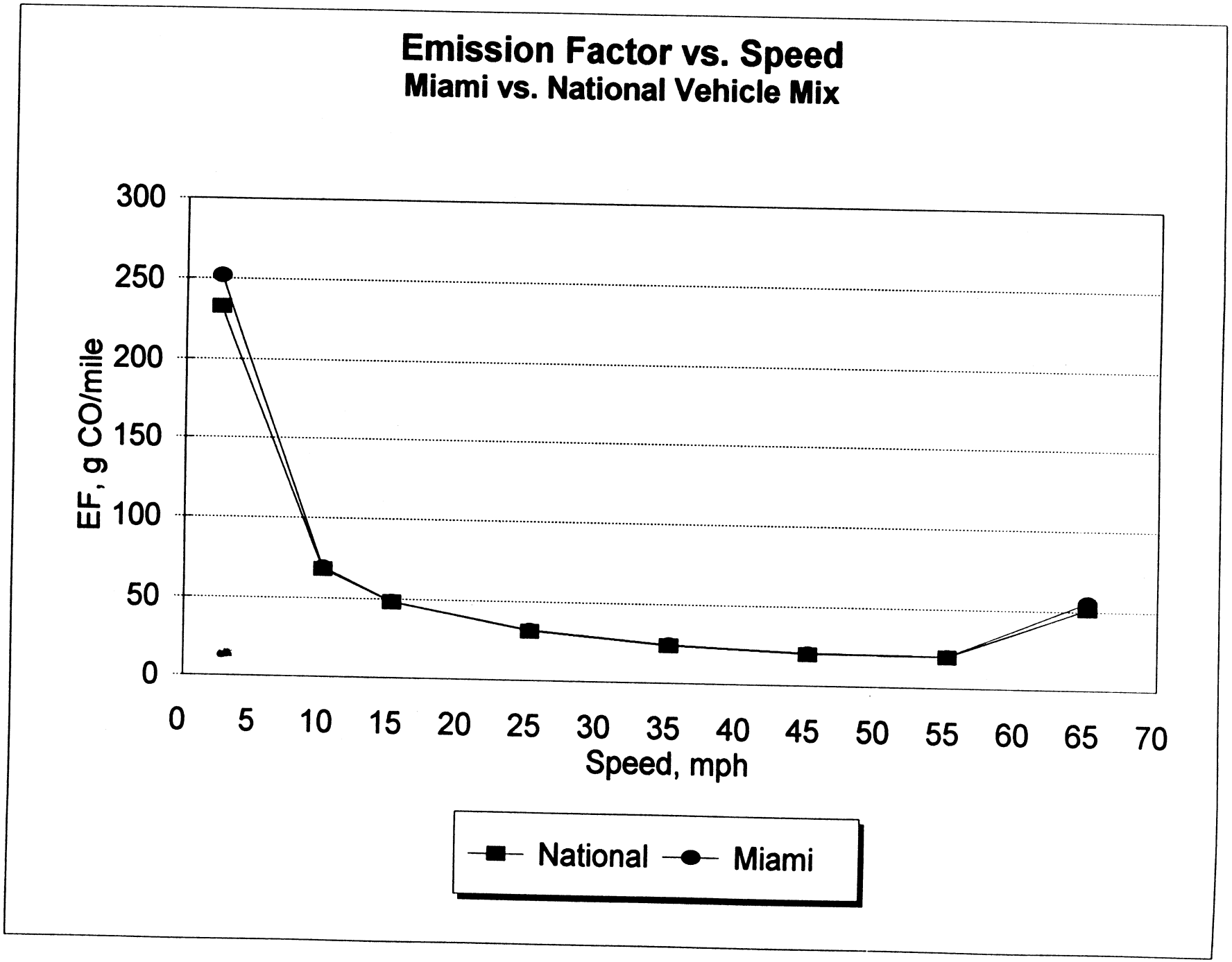

Emission Factor vs. Speed
Jacksonville vs. National Vehicle Mix
EF, g CO/mile
300
250
200
150
100
50
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Speed, mph
National
Jacksonville

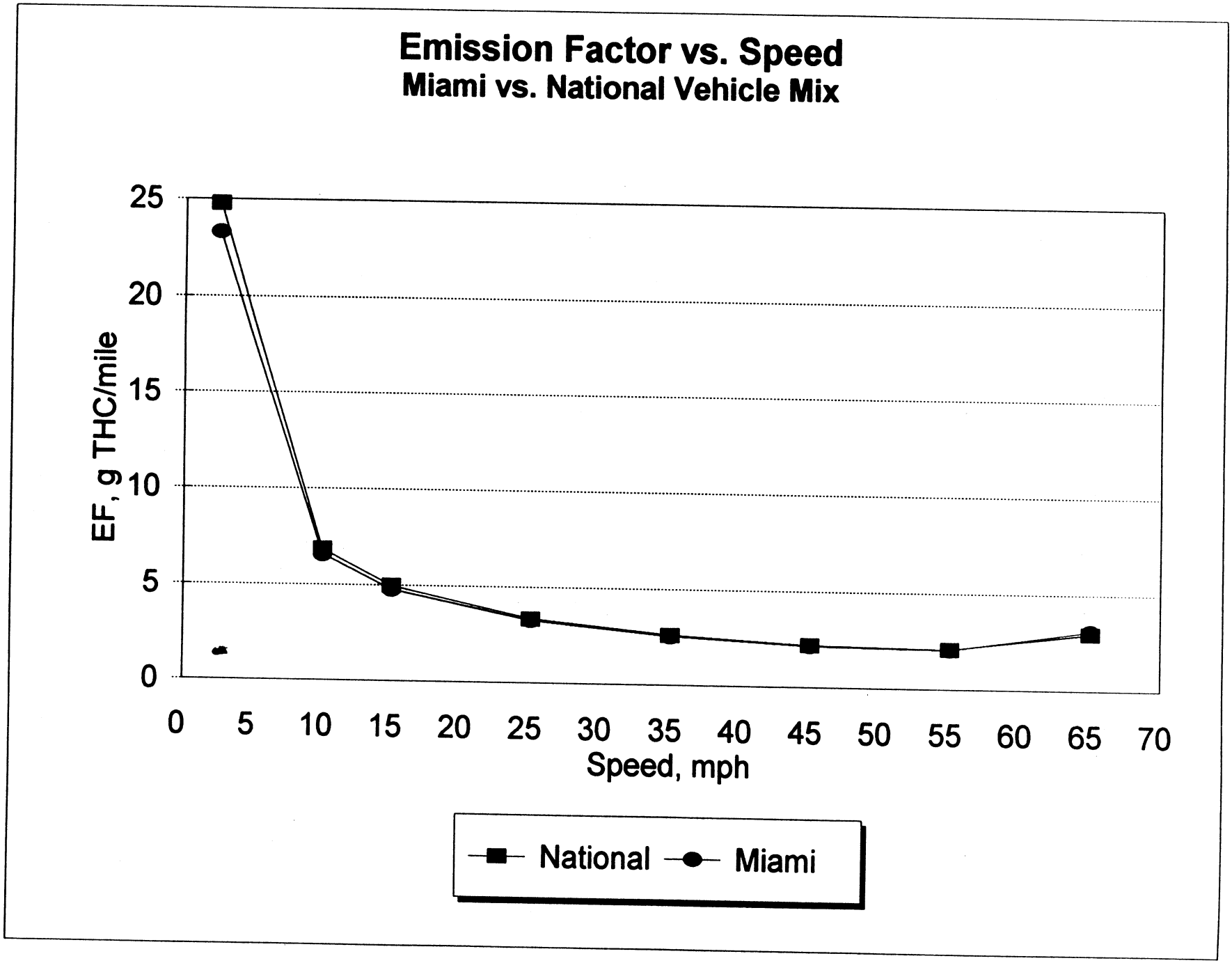

Emission Factor vs. Speed
Jacksonville vs. National Vehicle Mix
EF, g THC/mile
30
25
20
15
10
5
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Speed, mph
National
Jacksonville

COMPARISON TO DEFAULT VALUES

MIAMI SPECIFIC VALUES

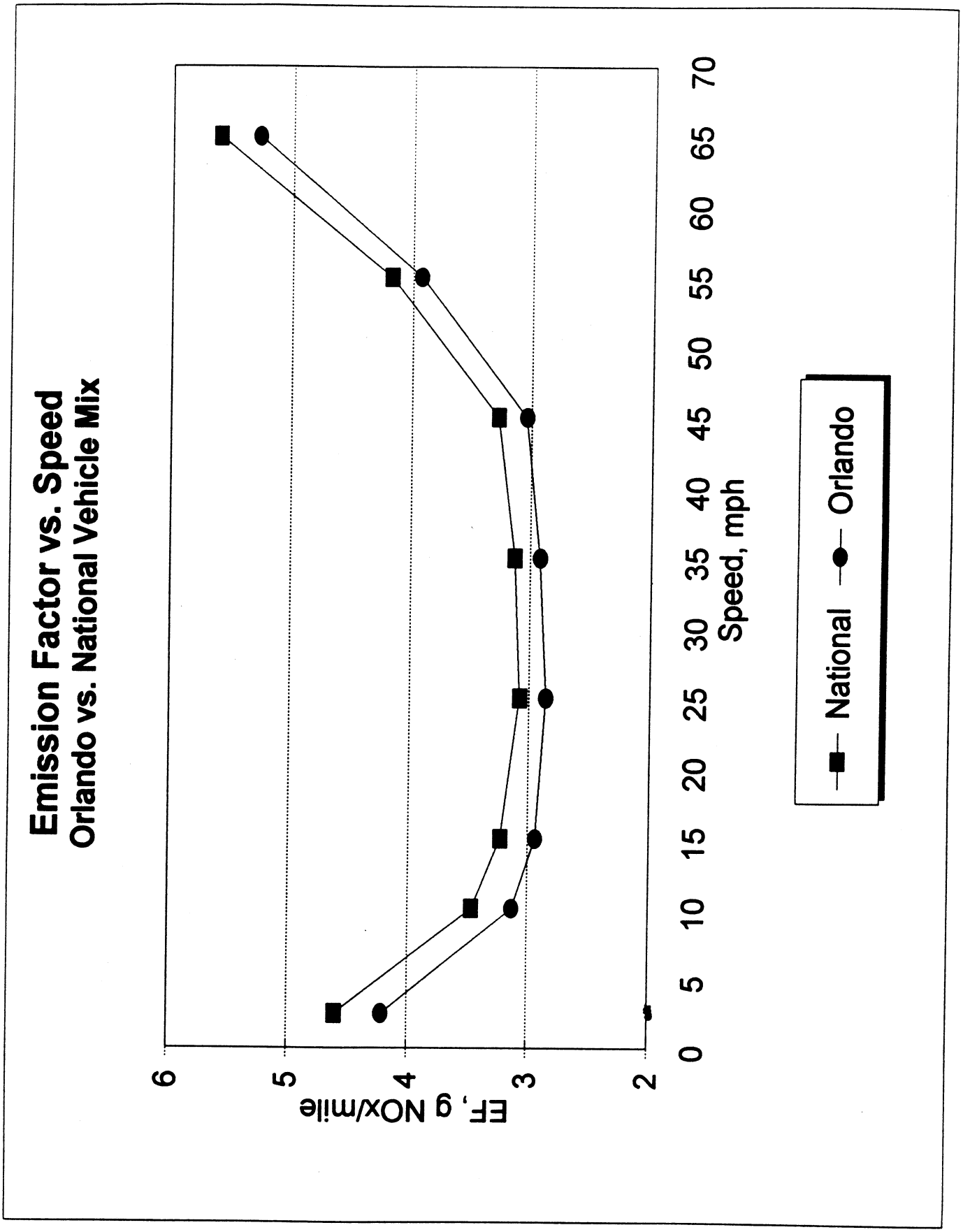

Emission Factor vs. Speed
Miami vs. National Vehicle Mix
EF, g NOx/mile
6
5
4
3
2
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Speed, mph
National
Miami

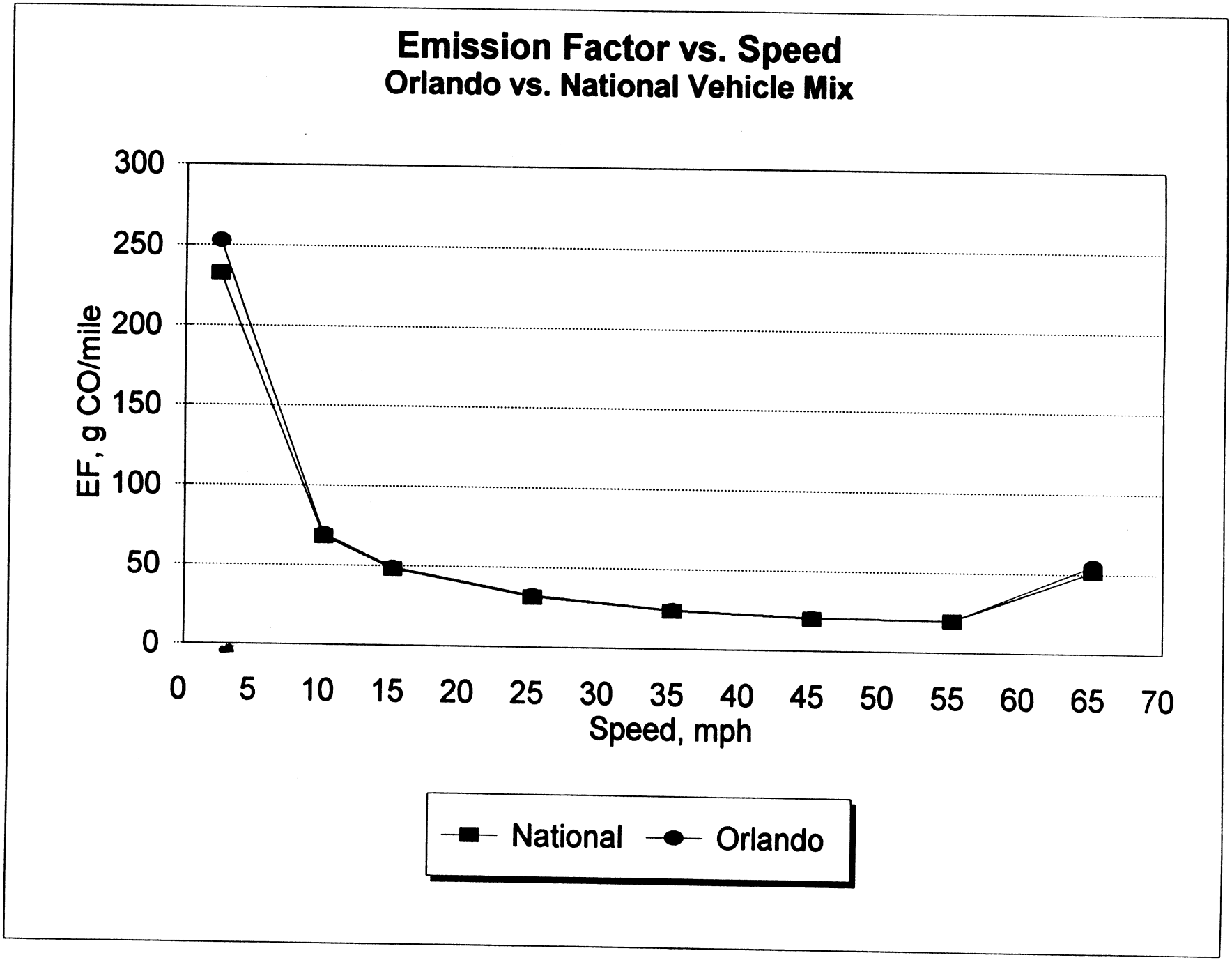

Emission Factor vs. Speed
Miami vs. National Vehicle Mix
EF, g CO/mile
300
250
200
150
100
50
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Speed, mph
National
Miami

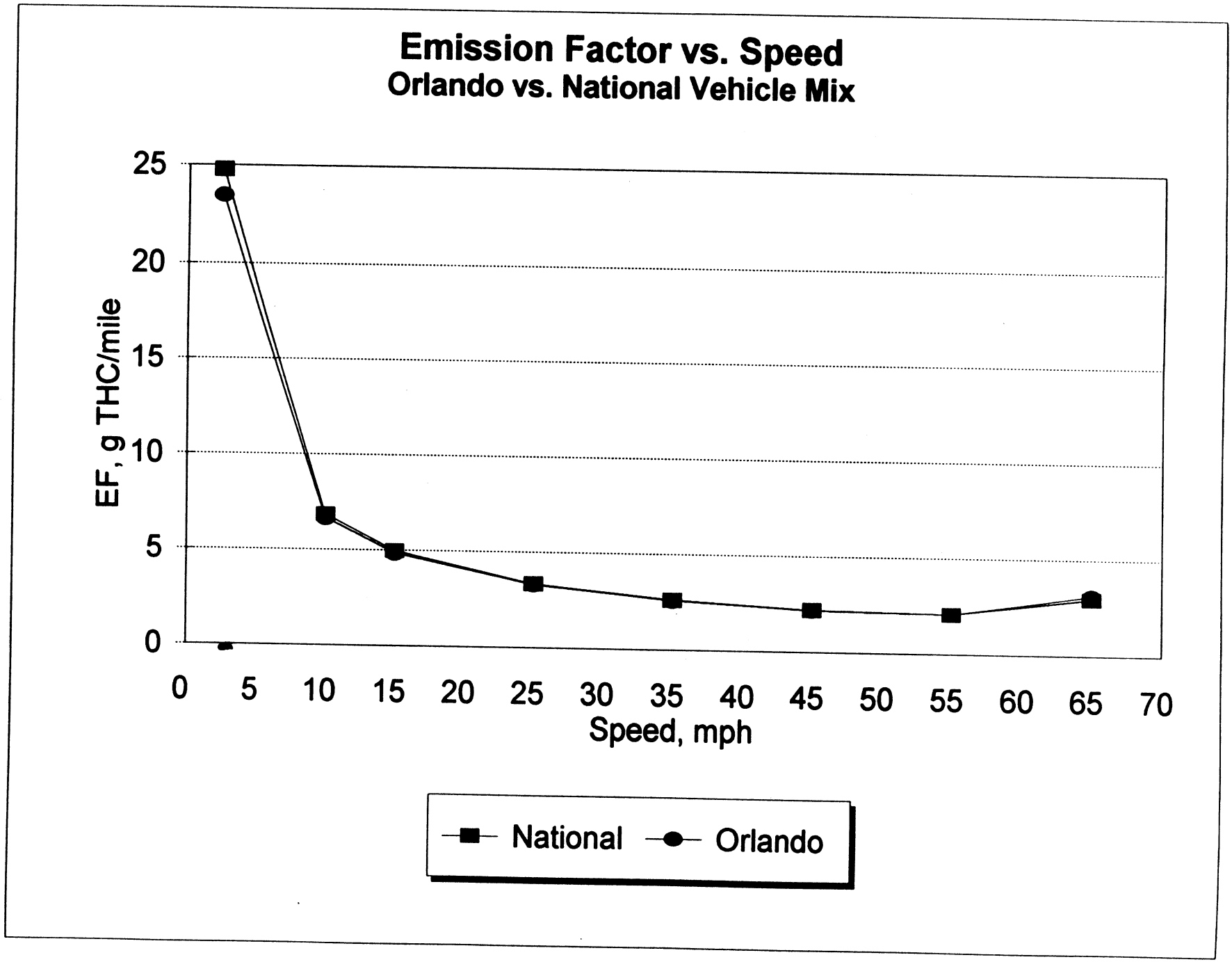

Emission Factor vs. Speed
Miami vs. National Vehicle Mix
EF, g THC/mile
25
20
15
10
5
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70
Speed, mph
National
Miami

COMPARISON TO DEFAULT VALUES

ORLANDO SPECIFIC VALUES

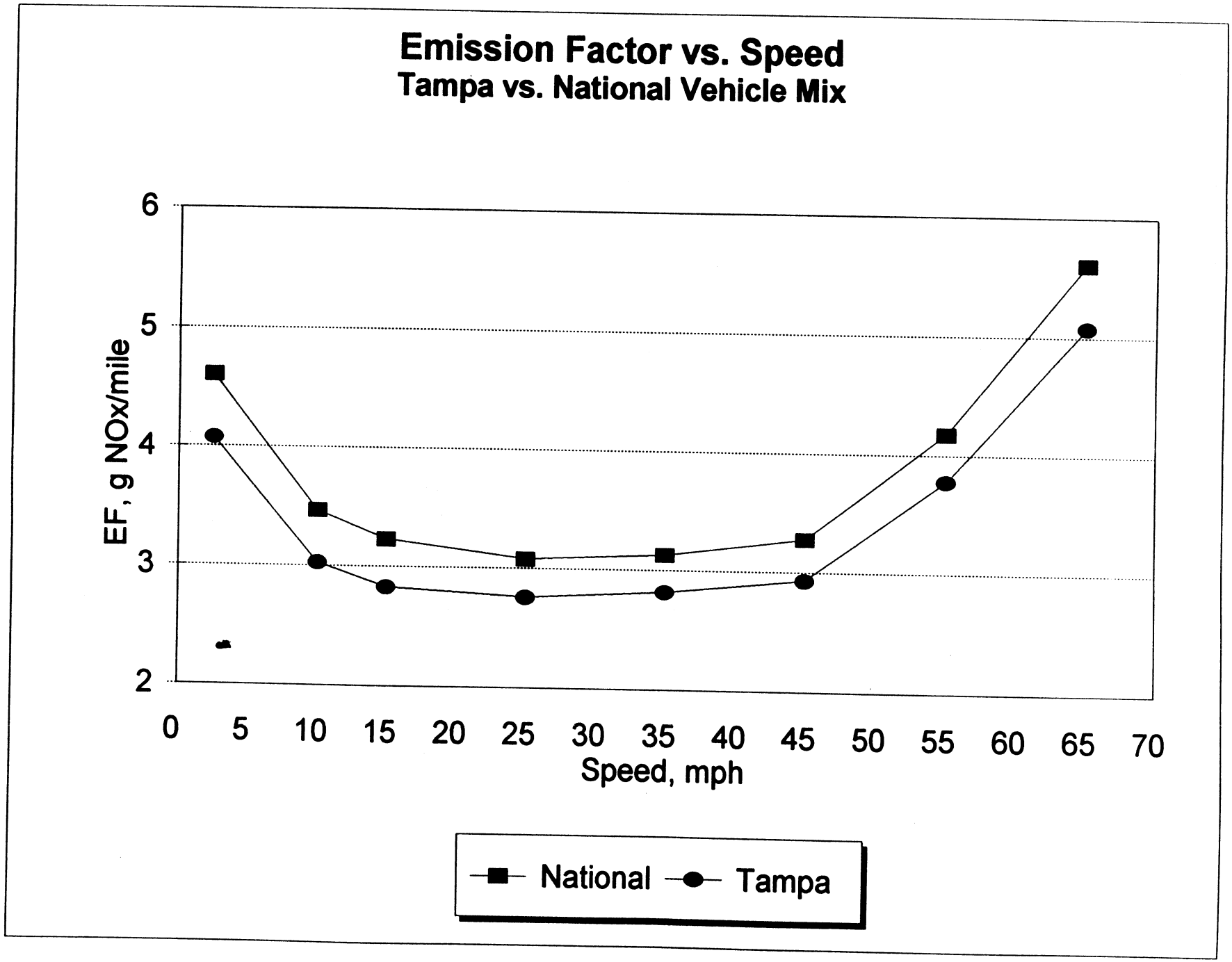

Emission Factor vs. Speed
Orlando vs. National Vehicle Mix
EF, g NOx/mile
2
3
4
5
6
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Speed, mph
National
Orlando

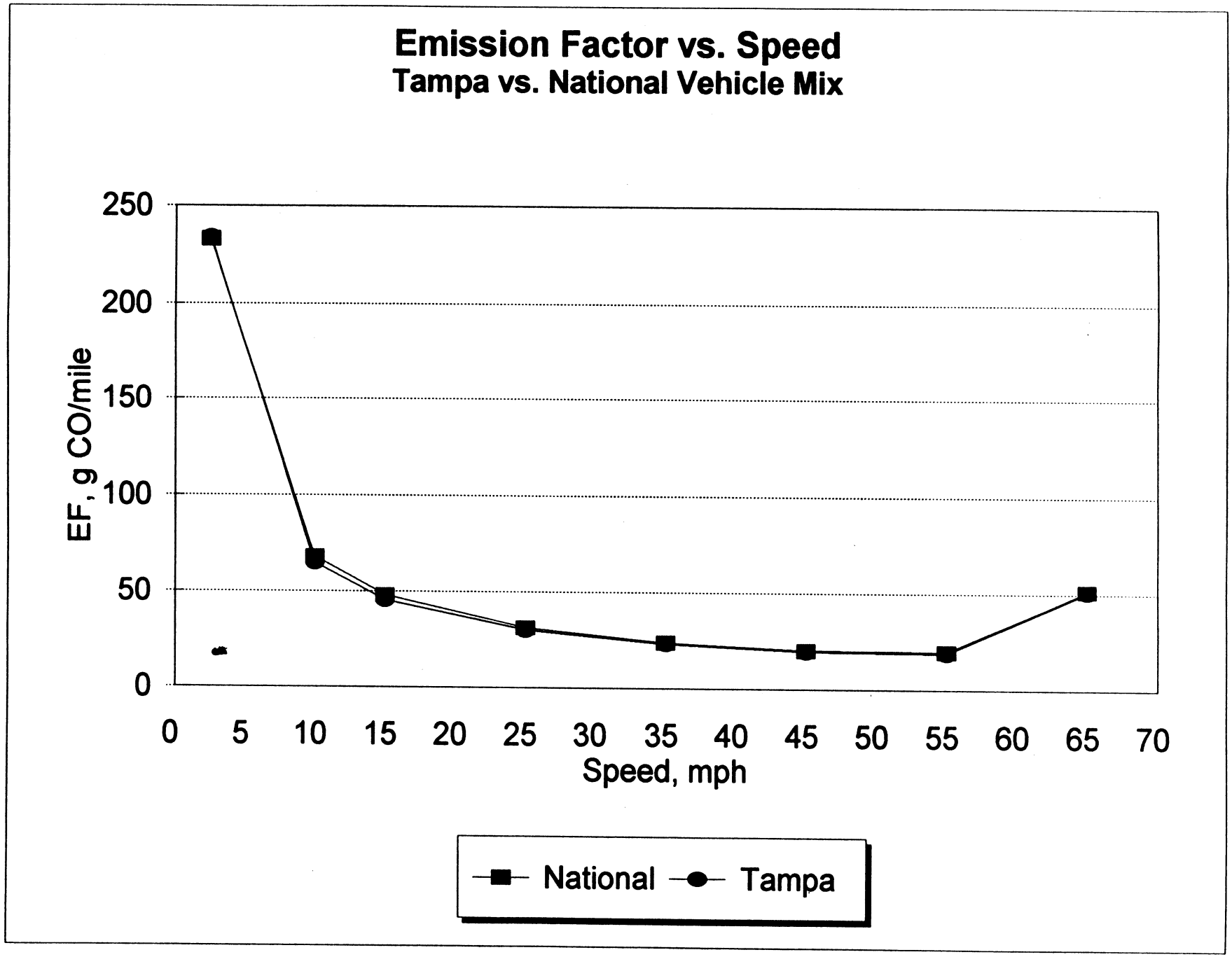

Emission Factor vs. Speed
Orlando vs. National Vehicle Mix
EF, g CO/mile
300
250
200
150
100
50
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Speed, mph
National
Orlando

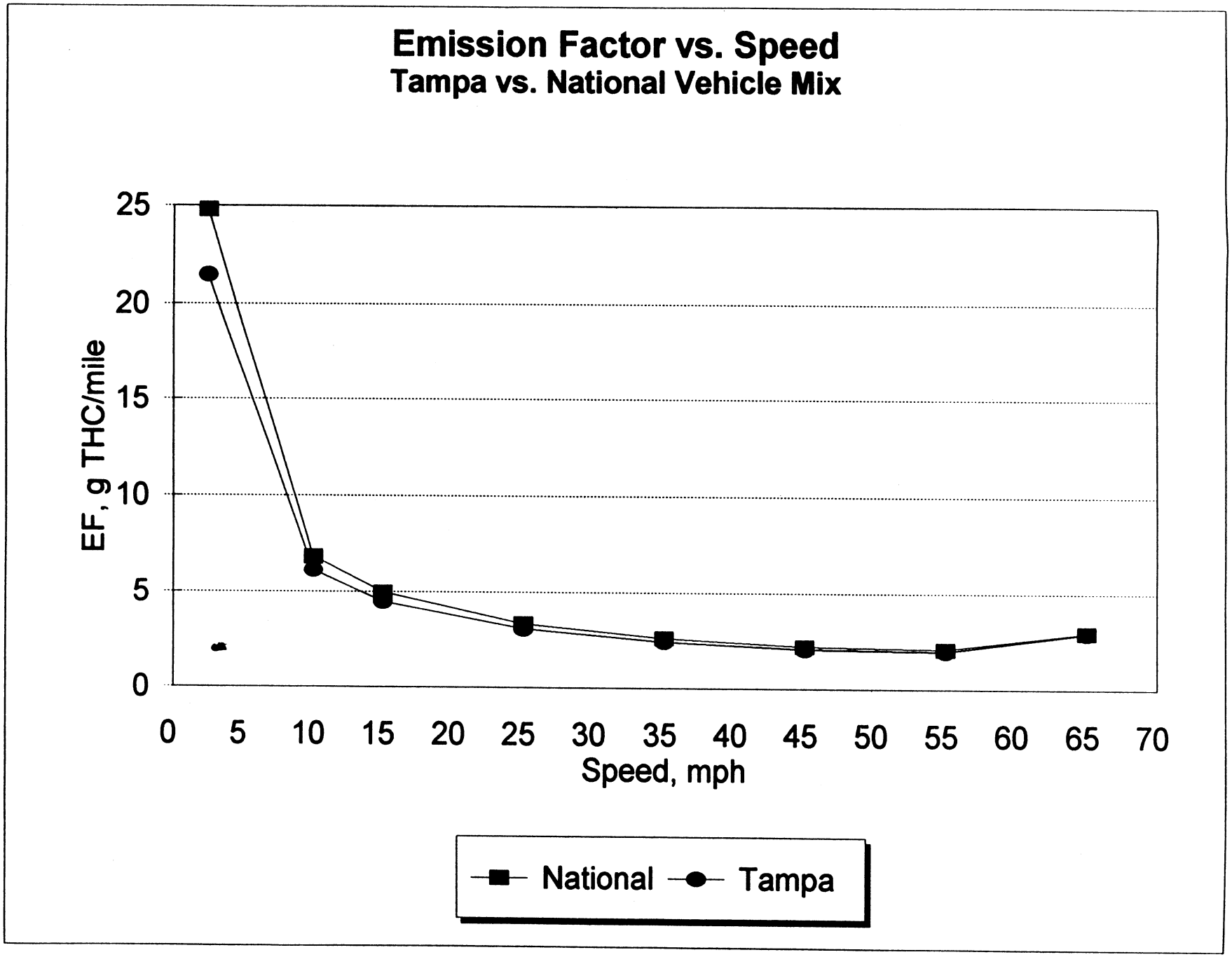

Emission Factor vs. Speed
Orlando vs. National Vehicle Mix
EF, g THC/mile
25
20
15
10
5
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Speed, mph
National
Orlando

COMPARISON TO DEFAULT VALUES

TAMPA SPECIFIC VALUES


Emission Factor vs. Speed
Tampa vs. National Vehicle Mix
EF, g NOx/mile
6
5
4
3
2
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Speed, mph
National
Tampa


Emission Factor vs. Speed
Tampa vs. National Vehicle Mix
EF, g CO/mile
250
200
150
100
50
0
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Speed, mph
National
Tampa


Emission Factor vs. Speed
Tampa vs. National Vehicle Mix
EF, g THC/mile
25
20
15
10
5
0
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70
Speed, mph
National
Tampa