# APPENDIX B

# TRAVEL DEMAND FORECASTING and AIR QUALITY CONFORMITY ANALYSIS METHODOLOGIES

**Supporting Documents**
**TRANPLAN Input and Output Files**
**Travel Demand Mode File Summary**
**Mobile 6.2 Input File**
**Mobile 6.2 Output Summary**
**AIRS Format Analyses for 2010, 2020 and 2030**
**Emissions Summary**

This appendix provides additional documentation regarding the travel demand forecasting and air quality conformity analysis procedures used in the update of the Dover/Kent MPO long range transportation plan. Included in the appendix are the following:

- Outline of steps completed in this analysis
- MOBILE 6.2 input files
- MOBILE 6.2 output files
- Sample of INTERNOC output & results
- A spreadsheet presenting HPMS and SIP adjustment factors for VMT
- TRANPLAN Job Control Input Statement Files for 2010, 2020, and 2030
- TRANPLAN network link coding data for 2010, 2020, and 2030 projects

**Outline of Steps:**

The following steps were completed in this conformity analysis:

**1. Travel Demand Modeling:**

One of the primary technical tools used in the systems evaluation phase of the overall transportation plan update project was a travel demand modeling process developed by DelDOT. The modeling process used in this air quality analysis used a 2002 base year network validated against 2002 traffic counts at key locations throughout Kent County. The general travel demand modeling approach used in this systems evaluation was based on a 1993 modeling validation, which was updated at the outset of this transportation plan update to reflect 2002 traffic conditions. For more information on the 1993 modeling validation refer to the report "Kent-Sussex Counties Travel Demand Model" prepared in November 1993 by Vanesse, Hangen, Brustlin (VHB, Boston, Massachusetts) for DelDOT's Division of Planning.

Travel demand models were developed for the years 2010, 2020, and 2030. The first step in that development was estimation of population and employment data to be used in the plan update. Those data were derived through the following steps:

a) Estimates of population and employment data at the traffic zone level were developed for each of those years by the University of Delaware's College of Urban Affairs and adopted by the Dover/Kent MPO in April, 2004.

b) The control totals for Kent County were subsequently updated in the Summer of 2004 by the Delaware Population Consortium and were deemed to be appropriate for this transportation plan.

c) The Dover/Kent MPO staff initiated a process to revise the traffic zone level data adopted in April, 2004 to reflect and account for the Summer, 2004 Delaware Population Consortium control totals for Kent County. This process occurred in the Fall of 2004 and culminated with the adoption of a set of population and employment data, at the traffic zone level, by the MPO Council on December 17, 2004.

Transportation network files in TRANPLAN format were also developed for each of the years 2010, 2020, and 2030. The process included coding highway improvements currently planned, funded and/or anticipated to be "in service" for each of those years, as well as coding certain proposed highway improvements.

The complete list of planned and proposed highway improvements recommended by this transportation plan and the assumed year each would be "in service" is included elsewhere in the plan. Note that the list of proposed highway improvements and in-service assumptions were developed for analytical purposes in evaluating the transportation plan. The list is a general guide as to the relative timing and priority of various projects, and is not intended to be a program of schedule projects and does not imply that funding has been committed to the planning or evaluation of any project.

Once demographic and highway network data were developed for each of the years, the travel demand model was run to estimate traffic volumes and speeds for each of the roadway segments included in the model network. The "No-Build" scenario for each of those years consisted of the 2002 existing conditions roadway network plus those projects currently under construction or already planned to be in place and open to traffic. The "Build" scenario for each year consisted of the "No-Build" network plus those projects proposed through this plan as identified in the appendix.

Included in this appendix is a subset list of those highway projects contained in this transportation plan which could be included in the travel demand model. Also shown are the network link coding data for specific projects for the 2010, 2020, and 2030 horizon years. The primary network link coding fields used to describe those projects are TIME1 which is "average travel time", a function of average link speeds and distances, and CAPACITY1 which is an estimate of 24-hour or "daily capacity" based on LOS E peak hour capacities.

The projects included in the list of proposals were developed through a series of model runs made to examine traffic volume, travel pattern, and "level of service" conditions for

2030. Note that the same population and employment estimates were used for both "No-Build" and "Build" scenarios for 2010, 2020, and 2030. In addition, the same travel demand modeling parameters such as trip generation rates, trip length distributions, etc. were used for all 2010, 2020, and 2030 scenarios.

The product of the travel demand modeling process was a "loaded network history file" for each analysis year in TRANPLAN proprietary FORTRAN format. This file contained the estimated traffic volumes and speeds on each roadway segment. Each year's file was converted to ASCII format for processing in the emissions estimation program, INTERNOC, described below.

**2. Emissions Factor Modeling:**

A MOBILE6.2 input file was developed for each of the following years: 2010, 2020, and 2030. MOBILE6.2 is the version of the EPA-developed software that must be used by air quality, transportation, and regional planning agencies to analyze air quality programs. The input files specified the types of required and planned mobile source emission reduction programs that are currently used or will be in place in each of those years. As submitted by DNREC to the EPA, each input file reflected strategies anticipated according to the State Implementation Plan (SIP) and its amendments. For example, a typical MOBILE6.2 input file would define county-specific atmospheric data, vehicle registrations by model year, and vehicle emissions testing programs (such as the "on-board diagnostics test" conducted in Kent County).

The product of the emissions modeling was an "emissions factor" file for each analysis year. This file included average emissions rates for VOC and NOx, for each one-mile per hour speed increment from 3 miles per hour to 65 miles per hour. (CO calculations were also produced but not used because Kent County is "in attainment" for that compound). Based on this emissions factor file and a traffic estimate for a given roadway segment, one could calculate the amount of emissions on each segment simply by multiplying the emissions rate by the traffic volume. For example:

Assume:

State Route A has 50,000 vehicles per day on a one-mile segment.
State Route A operates at 35 miles per hour, on average, in 2005.
The NOx emissions rate for 35 miles per hour, in 2005, is 1.45 grams per mile per day.

Emissions Calculation:

1. (50,000 vehicles) x (one mile segment) = 50,000 vehicle miles traveled (VMT)
2. (50,000 VMT) x (1.45 grams per mile) = 72,500 grams of NOx
3. 72,500 / 907200 grams per ton = *0.08 tons per day*.

The emissions factor file is important because VOC emission rates tend to decrease as average roadway speeds increase. NOx emissions, on the other hand, tend to increase as speeds increase. The file identifies a specific NOx and VOC emissions rate for each one-mile per hour speed increment.

Copies of the MOBILE6.2 input and output files for each analysis year are included in the appendix. The output files shown in this report were created using "80-column" print format for ease of reading (OUTFMT=3); the output files used in the actual analysis used "spreadsheet format" (OUTFMT=6) which is more easily read by computer programs.

### 3. Mobile Source Emissions:

A post-processing "linkage" program called INTERNOC was developed for the DelDOT's Division of Planning. The program multiplies the estimated volume on each segment of the roadway network (output from the travel demand model) by the appropriate emissions rate (output from the MOBILE6.2 program) corresponding to each segment's average speed. The program essentially performs the calculation shown in the above example, but does the calculation for each roadway segment included in a travel demand model's network coverage. The program also converted the "average daily traffic" produced by the travel demand model into "peak ozone season" or "summer traffic" levels by multiplying each roadway segment by a countywide seasonal adjustment factor.

The traffic volume on each segment of roadway in Kent County was multiplied by a seasonal adjustment factor. This was done for each analysis year. Once emissions for each segment were calculated they were summed to identify the county-wide totals presented in the plan document. The emissions for each roadway segment for each analysis year are shown in the appropriate "*.PLN" file included in the appendix. One such file was created for each separate analysis year.

> The first two columns in the "*.PLN" file identify the "A" and "B" nodes defining individual roadway segments. The third column shows the estimated vehicle miles traveled (VMT) for each segment; this is simply the estimated volume for each link segment multiplied by its length in miles. The fourth column included the average travel speed for each segment; this is the "loaded" speed referring to the average speed of travel with "all traffic" using the highway system. The last three columns in the right side of the page refer to the VOC, CO, and NOx emissions for each roadway segment. The last line of each file illustrates the county-wide sums for VMT, VOC, CO, and NOx for each analysis year.

**4. Perform SIP Adjustment Process:**

The appendix also includes a worksheet that shows how adjustment factors were calculated and applied to convert the raw seasonally adjusted VMT VOC, and NOx data for each year's modeling into numbers which could be directly compared to emissions data shown in Delaware's SIP documents for Kent County. The adjustment factors align the model outputs with DelDOT's Highway Performance Monitoring System (HPMS) which is an EPA requirement for mobile source air quality planning.

**5. Conduct Conformity Test:**

The conformity test involved a comparison of the NOx and VOC emissions for the "Build" scenarios for 2010, 2020, and 2030 to the allowable NOx and VOC emissions budgets as defined in Delaware's "Year 2005 Attainment Plan MOBILE6" SIP submitted by DNREC to the EPA.

The conformity rule under which this transportation plan was developed requires the "Build" scenario for each analysis year to generate emissions levels that are less than the emissions for 2005. Since this transportation plan meets those criteria it was determined to be in conformity with the SIP.

# TRANPLAN Network Link Coding Data for "Build" Projects

***Projects Added to 2005 Network to Create 2010 Build Network:***

| | Link | Base TIME1 | Base CAPACITY1 | Build TIME1 | Build CAPACITY1 |
|---|---|---|---|---|---|
| Complete Governors Avenue corridor and intersection improvements: | 2919-2842 | 112 | 4350 | 100 | 5000 |
| | 2842-2918 | 69 | 4350 | 62 | 5000 |
| | 2918-2975 | 182 | 4350 | 164 | 5000 |
| Complete Harrington Truck Route | 2757-3336 | - | - | 137 | 5100 |
| Upgrade College Road To an Urban Standard | 2938-2939 | 188 | 3560 | 170 | 4000 |
| Complete Carter Road Improvements from DE 300 to Sunnyside Road | 2859-3324 | 209 | 3750 | 190 | 4000 |
| Construct a Connector Road Between Garrison Tract and DE 8 | 2905-3217 | - | - | 91 | 5000 |

***Projects Added to 2010 Network to Create 2020 Build Network:***

| | Link | Base TIME1 | Base CAPACITY1 | Build TIME1 | Build CAPACITY1 |
|---|---|---|---|---|---|
| Complete Kenton Road Corridor Improvements | 3290-2942 | 69 | 4350 | 62 | 5000 |
| | 3290-2940 | 77 | 4350 | 69 | 5000 |
| | 3940-2939 | 10 | 5500 | 9 | 6000 |
| | 2939-3283 | 122 | 4350 | 110 | 5000 |
| Upgrade SR 36 west of US 113 | 2718-3074 | 292 | 4350 | 263 | 5000 |
| | 3074-3073 | 215 | 4350 | 194 | 5000 |
| Upgrade DE 14 from DE 15 to Church Street | 2762-2763 | 138 | 6500 | 124 | 7000 |
| | 2719-2763 | 87 | 6500 | 78 | 7000 |
| Upgrade DE 42 between Kenton Road and US 13 | 2876-2877 | 397 | 4140 | 357 | 5000 |
| | 2875-2876 | 239 | 3600 | 215 | 4000 |
| | 2730-2875 | 133 | 4040 | 120 | 4500 |
| | 2730-2874 | 59 | 4350 | 53 | 4600 |
| | 2607-2874 | 106 | 4040 | 96 | 4500 |

| | Link | Base TIME1 | Base CAPACITY1 | Build TIME1 | Build CAPACITY1 |
|---|---|---|---|---|---|
| Upgrade New Burton Road Between Wyoming and Dover | 2669-2686 | 52 | 4350 | 47 | 4600 |
| | 2686-2949 | 74 | 4350 | 67 | 4600 |
| | 2843-2949 | 60 | 5500 | 54 | 6000 |
| | 2843-2974 | 99 | 5500 | 89 | 6000 |
| | 2973-2974 | 129 | 5500 | 116 | 6000 |
| Construct West Dover Connector (Concept 5 Assumed) | 2951-3338 | - | - | 200 | 6000 |
| | 2338-3339 | - | - | 225 | 6500 |
| | 3339-3340 | - | - | 50 | 6000 |
| | 3339-3341 | - | - | 15 | 6000 |
| | 3341-3342 | - | - | 180 | 6000 |
| Upgrade DE 15 between DE 10 And DE 14 | 2977-3006 | 422 | 4350 | 380 | 5000 |
| | 3005-3006 | 73 | 4350 | 65 | 5000 |
| | 3004-3005 | 173 | 4350 | 155 | 5000 |
| | 2630-3004 | 104 | 4140 | 93 | 5000 |
| | 2630-3032 | 52 | 4350 | 47 | 5000 |
| | 3032-3034 | 116 | 4500 | 105 | 5000 |
| | 3034-3036 | 416 | 4500 | 375 | 5000 |
| | 3036-3037 | 250 | 4500 | 225 | 5000 |
| | 3037-3046 | 175 | 4500 | 158 | 5000 |
| | 3045-3046 | 536 | 4500 | 482 | 5000 |
| | 2762-3045 | 250 | 4500 | 225 | 5000 |
| Upgrade McKee Road/Saulsbury Road from Denny's Road to Lynnbury Woods Road | 2891-2892 | 130 | 3750 | 117 | 4000 |
| | 2874-2891 | 245 | 4040 | 220 | 4500 |
| Extend Crawford Carroll Avenue To DSU | 2913-3228 | - | - | 84 | 5000 |
| Construct Connection between Carter Road and SR 1 | 2811-3343 | - | - | 95 | 5000 |
| Upgrade Carpenter Bridge Road From Frederica to DE 15 | 3040-3046 | 349 | 3750 | 314 | 4000 |
| Upgrade Irish Hill Road from US 113A to US 13 | 2997-2998 | 668 | 4140 | 600 | 5000 |
| | 2998-2999 | 115 | 4140 | 103 | 5000 |
| | 2999-3038 | 258 | 4140 | 232 | 5000 |
| | 3033-3038 | 201 | 4140 | 180 | 5000 |
| | 3032-3033 | 31 | 4350 | 28 | 5000 |

***Projects Added to 2020 Network to Create 2030 Build Network:***

| | Base Link | Base TIME1 | Base CAPACITY1 | Build TIME1 | Build CAPACITY1 |
|---|---|---|---|---|---|
| Widen US 13 to 6 lanes from Smyrna to Dover | 2811-3325 | 30 | 16000 | 30 | 24000 |
| | 2605-3325 | 126 | 16000 | 126 | 24000 |
| | 2605-2606 | 174 | 16000 | 174 | 24000 |
| | 2606-2607 | 163 | 16000 | 163 | 24000 |
| | 2607-2608 | 201 | 16000 | 201 | 24000 |
| | 2608-2820 | 57 | 15860 | 57 | 24000 |
| Complete Conversion of SR 1 South of DAFB to limited Access highway. | 2990-3066 | 184 | 34780 | 184 | 38000 |
| | 2990-2995 | 80 | 16000 | 80 | 20000 |
| | 2995-2996 | 166 | 16000 | 166 | 20000 |
| | 2996-3044 | 280 | 16000 | 280 | 20000 |
| | 3043-3044 | 75 | 16000 | 75 | 20000 |
| | 2836-3043 | 201 | 16000 | 201 | 20000 |
| | 2723-2836 | 202 | 16000 | 202 | 20000 |
| | 2722-2723 | 289 | 16000 | 289 | 20000 |
| | 2722-3328 | 103 | 16000 | 103 | 20000 |
| | 2721-3328 | 156 | 16000 | 156 | 20000 |
| | 2721-3089 | 210 | 16000 | 210 | 20000 |
| | 2771-3089 | 221 | 16000 | 221 | 20000 |

U.S. Department
of Transportation

**Federal Transit Administration**
1760 Market Street
Suite 500
Philadelphia PA 19103

**Federal Highway Administration**
300 South New Street
Room 2101
Dover DE 19904

JUL 1 1 2005

Mr. Anthony J. DePrima
Chairman
Dover/Kent County Metropolitan Planning Organization
P.O. Box 383
Dover, Delaware 19903

Re: Air Quality Conformity Determination – Dover/Kent County Metropolitan Planning Organization's FY 2006-2008 TIP and 2030 Regional Transportation Plan

Dear Chairman DePrima:

The Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) have completed our review of the Dover/Kent County Metropolitan Planning Organization's (MPO) air quality conformity documentation for the FY 2006-2008 Transportation Improvement Program (TIP) and the new 2030 Regional Transportation Plan (RTP).

Based on the information provided with Ms. Juanita Wieczoreck's May 13, 2005, and June 1, 2005, letters, and in concurrence with the Environmental Protection Agency and the Delaware Department of Natural Resources and Environmental Control, FHWA and FTA have determined that the Conformity Determinations for the FY 2006-2008 TIP and the 2030 RTP for the Dover/Kent County non-attainment area adequately address and meet the requirements as specified in the November 1993 Federal Conformity Rule and its subsequent amendments. This action rescinds the conformity lapse issued June 15, 2005.

Any questions concerning this approval should be directed to Paul Lang, FHWA Delaware Division, 302-734-2835, or Anthony Tarone, FTA Region III, 215-656-7061.

Sincerely,

Susan Borinsky
Regional Administrator
Federal Transit Administration

Raymond J. McCormick
Division Administrator
Federal Highway Administration

cc: via e-mail:
Carolann Wicks, Chief Engineer, DelDOT
Ralph Reeb, Director, DelDOT Planning
Steven Kingsberry, Acting Director, Delaware Transit Corporation, DelDOT
Susan Borinsky, Regional Administrator, Region 3, FTA
Raymond J. McCormick, Division Administrator, FHWA
Kathy English, Director, DelDOT Finance
Earle Timpson, DelDOT Finance
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Interagency Air Quality Consultation Process Work Group:
Juanita Wieczoreck, Executive Director, Dover/Kent County MPO
Tigist Zegeye, Executive Director, WILMAPCO
Larry Budney, EPA Region III
Martin Kotsch, EPA Region III
Tony Tarone, FTA Region III
Paul Lang, DE Division, FHWA
Joe Cantalupo, DelDOT Planning
Mark Glaze, DelDOT Planning
Scott Clapper, DelDOT DMV
Ray Malenfant, DNREC
Phil Wheeler, DNREC
Tammy Popov-Ford, TMA of Delaware

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103

RECEIVED
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Mr Paul Lang
Federal Highway Administration
J. Allen Frear Federal Building
300 South New Street, Suite 2101
Dover, Delaware 19904-6726

JUN 09 2005

Dear Mr. Lang:

The U.S. Environmental Protection Agency (EPA) has reviewed the 8-hour ozone transportation conformity determinations for the FY 2006-2008 Transportation Improvement Programs and 2030 Regional Transportation Plan for Kent County Delaware submitted to us with your letter dated May 20, 2005. EPA reviewed the conformity determinations in accordance with the procedures and criteria of the Transportation Conformity Rule contained in 40 CFR Part 93, Sections 93.106, 93.108, 93.110, 93.111, 93.112, 93.113(b), 93.113(c), 93.118 and 93.119.

Our review of the conformity determinations for Kent County indicates that the determinations meet the requirements of the Clean Air Act and the applicable regulations promulgated thereunder at 40 CFR Part 93. Enclosed, please find EPA's detailed evaluations titled "Technical Support Document for Review of 8-Hour Ozone Conformity Determinations for the Kent County, Delaware FY 2006-2008 Transportation Improvement Program and 2030 Regional Transportation Plan".

If you have any questions, please contact Carol Febbo, Chief, Energy, Radiation, and Indoor Environment Branch, at 215-814-2076 or Martin Kotsch, at 215-814-3335.

Sincerely,

Judith M. Katz, Director
Air Protection Division

Enclosure

cc: Juanita Wieczoreck (Kent/Dover MPO) w\enclosure
Joe Cantaloupo (DelDOT) w\enclosure
Tony Tarone (FTA) w\enclosure
Ray Malenfant (DNREC) w\enclosure

*Customer Service Hotline: 1-800-438-2474*

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103

June 7, 2005

SUBJECT: Technical Support Document for Review of 8-Hour Ozone Conformity Determinations for the Kent County, Delaware FY 2006-2008 Transportation Improvement Program and 2030 Regional Transportation Plan

FROM: Martin Kotsch, (3AP23)

TO: Administrative Record of EPA's Review of 8-Hour Ozone Conformity Determinations for the Kent County, Delaware FY 2006-2008 Transportation Improvement Program and 2030 Regional Transportation Plan

THRU: Carol Febbo, Chief 6/7/05
Energy, Radiation and Indoor Environment Branch (3AP23)

The purpose of this document is to review 8-hour ozone transportation conformity determinations for the Kent County, Delaware FY 2006-2008 Transportation Improvement Program (TIP) and 2030 Regional Transportation Plan (Plan) and to determine whether or not the conformity determinations meet the requirements of the Clean Air Act and the applicable regulations promulgated thereunder at 40 C.F.R. Part 93. On May 24, 2005, EPA Region III received the Kent County conformity determinations for the Plan under a cover letter dated May 20, 2005 from the Delaware Division Office of the Federal Highway Administration (FHWA) and the TIP under a cover letter dated June 1, 2005. The conformity determinations were prepared by the Dover/Kent County Metropolitan Planning Organization (MPO). The conformity determinations were reviewed in accordance with the procedures and criteria of the Federal Transportation Conformity Rule, 40 CFR Part 93, Sections 93.106, 93.108, 93.110, 93.111, 93.112, 93.113(b), 93.113(c) and 93.118.

The Kent County area is a moderate 8-hour non-attainment area for ozone with the same geographical boundaries as its previous 1-hour non-attainment area. For the 8-hour conformity analysis, the 2005 Attainment SIP budgets for the 1-hour standard are applicable for use in the 8-hour conformity analysis per 93.109(e) of the conformity rule since there are no current adequate or approved 8-hour mobile budgets.

| EVALUATION OF CONFORMITY DETERMINATIONS FOR THE KENT COUNTY, DELAWARE TIP AND PLAN SUBMITTED TO EPA BY FHWA ON MAY 20, 2005 | | | |
|---|---|---|---|
| **GENERAL CRITERIA APPLICABLE TO BOTH PLAN AND TIP** | | | |
| SECTION of 40 CFR Part 93 | CRITERIA | Y/N | COMMENTS |
| 93.110 | Are the conformity determinations based upon the latest planning assumptions? | Y | |
| | (a) Are the conformity determinations, with respect to all other applicable criteria in §§93.111 - 93.119, based upon the most recent planning assumptions in force at the time of the conformity determinations? | Y | (a, b) The conformity determinations are based upon the latest planning assumptions in force and approved by the MPO at the time of the determinations. Year 2004 vehicle registration data were used in the analysis. The analyses utilized socio-economic data based upon the year 2000 U.S. Census demographic data and projected to each of the analysis years. |
| | (b) Are the assumptions derived from the estimates of current and future population, employment, travel, and congestion the most recently developed by the MPO or other designated agency? Are the conformity determinations based upon the latest assumptions about current and future background concentrations? | Y | |
| | (c) Are any changes in the transit operating policies (including fares and service levels) and assumed transit ridership since the previous conformity determination discussed? | Y | There have been no changes in any operating policies or assumptions for ridership since the last conformity determination. |
| | (d) The conformity determinations must include reasonable assumptions about transit service and increases in transit fares and road and bridge tolls over time. | Y | The conformity determinations included reasonable toll, transit service and fare assumptions. |
| | (e) The conformity determinations must use the latest existing information regarding the effectiveness of the TCMs and other implementation plan measures which have already been implemented. | N/A | There are no TCMs in the SIP. However, the following implementation plan measures were accounted for in the conformity analyses: the Federal Motor Vehicle Control Program (FMVCP), reformulated gas, Reed Vapor Pressure 7.8 psi for all analysis years, Stage II vapor recovery, I&M, On Board Diagnostics and anti-tampering programs. |

| | | | |
|---|---|---|---|
| | (f) Key assumptions will be specified and included in the draft documents and supporting materials used for the interagency and public consultation required by §93.105. | Y | Key assumptions have been included in the documents and supporting materials used for interagency and public consultation. They were included in the materials made available during the public review period.. |
| 93.111 | Are the conformity determinations based upon the latest emissions model? | Y | The conformity determinations were based upon emission factors developed using MOBILE6.2, the currently-approved EPA mobile emissions model. |
| 93.112 | Did the MPO make the conformity determinations according to the consultation procedures of the conformity rule or the state's conformity SIP? | Y | Consultation has occurred among all appropriate agencies. A public comment period was held from March 23 to April 27, 2005 on the Plan and from April 13 to May 13, 2005 on the TIP. No comments were received on the conformity determination. |

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| SPECIFIC CRITERIA APPLICABLE TO THE PLAN | | | |
|---|---|---|---|
| SECTION of 40 CFR Part 93 | CRITERIA | Y/N | COMMENTS |
| 93.106(a) (1) | Are the horizon years correct? | Y | The years 2010, 2020 and 2030 are appropriate horizon years. |
| 93.106(a) (2)(i) | Does the plan quantify and document the demographic and employment factors influencing transportation demand? | Y | Chapter 4 of the Plan discusses demographic and employment factors. |
| 93.106(a) (2)(ii) | Is the highway and transit system adequately described in terms of the regionally significant additions or modifications to the existing transportation network which is envisioned to be operational in the horizon years? | Y | The highway and transit system is adequately described in terms of regionally significant additions or modifications to the existing transportation network, which the transportation plan envisions to be operational in the horizon years. |
| 93.108 | Is the Transportation Plan fiscally constrained? | Y | EPA is deferring to the MPO and FHWA who have found the Plan to be fiscally constrained |
| 93.113(b) | Are TCMs being implemented in a timely manner? | N/A | There are no TCMs in the SIP. |
| 93.118 | For areas with SIP budgets:<br>Is the Transportation Plan, TIP or Project consistent with the motor vehicle emissions budget(s) in the applicable SIP? | Y | For Kent County, projected emissions for 2010, 2020 and 2030 are less than the 2005 Attainment SIP emission budgets (in parentheses) as shown below (all emissions in tons per day):<br>Year - VOC - NOx<br>2010 4.46 (5.14) 5.33 (8.42)<br>2020 2.60 (5.14) 2.01 (8.42)<br>2030 2.53 (5.14) 1.60 (8.42) |

| SPECIFIC CRITERIA APPLICABLE TO THE TIP | | | |
|---|---|---|---|
| SECTION of 40 CFR Part 93 | CRITERIA | Y/N | COMMENTS |
| 93.108 | Is the Transportation Improvement Program fiscally constrained? | Y | EPA is deferring to the MPO and FHWA who have found the TIP to be fiscally constrained |
| 93.113(c) | Are TCM's being implemented in a timely manner? | N/A | There are no TCMs in the SIP. |
| 93.118 | For areas with SIP budgets: Is the Transportation Plan, TIP or Project consistent with the motor vehicle emissions budget(s) in the applicable SIP? | Y | For Kent County, projected emissions for 2010, 2020 and 2030 are less than the 2005 Attainment SIP emission budgets (in parentheses) as shown below (all emissions in tons per day): Year VOC NOx 2010 4.46 (5.14) 5.33 (8.42) 2020 2.60 (5.14) 2.01 (8.42) 2030 2.53 (5.14) 1.60 (8.42) |

## CONCLUSION

Pursuant to FHWA's May 20, 2005 request, we have reviewed the Kent County, Delaware 8-hour ozone conformity determinations for the 2006-2008 TIP and 2030 Plan. We have determined that the TIP and Plan meet the requirements of the Clean Air Act and the applicable regulations promulgated thereunder at 40 C.F.R. Part 93.

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STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES
& ENVIRONMENTAL CONTROL
DIVISION OF AIR & WASTE MANAGEMENT
156 S. STATE STREET
DOVER, DELAWARE 19901

AIR QUALITY MANAGEMENT
SECTION

TELEPHONE: (302) 739 - 4791
FAX NO.: (302) 739 - 3106



April 27, 2005

Ms. Juanita Wieczoreck
Executive Director
Dover Kent Metropolitan Planning Organization
P.O. Box 383
Dover, Delaware 19903

Dear Ms. Wieczoreck:

This letter is to inform you that we have completed our review of the conformity analysis using the Mobile 6 model of the 2030 Dover Kent MPO Regional Transportation Plan and the 2006-2008 Transportation Improvement Program (TIP). Based on the information provided, the Plan and the TIP were found to be in conformance with the existing Delaware State Implementation Plan (SIP) through procedures prescribed by Gay MacGregor, Director, Regional and States Programs Division, Office of Mobile Sources, US EPA in a memo dated May 14, 1999, and Federal Highway Administration additional supplemental guidance dated June 18, 1999. I see no reason why this conformity analysis should not be deemed complete.

Thank you for your cooperation.

Sincerely,

Raymond H. Malenfant

Raymond H. Malenfant, P.E.
Program Manager
Planning and Community Protection

Cc: Ali Mirzakhalili, DNREC
Ronald Amirikian, DNREC
Philip Wheeler, DNREC
Michael DuRoss, DelDOT
Paul J. Lang, FHWA
Larry Budney, EPA Region III

*Delaware's good nature depends on you!*

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**Dover/Kent County Metropolitan Planning Organization**
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**RESOLUTION**

**ADOPTING THE AIR QUALITY CONFORMITY ANALYSIS FOR THE 2030 LONG-RANGE TRANSPORTATION PLAN**

**WHEREAS,** Kent County, Delaware has been designated as a moderate non-attainment area under the 8-hour National Ambient Air Quality Standards (NAAQS) for ozone by the US EPA with a designated attainment year of 2010, as required by the CAAA of 1990; and

**WHEREAS,** the DOVER/KENT COUNTY METROPOLITAN PLANNING ORGANIZATION (D/KC MPO) has been designated the Metropolitan Planning Organization for Kent County, Delaware by the Governor of Delaware; and

**WHEREAS,** the D/KC MPO is responsible for the development of transportation plans and programs in accordance with 23 U.S.C. 134 and Section 8 of the Federal Transit Act with the Delaware Department of Transportation (DelDOT); and

**WHEREAS,** the United States Department of Transportation (USDOT) Regulations on the Transportation Equity Act for the 21st Century (TEA-21) Metropolitan Planning Requirements require that the MPO, in cooperation with participants in the planning process, develop, and at least every three years update, the Long-Range Transportation Plan (LRTP); and

**WHEREAS,** the Transportation Conformity Rule requires an air quality conformity determination demonstrating conformity with the 8-hour NAAQS by June 15, 2005; and

**WHEREAS,** the emission projections outlined in this Analysis show Kent County at or below the mobile budgets defined in the current SIP for the defined milestone years of 2010, 2020 and 2030; and

**WHEREAS,** the Air Quality Conformity Analysis for the 2030 LRTP for Kent County, Delaware has undergone a 30-day public review and comment period.

**NOW, THEREFORE, BE IT RESOLVED** that the DOVER/KENT COUNTY METROPOLITAN PLANNING ORGANIZATION makes a determination that the 2030 LRTP is found to conform to the current Delaware State Implementation Plan (SIP).

5/11/05
Date:

Anthony DePrima, Chairperson
DOVER/KENT COUNTY
METROPOLITAN PLANNING ORGANIZATION

JSW:crs

# TRANPLAN Job Control Input Statement Files for 2030

```
$HIGHWAY SELECTED SUMMATION
$FILES
  INPUT FILE = HWYNET, USER ID=$U030BNET.DAT$
  INPUT FILE = TRNDATA, USER ID = $K25JTURN.PRN$
  OUTPUT FILE = HWYSKIM, USER ID=$T030SKM.DAT$
$HEADERS
    YEAR 2030 NETWORK T030 - WITHOUT TAZ 106/115 ADJ
    DK MPO PLAN UPDATE - BUILD HIGHWAY NETWORK RUN
          MARCH 7, 2005
$OPTION
  TURN FILE
$PARAMETERS
$DATA
  TABLE=TIME1
$END TP FUNCTION

$MATRIX UPDATE
$FILES
   INPUT FILE=UPDIN,  USER ID=$T030SKM.DAT$
  OUTPUT FILE=UPDOUT, USER ID=$T030SKMT.DAT$
$HEADERS
     NO BUILD NETWORK BASED ON W005BNET - ADD TERMINAL TIME TO O/D ZONES
$OPTIONS
  PRINT TRIP ENDS
$DATA
  ORIGIN, TIME 1,  1-63, +  50
  DESTINATION, TIME 1,  1-227, +  50
  ORIGIN, TIME 1, 64-87, + 100
  DESTINATION, TIME 1, 1-227, + 100
  ORIGIN, TIME 1, 88-227, +  50
  DESTINATION, TIME 1, 1-227, +  50
$END TP FUNCTION

$BUILD INTRAZONAL IMPEDANCES
$FILES
  INPUT FILE=IZIN, USER ID=$T030SKMT.DAT$
  OUTPUT FILE=IZOUT, USER ID=$T030INT.DAT$
$HEADERS
        NO BUILD NETWORK BASED ON W005BNET
$OPTION
  PRINT DETAIL
$PARAMETERS
  NUMBER OF ADJACENT ZONES=3
$END TP FUNCTION

$GRAVITY MODEL
$FILES
  INPUT FILE=GMSKIM, USER ID=$T030INT.DAT$
  OUTPUT FILE=GMVOL, USER ID=$T030IIA.DAT$
$HEADERS
          YEAR 2030 NO BUILD NETWORK RUN
$OPTIONS
```

```
  MERGED PURPOSE FILE
  PRINT TRIP ENDS
  PRINT TRIP LENGTH STATISTICS
$PARAMETERS
  MAXIMUM PURPOSE=3
  ITERATIONS ON ATTRACTIONS=3
$DATA
$INCLUDE GM0430_G.PRN
$INCLUDE GMIIFFKS.TP
$END TP FUNCTION

$MATRIX UPDATE
$FILES
          INPUT FILE = UPDIN, USER ID = $KSEI8525.DAT$
          OUTPUT FILE=UPDOUT, USER ID = $KSEI8530.DAT$
$HEADERS
          TRIP TABLE EXTRAPOLATION KENT & SUSSEX COUNTY
       2025 TOTAL EI TRIPS * 1.05
$OPTIONS
     PRINT TRIP ENDS
$DATA
          T1,1-227,1-227,*1.05
$END TP FUNCTION

$MATRIX UPDATE
$FILES
          INPUT FILE = UPDIN, USER ID = $KSEE8525.DAT$
          OUTPUT FILE=UPDOUT, USER ID = $KSEE8530.DAT$
$HEADERS
       NO BUILD NETWORK RUN FOR DK MPO PLAN UPDATE
          TRIP TABLE EXTRAPOLATION KENT & SUSSEX COUNTY
       2025 TOTAL EE TRIPS * 1.05
$OPTIONS
     PRINT TRIP ENDS
$DATA
          T1,1-227,1-227,*1.05
$END TP FUNCTION

$MATRIX UPDATE
$FILES
          INPUT FILE = UPDIN, USER ID = $KSTT8525.DAT$
          OUTPUT FILE=UPDOUT, USER ID = $KSTT8530.DAT$
$HEADERS
          NO BUILD NETWORK RUN FOR DK MPO PLAN UPDATE
          TRIP TABLE EXTRAPOLATION KENT & SUSSEX COUNTY
       2025 TOTAL TT TRIPS * 1.05
$OPTIONS
     PRINT TRIP ENDS
$DATA
          T1,1-227,1-227,*1.05
$END TP FUNCTION
```

```
$MATRIX MANIPULATE
$FILES
  INPUT FILE=TMAN1, USER ID=$T030IIA.DAT$
  INPUT FILE=TMAN2, USER ID=$KSEI8530.DAT$
  INPUT FILE=TMAN3, USER ID=$KSEE8530.DAT$
  INPUT FILE=TMAN4, USER ID=$KSTT8530.DAT$
  OUTPUT FILE=TMAN5, USER ID=$T030ATOT.DAT$
$HEADERS
      NETWORK W005BNET.DAT
      FOR ASSIGNMENT - AADT
      COMBINING ALL TRIP PURPOSES TOGETHER
$DATA
  TMAN5,T1=TMAN1,T1+TMAN1,T2+TMAN1,T3
        +TMAN2,T1+TMAN3,T1+TMAN4,T1
$END TP FUNCTION

$MATRIX TRANSPOSE
$FILES
  INPUT FILE=TRNSPIN, USER ID=$T030ATOT.DAT$
  OUTPUT FILE=TRNSPOT, USER ID=$T030ATRS.DAT$
$OPTIONS
  PRINT TRIP ENDS
$PARAMETERS
  SELECTED PURPOSES=1
$END TP FUNCTION

$MATRIX MANIPULATE
$FILES
  INPUT FILE=TMAN1,  USER ID=$T030ATOT.DAT$
  INPUT FILE=TMAN2,  USER ID=$T030ATRS.DAT$
  OUTPUT FILE=TMAN3, USER ID=$T030ACOM.DAT$
$HEADERS
      NETWORK W005BNET.DAT
          COMBINING TOTAL AND TRANSPOSE TRIP TABLES
      FOR MATRIX UPDATE
$DATA
  TMAN3,T1=TMAN1,T1+TMAN2,T1
$END TP FUNCTION

$MATRIX UPDATE
$FILES
  INPUT FILE=UPDIN, USER ID=$T030ACOM.DAT$
  OUTPUT FILE=UPDOUT, USER ID=$T030ALOD.DAT$
$HEADERS
          NETWORK W005BNET.DAT
      DIVIDING COMBINED TRIP TABLE BY 2
      FOR DAILY 24-HOUR ASSIGNMENT
$OPTIONS
  PRINT TRIP ENDS
$DATA
  T1,1-227,1-227,*0.5
$END TP FUNCTION
```

```
$EQUILIBRIUM HIGHWAY LOAD
$FILES
  INPUT FILE=HWYNET, USER ID=$U030BNET.DAT$
  INPUT FILE=HWYTRIP, USER ID=$T030ALOD.DAT$
  INPUT FILE=TRNDATA, USER ID=$K25JTURN.PRN$
  OUTPUT FILE=LODHIST, USER ID=$U030LNET.LOD$
$HEADERS
          KENT AND SUSSEX COUNTY NETWORK - W005BNET.DAT
       EQUILIBRIUM HIGHWAY LOAD - NO BUILD MODEL RUN
       YEAR 2030 AADT LOAD WITH TOLLS
$OPTIONS
  TURN FILE
$PARAMETERS
  EQUILIBRIUM ITERATIONS = 10
  EPS = 0.05
$END TP FUNCTION
```

Kent County Travel Demand Model File Summary

| Year | LOD File Name | Netcard File Name * |
|---|---|---|
| 2010 | U010LNET.LOD | KC10.TXT |
| 2020 | U020LNET.LOD | KC20.TXT |
| 2030 | U030LNET.LOD | KC30.TXT |

*Note: Travel Demand Model output files available upon request.

## 2010 MOBILE 6.2 Input File

```
MOBILE6 INPUT FILE :
* Mobile 6 Delaware Kent County Inputs according to previous m5b inputs and 2004 Registration Data
POLLUTANTS          : HC CO NOx
REPORT FILE         : KC10.out
RUN DATA

VMT FRACTIONS       :
0.4964 0.0630 0.2099 0.0825 0.0379 0.0356 0.0087 0.0035
0.0014 0.0045 0.0048 0.0087  0.0049 0.0034 0.0048 0.0300

REG DIST            : kcreg04.d

I/M PROGRAM         : 1 1991 2050 2 T/O 2500/IDLE
I/M MODEL YEARS     : 1 1981 1995
I/M VEHICLES        : 1 22222 11111111 1
I/M STRINGENCY      : 1 20.0
I/M COMPLIANCE      : 1 96.0
I/M WAIVER RATES    : 1 3.0 3.0
NO I/M TTC CREDITS : 1
I/M PROGRAM         : 2 1995 2050 2 T/O FP & GC
I/M STRINGENCY      : 2 20.0
I/M COMPLIANCE      : 2 96.0
I/M WAIVER RATES    : 2 0.0 0.0
I/M MODEL YEARS     : 2 1975 1995
I/M VEHICLES        : 2 22222 11111111 1
I/M PROGRAM         : 3 2002 2050 2 T/O OBD I/M
I/M MODEL YEARS     : 3 1996 2050
I/M VEHICLES        : 3 22222 11111111 1
I/M STRINGENCY      : 3 20.0
I/M COMPLIANCE      : 3 96.0
I/M WAIVER RATES    : 3 3.0 3.0
I/M GRACE PERIOD    : 3 5

ANTI-TAMPERING PROG:
95 75 05 22222 11111111 1 11 096. 12211112

MIN/MAX TEMPERATURE: 71. 96.
FUEL PROGRAM        : 2 N
FUEL RVP            : 8.1

*Freeway
SCENARIO RECORD     : Scenario Title : DE speed 65
> 2005 Speed 65 mph (Freeway)
* This text is for annotating this file and is otherwise ignored.
ABSOLUTE HUMIDITY   : 75.0
CALENDAR YEAR       : 2010
EVALUATION MONTH    : 7
ALTITUDE            : 1
AVERAGE SPEED       : 65 Freeway 92.0 0.0 0.0 8.0
```

**……..Continues to 2.7 MPH in 1 MPH increments.**

```
SCENARIO RECORD     : Scenario Title : DE speed 2.7
> 2005 Speed 2.7 mph (Freeway)
* This text is for annotating this file and is otherwise ignored.
ABSOLUTE HUMIDITY   : 75.0
CALENDAR YEAR       : 2010
EVALUATION MONTH    : 7
ALTITUDE            : 1
AVERAGE SPEED       : 2.7 Freeway 92.0 0.0 0.0 8.0


VMT FRACTIONS       :
0.4964 0.0630 0.2099 0.0825 0.0379 0.0356 0.0087 0.0035
0.0014 0.0045 0.0048 0.0087 0.0049 0.0034 0.0048 0.0300

REG DIST            : kcreg04.d

I/M PROGRAM         : 1 1991 2050 2 T/O 2500/IDLE
I/M MODEL YEARS     : 1 1981 1995
I/M VEHICLES        : 1 22222 11111111 1
I/M STRINGENCY      : 1 20.0
I/M COMPLIANCE      : 1 96.0
I/M WAIVER RATES    : 1 3.0 3.0
```

```
NO I/M TTC CREDITS : 1
I/M PROGRAM        : 2 1995 2050 2 T/O FP & GC
I/M STRINGENCY     : 2 20.0
I/M COMPLIANCE     : 2 96.0
I/M WAIVER RATES   : 2 0.0 0.0
I/M MODEL YEARS    : 2 1975 1995
I/M VEHICLES       : 2 22222 11111111 1
I/M PROGRAM        : 3 2002 2050 2 T/O OBD I/M
I/M MODEL YEARS    : 3 1996 2050
I/M VEHICLES       : 3 22222 11111111 1
I/M STRINGENCY     : 3 20.0
I/M COMPLIANCE     : 3 96.0
I/M WAIVER RATES   : 3 3.0 3.0
I/M GRACE PERIOD   : 3 5

ANTI-TAMPERING PROG:
95 75 05 22222 11111111 1 11 096. 12211112

MIN/MAX TEMPERATURE: 71. 96.
FUEL PROGRAM       : 2 N
FUEL RVP           : 8.1

SCENARIO RECORD    : Scenario Title : DE speed 65
> 2005 Speed 65 mph (Arterial)
* This text is for annotating this file and is otherwise ignored.
ABSOLUTE HUMIDITY  : 75.0
CALENDAR YEAR      : 2010
EVALUATION MONTH   : 7
ALTITUDE           : 1
AVERAGE SPEED      : 65 Arterial
```

**……..Continues to 2.5 MPH in 1 MPH increments.**

```
SCENARIO RECORD    : Scenario Title : DE speed 2.5
> 2005 Speed 2.5 mph (Arterial)
* This text is for annotating this file and is otherwise ignored.
ABSOLUTE HUMIDITY  : 75.0
CALENDAR YEAR      : 2010
EVALUATION MONTH   : 7
ALTITUDE           : 1
AVERAGE SPEED      : 2.5 Arterial

SCENARIO RECORD    : Scenario Title : DE speed 12.9
> 2005 Speed 12.9 mph (Local)
* This text is for annotating this file and is otherwise ignored.
ABSOLUTE HUMIDITY  : 75.0
CLOUD COVER        : 0.5
CALENDAR YEAR      : 2010
EVALUATION MONTH   : 7
ALTITUDE           : 1
AVERAGE SPEED      : 12.9 Local

END OF RUN         :
```

**Note: Same input file format used for analysis years 2020 and 2030.**

# 2010 MOBILE 6.2 Output

## Kent County 2010 Summer
## Mobile 6.2 Emission Factors

| Arterial | | | Freeway | | | Local | | |
|---|---|---|---|---|---|---|---|---|
| Vehicle Speed (mph) | **VOCs** Emission Factor (g/veh-mile) | **NOx** Emission Factor (g/veh-mile) | Vehicle Speed (mph) | **VOCs** Emission Factor (g/veh-mile) | **NOx** Emission Factor (g/veh-mile) | Vehicle Speed (mph) | **VOCs** Emission Factor (g/veh-mile) | **NOx** Emission Factor (g/veh-mile) |
| 2.5 | 4.63 | 1.63 | 2.7 | 4.32 | 1.59 | | | |
| 3 | 3.73 | 1.56 | 3 | 3.82 | 1.55 | | | |
| 4 | 2.60 | 1.48 | 4 | 2.69 | 1.47 | | | |
| 5 | 1.93 | 1.43 | 5 | 2.02 | 1.42 | | | |
| 6 | 1.67 | 1.34 | 6 | 1.67 | 1.33 | | | |
| 7 | 1.48 | 1.28 | 7 | 1.48 | 1.24 | | | |
| 8 | 1.35 | 1.23 | 8 | 1.34 | 1.18 | | | |
| 9 | 1.24 | 1.20 | 9 | 1.23 | 1.13 | | | |
| 10 | 1.15 | 1.17 | 10 | 1.14 | 1.09 | | | |
| 11 | 1.10 | 1.13 | 11 | 1.07 | 1.05 | | | |
| 12 | 1.05 | 1.09 | 12 | 1.02 | 1.01 | | | |
| 13 | 1.01 | 1.06 | 13 | 0.98 | 0.97 | 12.9 | 1.00 | 0.90 |
| 14 | 0.97 | 1.03 | 14 | 0.94 | 0.94 | | | |
| 15 | 0.94 | 1.01 | 15 | 0.91 | 0.91 | | | |
| 16 | 0.92 | 0.99 | 16 | 0.89 | 0.90 | | | |
| 17 | 0.89 | 0.97 | 17 | 0.87 | 0.89 | | | |
| 18 | 0.87 | 0.95 | 18 | 0.85 | 0.89 | | | |
| 19 | 0.85 | 0.94 | 19 | 0.83 | 0.88 | | | |
| 20 | 0.83 | 0.92 | 20 | 0.82 | 0.88 | | | |
| 21 | 0.82 | 0.91 | 21 | 0.81 | 0.87 | | | |
| 22 | 0.81 | 0.90 | 22 | 0.80 | 0.87 | | | |
| 23 | 0.79 | 0.89 | 23 | 0.79 | 0.87 | | | |
| 24 | 0.78 | 0.88 | 24 | 0.78 | 0.86 | | | |
| 25 | 0.77 | 0.87 | 25 | 0.77 | 0.86 | | | |
| 26 | 0.76 | 0.86 | 26 | 0.76 | 0.86 | | | |
| 27 | 0.75 | 0.86 | 27 | 0.75 | 0.86 | | | |
| 28 | 0.74 | 0.85 | 28 | 0.74 | 0.86 | | | |
| 29 | 0.74 | 0.84 | 29 | 0.74 | 0.85 | | | |
| 30 | 0.73 | 0.84 | 30 | 0.73 | 0.85 | | | |
| 31 | 0.72 | 0.84 | 31 | 0.73 | 0.85 | | | |
| 32 | 0.72 | 0.83 | 32 | 0.72 | 0.85 | | | |
| 33 | 0.71 | 0.83 | 33 | 0.71 | 0.85 | | | |
| 34 | 0.70 | 0.83 | 34 | 0.71 | 0.85 | | | |
| 35 | 0.70 | 0.83 | 35 | 0.70 | 0.85 | | | |
| 36 | 0.69 | 0.83 | 36 | 0.70 | 0.85 | | | |
| 37 | 0.69 | 0.83 | 37 | 0.69 | 0.86 | | | |
| 38 | 0.69 | 0.84 | 38 | 0.69 | 0.86 | | | |
| 39 | 0.68 | 0.84 | 39 | 0.69 | 0.86 | | | |
| 40 | 0.68 | 0.84 | 40 | 0.68 | 0.86 | | | |
| 41 | 0.68 | 0.85 | 41 | 0.68 | 0.87 | | | |
| 42 | 0.67 | 0.85 | 42 | 0.68 | 0.88 | | | |
| 43 | 0.67 | 0.86 | 43 | 0.67 | 0.88 | | | |
| 44 | 0.67 | 0.86 | 44 | 0.67 | 0.89 | | | |
| 45 | 0.66 | 0.87 | 45 | 0.67 | 0.89 | | | |
| 46 | 0.66 | 0.87 | 46 | 0.66 | 0.90 | | | |
| 47 | 0.66 | 0.88 | 47 | 0.66 | 0.91 | | | |
| 48 | 0.66 | 0.89 | 48 | 0.66 | 0.92 | | | |
| 49 | 0.65 | 0.90 | 49 | 0.66 | 0.93 | | | |
| 50 | 0.65 | 0.90 | 50 | 0.65 | 0.94 | | | |
| 51 | 0.65 | 0.91 | 51 | 0.65 | 0.95 | | | |
| 52 | 0.65 | 0.93 | 52 | 0.65 | 0.96 | | | |
| 53 | 0.64 | 0.94 | 53 | 0.65 | 0.98 | | | |
| 54 | 0.64 | 0.95 | 54 | 0.65 | 0.99 | | | |
| 55 | 0.64 | 0.96 | 55 | 0.65 | 1.01 | | | |
| 56 | 0.64 | 0.97 | 56 | 0.65 | 1.02 | | | |
| 57 | 0.64 | 0.99 | 57 | 0.65 | 1.04 | | | |
| 58 | 0.64 | 1.00 | 58 | 0.65 | 1.06 | | | |
| 59 | 0.64 | 1.01 | 59 | 0.65 | 1.09 | | | |
| 60 | 0.64 | 1.03 | 60 | 0.66 | 1.11 | | | |
| 61 | 0.64 | 1.05 | 60.7 | 0.66 | 1.12 | | | |
| 62 | 0.65 | 1.07 | | | | | | |
| 63 | 0.65 | 1.09 | | | | | | |
| 64 | 0.65 | 1.11 | | | | | | |
| 65 | 0.65 | 1.12 | | | | | | |

NOTE: Emission factors were calculated by MOBILE6.2 and represent a composite vehicle type during summer conditions.

# 2020 MOBILE 6.2 Output

## Kent County 2020 Summer
## Mobile 6.2 Emission Factors

| Arterial | | | Freeway | | | Local | | |
|---|---|---|---|---|---|---|---|---|
| Vehicle Speed (mph) | **VOCs** Emission Factor (g/veh-mile) | **NOx** Emission Factor (g/veh-mile) | Vehicle Speed (mph) | **VOCs** Emission Factor (g/veh-mile) | **NOx** Emission Factor (g/veh-mile) | Vehicle Speed (mph) | **VOCs** Emission Factor (g/veh-mile) | **NOx** Emission Factor (g/veh-mile) |
| 2.5 | 2.42 | 0.57 | 2.7 | 2.26 | 0.56 | | | |
| 3 | 1.96 | 0.55 | 3 | 2.01 | 0.54 | | | |
| 4 | 1.39 | 0.52 | 4 | 1.43 | 0.51 | | | |
| 5 | 1.04 | 0.50 | 5 | 1.09 | 0.49 | | | |
| 6 | 0.90 | 0.47 | 6 | 0.90 | 0.46 | | | |
| 7 | 0.80 | 0.44 | 7 | 0.80 | 0.43 | | | |
| 8 | 0.73 | 0.43 | 8 | 0.72 | 0.40 | | | |
| 9 | 0.67 | 0.41 | 9 | 0.66 | 0.38 | | | |
| 10 | 0.62 | 0.40 | 10 | 0.61 | 0.37 | | | |
| 11 | 0.59 | 0.39 | 11 | 0.57 | 0.35 | | | |
| 12 | 0.56 | 0.37 | 12 | 0.55 | 0.34 | | | |
| 13 | 0.54 | 0.36 | 13 | 0.52 | 0.32 | 12.9 | 0.54 | 0.31 |
| 14 | 0.52 | 0.35 | 14 | 0.50 | 0.31 | | | |
| 15 | 0.50 | 0.35 | 15 | 0.49 | 0.30 | | | |
| 16 | 0.49 | 0.34 | 16 | 0.47 | 0.30 | | | |
| 17 | 0.47 | 0.33 | 17 | 0.46 | 0.29 | | | |
| 18 | 0.46 | 0.33 | 18 | 0.45 | 0.29 | | | |
| 19 | 0.45 | 0.32 | 19 | 0.44 | 0.29 | | | |
| 20 | 0.44 | 0.32 | 20 | 0.43 | 0.29 | | | |
| 21 | 0.43 | 0.31 | 21 | 0.42 | 0.29 | | | |
| 22 | 0.42 | 0.31 | 22 | 0.42 | 0.29 | | | |
| 23 | 0.42 | 0.30 | 23 | 0.41 | 0.29 | | | |
| 24 | 0.41 | 0.30 | 24 | 0.41 | 0.29 | | | |
| 25 | 0.40 | 0.30 | 25 | 0.40 | 0.29 | | | |
| 26 | 0.40 | 0.30 | 26 | 0.40 | 0.29 | | | |
| 27 | 0.39 | 0.29 | 27 | 0.39 | 0.29 | | | |
| 28 | 0.39 | 0.29 | 28 | 0.39 | 0.29 | | | |
| 29 | 0.38 | 0.29 | 29 | 0.38 | 0.29 | | | |
| 30 | 0.38 | 0.29 | 30 | 0.38 | 0.29 | | | |
| 31 | 0.37 | 0.29 | 31 | 0.37 | 0.29 | | | |
| 32 | 0.37 | 0.29 | 32 | 0.37 | 0.29 | | | |
| 33 | 0.37 | 0.29 | 33 | 0.37 | 0.29 | | | |
| 34 | 0.36 | 0.28 | 34 | 0.36 | 0.29 | | | |
| 35 | 0.36 | 0.28 | 35 | 0.36 | 0.29 | | | |
| 36 | 0.36 | 0.29 | 36 | 0.36 | 0.29 | | | |
| 37 | 0.36 | 0.29 | 37 | 0.36 | 0.29 | | | |
| 38 | 0.35 | 0.29 | 38 | 0.35 | 0.29 | | | |
| 39 | 0.35 | 0.29 | 39 | 0.35 | 0.29 | | | |
| 40 | 0.35 | 0.29 | 40 | 0.35 | 0.29 | | | |
| 41 | 0.35 | 0.29 | 41 | 0.35 | 0.30 | | | |
| 42 | 0.35 | 0.29 | 42 | 0.35 | 0.30 | | | |
| 43 | 0.34 | 0.29 | 43 | 0.34 | 0.30 | | | |
| 44 | 0.34 | 0.30 | 44 | 0.34 | 0.30 | | | |
| 45 | 0.34 | 0.30 | 45 | 0.34 | 0.30 | | | |
| 46 | 0.34 | 0.30 | 46 | 0.34 | 0.31 | | | |
| 47 | 0.34 | 0.30 | 47 | 0.34 | 0.31 | | | |
| 48 | 0.34 | 0.30 | 48 | 0.34 | 0.31 | | | |
| 49 | 0.34 | 0.31 | 49 | 0.34 | 0.31 | | | |
| 50 | 0.33 | 0.31 | 50 | 0.34 | 0.32 | | | |
| 51 | 0.33 | 0.31 | 51 | 0.33 | 0.32 | | | |
| 52 | 0.33 | 0.32 | 52 | 0.33 | 0.32 | | | |
| 53 | 0.33 | 0.32 | 53 | 0.33 | 0.33 | | | |
| 54 | 0.33 | 0.32 | 54 | 0.34 | 0.33 | | | |
| 55 | 0.33 | 0.33 | 55 | 0.34 | 0.34 | | | |
| 56 | 0.33 | 0.33 | 56 | 0.34 | 0.34 | | | |
| 57 | 0.33 | 0.33 | 57 | 0.34 | 0.35 | | | |
| 58 | 0.34 | 0.34 | 58 | 0.34 | 0.35 | | | |
| 59 | 0.34 | 0.34 | 59 | 0.35 | 0.36 | | | |
| 60 | 0.34 | 0.35 | 60 | 0.35 | 0.37 | | | |
| 61 | 0.34 | 0.35 | 60.7 | 0.35 | 0.37 | | | |
| 62 | 0.34 | 0.36 | | | | | | |
| 63 | 0.34 | 0.36 | | | | | | |
| 64 | 0.35 | 0.37 | | | | | | |
| 65 | 0.35 | 0.37 | | | | | | |

NOTE: Emission factors were calculated by MOBILE6.2 and represent a composite vehicle type during summer conditions.

# 2030 MOBILE 6.2 Output

## Kent County 2030 Summer
## Mobile 6.2 Emission Factors

| Arterial | | | Freeway | | | Local | | |
|---|---|---|---|---|---|---|---|---|
| Vehicle Speed (mph) | **VOCs** Emission Factor (g/veh-mile) | **NOx** Emission Factor (g/veh-mile) | Vehicle Speed (mph) | **VOCs** Emission Factor (g/veh-mile) | **NOx** Emission Factor (g/veh-mile) | Vehicle Speed (mph) | **VOCs** Emission Factor (g/veh-mile) | **NOx** Emission Factor (g/veh-mile) |
| 2.5 | 2.26 | 0.42 | 2.7 | 2.11 | 0.40 | | | |
| 3 | 1.83 | 0.40 | 3 | 1.86 | 0.39 | | | |
| 4 | 1.28 | 0.37 | 4 | 1.32 | 0.37 | | | |
| 5 | 0.95 | 0.36 | 5 | 0.99 | 0.35 | | | |
| 6 | 0.82 | 0.34 | 6 | 0.82 | 0.33 | | | |
| 7 | 0.72 | 0.32 | 7 | 0.72 | 0.30 | | | |
| 8 | 0.65 | 0.31 | 8 | 0.65 | 0.28 | | | |
| 9 | 0.60 | 0.30 | 9 | 0.59 | 0.27 | | | |
| 10 | 0.55 | 0.29 | 10 | 0.54 | 0.25 | | | |
| 11 | 0.52 | 0.28 | 11 | 0.51 | 0.24 | | | |
| 12 | 0.50 | 0.27 | 12 | 0.48 | 0.23 | | | |
| 13 | 0.48 | 0.26 | 13 | 0.46 | 0.22 | 12.9 | 0.47 | 0.21 |
| 14 | 0.46 | 0.25 | 14 | 0.44 | 0.21 | | | |
| 15 | 0.44 | 0.24 | 15 | 0.43 | 0.21 | | | |
| 16 | 0.43 | 0.24 | 16 | 0.41 | 0.20 | | | |
| 17 | 0.41 | 0.23 | 17 | 0.40 | 0.20 | | | |
| 18 | 0.40 | 0.23 | 18 | 0.39 | 0.20 | | | |
| 19 | 0.39 | 0.23 | 19 | 0.38 | 0.20 | | | |
| 20 | 0.38 | 0.22 | 20 | 0.37 | 0.20 | | | |
| 21 | 0.37 | 0.22 | 21 | 0.37 | 0.20 | | | |
| 22 | 0.37 | 0.22 | 22 | 0.36 | 0.20 | | | |
| 23 | 0.36 | 0.21 | 23 | 0.35 | 0.20 | | | |
| 24 | 0.35 | 0.21 | 24 | 0.35 | 0.20 | | | |
| 25 | 0.35 | 0.21 | 25 | 0.34 | 0.20 | | | |
| 26 | 0.34 | 0.21 | 26 | 0.34 | 0.20 | | | |
| 27 | 0.34 | 0.21 | 27 | 0.33 | 0.20 | | | |
| 28 | 0.33 | 0.21 | 28 | 0.33 | 0.20 | | | |
| 29 | 0.33 | 0.20 | 29 | 0.33 | 0.20 | | | |
| 30 | 0.32 | 0.20 | 30 | 0.32 | 0.20 | | | |
| 31 | 0.32 | 0.20 | 31 | 0.32 | 0.20 | | | |
| 32 | 0.32 | 0.20 | 32 | 0.32 | 0.20 | | | |
| 33 | 0.31 | 0.20 | 33 | 0.31 | 0.20 | | | |
| 34 | 0.31 | 0.20 | 34 | 0.31 | 0.20 | | | |
| 35 | 0.31 | 0.20 | 35 | 0.31 | 0.20 | | | |
| 36 | 0.30 | 0.20 | 36 | 0.30 | 0.20 | | | |
| 37 | 0.30 | 0.20 | 37 | 0.30 | 0.20 | | | |
| 38 | 0.30 | 0.20 | 38 | 0.30 | 0.20 | | | |
| 39 | 0.30 | 0.20 | 39 | 0.30 | 0.20 | | | |
| 40 | 0.30 | 0.20 | 40 | 0.30 | 0.20 | | | |
| 41 | 0.29 | 0.20 | 41 | 0.29 | 0.21 | | | |
| 42 | 0.29 | 0.20 | 42 | 0.29 | 0.21 | | | |
| 43 | 0.29 | 0.21 | 43 | 0.29 | 0.21 | | | |
| 44 | 0.29 | 0.21 | 44 | 0.29 | 0.21 | | | |
| 45 | 0.29 | 0.21 | 45 | 0.29 | 0.21 | | | |
| 46 | 0.29 | 0.21 | 46 | 0.29 | 0.21 | | | |
| 47 | 0.28 | 0.21 | 47 | 0.29 | 0.21 | | | |
| 48 | 0.28 | 0.21 | 48 | 0.28 | 0.21 | | | |
| 49 | 0.28 | 0.21 | 49 | 0.28 | 0.22 | | | |
| 50 | 0.28 | 0.21 | 50 | 0.28 | 0.22 | | | |
| 51 | 0.28 | 0.22 | 51 | 0.28 | 0.22 | | | |
| 52 | 0.28 | 0.22 | 52 | 0.28 | 0.22 | | | |
| 53 | 0.28 | 0.22 | 53 | 0.28 | 0.23 | | | |
| 54 | 0.28 | 0.22 | 54 | 0.28 | 0.23 | | | |
| 55 | 0.28 | 0.22 | 55 | 0.29 | 0.23 | | | |
| 56 | 0.28 | 0.23 | 56 | 0.29 | 0.23 | | | |
| 57 | 0.28 | 0.23 | 57 | 0.29 | 0.24 | | | |
| 58 | 0.28 | 0.23 | 58 | 0.29 | 0.24 | | | |
| 59 | 0.28 | 0.23 | 59 | 0.29 | 0.24 | | | |
| 60 | 0.29 | 0.24 | 60 | 0.30 | 0.25 | | | |
| 61 | 0.29 | 0.24 | 60.7 | 0.30 | 0.25 | | | |
| 62 | 0.29 | 0.24 | | | | | | |
| 63 | 0.29 | 0.25 | | | | | | |
| 64 | 0.29 | 0.25 | | | | | | |
| 65 | 0.30 | 0.25 | | | | | | |

NOTE: Emission factors were calculated by MOBILE6.2 and represent a composite vehicle type during summer conditions.

# Table: 1

## VEHICLE MILES OF TRAVEL

## Kent County

| Functional Class | Network Model Output | HPMS & Seasonal Factor Adjusted |
|---|---|---|
| *Interstate-Rural* | 0 | 0 |
| *Other PA-Rural* | 1,591,655 | 1,351,315 |
| *Minor Art. -Rural* | 376,928 | 471,536 |
| *Major Coll.-Rural* | 696,953 | 540,836 |
| *Minor Coll.-Rural* | 24,231 | 66,586 |
| *Local-Rural* | 104,620 | 589,322 |
| *Interstate-Urban* | 0 | 0 |
| *Other F/E-Urban* | 224,302 | 317,164 |
| *Other PA-Urban* | 110,468 | 430,604 |
| *Minor Art.-Urban* | 450,051 | 927,555 |
| *Collector-Urban* | 88,400 | 330,615 |
| *Local-Urban* | 13,979 | 346,014 |
| **Total** | **3,681,585** | **5,371,546** |

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Table: 5

## Total Volatile Organic Compound Emissions(grams/day)

## Kent County

| Functional Class | LDGV | LDGT1 | LDGT2 | HDGV | LDDV | LDDT | HDDV | MC | Total |
|---|---|---|---|---|---|---|---|---|---|
| Interstate-Rural | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other PA-Rural | 412,663 | 218,065 | 99,083 | 29,519 | 96 | 645 | 29,519 | 132,723 | 908,301 |
| Minor Art. -Rural | 148,305 | 77,972 | 35,472 | 10,816 | 35 | 239 | 10,816 | 45,586 | 324,376 |
| Major Coll.-Rural | 173,978 | 91,183 | 41,500 | 12,842 | 42 | 284 | 12,842 | 53,103 | 380,117 |
| Minor Coll.-Rural | 21,510 | 11,270 | 5,130 | 1,603 | 5 | 36 | 1,603 | 6,584 | 47,053 |
| Local-Rural | 267,166 | 137,506 | 62,974 | 25,355 | 78 | 554 | 25,355 | 81,680 | 592,426 |
| Interstate-Urban | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other F/E-Urban | 92,872 | 49,458 | 22,423 | 6,506 | 21 | 142 | 6,506 | 34,515 | 209,187 |
| Other PA-Urban | 138,521 | 72,543 | 33,011 | 10,294 | 34 | 230 | 10,294 | 42,474 | 302,992 |
| Minor Art.-Urban | 312,028 | 162,858 | 74,175 | 24,051 | 79 | 539 | 24,051 | 95,592 | 683,625 |
| Collector-Urban | 114,955 | 59,868 | 27,292 | 9,119 | 30 | 205 | 9,119 | 35,204 | 252,257 |
| Local-Urban | 156,863 | 80,735 | 36,975 | 14,887 | 46 | 325 | 14,887 | 47,958 | 347,836 |
| **Total** | **1,838,861** | **961,459** | **438,036** | **144,991** | **465** | **3,199** | **85,740** | **575,418** | **4,048,170** |
| **Total (in Tons)** | **2.03** | **1.06** | **0.48** | **0.16** | **0.00** | **0.00** | **0.09** | **0.63** | **4.46** |

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# Table: 6

## Total Nitrogen Oxide Emissions(grams/day)

## Kent County

| Functional Class | LDGV | LDGT1 | LDGT2 | HDGV | LDDV | LDDT | HDDV | MC | Total |
|---|---|---|---|---|---|---|---|---|---|
| Interstate-Rural | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other PA-Rural | 357,786 | 227,418 | 123,658 | 91,225 | 261 | 1,425 | 91,225 | 53,842 | 1,246,051 |
| Minor Art. -Rural | 123,846 | 78,053 | 42,584 | 30,330 | 79 | 432 | 30,330 | 17,338 | 410,939 |
| Major Coll.-Rural | 142,351 | 89,313 | 48,793 | 34,079 | 88 | 477 | 34,079 | 19,344 | 464,944 |
| Minor Coll.-Rural | 17,594 | 11,011 | 6,018 | 4,156 | 11 | 59 | 4,156 | 2,361 | 57,258 |
| Local-Rural | 160,767 | 96,174 | 52,630 | 29,961 | 122 | 666 | 29,961 | 16,972 | 533,269 |
| Interstate-Urban | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other F/E-Urban | 87,309 | 56,235 | 30,409 | 23,251 | 84 | 459 | 23,251 | 15,050 | 344,035 |
| Other PA-Urban | 111,850 | 70,097 | 38,368 | 26,685 | 68 | 372 | 26,685 | 15,300 | 364,318 |
| Minor Art.-Urban | 250,617 | 155,317 | 84,955 | 56,063 | 151 | 822 | 56,063 | 32,053 | 804,863 |
| Collector-Urban | 92,169 | 56,638 | 30,970 | 19,584 | 55 | 300 | 19,584 | 11,145 | 292,983 |
| Local-Urban | 94,393 | 56,467 | 30,901 | 17,591 | 72 | 391 | 17,591 | 9,965 | 313,103 |
| **Total** | **1,438,682** | **896,723** | **489,286** | **332,925** | **991** | **5,404** | **1,474,381** | **193,371** | **4,831,765** |
| **Total (in Tons)** | **1.59** | **0.99** | **0.54** | **0.37** | **0.00** | **0.01** | **1.63** | **0.21** | **5.33** |

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# Table: 1

## VEHICLE MILES OF TRAVEL

## Kent County

| Functional Class | Network Model Output | HPMS & Seasonal Factor Adjusted |
|---|---|---|
| *Interstate-Rural* | 0 | 0 |
| *Other PA-Rural* | 1,699,737 | 1,443,077 |
| *Minor Art. -Rural* | 404,565 | 506,111 |
| *Major Coll.-Rural* | 810,115 | 628,650 |
| *Minor Coll.-Rural* | 26,198 | 71,991 |
| *Local-Rural* | 109,907 | 619,105 |
| *Interstate-Urban* | 0 | 0 |
| *Other F/E-Urban* | 249,966 | 353,452 |
| *Other PA-Urban* | 108,861 | 424,339 |
| *Minor Art.-Urban* | 469,232 | 967,088 |
| *Collector-Urban* | 93,075 | 348,099 |
| *Local-Urban* | 21,270 | 526,471 |
| **Total** | **3,992,925** | **5,888,382** |

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# Table: 5

## Total Volatile Organic Compound Emissions(grams/day)

## Kent County

| Functional Class | LDGV | LDGT1 | LDGT2 | HDGV | LDDV | LDDT | HDDV | MC | Total |
|---|---|---|---|---|---|---|---|---|---|
| Interstate-Rural | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other PA-Rural | 190,741 | 109,444 | 52,043 | 15,694 | 34 | 282 | 15,694 | 126,223 | 505,658 |
| Minor Art. -Rural | 69,158 | 39,348 | 18,726 | 5,809 | 13 | 106 | 5,809 | 43,800 | 181,321 |
| Major Coll.-Rural | 87,836 | 49,824 | 23,694 | 7,426 | 16 | 135 | 7,426 | 55,203 | 229,760 |
| Minor Coll.-Rural | 10,085 | 5,712 | 2,718 | 861 | 2 | 16 | 861 | 6,364 | 26,425 |
| Local-Rural | 126,515 | 70,623 | 33,409 | 12,938 | 27 | 236 | 12,938 | 79,122 | 334,974 |
| Interstate-Urban | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other F/E-Urban | 44,695 | 26,050 | 12,381 | 3,603 | 8 | 64 | 3,603 | 34,399 | 123,648 |
| Other PA-Urban | 60,312 | 34,016 | 16,199 | 5,197 | 11 | 96 | 5,197 | 38,076 | 158,022 |
| Minor Art.-Urban | 142,026 | 80,003 | 38,074 | 12,433 | 27 | 230 | 12,433 | 89,527 | 372,417 |
| Collector-Urban | 52,823 | 29,731 | 14,142 | 4,700 | 10 | 87 | 4,700 | 33,215 | 138,613 |
| Local-Urban | 107,585 | 60,056 | 28,410 | 11,002 | 23 | 201 | 11,002 | 67,283 | 284,853 |
| **Total** | **891,777** | **504,807** | **239,797** | **79,661** | **172** | **1,454** | **64,810** | **573,212** | **2,355,691** |
| **Total (in Tons)** | **0.98** | **0.56** | **0.26** | **0.09** | **0.00** | **0.00** | **0.07** | **0.63** | **2.60** |

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# Table: 6

## Total Nitrogen Oxide Emissions(grams/day)

## Kent County

| Functional Class | LDGV | LDGT1 | LDGT2 | HDGV | LDDV | LDDT | HDDV | MC | Total |
|---|---|---|---|---|---|---|---|---|---|
| Interstate-Rural | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other PA-Rural | 126,688 | 96,535 | 56,337 | 25,954 | 45 | 459 | 25,954 | 57,331 | 456,534 |
| Minor Art. -Rural | 44,136 | 33,237 | 19,447 | 8,655 | 14 | 140 | 8,655 | 18,536 | 152,543 |
| Major Coll.-Rural | 55,061 | 41,241 | 24,155 | 10,588 | 16 | 169 | 10,588 | 22,505 | 187,865 |
| Minor Coll.-Rural | 6,311 | 4,711 | 2,760 | 1,196 | 2 | 19 | 1,196 | 2,547 | 21,419 |
| Local-Rural | 59,573 | 41,056 | 23,203 | 8,411 | 21 | 212 | 8,411 | 17,830 | 192,504 |
| Interstate-Urban | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other F/E-Urban | 32,177 | 24,985 | 14,587 | 6,900 | 15 | 153 | 6,900 | 16,679 | 127,650 |
| Other PA-Urban | 36,978 | 27,534 | 16,169 | 6,935 | 11 | 112 | 6,935 | 14,917 | 125,232 |
| Minor Art.-Urban | 87,220 | 64,243 | 37,653 | 15,579 | 25 | 260 | 15,579 | 33,355 | 290,830 |
| Collector-Urban | 32,536 | 23,724 | 13,896 | 5,543 | 9 | 96 | 5,543 | 11,795 | 107,067 |
| Local-Urban | 50,659 | 34,913 | 19,731 | 7,152 | 17 | 180 | 7,152 | 15,162 | 163,701 |
| **Total** | **531,338** | **392,179** | **227,937** | **96,912** | **175** | **1,799** | **364,346** | **210,657** | **1,825,344** |
| **Total (in Tons)** | **0.59** | **0.43** | **0.25** | **0.11** | **0.00** | **0.00** | **0.40** | **0.23** | **2.01** |

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# Table: 1

## VEHICLE MILES OF TRAVEL

## Kent County

| Functional Class | Network Model Output | HPMS & Seasonal Factor Adjusted |
|---|---|---|
| *Interstate-Rural* | 0 | 0 |
| *Other PA-Rural* | 1,929,310 | 1,637,984 |
| *Minor Art. -Rural* | 473,556 | 592,418 |
| *Major Coll.-Rural* | 911,975 | 707,693 |
| *Minor Coll.-Rural* | 30,855 | 84,788 |
| *Local-Rural* | 123,585 | 696,156 |
| *Interstate-Urban* | 0 | 0 |
| *Other F/E-Urban* | 285,370 | 403,513 |
| *Other PA-Urban* | 119,508 | 465,841 |
| *Minor Art.-Urban* | 529,339 | 1,090,967 |
| *Collector-Urban* | 105,920 | 396,142 |
| *Local-Urban* | 24,004 | 594,156 |
| **Total** | **4,533,421** | **6,669,658** |

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# Table: 5

## Total Volatile Organic Compound Emissions(grams/day)

## Kent County

| Functional Class | LDGV | LDGT1 | LDGT2 | HDGV | LDDV | LDDT | HDDV | MC | Total |
|---|---|---|---|---|---|---|---|---|---|
| Interstate-Rural | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other PA-Rural | 172,051 | 107,617 | 48,650 | 13,455 | 27 | 231 | 13,455 | 132,581 | 486,341 |
| Minor Art. -Rural | 64,734 | 40,022 | 18,099 | 5,159 | 10 | 90 | 5,159 | 47,674 | 180,499 |
| Major Coll.-Rural | 80,242 | 49,281 | 22,290 | 6,451 | 13 | 112 | 6,451 | 58,327 | 222,686 |
| Minor Coll.-Rural | 9,608 | 5,891 | 2,665 | 778 | 2 | 14 | 778 | 7,019 | 26,716 |
| Local-Rural | 119,817 | 71,243 | 32,117 | 11,245 | 22 | 200 | 11,245 | 84,583 | 331,772 |
| Interstate-Urban | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other F/E-Urban | 40,242 | 25,679 | 11,611 | 3,084 | 6 | 53 | 3,084 | 35,777 | 119,023 |
| Other PA-Urban | 53,526 | 32,699 | 14,787 | 4,371 | 9 | 78 | 4,371 | 39,126 | 148,787 |
| Minor Art.-Urban | 130,933 | 79,579 | 36,001 | 10,858 | 22 | 194 | 10,858 | 95,204 | 363,510 |
| Collector-Urban | 49,173 | 29,840 | 13,504 | 4,127 | 8 | 74 | 4,127 | 35,592 | 136,458 |
| Local-Urban | 102,261 | 60,804 | 27,412 | 9,597 | 19 | 171 | 9,597 | 72,190 | 283,162 |
| **Total** | **822,587** | **502,653** | **227,135** | **69,125** | **139** | **1,216** | **68,027** | **608,073** | **2,298,956** |
| **Total (in Tons)** | **0.91** | **0.55** | **0.25** | **0.08** | **0.00** | **0.00** | **0.07** | **0.67** | **2.53** |

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# Table: 6

## Total Nitrogen Oxide Emissions(grams/day)

## Kent County

| Functional Class | LDGV | LDGT1 | LDGT2 | HDGV | LDDV | LDDT | HDDV | MC | Total |
|---|---|---|---|---|---|---|---|---|---|
| Interstate-Rural | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other PA-Rural | 103,946 | 88,647 | 50,618 | 10,239 | 19 | 363 | 10,239 | 64,759 | 360,759 |
| Minor Art. -Rural | 37,651 | 31,593 | 18,048 | 3,534 | 6 | 116 | 3,534 | 21,717 | 126,124 |
| Major Coll.-Rural | 45,518 | 37,759 | 21,601 | 4,137 | 7 | 134 | 4,137 | 25,246 | 149,935 |
| Minor Coll.-Rural | 5,443 | 4,503 | 2,574 | 488 | 1 | 16 | 488 | 2,988 | 17,850 |
| Local-Rural | 50,068 | 37,236 | 20,311 | 3,281 | 9 | 168 | 3,281 | 20,049 | 150,654 |
| Interstate-Urban | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Other F/E-Urban | 26,330 | 23,029 | 13,221 | 2,720 | 6 | 117 | 2,720 | 18,653 | 97,795 |
| Other PA-Urban | 29,809 | 24,558 | 14,056 | 2,652 | 5 | 87 | 2,652 | 16,349 | 97,536 |
| Minor Art.-Urban | 72,517 | 58,904 | 33,716 | 6,087 | 11 | 207 | 6,087 | 37,422 | 232,762 |
| Collector-Urban | 27,308 | 21,961 | 12,567 | 2,192 | 4 | 77 | 2,192 | 13,392 | 86,438 |
| Local-Urban | 42,732 | 31,780 | 17,335 | 2,800 | 8 | 143 | 2,800 | 17,112 | 128,581 |
| **Total** | **441,321** | **359,970** | **204,047** | **38,128** | **76** | **1,429** | **165,776** | **237,686** | **1,448,435** |
| **Total (in Tons)** | **0.49** | **0.40** | **0.22** | **0.04** | **0.00** | **0.00** | **0.18** | **0.26** | **1.60** |

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## Delaware Mobile Source Emissions Calculations

**VMT AND TOTAL EMISSIONS BY Year (in tons per summer day)**

| Year | Kent County | | | | |
|---|---|---|---|---|---|
| | VMT | VOC | Budget | Nox | Budget |
| 2005 | | | 5.14 | | 8.42 |
| 2010 | 5,371,546 | 4.46 | -- | 5.33 | -- |
| 2020 | 5,888,382 | 2.60 | -- | 2.01 | -- |
| 2030 | 6,669,658 | 2.53 | -- | 1.60 | -- |

Notes:

1) The emission calculations for all analysis years above used 2004 registration data for vehicle age distribution and fleet mix