

DVRPC 2005 Tier 2/Sulfur Program Benefit Estimation and Resulting Transportation Conformity Budget

This workbook was developed to establish the transportation conformity budget for the New Jersey counties in the DVRPC area. It includes the benefits from the federal Tier 2/Sulfur program per USEPA guidance.

This workbook was developed by Chris N. Salmi, NJDEP, December 12, 1999.

<u>Worksheet</u>	<u>Description</u>
Documentation	This worksheet.
Constants	Contains the constants used in the calculations
Emissions	Contains the base 2005 emissions, the Tier 2/Sulfur adjustment using Tables 8&9, and the resulting budget.
Base VMT	Contains the breakdown of VMT by county and vehicle class.
EPA T2 Credits	Contains the EPA Tier 2/Sulfur credits.
T2 Adj by Veh Class	Contains a calculation of the benefits of Tier 2/Sulfur by vehicle class (Table 8&9) method.
Comparison of EPA Methods	Contains a comparison of the Table 8&9 methods to the Tables 1-5 method.

Enhanced I/M Adjustments

- Centralized / Decentralized split (0.7/0.3)
- The decentralized program is 80% effective as the centralized program.

Constants

Conversion Factor

kg->lbs	2.2046
lbs->tons	0.0005

Source: Slade, David, Meteorology and Atomic Energy, 1968, U.S. Atomic Energy Commission

Emission Estimates

Base	VOC (kg)	NOx (kg)	VOC (lbs)	NOx (lbs)	VOC (tons)	NOx (tons)
Burlington	9,106.6	17,918.6	20,076	39,503	10.04	19.75
Camden	8,874.2	16,183.0	19,564	35,677	9.78	17.84
Gloucester	5,344.6	10,630.7	11,783	23,436	5.89	11.72
Mercer	6,980.3	13,411.9	15,389	29,568	7.69	14.78
Total	30,305.7	58,144.2	66,812	128,185	33.41	64.09

T2 Adjustment (Using Tables 8&9)

Burlington	281	1,467	620	3,235	0.31	1.62
Camden	255	1,328	561	2,928	0.28	1.46
Gloucester	168	873	369	1,926	0.18	0.96
Mercer	207	1,080	456	2,380	0.23	1.19
Total	910	4,749	2,007	10,469	1.00	5.23

Revised Budget

Burlington	8,826	16,451	19,457	36,268	9.73	18.13
Camden	8,620	14,855	19,003	32,749	9.50	16.37
Gloucester	5,177	9,757	11,413	21,511	5.71	10.76
Mercer	6,773	12,332	14,932	27,188	7.47	13.59
Total	29,396	53,396	64,805	117,716	32.40	58.86

VMT Estimates

<u>VMT</u>									
County	Burlington	Camden	Gloucester	Mercer	Total				
Freeway	3,842,600	4,067,400	3,011,700	3,865,900	14,787,600				
Arterial	6,859,000	5,656,900	3,464,500	4,066,000	20,046,400				
Local	3,212,900	2,871,800	1,811,300	2,311,400	10,207,400				
Total	13,914,500	12,596,100	8,287,500	10,243,300	45,041,400				
<u>VMT Mix</u>	LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC	Total
Freeway	0.779	0.089	0.042	0.022	0.003	0.003	0.059	0.003	1.000
Arterial	0.793	0.080	0.047	0.020	0.003	0.051	0.003	0.003	1.000
Local	0.819	0.084	0.049	0.007	0.003	0.032	0.003	0.003	1.000
County									
Burlington									
Freeway	2,993,385	341,991	161,389	84,537	11,528	11,528	226,713	11,528	3,842,600
Arterial	5,439,187	548,720	322,373	137,180	20,577	349,809	20,577	20,577	6,859,000
Local	2,631,365	269,884	157,432	22,490	9,639	102,813	9,639	9,639	3,212,900
	11,063,938	1,160,595	641,194	244,208	41,744	464,150	256,929	41,744	13,914,500
Camden									
Freeway	3,168,505	361,999	170,831	89,483	12,202	12,202	239,977	12,202	4,067,400
Arterial	4,485,922	452,552	265,874	113,138	16,971	288,502	16,971	16,971	5,656,900
Local	2,352,004	241,231	140,718	20,103	8,615	91,898	8,615	8,615	2,871,800
	10,006,431	1,055,782	577,423	222,723	37,788	392,602	265,563	37,788	12,596,100
Gloucester									
Freeway	2,346,114	268,041	126,491	66,257	9,035	9,035	177,690	9,035	3,011,700
Arterial	2,747,349	277,160	162,832	69,290	10,394	176,690	10,394	10,394	3,464,500
Local	1,483,455	152,149	88,754	12,679	5,434	57,962	5,434	5,434	1,811,300
	6,576,918	697,351	378,077	148,227	24,863	243,686	193,518	24,863	8,287,500
Mercer									
Freeway	3,011,536	344,065	162,368	85,050	11,598	11,598	228,088	11,598	3,865,900
Arterial	3,224,338	325,280	191,102	81,320	12,198	207,366	12,198	12,198	4,066,000
Local	1,893,037	194,158	113,259	16,180	6,934	73,965	6,934	6,934	2,311,400
	8,128,911	863,503	466,728	182,550	30,730	292,929	247,220	30,730	10,243,300
Total	35,776,196	3,777,230	2,063,423	797,707	135,124	1,393,366	963,230	135,124	45,041,400

USEPA Tier 2/Sulfur Credits

		Final Reform. Base-T2	Final Reform. Base-T2	Final Reform. Base-T2	Final Reform. Base-T2	Final Reform. Base-T2
HC		LDGV	LDGT1	LDGT2	LDDT	HDGV
2005		0.018	0.023	0.033	0.133	0.038
NOx						
2005		0.106	0.118	0.144	0.233	0.204

Source

USEPA Memorandum, Wegman, Lydia N. & Zaw-Mon, Merrylin To Air Directors, Regions I-VI, dated November 8, 1999,
Regarding: 1-Hour Ozone Attainment Demonstrations and Tier 2/Sulfur Rulemaking, Tables 8&9

VOC - 2005	LDGV	LDGT1	LDGT2	LDDT	HDGV	Total
Burlington	0.0444	0.077	0.0476	0.0032	0.0085	0.1807
Camden	0.0601	0.1035	0.0646	0.0038	0.0112	0.2432
Gloucester	0.0278	0.0485	0.0303	0.0017	0.0053	0.1136
Mercer	0.0449	0.0787	0.0483	0.0034	0.0085	0.1838
Total	0.1772	0.3077	0.1908	0.0121	0.0335	0.7213
NOx - 2005						
Burlington	0.4396	0.512	0.2098	0.0067	0.0553	1.2234
Camden	0.5351	0.621	0.254	0.0088	0.0567	1.4756
Gloucester	0.2728	0.3182	0.1301	0.0043	0.0338	0.7592
Mercer	0.4579	0.5342	0.2183	0.0069	0.0566	1.2739
Total	1.7054	1.9854	0.8122	0.0267	0.2024	4.7321

Source

USEPA Memorandum, Wegman, Lydia N. & Zaw-Mon, Merrylin To Air Directors, Regions I-VI, dated November 8, 1999,
Regarding: 1-Hour Ozone Attainment Demonstrations and Tier 2/Sulfur Rulemaking, Tables 1-5

Tier 2/Sulfur Adjustments by Vehicle Class

County	LDGV	LDGT1	LDGT2	HDGV	LDDV	LDDT	HDDV	MC	Total
Burlington	11,063,938	1,160,595	641,194	244,208	41,744	464,150	256,929	41,744	13,914,500
Camden	10,006,431	1,055,782	577,423	222,723	37,788	392,602	265,563	37,788	12,596,100
Gloucester	6,576,918	697,351	378,077	148,227	24,863	243,686	193,518	24,863	8,287,500
Mercer	8,128,911	863,503	466,728	182,550	30,730	292,929	247,220	30,730	10,243,300
Total	35,776,196	3,777,230	2,063,423	797,707	135,124	1,393,366	963,230	135,124	45,041,400
HC Adj Factor	0.018	0.023	0.033	0.133	0.038	0	0	0	
HC Adjustment									
Burlington	199,151	26,694	21,159	32,480	1,586	-	-	-	281,070
Camden	180,116	24,283	19,055	29,622	1,436	-	-	-	254,512
Gloucester	118,385	16,039	12,477	19,714	945	-	-	-	167,559
Mercer	146,320	19,861	15,402	24,279	1,168	-	-	-	207,030
Total	643,972	86,876	68,093	106,095	5,135	-	-	-	910,171
NOx Adj Factor	0.106	0.118	0.144	0.233	0.204	0	0	0	
NOx Adjustment									
Burlington	1,172,777	136,950	92,332	56,900	8,516	-	-	-	1,467,476
Camden	1,060,682	124,582	83,149	51,895	7,709	-	-	-	1,328,016
Gloucester	697,153	82,287	54,443	34,537	5,072	-	-	-	873,492
Mercer	861,665	101,893	67,209	42,534	6,269	-	-	-	1,079,570
Total	3,792,277	445,713	297,133	185,866	27,565	-	-	-	4,748,554

Source

USEPA Memorandum, Wegman, Lydia N. & Zaw-Mon, Merrylin To Air Directors, Regions I-VI, dated November 8, 1999,
Regarding: 1-Hour Ozone Attainment Demonstrations and Tier 2/Sulfur Rulemaking, Tables 8 & 9

Comparison of the USEPA Methods to Calculate the Tier 2/Sulfur Credits

	Base Budget		Adjustment w/ Tables 8&9		Resulting Budget	
	VOC (tons)	NOx (tons)	VOC (tons)	NOx (tons)	VOC (tons)	NOx (tons)
Burlington	10.04	19.75	0.31	1.62	9.73	18.13
Camden	9.78	17.84	0.28	1.46	9.50	16.37
Gloucester	5.89	11.72	0.18	0.96	5.71	10.76
Mercer	7.69	14.78	0.23	1.19	7.47	13.59
Total	33.41	64.09	1.00	5.23	32.40	58.86

	Base Budget		Adjustment w/ Tables 1-5			
	VOC (tons)	NOx (tons)	VOC (tons)	NOx (tons)		
Burlington	10.04	19.75	0.1807	1.2234	9.86	18.53
Camden	9.78	17.84	0.2432	1.4756	9.54	16.36
Gloucester	5.89	11.72	0.1136	0.7592	5.78	10.96
Mercer	7.69	14.78	0.1838	1.2739	7.51	13.51
Total	33.41	64.09	0.7213	4.7321	32.68	59.36

Ratio Table 8&9: Tables 1-5

Burlington	1.71	1.32
Camden	1.15	0.99
Gloucester	1.63	1.27
Mercer	1.24	0.93
Total	1.39	1.11