

## **Appendix K**

### **EMISSION SENSITIVITY TABLES (for Air Conditioning, Extra Load, and Trailer Towing)**

The tables in Appendix K illustrate the sensitivity of MOBILE5 emission factors to variations in air conditioning use, extra vehicle loads, and trailer towing. The LDGT category is a weighted average of LDGT1s and LDGT2s. The following conditions are presented in these tables:

1. Altitude (low or high)
2. Air conditioner usage (0%, 50%, or 100%)
3. Fraction of fleet carrying extra load (0%, 5%, 10%, or 15%)
4. Fraction of fleet towing a trailer (0%, 5%, or 10%)

TABLE 1

## LOW ALTITUDE

## EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 0%

WET BULB TEMPERATURE = 66.0F

DRY BULB TEMPERATURE = 71.0F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE		
		0%	5%	10%	0%	5%	10%	0%	5%	10%
1990	0%	2.25	2.32	2.38	3.48	3.58	3.68	2.76	2.83	2.89
1990	5%	2.26	2.32	2.39	3.48	3.59	3.69	2.76	2.83	2.90
1990	10%	2.26	2.33	2.39	3.49	3.59	3.69	2.77	2.84	2.90
1990	15%	2.27	2.33	2.40	3.50	3.60	3.70	2.78	2.84	2.91
1995	0%	1.76	1.81	1.87	2.54	2.61	2.69	2.10	2.15	2.20
1995	5%	1.76	1.82	1.87	2.54	2.62	2.69	2.10	2.16	2.21
1995	10%	1.77	1.82	1.87	2.55	2.62	2.70	2.11	2.16	2.21
1995	15%	1.77	1.83	1.88	2.56	2.63	2.70	2.11	2.17	2.22
2000	0%	1.56	1.61	1.65	2.14	2.20	2.26	1.80	1.85	1.90
2000	5%	1.56	1.61	1.66	2.14	2.20	2.27	1.81	1.86	1.90
2000	10%	1.57	1.61	1.66	2.15	2.21	2.27	1.81	1.86	1.90
2000	15%	1.57	1.62	1.66	2.15	2.21	2.28	1.82	1.86	1.91
2005	0%	1.48	1.52	1.57	1.98	2.04	2.10	1.69	1.73	1.77
2005	5%	1.48	1.53	1.57	1.99	2.05	2.10	1.69	1.73	1.78
2005	10%	1.49	1.53	1.57	1.99	2.05	2.11	1.69	1.74	1.78
2005	15%	1.49	1.53	1.58	2.00	2.06	2.11	1.70	1.74	1.78
2010	0%	1.45	1.49	1.53	1.96	2.02	2.08	1.66	1.70	1.74
2010	5%	1.45	1.50	1.54	1.97	2.02	2.08	1.66	1.70	1.74
2010	10%	1.46	1.50	1.54	1.97	2.03	2.09	1.66	1.71	1.75
2010	15%	1.46	1.50	1.54	1.98	2.03	2.09	1.67	1.71	1.75
2020	0%	1.44	1.48	1.52	1.93	1.99	2.04	1.65	1.69	1.73
2020	5%	1.44	1.48	1.53	1.93	1.99	2.05	1.65	1.69	1.73
2020	10%	1.44	1.49	1.53	1.94	2.00	2.05	1.65	1.69	1.74
2020	15%	1.45	1.49	1.53	1.94	2.00	2.06	1.66	1.70	1.74

\*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR  
UNDER CONDITIONS OF 20.6% COLD START VMT, 27.3% HOT START VMT,  
71F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 1: EXHAUST NMHC @ 0% A/C USAGE

TABLE 2

## LOW ALTITUDE

## EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 50%

WET BULB TEMPERATURE = 71.0F

DRY BULB TEMPERATURE = 79.0F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE		
		0%	5%	10%	0%	5%	10%	0%	5%	10%
		-----	-----	-----	-----	-----	-----	-----	-----	-----
1990	0%	2.22	2.28	2.35	3.43	3.53	3.62	2.72	2.79	2.86
1990	5%	2.22	2.29	2.35	3.44	3.54	3.63	2.73	2.80	2.86
1990	10%	2.23	2.30	2.36	3.44	3.54	3.64	2.73	2.80	2.87
1990	15%	2.23	2.30	2.37	3.45	3.55	3.65	2.74	2.81	2.87
1995	0%	1.70	1.75	1.80	2.46	2.54	2.61	2.05	2.10	2.15
1995	5%	1.71	1.76	1.81	2.47	2.54	2.62	2.05	2.10	2.15
1995	10%	1.71	1.76	1.81	2.48	2.55	2.62	2.05	2.11	2.16
1995	15%	1.72	1.77	1.82	2.48	2.56	2.63	2.06	2.11	2.16
2000	0%	1.50	1.55	1.59	2.06	2.12	2.18	1.75	1.79	1.84
2000	5%	1.51	1.55	1.60	2.06	2.12	2.18	1.75	1.80	1.84
2000	10%	1.51	1.56	1.60	2.07	2.13	2.19	1.75	1.80	1.84
2000	15%	1.51	1.56	1.61	2.07	2.13	2.19	1.76	1.80	1.85
2005	0%	1.43	1.47	1.51	1.90	1.96	2.01	1.63	1.67	1.71
2005	5%	1.43	1.47	1.51	1.90	1.96	2.02	1.63	1.67	1.72
2005	10%	1.43	1.48	1.52	1.91	1.96	2.02	1.64	1.68	1.72
2005	15%	1.44	1.48	1.52	1.91	1.97	2.03	1.64	1.68	1.72
2010	0%	1.40	1.44	1.48	1.88	1.93	1.99	1.60	1.64	1.68
2010	5%	1.40	1.44	1.49	1.88	1.94	2.00	1.61	1.64	1.69
2010	10%	1.40	1.45	1.49	1.89	1.94	2.00	1.61	1.65	1.69
2010	15%	1.41	1.45	1.49	1.89	1.95	2.00	1.61	1.65	1.69
2020	0%	1.39	1.43	1.47	1.85	1.90	1.96	1.59	1.63	1.67
2020	5%	1.39	1.43	1.47	1.85	1.91	1.96	1.60	1.63	1.67
2020	10%	1.39	1.43	1.48	1.86	1.91	1.97	1.60	1.64	1.68
2020	15%	1.40	1.44	1.48	1.86	1.92	1.97	1.60	1.64	1.68

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 \*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR  
 UNDER CONDITIONS OF 20.6% COLD START VMT, 27.3% HOT START VMT,  
 79F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 2: EXHAUST NMHC @ 50% A/C USAGE

TABLE 3

## LOW ALTITUDE

## EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 100%

WET BULB TEMPERATURE = 79.0F

DRY BULB TEMPERATURE = 86.0F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE		
		0%	5%	10%	0%	5%	10%	0%	5%	10%
		-----	-----	-----	-----	-----	-----	-----	-----	-----
1990	0%	2.41	2.48	2.55	3.65	3.75	3.86	2.91	2.98	3.05
1990	5%	2.41	2.48	2.55	3.66	3.76	3.87	2.91	2.99	3.06
1990	10%	2.42	2.49	2.56	3.67	3.77	3.88	2.92	2.99	3.06
1990	15%	2.42	2.49	2.57	3.68	3.78	3.89	2.93	3.00	3.07
1995	0%	1.79	1.85	1.90	2.58	2.66	2.73	2.14	2.20	2.25
1995	5%	1.80	1.85	1.90	2.59	2.67	2.74	2.15	2.20	2.25
1995	10%	1.80	1.86	1.91	2.60	2.67	2.75	2.15	2.20	2.26
1995	15%	1.81	1.86	1.91	2.60	2.68	2.75	2.15	2.21	2.26
2000	0%	1.57	1.62	1.66	2.13	2.19	2.26	1.81	1.86	1.90
2000	5%	1.57	1.62	1.66	2.13	2.20	2.26	1.82	1.86	1.91
2000	10%	1.58	1.62	1.67	2.14	2.20	2.27	1.82	1.87	1.91
2000	15%	1.58	1.63	1.67	2.14	2.21	2.27	1.82	1.87	1.92
2005	0%	1.48	1.52	1.57	1.95	2.01	2.07	1.68	1.72	1.76
2005	5%	1.48	1.53	1.57	1.95	2.01	2.07	1.68	1.73	1.77
2005	10%	1.49	1.53	1.57	1.96	2.02	2.07	1.69	1.73	1.77
2005	15%	1.49	1.53	1.58	1.96	2.02	2.08	1.69	1.73	1.77
2010	0%	1.45	1.49	1.53	1.93	1.99	2.04	1.65	1.69	1.73
2010	5%	1.45	1.50	1.54	1.93	1.99	2.05	1.65	1.69	1.74
2010	10%	1.46	1.50	1.54	1.94	2.00	2.05	1.65	1.70	1.74
2010	15%	1.46	1.50	1.55	1.94	2.00	2.06	1.66	1.70	1.74
2020	0%	1.44	1.48	1.52	1.90	1.96	2.01	1.64	1.68	1.72
2020	5%	1.44	1.49	1.53	1.90	1.96	2.02	1.64	1.68	1.72
2020	10%	1.45	1.49	1.53	1.91	1.96	2.02	1.64	1.68	1.73
2020	15%	1.45	1.49	1.53	1.91	1.97	2.03	1.65	1.69	1.73

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 \*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR  
 UNDER CONDITIONS OF 20.6% COLD START VMT, 27.3% HOT START VMT,  
 86F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 3: EXHAUST NMHC @ 100% A/C USAGE

TABLE 4

## LOW ALTITUDE

## EXHAUST CO EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 0%

WET BULB TEMPERATURE = 66.0F

DRY BULB TEMPERATURE = 71.0F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE		
		0%	5%	10%	0%	5%	10%	0%	5%	10%
		-----	-----	-----	-----	-----	-----	-----	-----	-----
1990	0%	27.09	30.76	34.44	39.30	43.82	48.34	32.48	35.99	39.50
1990	5%	27.48	31.21	34.94	39.80	44.39	48.97	32.86	36.42	39.98
1990	10%	27.87	31.66	35.44	40.30	44.95	49.60	33.24	36.85	40.46
1990	15%	28.26	32.10	35.94	40.81	45.52	50.24	33.62	37.28	40.95
1995	0%	22.40	25.66	28.91	29.69	33.73	37.76	25.73	28.85	31.98
1995	5%	22.74	26.04	29.34	30.12	34.21	38.31	26.06	29.23	32.40
1995	10%	23.08	26.43	29.78	30.54	34.69	38.85	26.38	29.60	32.81
1995	15%	23.41	26.82	30.22	30.96	35.18	39.39	26.71	29.97	33.23
2000	0%	20.81	23.90	26.99	27.08	31.02	34.96	22.88	25.88	28.87
2000	5%	21.13	24.27	27.41	27.49	31.49	35.49	23.19	26.23	29.27
2000	10%	21.44	24.63	27.82	27.90	31.96	36.01	23.50	26.58	29.67
2000	15%	21.76	25.00	28.23	28.30	32.42	36.54	23.81	26.94	30.07
2005	0%	20.52	23.57	26.62	26.05	29.92	33.79	21.68	24.61	27.54
2005	5%	20.83	23.93	27.02	26.45	30.38	34.31	21.98	24.95	27.93
2005	10%	21.15	24.29	27.43	26.85	30.84	34.83	22.28	25.30	28.32
2005	15%	21.46	24.65	27.84	27.25	31.30	35.35	22.58	25.65	28.71
2010	0%	20.45	23.49	26.53	26.33	30.25	34.16	21.39	24.32	27.24
2010	5%	20.76	23.85	26.93	26.74	30.71	34.68	21.69	24.66	27.63
2010	10%	21.08	24.21	27.34	27.14	31.17	35.21	21.99	25.01	28.02
2010	15%	21.39	24.57	27.75	27.54	31.64	35.73	22.30	25.35	28.41
2020	0%	20.43	23.47	26.50	26.12	30.01	33.89	21.24	24.14	27.03
2020	5%	20.74	23.82	26.91	26.52	30.47	34.41	21.54	24.48	27.42
2020	10%	21.05	24.18	27.31	26.92	30.92	34.92	21.84	24.82	27.81
2020	15%	21.37	24.54	27.72	27.32	31.38	35.44	22.14	25.16	28.19

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 \*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR  
 UNDER CONDITIONS OF 20.6% COLD START VMT, 27.3% HOT START VMT,  
 71F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 4: EXHAUST CO @ 0% A/C USAGE

TABLE 5

## LOW ALTITUDE

## EXHAUST CO EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 50%

WET BULB TEMPERATURE = 71.0F

DRY BULB TEMPERATURE = 79.0F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE		
		0%	5%	10%	0%	5%	10%	0%	5%	10%
1990	0%	28.26	32.09	35.91	40.68	45.35	50.02	33.86	37.50	41.15
1990	5%	28.67	32.55	36.43	41.20	45.94	50.67	34.25	37.95	41.65
1990	10%	29.08	33.01	36.95	41.72	46.52	51.32	34.65	38.40	42.15
1990	15%	29.48	33.48	37.47	42.24	47.11	51.98	35.04	38.84	42.64
1995	0%	22.75	26.04	29.34	30.01	34.07	38.13	26.24	29.39	32.55
1995	5%	23.09	26.44	29.78	30.43	34.56	38.68	26.57	29.77	32.97
1995	10%	23.43	26.83	30.23	30.86	35.04	39.23	26.89	30.15	33.40
1995	15%	23.77	27.22	30.67	31.29	35.53	39.78	27.22	30.52	33.82
2000	0%	21.13	24.27	27.41	27.01	30.93	34.85	23.17	26.18	29.20
2000	5%	21.45	24.64	27.83	27.41	31.39	35.37	23.48	26.54	29.60
2000	10%	21.78	25.01	28.25	27.82	31.86	35.90	23.79	26.90	30.01
2000	15%	22.10	25.38	28.67	28.22	32.32	36.42	24.10	27.25	30.41
2005	0%	20.90	24.00	27.11	25.77	29.61	33.44	21.87	24.82	27.78
2005	5%	21.22	24.37	27.52	26.17	30.06	33.95	22.17	25.17	28.17
2005	10%	21.54	24.74	27.94	26.56	30.51	34.46	22.48	25.52	28.56
2005	15%	21.86	25.10	28.35	26.96	30.96	34.97	22.78	25.87	28.96
2010	0%	20.89	23.99	27.09	26.07	29.95	33.82	21.59	24.54	27.49
2010	5%	21.20	24.36	27.51	26.47	30.41	34.34	21.89	24.89	27.88
2010	10%	21.52	24.72	27.92	26.87	30.86	34.86	22.20	25.24	28.28
2010	15%	21.84	25.09	28.34	27.27	31.32	35.37	22.50	25.58	28.67
2020	0%	20.88	23.99	27.09	25.87	29.71	33.56	21.44	24.36	27.29
2020	5%	21.20	24.35	27.50	26.26	30.17	34.07	21.74	24.71	27.68
2020	10%	21.52	24.72	27.92	26.66	30.62	34.58	22.04	25.06	28.07
2020	15%	21.84	25.09	28.33	27.06	31.08	35.10	22.34	25.40	28.46

\*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR  
UNDER CONDITIONS OF 20.6% COLD START VMT, 27.3% HOT START VMT,  
79F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 5: EXHAUST CO @ 50% A/C USAGE

TABLE 6

## LOW ALTITUDE

## EXHAUST CO EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 100%

WET BULB TEMPERATURE = 79.0F

DRY BULB TEMPERATURE = 86.0F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE		
		0%	5%	10%	0%	5%	10%	0%	5%	10%
		-----	-----	-----	-----	-----	-----	-----	-----	-----
1990	0%	33.57	38.12	42.68	47.10	52.56	58.02	39.57	43.88	48.20
1990	5%	34.05	38.67	43.30	47.71	53.24	58.77	40.03	44.41	48.79
1990	10%	34.53	39.22	43.92	48.31	53.92	59.53	40.50	44.94	49.38
1990	15%	35.01	39.77	44.53	48.92	54.60	60.29	40.96	45.46	49.97
1995	0%	25.57	29.27	32.97	33.48	38.01	42.54	29.44	32.97	36.51
1995	5%	25.95	29.71	33.46	33.96	38.55	43.15	29.81	33.39	36.98
1995	10%	26.33	30.15	33.96	34.43	39.09	43.76	30.17	33.81	37.46
1995	15%	26.72	30.58	34.45	34.91	39.64	44.37	30.54	34.24	37.93
2000	0%	23.22	26.68	30.13	29.29	33.53	37.78	25.36	28.66	31.96
2000	5%	23.58	27.08	30.59	29.73	34.04	38.35	25.70	29.05	32.40
2000	10%	23.93	27.49	31.05	30.16	34.54	38.91	26.04	29.44	32.84
2000	15%	24.29	27.90	31.51	30.60	35.04	39.48	26.38	29.83	33.28
2005	0%	22.76	26.15	29.53	27.45	31.53	35.61	23.60	26.79	29.98
2005	5%	23.11	26.55	29.98	27.87	32.01	36.15	23.93	27.17	30.40
2005	10%	23.46	26.94	30.43	28.29	32.49	36.70	24.25	27.54	30.83
2005	15%	23.81	27.34	30.88	28.71	32.98	37.24	24.58	27.92	31.25
2010	0%	22.74	26.12	29.50	27.73	31.85	35.98	23.23	26.41	29.60
2010	5%	23.09	26.52	29.95	28.16	32.34	36.53	23.56	26.79	30.02
2010	10%	23.43	26.92	30.40	28.58	32.83	37.08	23.89	27.17	30.45
2010	15%	23.78	27.32	30.85	29.00	33.31	37.63	24.21	27.54	30.87
2020	0%	22.74	26.11	29.49	27.52	31.61	35.70	23.06	26.22	29.37
2020	5%	23.08	26.51	29.94	27.94	32.09	36.24	23.39	26.59	29.79
2020	10%	23.43	26.91	30.40	28.36	32.58	36.79	23.71	26.96	30.21
2020	15%	23.78	27.31	30.85	28.78	33.06	37.33	24.03	27.33	30.63

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 \*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR  
 UNDER CONDITIONS OF 20.6% COLD START VMT, 27.3% HOT START VMT,  
 86F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 6: EXHAUST CO @ 100% A/C USAGE

TABLE 7

## LOW ALTITUDE

EXHAUST NO<sub>x</sub> EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 0%

WET BULB TEMPERATURE = 66.0F

DRY BULB TEMPERATURE = 71.0F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE		
		0%	5%	10%	0%	5%	10%	0%	5%	10%
		-----	-----	-----	-----	-----	-----	-----	-----	-----
1990	0%	1.88	1.92	1.95	2.46	2.50	2.54	3.19	3.22	3.25
1990	5%	1.89	1.92	1.96	2.47	2.51	2.55	3.19	3.22	3.26
1990	10%	1.90	1.93	1.97	2.47	2.52	2.56	3.20	3.23	3.26
1990	15%	1.90	1.94	1.97	2.48	2.52	2.57	3.20	3.24	3.27
1995	0%	1.69	1.73	1.76	2.06	2.09	2.13	2.69	2.72	2.75
1995	5%	1.70	1.73	1.76	2.06	2.10	2.14	2.69	2.73	2.76
1995	10%	1.71	1.74	1.77	2.07	2.11	2.15	2.70	2.73	2.76
1995	15%	1.71	1.74	1.78	2.08	2.12	2.15	2.71	2.74	2.77
2000	0%	1.46	1.49	1.51	1.91	1.94	1.98	2.31	2.34	2.37
2000	5%	1.46	1.49	1.52	1.91	1.95	1.99	2.32	2.34	2.37
2000	10%	1.47	1.50	1.53	1.92	1.96	1.99	2.32	2.35	2.38
2000	15%	1.47	1.50	1.53	1.93	1.96	2.00	2.33	2.35	2.38
2005	0%	1.35	1.37	1.40	1.78	1.82	1.85	2.06	2.08	2.11
2005	5%	1.35	1.38	1.40	1.79	1.83	1.86	2.06	2.09	2.11
2005	10%	1.36	1.38	1.41	1.80	1.83	1.87	2.07	2.09	2.12
2005	15%	1.36	1.39	1.41	1.80	1.84	1.87	2.07	2.10	2.12
2010	0%	1.31	1.33	1.36	1.75	1.78	1.82	1.97	1.99	2.02
2010	5%	1.31	1.34	1.36	1.75	1.79	1.82	1.97	2.00	2.02
2010	10%	1.32	1.34	1.37	1.76	1.79	1.83	1.98	2.00	2.03
2010	15%	1.32	1.35	1.37	1.77	1.80	1.84	1.98	2.01	2.03
2020	0%	1.29	1.32	1.34	1.70	1.73	1.76	1.93	1.96	1.98
2020	5%	1.30	1.32	1.35	1.70	1.74	1.77	1.94	1.96	1.99
2020	10%	1.30	1.33	1.35	1.71	1.74	1.78	1.94	1.97	1.99
2020	15%	1.31	1.33	1.36	1.72	1.75	1.78	1.95	1.97	2.00

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 \*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR  
 UNDER CONDITIONS OF 20.6% COLD START VMT, 27.3% HOT START VMT,  
 71F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 7: EXHAUST NO<sub>x</sub> @ 0% A/C USAGE



TABLE 8

## LOW ALTITUDE

EXHAUST NO<sub>x</sub> EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 50%

WET BULB TEMPERATURE = 71.0F

DRY BULB TEMPERATURE = 79.0F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV			LDGT			EMISSION FACTORS FOR 8 VEHICLE TYPES			
		EMISSION FACTORS @ TRAILER TOWING			EMISSION FACTORS @ TRAILER TOWING			@LDG TRAILER TOWING			
		PERCENTAGE	0%	5%	10%	PERCENTAGE	0%	5%	10%	PERCENTAGE	0%
1990	0%	1.94	1.97	2.01	2.46	2.50	2.54	3.21	3.25	3.28	
1990	5%	1.95	1.98	2.02	2.47	2.51	2.55	3.22	3.25	3.29	
1990	10%	1.95	1.99	2.02	2.48	2.52	2.56	3.23	3.26	3.29	
1990	15%	1.96	1.99	2.03	2.48	2.53	2.57	3.23	3.27	3.30	
1995	0%	1.78	1.81	1.84	2.08	2.12	2.16	2.74	2.77	2.81	
1995	5%	1.78	1.82	1.85	2.09	2.13	2.16	2.75	2.78	2.81	
1995	10%	1.79	1.82	1.86	2.10	2.13	2.17	2.76	2.79	2.82	
1995	15%	1.79	1.83	1.86	2.10	2.14	2.18	2.76	2.79	2.82	
2000	0%	1.54	1.57	1.60	1.94	1.98	2.01	2.37	2.40	2.42	
2000	5%	1.55	1.58	1.61	1.95	1.98	2.02	2.37	2.40	2.43	
2000	10%	1.55	1.58	1.61	1.95	1.99	2.03	2.38	2.41	2.44	
2000	15%	1.56	1.59	1.62	1.96	2.00	2.04	2.38	2.41	2.44	
2005	0%	1.43	1.46	1.48	1.82	1.86	1.89	2.11	2.14	2.17	
2005	5%	1.43	1.46	1.49	1.83	1.87	1.90	2.12	2.15	2.17	
2005	10%	1.44	1.47	1.49	1.84	1.87	1.91	2.12	2.15	2.18	
2005	15%	1.44	1.47	1.50	1.84	1.88	1.91	2.13	2.16	2.18	
2010	0%	1.38	1.41	1.44	1.79	1.82	1.86	2.02	2.05	2.08	
2010	5%	1.39	1.42	1.44	1.79	1.83	1.86	2.03	2.05	2.08	
2010	10%	1.39	1.42	1.45	1.80	1.83	1.87	2.03	2.06	2.09	
2010	15%	1.40	1.43	1.45	1.80	1.84	1.88	2.04	2.06	2.09	
2020	0%	1.37	1.40	1.42	1.74	1.77	1.80	1.99	2.01	2.04	
2020	5%	1.38	1.40	1.43	1.74	1.77	1.81	1.99	2.02	2.04	
2020	10%	1.38	1.41	1.43	1.75	1.78	1.82	2.00	2.02	2.05	
2020	15%	1.39	1.41	1.44	1.75	1.79	1.82	2.00	2.03	2.05	

\*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR  
UNDER CONDITIONS OF 20.6% COLD START VMT, 27.3% HOT START VMT,  
79F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 8: EXHAUST NO<sub>x</sub> @ 50% A/C USAGE

TABLE 9

## LOW ALTITUDE

EXHAUST NO<sub>x</sub> EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 100%

WET BULB TEMPERATURE = 79.0F

DRY BULB TEMPERATURE = 86.0F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE		
		0%	5%	10%	0%	5%	10%	0%	5%	10%
		-----	-----	-----	-----	-----	-----	-----	-----	-----
1990	0%	2.01	2.05	2.08	2.46	2.50	2.54	3.25	3.28	3.32
1990	5%	2.02	2.05	2.09	2.47	2.51	2.55	3.26	3.29	3.32
1990	10%	2.02	2.06	2.10	2.48	2.52	2.56	3.26	3.30	3.33
1990	15%	2.03	2.07	2.10	2.48	2.53	2.57	3.27	3.30	3.34
1995	0%	1.90	1.94	1.98	2.14	2.18	2.22	2.83	2.87	2.90
1995	5%	1.91	1.95	1.98	2.15	2.19	2.23	2.84	2.87	2.91
1995	10%	1.92	1.95	1.99	2.16	2.20	2.24	2.85	2.88	2.91
1995	15%	1.92	1.96	2.00	2.17	2.21	2.25	2.85	2.89	2.92
2000	0%	1.67	1.70	1.73	2.03	2.07	2.10	2.47	2.50	2.53
2000	5%	1.67	1.71	1.74	2.03	2.07	2.11	2.47	2.50	2.53
2000	10%	1.68	1.71	1.74	2.04	2.08	2.12	2.48	2.51	2.54
2000	15%	1.68	1.72	1.75	2.05	2.09	2.13	2.48	2.52	2.55
2005	0%	1.55	1.58	1.61	1.92	1.95	1.99	2.21	2.24	2.27
2005	5%	1.55	1.59	1.62	1.92	1.96	2.00	2.22	2.25	2.28
2005	10%	1.56	1.59	1.62	1.93	1.97	2.01	2.22	2.25	2.28
2005	15%	1.57	1.60	1.63	1.94	1.98	2.01	2.23	2.26	2.29
2010	0%	1.50	1.53	1.56	1.88	1.91	1.95	2.12	2.15	2.18
2010	5%	1.51	1.54	1.57	1.88	1.92	1.96	2.13	2.15	2.18
2010	10%	1.51	1.54	1.57	1.89	1.93	1.97	2.13	2.16	2.19
2010	15%	1.52	1.55	1.58	1.90	1.93	1.97	2.14	2.16	2.19
2020	0%	1.49	1.52	1.55	1.83	1.86	1.89	2.08	2.11	2.14
2020	5%	1.49	1.52	1.55	1.83	1.87	1.90	2.09	2.12	2.14
2020	10%	1.50	1.53	1.56	1.84	1.87	1.91	2.09	2.12	2.15
2020	15%	1.50	1.53	1.56	1.84	1.88	1.92	2.10	2.13	2.15

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 \*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR  
 UNDER CONDITIONS OF 20.6% COLD START VMT, 27.3% HOT START VMT,  
 86F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 9: EXHAUST NO<sub>x</sub> @ 100% A/C USAGE

TABLE 10

## HIGH ALTITUDE

## EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 0%

WET BULB TEMPERATURE = 66.0F

DRY BULB TEMPERATURE = 71.0F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE		
		0%	5%	10%	0%	5%	10%	0%	5%	10%
1990	0%	2.43	2.50	2.57	4.04	4.16	4.27	3.26	3.34	3.41
1990	5%	2.43	2.51	2.58	4.05	4.17	4.28	3.27	3.34	3.42
1990	10%	2.44	2.51	2.58	4.06	4.18	4.30	3.28	3.35	3.42
1990	15%	2.45	2.52	2.59	4.07	4.19	4.31	3.28	3.36	3.43
1995	0%	1.81	1.87	1.92	2.81	2.89	2.97	2.42	2.48	2.54
1995	5%	1.82	1.87	1.92	2.81	2.89	2.98	2.43	2.48	2.54
1995	10%	1.82	1.87	1.93	2.82	2.90	2.98	2.43	2.49	2.54
1995	15%	1.82	1.88	1.93	2.83	2.91	2.99	2.44	2.49	2.55
2000	0%	1.59	1.64	1.68	2.23	2.30	2.37	2.06	2.11	2.15
2000	5%	1.59	1.64	1.69	2.24	2.30	2.37	2.06	2.11	2.16
2000	10%	1.60	1.64	1.69	2.24	2.31	2.38	2.07	2.12	2.16
2000	15%	1.60	1.65	1.69	2.25	2.32	2.38	2.07	2.12	2.17
2005	0%	1.50	1.55	1.59	2.02	2.08	2.14	1.93	1.97	2.02
2005	5%	1.51	1.55	1.60	2.03	2.09	2.15	1.93	1.98	2.02
2005	10%	1.51	1.56	1.60	2.03	2.09	2.15	1.94	1.98	2.03
2005	15%	1.52	1.56	1.61	2.04	2.10	2.16	1.94	1.99	2.03
2010	0%	1.48	1.52	1.56	1.97	2.03	2.08	1.90	1.94	1.99
2010	5%	1.48	1.52	1.57	1.97	2.03	2.09	1.90	1.95	1.99
2010	10%	1.48	1.53	1.57	1.98	2.04	2.09	1.91	1.95	1.99
2010	15%	1.49	1.53	1.57	1.98	2.04	2.10	1.91	1.95	2.00
2020	0%	1.46	1.51	1.55	1.93	1.99	2.04	1.90	1.94	1.98
2020	5%	1.47	1.51	1.55	1.93	1.99	2.05	1.90	1.94	1.99
2020	10%	1.47	1.51	1.56	1.94	2.00	2.05	1.90	1.95	1.99
2020	15%	1.47	1.52	1.56	1.94	2.00	2.06	1.91	1.95	1.99

\*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR  
UNDER CONDITIONS OF 20.6% COLD START VMT, 27.3% HOT START VMT,  
71F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 10: EXHAUST NMHC @ 0% A/C USAGE

TABLE 11

## HIGH ALTITUDE

## EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 50%

WET BULB TEMPERATURE = 71.0F

DRY BULB TEMPERATURE = 79.0F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV			LDGT			EMISSION FACTORS FOR 8 VEHICLE TYPES			
		EMISSION FACTORS @ TRAILER TOWING			EMISSION FACTORS @ TRAILER TOWING			@LDG TRAILER TOWING			
		PERCENTAGE	0%	5%	10%	PERCENTAGE	0%	5%	10%	PERCENTAGE	0%
1990	0%	2.40	2.47	2.54	3.98	4.09	4.21	3.22	3.30	3.37	
1990	5%	2.40	2.47	2.54	3.99	4.11	4.22	3.23	3.31	3.38	
1990	10%	2.41	2.48	2.55	4.00	4.12	4.23	3.24	3.31	3.38	
1990	15%	2.41	2.48	2.55	4.01	4.13	4.24	3.24	3.32	3.39	
1995	0%	1.75	1.81	1.86	2.73	2.81	2.89	2.37	2.42	2.47	
1995	5%	1.76	1.81	1.86	2.73	2.81	2.89	2.37	2.43	2.48	
1995	10%	1.76	1.82	1.87	2.74	2.82	2.90	2.38	2.43	2.48	
1995	15%	1.77	1.82	1.87	2.74	2.83	2.91	2.38	2.43	2.49	
2000	0%	1.53	1.58	1.62	2.15	2.21	2.28	2.00	2.05	2.09	
2000	5%	1.54	1.58	1.63	2.15	2.22	2.28	2.01	2.05	2.10	
2000	10%	1.54	1.59	1.63	2.16	2.22	2.29	2.01	2.06	2.10	
2000	15%	1.54	1.59	1.63	2.16	2.23	2.29	2.01	2.06	2.11	
2005	0%	1.45	1.50	1.54	1.94	2.00	2.05	1.87	1.91	1.96	
2005	5%	1.46	1.50	1.54	1.94	2.00	2.06	1.88	1.92	1.96	
2005	10%	1.46	1.50	1.54	1.95	2.00	2.06	1.88	1.92	1.96	
2005	15%	1.46	1.50	1.55	1.95	2.01	2.07	1.88	1.92	1.97	
2010	0%	1.42	1.47	1.51	1.88	1.94	2.00	1.84	1.88	1.92	
2010	5%	1.43	1.47	1.51	1.89	1.95	2.00	1.85	1.89	1.93	
2010	10%	1.43	1.47	1.51	1.89	1.95	2.01	1.85	1.89	1.93	
2010	15%	1.43	1.48	1.52	1.90	1.95	2.01	1.85	1.89	1.93	
2020	0%	1.41	1.46	1.50	1.85	1.90	1.96	1.84	1.88	1.92	
2020	5%	1.42	1.46	1.50	1.85	1.91	1.96	1.85	1.89	1.93	
2020	10%	1.42	1.46	1.50	1.86	1.91	1.97	1.85	1.89	1.93	
2020	15%	1.42	1.47	1.51	1.86	1.92	1.97	1.85	1.89	1.93	

\*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR  
UNDER CONDITIONS OF 20.6% COLD START VMT, 27.3% HOT START VMT,  
79F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 11: EXHAUST NMHC @ 50% A/C USAGE

TABLE 12

## HIGH ALTITUDE

## EXHAUST NMHC EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 100%

WET BULB TEMPERATURE = 79.0F

DRY BULB TEMPERATURE = 86.0F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE		
		0%	5%	10%	0%	5%	10%	0%	5%	10%
		-----	-----	-----	-----	-----	-----	-----	-----	-----
1990	0%	2.60	2.68	2.75	4.23	4.35	4.47	3.43	3.51	3.59
1990	5%	2.61	2.68	2.76	4.24	4.36	4.48	3.44	3.52	3.60
1990	10%	2.61	2.69	2.77	4.25	4.37	4.49	3.44	3.52	3.60
1990	15%	2.62	2.70	2.77	4.26	4.38	4.51	3.45	3.53	3.61
1995	0%	1.85	1.90	1.96	2.86	2.94	3.02	2.47	2.53	2.59
1995	5%	1.85	1.91	1.96	2.86	2.95	3.03	2.48	2.53	2.59
1995	10%	1.86	1.91	1.97	2.87	2.95	3.04	2.48	2.54	2.59
1995	15%	1.86	1.92	1.97	2.88	2.96	3.04	2.48	2.54	2.60
2000	0%	1.60	1.65	1.69	2.23	2.29	2.36	2.07	2.12	2.17
2000	5%	1.60	1.65	1.70	2.23	2.30	2.37	2.07	2.12	2.17
2000	10%	1.61	1.65	1.70	2.24	2.30	2.37	2.08	2.13	2.17
2000	15%	1.61	1.66	1.71	2.24	2.31	2.38	2.08	2.13	2.18
2005	0%	1.50	1.55	1.59	1.99	2.05	2.11	1.92	1.97	2.01
2005	5%	1.51	1.55	1.60	1.99	2.05	2.11	1.93	1.97	2.01
2005	10%	1.51	1.56	1.60	2.00	2.06	2.12	1.93	1.97	2.02
2005	15%	1.51	1.56	1.61	2.00	2.06	2.12	1.93	1.98	2.02
2010	0%	1.48	1.52	1.56	1.94	1.99	2.05	1.89	1.93	1.98
2010	5%	1.48	1.52	1.57	1.94	2.00	2.06	1.89	1.94	1.98
2010	10%	1.48	1.53	1.57	1.94	2.00	2.06	1.90	1.94	1.98
2010	15%	1.49	1.53	1.57	1.95	2.01	2.06	1.90	1.94	1.99
2020	0%	1.47	1.51	1.55	1.90	1.96	2.01	1.89	1.93	1.97
2020	5%	1.47	1.51	1.56	1.90	1.96	2.02	1.89	1.93	1.98
2020	10%	1.47	1.52	1.56	1.91	1.96	2.02	1.90	1.94	1.98
2020	15%	1.48	1.52	1.56	1.91	1.97	2.03	1.90	1.94	1.98

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 \*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR  
 UNDER CONDITIONS OF 20.6% COLD START VMT, 27.3% HOT START VMT,  
 86F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 12: EXHAUST NMHC @ 100% A/C USAGE

TABLE 13

## HIGH ALTITUDE

## EXHAUST CO EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 0%

WET BULB TEMPERATURE = 66.0F

DRY BULB TEMPERATURE = 71.0F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE		
		0%	5%	10%	0%	5%	10%	0%	5%	10%
		-----	-----	-----	-----	-----	-----	-----	-----	-----
1990	0%	33.25	37.71	42.16	54.66	60.91	67.16	42.97	47.41	51.85
1990	5%	33.72	38.25	42.77	55.35	61.69	68.03	43.45	47.96	52.46
1990	10%	34.20	38.79	43.38	56.05	62.47	68.90	43.93	48.50	53.07
1990	15%	34.67	39.33	43.99	56.74	63.26	69.77	44.41	49.05	53.68
1995	0%	24.00	27.46	30.92	37.57	42.62	47.67	30.77	34.29	37.81
1995	5%	24.36	27.87	31.39	38.10	43.23	48.35	31.14	34.71	38.29
1995	10%	24.72	28.28	31.85	38.63	43.83	49.03	31.51	35.13	38.76
1995	15%	25.08	28.70	32.32	39.16	44.44	49.71	31.87	35.55	39.23
2000	0%	21.18	24.33	27.47	29.62	33.90	38.18	25.38	28.50	31.62
2000	5%	21.50	24.70	27.89	30.06	34.41	38.76	25.70	28.87	32.03
2000	10%	21.83	25.07	28.31	30.50	34.92	39.33	26.02	29.24	32.45
2000	15%	22.15	25.44	28.73	30.95	35.42	39.90	26.34	29.60	32.87
2005	0%	20.56	23.62	26.67	26.98	30.99	35.00	23.33	26.30	29.27
2005	5%	20.88	23.98	27.08	27.40	31.47	35.54	23.63	26.65	29.67
2005	10%	21.19	24.34	27.49	27.81	31.94	36.07	23.94	27.00	30.07
2005	15%	21.51	24.70	27.90	28.22	32.41	36.61	24.25	27.35	30.46
2010	0%	20.45	23.49	26.53	26.44	30.37	34.30	22.77	25.69	28.62
2010	5%	20.76	23.85	26.93	26.85	30.83	34.83	23.07	26.04	29.01
2010	10%	21.08	24.21	27.34	27.25	31.30	35.35	23.37	26.39	29.40
2010	15%	21.39	24.57	27.75	27.65	31.76	35.87	23.67	26.73	29.79
2020	0%	20.43	23.47	26.50	26.12	30.01	33.89	22.64	25.53	28.43
2020	5%	20.74	23.82	26.91	26.52	30.47	34.41	22.94	25.88	28.82
2020	10%	21.05	24.18	27.31	26.92	30.92	34.92	23.23	26.22	29.20
2020	15%	21.37	24.54	27.72	27.32	31.38	35.44	23.53	26.56	29.59

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 \*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR  
 UNDER CONDITIONS OF 20.6% COLD START VMT, 27.3% HOT START VMT,  
 71F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 13: EXHAUST CO @ 0% A/C USAGE

TABLE 14

## HIGH ALTITUDE

## EXHAUST CO EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 50%

WET BULB TEMPERATURE = 71.0F

DRY BULB TEMPERATURE = 79.0F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE		
		0%	5%	10%	0%	5%	10%	0%	5%	10%
		-----	-----	-----	-----	-----	-----	-----	-----	-----
1990	0%	34.99	39.67	44.35	56.82	63.30	69.78	45.04	49.68	54.33
1990	5%	35.49	40.24	44.99	57.54	64.11	70.69	45.54	50.25	54.97
1990	10%	35.99	40.81	45.63	58.26	64.93	71.59	46.04	50.82	55.60
1990	15%	36.49	41.38	46.27	58.98	65.74	72.49	46.54	51.39	56.24
1995	0%	24.49	28.01	31.54	38.21	43.33	48.45	31.54	35.12	38.70
1995	5%	24.85	28.43	32.01	38.74	43.94	49.14	31.91	35.54	39.18
1995	10%	25.22	28.85	32.48	39.28	44.56	49.83	32.28	35.97	39.66
1995	15%	25.59	29.27	32.96	39.82	45.17	50.52	32.66	36.40	40.14
2000	0%	21.54	24.74	27.94	29.65	33.93	38.21	25.76	28.91	32.06
2000	5%	21.87	25.12	28.36	30.09	34.43	38.78	26.08	29.28	32.48
2000	10%	22.19	25.49	28.79	30.53	34.94	39.35	26.41	29.66	32.90
2000	15%	22.52	25.87	29.22	30.97	35.45	39.92	26.73	30.03	33.33
2005	0%	20.94	24.06	27.17	26.73	30.70	34.67	23.55	26.55	29.54
2005	5%	21.26	24.42	27.58	27.14	31.17	35.20	23.86	26.90	29.94
2005	10%	21.58	24.79	28.00	27.55	31.64	35.73	24.17	27.26	30.34
2005	15%	21.90	25.16	28.42	27.95	32.11	36.26	24.48	27.61	30.74
2010	0%	20.89	23.99	27.09	26.18	30.07	33.96	22.98	25.93	28.89
2010	5%	21.20	24.36	27.51	26.58	30.53	34.48	23.28	26.28	29.28
2010	10%	21.52	24.72	27.92	26.98	30.99	35.00	23.59	26.63	29.68
2010	15%	21.84	25.09	28.34	27.38	31.45	35.52	23.89	26.98	30.07
2020	0%	20.88	23.99	27.09	25.87	29.71	33.56	22.85	25.78	28.70
2020	5%	21.20	24.35	27.50	26.26	30.17	34.07	23.15	26.12	29.09
2020	10%	21.52	24.72	27.92	26.66	30.62	34.58	23.45	26.47	29.48
2020	15%	21.84	25.09	28.33	27.06	31.08	35.10	23.75	26.81	29.87

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 \*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR  
 UNDER CONDITIONS OF 20.6% COLD START VMT, 27.3% HOT START VMT,  
 79F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 14: EXHAUST CO @ 50% A/C USAGE

TABLE 15

## HIGH ALTITUDE

## EXHAUST CO EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 100%

WET BULB TEMPERATURE = 79.0F

DRY BULB TEMPERATURE = 86.0F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE		
		0%	5%	10%	0%	5%	10%	0%	5%	10%
		-----	-----	-----	-----	-----	-----	-----	-----	-----
1990	0%	41.87	47.50	53.12	65.75	73.32	80.89	52.72	58.24	63.77
1990	5%	42.47	48.18	53.88	66.59	74.27	81.94	53.31	58.92	64.53
1990	10%	43.07	48.86	54.65	67.43	75.21	82.99	53.91	59.59	65.28
1990	15%	43.67	49.54	55.41	68.26	76.15	84.04	54.50	60.27	66.04
1995	0%	27.70	31.68	35.66	42.76	48.49	54.21	35.50	39.52	43.55
1995	5%	28.11	32.15	36.19	43.37	49.17	54.98	35.92	40.00	44.09
1995	10%	28.53	32.63	36.73	43.97	49.86	55.75	36.34	40.48	44.63
1995	15%	28.94	33.10	37.26	44.57	50.54	56.52	36.76	40.97	45.17
2000	0%	23.73	27.26	30.79	32.30	36.95	41.60	28.25	31.71	35.17
2000	5%	24.10	27.68	31.26	32.78	37.50	42.22	28.61	32.12	35.63
2000	10%	24.46	28.09	31.73	33.26	38.05	42.84	28.96	32.53	36.09
2000	15%	24.82	28.51	32.20	33.74	38.60	43.46	29.32	32.94	36.55
2005	0%	22.82	26.21	29.60	28.48	32.71	36.94	25.38	28.62	31.85
2005	5%	23.16	26.61	30.05	28.91	33.21	37.51	25.71	29.00	32.29
2005	10%	23.51	27.01	30.50	29.35	33.71	38.07	26.05	29.38	32.72
2005	15%	23.86	27.41	30.95	29.78	34.21	38.64	26.38	29.76	33.15
2010	0%	22.74	26.12	29.50	27.85	31.99	36.13	24.68	27.87	31.06
2010	5%	23.09	26.52	29.95	28.27	32.48	36.68	25.01	28.25	31.49
2010	10%	23.43	26.92	30.40	28.70	32.97	37.23	25.34	28.62	31.91
2010	15%	23.78	27.32	30.85	29.13	33.45	37.78	25.67	29.00	32.34
2020	0%	22.74	26.11	29.49	27.52	31.61	35.70	24.53	27.69	30.84
2020	5%	23.08	26.51	29.94	27.94	32.09	36.24	24.86	28.06	31.26
2020	10%	23.43	26.91	30.40	28.36	32.58	36.79	25.18	28.43	31.68
2020	15%	23.78	27.31	30.85	28.78	33.06	37.33	25.51	28.81	32.10

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 \*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR  
 UNDER CONDITIONS OF 20.6% COLD START VMT, 27.3% HOT START VMT,  
 86F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 15: EXHAUST CO @ 100% A/C USAGE



TABLE 16

## HIGH ALTITUDE

EXHAUST NO<sub>x</sub> EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 0%

WET BULB TEMPERATURE = 66.0F

DRY BULB TEMPERATURE = 71.0F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE		
		0%	5%	10%	0%	5%	10%	0%	5%	10%
1990	0%	1.71	1.74	1.77	2.11	2.14	2.18	2.92	2.95	2.98
1990	5%	1.71	1.75	1.78	2.11	2.15	2.18	2.92	2.95	2.98
1990	10%	1.72	1.75	1.78	2.12	2.16	2.19	2.93	2.96	2.99
1990	15%	1.73	1.76	1.79	2.13	2.16	2.20	2.93	2.96	2.99
1995	0%	1.66	1.69	1.72	1.93	1.97	2.00	2.58	2.61	2.64
1995	5%	1.66	1.69	1.73	1.94	1.98	2.01	2.59	2.62	2.65
1995	10%	1.67	1.70	1.73	1.95	1.98	2.02	2.60	2.63	2.65
1995	15%	1.67	1.71	1.74	1.95	1.99	2.03	2.60	2.63	2.66
2000	0%	1.45	1.48	1.51	1.87	1.91	1.94	2.26	2.29	2.31
2000	5%	1.46	1.48	1.51	1.88	1.91	1.95	2.26	2.29	2.32
2000	10%	1.46	1.49	1.52	1.89	1.92	1.96	2.27	2.30	2.32
2000	15%	1.47	1.50	1.52	1.89	1.93	1.97	2.27	2.30	2.33
2005	0%	1.35	1.37	1.40	1.78	1.81	1.85	2.03	2.05	2.08
2005	5%	1.35	1.38	1.40	1.78	1.82	1.85	2.03	2.06	2.08
2005	10%	1.36	1.38	1.41	1.79	1.83	1.86	2.04	2.06	2.09
2005	15%	1.36	1.39	1.41	1.80	1.83	1.87	2.04	2.07	2.09
2010	0%	1.31	1.33	1.36	1.75	1.78	1.82	1.94	1.97	1.99
2010	5%	1.31	1.34	1.36	1.75	1.79	1.82	1.95	1.97	2.00
2010	10%	1.32	1.34	1.37	1.76	1.79	1.83	1.95	1.98	2.00
2010	15%	1.32	1.35	1.37	1.77	1.80	1.84	1.96	1.98	2.01
2020	0%	1.29	1.32	1.34	1.70	1.73	1.76	1.91	1.93	1.96
2020	5%	1.30	1.32	1.35	1.70	1.74	1.77	1.91	1.94	1.96
2020	10%	1.30	1.33	1.35	1.71	1.74	1.78	1.92	1.94	1.97
2020	15%	1.31	1.33	1.36	1.72	1.75	1.78	1.92	1.95	1.97

\*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR  
UNDER CONDITIONS OF 20.6% COLD START VMT, 27.3% HOT START VMT,  
71F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 16: EXHAUST NO<sub>x</sub> @ 0% A/C USAGE

TABLE 17

## HIGH ALTITUDE

EXHAUST NO<sub>x</sub> EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 50%

WET BULB TEMPERATURE = 71.0F

DRY BULB TEMPERATURE = 79.0F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE		
		0%	5%	10%	0%	5%	10%	0%	5%	10%
1990	0%	1.76	1.79	1.83	2.11	2.15	2.18	2.95	2.98	3.01
1990	5%	1.77	1.80	1.83	2.12	2.15	2.19	2.95	2.98	3.02
1990	10%	1.77	1.81	1.84	2.13	2.16	2.20	2.96	2.99	3.02
1990	15%	1.78	1.81	1.85	2.13	2.17	2.20	2.97	3.00	3.03
1995	0%	1.74	1.77	1.81	1.96	2.00	2.03	2.64	2.67	2.70
1995	5%	1.75	1.78	1.81	1.97	2.00	2.04	2.64	2.68	2.71
1995	10%	1.75	1.78	1.82	1.97	2.01	2.05	2.65	2.68	2.71
1995	15%	1.76	1.79	1.83	1.98	2.02	2.05	2.66	2.69	2.72
2000	0%	1.53	1.56	1.59	1.91	1.94	1.98	2.32	2.34	2.37
2000	5%	1.54	1.57	1.60	1.91	1.95	1.99	2.32	2.35	2.38
2000	10%	1.54	1.57	1.60	1.92	1.96	1.99	2.33	2.36	2.38
2000	15%	1.55	1.58	1.61	1.93	1.96	2.00	2.33	2.36	2.39
2005	0%	1.43	1.46	1.48	1.82	1.85	1.89	2.08	2.11	2.14
2005	5%	1.43	1.46	1.49	1.82	1.86	1.89	2.09	2.12	2.14
2005	10%	1.44	1.47	1.49	1.83	1.87	1.90	2.09	2.12	2.15
2005	15%	1.44	1.47	1.50	1.84	1.87	1.91	2.10	2.13	2.15
2010	0%	1.38	1.41	1.44	1.79	1.82	1.86	2.00	2.02	2.05
2010	5%	1.39	1.42	1.44	1.79	1.83	1.86	2.00	2.03	2.06
2010	10%	1.39	1.42	1.45	1.80	1.83	1.87	2.01	2.03	2.06
2010	15%	1.40	1.43	1.45	1.80	1.84	1.88	2.01	2.04	2.07
2020	0%	1.37	1.40	1.42	1.74	1.77	1.80	1.97	1.99	2.02
2020	5%	1.38	1.40	1.43	1.74	1.77	1.81	1.97	2.00	2.02
2020	10%	1.38	1.41	1.43	1.75	1.78	1.82	1.98	2.00	2.03
2020	15%	1.39	1.41	1.44	1.75	1.79	1.82	1.98	2.01	2.03

\*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR  
UNDER CONDITIONS OF 20.6% COLD START VMT, 27.3% HOT START VMT,  
79F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 17: EXHAUST NO<sub>x</sub> @ 50% A/C USAGE

TABLE 18

## HIGH ALTITUDE

EXHAUST NO<sub>x</sub> EMISSION FACTORS (GRAMS/MILE)

AIR CONDITIONING USAGE = 100%

WET BULB TEMPERATURE = 79.0F

DRY BULB TEMPERATURE = 86.0F

CAL. YEAR	EXTRA LOAD PERCENTAGE	LDGV EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			LDGT EMISSION FACTORS @ TRAILER TOWING PERCENTAGE			EMISSION FACTORS FOR 8 VEHICLE TYPES @LDG TRAILER TOWING PERCENTAGE		
		0%	5%	10%	0%	5%	10%	0%	5%	10%
1990	0%	1.83	1.87	1.90	2.12	2.16	2.20	2.99	3.02	3.06
1990	5%	1.84	1.88	1.91	2.13	2.17	2.20	3.00	3.03	3.06
1990	10%	1.85	1.88	1.92	2.14	2.17	2.21	3.01	3.04	3.07
1990	15%	1.85	1.89	1.92	2.15	2.18	2.22	3.01	3.04	3.07
1995	0%	1.87	1.90	1.94	2.03	2.06	2.10	2.73	2.77	2.80
1995	5%	1.87	1.91	1.95	2.03	2.07	2.11	2.74	2.77	2.81
1995	10%	1.88	1.92	1.95	2.04	2.08	2.12	2.74	2.78	2.81
1995	15%	1.89	1.92	1.96	2.05	2.08	2.12	2.75	2.79	2.82
2000	0%	1.66	1.69	1.72	1.99	2.03	2.07	2.42	2.45	2.48
2000	5%	1.66	1.70	1.73	2.00	2.04	2.08	2.42	2.45	2.48
2000	10%	1.67	1.70	1.74	2.01	2.05	2.09	2.43	2.46	2.49
2000	15%	1.68	1.71	1.74	2.02	2.05	2.09	2.43	2.46	2.49
2005	0%	1.55	1.58	1.61	1.91	1.95	1.98	2.18	2.21	2.24
2005	5%	1.55	1.59	1.62	1.92	1.95	1.99	2.19	2.22	2.25
2005	10%	1.56	1.59	1.62	1.92	1.96	2.00	2.19	2.22	2.25
2005	15%	1.57	1.60	1.63	1.93	1.97	2.01	2.20	2.23	2.26
2010	0%	1.50	1.53	1.56	1.88	1.91	1.95	2.10	2.12	2.15
2010	5%	1.51	1.54	1.57	1.88	1.92	1.96	2.10	2.13	2.16
2010	10%	1.51	1.54	1.57	1.89	1.93	1.97	2.11	2.13	2.16
2010	15%	1.52	1.55	1.58	1.90	1.93	1.97	2.11	2.14	2.17
2020	0%	1.49	1.52	1.55	1.83	1.86	1.89	2.06	2.09	2.12
2020	5%	1.49	1.52	1.55	1.83	1.87	1.90	2.07	2.09	2.12
2020	10%	1.50	1.53	1.56	1.84	1.87	1.91	2.07	2.10	2.13
2020	15%	1.50	1.53	1.56	1.84	1.88	1.92	2.08	2.10	2.13

\*EMISSION FACTORS ARE CALCULATED FOR JANUARY 1 OF CALENDAR YEAR  
UNDER CONDITIONS OF 20.6% COLD START VMT, 27.3% HOT START VMT,  
86F AMBIENT TEMPERATURE, AND 19.6 MPH AVERAGE SPEED.

TABLE 18: EXHAUST NO<sub>x</sub> @ 100% A/C USAGE