

Appendix F

Energy Calculations

Energy Calculations Summary Table

Total and per Capita Energy Use Under the Proposed Plan: 2022, 2035, 2050

Category	2022 (Baseline)		2035		2050	
	Energy Use	Trillion BTU	Energy Use	Trillion BTU	Energy Use	Trillion BTU
Regional Growth and Land Use Change	-	122	-	128	-	134
Electricity (GWh)	17,471	60	21,742	74	23,732	81
Natural Gas (million therms)	622	62	537	54	534	53
Transportation Network Improvements and Programs		142		110		102
Vehicles, Gasoline (million gallons)	1,008	121	769	92	692	83
Vehicles, Diesel (million gallons)	127	17	109	15	118	16
Vehicle, Electricity (GWh)	269	1	1,157	0.0	1,693	0.01
Vehicle, Compressed Natural Gas (million gallons)	8	0.2	6	0.1	3	0.06
Rail, Diesel (million gallons)	3	0.4	1	0.1	0	0.01
Construction Equipment (million gallons)	15	2	15	2	15	2
Total Energy Use	-	264	-	238	-	236
Per Capita Energy Use (metric million BTU/person)		80		70		69
Population:	3,287,306		3,404,362		3,400,250	
Total Energy Use, Percent Change 2022 to Plan Year			-10%		-11%	
Per Capita Energy Use, Percent Change 2022 to Plan Year			-13%		-14%	

Metrics

1 kWh = 3,412 BTU; 1 therm = 99,976 BTU; 1 gallon, gasoline = 120,286 BTU; 1 gallon, diesel = 137,381 BTU.

Energy convert to BTU data source

<https://www.bts.gov/content/energy-intensity-transit-motor-buses>

Energy Consumption Calculation per Emission Category

Values from EPIC Inventory

On-Road Transportation – Passenger Car and Light-Duty Vehicles

see tab: on-road summary

On-Road Transportation - Heavy-Duty Trucks and Other Vehicles

see tab: on-road summary

Electricity

Table G.8	2022		
Electricity Sales – Bundled (MWh)	6,331,771		
Electricity Sales – Direct Access (MWh)	3,711,568		
Electricity Sales – CCA (MWh)	6,104,049		
Transmission and Distribution Loss Factor	0.082	loss_multiplier	1.082
Total 2022 Electricity (GWh)	17,471		
Total Electricity =Electricity Sales * (1+Loss Factor)	amount (sales)		
Table G.10	2035	2050	
Projected Electricity Sales (GWh)			
SDG&E Bundled	4,680	3,334	
San Diego Community Power	9,425	11,836	
Clean Energy Alliance	1,589	1,996	
ESPs for Direct Access	4,400	4,767	
Total Electricity Sales (GWh)	20,094	21,933	
Total Electricity applying Loss	21,742	23,732	
	2022	2035	2050
Total Electricity (GWh)	17,471	21,742	23,732

Natural Gas

Table G.12 and G.13	2022	2035	2050
Sales (Therms)	621,630,424	536,765,682	534,332,373
Natural Gas Sales (MTherms)	622	537	534

Industrial

Table G.14 and G.15	2022	2035	2050
Total industry San Diego Region MMT CO2e	2	3	3
Energy Intensity (lbs CO2e/MWh)	641	104	0
Total Electricity (MWh)	8,254,427	53,843,604	0
Total Electricity (GWh), considering loss	8,931	58,259	0

Direct Access Energy Provider (Table G.7 and G.9)

Construction and Mining

Table G.20	2022	2035	2050
GHG Emissions (MT CO2e)	154,900	155,300	155,400
Diesel Gallons	15,171,401	15,210,578	15,220,372
Diesel Million Gallons	15	15	15

Note that construction/mining subcategory was used as a proxy for construction equipment energy

Energy Consumption Calculation per Emission Category

Rail	Table G.41 and G.42	2022	2035	2050
Freight and Other Inter-Regional Diesel Rail (OFFROAD) (MT CO ₂ e)		2,200	800	600
Freight and Other Inter-Regional Electric Rail (OFFROAD) (MT CO ₂ e)		0	300	0
Intra-Regional Diesel Light Rail (MT CO ₂ e)		13,075	4,900	0
Intra-Regional Electric Light Rail (MT CO ₂ e)		13,110	3,000	--
Total Diesel MTCO₂e		15,275	5,700	600
Total Electric MTCO₂e		13,110	3,300	0
Total Diesel Gallons		1,496,088	558,276	58,766
Total Electric KWh		56,896,708	14,321,350	0
Total Diesel Gallons (diesel+electric equivalent)		2,894,042	910,152	58,766
Total Diesel Million Gallons (diesel+electric equivalent)		3	1	0
Intra-Regional Light Rail – Diesel Fuel Consumption (gallons)		1,280,613		
Intra-Regional Light Rail – Electric Energy Consumption (kWh)		56,896,708		

kWh equivalent of 1 gallon of diesel	40.7
Diesel Emission Factor (kg CO ₂ per gallon)*	10.21
Diesel gallons per MTCO ₂ e	98
2022 GHG Emission intensi	508
MT to lbs	2204.62
CO ₂ e MT/kWh	0.000230425

Energy Consumption Calculation per Emission Category

Water Supply

2022 Upstream Water Supply (Table G.26)		
Water Source	Imported Treated Water	Imported Raw Water
Water Demand (Acre-feet)	142,374	270,806
Energy Intensity (kWh/Acre-foot)*	1,873	1,767
Total Upstream Electricity Use (Treated and Raw) (kWh)	266,666,502	478,514,202
Local Water Treatment (Table G.27)		
Local Water Treatment Electricity Use (kWh)	320,869,821	
Total Water Electricity Use (KWh)	1,066,050,525	

Projection Year	2035	2050
Upstream		
Imported Treated Water (Acre-feet)	112,689	129,277
Imported Raw Water (Acre-feet)	245,436	281,566
Total Upstream Electricity Use (Treated and Raw) (kWh)	655,784,130	752,319,196
Local Treatment		
Water Treated at Local Water Treatment Plants (Acre- feet)	321,595	354,225
Water Further Treated to Potable Reuse (Acre-feet)**	112,562	112,562
Water Treated with Desalinization (Acre-feet)	6,000	6,000
Total Local Treatment Electricity Use (kWh)	565,033,143	603,308,133
Total Water Electricity Use (KWh)	1,220,817,273	1,355,627,329

	2022	2035	2050
Total Water Electricity Use (GWh)	1,066	1,221	1,356

Energy intensity
1,862 (kWh/Acre-foot) imported
Energy Intensity
(kWh/Acre-foot) imported
1,817 raw water

kWh/AF energy intensity
1,173 at pure water facility

kWh/AF energy intensity
at Advanced Water
1,584 Purification (AWP)

On-Road Energy Consumption Summary

Year 2022

Vehicle Category	Electricity (KWh)	Diesel (gals)	Gasoline (gals)	NG (gals)
Light Duty Vehicles				
LDA	343,844,875	1,810,885	605,180,860	0
LDT1	1,024,023	17,269	71,811,684	0
LDT2	12,658,650	993,505	351,560,914	0
MDV	10,345,570	3,876,500	252,429,029	0
subtotal	367,873,118	6,698,159	1,280,982,487	0
Heavy-Duty Trucks and Vehicles				
subtotal	0	166,998,209	97,081,684	11,475,765
total	367,873,118	173,696,368	1,378,064,171	11,475,765
adjusted total	269,085,159	127,052,270	1,008,001,396	8,394,085

Note: Energy uses are adjusted using ABM VMT to EMFAC VMT ratio for each scenario year.

VMT per day	2022	2035	2050
EMFAC	97,399,642	105,714,741	111,251,276
ABM	71,244,124	73,453,955	73,313,426
adjust factor	0.73	0.69	0.66

2035

	Vehicle Category	Electricity (KWh)	Diesel (gals)	Gasoline (gals)	NG (gals)
Light Duty Vehicles					
	LDA	954,491,096	342,319	489,111,380	0
	LDT1	12,071,002	368	43,137,476	0
	LDT2	103,921,734	864,524	297,708,420	0
	MDV	87,033,171	2,195,281	208,152,422	0
	subtotal	1,157,517,003	3,402,492	1,038,109,698	0
Heavy-Duty Trucks and Vehicles					
	subtotal	507,157,610	154,162,186	68,501,219	9,189,411
	total	1,664,674,613	157,564,677	1,106,610,916	9,189,411
	adjusted total	1,156,668,715	109,480,935	768,908,360	6,385,094

2050

	Vehicle Category	Electricity (KWh)	Diesel (gals)	Gasoline (gals)	NG (gals)
Light Duty Vehicles					
	LDA	1,079,084,319	185,924	481,382,945	0
	LDT1	18,692,602	449	35,326,922	0
	LDT2	138,463,581	843,566	286,290,664	0
	MDV	114,277,382	1,788,931	200,478,664	0
	subtotal	1,350,517,884	2,818,870	1,003,479,195	0
Heavy-Duty Trucks and Vehicles					
	subtotal	1,219,084,971	176,057,055	46,234,005	4,294,897
	total	2,569,602,855	178,875,925	1,049,713,200	4,294,897
	adjusted total	1,693,341,377	117,877,362	691,750,008	2,830,292

On-Road Fuel Consumption Calculation
Source: EMFAC2021 (v1.0.2) Emissions Inventory
Region Type: MPO
Region: SANDAG
Calendar Year: 2022, 2035, 2050
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

CH4
N2O_
tons to MT
0.907185

Vehicle Classification: EMFAC2007 Categories										GWP										Operation									
Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, tons/day for Emissions, 1000 gallons/day for Fuel Consumption										125298																			
Calendar				Energy				Fuel				Electricity				Diesel				Gasoline				Vehicle					
Year	Vehicle Category	Model Year	Speed	Fuel	Population	Total VMT	CVMT	EVMT	Trips	Consumption	ion	CO2_TOTE	CH4_TOTE	N2O_TOTE	CO2e	Days	CO2e (MT)	(KWh)	(gals)	(gals)	NG (gals)	Category	Days						
2022	All Other Buses	Aggregate	Aggregate	Diesel	434.4573561	24398.7159	24398.7159	0	3866.67	0	2.848525	31.88781	0.000217	0.005024	30.29124	292	8845.043	0	831769.4	0	0	LDA	347						
2022	All Other Buses	Aggregate	Aggregate	Natural Gas	86.54839544	5491.319613	5491.319613	0	770.2807	0	0.766594	6.632311	0.005221	0.001352	6.500646	292	1898.189	0	0	0	223845.5	0	LDT1	347					
2022	LDA	Aggregate	Aggregate	Gasoline	1200745.494	46651921.79	46651921.79	0	5588599	0	1720.311	16314.19	0.645718	0.475655	14943.22	347	5185298	0	0	5.97E+08	0	0	LDT2	347					
2022	LDA	Aggregate	Aggregate	Diesel	6495.421997	205721.6287	205721.6287	0	28048.71	0	5.218689	58.42059	0.000414	0.009204	55.49595	347	19257.09	0	1810885	0	0	0	LHD1	327					
2022	LDA	Aggregate	Aggregate	Electricity	46339.91026	2097108.011	0	2097108	232269.8	809656.776	0	0	0	0	0	347	0	280950901	0	0	0	0	LHD2	327					
2022	LDA	Aggregate	Aggregate	Plug-in Hybrid	26391.59534	1248833.575	648725.1075	600108.5	109129.2	181250.6434	23.72602	225.0005	0.005813	0.003452	205.1821	347	71198.2	62893973.2	0	8232930	0	0	MCY	347					
2022	LDT1	Aggregate	Aggregate	Gasoline	138289.5269	4651323.272	4651323.272	0	604313.9	0	206.9057	1962.145	0.14893	0.09856	1810.051	347	628087.7	0	0	71796293	0	0	MDV	347					
2022	LDT1	Aggregate	Aggregate	Diesel	74.65063347	1118.115896	1118.115896	0	221.5234	0	0.049765	0.557097	1.98E-05	8.78E-05	0.529566	347	183.7595	0	17268.53	0	0	0	MH	327					
2022	LDT1	Aggregate	Aggregate	Electricity	174.798842	6613.859084	0	6613.859	826.8081	2553.495478	0	0	0	0	0	347	0	886062.931	0	0	0	0	Motor Coar	292					
2022	LDT1	Aggregate	Aggregate	Plug-in Hybrid	49.0526983	2525.068387	1208.710246	1316.358	202.8329	397.5793924	0.044356	0.420644	1.08E-05	6.43E-06	0.383585	347	133.1039	137960.049	0	15391.68	0	0	OBUS	327					
2022	LDT2	Aggregate	Aggregate	Gasoline	556991.8309	21817861.26	21817861.26	0	2599602	0	1010.934	9586.972	0.369089	0.290228	8783.989	347	3048044	0	0	3.51E+08	0	0	PTO	312					
2022	LDT2	Aggregate	Aggregate	Diesel	1975.910285	82881.65222	82881.65222	0	9486.618	0	2863127	32.05126	0.000119	0.00505	30.44426	347	10564.16	0	993504.9	0	0	0	SBUS	327					
2022	LDT2	Aggregate	Aggregate	Electricity	1225.207659	46668.62996	0	46668.63	6320.456	18017.94294	0	0	0	0	0	347	0	6252226.2	0	0	0	0	T6 Ag	312					
2022	LDT2	Aggregate	Aggregate	Plug-in Hybrid	2426.919467	121163.805	60036.3379	61127.47	10035.31	18462.31695	2.209617	20.95441	0.000536	0.000319	19.10779	347	6630.402	6406423.98	0	766737	0	0	T6 CAIRP h	312					
2022	LHD1	Aggregate	Aggregate	Gasoline	43036.00065	1632171.624	1632171.624	0	64117.23	0	175.9423	1668.51	0.052338	0.061416	1531.438	327	500780.1	0	0	57533138	0	0	T6 CAIRP s	312					
2022	LHD1	Aggregate	Aggregate	Diesel	29910.93808	1147917.245	1147917.245	0	376242	0	72.06013	806.6769	0.013678	0.127092	766.4736	327	250636.9	0	23563661	0	0	0	T6 instate c	312					
2022	LHD2	Aggregate	Aggregate	Gasoline	6040.899716	225990.3716	225990.3716	0	90000.4	0	27.27706	258.676	0.006396	0.008263	237.046	327	77514.05	0	0	8919599	0	0	T6 instate c	312					
2022	LHD2	Aggregate	Aggregate	Diesel	11103.8354	448078.675	448078.675	0	139672.3	0	34.25596	383.4783	0.004565	0.060417	364.3225	327	119133.5	0	11201699	0	0	0	T6 instate f	312					
2022	MCY	Aggregate	Aggregate	Gasoline	71279.32481	436040.4818	436040.4818	0	142558.6	0	11.25594	106.7432	0.132594	0.021582	105.6774	347	36670.07	0	0	3905812	0	0	T6 instate s	312					
2022	MDV	Aggregate	Aggregate	Gasoline	337890.4603	12907287.4	12907287.4	0	1554163	0	725.9486	6884.374	0.291191	0.212884	6309.556	347	2189416	0	0	2.52E+08	0	0	T6 OOS hei	312					
2022	MDV	Aggregate	Aggregate	Diesel	6001.720384	245783.2636	245783.2636	0	28331.74	0	11.17147	125.059	0.000329	0.019703	118.7857	347	41218.63	0	3876500	0	0	0	T6 OOS sm	312					
2022	MDV	Aggregate	Aggregate	Electricity	1236.316501	46899.48249	0	46899.48	6365.784	18107.07107	0	0	0	0	0	347	0	6283153.66	0	0	0	0	T6 Public	312					
2022	MDV	Aggregate	Aggregate	Plug-in Hybrid	1602.010662	79487.45052	40725.54054	38761.91	6624.314	11707.2521	1.512579	14.34421	0.000356	0.000213	13.07855	347	4538.256	4062416.48	0	524864.9	0	0	T6 utility	312					
2022	MH	Aggregate	Aggregate	Gasoline	11510.44919	103886.224	103886.224	0	1151.505	0	23.57086	223.5291	0.002425	0.003465	203.7739	327	66634.05	0	0	7707671	0	0	T6TS	327					
2022	MH	Aggregate	Aggregate	Diesel	4146.189411	40359.02566	40359.02566	0	414.6189	0	4.296863	48.10122	0.000284	0.007578	45.69189	327	14941.25	0	1405074	0	0	0	T7 Ag	312					
2022	Motor Coach	Aggregate	Aggregate	Diesel	159.412991	22799.83257	22799.83257	0	3663.311	0	4.153691	46.49849	6.08E-05	0.007326	44.16459	292	12896.06	0	1212878	0	0	0	T7 CAIRP	312					
2022	OBUS	Aggregate	Aggregate	Gasoline	1248.39658	61727.81874	61727.81874	0	24977.92	0	13.16093	124.8088	0.002888	0.003145	114.1405	327	37323.93	0	0	4303625	0	0	T7 CAIRP c	312					
2022	PTO	Aggregate	Aggregate	Diesel	0	35069.79884	35069.79884	0	0	0	7.298737	81.70569	0.000102	0.012873	77.60452	312	24212.61	0	2277206	0	0	0	T7 NNOOS	312					
2022	SBUS	Aggregate	Aggregate	Gasoline	262.6265152	14719.57489	14719.57489	0	1050.506	0	1.516176	14.37832	0.001444	0.001158	13.38966	327	4378.417	0	0	495789.5	0	0	T7 NOOS	312					
2022	SBUS	Aggregate	Aggregate	Diesel	2122.450792	45543.46567	45543.46567	0	30733.09	0	5.679746	63.5819	0.000226	0.010017	60.39378	327	19748.77	0	1857277	0	0	0	T7 other po	312					
2022	SBUS	Aggregate	Aggregate	Natural Gas	15.14060907	396.9399439	396.9399439	0	219.236	0	0.067897	0.587423	0.001576	0.000012	0.601008	327	196.5297	0	0	22202.35	0	0	T7 POLA	312					
2022	T6 CAIRP heavy	Aggregate	Aggregate	Diesel	59.69322806	12355.98091	12355.98091	0	1371.75	0	1.295589	14.50347	5.81E-06	0.002285	13.7752	312	4297.863	0	404223.9	0	0	0	T7 Public	312					
2022	T6 CAIRP small	Aggregate	Aggregate	Diesel	53.09065563	3273.260335	3273.260335	0	1220.023	0	0.368312	4.123069	2.2E-06	0.000065	3.916047	312	1221.807	0	114913.4	0	0	0	T7 Single	312					
2022	T6 instate heavy	Aggregate	Aggregate	Diesel	2421.057765	125423.8719	125423.8719	0	29304.65	0	14.53667	162.7307	0.000235	0.025638	154.5632	312	48223.73	0	4535440	0	0	0	T7 single cr	312					
2022	T6 instate heavy	Aggregate	Aggregate	Natural Gas	16.03956855	995.1037664	995.1037664	0	198.0007	0	0.136477	1.80749	0.001029	0.000241	1.179531	312	361.7863	0	0	42580.7	0	0	T7 SWCV	312					
2022	T6 instate small	Aggregate	Aggregate	Diesel	12157.00615	492427.5558	492427.5558	0	150085.6	0	58.88744	659.2153	0.001483	0.10386	626.1414	312	195356.1	0	18372881	0	0	0	T7 tractor	312					
2022	T6 instate small	Aggregate	Aggregate	Natural Gas	231.9138294	10462.57483	10462.57483	0	2835.567	0	1.435917	12.42307	0.001174	0.002533	12.22055	312	3821.812	0	0	448006.2	0	0	T7 tractor c	312					
2022	T6 OOS heavy	Aggregate	Aggregate	Diesel	32.65586513	8163.907105	8163.907105	0	750.4318	0	0.854603	9.56695	3.93E-06	0.001507	9.086466	312	2834.977	0	266636.1	0	0	0	T7 utility	312					
2022	T6 OOS small	Aggregate	Aggregate	Diesel	30.45058366	1865.665296	1865.665296	0	699.7544	0	0.209896	2.349683	1.45E-06	0.00037	2.231709	312	696.2932	0	65487.64	0	0	0	T7IS	327					
2022	T6 Public	Aggregate	Aggregate	Diesel	2074.936769	79834.57686	79834.57686	0	10644.43	0	10.48545	117.3793	0.000367	0.018493	111.4926	312	37485.68	0	3271461	0	0	0	UBUS	327					
2022	T6 Public	Aggregate	Aggregate	Natural Gas	14.48488432	667.4392733	667.4392733	0	74.30746	0	0.099205	0.858292	0.000974	0.000175	0.848015	312	264.5807	0	0	30952.09	0	0	All Other B2	292					
2022	T6 Utility	Aggregate	Aggregate	Diesel	301.998994	12683.25932	12683.25932	0	3865.587	0	1.456703	16.30705	1.19E-05	0.002569	15.48834	312	4832.362	0	454491.2	0	0	0	from 2021 EIR						
2022	T6TS	Aggregate	Aggregate	Gasoline	3632.319527	192778.3811	192778.3811	0	72675.45	0	41.82663	396.6536	0.010151	0.009304	362.5836	327	118564.8	0	0	13677307	0	0							
2022	T7 CAIRP	Aggregate	Aggregate	Diesel	1988.745582	408728.0633	408728.0633	0	45701.37	0	68.36371	765.2974	0.001516	0.120573	726.8965	312	226791.7	0	21329478	0	0	0							
2022	T7 CAIRP	Aggregate	Aggregate	Natural Gas	1.692138066	369.5299146	369.5299146	0	38.88533	0	0.066814	0.578055	0.000653	0.000118	0.571076	312	178.1757	0	0	0	0	20846.06							
2022	T7 NNOOS	Aggregate	Aggregate	Diesel	1785.106075	483679.4796	483679.4796	0	41021.74	0	80.91201	903.7652	0.001603	0.142704	860.3154	312	268418.4	0	25244546	0	0	0							
2022	T7 NOOS	Aggregate	Aggregate	Diesel	743.8922827	175712.1633	175712.1633	0	17094.64	0	29.57308	331.0558	0.000699	0.052158	314.4451	312	98106.89	0	9226802	0	0	0							
2022	T7 Other Port	Aggregate	Aggregate	Diesel	538.6186911	92967.06301	92967.06301	0	8811.802	0	15.88967	177.8769	0.000401	0.028025	168.9526	312	52713.2	0	4957578	0	0	0							
2022	T7 POLA	Aggregate	Aggregate	Diesel	222.5636706	29021.27692	29021.27692	0	3641.142	0	5.076847	56.83275	0.0																

Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	Total VMT	CVMT	EVMT	Trips	Energy Consumption	Fuel Consumption	CO2_TOTE X	CH4_TOTE X	N2O_TOTE X	CO2e (MT/day)	Days	Electricity CO2e (MT)	Electricity (KWh)	Diesel (gals)	Gasoline (gals)	NG (gals)	Vehicle Category	Days (days/yr)
2035	All Other Buses	Aggregate	Aggregate	Natural Gas	101.4503332	5213.393453	5213.393453	0	902.908	0	0.663168	5.737502	0.005179	0.00117	5.638634	292	1646.481	0	0	0	193645		
2035	LDA	Aggregate	Aggregate	Gasoline	1110759.184	46347911.89	46347911.89	0	5164619	0	1175.497	13044.22	0.307965	0.329363	11929.55	347	4139554	0	0	4.77E+08	0		
2035	LDA	Aggregate	Aggregate	Diesel	1519.306492	45149.63773	45149.63773	0	6406.123	0	0.986511	11.04349	4.36E-05	0.00174	10.48985	347	3639.976	0	342319.1	0	0		
2035	LDA	Aggregate	Aggregate	Electricity	130716.132	6138023.808	0	6138024	626679.2	2369783.789	0	0	0	0	0	347	0	822314975	0	0	0		
2035	LDA	Aggregate	Aggregate	Plug-in Hybrid	49294.49561	2183801.775	922631.4992	1261170	203832.7	380911.0121	34.04569	322.8648	0.010146	0.00566	294.6583	347	102246.4	132176121	0	11813855	0		
2035	LDT1	Aggregate	Aggregate	Gasoline	93857.68538	3390000.626	3390000.626	0	407965.6	0	123.5656	1171.807	0.041855	0.035057	1073.473	347	372495	0	0	42877274	0		
2035	LDT1	Aggregate	Aggregate	Diesel	0.647733662	29.05996437	29.05996437	0	3.105948	0	0.00106	0.011869	3.82E-08	1.87E-06	0.011274	347	3.911985	0	367.9065	0	0		
2035	LDT1	Aggregate	Aggregate	Electricity	1344.694667	67210.15522	0	67210.16	6574.167	25948.66707	0	0	0	0	0	347	0	9004187.47	0	0	0		
2035	LDT1	Aggregate	Aggregate	Plug-in Hybrid	1036.853104	49528.79652	20266.51075	29262.29	4287.388	8838.082459	0.749862	7.111148	0.000216	0.000122	6.488885	347	2251.643	3066814.61	0	260202	0		
2035	LDT2	Aggregate	Aggregate	Gasoline	564854.8326	23373410.67	23373410.67	0	2615349	0	849.6967	8057.911	0.201982	0.196984	7367.85	347	2556644	0	0	2.95E+08	0		
2035	LDT2	Aggregate	Aggregate	Diesel	2124.456927	88897.51513	88897.51513	0	9911.945	0	2.491423	27.89023	0.000116	0.004394	26.49214	347	9192.774	0	864523.8	0	0		
2035	LDT2	Aggregate	Aggregate	Electricity	15409.83751	531116.4945	0	531116.5	75330.98	205054.8023	0	0	0	0	0	347	0	71154016.4	0	0	0		
2035	LDT2	Aggregate	Aggregate	Plug-in Hybrid	11787.55999	534718.9128	222062.8091	312656.1	48741.56	94431.46195	8.252663	78.26231	0.002431	0.001359	71.4208	347	24783.02	32767717.3	0	2863674	0		
2035	LHD1	Aggregate	Aggregate	Gasoline	34320.5996	1382832.606	1382832.606	0	511325.8	0	126.8769	1203.209	0.020585	0.029988	1100.107	327	359735.1	0	0	41488749	0		
2035	LHD1	Aggregate	Aggregate	Diesel	26680.75033	1039152.429	1039152.429	0	335610.3	0	62.72909	702.2207	0.006486	0.110635	667.1004	327	218141.8	0	20512413	0	0		
2035	LHD1	Aggregate	Aggregate	Electricity	12327.98337	735137.5642	0	735137.6	172166.2	478319.5318	0	0	0	0	0	327	0	156410487	0	0	0		
2035	LHD2	Aggregate	Aggregate	Gasoline	4925.019313	188890.3519	188890.3519	0	73375.45	0	19.68294	186.6589	0.002659	0.004152	170.5169	327	55759.01	0	0	6436323	0		
2035	LHD2	Aggregate	Aggregate	Diesel	12150.49033	468652.3681	468652.3681	0	152837.9	0	33.256	372.2842	0.003058	0.058654	353.6565	327	115645.7	0	10874713	0	0		
2035	LHD2	Aggregate	Aggregate	Electricity	3263.880242	185714.7364	0	185714.7	43252.03	118913.2816	0	0	0	0	0	327	0	38884643.1	0	0	0		
2035	MCY	Aggregate	Aggregate	Gasoline	67054.21067	400554.5443	400554.5443	0	134108.4	0	10.01891	95.0121	0.100087	0.017454	93.1821	347	32334.19	0	0	3476561	0		
2035	MDV	Aggregate	Aggregate	Gasoline	327359.1965	13492450.18	13492450.18	0	1503880	0	594.6012	5638.769	0.126548	0.118367	5150.277	347	1787146	0	0	2.06E+08	0		
2035	MDV	Aggregate	Aggregate	Diesel	4387.313403	168660.2634	168660.2634	0	19765.18	0	6.326458	70.82151	0.000121	0.011158	67.26742	347	23341.8	0	2195281	0	0		
2035	MDV	Aggregate	Aggregate	Electricity	14481.72767	495120.2713	0	495120.3	70609.91	191157.2892	0	0	0	0	0	347	0	66331579.4	0	0	0		
2035	MDV	Aggregate	Aggregate	Plug-in Hybrid	7296.103911	337826.5912	140300.5042	197526.1	30169.39	59658.76548	5.261692	49.8981	0.001512	0.000849	45.53051	347	15799.09	20701591.6	0	1825807	0		
2035	MH	Aggregate	Aggregate	Gasoline	5736.294014	58799.13712	58799.13712	0	573.8589	0	13.31363	126.2569	0.000363	0.001005	114.8182	327	37545.56	0	0	4353556	0		
2035	MH	Aggregate	Aggregate	Diesel	3571.291212	33466.80879	33466.80879	0	357.1291	0	3.576978	40.04247	0.000193	0.006309	38.03581	327	12437.71	0	1169672	0	0		
2035	Motor Coach	Aggregate	Aggregate	Diesel	201.7086987	24395.24784	24395.24784	0	4635.266	0	4.018333	44.98322	5.58E-05	0.007087	42.72531	292	12475.79	0	1173353	0	0		
2035	OBUS	Aggregate	Aggregate	Gasoline	756.7052618	30803.79026	30803.79026	0	15140.16	0	5.892962	55.88461	0.001052	0.000972	50.98432	327	16671.87	0	0	1926999	0		
2035	OBUS	Aggregate	Aggregate	Electricity	132.5179545	11904.72116	0	11904.72	2651.419	13205.71895	0	0	0	0	0	327	0	4318270.1	0	0	0		
2035	PTO	Aggregate	Aggregate	Diesel	0	31790.11507	31790.11507	0	0	0	5.775432	64.65306	2.73E-05	0.010186	61.40663	312	19158.87	0	1801935	0	0		
2035	PTO	Aggregate	Aggregate	Electricity	0	11053.8171	0	11053.82	0	22898.18959	0	0	0	0	0	312	0	7144235.15	0	0	0		
2035	SBUS	Aggregate	Aggregate	Gasoline	276.759639	16522.8023	16522.8023	0	1107.039	0	1.532527	14.53338	0.000912	0.000333	13.29515	327	4347.513	0	0	501136.3	0		
2035	SBUS	Aggregate	Aggregate	Diesel	1621.596239	35557.75102	35557.75102	0	23480.71	0	4.077379	45.64421	6.91E-05	0.007191	43.3534	327	14176.56	0	1333303	0	0		
2035	SBUS	Aggregate	Aggregate	Electricity	435.4153046	13718.93538	0	13718.94	5605.363	14452.28917	0	0	0	0	0	327	0	4725898.56	0	0	0		
2035	SBUS	Aggregate	Aggregate	Natural Gas	28.35701133	659.1718528	659.1718528	0	410.6095	0	0.107835	0.932954	0.002291	0.00019	0.949729	327	310.5613	0	0	35262.14	0		
2035	T6 CAIRP heavy	Aggregate	Aggregate	Diesel	63.2547956	12298.22818	12298.22818	0	1453.595	0	1.124515	12.58838	3.89E-06	0.001983	11.95625	312	3730.349	0	350848.7	0	0		
2035	T6 CAIRP heavy	Aggregate	Aggregate	Electricity	12.16184835	2603.112628	0	2603.113	279.4793	2827.718359	0	0	0	0	0	312	0	882248.128	0	0	0		
2035	T6 CAIRP small	Aggregate	Aggregate	Diesel	49.33669095	2534.668685	2534.668685	0	1133.757	0	0.263823	2.953366	8.77E-07	0.000465	2.80506	312	875.1787	0	82312.78	0	0		
2035	T6 CAIRP small	Aggregate	Aggregate	Electricity	22.88870664	1412.890649	0	1412.891	525.9825	1534.799833	0	0	0	0	0	312	0	478857.548	0	0	0		
2035	T6 instate heavy	Aggregate	Aggregate	Diesel	3027.516521	124657.2383	124657.2383	0	36565.36	0	13.8451	154.9889	8.53E-05	0.024419	147.2069	312	45928.55	0	4319670	0	0		
2035	T6 instate heavy	Aggregate	Aggregate	Electricity	416.4594325	26807.90168	0	26807.9	5031.949	28453.50218	0	0	0	0	0	312	0	8877492.68	0	0	0		
2035	T6 instate heavy	Aggregate	Aggregate	Natural Gas	23.29109761	996.4292234	996.4292234	0	284.5599	0	0.136416	1.180228	0.001137	0.000241	1.161515	312	362.3926	0	0	42561.91	0		
20																							

Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	Total VMT	CVMT	EVMT	Trips	Energy Consumption	Fuel					CO2e (MT/day)	Days	Electricity (KWh)	Diesel (gals)	Gasoline (gals)	NG (gals)	Vehicle Category	Days (days/yr)
											Consumption	CO2_TOTE X	CH4_TOTE X	N2O_TOTE X									
2035	T7 SWCV	Aggregate	Aggregate	Electricity	238.1485776	15266.15119	0	15266.15	1095.483	28403.44836	0	0	0	0	0	312	0	8861875.89	0	0	0		
2035	T7 SWCV	Aggregate	Aggregate	Natural Gas	987.6303341	64032.42514	64032.42514	0	4543.1	0	12.18483	105.419	0.074955	0.02149	103.1442	312	32180.99	0	0	3801666			
2035	T7 Tractor	Aggregate	Aggregate	Diesel	5897.443611	375121.0727	375121.0727	0	85689.86	0	54.97977	615.4709	0.001254	0.096968	584.5887	312	182391.7	0	17153688	0	0		
2035	T7 Tractor	Aggregate	Aggregate	Electricity	546.8080211	42371.0873	0	42371.09	7945.121	77145.45388	0	0	0	0	0	312	0	24069381.6	0	0	0		
2035	T7 Tractor	Aggregate	Aggregate	Natural Gas	82.55869053	5223.480914	5223.480914	0	1199.578	0	0.920769	7.966179	0.010502	0.001624	7.904009	312	2466.051	0	0	287279.9			
2035	T7 Utility	Aggregate	Aggregate	Diesel	131.4577192	5404.208165	5404.208165	0	1682.659	0	0.880369	9.855293	7.51E-06	0.001553	9.360504	312	2920.477	0	274675.3	0	0		
2035	T7 Utility	Aggregate	Aggregate	Electricity	27.0410651	1522.323005	0	1522.323	346.1256	2866.22714	0	0	0	0	0	312	0	894262.868	0	0	0		
2035	T7IS	Aggregate	Aggregate	Gasoline	3.23332373	480.1027128	480.1027128	0	64.69234	0	0.105818	1.0035	5.11E-05	6.07E-05	0.927924	327	303.4311	0	0	34602.44	0		
2035	T7IS	Aggregate	Aggregate	Electricity	0.742805557	185.9511685	0	185.9512	14.86205	373.6585949	0	0	0	0	0	327	0	122186.361	0	0	0		
2035	UBUS	Aggregate	Aggregate	Gasoline	179.2514382	18446.75727	18446.75727	0	717.0058	0	1.856877	17.60929	5.48E-05	0.000121	16.00887	327	5234.901	0	0	607198.9	0		
2035	UBUS	Aggregate	Aggregate	Electricity	740.4326744	90624.44581	0	90624.45	2961.731	157980.5322	0	0	0	0	0	327	0	51659634	0	0	0		
2035	UBUS	Aggregate	Aggregate	Natural Gas	536.8488912	65734.82603	65734.82603	0	2147.396	0	11.40074	98.63534	0.325566	0.020107	102.3001	327	33452.13	0	0	0	3728042		
2050	All Other Buses	Aggregate	Aggregate	Diesel	536.4504346	27491.62792	27491.62792	0	4774.409	0	2.748766	30.77105	2.17E-05	0.004848	29.22614	292	8534.033	0	802639.6	0	0		
2050	All Other Buses	Aggregate	Aggregate	Natural Gas	106.0815371	5311.773986	5311.773986	0	944.1257	0	0.65032	5.62635	0.005342	0.001147	5.53536	292	1616.325	0	0	0	189893.5		
2050	LDA	Aggregate	Aggregate	Gasoline	1146207.31	47755582.22	47755582.22	0	5350192	0	1353.24	12833.15	0.243215	0.317496	11733.39	347	4071486	0	0	4.7E+08	0		
2050	LDA	Aggregate	Aggregate	Diesel	770.6086424	28000.90946	28000.90946	0	3407.35	0	0.535803	5.998051	1.16E-05	0.000945	5.697076	347	1976.885	0	185923.8	0	0		
2050	LDA	Aggregate	Aggregate	Electricity	159411.415	6996707.491	0	6996707	749382.7	2701306.561	0	0	0	0	0	347	0	937353377	0	0	0		
2050	LDA	Aggregate	Aggregate	Plug-in Hybrid	53992.45635	2281207.608	928869.1558	1352338	223258.8	408446.5187	34.03108	322.7262	0.010847	0.005933	294.6223	347	102233.9	141730942	0	11808784	0		
2050	LDT1	Aggregate	Aggregate	Gasoline	79440.64221	3062405.871	3062405.871	0	357568.5	0	100.6628	954.6137	0.017337	0.021964	872.3421	347	302702.7	0	0	34930001	0		
2050	LDT1	Aggregate	Aggregate	Diesel	0.900072564	36.28856539	36.28856539	0	4.153715	0	0.001295	0.014493	4.63E-08	2.28E-06	0.013766	347	4.776866	0	449.2453	0	0		
2050	LDT1	Aggregate	Aggregate	Electricity	2434.561036	104184.6679	0	104184.7	11345.1	40223.88063	0	0	0	0	0	347	0	13957686.6	0	0	0		
2050	LDT1	Aggregate	Aggregate	Plug-in Hybrid	1849.505045	76168.13774	30989.52303	45178.61	7647.703	13645.28818	1.143865	10.84759	0.00037	0.000201	9.903573	347	3436.54	4734915	0	396921.3	0		
2050	LDT2	Aggregate	Aggregate	Gasoline	582476.1491	23920932.35	23920932.35	0	2701874	0	814.9864	7728.744	0.159871	0.180394	7063.794	347	2451137	0	0	2.83E+08	0		
2050	LDT2	Aggregate	Aggregate	Diesel	2241.84305	91950.6223	91950.6223	0	10394.56	0	2.431025	27.2141	0.000116	0.004288	25.84997	347	8969.941	0	843565.5	0	0		
2050	LDT2	Aggregate	Aggregate	Electricity	23794.5107	723757.2214	0	723757.2	111930.7	279430.0224	0	0	0	0	0	347	0	96962217.8	0	0	0		
2050	LDT2	Aggregate	Aggregate	Plug-in Hybrid	16114.25388	667925.8206	271936.8512	395989	66632.44	119600.4711	10.05875	95.38992	0.003229	0.00176	87.08523	347	30218.57	41501363.5	0	3490386	0		
2050	LHD1	Aggregate	Aggregate	Gasoline	23526.90479	954197.3898	954197.3898	0	350515.8	0	83.25116	789.494	0.010494	0.016634	720.952	327	235751.3	0	0	27223129	0		
2050	LHD1	Aggregate	Aggregate	Diesel	18897.2583	725721.1834	725721.1834	0	237703.7	0	42.755098	478.5757	0.003206	0.0754	454.6131	327	148658.5	0	13979571	0	0		
2050	LHD1	Aggregate	Aggregate	Electricity	35904.84914	1659414.522	0	1659415	499722.9	1078838.794	0	0	0	0	0	327	0	352780286	0	0	0		
2050	LHD2	Aggregate	Aggregate	Gasoline	3362.222203	128756.9681	128756.9681	0	50092.1	0	12.66287	120.0855	0.001296	0.002141	109.548	327	35822.2	0	0	4140759	0		
2050	LHD2	Aggregate	Aggregate	Diesel	9410.853147	342734.3586	342734.3586	0	118376.7	0	23.64981	264.7478	0.001858	0.041711	251.4936	327	82238.4	0	7733489	0	0		
2050	LHD2	Aggregate	Aggregate	Electricity	9874.99119	437064.401	0	437064.4	130645.9	279736.1468	0	0	0	0	0	327	0	91473720	0	0	0		
2050	MCY	Aggregate	Aggregate	Gasoline	66182.70845	391981.6642	391981.6642	0	132365.4	0	9.585707	90.90394	0.08656	0.015977	88.74909	347	30795.94	0	0	3326240	0		
2050	MDV	Aggregate	Aggregate	Gasoline	337243.7802	13848443.39	13848443.39	0	1554527	0	571.2646	5417.462	0.093881	0.106593	4945.586	347	1716118	0	0	1.98E+08	0		
2050	MDV	Aggregate	Aggregate	Diesel	3765.778405	150832.8851	150832.8851	0	17153.98	0	5.155421	57.71235	6.51E-05	0.009093	54.81536	347	19020.93	0	1788931	0	0		
2050	MDV	Aggregate	Aggregate	Electricity	21869.33269	655562.6726	0	655562.7	102319.5	253101.2982	0	0	0	0	0	347	0	87826150.5	0	0	0		
2050	MDV	Aggregate	Aggregate	Plug-in Hybrid	10285.53373	425727.2686	173340.4758	252386.8	42530.68	76228.33376	6.483703	61.48677	0.002058	0.001121	56.12955	347	19476.95	26451231.8	0	2249845	0		
2050	MH	Aggregate	Aggregate	Gasoline	4120.045831	48347.38263	48347.38263	0	412.1694	0	10.94551	103.7994	0.000167	0.000958	94.42811	327	30877.99	0	0	3579183	0		
2050	MH	Aggregate	Aggregate	Diesel	2767.492476	28038.49172	28038.49172	0	276.7492	0	3.009948	33.69485	0.000121	0.005309	32.00535	327	10465.75	0	984252.9	0	0		
2050	Motor Coach	Aggregate	Aggregate	Diesel	210.1975667	26475.43327	26475.43327	0	4830.34	0	4.142003	46.36764	5.73E-05	0.007305	44.04024	292	12859.75	0	1209465	0	0		
2050	OBUS	Aggregate	Aggregate	Gasoline	403.625802	17180.30827	17180.30827	0	8075.745	0	3.060407	29.02269	0.000373	0.000499	26.47244	327	8656.488	0	0	1000753	0		
2050	OBUS	Aggregate	Aggregate	Electricity	322.7398386	23339.41599	0	23339.42	6457.379	25890.04512	0	0	0	0	0	327	0	8466044.75	0	0	0		
2050	PTO	Aggregate	Aggregate	Diesel	0	28827.79068	28827.79068	0	0	0	4.871266	54.53138	2.02E-05	0.008591	51.								

Calendar Year	Vehicle Category	Model Year	Speed	Fuel						Energy Consumption	Fuel										Electricity CO2e (MT)	Electricity (KWh)	Diesel (gals)	Gasoline (gals)	NG (gals)	Vehicle Category	Days (days/yr)
					Population	Total VMT	CVMT	EVMT	Trips		Consumption	ion	CO2_TOTE X	CH4_TOTE X	N2O_TOTE X	CO2e (MT/day)	Days										
2050	T7 NNOOS	Aggregate	Aggregate	Diesel	3805.085998	1110592.348	1110592.348	0	87440.88	0	142.6436	1596.823	0.003151	0.25158	1516.698	312	473209.7	0	44504795	0	0						
2050	T7 NNOOS	Aggregate	Aggregate	Diesel	1634.746382	403458.4726	403458.4726	0	37566.47	0	52.40184	586.6122	0.001319	0.092421	557.1809	312	173840.5	0	16349374	0	0						
2050	T7 Other Port	Aggregate	Aggregate	Diesel	523.2925872	124364.7613	124364.7613	0	8561.067	0	17.1234	191.6878	0.000156	0.0302	182.0643	312	56804.06	0	5342501	0	0						
2050	T7 Other Port	Aggregate	Aggregate	Electricity	120.648649	31321.50867	0	31321.51	1973.812	57004.1196	0	0	0	0	0	312	0	17785285.3	0	0	0	0					
2050	T7 POLA	Aggregate	Aggregate	Diesel	219.1301207	40455.58229	40455.58229	0	3584.969	0	5.594163	62.62384	6.05E-05	0.009866	59.48008	312	18557.78	0	1745379	0	0						
2050	T7 POLA	Aggregate	Aggregate	Electricity	42.49919761	7768.677529	0	7768.678	695.2869	14138.73858	0	0	0	0	0	312	0	4411286.44	0	0	0	0					
2050	T7 Public	Aggregate	Aggregate	Diesel	968.4468911	39064.73665	39064.73665	0	4968.133	0	6.375761	71.37344	0.000113	0.011245	67.79144	312	21150.93	0	1989237	0	0						
2050	T7 Public	Aggregate	Aggregate	Electricity	712.7371892	32420.78054	0	32420.78	3656.342	63628.45854	0	0	0	0	0	312	0	19852079.1	0	0	0	0					
2050	T7 Public	Aggregate	Aggregate	Natural Gas	8.716412293	352.7207804	352.7207804	0	44.7152	0	0.071967	0.622637	0.000826	0.000127	0.617894	312	192.7828	0	0	0	22453.81						
2050	T7 Single	Aggregate	Aggregate	Diesel	2725.618771	134881.6421	134881.6421	0	25675.33	0	20.36394	227.964	0.000325	0.035916	216.5224	312	67555	0	6353548	0	0						
2050	T7 Single	Aggregate	Aggregate	Electricity	2914.459514	167360.4602	0	167360.5	27454.21	305123.9215	0	0	0	0	0	312	0	95198663.5	0	0	0	0					
2050	T7 Single	Aggregate	Aggregate	Natural Gas	208.7987991	10300.874	10300.874	0	1966.885	0	1.72009	14.88164	0.018227	0.003034	14.73392	312	4596.984	0	0	0	536668.1						
2050	T7 SWCV	Aggregate	Aggregate	Diesel	31.30015766	1933.154325	1933.154325	0	143.9807	0	0.758562	8.491719	6.17E-06	0.001338	8.065382	312	2516.399	0	236671.3	0	0						
2050	T7 SWCV	Aggregate	Aggregate	Electricity	680.9434999	44010.08497	0	44010.08	3132.34	81882.99463	0	0	0	0	0	312	0	25547494.3	0	0	0	0					
2050	T7 SWCV	Aggregate	Aggregate	Natural Gas	759.7361312	49330.69912	49330.69912	0	3494.786	0	8.882964	76.85239	0.022328	0.015667	74.46112	312	23231.87	0	0	0	2771485						
2050	T7 Tractor	Aggregate	Aggregate	Diesel	8692.718002	581672.9908	581672.9908	0	126305.2	0	78.06358	873.8826	0.001839	0.137681	830.0356	312	258971.1	0	24355838	0	0						
2050	T7 Tractor	Aggregate	Aggregate	Electricity	1764.410886	127565.1634	0	127565.2	25636.89	232259.1431	0	0	0	0	0	312	0	72464852.6	0	0	0	0					
2050	T7 Tractor	Aggregate	Aggregate	Natural Gas	117.116667	7832.608901	7832.608901	0	1701.705	0	1.308029	11.31662	0.015074	0.002307	11.23181	312	3504.326	0	0	0	408105						
2050	T7 Utility	Aggregate	Aggregate	Diesel	91.34631715	3759.911009	3759.911009	0	1169.233	0	0.579351	6.485544	5.11E-06	0.001022	6.159939	312	1921.901	0	180757.5	0	0						
2050	T7 Utility	Aggregate	Aggregate	Electricity	74.61737927	3416.972794	0	3416.973	955.1025	6433.470511	0	0	0	0	0	312	0	2007242.8	0	0	0	0					
2050	T7IS	Aggregate	Aggregate	Gasoline	2.452446189	341.6065336	341.6065336	0	49.06854	0	0.071519	0.678237	3.48E-05	4.38E-05	0.627912	327	205.3271	0	0	23386.8	0						
2050	T7IS	Aggregate	Aggregate	Electricity	2.55717681	426.7081175	0	426.7081	51.16399	857.4463762	0	0	0	0	0	327	0	280384.965	0	0	0	0					
2050	UBUS	Aggregate	Aggregate	Gasoline	235.9001055	24773.53236	24773.53236	0	943.6004	0	2.425498	23.00168	6.46E-05	0.000134	20.90443	327	6835.748	0	0	793137.9	0						
2050	UBUS	Aggregate	Aggregate	Electricity	1768.082969	215734.8	0	215734.8	7072.332	376078.4213	0	0	0	0	0	327	0	122977644	0	0	0	0					