

Appendix 6.0

Energy Calculations

Operation-Related Vehicle Fuel/Energy Usage

PROPOSED COMMUTE

| Year | Gas | | Diesel | | CNG | | Electricity | |
|------------------|----------------|--------------|---------------|--------------|------------|-----------|--------------|------------|
| | VMT | Gallons | VMT | Gallons | VMT | Gallons | VMT | kWh |
| Proposed Project | 180,046 | 6,942 | 21,609 | 2,508 | 192 | 57 | 1,268 | 424 |
| Total | 180,046 | 6,942 | 21,609 | 2,508 | 192 | 57 | 1,268 | 424 |

Proposed Facilities

PROPOSED CONDITIONS

| Vehicle type | Fleet percent | | | VMT |
|--------------|---------------|------------------|---------|-----|
| | Place of | | Total | |
| | Worship | Place of Worship | | |
| LDA | 53.81% | 109,289 | 109,289 | |
| LDT1 | 3.84% | 7,810 | 7,810 | |
| LDT2 | 18.44% | 37,452 | 37,452 | |
| MDV | 12.21% | 24,802 | 24,802 | |
| LHD1 | 1.74% | 3,535 | 3,535 | |
| LHD2 | 0.53% | 1,084 | 1,084 | |
| MHD | 1.73% | 3,504 | 3,504 | |
| HHD | 6.77% | 13,753 | 13,753 | |
| OBUS | 0.14% | 277 | 277 | |
| UBUS | 0.12% | 246 | 246 | |
| MCY | 0.46% | 940 | 940 | |
| SBUS | 0.10% | 195 | 195 | |
| MH | 0.11% | 227 | 227 | |
| | 100.00% | 203,115 | 203,115 | |

4.2 Trip Summary Information

| Land Use | Average Daily Trip Rate | | | Unmitigated Annual VMT | Mitigated Annual VMT |
|------------------|-------------------------|---------------|---------------|------------------------|----------------------|
| | Weekday | Saturday | Sunday | | |
| Parking Lot | 0.00 | 0.00 | 0.00 | | |
| Place of Worship | 0.00 | 299.78 | 348.99 | 203,115 | 203,115 |
| Total | 0.00 | 299.78 | 348.99 | 203,115 | 203,115 |

4.4 Fleet Mix

| Land Use | LDA | LDT1 | LDT2 | MDV | LHD1 | LHD2 | MHD | HHD | OBUS | UBUS | MCY | SBUS | MH |
|------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Parking Lot | 0.538064 | 0.038449 | 0.184390 | 0.122109 | 0.017402 | 0.009339 | 0.017220 | 0.067711 | 0.001385 | 0.001213 | 0.004629 | 0.000959 | 0.001120 |
| Place of Worship | 0.538064 | 0.038449 | 0.184390 | 0.122109 | 0.017402 | 0.009339 | 0.017220 | 0.067711 | 0.001385 | 0.001213 | 0.004629 | 0.000959 | 0.001120 |

PROPOSED CONDITIONS

| Vehicle type | Gas percent | Diesel percent | CNG percent | Electricity percent |
|--------------|-------------|----------------|-------------|---------------------|
| LDA | 98.12% | 0.91% | 0.00% | 0.97% |
| LDT1 | 99.74% | 0.03% | 0.00% | 0.23% |
| LDT2 | 99.06% | 0.55% | 0.00% | 0.40% |
| MDV | 97.75% | 2.08% | 0.00% | 0.17% |
| LHD1 | 48.89% | 51.11% | 0.00% | 0.00% |
| LHD2 | 26.28% | 73.72% | 0.00% | 0.00% |
| MHD | 6.62% | 93.38% | 0.00% | 0.00% |
| HHD | 0.03% | 99.54% | 0.44% | 0.00% |
| OBUS | 51.57% | 48.43% | 0.00% | 0.00% |
| UBUS | 46.24% | 0.12% | 53.63% | 0.00% |
| MCY | 100.00% | 0.00% | 0.00% | 0.00% |
| SBUS | 35.83% | 64.17% | 0.00% | 0.00% |
| MH | 71.95% | 28.05% | 0.00% | 0.00% |

<< Equal to T6 (<https://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf>)
 << Equal to T7 (<https://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf>)
 << Motor coach, all other buses, and OBUS (<https://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf>)

PROPOSED CONDITIONS

| Vehicle type | VMT | Gasoline | | Diesel | | CNG | | Electricity | | |
|--------------|----------------|----------|--------------|---------------|---------|--------------|------------|-------------|--------------|------------|
| | | mpg | Gallons | mpg | Gallons | mpg | Gallons | m/kWh | kWh | |
| LDA | 107,234 | 30.62 | 3,502 | 995 | 49.78 | 20 | 0 | 1,060 | 2.99 | 354 |
| LDT1 | 7,789 | 26.04 | 299 | 3 | 25.18 | 0 | 0 | 18 | 2.99 | 6 |
| LDT2 | 37,099 | 24.10 | 1,539 | 205 | 37.02 | 6 | 0 | 149 | 2.99 | 50 |
| MDV | 24,244 | 19.38 | 1,251 | 516 | 27.30 | 19 | 0 | 42 | 2.99 | 14 |
| LHD1 | 1,728 | 10.64 | 162 | 1,806 | 20.52 | 88 | 0 | 0 | 0.00 | 0 |
| LHD2 | 285 | 9.31 | 31 | 799 | 18.77 | 43 | 0 | 0 | 0.00 | 0 |
| MHD | 232 | 5.11 | 45 | 3,272 | 10.56 | 310 | 0 | 0 | 0.00 | 0 |
| HHD | 4 | 3.99 | 1 | 13,689 | 6.90 | 1,985 | 60 | 2.29 | 26 | 0.00 |
| OBUS | 143 | 5.04 | 28 | 134 | 8.85 | 15 | 0 | 0 | 0.00 | 0 |
| UBUS | 114 | 6.16 | 18 | 0 | 8.92 | 0 | 132 | 4.23 | 31 | 0.00 |
| MCY | 940 | 38.12 | 25 | 0 | 0.00 | 0 | 0 | 0 | 0.00 | 0 |
| SBUS | 70 | 8.79 | 8 | 125 | 7.41 | 17 | 0 | 0 | 0.00 | 0 |
| MH | 164 | 5.08 | 32 | 64 | 10.73 | 6 | 0 | 0 | 0.00 | 0 |
| | 180,046 | | 6,942 | 21,609 | | 2,508 | 192 | 57 | 1,268 | 424 |

Appendix C: Evidence Used to Define the Average Number of KWH Required to Displace a Gallong of Gasoline

Table A 3: Evidence from U.S. Department of Energy and U.S. Environmental Protection Agency's fuel economy website^[32]

| Vehicle | Model year | Electric consumption | Gasoline fuel economy | Number of kWh that are equivalent to 1 gallon |
|--|------------|-----------------------------|-----------------------|---|
| Ford Fusion Energi & Ford C-Max Energi | 2013 | 0.34 kWh per mile | 43 mpg | 14.6 |
| Chevrolet Volt | 2013 | 0.35 kWh per mile | 37 mpg | 12.9 |
| Chevrolet Volt | 2012 | 0.36 kWh per mile | 37 mpg | 13.3 |
| Fisker Karma | 2012 | 0.62 kWh per mile | 20 mpg | 12.4 |
| Toyota Prius | 2013 | 0.29 kWh per mile & 0.2 gal | 50 mpg | 13.1 |
| Average for five models | - | - | - | 13.3 +/- 0.8 |

Table A 5: Average power consumption per mile traveled over time for different PEV categories

| Year range | 2012- 2020 | 2020-2030 | 2030-2040 | 2040-2050 | 2050 |
|---------------------------------|------------|-----------|-----------|-----------|-------|
| Efficiency improvement per year | 0.3% | 0.8% | 0.9% | 0.9% | |
| Year | 2012 | 2020 | 2030 | 2040 | 2050 |
| Relative energy efficiency | 1.000 | 0.976 | 0.901 | 0.823 | 0.752 |

https://www.fhwa.dot.gov/environment/climate_change/mitigation/publications_and_tools/ev_deployment/page08.cfm

| | | | |
|------|------|------|------|
| 0.34 | 14.6 | 2013 | 0.34 |
| 0.35 | 12.9 | 2014 | 0.34 |
| 0.36 | 13.3 | 2015 | 0.34 |
| 0.34 | 13.3 | 2016 | 0.34 |
| | | 2017 | 0.34 |
| | | 2018 | 0.34 |
| | | 2019 | 0.34 |
| | | 2020 | 0.33 |
| | | 2021 | 0.33 |
| | | 2022 | 0.33 |
| | | 2023 | 0.33 |
| | | 2024 | 0.32 |
| | | 2025 | 0.32 |
| | | 2026 | 0.32 |
| | | 2027 | 0.32 |
| | | 2028 | 0.31 |
| | | 2029 | 0.31 |
| | | 2030 | 0.31 |
| | | 2031 | 0.31 |
| | | 2032 | 0.30 |
| | | 2033 | 0.30 |
| | | 2034 | 0.30 |
| | | 2035 | 0.29 |

EMFAC Fuel Usage: Year 2020

| Vehicle type | VMT/day | Gasoline Gallons/day | Miles/gallon | VMT/day |
|-----------------|-------------------|-------------------------|--------------|------------------|
| All other buses | 0 | 0 | #DIV/0! | 9,716 |
| LDA | 22,811,940 | 744,924 | 30.62 | 211,708 |
| LDT1 | 2,171,444 | 83,378 | 26.04 | 704 |
| LDT2 | 6,953,901 | 288,501 | 24.10 | 38,381 |
| LHD1 | 522,854 | 49,160 | 10.64 | 546,498 |
| LHD2 | 74,925 | 8,051 | 9.31 | 210,206 |
| MCY | 186,162 | 4,883 | 38.12 | 0 |
| MDV | 5,759,435 | 297,212 | 19.38 | 122,611 |
| MH | 42,692 | 8,403 | 5.08 | 16,646 |
| Motor coach | 0 | 0 | #DIV/0! | 5,401 |
| OBUS | 16,099 | 3,193 | 5.04 | 0 |
| PTO | 0 | 0 | #DIV/0! | 38,521 |
| SBUS | 14,360 | 1,634 | 8.79 | 25,717 |
| T6 | 51,276 | 10,044 | 5.11 | 722,760 |
| T7 | 496 | 124 | 3.99 | 1,811,263 |
| UBUS | 22,881 | 3,712 | 6.16 | 59 |
| Total | 38,628,465 | 1,503,220 | 25.70 | 3,760,189 |

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EMFAC2017 (v1.0.2) Emissions Inventory

Region Type: Sub-Area

Region: Riverside (SC)

Calendar Year: 2020

Season: Annual

Vehicle Classification: EMFAC2011 Categories

Units: miles/day for VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumpt

| Region | CalYr | VehClass | MdlYr | Speed |
|----------------|-------|----------------------|------------|------------|
| Riverside (SC) | | 2020 All Other Buses | Aggregated | Aggregated |
| Riverside (SC) | | 2020 LDA | Aggregated | Aggregated |
| Riverside (SC) | | 2020 LDA | Aggregated | Aggregated |
| Riverside (SC) | | 2020 LDA | Aggregated | Aggregated |
| Riverside (SC) | | 2020 LDT1 | Aggregated | Aggregated |
| Riverside (SC) | | 2020 LDT1 | Aggregated | Aggregated |
| Riverside (SC) | | 2020 LDT1 | Aggregated | Aggregated |
| Riverside (SC) | | 2020 LDT2 | Aggregated | Aggregated |
| Riverside (SC) | | 2020 LDT2 | Aggregated | Aggregated |
| Riverside (SC) | | 2020 LDT2 | Aggregated | Aggregated |
| Riverside (SC) | | 2020 LHD1 | Aggregated | Aggregated |

| | | | |
|----------------|------------------------------------|------------|------------|
| Riverside (SC) | 2020 LHD1 | Aggregated | Aggregated |
| Riverside (SC) | 2020 LHD2 | Aggregated | Aggregated |
| Riverside (SC) | 2020 LHD2 | Aggregated | Aggregated |
| Riverside (SC) | 2020 MCY | Aggregated | Aggregated |
| Riverside (SC) | 2020 MDV | Aggregated | Aggregated |
| Riverside (SC) | 2020 MDV | Aggregated | Aggregated |
| Riverside (SC) | 2020 MDV | Aggregated | Aggregated |
| Riverside (SC) | 2020 MH | Aggregated | Aggregated |
| Riverside (SC) | 2020 MH | Aggregated | Aggregated |
| Riverside (SC) | 2020 Motor Coach | Aggregated | Aggregated |
| Riverside (SC) | 2020 OBUS | Aggregated | Aggregated |
| Riverside (SC) | 2020 PTO | Aggregated | Aggregated |
| Riverside (SC) | 2020 SBUS | Aggregated | Aggregated |
| Riverside (SC) | 2020 SBUS | Aggregated | Aggregated |
| Riverside (SC) | 2020 T6 Ag | Aggregated | Aggregated |
| Riverside (SC) | 2020 T6 CAIRP heavy | Aggregated | Aggregated |
| Riverside (SC) | 2020 T6 CAIRP small | Aggregated | Aggregated |
| Riverside (SC) | 2020 T6 instate construction heavy | Aggregated | Aggregated |
| Riverside (SC) | 2020 T6 instate construction small | Aggregated | Aggregated |
| Riverside (SC) | 2020 T6 instate heavy | Aggregated | Aggregated |
| Riverside (SC) | 2020 T6 instate small | Aggregated | Aggregated |
| Riverside (SC) | 2020 T6 OOS heavy | Aggregated | Aggregated |
| Riverside (SC) | 2020 T6 OOS small | Aggregated | Aggregated |
| Riverside (SC) | 2020 T6 Public | Aggregated | Aggregated |
| Riverside (SC) | 2020 T6 utility | Aggregated | Aggregated |
| Riverside (SC) | 2020 T6TS | Aggregated | Aggregated |
| Riverside (SC) | 2020 T7 Ag | Aggregated | Aggregated |
| Riverside (SC) | 2020 T7 CAIRP | Aggregated | Aggregated |
| Riverside (SC) | 2020 T7 CAIRP construction | Aggregated | Aggregated |
| Riverside (SC) | 2020 T7 NNOOS | Aggregated | Aggregated |
| Riverside (SC) | 2020 T7 NOOS | Aggregated | Aggregated |
| Riverside (SC) | 2020 T7 POLA | Aggregated | Aggregated |
| Riverside (SC) | 2020 T7 Public | Aggregated | Aggregated |
| Riverside (SC) | 2020 T7 Single | Aggregated | Aggregated |
| Riverside (SC) | 2020 T7 single construction | Aggregated | Aggregated |
| Riverside (SC) | 2020 T7 SWCV | Aggregated | Aggregated |
| Riverside (SC) | 2020 T7 SWCV | Aggregated | Aggregated |
| Riverside (SC) | 2020 T7 tractor | Aggregated | Aggregated |
| Riverside (SC) | 2020 T7 tractor construction | Aggregated | Aggregated |
| Riverside (SC) | 2020 T7 utility | Aggregated | Aggregated |
| Riverside (SC) | 2020 T7IS | Aggregated | Aggregated |
| Riverside (SC) | 2020 UBUS | Aggregated | Aggregated |
| Riverside (SC) | 2020 UBUS | Aggregated | Aggregated |
| Riverside (SC) | 2020 UBUS | Aggregated | Aggregated |
| Riverside (SC) | 2020 UBUS | Aggregated | Aggregated |

| Diesel | | | Natural Gas | | Electricity |
|----------------|--------------|---------------|--------------|--------------|----------------|
| Gallons/day | Miles/gallon | VMT/day | Gallons/day | Miles/gallon | VMT/day |
| 958 | 10.14 | 0 | 0 | #DIV/0! | 0 |
| 4,253 | 49.78 | 0 | 0 | #DIV/0! | 225,470 |
| 28 | 25.18 | 0 | 0 | #DIV/0! | 5,032 |
| 1,037 | 37.02 | 0 | 0 | #DIV/0! | 27,870 |
| 26,632 | 20.52 | 0 | 0 | #DIV/0! | 0 |
| 11,198 | 18.77 | 0 | 0 | #DIV/0! | 0 |
| 0 | #DIV/0! | 0 | 0 | #DIV/0! | 0 |
| 4,492 | 27.30 | 0 | 0 | #DIV/0! | 9,883 |
| 1,552 | 10.73 | 0 | 0 | #DIV/0! | 0 |
| 826 | 6.54 | 0 | 0 | #DIV/0! | 0 |
| 0 | #DIV/0! | 0 | 0 | #DIV/0! | 0 |
| 7,801 | 4.94 | 0 | 0 | #DIV/0! | 0 |
| 3,471 | 7.41 | 0 | 0 | #DIV/0! | 0 |
| 68,471 | 10.56 | 0 | 0 | #DIV/0! | 0 |
| 262,583 | 6.90 | 7,927 | 3,460 | 2.29 | 0 |
| 7 | 8.92 | 26,538 | 6,280 | 4.23 | 1 |
| 393,309 | 9.56 | 34,465 | 9,740 | 3.54 | 268,256 |

tion

| Fuel | Population | VMT | Trips | Fuel_Consumption |
|------|-------------|-------------|-------------|------------------|
| DSL | 181.6035296 | 9715.890037 | 1525.469649 | 0.958448271 |
| GAS | 544330.7452 | 22811940.05 | 2577014.349 | 744.9244753 |
| DSL | 4801.796275 | 211707.5045 | 23004.1958 | 4.252687363 |
| ELEC | 5917.336596 | 225470.3815 | 29889.44984 | 0 |
| GAS | 56941.70538 | 2171443.935 | 257765.5069 | 83.37784248 |
| DSL | 32.63987716 | 703.6072479 | 107.6552039 | 0.027947212 |
| ELEC | 131.0488487 | 5032.136237 | 662.2684204 | 0 |
| GAS | 172787.9159 | 6953901.02 | 808078.8723 | 288.5007234 |
| DSL | 801.9527862 | 38380.62057 | 3973.327641 | 1.036808352 |
| ELEC | 857.4023436 | 27869.83896 | 4368.931582 | 0 |
| GAS | 15903.23291 | 522854.1613 | 236934.4745 | 49.16043014 |

| | | | | |
|------|-------------|-------------|-------------|-------------|
| DSL | 15724.26694 | 546497.7935 | 197791.4969 | 26.63227902 |
| GAS | 2247.021483 | 74925.36029 | 33477.27203 | 8.050830837 |
| DSL | 5986.499893 | 210205.549 | 75302.63764 | 11.19837134 |
| GAS | 27562.03276 | 186161.6877 | 55124.06552 | 4.883458381 |
| GAS | 154154.4763 | 5759434.716 | 707160.9966 | 297.211555 |
| DSL | 2774.383834 | 122611.3071 | 13585.962 | 4.491895248 |
| ELEC | 297.2379218 | 9882.784579 | 1525.076046 | 0 |
| GAS | 5298.489729 | 42692.11287 | 530.0609125 | 8.40271755 |
| DSL | 1995.592802 | 16646.26539 | 199.5592802 | 1.551805421 |
| DSL | 42.30029755 | 5401.269536 | 617.5843442 | 0.825720997 |
| GAS | 443.2109762 | 16098.84235 | 8867.765211 | 3.193257484 |
| DSL | 0 | 38520.7455 | 0 | 7.801198622 |
| GAS | 395.8309322 | 14360.45933 | 1583.323729 | 1.634422225 |
| DSL | 812.4348173 | 25716.68219 | 9375.385152 | 3.471308225 |
| DSL | 4.383129537 | 86.90049156 | 19.28576996 | 0.00907683 |
| DSL | 43.44038344 | 8684.393791 | 634.2295983 | 0.741465283 |
| DSL | 22.20660971 | 1173.298703 | 324.2165018 | 0.106869275 |
| DSL | 651.6687014 | 44305.75524 | 2946.168862 | 4.30468991 |
| DSL | 1354.596268 | 69151.91035 | 6124.077059 | 6.632685074 |
| DSL | 1840.996412 | 233900.13 | 21244.84335 | 21.33117101 |
| DSL | 7200.600575 | 347280.5151 | 83093.93232 | 33.34465165 |
| DSL | 24.49029118 | 4896.574691 | 357.5582512 | 0.418200687 |
| DSL | 12.91506092 | 676.784668 | 188.5598895 | 0.061718982 |
| DSL | 666.265115 | 9892.453581 | 2021.00418 | 1.241735601 |
| DSL | 162.4337825 | 2711.229749 | 1867.988498 | 0.278258807 |
| GAS | 1269.719696 | 51275.62336 | 25404.55167 | 10.04377418 |
| DSL | 9.338038061 | 123.7615746 | 41.08736747 | 0.021128599 |
| DSL | 1539.898711 | 278768.5233 | 22482.52118 | 39.66330935 |
| DSL | 173.0313734 | 31825.20886 | 782.2681119 | 4.293420395 |
| DSL | 1683.711642 | 339842.5129 | 24582.18997 | 46.93881982 |
| DSL | 605.2818517 | 109522.9222 | 8837.115035 | 15.9684922 |
| DSL | 2112.421737 | 258474.6019 | 16054.4052 | 40.94558036 |
| DSL | 798.4264191 | 16189.07496 | 2421.893469 | 2.79493417 |
| DSL | 2589.190539 | 193998.174 | 29878.89984 | 28.08363094 |
| DSL | 1119.443397 | 78952.48956 | 5060.960073 | 11.75612883 |
| DSL | 88.10157927 | 3599.687783 | 343.5961592 | 1.779851942 |
| NG | 195.4860734 | 7927.187827 | 762.3956863 | 3.460299106 |
| DSL | 3143.427852 | 432646.5594 | 39921.53372 | 60.26544413 |
| DSL | 926.7659356 | 65128.85285 | 4189.872762 | 9.726733713 |
| DSL | 107.9345364 | 2190.478739 | 1241.247169 | 0.345493149 |
| GAS | 7.834009455 | 495.6972074 | 156.7428612 | 0.124168185 |
| GAS | 162.5145119 | 22881.1992 | 650.0580478 | 3.711979171 |
| DSL | 1.105797941 | 58.57190354 | 4.423191762 | 0.006566327 |
| ELEC | 0.058469431 | 1.251702935 | 0.233877724 | 0 |
| NG | 201.6964296 | 26538.11439 | 806.7857186 | 6.279789141 |