# 2020 NEI Onroad Update

June 16, 2022

# Today's Update Includes

▸ Representative counties

▸ Activity data plots for VMT and VPOP

▸ Data and maps can be found at:

▸ https://gaftp.epa.gov/Air/nei/2020/doc/supporting_data/onroad/
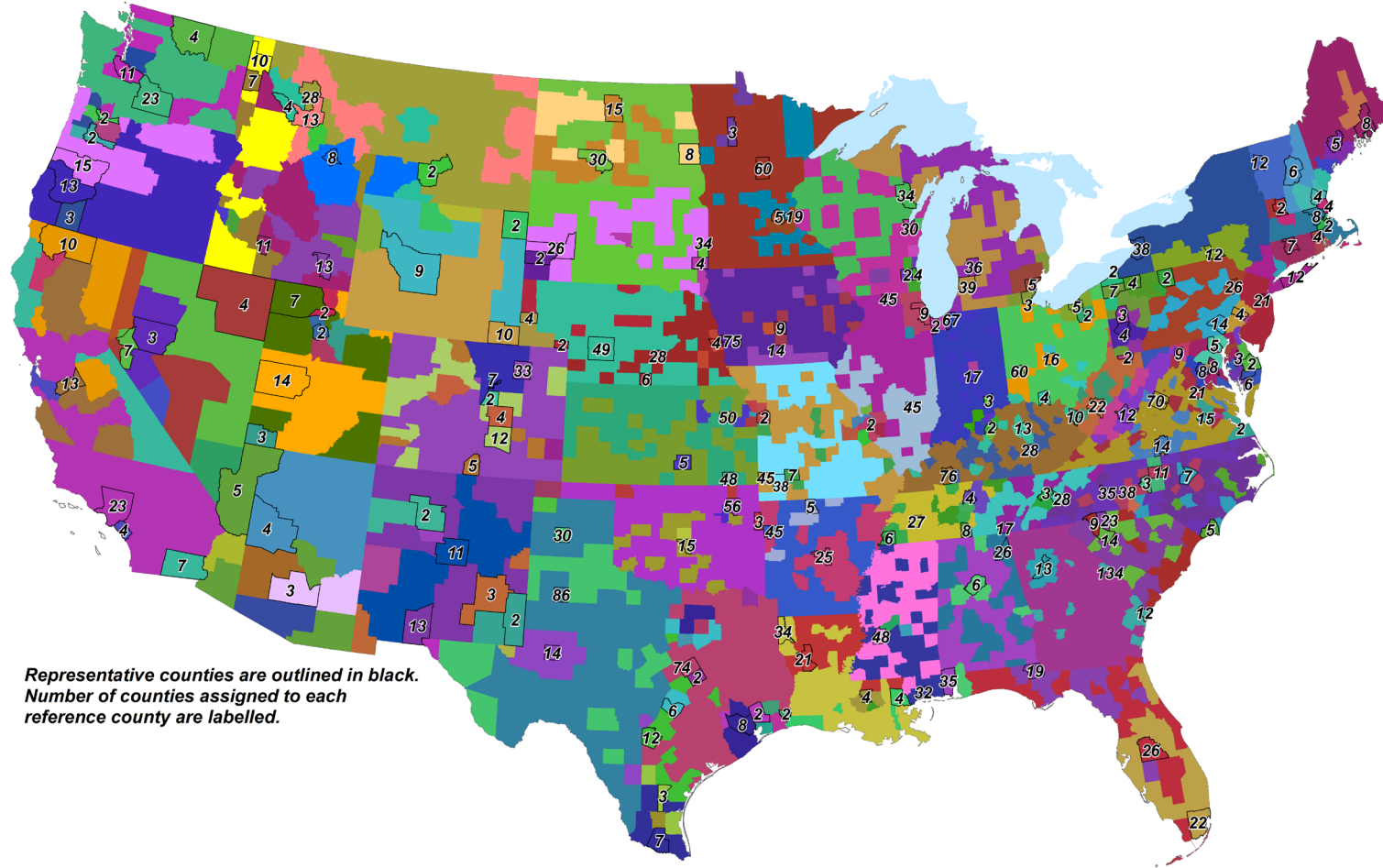
# Representative County Development for 2020

- Representative counties (253) are developed based on:
  - Their state (counties represent other similar counties in the same state),
  - Light-duty age distributions,
  - Altitude,
  - Fuel region, and
  - Inspection and maintenance programs.
- Ramp fractions are not considered in MOVES3, instead that VMT is included in rural and urban freeway driving.
  - Note: representative county CDBs use a population-weighted average of the member county age distributions.

# Representative County Spreadsheet

| stateid | countyid | State Name | altitude | 2020fuelregion | 2020imbin | county In MSA YN | MSAName | 2020meanLD ageBin | 2020 mean LD age | Groups(stateID_altitude_ fuel region_imbin_ meanLDagebin) | 2020 draft rep. county |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | 6101 | California | L_mod | 1570011000 | 1 | Y | Yuba City; CA | 4 | 11.0 | 6_L_mod_1570011000_1_4 | 6099 |
| 6 | 6103 | California | L_mod | 1570011000 | 1 | N | | 4 | 12.6 | 6_L_mod_1570011000_1_4 | 6099 |
| 6 | 6105 | California | L_mod | 1570011000 | 0 | N | | 6 | 15.3 | 6_L_mod_1570011000_0_6 | 6105 |
| 6 | 6107 | California | L_mod | 1570011000 | 1 | Y | Visalia-Porterville; CA | 4 | 11.4 | 6_L_mod_1570011000_1_4 | 6099 |
| 6 | 6109 | California | L_mod | 1570011000 | 0 | N | | 5 | 13.1 | 6_L_mod_1570011000_0_5 | 6093 |
| 6 | 6111 | California | L_mod | 1570011000 | 1 | Y | Oxnard-Thousand Oaks-Ventura; | 3 | 9.6 | 6_L_mod_1570011000_1_3 | 6037 |
| 6 | 6113 | California | L_mod | 1570011000 | 1 | Y | Sacramento--Roseville--Arden-Arc | 3 | 9.3 | 6_L_mod_1570011000_1_3 | 6037 |
| 6 | 6115 | California | L_mod | 1570011000 | 1 | Y | Yuba City; CA | 4 | 12.2 | 6_L_mod_1570011000_1_4 | 6099 |
| 8 | 8001 | Colorado | H_mod | 578000000 | 1 | Y | Denver-Aurora-Lakewood; CO | 3 | 10.7 | 8_H_mod_578000000_1_3 | 8031 |
| 8 | 8003 | Colorado | H_mod | 500000000 | 0 | N | | 5 | 13.4 | 8_H_mod_500000000_0_5 | 8087 |
| 8 | 8005 | Colorado | H_mod | 578000000 | 1 | Y | Denver-Aurora-Lakewood; CO | 3 | 9.3 | 8_H_mod_578000000_1_3 | 8031 |
| 8 | 8007 | Colorado | H_mod | 500000000 | 0 | N | | 5 | 13.0 | 8_H_mod_500000000_0_5 | 8087 |
| 8 | 8009 | Colorado | H_mod | 500000000 | 0 | N | | 5 | 14.9 | 8_H_mod_500000000_0_5 | 8087 |
| 8 | 8011 | Colorado | H_mod | 500000000 | 0 | N | | 6 | 15.1 | 8_H_mod_500000000_0_6 | 8023 |
| 8 | 8013 | Colorado | H_mod | 578000000 | 1 | Y | Boulder; CO | 3 | 10.3 | 8_H_mod_578000000_1_3 | 8031 |
| 8 | 8014 | Colorado | H_mod | 578000000 | 1 | Y | Denver-Aurora-Lakewood; CO | 2 | 9.0 | 8_H_mod_578000000_1_2 | 8035 |
| 8 | 8015 | Colorado | H_mod | 500000000 | 0 | N | | 5 | 13.4 | 8_H_mod_500000000_0_5 | 8087 |
| 8 | 8017 | Colorado | H_mod | 500000000 | 0 | N | | 5 | 13.2 | 8_H_mod_500000000_0_5 | 8087 |
| 8 | 8019 | Colorado | H_mod | 500000000 | 0 | Y | Denver-Aurora-Lakewood; CO | 4 | 13.0 | 8_H_mod_500000000_0_4 | 8101 |
| 8 | 8021 | Colorado | H_mod | 500000000 | 0 | N | | 5 | 14.7 | 8_H_mod_500000000_0_5 | 8087 |
| 8 | 8023 | Colorado | H_mod | 500000000 | 0 | N | | 6 | 15.3 | 8_H_mod_500000000_0_6 | 8023 |
| 8 | 8025 | Colorado | H_mod | 500000000 | 0 | N | | 6 | 15.4 | 8_H_mod_500000000_0_6 | 8023 |
| 8 | 8027 | Colorado | H_mod | 500000000 | 0 | N | | 5 | 13.7 | 8_H_mod_500000000_0_5 | 8087 |
| 8 | 8029 | Colorado | H_mod | 500000000 | 0 | N | | 5 | 14.7 | 8_H_mod_500000000_0_5 | 8087 |
| 8 | 8031 | Colorado | H_mod | 578000000 | 1 | Y | Denver-Aurora-Lakewood; CO | 3 | 9.3 | 8_H_mod_578000000_1_3 | 8031 |

See 2020_Representative_Counties_Analysis_20220614.xlsx

# 2020 NEI Draft Representative Counties



Representative counties are outlined in black.
Number of counties assigned to each
reference county are labelled.

Representative County Groups 2020NEI draft

Hint: download the file, and then you can "zoom in" to areas of interest to better
See the representative counties

representative_county_groups_2020nei_draft.png

# Activity Data Plots

- File: VMT_VPOP_2020_plots.zip
- Types of VMT and VPOP plots included *for each source type* are:
  - Total for 2017 NEI, 2020 EPA default, 2020 NEI draft
  - 2020 NEI – 2017 NEI (absolute and percent difference)
  - 2020 NEI – 2020 EPA default (absolute and percent difference)
- Similar plots included for total light duty, total heavy duty, and overall total
- VMT/VPOP plots are included for each source type and fuel type

# VMT and VPOP Changes by Source Type

| Source Type | 2017 NEI VPOP | 2020 Draft VPOP | 2020 Draft VPOP - 2017 % | 2017 NEI VMT | 2020 Draft VMT | 2020 Draft VMT - 2017 % |
|---|---|---|---|---|---|---|
| Combination Long-haul Truck | 1,466,068 | 1,930,758 | 32% | 1.22E+11 | 1.09E+11 | -11% |
| Combination Short-haul Truck | 1,842,605 | 1,665,658 | -10% | 5.67E+10 | 6.08E+10 | 7% |
| Intercity Bus | 137,180 | 120,751 | -12% | 5.29E+09 | 2.84E+09 | -46% |
| Light Commercial Truck | 13,215,723 | 12,952,344 | -2% | 1.49E+11 | 1.34E+11 | -10% |
| Motor Home | 1,397,770 | 984,145 | -30% | 3.19E+09 | 8.10E+09 | 154% |
| Motorcycle | 10,577,672 | 10,651,013 | 1% | 1.95E+10 | 1.67E+10 | -15% |
| Passenger Car | 113,542,442 | 104,506,972 | -8% | 1.29E+12 | 1.11E+12 | -14% |
| Passenger Truck | 123,628,679 | 132,764,162 | 7% | 1.43E+12 | 1.41E+12 | -1% |
| Refuse Truck | 129,761 | 71,161 | -45% | 2.74E+09 | 1.12E+09 | -59% |
| School Bus | 735,316 | 564,523 | -23% | 6.94E+09 | 8.01E+09 | 15% |
| Single Unit Long-haul Truck | 1,639,060 | 854,406 | -48% | 3.09E+10 | 1.28E+10 | -59% |
| Single Unit Short-haul Truck | 5,003,050 | 6,379,995 | 28% | 7.25E+10 | 8.11E+10 | 12% |
| Transit Bus | 156,454 | 139,465 | -11% | 3.51E+09 | 3.32E+09 | -6% |
| **Grand Total** | **273,471,780** | **273,585,352** | **0%** | **3.20E+12** | **2.96E+12** | **-7%** |

See 2020NEI VMT VPOP comparisons.xlsx:
https://gaftp.epa.gov/Air/nei/2020/doc/supporting_data/onroad/

# VPOP Changes by State
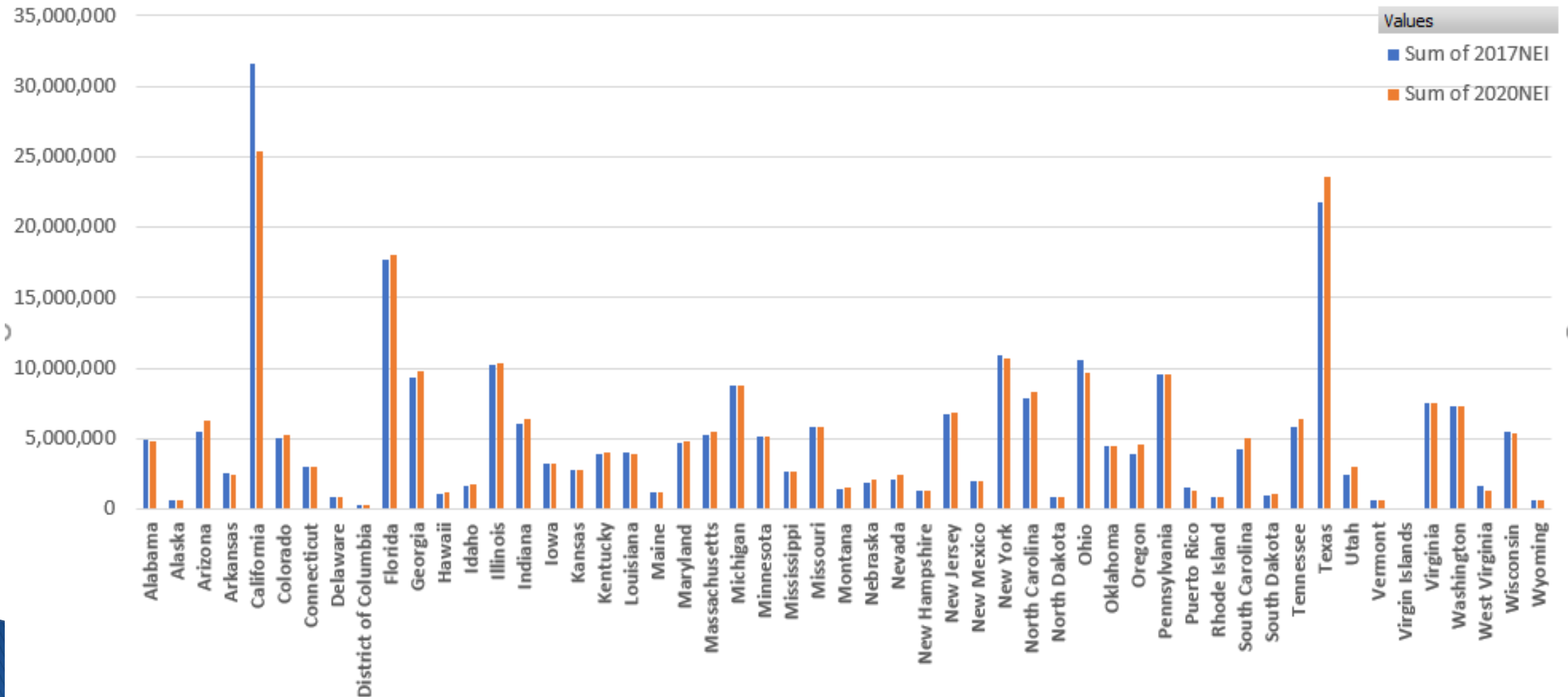
# VMT Changes by State
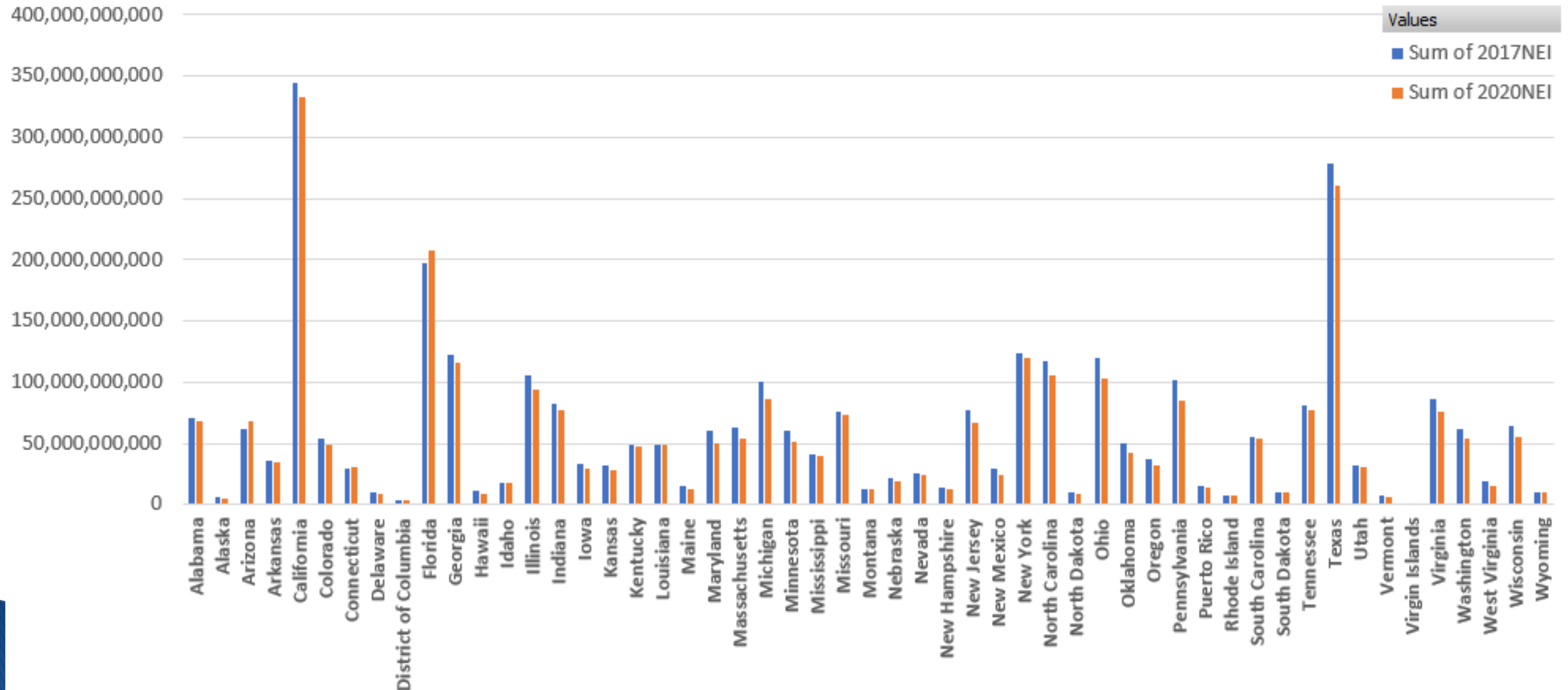
# All Vehicles VMT & VPOP minus EPA Default



2020NEI onroad VMT All Vehicles : minus EPA default

Max: 10279459000.0  Min: -2508666400.0

2020NEI onroad VMT All Vehicles : minus EPA default %

Max: inf  Min: -71.5612

2020NEI onroad VPOP All Vehicles : minus EPA default

Max: 123843.68  Min: -1620309.5

2020NEI onroad VPOP All Vehicles : minus EPA default %

Max: 564.47784  Min: -85.58005
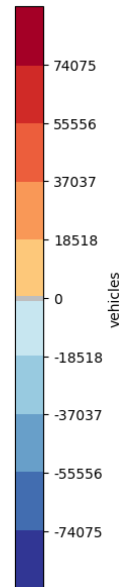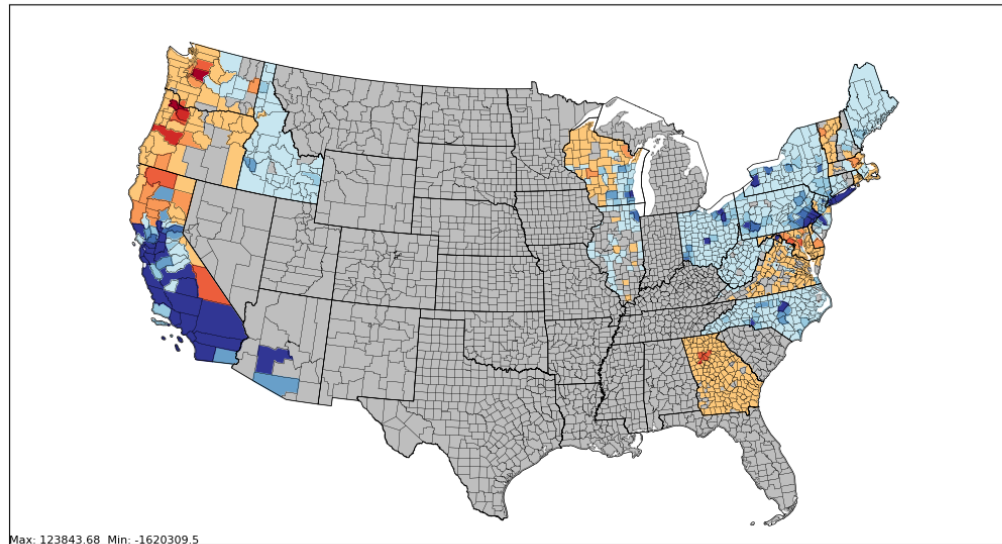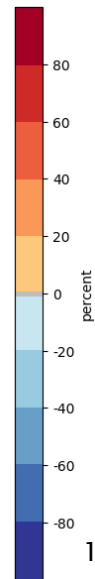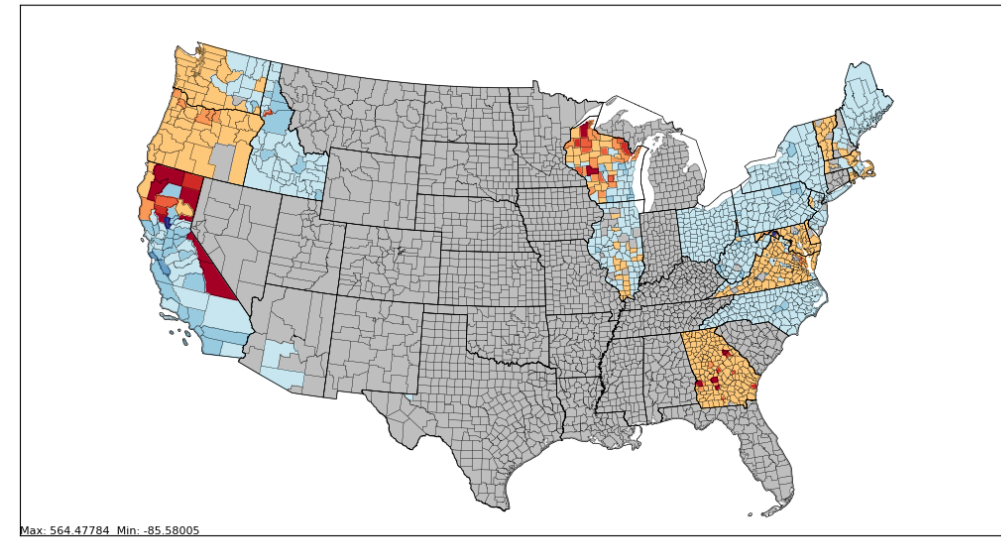
# Example Maps: Total Light Duty VPOP



2017NEI onroad VPOP Light Duty
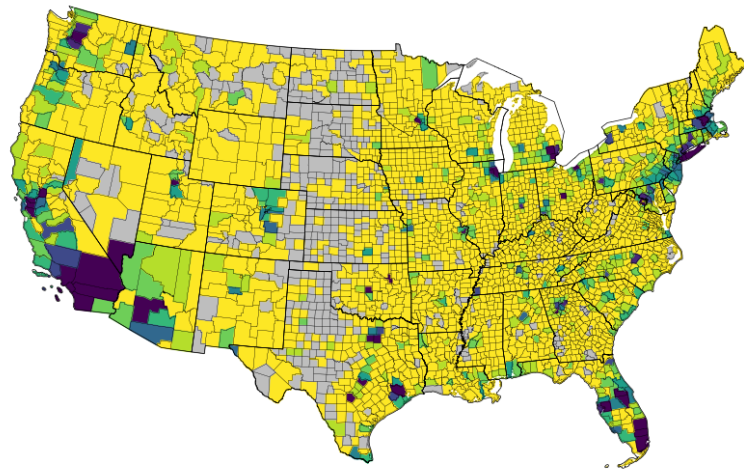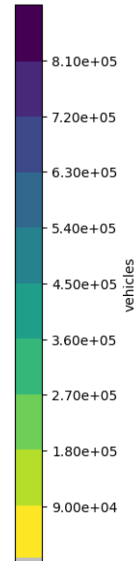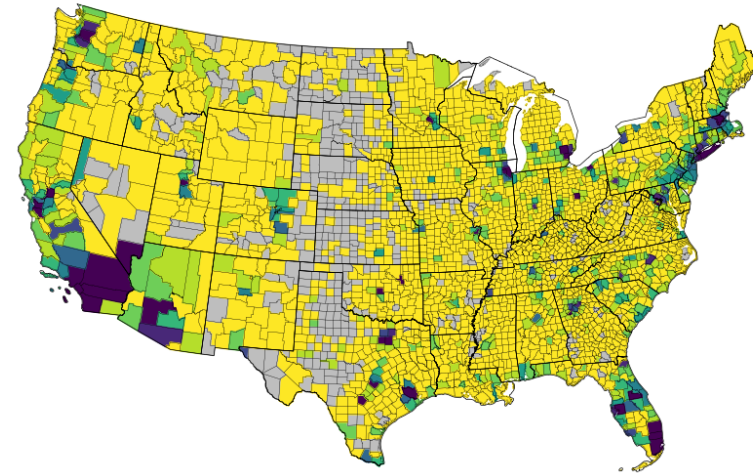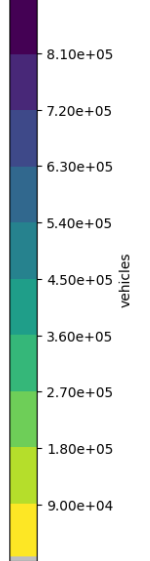


2020NEI onroad VPOP Light Duty
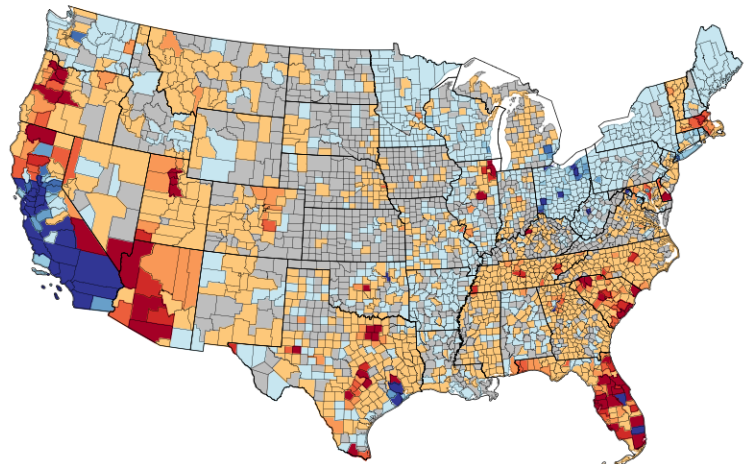


2020NEI onroad VPOP Light Duty : minus 2017NEI
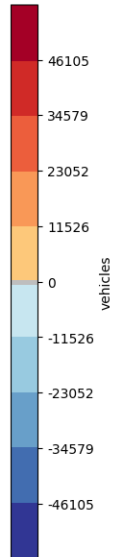


2020NEI onroad VPOP Light Duty : minus 2017NEI %
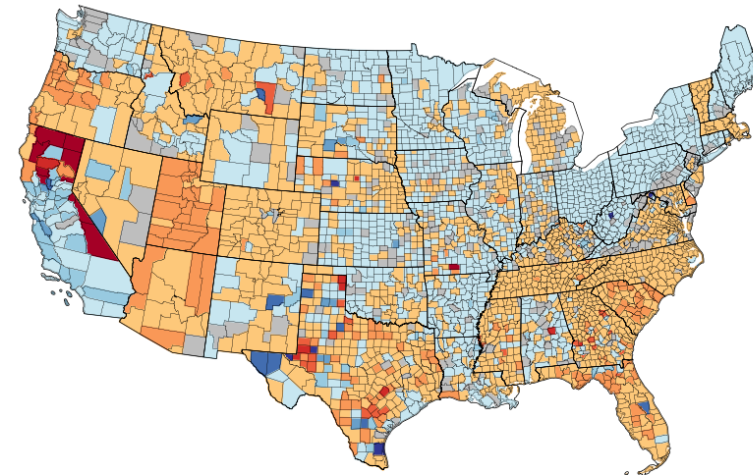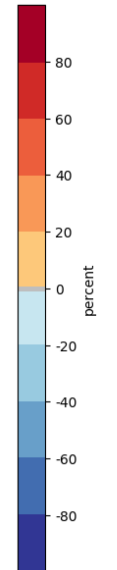
# Heavy Duty VMT & VPOP vs 2017 and Default
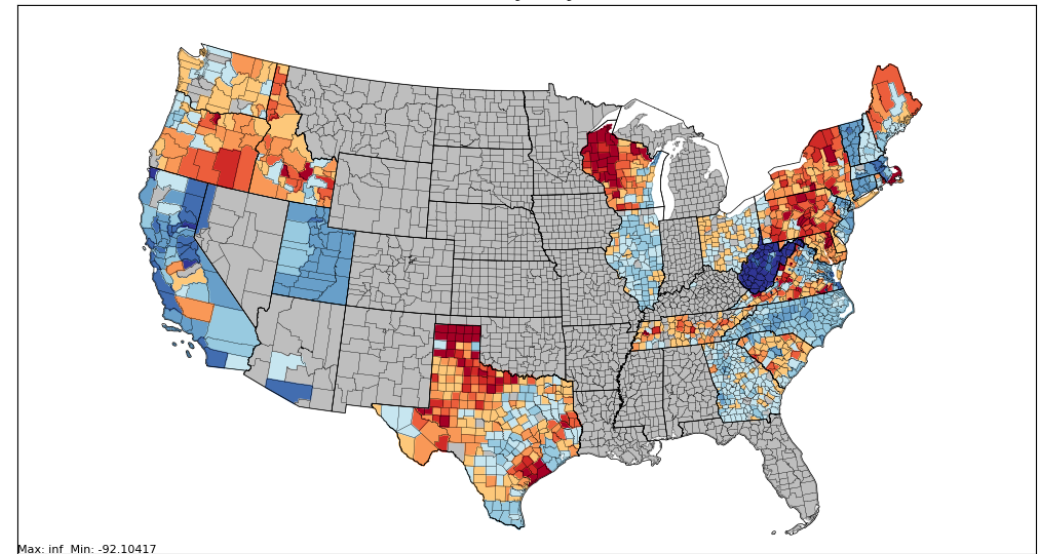
# 2020NEI onroad VMT Passenger Cars : minus 2017NEI



Max: 1701697700.0  Min: -4229352700.0

miles/yr
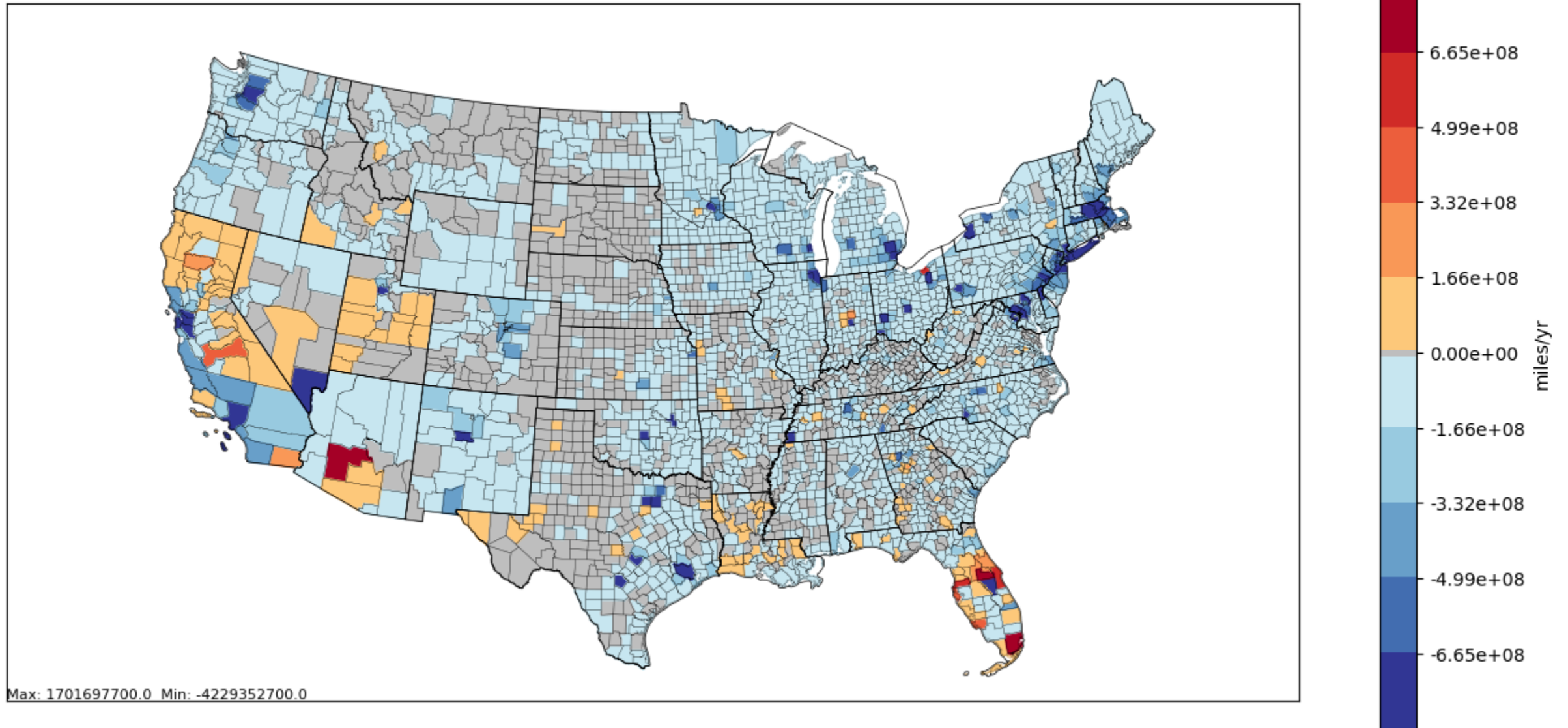
2020NEI onroad VMT Combination Short-Haul Trucks : minus 2017NEI
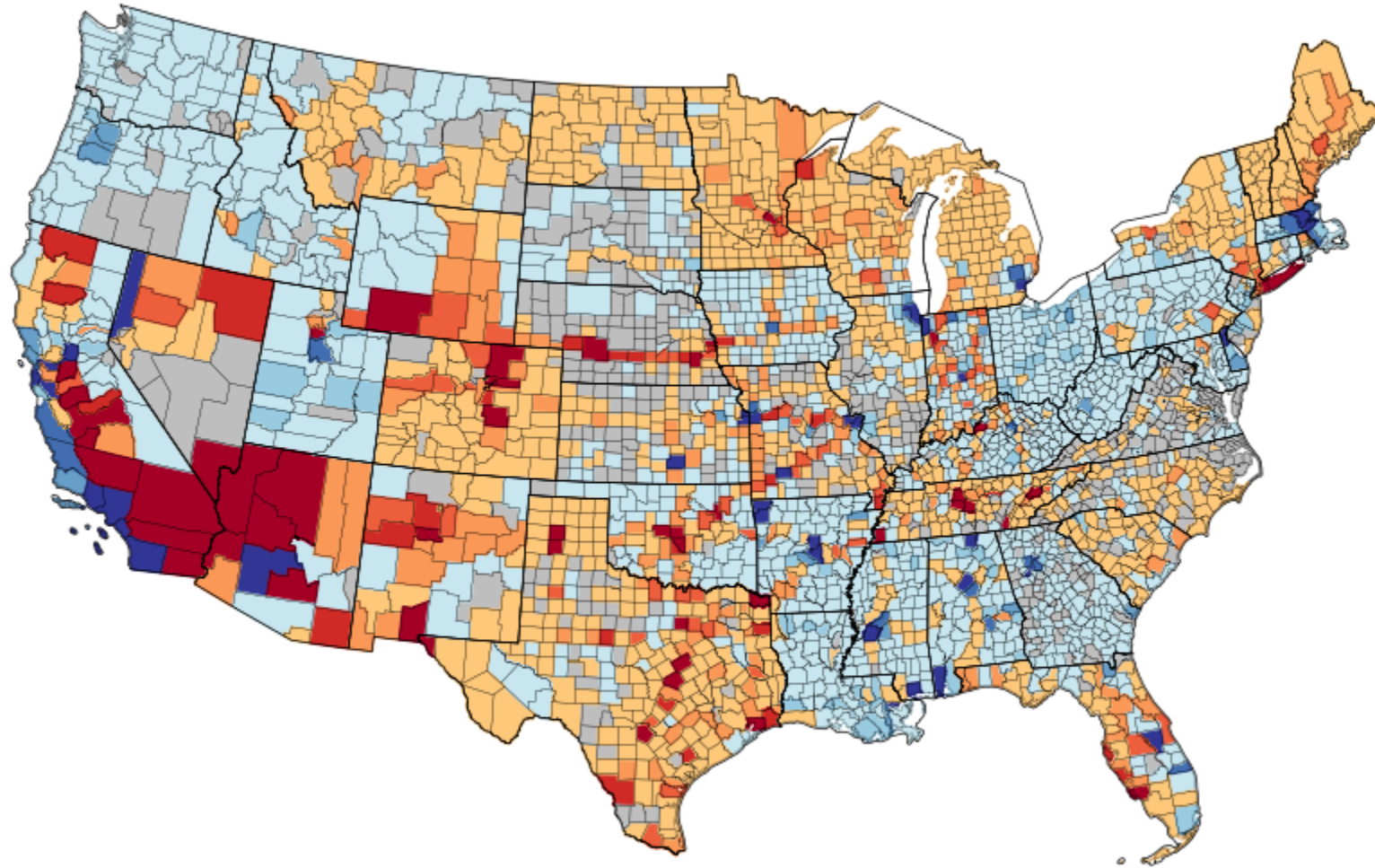
Max: 328789200.0  Min: -378759170.0
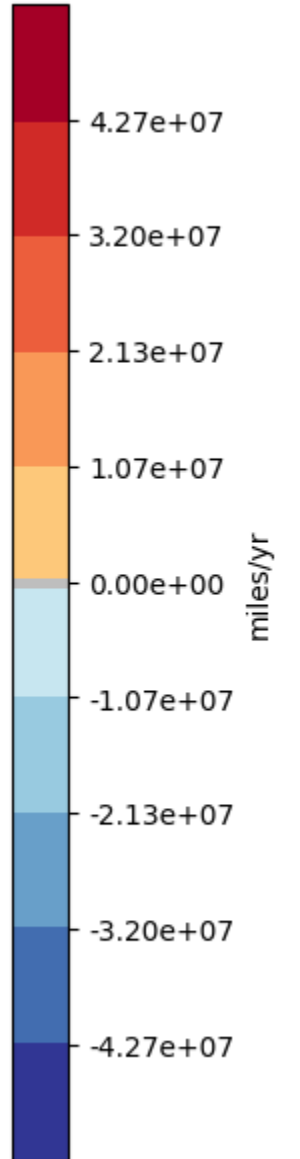
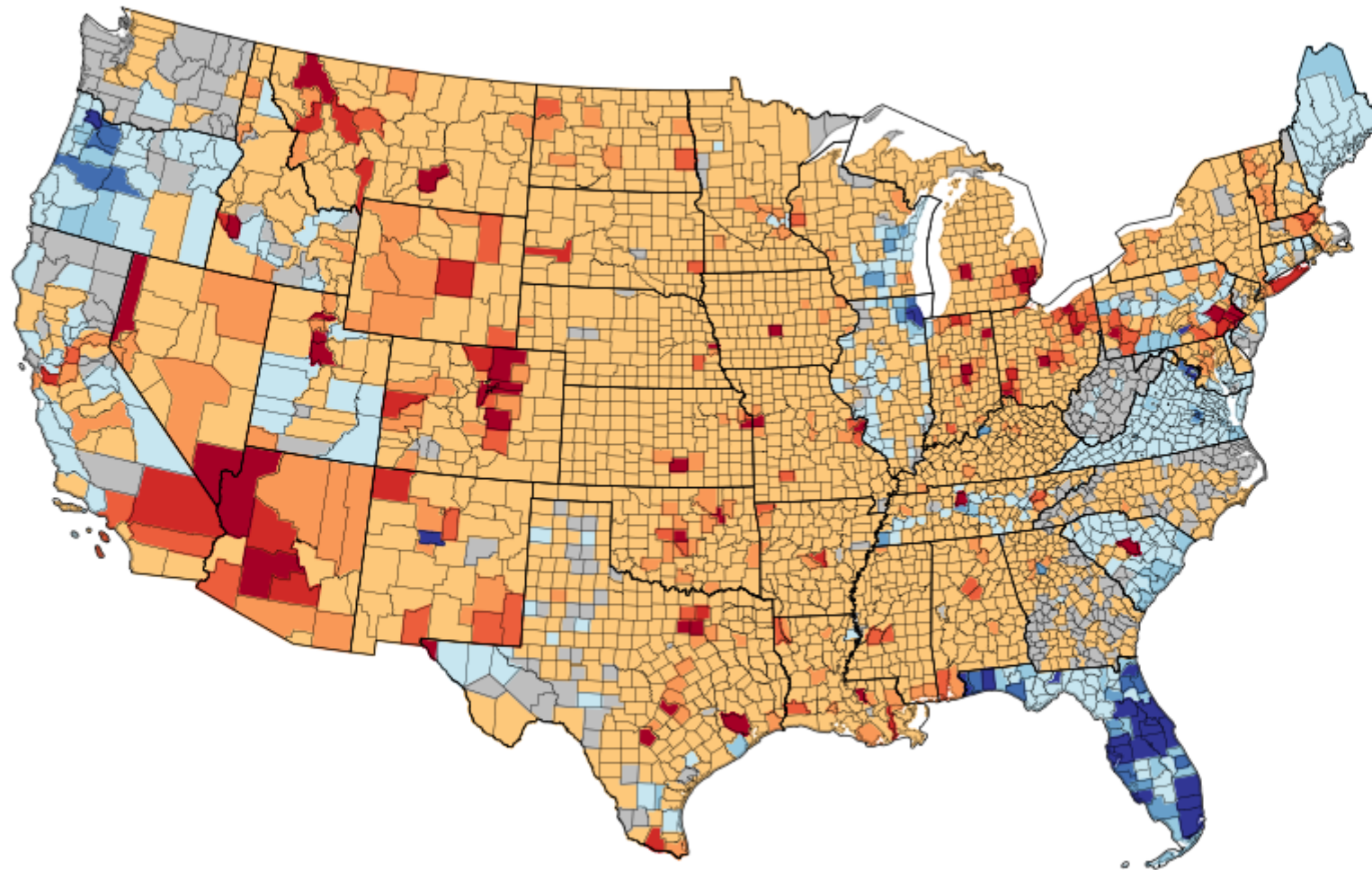2020NEI onroad VMT Single Unit Long-Haul Trucks : minus 2017NEI

Max: 91817730.0   Min: -1765670900.0
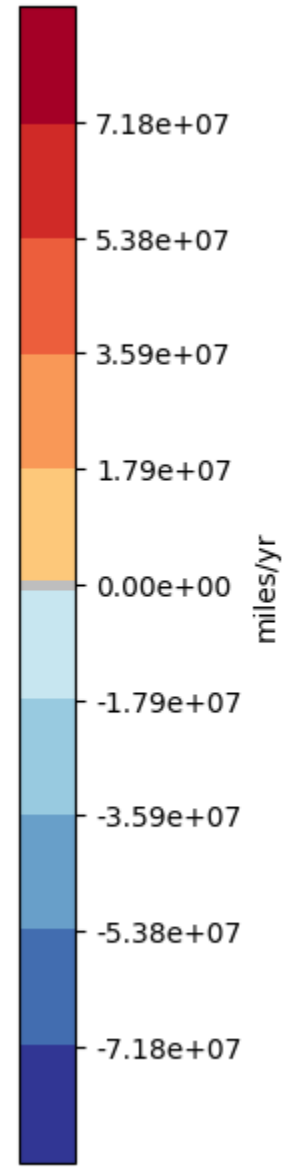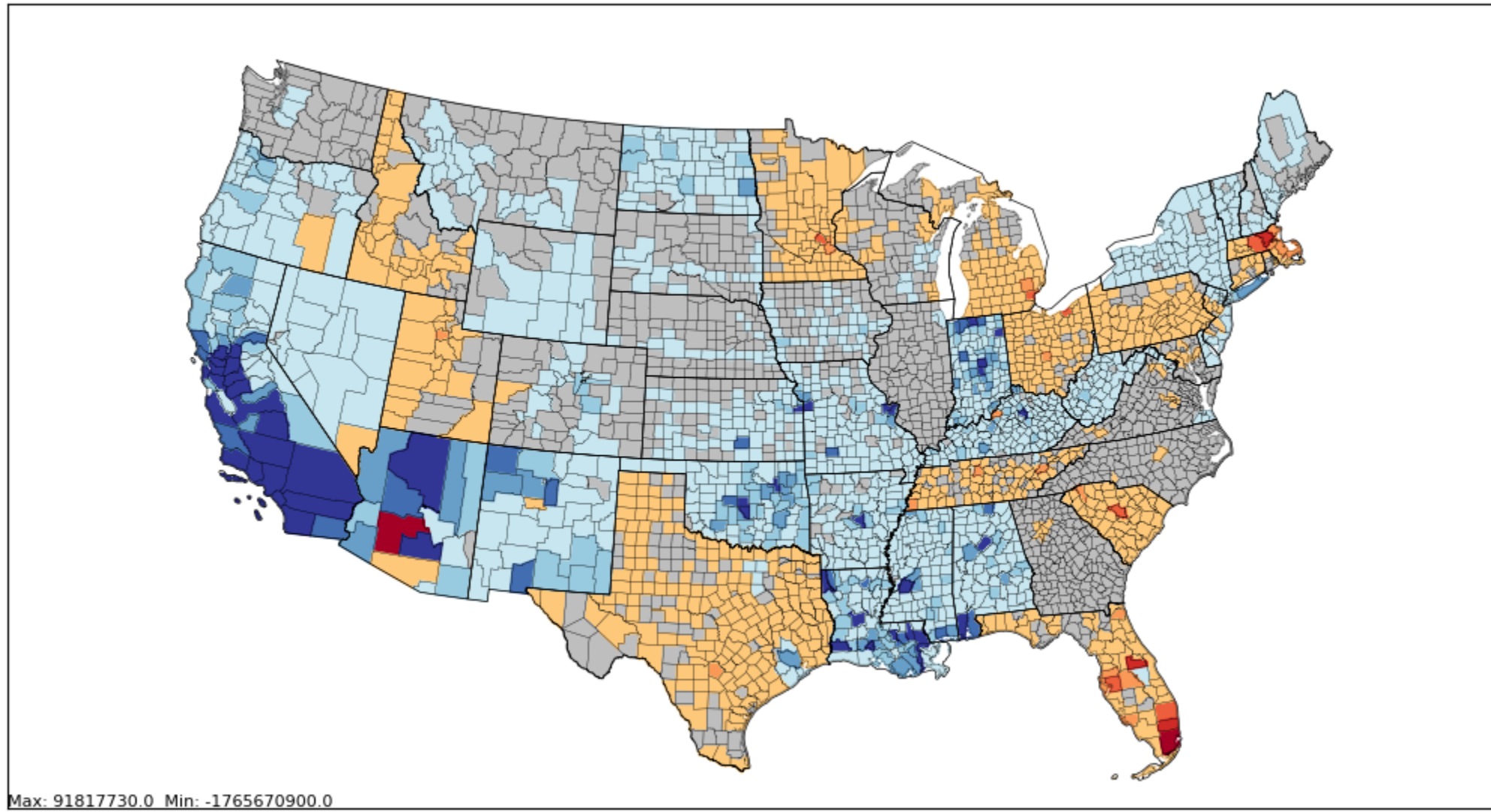
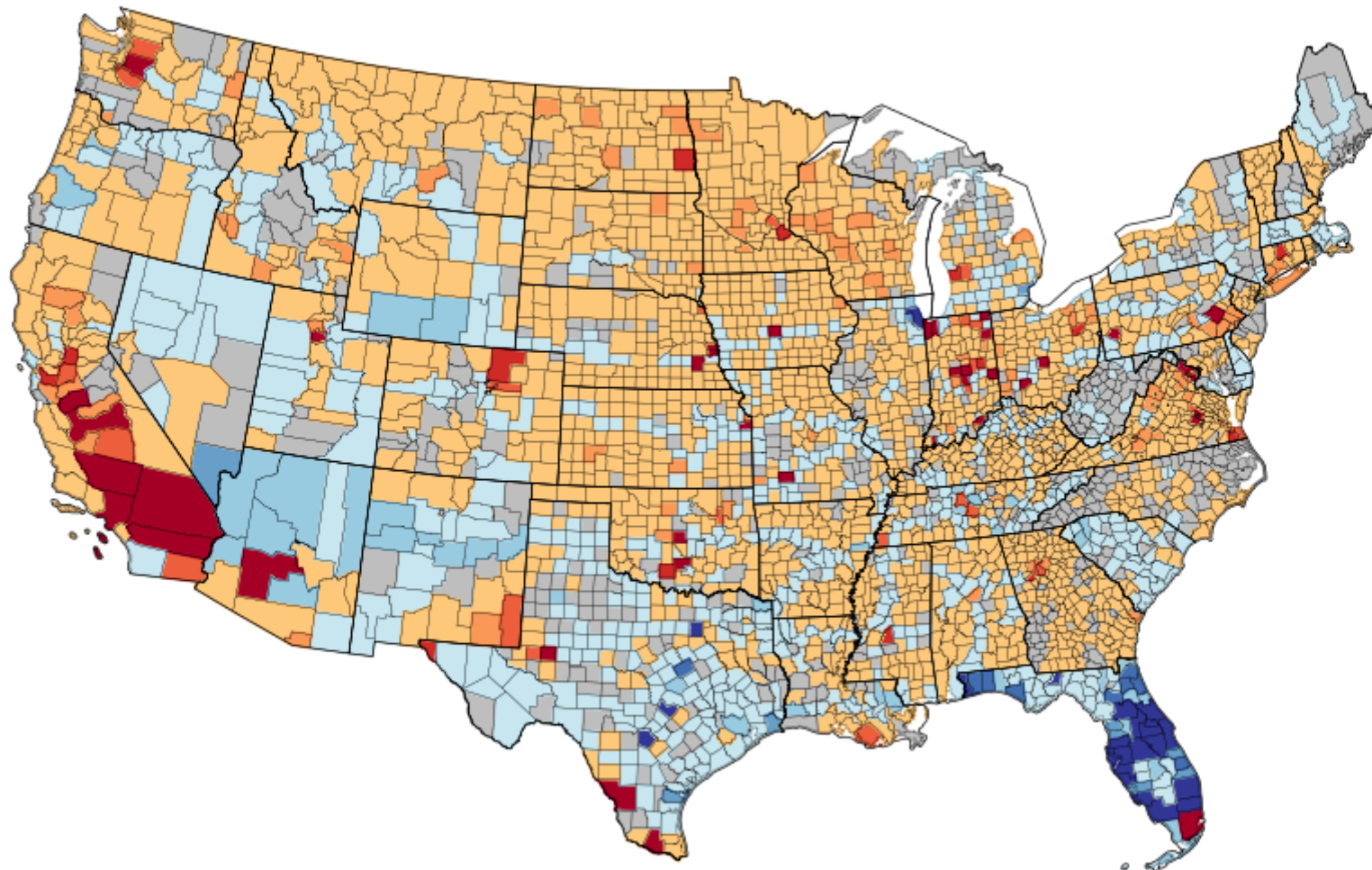**2020NEI onroad VPOP Motor Homes : minus 2017NEI**
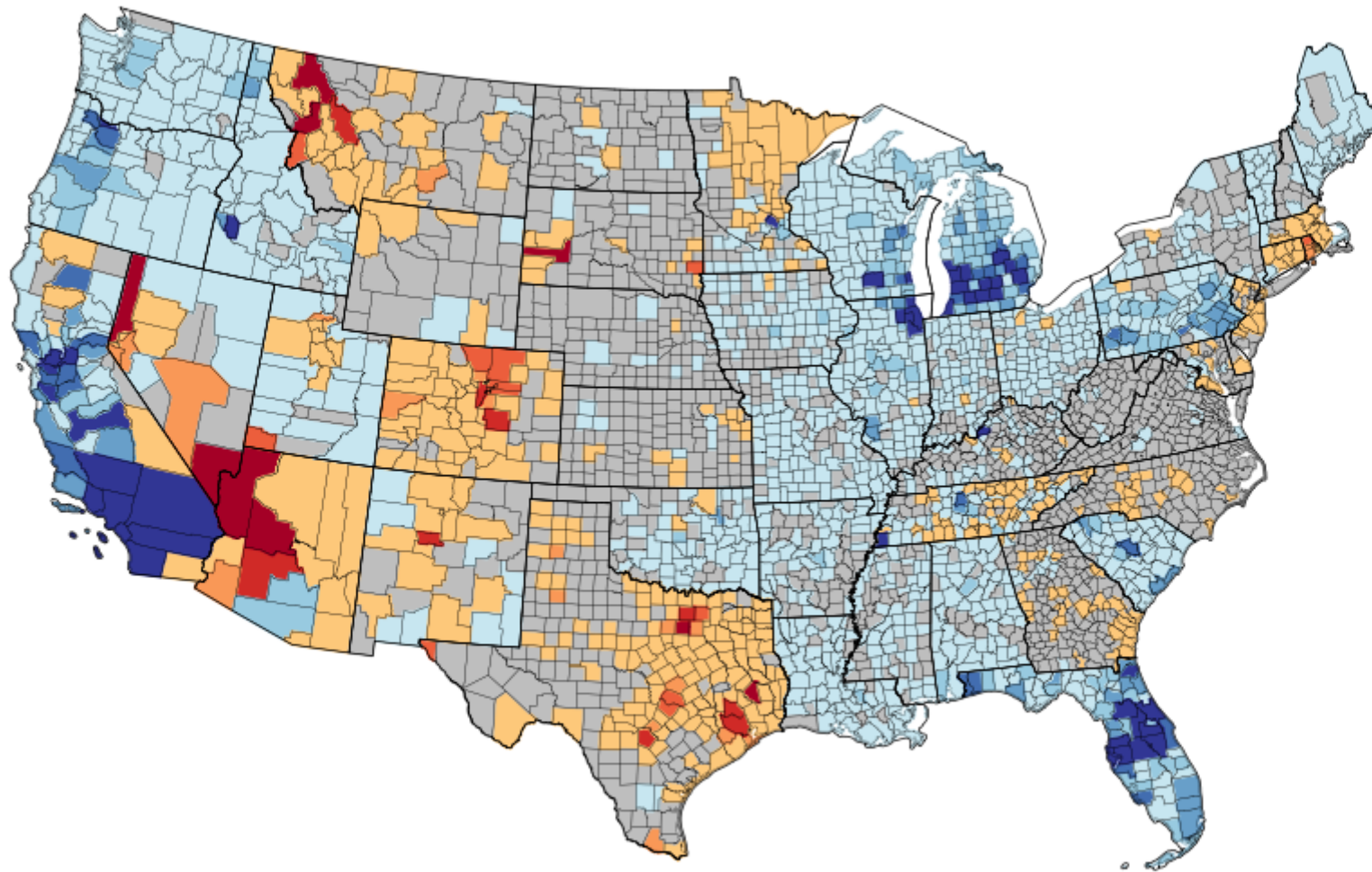
Max: 6661.964  Min: -18417.748

2020NEI onroad VPOP Single Unit Short-Haul Trucks : minus 2017NEI

Max: 56479.0  Min: -28890.553

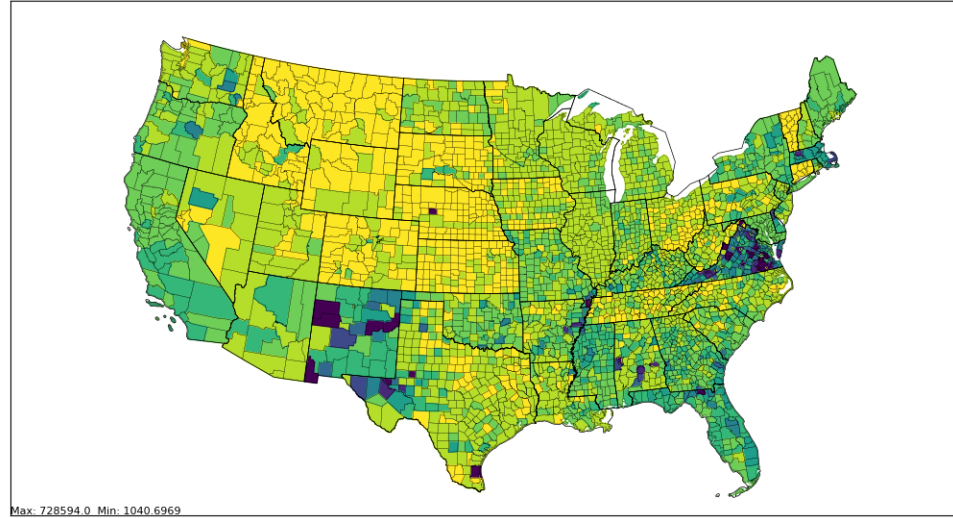2020NEI onroad VPOP Combination Long-Haul Trucks : minus 2017NEI

Max: 43301.41  Min: -11350.774

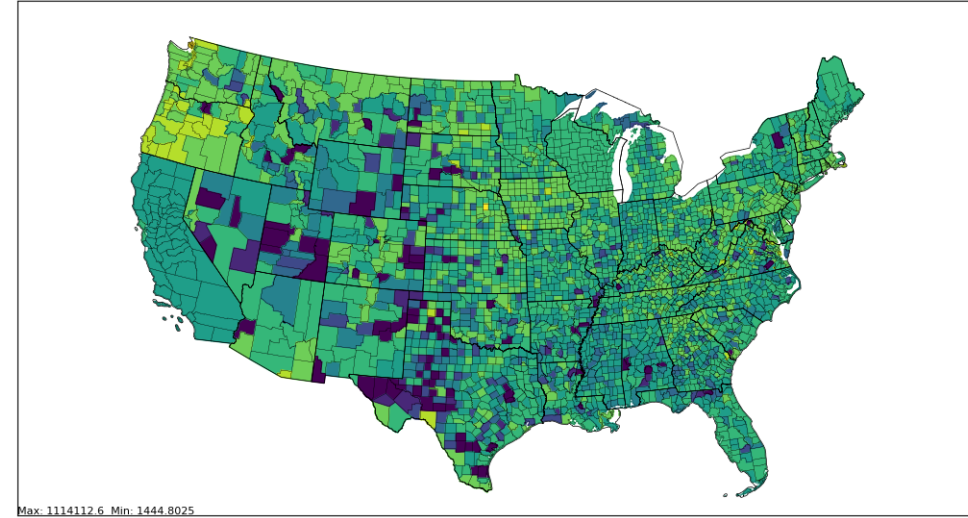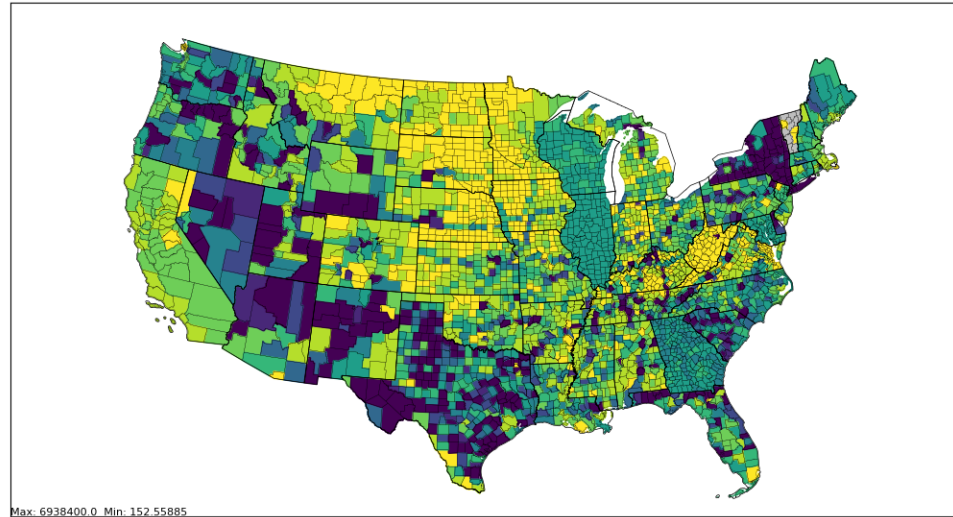# VMT/VPOP Examples: gas and diesel



**2020NEI onroad VMT/VPOP ratio: Gas Single Unit Short-Haul Trucks**
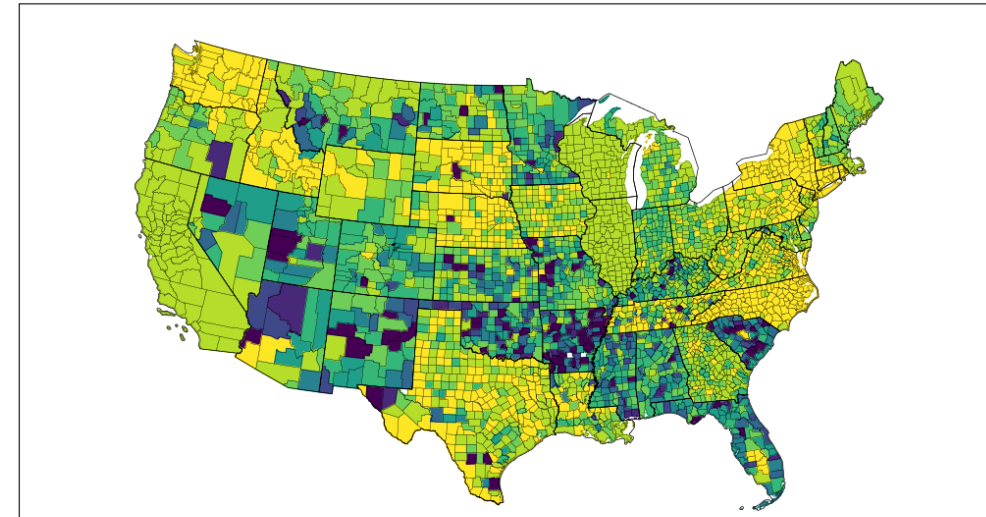Max: 728594.0  Min: 1040.6969

**2020NEI onroad VMT/VPOP ratio: Gas Passenger Trucks**
Max: 1114112.6  Min: 1444.8025

**2020NEI onroad VMT/VPOP ratio: Diesel Combination Long-Haul Trucks**
Max: 6938400.0  Min: 152.55885

**2020NEI onroad VMT/VPOP ratio: Diesel School Buses**
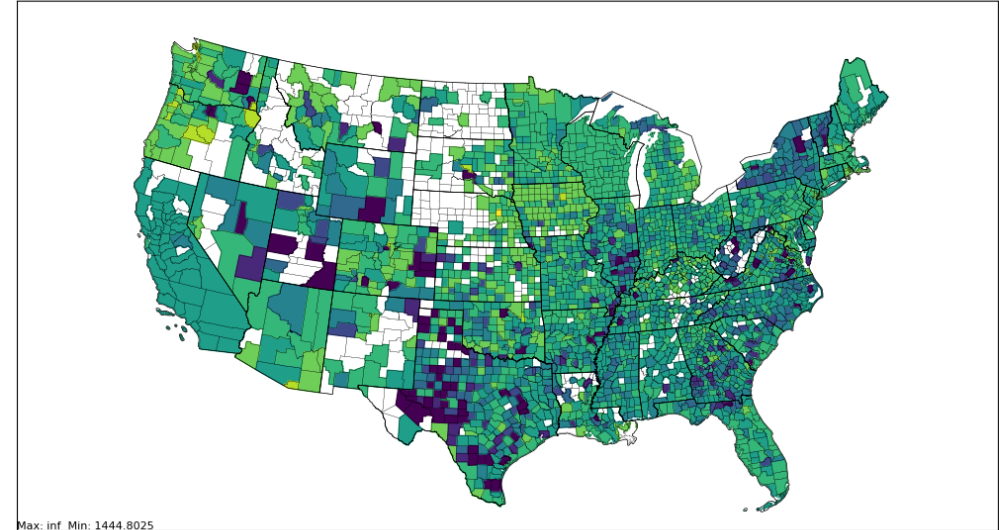Max: inf  Min: 249.78072
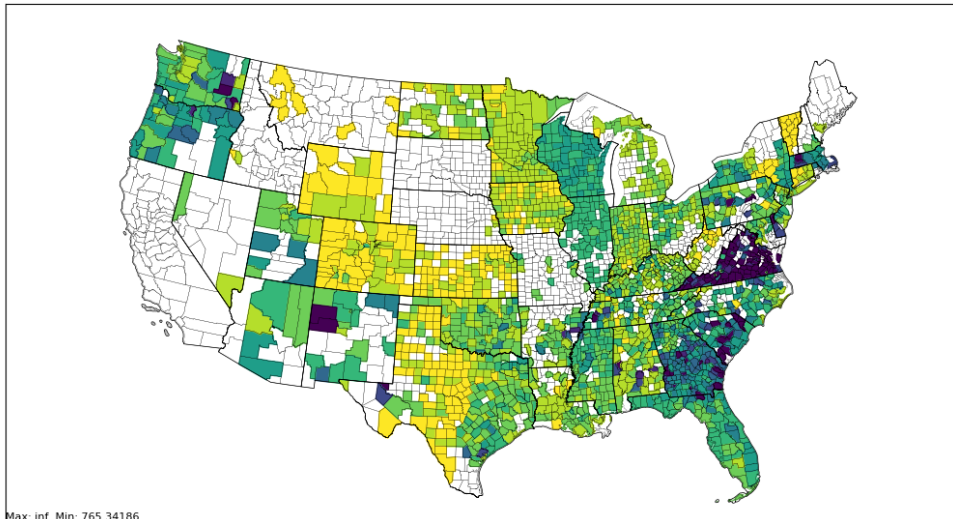
# VMT/VPOP Examples: electric and CNG



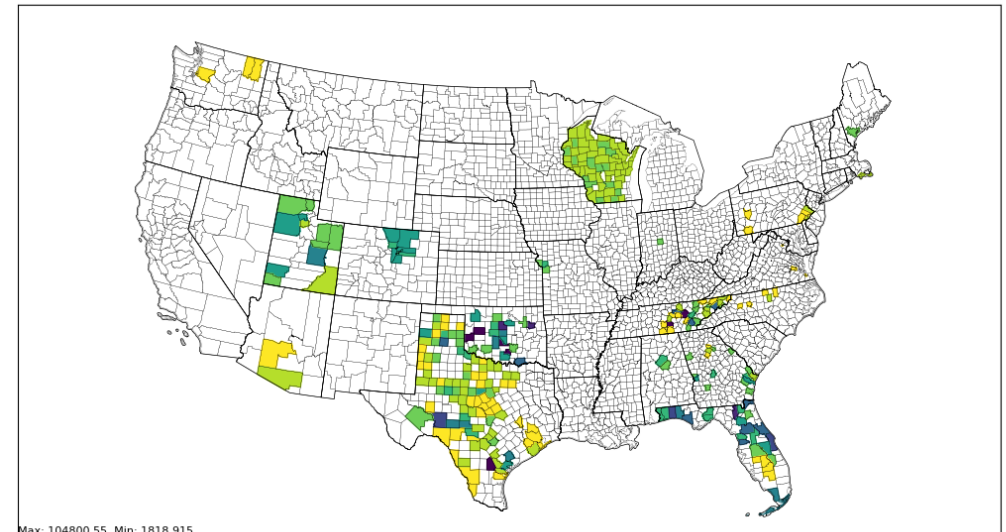**2020NEI onroad VMT/VPOP ratio: electric Passenger Cars**
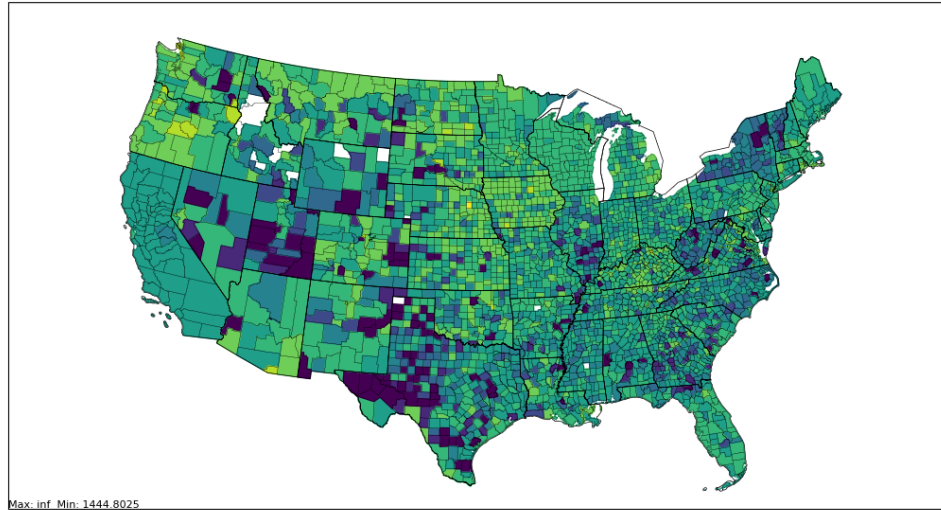
**2020NEI onroad VMT/VPOP ratio: electric Light Commercial Trucks**

**2020NEI onroad VMT/VPOP ratio: CNG Single Unit Short-Haul Trucks**

**2020NEI onroad VMT/VPOP ratio: CNG School Buses**

# Next Steps

▸ Review the draft VMT and VPOP and the VMT/VPOP ratios for anomalies

▸ Review age distribution data including state submittals

▸ Review soon-to-be-provided data on speeds and temporal profiles by month

▸ Once all MOVES input data are finalized, run MOVES to generate emission factors (late summer)

▸ Run SMOKE-MOVES for key months and perform QA

▸ Run SMOKE-MOVES for all months with final inputs (fall)