

Reporting 2020 Registered Passenger Vehicle Fuel Efficiency Averages by Census Block

Oregon Department of Transportation (ODOT) passenger vehicle registration records were processed and enhanced in order to estimate the average fleet fuel efficiency by Census Block across the state of Oregon. Oregon Metropolitan Planning Organizations (MPOs) and Oregon counties are monitoring passenger fleet characteristics, primarily related to fuel efficiency. ODOT utilized DataOne software to assign EPA fuel efficiency estimates for each vehicle. Each vehicle location listed in the registration record was geocoded to a Census Block centroid to ensure privacy. All vehicles residing in a Census Block were used to estimate the average fuel efficiency for the Block. Not all records could be geocoded, but they are retained in a separate table within the county geodatabase file to avoid losing valuable information. Over 3.5 million passenger vehicles were geocoded to Census Blocks.

A Census Block must have four or more vehicles to report an average value in order to maintain privacy and confidentiality. Furthermore, to maintain privacy no more than 80% of the Census Block vehicles can be at one location to report results. Records not meeting confidentiality criteria were retained and placed into a table for non-geocoded vehicles. A geodatabase (.gdb) was created for each Oregon county and compressed using 7zip before posting online.

Registration data for currently registered passenger vehicles was pulled from the DMV master file December 31, 2020. Two software tools were used to process the data. Selected fields were standardized and prepared for aggregation using the statistical software JMP. ArcGIS was used to geocode the registered vehicle addresses and aggregate them to Oregon's 196,550 Census Blocks. The geodatabase format is a compact form to store large data sets. There are multiple ways to access the data, such as ArcGIS, QGIS, Tableau Desktop, as well as others.

This process provides MPOs and other agency partners access to passenger fleet information previously unavailable. The Oregon passenger vehicle fleet tends to be older than many U.S. states. This has implications related to transportation sector GHG production, vehicle emissions, energy use and implementation of safety features available in new vehicles. This data set enables public agencies to monitor the passenger fleet characteristics, as well as provide information for long range planning and public policy analysis.

For questions related to this information, please contact Becky Knudson at 503.986.4113 or rebecca.a.knudson@odot.state.or.us.

The variables included in the main geodatabase table are listed below in Table 1. A subset of these variables are included in the secondary table listing the non-geocoded records.

Table 1. 2020 Data Elements

2020 Variable Name	Description
OBJECTID	GIS-generated unique record number (changes when records are deleted)
CB_Geo_ID	Unique 2010 Census Block (CB) identification number
Geo_Lat	GIS Census Block centroid 'Latitude' location (OGIC ft.)
Geo_Long	GIS Census Block centroid 'Longitude' location (OGIC ft.)
Unique_ID	Unique Vehicle Record Number
MAKE	Make of vehicle (CHEV, MAZD, LEXS, etc.)
MODEL_YEAR	Model year of vehicle (1994, 2014, etc.)
MPG_city	Individual vehicle city mpg from EPA
MPG_highway	Individual vehicle highway mpg from EPA
MPG_combined	Individual vehicle combined mpg from EPA
City_Name	Name of city of residence
MPO	Name of metropolitan planning organization of residence
CB_City_MPG	GIS-calculated average vehicle city mpg per Census Block
CB_Hwy_MPG	GIS-calculated average vehicle highway mpg per Census Block
CB_Combine_MPG	GIS-calculated average vehicle combined mpg per Census Block
CB_Veh_Count	GIS total vehicle count for Census Block records (all vehicles, with or without mpg data)
CB_Veh_MPG_Count	GIS count of vehicles with MPG data in Census Block
Motive_Power_Text	Motive power of vehicle (gasoline, hybrid, flex fuel, etc.)
County_Name	Registered vehicle location county (name)
OR_County_Code	Registered vehicle location county (code)
Note	GIS note included in non-confidential table