# Project Proposal- TTP 289

**Aim**: \* To establish the relationship between the driving patterns and parameters( speed,acceleration,number of stops etc) with the type of drive train, fuel and vocation of the vehicle.

* To predict the type of drivetrain,fuel type and the vocation based on the driving pattern.

**Data set**: FLeet DNA dataset will be employed

**Summary of the data set**:

## vid did pid class\_id   
## Min. : 1.0 Min. : 0.00 Min. : 1.00 Min. :2.000   
## 1st Qu.: 99.0 1st Qu.:18.00 1st Qu.: 6.00 1st Qu.:6.000   
## Median : 236.0 Median :33.00 Median :16.00 Median :6.000   
## Mean : 515.3 Mean :30.87 Mean :12.74 Mean :6.303   
## 3rd Qu.: 327.0 3rd Qu.:42.00 3rd Qu.:18.00 3rd Qu.:8.000   
## Max. :9868.0 Max. :62.00 Max. :24.00 Max. :8.000   
##   
## voc\_id type\_id drive\_id fuel\_id   
## Min. : 1.000 Min. : 2.00 Min. :0.0000 Min. :0.000   
## 1st Qu.: 4.000 1st Qu.:26.00 1st Qu.:0.0000 1st Qu.:1.000   
## Median : 5.000 Median :31.00 Median :0.0000 Median :1.000   
## Mean : 7.014 Mean :27.26 Mean :0.2823 Mean :1.048   
## 3rd Qu.:10.000 3rd Qu.:36.00 3rd Qu.:1.0000 3rd Qu.:1.000   
## Max. :18.000 Max. :39.00 Max. :3.0000 Max. :3.000   
##   
## day\_id trip\_count mt\_count start\_ts   
## Min. : 1.00 Min. : 1.000 Min. : 2.0 Length:4705   
## 1st Qu.: 4.00 1st Qu.: 4.000 1st Qu.: 42.0 Class :character   
## Median : 9.00 Median : 8.000 Median : 80.0 Mode :character   
## Mean : 21.42 Mean : 8.808 Mean :110.1   
## 3rd Qu.: 16.00 3rd Qu.:12.000 3rd Qu.:137.0   
## Max. :276.00 Max. :40.000 Max. :826.0   
##   
## end\_ts start\_rts end\_rts   
## Length:4705 Min. : -7 Min. :2.015e+03   
## Class :character 1st Qu.: 313261 1st Qu.:3.534e+05   
## Mode :character Median : 905952 Median :9.474e+05   
## Mean : 19593781 Mean :1.964e+07   
## 3rd Qu.: 1733025 3rd Qu.:1.797e+06   
## Max. :3555105403 Max. :3.555e+09   
##   
## absolute\_time\_duration\_hrs speed\_data\_duration\_hrs driving\_data\_duration\_hrs  
## Min. : 0.2244 Min. : 0.2019 Min. : 0.1775   
## 1st Qu.: 8.7607 1st Qu.: 2.7700 1st Qu.: 1.4686   
## Median :10.9055 Median : 4.1794 Median : 2.2522   
## Mean :12.2683 Mean : 5.0870 Mean : 2.5989   
## 3rd Qu.:15.7667 3rd Qu.: 6.6883 3rd Qu.: 3.0397   
## Max. :23.9875 Max. :23.2847 Max. :13.7978   
##   
## non\_recorded\_time\_hrs collected\_vs\_real\_time\_ratio  
## Min. :-0.001472 Min. :0.03191   
## 1st Qu.: 3.701676 1st Qu.:0.25340   
## Median : 6.413889 Median :0.38578   
## Mean : 7.181309 Mean :0.44767   
## 3rd Qu.: 9.932222 3rd Qu.:0.60051   
## Max. :22.162793 Max. :1.00493   
##   
## mean\_estimated\_sampling\_rate\_hz max\_gap\_between\_samples\_s  
## Min. :0.0319 Min. : 1   
## 1st Qu.:0.2534 1st Qu.: 3568   
## Median :0.3858 Median : 8434   
## Mean :0.4477 Mean :12422   
## 3rd Qu.:0.6005 3rd Qu.:18315   
## Max. :1.0049 Max. :70489   
##   
## min\_gap\_between\_samples\_s mean\_gap\_between\_samples\_s  
## Min. :0.0000 Min. : 0.9951   
## 1st Qu.:1.0000 1st Qu.: 1.6653   
## Median :1.0000 Median : 2.5923   
## Mean :0.9038 Mean : 3.4455   
## 3rd Qu.:1.0000 3rd Qu.: 3.9467   
## Max. :1.0000 Max. :31.3494   
##   
## median\_gap\_between\_samples\_s std\_gap\_between\_samples\_s  
## Min. :0.800 Min. : 0.00   
## 1st Qu.:1.000 1st Qu.: 42.70   
## Median :1.000 Median : 90.13   
## Mean :1.003 Mean : 129.47   
## 3rd Qu.:1.000 3rd Qu.: 180.69   
## Max. :2.000 Max. :1423.84   
##   
## var\_gap\_between\_samples\_s gap\_25th\_percentile\_s gap\_75th\_percentile\_s  
## Min. : 0 Min. :0.200 Min. :1.000   
## 1st Qu.: 1823 1st Qu.:1.000 1st Qu.:1.000   
## Median : 8123 Median :1.000 Median :1.000   
## Mean : 33159 Mean :1.003 Mean :1.087   
## 3rd Qu.: 32647 3rd Qu.:1.000 3rd Qu.:1.000   
## Max. :2027333 Max. :2.000 Max. :2.000   
##   
## gap\_inter\_quartile\_range\_s gap\_median\_absolute\_deviation\_s  
## Min. :0.00000 Min. :0.000e+00   
## 1st Qu.:0.00000 1st Qu.:0.000e+00   
## Median :0.00000 Median :0.000e+00   
## Mean :0.08374 Mean :4.251e-05   
## 3rd Qu.:0.00000 3rd Qu.:0.000e+00   
## Max. :1.00000 Max. :2.000e-01   
##   
## median\_estimated\_sampling\_rate\_hz max\_speed total\_average\_speed  
## Min. :0.800 Min. :20.15 Min. : 1.202   
## 1st Qu.:1.000 1st Qu.:54.87 1st Qu.: 8.888   
## Median :1.000 Median :61.44 Median :13.266   
## Mean :1.003 Mean :59.45 Mean :15.397   
## 3rd Qu.:1.000 3rd Qu.:66.13 3rd Qu.:19.835   
## Max. :2.000 Max. :80.67 Max. :50.306   
##   
## total\_median\_speed 32total\_root\_mean\_cubed\_speed total\_speed\_variance  
## Min. : 0.000 Min. : 8.043 Min. : 21.68   
## 1st Qu.: 0.000 1st Qu.:21.324 1st Qu.:159.56   
## Median : 4.929 Median :26.152 Median :247.53   
## Mean :10.182 Mean :27.733 Mean :292.92   
## 3rd Qu.:16.283 3rd Qu.:32.627 3rd Qu.:417.48   
## Max. :65.043 Max. :57.894 Max. :853.88   
##   
## total\_speed\_standard\_deviation total\_speed\_velocity\_ratio  
## Min. : 4.656 Min. : 1.085   
## 1st Qu.:12.632 1st Qu.: 1.562   
## Median :15.733 Median : 1.960   
## Mean :16.417 Mean : 2.162   
## 3rd Qu.:20.432 3rd Qu.: 2.532   
## Max. :29.221 Max. :11.431   
##   
## total\_speed\_25th\_percentile total\_speed\_75th\_percentile  
## Min. : 0.000 Min. : 0.00   
## 1st Qu.: 0.000 1st Qu.:12.72   
## Median : 0.000 Median :23.76   
## Mean : 2.148 Mean :25.29   
## 3rd Qu.: 0.000 3rd Qu.:33.33   
## Max. :43.453 Max. :67.69   
##   
## total\_speed\_inter\_quartile\_range total\_speed\_median\_absolute\_deviation  
## Min. : 0.00 Min. : 0.000   
## 1st Qu.:12.69 1st Qu.: 0.000   
## Median :20.78 Median : 4.676   
## Mean :23.14 Mean : 6.689   
## 3rd Qu.:31.42 3rd Qu.:10.691   
## Max. :65.02 Max. :32.891   
##   
## driving\_average\_speed driving\_median\_speed driving\_root\_mean\_cubed\_speed  
## Min. : 8.447 Min. : 2.835 Min. : 8.447   
## 1st Qu.:20.055 1st Qu.:17.180 1st Qu.:20.055   
## Median :24.165 Median :22.853 Median :24.165   
## Mean :26.160 Mean :25.472 Mean :26.160   
## 3rd Qu.:31.715 3rd Qu.:30.976 3rd Qu.:31.715   
## Max. :54.482 Max. :65.219 Max. :54.482   
##   
## driving\_speed\_variance driving\_speed\_standard\_deviation  
## Min. : 20.78 Min. : 4.559   
## 1st Qu.:155.89 1st Qu.:12.486   
## Median :252.02 Median :15.875   
## Mean :262.23 Mean :15.731   
## 3rd Qu.:359.37 3rd Qu.:18.957   
## Max. :659.72 Max. :25.685   
##   
## driving\_speed\_velocity\_ratio driving\_speed\_25th\_percentile  
## Min. :1 Min. : 1.710   
## 1st Qu.:1 1st Qu.: 8.562   
## Median :1 Median :11.317   
## Mean :1 Mean :12.985   
## 3rd Qu.:1 3rd Qu.:14.482   
## Max. :1 Max. :53.627   
##   
## driving\_speed\_75th\_percentile driving\_speed\_inter\_quartile\_range  
## Min. :11.28 Min. : 0.8817   
## 1st Qu.:29.00 1st Qu.:18.6851   
## Median :35.41 Median :23.9636   
## Mean :38.82 Mean :25.8310   
## 3rd Qu.:51.38 3rd Qu.:32.4678   
## Max. :68.16 Max. :53.2843   
##   
## driving\_speed\_median\_absolute\_deviation zero\_seconds zero\_five\_seconds  
## Min. : 0.2324 Min. : 10 Min. : 15   
## 1st Qu.: 8.2260 1st Qu.: 2589 1st Qu.: 431   
## Median :10.7611 Median : 6275 Median : 713   
## Mean :11.5266 Mean : 8957 Mean :1019   
## 3rd Qu.:14.3101 3rd Qu.:13383 3rd Qu.:1209   
## Max. :26.9507 Max. :76965 Max. :8891   
##   
## five\_ten\_seconds ten\_fifteen\_seconds fifteen\_twenty\_seconds  
## Min. : 26 Min. : 15 Min. : 23.0   
## 1st Qu.: 563 1st Qu.: 436 1st Qu.: 366.0   
## Median : 969 Median : 806 Median : 663.0   
## Mean : 1206 Mean : 1079 Mean : 931.2   
## 3rd Qu.: 1527 3rd Qu.: 1367 3rd Qu.: 1162.0   
## Max. :10300 Max. :15216 Max. :11551.0   
##   
## twenty\_twenty\_five\_seconds twenty\_five\_thirty\_seconds  
## Min. : 1.0 Min. : 0.0   
## 1st Qu.: 362.0 1st Qu.: 365.0   
## Median : 615.0 Median : 592.0   
## Mean : 844.2 Mean : 802.5   
## 3rd Qu.: 1023.0 3rd Qu.: 900.0   
## Max. :10589.0 Max. :10147.0   
##   
## thirty\_thirty\_five\_seconds thirty\_five\_fourty\_seconds  
## Min. : 0.0 Min. : 0.0   
## 1st Qu.: 345.0 1st Qu.: 238.0   
## Median : 561.0 Median : 443.0   
## Mean : 727.9 Mean : 564.5   
## 3rd Qu.: 852.0 3rd Qu.: 733.0   
## Max. :6381.0 Max. :3959.0   
##   
## fourty\_fourty\_five\_seconds fourty\_five\_fifty\_seconds fifty\_fifty\_five\_seconds  
## Min. : 0.0 Min. : 0.0 Min. : 0.0   
## 1st Qu.: 134.0 1st Qu.: 68.0 1st Qu.: 34.0   
## Median : 273.0 Median : 181.0 Median : 183.0   
## Mean : 399.1 Mean : 296.2 Mean : 513.3   
## 3rd Qu.: 534.0 3rd Qu.: 370.0 3rd Qu.: 479.0   
## Max. :4115.0 Max. :5377.0 Max. :10561.0   
##   
## fifty\_five\_sixty\_seconds sixty\_sixty\_five\_seconds sixty\_five\_seventy\_seconds  
## Min. : 0.0 Min. : 0.0 Min. : 0.0   
## 1st Qu.: 0.0 1st Qu.: 0.0 1st Qu.: 0.0   
## Median : 145.0 Median : 20.0 Median : 0.0   
## Mean : 492.3 Mean : 345.6 Mean : 129.3   
## 3rd Qu.: 510.0 3rd Qu.: 331.0 3rd Qu.: 19.0   
## Max. :12278.0 Max. :10095.0 Max. :8053.0   
##   
## seventy\_seventy\_five\_seconds seventy\_five\_plus\_seconds driving\_time\_seconds  
## Min. : 0.000 Min. : 0.0000 Min. : 639   
## 1st Qu.: 0.000 1st Qu.: 0.0000 1st Qu.: 5287   
## Median : 0.000 Median : 0.0000 Median : 8108   
## Mean : 6.074 Mean : 0.1031 Mean : 9356   
## 3rd Qu.: 0.000 3rd Qu.: 0.0000 3rd Qu.:10943   
## Max. :3625.000 Max. :372.0000 Max. :49672   
##   
## percent\_zero percent\_zero\_five percent\_five\_ten percent\_ten\_fifteen  
## Min. : 0.6941 Min. : 0.2491 Min. : 0.2439 Min. : 0.3062   
## 1st Qu.:28.9515 1st Qu.: 3.6430 1st Qu.: 4.5771 1st Qu.: 3.6268   
## Median :43.7751 Median : 5.0862 Median : 6.5067 Median : 5.6237   
## Mean :43.1794 Mean : 5.5815 Mean : 7.0151 Mean : 6.2542   
## 3rd Qu.:58.4160 3rd Qu.: 6.9484 3rd Qu.: 8.9601 3rd Qu.: 8.0203   
## Max. :95.3324 Max. :22.3539 Max. :25.8086 Max. :28.3372   
##   
## percent\_fifteen\_twenty percent\_twenty\_twenty\_five percent\_twenty\_five\_thirty  
## Min. : 0.1409 Min. : 0.01182 Min. : 0.000   
## 1st Qu.: 2.8938 1st Qu.: 2.72924 1st Qu.: 2.569   
## Median : 4.4269 Median : 4.06009 Median : 4.010   
## Mean : 5.3899 Mean : 5.08178 Mean : 4.936   
## 3rd Qu.: 7.1906 3rd Qu.: 6.25477 3rd Qu.: 5.934   
## Max. :22.5928 Max. :25.03113 Max. :29.864   
##   
## percent\_thirty\_thirty\_five percent\_thirty\_five\_fourty  
## Min. : 0.000 Min. : 0.000   
## 1st Qu.: 2.295 1st Qu.: 1.622   
## Median : 3.874 Median : 3.067   
## Mean : 4.705 Mean : 3.768   
## 3rd Qu.: 6.141 3rd Qu.: 5.263   
## Max. :23.899 Max. :26.299   
##   
## percent\_fourty\_fourty\_five percent\_fourty\_five\_fifty percent\_fifty\_fifty\_five  
## Min. : 0.0000 Min. : 0.0000 Min. : 0.0000   
## 1st Qu.: 0.9361 1st Qu.: 0.4497 1st Qu.: 0.2214   
## Median : 1.8961 Median : 1.2208 Median : 1.1886   
## Mean : 2.6591 Mean : 1.8959 Mean : 3.2493   
## 3rd Qu.: 3.6453 3rd Qu.: 2.5361 3rd Qu.: 3.1963   
## Max. :20.5465 Max. :23.4525 Max. :65.1534   
##   
## percent\_fifty\_five\_sixty percent\_sixty\_sixty\_five percent\_sixty\_five\_seventy  
## Min. : 0.000 Min. : 0.0000 Min. : 0.0000   
## 1st Qu.: 0.000 1st Qu.: 0.0000 1st Qu.: 0.0000   
## Median : 0.851 Median : 0.1226 Median : 0.0000   
## Mean : 3.211 Mean : 2.1428 Mean : 0.8876   
## 3rd Qu.: 3.354 3rd Qu.: 2.0961 3rd Qu.: 0.1232   
## Max. :50.496 Max. :44.6246 Max. :51.4372   
##   
## percent\_seventy\_seventy\_five percent\_seventy\_five\_plus  
## Min. : 0.00000 Min. :0.000000   
## 1st Qu.: 0.00000 1st Qu.:0.000000   
## Median : 0.00000 Median :0.000000   
## Mean : 0.04177 Mean :0.000903   
## 3rd Qu.: 0.00000 3rd Qu.:0.000000   
## Max. :14.34108 Max. :3.545896   
##   
## percent\_distance\_zero\_five percent\_distance\_twenty\_twenty\_five  
## Min. : 0.0477 Min. : 0.04365   
## 1st Qu.: 0.7341 1st Qu.: 4.49721   
## Median : 1.1604 Median : 8.09247   
## Mean : 1.5884 Mean : 8.76515   
## 3rd Qu.: 1.9791 3rd Qu.:11.99092   
## Max. :13.4549 Max. :30.62359   
##   
## percent\_distance\_twenty\_five\_thirty percent\_distance\_total  
## Min. : 0.000 Min. :100   
## 1st Qu.: 5.475 1st Qu.:100   
## Median : 9.174 Median :100   
## Mean :10.026 Mean :100   
## 3rd Qu.:13.552 3rd Qu.:100   
## Max. :34.304 Max. :100   
##   
## percent\_distance\_thirty\_thirty\_five percent\_distance\_thirty\_five\_fourty  
## Min. : 0.000 Min. : 0.000   
## 1st Qu.: 6.029 1st Qu.: 5.097   
## Median :10.020 Median : 8.778   
## Mean :10.955 Mean : 9.701   
## 3rd Qu.:14.620 3rd Qu.:13.322   
## Max. :47.880 Max. :46.676   
##   
## percent\_distance\_ten\_fifteen percent\_distance\_sixty\_sixty\_five  
## Min. : 0.1917 Min. : 0.0000   
## 1st Qu.: 3.1873 1st Qu.: 0.0000   
## Median : 5.7618 Median : 0.5706   
## Mean : 6.6478 Mean : 6.6331   
## 3rd Qu.: 8.7658 3rd Qu.: 9.0896   
## Max. :47.0660 Max. :64.2266   
##   
## percent\_distance\_sixty\_five\_seventy percent\_distance\_seventy\_seventy\_five  
## Min. : 0.0000 Min. : 0.0000   
## 1st Qu.: 0.0000 1st Qu.: 0.0000   
## Median : 0.0000 Median : 0.0000   
## Mean : 2.2884 Mean : 0.1084   
## 3rd Qu.: 0.6023 3rd Qu.: 0.0000   
## Max. :68.0643 Max. :30.7129   
##   
## percent\_distance\_seventy\_five\_plus percent\_distance\_fourty\_fourty\_five  
## Min. :0.000000 Min. : 0.000   
## 1st Qu.:0.000000 1st Qu.: 3.428   
## Median :0.000000 Median : 6.291   
## Mean :0.002393 Mean : 7.296   
## 3rd Qu.:0.000000 3rd Qu.: 9.856   
## Max. :8.179368 Max. :35.537   
##   
## percent\_distance\_fourty\_five\_fifty percent\_distance\_five\_ten  
## Min. : 0.000 Min. : 0.1807   
## 1st Qu.: 2.068 1st Qu.: 2.2993   
## Median : 4.429 Median : 3.8003   
## Mean : 5.392 Mean : 4.6537   
## 3rd Qu.: 7.592 3rd Qu.: 6.0263   
## Max. :42.127 Max. :29.7350   
##   
## percent\_distance\_fifty\_five\_sixty percent\_distance\_fifty\_fifty\_five  
## Min. : 0.000 Min. : 0.000   
## 1st Qu.: 0.000 1st Qu.: 1.074   
## Median : 4.072 Median : 4.925   
## Mean : 9.053 Mean : 9.196   
## 3rd Qu.:12.906 3rd Qu.:10.656   
## Max. :73.227 Max. :88.548   
##   
## percent\_distance\_fifteen\_twenty percent\_total distance\_zero\_five  
## Min. : 0.4371 Min. :100 Min. :0.01495   
## 1st Qu.: 3.5956 1st Qu.:100 1st Qu.:0.40681   
## Median : 6.8313 Median :100 Median :0.66491   
## Mean : 7.6936 Mean :100 Mean :0.88125   
## 3rd Qu.:10.4640 3rd Qu.:100 3rd Qu.:1.03837   
## Max. :40.0092 Max. :100 Max. :7.11689   
##   
## distance\_five\_ten distance\_ten\_fifteen distance\_fifteen\_twenty  
## Min. : 0.05834 Min. : 0.0506 Min. : 0.1114   
## 1st Qu.: 1.17995 1st Qu.: 1.5285 1st Qu.: 1.8135   
## Median : 2.14306 Median : 2.9000 Median : 3.2946   
## Mean : 2.58358 Mean : 3.8712 Mean : 4.7040   
## 3rd Qu.: 3.34873 3rd Qu.: 5.0915 3rd Qu.: 6.1259   
## Max. :21.80031 Max. :53.2617 Max. :54.7032   
##   
## distance\_twenty\_twenty\_five distance\_twenty\_five\_thirty  
## Min. : 0.00557 Min. : 0.000   
## 1st Qu.: 2.29557 1st Qu.: 2.844   
## Median : 3.93680 Median : 4.686   
## Mean : 5.52363 Mean : 6.403   
## 3rd Qu.: 6.89535 3rd Qu.: 7.311   
## Max. :65.79934 Max. :77.298   
##   
## distance\_thirty\_thirty\_five distance\_thirty\_five\_fourty  
## Min. : 0.000 Min. : 0.000   
## 1st Qu.: 3.169 1st Qu.: 2.528   
## Median : 5.181 Median : 4.694   
## Mean : 6.867 Mean : 6.155   
## 3rd Qu.: 8.199 3rd Qu.: 8.134   
## Max. :57.376 Max. :40.971   
##   
## distance\_fourty\_fourty\_five distance\_fourty\_five\_fifty  
## Min. : 0.000 Min. : 0.0000   
## 1st Qu.: 1.616 1st Qu.: 0.9491   
## Median : 3.328 Median : 2.4548   
## Mean : 4.917 Mean : 4.0114   
## 3rd Qu.: 6.700 3rd Qu.: 5.0783   
## Max. :48.697 Max. :70.9164   
##   
## distance\_fifty\_fifty\_five distance\_fifty\_five\_sixty distance\_sixty\_sixty\_five  
## Min. : 0.0000 Min. : 0.000 Min. : 0.0000   
## 1st Qu.: 0.5312 1st Qu.: 0.000 1st Qu.: 0.0000   
## Median : 2.7985 Median : 2.389 Median : 0.3701   
## Mean : 7.6265 Mean : 7.931 Mean : 6.0405   
## 3rd Qu.: 7.0901 3rd Qu.: 8.372 3rd Qu.: 5.9658   
## Max. :159.3442 Max. :192.559 Max. :176.8597   
##   
## distance\_sixty\_five\_seventy distance\_seventy\_seventy\_five  
## Min. : 0.0000 Min. : 0.0000   
## 1st Qu.: 0.0000 1st Qu.: 0.0000   
## Median : 0.0000 Median : 0.0000   
## Mean : 2.4087 Mean : 0.1252   
## 3rd Qu.: 0.3814 3rd Qu.: 0.0000   
## Max. :148.9082 Max. :71.2057   
##   
## distance\_seventy\_five\_plus distance\_total   
## Min. :0.000000 Min. : 5.128   
## 1st Qu.:0.000000 1st Qu.: 36.441   
## Median :0.000000 Median : 56.663   
## Mean :0.002696 Mean : 70.051   
## 3rd Qu.:0.000000 3rd Qu.: 85.195   
## Max. :9.963702 Max. :568.266   
##   
## total\_number\_of\_acceleration\_events total\_number\_of\_deceleration\_events  
## Min. : 24.0 Min. : 24.0   
## 1st Qu.: 255.0 1st Qu.: 255.0   
## Median : 406.0 Median : 406.0   
## Mean : 467.1 Mean : 467.1   
## 3rd Qu.: 583.0 3rd Qu.: 583.0   
## Max. :2292.0 Max. :2292.0   
##   
## acceleration\_events\_per\_mile deceleration\_events\_per\_mile  
## Min. : 2.775 Min. : 2.775   
## 1st Qu.: 5.253 1st Qu.: 5.253   
## Median : 6.577 Median : 6.577   
## Mean : 7.478 Mean : 7.478   
## 3rd Qu.: 8.687 3rd Qu.: 8.687   
## Max. :29.687 Max. :29.687   
##   
## max\_acceleration\_ft\_per\_second\_squared max\_deceleration\_ft\_per\_second\_squared  
## Min. : 2.680 Min. :-23.889   
## 1st Qu.: 6.115 1st Qu.:-10.731   
## Median : 7.391 Median : -8.540   
## Mean : 8.295 Mean : -9.355   
## 3rd Qu.: 9.319 3rd Qu.: -7.127   
## Max. :30.839 Max. : -3.643   
##   
## average\_acceleration\_ft\_per\_second\_squared  
## Min. :0.2555   
## 1st Qu.:0.9120   
## Median :1.2064   
## Mean :1.2005   
## 3rd Qu.:1.4526   
## Max. :2.4960   
##   
## average\_deceleration\_ft\_per\_second\_squared  
## Min. :-2.8810   
## 1st Qu.:-1.6005   
## Median :-1.3216   
## Mean :-1.3298   
## 3rd Qu.:-1.0186   
## Max. :-0.2637   
##   
## median\_acceleration\_ft\_per\_second\_squared  
## Min. :0.04777   
## 1st Qu.:0.56240   
## Median :0.81885   
## Mean :0.84627   
## 3rd Qu.:1.05469   
## Max. :2.35030   
##   
## median\_deceleration\_ft\_per\_second\_squared  
## Min. :-2.56620   
## 1st Qu.:-1.04840   
## Median :-0.80360   
## Mean :-0.83696   
## 3rd Qu.:-0.52223   
## Max. :-0.04282   
##   
## std\_acceleration\_ft\_per\_second\_squared std\_deceleration\_ft\_per\_second\_squared  
## Min. :0.4483 Min. :0.5449   
## 1st Qu.:0.9383 1st Qu.:1.1623   
## Median :1.1392 Median :1.3703   
## Mean :1.1318 Mean :1.3774   
## 3rd Qu.:1.3246 3rd Qu.:1.5957   
## Max. :2.1643 Max. :2.4026   
##   
## var\_acceleration\_ft\_per\_second\_squared var\_deceleration\_ft\_per\_second\_squared  
## Min. :0.2010 Min. :0.2969   
## 1st Qu.:0.8803 1st Qu.:1.3510   
## Median :1.2977 Median :1.8777   
## Mean :1.3566 Mean :1.9927   
## 3rd Qu.:1.7545 3rd Qu.:2.5464   
## Max. :4.6841 Max. :5.7726   
##   
## acceleration\_25th\_percentile\_ft\_per\_second\_squared  
## Min. :0.01837   
## 1st Qu.:0.20287   
## Median :0.30749   
## Mean :0.32281   
## 3rd Qu.:0.40614   
## Max. :1.12593   
##   
## deceleration\_25th\_percentile\_ft\_per\_second\_squared  
## Min. :-4.4119   
## 1st Qu.:-2.4571   
## Median :-1.9375   
## Mean :-1.9575   
## 3rd Qu.:-1.4058   
## Max. :-0.1626   
##   
## acceleration\_75th\_percentile\_ft\_per\_second\_squared  
## Min. :0.2016   
## 1st Qu.:1.3391   
## Median :1.7976   
## Mean :1.7952   
## 3rd Qu.:2.2028   
## Max. :3.8239   
##   
## deceleration\_75th\_percentile\_ft\_per\_second\_squared  
## Min. :-1.02397   
## 1st Qu.:-0.38551   
## Median :-0.28525   
## Mean :-0.30049   
## 3rd Qu.:-0.18064   
## Max. :-0.01637   
##   
## acceleration\_inter\_quartile\_range\_ft\_per\_second\_squared  
## Min. :0.180   
## 1st Qu.:1.120   
## Median :1.476   
## Mean :1.472   
## 3rd Qu.:1.790   
## Max. :3.373   
##   
## deceleration\_inter\_quartile\_range\_ft\_per\_second\_squared  
## Min. :0.1414   
## 1st Qu.:1.2067   
## Median :1.6361   
## Mean :1.6570   
## 3rd Qu.:2.0783   
## Max. :3.7936   
##   
## acceleration\_median\_absolute\_deviation\_ft\_per\_second\_squared  
## Min. :0.03884   
## 1st Qu.:0.42938   
## Median :0.61415   
## Mean :0.61291   
## 3rd Qu.:0.76551   
## Max. :1.41771   
##   
## deceleration\_median\_absolute\_deviation\_ft\_per\_second\_squared  
## Min. :0.03484   
## 1st Qu.:0.41444   
## Median :0.61924   
## Mean :0.64206   
## 3rd Qu.:0.81000   
## Max. :1.76103   
##   
## cumulative\_acceleration\_duration cumulative\_deceleration\_duration  
## Min. :0 Min. :0   
## 1st Qu.:0 1st Qu.:0   
## Median :0 Median :0   
## Mean :0 Mean :0   
## 3rd Qu.:0 3rd Qu.:0   
## Max. :0 Max. :0   
##   
## cumulative\_acceleration\_cycle\_duration\_percent  
## Min. :0   
## 1st Qu.:0   
## Median :0   
## Mean :0   
## 3rd Qu.:0   
## Max. :0   
##   
## cumulative\_deceleration\_cycle\_duration\_percent  
## Min. :0   
## 1st Qu.:0   
## Median :0   
## Mean :0   
## 3rd Qu.:0   
## Max. :0   
##   
## absolute\_time\_cumulative\_acceleration\_duration  
## Min. : 335   
## 1st Qu.: 2917   
## Median : 4578   
## Mean : 5128   
## 3rd Qu.: 6228   
## Max. :25549   
##   
## absolute\_time\_cumulative\_deceleration\_duration  
## Min. : 335   
## 1st Qu.: 2917   
## Median : 4578   
## Mean : 5128   
## 3rd Qu.: 6228   
## Max. :25549   
##   
## absolute\_time\_cumulative\_acceleration\_cycle\_duration\_percent  
## Min. : 6660689   
## 1st Qu.: 89805436   
## Median :153081097   
## Mean :167976117   
## 3rd Qu.:223223003   
## Max. :703293413   
##   
## absolute\_time\_cumulative\_deceleration\_cycle\_duration\_percent  
## Min. : 6660689   
## 1st Qu.: 89805436   
## Median :153081097   
## Mean :167976117   
## 3rd Qu.:223223003   
## Max. :703293413   
##   
## average\_acceleration\_event\_duration average\_deceleration\_event\_duration  
## Min. : 6.438 Min. : 5.956   
## 1st Qu.: 9.971 1st Qu.: 9.236   
## Median :11.188 Median : 10.535   
## Mean :11.283 Mean : 13.295   
## 3rd Qu.:12.453 3rd Qu.: 12.422   
## Max. :20.749 Max. :1809.583   
##   
## min\_acceleration\_event\_duration min\_deceleration\_event\_duration  
## Min. :0.000 Min. :0.000   
## 1st Qu.:1.000 1st Qu.:1.000   
## Median :1.000 Median :1.000   
## Mean :1.014 Mean :1.015   
## 3rd Qu.:1.000 3rd Qu.:1.000   
## Max. :4.000 Max. :4.000   
##   
## max\_acceleration\_event\_duration max\_deceleration\_event\_duration  
## Min. : 18.0 Min. : 21.0   
## 1st Qu.: 49.0 1st Qu.: 43.0   
## Median : 58.0 Median : 53.0   
## Mean : 60.1 Mean : 654.3   
## 3rd Qu.: 69.0 3rd Qu.: 76.0   
## Max. :300.9 Max. :61208.9   
##   
## std\_acceleration\_event\_duration std\_deceleration\_event\_duration  
## Min. : 3.314 Min. : 3.642   
## 1st Qu.: 7.696 1st Qu.: 6.790   
## Median : 8.956 Median : 7.877   
## Mean : 9.007 Mean : 40.666   
## 3rd Qu.:10.238 3rd Qu.: 9.721   
## Max. :42.830 Max. :10188.486   
##   
## var\_acceleration\_event\_duration var\_deceleration\_event\_duration  
## Min. : 10.98 Min. : 13   
## 1st Qu.: 59.23 1st Qu.: 46   
## Median : 80.21 Median : 62   
## Mean : 85.12 Mean : 52178   
## 3rd Qu.: 104.83 3rd Qu.: 94   
## Max. :1834.44 Max. :103805254   
##   
## median\_acceleration\_event\_duration median\_deceleration\_event\_duration  
## Min. : 5.000 Min. : 4.00   
## 1st Qu.: 8.000 1st Qu.: 7.00   
## Median : 8.500 Median : 8.00   
## Mean : 8.674 Mean : 8.35   
## 3rd Qu.:10.000 3rd Qu.: 9.00   
## Max. :17.000 Max. :14.00   
##   
## acceleration\_event\_duration\_25th\_percentile  
## Min. : 2.500   
## 1st Qu.: 4.312   
## Median : 5.000   
## Mean : 5.097   
## 3rd Qu.: 6.000   
## Max. :10.000   
##   
## deceleration\_event\_duration\_25th\_percentile  
## Min. :2.200   
## 1st Qu.:4.250   
## Median :5.000   
## Mean :5.077   
## 3rd Qu.:6.000   
## Max. :9.000   
##   
## acceleration\_event\_duration\_75th\_percentile  
## Min. : 7.00   
## 1st Qu.:13.00   
## Median :15.00   
## Mean :14.75   
## 3rd Qu.:17.00   
## Max. :31.00   
##   
## deceleration\_event\_duration\_75th\_percentile  
## Min. : 6.00   
## 1st Qu.:12.00   
## Median :13.00   
## Mean :13.51   
## 3rd Qu.:15.00   
## Max. :53.75   
##   
## acceleration\_event\_duration\_inter\_quartile\_range  
## Min. : 3.000   
## 1st Qu.: 8.000   
## Median :10.000   
## Mean : 9.651   
## 3rd Qu.:11.000   
## Max. :26.000   
##   
## deceleration\_event\_duration\_inter\_quartile\_range  
## Min. : 2.000   
## 1st Qu.: 7.000   
## Median : 9.000   
## Mean : 8.437   
## 3rd Qu.:10.000   
## Max. :47.750   
##   
## acceleration\_event\_duration\_median\_absolute\_deviation  
## Min. :1.000   
## 1st Qu.:4.000   
## Median :4.000   
## Mean :4.249   
## 3rd Qu.:5.000   
## Max. :9.000   
##   
## deceleration\_event\_duration\_median\_absolute\_deviation total\_stops   
## Min. :1.000 Min. : 2.0   
## 1st Qu.:3.000 1st Qu.: 41.0   
## Median :4.000 Median : 80.0   
## Mean :3.842 Mean :109.5   
## 3rd Qu.:5.000 3rd Qu.:135.0   
## Max. :8.000 Max. :825.0   
##   
## stops\_0\_30 stops\_30\_60 stops\_60\_plus stops\_300\_plus stops\_1800\_plus  
## Min. :0 Min. :0 Min. :1 Min. :1 Min. :1   
## 1st Qu.:0 1st Qu.:0 1st Qu.:1 1st Qu.:1 1st Qu.:1   
## Median :0 Median :0 Median :1 Median :1 Median :1   
## Mean :0 Mean :0 Mean :1 Mean :1 Mean :1   
## 3rd Qu.:0 3rd Qu.:0 3rd Qu.:1 3rd Qu.:1 3rd Qu.:1   
## Max. :0 Max. :0 Max. :1 Max. :1 Max. :1   
##   
## stops\_3600\_plus stops\_per\_mile average\_stop\_duration min\_stop\_duration  
## Min. :1 Min. : 0.05881 Min. :-1182.4 Min. :-85672   
## 1st Qu.:1 1st Qu.: 0.89485 1st Qu.: 165.7 1st Qu.: 2   
## Median :1 Median : 1.45086 Median : 354.4 Median : 2   
## Mean :1 Mean : 2.00740 Mean : 557.9 Mean : -2016   
## 3rd Qu.:1 3rd Qu.: 2.30365 3rd Qu.: 747.3 3rd Qu.: 2   
## Max. :1 Max. :16.74998 Max. :11200.8 Max. : 20   
##   
## max\_stop\_duration median\_stop\_duration mean\_stop\_duration std\_stop\_duration  
## Min. : 23 Min. :-440.50 Min. :-1182.4 Min. : 8.5   
## 1st Qu.: 3979 1st Qu.: 20.00 1st Qu.: 165.7 1st Qu.: 727.4   
## Median : 9221 Median : 26.50 Median : 354.4 Median : 1461.6   
## Mean :13023 Mean : 45.43 Mean : 557.9 Mean : 2054.8   
## 3rd Qu.:18677 3rd Qu.: 40.50 3rd Qu.: 747.3 3rd Qu.: 2893.1   
## Max. :70493 Max. :3381.50 Max. :11200.8 Max. :23895.8   
##   
## var\_stop\_duration stop\_duration\_25th\_percentile  
## Min. : 72 Min. :-1387.75   
## 1st Qu.: 529073 1st Qu.: 8.00   
## Median : 2136317 Median : 9.75   
## Mean : 7993495 Mean : 11.98   
## 3rd Qu.: 8370077 3rd Qu.: 13.00   
## Max. :571009138 Max. : 1932.95   
##   
## stop\_duration\_75th\_percentile stop\_duration\_inter\_quartile\_range  
## Min. : 15.00 Min. : 6.0   
## 1st Qu.: 54.25 1st Qu.: 44.0   
## Median : 98.30 Median : 85.0   
## Mean : 319.56 Mean : 307.6   
## 3rd Qu.: 265.00 3rd Qu.: 250.0   
## Max. :13586.00 Max. :13567.0   
##   
## stop\_duration\_median\_absolute\_deviation max\_elevation min\_elevation   
## Min. : 1.00 Min. : 9.549 Min. : -13.86   
## 1st Qu.: 14.50 1st Qu.: 426.215 1st Qu.: 17.69   
## Median : 20.50 Median : 771.857 Median : 307.02   
## Mean : 38.82 Mean :1291.616 Mean : 904.52   
## 3rd Qu.: 34.00 3rd Qu.:1133.886 3rd Qu.: 810.38   
## Max. :3355.00 Max. :8059.118 Max. :5169.21   
##   
## mean\_elevation median\_elevation std\_of\_elevation var\_of\_elevation   
## Min. : 4.301 Min. : 3.503 Min. : 0.7234 Min. : 0.5   
## 1st Qu.: 201.224 1st Qu.: 168.288 1st Qu.: 34.8835 1st Qu.: 1216.9   
## Median : 455.133 Median : 447.045 Median : 67.4121 Median : 4544.4   
## Mean :1055.504 Mean :1048.548 Mean : 92.4686 Mean : 19314.5   
## 3rd Qu.: 926.347 3rd Qu.: 923.929 3rd Qu.: 120.9243 3rd Qu.: 14622.7   
## Max. :6165.868 Max. :6053.964 Max. :1637.0538 Max. :2679945.0   
##   
## elevation\_25th\_percentile elevation\_75th\_percentile  
## Min. : 2.037 Min. : 4.204   
## 1st Qu.: 64.099 1st Qu.: 298.289   
## Median : 383.226 Median : 527.357   
## Mean : 986.900 Mean :1114.925   
## 3rd Qu.: 891.959 3rd Qu.: 957.740   
## Max. :5989.804 Max. :7605.251   
##   
## elevation\_inter\_quartile\_range elevation\_median\_absolute\_deviation  
## Min. : 0.00 Min. : 0.00   
## 1st Qu.: 35.09 1st Qu.: 12.44   
## Median : 80.75 Median : 31.82   
## Mean : 128.02 Mean : 48.29   
## 3rd Qu.: 168.28 3rd Qu.: 65.50   
## Max. :2436.25 Max. :1109.30   
##   
## delta\_elevation delta\_elevation\_cumulative  
## Min. :-1175.9534 Min. :-1175.9534   
## 1st Qu.: -2.6322 1st Qu.: -2.6322   
## Median : -0.0716 Median : -0.0716   
## Mean : -1.8817 Mean : -1.8817   
## 3rd Qu.: 2.1132 3rd Qu.: 2.1132   
## Max. : 1182.0362 Max. : 1182.0362   
##   
## absolute\_delta\_elevation\_cumulative total\_elevation\_gained  
## Min. : 74.01 Min. : 19.91   
## 1st Qu.: 1998.00 1st Qu.: 1000.93   
## Median : 4009.37 Median : 2005.77   
## Mean : 6159.49 Mean : 3078.80   
## 3rd Qu.: 7781.03 3rd Qu.: 3898.39   
## Max. :54407.23 Max. :27205.04   
##   
## total\_elevation\_lost average\_absolute\_elevation\_rate\_change max\_climbing\_rate  
## Min. : 19.91 Min. :0.005791 Min. : 0.1265   
## 1st Qu.: 1000.93 1st Qu.:0.127773 1st Qu.: 4.3813   
## Median : 2005.77 Median :0.277683 Median : 6.4676   
## Mean : 3078.80 Mean :0.379445 Mean : 7.0493   
## 3rd Qu.: 3898.39 3rd Qu.:0.546359 3rd Qu.: 8.7516   
## Max. :27205.04 Max. :1.680787 Max. :26.7685   
##   
## average\_climbing\_rate median\_climbing\_rate max\_descending\_rate   
## Min. :0.02849 Min. :0.003262 Min. :-0.0050294   
## 1st Qu.:0.28354 1st Qu.:0.115601 1st Qu.:-0.0000983   
## Median :0.59301 Median :0.257313 Median :-0.0000178   
## Mean :0.61321 Mean :0.308959 Mean :-0.0001114   
## 3rd Qu.:0.83373 3rd Qu.:0.421000 3rd Qu.: 0.0000000   
## Max. :2.00583 Max. :1.491143 Max. : 0.0000000   
##   
## average\_descending\_rate median\_descending\_rate climbing\_rate\_25th\_percentile  
## Min. :-2.06958 Min. :-1.43292 Min. :0.0000128   
## 1st Qu.:-0.83916 1st Qu.:-0.41018 1st Qu.:0.0316805   
## Median :-0.58826 Median :-0.25371 Median :0.0695758   
## Mean :-0.61807 Mean :-0.30158 Mean :0.0926365   
## 3rd Qu.:-0.28825 3rd Qu.:-0.11681 3rd Qu.:0.1338468   
## Max. :-0.02906 Max. :-0.00384 Max. :0.5726341   
##   
## descending\_rate\_25th\_percentile climbing\_rate\_75th\_percentile  
## Min. :-2.99309 Min. :0.01786   
## 1st Qu.:-1.11569 1st Qu.:0.31805   
## Median :-0.74116 Median :0.75359   
## Mean :-0.80371 Mean :0.81547   
## 3rd Qu.:-0.31884 3rd Qu.:1.15014   
## Max. :-0.02717 Max. :3.03866   
##   
## descending\_rate\_75th\_percentile climbing\_rate\_inter\_quartile\_range  
## Min. :-0.48825 Min. :0.01784   
## 1st Qu.:-0.13004 1st Qu.:0.28396   
## Median :-0.06884 Median :0.65848   
## Mean :-0.08967 Mean :0.72283   
## 3rd Qu.:-0.03177 3rd Qu.:1.02299   
## Max. : 0.00000 Max. :2.72377   
##   
## descending\_rate\_inter\_quartile\_range climbing\_rate\_median\_absolute\_deviation  
## Min. :0.02717 Min. :0.003262   
## 1st Qu.:0.28462 1st Qu.:0.098891   
## Median :0.65261 Median :0.220520   
## Mean :0.71404 Mean :0.258184   
## 3rd Qu.:0.99695 3rd Qu.:0.353016   
## Max. :2.59981 Max. :1.096097   
##   
## descending\_rate\_median\_absolute\_deviation max\_road\_grade   
## Min. :0.00384 Min. :0.00565   
## 1st Qu.:0.09871 1st Qu.:0.07784   
## Median :0.21916 Median :0.11592   
## Mean :0.25398 Mean :0.12431   
## 3rd Qu.:0.34311 3rd Qu.:0.16703   
## Max. :1.08416 Max. :0.41246   
##   
## min\_road\_grade mean\_road\_grade median\_road\_grade   
## Min. :-0.445294 Min. :-1.629e-02 Min. :-6.018e-03   
## 1st Qu.:-0.161896 1st Qu.:-8.840e-05 1st Qu.: 0.000e+00   
## Median :-0.118295 Median : 4.960e-05 Median : 0.000e+00   
## Mean :-0.124153 Mean : 4.946e-05 Mean :-3.201e-06   
## 3rd Qu.:-0.080988 3rd Qu.: 2.599e-04 3rd Qu.: 0.000e+00   
## Max. :-0.004916 Max. : 7.041e-03 Max. : 5.338e-03   
##   
## std\_of\_road\_grade var\_of\_road\_grade road\_grade\_25th\_percentile  
## Min. :0.001099 Min. :1.210e-06 Min. :-0.0315587   
## 1st Qu.:0.008653 1st Qu.:7.490e-05 1st Qu.:-0.0051834   
## Median :0.015893 Median :2.526e-04 Median :-0.0007437   
## Mean :0.017845 Mean :4.337e-04 Mean :-0.0034413   
## 3rd Qu.:0.025676 3rd Qu.:6.593e-04 3rd Qu.: 0.0000000   
## Max. :0.070768 Max. :5.008e-03 Max. : 0.0000000   
##   
## road\_grade\_75th\_percentile road\_grade\_inter\_quartile\_range  
## Min. :0.0000000 Min. :0.000000   
## 1st Qu.:0.0000000 1st Qu.:0.000000   
## Median :0.0008311 Median :0.001671   
## Mean :0.0034324 Mean :0.006874   
## 3rd Qu.:0.0053256 3rd Qu.:0.010543   
## Max. :0.0303716 Max. :0.058761   
##   
## road\_grade\_median\_absolute\_deviation maximum\_kinetic\_power\_density\_demand  
## Min. :0.0000000 Min. : 6.212   
## 1st Qu.:0.0000000 1st Qu.: 14.467   
## Median :0.0007871 Median : 17.843   
## Mean :0.0034274 Mean : 22.019   
## 3rd Qu.:0.0052163 3rd Qu.: 23.308   
## Max. :0.0303726 Max. :120.511   
##   
## total\_kinetic\_power\_density\_demand average\_kinetic\_power\_density\_demand  
## Min. : 887.3 Min. :0.8871   
## 1st Qu.: 7457.6 1st Qu.:2.3589   
## Median :12195.1 Median :2.9120   
## Mean :14426.3 Mean :2.9529   
## 3rd Qu.:17688.5 3rd Qu.:3.4499   
## Max. :82521.1 Max. :6.1789   
##   
## variance\_kinetic\_power\_density\_demand  
## Min. : 1.036   
## 1st Qu.: 5.669   
## Median : 7.780   
## Mean : 8.670   
## 3rd Qu.:10.629   
## Max. :43.805   
##   
## standard\_deivation\_kinetic\_power\_density\_demand  
## Min. :1.018   
## 1st Qu.:2.381   
## Median :2.789   
## Mean :2.860   
## 3rd Qu.:3.260   
## Max. :6.619   
##   
## maximum\_kinetic\_power\_density\_regen total\_kinetic\_power\_density\_regen  
## Min. :-123.218 Min. :-82520.7   
## 1st Qu.: -36.802 1st Qu.:-17654.4   
## Median : -29.642 Median :-12167.3   
## Mean : -32.234 Mean :-14406.0   
## 3rd Qu.: -24.281 3rd Qu.: -7453.3   
## Max. : -7.662 Max. : -887.3   
##   
## average\_kinetic\_power\_density\_regen variance\_kinetic\_power\_density\_regen  
## Min. :-6.9179 Min. : 1.034   
## 1st Qu.:-3.8634 1st Qu.:10.494   
## Median :-3.2082 Median :14.614   
## Mean :-3.2902 Mean :16.364   
## 3rd Qu.:-2.6225 3rd Qu.:20.188   
## Max. :-0.8336 Max. :74.459   
##   
## standard\_deivation\_kinetic\_power\_density\_regen  
## Min. :1.017   
## 1st Qu.:3.239   
## Median :3.823   
## Mean :3.924   
## 3rd Qu.:4.493   
## Max. :8.629   
##   
## maximum\_potential\_power\_density\_demand total\_potential\_power\_density\_demand  
## Min. : 0.3782 Min. : 59.5   
## 1st Qu.: 14.7850 1st Qu.: 2991.8   
## Median : 21.9586 Median : 5995.4   
## Mean : 26.6672 Mean : 9202.8   
## 3rd Qu.: 33.3237 3rd Qu.:11652.5   
## Max. :294.0453 Max. :81317.7   
##   
## average\_potential\_power\_density\_demand variance\_potential\_power\_density\_demand  
## Min. :0.08614 Min. : 0.00832   
## 1st Qu.:0.84997 1st Qu.: 2.32183   
## Median :1.88134 Median : 6.45546   
## Mean :1.92413 Mean : 8.81958   
## 3rd Qu.:2.71637 3rd Qu.:13.89880   
## Max. :5.99556 Max. :82.11292   
##   
## standard\_deivation\_potential\_power\_density\_demand  
## Min. :0.09122   
## 1st Qu.:1.52376   
## Median :2.54076   
## Mean :2.63833   
## 3rd Qu.:3.72811   
## Max. :9.06162   
##   
## maximum\_potential\_power\_density\_regen total\_potential\_power\_density\_regen  
## Min. :-310.8519 Min. :-81309.18   
## 1st Qu.: -35.0845 1st Qu.:-11636.24   
## Median : -23.5325 Median : -6006.44   
## Mean : -28.1124 Mean : -9208.37   
## 3rd Qu.: -15.5025 3rd Qu.: -2986.21   
## Max. : -0.4181 Max. : -64.45   
##   
## average\_potential\_power\_density\_regen variance\_potential\_power\_density\_regen  
## Min. :-6.18612 Min. : 0.00929   
## 1st Qu.:-2.74787 1st Qu.: 2.40064   
## Median :-1.86465 Median : 6.91006   
## Mean :-1.93939 Mean : 9.63901   
## 3rd Qu.:-0.86384 3rd Qu.:14.89072   
## Max. :-0.08689 Max. :99.92143   
##   
## standard\_deivation\_potential\_power\_density\_regen  
## Min. :0.09639   
## 1st Qu.:1.54940   
## Median :2.62870   
## Mean :2.74505   
## 3rd Qu.:3.85885   
## Max. :9.99607   
##   
## maximum\_aerodynamic\_power\_density\_demand  
## Min. : 271.1   
## 1st Qu.: 5530.2   
## Median : 7758.1   
## Mean : 7465.6   
## 3rd Qu.: 9677.9   
## Max. :17492.7   
##   
## total\_aerodynamic\_power\_density\_demand  
## Min. : 113646   
## 1st Qu.: 4395870   
## Median : 9405276   
## Mean : 14923732   
## 3rd Qu.: 18163896   
## Max. :216164367   
##   
## average\_aerodynamic\_power\_density\_demand  
## Min. : 46.2   
## 1st Qu.: 644.7   
## Median :1127.0   
## Mean :1580.7   
## 3rd Qu.:2302.9   
## Max. :7040.4   
##   
## variance\_aerodynamic\_power\_density\_demand  
## Min. : 3104   
## 1st Qu.: 836022   
## Median : 3191185   
## Mean : 4277803   
## 3rd Qu.: 6617246   
## Max. :27738293   
##   
## standard\_deivation\_aerodynamic\_power\_density\_demand  
## Min. : 55.71   
## 1st Qu.: 914.34   
## Median :1786.39   
## Mean :1818.91   
## 3rd Qu.:2572.40   
## Max. :5266.72   
##   
## maximum\_aerodynamic\_power\_density\_regen total\_aerodynamic\_power\_density\_regen  
## Min. :0.0000000 Min. :0   
## 1st Qu.:0.0000000 1st Qu.:0   
## Median :0.0000000 Median :0   
## Mean :0.0005648 Mean :0   
## 3rd Qu.:0.0000000 3rd Qu.:0   
## Max. :0.5010640 Max. :0   
##   
## average\_aerodynamic\_power\_density\_regen  
## Min. :0   
## 1st Qu.:0   
## Median :0   
## Mean :0   
## 3rd Qu.:0   
## Max. :0   
##   
## variance\_aerodynamic\_power\_density\_regen  
## Min. :0   
## 1st Qu.:0   
## Median :0   
## Mean :0   
## 3rd Qu.:0   
## Max. :0   
##   
## standard\_deivation\_aerodynamic\_power\_density\_regen  
## Min. :0   
## 1st Qu.:0   
## Median :0   
## Mean :0   
## 3rd Qu.:0   
## Max. :0   
##   
## maximum\_rolling\_power\_density\_demand total\_rolling\_power\_density\_demand  
## Min. : 87.9 Min. : 72363   
## 1st Qu.:240.5 1st Qu.: 563538   
## Median :269.2 Median : 832990   
## Mean :260.5 Mean :1071674   
## 3rd Qu.:289.8 3rd Qu.:1283935   
## Max. :352.7 Max. :8968537   
##   
## average\_rolling\_power\_density\_demand variance\_rolling\_power\_density\_demand  
## Min. : 35.71 Min. : 431   
## 1st Qu.: 86.67 1st Qu.: 3053   
## Median :104.83 Median : 4904   
## Mean :113.52 Mean : 5104   
## 3rd Qu.:137.78 3rd Qu.: 6992   
## Max. :238.48 Max. :12770   
##   
## standard\_deivation\_rolling\_power\_density\_demand  
## Min. : 20.76   
## 1st Qu.: 55.26   
## Median : 70.03   
## Mean : 69.43   
## 3rd Qu.: 83.62   
## Max. :113.01   
##   
## maximum\_rolling\_power\_density\_regen total\_rolling\_power\_density\_regen  
## Min. :0 Min. :0   
## 1st Qu.:0 1st Qu.:0   
## Median :0 Median :0   
## Mean :0 Mean :0   
## 3rd Qu.:0 3rd Qu.:0   
## Max. :0 Max. :0   
##   
## average\_rolling\_power\_density\_regen variance\_rolling\_power\_density\_regen  
## Min. :0 Min. :0   
## 1st Qu.:0 1st Qu.:0   
## Median :0 Median :0   
## Mean :0 Mean :0   
## 3rd Qu.:0 3rd Qu.:0   
## Max. :0 Max. :0   
##   
## standard\_deivation\_rolling\_power\_density\_regen  
## Min. :0   
## 1st Qu.:0   
## Median :0   
## Mean :0   
## 3rd Qu.:0   
## Max. :0   
##   
## maximum\_instantanteous\_potential\_energy\_density  
## Min. : 28.54   
## 1st Qu.: 1273.98   
## Median : 2307.13   
## Mean : 3860.73   
## 3rd Qu.: 3389.26   
## Max. :24089.24   
##   
## average\_instantanteous\_potential\_energy\_density  
## Min. : 12.86   
## 1st Qu.: 601.47   
## Median : 1360.42   
## Mean : 3154.97   
## 3rd Qu.: 2768.91   
## Max. :18430.19   
##   
## cumulative\_instanteous\_potential\_energy\_density  
## Min. : 100777   
## 1st Qu.: 5713419   
## Median : 18625481   
## Mean : 59579025   
## 3rd Qu.: 58998204   
## Max. :728017210   
##   
## maximum\_instantanteous\_kinetic\_energy\_density  
## Min. : 40.57   
## 1st Qu.:300.79   
## Median :377.24   
## Mean :360.71   
## 3rd Qu.:436.95   
## Max. :650.25   
##   
## average\_instantanteous\_kinetic\_energy\_density  
## Min. : 2.315   
## 1st Qu.: 26.818   
## Median : 45.541   
## Mean : 60.914   
## 3rd Qu.: 73.889   
## Max. :306.456   
##   
## cumulative\_instanteous\_kinetic\_energy\_density  
## Min. : 24369   
## 1st Qu.: 389101   
## Median : 662270   
## Mean : 952384   
## 3rd Qu.: 1136859   
## Max. :11249734   
##   
## maximum\_instantanteous\_aerodynamic\_energy\_density  
## Min. : 365.5   
## 1st Qu.: 7377.5   
## Median :10362.0   
## Mean : 9965.4   
## 3rd Qu.:12917.1   
## Max. :23449.8   
##   
## average\_instantanteous\_aerodynamic\_energy\_density  
## Min. : 23.24   
## 1st Qu.: 433.13   
## Median : 798.99   
## Mean :1280.88   
## 3rd Qu.:1551.49   
## Max. :8667.86   
##   
## cumulative\_instanteous\_aerodynamic\_energy\_density  
## Min. : 152657   
## 1st Qu.: 5865091   
## Median : 12545249   
## Mean : 19905331   
## 3rd Qu.: 24225082   
## Max. :288243308   
##   
## maximum\_instantanteous\_rolling\_energy\_density  
## Min. : 88.34   
## 1st Qu.:240.53   
## Median :269.37   
## Mean :260.62   
## 3rd Qu.:289.90   
## Max. :353.65   
##   
## average\_instantanteous\_rolling\_energy\_density  
## Min. : 5.269   
## 1st Qu.: 38.964   
## Median : 58.157   
## Mean : 67.501   
## 3rd Qu.: 86.957   
## Max. :220.540   
##   
## cumulative\_instanteous\_rolling\_energy\_density characteristic\_acceleration  
## Min. : 72370 Min. :0.03373   
## 1st Qu.: 563538 1st Qu.:0.14084   
## Median : 832990 Median :0.17382   
## Mean :1071674 Mean :0.17842   
## 3rd Qu.:1283935 3rd Qu.:0.21269   
## Max. :8968537 Max. :0.40711   
##   
## characteristic\_deceleration aerodynamic\_speed kinetic\_intensity   
## Min. :-0.40750 Min. : 4.946 Min. : 0.08134   
## 1st Qu.:-0.21304 1st Qu.:11.952 1st Qu.: 0.44150   
## Median :-0.17396 Median :14.690 Median : 0.82118   
## Mean :-0.17857 Mean :14.966 Mean : 1.09495   
## 3rd Qu.:-0.14096 3rd Qu.:18.081 3rd Qu.: 1.46186   
## Max. :-0.03373 Max. :24.044 Max. :11.46433   
##   
## ca\_standard cd\_standard as\_standard ki\_standard   
## Min. :0.1107 Min. :-1.3369 Min. :16.23 Min. : 0.1309   
## 1st Qu.:0.4621 1st Qu.:-0.6990 1st Qu.:39.21 1st Qu.: 0.7105   
## Median :0.5703 Median :-0.5707 Median :48.20 Median : 1.3216   
## Mean :0.5854 Mean :-0.5859 Mean :49.10 Mean : 1.7622   
## 3rd Qu.:0.6978 3rd Qu.:-0.4625 3rd Qu.:59.32 3rd Qu.: 2.3526   
## Max. :1.3357 Max. :-0.1107 Max. :78.89 Max. :18.4501   
##   
## group\_ttl\_distance group\_ttl\_mean\_speed group\_ttl\_std\_speed group\_ttl\_ttl   
## Min. : 4.585 Min. : 1.202 Min. : 4.656 Min. : 727   
## 1st Qu.: 35.707 1st Qu.: 8.888 1st Qu.:12.632 1st Qu.: 9972   
## Median : 52.780 Median :13.266 Median :15.733 Median :15046   
## Mean : 67.904 Mean :15.397 Mean :16.417 Mean :18313   
## 3rd Qu.: 81.353 3rd Qu.:19.835 3rd Qu.:20.432 3rd Qu.:24078   
## Max. :568.266 Max. :50.306 Max. :29.221 Max. :83825   
##   
## group\_ttl\_zero\_speed matched\_ttl\_distance matched\_ttl\_mean\_speed  
## Min. : 10 Min. : 0.00 Min. : 1.202   
## 1st Qu.: 2589 1st Qu.: 35.59 1st Qu.: 8.925   
## Median : 6275 Median : 52.51 Median :13.286   
## Mean : 8957 Mean : 67.54 Mean :15.448   
## 3rd Qu.:13383 3rd Qu.: 80.94 3rd Qu.:19.952   
## Max. :76965 Max. :568.27 Max. :50.306   
## NA's :22   
## matched\_ttl\_std\_speed matched\_ttl\_ttl matched\_ttl\_zero\_speed  
## Min. : 4.656 Min. : 0 Min. : 0   
## 1st Qu.:12.633 1st Qu.: 9782 1st Qu.: 2527   
## Median :15.752 Median :14944 Median : 6187   
## Mean :16.415 Mean :18180 Mean : 8879   
## 3rd Qu.:20.423 3rd Qu.:23962 3rd Qu.:13313   
## Max. :29.221 Max. :83825 Max. :76965   
## NA's :22   
## non\_matched\_ttl\_distance non\_matched\_ttl\_mean\_speed non\_matched\_ttl\_std\_speed  
## Min. : 0.0000 Min. : 0.064 Min. : 0.477   
## 1st Qu.: 0.0000 1st Qu.: 2.530 1st Qu.: 3.394   
## Median : 0.0000 Median : 6.114 Median : 5.006   
## Mean : 0.3655 Mean : 7.275 Mean : 6.610   
## 3rd Qu.: 0.0000 3rd Qu.: 9.722 3rd Qu.: 8.694   
## Max. :121.8649 Max. :29.202 Max. :26.258   
## NA's :4354 NA's :4354   
## non\_matched\_ttl\_ttl non\_matched\_ttl\_zero\_speed func\_1\_distance   
## Min. : 0 Min. : 0.00 Min. : 0.000   
## 1st Qu.: 0 1st Qu.: 0.00 1st Qu.: 0.000   
## Median : 0 Median : 0.00 Median : 0.000   
## Mean : 133 Mean : 78.47 Mean : 1.828   
## 3rd Qu.: 0 3rd Qu.: 0.00 3rd Qu.: 1.687   
## Max. :40959 Max. :27808.00 Max. :37.927   
##   
## func\_1\_mean\_speed func\_1\_std\_speed func\_1\_ttl func\_1\_zero\_speed   
## Min. : 2.286 Min. : 0.0206 Min. : 0.0 Min. : 0.000   
## 1st Qu.:52.528 1st Qu.: 2.3702 1st Qu.: 0.0 1st Qu.: 0.000   
## Median :57.198 Median : 3.7699 Median : 0.0 Median : 0.000   
## Mean :55.762 Mean : 5.2951 Mean : 118.5 Mean : 3.101   
## 3rd Qu.:60.806 3rd Qu.: 6.4218 3rd Qu.: 108.0 3rd Qu.: 0.000   
## Max. :72.520 Max. :28.0697 Max. :5117.0 Max. :3385.000   
## NA's :2847 NA's :2847   
## func\_2\_distance func\_2\_mean\_speed func\_2\_std\_speed func\_2\_ttl   
## Min. : 0.000 Min. : 1.513 Min. : 0.0034 Min. : 0   
## 1st Qu.: 0.000 1st Qu.:45.715 1st Qu.: 5.1690 1st Qu.: 0   
## Median : 2.538 Median :52.523 Median : 9.0449 Median : 185   
## Mean : 14.534 Mean :50.376 Mean :10.5456 Mean : 1039   
## 3rd Qu.: 17.597 3rd Qu.:57.949 3rd Qu.:15.0331 3rd Qu.: 1175   
## Max. :286.648 Max. :67.493 Max. :30.7500 Max. :23325   
## NA's :1685 NA's :1685   
## func\_2\_zero\_speed func\_3\_distance func\_3\_mean\_speed func\_3\_std\_speed   
## Min. : 0.00 Min. : 0.000 Min. : 0.2531 Min. : 0.0855   
## 1st Qu.: 0.00 1st Qu.: 1.141 1st Qu.:17.8116 1st Qu.:10.7761   
## Median : 0.00 Median : 4.743 Median :32.4819 Median :15.7316   
## Mean : 57.05 Mean : 11.143 Mean :31.5258 Mean :15.1768   
## 3rd Qu.: 0.00 3rd Qu.: 14.694 3rd Qu.:44.9063 3rd Qu.:19.9007   
## Max. :18555.00 Max. :220.509 Max. :67.9519 Max. :30.3286   
## NA's :473 NA's :473   
## func\_3\_ttl func\_3\_zero\_speed func\_4\_distance func\_4\_mean\_speed  
## Min. : 0 Min. : 0.0 Min. : 0.000 Min. : 0.00   
## 1st Qu.: 177 1st Qu.: 0.0 1st Qu.: 3.950 1st Qu.: 9.58   
## Median : 783 Median : 57.0 Median : 8.465 Median :15.74   
## Mean : 1390 Mean : 427.8 Mean : 12.336 Mean :16.44   
## 3rd Qu.: 1820 3rd Qu.: 319.0 3rd Qu.: 16.675 3rd Qu.:22.36   
## Max. :29780 Max. :29503.0 Max. :108.801 Max. :54.07   
## NA's :58   
## func\_4\_std\_speed func\_4\_ttl func\_4\_zero\_speed func\_5\_distance   
## Min. : 0.00 Min. : 0 Min. : 0 Min. : 0.000   
## 1st Qu.:12.32 1st Qu.: 1084 1st Qu.: 206 1st Qu.: 8.012   
## Median :14.90 Median : 2378 Median : 827 Median : 13.258   
## Mean :14.64 Mean : 3299 Mean : 1580 Mean : 16.514   
## 3rd Qu.:17.15 3rd Qu.: 4600 3rd Qu.: 1918 3rd Qu.: 20.122   
## Max. :25.36 Max. :30600 Max. :28255 Max. :128.385   
## NA's :58   
## func\_5\_mean\_speed func\_5\_std\_speed func\_5\_ttl func\_5\_zero\_speed  
## Min. : 0.2728 Min. : 1.209 Min. : 0 Min. : 0   
## 1st Qu.: 6.4317 1st Qu.:10.370 1st Qu.: 2597 1st Qu.: 686   
## Median :10.7679 Median :12.562 Median : 4739 Median : 1910   
## Mean :11.7982 Mean :12.444 Mean : 6648 Mean : 3628   
## 3rd Qu.:16.0377 3rd Qu.:14.579 3rd Qu.: 8665 3rd Qu.: 5105   
## Max. :44.0301 Max. :24.779 Max. :71206 Max. :68140   
## NA's :37 NA's :37   
## spd\_cat\_1\_distance spd\_cat\_1\_mean\_speed spd\_cat\_1\_std\_speed spd\_cat\_1\_ttl   
## Min. : 0.000 Min. : 7.146 Min. : 0.2008 Min. : 0.0   
## 1st Qu.: 0.000 1st Qu.:49.396 1st Qu.: 3.6235 1st Qu.: 0.0   
## Median : 0.000 Median :55.459 Median : 5.7940 Median : 0.0   
## Mean : 9.484 Mean :53.353 Mean : 8.7211 Mean : 627.2   
## 3rd Qu.: 8.954 3rd Qu.:59.755 3rd Qu.:13.1689 3rd Qu.: 624.0   
## Max. :179.149 Max. :68.941 Max. :30.7134 Max. :17694.0   
## NA's :2755 NA's :2755   
## spd\_cat\_1\_zero\_speed spd\_cat\_2\_distance spd\_cat\_2\_mean\_speed  
## Min. : 0.00 Min. : 0.0 Min. : 1.398   
## 1st Qu.: 0.00 1st Qu.: 0.0 1st Qu.:42.524   
## Median : 0.00 Median : 0.0 Median :50.371   
## Mean : 21.79 Mean : 13.0 Mean :46.937   
## 3rd Qu.: 0.00 3rd Qu.: 12.2 3rd Qu.:55.161   
## Max. :13124.00 Max. :388.1 Max. :66.419   
## NA's :2530   
## spd\_cat\_2\_std\_speed spd\_cat\_2\_ttl spd\_cat\_2\_zero\_speed spd\_cat\_3\_distance  
## Min. : 0.0233 Min. : 0 Min. : 0.00 Min. : 0.000   
## 1st Qu.: 5.6299 1st Qu.: 0 1st Qu.: 0.00 1st Qu.: 1.489   
## Median :10.2697 Median : 0 Median : 0.00 Median : 5.889   
## Mean :11.1919 Mean : 1027 Mean : 78.41 Mean : 10.226   
## 3rd Qu.:16.4323 3rd Qu.: 984 3rd Qu.: 0.00 3rd Qu.: 12.792   
## Max. :28.4533 Max. :29037 Max. :17227.00 Max. :202.180   
## NA's :2530   
## spd\_cat\_3\_mean\_speed spd\_cat\_3\_std\_speed spd\_cat\_3\_ttl spd\_cat\_3\_zero\_speed  
## Min. : 0.3731 Min. : 0.0434 Min. : 0 Min. : 0   
## 1st Qu.:10.7209 1st Qu.:11.6161 1st Qu.: 273 1st Qu.: 13   
## Median :20.4124 Median :14.7927 Median : 1193 Median : 199   
## Mean :21.6937 Mean :14.5860 Mean : 2347 Mean : 1047   
## 3rd Qu.:30.3799 3rd Qu.:17.8253 3rd Qu.: 2893 3rd Qu.: 977   
## Max. :63.8984 Max. :26.9537 Max. :39868 Max. :29510   
## NA's :594 NA's :594   
## spd\_cat\_4\_distance spd\_cat\_4\_mean\_speed spd\_cat\_4\_std\_speed spd\_cat\_4\_ttl   
## Min. : 0.000 Min. : 0.3386 Min. : 0.3913 Min. : 0   
## 1st Qu.: 8.113 1st Qu.: 8.7555 1st Qu.:11.6584 1st Qu.: 2385   
## Median : 14.595 Median :13.7066 Median :13.9164 Median : 4281   
## Mean : 20.038 Mean :14.2347 Mean :13.8385 Mean : 5941   
## 3rd Qu.: 24.543 3rd Qu.:19.2694 3rd Qu.:16.0727 3rd Qu.: 7436   
## Max. :155.241 Max. :51.9433 Max. :26.2744 Max. :63762   
## NA's :50 NA's :50   
## spd\_cat\_4\_zero\_speed spd\_cat\_5\_distance spd\_cat\_5\_mean\_speed  
## Min. : 0 Min. : 0.000 Min. : 0.1672   
## 1st Qu.: 630 1st Qu.: 4.334 1st Qu.: 4.0621   
## Median : 1540 Median : 9.871 Median : 7.1840   
## Mean : 2852 Mean : 14.790 Mean : 8.7489   
## 3rd Qu.: 3445 3rd Qu.: 19.641 3rd Qu.:11.5359   
## Max. :61256 Max. :180.211 Max. :66.6429   
## NA's :58   
## spd\_cat\_5\_std\_speed spd\_cat\_5\_ttl spd\_cat\_5\_zero\_speed spd\_cat\_6\_distance  
## Min. : 0.2177 Min. : 0 Min. : 0 Min. :0   
## 1st Qu.: 7.6748 1st Qu.: 2517 1st Qu.: 748 1st Qu.:0   
## Median : 9.7668 Median : 5909 Median : 2942 Median :0   
## Mean : 9.8763 Mean : 8238 Mean : 4880 Mean :0   
## 3rd Qu.:11.6602 3rd Qu.:11334 3rd Qu.: 6953 3rd Qu.:0   
## Max. :25.5395 Max. :72975 Max. :66435 Max. :0   
## NA's :58   
## spd\_cat\_6\_mean\_speed spd\_cat\_6\_std\_speed spd\_cat\_6\_ttl spd\_cat\_6\_zero\_speed  
## Min. : NA Min. : NA Min. :0 Min. :0   
## 1st Qu.: NA 1st Qu.: NA 1st Qu.:0 1st Qu.:0   
## Median : NA Median : NA Median :0 Median :0   
## Mean :NaN Mean :NaN Mean :0 Mean :0   
## 3rd Qu.: NA 3rd Qu.: NA 3rd Qu.:0 3rd Qu.:0   
## Max. : NA Max. : NA Max. :0 Max. :0   
## NA's :4705 NA's :4705   
## spd\_cat\_7\_distance spd\_cat\_7\_mean\_speed spd\_cat\_7\_std\_speed spd\_cat\_7\_ttl  
## Min. :0 Min. : NA Min. : NA Min. :0   
## 1st Qu.:0 1st Qu.: NA 1st Qu.: NA 1st Qu.:0   
## Median :0 Median : NA Median : NA Median :0   
## Mean :0 Mean :NaN Mean :NaN Mean :0   
## 3rd Qu.:0 3rd Qu.: NA 3rd Qu.: NA 3rd Qu.:0   
## Max. :0 Max. : NA Max. : NA Max. :0   
## NA's :4705 NA's :4705   
## spd\_cat\_7\_zero\_speed spd\_cat\_8\_distance spd\_cat\_8\_mean\_speed  
## Min. :0 Min. :0 Min. : NA   
## 1st Qu.:0 1st Qu.:0 1st Qu.: NA   
## Median :0 Median :0 Median : NA   
## Mean :0 Mean :0 Mean :NaN   
## 3rd Qu.:0 3rd Qu.:0 3rd Qu.: NA   
## Max. :0 Max. :0 Max. : NA   
## NA's :4705   
## spd\_cat\_8\_std\_speed spd\_cat\_8\_ttl spd\_cat\_8\_zero\_speed  
## Min. : NA Min. :0 Min. :0   
## 1st Qu.: NA 1st Qu.:0 1st Qu.:0   
## Median : NA Median :0 Median :0   
## Mean :NaN Mean :0 Mean :0   
## 3rd Qu.: NA 3rd Qu.:0 3rd Qu.:0   
## Max. : NA Max. :0 Max. :0   
## NA's :4705

## [1] "\n"

**Hypothesis to be tested**:

1. Conventional drivetrains and diesel fuel will be employed for long haul delivery.
2. local delivery vehicles will be more electriifed as compared to other vocations

*The drive trains considered are*  The vocations are \* The fuel types are