

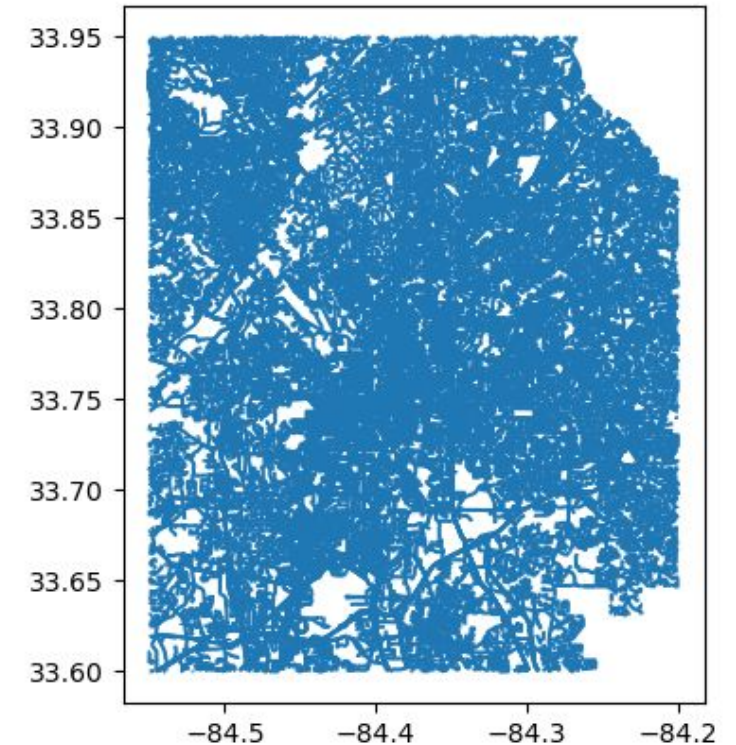
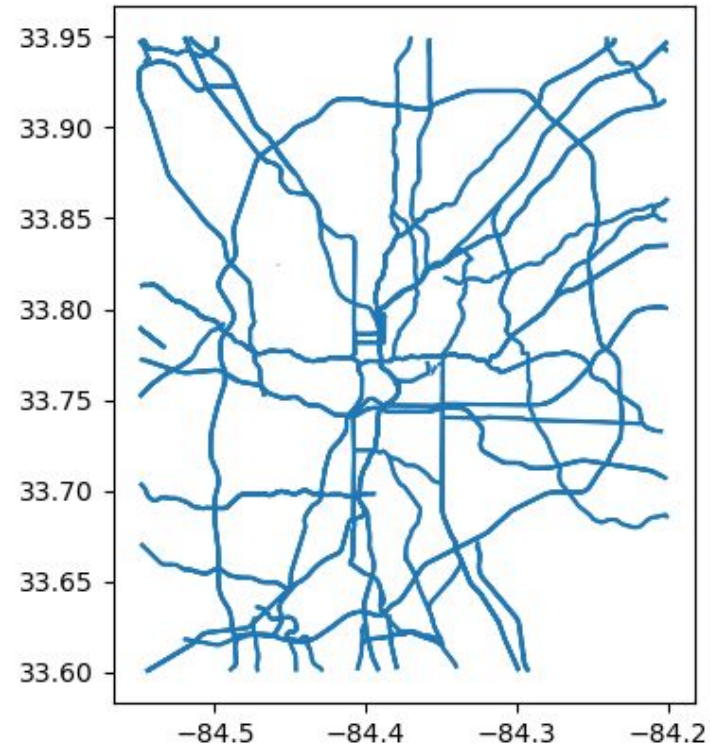
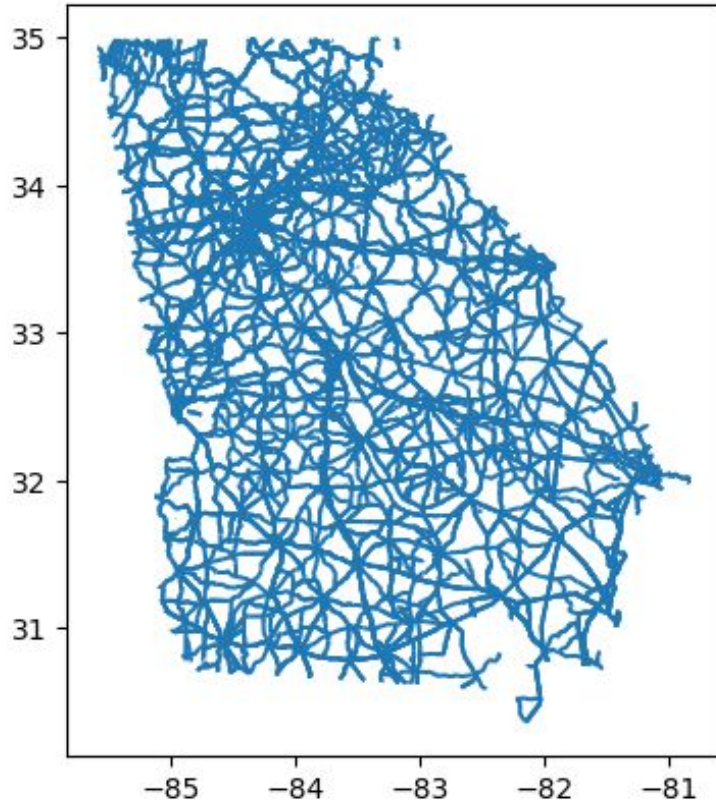
Longest Straightest Road

In Atlanta



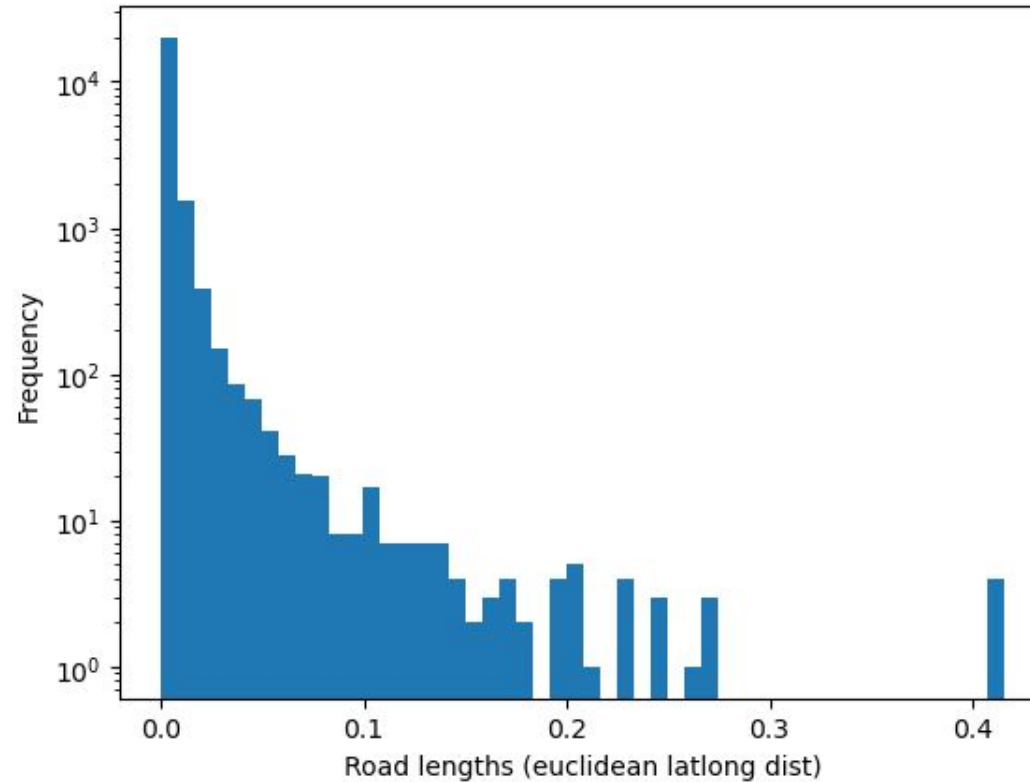
Dataset

- All roads in Georgia from [TIGER 2022](#)
 - TIGER is the Census's road data.
- I am only considering roads which fit inside the bounds of the two figures on the right

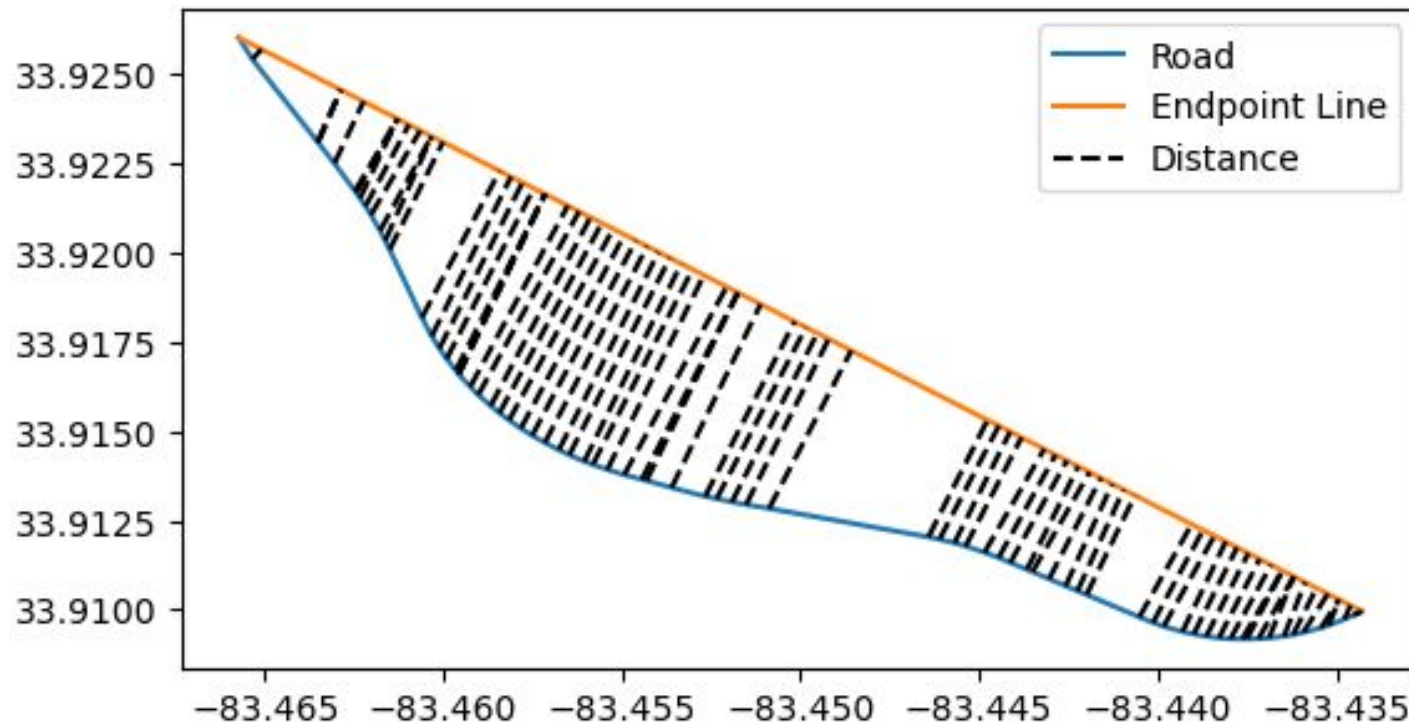


Calculating length of road

- This is pretty straightforward.

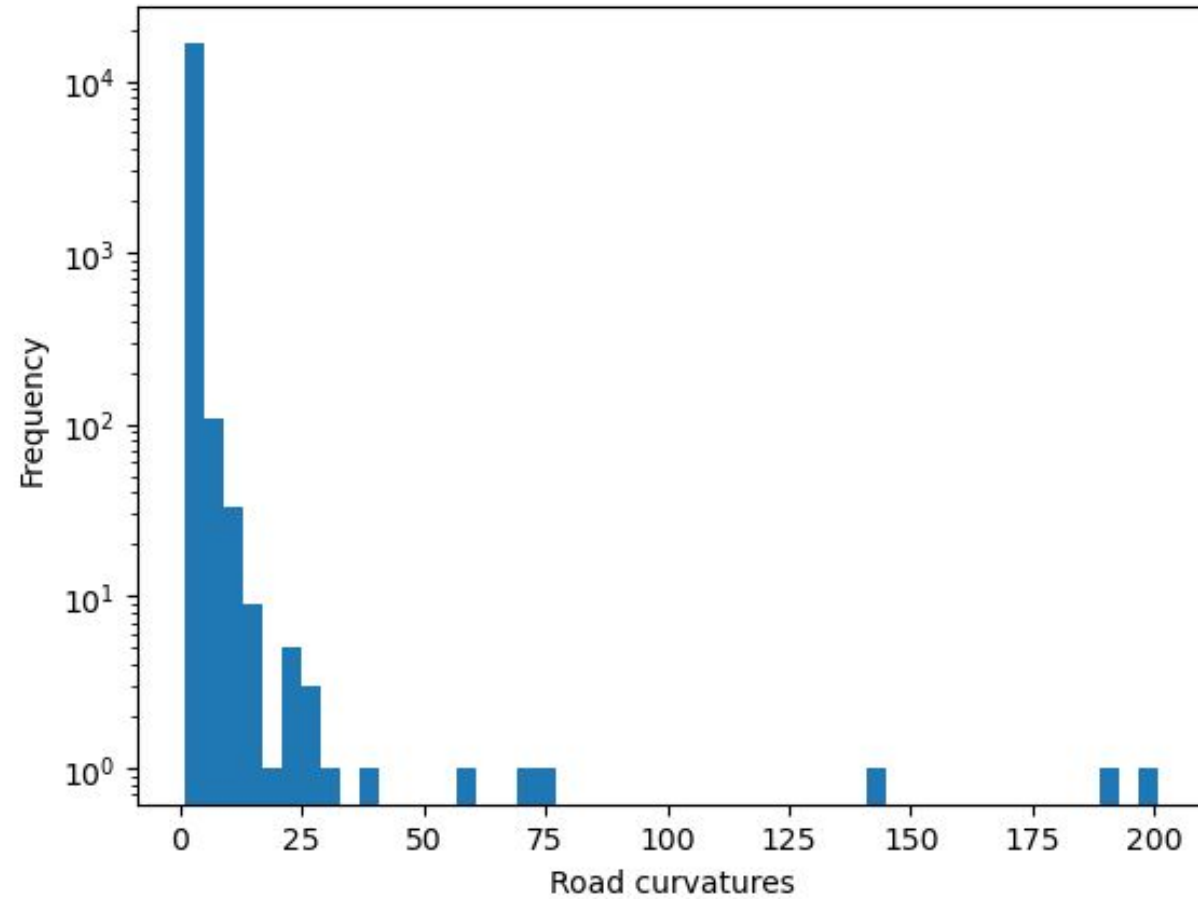


Calculating Curvature of Road

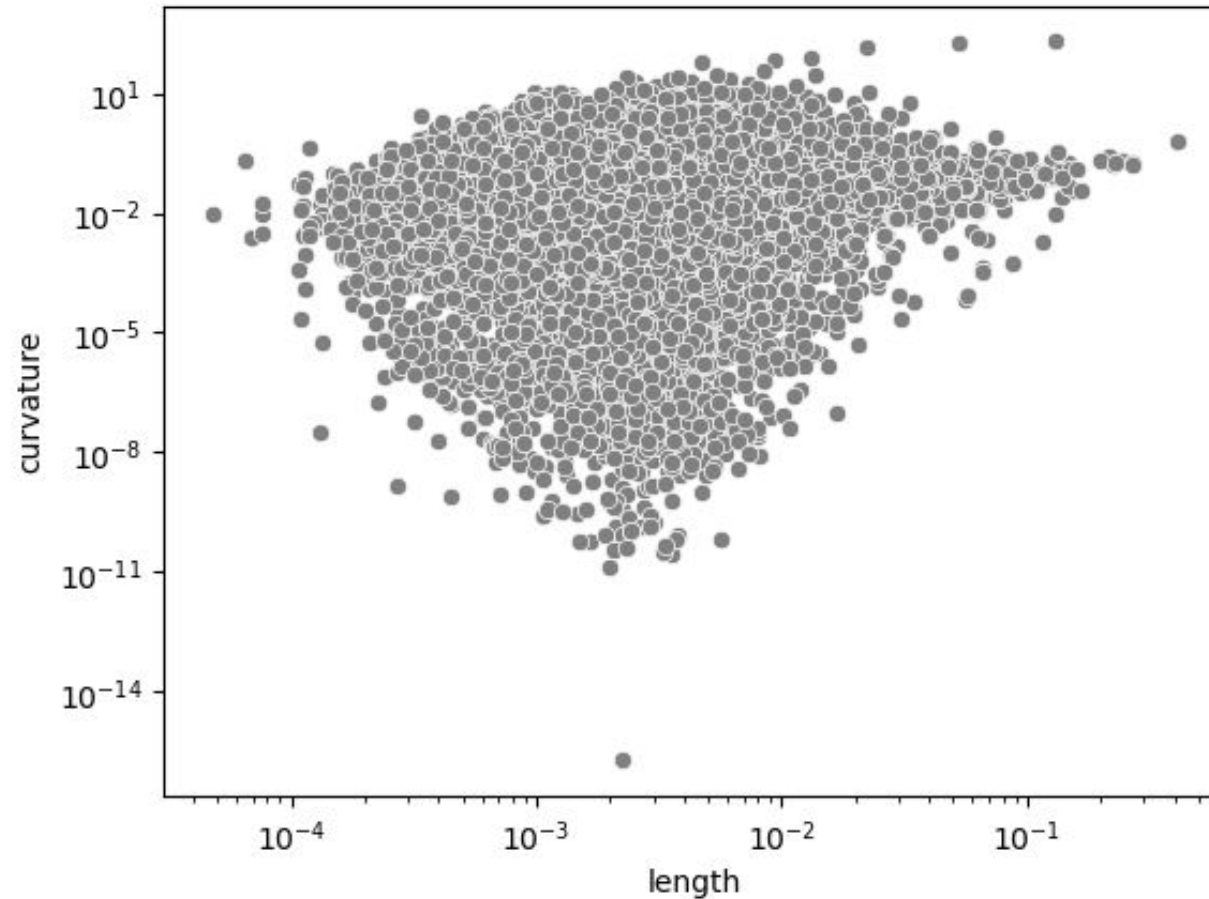


- Call curvature σ
- $\sigma = \frac{l_{road} - l_{EndpointLine}}{l_{EndpointLine}}$

Road curvature distribution



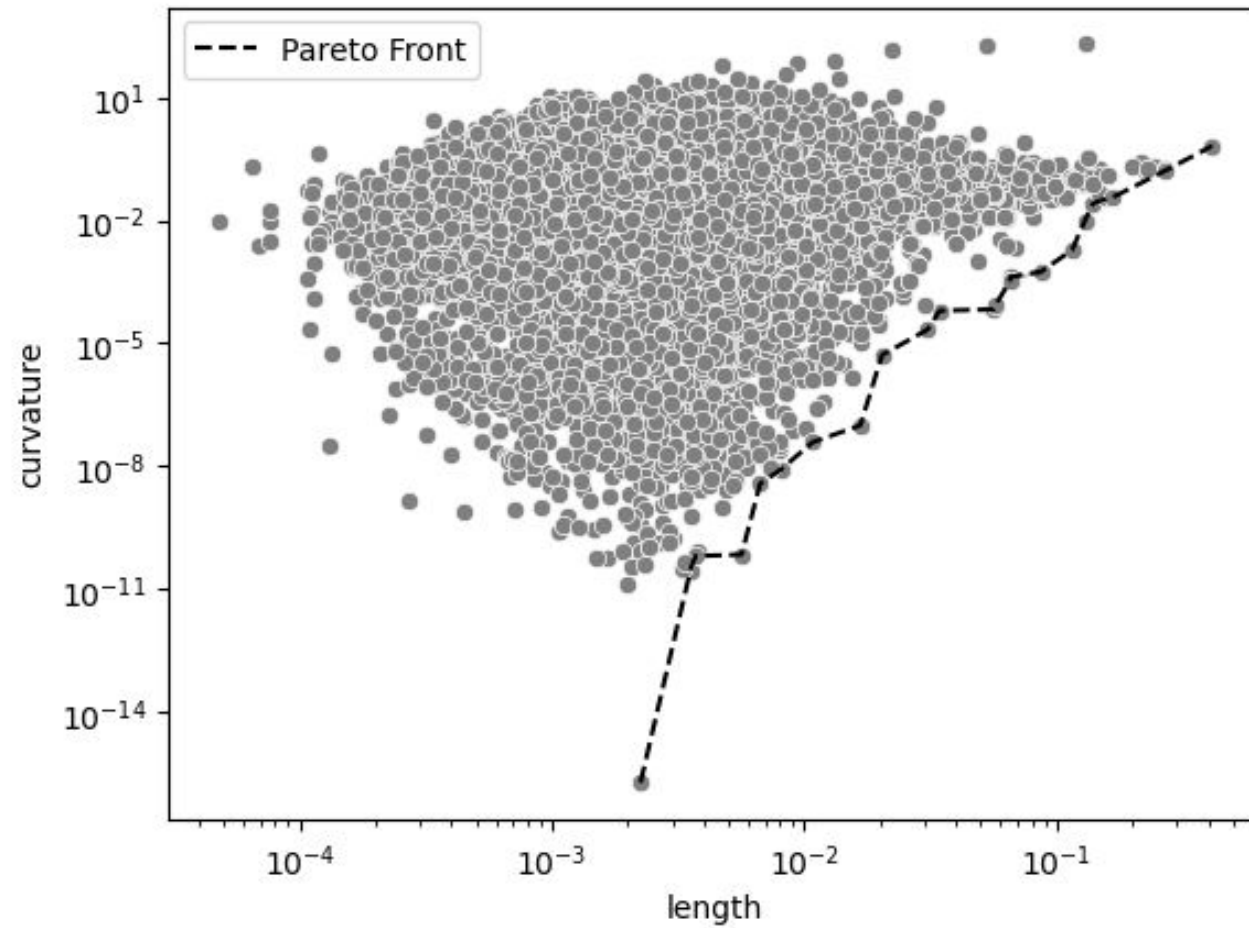
Now we're getting somewhere



Pareto

- We want the straightest, longest road. We must make a tradeoff between length and curvature.
- Any road which is both shorter and curvier than another road cannot be our straightest, longest road.
- The grouping of roads which are not both shorter and curvier than another road are our [Pareto Front](#)

Pareto Front

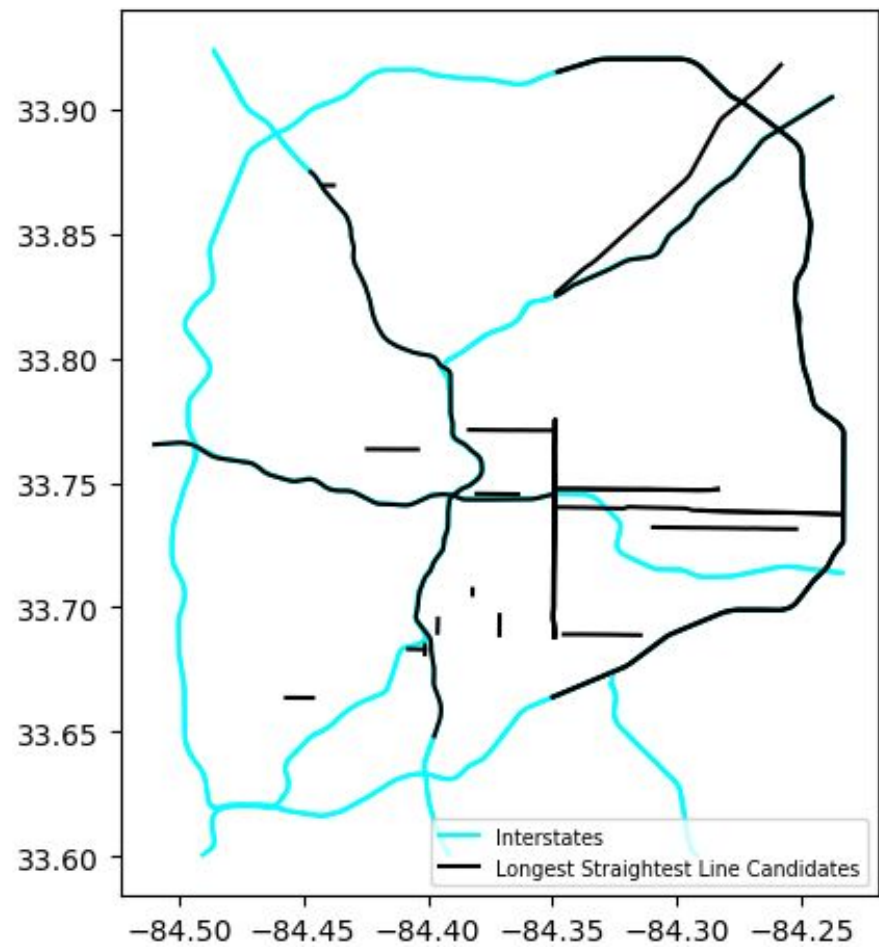


Pareto Front

- Here are the Pareto Front roads in table form. Looks reasonable
- Some roads have been split or duplicated
 - Why are there two entries for State Route 407?
 - Do we need a better dataset?

FULLNAME	RTTYP	length	curvature
Hopkins St SE	M	0.002	2E-16
Musket Rdg NW	M	0.004	3E-11
Beeler Dr SW	M	0.004	7E-11
Polar Rock Ave SW	M	0.006	7E-11
Connell Ave SW	M	0.007	4E-09
Burroughs Ave SE	M	0.008	8E-09
Walker Ave	M	0.011	4E-08
Woodward Ave SE	M	0.017	1E-07
Joseph E Boone St	M	0.020	5E-06
Constitution Rd SE	M	0.031	2E-05
North Ave NE	M	0.034	6E-05
Glenwood Rd	M	0.056	7E-05
McAfee Rd	M	0.057	9E-05
Aus Hwy 23	M	0.065	3E-04
Moreland Ave SE	M	0.065	3E-04
Moreland Ave SE	M	0.065	3E-04
Aus Hwy 23	M	0.065	3E-04
Memorial Dr SE	M	0.066	4E-04
State Rte 154	S	0.066	4E-04
US Hwy 23	U	0.087	6E-04
State Rte 42	S	0.087	6E-04
State Rte 42	S	0.087	6E-04
US Hwy 23	U	0.087	6E-04
State Rte 260	S	0.115	2E-03
State Rte 13	S	0.130	1E-02
State Rte 403	S	0.140	3E-02
State Rte 402	S	0.168	4E-02
State Rte 401	S	0.269	2E-01
State Rte 407	S	0.414	7E-01
State Rte 407	S	0.415	7E-01

Longest Straightest Line Candidates



FULLNAME	RTTYP	length	curvature
Hopkins St SE	M	0.002	2E-16
Musket Rdg NW	M	0.004	3E-11
Beeler Dr SW	M	0.004	7E-11
Polar Rock Ave SW	M	0.006	7E-11
Connell Ave SW	M	0.007	4E-09
Burroughs Ave SE	M	0.008	8E-09
Walker Ave	M	0.011	4E-08
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State Rte 154	S	0.066	4E-04
US Hwy 23	U	0.087	6E-04
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State Rte 403	S	0.140	3E-02
State Rte 402	S	0.168	4E-02
State Rte 401	S	0.269	2E-01
State Rte 407	S	0.414	7E-01
State Rte 407	S	0.415	7E-01

Todo

- Clean this dataset?
 - Remove duplicates
 - Somehow re-join split up roads
 - Common endpoints + names -> combine?
- Find better dataset?
 - Look at openstreetmap