

The upzoning TRAP

Exclusionary zoning and traffic-related pollutant exposure in the greater Seattle area

Mackey Guenther

Intro:

- Seattle area cities use "zoning": maps of what you can build, where!
- Changes to land use are political, and reflect competing interests (Gabbe, 2017)
- Seattle needs more homes to lower prices: where should they go?

■ white = single detached dwellings
■ red = attached dwellings

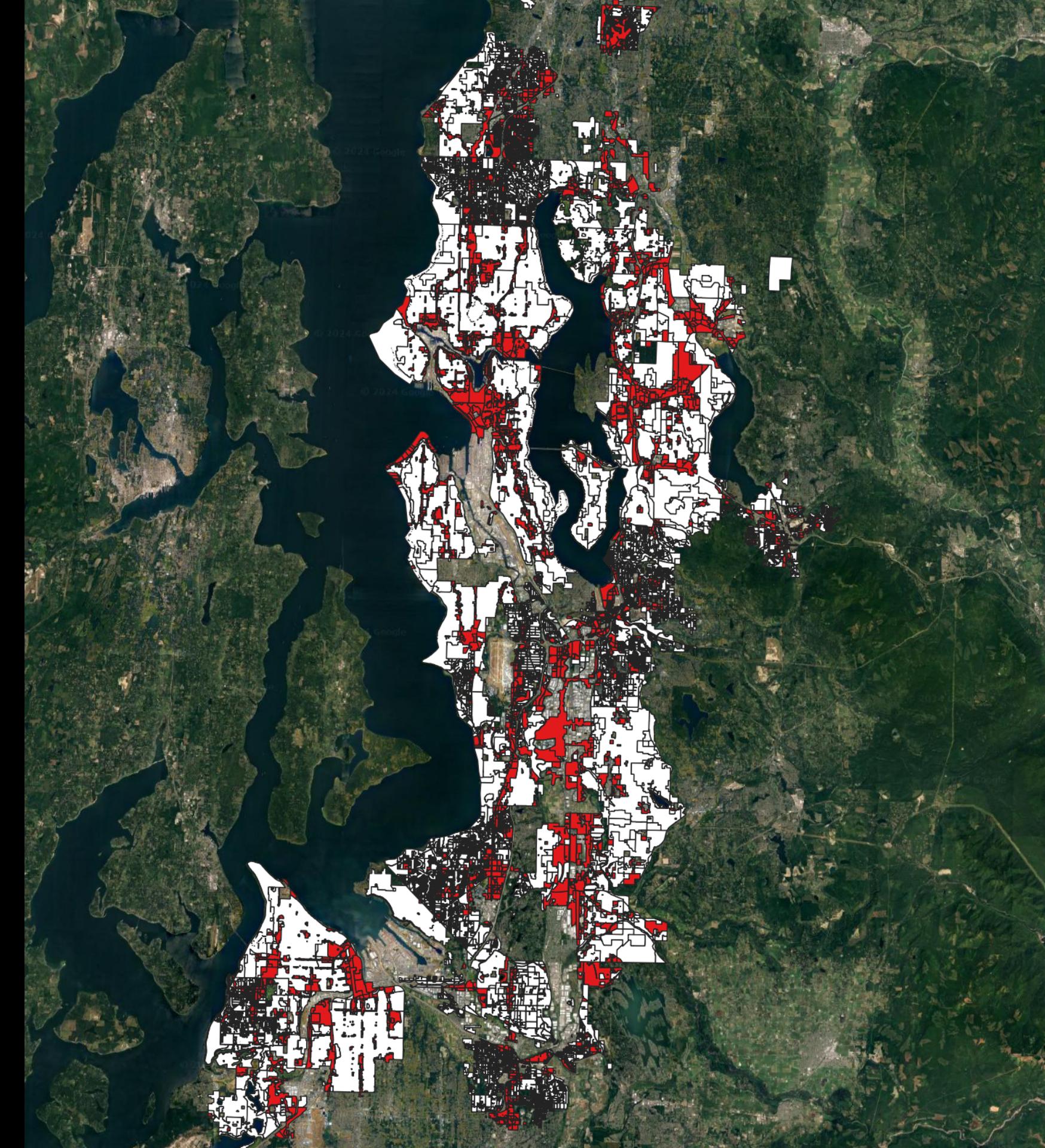
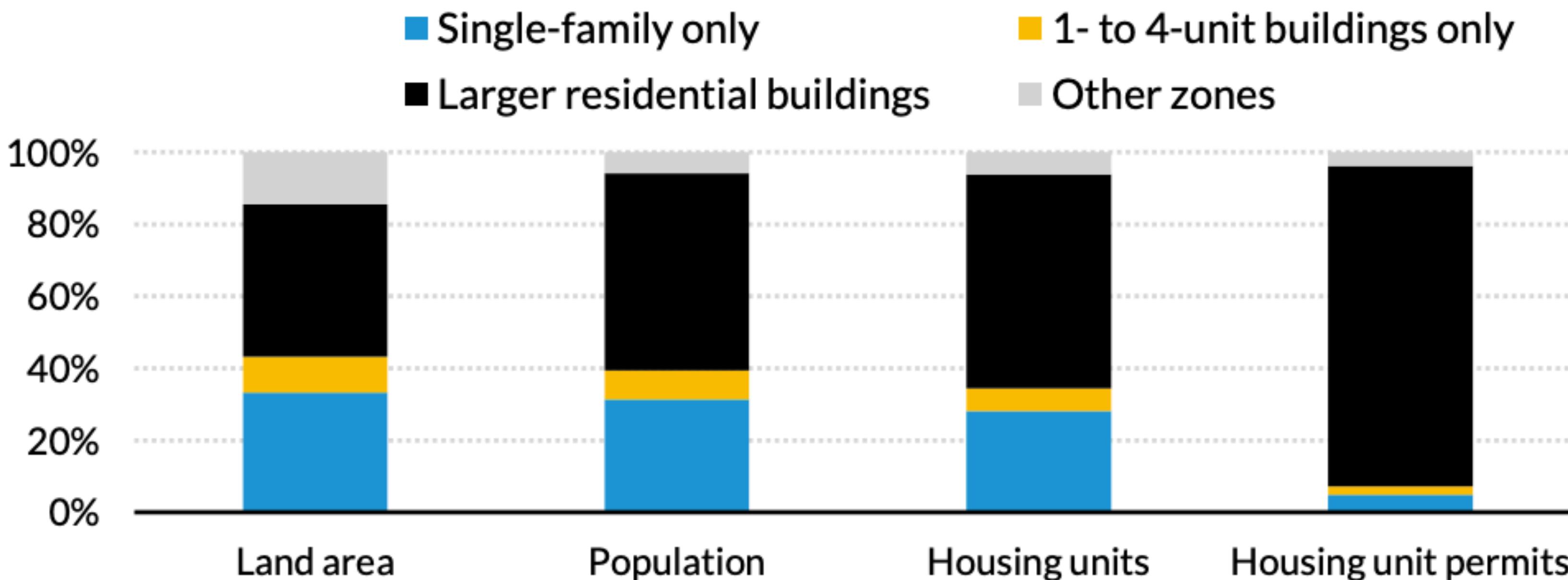


FIGURE 1

Permitting Occurs Disproportionately in Multi-Family Zones

Share of transit-adjacent areas, by type of buildings allowed by zoning district



WOULD YOU LIKE THIS CONDITION
NEXT YOUR HOME?

EIGHT COTTAGES ON ONE 60FT. LOT



ZONING WOULD PREVENT IT

CITY OF SEATTLE ZONING COMMISSION

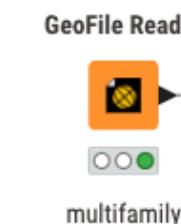
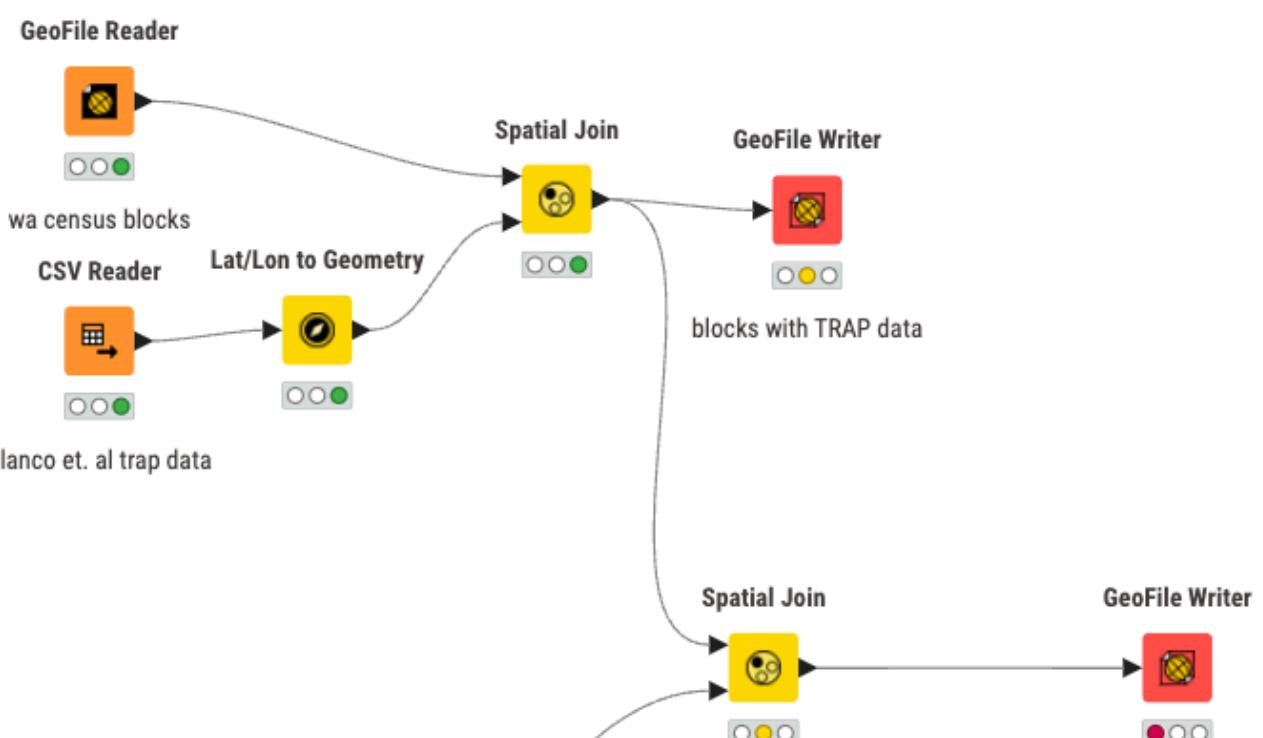
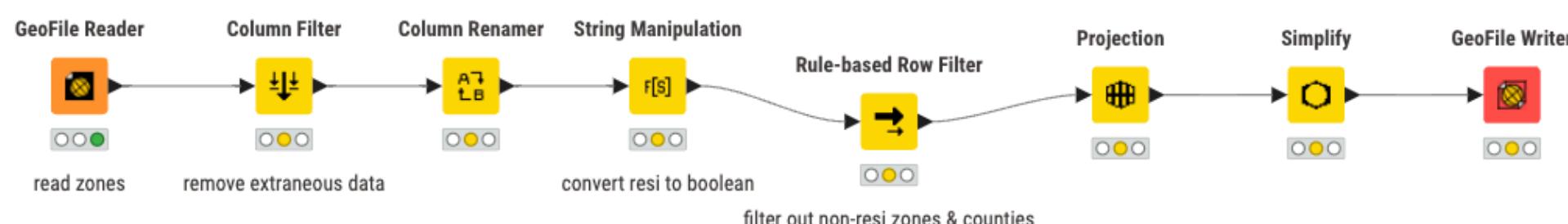
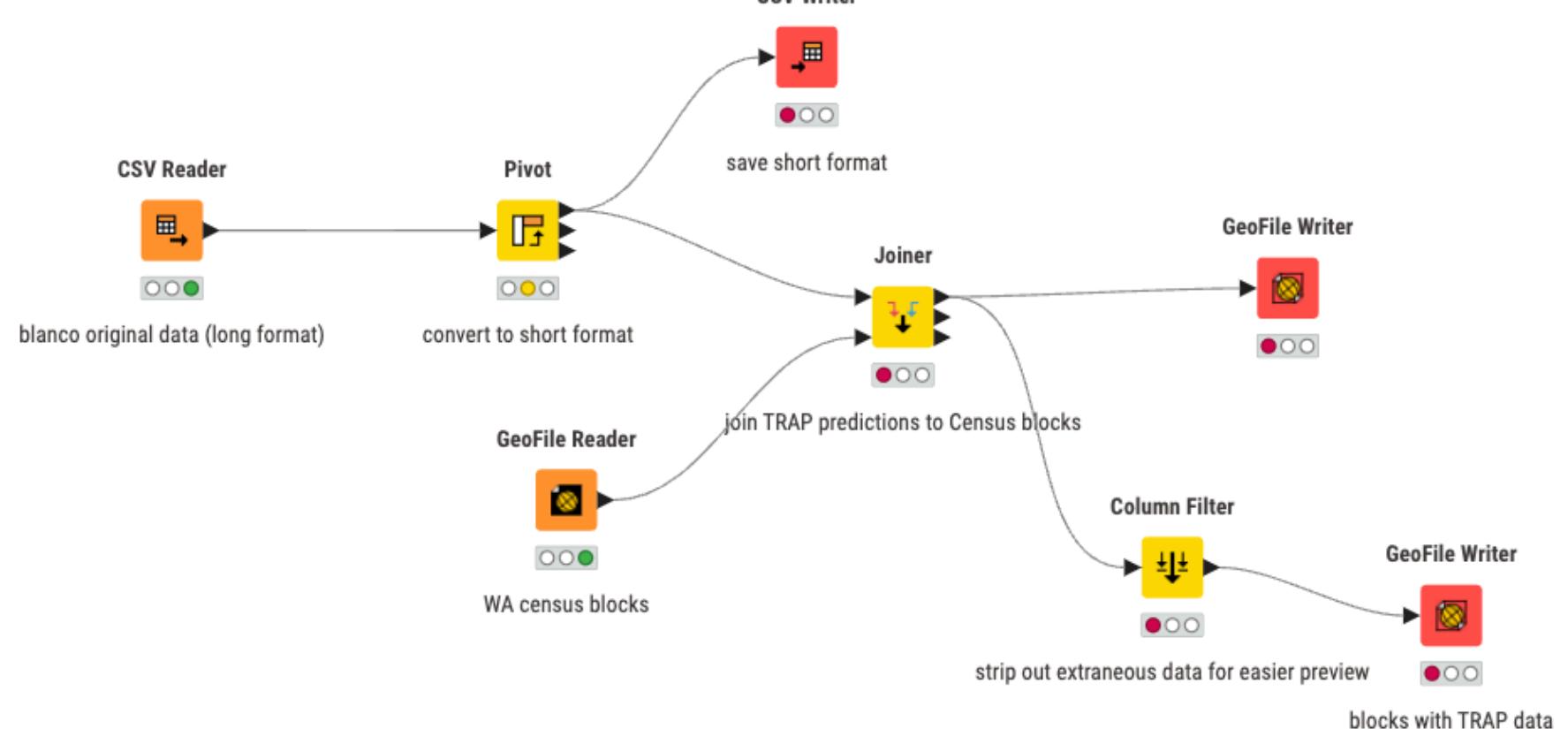
Research question:

How does traffic-related air pollutant (TRAP)¹ exposure vary between exclusionary (single-family) zones, and other residential zones, across Seattle area cities?

¹ traffic-related air pollutants: black carbon (BC), ultra-fine particles (UFP), nitrogen dioxide (NO₂)

Methods:

1. Send *short* emails
2. Clean and compile *zoning maps* (Freemark et al., 2023) and *TRAP measurements* (Blanco et al., 2022)
3. Visualize & process data in a computational notebook (Observable)



Results:

- Working on it 😅
- Learning how to deal with large, geospatial data
- Planning to compile findings (summary statistics for each city) in web-based, interactive dashboard

Discussion:

- Geospatial data is... very unique to work with
 - You have to find a balance between *visualizing* features and *summarizing* them
- Mental models aren't enough
 - Write stuff down: **a "lab notebook" is great for non-lab work too!!!**

References:

- Blanco, M. N., Gassett, A., Gould, T., Doubleday, A., Slager, D. L., Austin, E., Seto, E., Larson, T. V., Marshall, J. D., & Sheppard, L. (2022). Characterization of annual average traffic-related air pollution concentrations in the greater Seattle area from a year-long mobile monitoring campaign. *Environmental Science & Technology*, 56(16), 11460–11472. <https://doi.org/10.1021/acs.est.2c01077>
- Brugge, D., Patton, A. P., Bob, A., Reisner, E., Lowe, L., Bright, O.-J. M., Durant, J. L., Newman, J., & Zamore, W. (2015). Developing community-level policy and practice to reduce traffic-related air pollution exposure. *Environmental Justice*, 8(3), 95–104. <https://doi.org/10.1089/env.2015.0007>
- Freemark, Y., Lo, L., Fiol, O., Samuels, G., & Trueblood, A. (2023). Making Room for Housing near Transit: Zoning's Promise and Barriers.
- Gabbe, C. J. (2017). Why Are Regulations Changed? A Parcel Analysis of Upzoning in Los Angeles. *Journal of Planning Education and Research*, 0739456X1769603. <https://doi.org/10.1177/0739456X17696034>