

The upzoning TRAP

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

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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

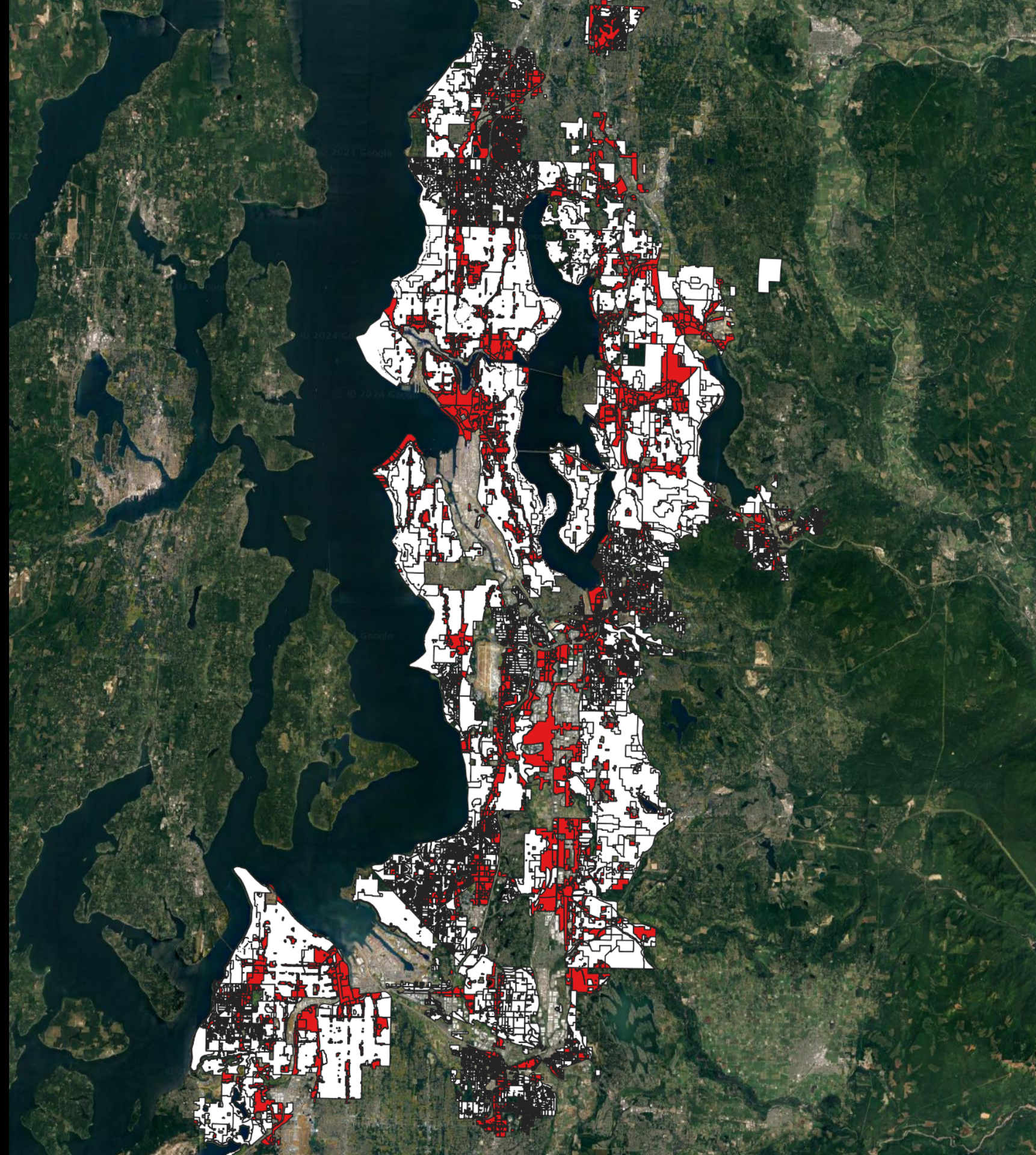
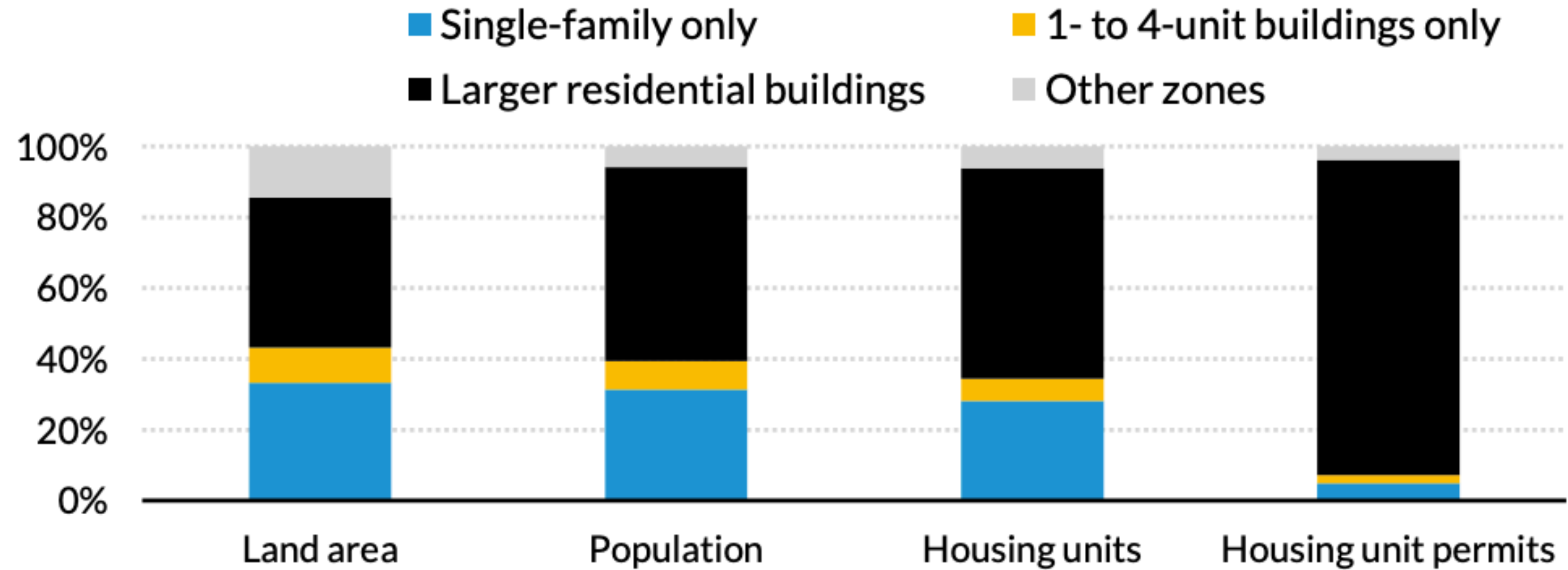


FIGURE 1

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

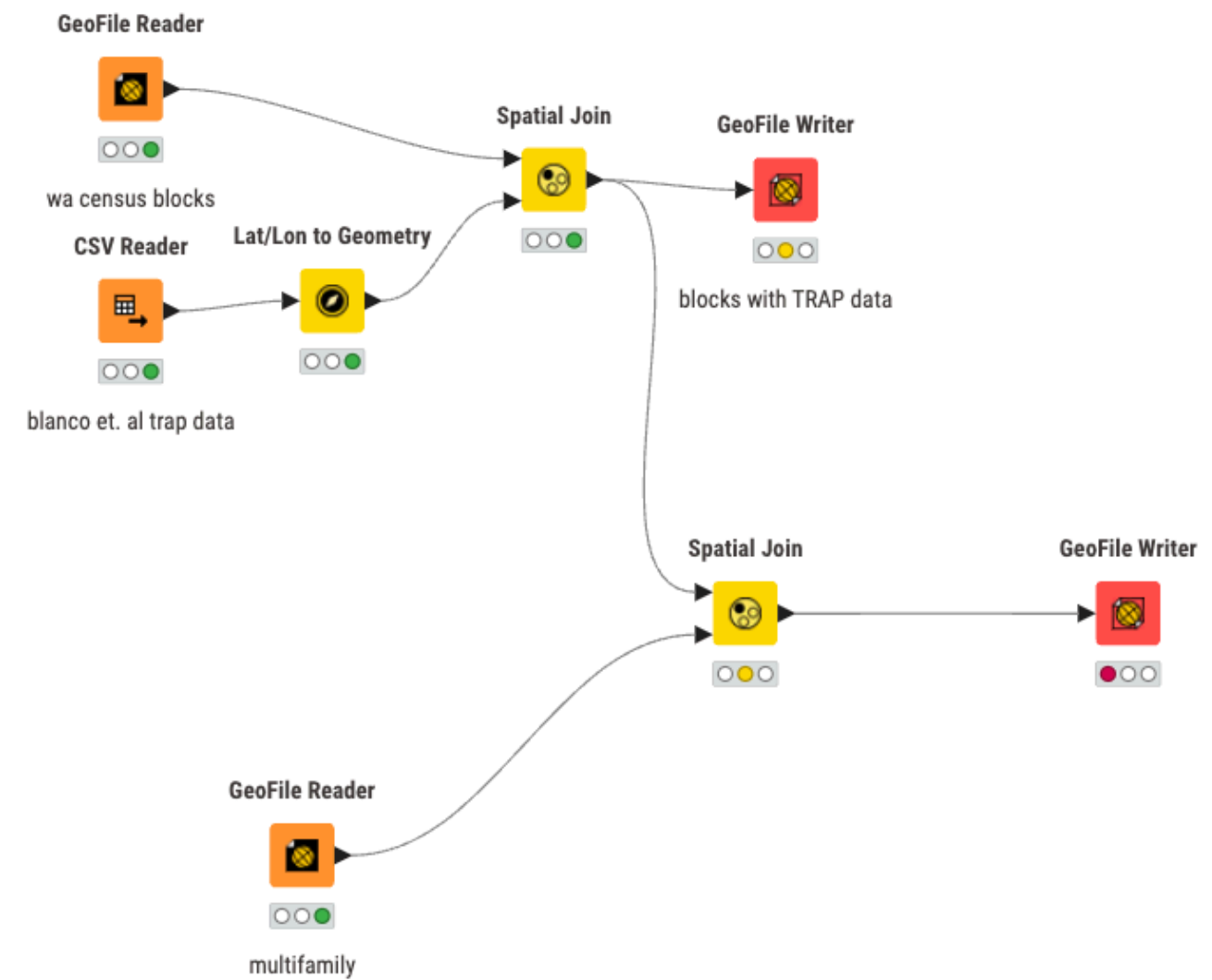
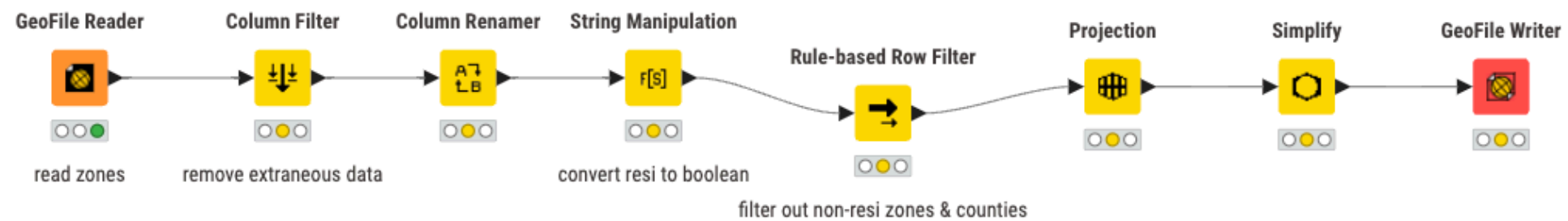
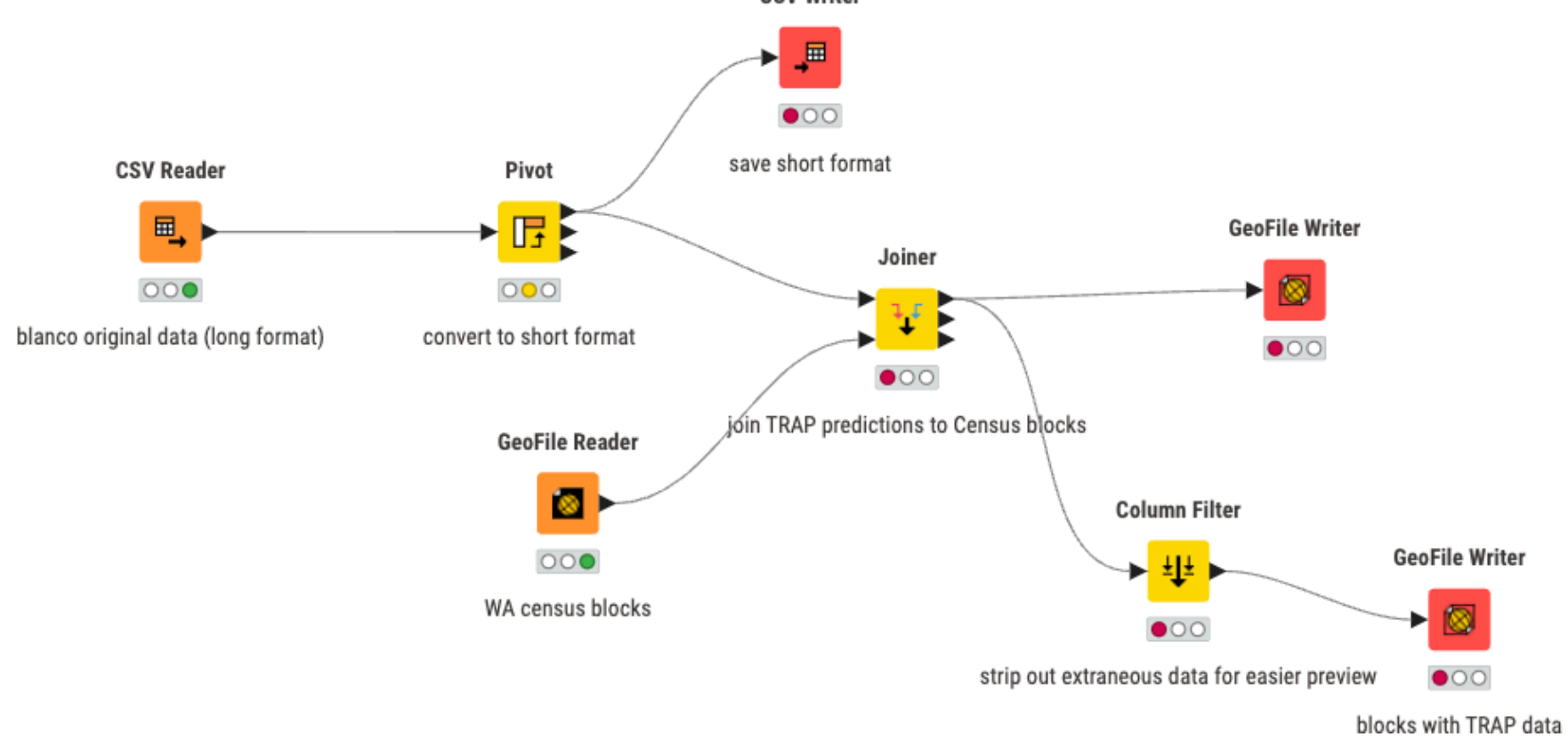
Research question:

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., Gasset, 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>