Measuring Transportation Racial Equity Geographically:

What Works & What Needs Work

Innovations in Travel Analysis & Planning

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Overview

Introduction

- Planning context
- Equity & data analytics

Measuring Equity

- Person- & place-based
- Place-based applications

Recent Developments

Next Steps

Central Puget Sound Region & Equity

Puget Sound Regional Council (PSRC)

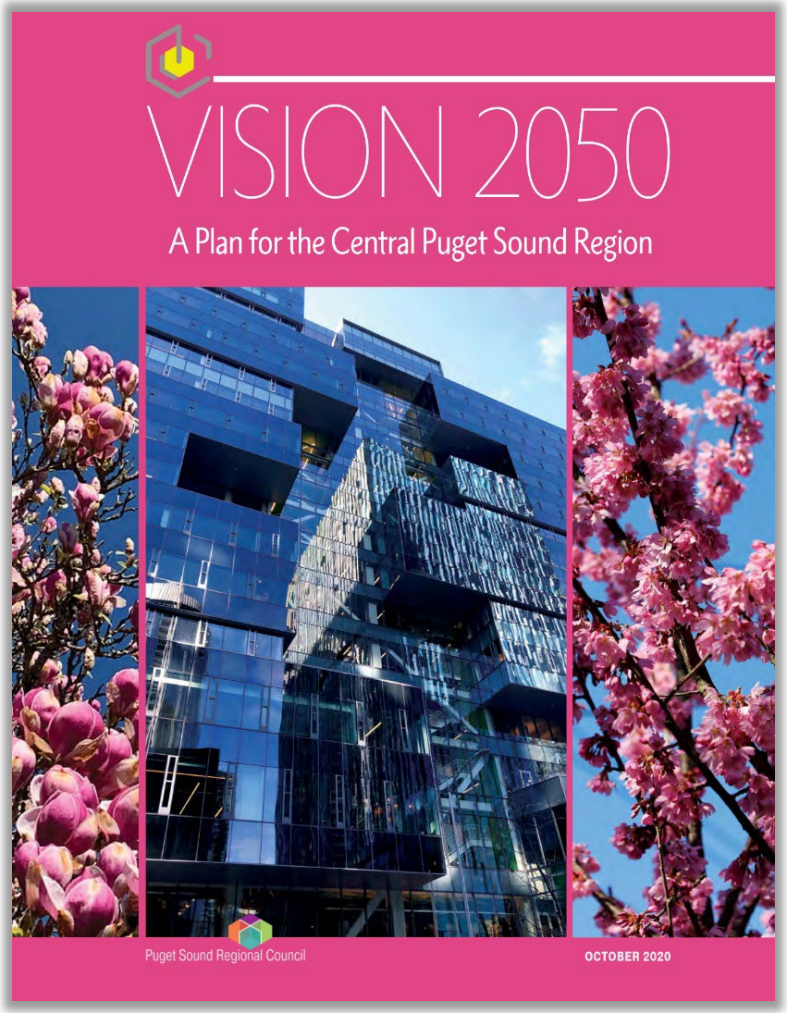
Our region

- 4 counties, 82 cities & towns
- 6,300 sq. mi., urban & rural
- 1,000 sq. mi. urban growth areas
- 4.2 mil. people, 2.3 mil. jobs

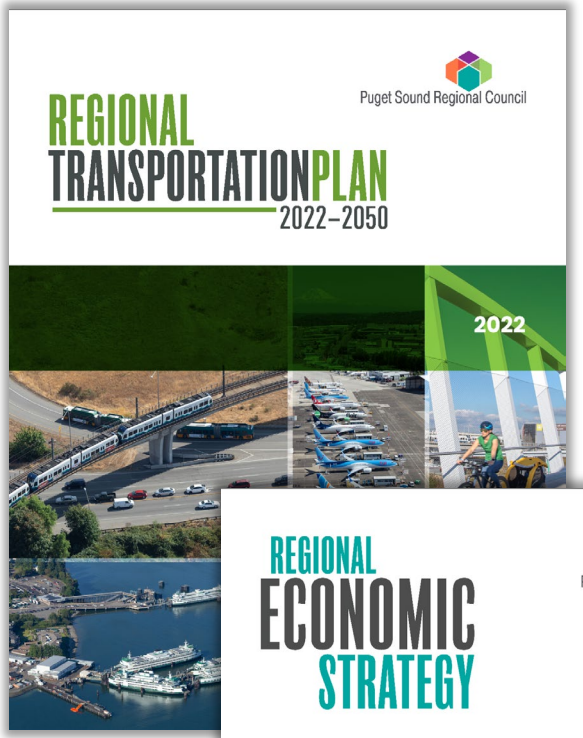
Our members

- Cities, counties, ports, & transit agencies
- State agencies & tribal governments

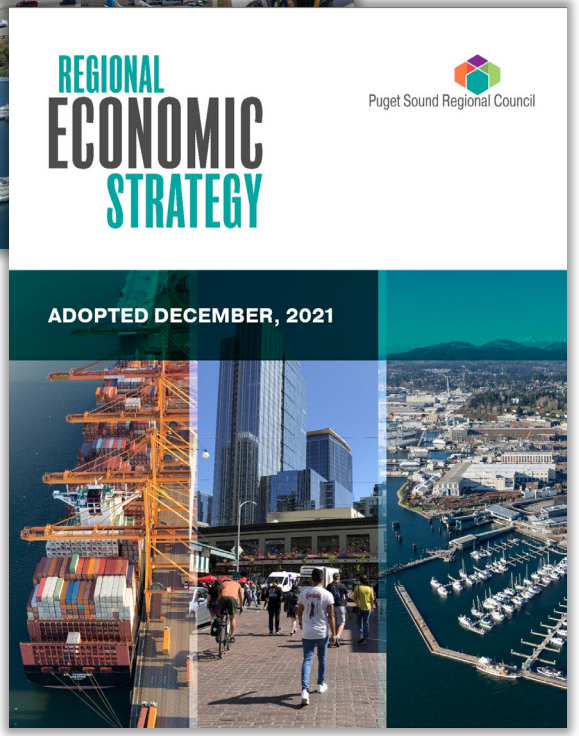
Planning for a Growing Region



2020



2022



2021

Regional Equity Strategy (in development)

Capacity building

- Learning Opportunities
- Prioritizing Equity
- Inclusive Procurement
- Hiring and Retention

Community engagement

- Equity Advisory Committee
- Anti-Displacement Organizations
- Inclusive Engagement Guidance

Data and research

- Equity Analyses
- Equity Tracker
- Legacy of Structural Racism
- Data & Analysis

Best practices

- Equity Impact Tool
- Equity Planning Resources

Regional Equity Strategy work plan: https://www.psrc.org/sites/default/files/2022-03/equitystrategy-workplan-full.pdf

Measuring Equity

Person- & Place-Based Approaches

Person-based:

- Directly measure people with different characteristics
- Survey data (various Census products, household travel survey)
- E.g., income of people of color

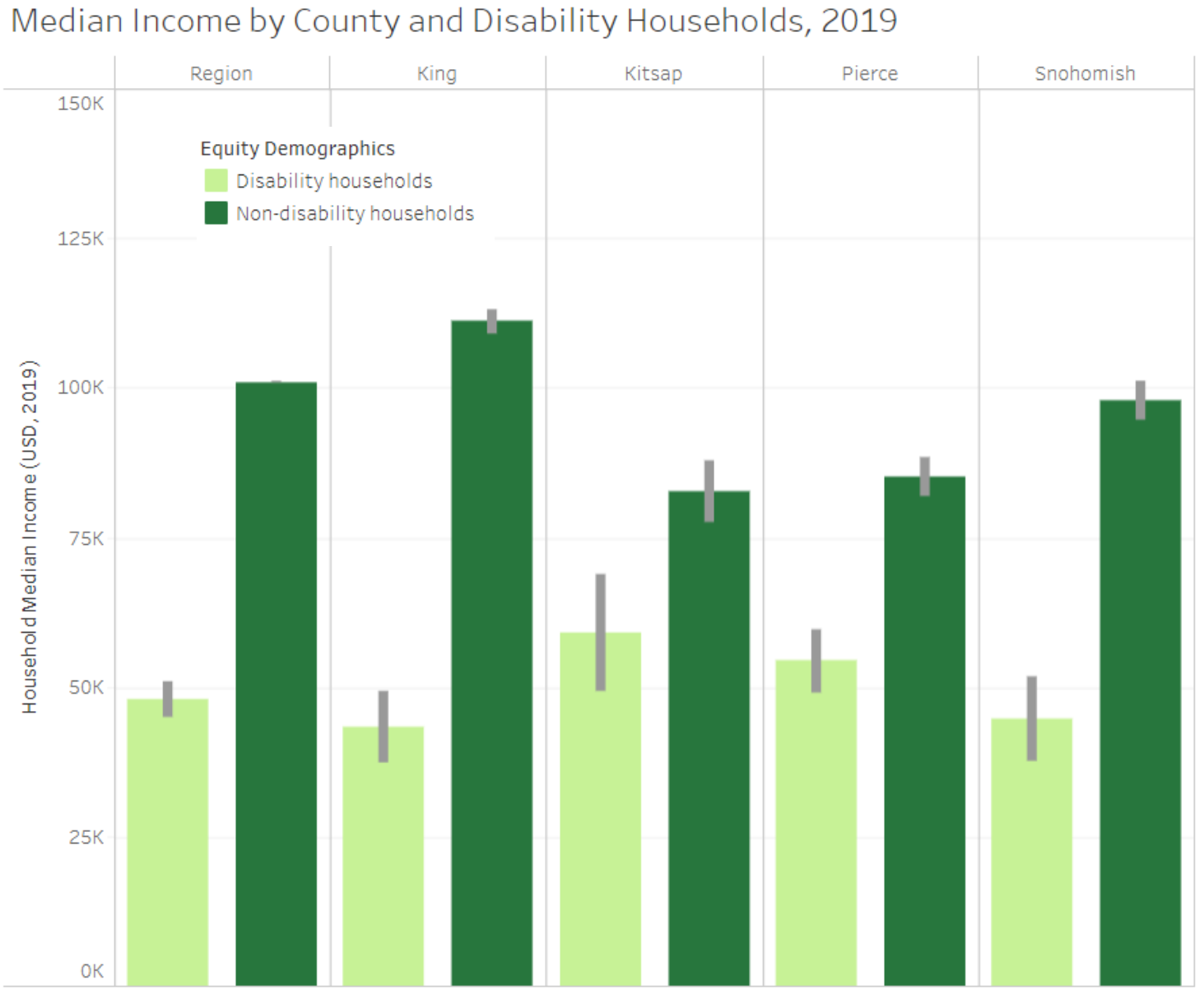
Place-based:

- Indirectly measure people via place socio-demographics
- Leverage Census data to use other sources (incl. model outputs)
- E.g., income of people in areas with high shares of people of color

Person-Based Example (Census PUMS)

Public Use Microdata Sample (PUMS)

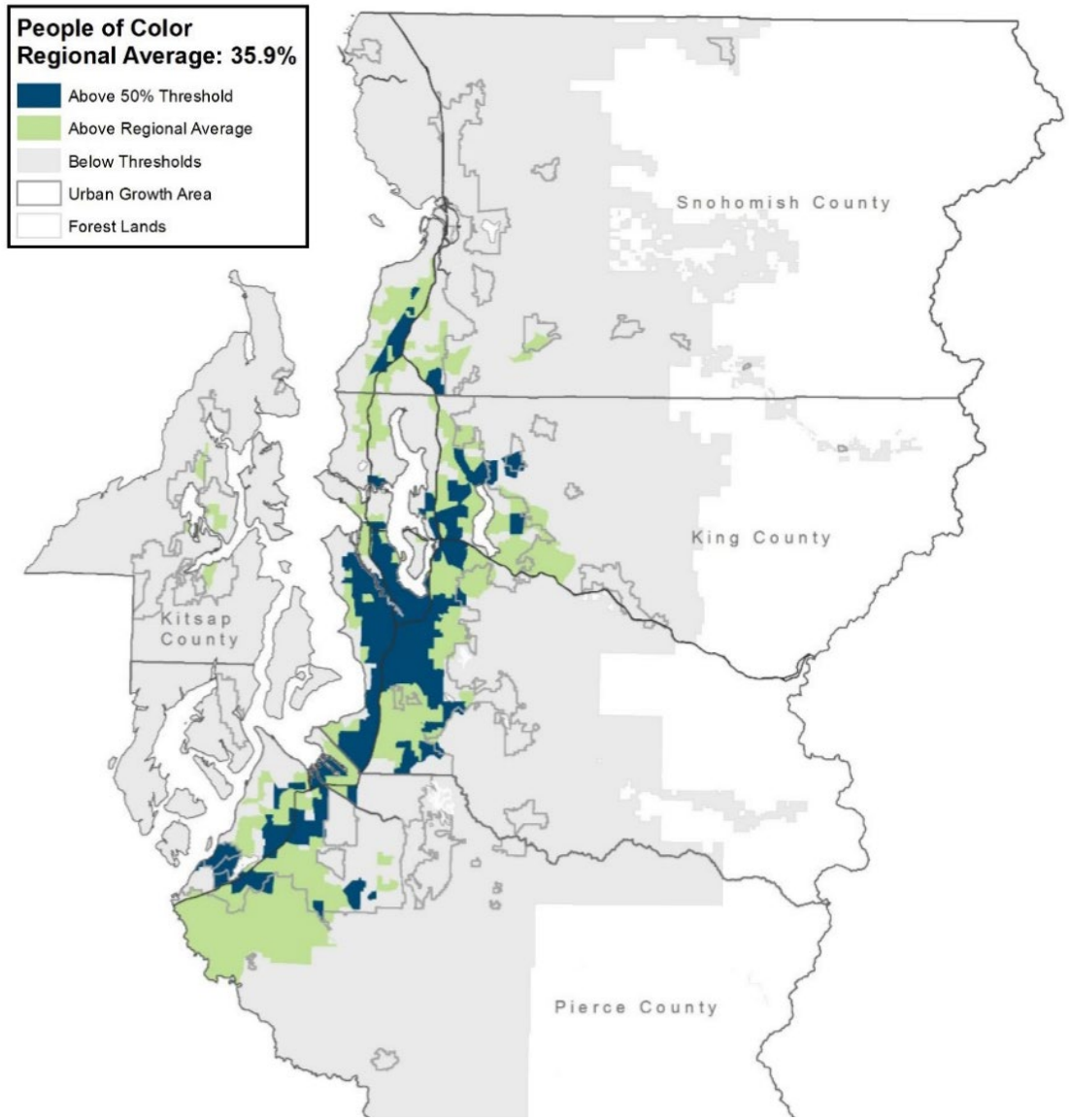
- Cross-tabulate metrics with race/ethnicity, income, disability, age, English proficiency
- Large geographies
  - PUMA often not useful
  - Counties, multi-county regions
- Limited measures for transportation in PUMS



Place-Based Example (Equity Focus Area)

Equity Focus Area (EFA)

- Identify EFAs
  - Calculate socio-demographic shares with American Community Survey data
  - Categorize places (Census tracts) based thresholds (e.g., 50% & regional average)
  - Focus on areas above these proportions
- Use EFAs in analysis
  - Calculate average outcomes for EFAs
  - Compare to regional or non-EFAs

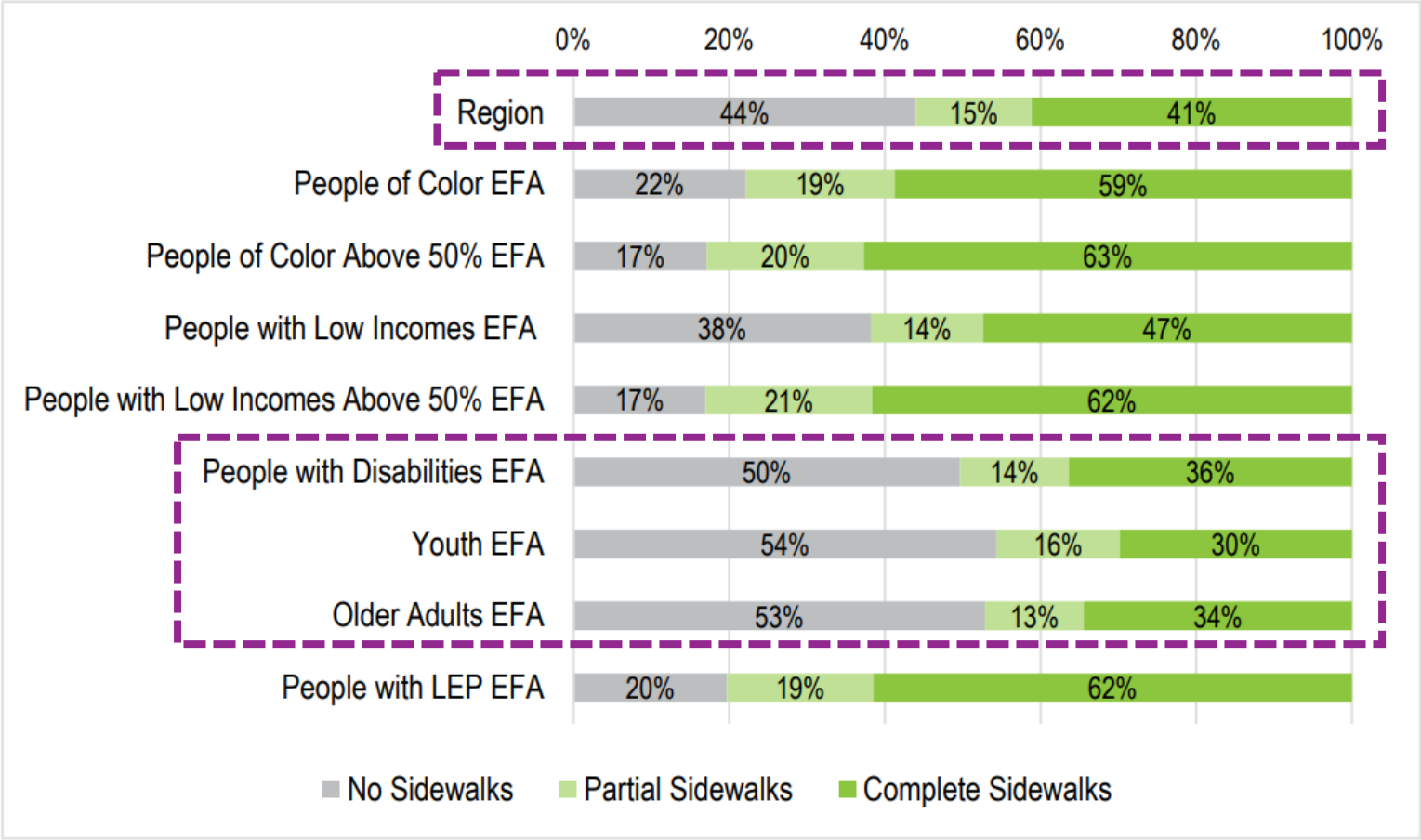


Regional Transportation Plan, 2022: https://www.psrc.org/planning-2050/regional-transportation-plan

Place-Based Example (Equity Focus Area)

Arterial sidewalk completeness

- Compare EFAs to Region
- EFAs for People with Disabilities, Youth, & Older Adults have more arterials with no sidewalks



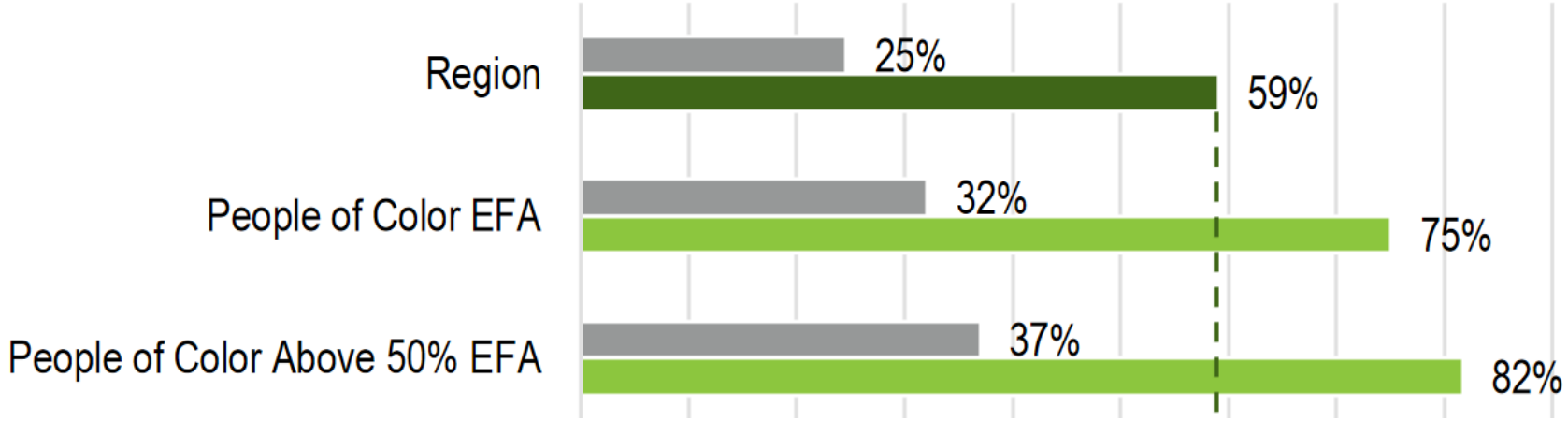
Regional Transportation Plan, 2022: https://www.psrc.org/planning-2050/regional-transportation-plan

Place-Based Example (Equity Focus Area)

Average vehicle time drive daily per person (in minutes)

	2018	2050	% Change
Region	**39.6**	**33.8**	**-15%**
People of Color EFA	36.4	29.8	-18%
Non-People of Color EFA	42.2	37.5	-11%
People of Color Above 50% EFA	36	30.7	-15%

Shares of households within ½ mile of transit (2018 vs. 2050)



Regional Transportation Plan, 2022: https://www.psrc.org/planning-2050/regional-transportation-plan

Place-Based Considerations

Who is included and who is not?

- Average outcomes are for everyone in EFAs or non-EFAs, not just members of specific groups
- Vulnerable populations live in both EFAs and non-EFAs

Places today vs. in the future

- Model results for future are applied to EFAs based on current population distributions
- Forecast socio-demographics?

Ease of communication

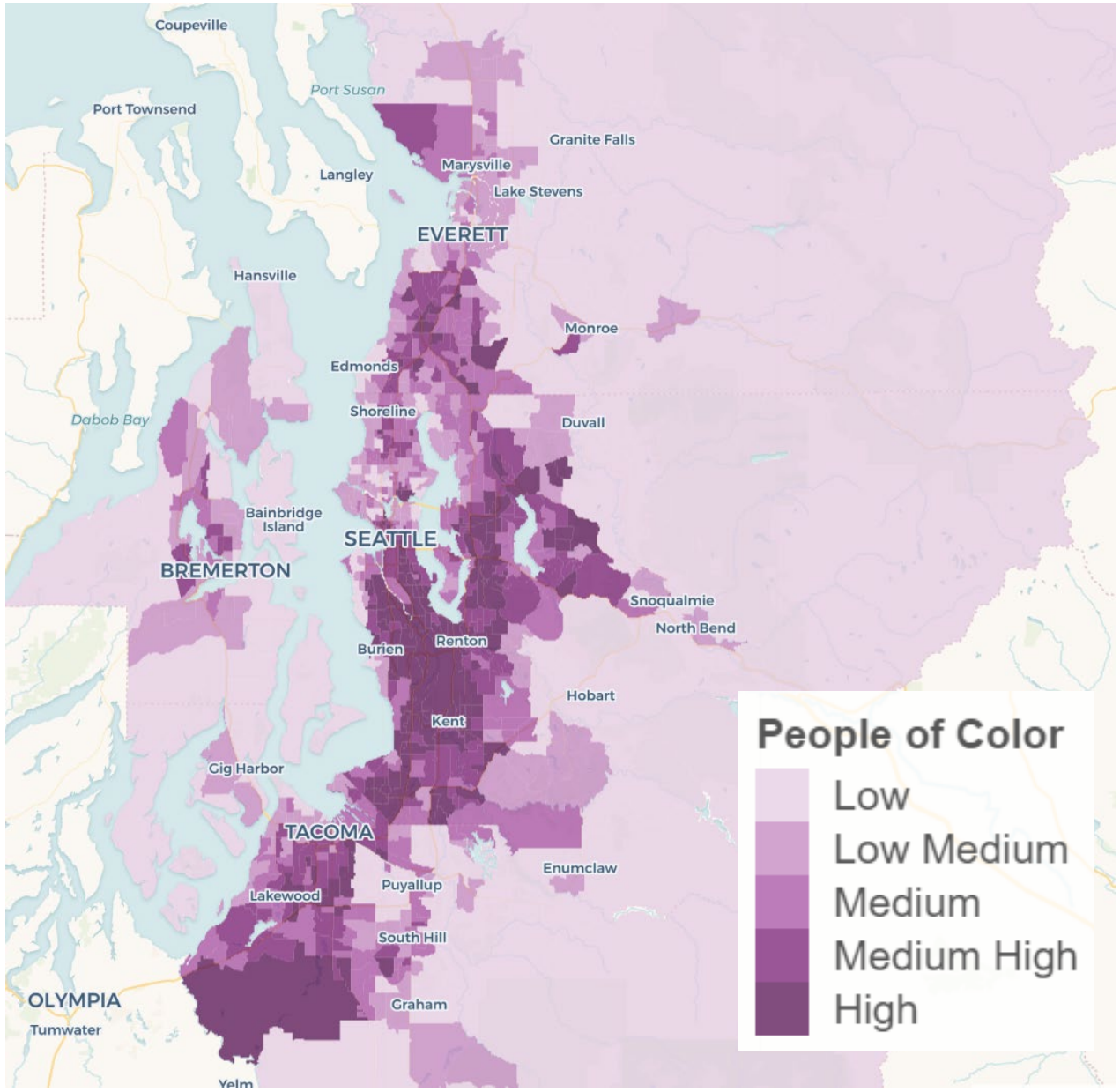
- How best to explain to decision makers, general public?

Recent Developments

Place-Based Refinement (tract quintiles)

Census tract quintiles

- Rank tracts by shares of people with certain characteristics
- Categorize tracts into five groups of equal size
- Calculate weighted averages of metrics for people in each quintile



Place-Based Refinement (tract quintiles)

Average weighted distance to High Capacity Transit

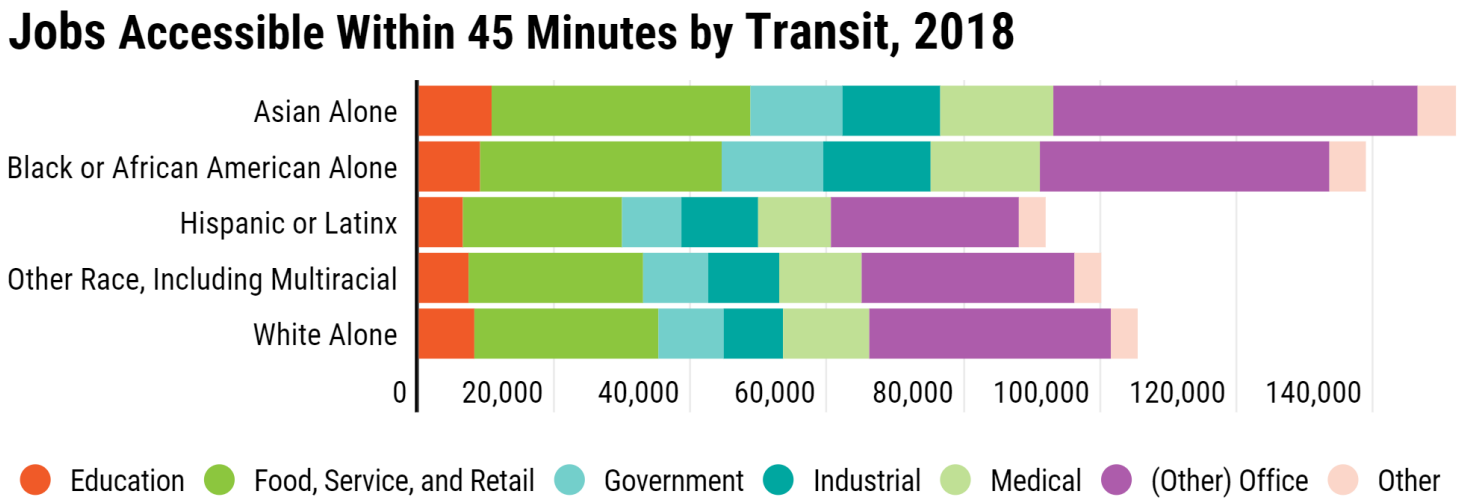
distance measured in miles

U.S. Census Bureau, American Community Survey (ACS) 2020 5-Year Public Use Microdata Sample (PUMS), 2020 Census Tracts

Synthetic Population

Measure current conditions

- Use base year, parcel-level synthesized population & household data for racial equity measures
- E.g., accessibility to jobs by different modes & race/ethnicity
  - Parse people of color into different groups
  - Results show Hispanic or Latinx people have less access to jobs by transit



Looking at Equity in Transportation Access: https://www.psrc.org/about-us/media-hub/looking-equity-transportation-access

Synthetic Population

Measure current conditions

- Synthetic population allows analyses with detailed networks
- E.g., compare populations near pollution & noise

	Region	Population Distributions: 500' of Freeways (odds ratio)		Population Distributions: 500' of Freight Routes (odds ratio)	
Asian alone non-Hispanic	13%	15%	(1.1)	15%	(1.2)
Black or African American alone non-Hispanic	5%	6%	(1.1)	7%	(1.3)
Non-white Hispanic	5%	5%	(1.2)	6%	(1.3)
Some Other Race alone non-Hispanic	2%	2%	(1.1)	2%	(1.2)
Two or More Races non-Hispanic	6%	6%	(1.1)	6%	(1.1)
White alone non-Hispanic	65%	61%	(0.9)	59%	(0.9)
White Hispanic	5%	6%	(1.1)	5%	(1.1)

Synthetic Population

Outstanding questions & considerations

- How valid are these analyses?
- At what level could we trust these analyses?
  - Within a block group, placement of households determined by UrbanSim household location choice model
  - Race is not a factor in this model
- What can we do for future year comparisons?
  - Include race into future population distributions?
  - How would that compare with using current spatial distributions?
  - How can we evaluate which method is better?

Next Steps

Upcoming Developments

- Apply tract quintile method in Equity Tracker
- Continue experimentation using synthetic population to measure current racial equity
- Exchange ideas & collaborate with others

Thank you!

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