

Race, Class, and Transit Oriented Development

Examining high-income demographic change after light rail transit



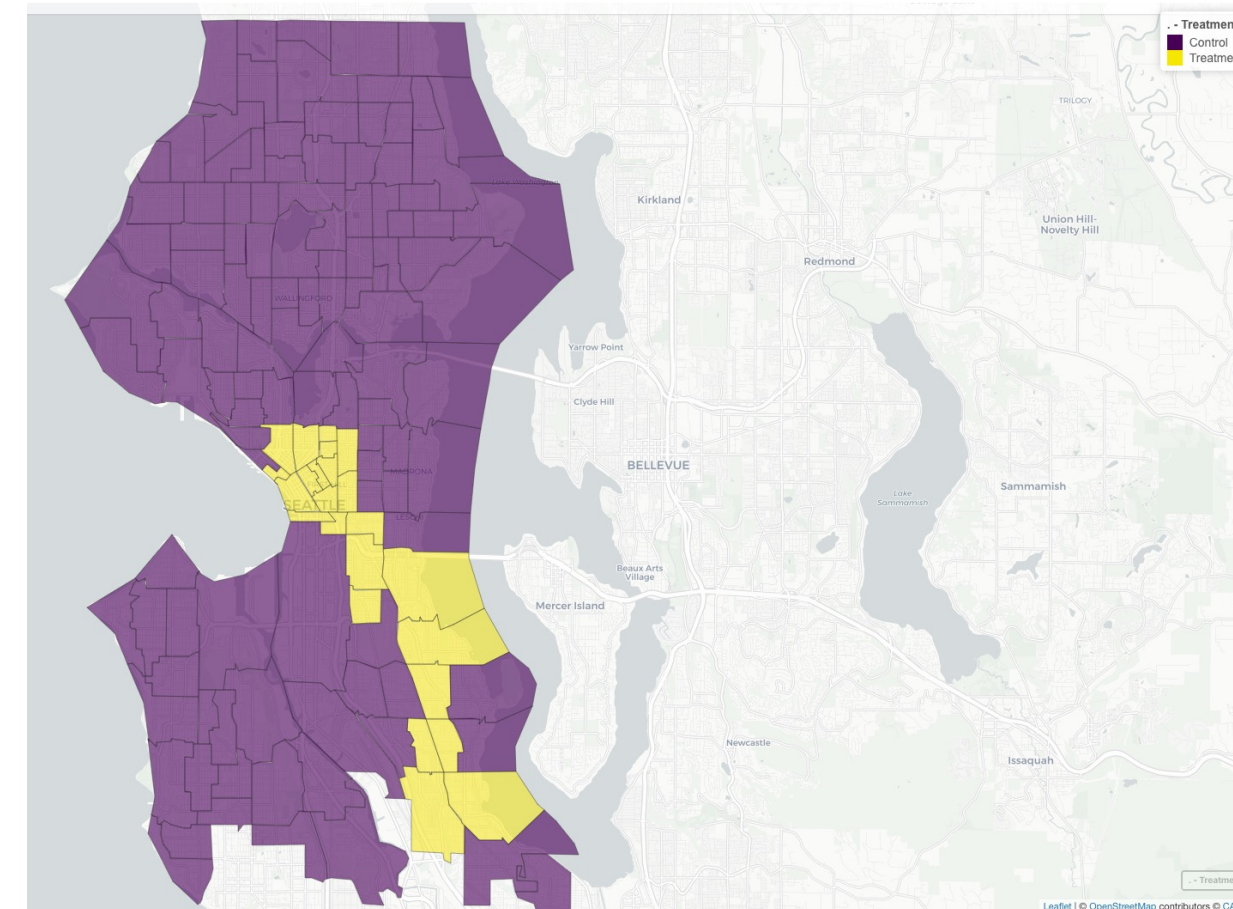
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How and where people move have been core questions in urban sociology and poverty research for years. These moves have consequences for wellbeing and social mobility.

Researchers are interested in the effects of gentrification on mobility patterns in U.S. cities. However, research finds that low-income people *do not* move out of these areas at higher rates. In fact, they are actually far less mobile than previously thought (Freeman 2005). But there are still many unanswered questions about the mechanisms that may move low-income residents from central areas.

Yet, in fast-growing cities like Seattle, historically low-income racial groups are declining significantly in areas with urban reinvestment, leaving unanswered questions about how populations are changing (Hess 2020).

Light Rail Transit Tracts (Gold) in Seattle.



Motivation and Hypotheses

As it turns out, transit developments, like Light Rail (LRT), are similar to processes of gentrification (Zuk et al. 2017).

Additionally, one factor that that many studies ignore, is the role of income in urban demographic change.

This study examines the effect of LRT on the racial and income composition of Seattle census tracts.

This leads to my overall hypothesis:

I argue that middle and high-income groups are the primary forces shifting neighborhood racial composition in LRT neighborhoods because of their capacity to move.

For detailed reproducible code: Everything to compile this thesis will be hosted at <https://github.com/theloniousgoerz>

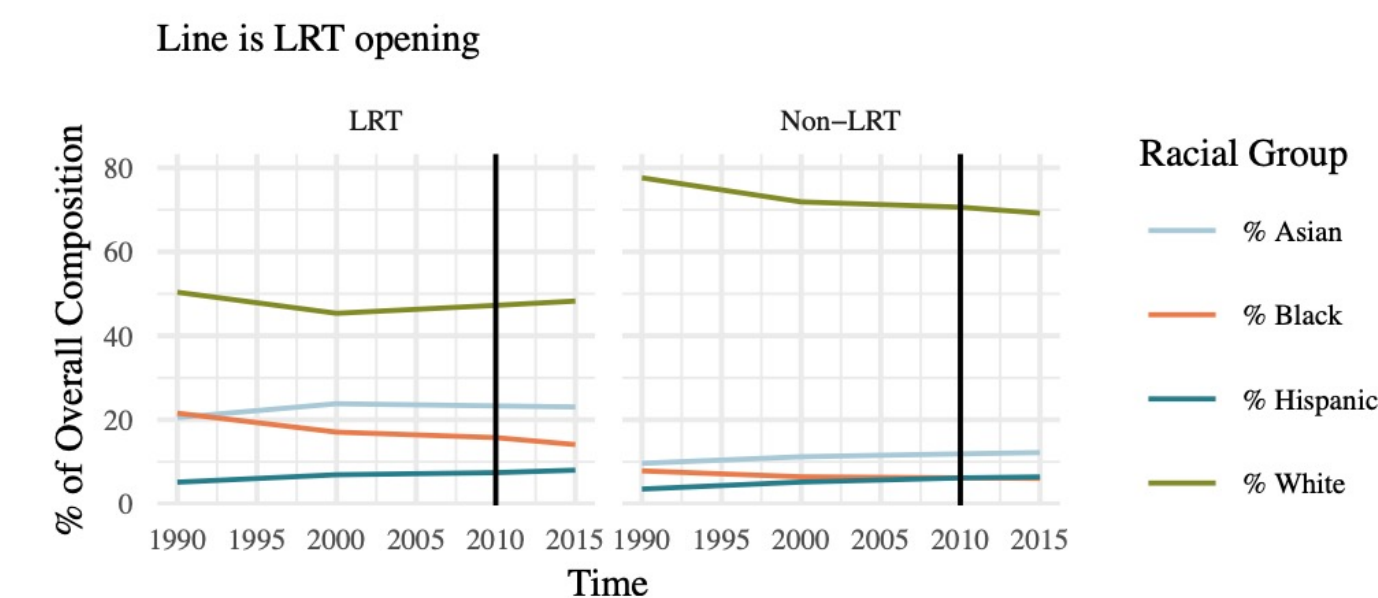


Figure 1: Comparison of Percent of Each Racial Group Over Time in Seattle

Methods

To estimate the effect of LRT development on racial and income composition:

- Unique dataset of Census American Community Survey data (1990-2015) (N = 540).
- Variables: Income (by Race), demographic indicators, and neighborhood controls.
- Regression framework, that compares both LRT and non-LRT tracts (Difference in Difference).¹

Model equation:
Difference in Difference

$$Y_{it} = \alpha(LRT)_i + \gamma(Time)_t + \beta(Density)_{it} + \beta(Pop)_{it} + \beta(Homeowner)_{it} + \beta(Rent_{80}) + \beta(Vacant_{80}) + \beta(Race_{80}) + \beta\delta_{1990} + \beta\delta_{2010} + \beta\delta_{2015} + \epsilon_{it}$$

$\epsilon \sim N(\mu, \sigma^2)$

Results

- 5 years after LRT, neighborhoods experience statistically significant 5% increases in White residents, and declining or stagnant non-white groups.
- 5 years after LRT, there is a statistically significant 7% shift in the income distribution tending toward the highest earners.
- Asian and White residents have significant in their respective income distributions equivalent to 7% and 8% to the highest income earners.
- There is no significant change in the income distribution of Black and Hispanic residents.

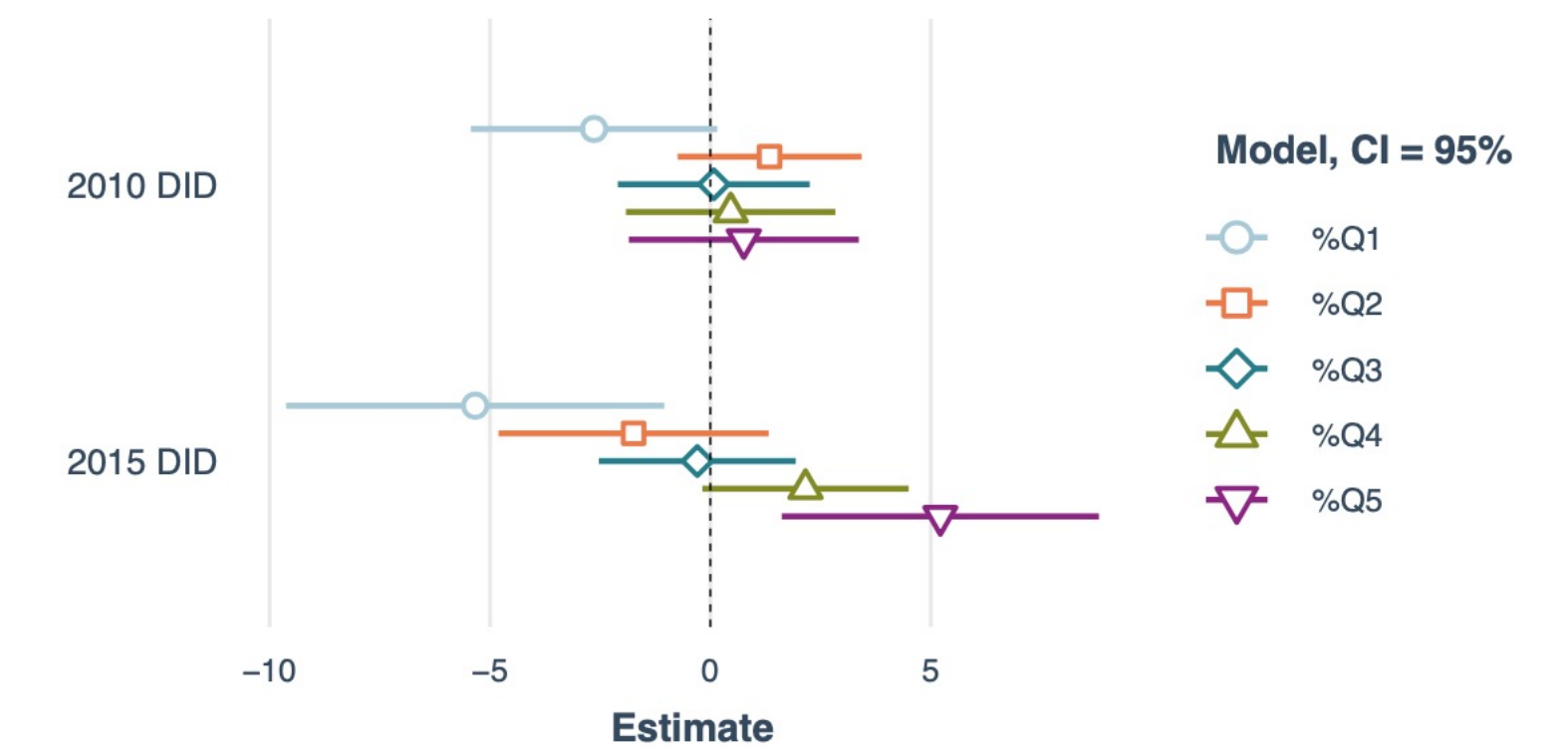


Figure 4: DID estimates of LRT effect on income quintile percent

Conclusion and Limitations

- Results suggest that Income patterns are consistent with hypotheses that high-income residents may be shifting the overall composition.
- There is variation in the trajectories by racial group.
- With the largest gains in higher-income share in White and Asian groups.
- These results inform:
 - How mobility researchers think about population change and dynamics of very high-income people.
 - Our understanding of how race and class interact.
- Limitations:
 - The data only represent compositions, so individual contribution is not clear.
 - No specificity in which Asian groups are in the sample.
 - LRT tracts are not randomly assigned, so inference is tentative.

References

Freeman, Lance. 2005. "Displacement or Succession?: Residential Mobility in Gentrifying Neighborhoods." *Urban Affairs Review* 40(4):463-91. doi: [10.1177/1078087404273341](https://doi.org/10.1177/1078087404273341).
Hess, Chris L. 2020. "Light-Rail Investment in Seattle: Gentrification Pressures and Trends in Neighborhood Ethnoracial Composition." *Urban Affairs Review* 56(1):154-87. doi: [10.1177/1078087418758959](https://doi.org/10.1177/1078087418758959).
Zuk, Miriam, Ariel H. Bierbaum, Karen Chapple, Karolina Gorska, and Anastasia Loukaitou-Sideris. 2017. "Gentrification, Displacement, and the Role of Public Investment." *Journal of Planning Literature* 33(1):31-44. doi: [10.1177/0885412217716439](https://doi.org/10.1177/0885412217716439).

Light Rail Transit In Seattle: Facts

- Link Light Rail has been in development since 1996.
- Construction began in 2003 and a majority of stations opened in 2009.
- As of 2021 there are 14 stations.
- There are currently north and south expansions in development to 2036.
- In the U.S., LRT is a major policy strategy and in rapid development.