Improving Access to Out-of-School Opportunities using Data Science

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1 Introduction

During summer vacation, students lose on average a whole month of knowledge on a grade-level equivalent scale ('Summer Slide'). Summer programs (e.g. arts, sports) help reduce this slide.

"ReSchool Colorado", a Denver-based non-profit, exists to solve this problem: to ensure students have access not only to a quality in-school education, but also opportunities for out-of-school learning, growth, and enjoyment. Last year ReSchool released its "Blueprint4Summer" website. The site allows parents to quickly and easily search through summer extracurricular programs offered in Denver based on the type of program they're looking for, providing information like location, cost, and age range.

We partnered with ReSchool to help them better understand the distribution of programs within the city of Denver and asses if all Denver students have equal access to out of school resources.
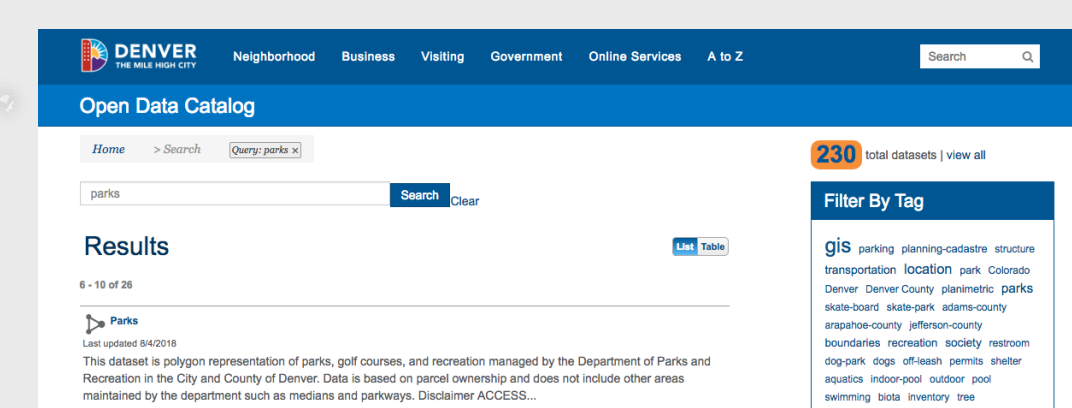
2 Data

Blueprint4Summer:
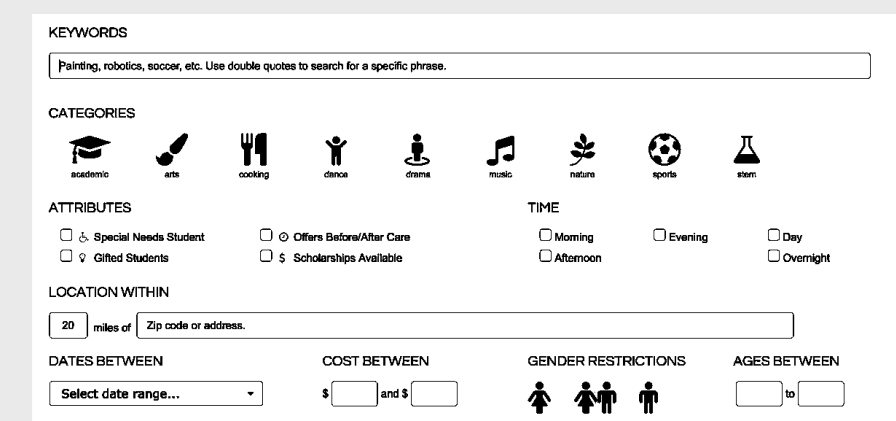
Program and search data

Denver Open Data

Parks, libraries, playgrounds, rec centers..
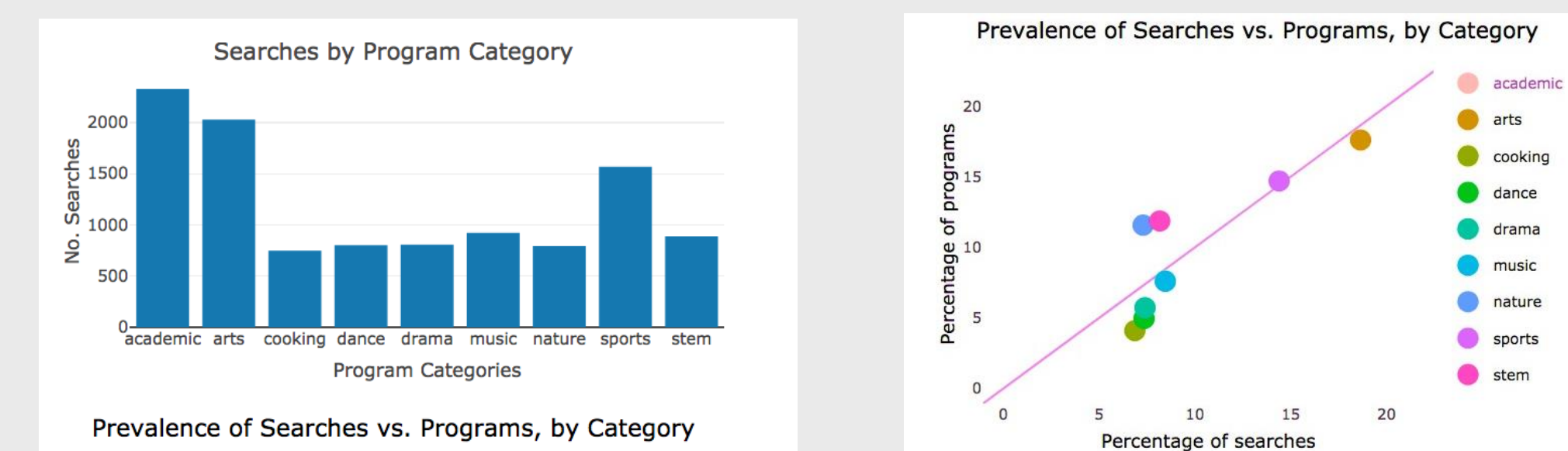
Census Demographics

Median household income, race / ethnicity, education levels, age breakdowns, language besides English spoken at home
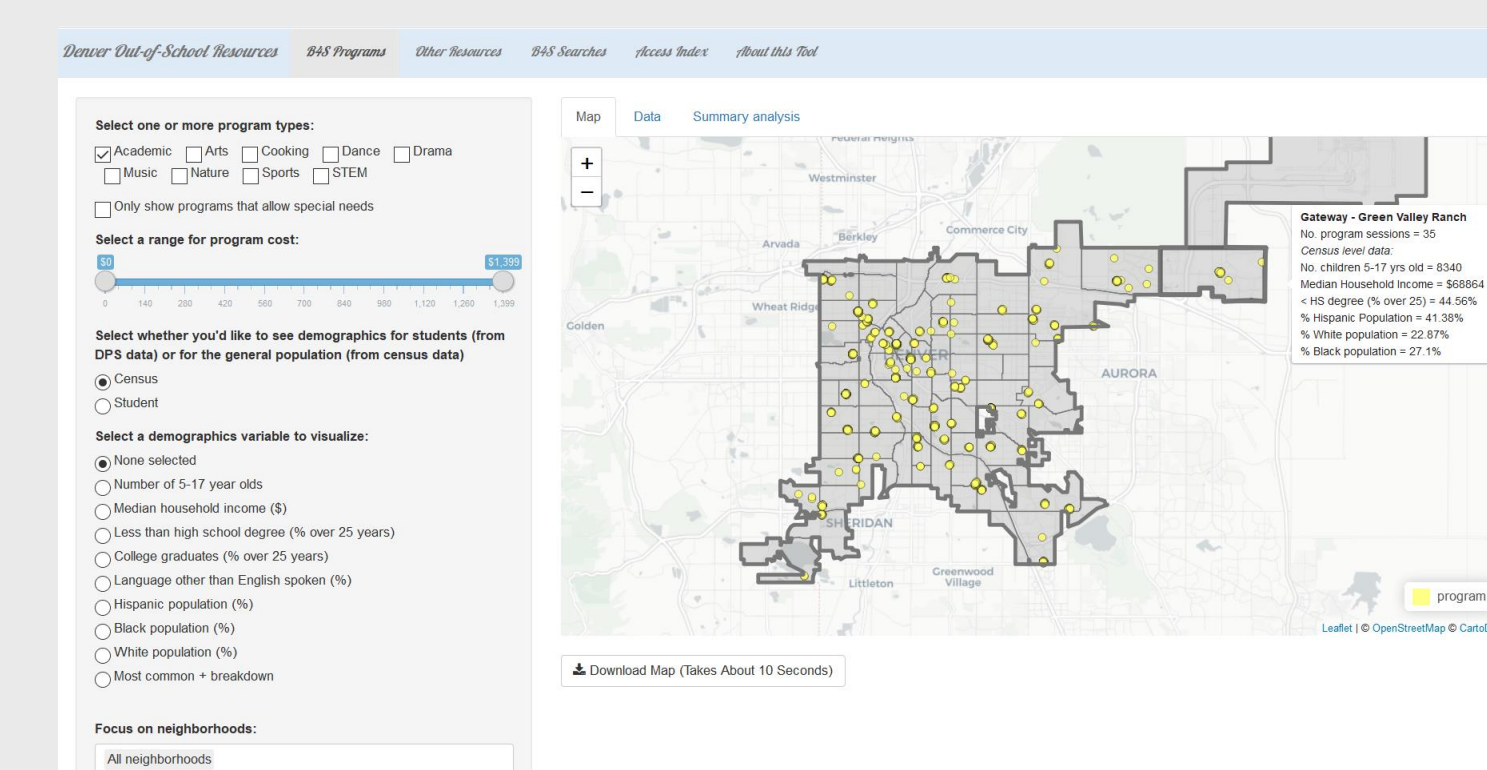
Denver Public Schools

- Student demographics (race/ethnicity, disabilities, English language learners)
- Approximate student locations (nearest census block group)
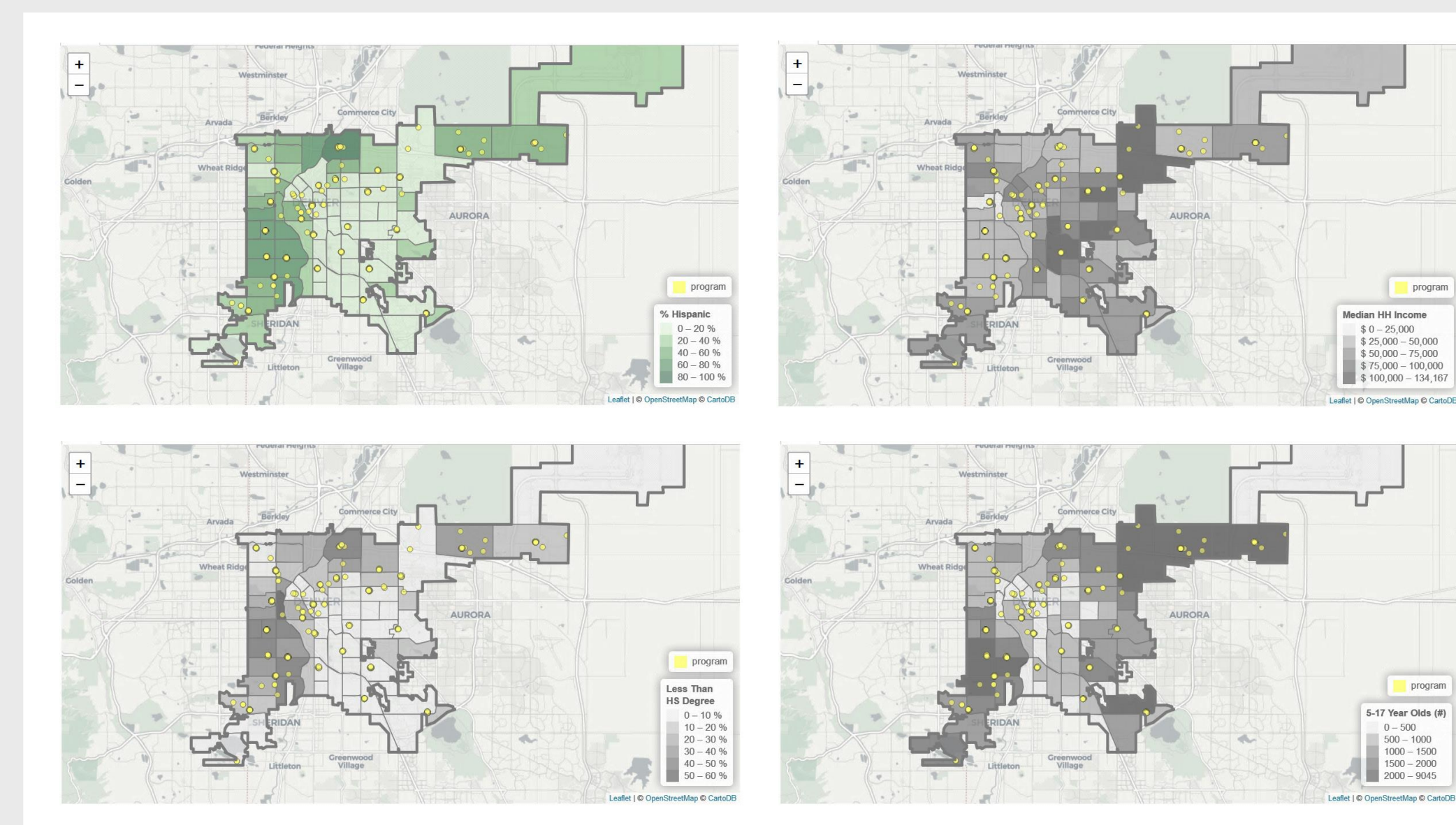
3 Insights

What program categories do people search for the most?
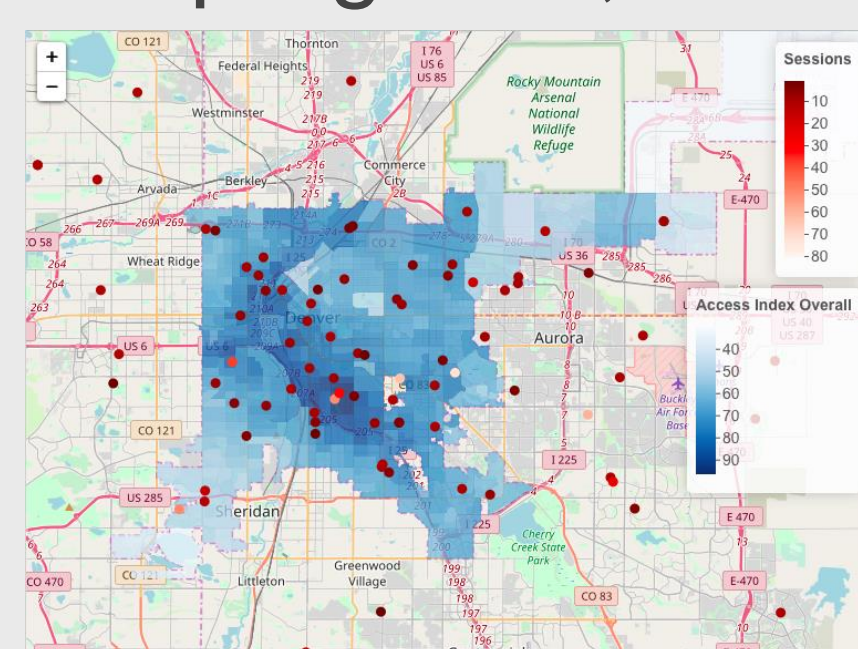
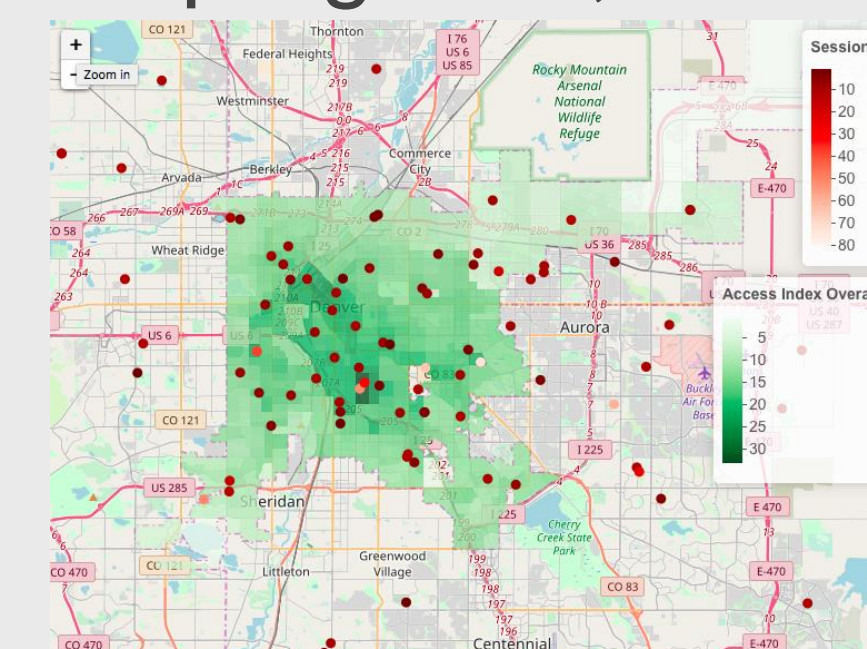### How are programs distributed in Denver?

Overdyed with demographics

Measuring Access to Summer Programs in Denver

$$A_{block}^{type}(\text{transit mode}) = \frac{1}{n_{\text{programs of type}}} \sum_{\text{programs of type}} f(T_{\text{block to program}}^{\text{transit mode}})$$
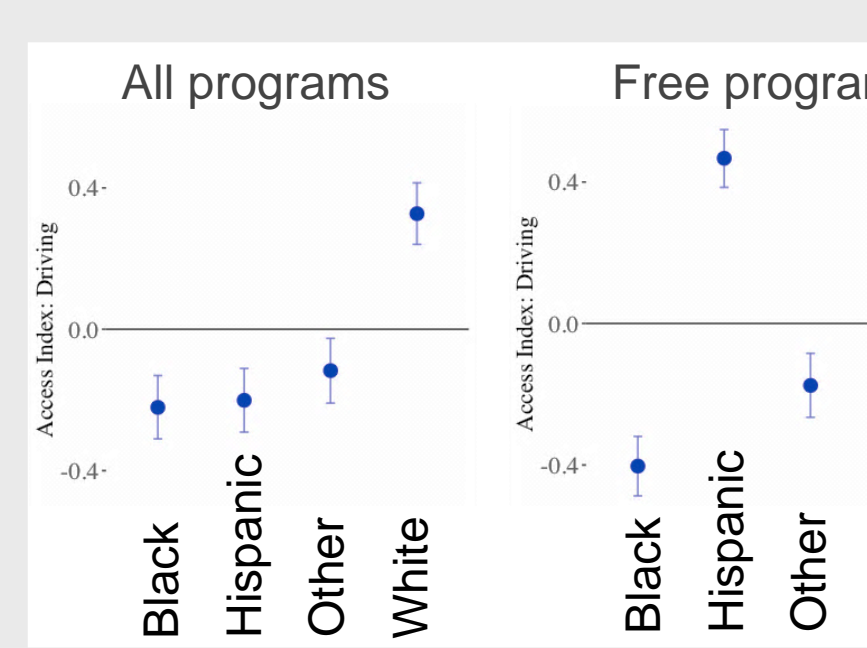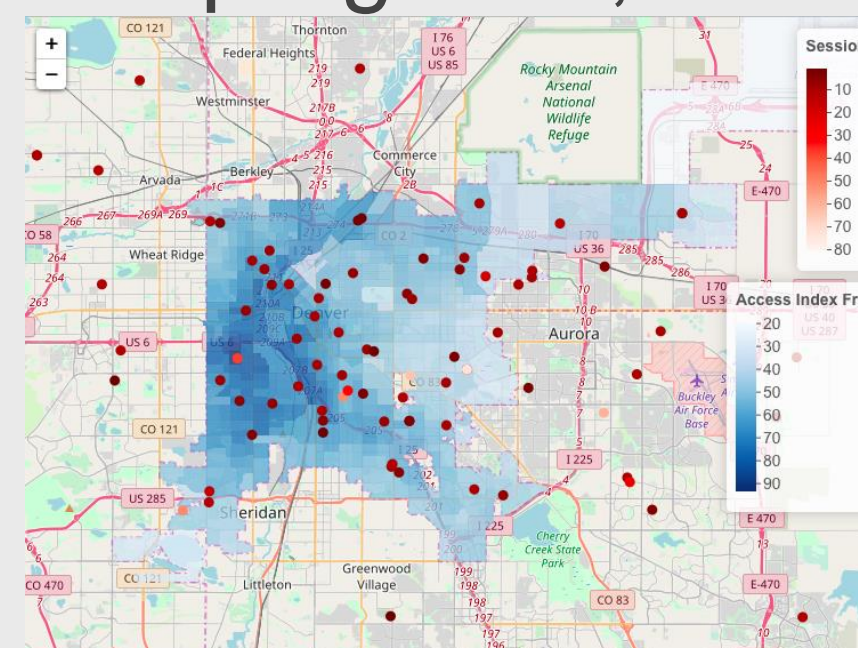
All programs, driving | all programs, transit

free programs, driving

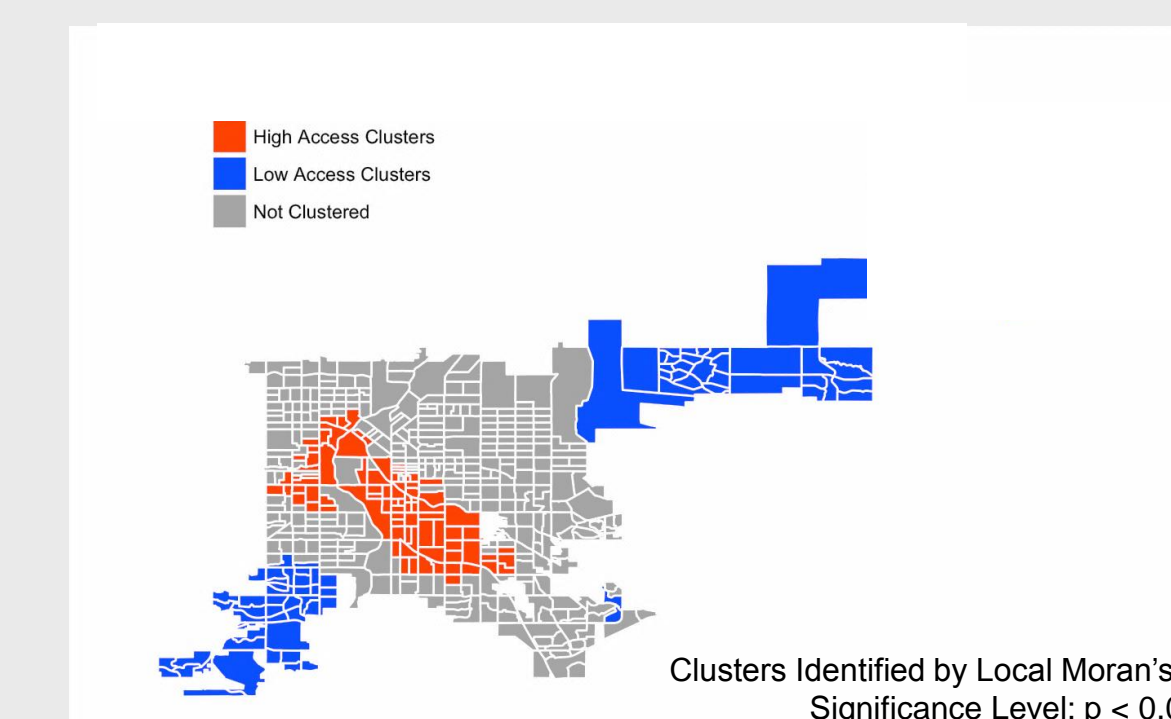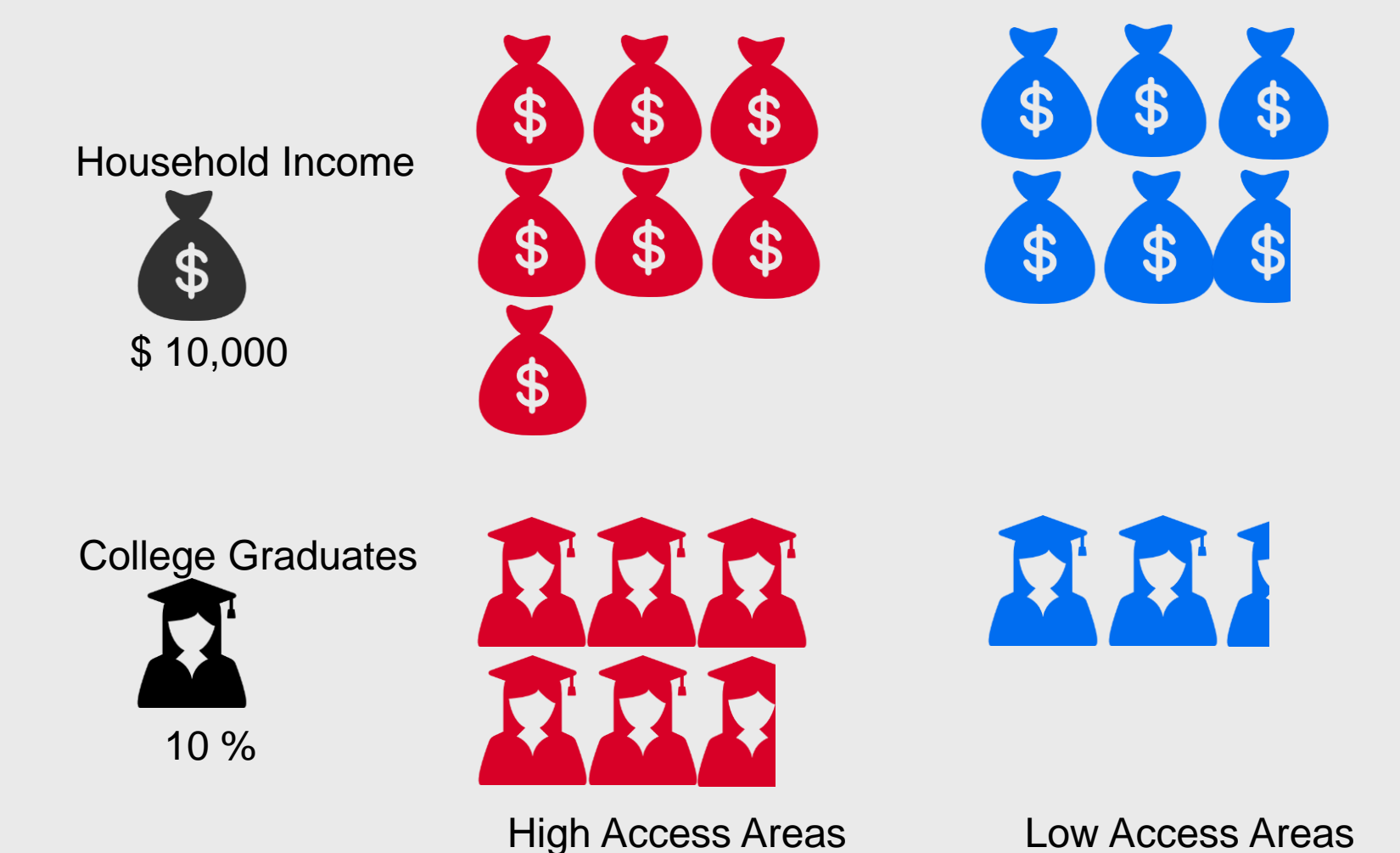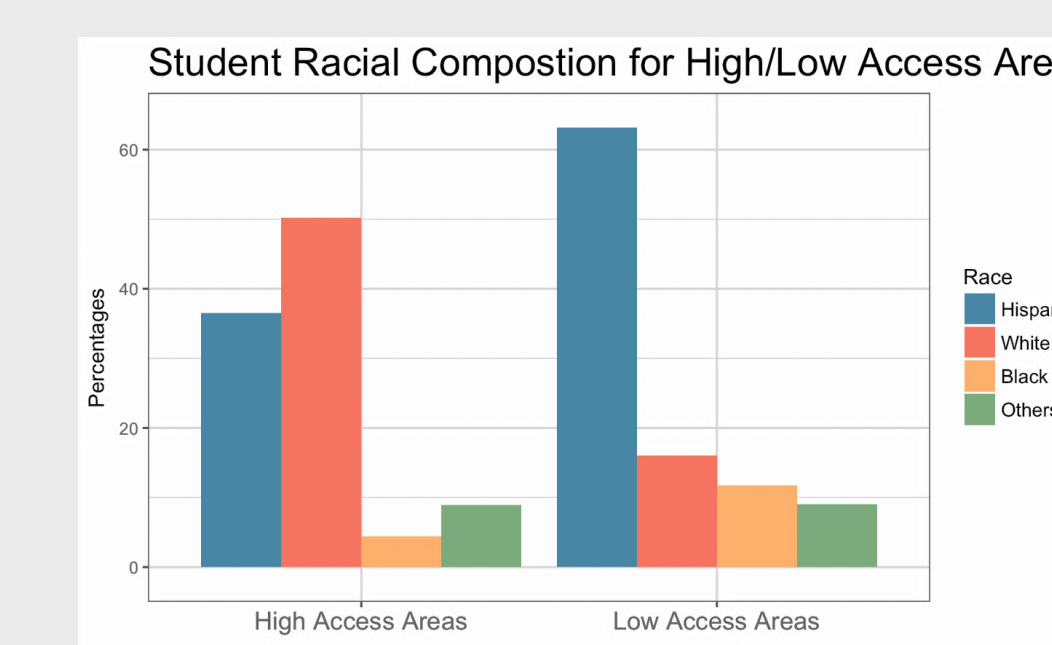All programs | Free programs

4 Insights – continued

Which areas have high/low access?

Clusters Identified by Local Moran's I, Significance Level: p < 0.05

Who is more likely to have high access?

Household Income

$ 10,000

College Graduates

10 %

High Access Areas | Low Access Areas

Access index by student race and program type

	All	Nature	Sports	Art	Academic	Free
Hispanic	63	64	54	68	67	**56**
White	**68**	**70**	**63**	**70**	**68**	50
Black	59	61	54	61	60	45
Other Races	62	64	57	65	64	49

Equity of access

Neighborhoods with Low Access and High Student Age Population
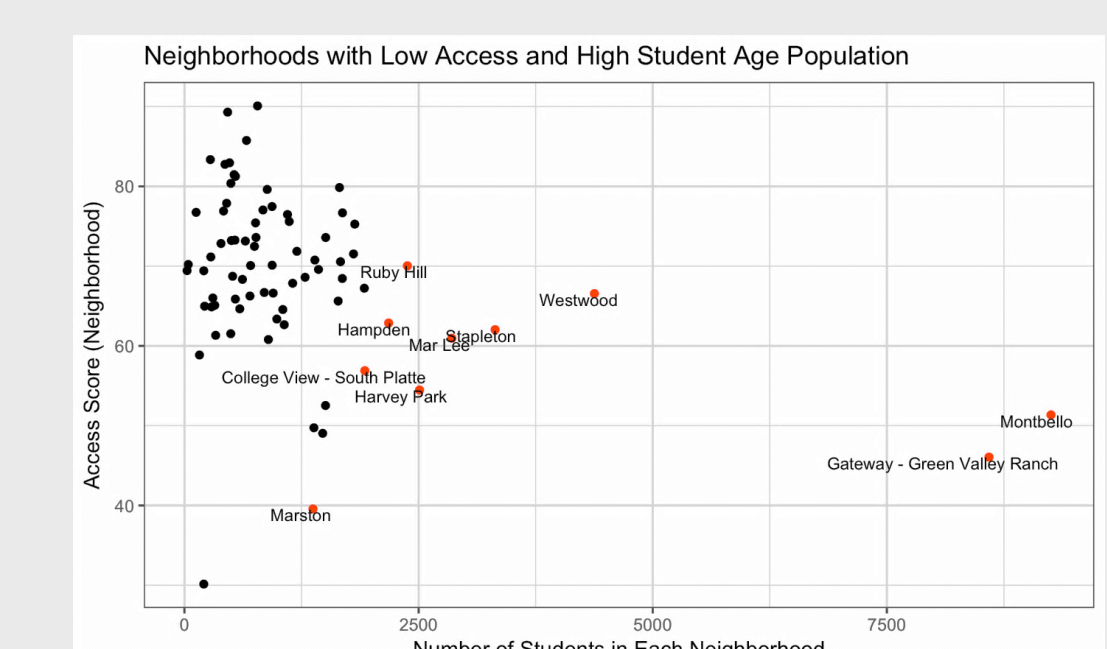
https://github.com/CRPE-UWB/osr_dssg2018