Out of School Resources

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Summer Slide is a Big Problem

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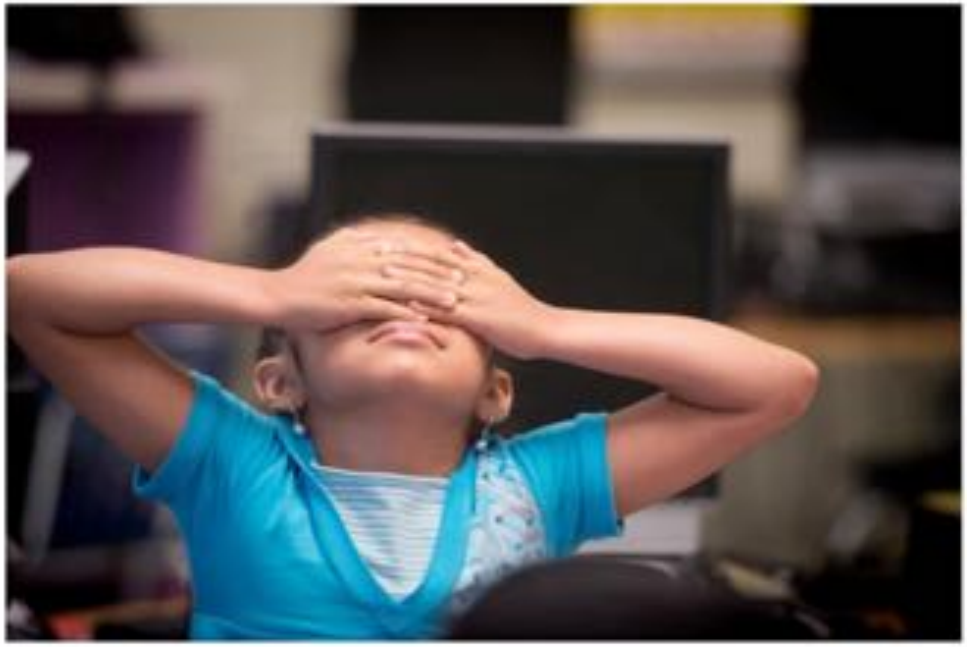
Is Summer Breaking America's Schools?

How the prolonged summer break is dividing students and costing educators.

By **Seth Cline**, Staff Writer June 7, 2018, at 12:55 p.m.



RECOMMENDED

WORLD
U.N.: Reports Say China Imprisons Uighurs

BEST STATES
The States Tackle Health Care

NATIONAL NEWS
Mystery of Jupiter's Bands Solved

BEST COUNTRIES

Summer Programs May Help Reduce Summer Slide

Summer Programs May Help Reduce Summer Slide

- Free programs in the City of Baltimore reduced summer slide[1]

[1] Baltimore City Public Schools, 2016 Summer Learning Evaluation

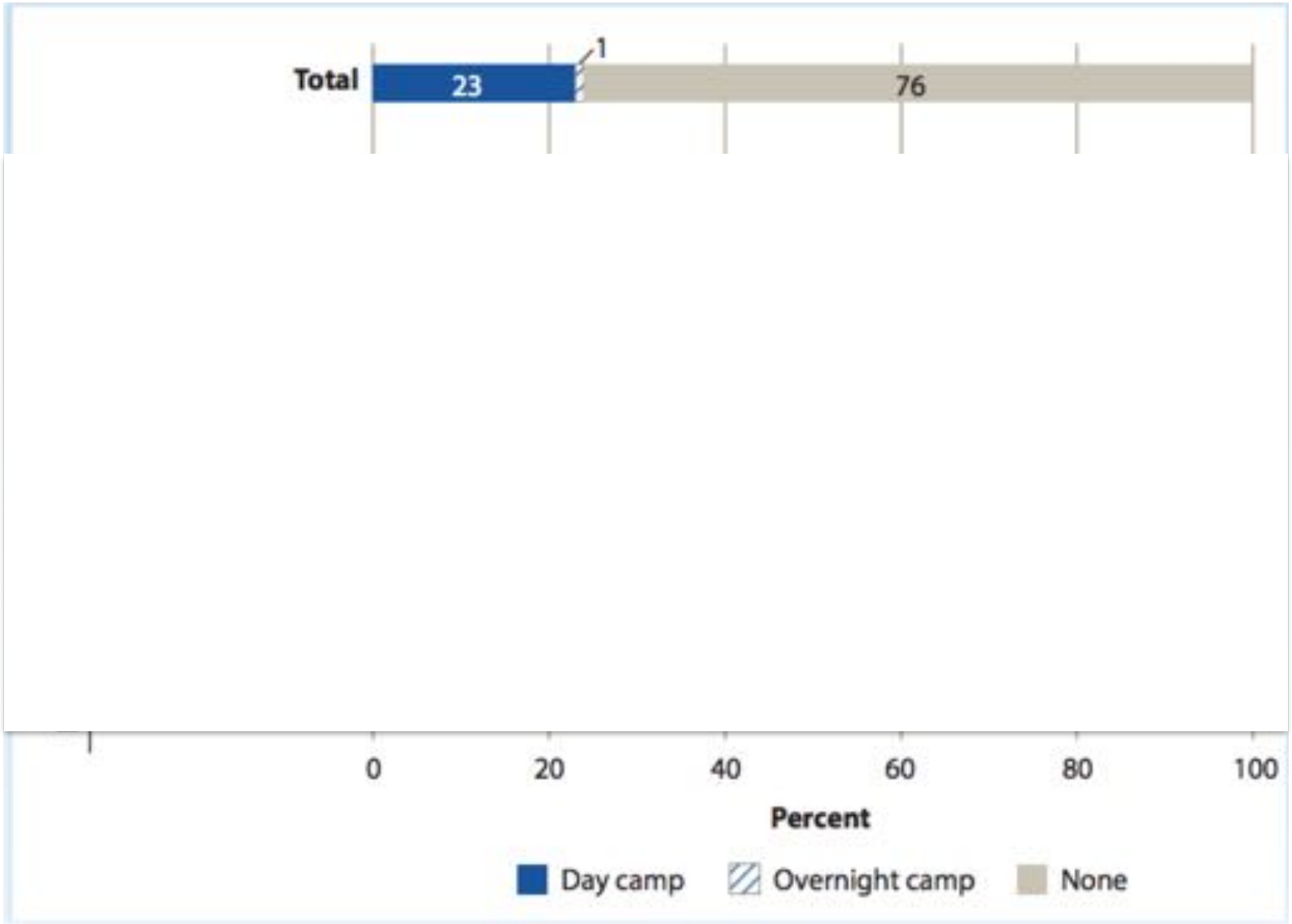
Summer Programs May Help Reduce Summer Slide

- Free programs in the City of Baltimore reduced summer slide[1]
- Benefits from all types of summer programs persist throughout school year[2]

[1] Baltimore City Public Schools, 2016 Summer Learning Evaluation

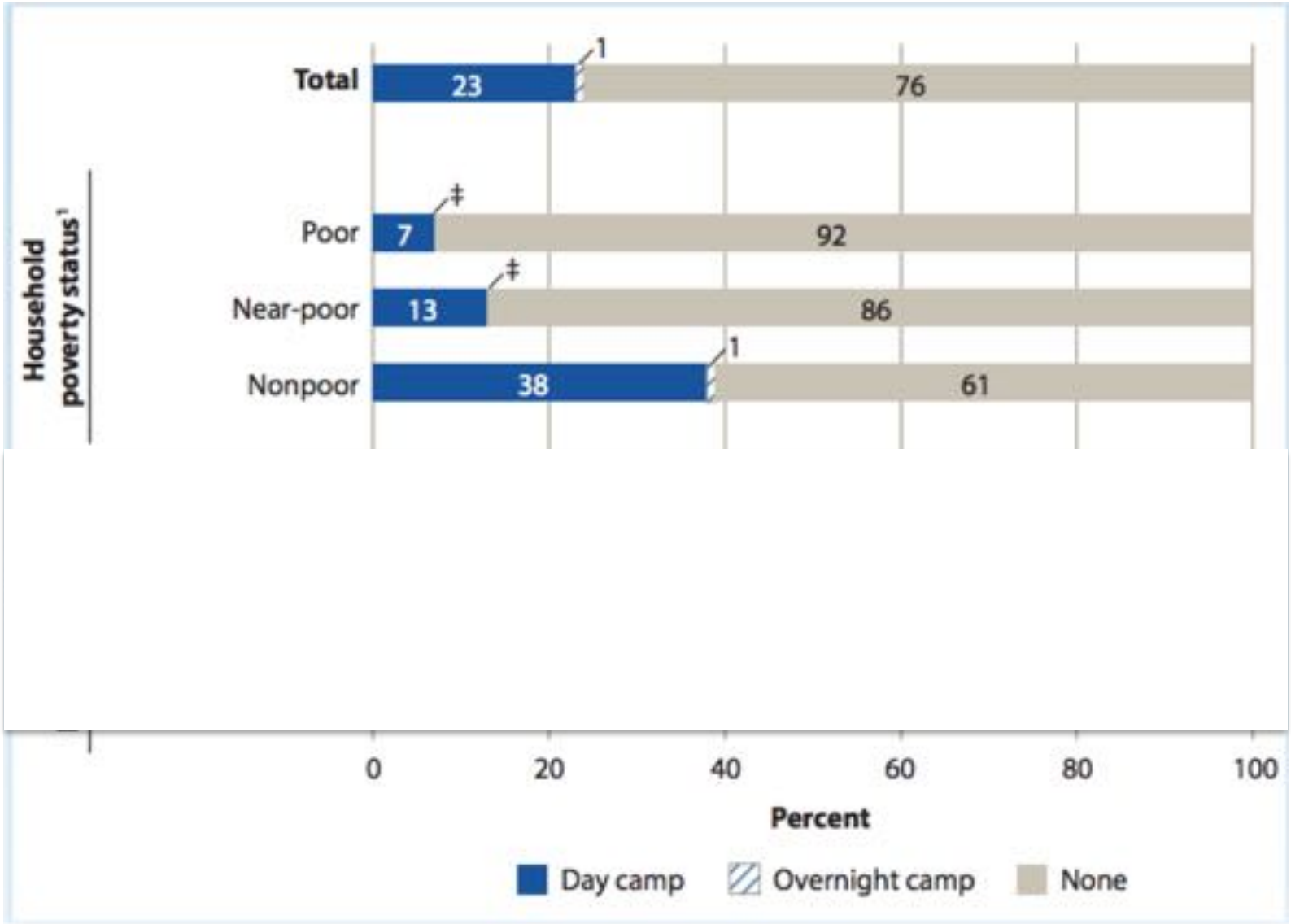
[2] RAND Corporation, 2017, *Making Summer Last*

Economically Disadvantaged Students Attend Fewer Summer Programs



US Dept of Ed, *The Summer After Kindergarten: Children's Experience by Socioeconomic Characteristics*

Economically Disadvantaged Students Attend Fewer Summer Programs



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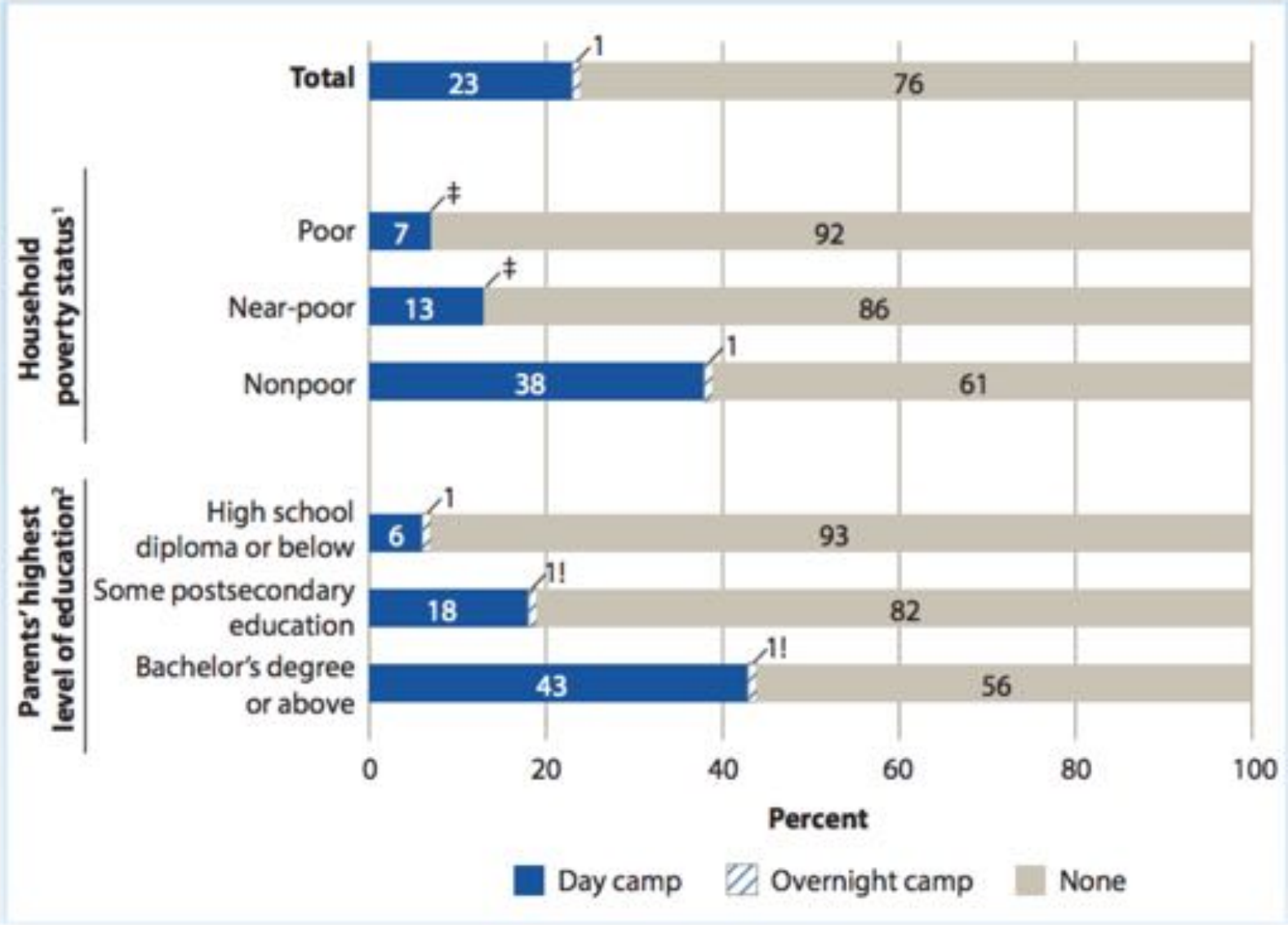

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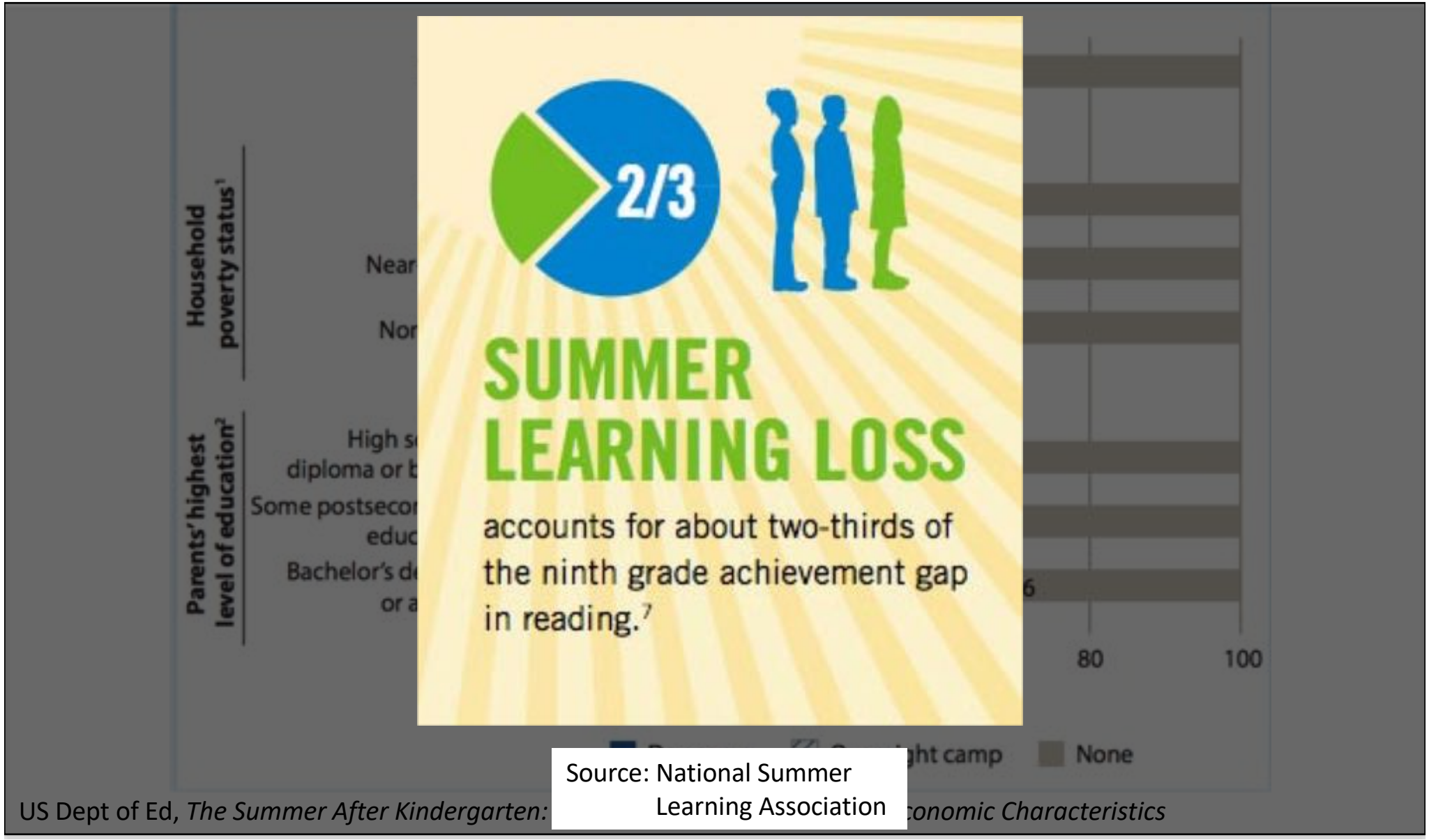


Source: National Summer Learning Association

US Dept of Ed, *The Summer After Kindergarten:* *conomic Characteristics*

RE|SCHOOL
COLORADO

Creating a New Education System

BLUEPRINT 4Summer CO

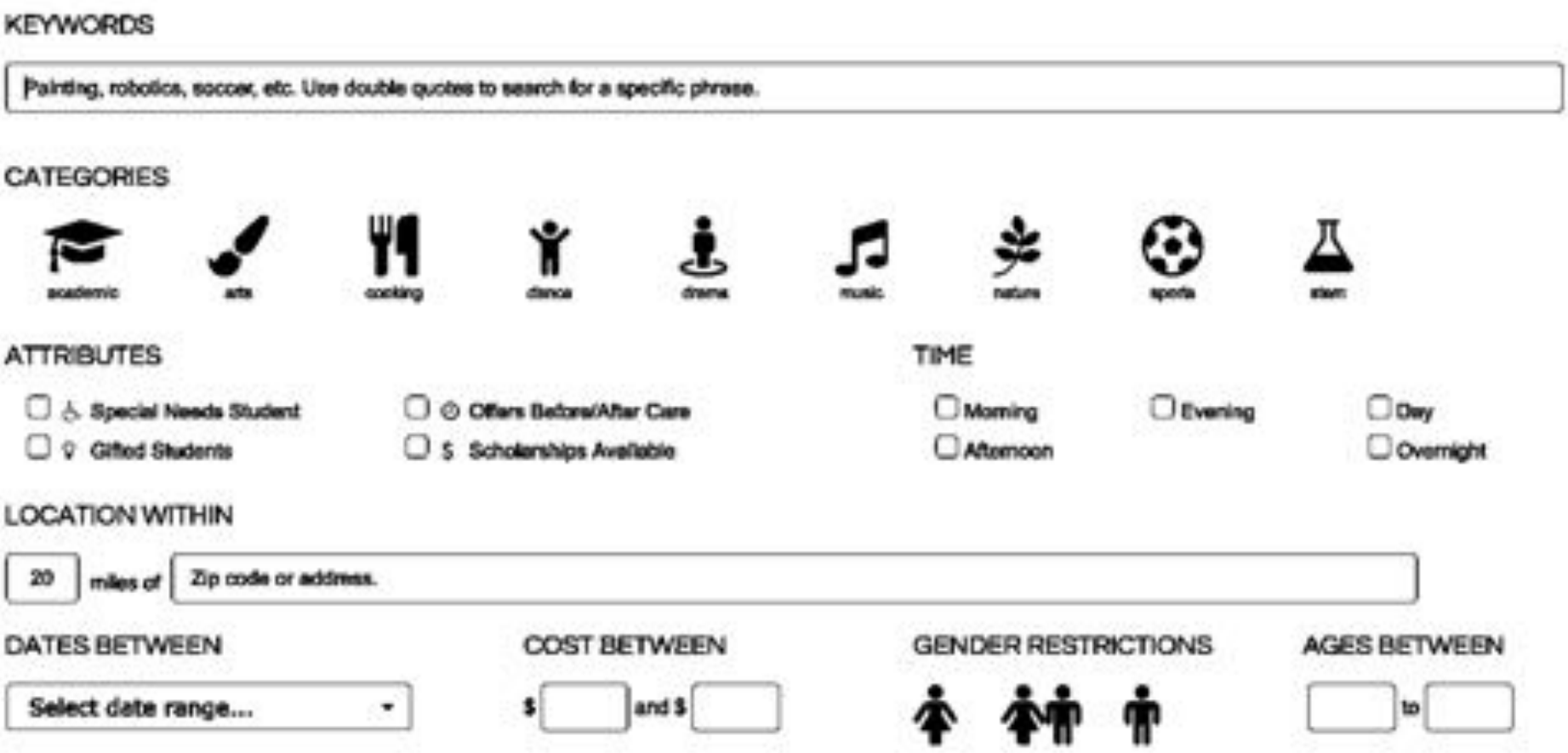
Powered By ReSchool Colorado

where2plan4FUN!

Our Driving Question:

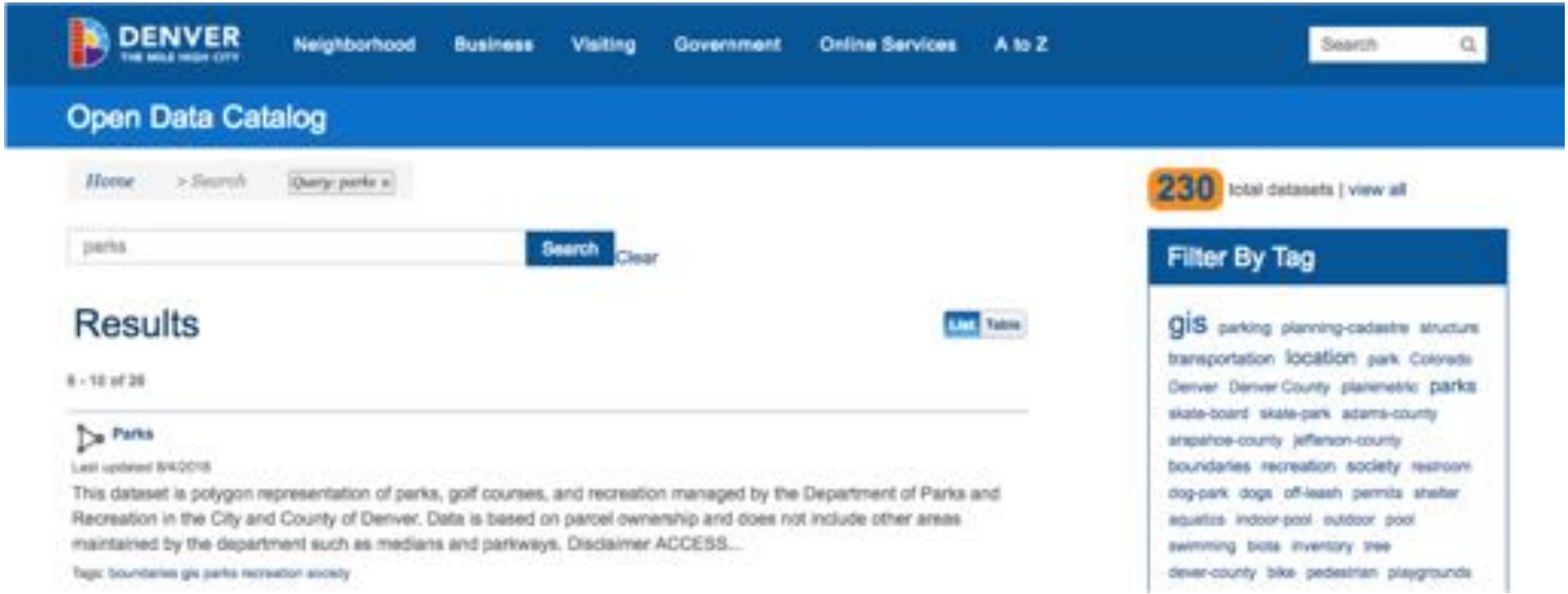
Do All Denver Students Have Equal Access to a Variety of Summer (Out of School) Resources?

Data Source 1: Blueprint4Summer



Program Data + Search Data

Data Source 2: Denver Open Data



Other resources: parks, libraries, playgrounds, rec centers, athletic fields (and we added museums)

Data Source 3: Census Demographics

- Median Household Income
- Race / Ethnicity
- Education Levels
- Age Breakdowns
- Language Besides English Spoken at Home

At *block group* level (American Fact Finder)

At *neighborhood* level (Denver Open Data)

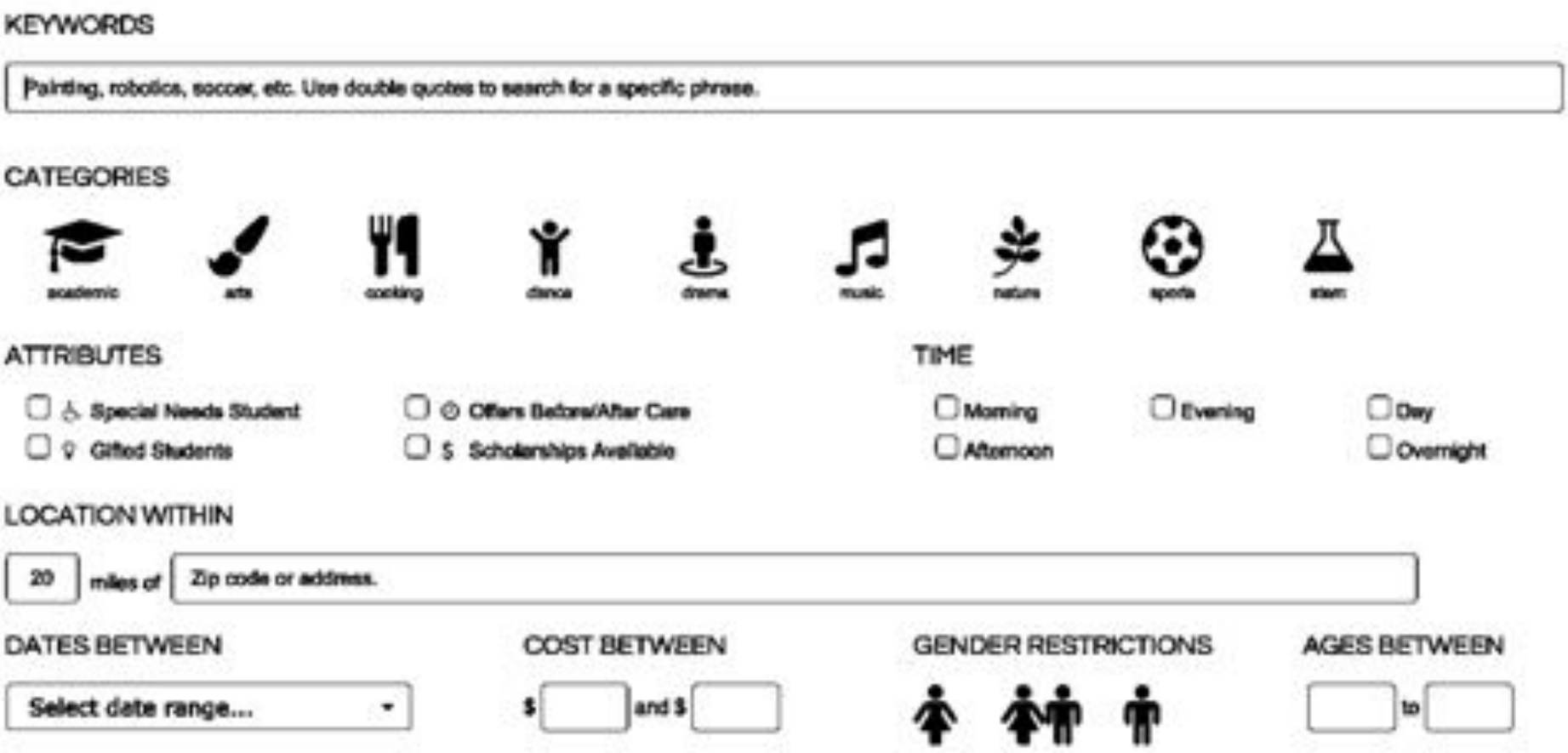
Data Source 4: Denver Public Schools

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

Building a Tool for Visualizing and Investigating the Data

R Shiny Dashboard

Data Source 1: Blueprint4Summer



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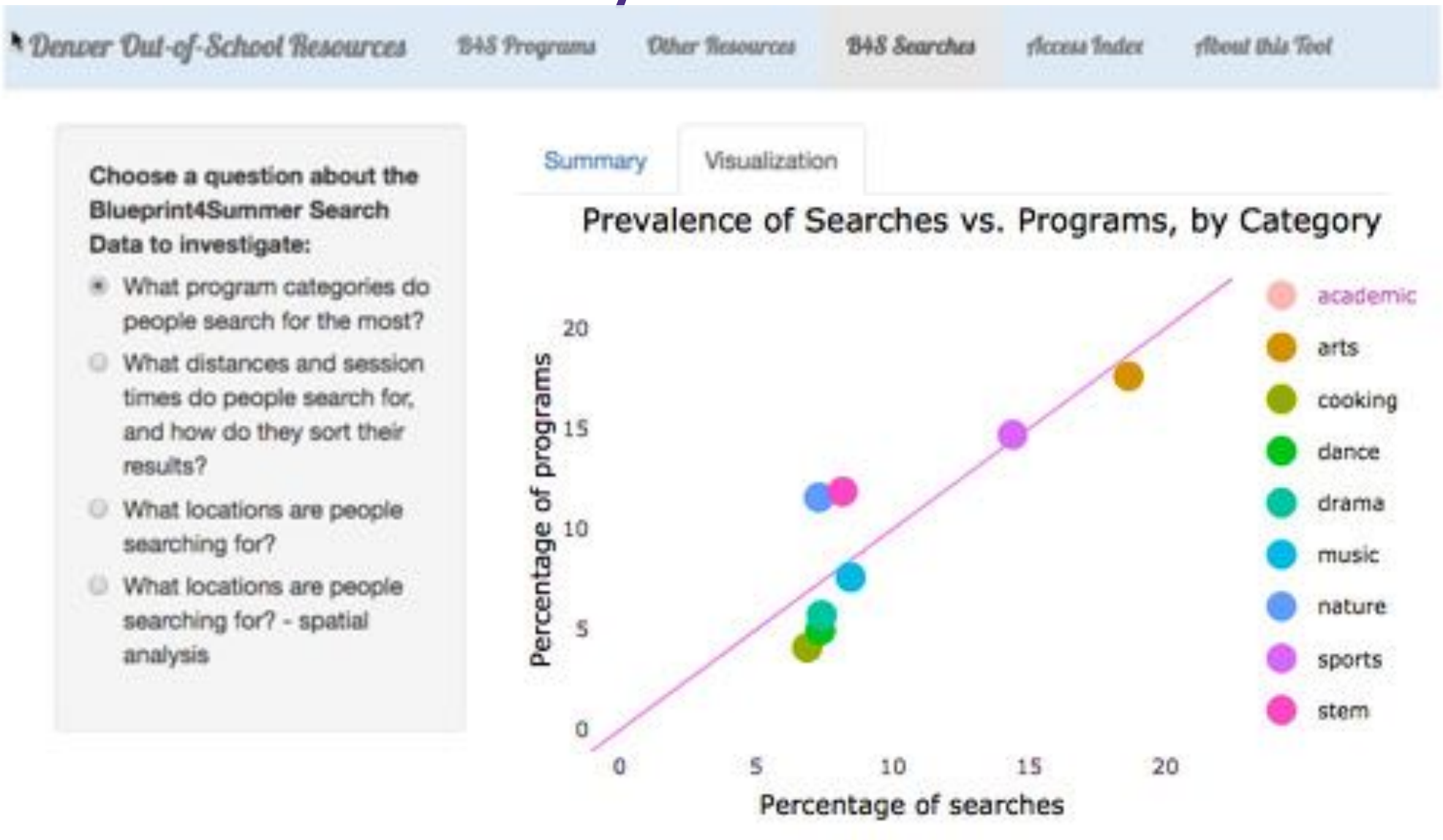

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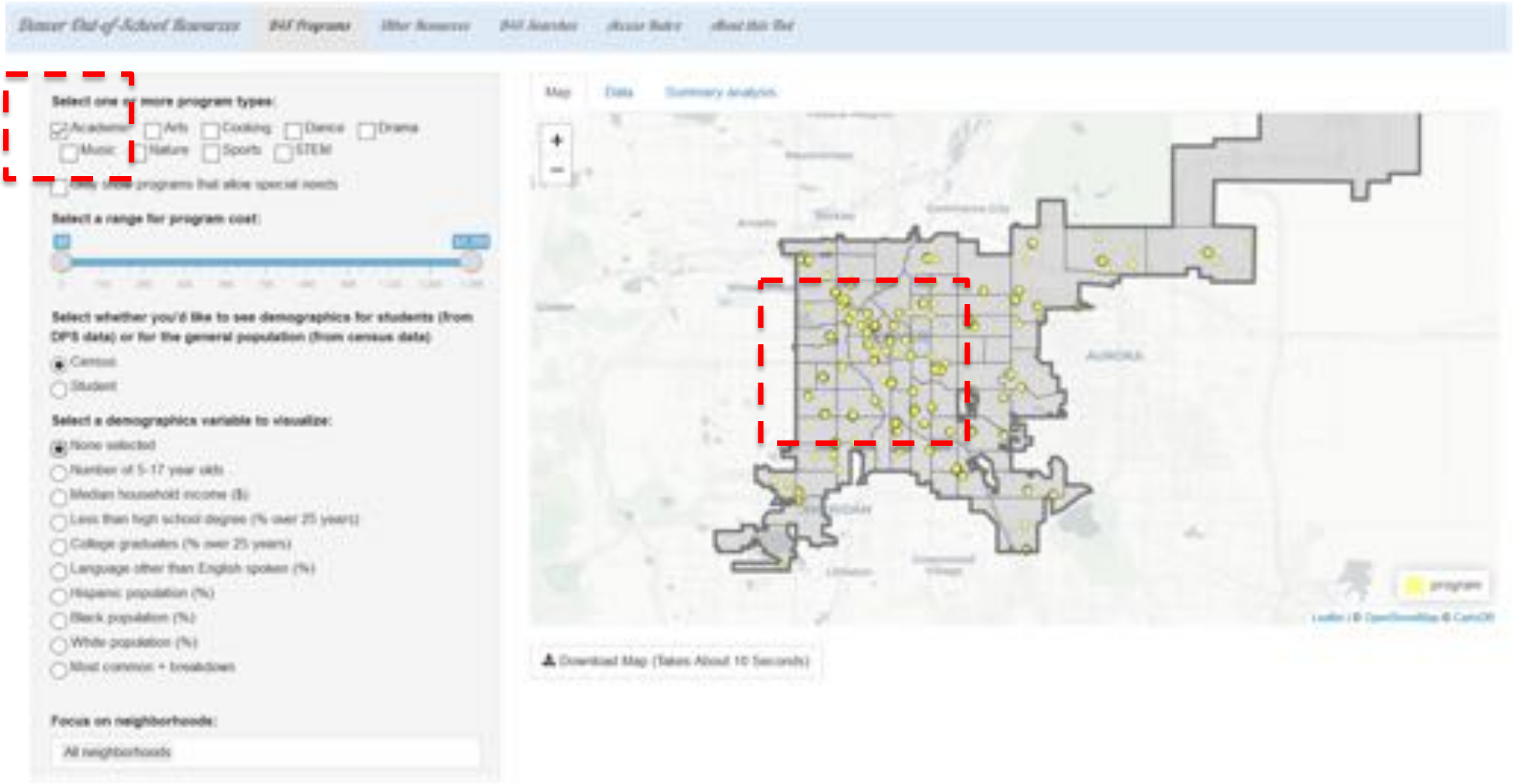

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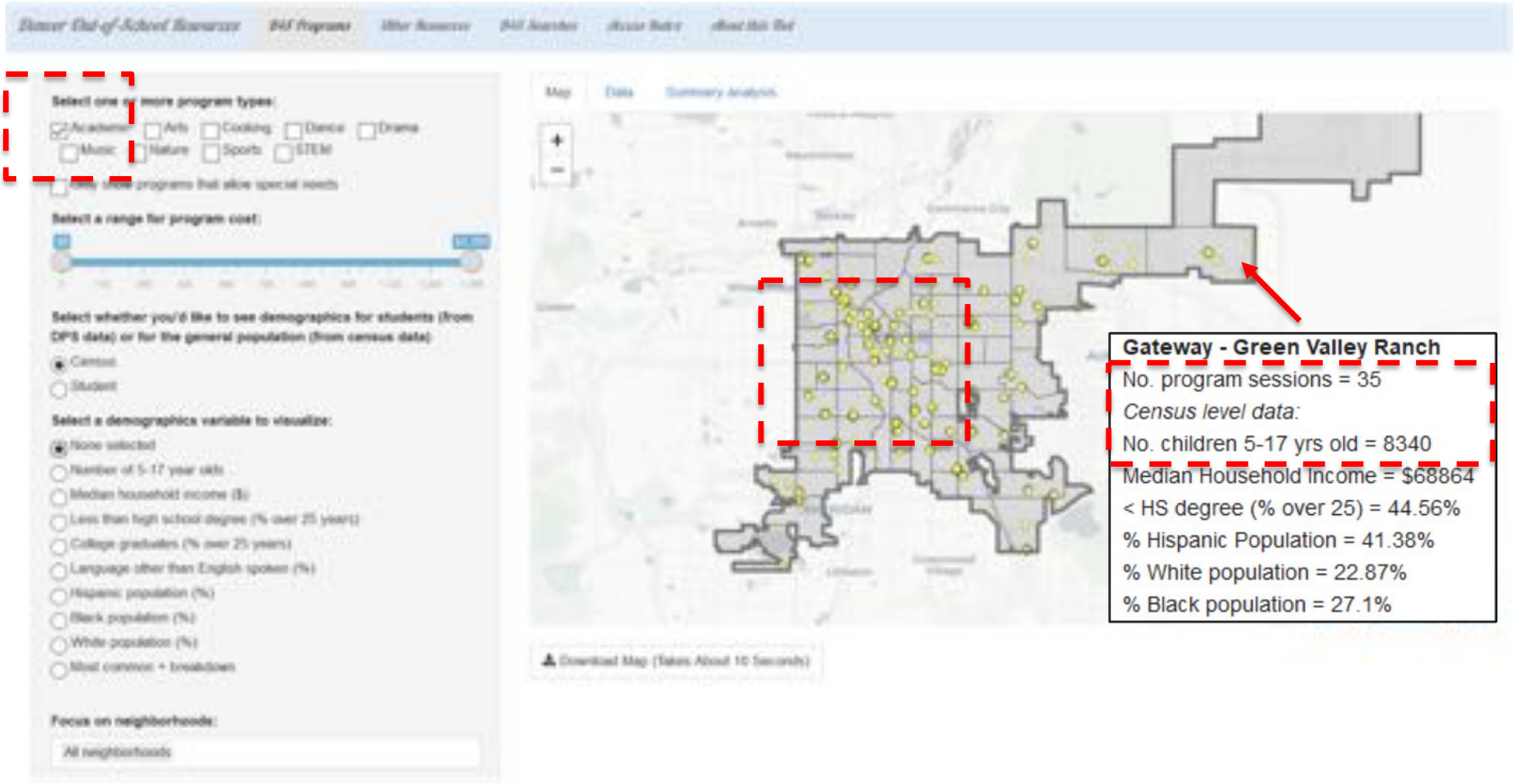

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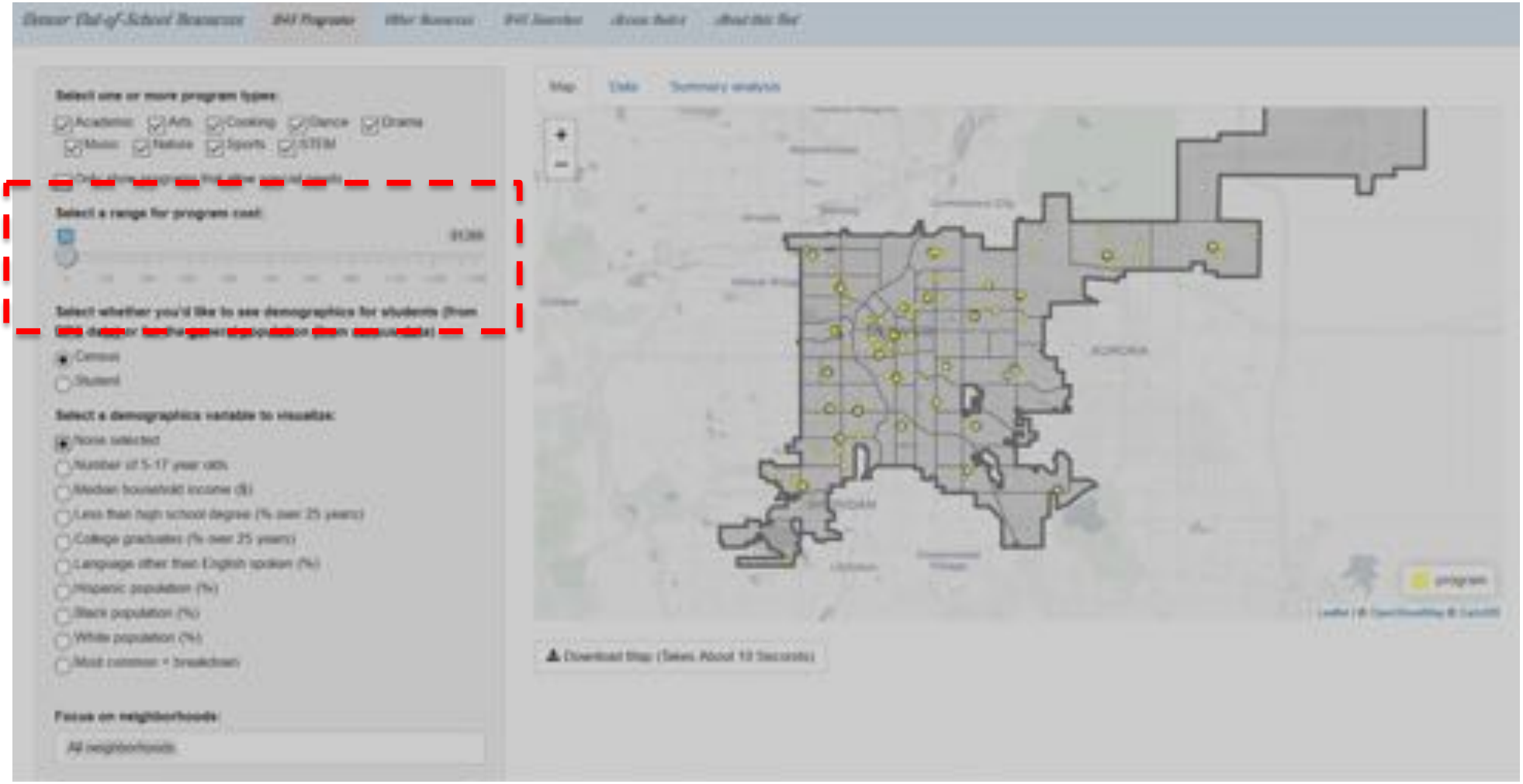

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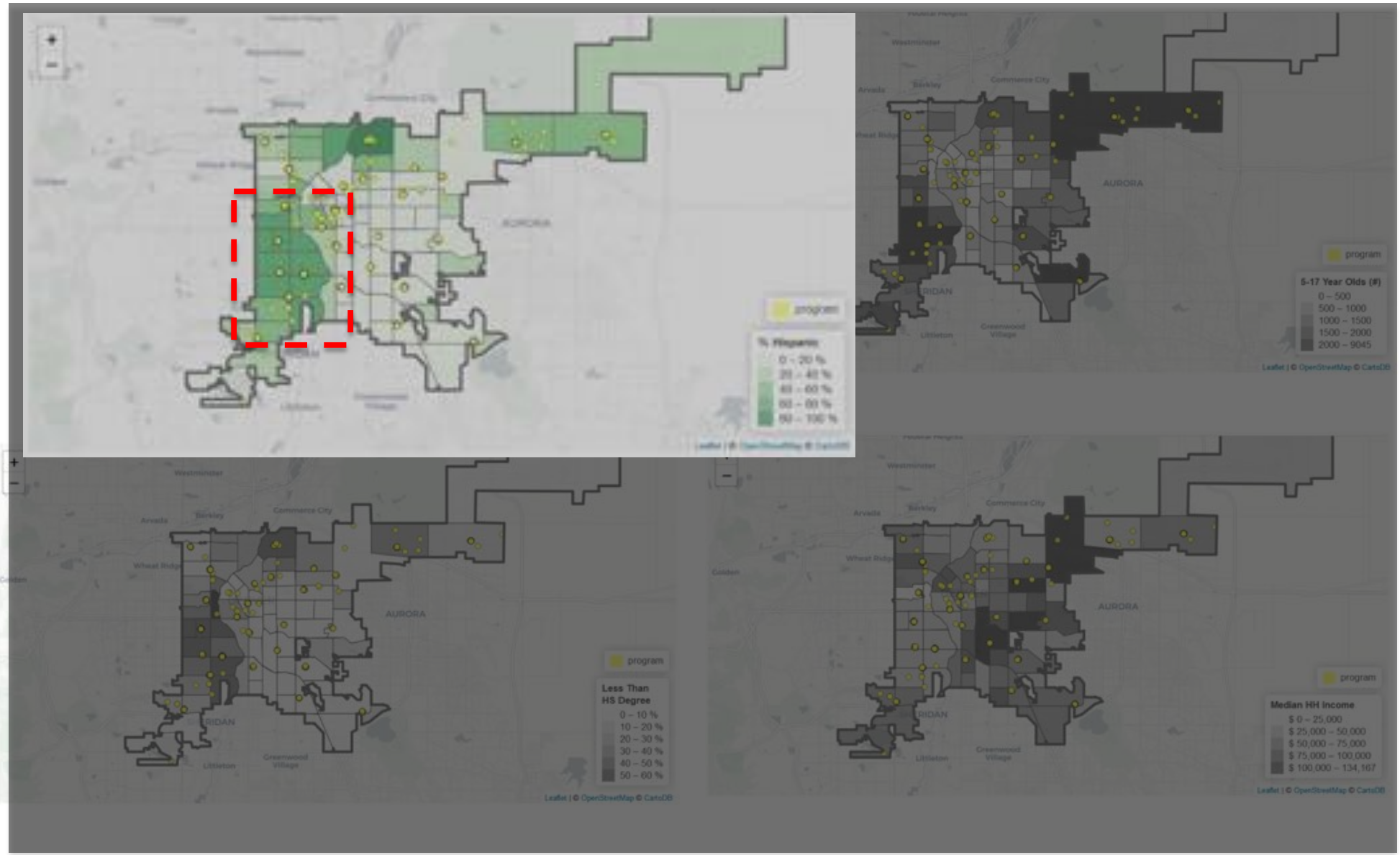

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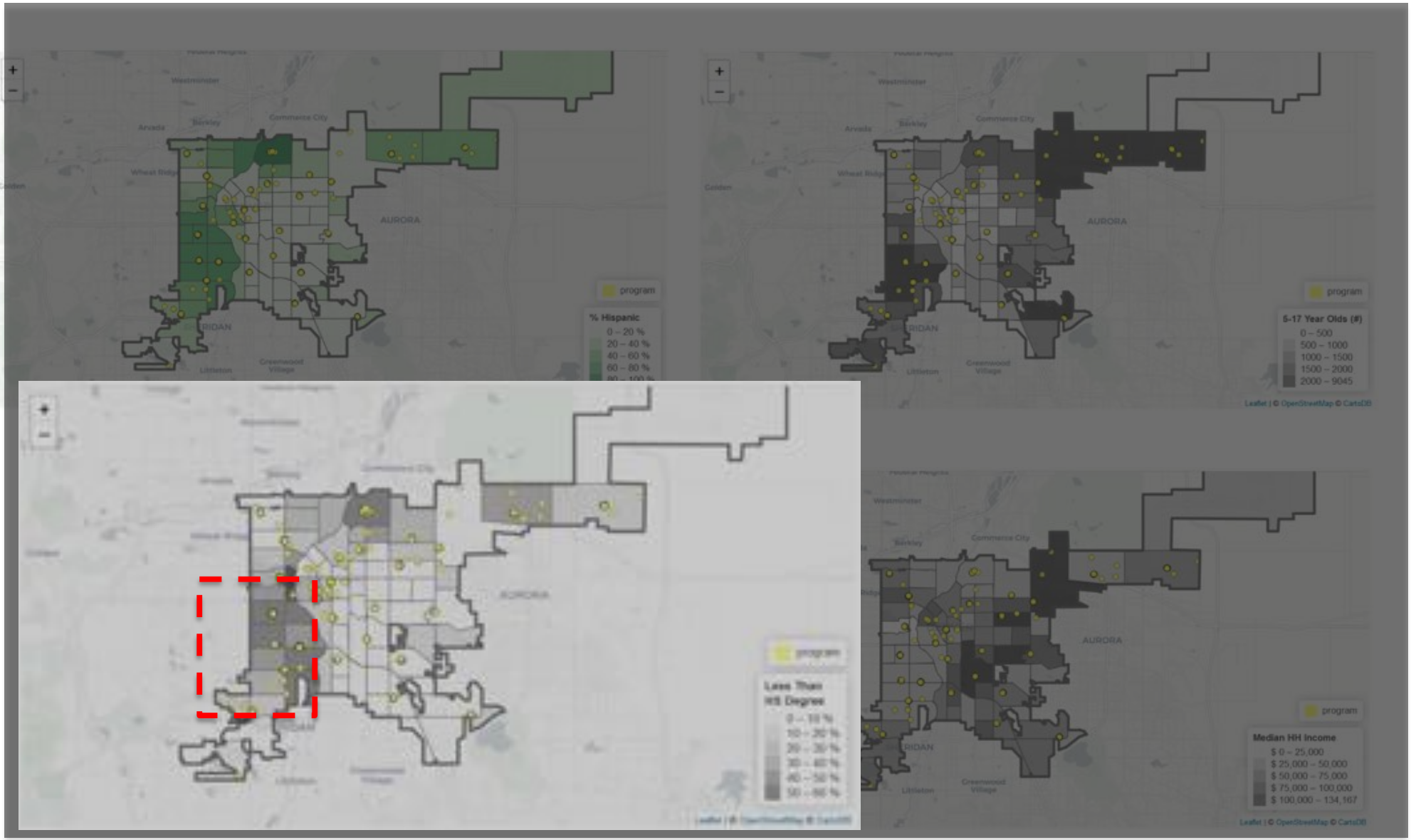

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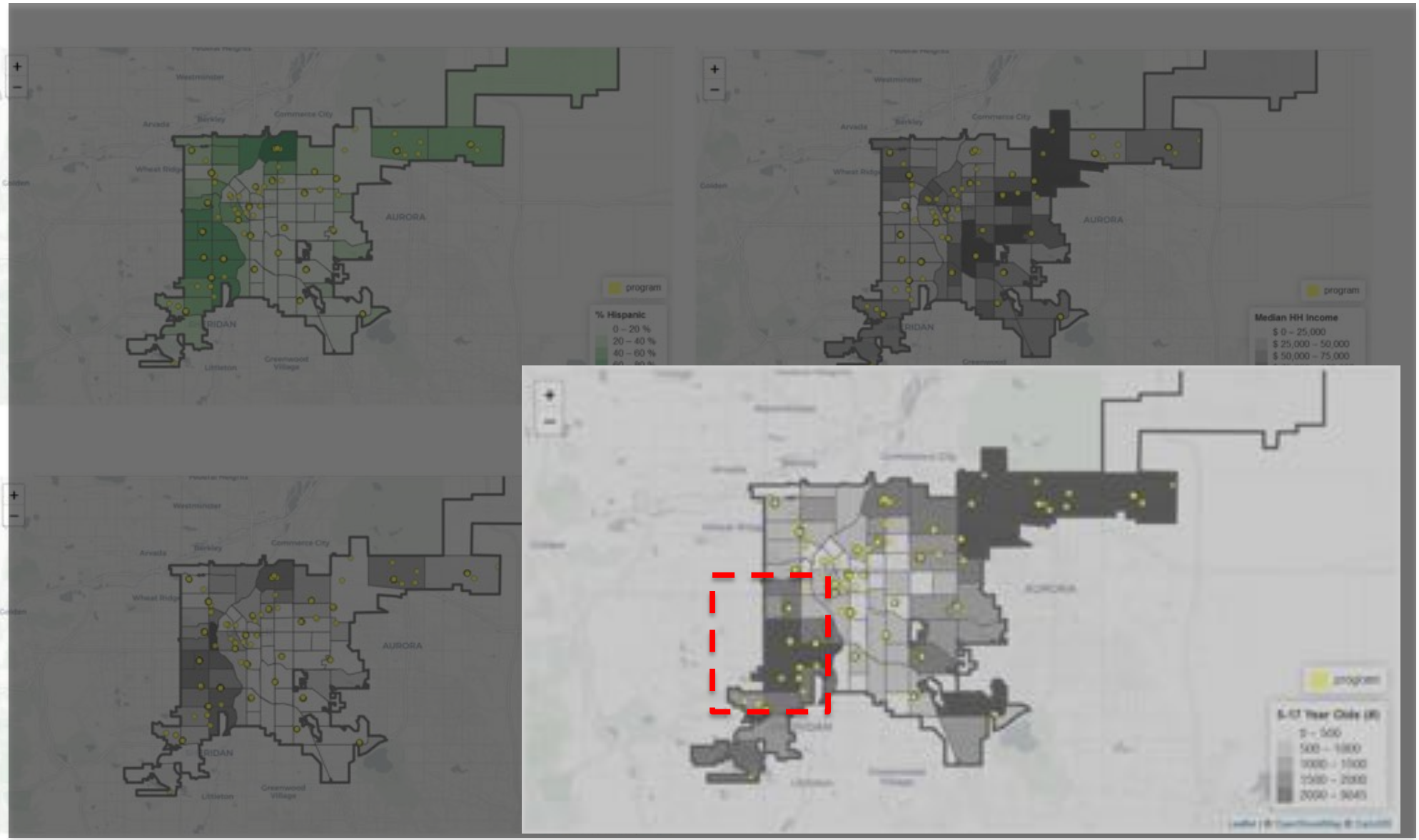

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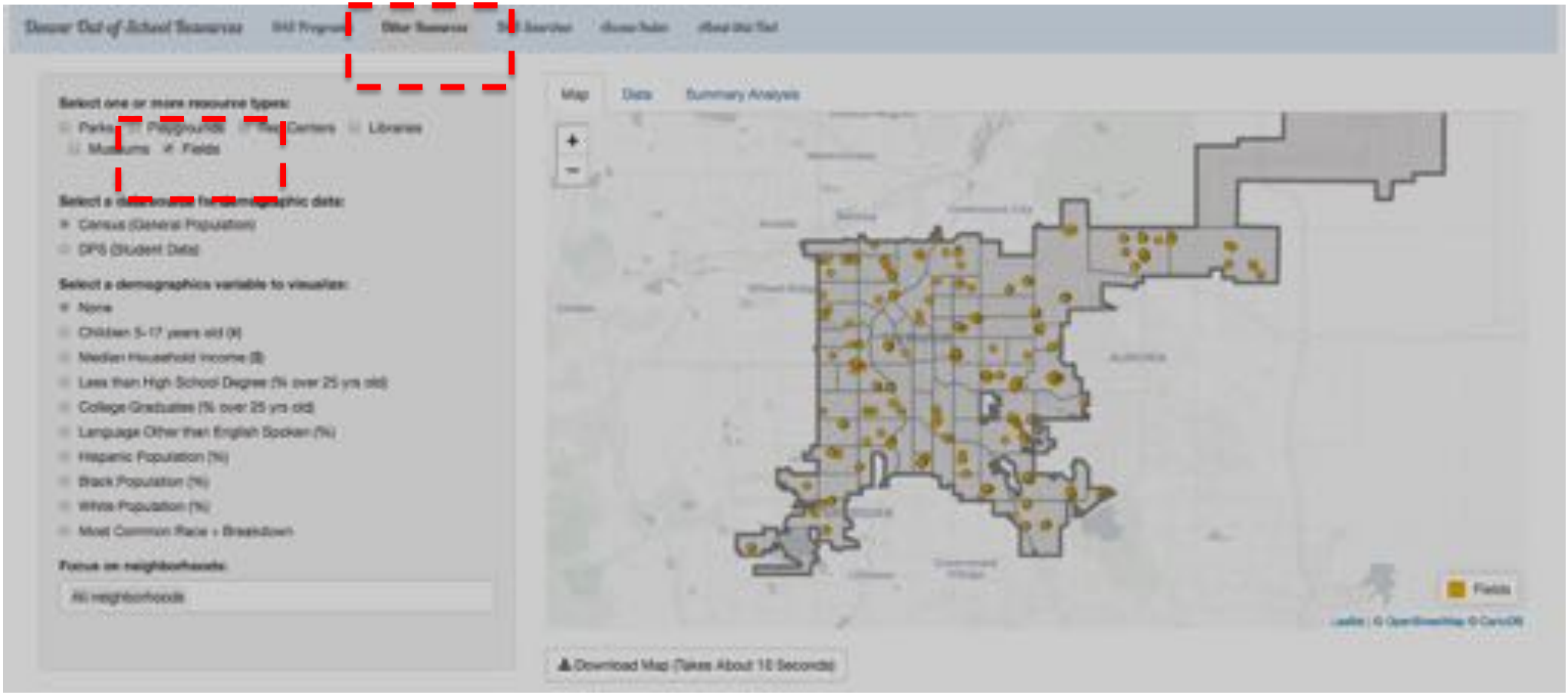

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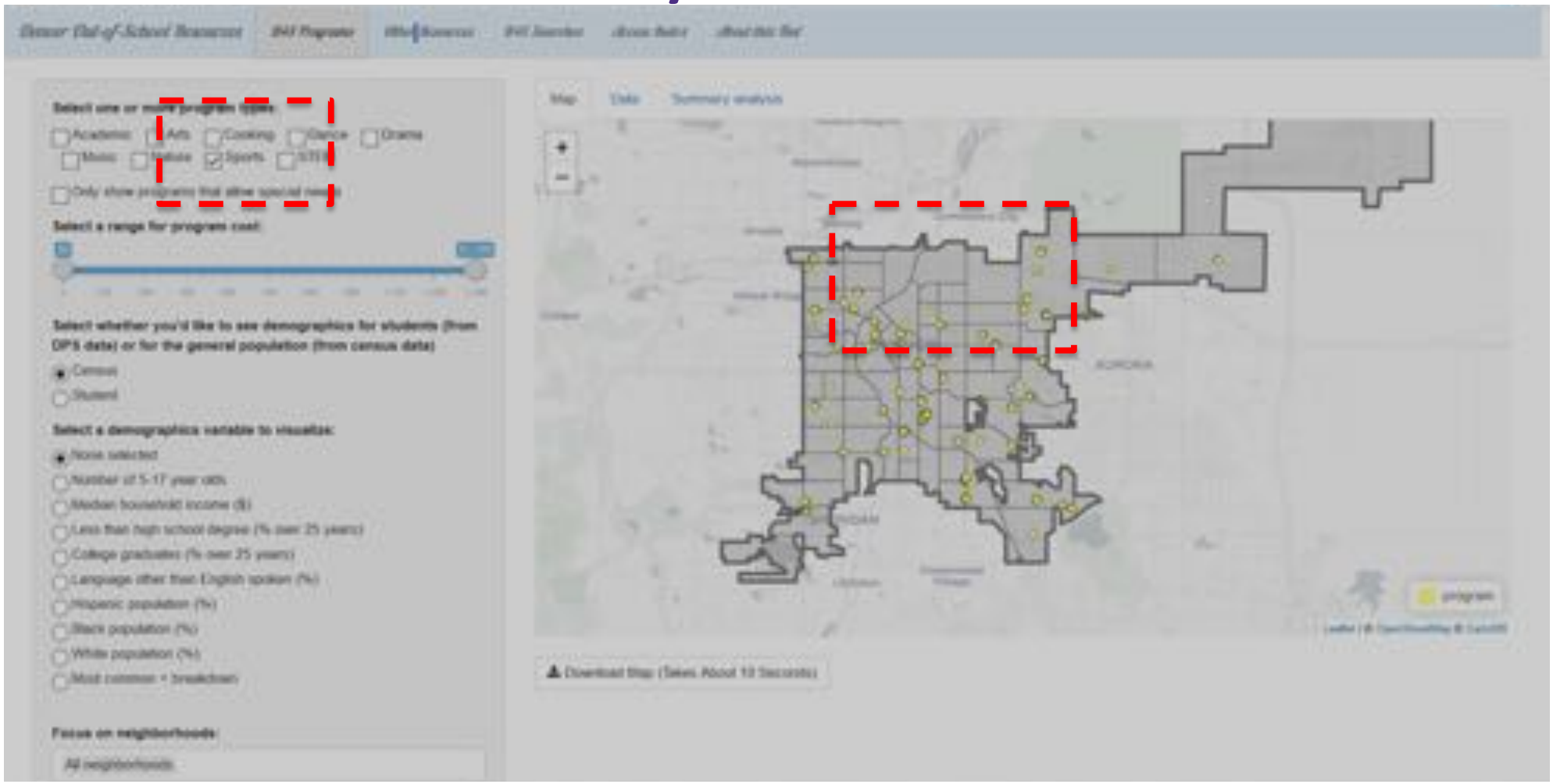

Access Index:
Measuring Access to Summer Programs in Denver

Access Index

Access Index

- Ability to access all program decays with the time it takes to reach the program

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  - Gravity-based decay function: $f(T) = \frac{1}{(1 + T/5min)^2}$

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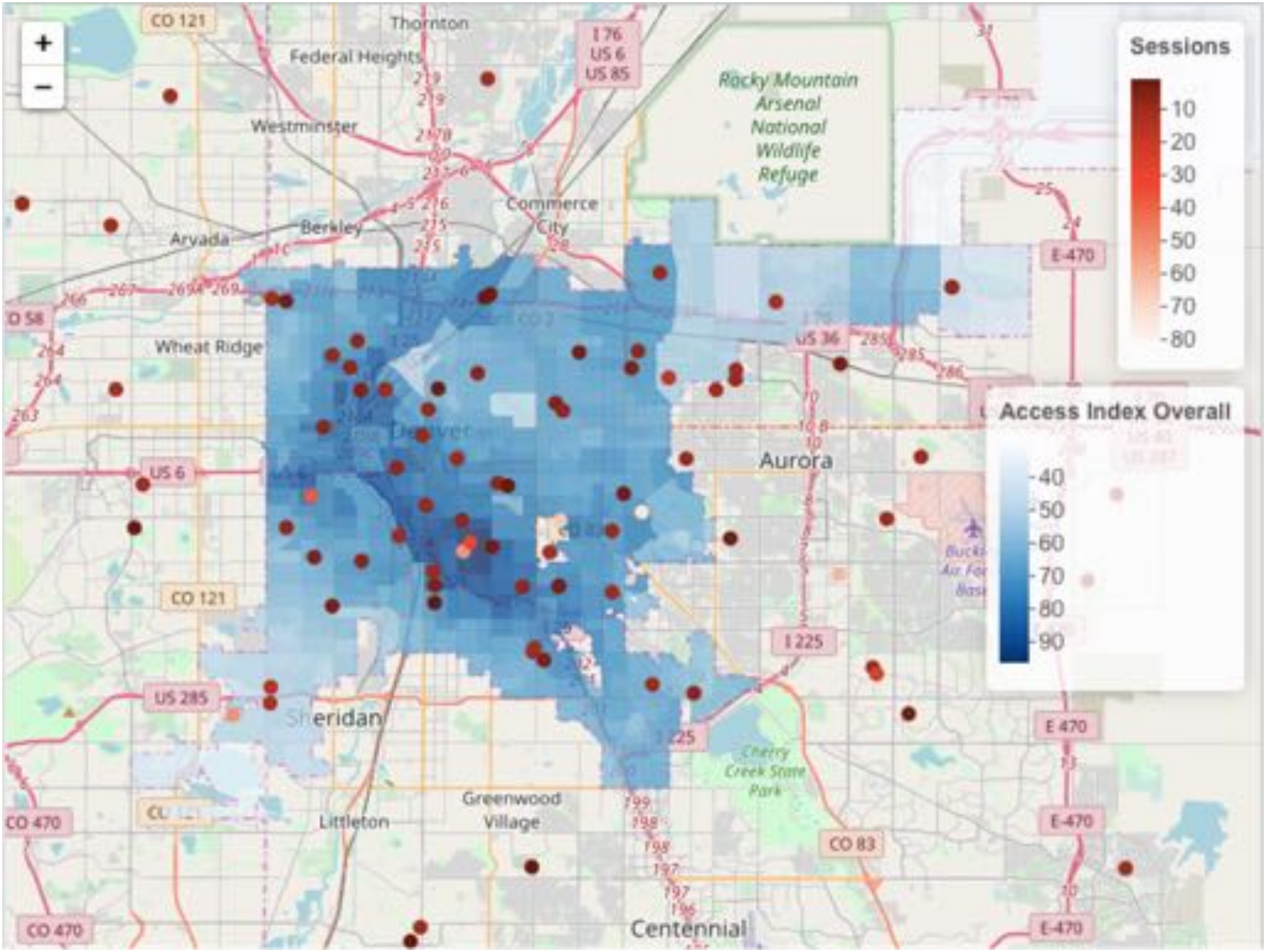
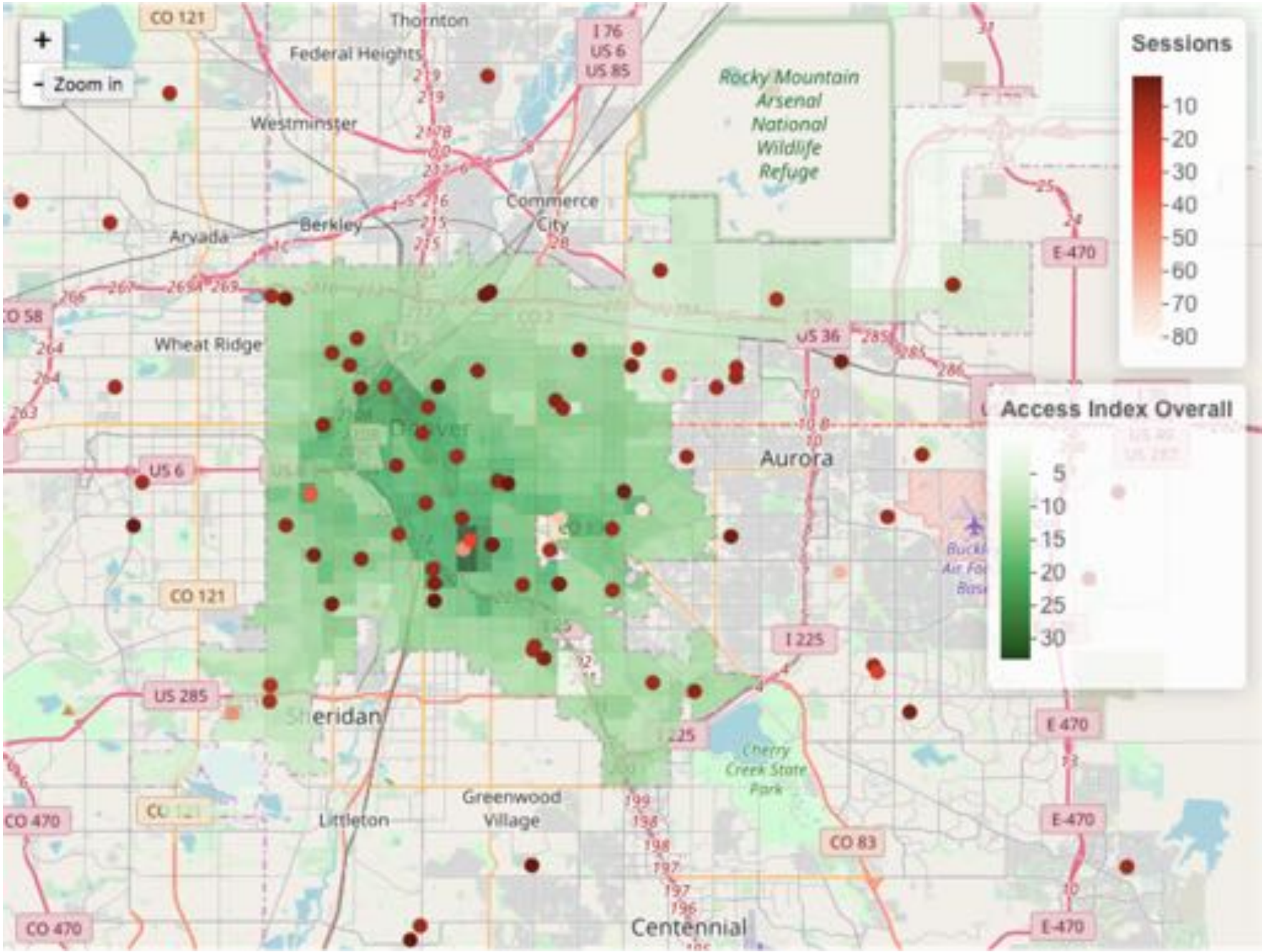
- Access Index is a 0-100 measure, for each block group, of the *total* access to programs
  - Flexible by type of program, e.g. restrict to free programs and/or academic programs

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

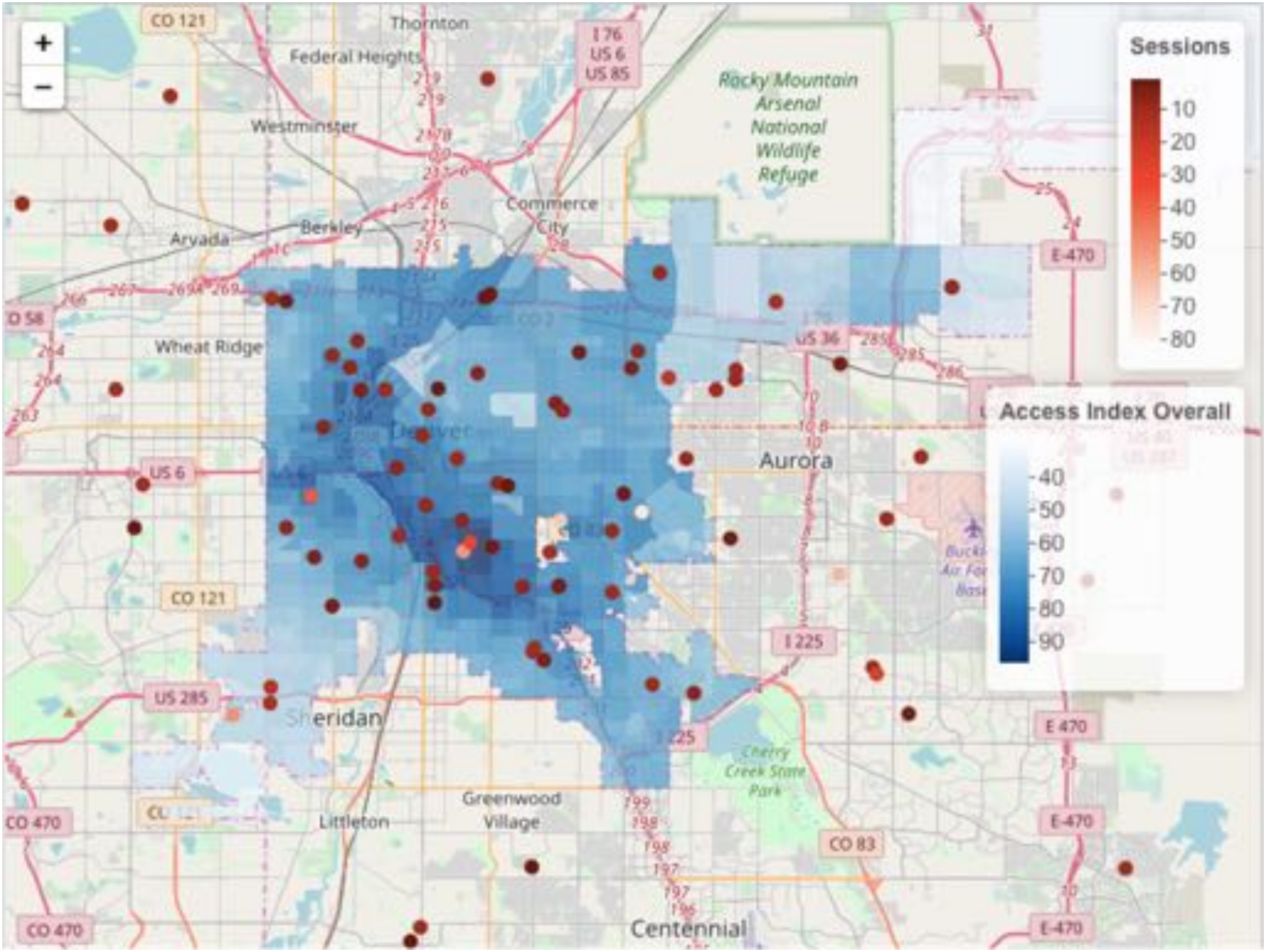
Access Index: All Programs, Driving



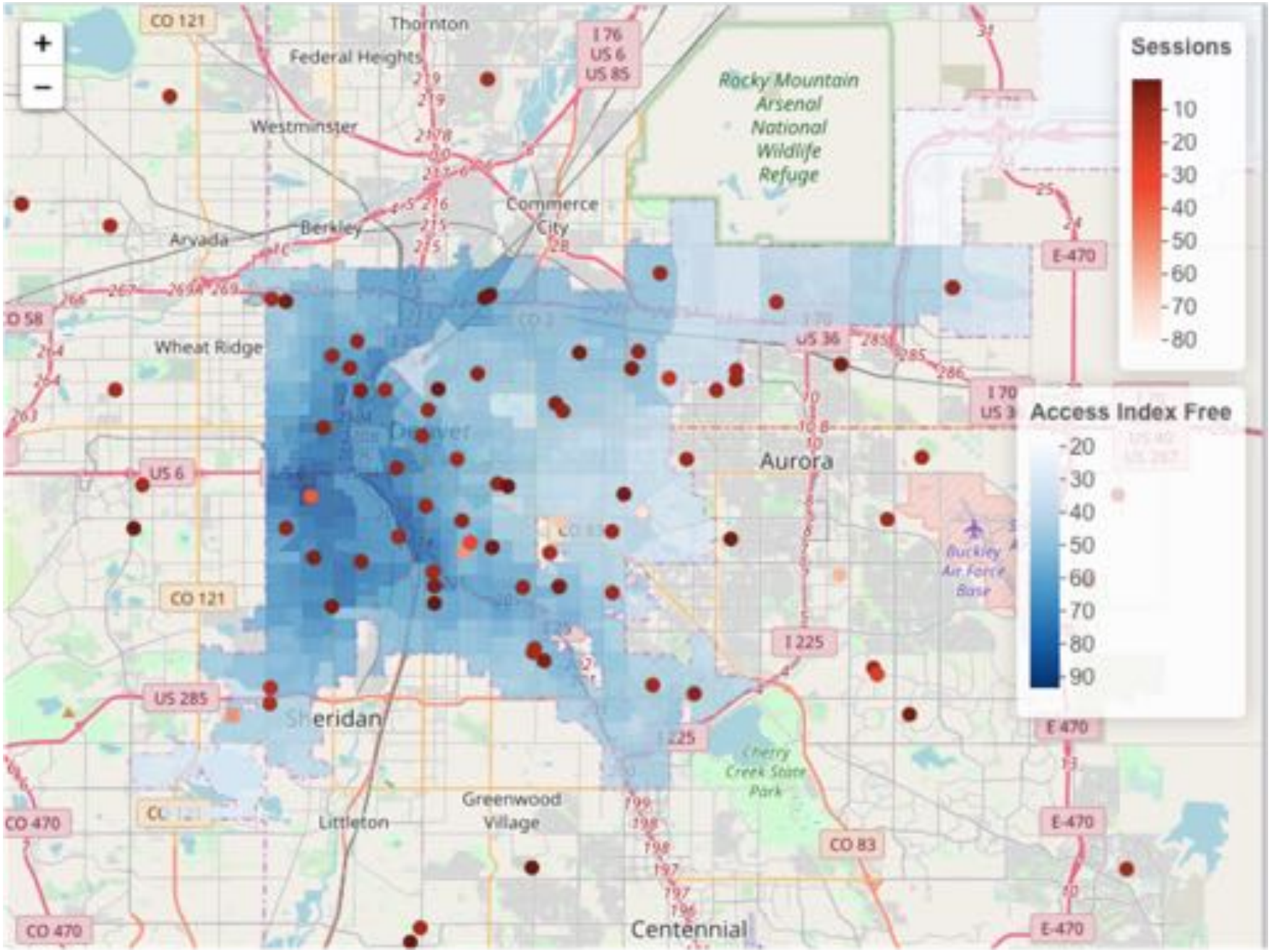
Access Index: All Programs, Transit



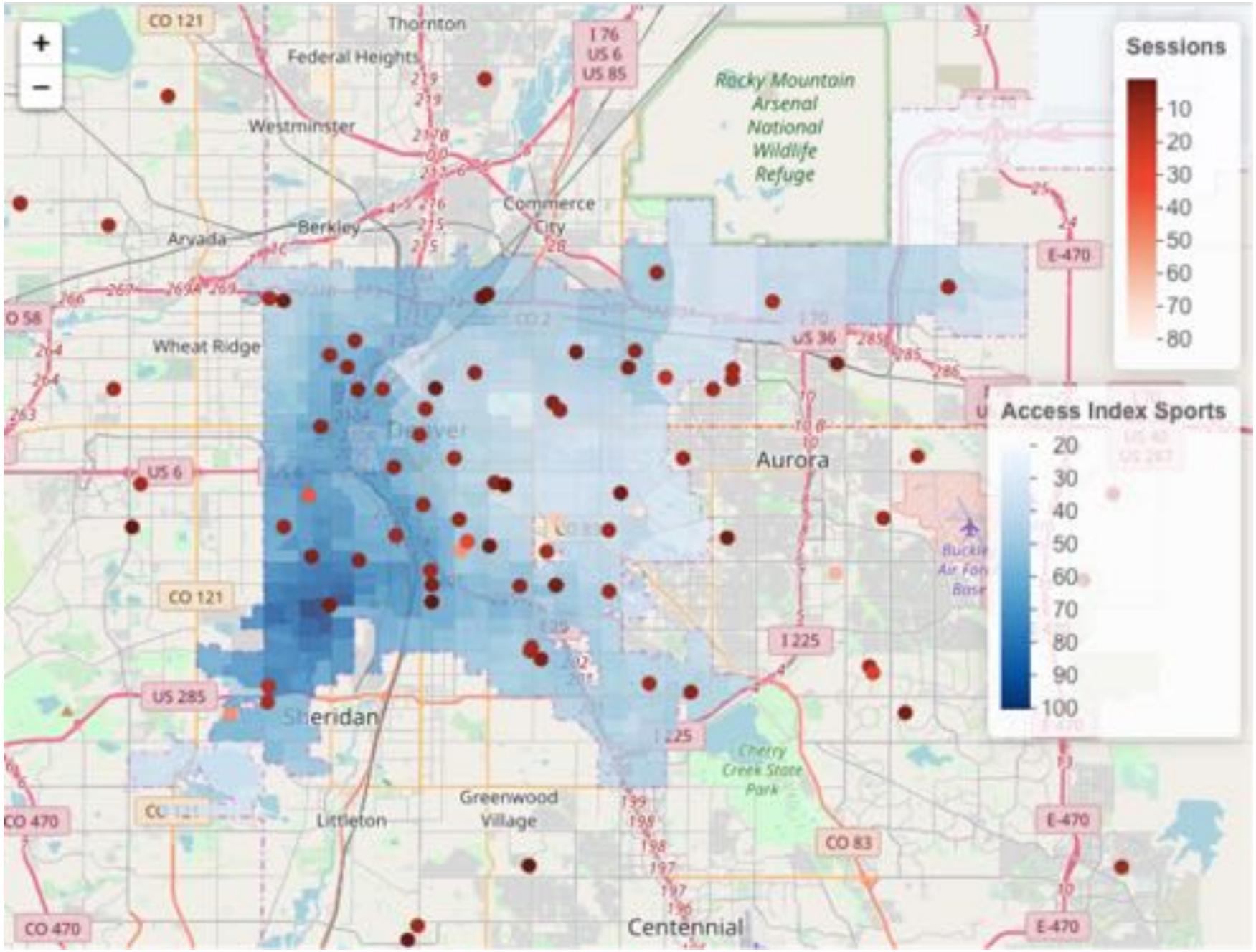
Access Index: All Programs, Driving



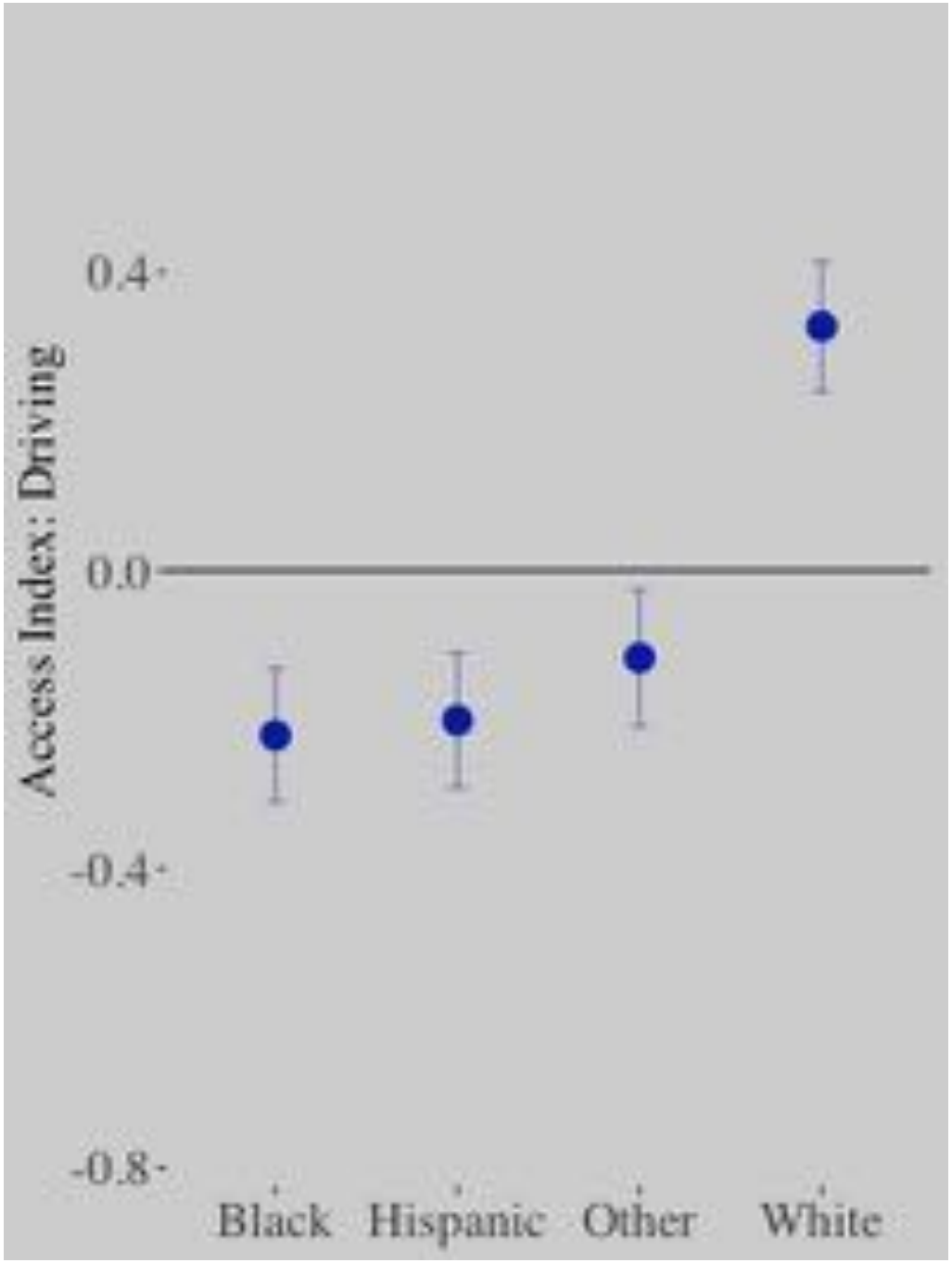
Access Index: Free Programs, Driving



Access Index: Free Sports Programs, Driving



Overall vs. Free Access Index by Race



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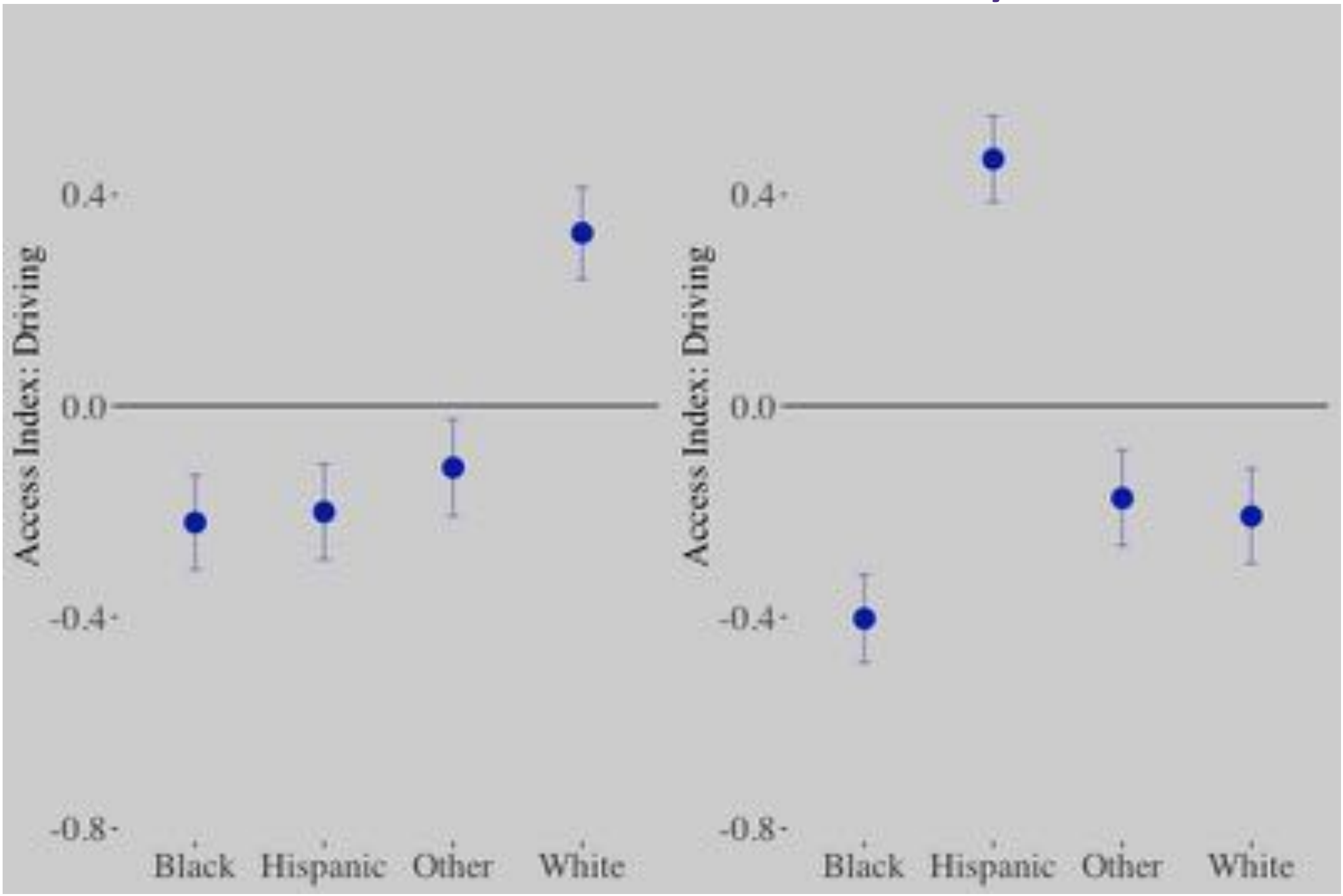

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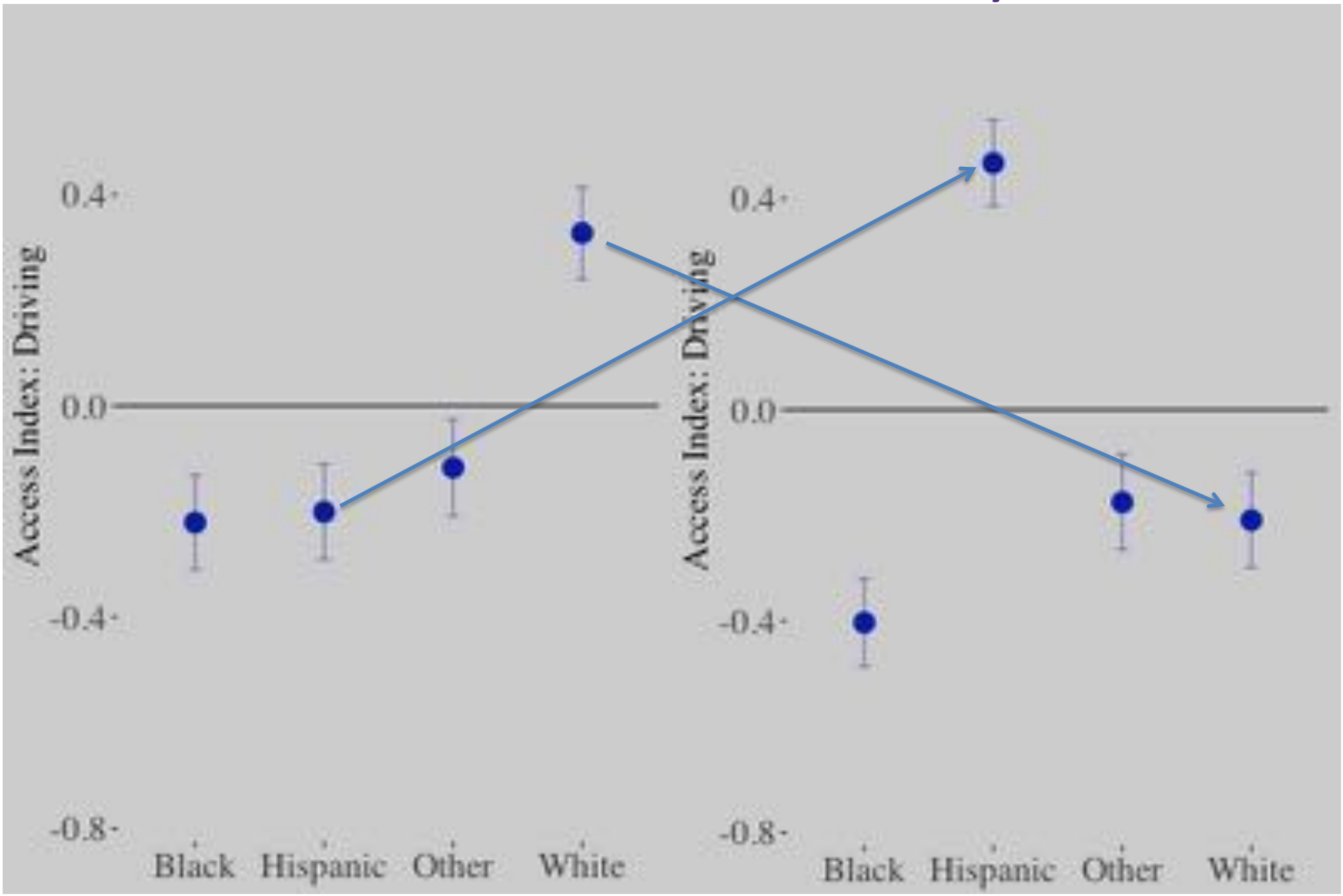

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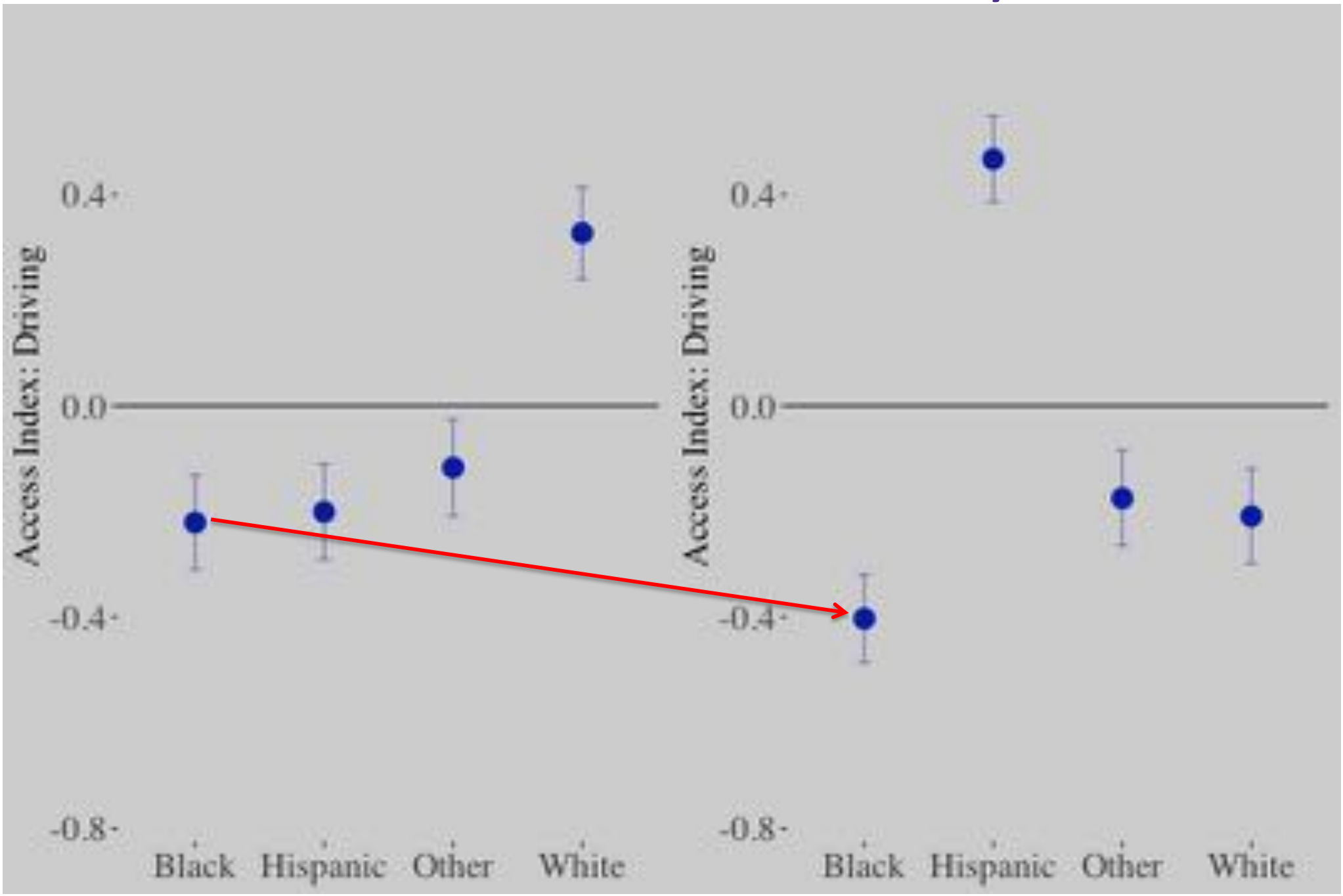
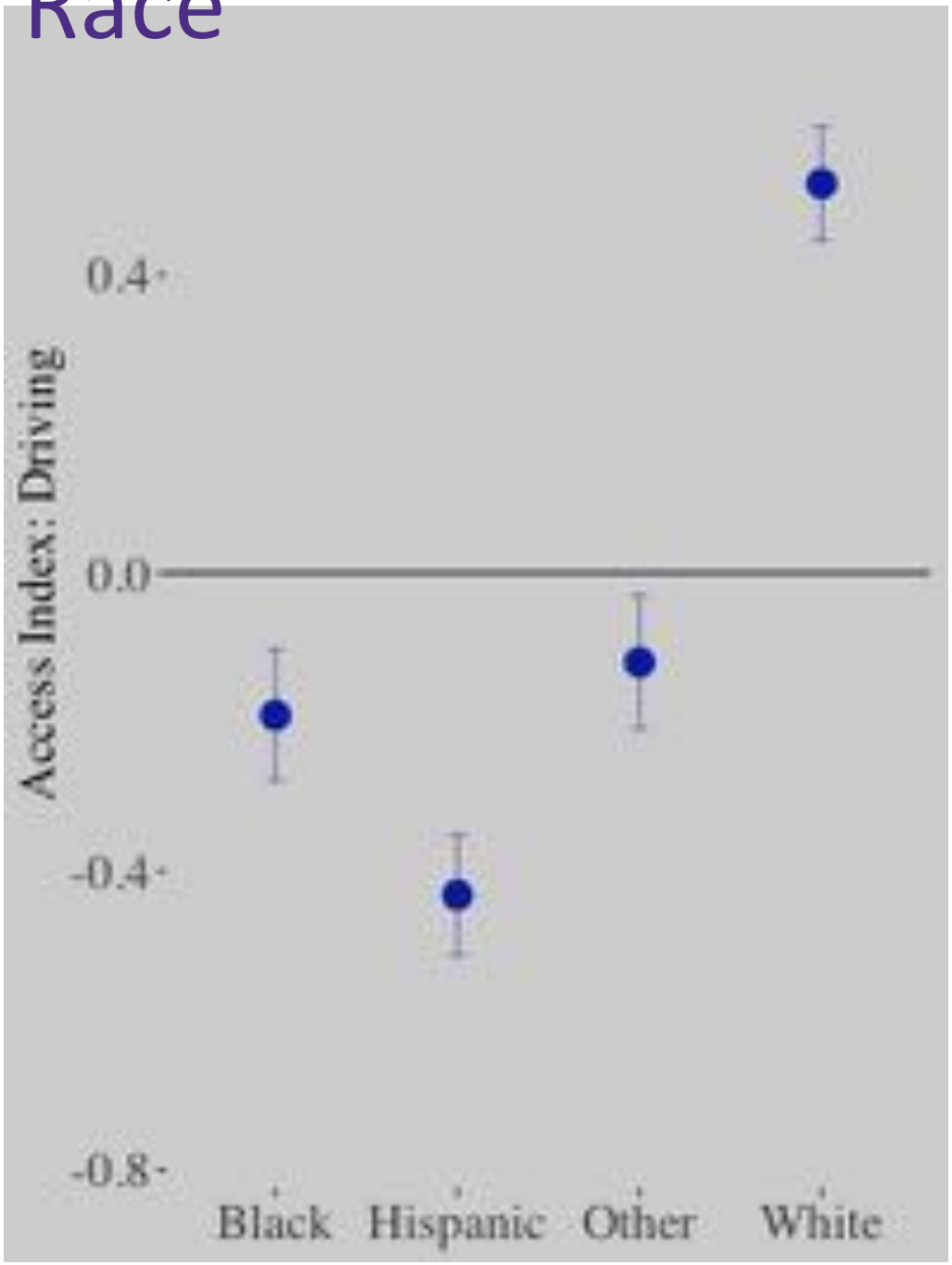


Sports Overall vs. Free Access Index by Race



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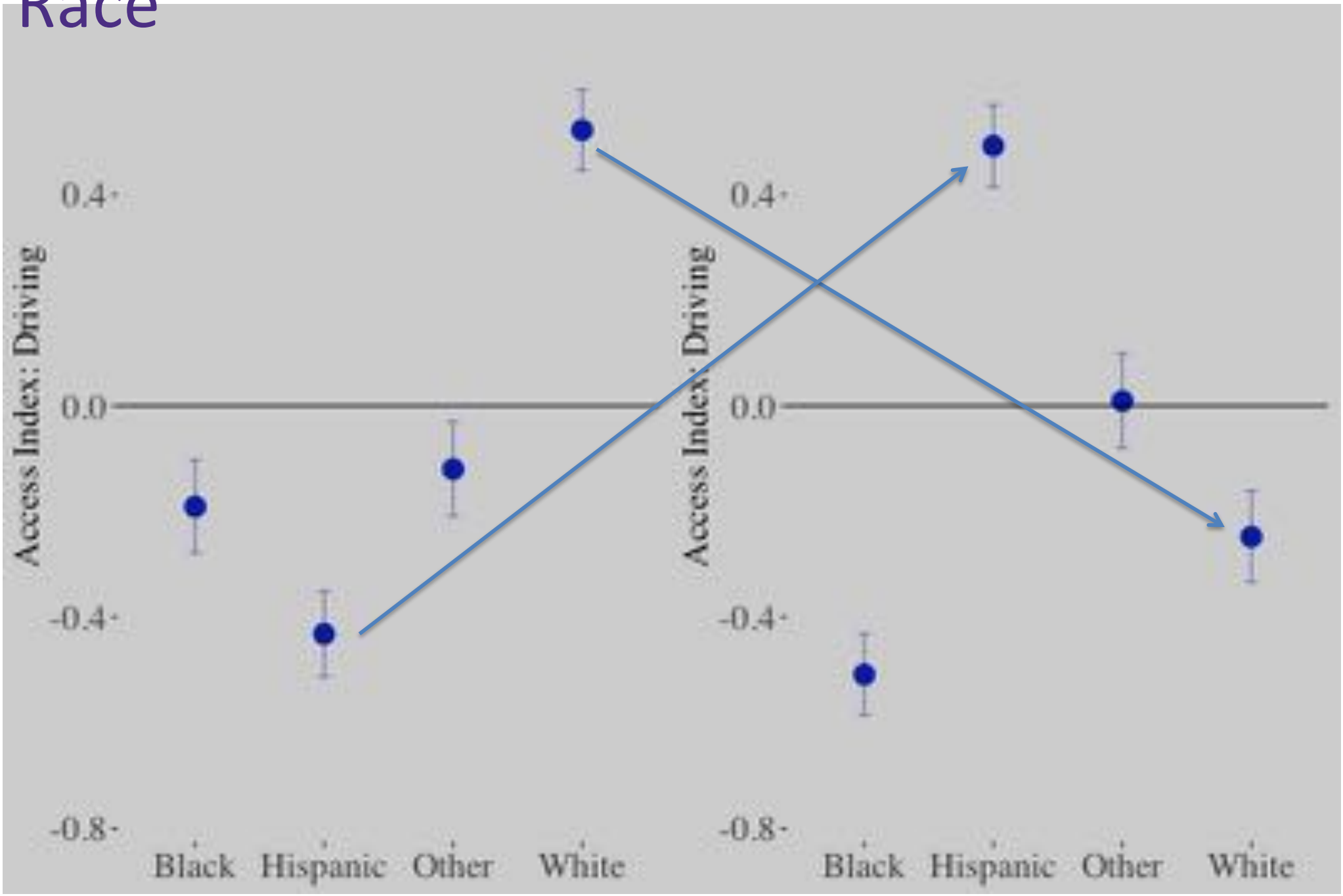

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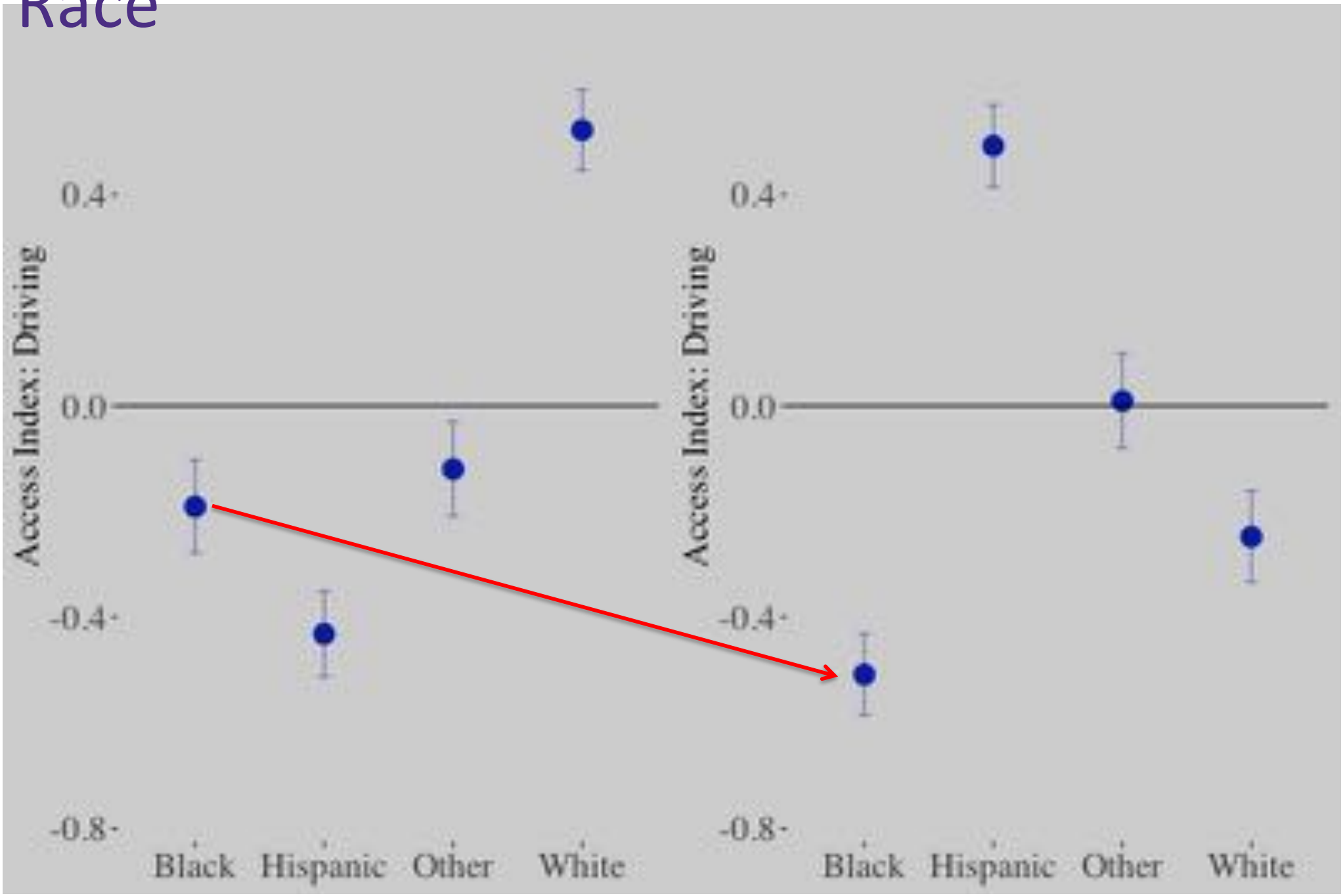
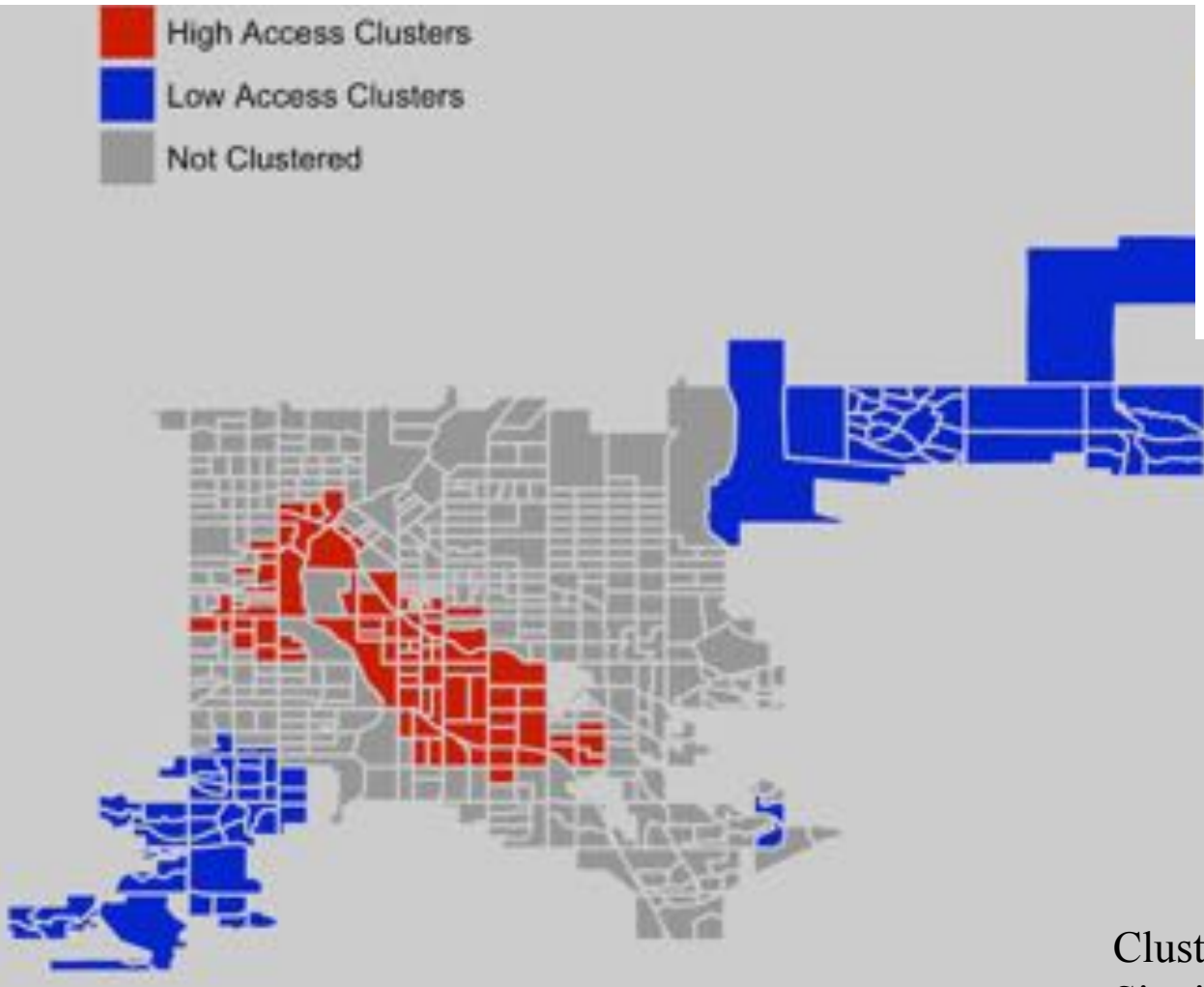


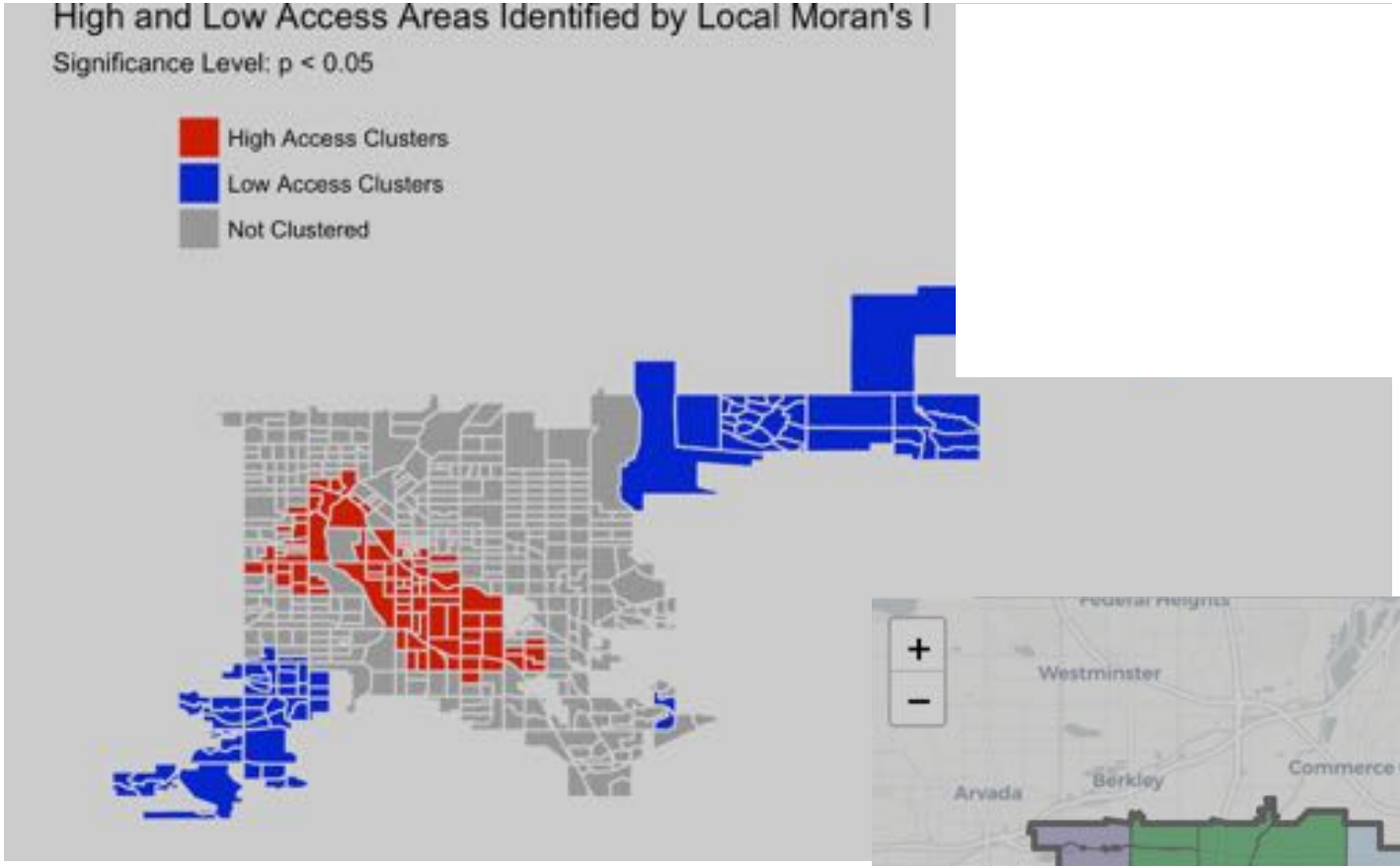
Returning to Our Question:

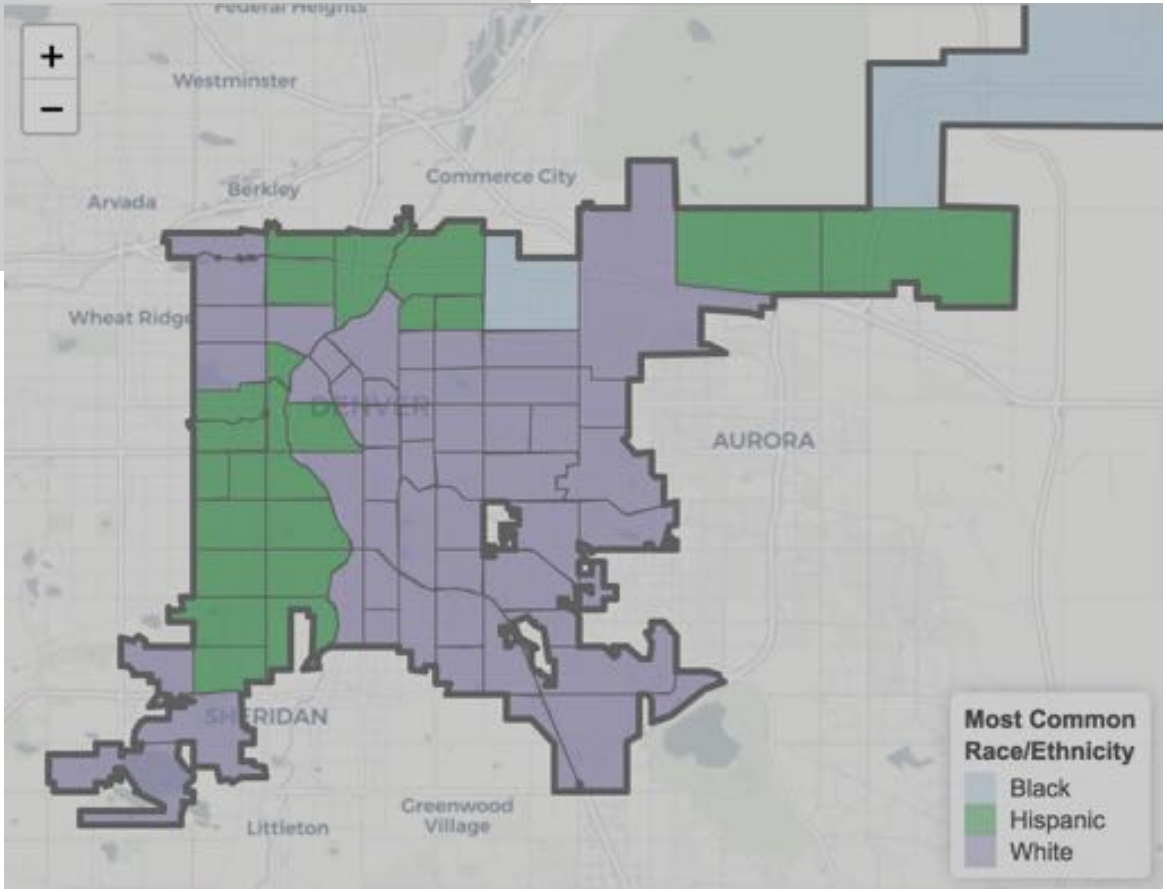
Do All Denver Students Have Equal Access to a Variety of Summer (Out of School) Resources?

Which areas have high/low access generally?

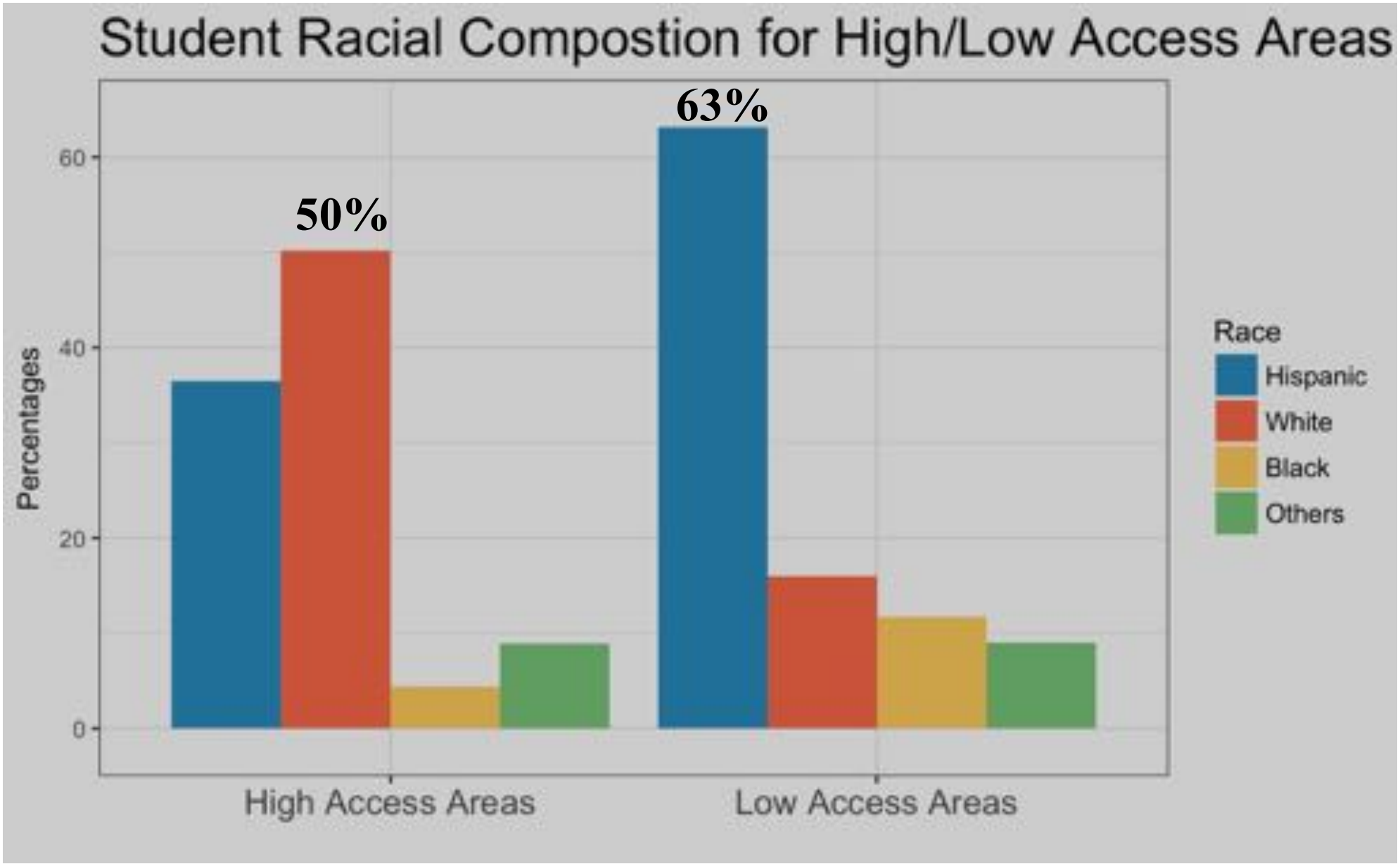


Clusters Identified by Local Moran's I,
Significance Level: $p < 0.05$


High and Low Access Areas Identified by Local Moran's I
Significance Level: p < 0.05
High Access Clusters
Low Access Clusters
Not Clustered


Westminster
Arvada
Berkley
Commerce City
Wheat Ridge
AURORA
Littleton
Greenwood Village
Most Common Race/Ethnicity
Black
Hispanic
White

Who is more likely to have high access?



Access Index by Student Race and Program Types

	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

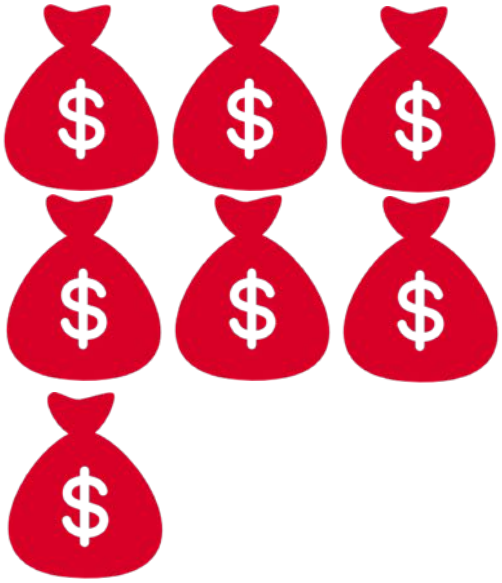
Who is more likely to have high access?

Household Income

$ 10,000

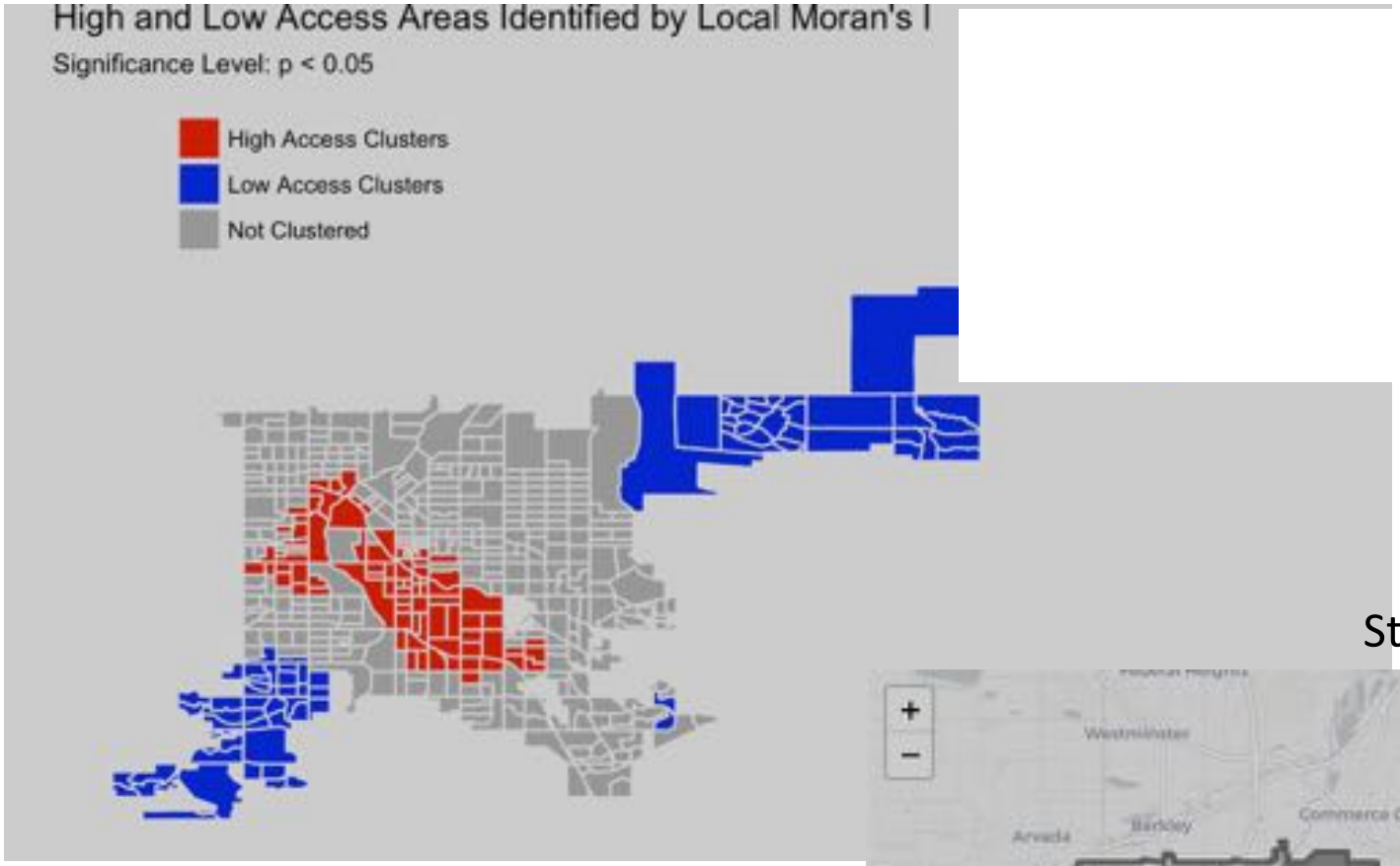
College Graduates

10 %

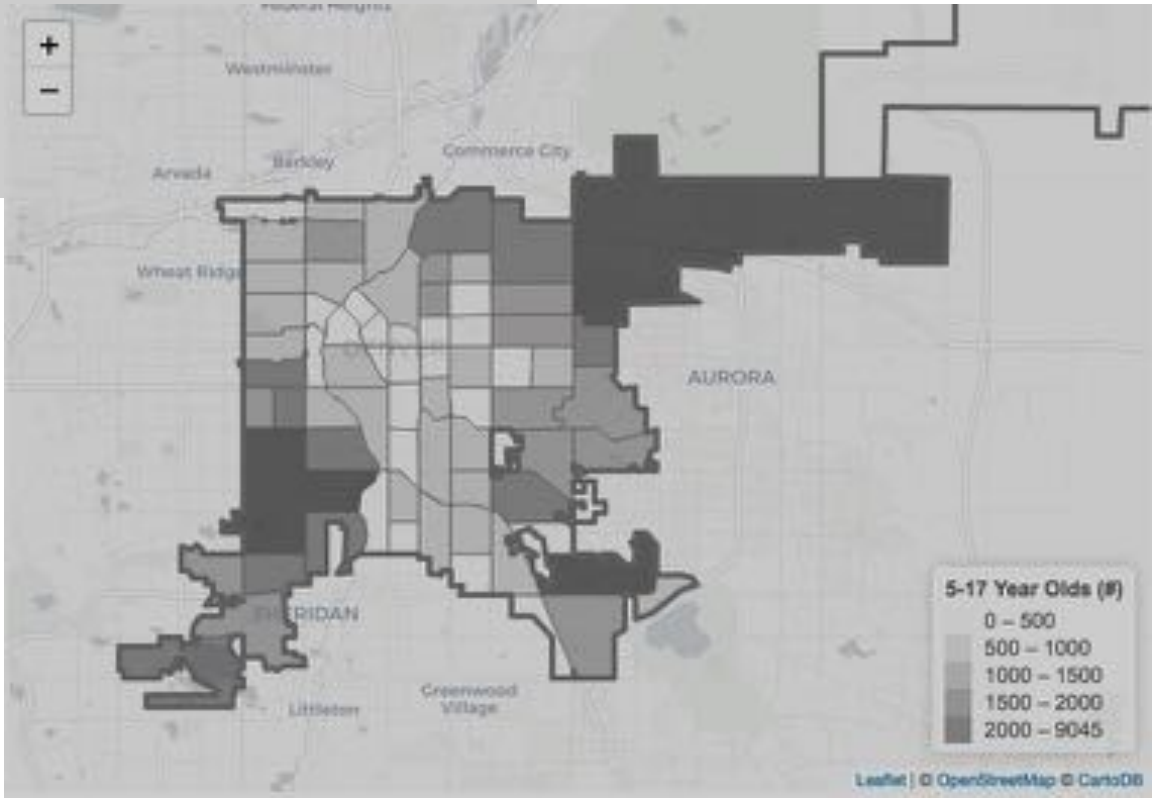


High Access Areas

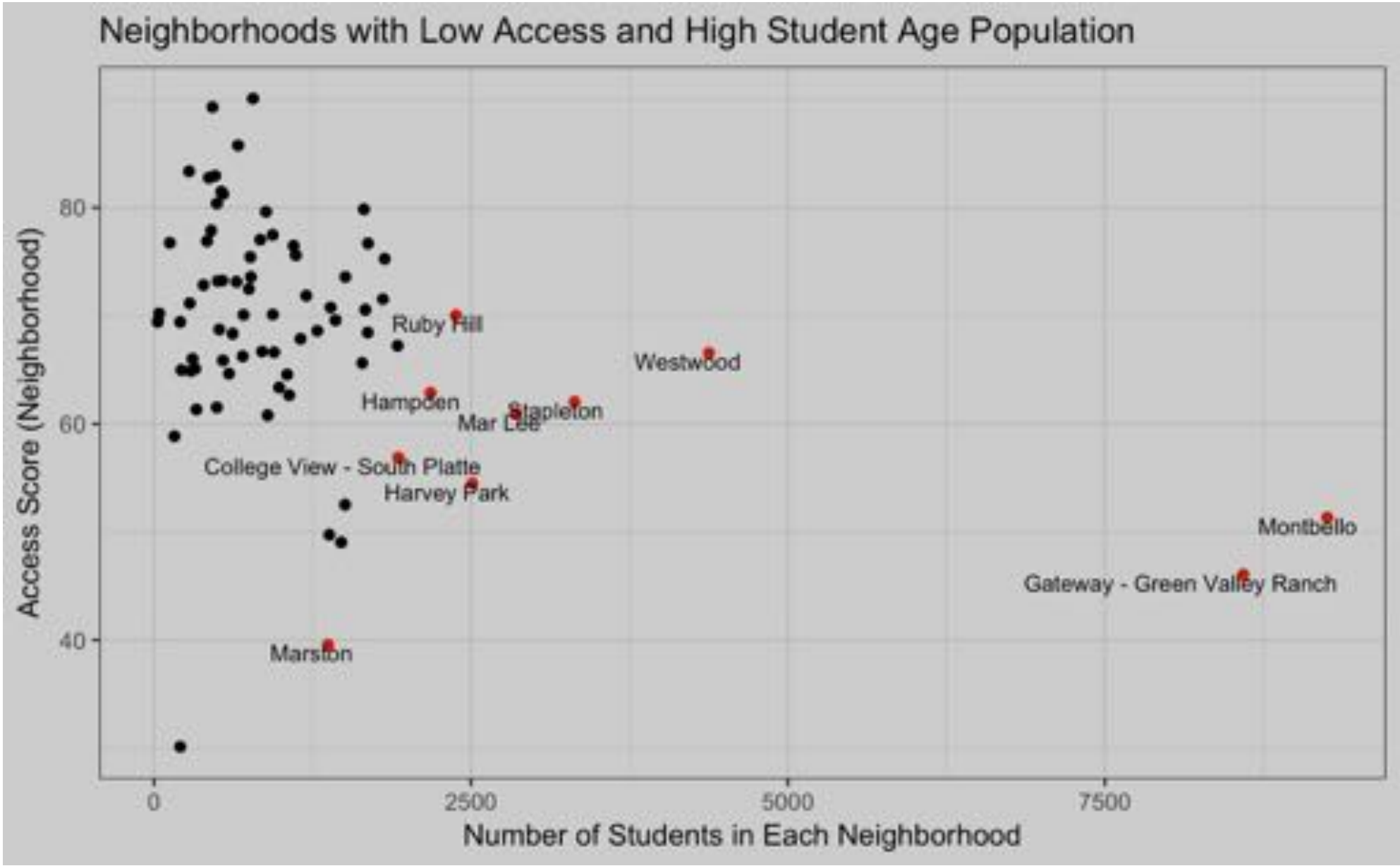
Low Access Areas



Student-Age Population Map



Equity of Access



Concluding Remarks

- Identified key areas of the city and demographic groups with high/low access

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- Information can help address “summer slide” achievement gaps
- Interactive dashboard allows ReSchool and other orgs. to identify additional gaps and trends
  - Updates as Denver programs change!

Lessons Learned

- Sustainability / Reproducibility
  - Data updating pipeline, tailored to most volatile data sources
  - We hope that this can be a model for other cities! https://github.com/CRPE-UWB/osr_dssg2018

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  - Data updating pipeline, tailored to most volatile data sources
  - We hope that this can be a model for other cities! https://github.com/CRPE-UWB/osr_dssg2018
- Collaboration
  - Leveraged diverse skill sets and backgrounds (within and outside our team) to make this happen!

GORDON AND BETTY MOORE FOUNDATION

Washington Research FOUNDATION

Microsoft

https://github.com/CRPE-UWB/osr_dssg2018