

Visualizing travel to regional parks using location-based services data

8/19/2019

Community Development Committee



Location based services data

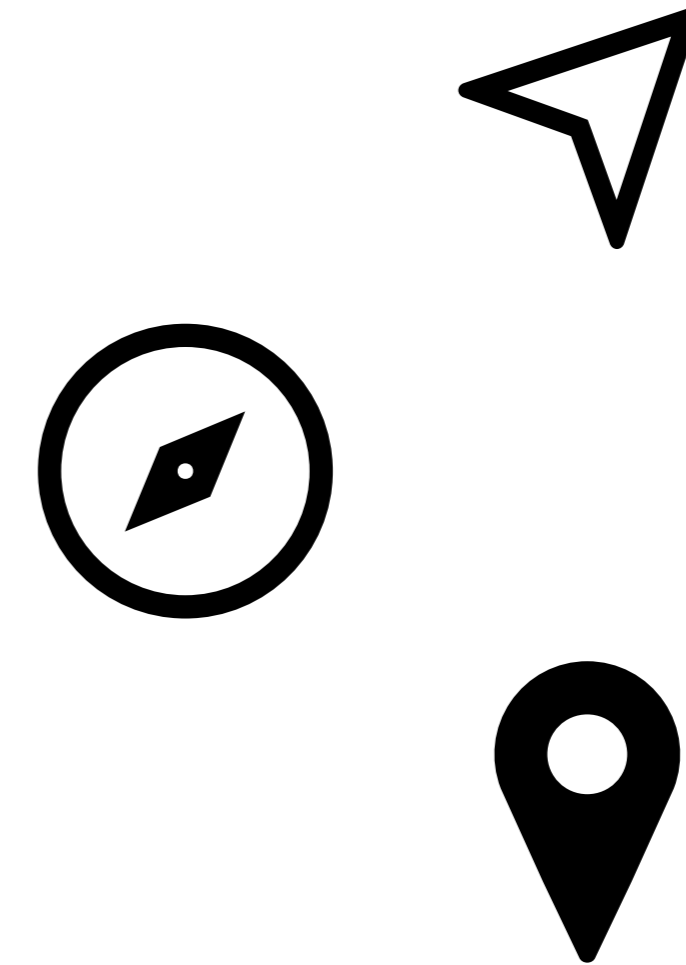
Take out your phones

– iPhone users go to:

- Settings > Privacy > Location Services

– Android users go to:

- Settings > Security & location > Location



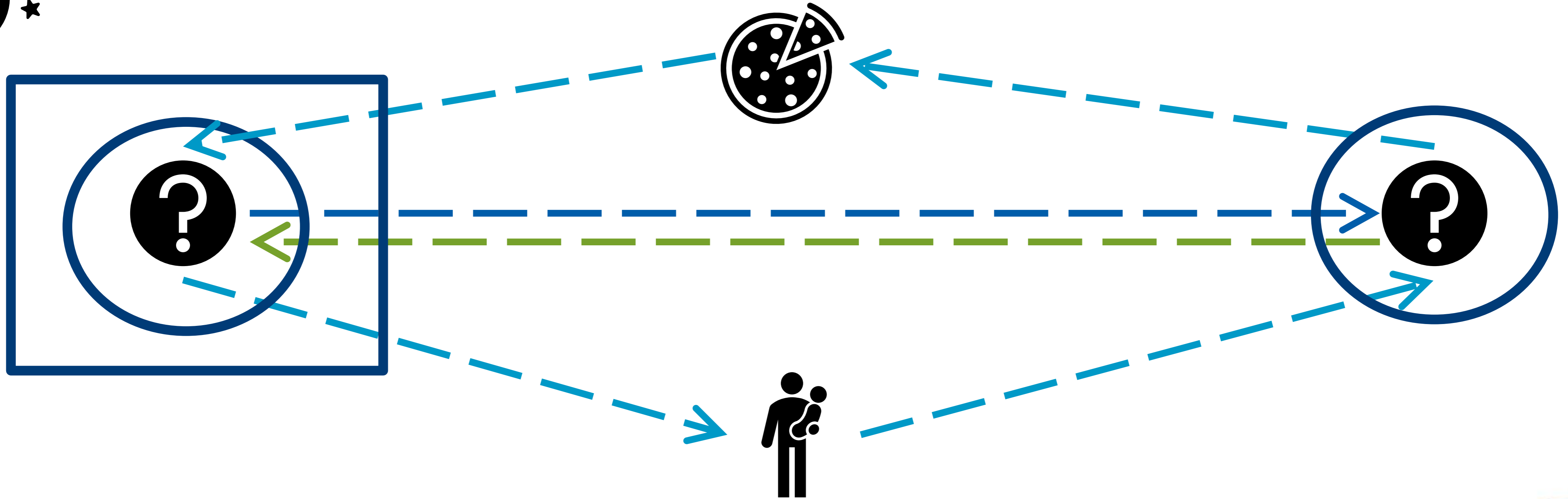
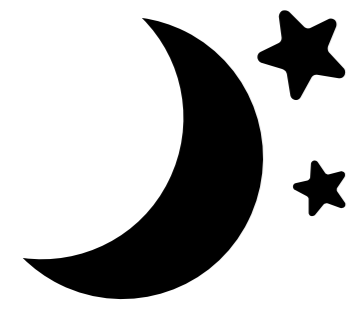
Streetlight Data

- Our provider of anonymized location-based services data from cell phones
- Can't identify individuals, can only look at patterns of travel
- 23% of the U.S. and Canadian adult population
- 60 billion location records/month
- Travel mode, visitor home/work location (Census block group), demographics
- Many types of analyses available

How does Streetlight infer traveler attributes?

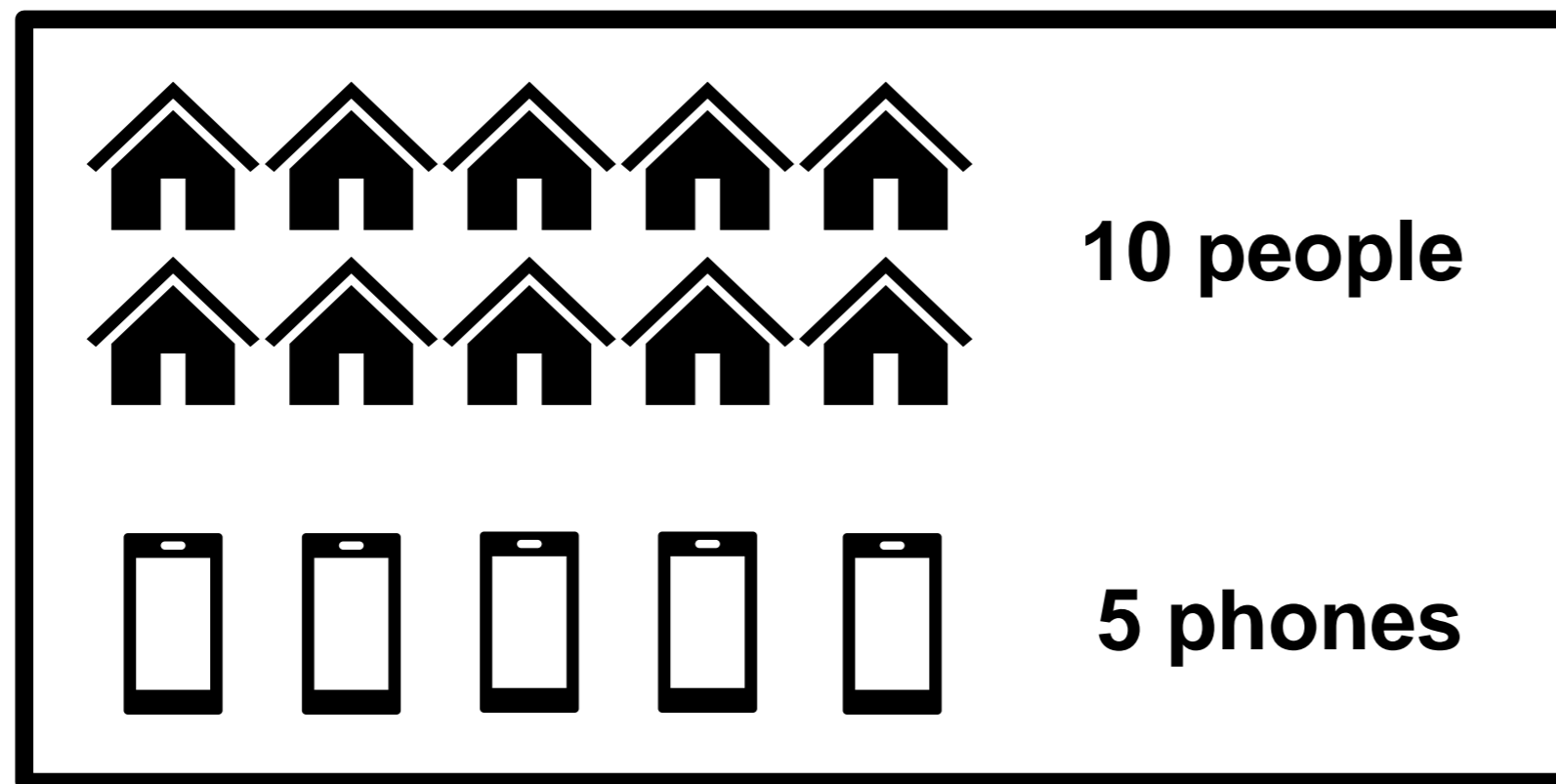
- First infer home location
- Then estimate demographics based on Census data of home location
- Infer travel mode using travel characteristics (e.g. speed, distance, etc.)

Inferring home & work location



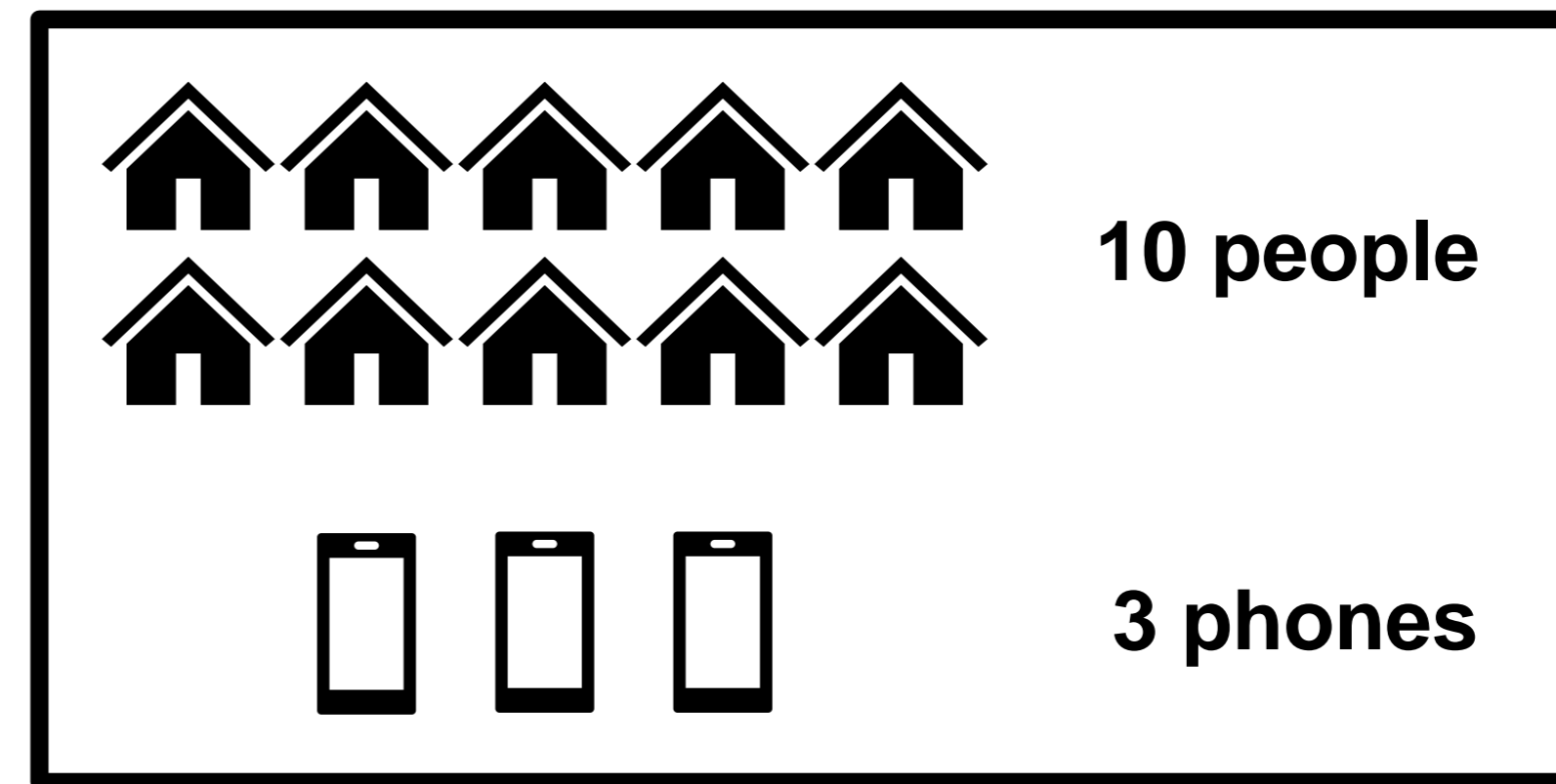
Accounting for differences in smartphone ownership rates (simplification for illustration)

Block 1



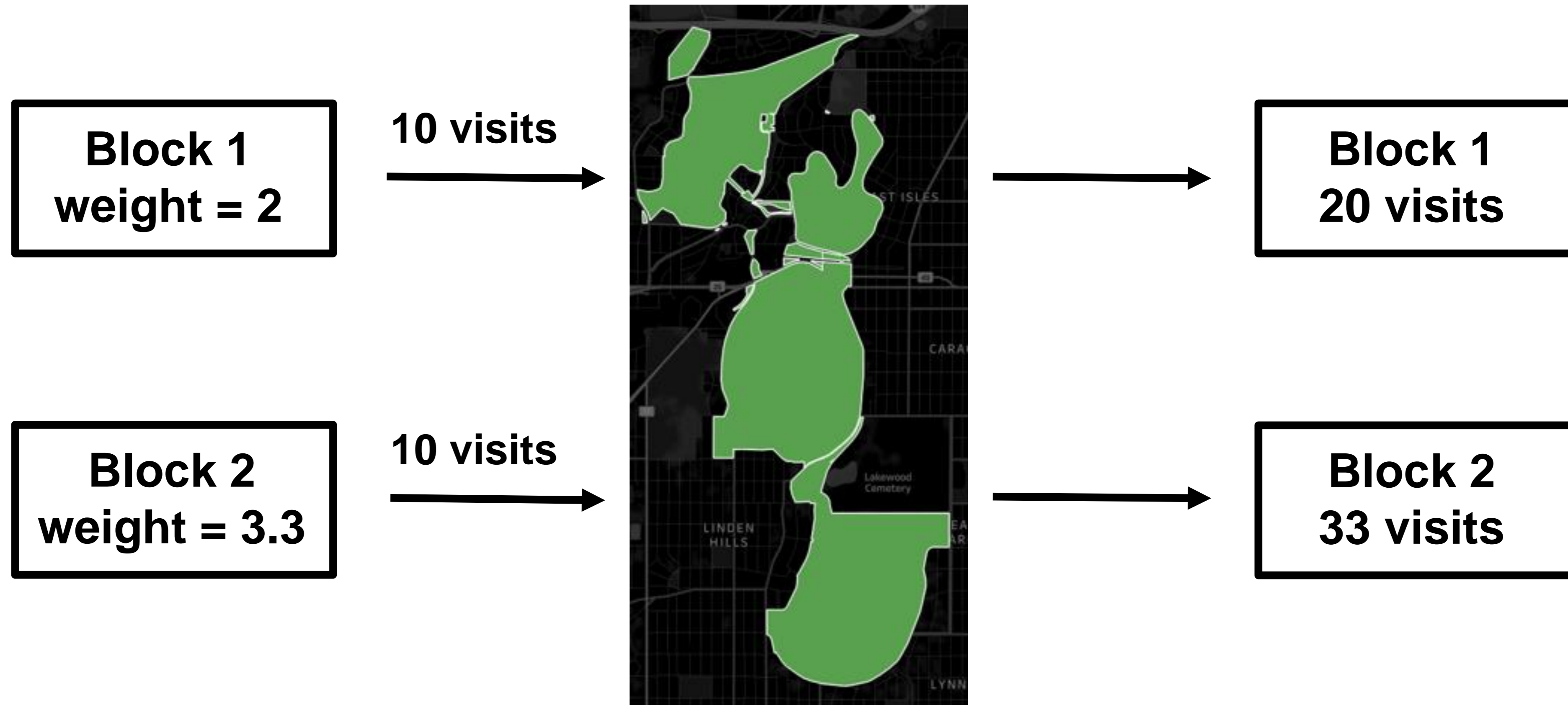
Block 1 weight = 2

Block 2

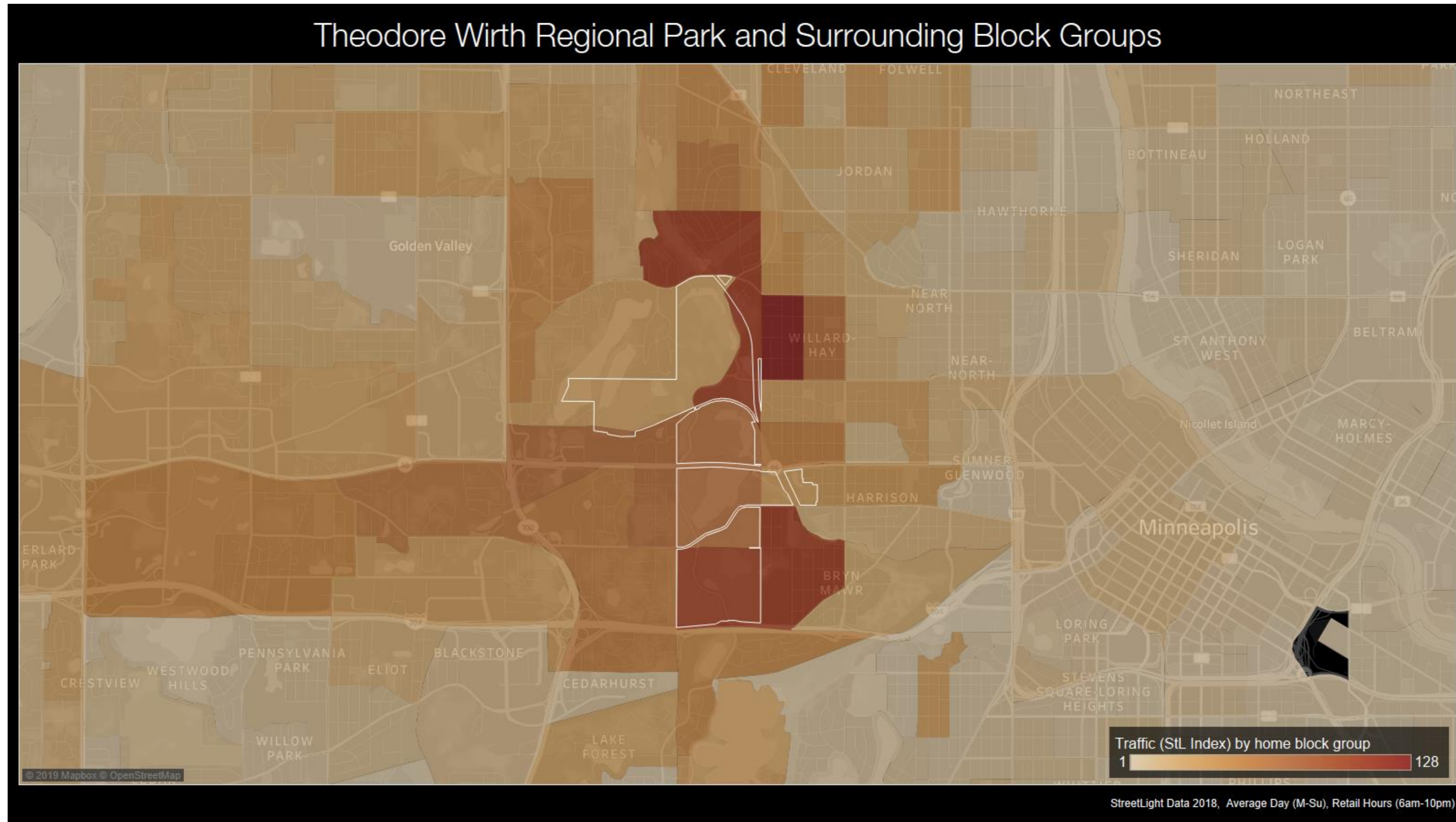


Block 2 weight = 3.33

Accounting for differences in smartphone ownership rates (simplification for illustration)



Home location data generally available at block group level



Parks visitation research

- Annual use estimate (how many people visit Regional Parks System)
 - Counts taken in parks system during summer months
 - Input to funding formulas
- Visitor study (who? where do they come from?)
 - Intercept survey in parks (~ every five years)
 - Local/non-local visitation %
 - Demographics
 - Seasonal visitation
 - Vehicle multiplier

Streetlight + Parks

- Currently, we can't provide park- or trail-level representative data
- Streetlight shows promise in providing park- and trail-level data
- Streetlight may even be able to provide useful data *within* a given park or trail
- Comparing Streetlight to supplemental park- and trail-level data collected in 2020 visitor study

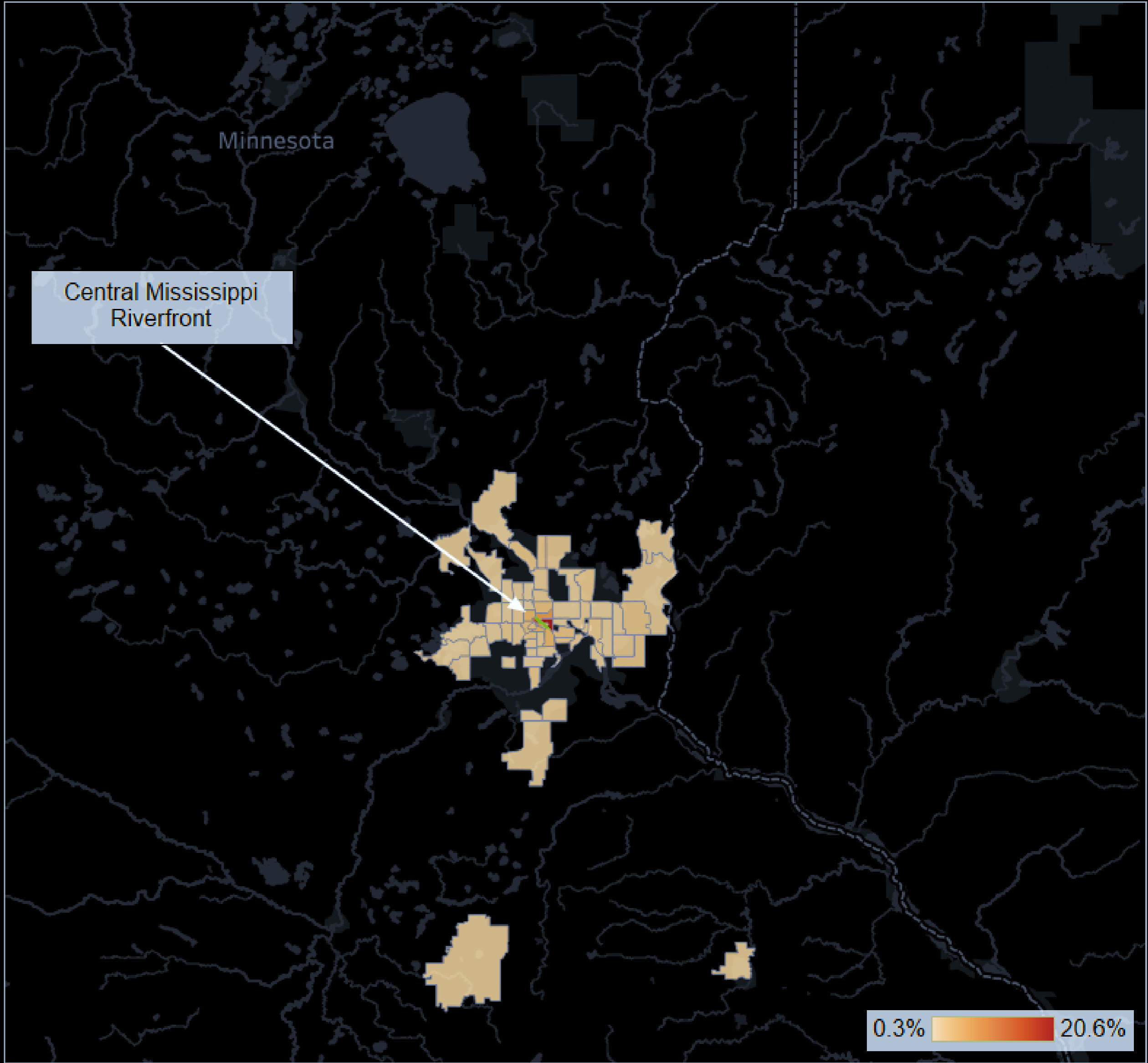
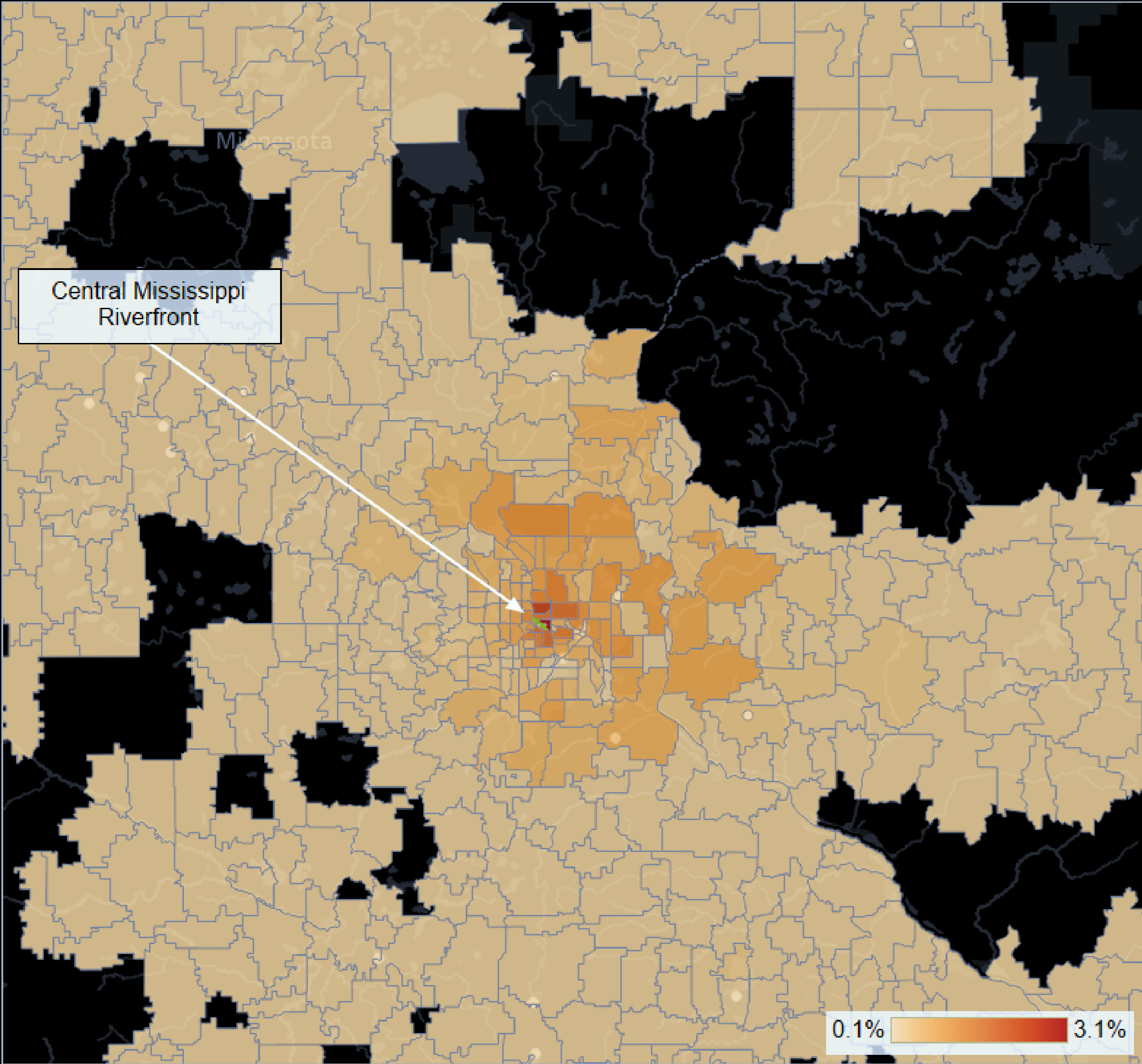
Comparison of Streetlight to U of M Visitor Survey

- 2016 University of Minnesota study collected some park-level data
- Compared Streetlight visitation to the survey data
- In general, Streetlight suggests higher non-local travel, slightly more people of color, and slightly more lower-income visitors than the U of M study

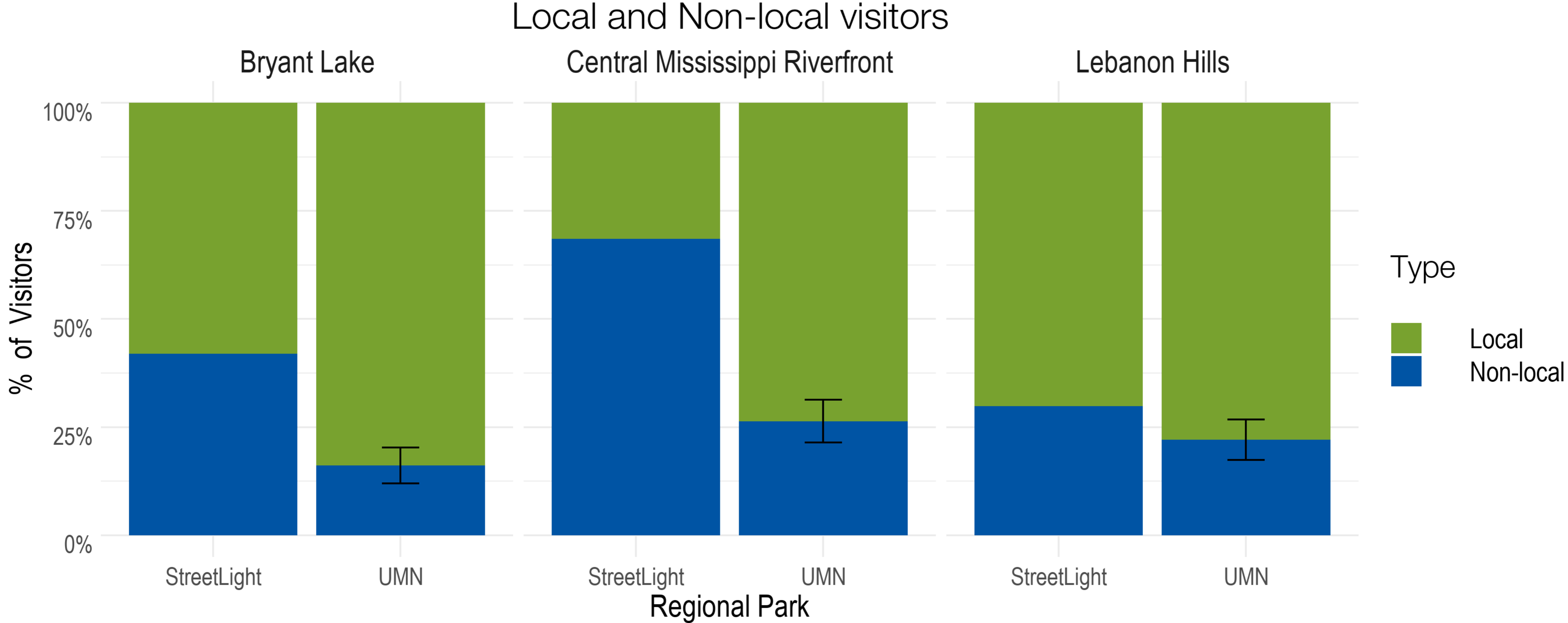
Central Mississippi Riverfront

StreetLight

University of Minnesota

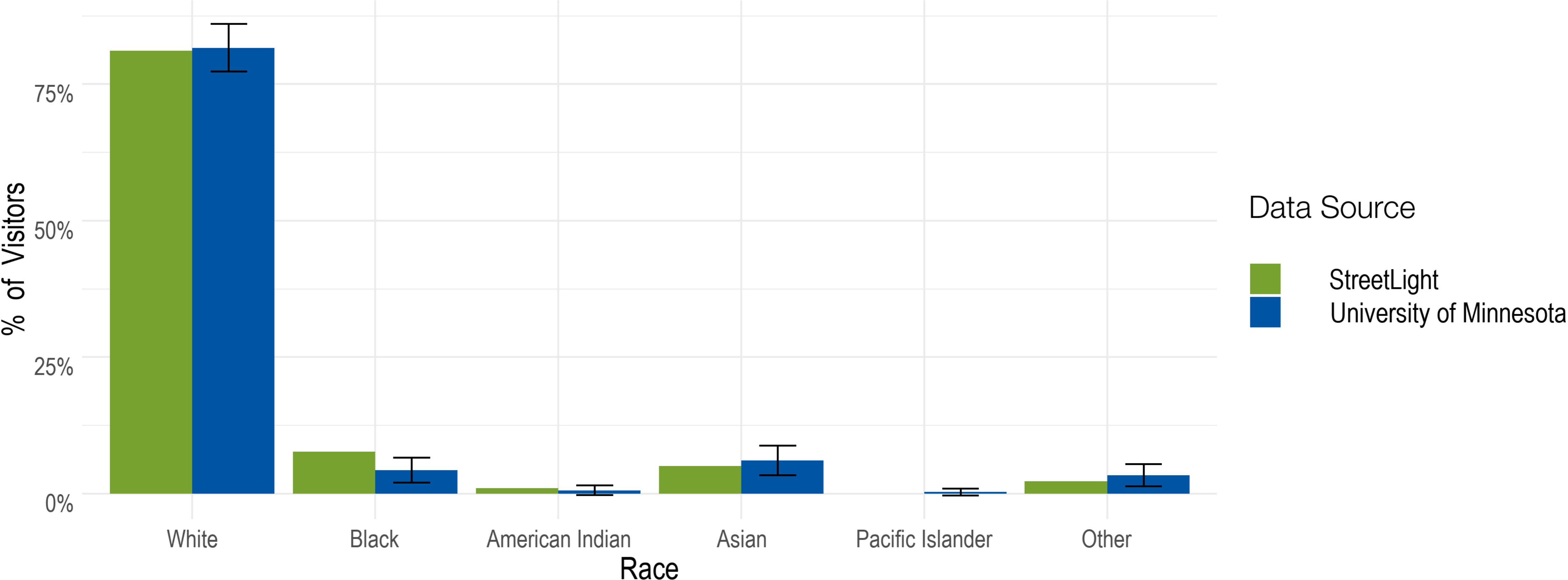


Streetlight generally captured more non-local visitation than the U of M visitor study

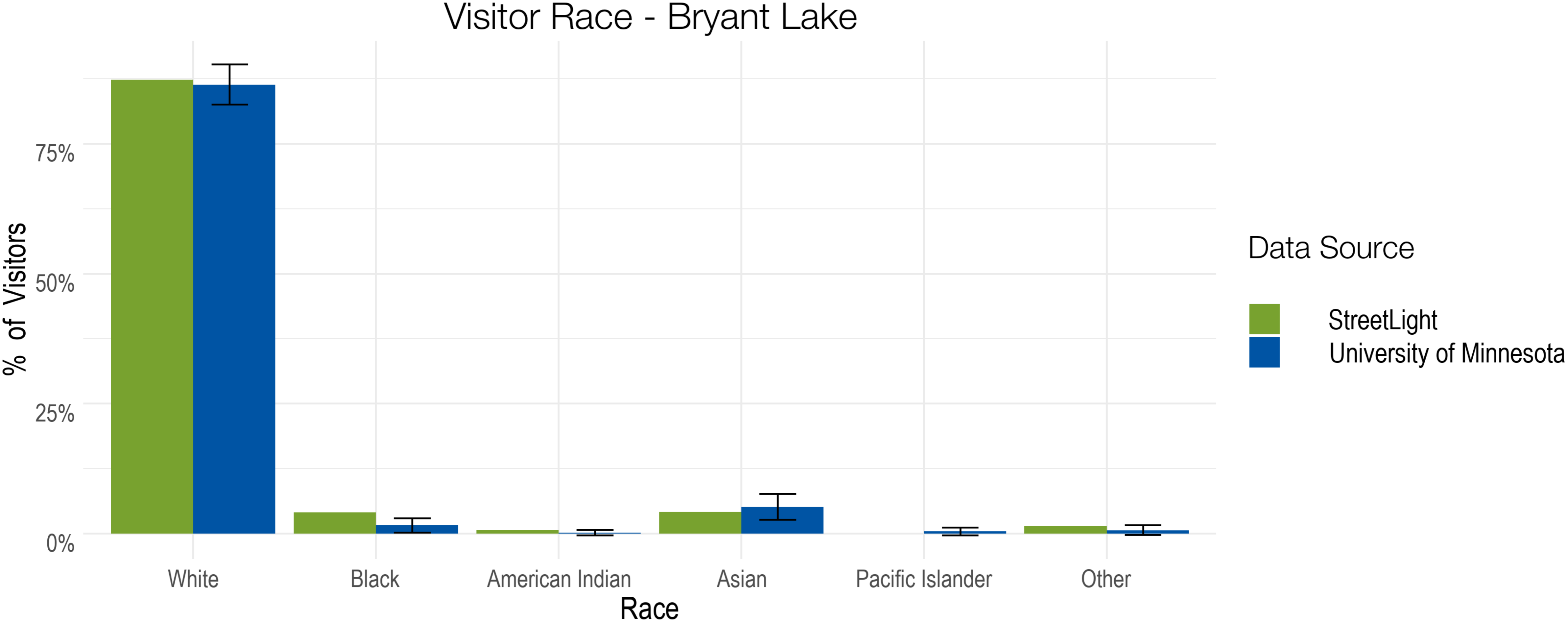


U of M Visitor Study and Streetlight generally agree on race

Visitor Race - Central Mississippi Riverfront

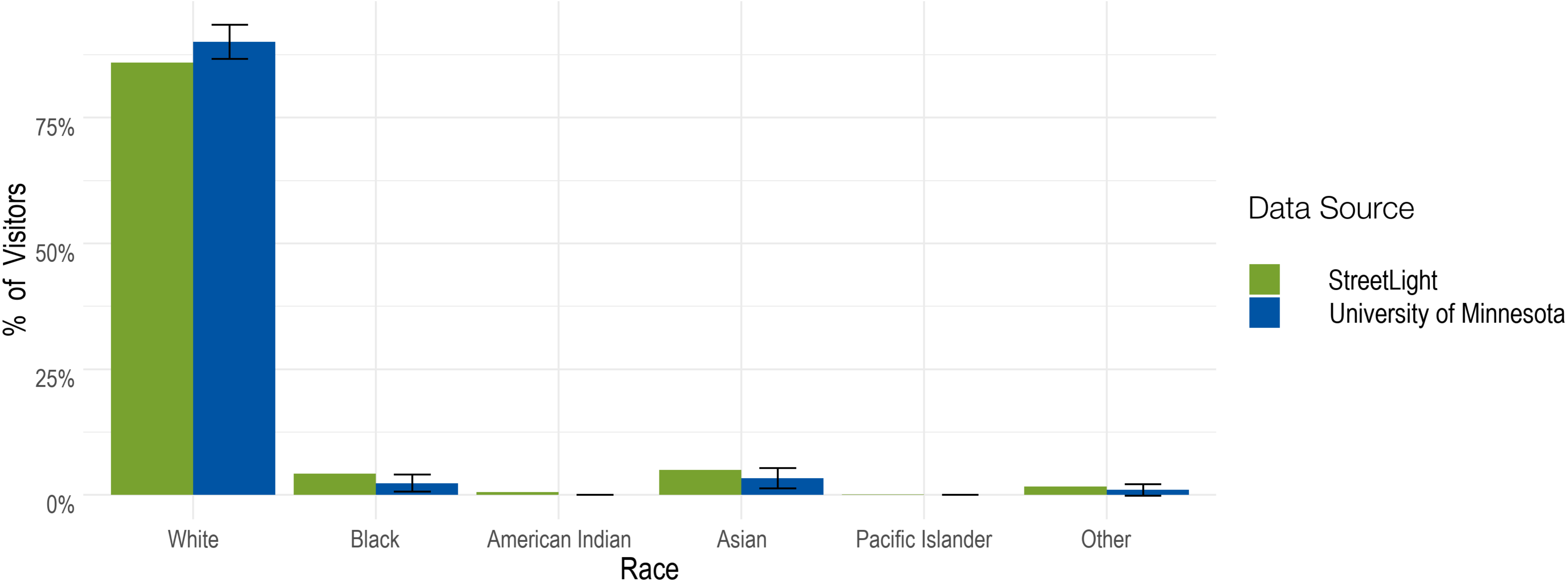


U of M Visitor Study and Streetlight generally agree on race



U of M Visitor Study and Streetlight generally agree on race

Visitor Race - Lebanon Hills



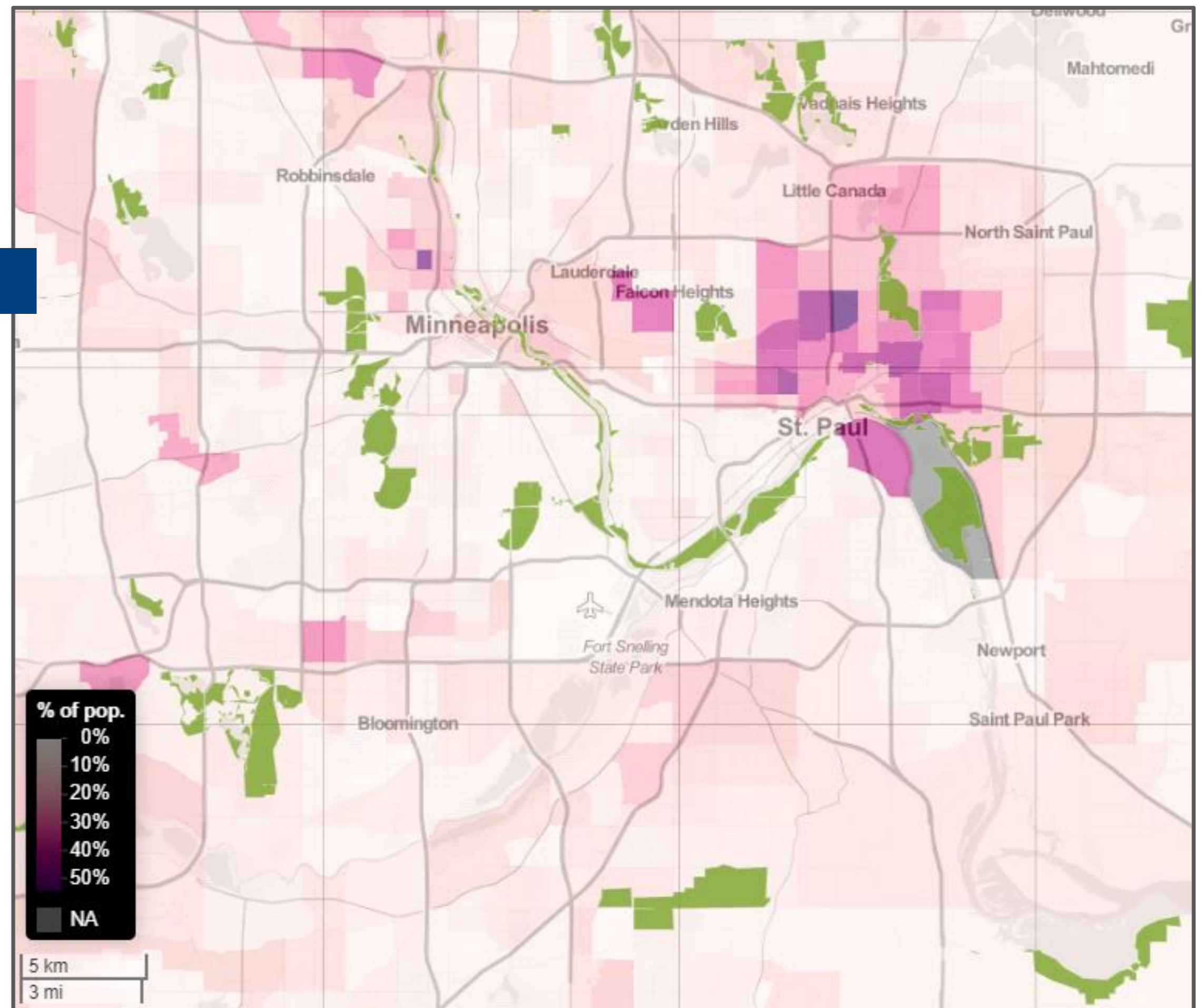
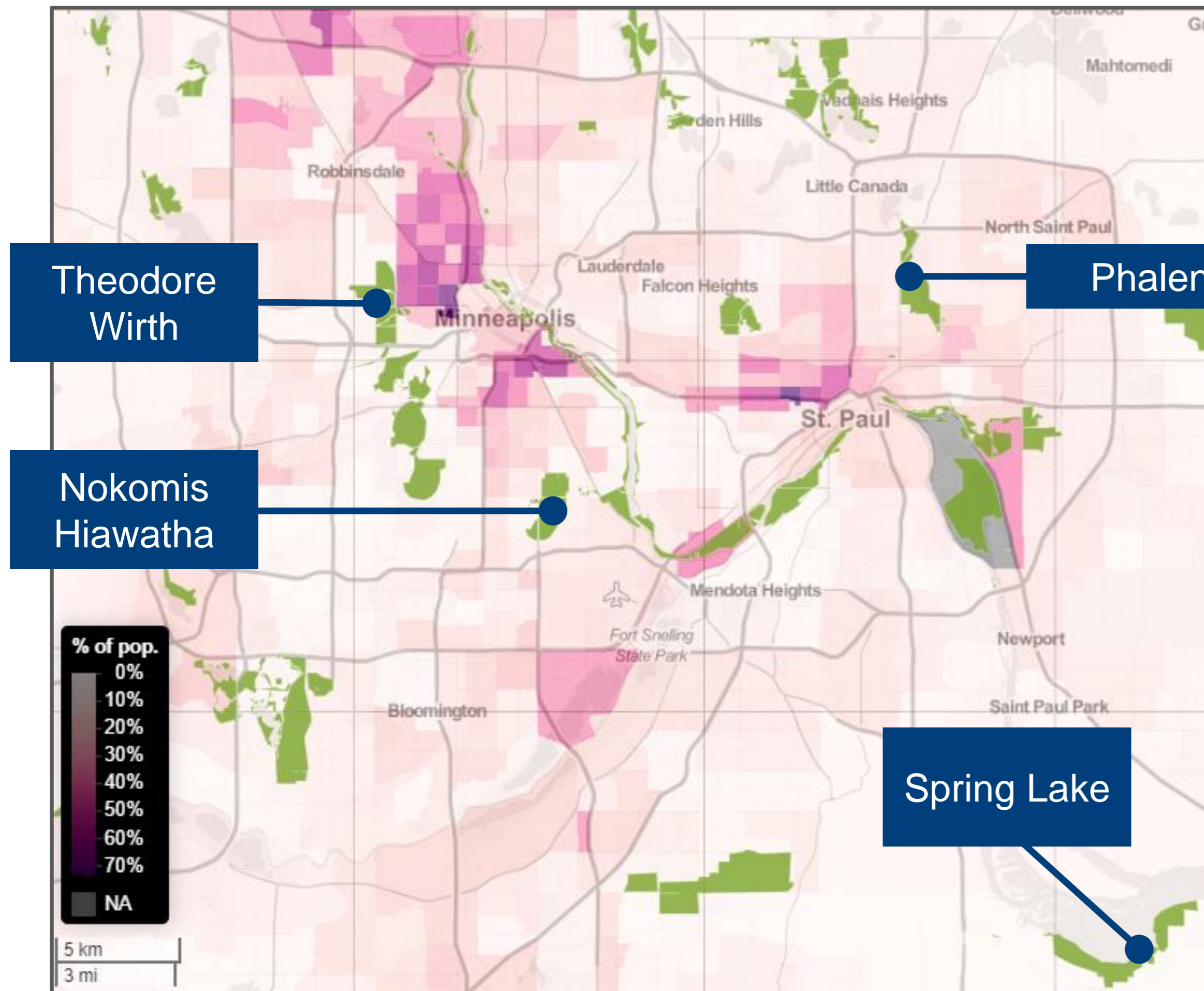
Additional demographic analysis of parks using Streetlight

- U of M study did not collect park-level data for parks in close proximity to large populations of color
- Conducted Streetlight analyses for select parks based on Census demographics
- Demographics across parks moved in generally expected ways

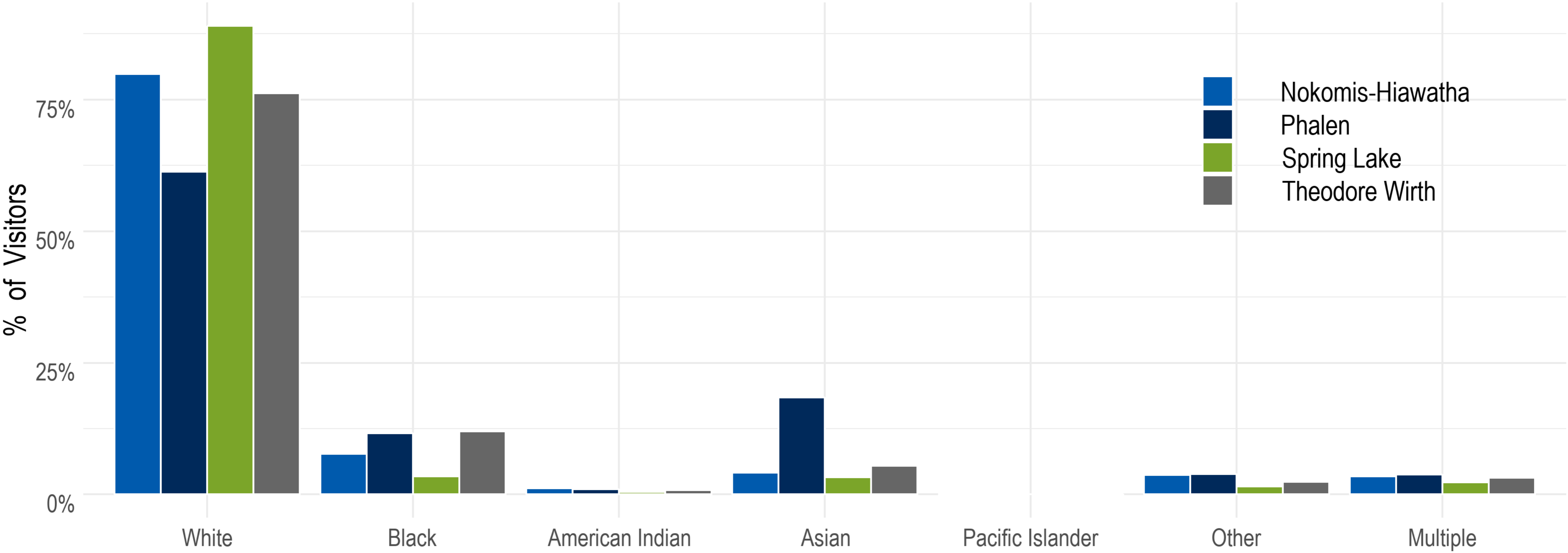
Census data (American Community Survey)

% Black

% Asian

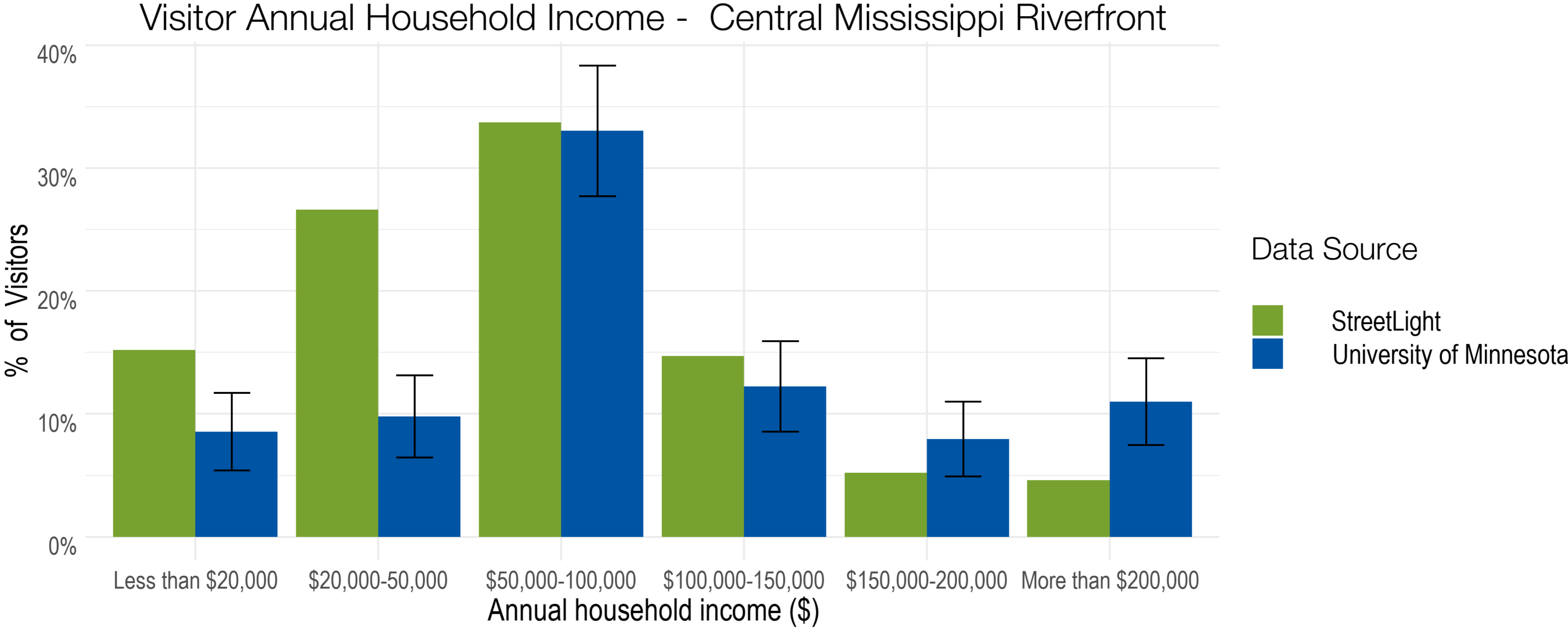


Racial variations across parks generally as expected



2018 StreetLight, retail hours (6am-10pm)

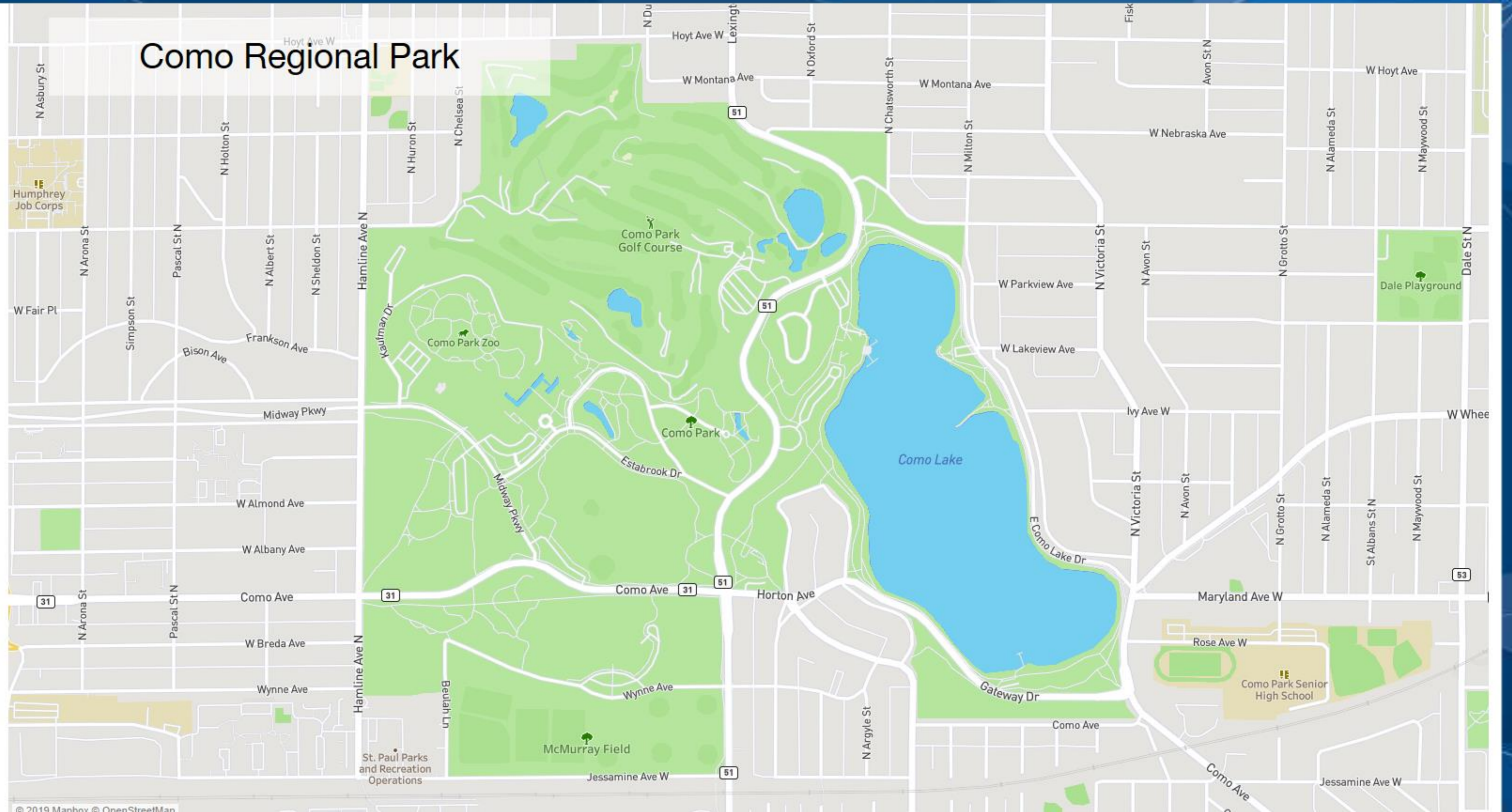
Income distributions generally align; U of M visitor study had fewer lower-income visitors (+ sizable missing values)



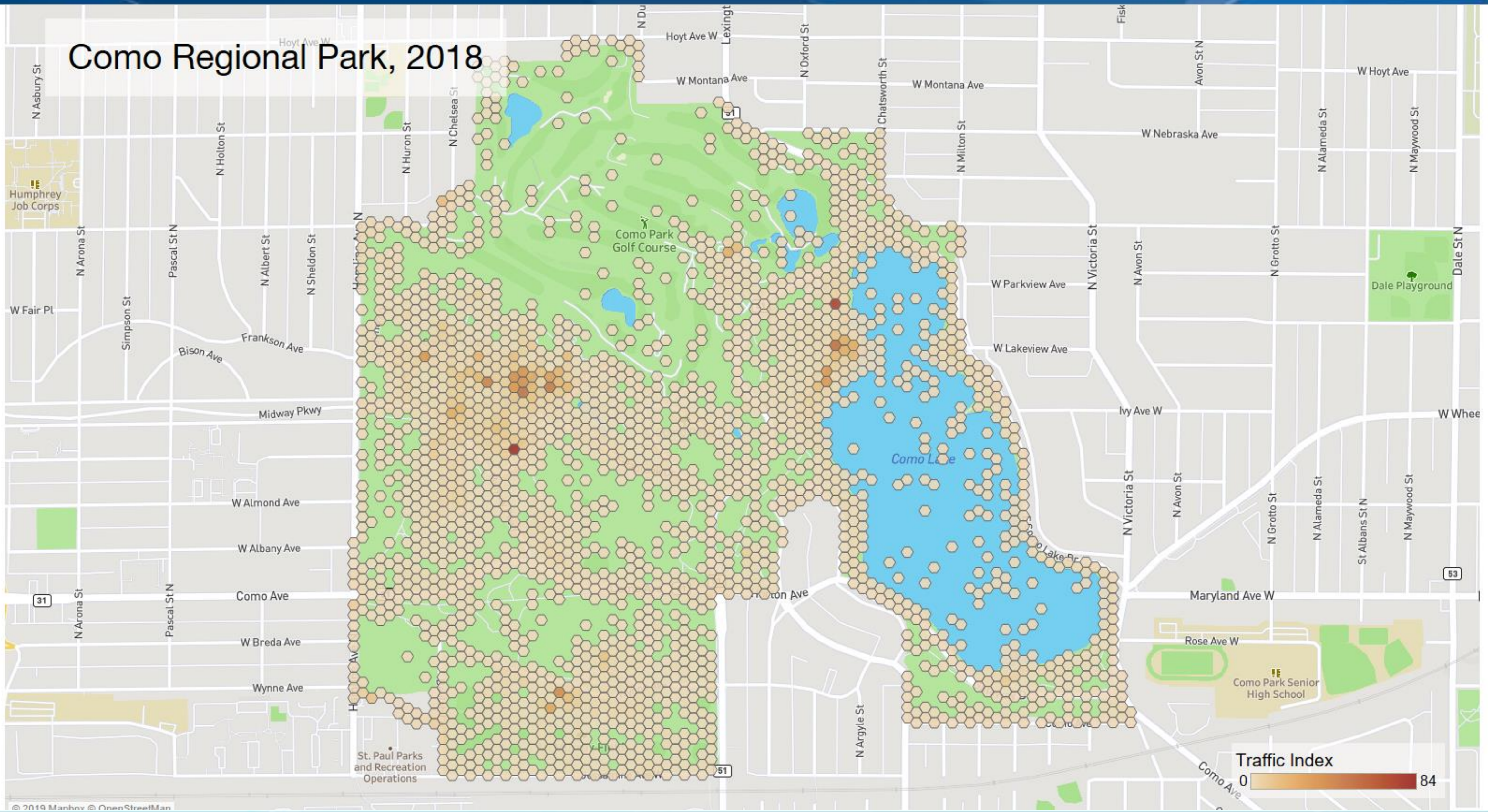
Using Streetlight for analysis within in a park

- Using Como Regional Park, we used Streetlight to analyze usage within a park
- Usage varies by season/day-of-week/time-of-day
- Dense activity in zoo/conservatory, pavilion, parking lots, etc.

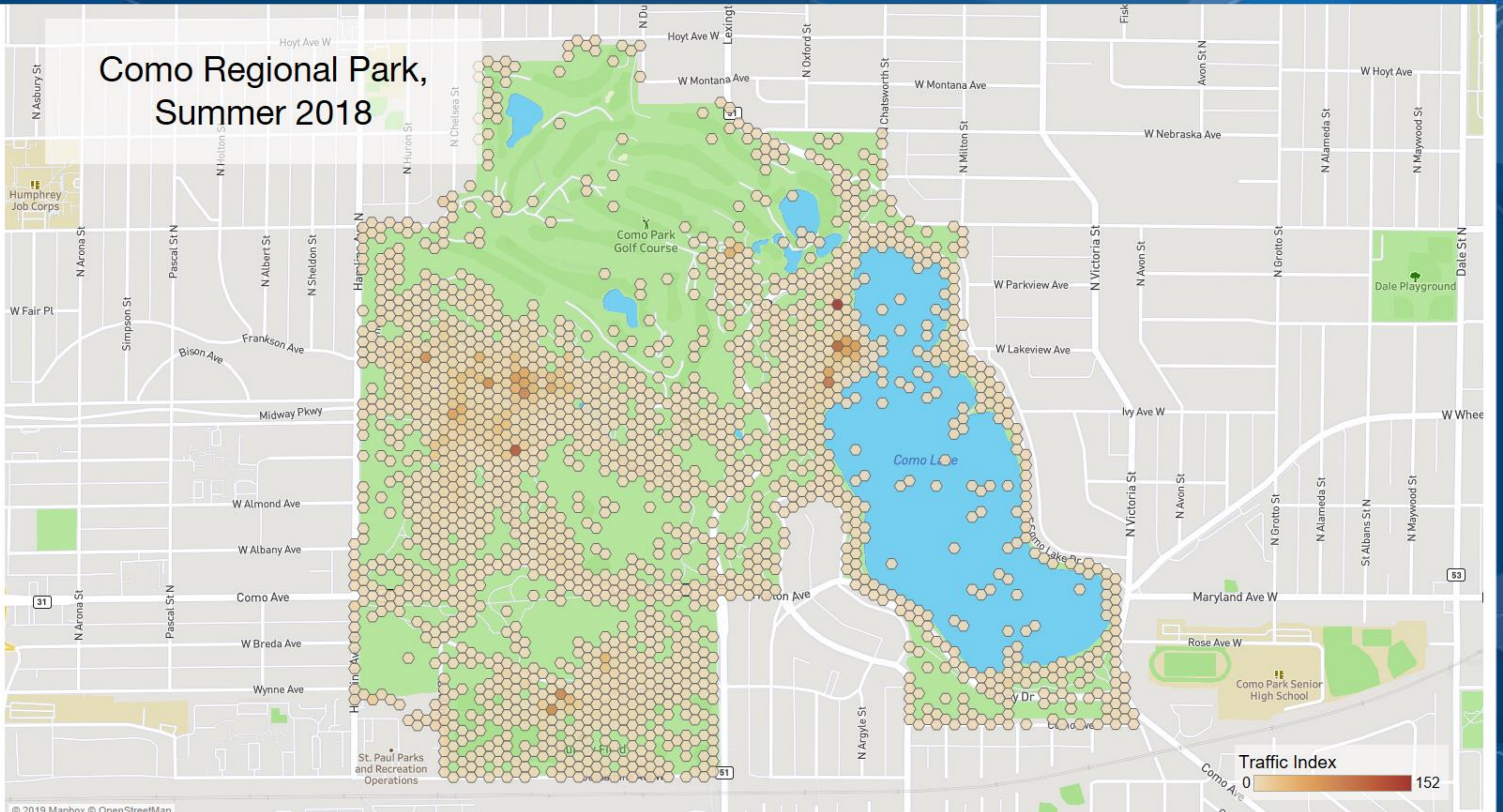
Como Regional Park



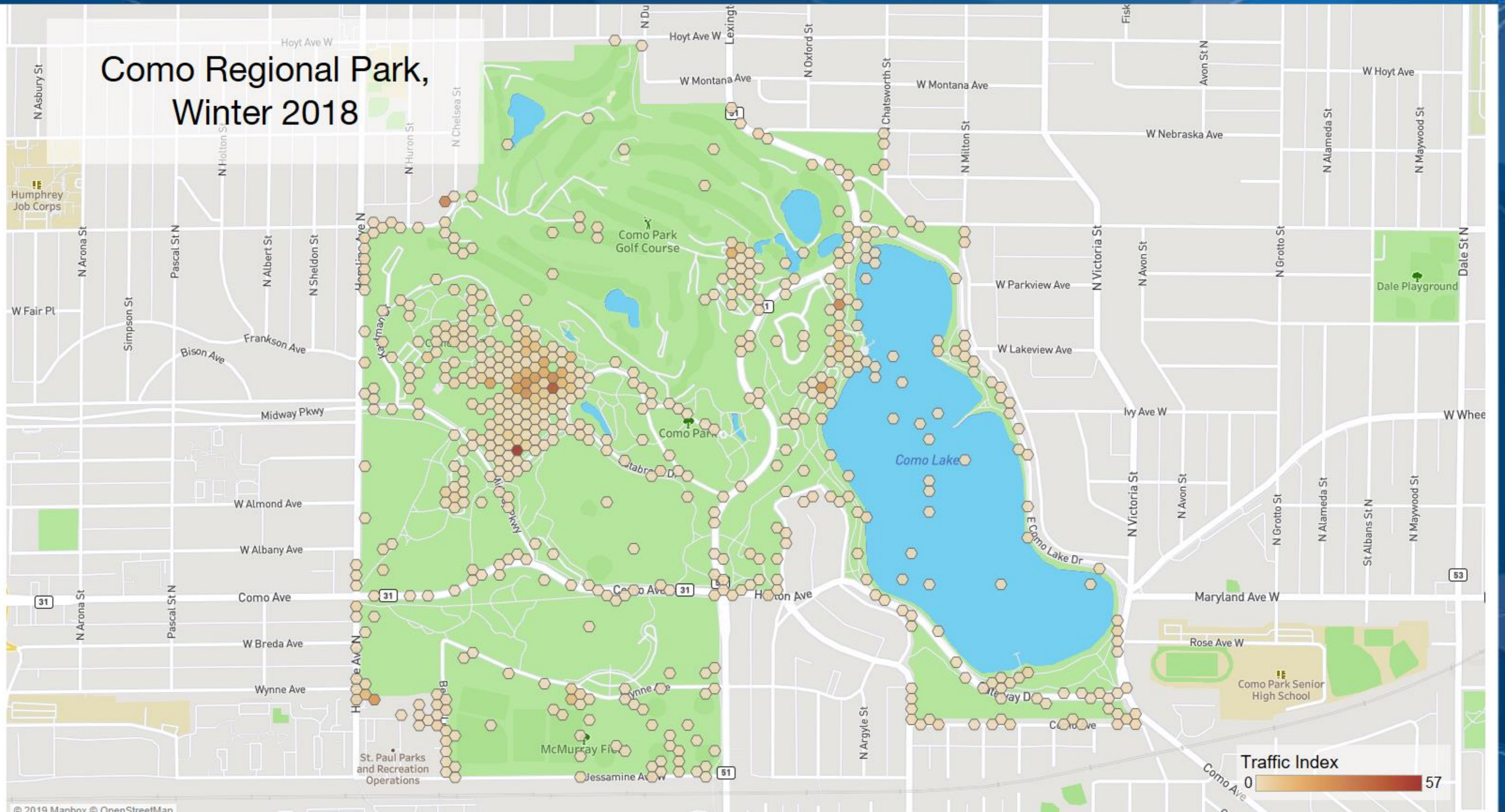
Como Regional Park, 2018



Como Regional Park, Summer 2018



Como Regional Park, Winter 2018

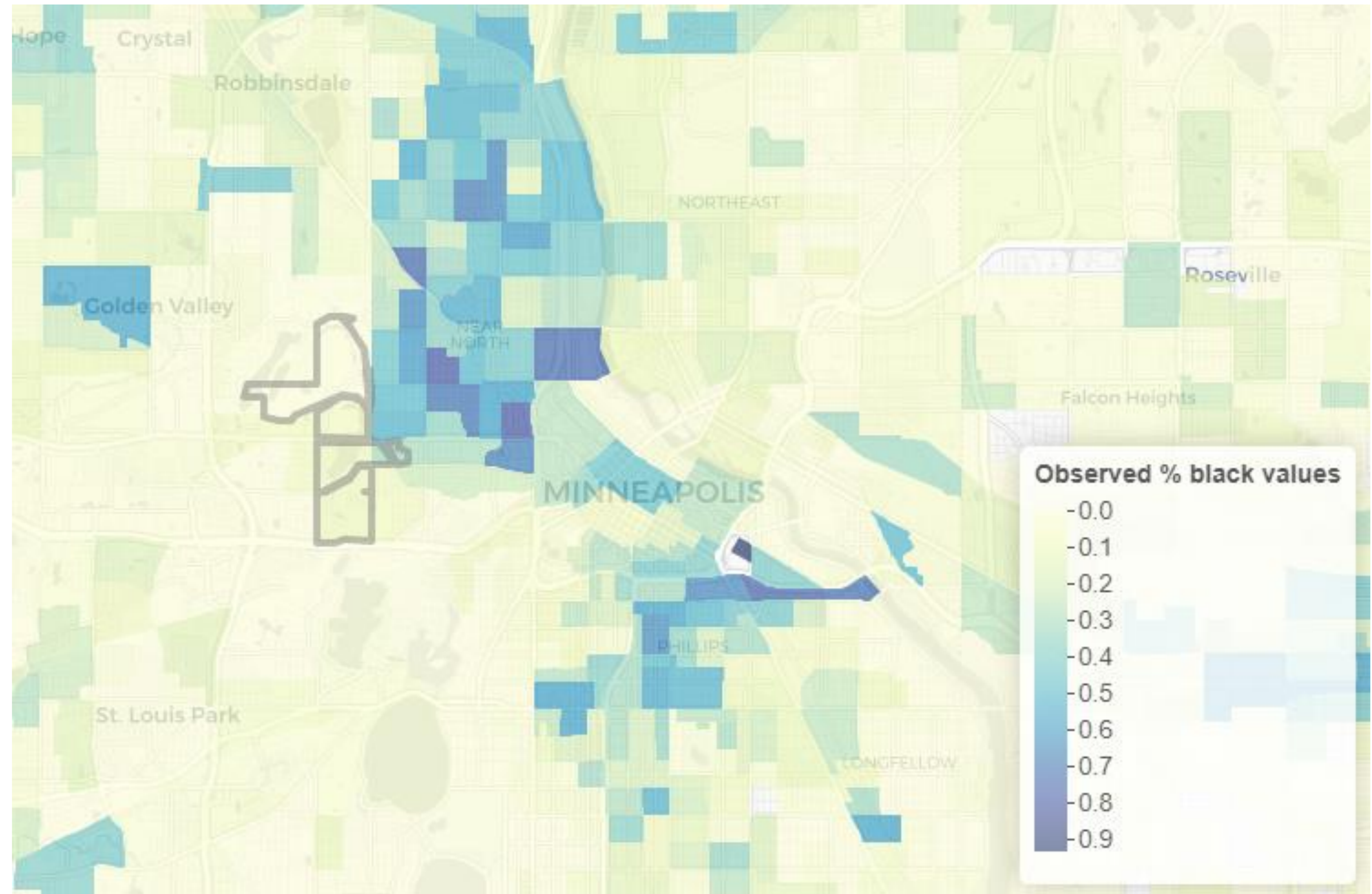


Example: Equity Analysis (proof of concept)

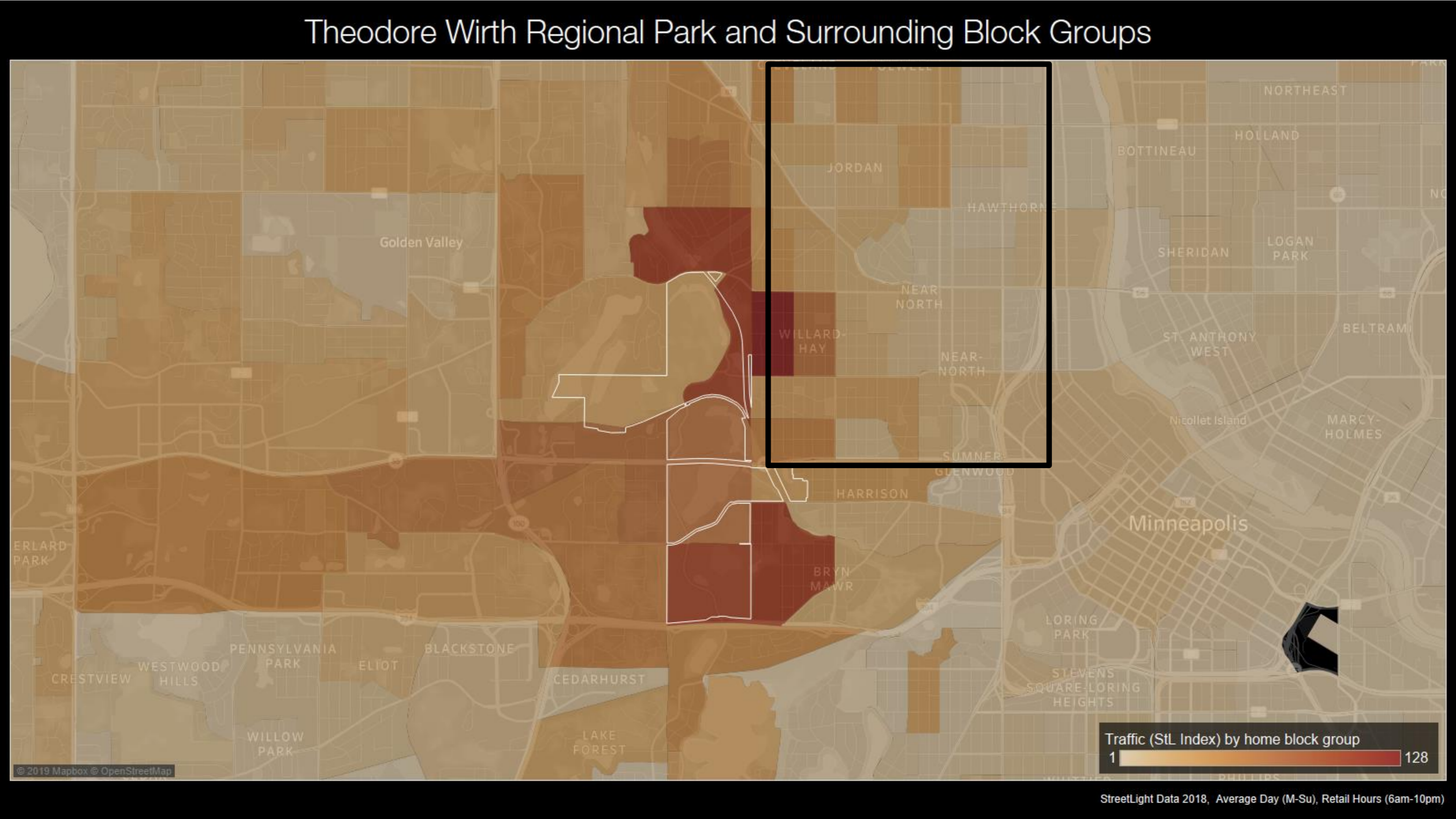
- Problem: don't have park-level demographic data
- Problem: What is the reference demographic when a park draws from multiple jurisdictions?
- Solution (proof of concept in progress):
 - Use statistical model to find parks where race most strongly predicts visitation, controlling for other factors (e.g. distance, population, etc.)

Example: Equity Analysis at Theodore Wirth

- Close proximity to large Black population
- Should be reflected in demographics of visitors

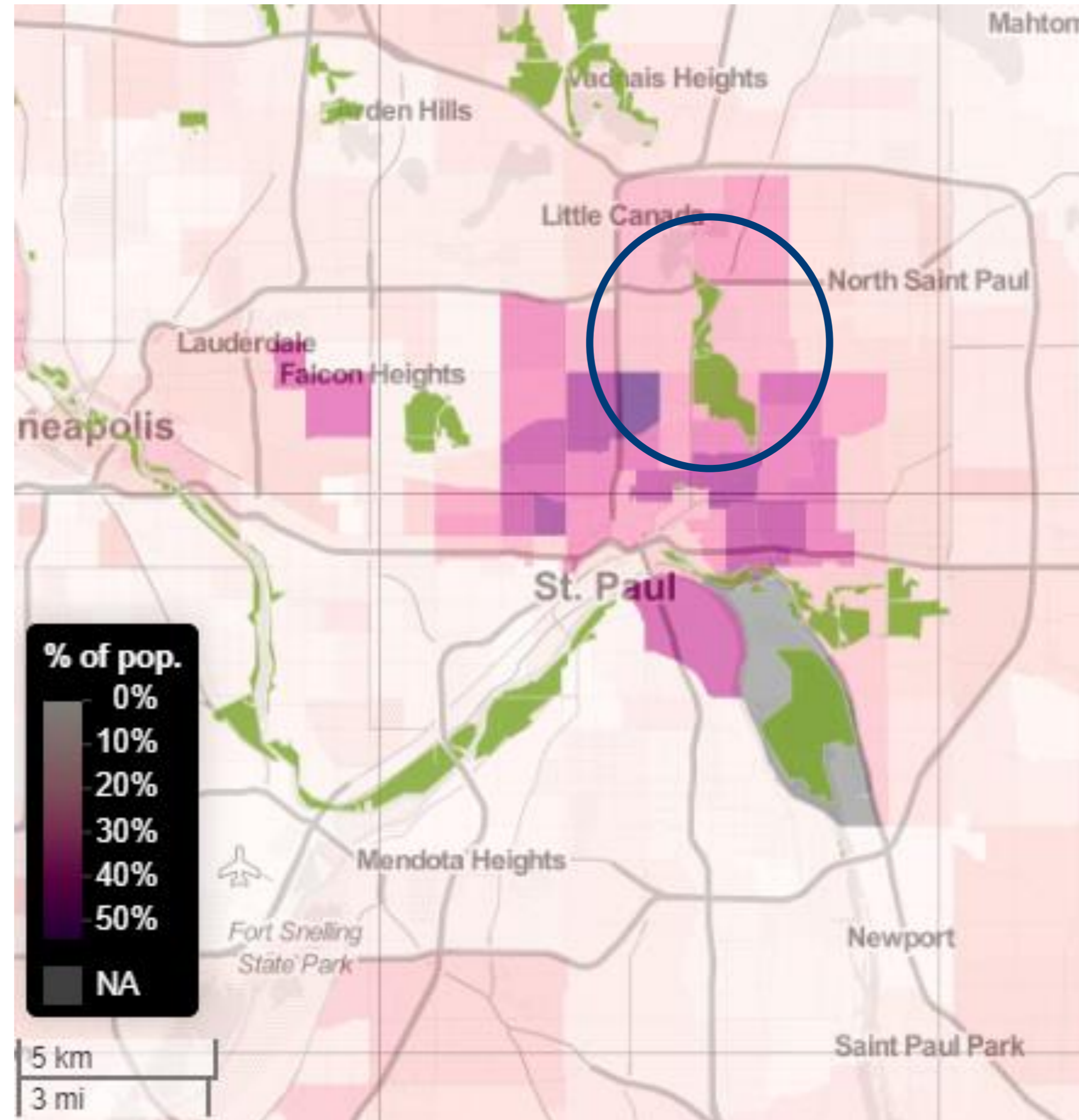


Theodore Wirth home location of visitors

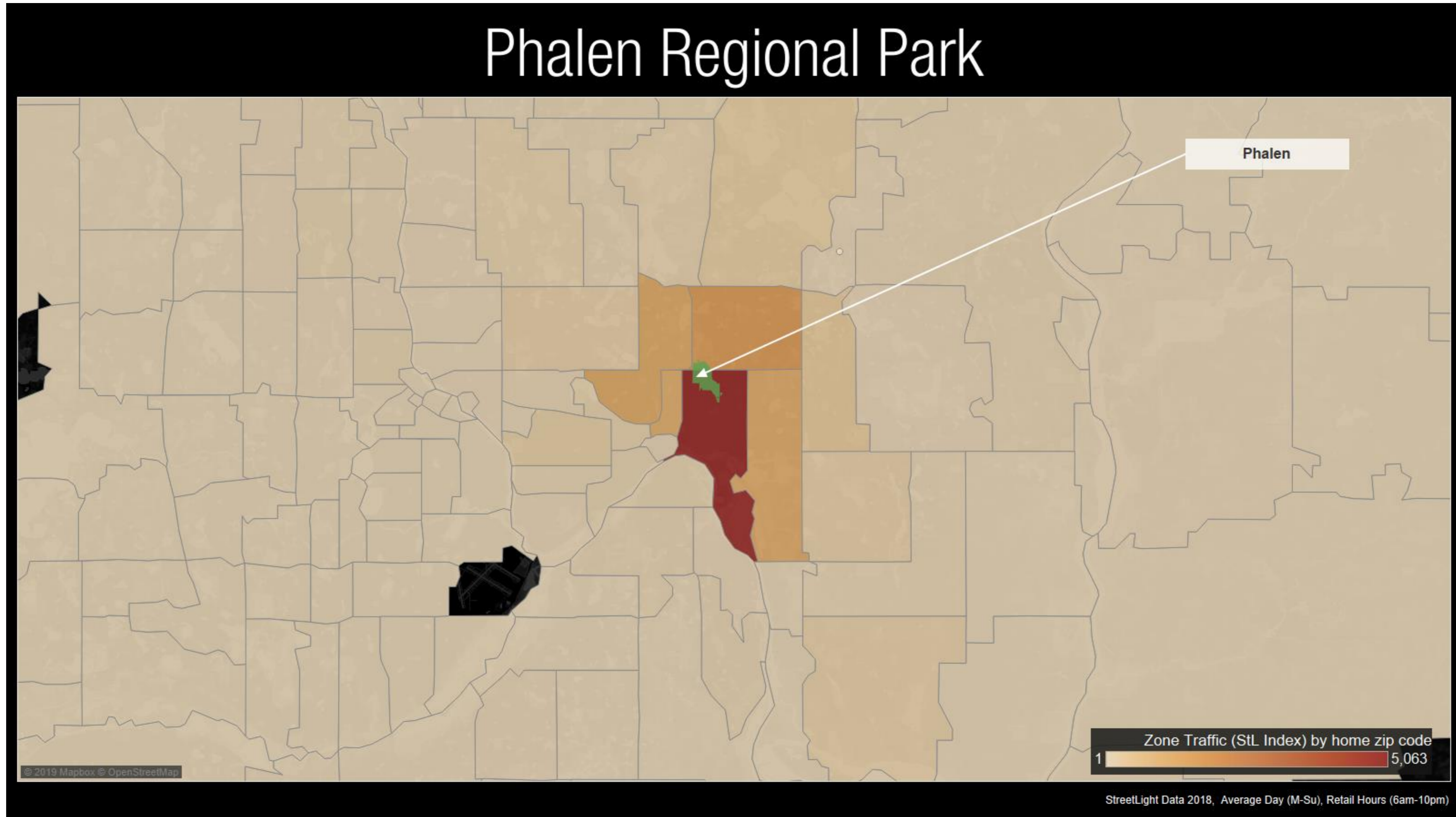


Example: Equity Analysis at Phalen

- Close proximity to large Asian population
- Should be reflected in demographics of visitors



Phalen home location of visitors





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