Using Location-based Data in Regional Parks Visitors Research

Liz Roten, Associate Data Scientist

Twin Cities Research Group

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METROPOLITAN COUNCIL

Agenda

- Introduction and background
  - Regional Parks
- Location-based services
  - StreetLight data characteristics and limitations
- Case study: Which parks are most popular?
- Case study: Measuring activity within Como Regional Park

Location-based data challenges the way we research regional parks.

Why regional parks?

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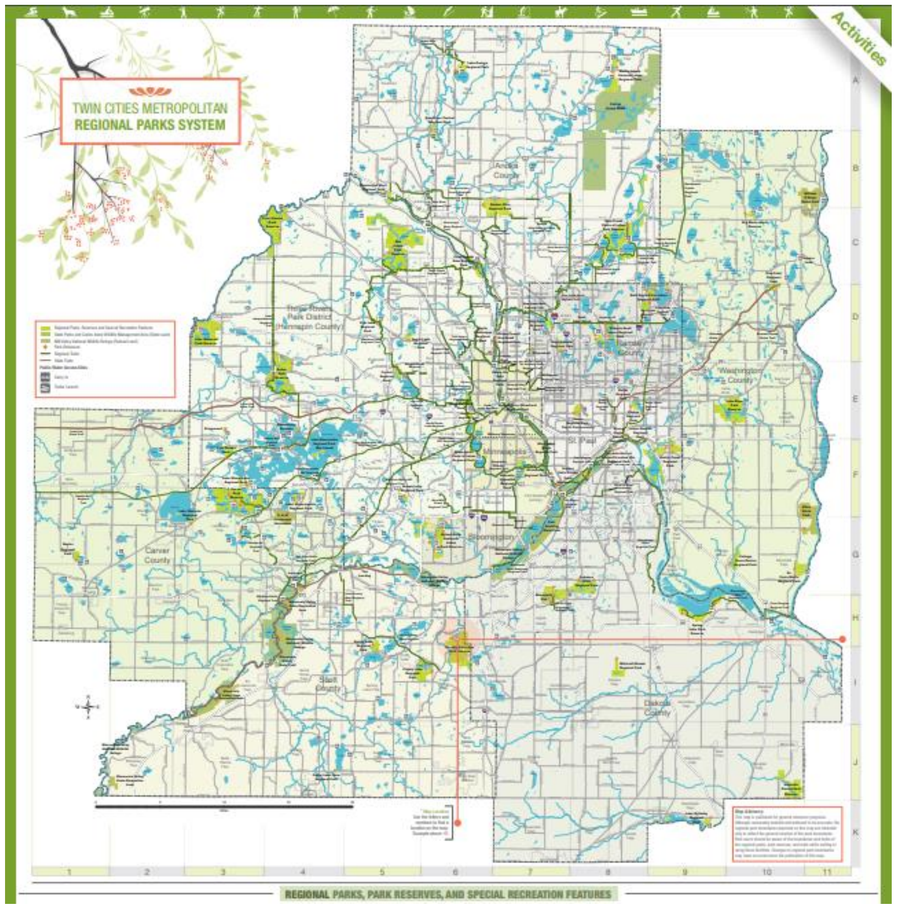
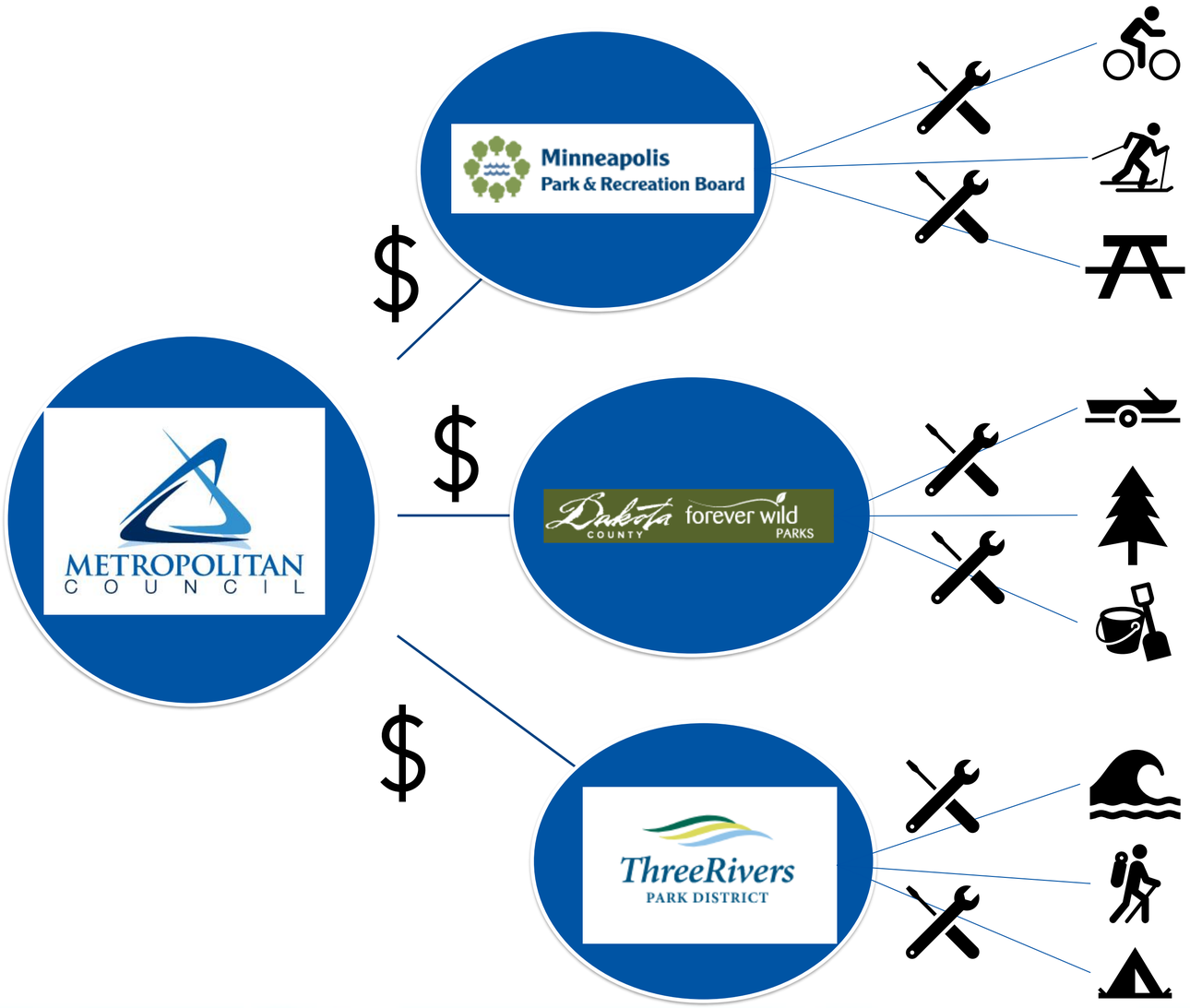
Why regional parks?

- The Metropolitan Council is required by law to estimate how many people visit the regional parks system annually
- Regional parks are owned and managed by implementing agencies
- There are 10 regional parks implementing agencies



Map: Metropolitan Council



10 Implementing agencies

68 Regional parks, park reserves, & special features

78 Regional trails

Most Popular Parks

Minneapolis Chain of Lakes

Image: Minneapolis Park and Recreation Board

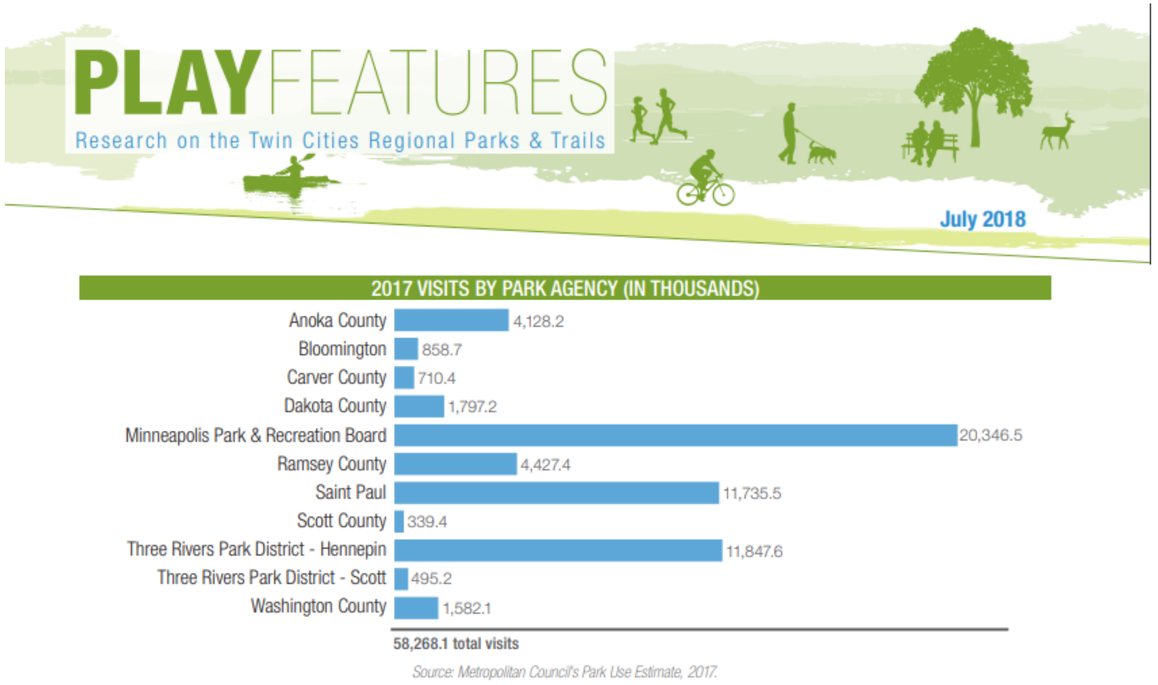
Como

Image: CityPages, 2019

How do you know?

How we usually research visitors

- Use estimates
  - Representative at the agency level
- Visitor Studies
  - In-person sampled surveys
  - Representative at the agency level
- Significant limitations
  - Every park has its unique features and geography
  - Self-selection survey bias
  - Funding restrictions



Image, chart: Metropolitan Council

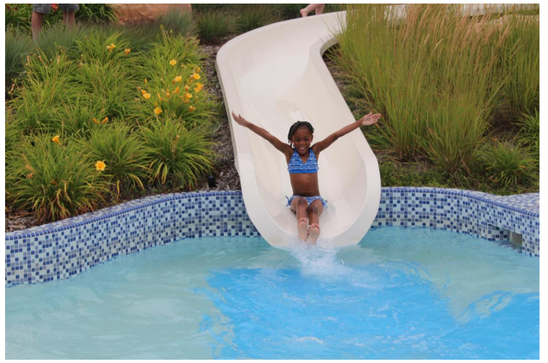
Preliminary 2018 Estimated Visits

Minneapolis Chain of Lakes

7.3 million

Como

4.9 million



Metropolitan Council, pending formal release.
Como image: City of St. Paul
Chain of Lakes image: Minneapolis Park and Recreation Board

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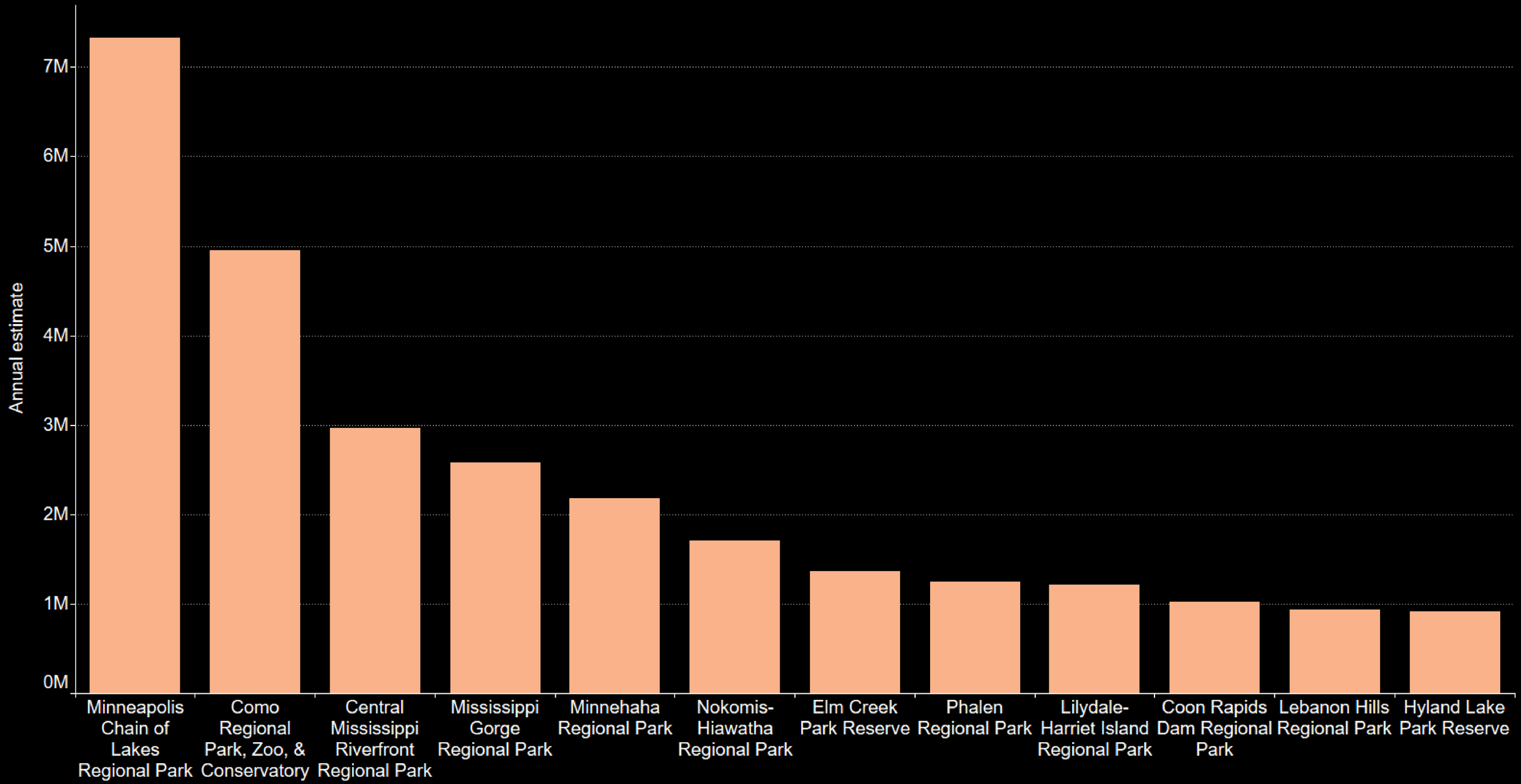
2018 Annual Use Estimate



Why location-based services?

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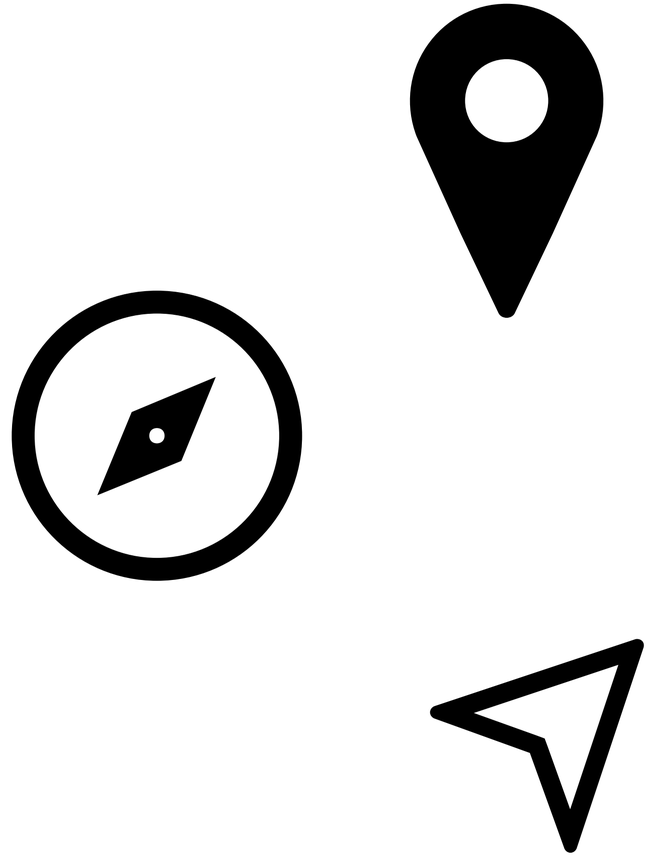
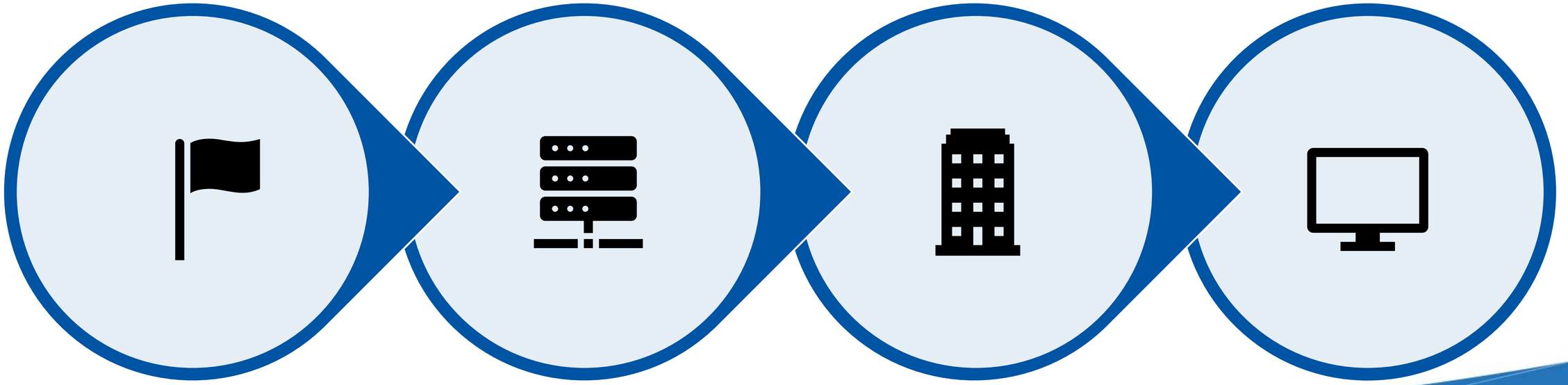
Take out your phone!

- Go to your settings
  - Or try swiping down from the top of your screen, and look for an icon like these
- If your location is turned on, then your data is being collected by *someone*
- Apps and services use your location



So what is LBS data?

- LBS data is information about a device’s location in space and time



StreetLight Data

- Subscription through partnership with MNDOT
- Provides platform for running individual “projects” on trips
- Gathered from apps, such as shopping, dating, weather, productivity
- Accurate to 20 meters (65 feet)

STREETLIGHT DATA

“StreetLight Data is the first company to make using real-world transportation data easy, efficient, and affordable.”

Image, quote: “About Us” page

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What is a trip?

- A trip must be greater than 500m and longer than 3 minutes
- Trips can be
  - Trip Start
  - Trip End
  - Trip Pass-Through
  - Trip All

StreetLight data characteristics

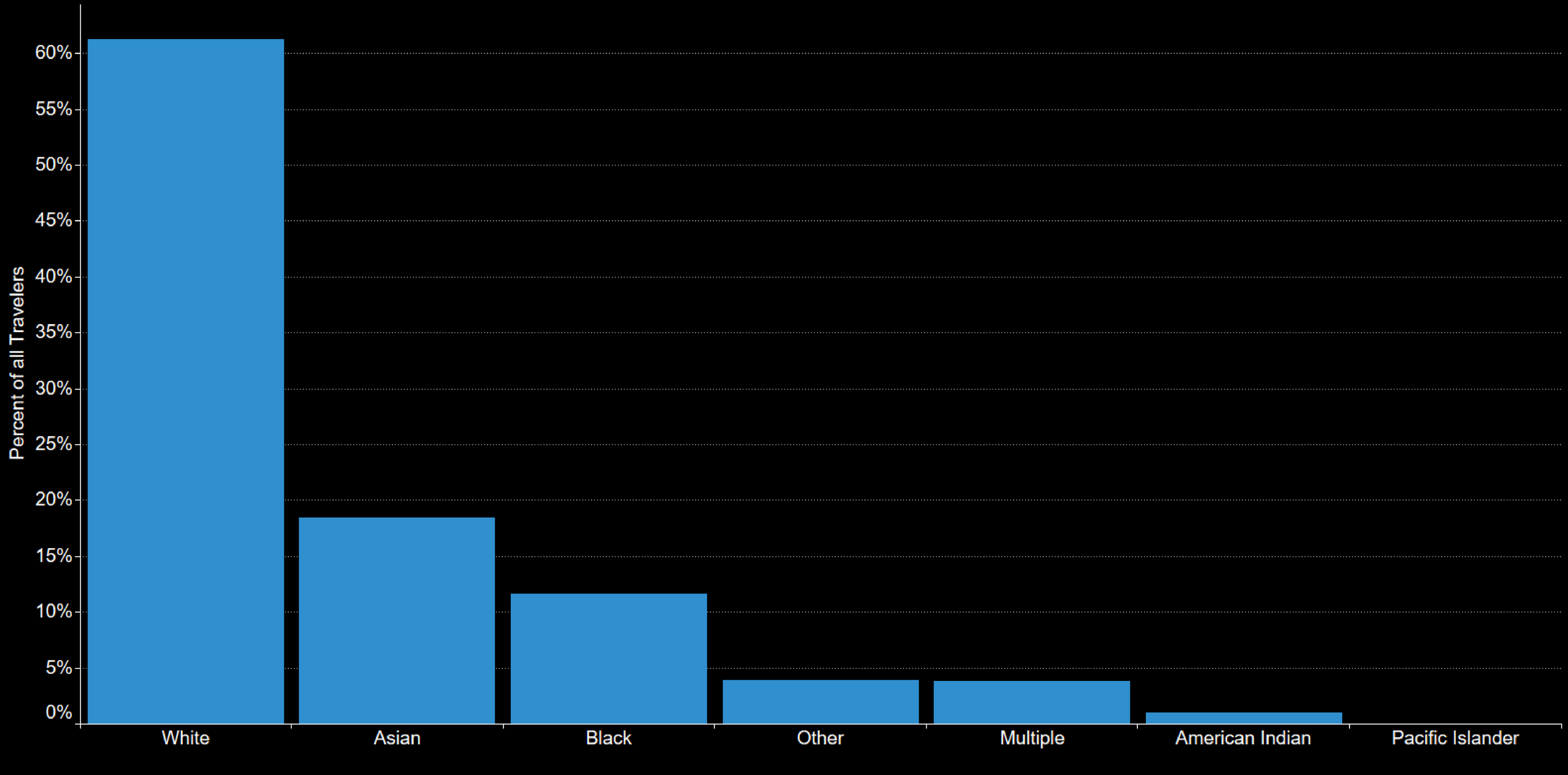
- **StreetLight Traffic Index** a normalized measure of the relative traffic in a given area
- Specific time periods, down to the day (3 months recommended)
  - Day type (i.e. weekday, weekend)
  - Day part (i.e. retail hours, morning, afternoon)
- Large sample size
- Bike and pedestrian (limited)

StreetLight data characteristics (cont.)

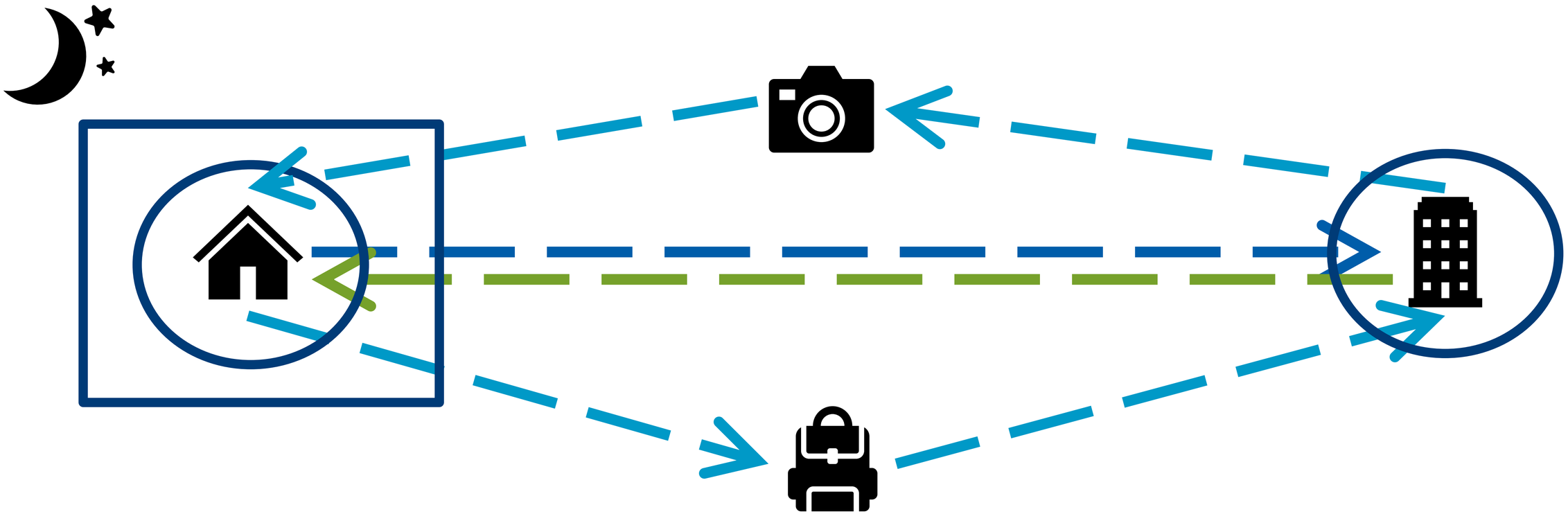
- Inferred traveler demographics
  - Race
  - Household income
  - Ethnicity
  - Family status (children, no children)
  - Education

Phalen - Traveler Race

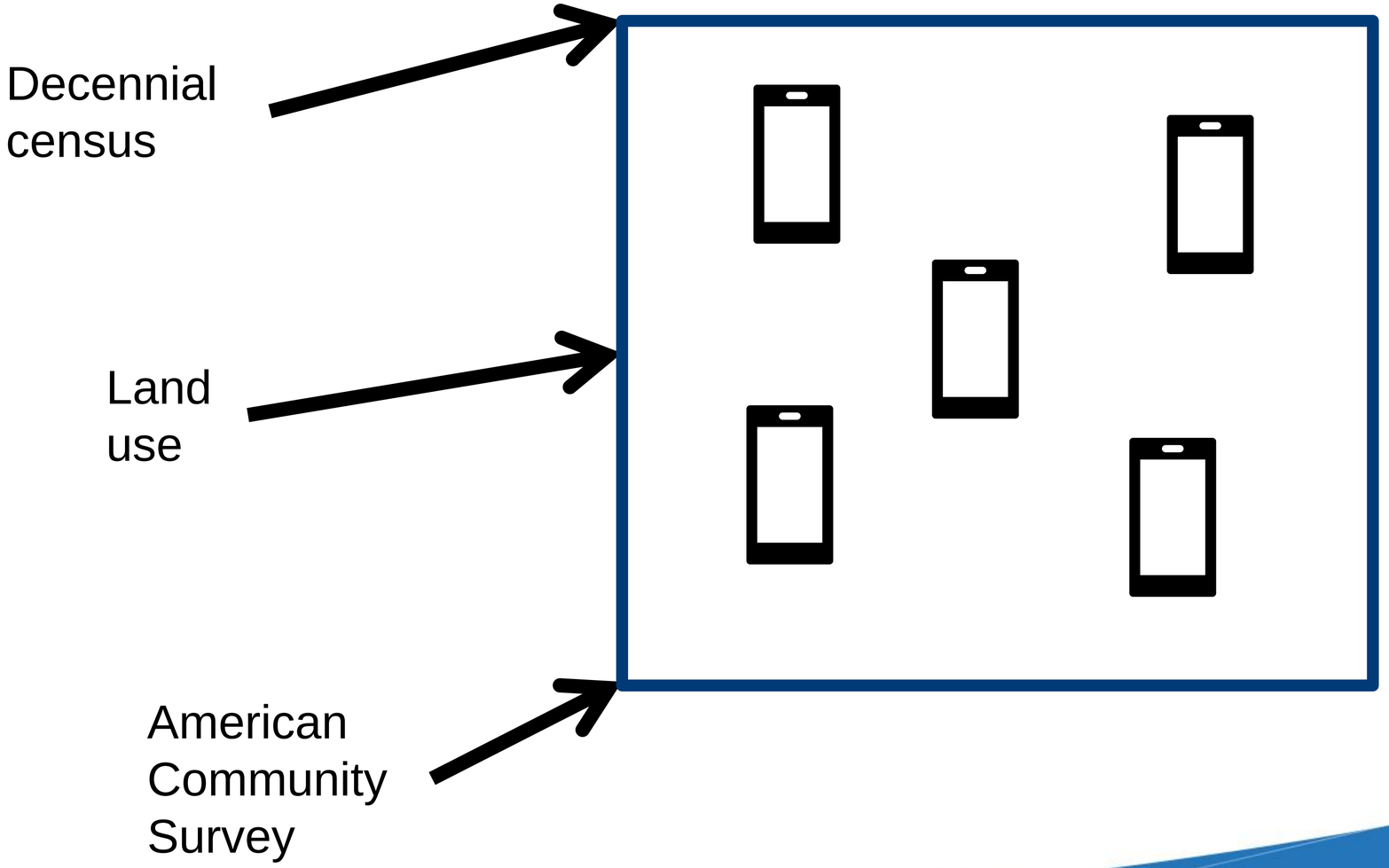
Retail Hours 2018



A weekday



StreetLight uses other data sources to determine the demographics for a given area



StreetLight data limitations

- Disparities in cell phone ownership
- Bias in what kinds of apps groups of people use
- Spatial accuracy
- StreetLight Traffic Index “black box”

Case study:
Which parks are most popular?

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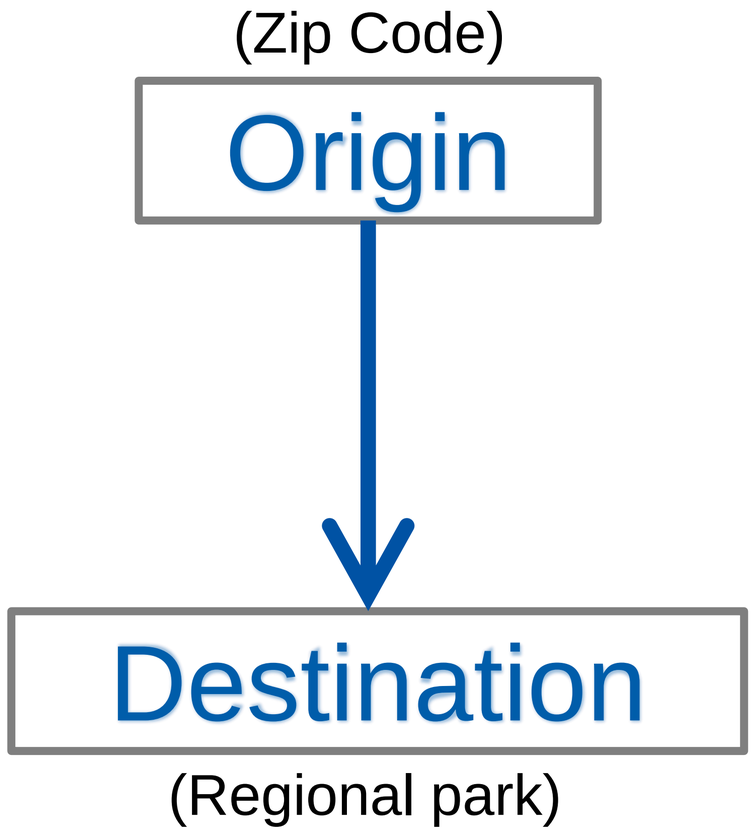
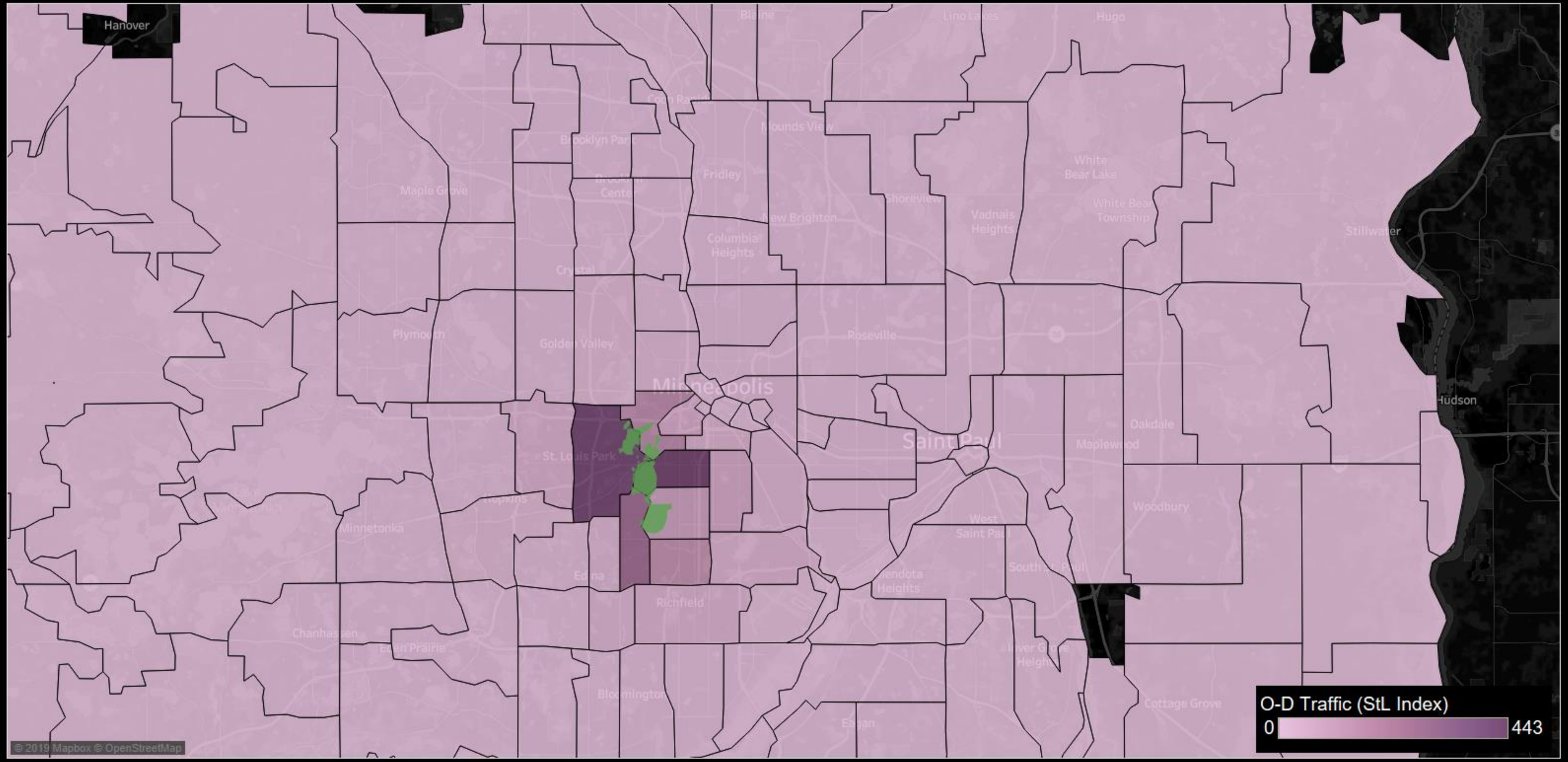
Origin-Destination Analysis

- Measures the relative traffic to each regional park from each zip code
- Includes Trips that end in the park
- Filter data to only include Average Day (M-Su), retail hours (6am-10pm), all 2018
- 84,000 devices
- 207,000 trips



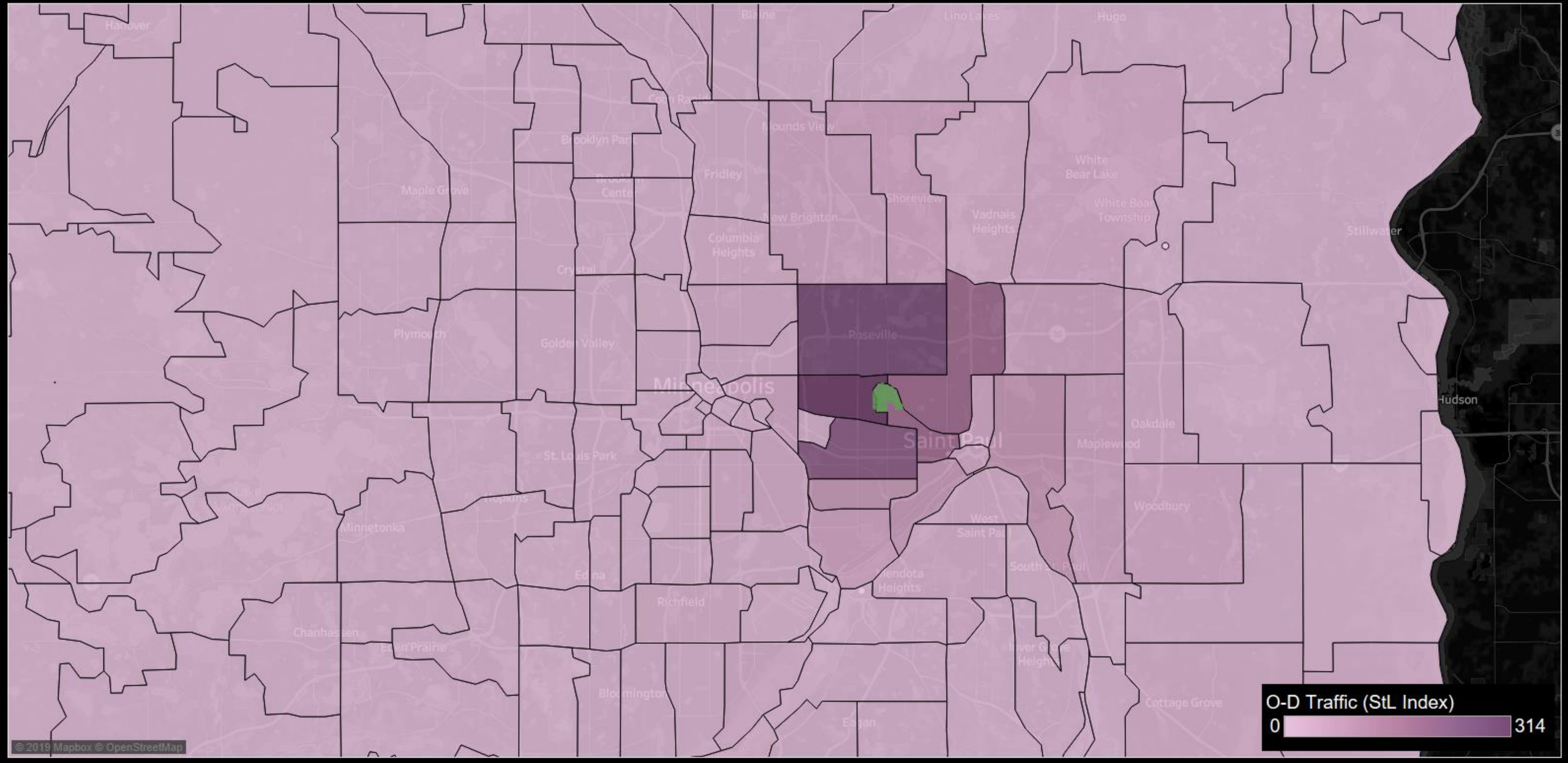
Minneapolis Chain of Lakes

OD Traffic by Zip Code

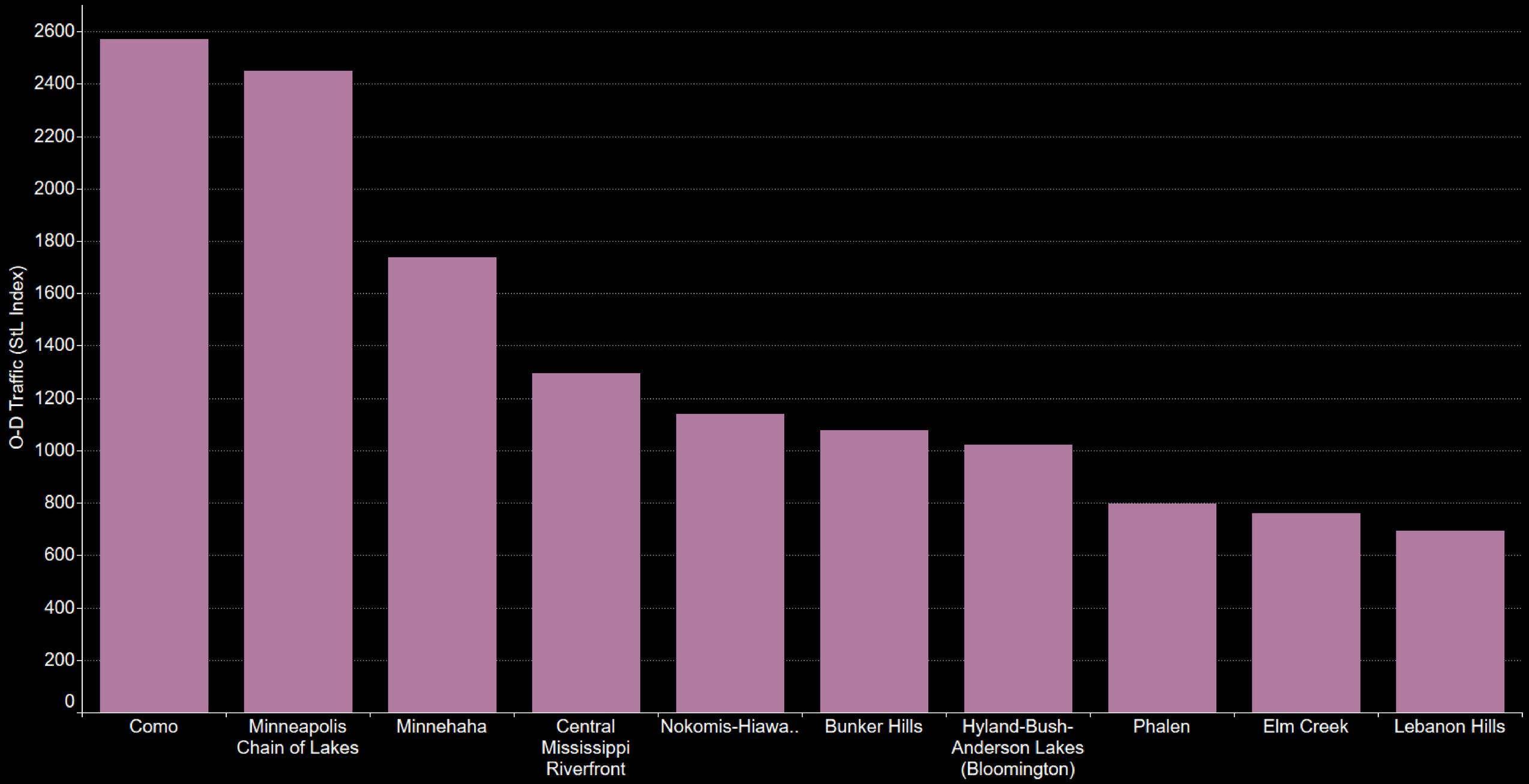


Como

OD Traffic by Zip Code

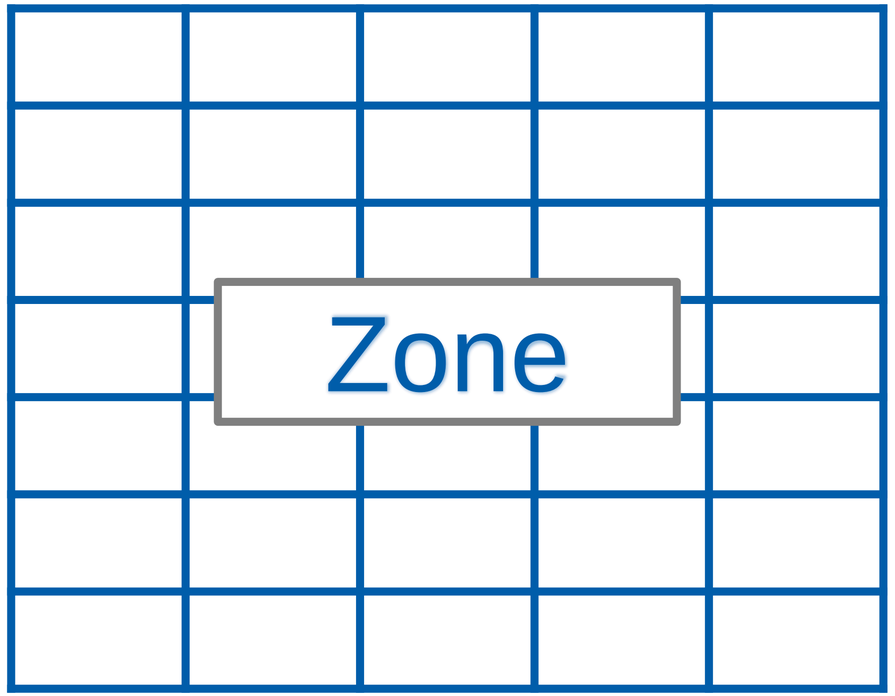


Total OD Traffic Index by Park



Zone Activity Analysis with Home Zip Codes

- Measures the relative traffic to each regional park from each home zip code
- Includes All Trips (Start, End, Pass-through)
- Filter data to only include Average Day (M-Su), retail hours (6am-10pm), all 2018
- 485,000 devices
- 673,000 trips



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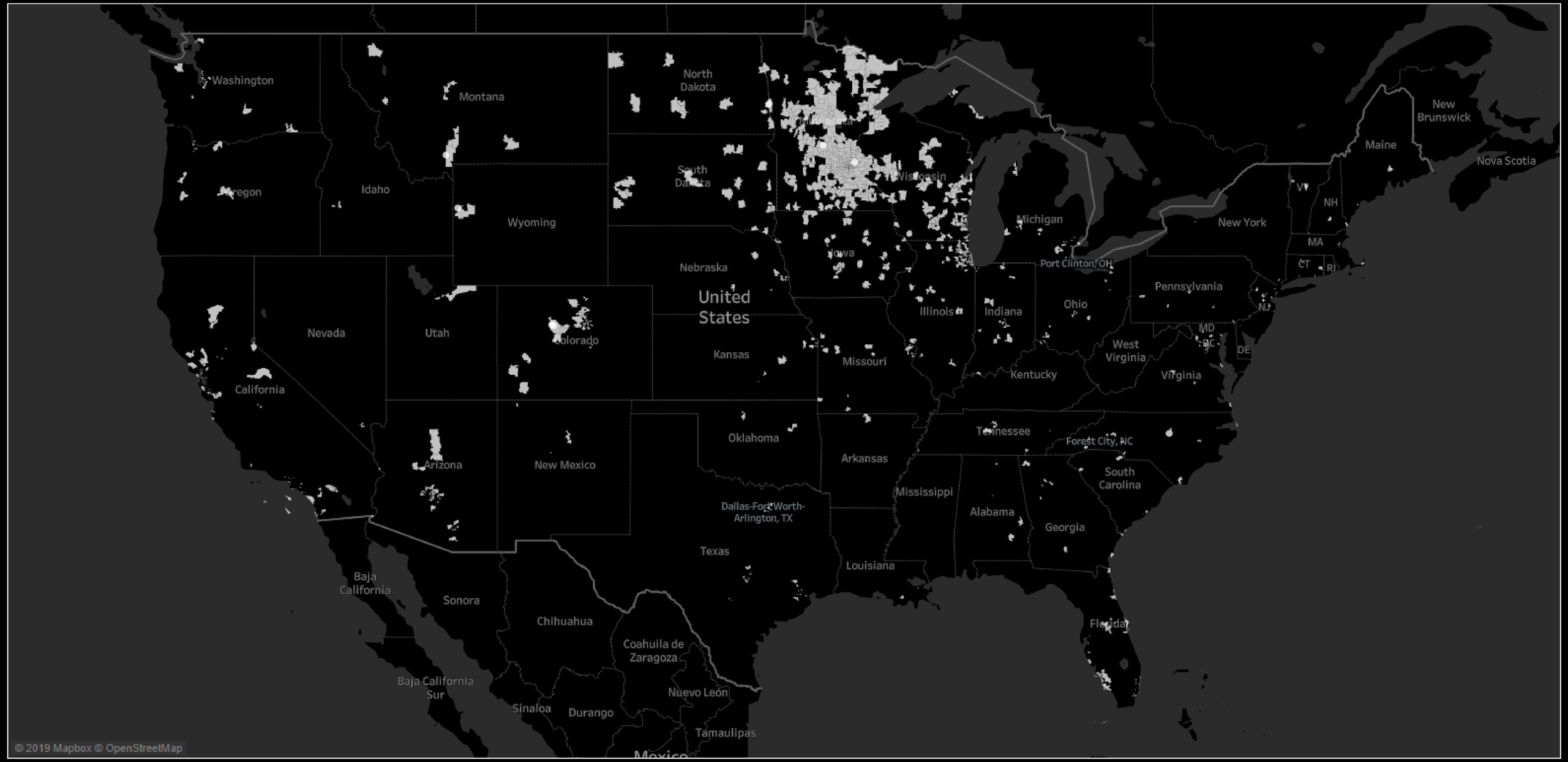
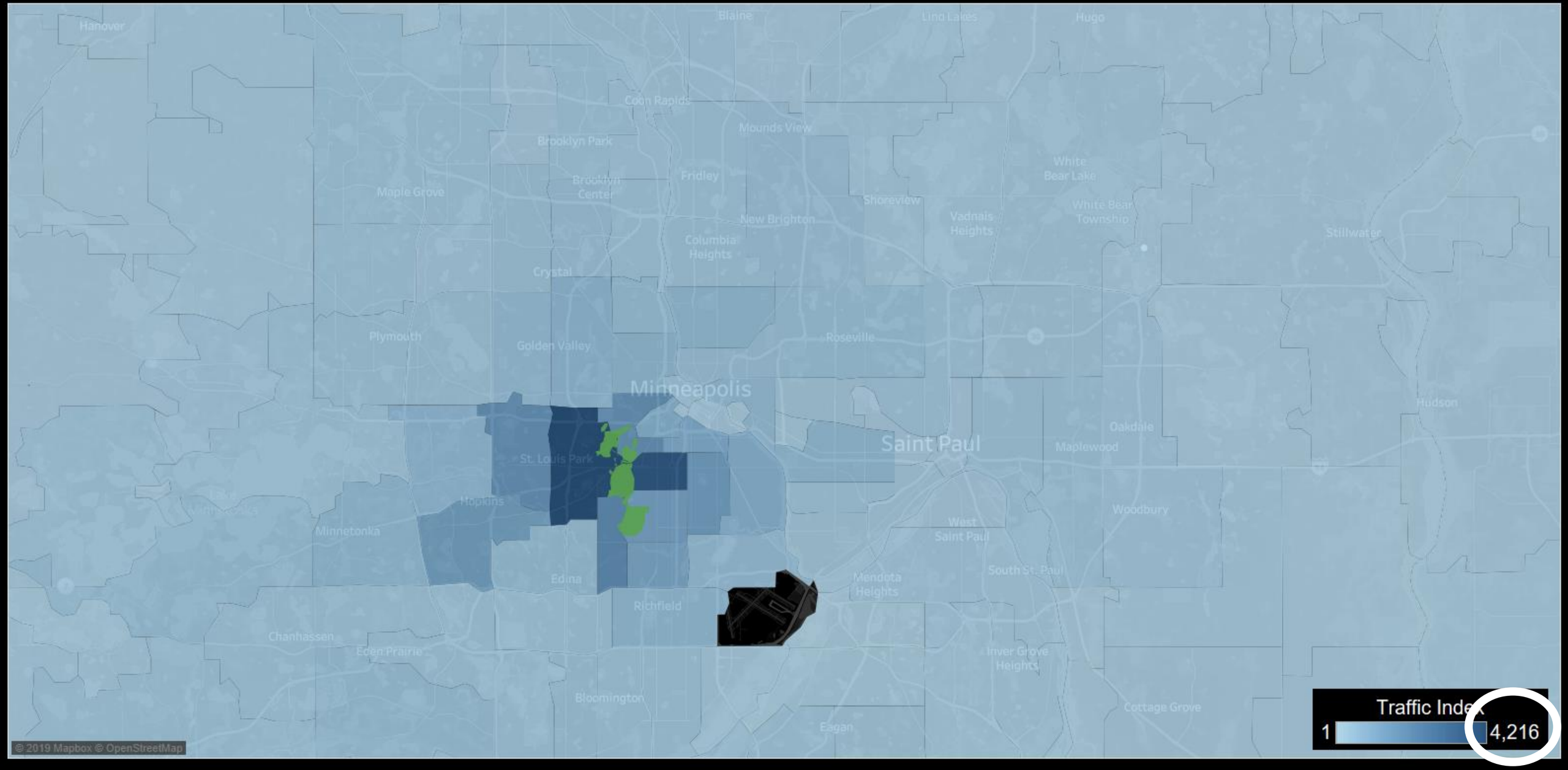
Visitor Home Zip Codes



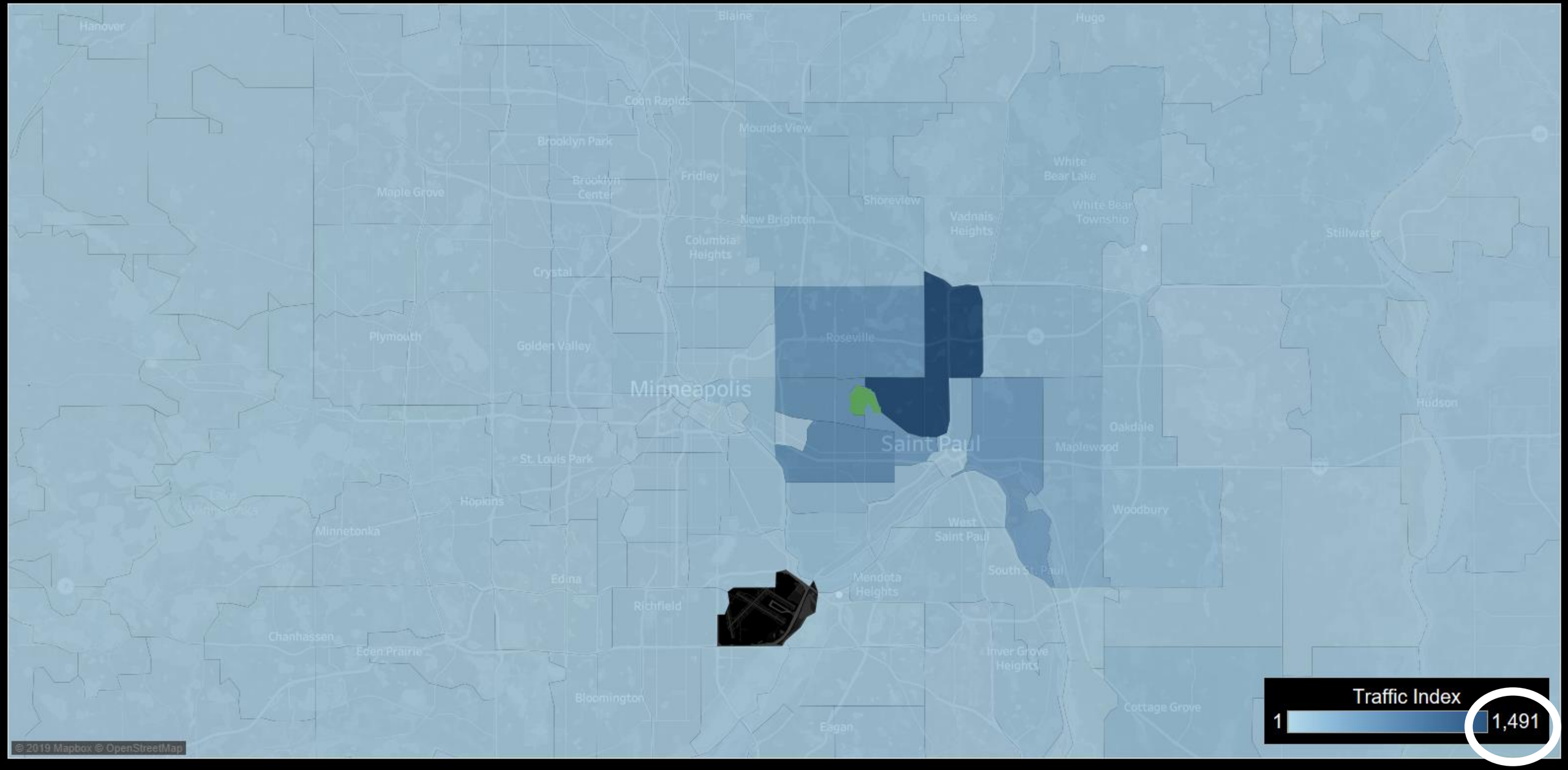
Minneapolis Chain of Lakes

Traffic by Home Zip Code

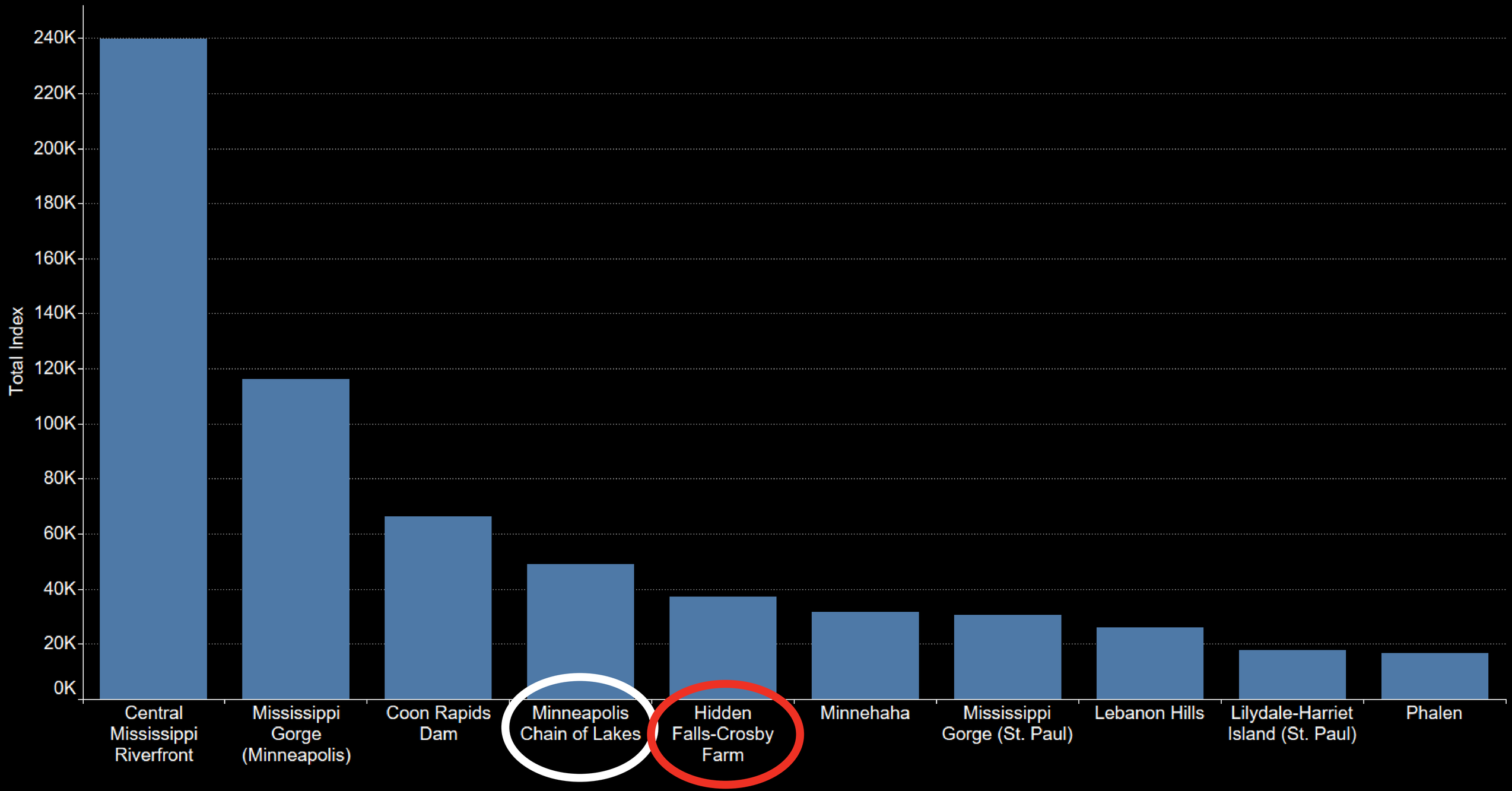


Como

Traffic by Home Zip Code

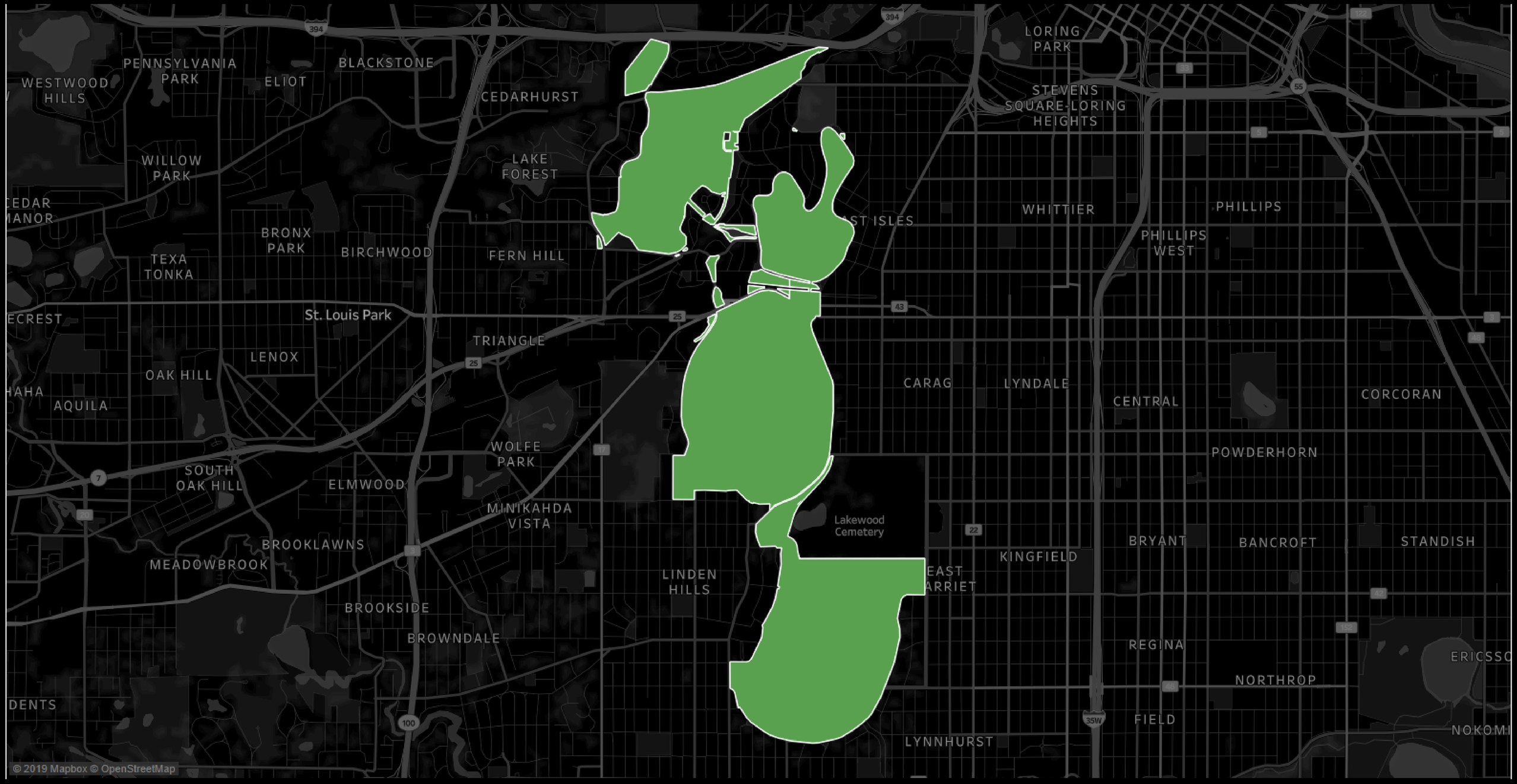


Total Traffic Index by Park



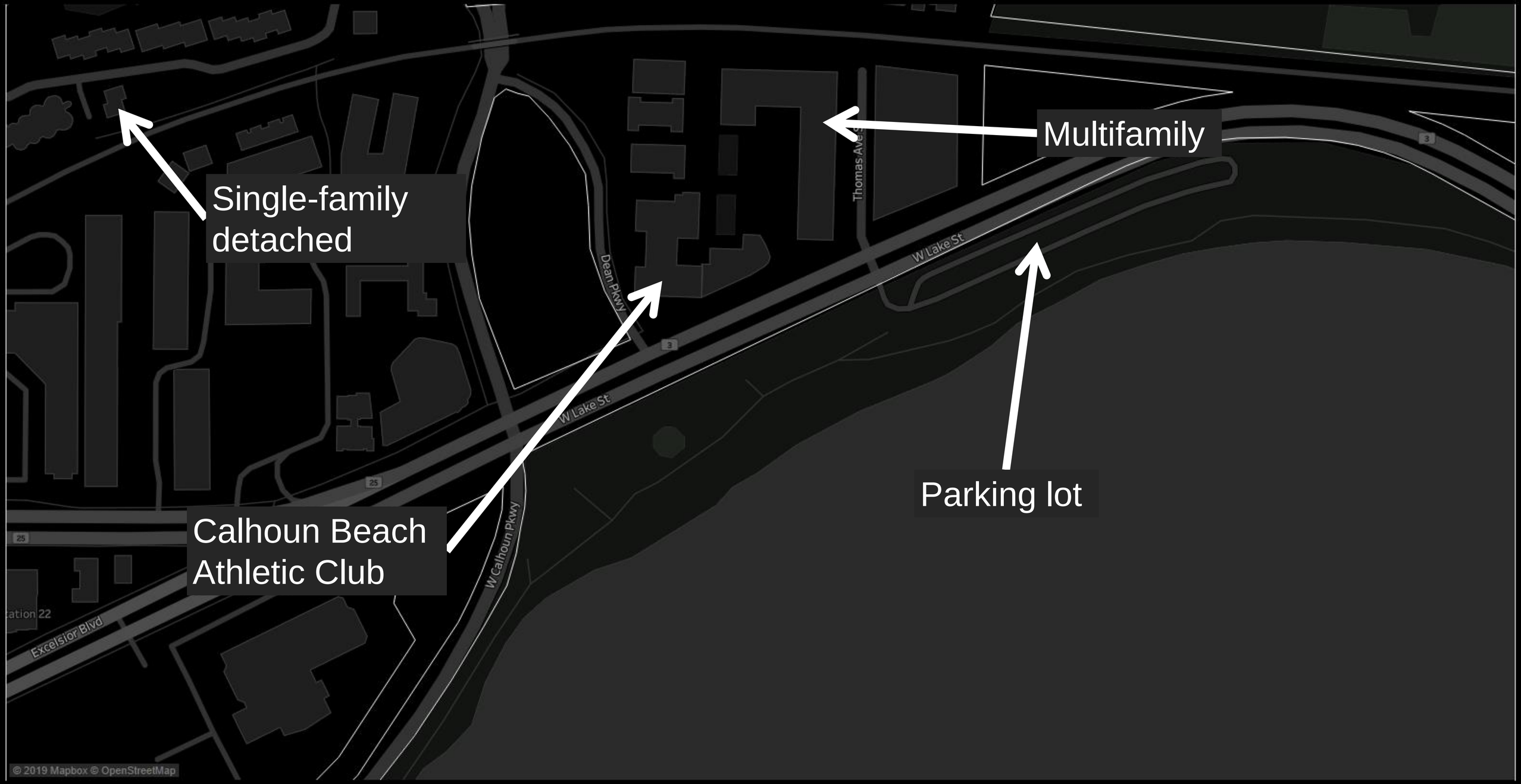
Hidden Falls-Crosby Farm

Minneapolis Chain of Lakes



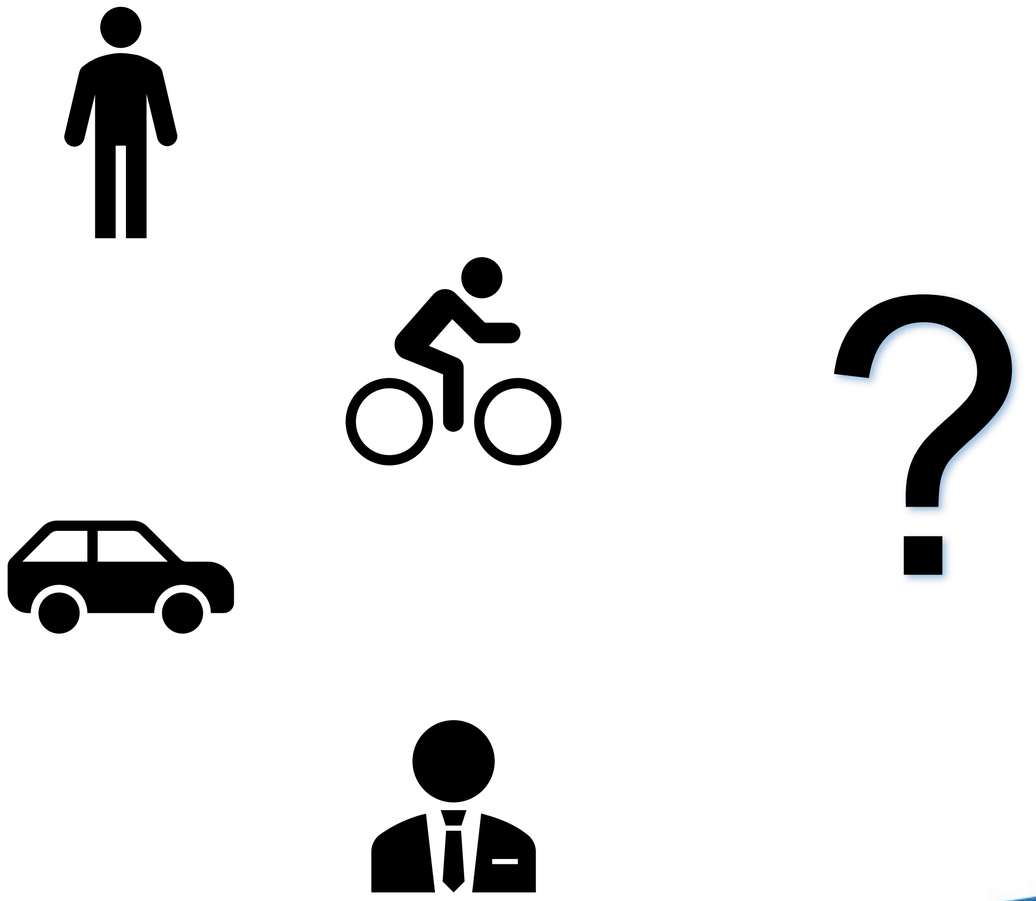
Minneapolis Chain of Lakes

Bde Maka Ska North Beach



What did we learn?

- There isn’t a consistent way to define who counts as a visitor across all regional parks
- Each park requires detailed review



Case study:
Measuring activity within Como

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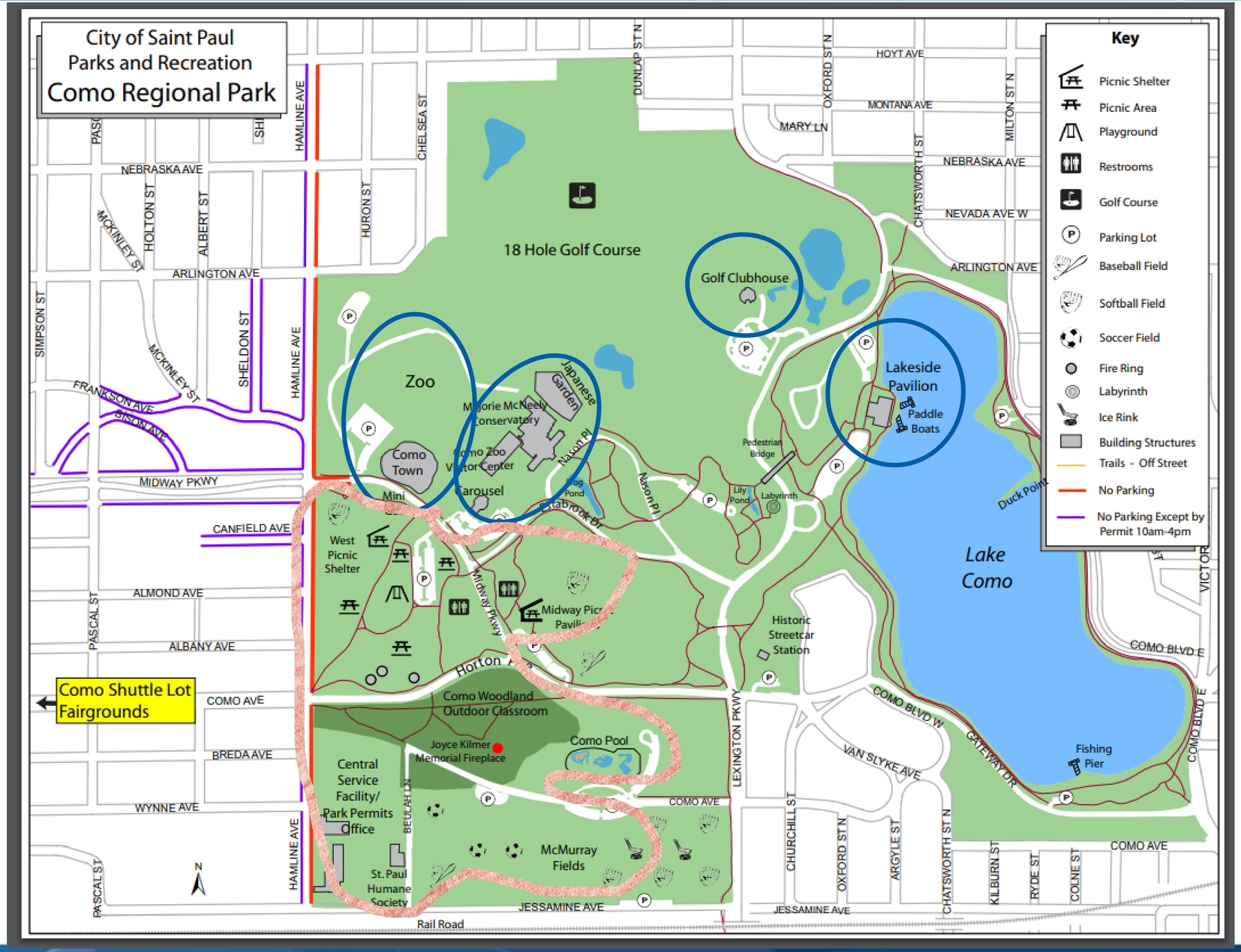
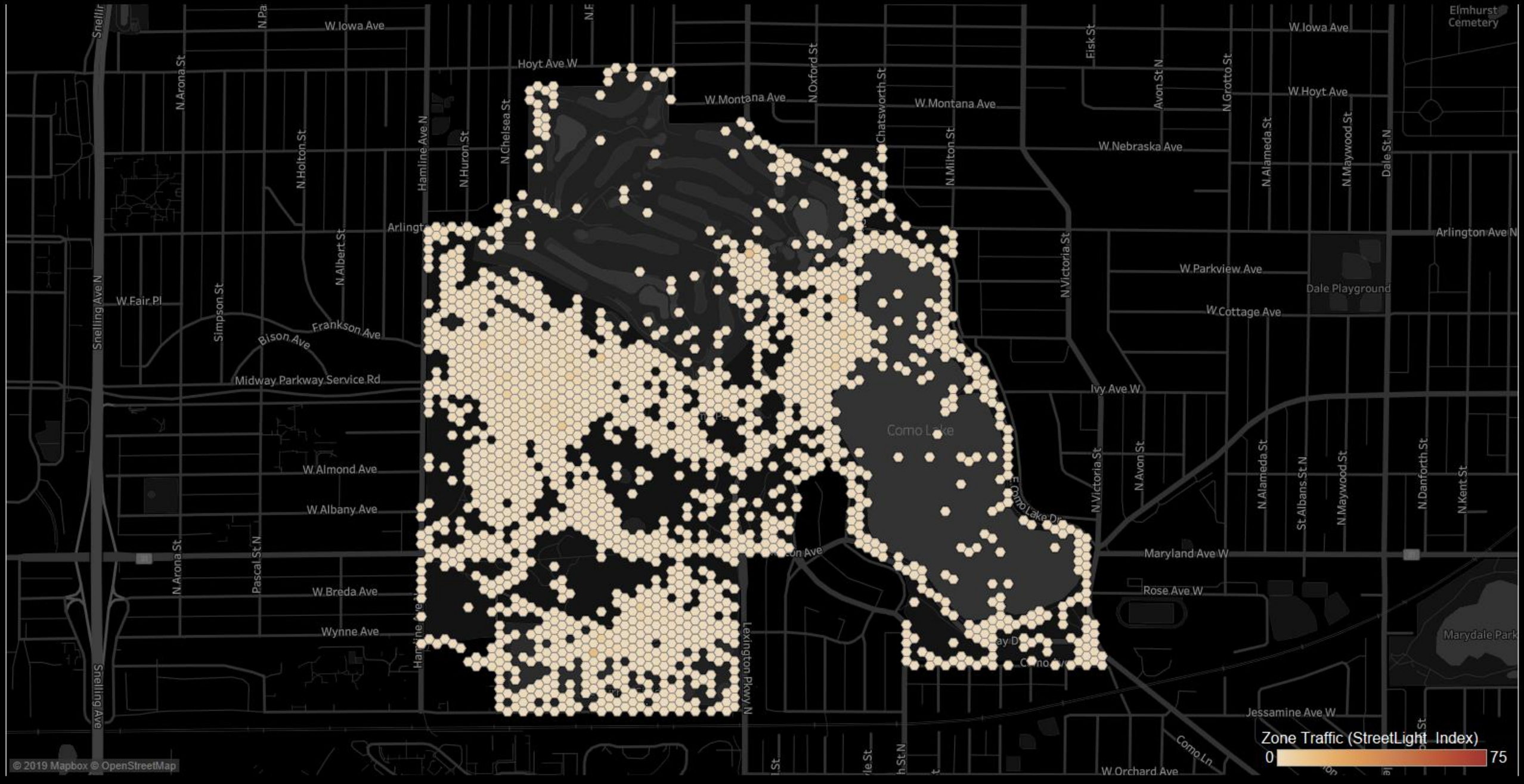
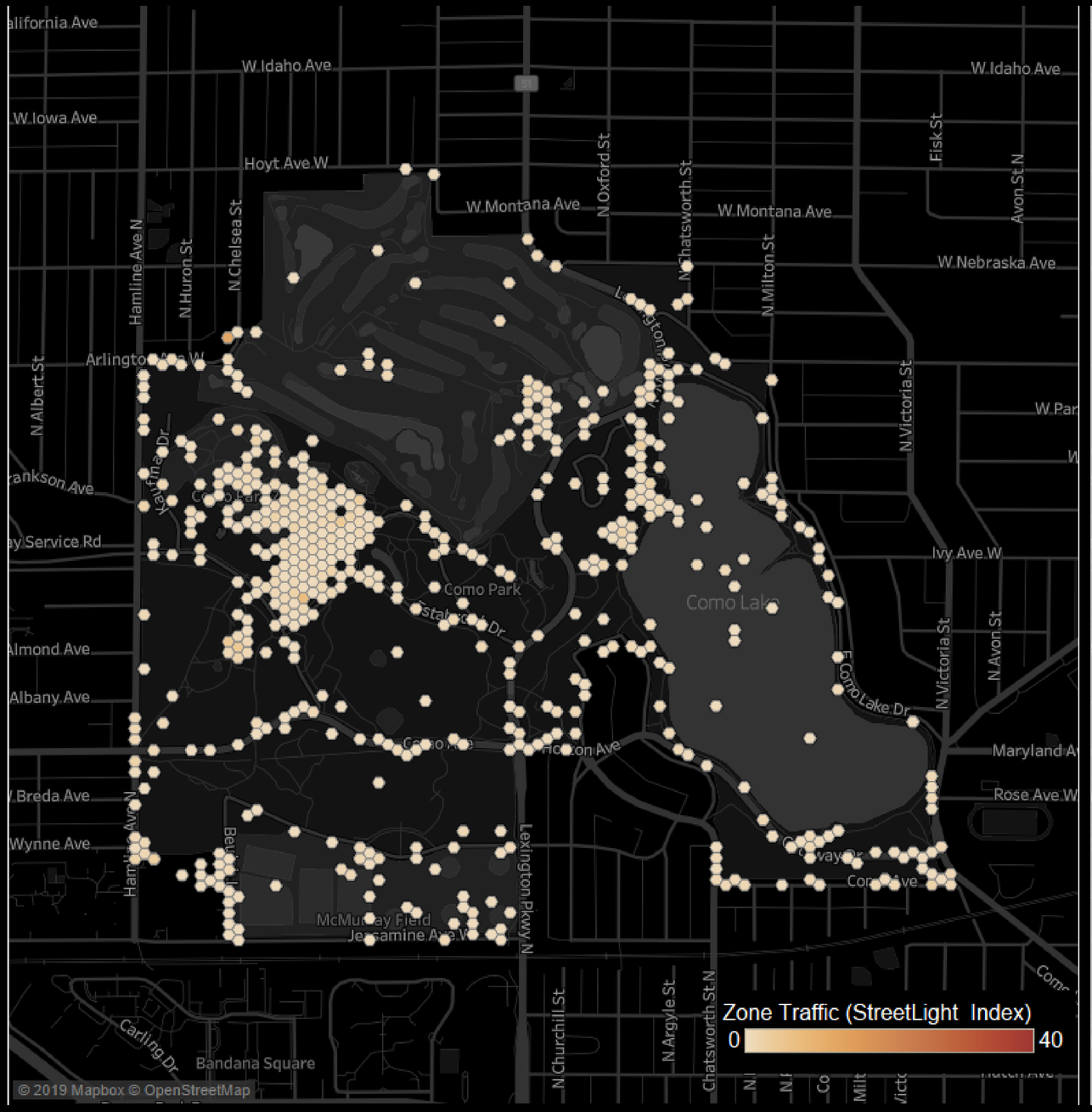


Map: St. Paul Parks and Recreation

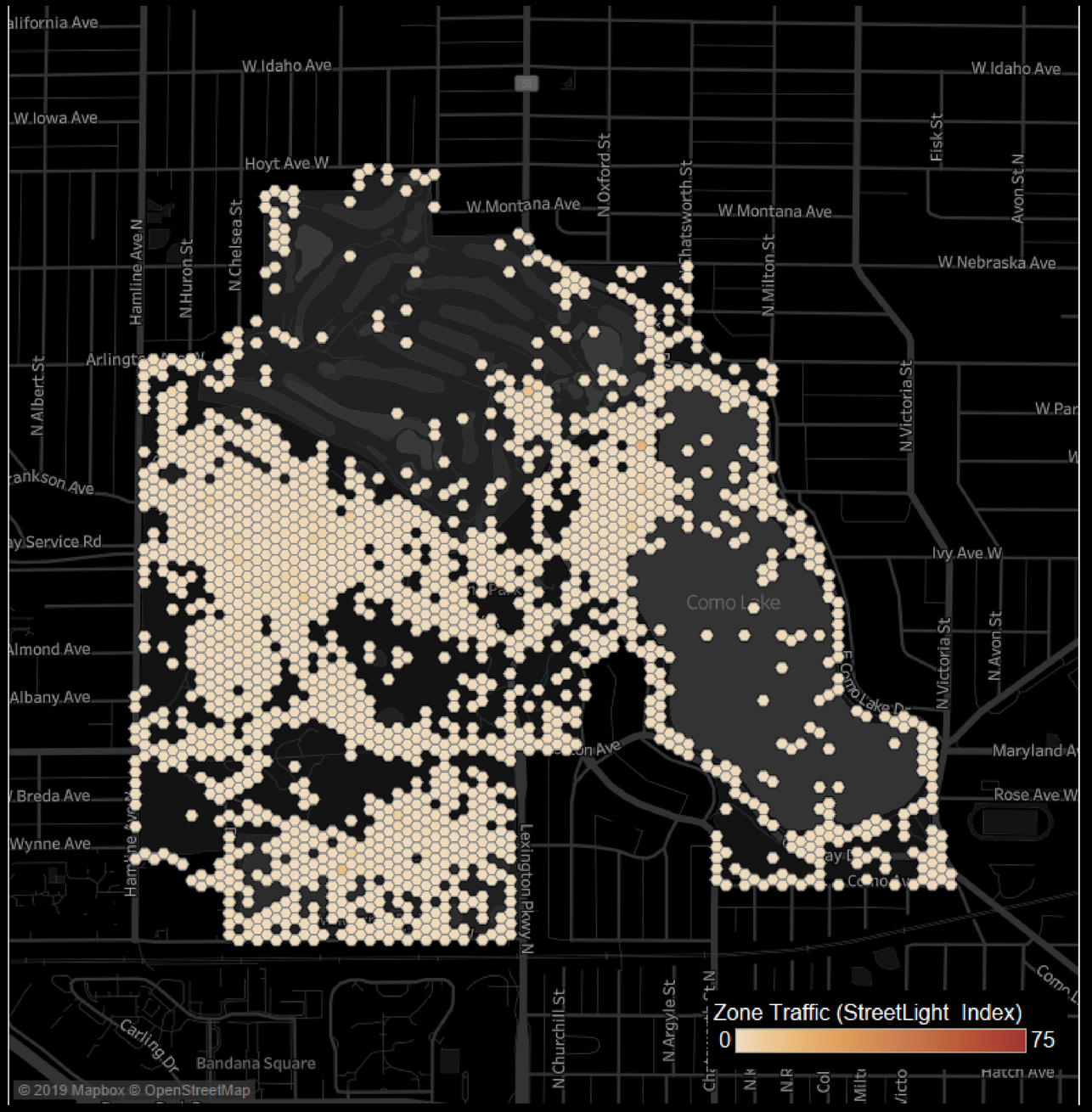
Summer 2018


W Iowa Ave
Hoyt Ave W
W Montana Ave
N Oxford St
Chatsworth St
Fisk St
Avon St N
N Grotto St
W Hoyt Ave
Elmhurst Cemetery
N Arona St
N Holton St
Hamline Ave N
N Huron St
N Chelsea St
N Milton St
W Nebraska Ave
N Alameda St
N Maywood St
Dale St N
Arlington Ave N
N Albert St
N Victoria St
W Parkview Ave
Dale Playground
W Cottage Ave
Snelling Ave N
W Fair Pl
Simpson St
Frankson Ave
Bison Ave
Midway Parkway Service Rd
Ivy Ave W
Como Lake
W Almond Ave
W Albany Ave
N Avon St
St Albans St N
N Danforth St
N Kent St
Pascal St N
Maryland Ave W
W Breda Ave
Rose Ave W
Wynne Ave
Lexington Pkwy N
Marydale Park
Jessamine Ave W
Como Ln
W Orchard Ave
Zone Traffic (StreetLight Index)
0
75
© 2019 Mapbox © OpenStreetMap

Winter 2018

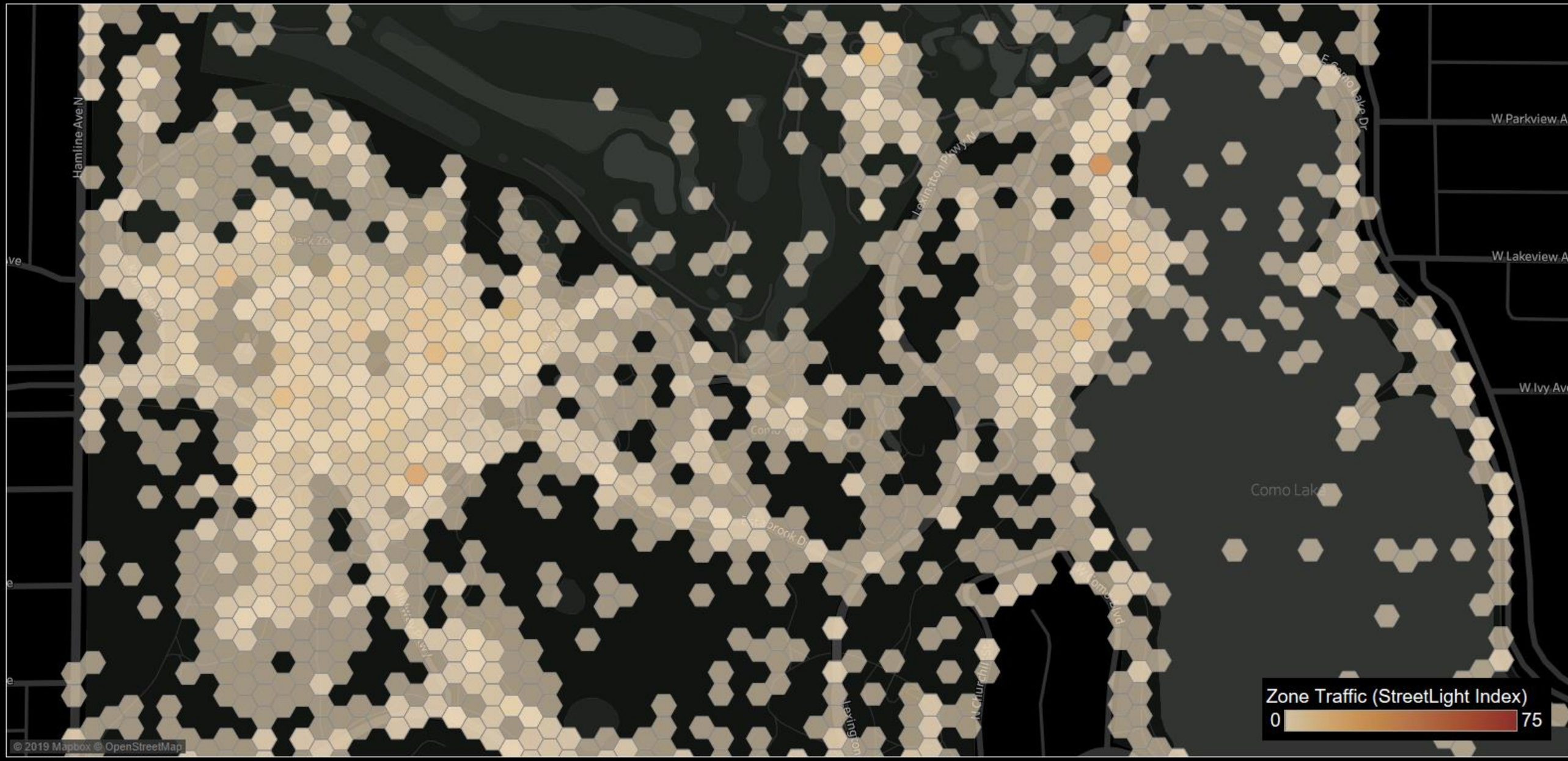


Summer 2018



Summer 2018

May 2018 - August 2018

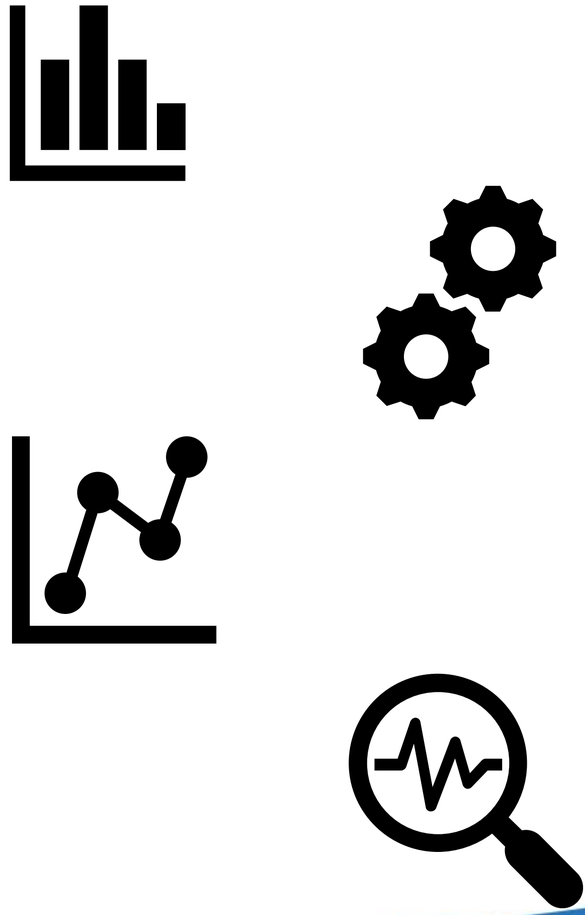


Implications

- Implement stronger sampling plans
- Target resources to different areas over the year
- Avoid placing survey staff where there are few people

What now?

- Location-based data challenges the way we think about regional parks visitors.
  - Examine disparities in park use
  - Differentiate passthrough and non-passthrough visitors
  - Locate busy areas within parks
  - Allow low-cost park-level analysis
  - Open the door for advanced research



Thank you!

Liz Roten
Associate Data Scientist, Metropolitan Council
elizabeth.roten@metc.state.mn.us

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