Changes to Metro-Area Travel During the COVID-19 (Coronavirus) Outbreak
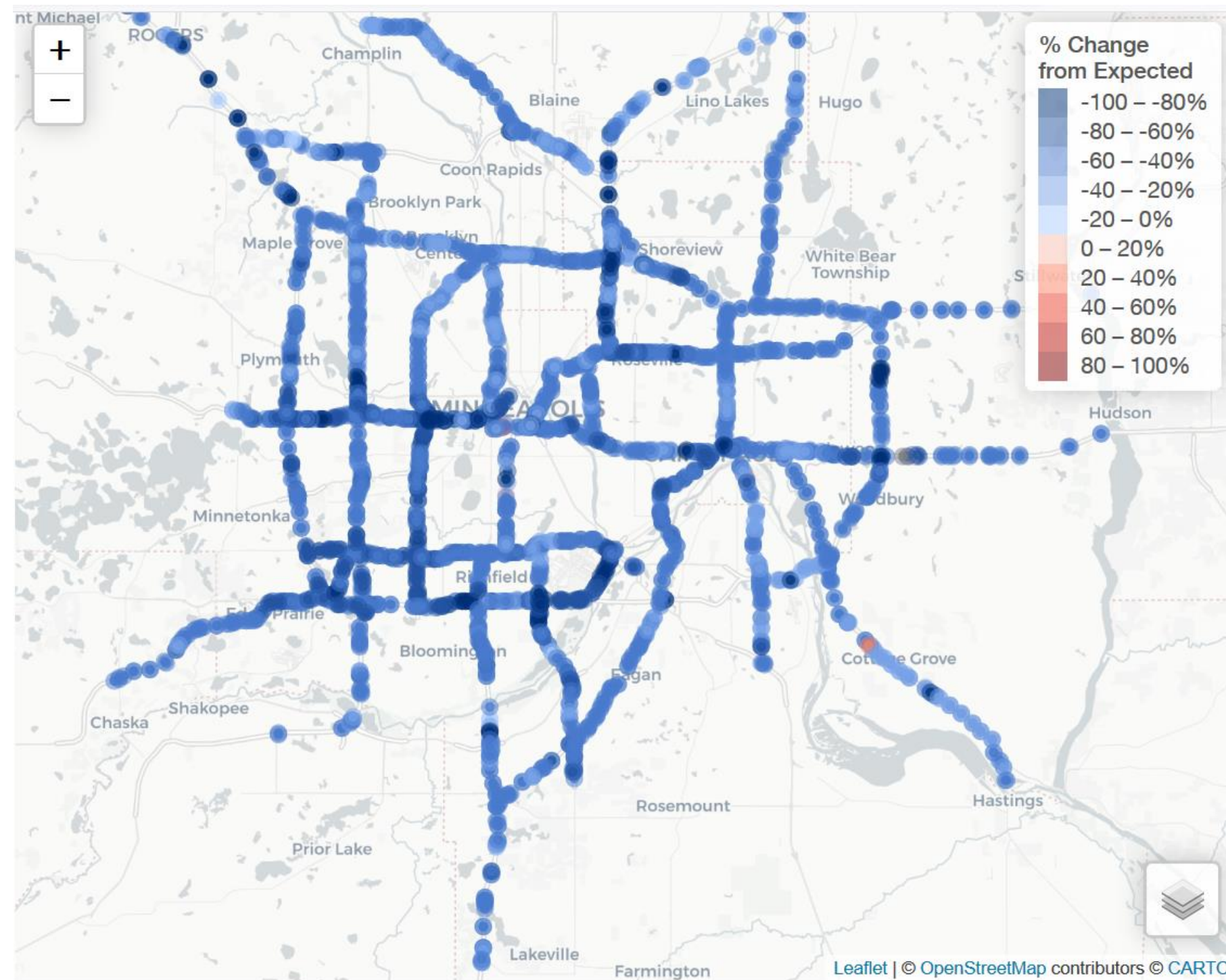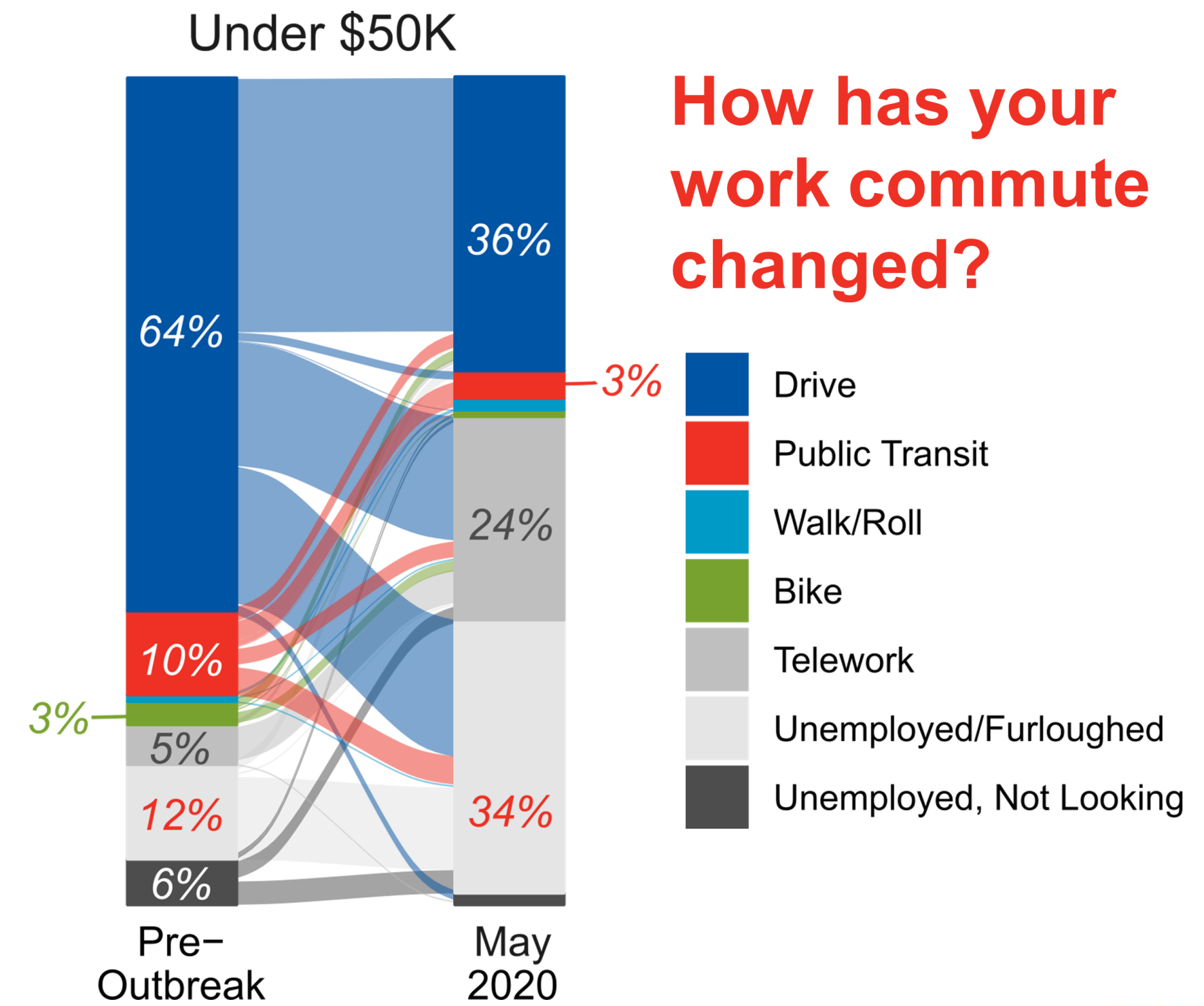
Ashley Asmus and Jonathan Ehrlich

Metropolitan Transportation Services

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Two sources of data

Traffic Volumes

COVID-19 Transportation Survey

How has your work commute changed?

Legend:
- Drive
- Public Transit
- Walk/Roll
- Bike
- Telework
- Unemployed/Furloughed
- Unemployed, Not Looking

Traffic as a measure of social distancing

- Minnesota Management and Budget office (MMB) asked MnDOT, Metropolitan Council and Metro Transit for measures of social distancing

- Measures meant to inform disease modeling efforts and evaluate effectiveness of social distancing policies

- Traffic and ridership data provide near-real-time measures of change

- Existing research was quickly re-tooled

Sources of traffic data

MnDOT

- 100+ Automated Traffic Recorders (ATRs) spread across the state on various roadway types
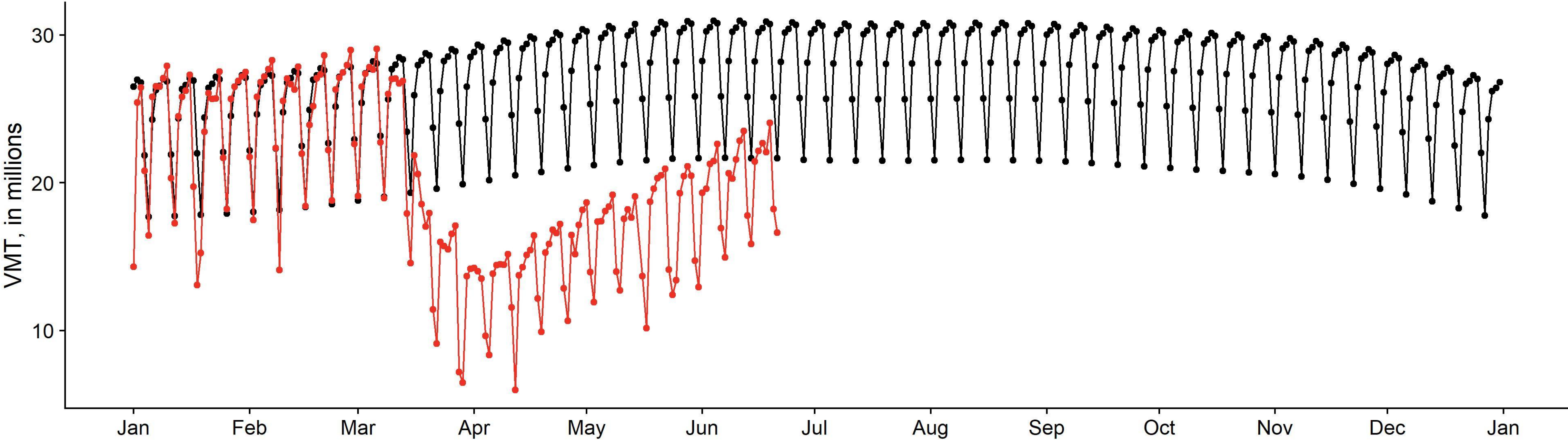
Metropolitan Council

- 1000+ MnDOT Regional Transportation Management Center (RTMC) traffic sensors on metro area freeways

- Data pulled using an open-source R package written by council staff, *tc.sensors*

Approach to estimate "typical" traffic

Selecting a robust baseline was of key importance.

- Used Generalized Additive Models (GAMs)

- Model accounted for weekday trends and seasonal trends

- Model relied on 3 years of data (January 2018 – early March 2020)
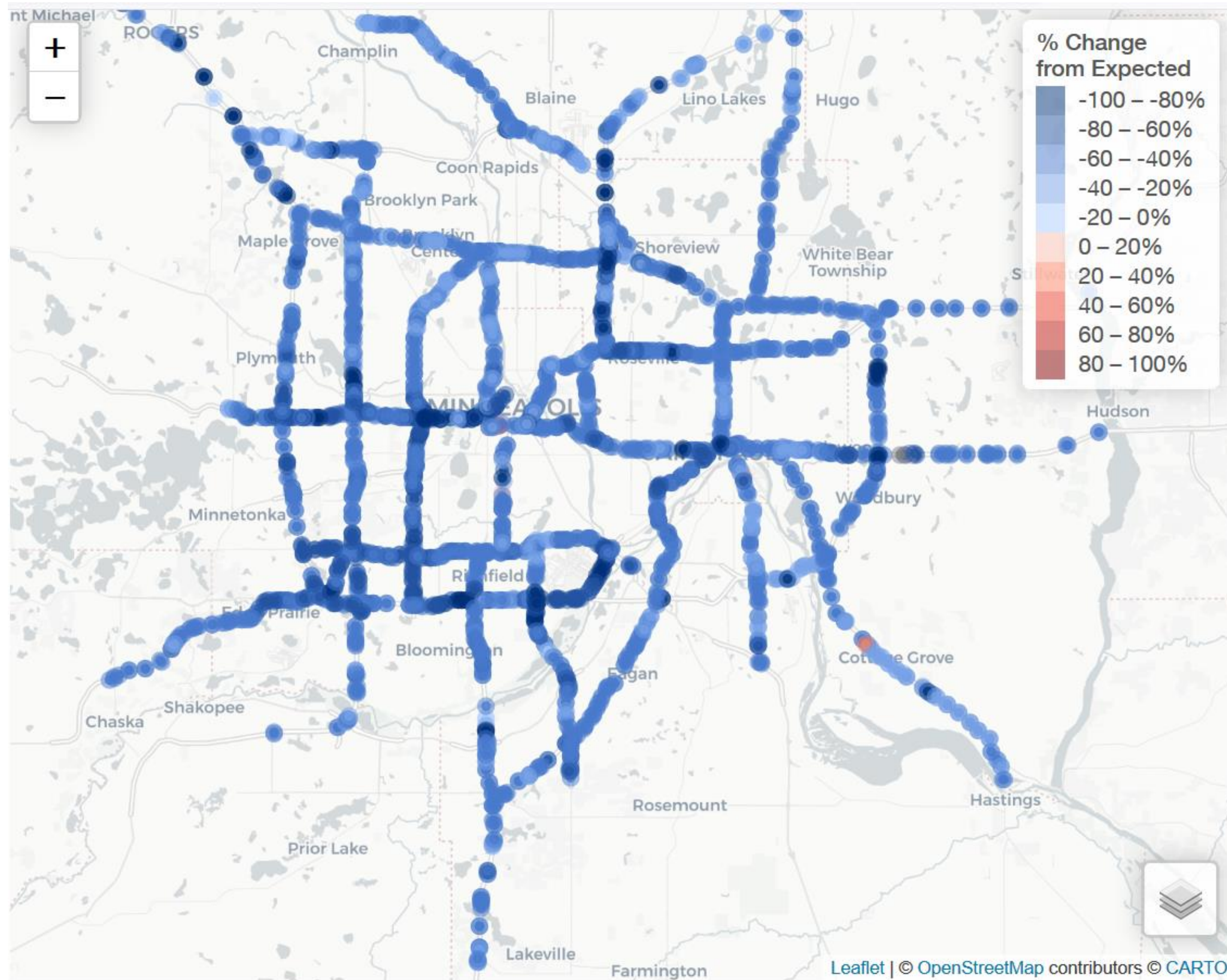
- Created one model for each traffic node

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Under the hood: predicted traffic volumes

Traffic trends, March 8 - Present

https://metrotransitmn.shinyapps.io/covid-traffic-trends/
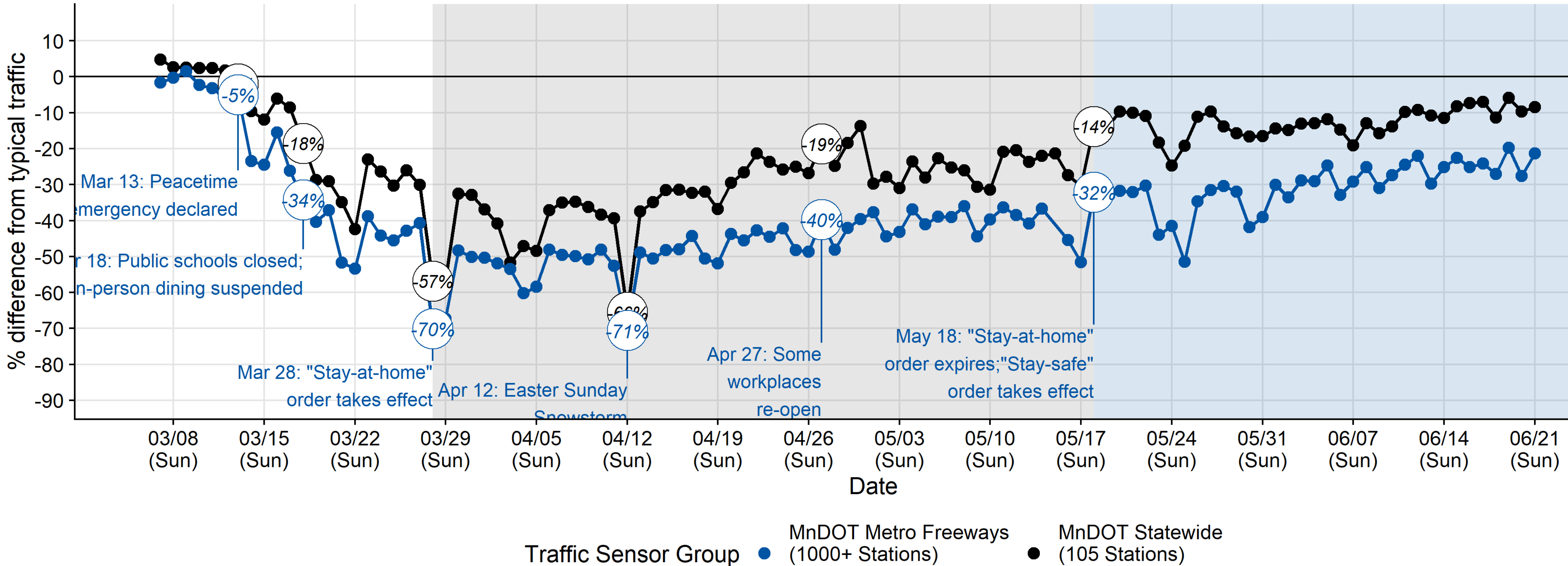
Traffic trends by sensor node

Interactive mapping application:

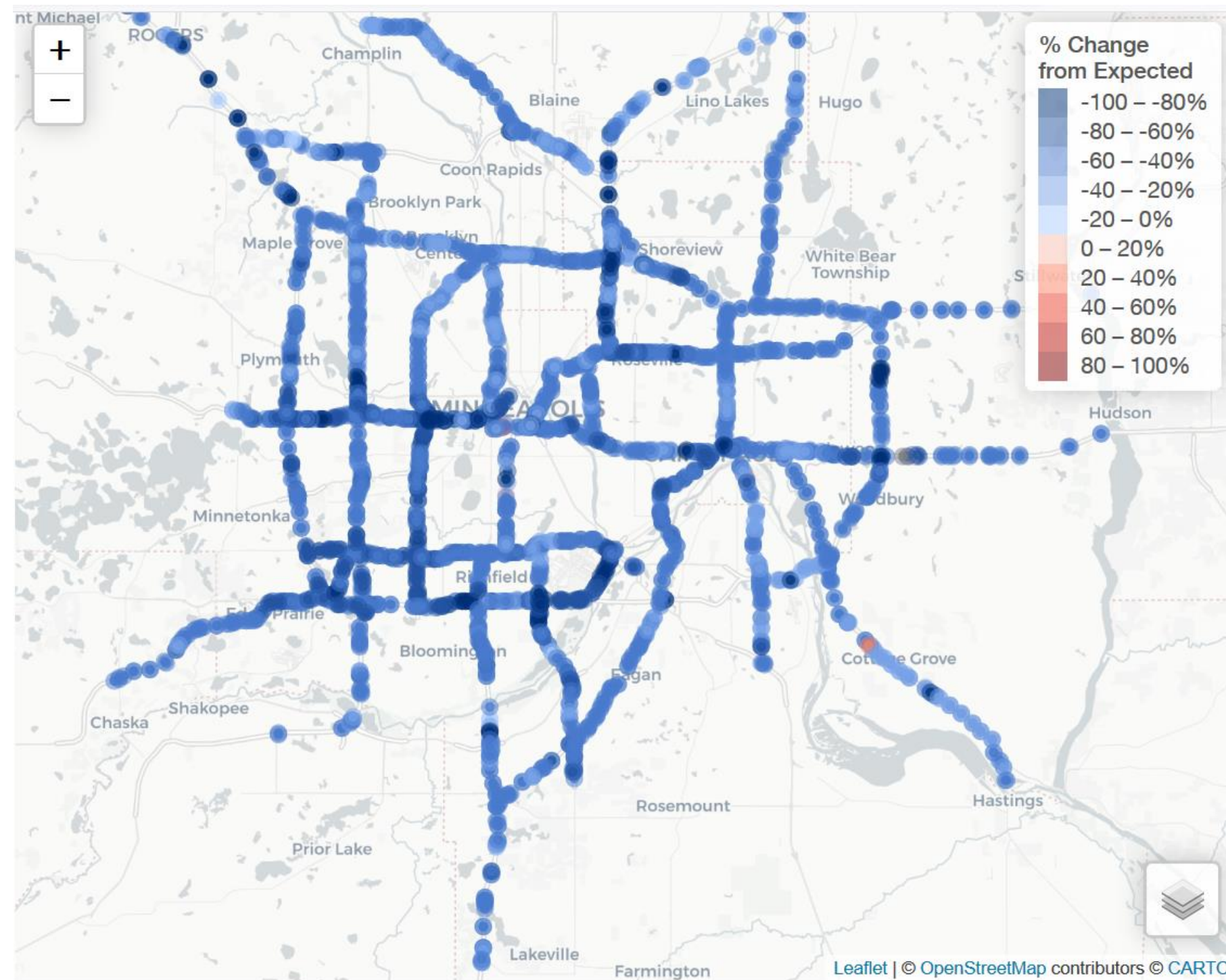http://metrotransitmn.shinyapps.io/covid-traffic-trends/
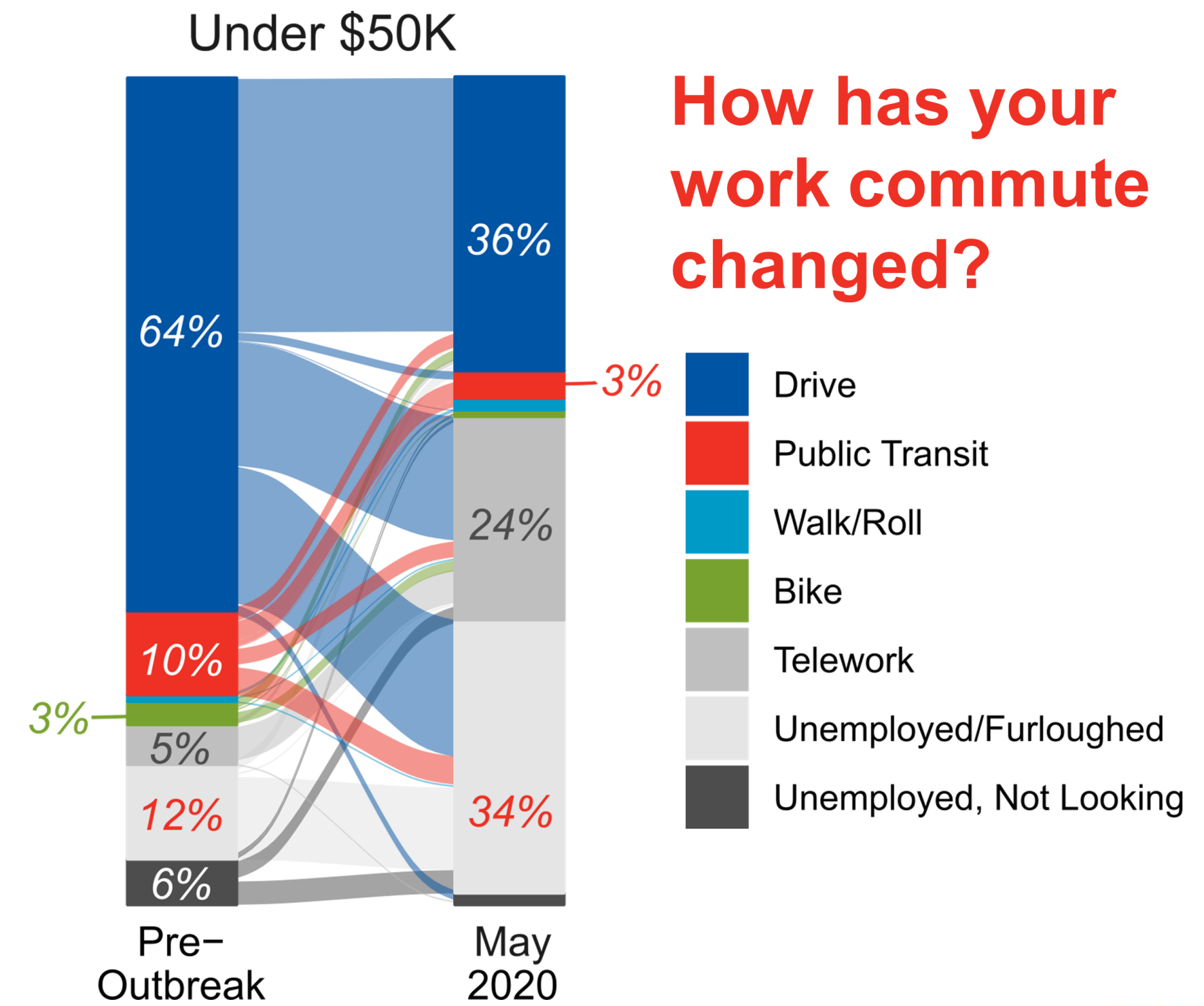
Summing up

Traffic counts:

- Can provide a near real-time proxy measure for social distancing and travel, at potentially fine geographic scales
- Cannot measure travel on local non-freeway streets, in non-motorized modes, or pinpoint who is traveling and why.

Two sources of data

Traffic Volumes

COVID-19 Transportation Survey

Under $50K

How has your work commute changed?

- Drive
- Public Transit
- Walk/Roll
- Bike
- Telework
- Unemployed/Furloughed
- Unemployed, Not Looking

Pre−Outbreak: 64%, 10%, 3%, 5%, 12%, 6%

May 2020: 36%, 3%, 24%, 34%

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Survey sample

- Eligible participants: metro-area adults who participated in 2019 Travel Behavior Inventory Survey
- 3,244 responses
- Survey was conducted May 14 – May 22
- Data received June 9
- Two additional waves planned (near-identical survey, timing TBD)
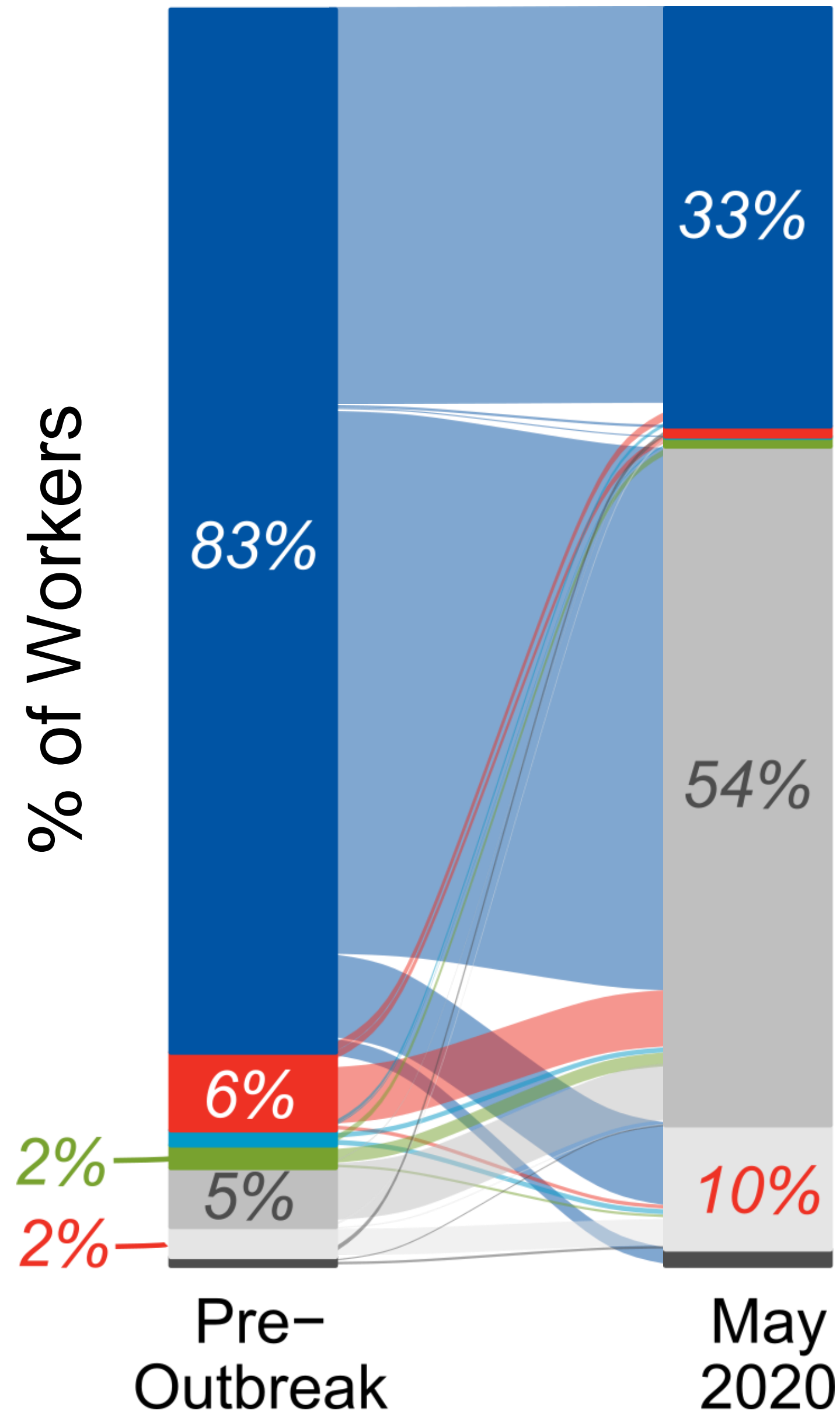
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List of topics covered in survey

- Exercise frequency and location
- Use of streets that have temporarily restricted vehicle traffic for social distancing
- Access to parks and trails: driving to reach parks and trails for exercise/recreation
- Bicycle frequency, trip purpose, bike share
- Grocery shopping type: in-store, delivery, pick-up
- Grocery shopping frequency
- Online shopping frequency
- All modes used last week
- All trip purposes for last week
- Travel to medical visits (and telehealth)
- Transit replacement modes

- Likelihood of purchasing a car, bike, scooter, bike share or transit pass in next six months
- Barriers to transportation
- Attitudes towards public health policies in air travel
- Attitudes towards public health policies on transit
- Demographics - change in residence, disability status, income, age, gender, race
- Size of household
- Employment status before and now
- Teleworking rates and preferences
- COVID-19 test, Missed work due to COVID-19
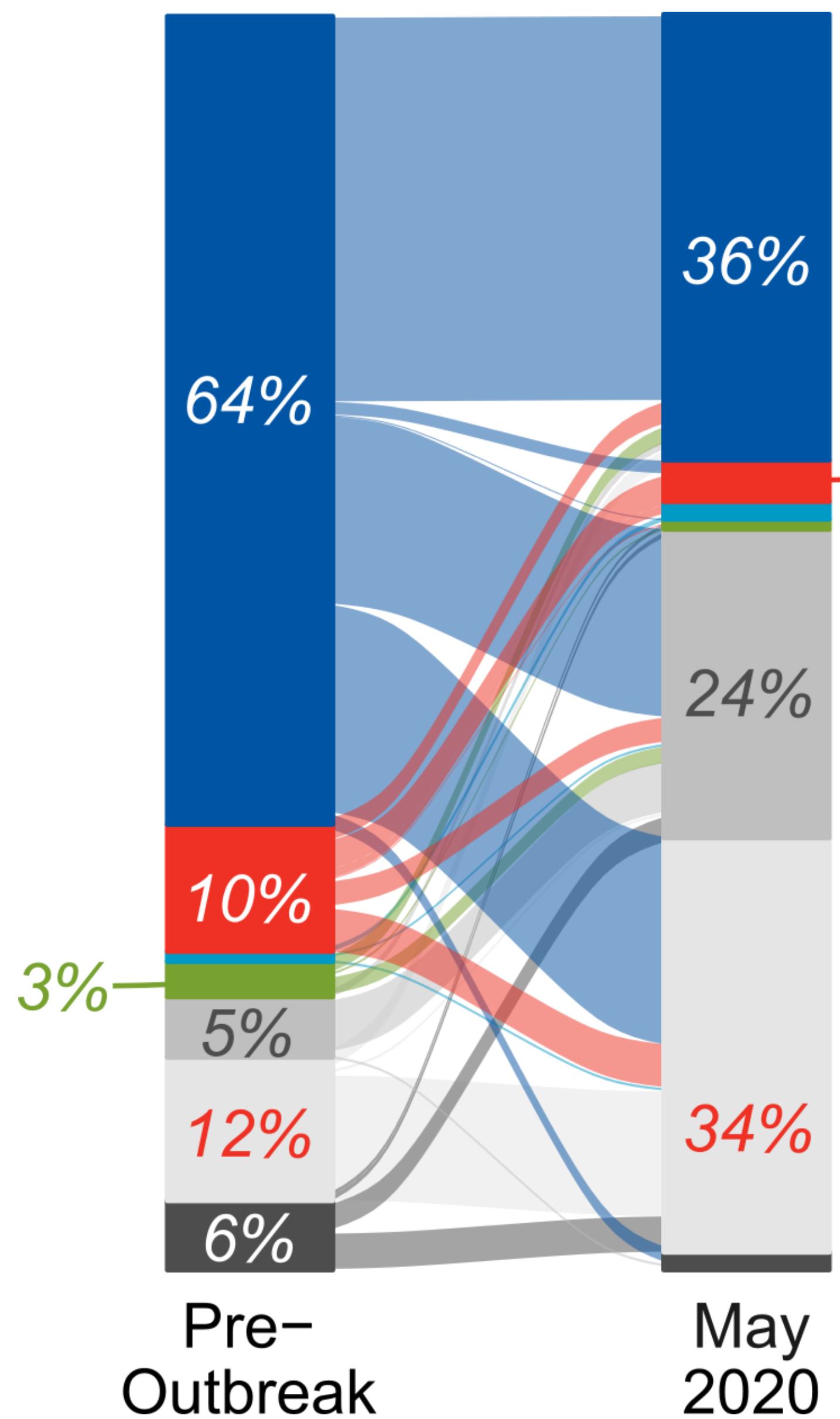- Perception of COVID-19 risks
- Job type

Full presentation to Metropolitan Council Transportation Committee here:
https://metrocouncil.org/Council-Meetings/Committees/Transportation-Committee/2020/June-22,-2020/Info-1-COVID.aspx
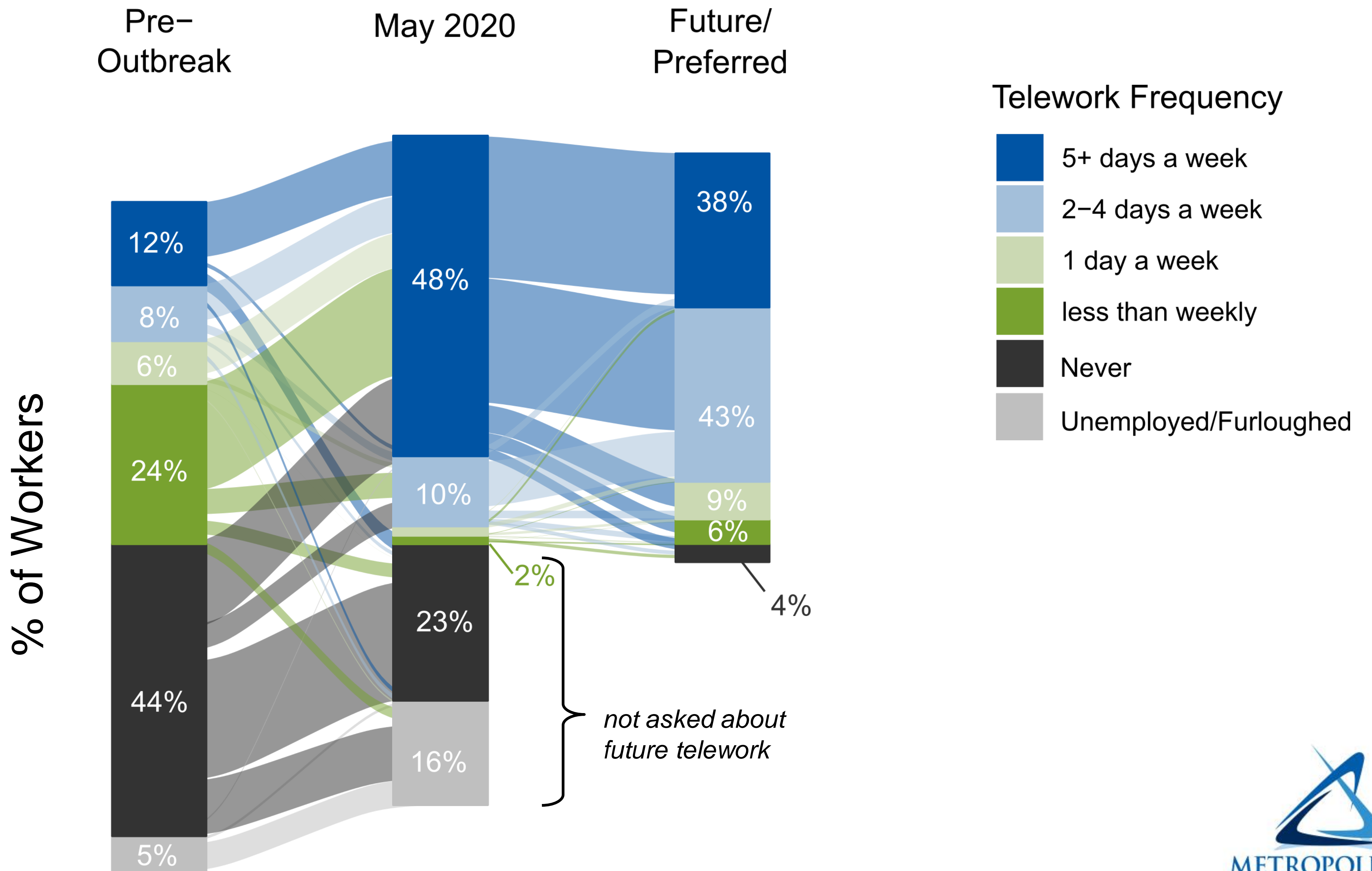
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How has your work commute changed?

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Pre–Outbreak | May 2020 | Future/Preferred

% of Workers

Pre–Outbreak: 12%, 8%, 6%, 24%, 44%, 5%

May 2020: 48%, 10%, 2%, 23%, 16%

Future/Preferred: 38%, 43%, 9%, 6%, 4%

not asked about future telework

Telework Frequency
- 5+ days a week
- 2−4 days a week
- 1 day a week
- less than weekly
- Never
- Unemployed/Furloughed
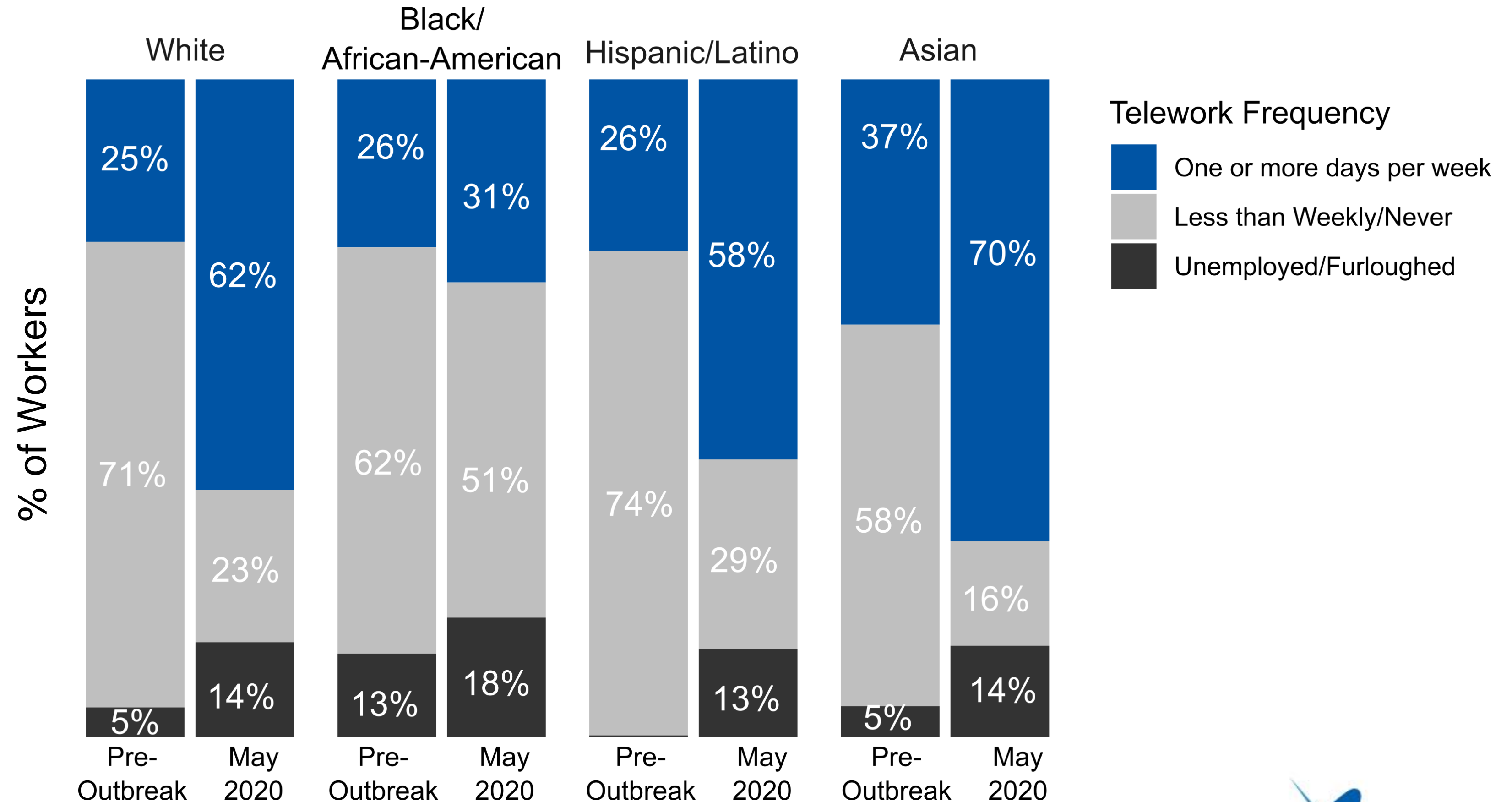
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Changes to telework frequency, by race

Although many workers moved from not teleworking to almost exclusively doing so, Black workers were just as likely to become unemployed as they were to move to telework.

Levels of/disparities in unemployment found in this survey are almost certainly an underestimate, see:

https://metrocouncil.org/Data-and-Maps/Research-and-Data/Research-by-topic/COVID-19-Economic-Impacts.aspx

Telework Frequency
- One or more days per week
- Less than Weekly/Never
- Unemployed/Furloughed

Summing up

Traffic counts:

- Can provide a near real-time proxy measure for social distancing and travel, at potentially fine geographic scales

- Cannot measure travel on local non-freeway streets, in non-motorized modes, or pinpoint who is traveling and why.

Surveys:

- Can help pinpoint who is traveling and why on a variety of modes, and provide contextual data on personal attitudes & perceptions

- Provide a regional snapshot, but are usually too small to disaggregate at fine geographic and temporal scales

How can "big data" help fill in the gaps?

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