



Credit: <https://twitter.com/cyclepronto>

CAPSTONE

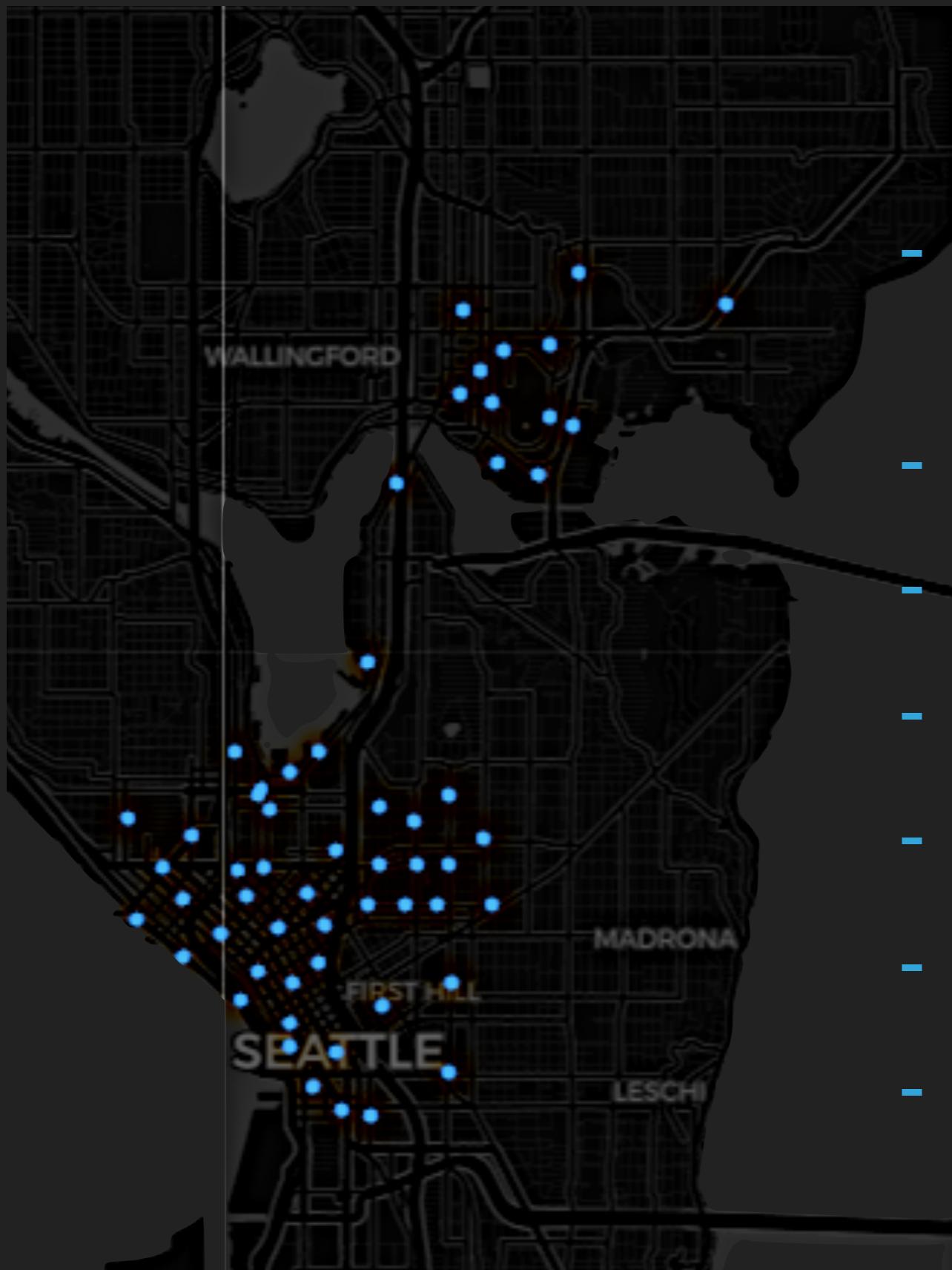
PRONTO BIKE SHARING

SEATTLE

Dr. Jorrik Fulda

- 1. OVERVIEW**
- 2. BUSINESS OBJECTIVE**
- 3. DATA ANALYSIS**
- 4. PREDICTIVE MODELING**
- 5. RECOMMENDATIONS**
- 6. FUTURE WORK**

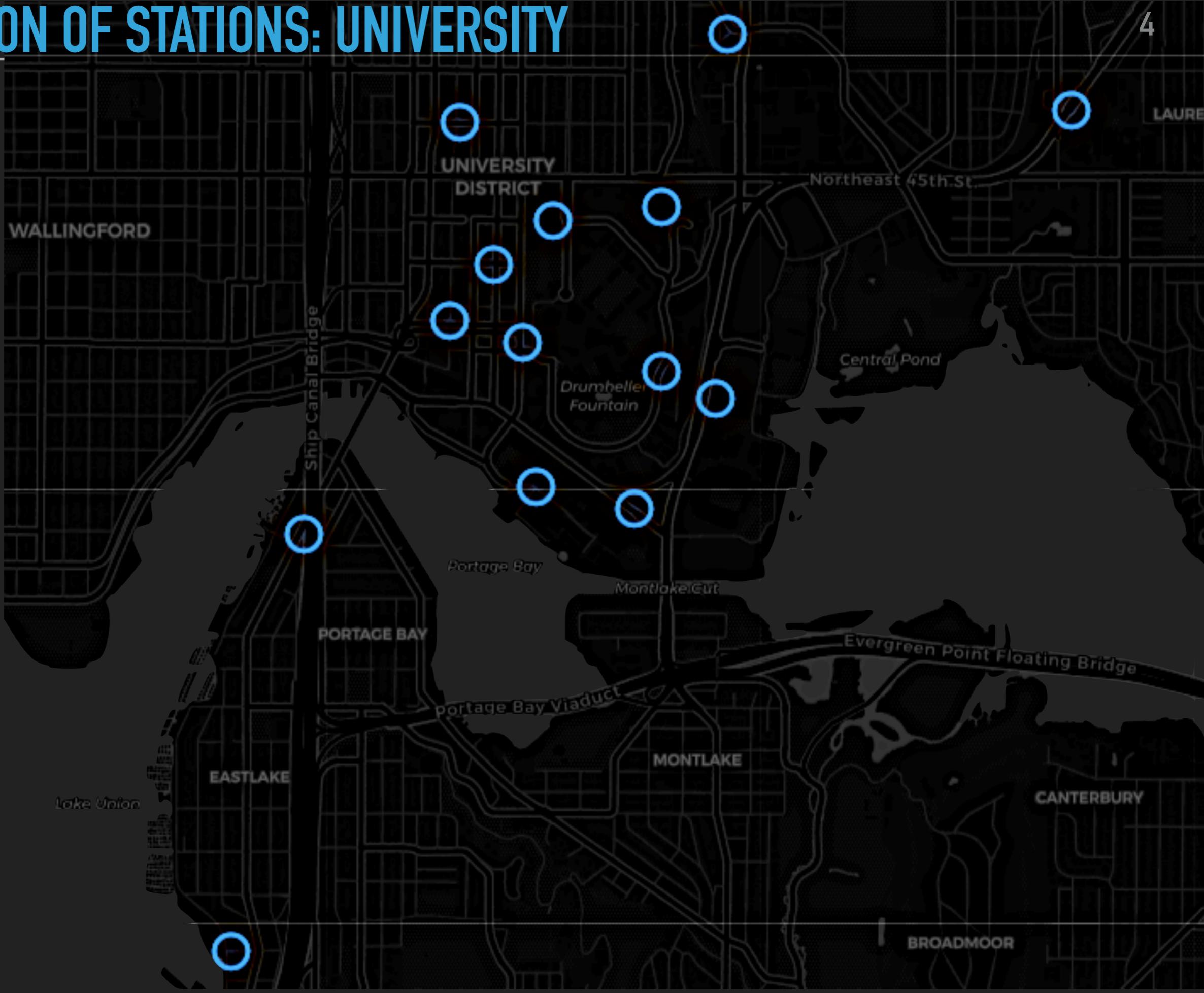
1. OVERVIEW



- **THREE DATASETS (TRIPS, STATIONS, WEATHER)**
- **TIMESPAN: 10/2014 - 09/2016**
- **236.000 TRIPS**
- **500 BIKES**
- **54 STATIONS**
- **8 \$ DAY, 16 \$ 3-DAY, 85 \$ YEAR**
- **FOR UNLIMITED 30 MIN. RIDES**

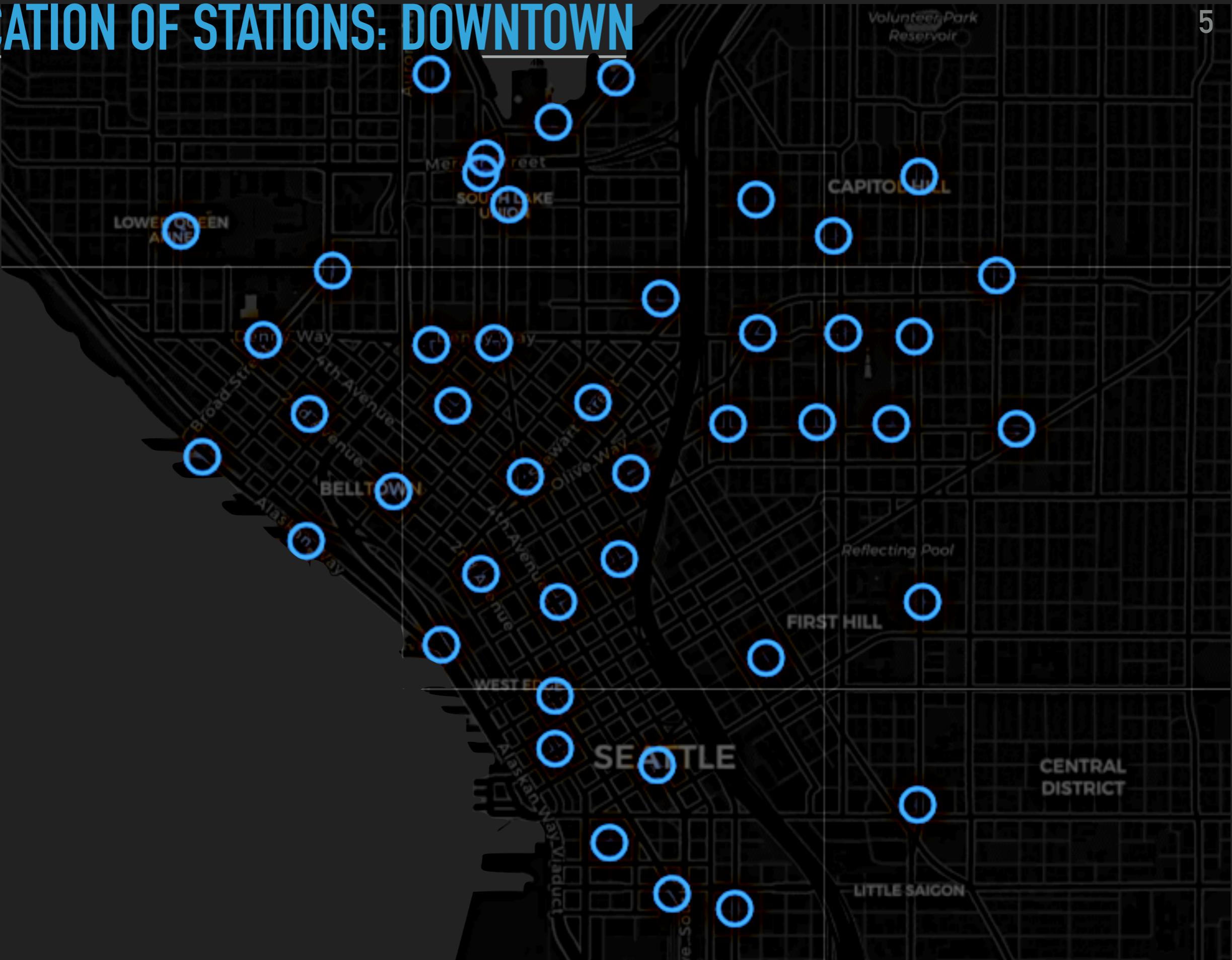
LOCATION OF STATIONS: UNIVERSITY

4

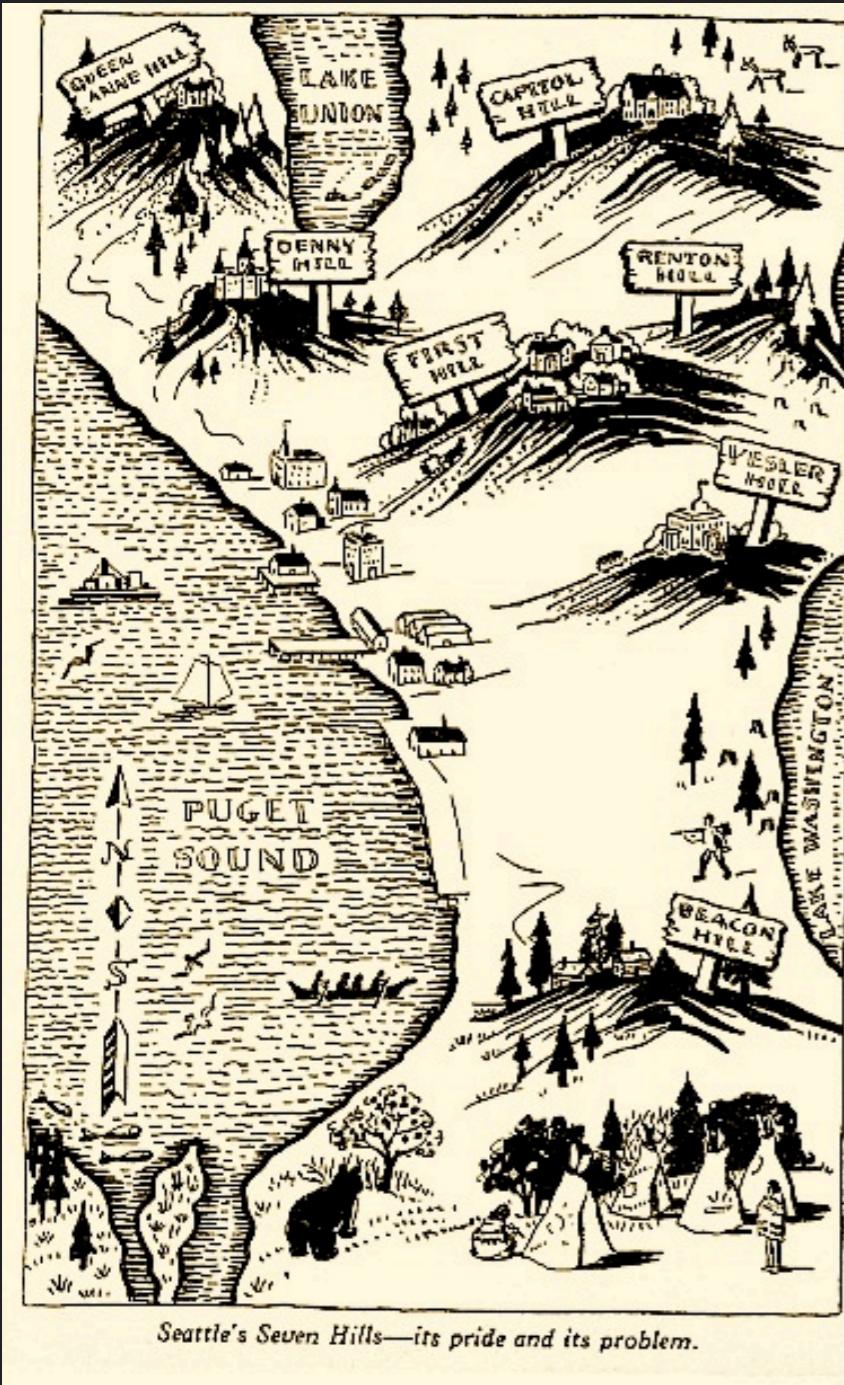


LOCATION OF STATIONS: DOWNTOWN

5



DESPITE THE RAIN AND THE 7 HILLS: SEATTLE IS ONE OF THE MOST BIKE FRIENDLY CITIES IN THE US!



#1

Seattle, WA

2018

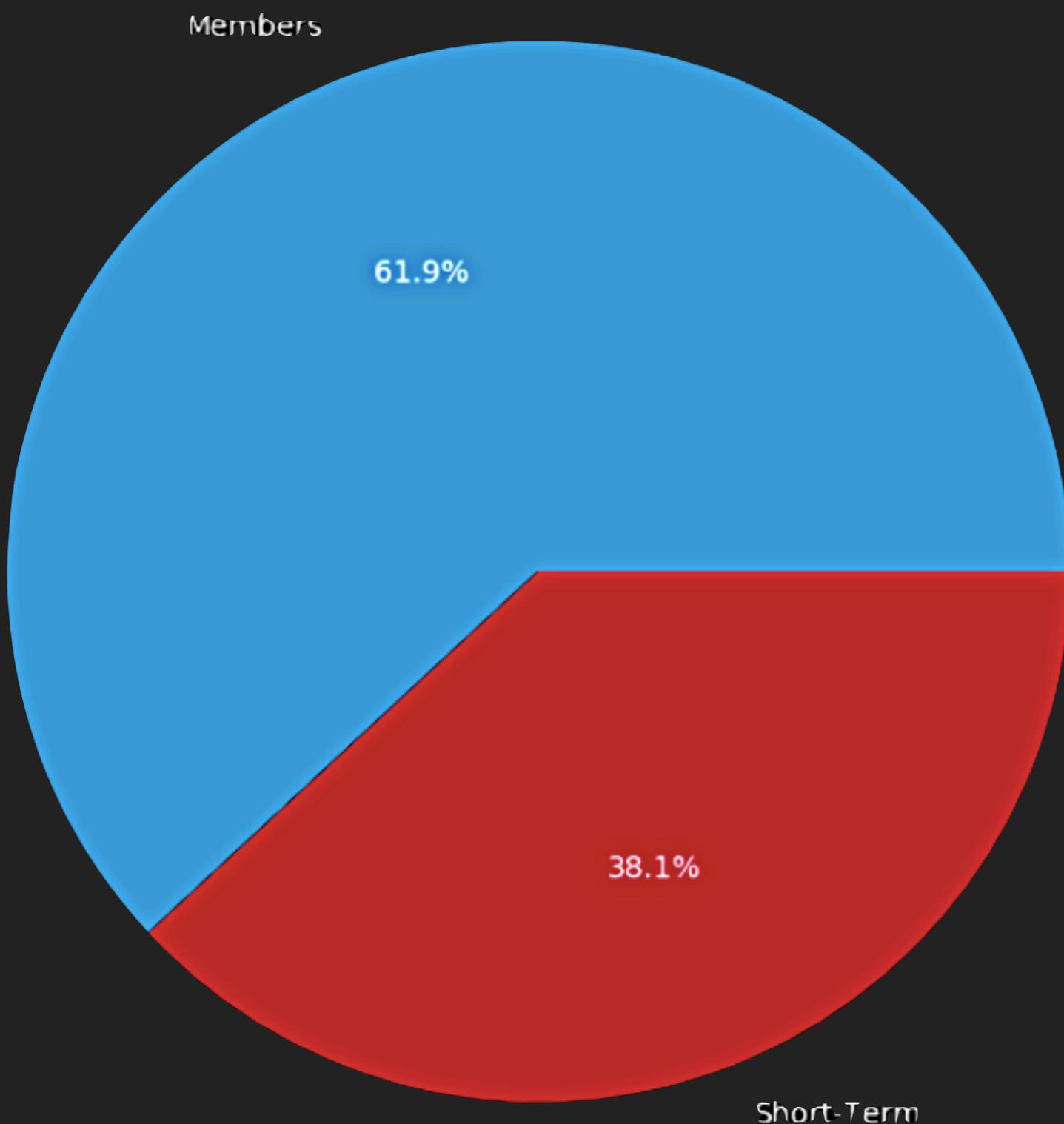


Credit: <http://geologywriter.com/> & <https://www.seattletimes.com/> & [/www.bicycling.com](http://www.bicycling.com)

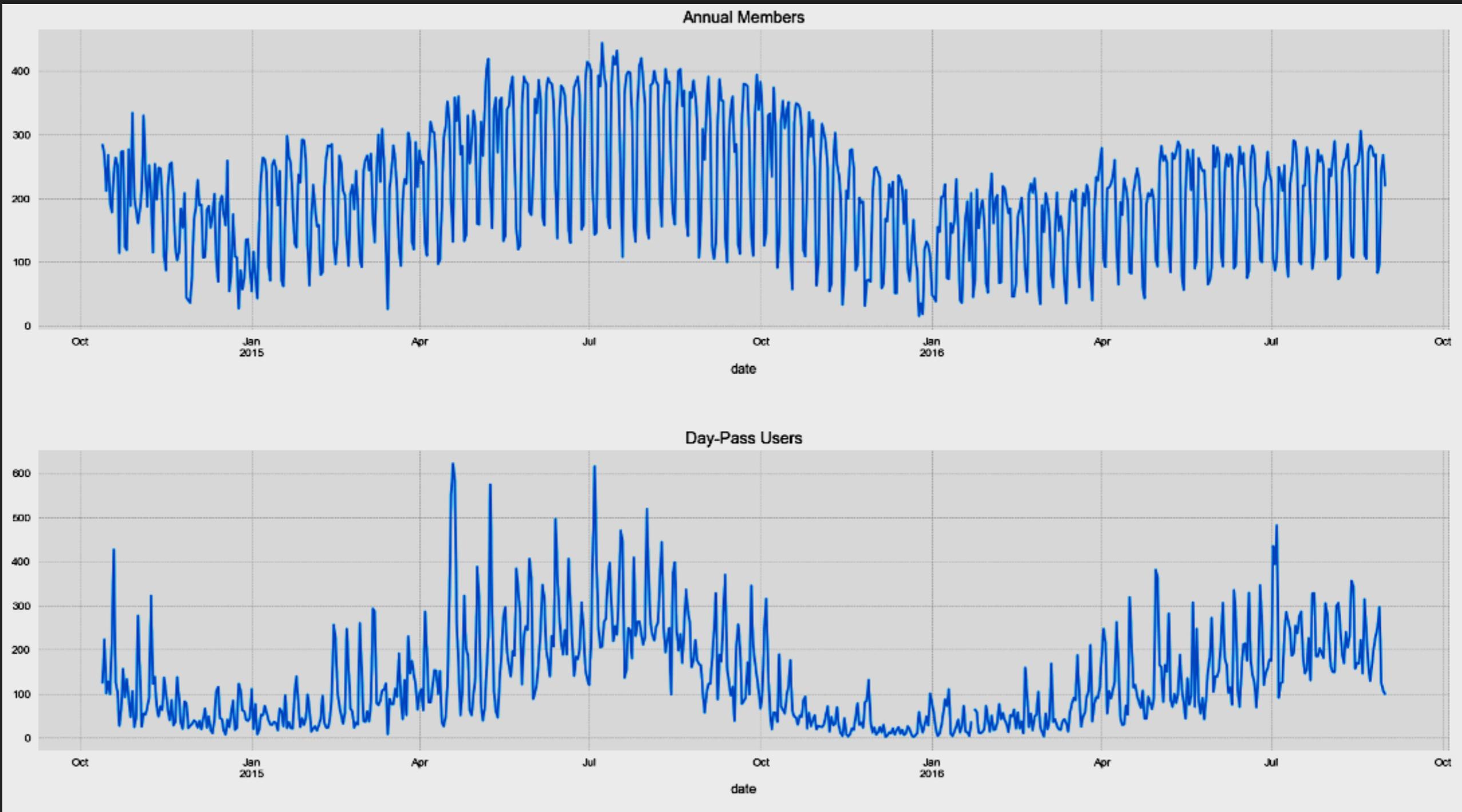
2. BUSINESS OBJECTIVE

- TO RAISE THE REVENUE FOR PRONTO BASED ON THE ANALYSIS OF THE USER BEHAVIOR
- WHO IS USING BIKE SHARING? WHAT KIND OF USER GROUPS ARE EXISTING? HOW CAN THEY BE SERVED DIFFERENTLY
- WHAT ARE THE MOST USED STATIONS?
- WHAT ARE THE MOST USED BIKE ROUTES?
- WHEN PEOPLE ARE USING BIKE SHARING? HOW DOES IT CHANGE ACROSS THE YEAR, WEEK, DAY
- HOW DOES THE WEATHER INFLUENCES THE LEASING RATE?

3. DATA ANALYSIS: USER GROUPS



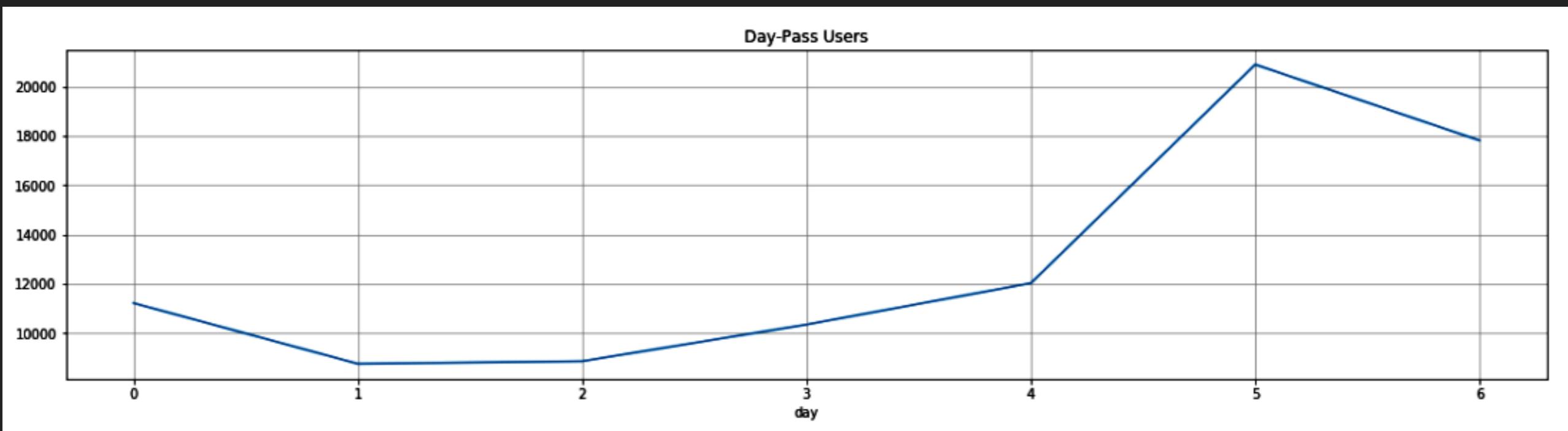
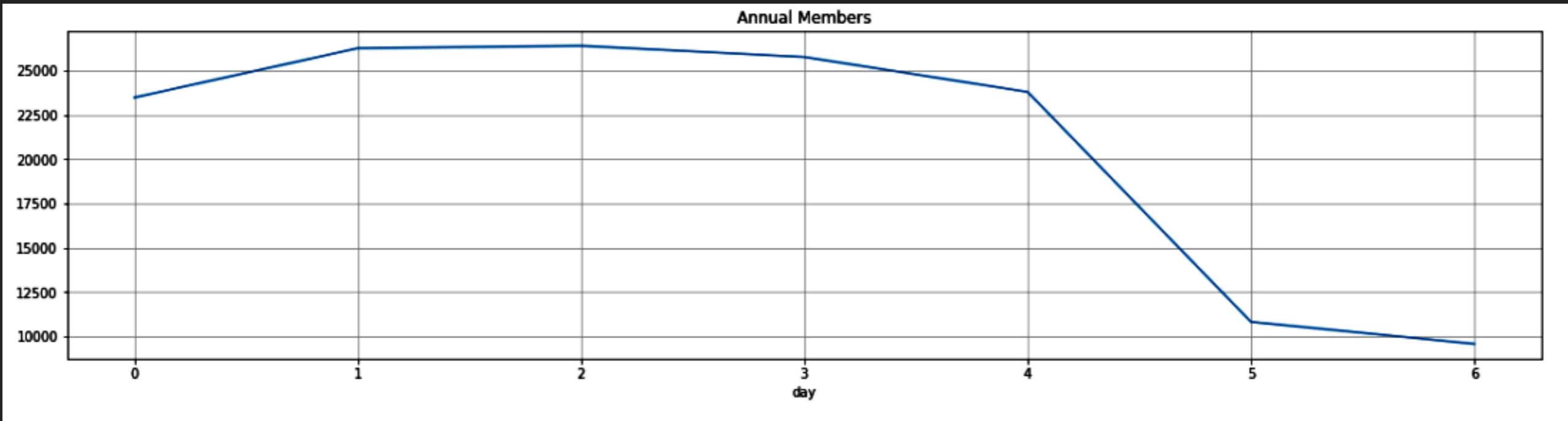
BIKE TRIPS 2014-2016



NUMBER OF TRIPS DECLINED IN 2016

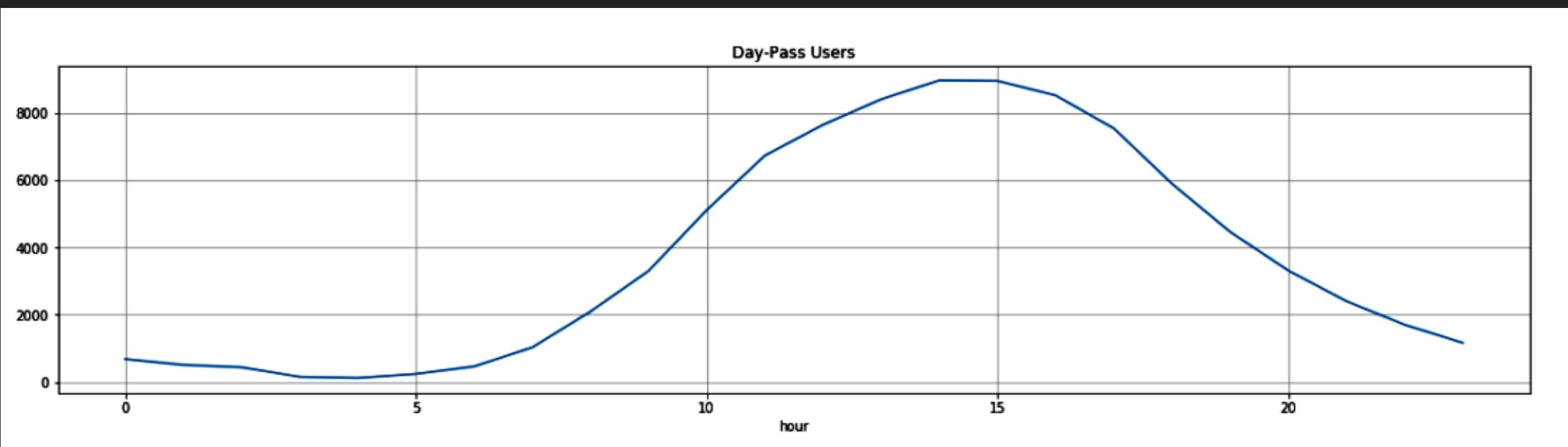
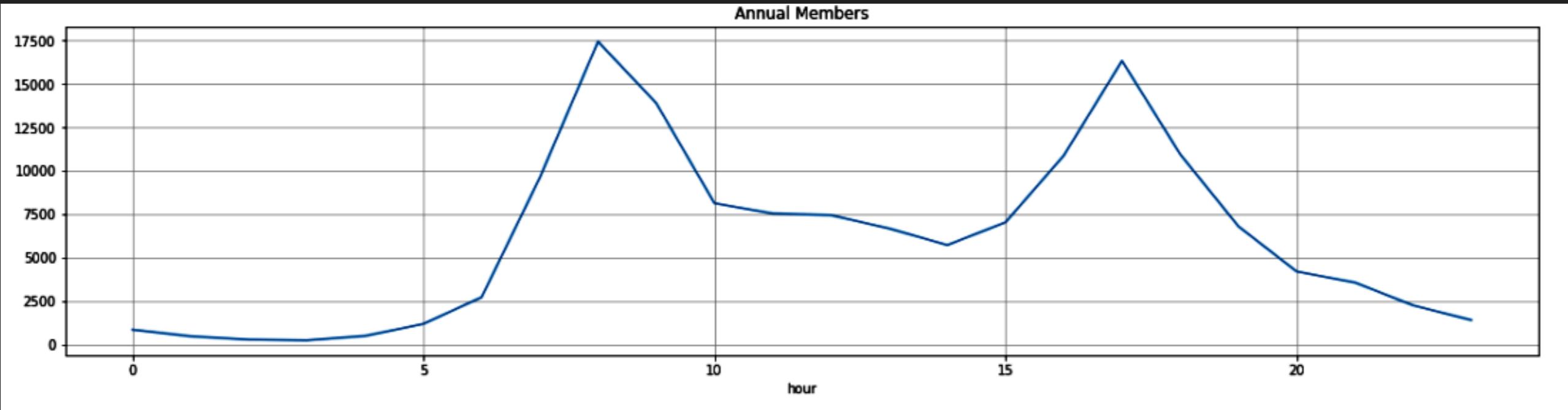
BIKE TRIPS: WEEK VS. WEEKEND

10



BIKE TRIPS: DAY

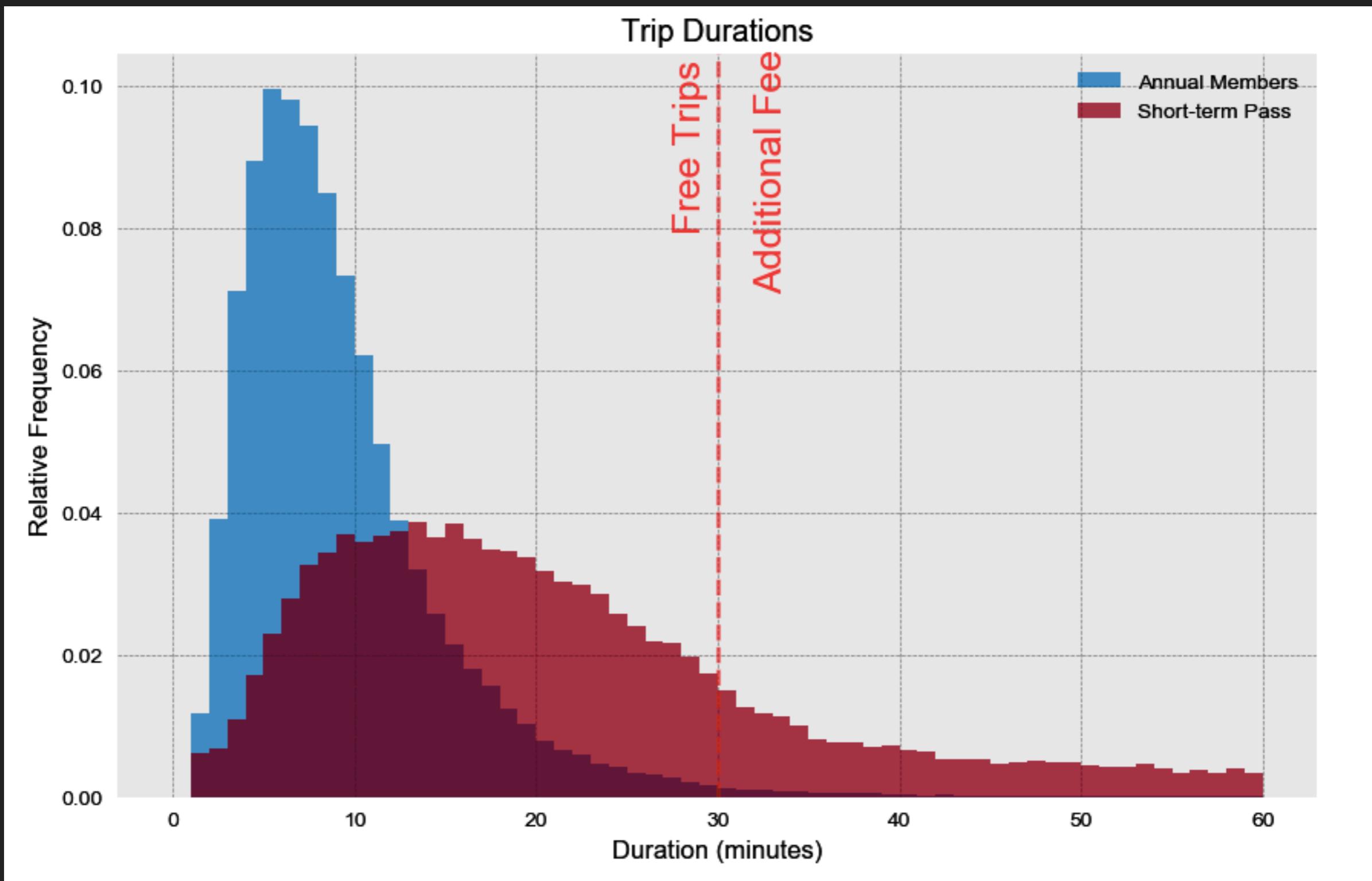
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MEMBER/COMMUTER ARE MOSTLY MALE (AGE 25-35)

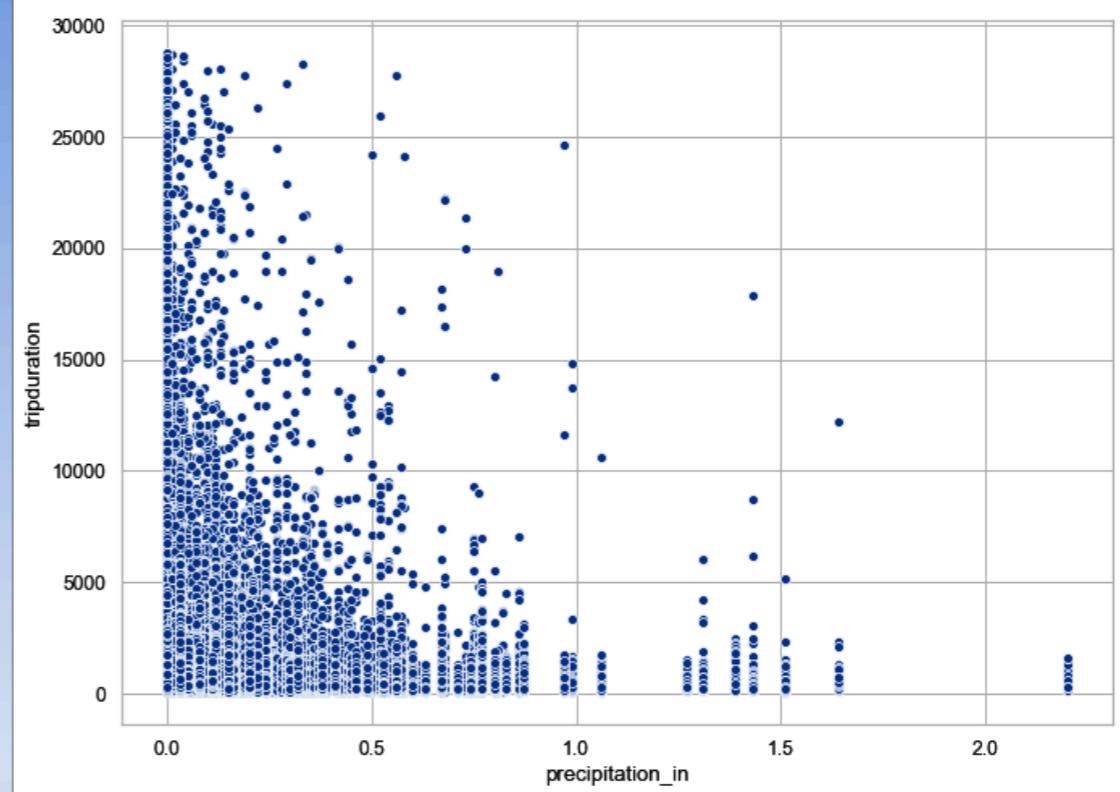
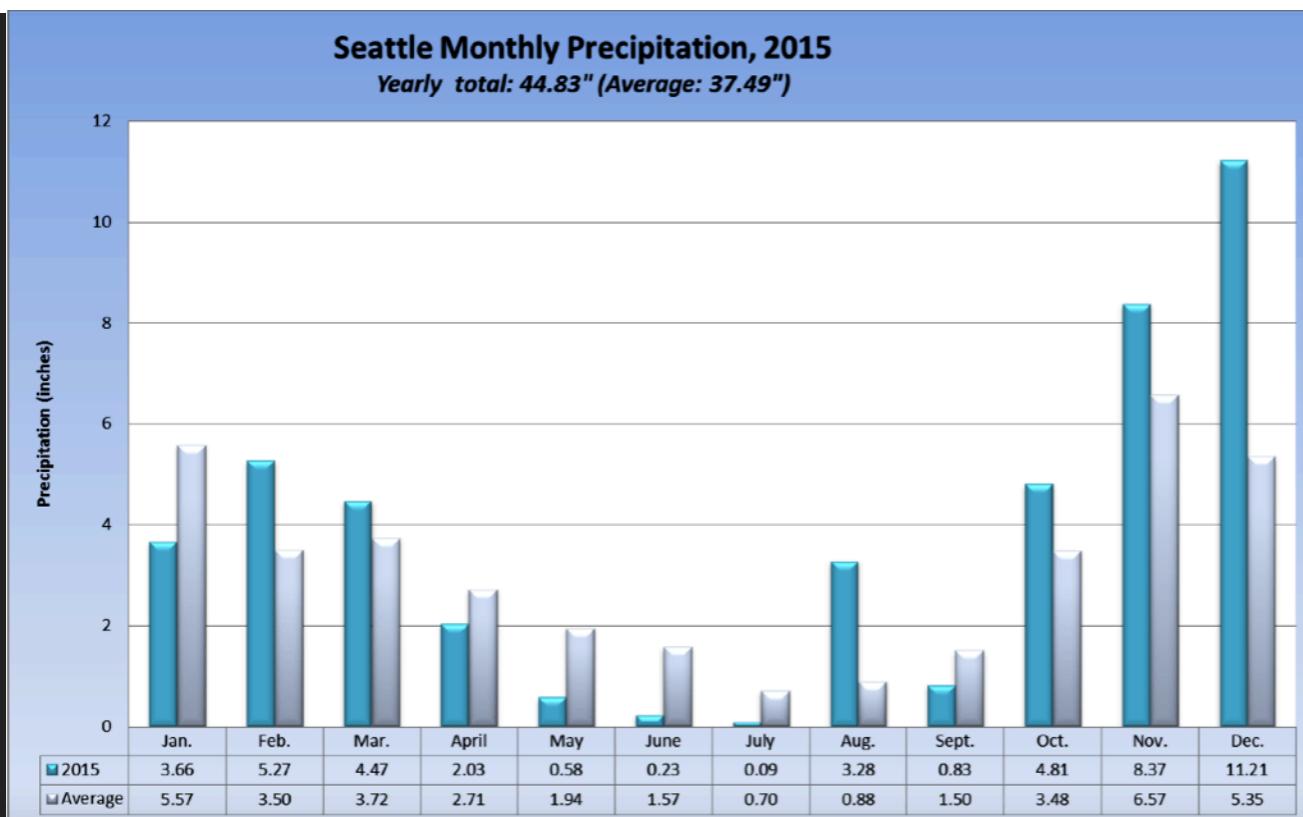
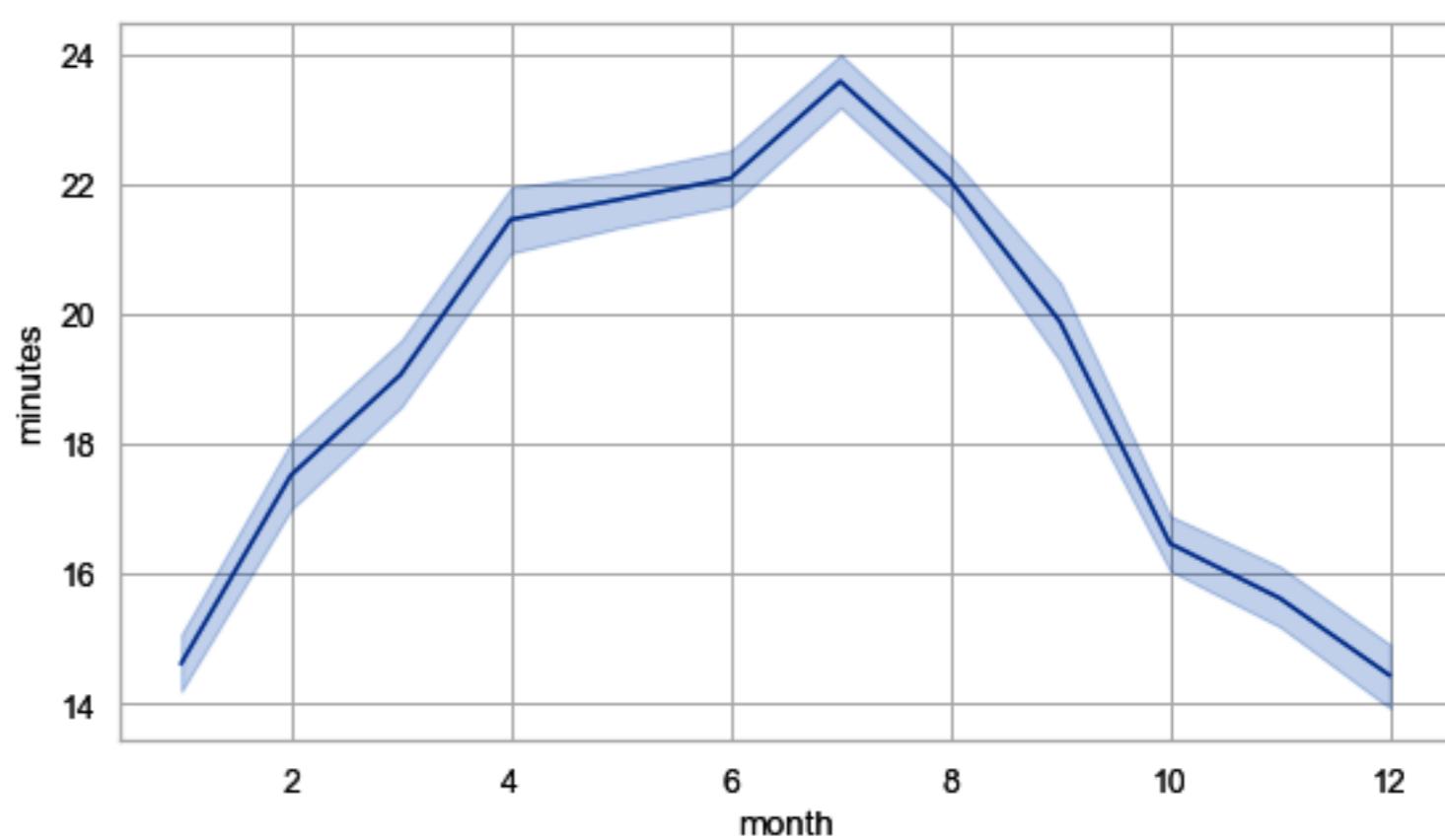
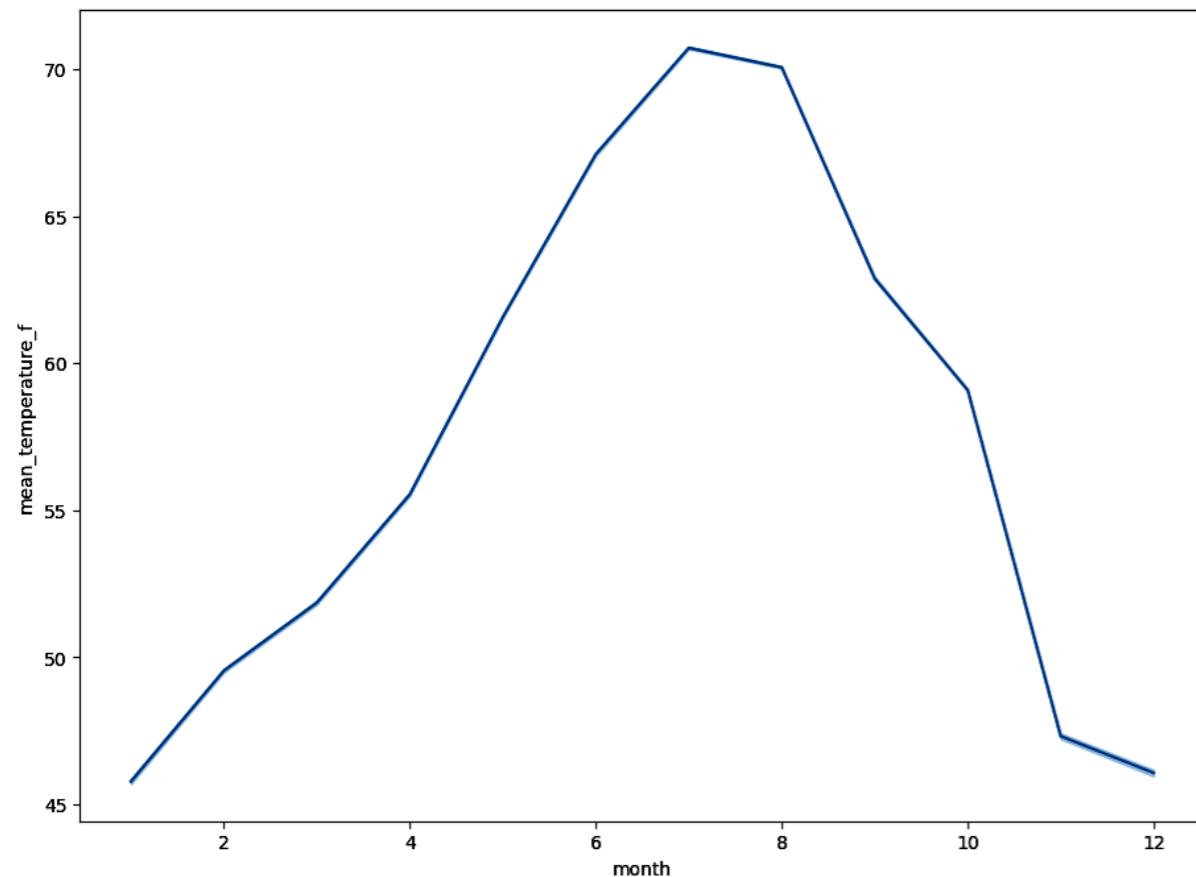
BIKE TRIPS: DURATION

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BIKE TRIPS: INFLUENCE OF WEATHER

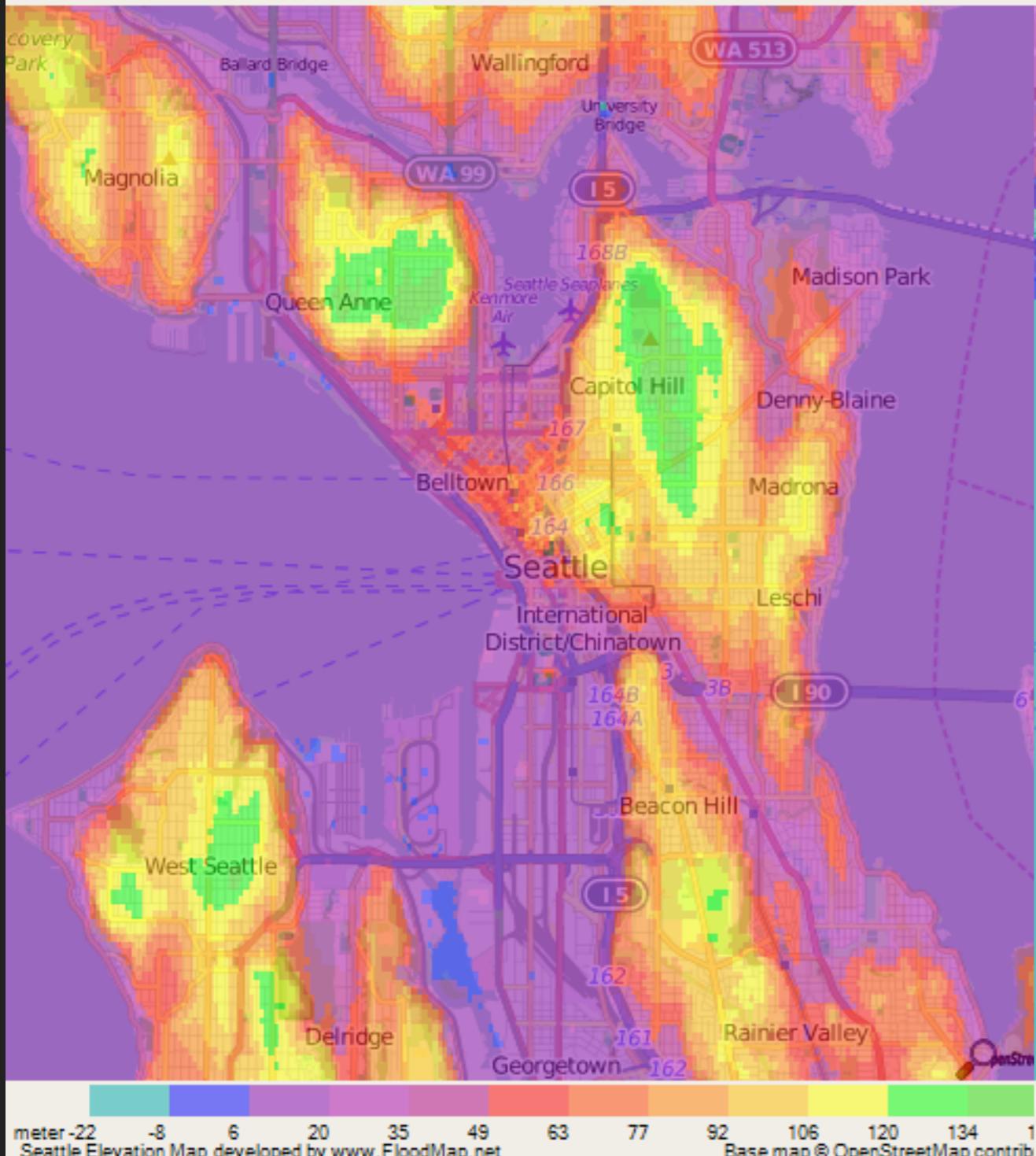
13



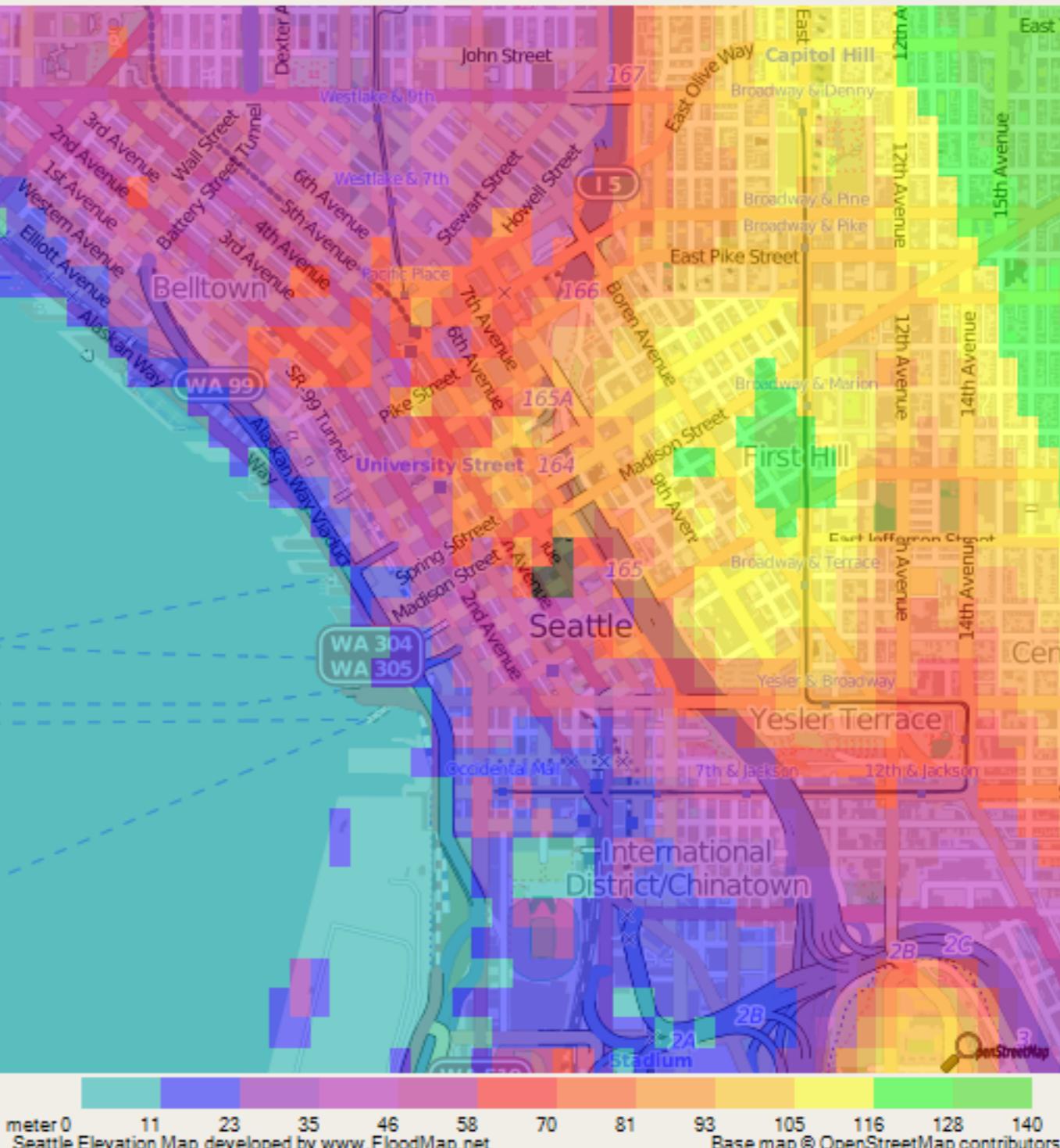
INFLUENCE OF TERRAIN: THE 7 HILLS OF SEATTLE

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Seattle Elevation: 60 meter Map by www.FloodMap.net (beta)



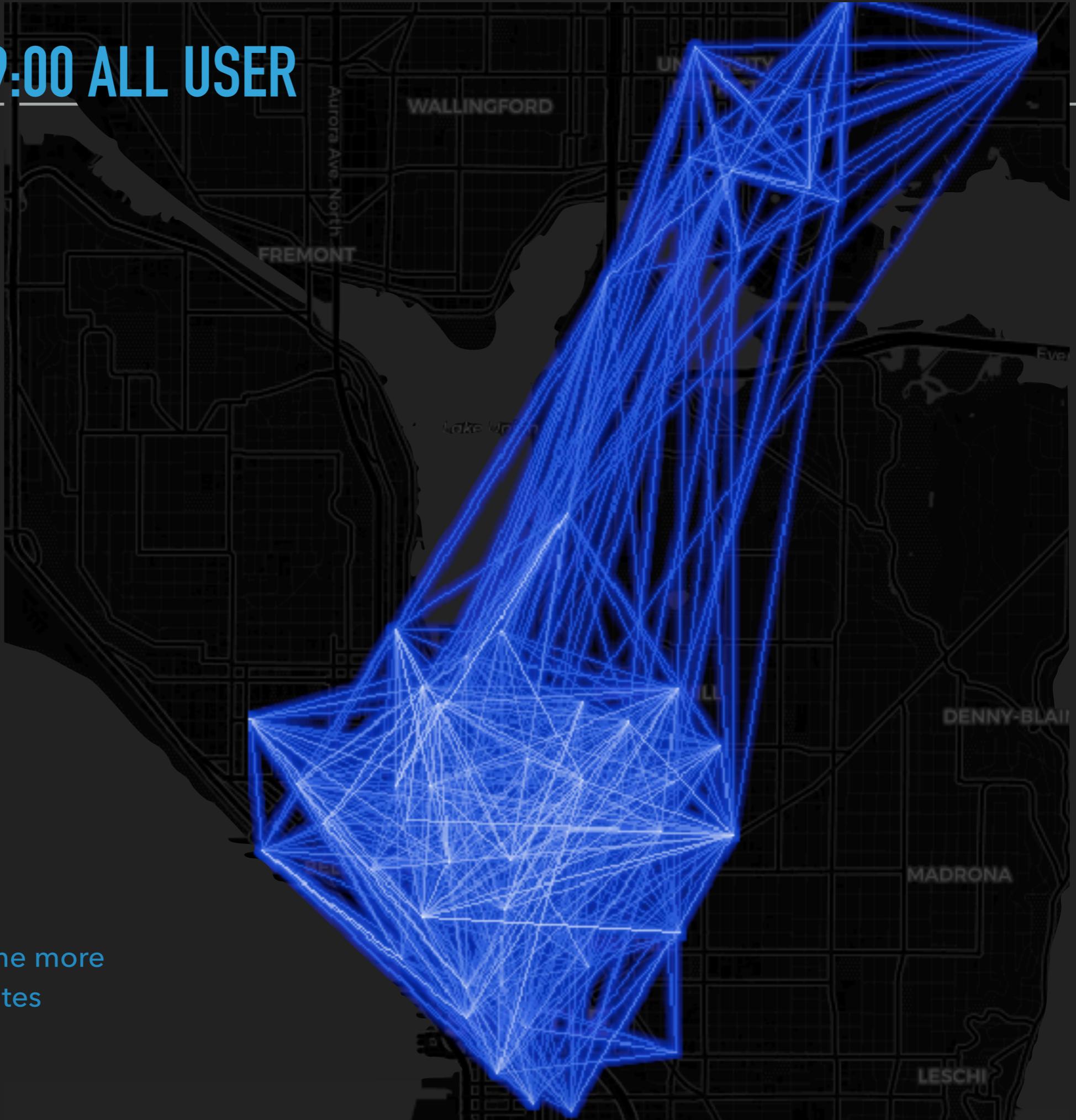
Seattle Elevation: 60 meter Map by www.FloodMap.net (beta)



Credit: www.floodmap.net

BIKE TRIPS 09:00 ALL USER

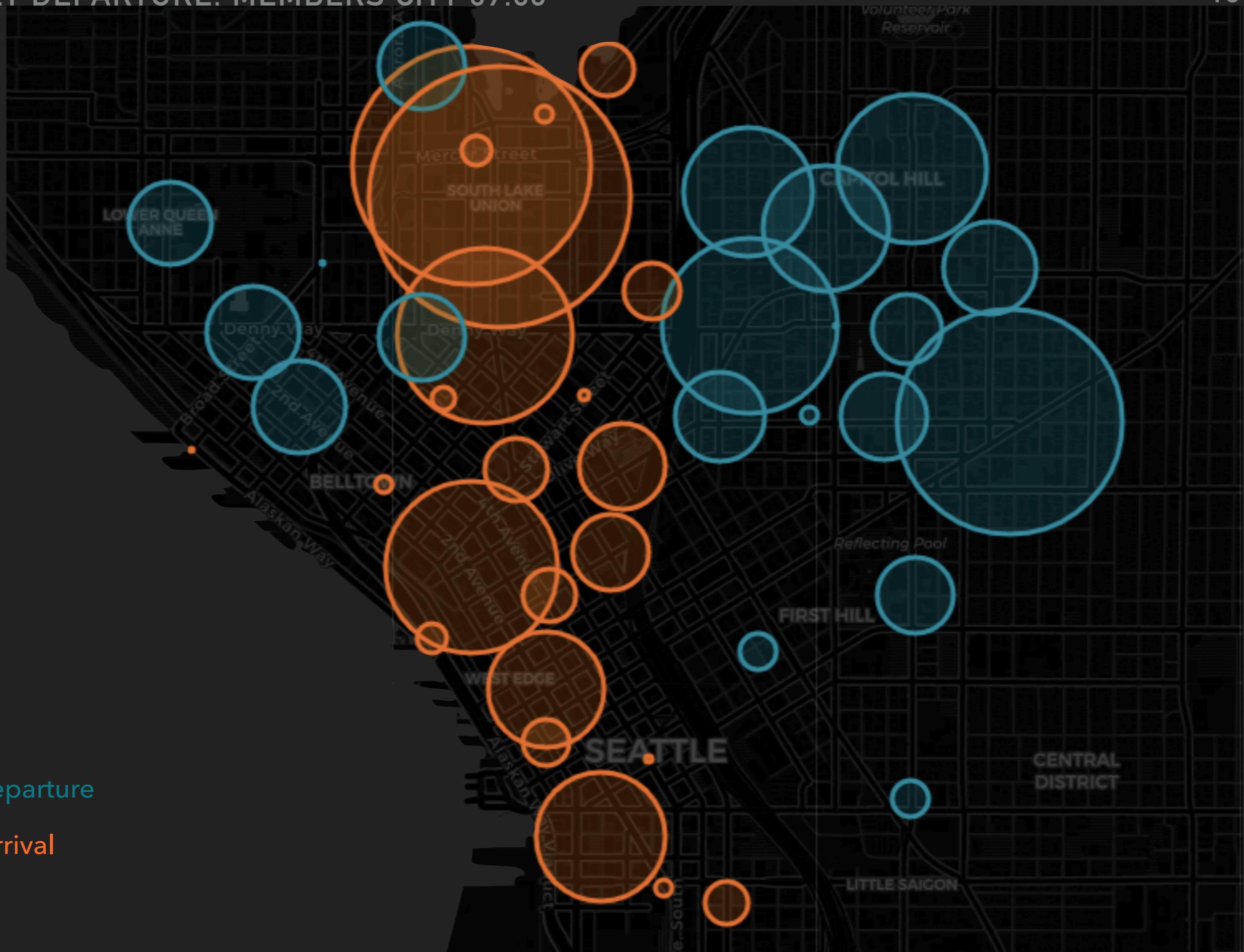
15



The more white, the more
used were the routes

NET DEPARTURE: MEMBERS CITY 09:00

16

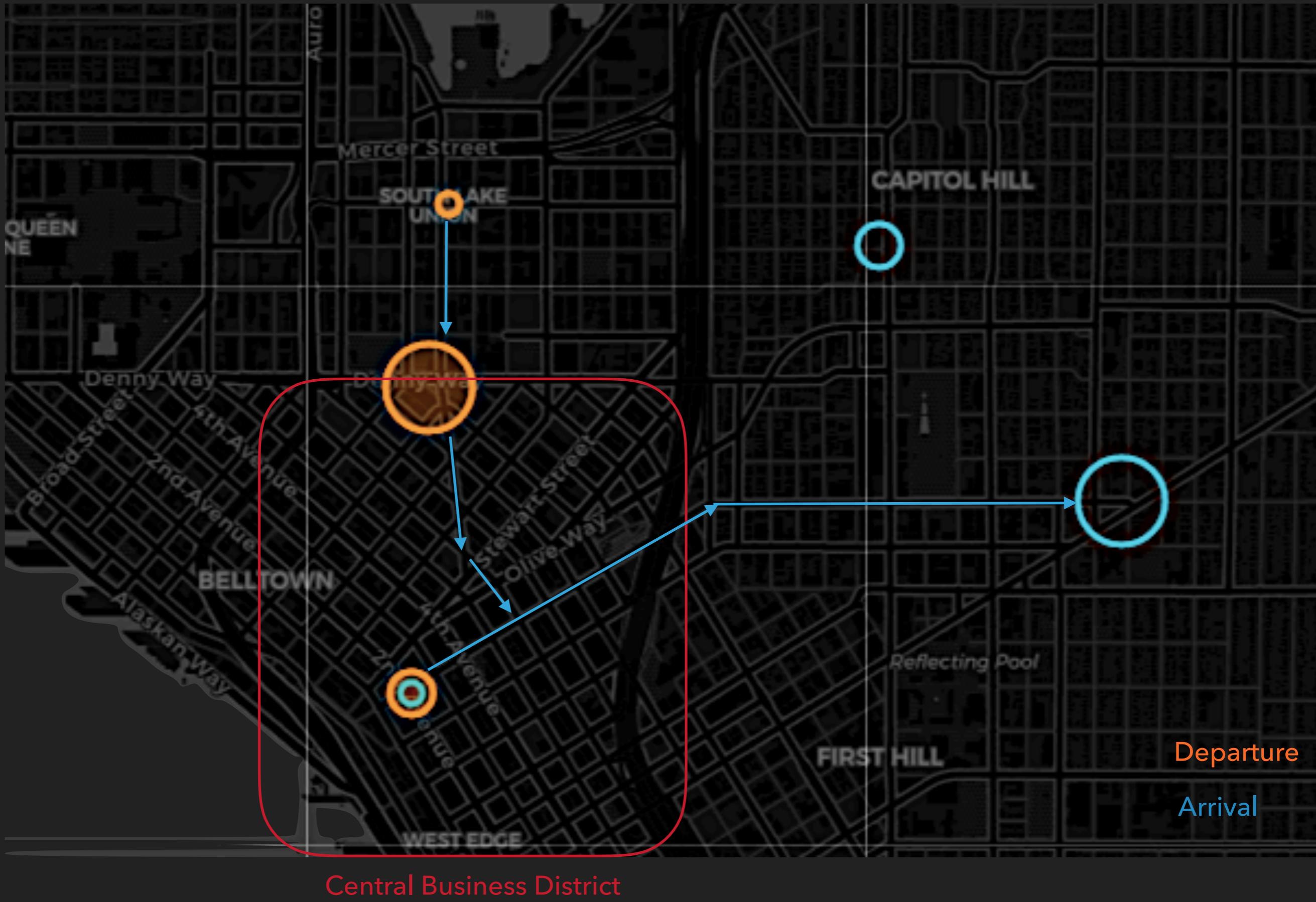


Departure

Arrival

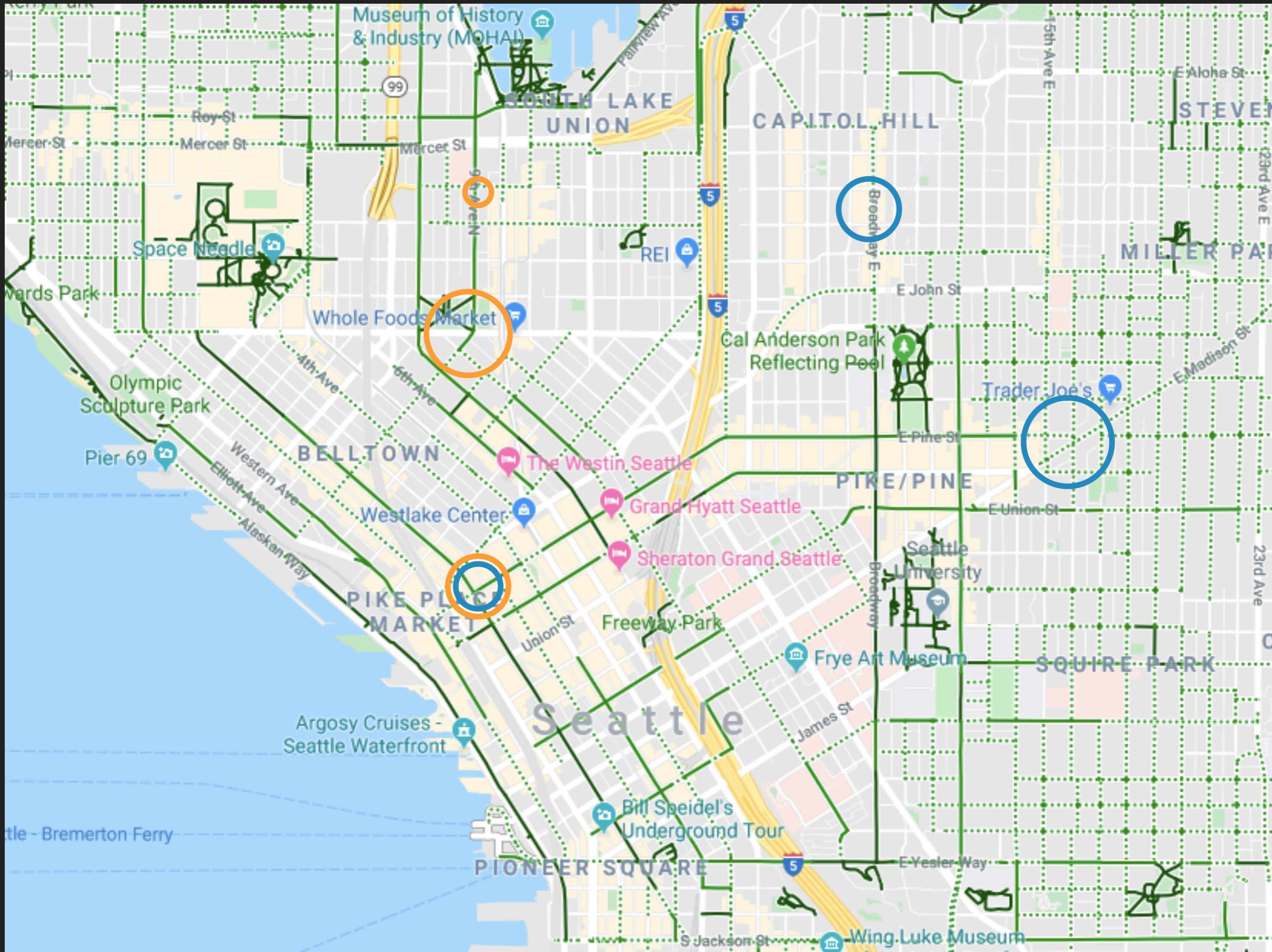
3 BEST OF STATIONS OF MEMBERS: DEPARTURE & ARRIVAL

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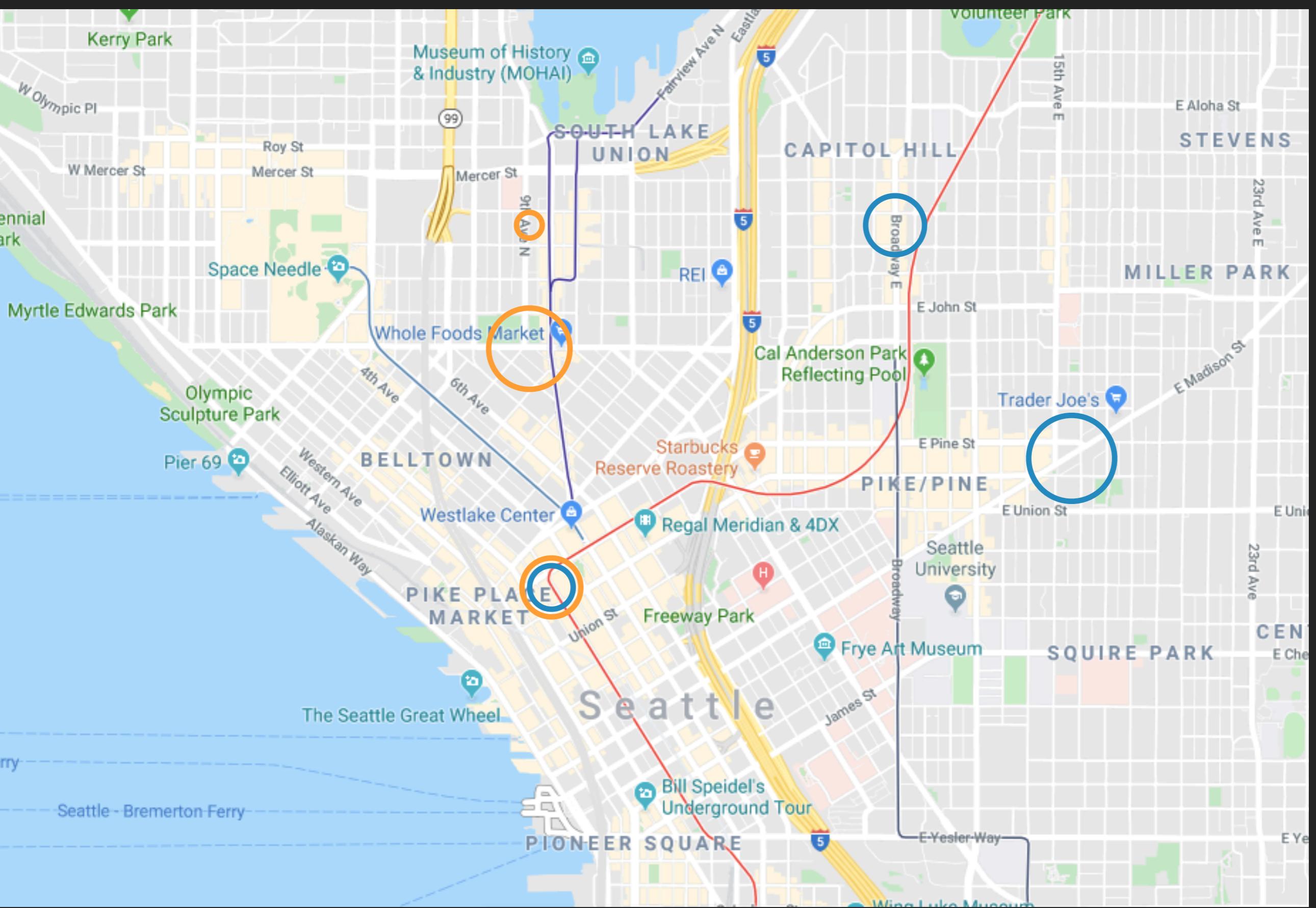
GOOGLEMAPS BIKE LANES + BEST OF STATIONS (COMMUTER)

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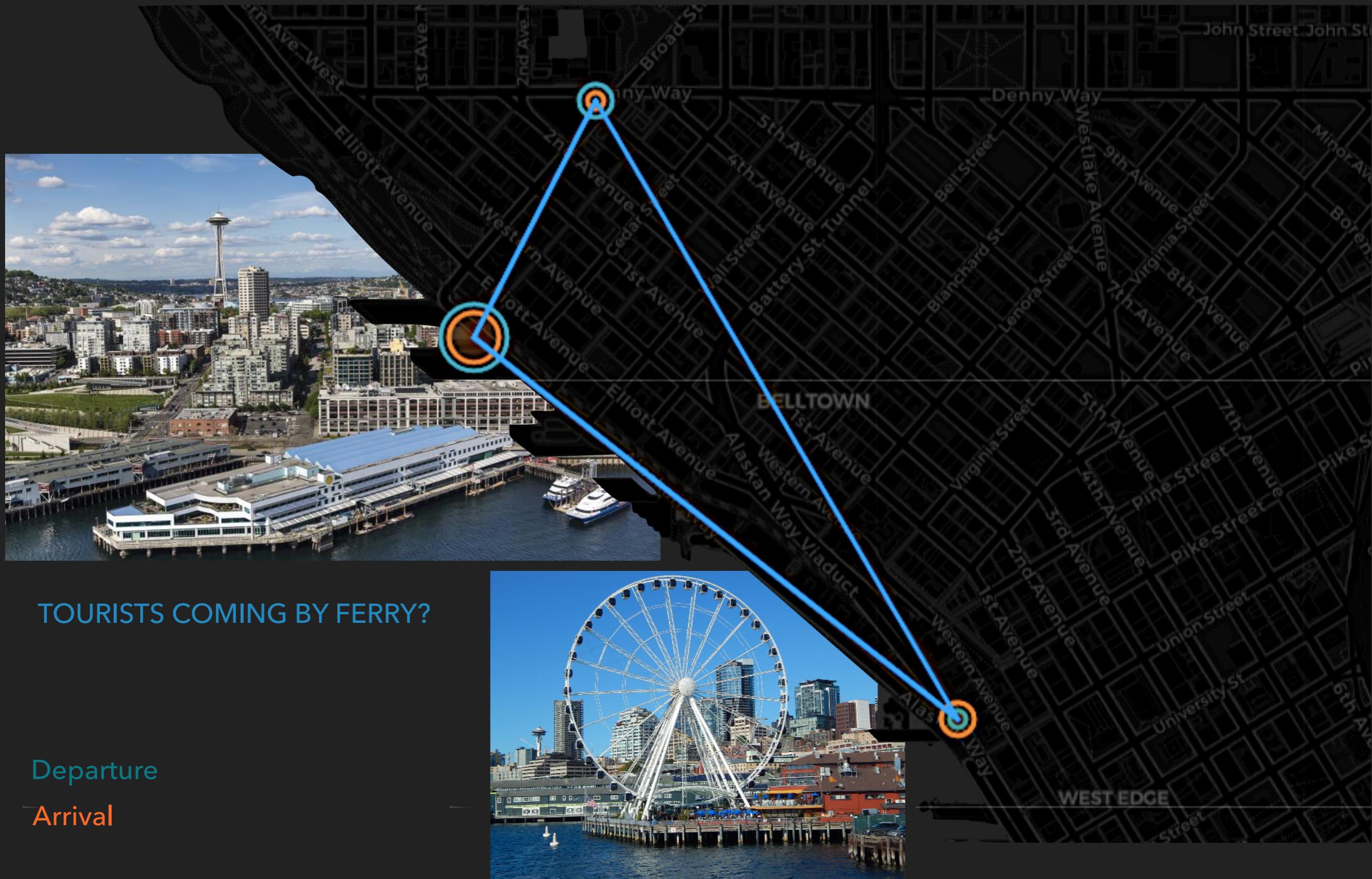
GOOGLEMAPS PUBLIC TRANSPORTATION + BEST OF STATIONS (COMMUTER)

19



3 BEST OF STATIONS - DAYPASS-USER: FROM & TO

20



Leasing Rate

How many Bikes will be rented at any given day in the year based on weather data?

Can be predicted with 73% Accuracy!

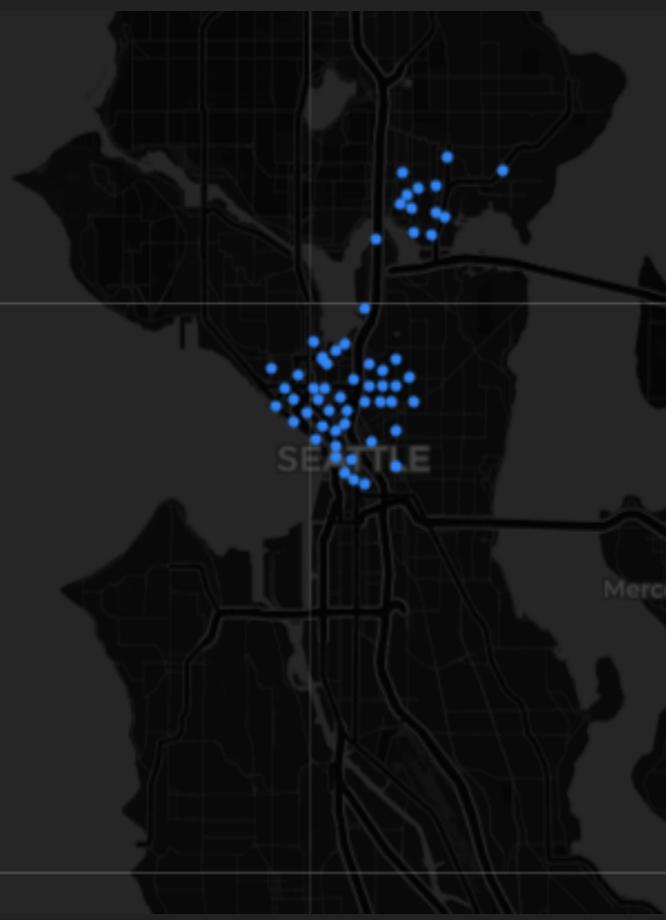
Model	R2-Score
Linear Reg	0.69
Polynomial	0.66
XG Boost Reg	0.73
Random Forest	0.69

- **2 TOTALLY DIFFERENT GROUPS: 60% ARE COMMUTERS, 40% ARE TOURISTS**
- **COMMUTERS ARE MOSTLY MALE (25–35), USE WEEKDAYS AT 8 AM + 17 PM, STATIONS AT BIKE LANES INTO DOWNTOWN (PINE STREET), AVERAGE USE 10 MIN.**
- **TOURISTS ARE COMING (MAYBE PER FERRY) ON WEEKENDS, START LATER (10 AM) – PEAK AT 15 PM, TRIANGLE BETWEEN PIER 69, SPACE NEEDLE AND THE GREAT WHEEL, AVERAGE USE 20 – 30 MIN.**

WHY HAS PRONTO DIED? ADVANTAGE OF FREE FLOATING E-BIKES



UBER/JUMP EBIKES SEATTLE



PRONTO SEATTLE

**SEATTLE IS THE 3RD MOST
POPULAR CITY FOR JUMP EBIKES
WORLDWIDE!**

- NOT THE RAIN, NOT THE HILLS
- SECOND PHASE DIDN'T HAPPEN: MORE STATIONS & BIKES
- BAD AVAILABILITY VS. FREE FLOATING BIKES
- EBIKES ARE NICE FOR RIDING HILLS

COMPARISON OF ALL PROVIDER IN SEATTLE

	Pronto!	Lime	Ofo	Spin	Jump
Bikes	500	2000	2000	3000	3500
Location	Downtown + University	All over	All over	All over	All over
Type 1	Bike	Bike+Ebike	Bike	Bike	Ebike
Expired	03/2017	12/2019	07/2018	Switched to scooters	
Revenue	449.000 \$	-	-	-	-
Type 2	Stations	Floating	Floating	Floating	Floating
Price*	8\$ day	1\$+15c min	1 \$ hour	1\$ 30 min	1\$+10c min
Duration	30 min	No limit	1 h	30 min	No limit
Rides year	150.000	1 Million	-	-	-

- RAISE THE NUMBER OF BIKES IN THE „TOURIST TRIANGLE“ ON WEEKENDS
- RAISE THE NUMBER OF BIKES WHERE THE MOST COMMUTER-DEPARTURES TAKE PLACE THROUGHOUT THE WEEK
- INSTALL MORE BIKE-STATIONS ALL OVER THE TOWN AND RAISE THE NUMBER OF BIKES AVAILABLE
- (REPLACE THE WHOLE STATIONARY SYSTEM WITH FREE FLOATING BIKES – PRONTO OPERATED FROM 10/2014 TO 03/2017)

- GET WEATHER DATA FOR EVERY HOUR EACH DAY OF TIME-PERIOD, TO MAKE BETTER PREDICTIONS
- ANIMATED PLOT OF NET DEPARTURE
- USE NEURAL NETWORK FOR PREDICTION
- ANALYSE A TRIP-DATASET FROM UBER/JUMP EBIKES

THANK YOU!