BIKING IN THE HILLS OF BARCELONA

GREEN CITY HACKATHON
BY

Prof. Saleha Habibullah, Professor, Pakistan
Dr. Sakinat Folorunso, Uni. Lecturer, Nigeria
Dr. Marta Kolczynska, Post Doc, Poland
Vera Paul, Scientific Assistant, Germany

THE CHALLENGE

- Reduce private car use within the City of Barcelona

- Increase the use of the city bike system Bicing

PROBLEM FORMULATION

We are investigating the effect of altitude on the utilization of the bike rental system in Barcelona.

- Locations of mechanical and electrical bike stations at various altitudes,
- Problems of stations with no bikes available and no empty slots available,
- Patterns of bike use on a randomly selected day.
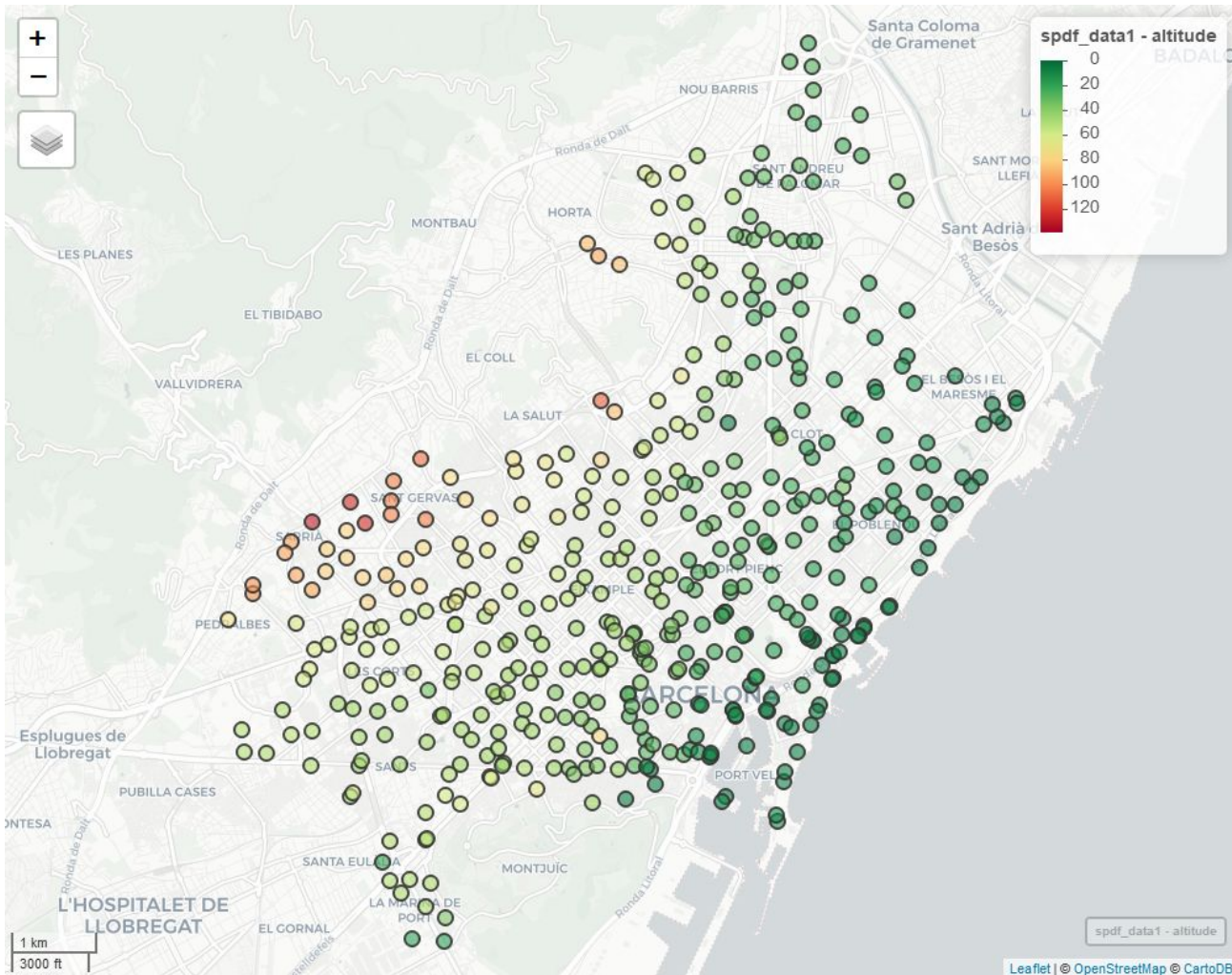
Altitude of bicing stations.

Min   = 0 m
Q1   = 16 m
Median = 32 m
Mean   = 35.32 m
Q3   = 50 m
Max   = 138 m
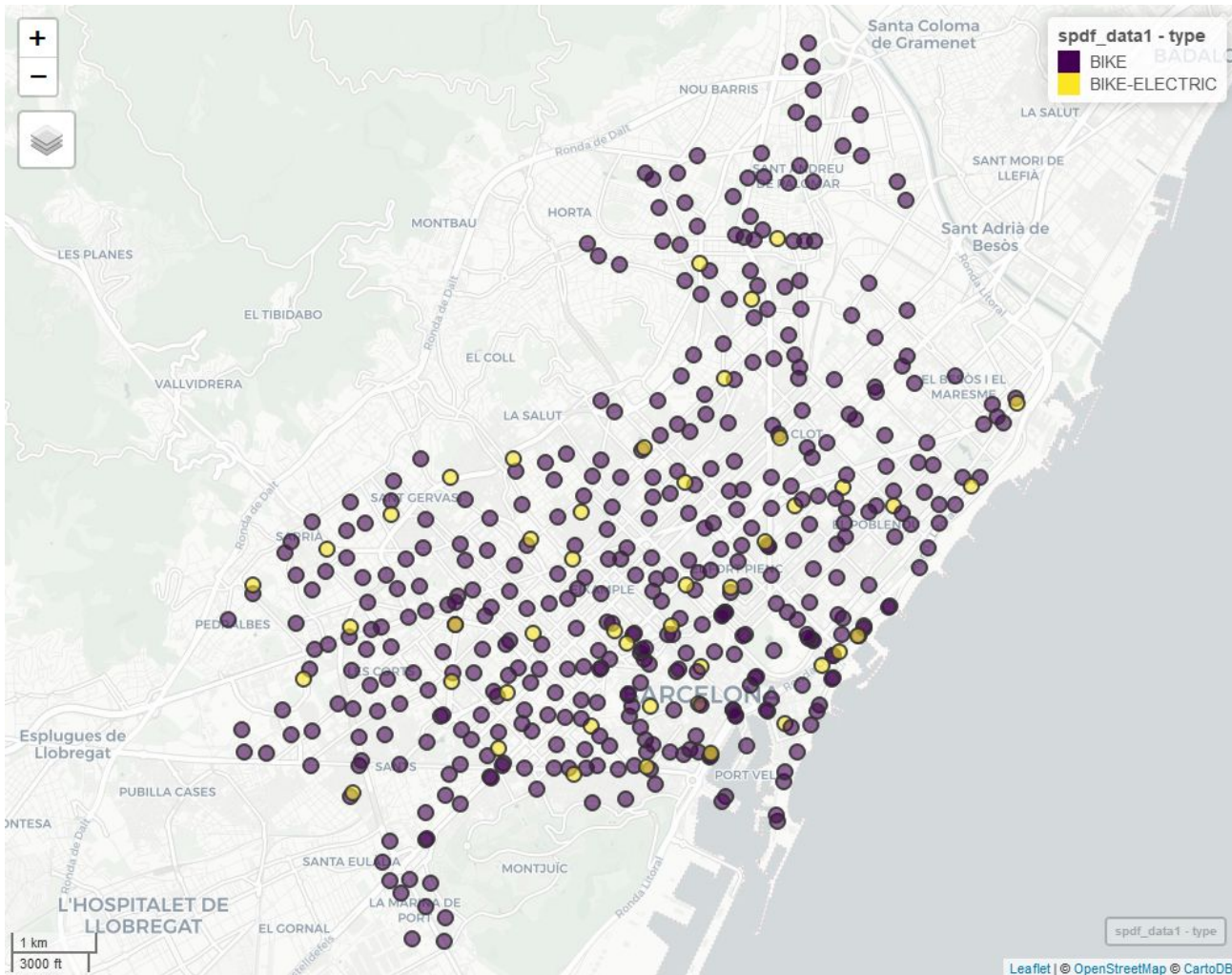
Type of stations.

Yellow = electric bikes
Violet = mechanical bikes

Altitude vs. Type of Bike Crosstabulation

		TypeOfBike		
		BIKE	BIKE-ELECTRIC	Total
0	Count	693024	70184	763208
	% within Altituded	90,8%	9,2%	100,0%
1	Count	231023	27168	258191
	% within Altituded	89,5%	10,5%	100,0%
2	Count	22648	4528	27176
	% within Altituded	83,3%	16,7%	100,0%

*0 => Altitude of 0-49 Meters
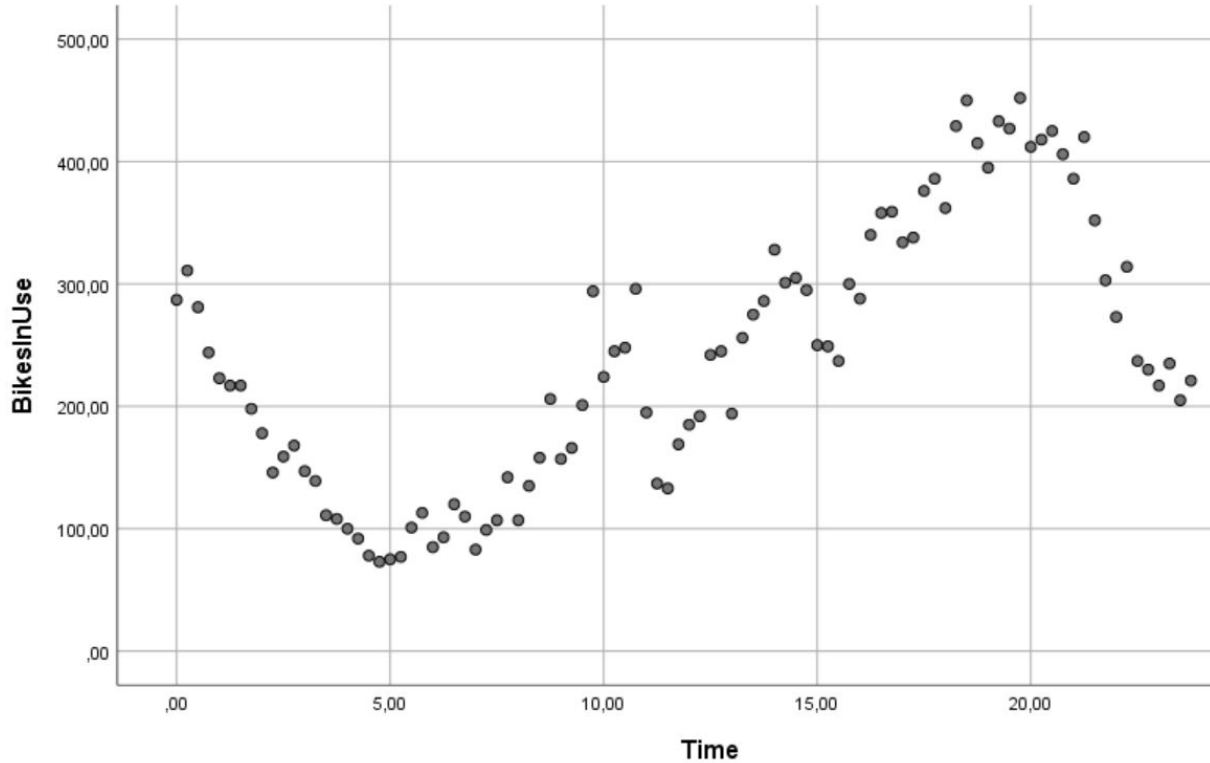*1 => Altitude of 50-99 Meters
*2 => Altitude of 100-138 Meters
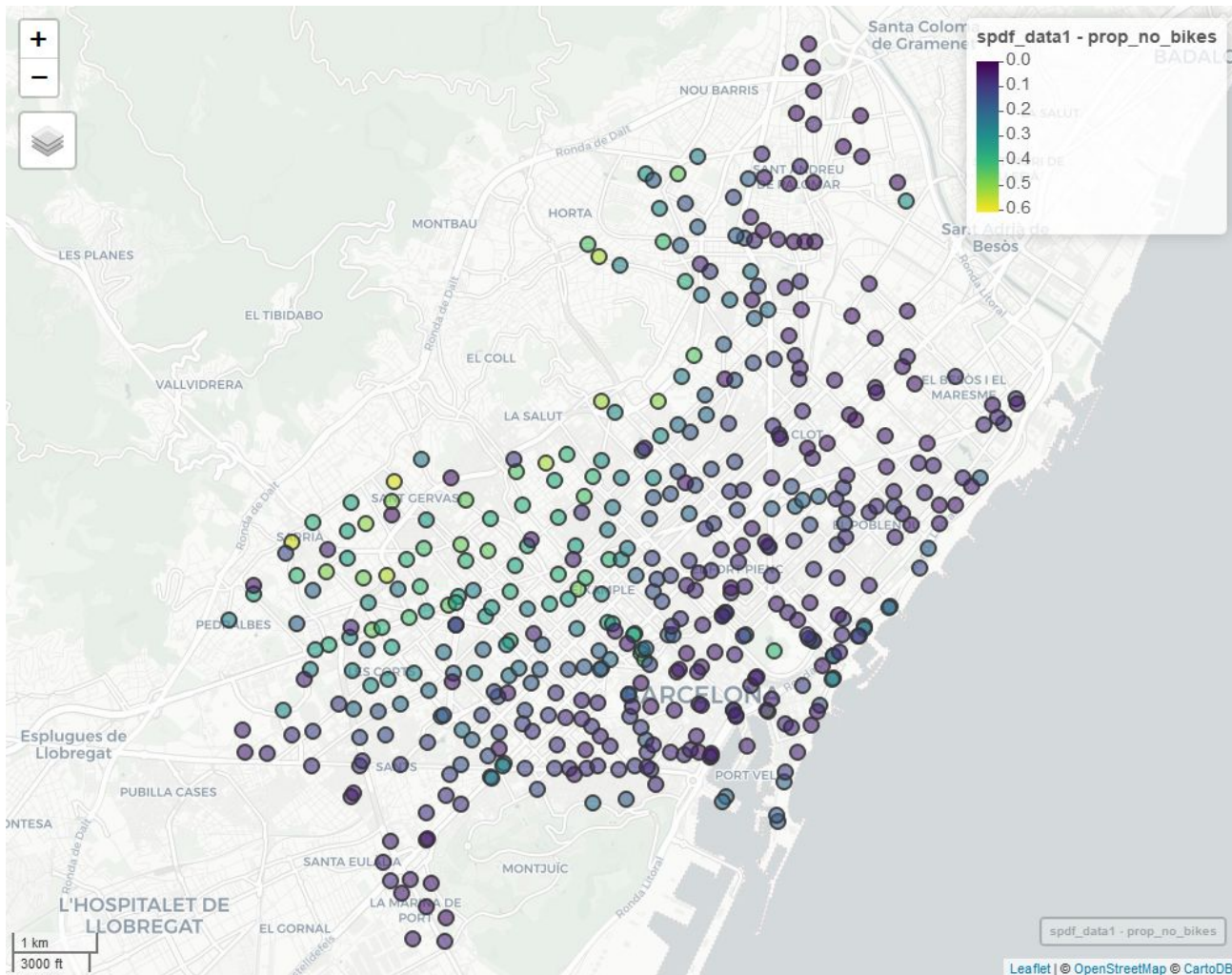
Proportion of time without bikes.

Min	= 0
Q1	= 0.04
Median	= 0.1
Mean	= 0.15
Q3	= 0.23
Max	= 0.61

Proportion of time with no bikes by station altitude

Altitude of station
— low (<16m)
— medium (16-68m)
— high (>68m)
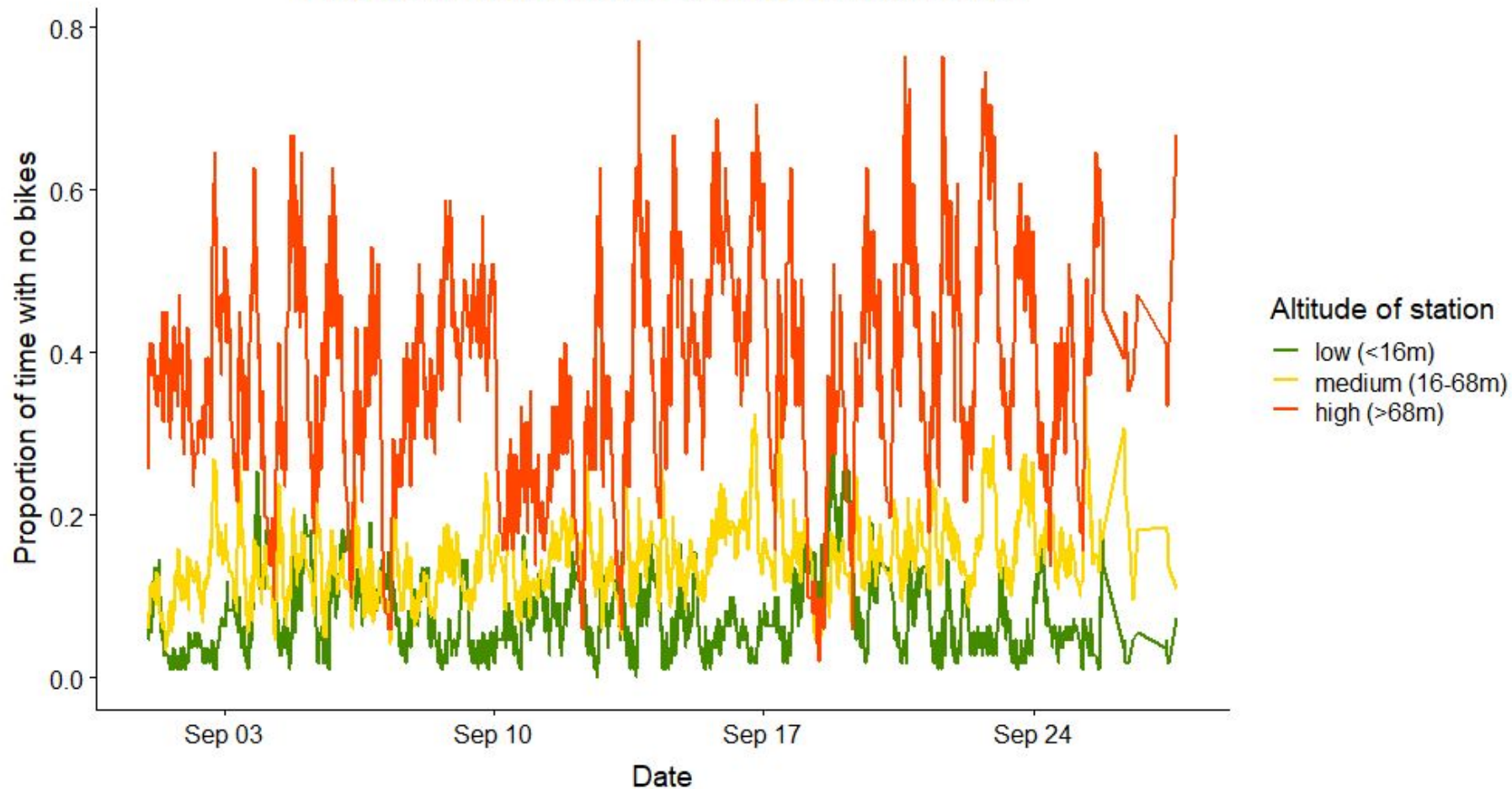
Bike Use Pattern for Saturday, 1st September 2018

Bike use, September 5 (Wednesday)
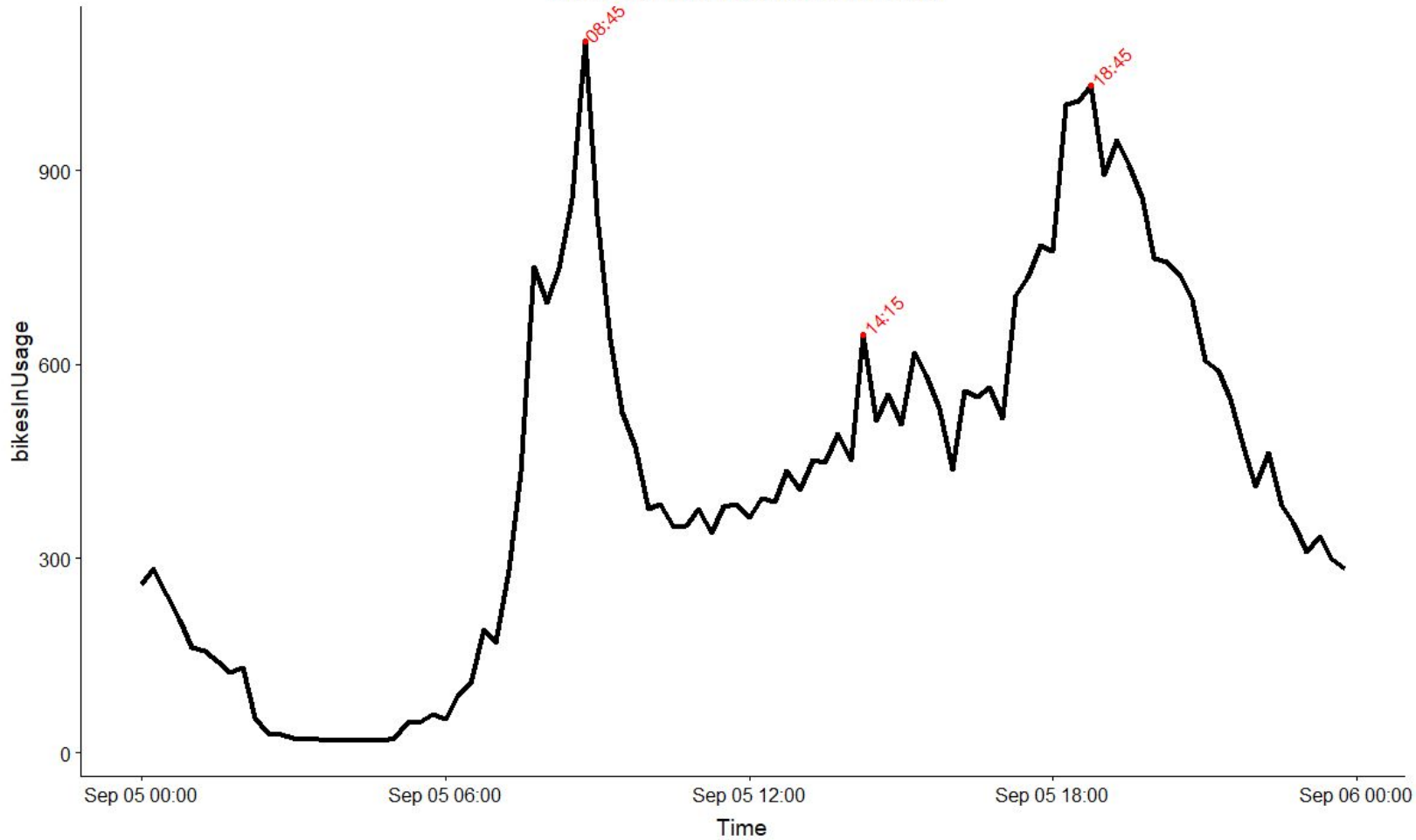
RECOMMENDATIONS

- Improve replenishing of bicing stations. Many stations are empty most of the time.

- Consider having
  - Mechanical bikes uphill in the mornings,
  - Electric bikes downhill in the afternoons so that people can bike up on their way back to work.

NEXT STEPS

- Analyze data on bike rentals and returns
- Analyze who uses bikes to promote user centric
- Look into data on usage of private bikes, scooters, etc.
- Logistic Regression to obtain a predictive model
- Multivariate Analysis

THANK YOU FOR LISTENING AND FOR THE GREAT HACKATHON!

Proportion of time with no bikes by station altitude
between 6 and 10 PM
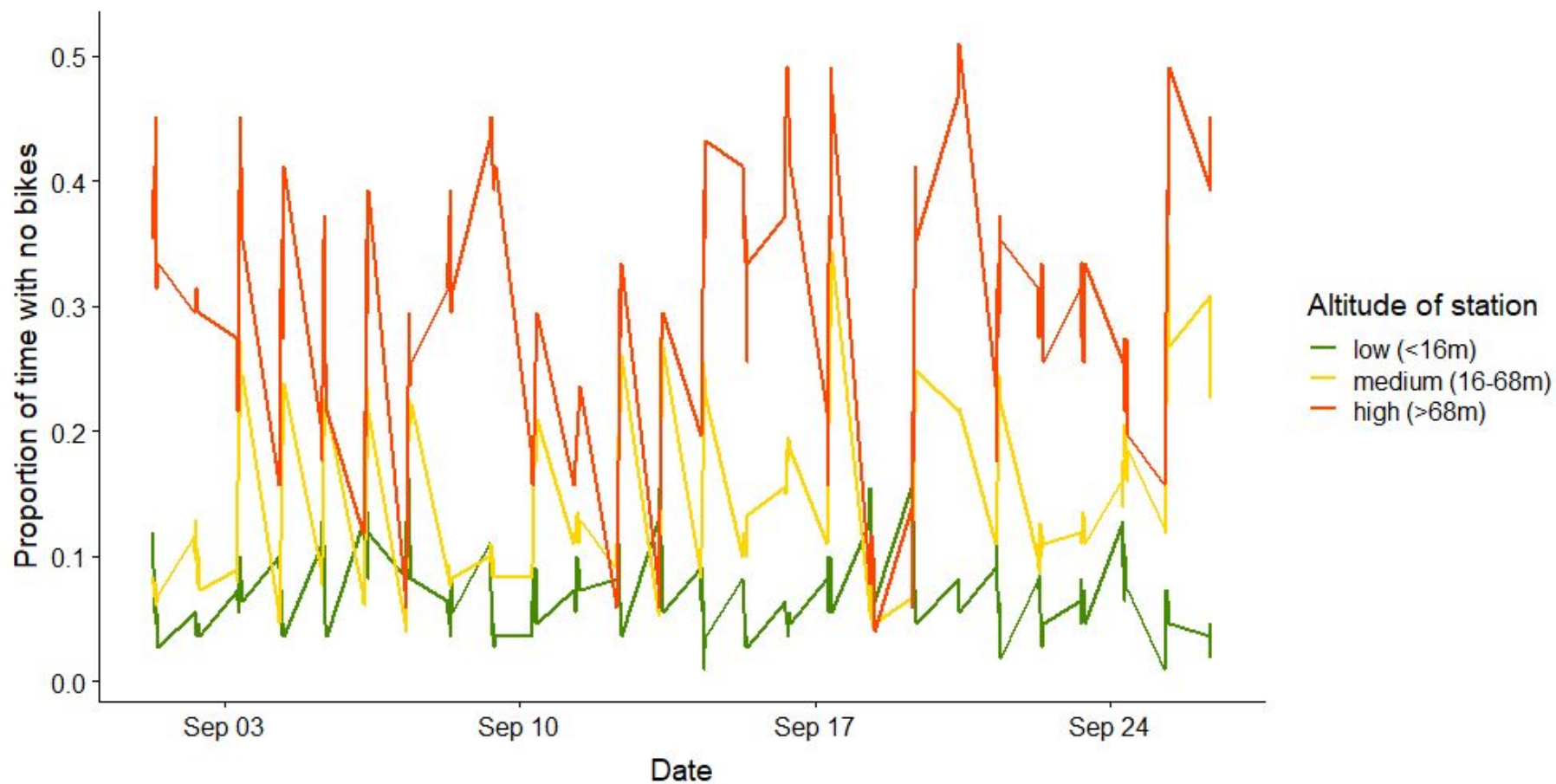
Proportion of time with no bikes by station altitude between 5 and 8 PM