# The Weather Influences in Uber and Taxi Trips

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## Introduction

You have to live in New York City for precisely one rainy day to appreciate that it's extremely difficult to find a taxi here when it rains. It's also extremely difficult to figure out how difficult it is compared to normal days. As an exponentially growing platform, Uber has galvanized the traditional taxi industry in an unprecedented way. Under extreme weathers, how Uber reacts and operates may be an interesting question. In this project, we will be exploring the impact of weather to Uber and the traditional taxi industry in New York City from multiple aspects.

## Main Objectives

We would like to answer the following questions:

1. How weather influences taxi and uber pickup quantity

2. How weather influences taxi pickup distribution and routine

3. How weather influences the tips and revenue
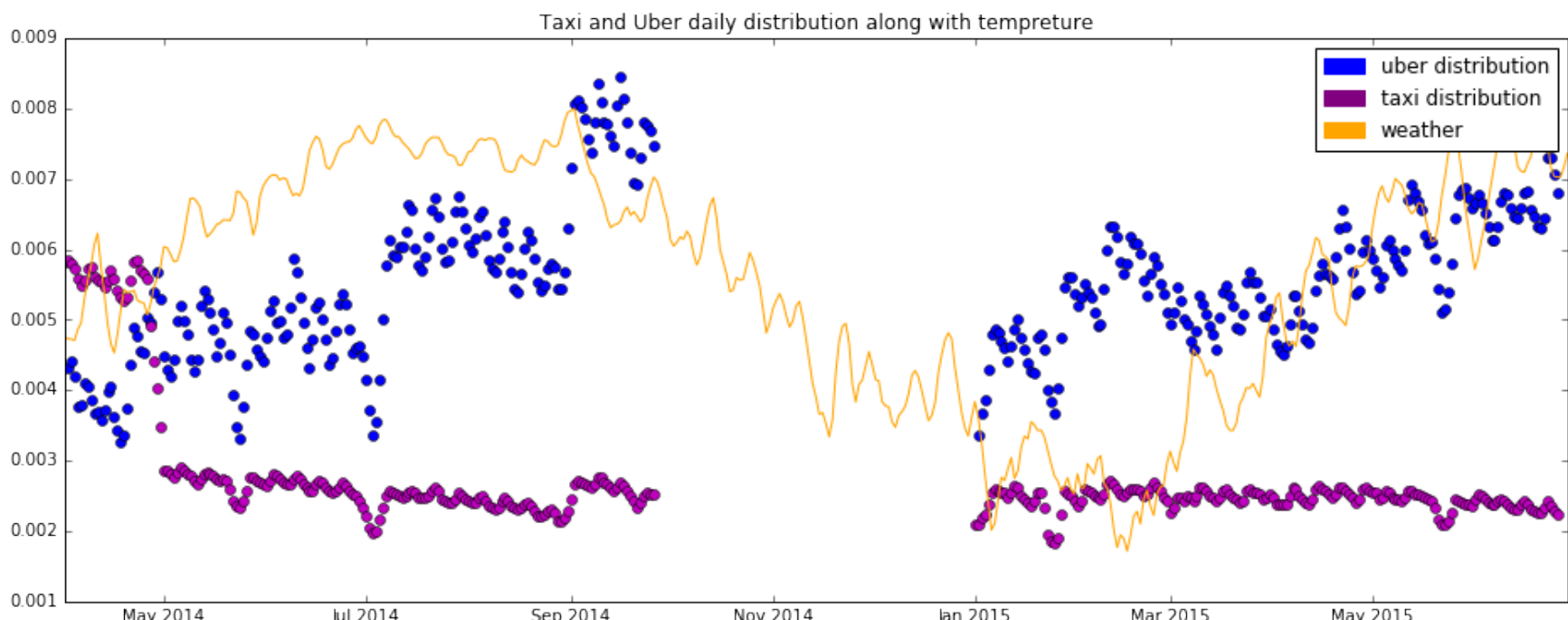
4. Do people prefer Uber or Taxi during peak hour

## Data Summary

1. Uber data: 4.5 million Uber pickups in New York City from April to September 2014, and 14.3 million more Uber pickups from January to June 2015.

2. Taxi data from Jan 2014 to Dec 2015. For each month, the data contains around 10 million pickups.

3. Weather data: Weather records from Global summary of the day from Jan 2014 to Dec 2015 in NYC.
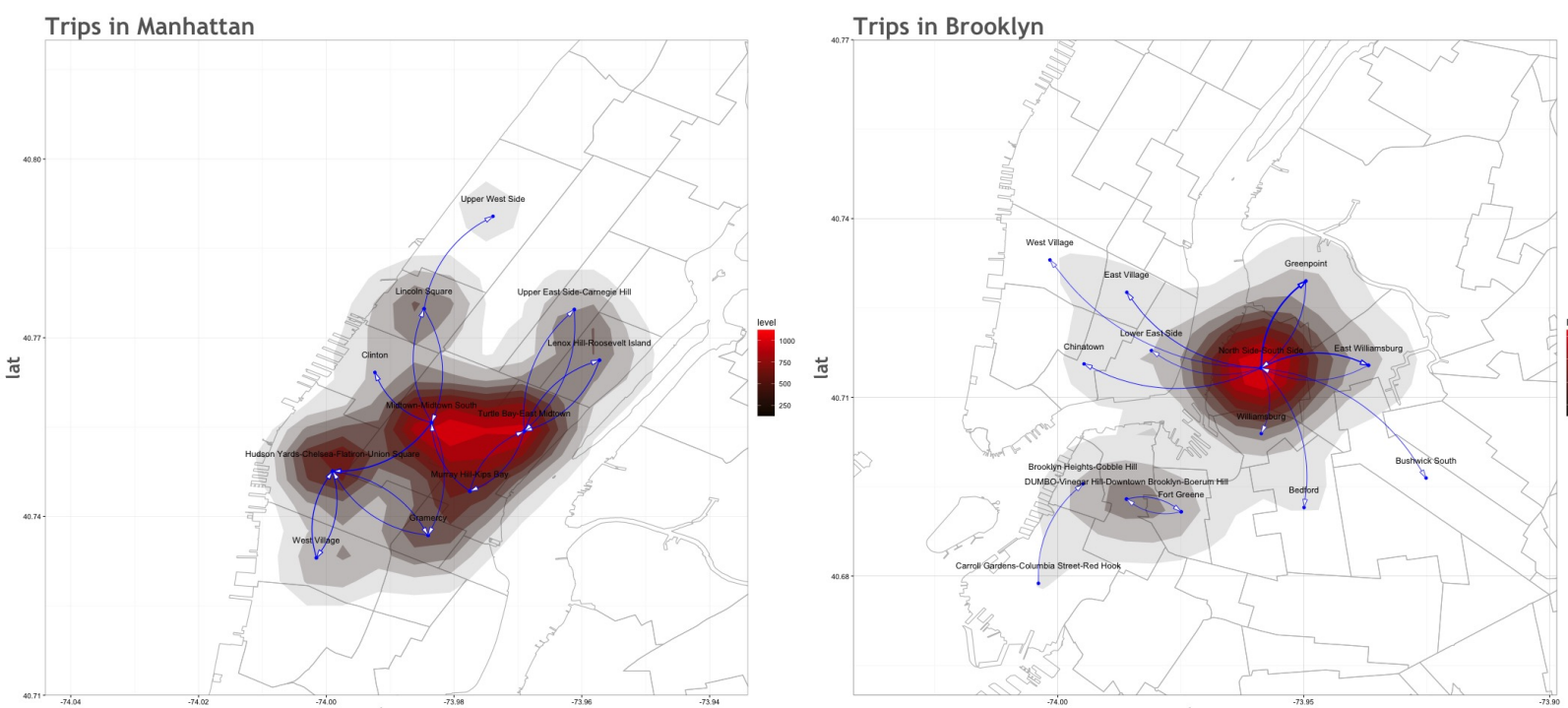
## Pick Up Quantity


**Figure 1**: *Taxi,Uber distribution with temperature*
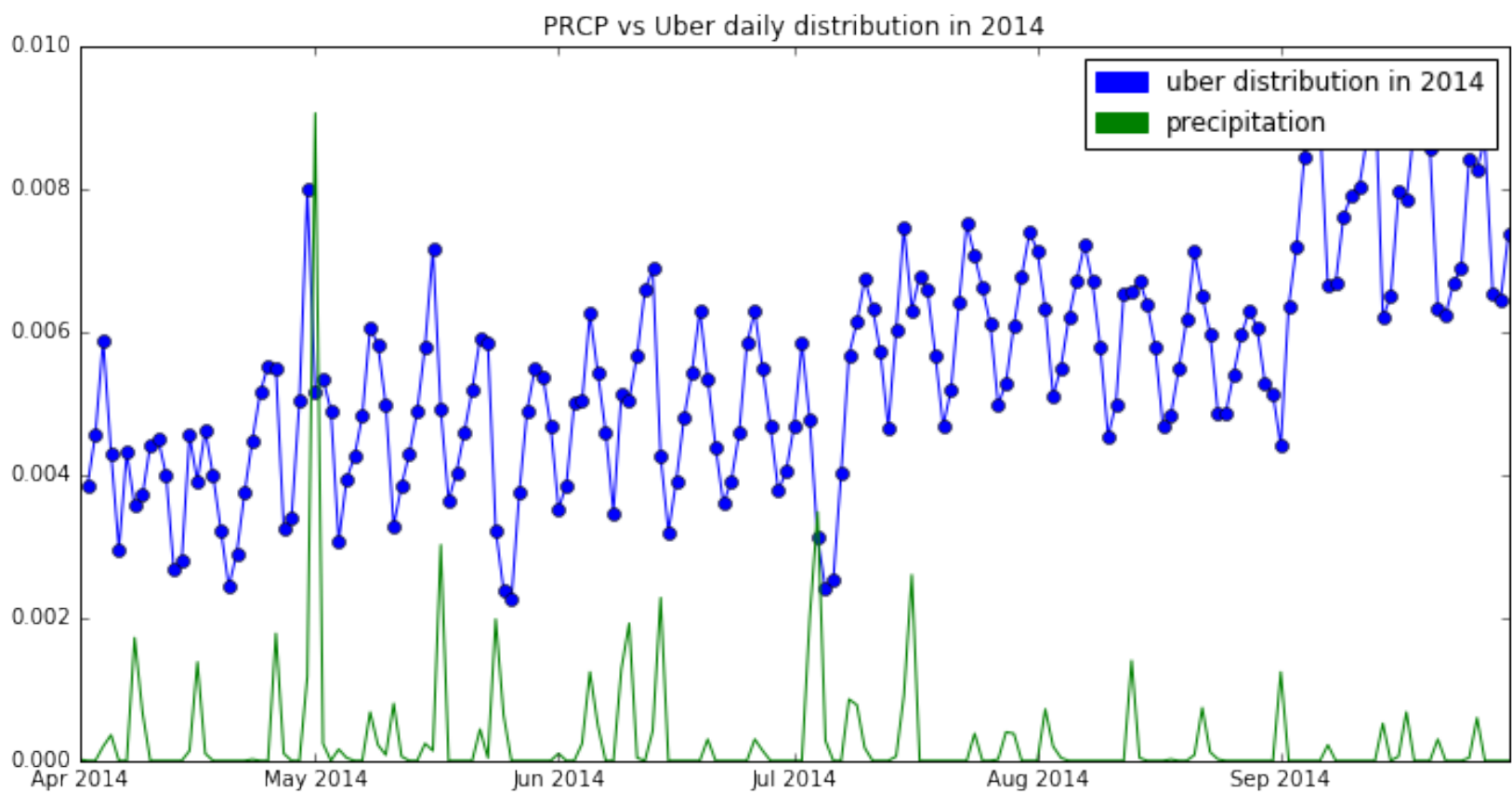

**Figure 2**: *Uber distribution in 2014 with precipitation*

## Taxi Pickup Distribution


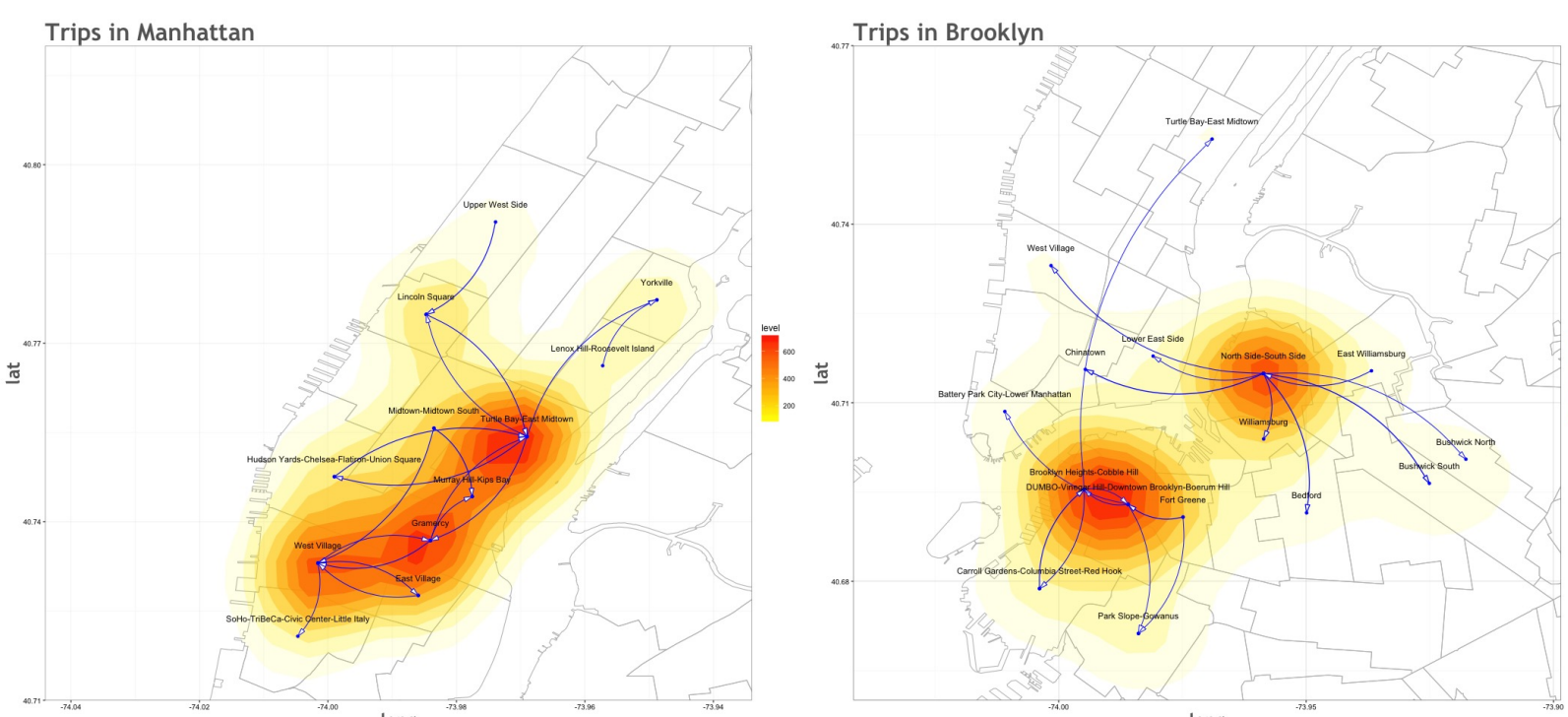**Figure 3**: *Taxi route in Manhattan vs Brooklyn in normal weather*


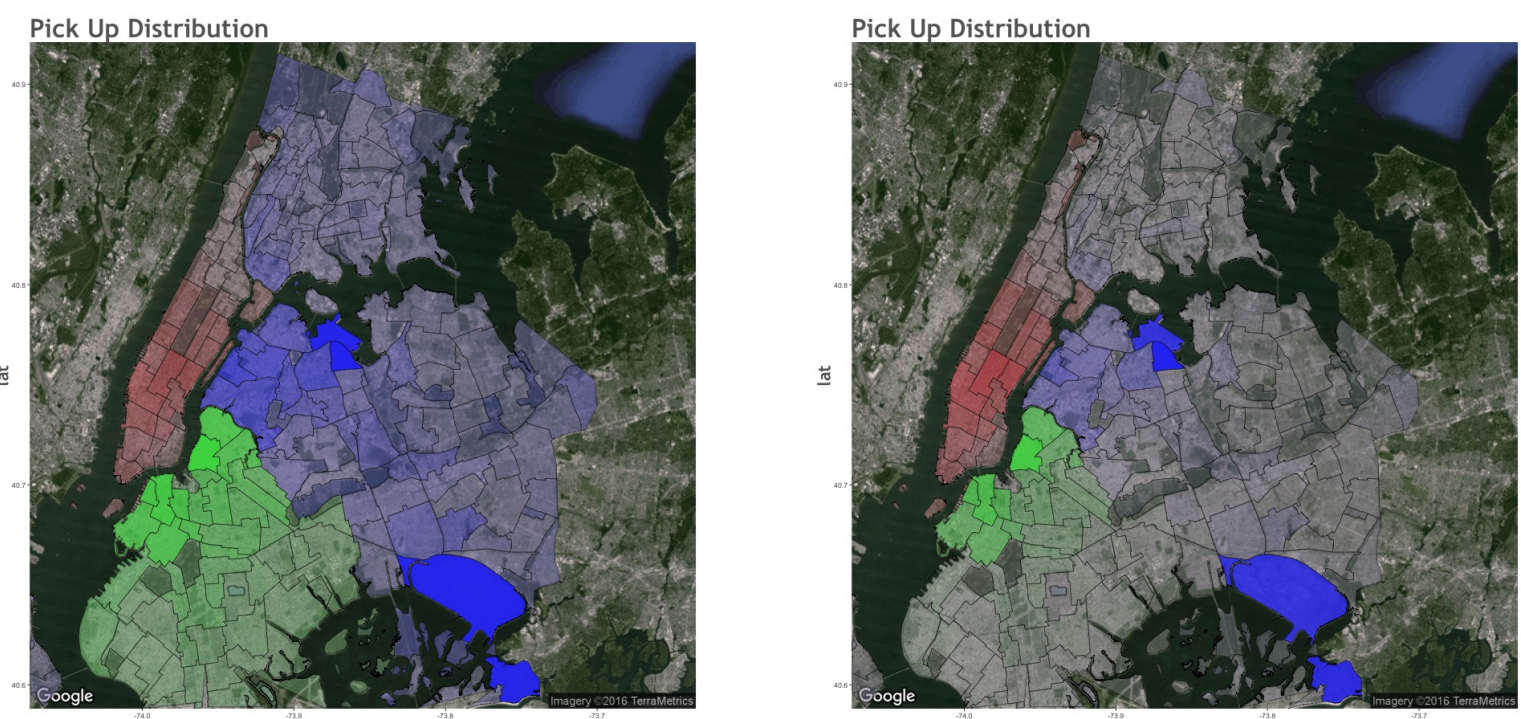**Figure 4**: *Taxi route in Manhattan vs Brooklyn in extreme weather*


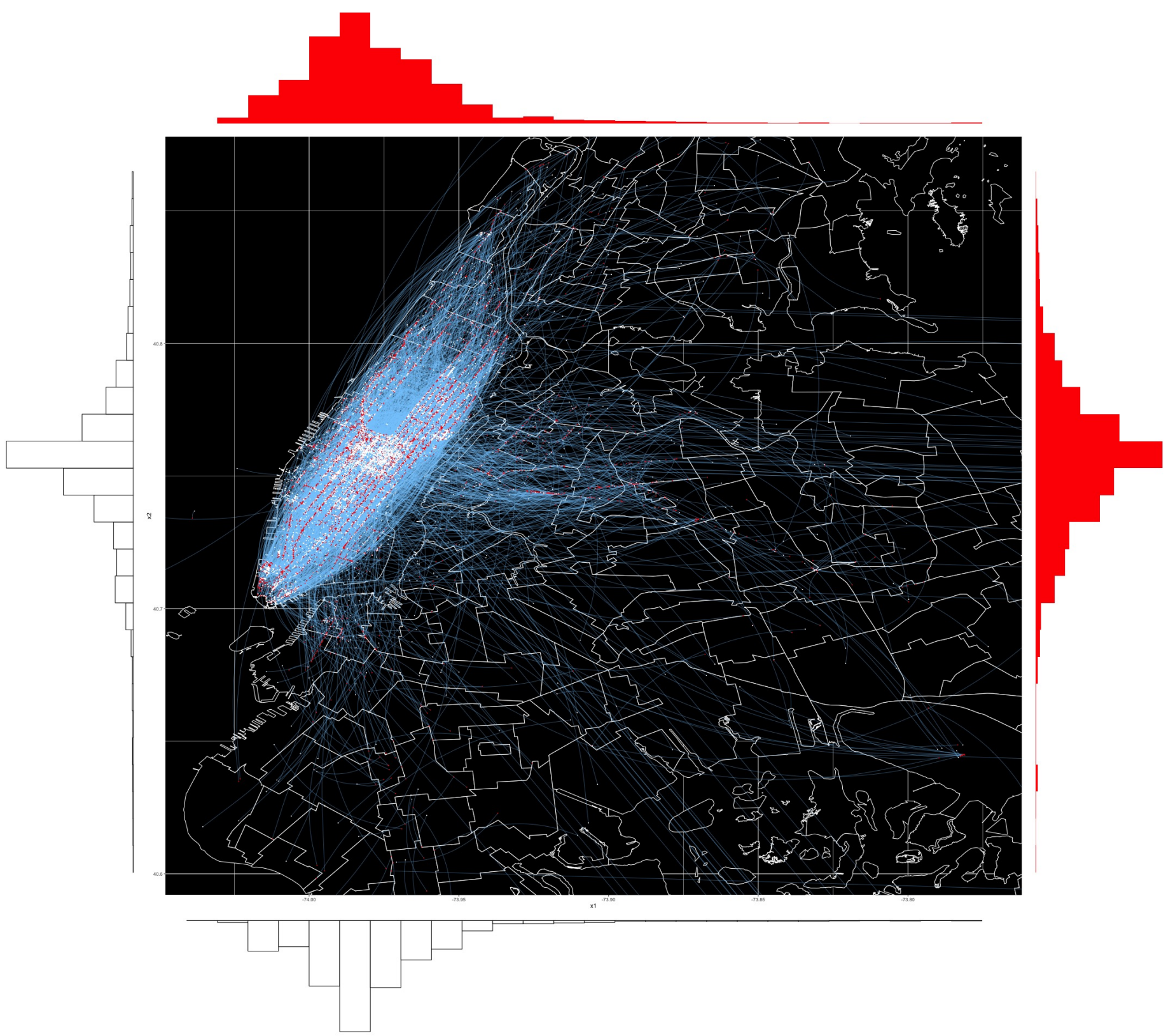**Figure 5**: *Taxi pick up distribution in Manhattan vs Brooklyn in normal weather*


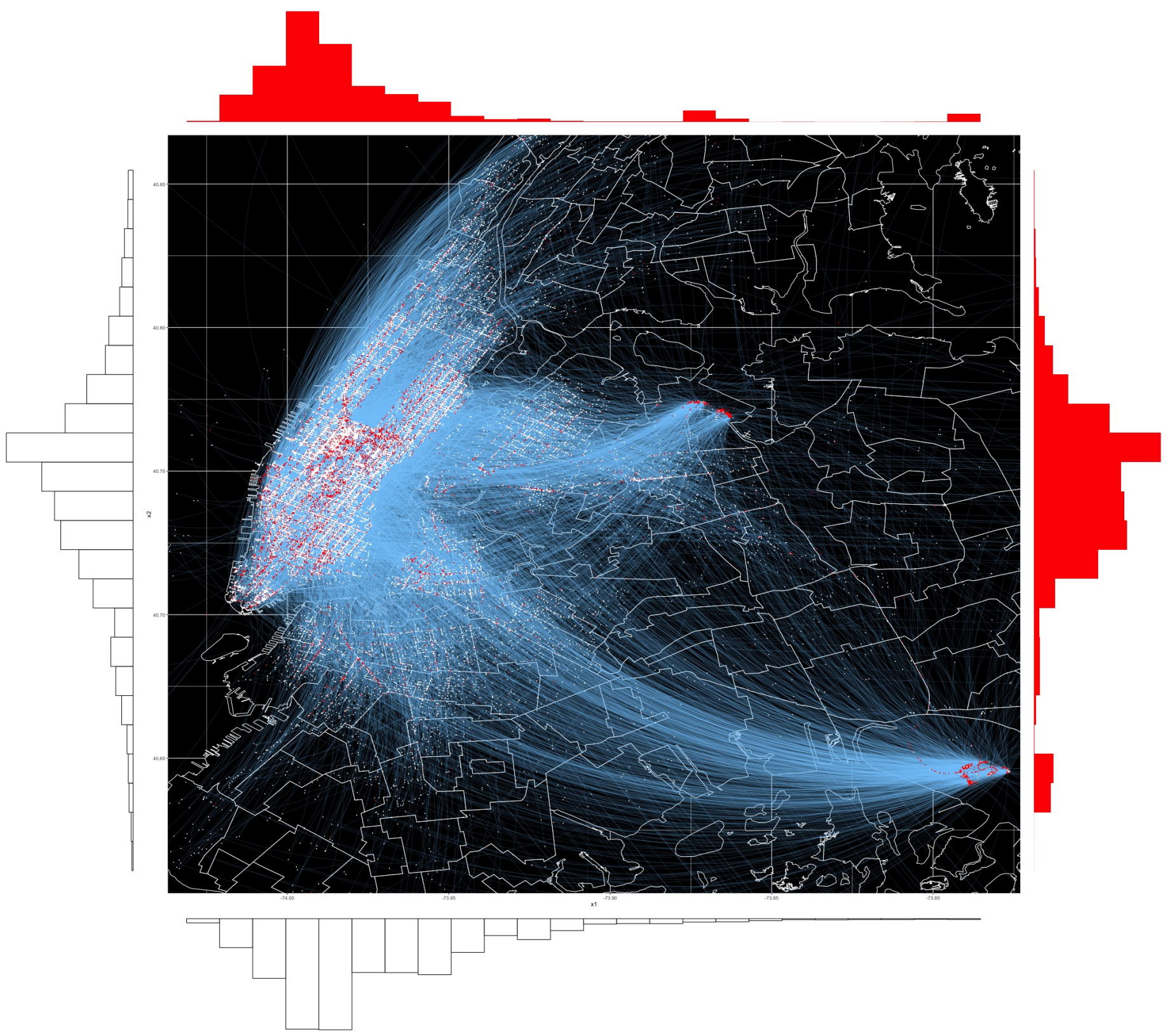**Figure 6**: *Taxi route in snow vs normal weather*


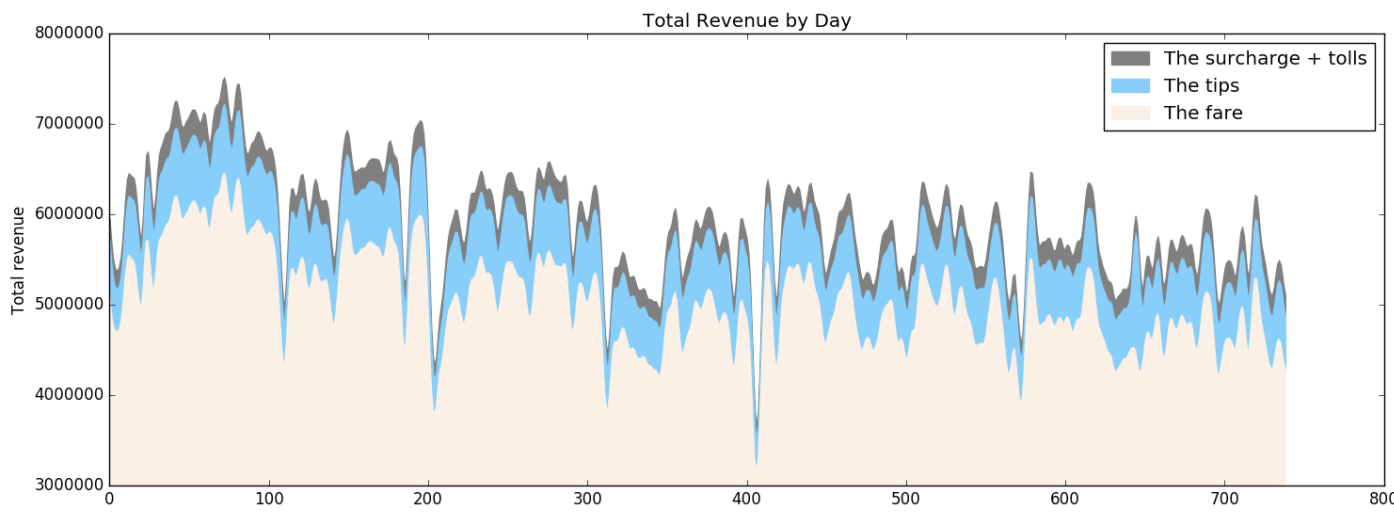**Figure 7**: *Taxi route in sn vs Brooklyn in normal weather*

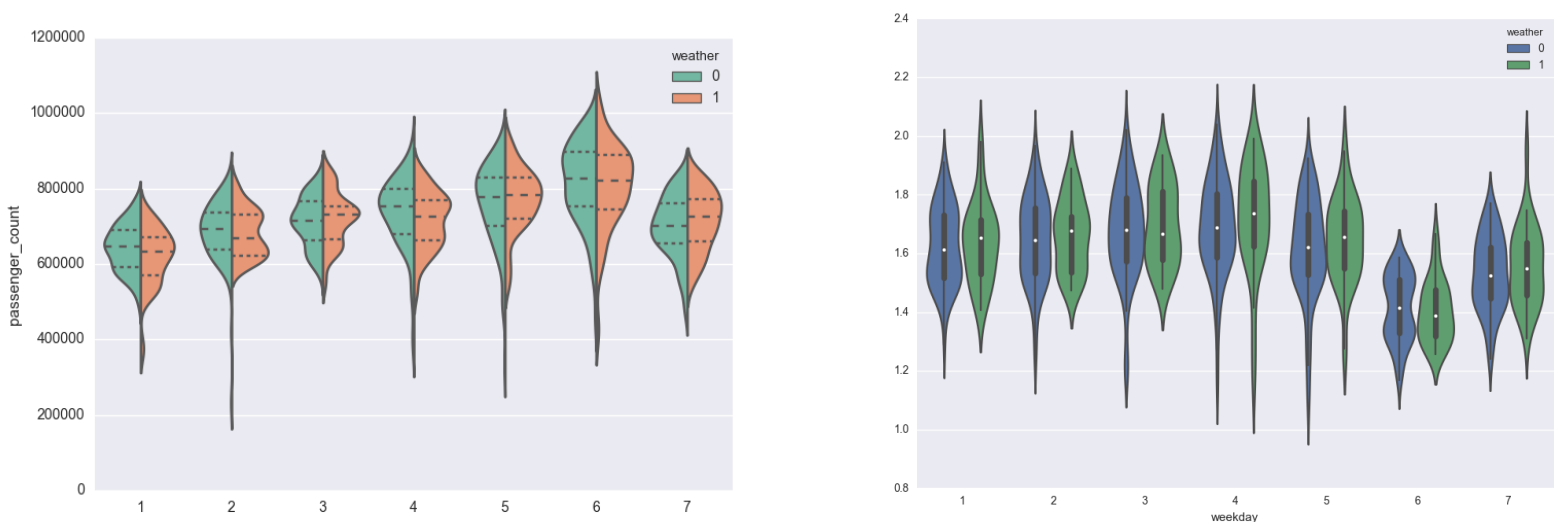## Tips and Revenue


**Figure 8**: *Taxi revenue by day*


**Figure 9**: *Taxi route in Manhattan vs Brooklyn in extreme weather*

## Peak hour Preference

|  | Peak hours | Off-peak hours |
|---|---|---|
| Taxi | 37747660 | 58440656 |
| Uber | 2183991 | 2350336 |
| Taxi / Uber | **24.86%** | **17.28%** |

**Table 1**: *People's preference taking taxi or uber during peak hours or off-peak hours*

## Conclusion

Uber and taxi has their unique properties regarding the weather effect. Uber trip quantities are more sensible to the weather, due to the flexibility of Uber drivers. In contrast, the number of taxi trips experiences less influence, since taxi drivers still have to work for their company even under severe weather conditions. However, the weather indeed affects taxi routines and the effect varies for different neighborhoods throughout NYC.

## References

[1].Veloso, Marco, Santi Phithakkitnukoon, and Carlos Bento. *Sensing urban mobility with taxi flow. ACM, 2011.* .

[2]. Rajaraman, Anand, and Jeffrey D. Ullman. *Mining of massive datasets.Cambridge: Cambridge University Press, 2012.*