# Visual Analytics to Compare Neurotypical and Neurodivergent College Students

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The CDC estimated that about 1 in 59 children has been identified with autism spectrum disorder (ASD). Additionally, for students with ASD who go to post-secondary institutions, it is estimated that only 38.8% will graduate. Neurotypical and neurodivergent students experience college life differently. To gain insight about the similarities and differences between these students, we have created a set of interactive visualizations.

## Goal

To offer insight into the unique challenges experienced by neurodivergent college students and to guide the design of assistive technology and help to better identify areas of improvement to accommodate neurodivergent students' needs.
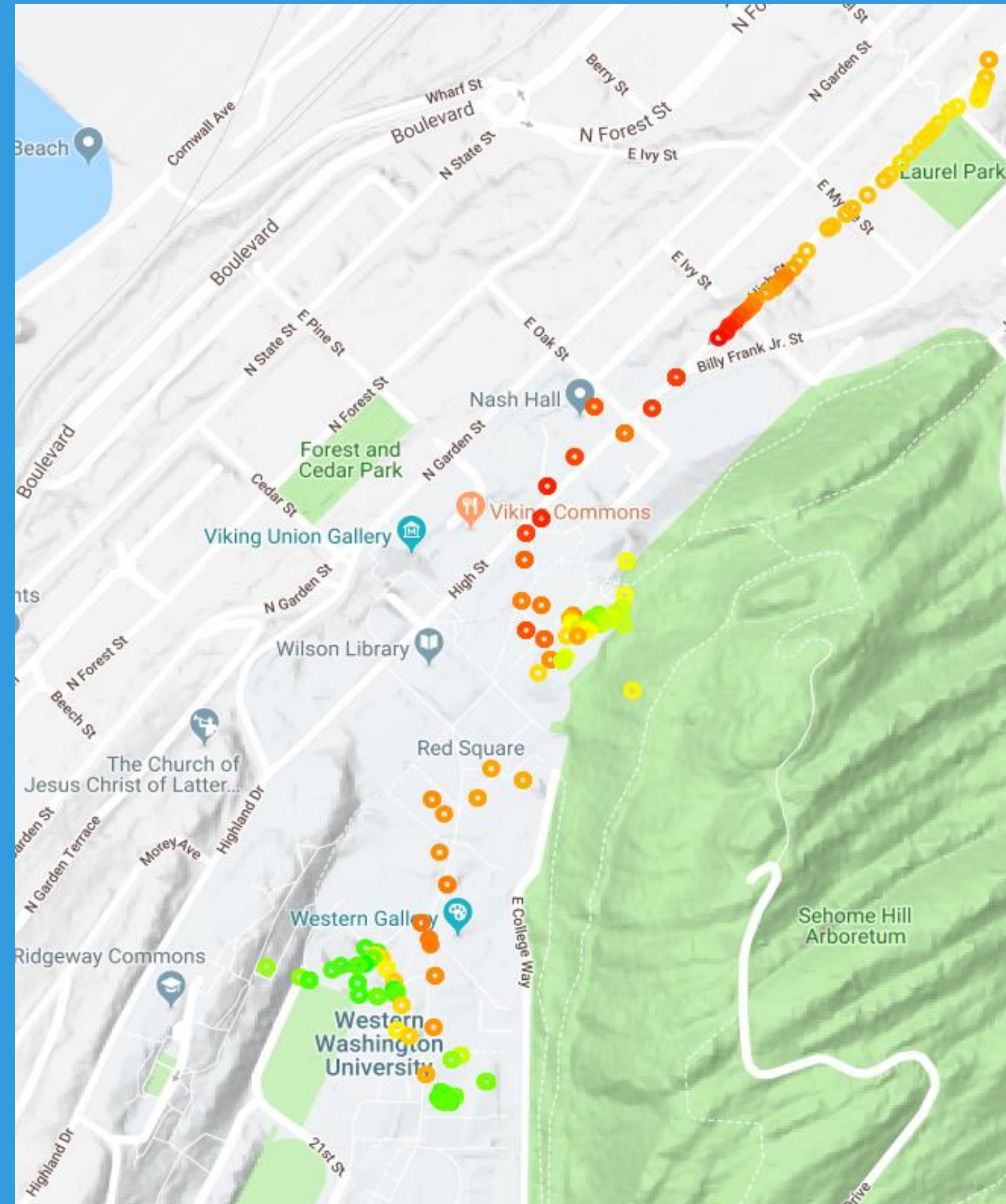
## Data

Our dataset includes biometric data, location, time, and interviews about routines, experiences, etc. We also collected self-reported data from these students, including self-reported stress levels associated with different daily events.
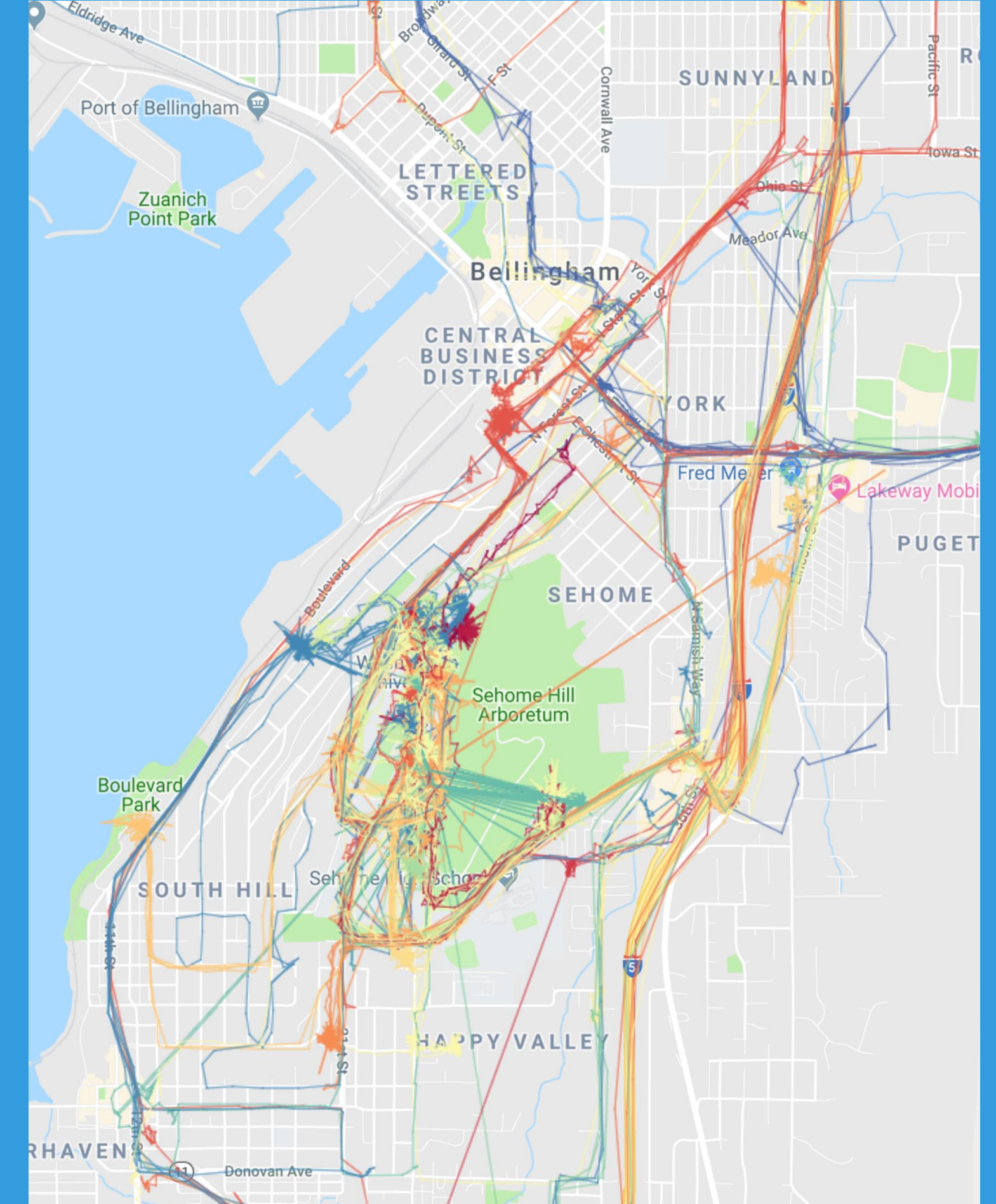
## Location
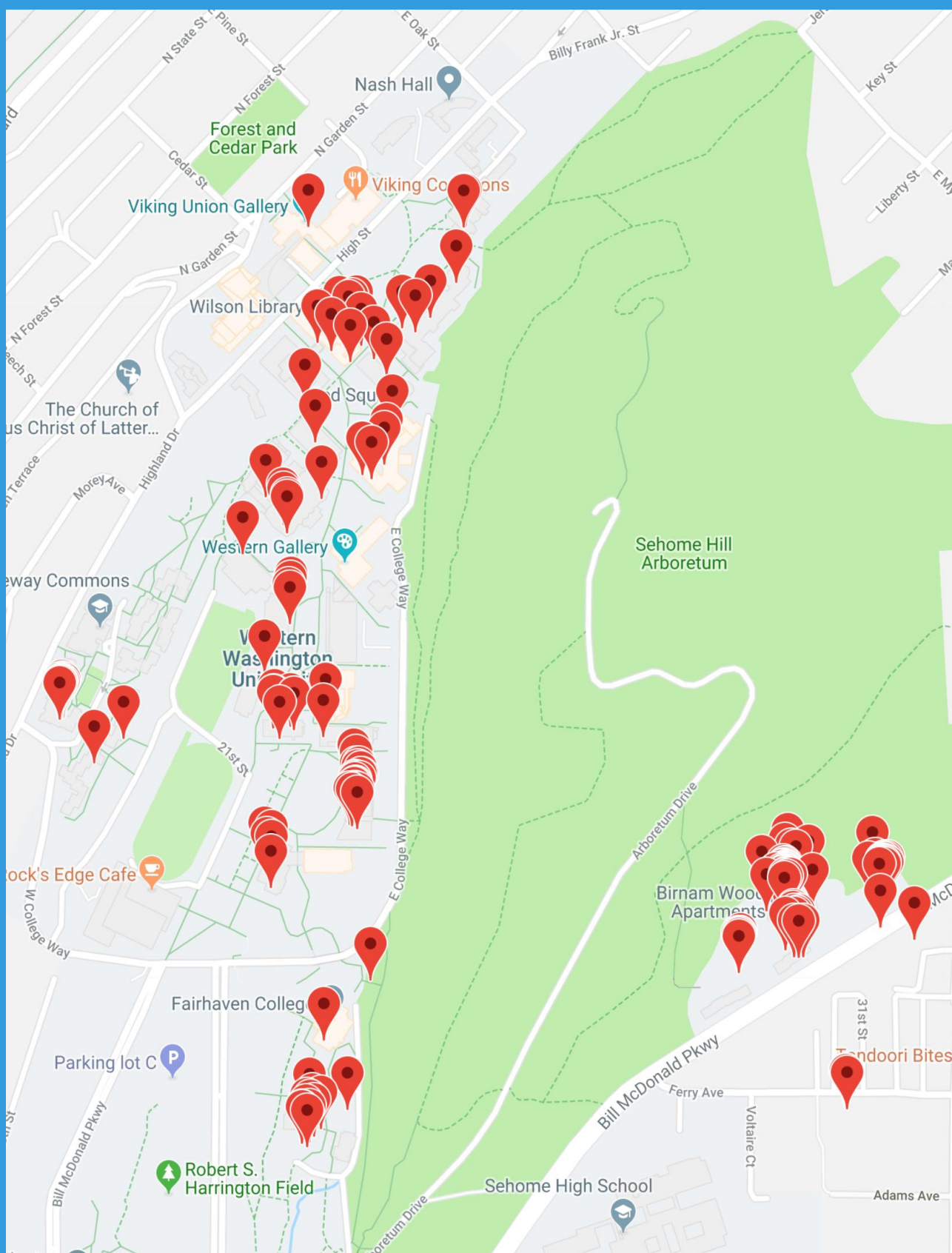


- Map of venues
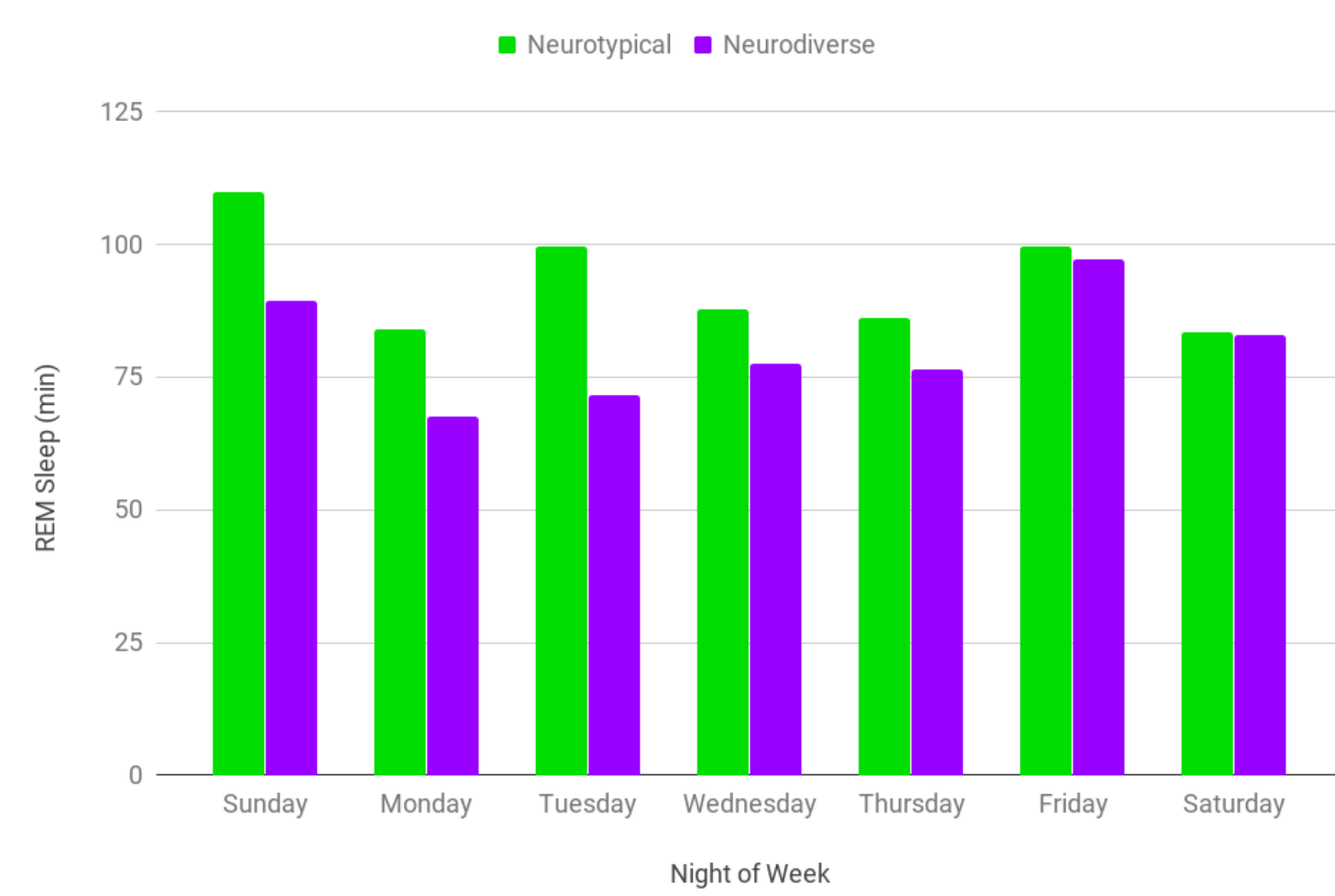- Participants spent > 30 minutes at one location



- Map of participants' heartrates
- Green circle = low heartrate
- Red circle = high heartrate



- Map of participants daily paths
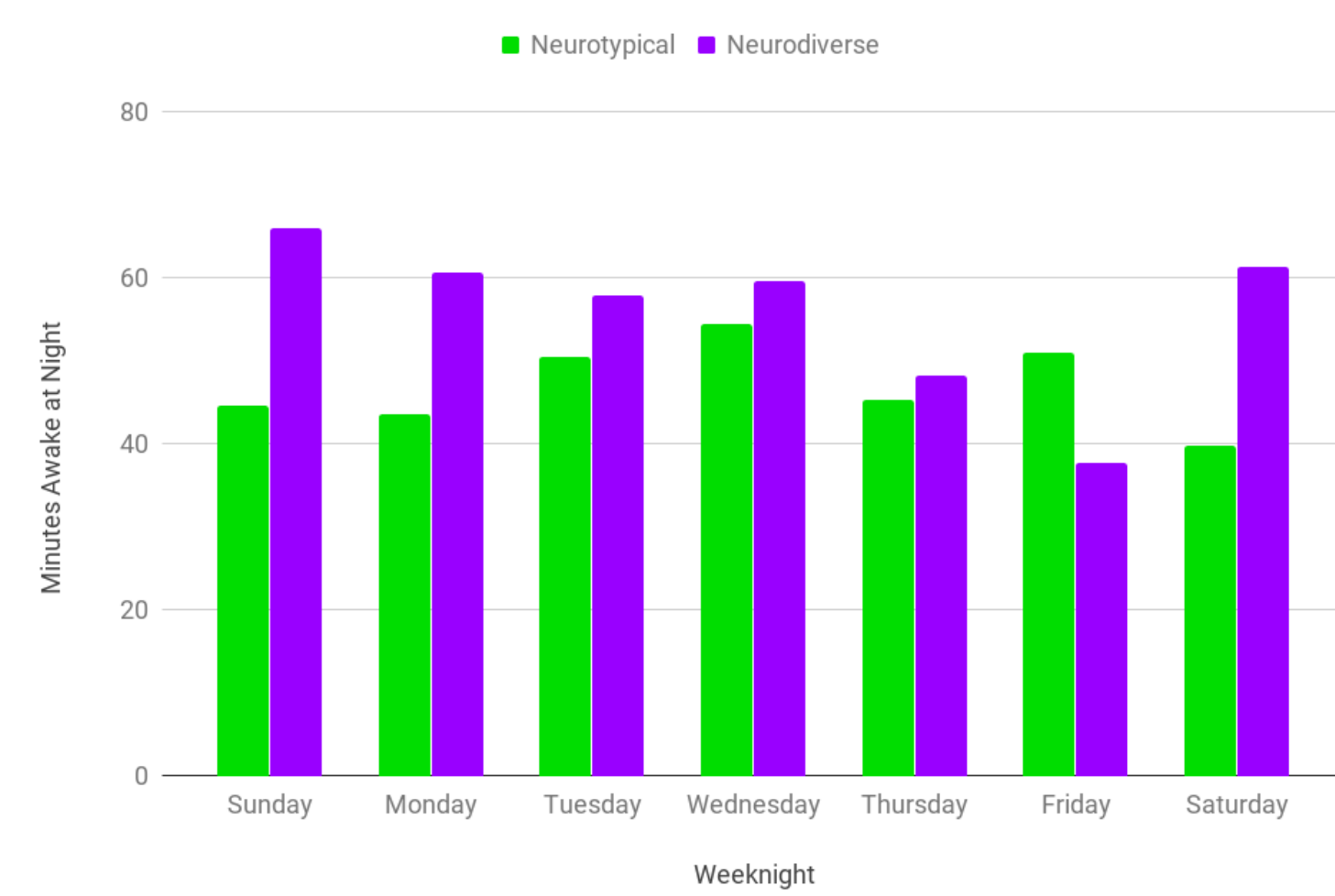- Shows scope and quantity of location data

## Sleep



REM Sleep per Night



Awake Duration per Night

- Longer REM sleep duration indicates better sleep quality.
- Neurodivergent students have significantly less REM sleep on school nights.
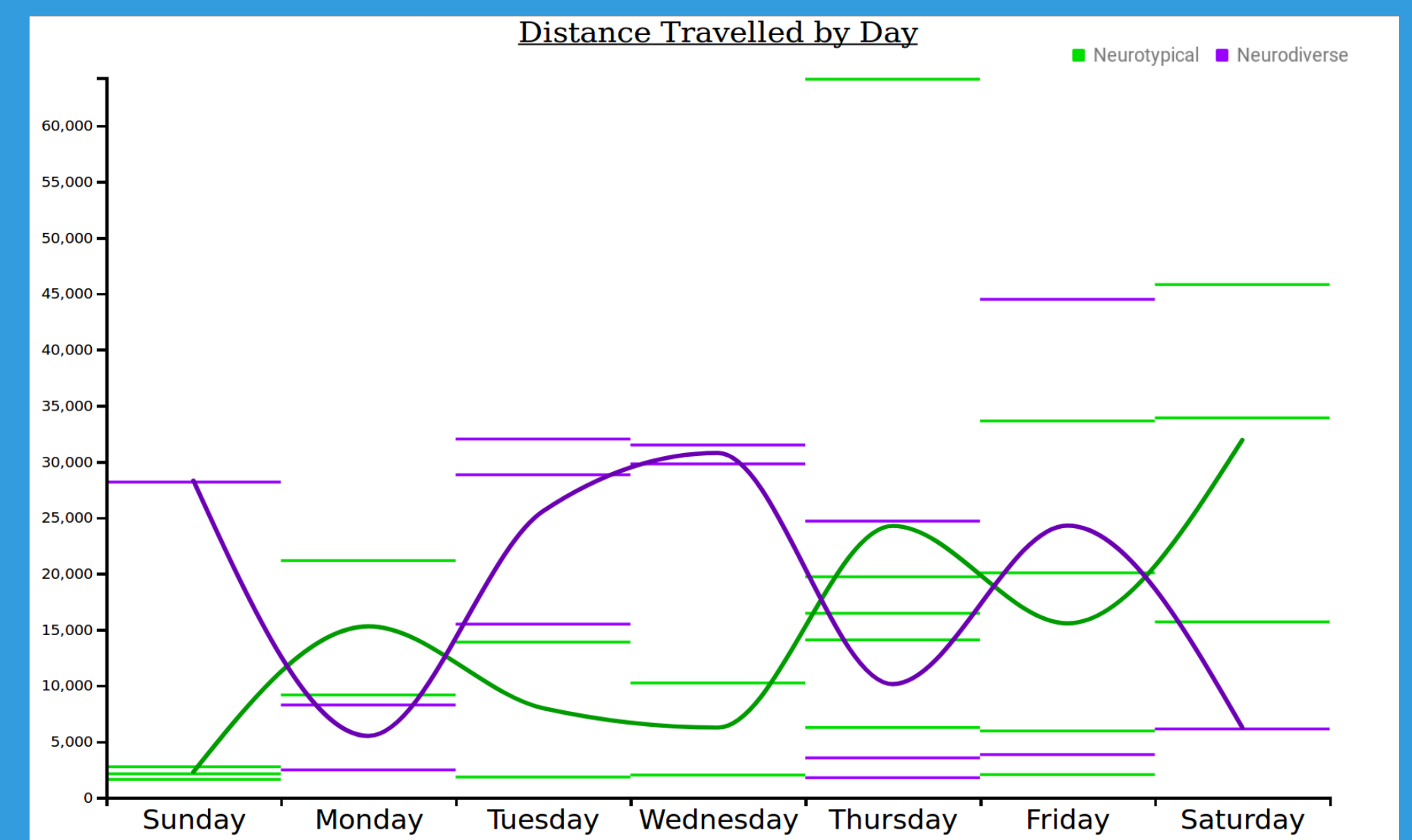- Both groups almost equal on weekends

- Less time awake indicates better sleep quality.
- Neurodiverse group spends more time awake every night but Friday

## Distance



Distance Travelled by Day

- Graph of distance travelled per day of the week
- Shows difference in travelling habits between neurotypical and neurodivergent students.

## Technology

Reading from an SQL database, we created interactive visualizations using D3.js, a JavaScript library built for creating dynamic visualizations.

## References

ASD Data and Statistics, https://www.cdc.gov/ncbddd/autism/data.htm

Lynn Newman, Mary Wagner, Anne-Marie Knockey, Camille Marder, Katherine Nagle, Debra Shaver, Xin Wei, Renee Cameto, Elidia Contreras, Kate Ferguson, Sarah Greene, and Meredith Schwarting. 2011. The post-high school outcomes of young adults with disabilities up to 8 years after high school. A report from the National Longitudinal Transition Study- 2 (MLTS2).

## Future Goals

- Provide tools for users to view their own individual data
- Share analytics tools with fellow researchers
- Discuss results with Western building planning team to better design spaces for neurodiverse students