Team 14

Who actually rides the T?

Brian Shen, Lewen Sun, Jonghyeon Lee, Ajibola Falade

COSI 116A Fall 2024 – Prof. Dylan Cashman, Brandeis University

Problem Statement

Initial Question:

Who Actually Uses the T? Do more affluent people use the T more?

The idea being that richer demographics are less to utilize public transportation but the question is if that is consistent throughout Boston or even true at all. Comparing those who take the T and those who live around the T to see they are similar in demographic or not.

Data

Age	Total Population	Median Age	0-9 years	%	10-17 years	%	18-19 years	%	20-34 years	%	35-59 years	%	60 and over	%
			3,579		2,436		3,809		42,227		13,792		8,715	74,558
United States	324,697,795	38.2	39,925,147	12.3%	33,504,245	10.3%	8,631,219	2.7%	67,045,523	20.6%	104,705,706	32.2%	70,885,955	21.8%
Massachusetts	6,850,553	39.2	726,905	10.6%	644,355	9.4%	208,160	3.0%	1,462,935	21.4%	2,258,851	33.0%	1,549,347	22.6%
Boston	684,379	32.8	62,783	9.2%	46,220	6.8%	30,684	4.5%	237,784	34.7%	196,133	28.7%	110,775	16.2%
Allston	19,261	27.5	409	2.1%	331	1.7%	2,359	12.2%	13,046	67.7%	2,307	12.0%	809	4.2%
Brighton	55,297	30.8	3,170	5.7%	2,105	3.8%	1,450	2.6%	29,181	52.9%	11,485	20.8%	7,906	14.3%
Charlestown	19,890	35.7	2,978	15.0%	996	5.0%	186	0.9%	5,603	28.2%	6,824	34.3%	3,303	16.6%
Dorchester	126,909	33.4	15,104	11.9%	13,018	10.3%	3,478	2.7%	35,771	28.2%	38,890	30.6%	20,648	16.3%
Downtown	18,306	33.5	1,122	6.1%	385	2.1%	2,307	12.6%	5,942	32.5%	4,923	26.9%	3,627	19.8%
East Boston	47,263	30.6	5,319	11.3%	3,857	8.2%	1,086	2.3%	14,689	31.1%	16,270	34.4%	6,042	12.8%
Fenway	33,489	26.3	509	1.5%	190	0.6%	8,496	25.4%	18,072	54.0%	3,981	11.9%	2,241	6.7%
Hyde Park	38,924	39.4	4,140	10.6%	4,148	10.7%	606	1.6%	8,221	21.1%	13,392	34.4%	8,417	21.6%
Jamaica Plain	40,867	34.8	4,232	10.4%	2,389	5.8%	674	1.6%	13,286	32.5%	13,387	32.8%	6,899	16.9%
Longwood	5,351	20.2	8	0.1%	43	0.8%	2,597	48.5%	2,575	48.1%	65	1.2%	63	1.2%
Mattapan	26,659	36.7	3,496	13.1%	3,072	11.5%	575	2.2%	5,582	20.9%	9,031	33.9%	4,903	18.4%
Mission Hill	17,386	30.1	660	3.8%	825	4.7%	1,424	8.2%	8,599	49.5%	3,163	18.2%	2,715	15.6%
North End	8,749	31.1	310	3.5%	199	2.3%	19	0.2%	5,208	59.5%	1,818	20.8%	1,195	13.7%
Roslindale	30,021	39.8	3,412	11.4%	2,567	8.6%	555	1.8%	6,310	21.0%	11,224	37.4%	5,953	19.8%
Roxbury	54,161	32.5	6,557	12.1%	5,289	9.8%	2,669	4.9%	15,059	27.8%	15,564	28.7%	9,023	16.7%
South Boston	36,772	31.9	3,165	8.6%	1,496	4.1%	305	0.8%	16,937	46.1%	10,206	27.8%	4,663	12.7%
South Boston Waterfront	4,403	34.5	138	3.1%	51	1.2%	43	1.0%	2,038	46.3%	1,546	35.1%	587	13.3%
South End	32,571	37.1	2,421	7.4%	1,544	4.7%	360	1.1%	11,029	33.9%	10,922	33.5%	6,295	19.3%
West End	6,619	37.8	297	4.5%	125	1.9%	141	2.1%	2,504	37.8%	2,168	32.8%	1,384	20.9%
West Roxbury	33,526	42.8	4,066	12.1%	2,829	8.4%	319	1.0%	6,062	18.1%	11,182	33.4%	9,068	27.0%

Boston Census

MBTA Gated Station Entries

MBTA OPMI
Massachusetts geoDOT

Summary

This file contains the count of gated station entries for any station with service for the last two years up to the most recent month that is available. The data is updated on a one- to two-month delay. See MBTA Gated Station Entries - Historical for data by year from 2014 to present.

View Full Details

Download

Details

Dataset
Table

Showing 25 of 2,212,984 rows

	service_date	time_period	stop_id	station_name	route_or_line	gated_entries
	10/31/2024, 12:00 AM	(00:00:00)	place-alfcl	Alewife	Red Line	8
	10/31/2024, 12:00 AM	(00:00:00)	place-andrw	Andrew	Red Line	6
	10/31/2024, 12:00 AM	(00:00:00)	place-aport	Airport	Blue Line	35
	10/31/2024, 12:00 AM	(00:00:00)	place-aqucl	Aquarium	Blue Line	52
	10/31/2024, 12:00 AM	(00:00:00)	place-armnl	Arlington	Green Line	44
	10/31/2024, 12:00 AM	(00:00:00)	place-asmnl	Ashmont	Red Line	4
	10/31/2024, 12:00 AM	(00:00:00)	place-bbsta	Back Bay	Orange Line	58
	10/31/2024, 12:00 AM	(00:00:00)	place-bmmnl	Beachmont	Blue Line	9
	10/31/2024, 12:00 AM	(00:00:00)	place-bomnl	Bowdoin	Blue Line	17

MBTA 2023 System-Wide Passenger Survey

Spring 2024

Prepared by the Office of Performance Management and Innovation

OPMI

MBTA Passenger Survey

MBTA Gated Entries

Compiling Data

Handled:

- Mismatched data
- Missing data
- Messy Data

Raw Sheet

Binned Sheet

Cleaned CSV

Compiled GeoJSON
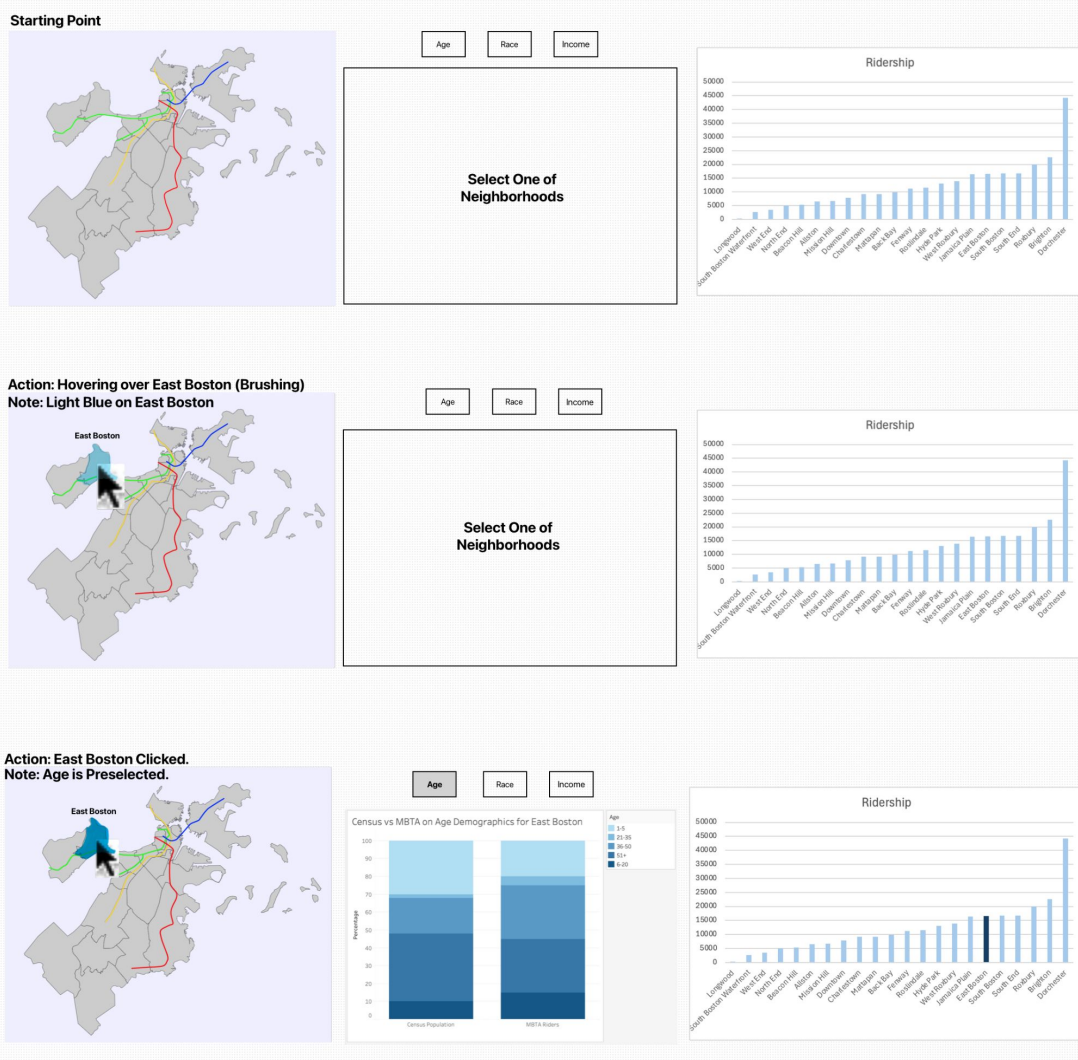
Excel functions

getcsv.py

getgeojson.py

Sketches

High fidelity Mockup
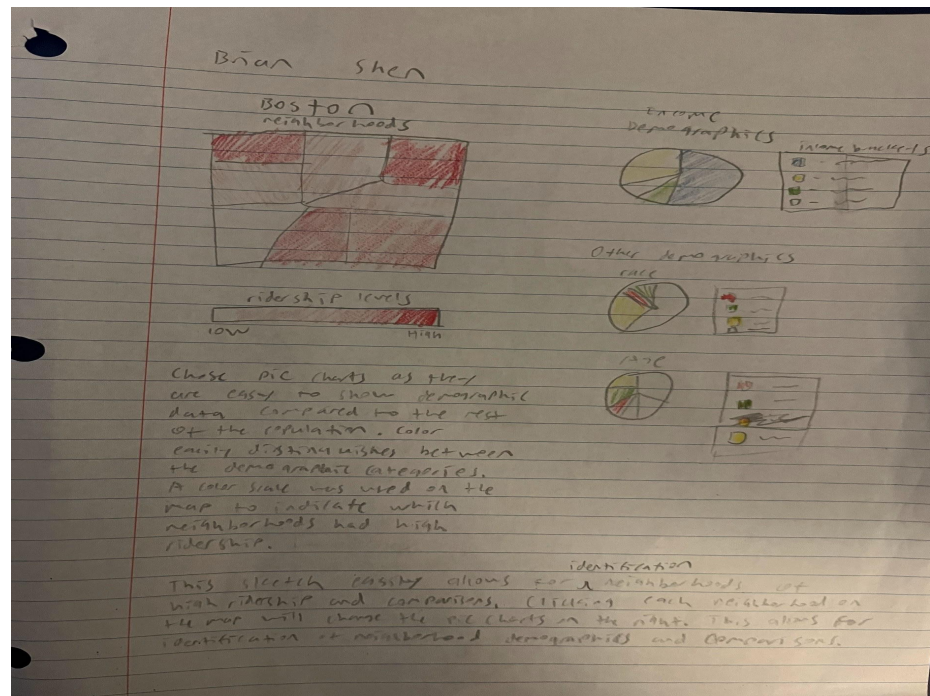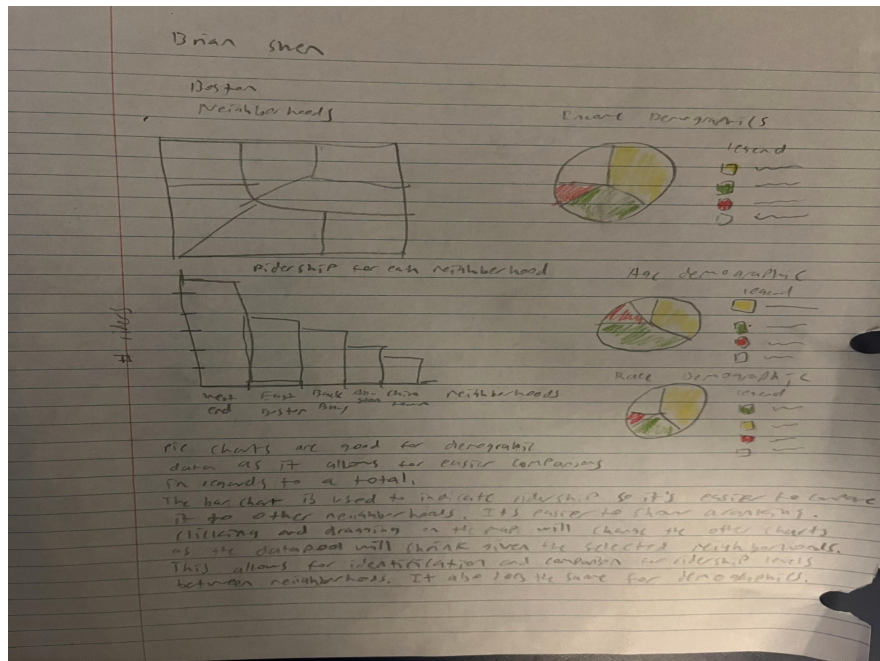
- Map of Boston and its neighborhoods
- Click on each neighborhood to see its demographic breakdown for its population and MBTA riders
- Demographic breakdown represented by stacked bar charts
- Simple bar chart to show ridership of each neighborhood

Creating our visualization

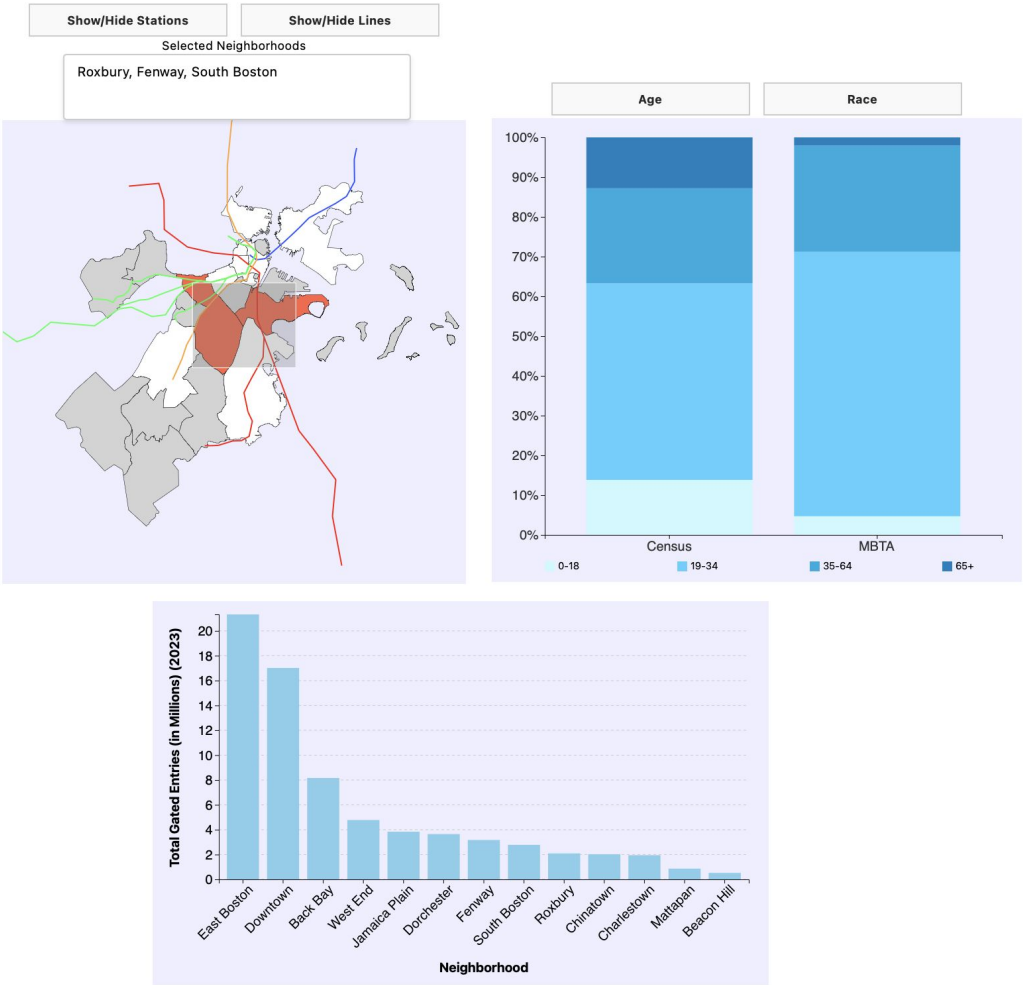**JSON files** containing neighborhood/station data

Python/Pandas to clean/compile data

JavaScript/D3 to create the visualization

ChatGPT to help with coding intricacies and table formatting

Peer Feedback for revisions/pivots

Final Visualization

Conclusion

Summary of Findings:

- Our interactive visualizations provide insights into MBTA ridership patterns and neighborhood demographics.
- Key neighborhoods like East Boston and Downtown exhibit significantly higher ridership, while others like Roslindale lack data due to the absence of MBTA stations.
- Fenway is the only neighborhood with a higher % of young adult (19-34) demographic compared to the MBTA.

Impact:

- These tools bridge the gap between data and public understanding, offering users a dynamic way to explore ridership and demographics.
- The project demonstrates the potential of visualization in driving data-informed decisions for urban planning and transit management.