Bluebikes: Compliment or Substitute to the MBTA?

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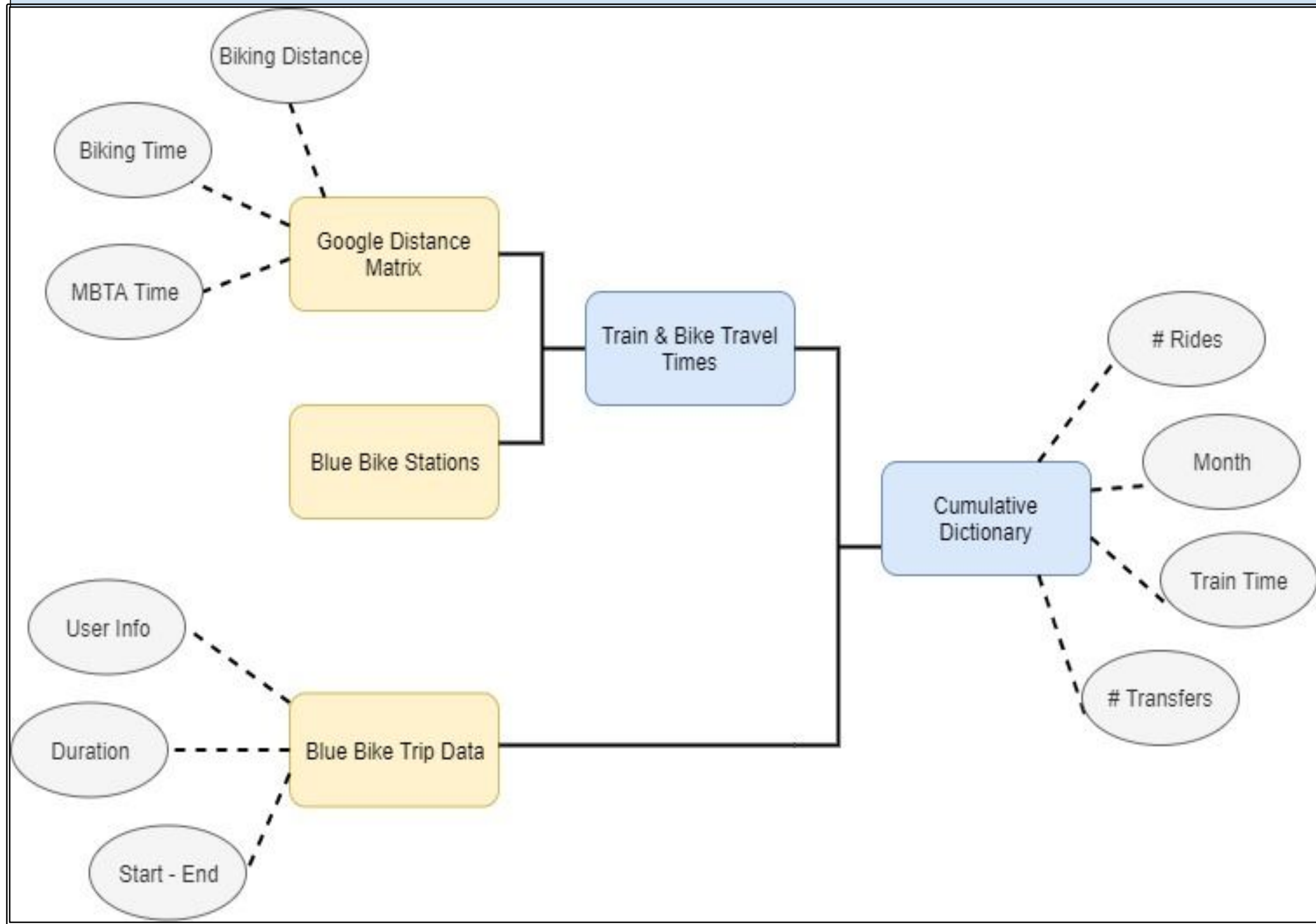
Problem Statement

Research Question:

- Is BlueBikes a compliment or a substitute to the MBTA?
- Are riders biking because they enjoy biking/ being eco-friendly or is it because there are no stops near them?

Hypothesis

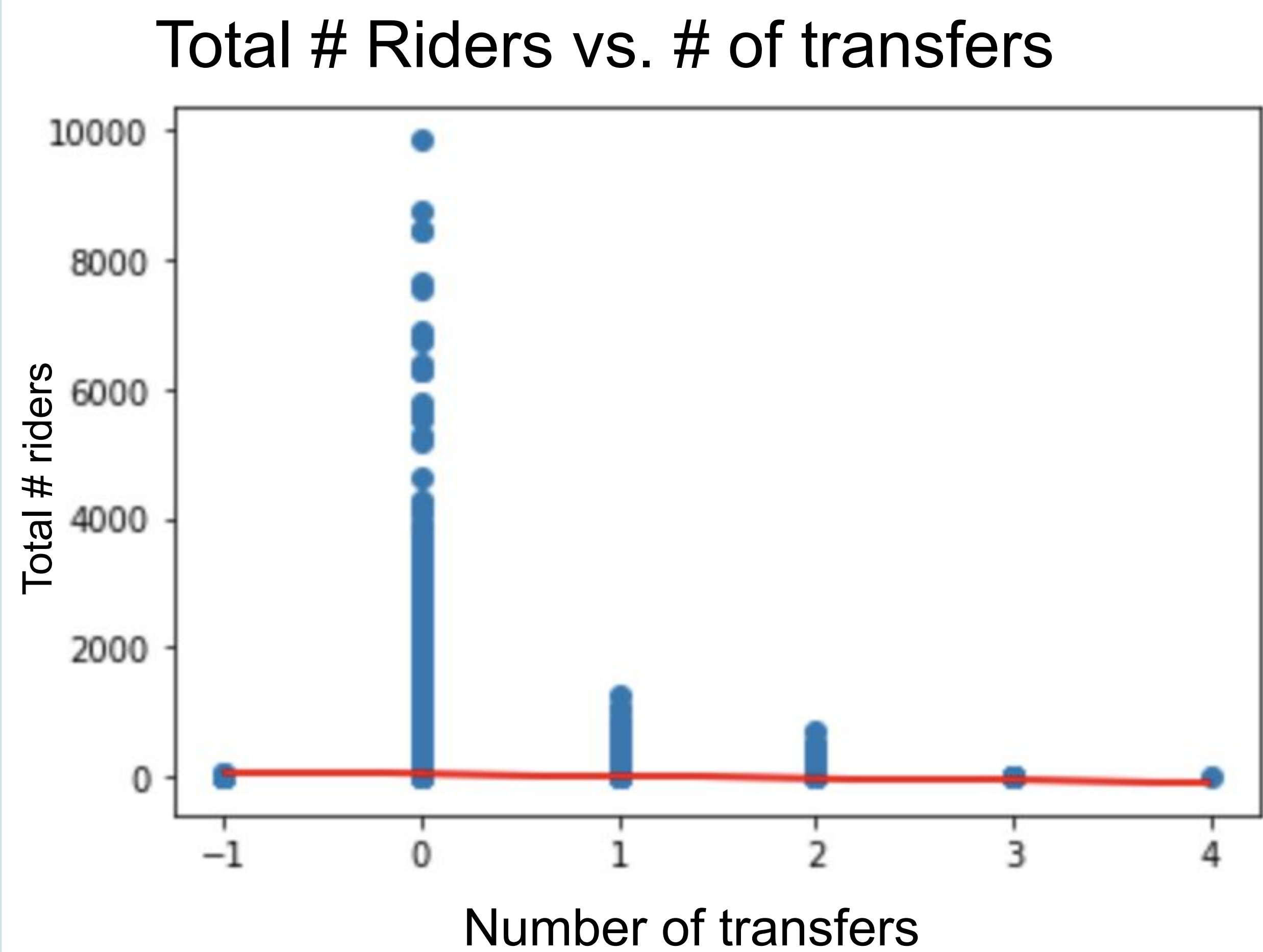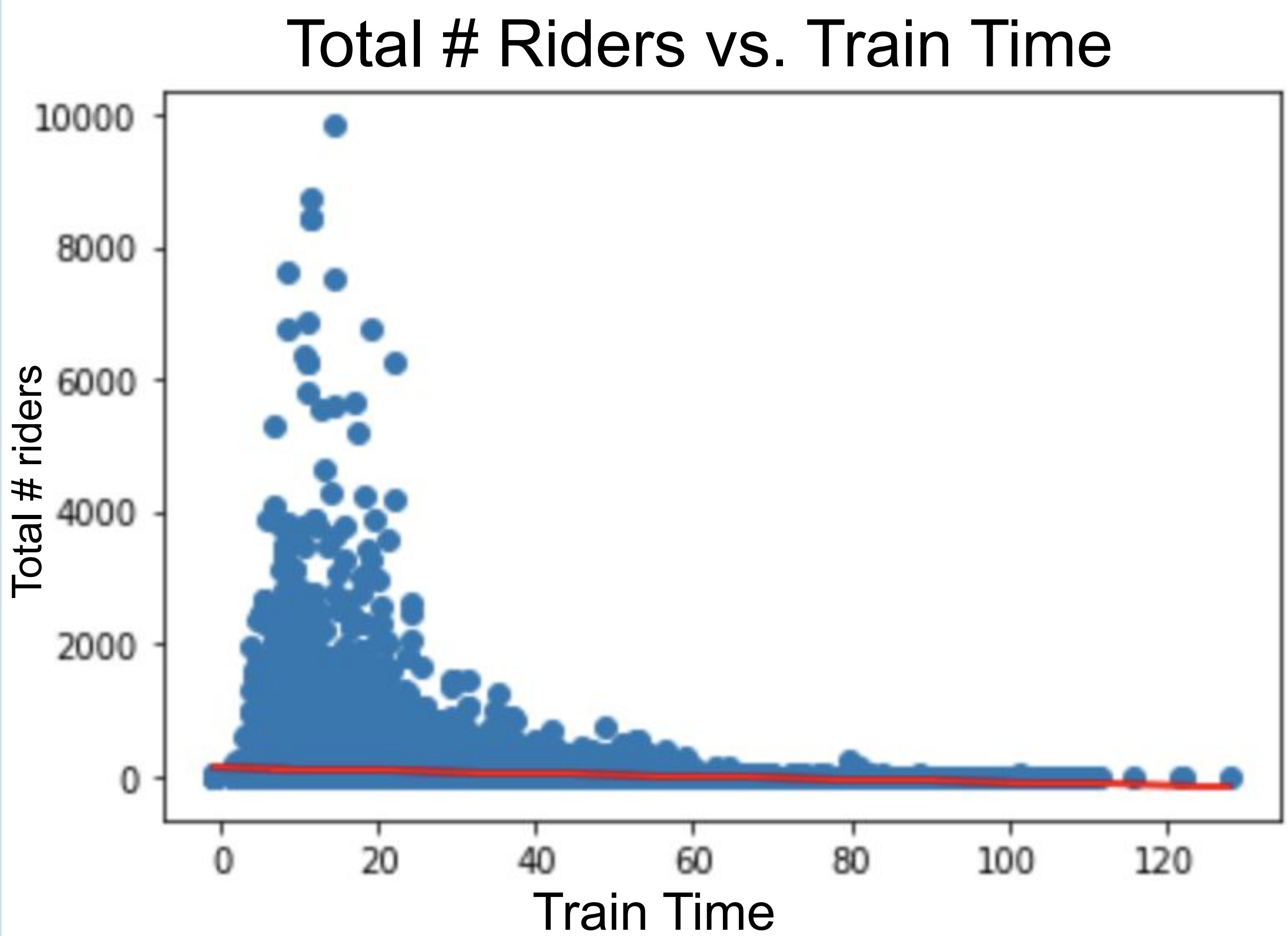- BlueBikes is a substitute in places where there are no train stations available

Datasets

- Number of trips ≅1,500,00
- Number of routes ≅ 54,000

Preliminary Graphs

Experimental Unit: *Rides(start, end) over 7 years*

Total # Riders vs. Train Time

Total # Riders vs. # of transfers

Baseline Regression

Response: # bike rides for a pair of stations

	coef	std err	t	P>|t|	[0.025	0.975]
biking distance	13.4781	2.999	4.495	0.000	7.601	19.356
biking time	-4.9243	0.514	-9.584	0.000	-5.931	-3.917
trainRoute?	106.1311	2.256	47.036	0.000	101.709	110.554

- Surprising:
  - more the distance, more rides
  - Inaccurate regression:
    - Variables are not independent

Complete Model

	coef	std err	t	P>|t|	[0.025	0.975]
biking distance	14.6166	2.993	4.883	0.000	8.750	20.484
biking time	-4.0833	0.518	-7.876	0.000	-5.099	-3.067
total train time	-0.5570	0.125	-4.466	0.000	-0.801	-0.313
in-train time	-0.9357	0.145	-6.435	0.000	-1.221	-0.651
train walk time	-0.9856	0.139	-7.093	0.000	-1.258	-0.713
train wait time	1.3643	0.338	4.032	0.000	0.701	2.028
number of transfers	-6.3509	2.634	-2.411	0.016	-11.514	-1.188
trainRoute?	136.2593	2.995	45.492	0.000	130.389	142.130

- Regression with train data as well to see impact of train factors