Table of Contents
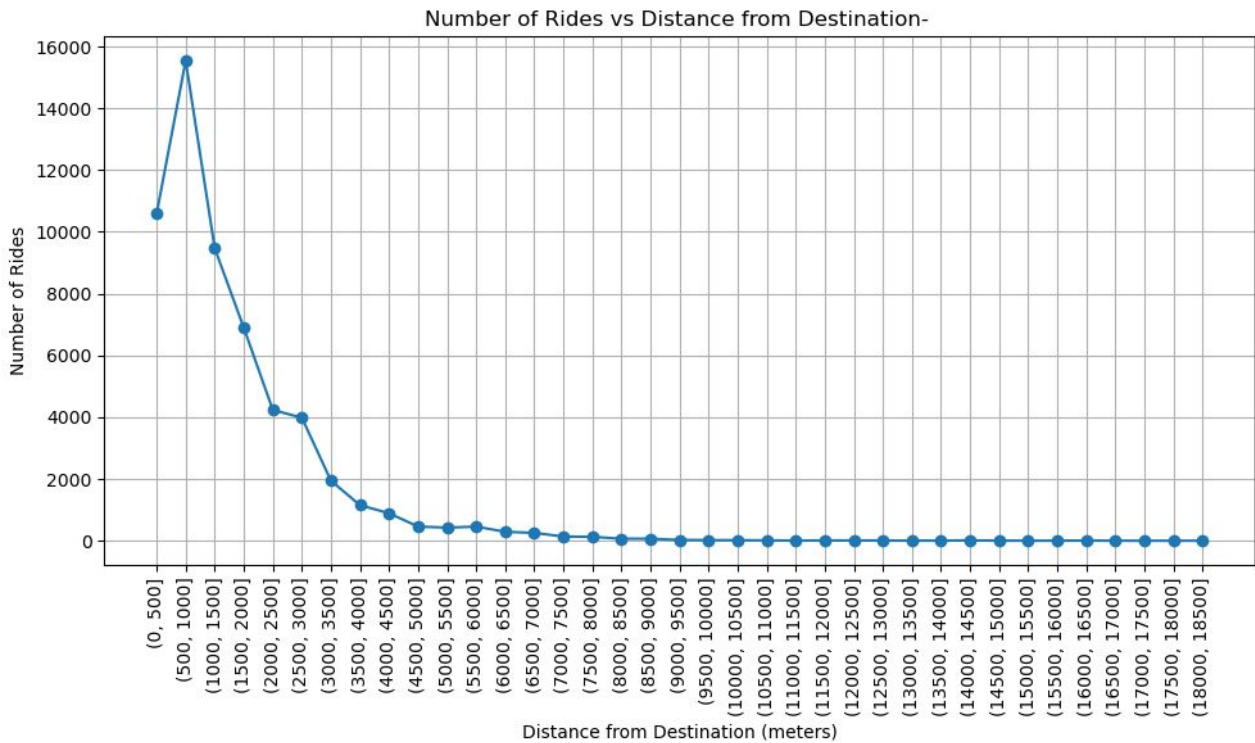
Raw Data, not normalized - Top 3 Locations
New York City, July 2023
Citibike Data

Link to raw distance data in csv format:
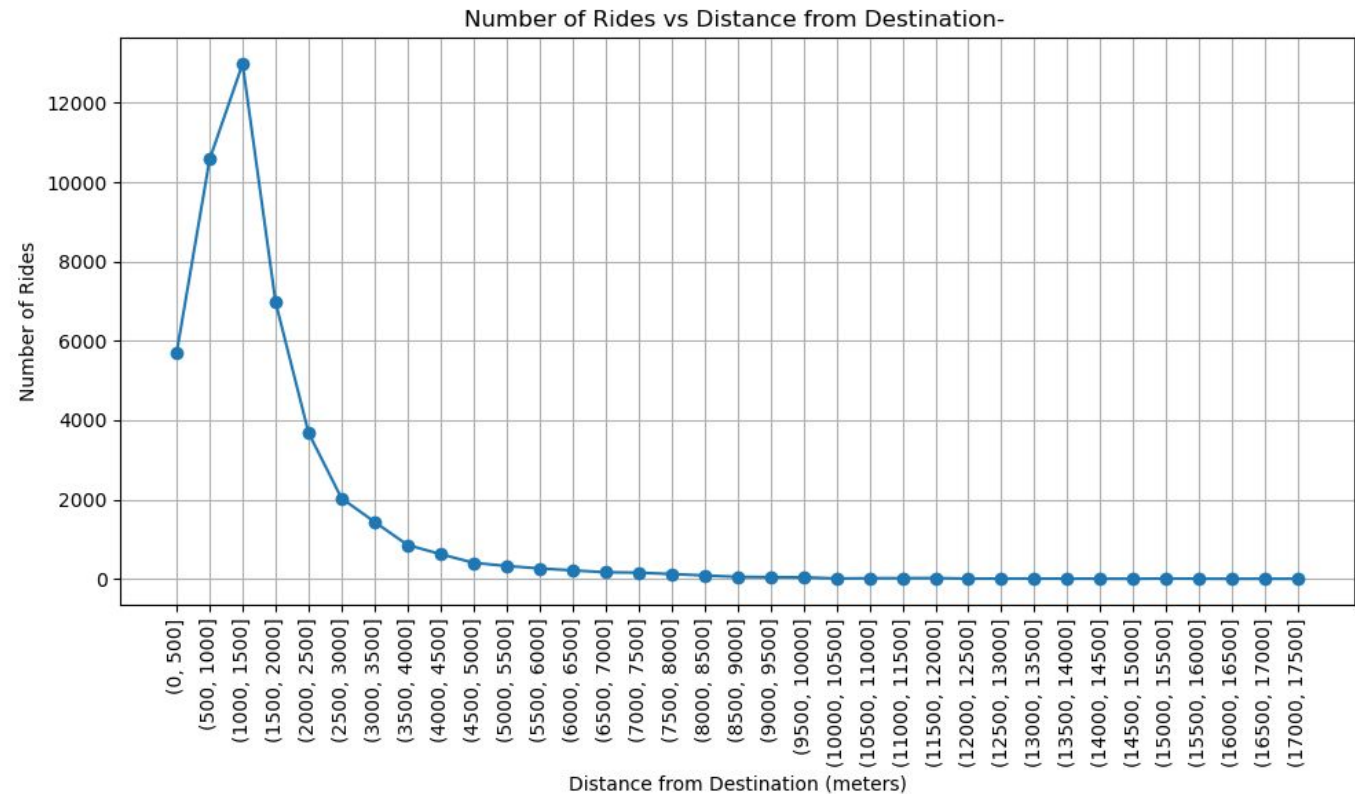https://docs.google.com/spreadsheets/d/1wxbbFtxz9qMDJ66SdOhYUoLAFZEqoFK0q2KX3efc6yA/edit?gid=0#gid=0

Location: The 500m square block centered at 40.72668135, -73.98491406 (near tompkins square park)

Number of Rides vs Distance from Destination-

distance_bin	num_rides
(0, 500]	10587
(500, 1000]	15544
(1000, 1500]	9468
(1500, 2000]	6897
(2000, 2500]	4234
(2500, 3000]	3982
(3000, 3500]	1943
(3500, 4000]	1152
(4000, 4500]	889
(4500, 5000]	459
(5000, 5500]	424
(5500, 6000]	458
(6000, 6500]	290
(6500, 7000]	254
(7000, 7500]	136
(7500, 8000]	125
(8000, 8500]	66
(8500, 9000]	65
(9000, 9500]	25
(9500, 10000]	20
(10000, 10500]	17

distance_bin	num_rides
(10500, 11000]	12
(11000, 11500]	5
(11500, 12000]	9
(12000, 12500]	9
(12500, 13000]	7
(13000, 13500]	3
(13500, 14000]	3
(14000, 14500]	12
(14500, 15000]	4
(15000, 15500]	0
(15500, 16000]	2
(16000, 16500]	5
(16500, 17000]	1
(17000, 17500]	0
(17500, 18000]	0
(18000, 18500]	0

Location: The 500m square block centered at 40.74015601, -73.99263760 (near madison square park)

Number of Rides vs Distance from Destination-

distance_bin	num_rides
(0, 500]	5700
(500, 1000]	10577
(1000, 1500]	12987
(1500, 2000]	6973
(2000, 2500]	3678
(2500, 3000]	2029
(3000, 3500]	1435
(3500, 4000]	852
(4000, 4500]	622
(4500, 5000]	404
(5000, 5500]	323
(5500, 6000]	262
(6000, 6500]	212
(6500, 7000]	166
(7000, 7500]	155
(7500, 8000]	120
(8000, 8500]	84
(8500, 9000]	49
(9000, 9500]	42
(9500, 10000]	38

distance_bin	num_rides
(10000, 10500]	8
(10500, 11000]	14
(11000, 11500]	16
(11500, 12000]	19
(12000, 12500]	4
(12500, 13000]	5
(13000, 13500]	6
(13500, 14000]	3
(14000, 14500]	3
(14500, 15000]	0
(15000, 15500]	7
(15500, 16000]	2
(16000, 16500]	0
(16500, 17000]	1
(17000, 17500]	1

Location: The 500m square block centered at 40.73566446, -73.99263760 (near union square)
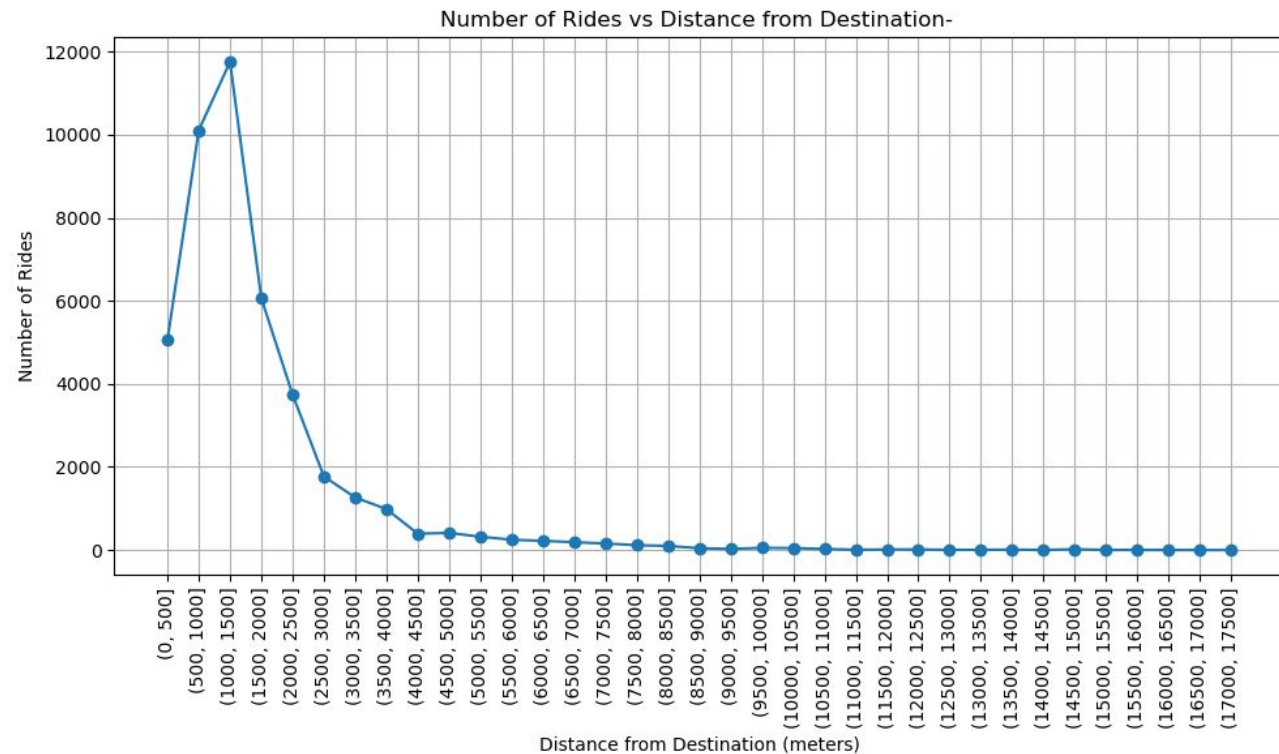
Number of Rides vs Distance from Destination-

distance_bin	num_rides
(0, 500]	5065
(500, 1000]	10107
(1000, 1500]	11756
(1500, 2000]	6063
(2000, 2500]	3742
(2500, 3000]	1772
(3000, 3500]	1265
(3500, 4000]	985
(4000, 4500]	394
(4500, 5000]	412
(5000, 5500]	321
(5500, 6000]	249
(6000, 6500]	220
(6500, 7000]	189
(7000, 7500]	156
(7500, 8000]	117
(8000, 8500]	98
(8500, 9000]	44
(9000, 9500]	28
(9500, 10000]	52

(10000, 10500]	47
(10500, 11000]	26
(11000, 11500]	7
(11500, 12000]	13
(12000, 12500]	14
(12500, 13000]	5
(13000, 13500]	5
(13500, 14000]	10
(14000, 14500]	3
(14500, 15000]	19
(15000, 15500]	3
(15500, 16000]	2
(16000, 16500]	1
(16500, 17000]	0
(17000, 17500]	0

Log-Log Scale, Normalized - Top 3 Locations

Normalizing function:
- Bucket with start, end (r_1, r_2), where start/end acts as radius
- 500 refers to 500 meters, the bucket size

$$\text{num\_rides} = \text{total\_rides} / (2\pi * ((r_2 / 500)^2 - (r_1 / 500)^2))$$

Log Scale:
- Y-axis: log(num_rides) if num_rides > 0, else 0 (the else condition causes wonky behavior at end of the graphs)
- X-axis: log(avg(interval)) -> for example, if interval is 500-1000, the axis point is log(750)

Top Visited Destination- Data points on next slide

Number of Rides vs Distance from Destination-
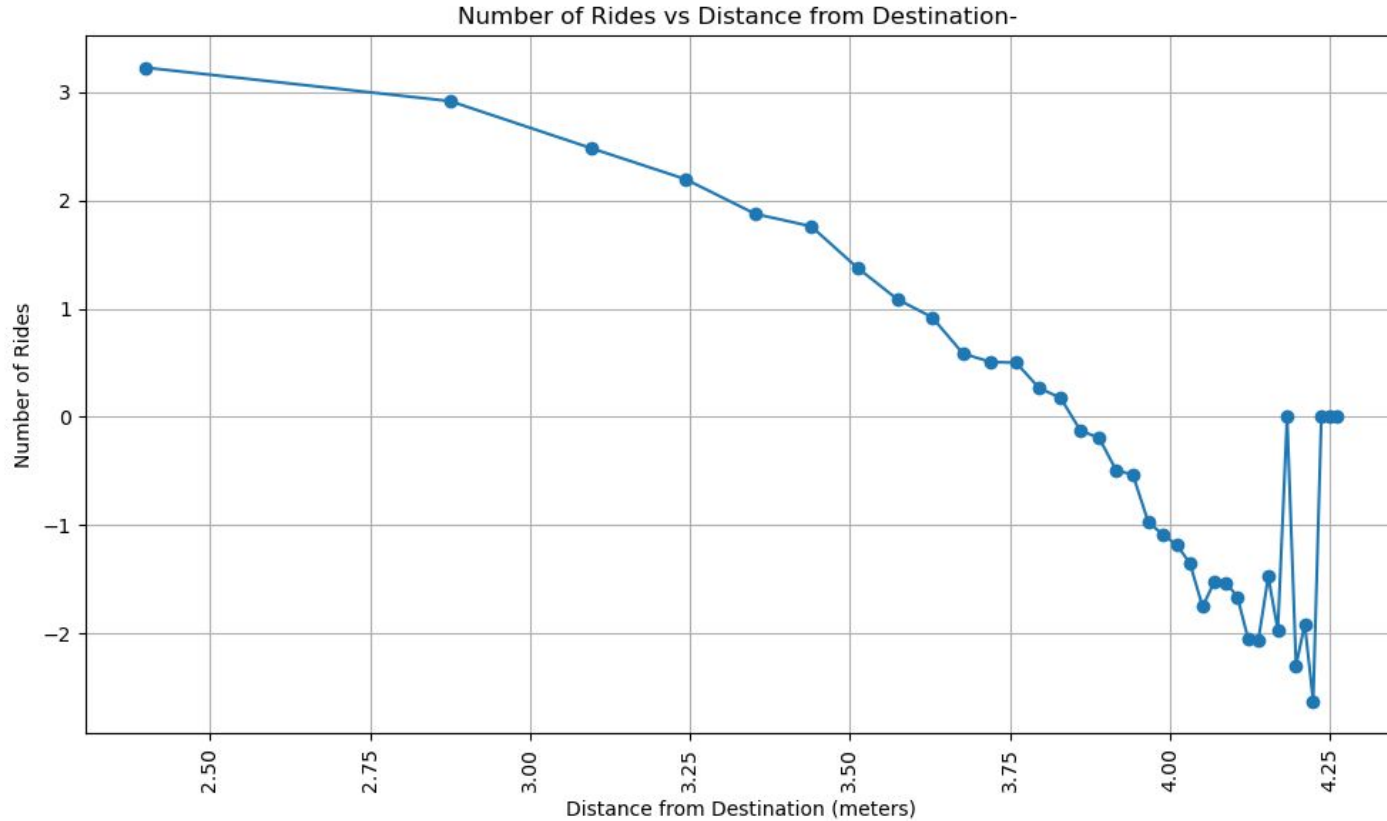
Raw distance data in csv

Bin Avg	log10(bin_avg)	log(num_rides)
250	2.39794000867204	3.2265930447215200
750	2.8750612633917	2.9162616645139500
1250	3.09691001300806	2.479108376562910
1750	3.24303804868629	2.1953823176165700
2250	3.35218251811136	1.8743284758859500
2750	3.43933269383026	1.7605287021750500
3250	3.51188336097887	1.3763495799348300
3750	3.57403126772772	1.087181351673400
4250	3.62838893005031	0.9202729712338250
4750	3.67669360962487	0.5848792162263170
5250	3.72015930340596	0.5069666935006980
5750	3.75966784468963	0.5009577736281610
6250	3.79588001734408	0.2662781208688030
6750	3.82930377283102	0.17529008410283600
7250	3.86033800657099	-0.12703895788685400
7750	3.88930170250631	-0.19263154918433100
8250	3.91645394854993	-0.49714987269413400
8750	3.94200805302231	-0.529334556065535
9250	3.96614173273903	-0.9684415837530720
9750	3.98900461569854	-1.088214479720630
10250	4.01072386539177	-1.1805148036995800
10750	4.03140846425162	-1.3524670778900800
11250	4.05115252244738	-1.75242237779744
11750	4.07003786660776	-1.5160352168545100
12250	4.08813608870055	-1.5341334389473000
12750	4.10551018476997	-1.6606520044417900
13250	4.12221587827283	-2.0453344832392400
13750	4.13830269816628	-2.0614213031327000
14250	4.15381486434453	-1.4748734779829800
14750	4.16879202031418	-1.9669718886723000
15250	4.1832698436828	0.0
15750	4.19728055812562	-2.2964904221477200
16250	4.21085336531489	-1.9121232206649500
16750	4.22401481137286	-2.6242546710589400
17250	4.23678909940929	0.0
17750	4.24919835739111	0.0
18250	4.26126286879249	0.0

# Second Top Visited Destination- Data points on next slide

Number of Rides vs Distance from Destination-
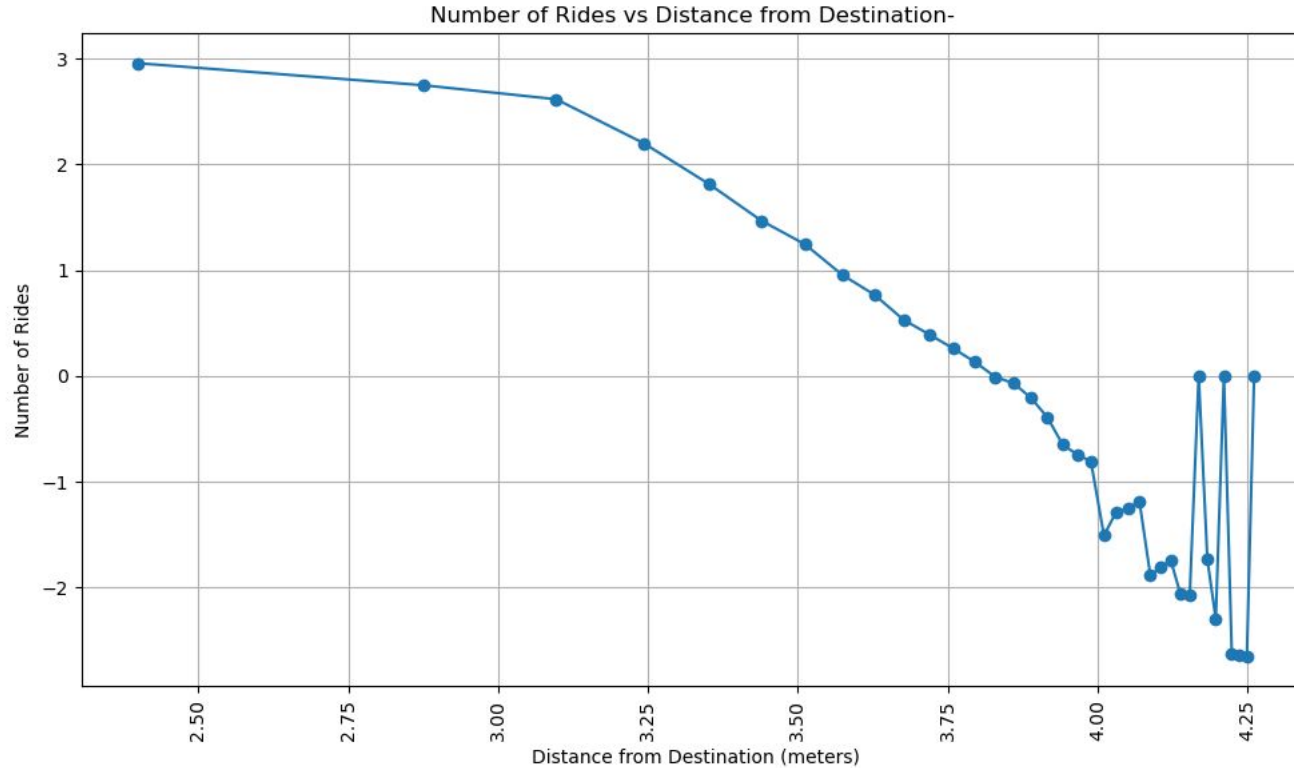
Raw distance data in csv

| Bin Avg	log10(bin_avg)	num_rides
250	2.39794000867204	2.9576949873143800
750	2.8750612633917	2.7490613812755000
1250	3.09691001300806	2.616358967838690
1750	3.24303804868629	2.2001417568325500
2250	3.35218251811136	1.8131893471046200
2750	3.43933269383026	1.4677094935170100
3250	3.51188336097887	1.2447286804050600
3750	3.57403126772772	0.9561684673529040
4250	3.62838893005031	0.7651615949544300
4750	3.67669360962487	0.529447895799661
5250	3.72015930340596	0.3888033592390690
5750	3.75966784468963	0.2583935869440380
6250	3.79588001734408	0.13021598389859900
6750	3.82930377283102	-0.009435544477047220
7250	3.86033800657099	-0.07024616808677960
7750	3.88930170250631	-0.21036031614476300
8250	3.91645394854993	-0.3924145221741210
8750	3.94200805302231	-0.652051832679877
9250	3.96614173273903	-0.7431323020272100
9750	3.98900461569854	-0.809460878767804
10250	4.01072386539177	-1.5078737380859100
10750	4.03140846425162	-1.2855202882594600
11250	4.05115252244738	-1.2472723994775300
11750	4.07003786660776	-1.1915241253410000
12250	4.08813608870055	-1.8863159570586700
12750	4.10551018476997	-1.8067800401200300
13250	4.12221587827283	-1.7443044875752600
13750	4.13830269816628	-2.0614213031327000
14250	4.15381486434453	-2.076933469310940
14750	4.16879202031418	0.0
15250	4.1832698436828	-1.7384116633546300
15750	4.19728055812562	-2.2964904221477200
16250	4.21085336531489	0.0
16750	4.22401481137286	-2.6242546710589400
17250	4.23678909940929	-2.63702895909537
17750	4.24919835739111	-2.6494382170771900
18250	4.26126286879249	0.0

Third Top Visited Destination- Data points on next slide

Number of Rides vs Distance from Destination-
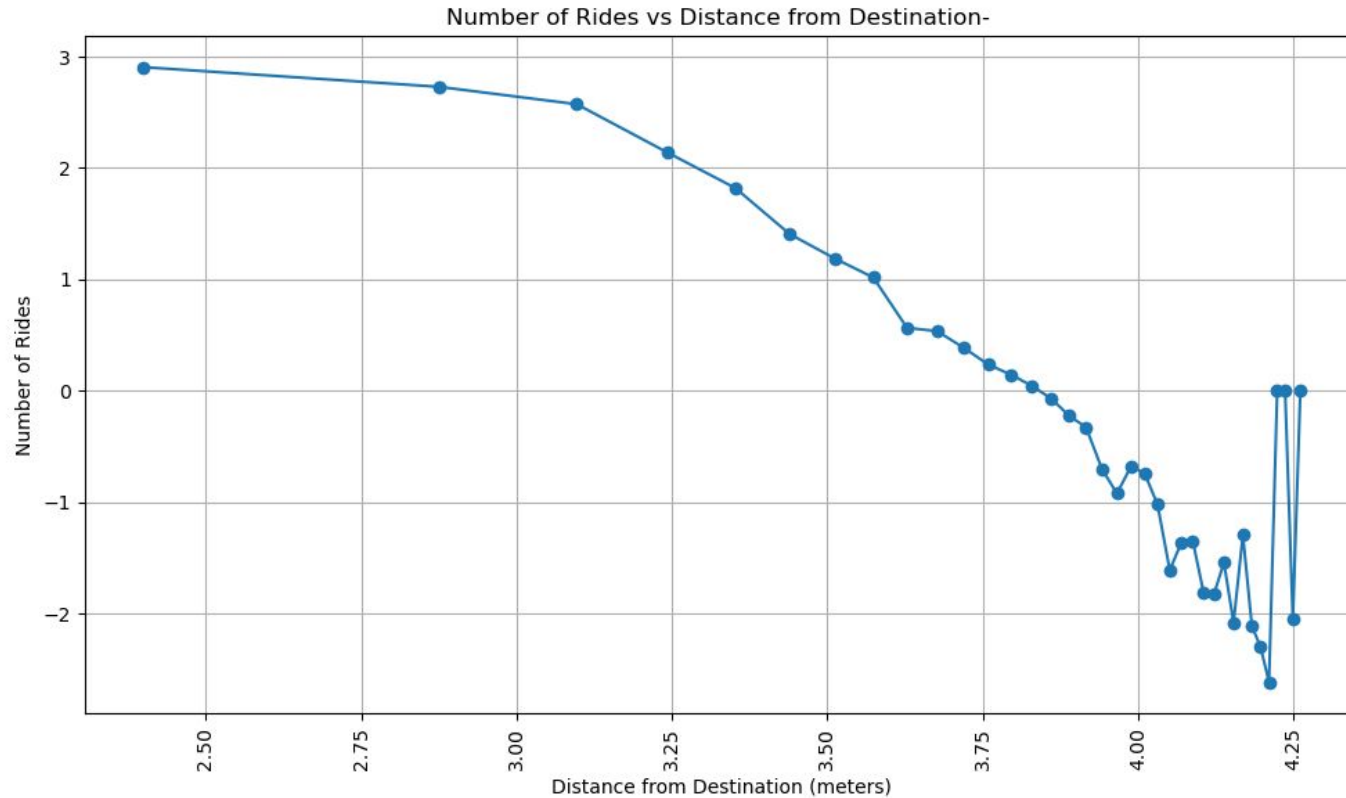
Raw distance data in csv

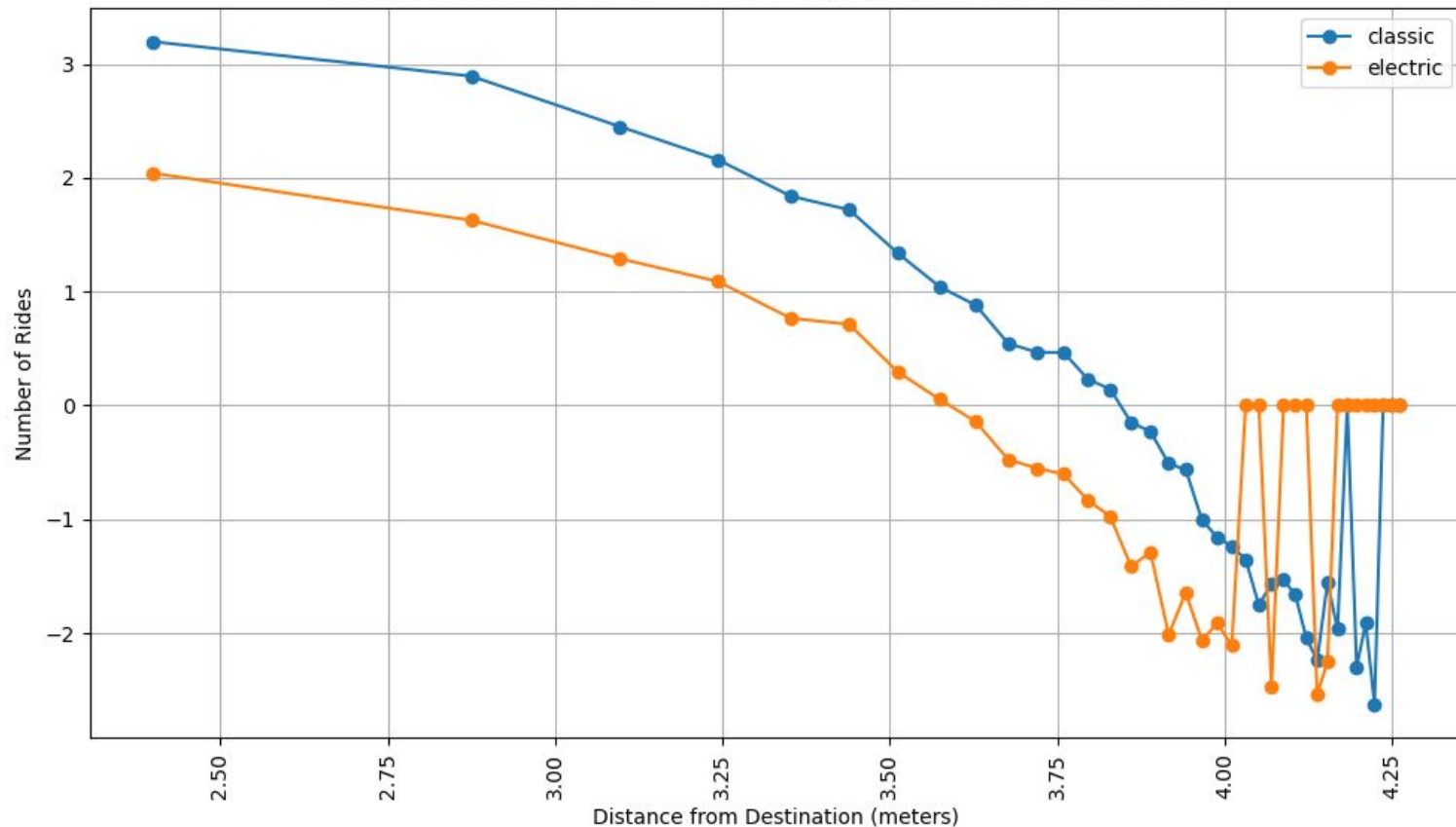| Bin Avg	log10(bin_avg)	num_rides
250	2.39794000867204	2.906399581338180
750	2.8750612633917	2.729321142623010
1250	3.09691001300806	2.5731097047064400
1750	3.24303804868629	2.1394096598625900
2250	3.35218251811136	1.8206814053665500
2750	3.43933269383026	1.408891164034690
3250	3.51188336097887	1.1899673048468800
3750	3.57403126772772	1.0191651030838200
4250	3.62838893005031	0.5668674320891850
4750	3.67669360962487	0.5379637467221910
5250	3.72015930340596	0.38610586931283800
5750	3.75966784468963	0.23629164272002800
6250	3.79588001734408	0.14630280379205400
6750	3.82930377283102	0.046918171656141800
7250	3.86033800657099	-0.06745326790260950
7750	3.88930170250631	-0.22135570044622600
8250	3.91645394854993	-0.32546773254350800
8750	3.94200805302231	-0.6987952362222030
9250	3.96614173273903	-0.9192235610828910
9750	3.98900461569854	-0.673241131749815
10250	4.01072386539177	-0.738865867142133
10750	4.03140846425162	-1.0166749759668800
11250	4.05115252244738	-1.606294342119200
11750	4.07003786660776	-1.3563343739870000
12250	4.08813608870055	-1.3422479127083900
12750	4.10551018476997	-1.8067800401200300
13250	4.12221587827283	-1.8234857336228900
13750	4.13830269816628	-1.5385425578523600
14250	4.15381486434453	-2.076933469310940
14750	4.16879202031418	-1.2902782790474300
15250	4.1832698436828	-2.1063884486492200
15750	4.19728055812562	-2.2964904221477200
16250	4.21085336531489	-2.6110932250009700
16750	4.22401481137286	0.0
17250	4.23678909940929	0.0
17750	4.24919835739111	-2.047378225749230
18250	4.26126286879249	0.0

Of the top 30 destinations, below is the distribution of the bucket where bike ridership peaked. Ex: 7 locations saw the most amount of bike riders come from origins between 0-100m away
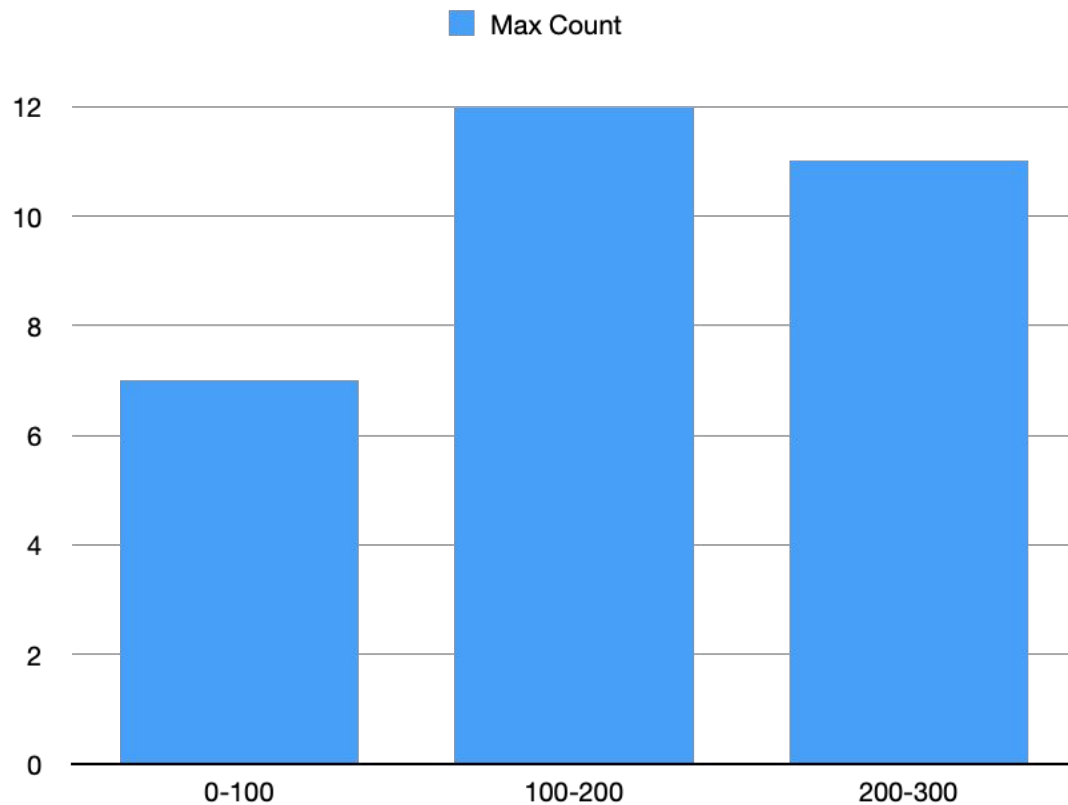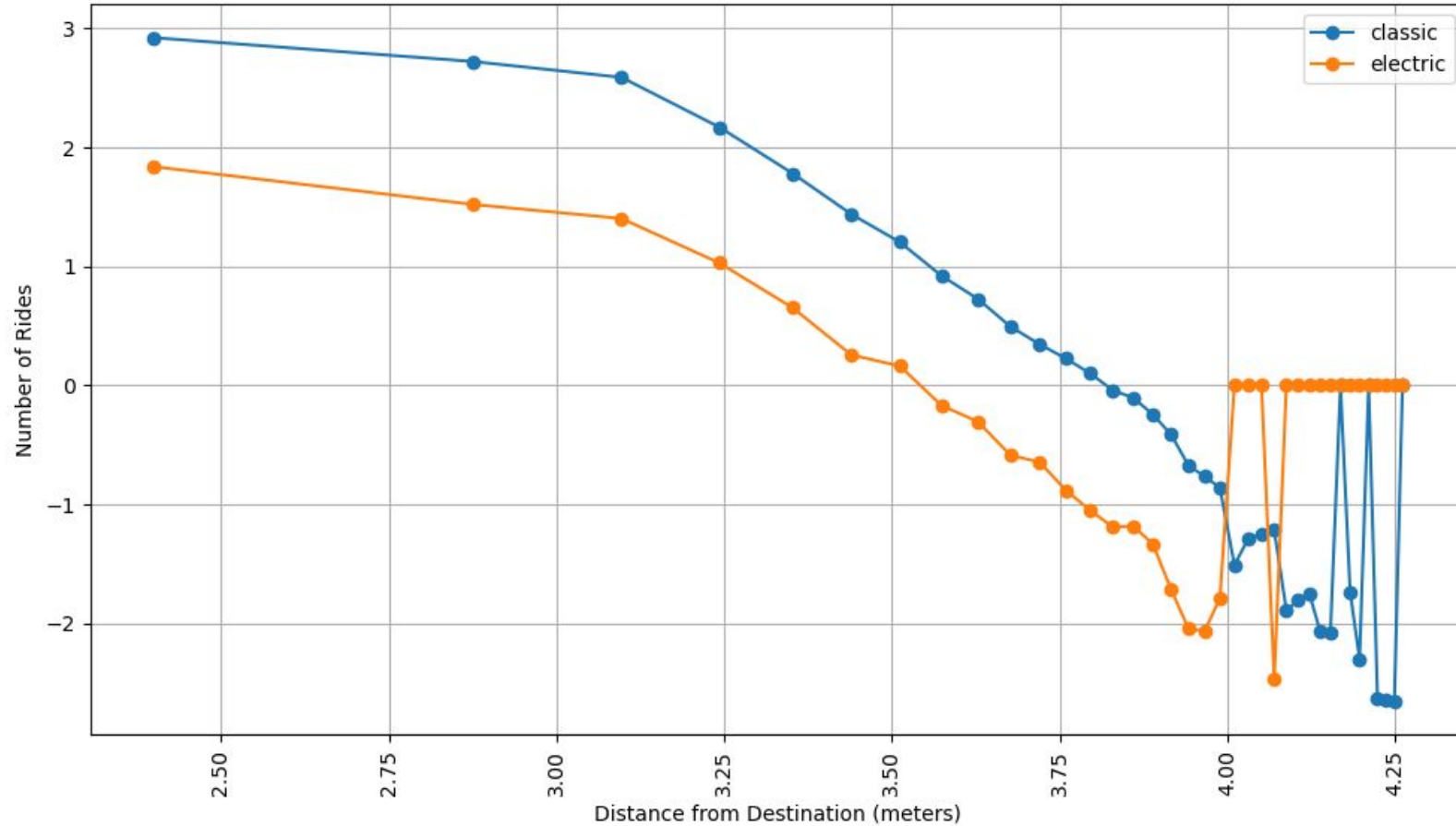
Classic vs Electric Bikes

Classic vs Electric Bike: Number of Rides vs Distance from Destination-

Bucket data: https://docs.google.com/spreadsheets/d/1wxbbFtxz9qMDJ66SdOhYUoLAFZEqoFK0q2KX3efc6yA/edit?gid=368682886#gid=368682886
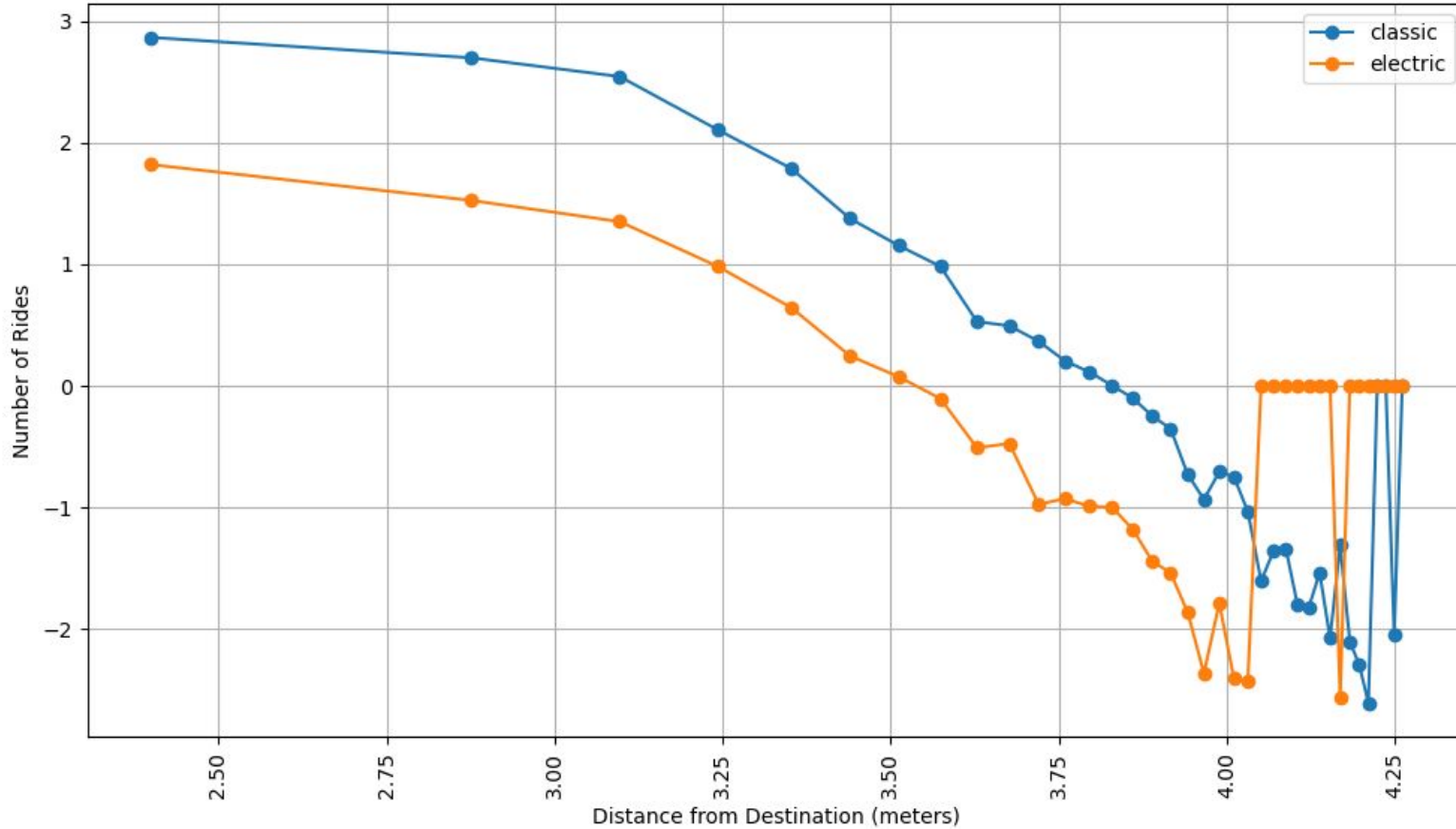Number of classic bike rides: **53,206**
Number of electric bike rides: **3,863**

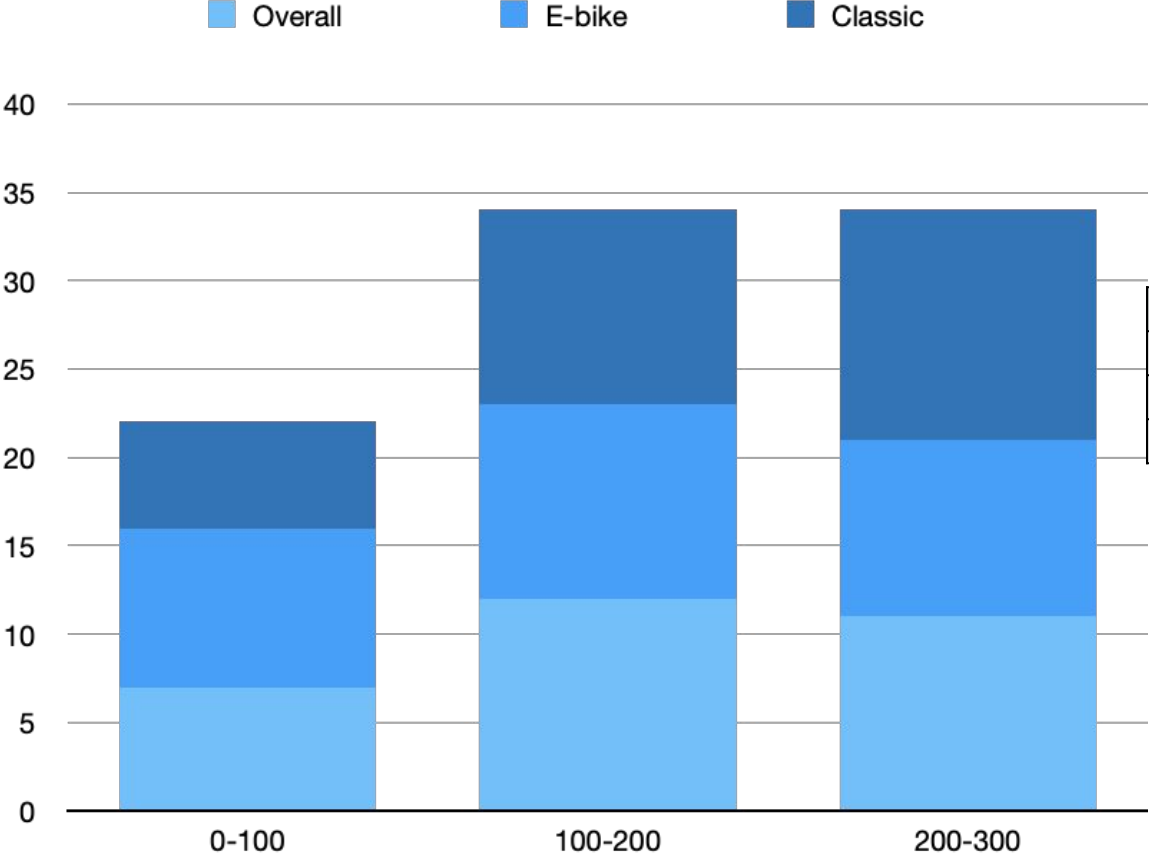Classic vs Electric Bike: Number of Rides vs Distance from Destination-

Number of classic: **43, 656**
Number of e-bike: **3,078**

Classic vs Electric Bike: Number of Rides vs Distance from Destination-

Number of classic: **40,235**
Number of e-bike: **2,894**

Of the top 30 destinations, below is the distribution of the bucket where bike ridership peaked for classic vs electric bikes. Ex: 7 locations saw the most amount of bike riders come from origins between 0-100m away
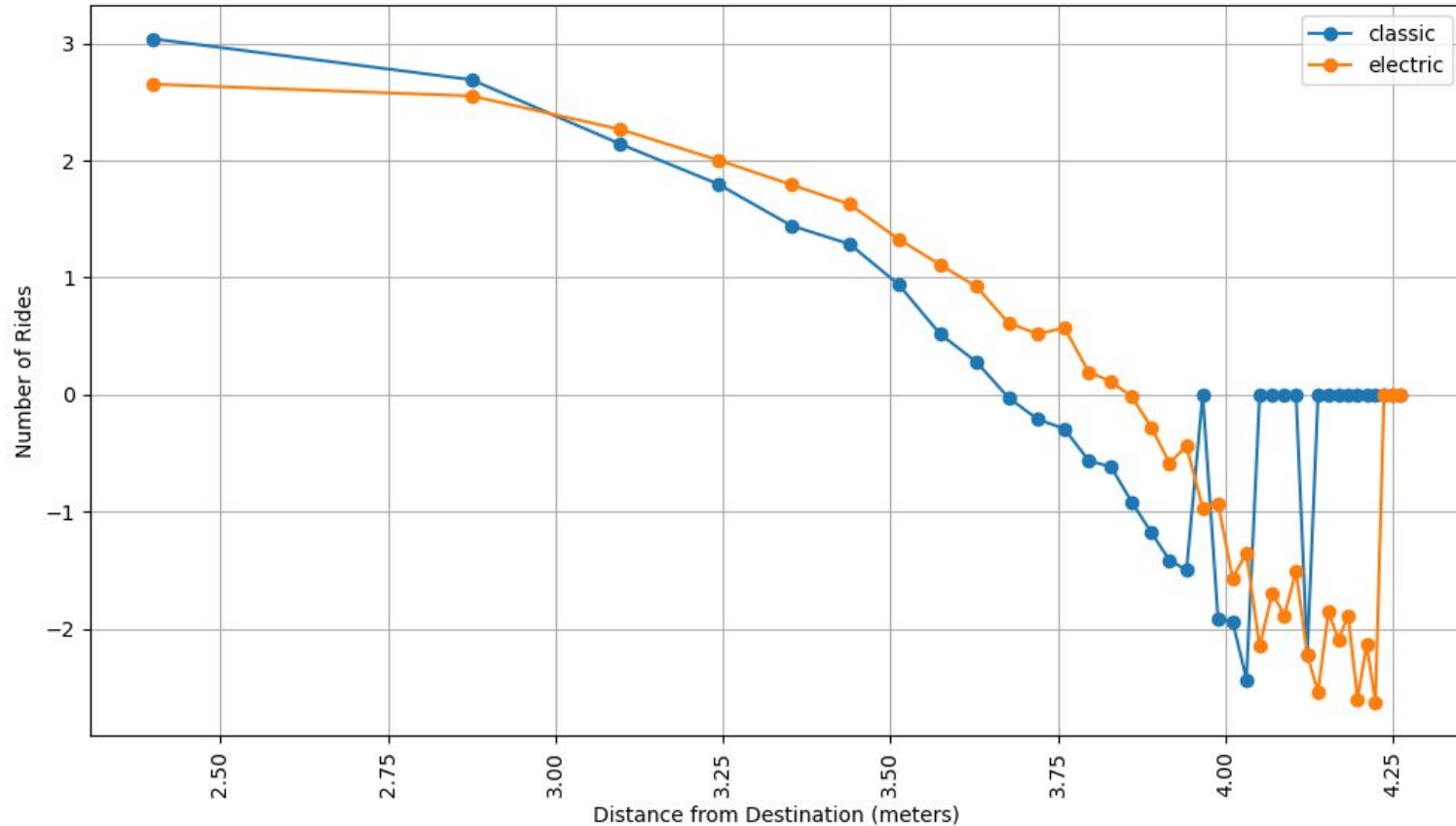

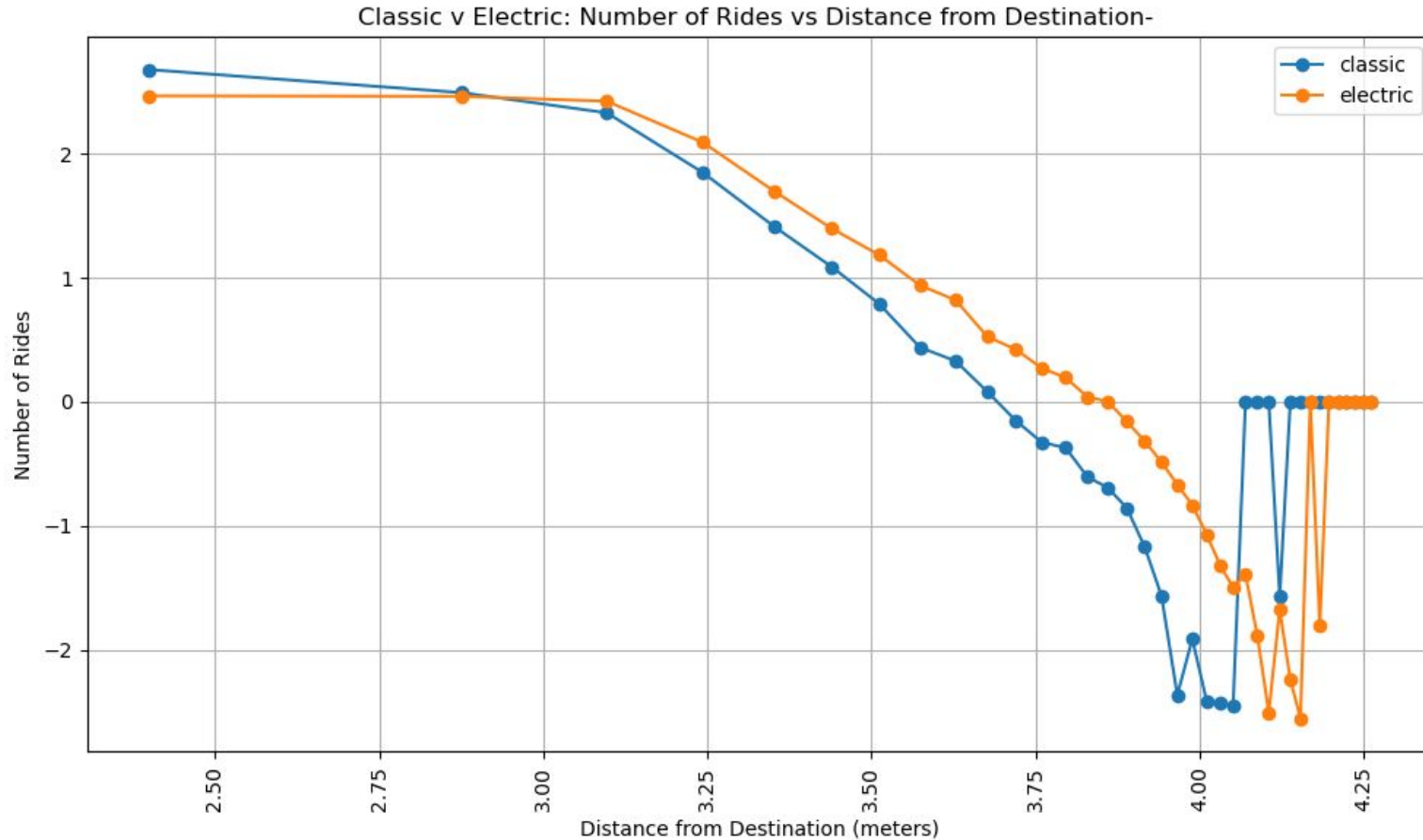| Meters	Overall	E-bike	Classic
0-100	7	9	6
100-200	12	11	11
200-300	11	10	13

May 2024 Data

Top 1 Visited Location (near tompkins square park)

Classic v Electric: Number of Rides vs Distance from Destination-
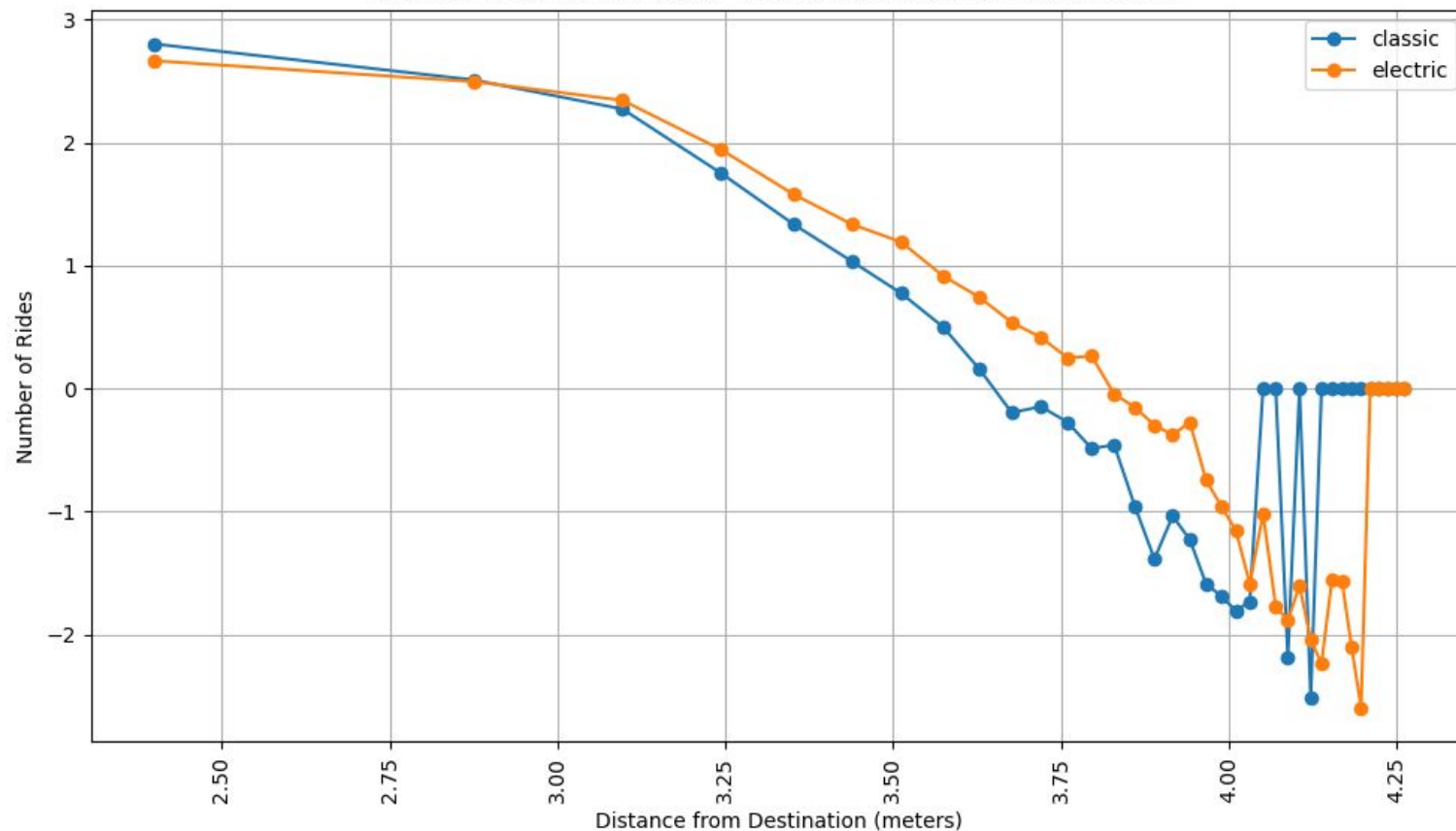
Number of classic: **27,709**
Number of e-bike: **32,438**

Top 2 Visited Location (near Madison square park)

Classic v Electric: Number of Rides vs Distance from Destination-

Number of classic: **22,566**
Number of e-bike: **30,596**

Top 3 Visited Location (near Union Square)

Classic v Electric: Number of Rides vs Distance from Destination-

Number of classic: **21,851**
Number of e-bike: **27,985**