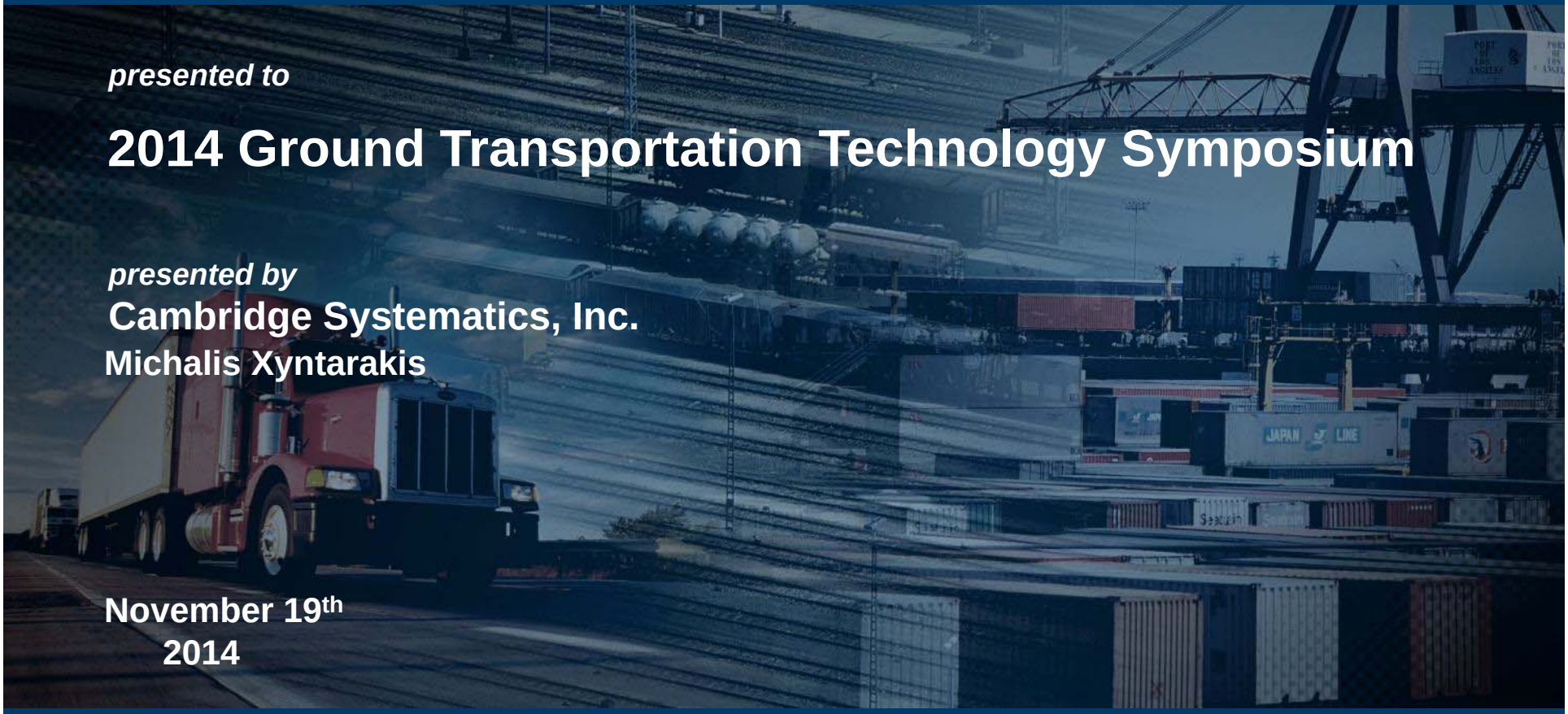
Analyzing and Visualizing Mobility using Observed and Simulated Trajectories



presented to

2014 Ground Transportation Technology Symposium

presented by

Cambridge Systematics, Inc.
Michalis Xyntarakis

November 19th 2014

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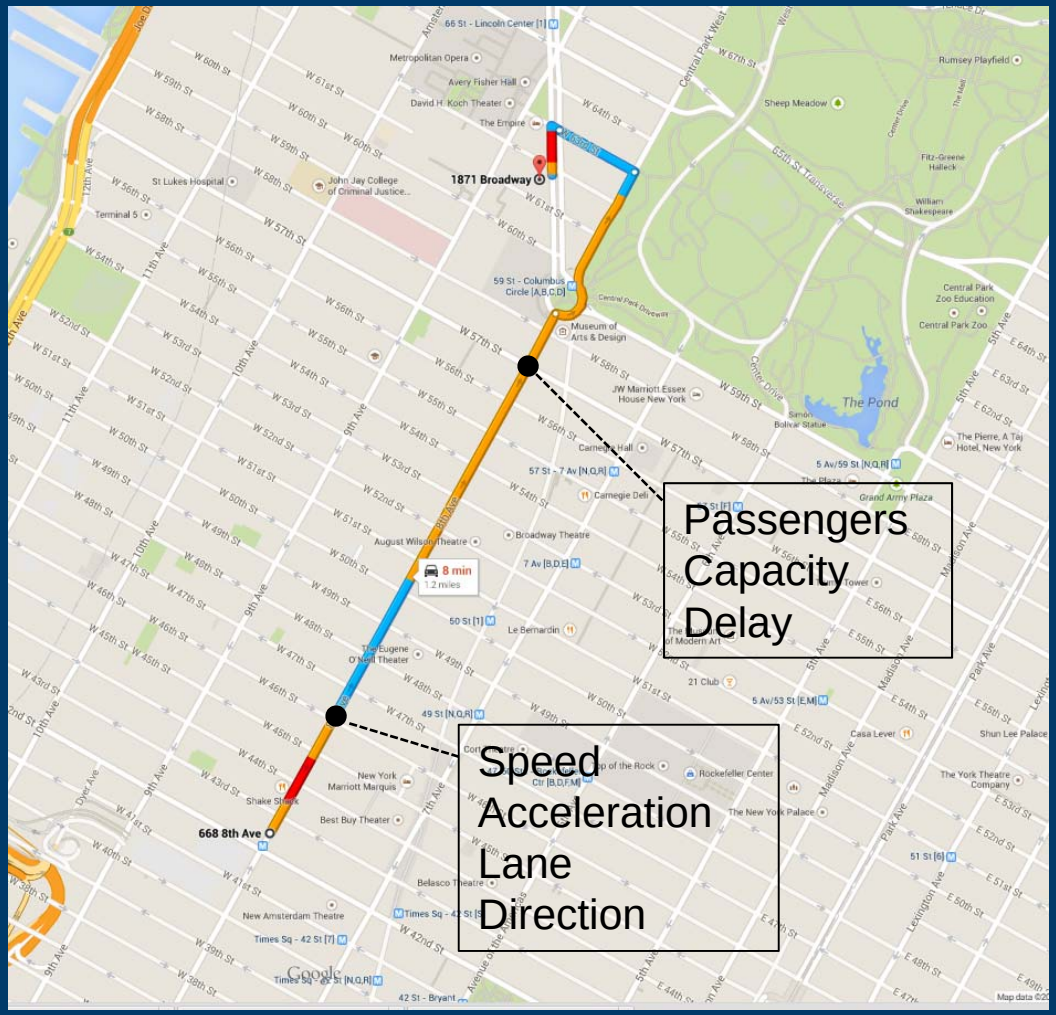
What is a Trajectory?



Trajectory=the path of a moving object over time

Or: X,Y,T,…records

Interested in events along movement path

Overall, mobility data are the fastest growing type of data

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Vehicle Trajectories in the NGSIM Data

- Cars are videotaped from a camera mounted on top of a building
- Video detection algorithms are used to extract a vehicle trajectory for each vehicle
- Vehicle positions are determined every 0.1 seconds
- Distances to all other vehicles, speed, acceleration are calculated

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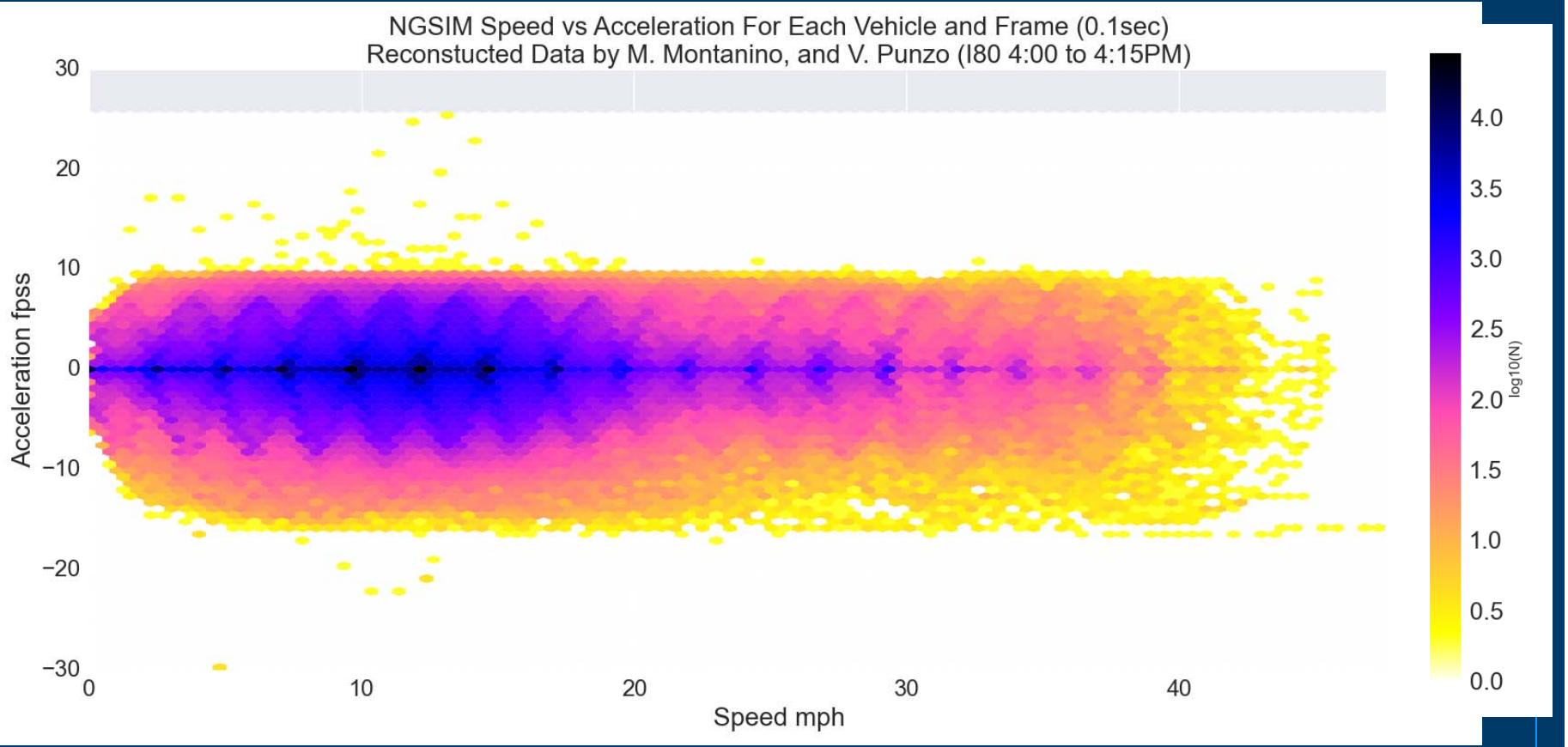
Vehicle Speed Vs Acceleration



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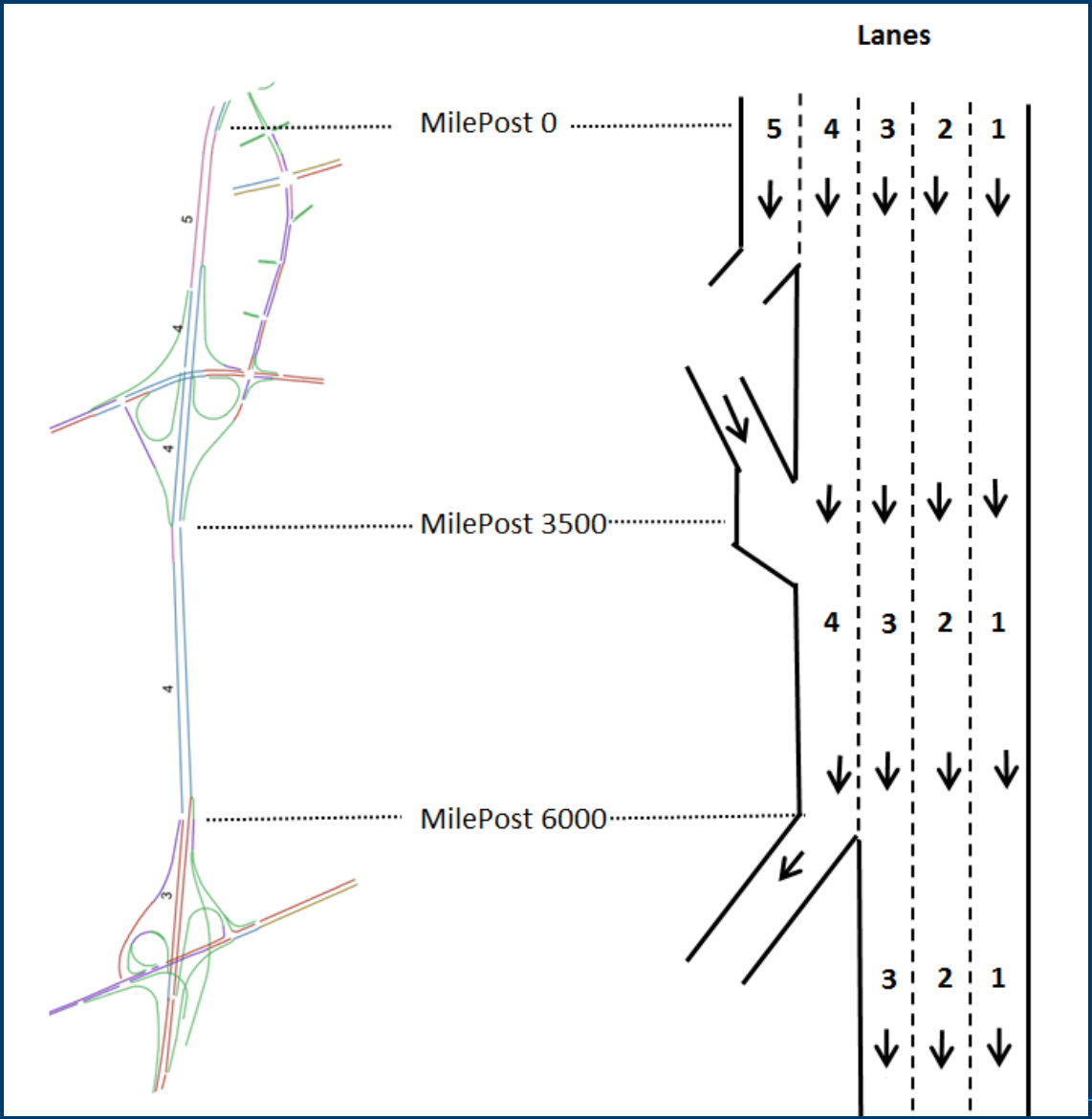
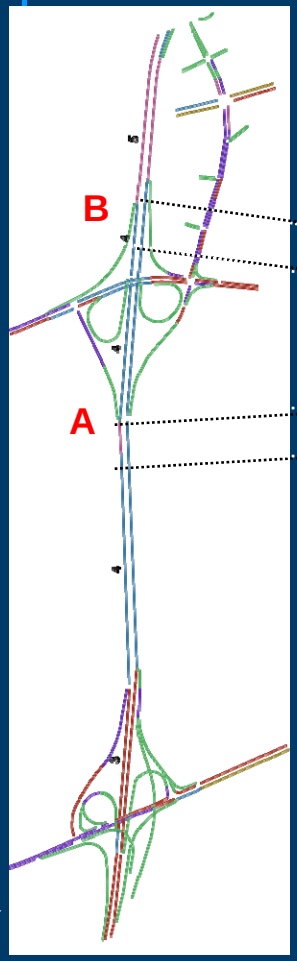
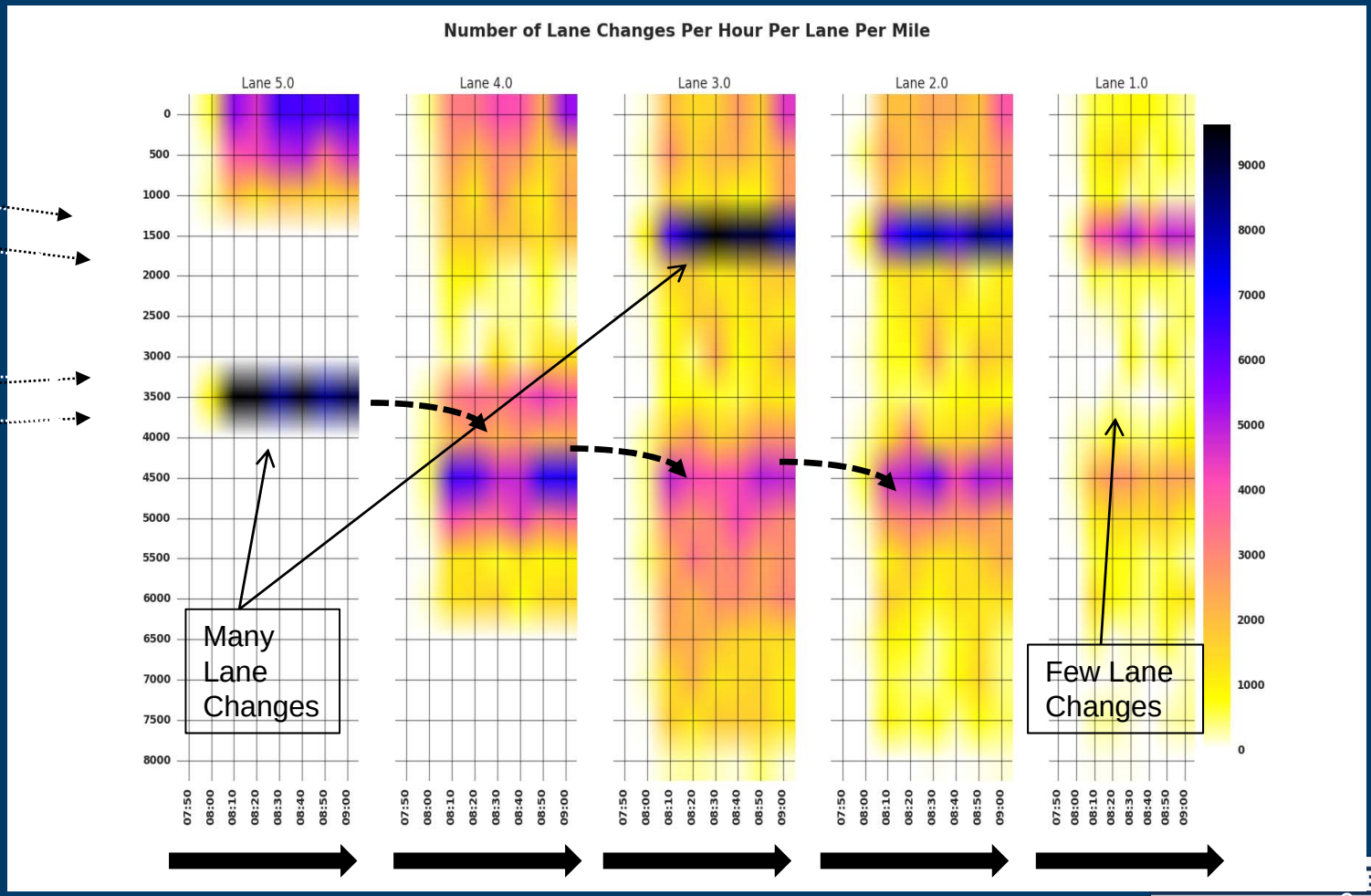
Freeway Corridor Geometry



Number of Lane Changes Per Hour/Lane/Mile (Simulation)





A = 300 ft on ramp

B = 300 ft 4 feet freeway segment immediately downstream a lane drop

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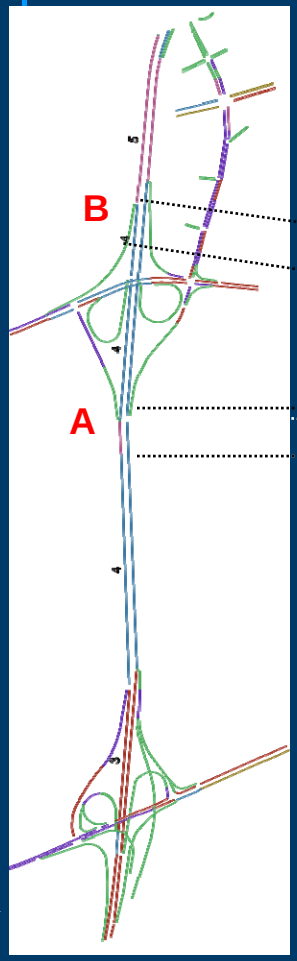
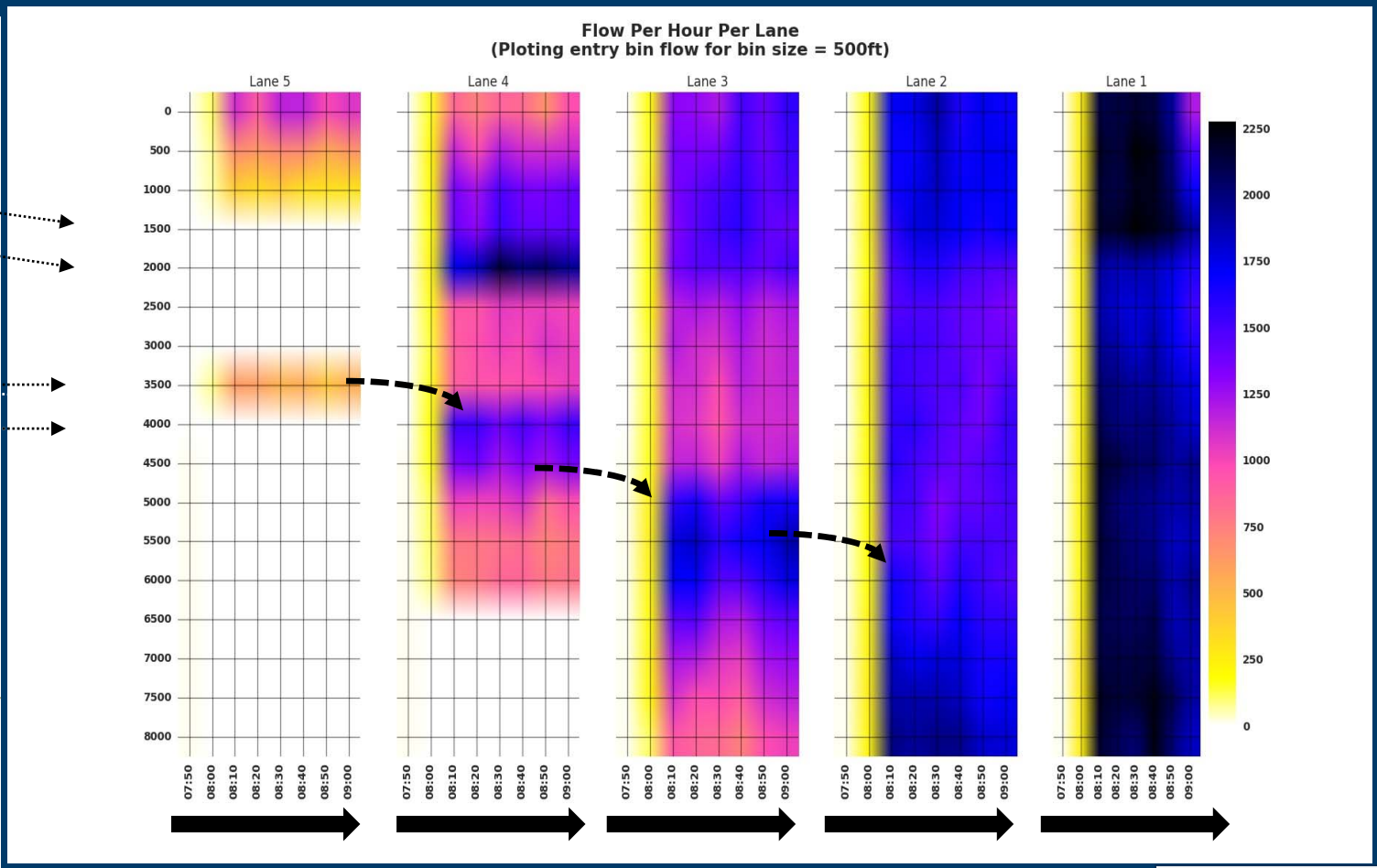
Flow Per Hour Per Lane (Simulation)

Low Flow

High Flow





A = 300 ft on ramp

B = 300 ft 4 feet freeway segment immediately downstream a lane drop

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Bus or Subway Trajectories

Weekday Service

3 Southbound

From Harlem-148 St, 7 Av, Manhattan, to New L

Harlem 148 St	135 St	96 St	Times Sq 42 St	14 St	Chambers St
12:03	12:07	12:15	12:25	—	—
12:23	12:27	12:35	12:45	—	—
12:43	12:47	12:55	1:05	—	—
1:03	1:07	1:15	1:25	—	—
1:23	1:27	1:35	1:45	—	—
1:43	1:47	1:55	2:05	—	—
2:03	2:07	2:15	2:25	—	—
2:23	2:27	2:35	2:45	—	—
2:43	2:47	2:55	3:05	—	—
3:03	3:07	3:15	3:25	—	—
3:23	3:27	3:35	3:45	—	—
3:43	3:47	3:55	4:05	—	—
4:03	4:07	4:15	4:25	—	—
4:23	4:27	4:35	4:45	—	—
4:43	4:47	4:55	5:05	—	—
5:03	5:07	5:15	5:21	5:25	5:29
5:14	5:17	5:25	5:32	—	—
5:18	5:22	5:30	5:36	5:40	5:44
5:32	5:36	5:44	5:50	5:54	5:58
5:36	5:40	5:48	5:54	—	—
5:48	5:52	6:00	6:06	6:10	6:14
5:59	6:03	6:11	6:17	6:21	6:25
6:10	6:14	6:23	6:30	6:33	6:38
6:22	6:25	6:33	6:40	6:43	6:48
6:29	6:33	6:41	6:48	6:51	6:56
6:40	6:44	6:52	6:59	7:02	7:07
6:48	6:51	7:00	7:07	7:10	7:15
6:54	6:58	7:07	7:14	7:18	7:22
6:58	7:02	7:13	7:20	7:24	7:28
7:10	7:13	7:22	7:29	7:33	7:37
7:16	7:19	7:28	7:35	7:39	7:43
7:23	7:26	7:35	7:42	7:46	7:51
7:30	7:34	7:42	7:49	7:53	7:58
7:37	7:40	7:51	7:58	8:02	8:07
7:44	7:47	7:56	8:04	8:08	8:13
7:50	7:53	8:03	8:10	8:14	8:19
—	7:58	8:08	8:15	8:19	8:24
7:58	8:04	8:14	8:22	8:26	8:31
8:04	8:08	8:19	8:27	8:31	8:36

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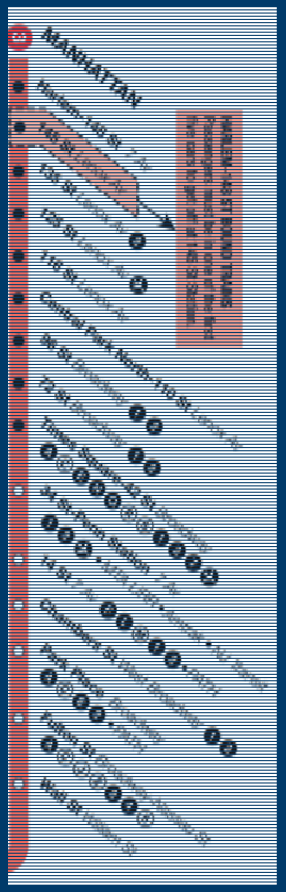

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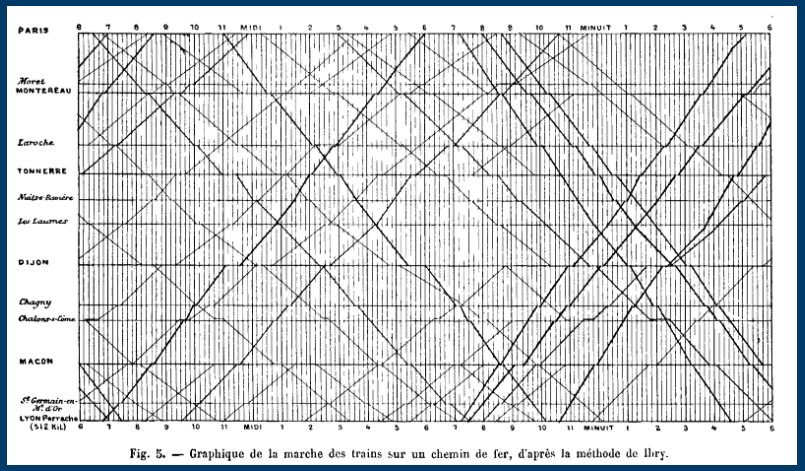

Fig. 5. — Graphique de la marche des trains sur un chemin de fer, d'après la méthode de Ibry.

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Online Demo of Web Graphics

http://swdev14.camsys.com/sharktank/delayVisualization/map3.html

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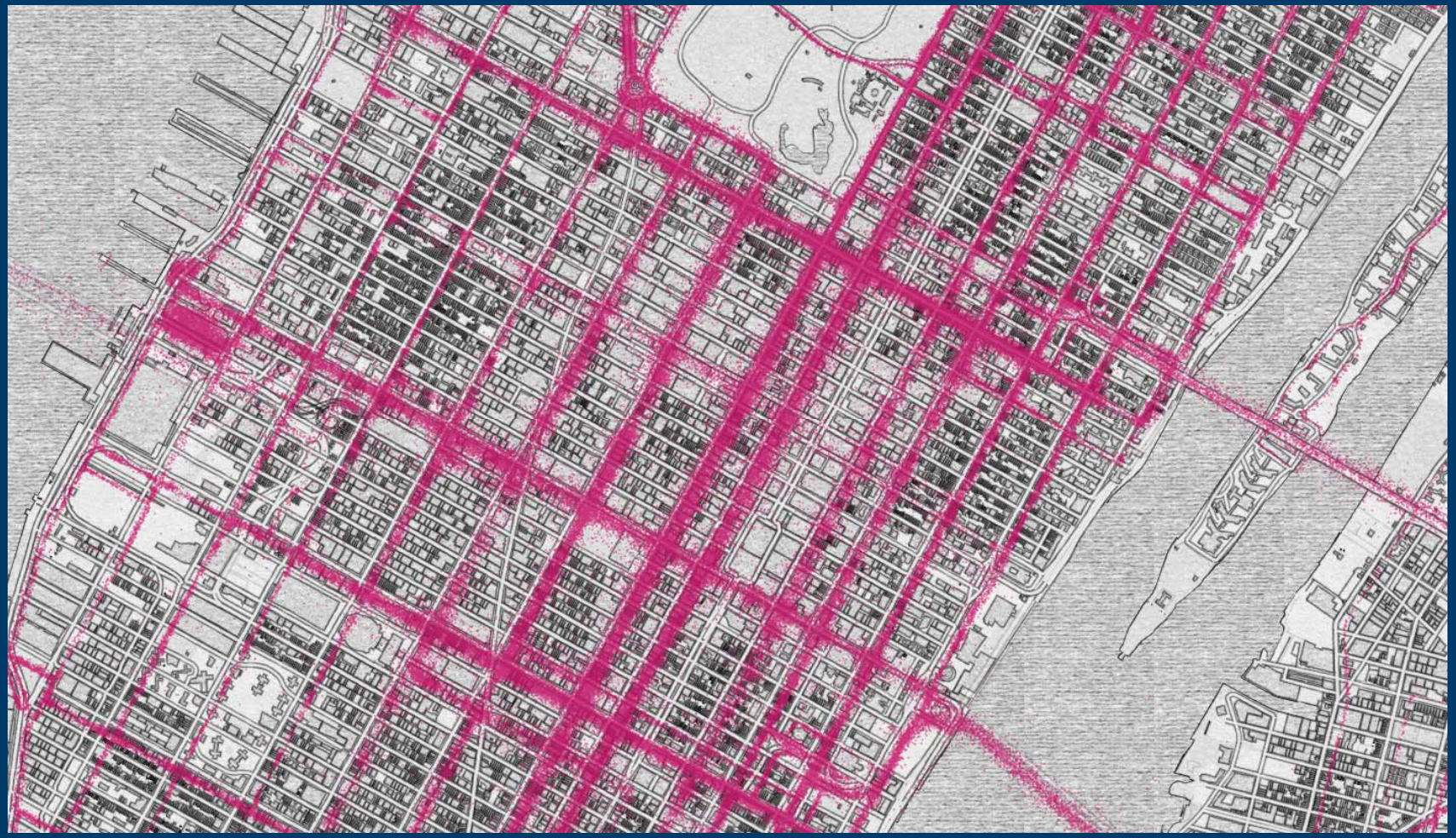
Visualizing Bus Stop Delay Interactively



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Contact Information

THANK YOU!

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