



In|Sync

REAL-TIME
ADAPTIVE SIGNAL CONTROL TECHNOLOGY

Case Study
Lincoln Highway, Bucks County, Pennsylvania

- Corridor Overview
- NB AM Data
- NB PM Data
- SB AM Data
- SB PM Data

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Table of Contents

Introduction	1
Corridor Overview	2
PC-Travel Reports for study: AM_NB_Final	3
Study Summary	4
Overall Output Statistics	5
Fuel Consumption & Emissions	6
Detailed Statistics By Run - Travel Times	7
Detailed Statistics By Run - Stops	8
Detailed Statistics By Run - Average Speed	9
Detailed Statistics By Run - Total Delay	10
Speed/Distance Profiles of All Runs	11
Time/Space Trajectories of All Runs	12
PC-Travel Reports for study: PM_NB_Final	13
Study Summary	14
Overall Output Statistics	15
Fuel Consumption & Emissions	16
Detailed Statistics By Run - Travel Times	17
Detailed Statistics By Run - Stops	19
Detailed Statistics By Run - Average Speed	21
Detailed Statistics By Run - Total Delay	23
Speed/Distance Profiles of All Runs	25
Time/Space Trajectories of All Runs	26

Table of Contents

PC-Travel Reports for study: AM_SB_Final	27
Study Summary	28
Overall Output Statistics	29
Fuel Consumption & Emissions	30
Detailed Statistics By Run - Travel Times	31
Detailed Statistics By Run - Stops	32
Detailed Statistics By Run - Average Speed	33
Detailed Statistics By Run - Total Delay	34
Speed/Distance Profiles of All Runs	35
Time/Space Trajectories of All Runs	36
PC-Travel Reports for study: PM_SB_Final	37
Study Summary	38
Overall Output Statistics	39
Fuel Consumption & Emissions	40
Detailed Statistics By Run - Travel Times	41
Detailed Statistics By Run - Stops	42
Detailed Statistics By Run - Average Speed	43
Detailed Statistics By Run - Total Delay	44
Speed/Distance Profiles of All Runs	45
Time/Space Trajectories of All Runs	46

Introduction

This study was conducted by Rhythm Engineering following a project, involving the installation of an adaptive traffic signal equipment at 12 intersections along two corridors in Pennsylvania Bucks County: Lincoln Hwy and Woodbourne Road both in Middletown Township. The main corridor runs North-South along Lincoln Hwy and spans 2.01 miles. It comprises of 10 intersections along Lincoln Hwy in between I-95 SB Ramp and Oxford Valley Road. Two additional intersections have been cross-coordinated along Woodbourne Road, starting from Lincoln Highway and Woodbourne, with first intersection being the Old Lincoln Hwy and Woodbourne Road, and the second one being 4th Street and Woodbourne Road. Data was collected only along Lincoln Highway. This study compares the operation of the corridor before and after the implementation of the In|Sync adaptive traffic control system.

The major challenge, targeted with this deployment, was heavy commuting traffic combined with commercial traffic to and from the Oxford Valley Mall, especially in the PM hours. The critical intersections were Lincoln Hwy and Flowers Mill Rd, Lincoln Hwy and Woodbourne Road and Lincoln Hwy and Oxford Valley. Cross coordination along Woodbourne Rd was also a challenge due to the closely spaced intersections and short storage bays. Field data was collected along the study corridor during two study periods. The runs were conducted with the GPS enabled vehicle to gather vehicle travel times during two time periods – 7:00-8:30 AM and 4:30-6:00 PM.

“Floating car” method was used so that the travel times collected are representative of the travel time of the average vehicle through the corridor.

Five performance measures have been evaluated: Route Travel Time, Delay at Intersections, Number of Stops, Speed, Fuel Consumption and Emissions. Data collected through the corridor was processed by PC-Travel software. The results of the study runs are presented below per approach and time segment. Based on this evaluation, it was found that the InSync ATC system generated significant benefits, as follows:

- **93.7% reduction in number of stops**
- **89.6% reduction in delay**
- **4.42% increase in speed**
- **46.92% reduction in emissions**
- **45% reduction in travel time**
- **30.10% reduction in fuel consumption**

**The results represent average values, calculated from all test runs across all time intervals.*

Corridor Overview

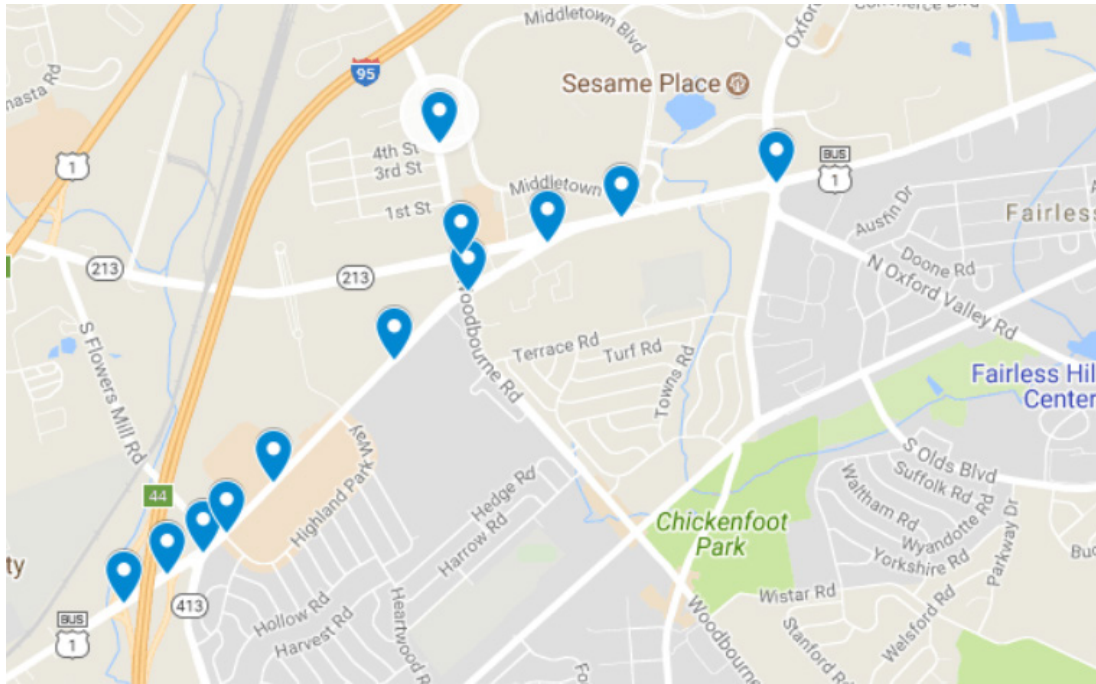


Figure 1 Schematic of the Lincoln Hwy corridor near Levittown, Pennsylvania

Corridor Length = 2.01 Miles

Number of Intersections = 10 along the study corridor (2 cross-coordinated not included)

1. Oxford Valley Rd
2. Mall Jughandle (S Bucks Town Rd)
3. Old Lincoln Hwy
4. Woodbourne Rd
5. Langhorne Square East Dr
6. Langhorne Square West Dr
7. Highland Parkway
8. Flowers Mill Rd
9. I-95 NB Ramp
10. I-95 SB Ramp

PC-Travel Reports for study: AM_NB_Final

Lincoln Hwy Corridor NB AM

Study Name : **AM_NB_Final**
Study Date : **10/10/2018**
Page No. : **4**

Study Summary

Runs Used in This Study

Run Title	Start Date	Start Time	Length	Before/After	Run Type
After_AM-NB-001	10/10/18	05:58	10636	After	Primary
After_AM-NB-002	10/10/18	06:06	10550	After	Secondary
After_AM-NB-003	10/10/18	06:14	10552	After	Secondary
After_AM-NB-004	10/10/18	06:21	10580	After	Secondary
After_AM-NB-005	10/10/18	06:30	10602	After	Secondary
Before_AM-NB-001	10/10/18	06:09	10600	Before	Secondary
Before_AM-NB-002	10/10/18	06:21	10637	Before	Secondary
Before_AM-NB-003	10/10/18	06:38	10542	Before	Secondary

Node Info

#	Len	Name
1	0	I75 SB Ramp
2	815	I75 NB Ramp
3	496	Flowers Mill
4	354	Highland Pk Wy
5	958	L Sq West Dr
6	2257	L Sq East Dr
7	1380	Woodbourne Rd
8	1250	Old Lincoln Hwy
9	1018	Mall Jughandle
10	2108	Oxford Valley Rd

Length of Study Route = 10,636 feet

Notes:

Lincoln Hwy Corridor

NB AM

Study Name : AM_NB_Final
 Study Date : 10/10/2018
 Page No. : 5

Overall Output Statistics

Node #	Length	Node Name		Travel Time	# of Stops	Avg Speed	Total Delay	Time <= 0 MPH	Time <= 35 MPH	Time <= 55 MPH
1	0	I75 SB Ramp								
2	815	I75 NB Ramp	Before	33.0	0.7	16.8	19.0	7.7	28.7	33.0
			After	14.4	0.0	38.6	0.6	0.0	2.6	14.4
			Change	-18.6	-0.7	21.8	-18.4	-7.7	-26.1	-18.6
3	496	Flowers Mill	Before	21.0	0.7	16.1	12.0	3.7	21.0	21.0
			After	11.0	0.0	30.7	2.2	0.0	7.2	11.0
			Change	-10.0	-0.7	14.6	-9.8	-3.7	-13.8	-10.0
4	354	Highland Pk Wy	Before	7.0	0.0	34.5	0.7	0.0	5.0	7.0
			After	6.6	0.0	36.6	0.4	0.0	2.0	6.6
			Change	-0.4	0.0	2.1	-0.3	0.0	-3.0	-0.4
5	958	L Sq West Dr	Before	18.0	0.0	36.3	1.0	0.0	5.7	18.0
			After	16.2	0.0	40.3	0.2	0.0	0.0	16.2
			Change	-1.8	0.0	4.0	-0.8	0.0	-5.7	-1.8
6	2257	L Sq East Dr	Before	39.0	0.0	39.5	1.3	0.0	6.3	39.0
			After	36.4	0.0	42.3	0.4	0.0	2.4	35.6
			Change	-2.6	0.0	2.8	-0.9	0.0	-3.9	-3.4
7	1380	Woodbourne Rd	Before	52.3	1.0	18.0	28.3	16.7	40.0	52.3
			After	22.2	0.0	42.4	0.0	0.0	0.0	22.2
			Change	-30.1	-1.0	24.4	-28.3	-16.7	-40.0	-30.1
8	1250	Old Lincoln Hwy	Before	45.7	0.7	18.7	24.0	16.7	33.7	45.7
			After	19.2	0.0	44.4	0.0	0.0	0.0	19.2
			Change	-26.5	-0.7	25.7	-24.0	-16.7	-33.7	-26.5
9	1018	Mall Jughandle	Before	22.0	0.3	31.5	4.0	0.7	9.0	22.0
			After	15.6	0.0	44.5	0.0	0.0	0.0	14.6
			Change	-6.4	-0.3	12.9	-4.0	-0.7	-9.0	-7.4
10	2108	Oxford Valley Rd	Before	73.3	1.0	19.6	37.7	30.7	45.7	72.7
			After	35.4	0.0	40.6	1.4	0.0	6.8	34.6
			Change	-37.9	-1.0	21.0	-36.3	-30.7	-38.9	-38.1
Totals	10,636		Before	311.3	4.3	23.3	128.0	76.0	195.0	310.7
			After	177.0	0.0	41.0	5.2	0.0	21.0	174.4
			Change	-134.3	-4.3	17.7	-122.8	-76.0	-174.0	-136.3

Stats based on 3 BEFORE runs & 5 AFTER runs.
 Stops based on a Stop Speed of 5 MPH.
 Total Delay based on a Normal Speed of 40 MPH.

Lincoln Hwy Corridor

NB AM

Study Name : AM_NB_Final

Study Date : 10/10/2018

Page No. : 6

Fuel Consumption & Emissions

Node #	Length	Node Name		Fuel (gal)	HC (grams)	CO (grams)	NOx (grams)
1	0	I75 SB Ramp					
2	815	I75 NB Ramp	Before	0.0117	1.2804	10.6505	0.8200
			After	0.0068	0.5246	6.9755	0.2751
			Change	-0.0049	-0.7558	-3.6751	-0.5448
3	496	Flowers Mill	Before	0.0082	1.0113	7.5587	0.7571
			After	0.0045	0.4663	4.6270	0.3069
			Change	-0.0036	-0.5450	-2.9317	-0.4502
4	354	Highland Pk Wy	Before	0.0028	0.2626	2.9193	0.1461
			After	0.0036	0.4409	5.4364	0.3273
			Change	0.0008	0.1784	2.5171	0.1813
5	958	L Sq West Dr	Before	0.0090	0.9757	12.1820	0.6628
			After	0.0080	0.6362	8.4147	0.3295
			Change	-0.0010	-0.3396	-3.7674	-0.3333
6	2257	L Sq East Dr	Before	0.0189	1.5358	19.7405	0.8473
			After	0.0180	1.1003	14.2582	0.4281
			Change	-0.0009	-0.4355	-5.4822	-0.4192
7	1380	Woodbourne Rd	Before	0.0181	1.8206	15.3909	1.0799
			After	0.0108	0.6992	8.9312	0.2988
			Change	-0.0073	-1.1214	-6.4597	-0.7810
8	1250	Old Lincoln Hwy	Before	0.0169	1.9108	19.2245	1.2147
			After	0.0109	0.8676	12.8715	0.4768
			Change	-0.0059	-1.0432	-6.3530	-0.7380
9	1018	Mall Jughandle	Before	0.0129	1.5538	16.5199	1.2308
			After	0.0084	0.4582	6.1271	0.1686
			Change	-0.0045	-1.0957	-10.3928	-1.0622
10	2108	Oxford Valley Rd	Before	0.0250	2.2288	23.5790	1.0384
			After	0.0163	1.0542	12.9405	0.4583
			Change	-0.0087	-1.1746	-10.6384	-0.5801
Totals	10,636		Before	0.1235	12.5798	127.7653	7.7971
			After	0.0873	6.2475	80.5821	3.0694
			Change	-0.0361	-6.3323	-47.1832	-4.7277

Stats based on 3 BEFORE runs & 5 AFTER runs.

Lincoln Hwy Corridor

NB AM

Study Name : **AM_NB_Final**
 Study Date : **10/10/2018**
 Page No. : **7**

Detailed Statistics By Run

Travel Time (sec) by Section

After_AM-NB-001 After_AM-NB-002 After_AM-NB-003 After_AM-NB-004 After_AM-NB-005 Before_AM-NB-001 Before_AM-NB-002 Before_AM-NB-003

Node #	Length	Node Name	Run #1	Run #2	Run #3	Run #4	Run #5	Run #6	Run #7	Run #8
1	0	I75 SB Ramp								
2	815	I75 NB Ramp	13	15	13	16	15	36	14	49
3	496	Flowers Mill	14	9	9	12	11	11	30	22
4	354	Highland Pk Wy	7	6	7	6	7	6	8	7
5	958	L Sq West Dr	15	16	17	16	17	18	19	17
6	2257	L Sq East Dr	30	41	37	38	36	43	36	38
7	1380	Woodbourne Rd	21	22	23	23	22	52	57	48
8	1250	Old Lincoln Hwy	17	20	20	21	18	52	63	22
9	1018	Mall Jughandle	13	16	17	18	14	18	20	28
10	2108	Oxford Valley Rd	40	32	34	39	32	41	120	59
Totals	10636		170	177	177	189	172	277	367	290

Lincoln Hwy Corridor

NB AM

Study Name : **AM_NB_Final**
 Study Date : **10/10/2018**
 Page No. : **8**

Detailed Statistics By Run

Number of Stops by Section

After_AM-NB-001 After_AM-NB-002 After_AM-NB-003 After_AM-NB-004 After_AM-NB-005
 Before_AM-NB-001 Before_AM-NB-002 Before_AM-NB-003

Node #	Length	Node Name	Run #1	Run #2	Run #3	Run #4	Run #5	Run #6	Run #7	Run #8
1	0	I75 SB Ramp								
2	815	I75 NB Ramp	0	0	0	0	0	1	0	1
3	496	Flowers Mill	0	0	0	0	0	0	1	1
4	354	Highland Pk Wy	0	0	0	0	0	0	0	0
5	958	L Sq West Dr	0	0	0	0	0	0	0	0
6	2257	L Sq East Dr	0	0	0	0	0	0	0	0
7	1380	Woodbourne Rd	0	0	0	0	0	1	1	1
8	1250	Old Lincoln Hwy	0	0	0	0	0	1	1	0
9	1018	Mall Jughandle	0	0	0	0	0	0	0	1
10	2108	Oxford Valley Rd	0	0	0	0	0	1	1	1
Totals	10636		0	0	0	0	0	4	4	5

Stops based on a Stop Speed of 5 MPH.

Lincoln Hwy Corridor

NB AM

Study Name : **AM_NB_Final**
 Study Date : **10/10/2018**
 Page No. : **9**

Detailed Statistics By Run

Average Speed (MPH) by Section

After_AM-NB-001 After_AM-NB-002 After_AM-NB-003 After_AM-NB-004 After_AM-NB-005
 Before_AM-NB-001 Before_AM-NB-002 Before_AM-NB-003

Node #	Length	Node Name	Run #1	Run #2	Run #3	Run #4	Run #5	Run #6	Run #7	Run #8
1	0	I75 SB Ramp								
2	815	I75 NB Ramp	42.8	38.7	43.8	34.7	38.7	16.0	40.2	11.6
3	496	Flowers Mill	24.1	37.8	37.3	30.8	28.7	31.4	11.8	15.6
4	354	Highland Pk Wy	34.6	39.8	35.6	38.3	34.9	36.7	30.3	33.0
5	958	L Sq West Dr	43.5	41.6	38.9	40.4	38.5	36.6	35.1	39.5
6	2257	L Sq East Dr	51.3	37.6	41.2	41.1	43.7	36.3	42.9	40.9
7	1380	Woodbourne Rd	44.8	41.7	41.5	40.4	42.1	18.0	16.1	19.2
8	1250	Old Lincoln Hwy	50.1	42.8	42.0	40.0	47.9	15.9	13.5	38.5
9	1018	Mall Jughandle	53.4	45.3	42.0	40.0	49.1	40.4	35.3	24.7
10	2108	Oxford Valley Rd	35.9	43.3	40.9	35.8	44.6	34.5	11.8	23.4
Totals	10636		42.6	40.9	40.9	38.4	42.3	26.2	19.8	24.9

Lincoln Hwy Corridor

NB AM

Study Name : **AM_NB_Final**
 Study Date : **10/10/2018**
 Page No. : **10**

Detailed Statistics By Run

Total Delay (sec) by Section

After_AM-NB-001 After_AM-NB-002 After_AM-NB-003 After_AM-NB-004 After_AM-NB-005
 Before_AM-NB-001 Before_AM-NB-002 Before_AM-NB-003

Node #	Length	Node Name	Run #1	Run #2	Run #3	Run #4	Run #5	Run #6	Run #7	Run #8
1	0	I75 SB Ramp								
2	815	I75 NB Ramp	0	1	0	2	0	22	0	35
3	496	Flowers Mill	6	0	0	3	2	2	21	13
4	354	Highland Pk Wy	1	0	0	0	1	0	1	1
5	958	L Sq West Dr	0	0	0	0	1	1	2	0
6	2257	L Sq East Dr	0	2	0	0	0	4	0	0
7	1380	Woodbourne Rd	0	0	0	0	0	28	33	24
8	1250	Old Lincoln Hwy	0	0	0	0	0	31	41	0
9	1018	Mall Jughandle	0	0	0	0	0	0	2	10
10	2108	Oxford Valley Rd	4	0	0	3	0	5	84	24
Totals	10636		11	3	0	8	4	93	184	107

Total Delay based on a Normal Speed of 40 MPH.

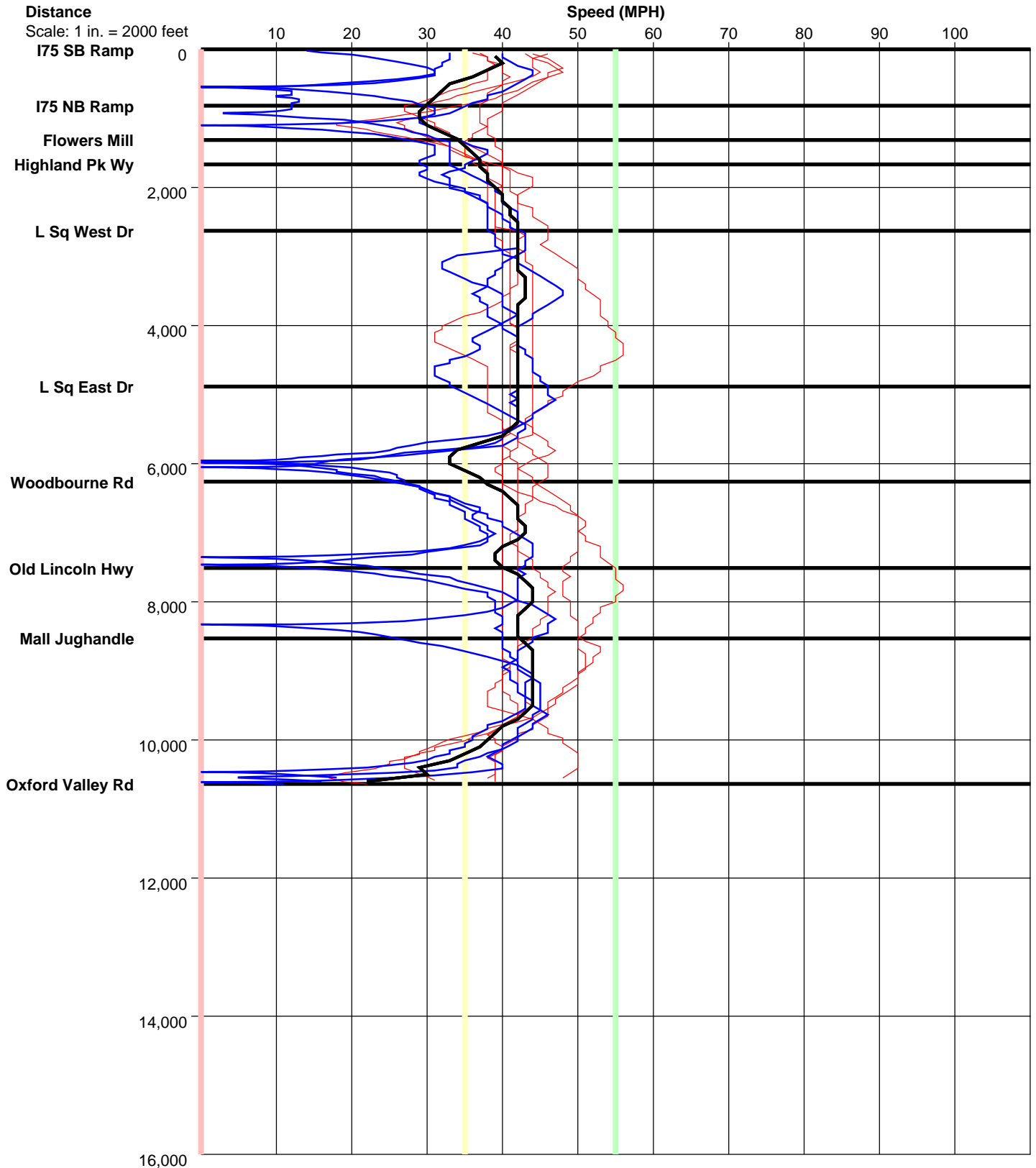
Lincoln Hwy Corridor

NB AM

Study Name : AM_NB_Final
Study Date : 10/10/2018
Page No. : 11

Speed/Distance Profiles of All Runs

Thick (blue) lines = Before Runs; Thin (red) lines = After Runs



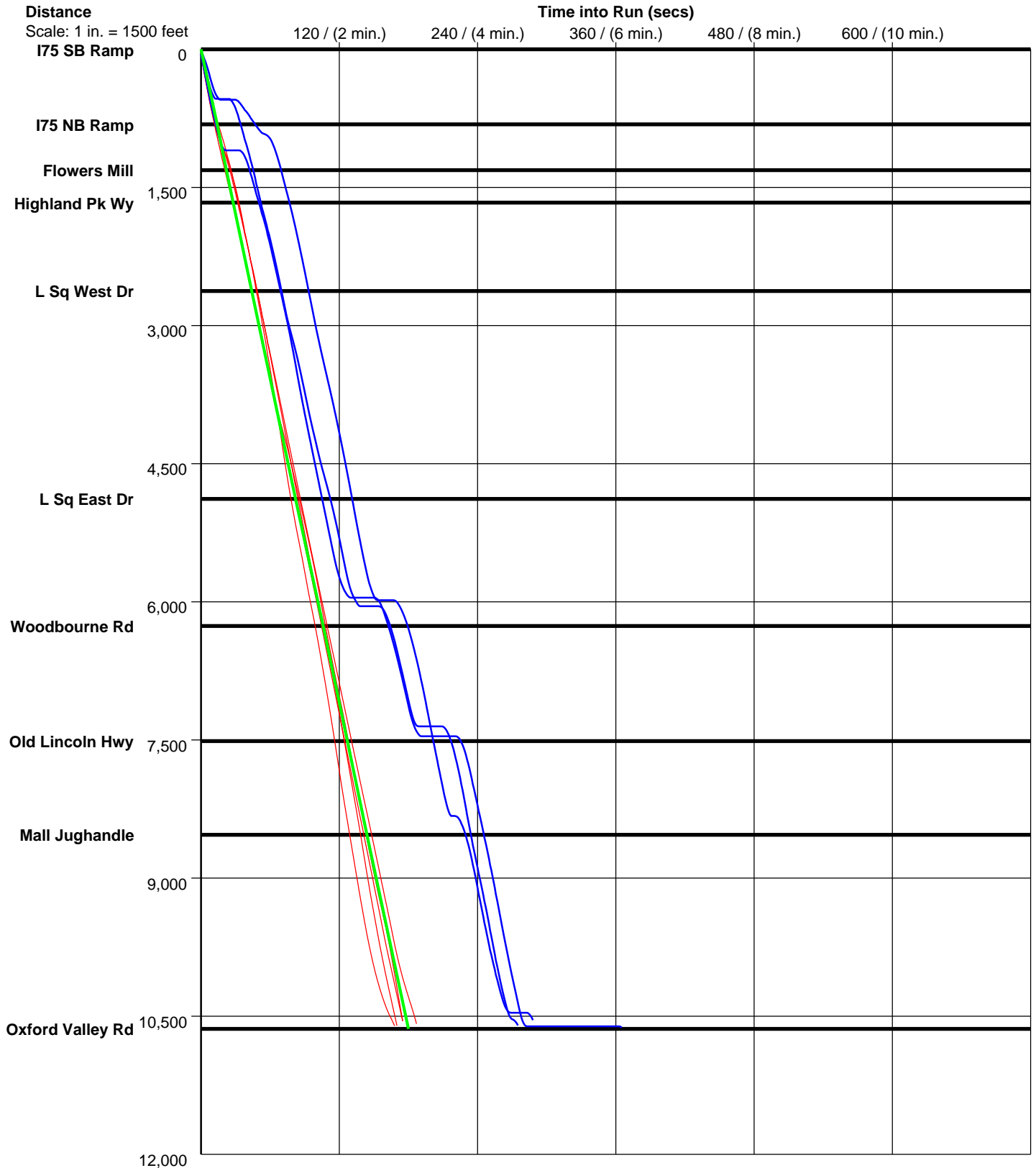
Lincoln Hwy Corridor

NB AM

Study Name : **AM_NB_Final**
 Study Date : **10/10/2018**
 Page No. : **12**

Time/Space Trajectories of All Runs

Thick (blue) lines = Before Runs; Thin (red) lines = After Runs



Solid Line is Normal Speed of 40 MPH

PC-Travel Reports for study: PM_NB_Final

Lincoln Hwy Corridor NB PM

Study Name : **PM_NB_Final**
Study Date : **10/10/2018**
Page No. : **14**

Study Summary

Runs Used in This Study

Run Title	Start Date	Start Time	Length	Before/After	Run Type
After PM-NB-001	10/10/18	14:50	12003	After	Secondary
After PM-NB-002	10/10/18	15:02	12448	After	Secondary
After PM-NB-003	10/10/18	15:12	12011	After	Secondary
After PM-NB-004	10/10/18	15:20	12790	After	Secondary
After PM-NB-005	10/10/18	15:38	12328	After	Secondary
Before_PM-NB-001	10/10/18	14:48	13707	Before	Secondary
Before_PM-NB-002	10/10/18	15:05	15443	Before	Secondary
Before_PM-NB-003	10/10/18	15:25	14054	Before	Secondary
Before_PM-NB-004	10/10/18	15:43	13288	Before	Secondary

Node Info

#	Len	Name
1	0	I75 SB Ramp
2	815	I75 NB Ramp
3	496	Flowers Mill
4	354	Highland Pk Wy
5	958	L Sq West Dr
6	2257	L Sq East Dr
7	1380	Woodbourne Rd
8	1250	Old Lincoln Hwy
9	1018	Mall Jughandle
10	2108	Oxford Valley Rd

Length of Study Route = 10,636 feet

Notes:

Lincoln Hwy Corridor

NB PM

Study Name : **PM_NB_Final**
 Study Date : **10/10/2018**
 Page No. : **15**

Overall Output Statistics

Node #	Length	Node Name		Travel Time	# of Stops	Avg Speed	Total Delay	Time <= 0 MPH	Time <= 35 MPH	Time <= 55 MPH
1	0	I75 SB Ramp								
2	815	I75 NB Ramp	Before	53.8	1.3	10.3	39.8	13.0	52.0	53.8
			After	64.0	1.0	8.7	49.4	21.8	63.4	64.0
			Change	10.3	-0.3	-1.7	9.7	8.8	11.4	10.3
3	496	Flowers Mill	Before	27.5	0.5	12.3	19.0	11.0	25.8	27.5
			After	20.2	0.2	16.7	11.4	8.2	14.8	20.2
			Change	-7.3	-0.3	4.4	-7.6	-2.8	-11.0	-7.3
4	354	Highland Pk Wy	Before	12.0	0.3	20.1	5.8	2.5	9.5	12.0
			After	7.0	0.0	34.5	0.8	0.0	4.6	7.0
			Change	-5.0	-0.3	14.4	-5.0	-2.5	-4.9	-5.0
5	958	L Sq West Dr	Before	46.0	1.0	14.2	29.0	15.3	44.3	46.0
			After	16.8	0.0	38.9	0.6	0.0	4.6	16.8
			Change	-29.2	-1.0	24.7	-28.4	-15.3	-39.7	-29.2
6	2257	L Sq East Dr	Before	69.0	1.0	22.3	31.0	13.8	51.5	69.0
			After	36.0	0.0	42.7	0.0	0.0	0.6	36.0
			Change	-33.0	-1.0	20.4	-31.0	-13.8	-50.9	-33.0
7	1380	Woodbourne Rd	Before	25.5	0.0	36.9	1.8	0.0	6.0	25.5
			After	20.8	0.0	45.2	0.0	0.0	0.4	20.8
			Change	-4.7	0.0	8.3	-1.8	0.0	-5.6	-4.7
8	1250	Old Lincoln Hwy	Before	55.0	0.8	15.5	33.3	19.5	44.3	55.0
			After	20.6	0.0	41.4	0.6	0.0	2.4	20.6
			Change	-34.4	-0.8	25.9	-32.7	-19.5	-41.9	-34.4
9	1018	Mall Jughandle	Before	28.3	0.3	24.6	11.0	8.5	15.0	28.3
			After	15.0	0.0	46.3	0.0	0.0	0.0	15.0
			Change	-13.3	-0.3	21.7	-11.0	-8.5	-15.0	-13.3
10	2108	Oxford Valley Rd	Before	91.5	1.5	15.7	55.3	37.5	71.8	91.5
			After	33.2	0.0	43.3	0.2	0.0	4.4	33.2
			Change	-58.3	-1.5	27.6	-55.1	-37.5	-67.4	-58.3
Totals	10,636		Before	408.5	6.5	17.8	225.8	121.0	320.0	408.5
			After	233.6	1.2	31.0	63.0	30.0	95.2	233.6
			Change	-174.9	-5.3	13.3	-162.8	-91.0	-224.8	-174.9

Stats based on 4 BEFORE runs & 5 AFTER runs.
 Stops based on a Stop Speed of 5 MPH.
 Total Delay based on a Normal Speed of 40 MPH.

Lincoln Hwy Corridor

NB PM

Study Name : **PM_NB_Final**
 Study Date : **10/10/2018**
 Page No. : **16**

Fuel Consumption & Emissions

Node #	Length	Node Name		Fuel (gal)	HC (grams)	CO (grams)	NOx (grams)
1	0	I75 SB Ramp					
2	815	I75 NB Ramp	Before	0.0173	2.0817	17.0003	1.3295
			After	0.0196	2.3436	17.1640	1.4781
			Change	0.0024	0.2619	0.1637	0.1486
3	496	Flowers Mill	Before	0.0087	0.9616	7.2910	0.5732
			After	0.0072	0.8130	8.4947	0.4881
			Change	-0.0015	-0.1486	1.2037	-0.0851
4	354	Highland Pk Wy	Before	0.0045	0.4679	4.0886	0.2986
			After	0.0034	0.3662	4.4529	0.2474
			Change	-0.0011	-0.1017	0.3643	-0.0512
5	958	L Sq West Dr	Before	0.0159	1.8693	15.1855	1.2459
			After	0.0083	0.7524	9.4938	0.4572
			Change	-0.0076	-1.1169	-5.6917	-0.7887
6	2257	L Sq East Dr	Before	0.0272	2.8634	27.0292	1.8418
			After	0.0194	1.5593	21.1911	0.8863
			Change	-0.0077	-1.3042	-5.8380	-0.9556
7	1380	Woodbourne Rd	Before	0.0123	1.0607	12.0318	0.6392
			After	0.0112	0.7180	9.9997	0.3337
			Change	-0.0011	-0.3427	-2.0321	-0.3055
8	1250	Old Lincoln Hwy	Before	0.0191	2.1240	19.4382	1.3075
			After	0.0107	0.8129	10.5375	0.4401
			Change	-0.0084	-1.3112	-8.9007	-0.8674
9	1018	Mall Jughandle	Before	0.0121	1.2805	14.6499	0.8103
			After	0.0090	0.7178	10.6384	0.4173
			Change	-0.0031	-0.5627	-4.0115	-0.3929
10	2108	Oxford Valley Rd	Before	0.0353	4.1690	43.5392	2.7315
			After	0.0177	1.2097	15.5975	0.6230
			Change	-0.0177	-2.9593	-27.9417	-2.1085
Totals	10,636		Before	0.1523	16.8782	160.2535	10.7776
			After	0.1065	9.2927	107.5695	5.3713
			Change	-0.0458	-7.5854	-52.6840	-5.4063

Stats based on 4 BEFORE runs & 5 AFTER runs.

Lincoln Hwy Corridor

NB PM

Study Name : **PM_NB_Final**
 Study Date : **10/10/2018**
 Page No. : **17**

Detailed Statistics By Run

Travel Time (sec) by Section

After PM-NB-001 After PM-NB-002 After PM-NB-003 After PM-NB-004 After PM-NB-005
 Before_PM-NB-001 Before_PM-NB-002 Before_PM-NB-003

Node #	Length	Node Name	Run #1	Run #2	Run #3	Run #4	Run #5	Run #6	Run #7	Run #8
1	0	I75 SB Ramp								
2	815	I75 NB Ramp	34	59	46	115	66	66	24	88
3	496	Flowers Mill	8	9	9	66	9	33	7	15
4	354	Highland Pk Wy	6	7	8	8	6	7	6	28
5	958	L Sq West Dr	16	18	16	19	15	52	49	31
6	2257	L Sq East Dr	36	36	36	37	35	35	100	59
7	1380	Woodbourne Rd	19	20	24	20	21	24	30	23
8	1250	Old Lincoln Hwy	19	21	25	20	18	61	23	62
9	1018	Mall Jughandle	15	16	14	15	15	17	62	16
10	2108	Oxford Valley Rd	37	37	31	29	32	93	103	91
Totals	10636		190	223	209	329	217	388	404	413

Lincoln Hwy Corridor

NB PM

Study Name : **PM_NB_Final**
Study Date : **10/10/2018**
Page No. : **18**

Detailed Statistics By Run

Travel Time (sec) by Section

Before_PM-NB-004

Node #	Length	Node Name	Run #9
1	0	I75 SB Ramp	
2	815	I75 NB Ramp	37
3	496	Flowers Mill	55
4	354	Highland Pk Wy	7
5	958	L Sq West Dr	52
6	2257	L Sq East Dr	82
7	1380	Woodbourne Rd	25
8	1250	Old Lincoln Hwy	74
9	1018	Mall Jughandle	18
10	2108	Oxford Valley Rd	79
Totals	10636		429

Lincoln Hwy Corridor

NB PM

Study Name : **PM_NB_Final**
 Study Date : **10/10/2018**
 Page No. : **19**

Detailed Statistics By Run

Number of Stops by Section

After PM-NB-001 After PM-NB-002 After PM-NB-003 After PM-NB-004 After PM-NB-005
 Before_PM-NB-001 Before_PM-NB-002 Before_PM-NB-003

Node #	Length	Node Name	Run #1	Run #2	Run #3	Run #4	Run #5	Run #6	Run #7	Run #8
1	0	I75 SB Ramp								
2	815	I75 NB Ramp	0	2	1	1	1	1	0	3
3	496	Flowers Mill	0	0	0	1	0	1	0	0
4	354	Highland Pk Wy	0	0	0	0	0	0	0	1
5	958	L Sq West Dr	0	0	0	0	0	1	1	1
6	2257	L Sq East Dr	0	0	0	0	0	0	2	1
7	1380	Woodbourne Rd	0	0	0	0	0	0	0	0
8	1250	Old Lincoln Hwy	0	0	0	0	0	1	0	1
9	1018	Mall Jughandle	0	0	0	0	0	0	1	0
10	2108	Oxford Valley Rd	0	0	0	0	0	2	2	1
Totals	10636		0	2	1	2	1	6	6	8

Stops based on a Stop Speed of 5 MPH.

Lincoln Hwy Corridor

NB PM

Study Name : **PM_NB_Final**
Study Date : **10/10/2018**
Page No. : **20**

Detailed Statistics By Run

Number of Stops by Section

Before_PM-NB-004

Node #	Length	Node Name	Run #9
1	0	I75 SB Ramp	
2	815	I75 NB Ramp	1
3	496	Flowers Mill	1
4	354	Highland Pk Wy	0
5	958	L Sq West Dr	1
6	2257	L Sq East Dr	1
7	1380	Woodbourne Rd	0
8	1250	Old Lincoln Hwy	1
9	1018	Mall Jughandle	0
10	2108	Oxford Valley Rd	1
Totals	10636		6

Stops based on a Stop Speed of 5 MPH.

Lincoln Hwy Corridor

NB PM

Study Name : **PM_NB_Final**
 Study Date : **10/10/2018**
 Page No. : **21**

Detailed Statistics By Run

Average Speed (MPH) by Section

After PM-NB-001 After PM-NB-002 After PM-NB-003 After PM-NB-004 After PM-NB-005
 Before_PM-NB-001 Before_PM-NB-002 Before_PM-NB-003

Node #	Length	Node Name	Run #1	Run #2	Run #3	Run #4	Run #5	Run #6	Run #7	Run #8
1	0	I75 SB Ramp								
2	815	I75 NB Ramp	17.1	9.9	12.4	5.0	8.9	8.5	23.8	6.4
3	496	Flowers Mill	40.3	36.6	36.2	5.2	36.8	10.5	47.1	23.4
4	354	Highland Pk Wy	41.7	33.9	31.9	32.0	41.8	32.9	44.2	8.2
5	958	L Sq West Dr	39.9	36.7	41.6	33.8	43.2	13.0	13.1	21.5
6	2257	L Sq East Dr	43.3	43.1	42.4	42.2	44.4	43.5	15.4	26.5
7	1380	Woodbourne Rd	48.8	45.8	39.6	46.3	44.7	39.8	32.0	40.7
8	1250	Old Lincoln Hwy	45.6	42.4	34.9	43.2	45.8	13.8	36.8	13.3
9	1018	Mall Jughandle	46.3	43.4	48.1	44.7	48.6	40.5	10.9	44.0
10	2108	Oxford Valley Rd	38.9	38.4	46.5	49.7	43.8	15.5	13.8	15.9
Totals	10636		38.3	32.6	34.9	22.1	33.5	18.7	17.9	17.6

Lincoln Hwy Corridor

NB PM

Study Name : **PM_NB_Final**
Study Date : **10/10/2018**
Page No. : **22**

Detailed Statistics By Run

Average Speed (MPH) by Section

Before_PM-NB-004

Node #	Length	Node Name	Run #9
1	0	I75 SB Ramp	
2	815	I75 NB Ramp	15.5
3	496	Flowers Mill	6.2
4	354	Highland Pk Wy	35.9
5	958	L Sq West Dr	12.6
6	2257	L Sq East Dr	18.5
7	1380	Woodbourne Rd	37.3
8	1250	Old Lincoln Hwy	11.7
9	1018	Mall Jughandle	38.3
10	2108	Oxford Valley Rd	18.4
Totals	10636		17.0

Lincoln Hwy Corridor

NB PM

Study Name : **PM_NB_Final**
 Study Date : **10/10/2018**
 Page No. : **23**

Detailed Statistics By Run

Total Delay (sec) by Section

After PM-NB-001 After PM-NB-002 After PM-NB-003 After PM-NB-004 After PM-NB-005
 Before_PM-NB-001 Before_PM-NB-002 Before_PM-NB-003

Node #	Length	Node Name	Run #1	Run #2	Run #3	Run #4	Run #5	Run #6	Run #7	Run #8
1	0	I75 SB Ramp								
2	815	I75 NB Ramp	19	44	32	101	51	52	10	74
3	496	Flowers Mill	0	0	0	57	0	24	0	6
4	354	Highland Pk Wy	0	1	2	1	0	1	0	22
5	958	L Sq West Dr	0	1	0	2	0	35	32	14
6	2257	L Sq East Dr	0	0	0	0	0	0	61	20
7	1380	Woodbourne Rd	0	0	0	0	0	0	6	0
8	1250	Old Lincoln Hwy	0	0	3	0	0	39	1	41
9	1018	Mall Jughandle	0	0	0	0	0	0	44	0
10	2108	Oxford Valley Rd	0	1	0	0	0	57	67	55
Totals	10636		19	47	37	161	51	208	221	232

Total Delay based on a Normal Speed of 40 MPH.

Lincoln Hwy Corridor

NB PM

Study Name : **PM_NB_Final**
Study Date : **10/10/2018**
Page No. : **24**

Detailed Statistics By Run

Total Delay (sec) by Section

Before_PM-NB-004

Node #	Length	Node Name	Run #9
1	0	I75 SB Ramp	
2	815	I75 NB Ramp	23
3	496	Flowers Mill	46
4	354	Highland Pk Wy	0
5	958	L Sq West Dr	35
6	2257	L Sq East Dr	43
7	1380	Woodbourne Rd	1
8	1250	Old Lincoln Hwy	52
9	1018	Mall Jughandle	0
10	2108	Oxford Valley Rd	42
Totals	10636		242

Total Delay based on a Normal Speed of 40 MPH.

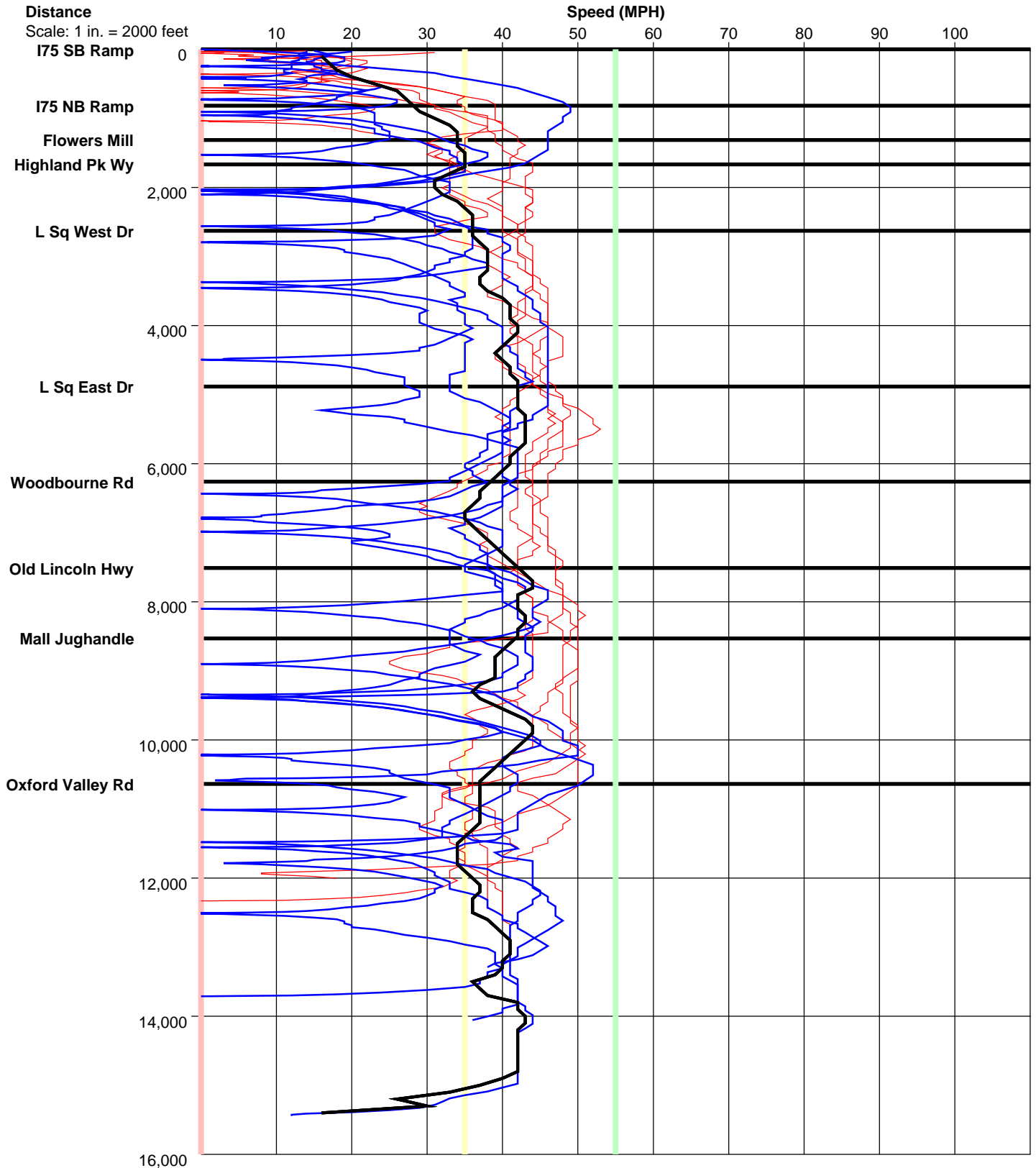
Lincoln Hwy Corridor

NB PM

Study Name : PM_NB_Final
Study Date : 10/10/2018
Page No. : 25

Speed/Distance Profiles of All Runs

Thick (blue) lines = Before Runs; Thin (red) lines = After Runs



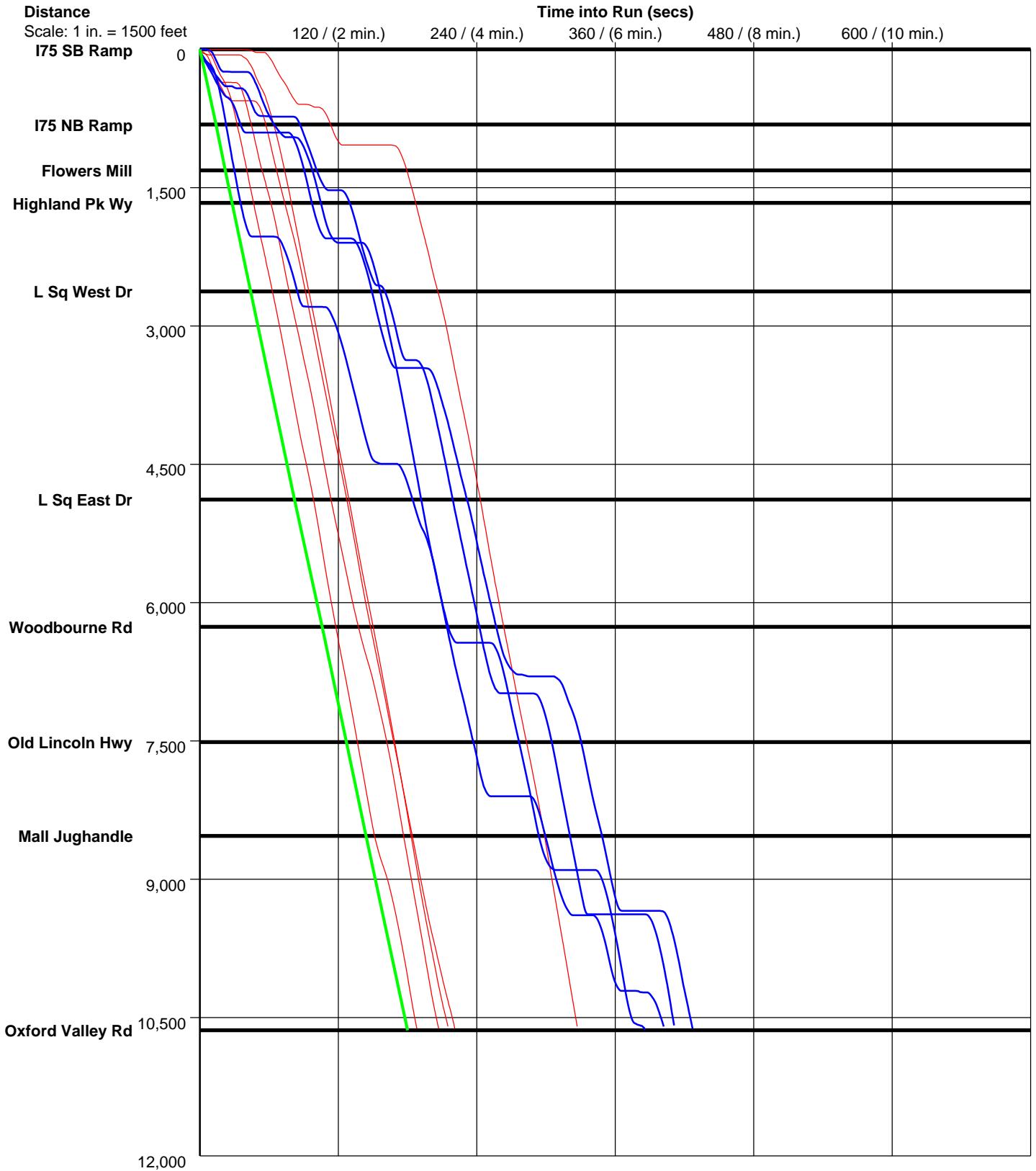
Lincoln Hwy Corridor

NB PM

Study Name : **PM_NB_Final**
 Study Date : **10/10/2018**
 Page No. : **26**

Time/Space Trajectories of All Runs

Thick (blue) lines = Before Runs; Thin (red) lines = After Runs



Solid Line is Normal Speed of 40 MPH

PC-Travel Reports for study: AM_SB_Final

Lincoln Hwy Corridor SB AM

Study Name : **AM_SB_Final**
Study Date : **10/10/2018**
Page No. : **28**

Study Summary

Runs Used in This Study

Run Title	Start Date	Start Time	Length	Before/After	Run Type
After_AM-SB-001	10/10/18	05:52	10498	After	Primary
After_AM-SB-002	10/10/18	06:02	10557	After	Secondary
After_AM-SB-003	10/10/18	06:10	10540	After	Secondary
After_AM-SB-004	10/10/18	06:18	10535	After	Secondary
After_AM-SB-005	10/10/18	06:26	10559	After	Secondary
Before_AM-SB-001	10/10/18	06:03	10538	Before	Secondary
Before_AM-SB-002	10/10/18	06:15	10600	Before	Secondary
Before_AM-SB-003	10/10/18	06:31	10540	Before	Secondary

Node Info

#	Len	Name
1	0	Oxford Valley Rd
2	2093	Mall Jughandle
3	1145	Old Lincoln Hwy
4	1156	Woodbourne Rd
5	1106	L Sq East Dr
6	2549	L Sq West Dr
7	880	Highland Pk Wy
8	405	Flowers Mill Rd
9	446	I95 NB Ramp
10	718	I95 SB Ramp

Length of Study Route = 10,498 feet

Notes:

Lincoln Hwy Corridor

SB AM

Study Name : **AM_SB_Final**
 Study Date : **10/10/2018**
 Page No. : **29**

Overall Output Statistics

Node #	Length	Node Name		Travel Time	# of Stops	Avg Speed	Total Delay	Time <= 0 MPH	Time <= 35 MPH	Time <= 55 MPH
1	0	Oxford Valley Rd								
2	2093	Mall Jughandle	Before	41.3	0.0	34.5	5.3	0.0	17.0	41.3
			After	36.8	0.0	38.8	0.8	0.0	8.0	36.8
			Change	-4.5	0.0	4.3	-4.5	0.0	-9.0	-4.5
3	1145	Old Lincoln Hwy	Before	21.7	0.0	36.0	2.0	0.0	8.0	21.7
			After	18.2	0.0	42.9	0.0	0.0	0.0	18.2
			Change	-3.5	0.0	6.9	-2.0	0.0	-8.0	-3.5
4	1156	Woodbourne Rd	Before	34.7	0.7	22.7	14.3	5.7	24.3	34.7
			After	19.6	0.0	40.2	0.4	0.0	2.0	19.6
			Change	-15.1	-0.7	17.5	-13.9	-5.7	-22.3	-15.1
5	1106	L Sq East Dr	Before	22.7	0.0	33.3	4.0	0.0	11.3	22.7
			After	18.2	0.0	41.4	0.0	0.0	0.0	18.2
			Change	-4.5	0.0	8.2	-4.0	0.0	-11.3	-4.5
6	2549	L Sq West Dr	Before	56.7	1.0	30.7	13.3	4.0	24.7	56.7
			After	39.8	0.0	43.7	0.0	0.0	0.0	39.8
			Change	-16.9	-1.0	13.0	-13.3	-4.0	-24.7	-16.9
7	880	Highland Pk Wy	Before	19.3	0.0	31.0	4.0	0.0	12.0	19.3
			After	14.6	0.0	41.1	0.0	0.0	0.2	14.6
			Change	-4.7	0.0	10.1	-4.0	0.0	-11.8	-4.7
8	405	Flowers Mill Rd	Before	53.0	1.0	5.2	46.0	39.7	52.7	53.0
			After	6.6	0.0	41.8	0.0	0.0	0.4	6.6
			Change	-46.4	-1.0	36.6	-46.0	-39.7	-52.3	-46.4
9	446	I95 NB Ramp	Before	35.3	0.0	8.6	27.3	21.7	34.3	35.3
			After	9.4	0.0	32.4	1.8	0.0	4.6	9.4
			Change	-25.9	0.0	23.7	-25.5	-21.7	-29.7	-25.9
10	718	I95 SB Ramp	Before	13.7	0.0	35.8	1.3	0.0	5.3	13.7
			After	14.0	0.0	35.0	1.8	0.0	5.6	14.0
			Change	0.3	0.0	-0.9	0.5	0.0	0.3	0.3
Totals	10,498		Before	298.3	2.7	24.0	117.7	71.0	189.7	298.3
			After	177.2	0.0	40.4	4.8	0.0	20.8	177.2
			Change	-121.1	-2.7	16.4	-112.9	-71.0	-168.9	-121.1

Stats based on 3 BEFORE runs & 5 AFTER runs.
 Stops based on a Stop Speed of 5 MPH.
 Total Delay based on a Normal Speed of 40 MPH.

Lincoln Hwy Corridor

SB AM

Study Name : **AM_SB_Final**

Study Date : **10/10/2018**

Page No. : **30**

Fuel Consumption & Emissions

Node #	Length	Node Name		Fuel (gal)	HC (grams)	CO (grams)	NOx (grams)
1	0	Oxford Valley Rd					
2	2093	Mall Jughandle	Before	0.0231	2.6137	28.4562	1.9826
			After	0.0240	2.6737	31.2748	2.0512
			Change	0.0009	0.0601	2.8186	0.0686
3	1145	Old Lincoln Hwy	Before	0.0109	1.1512	13.9128	0.7999
			After	0.0087	0.4451	5.2661	0.1249
			Change	-0.0022	-0.7062	-8.6467	-0.6751
4	1156	Woodbourne Rd	Before	0.0132	1.3453	12.1318	0.8471
			After	0.0089	0.5499	6.5300	0.2039
			Change	-0.0043	-0.7954	-5.6018	-0.6432
5	1106	L Sq East Dr	Before	0.0112	1.2789	13.5760	0.9498
			After	0.0087	0.5299	6.5493	0.1985
			Change	-0.0026	-0.7490	-7.0267	-0.7513
6	2549	L Sq West Dr	Before	0.0237	2.0650	21.5072	1.1882
			After	0.0197	1.0845	13.5462	0.3656
			Change	-0.0041	-0.9805	-7.9610	-0.8226
7	880	Highland Pk Wy	Before	0.0108	1.3041	12.2868	1.0529
			After	0.0070	0.4630	5.7101	0.2026
			Change	-0.0037	-0.8411	-6.5767	-0.8502
8	405	Flowers Mill Rd	Before	0.0111	1.0132	9.6360	0.1141
			After	0.0029	0.1390	1.4969	0.0284
			Change	-0.0082	-0.8741	-8.1392	-0.0857
9	446	I95 NB Ramp	Before	0.0128	1.6981	14.0335	1.2017
			After	0.0034	0.2119	2.3646	0.0571
			Change	-0.0094	-1.4862	-11.6688	-1.1446
10	718	I95 SB Ramp	Before	0.0058	0.4929	6.0375	0.2534
			After	0.0075	0.7963	9.1159	0.5607
			Change	0.0017	0.3035	3.0784	0.3074
Totals	10,498		Before	0.1226	12.9624	131.5776	8.3897
			After	0.0908	6.8934	81.8538	3.7930
			Change	-0.0318	-6.0690	-49.7238	-4.5967

Stats based on 3 BEFORE runs & 5 AFTER runs.

Lincoln Hwy Corridor

SB AM

Study Name : **AM_SB_Final**
 Study Date : **10/10/2018**
 Page No. : **31**

Detailed Statistics By Run

Travel Time (sec) by Section

After_AM-SB-001 After_AM-SB-002 After_AM-SB-003 After_AM-SB-004 After_AM-SB-005
 Before_AM-SB-001 Before_AM-SB-002 Before_AM-SB-003

Node #	Length	Node Name	Run #1	Run #2	Run #3	Run #4	Run #5	Run #6	Run #7	Run #8
1	0	Oxford Valley Rd								
2	2093	Mall Jughandle	35	38	37	36	38	45	41	38
3	1145	Old Lincoln Hwy	17	18	17	19	20	23	23	19
4	1156	Woodbourne Rd	22	19	19	19	19	42	22	40
5	1106	L Sq East Dr	18	18	18	18	19	18	20	30
6	2549	L Sq West Dr	37	39	40	41	42	55	60	55
7	880	Highland Pk Wy	13	15	14	16	15	19	20	19
8	405	Flowers Mill Rd	6	6	7	7	7	73	13	73
9	446	I95 NB Ramp	7	10	15	8	7	12	81	13
10	718	I95 SB Ramp	12	15	19	12	12	12	15	14
Totals	10498		167	178	186	176	179	299	295	301

Lincoln Hwy Corridor

SB AM

Study Name : **AM_SB_Final**
 Study Date : **10/10/2018**
 Page No. : **32**

Detailed Statistics By Run

Number of Stops by Section

After_AM-SB-001 After_AM-SB-002 After_AM-SB-003 After_AM-SB-004 After_AM-SB-005
 Before_AM-SB-001 Before_AM-SB-002 Before_AM-SB-003

Node #	Length	Node Name	Run #1	Run #2	Run #3	Run #4	Run #5	Run #6	Run #7	Run #8
1	0	Oxford Valley Rd								
2	2093	Mall Jughandle	0	0	0	0	0	0	0	0
3	1145	Old Lincoln Hwy	0	0	0	0	0	0	0	0
4	1156	Woodbourne Rd	0	0	0	0	0	1	0	1
5	1106	L Sq East Dr	0	0	0	0	0	0	0	0
6	2549	L Sq West Dr	0	0	0	0	0	1	1	1
7	880	Highland Pk Wy	0	0	0	0	0	0	0	0
8	405	Flowers Mill Rd	0	0	0	0	0	1	1	1
9	446	I95 NB Ramp	0	0	0	0	0	0	0	0
10	718	I95 SB Ramp	0	0	0	0	0	0	0	0
Totals	10498		0	0	0	0	0	3	2	3

Stops based on a Stop Speed of 5 MPH.

Lincoln Hwy Corridor

SB AM

Study Name : **AM_SB_Final**
 Study Date : **10/10/2018**
 Page No. : **33**

Detailed Statistics By Run

Average Speed (MPH) by Section

After_AM-SB-001 After_AM-SB-002 After_AM-SB-003 After_AM-SB-004 After_AM-SB-005 Before_AM-SB-001 Before_AM-SB-002 Before_AM-SB-003

Node #	Length	Node Name	Run #1	Run #2	Run #3	Run #4	Run #5	Run #6	Run #7	Run #8
1	0	Oxford Valley Rd								
2	2093	Mall Jughandle	40.7	38.0	39.7	39.8	37.7	32.0	35.1	37.5
3	1145	Old Lincoln Hwy	45.9	44.7	44.0	42.0	39.4	33.3	34.9	41.4
4	1156	Woodbourne Rd	35.8	40.5	43.2	42.0	41.1	19.6	35.5	19.9
5	1106	L Sq East Dr	42.0	43.3	42.0	42.0	41.1	41.1	36.6	25.4
6	2549	L Sq West Dr	47.0	44.3	42.9	42.1	41.2	31.5	28.9	31.3
7	880	Highland Pk Wy	46.1	40.7	43.4	37.0	41.0	31.6	31.4	32.4
8	405	Flowers Mill Rd	45.8	41.3	38.0	39.6	41.0	3.7	19.2	3.5
9	446	I95 NB Ramp	43.4	31.7	19.6	39.4	41.3	27.4	4.0	24.5
10	718	I95 SB Ramp	40.8	31.3	26.8	40.3	42.3	40.6	32.1	35.9
Totals	10498		42.9	40.3	38.6	40.8	40.3	24.0	24.3	23.9

Lincoln Hwy Corridor

SB AM

Study Name : **AM_SB_Final**
 Study Date : **10/10/2018**
 Page No. : **34**

Detailed Statistics By Run

Total Delay (sec) by Section

After_AM-SB-001
 After_AM-SB-002
 After_AM-SB-003
 After_AM-SB-004
 After_AM-SB-005
 Before_AM-SB-001
 Before_AM-SB-002
 Before_AM-SB-003

Node #	Length	Node Name	Run #1	Run #2	Run #3	Run #4	Run #5	Run #6	Run #7	Run #8
1	0	Oxford Valley Rd								
2	2093	Mall Jughandle	0	2	0	0	2	9	5	2
3	1145	Old Lincoln Hwy	0	0	0	0	0	3	3	0
4	1156	Woodbourne Rd	2	0	0	0	0	21	2	20
5	1106	L Sq East Dr	0	0	0	0	0	0	1	11
6	2549	L Sq West Dr	0	0	0	0	0	11	17	12
7	880	Highland Pk Wy	0	0	0	0	0	4	4	4
8	405	Flowers Mill Rd	0	0	0	0	0	66	6	66
9	446	I95 NB Ramp	0	2	7	0	0	4	73	5
10	718	I95 SB Ramp	0	3	6	0	0	0	3	1
Totals	10498		2	7	13	0	2	118	114	121

Total Delay based on a Normal Speed of 40 MPH.

Lincoln Hwy Corridor

SB AM

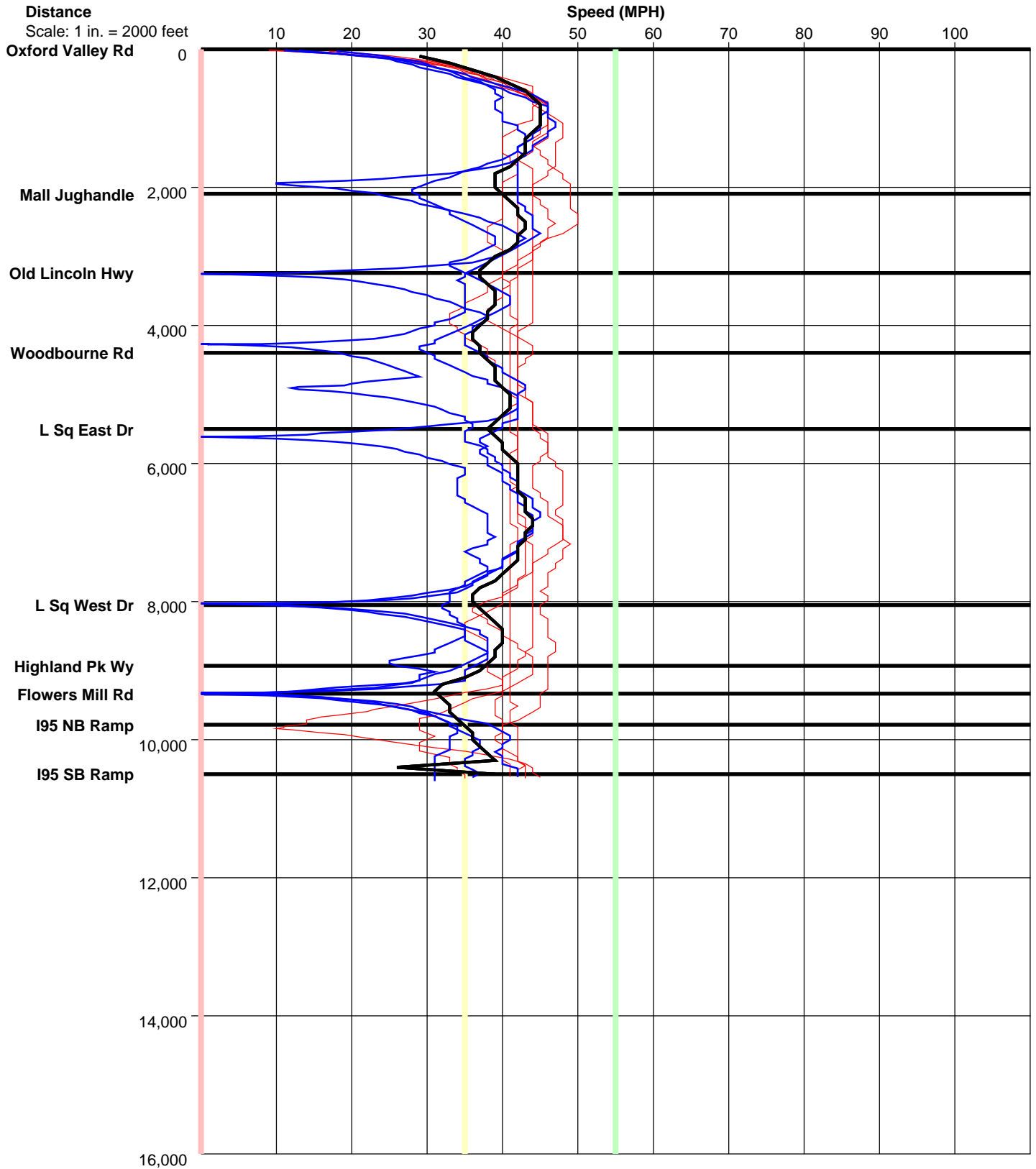
Study Name : AM_SB_Final

Study Date : 10/10/2018

Page No. : 35

Speed/Distance Profiles of All Runs

Thick (blue) lines = Before Runs; Thin (red) lines = After Runs



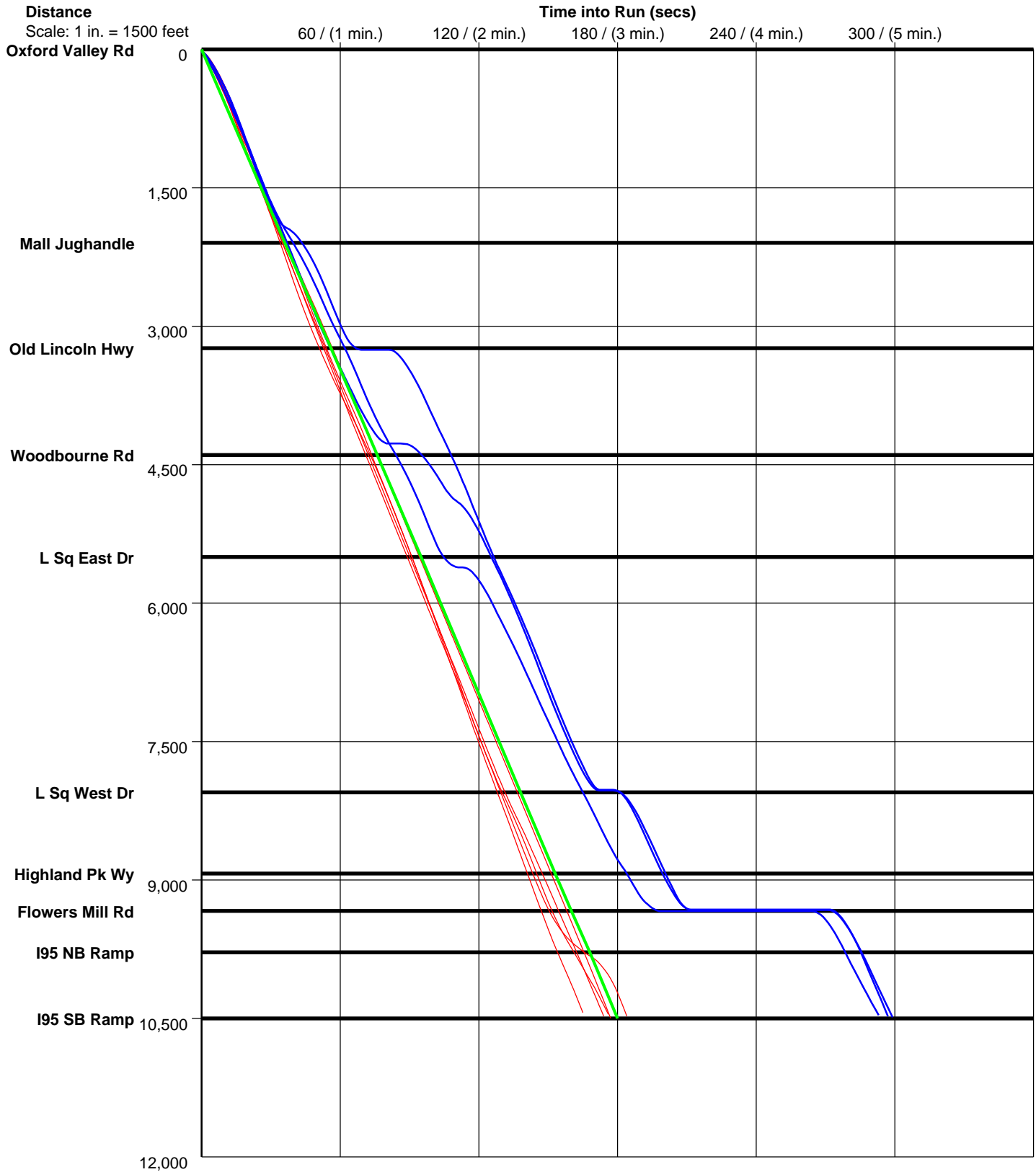
Lincoln Hwy Corridor

SB AM

Study Name : **AM_SB_Final**
 Study Date : **10/10/2018**
 Page No. : **36**

Time/Space Trajectories of All Runs

Thick (blue) lines = Before Runs; Thin (red) lines = After Runs



Solid Line is Normal Speed of 40 MPH

PC-Travel Reports for study: PM_SB_Final

Lincoln Hwy Corridor SB PM

Study Name : **PM_SB_Final**
Study Date : **10/10/2018**
Page No. : **38**

Study Summary

Runs Used in This Study

Run Title	Start Date	Start Time	Length	Before/After	Run Type
After PM-SB-001	10/10/18	14:30	10624	After	Secondary
After PM-SB-002	10/10/18	14:59	10609	After	Secondary
After PM-SB-003	10/10/18	15:08	10682	After	Secondary
After PM-SB-004	10/10/18	15:17	10603	After	Secondary
After PM-SB-005	10/10/18	15:35	10613	After	Secondary
Before_PM-SB-001	10/10/18	14:57	10632	Before	Secondary
Before_PM-SB-002	10/10/18	15:17	10645	Before	Secondary
Before_PM-SB-003	10/10/18	15:36	10648	Before	Secondary

Node Info

#	Len	Name
1	0	Oxford Valley Rd
2	2093	Mall Jughandle
3	1145	Old Lincoln Hwy
4	1156	Woodbourne Rd
5	1106	L Sq East Dr
6	2549	L Sq West Dr
7	880	Highland Pk Wy
8	405	Flowers Mill Rd
9	446	I95 NB Ramp
10	718	I95 SB Ramp

Length of Study Route = 10,498 feet

Notes:

Lincoln Hwy Corridor

SB PM

Study Name : **PM_SB_Final**
 Study Date : **10/10/2018**
 Page No. : **39**

Overall Output Statistics

Node #	Length	Node Name		Travel Time	# of Stops	Avg Speed	Total Delay	Time <= 0 MPH	Time <= 35 MPH	Time <= 55 MPH
1	0	Oxford Valley Rd								
2	2093	Mall Jughandle	Before	71.0	0.7	20.1	35.0	26.7	46.0	71.0
			After	34.2	0.0	41.7	0.0	0.0	4.2	34.2
			Change	-36.8	-0.7	21.6	-35.0	-26.7	-41.8	-36.8
3	1145	Old Lincoln Hwy	Before	37.0	0.7	21.1	17.0	6.0	30.0	37.0
			After	23.4	0.2	33.4	4.0	0.0	8.8	23.4
			Change	-13.6	-0.5	12.3	-13.0	-6.0	-21.2	-13.6
4	1156	Woodbourne Rd	Before	113.0	1.3	7.0	93.0	66.7	113.0	113.0
			After	23.2	0.0	34.0	3.0	0.0	12.4	23.2
			Change	-89.8	-1.3	27.0	-90.0	-66.7	-100.6	-89.8
5	1106	L Sq East Dr	Before	23.3	0.0	32.3	4.3	0.0	13.3	23.3
			After	18.4	0.0	41.0	0.0	0.0	0.0	18.4
			Change	-4.9	0.0	8.7	-4.3	0.0	-13.3	-4.9
6	2549	L Sq West Dr	Before	69.7	1.0	24.9	25.7	10.0	43.0	69.7
			After	42.6	0.0	40.8	0.0	0.0	0.4	42.6
			Change	-27.1	-1.0	15.9	-25.7	-10.0	-42.6	-27.1
7	880	Highland Pk Wy	Before	42.7	1.3	14.1	27.7	13.0	41.3	42.7
			After	19.4	0.2	30.9	4.2	0.0	11.4	19.4
			Change	-23.3	-1.1	16.9	-23.5	-13.0	-29.9	-23.3
8	405	Flowers Mill Rd	Before	21.7	0.3	12.7	14.7	5.3	21.7	21.7
			After	8.0	0.0	34.5	0.8	0.0	3.6	8.0
			Change	-13.7	-0.3	21.8	-13.9	-5.3	-18.1	-13.7
9	446	I95 NB Ramp	Before	17.0	0.3	17.9	9.0	0.7	15.0	17.0
			After	7.8	0.0	39.0	0.4	0.0	2.2	7.8
			Change	-9.2	-0.3	21.1	-8.6	-0.7	-12.8	-9.2
10	718	I95 SB Ramp	Before	21.0	0.3	23.3	8.7	2.0	19.3	21.0
			After	13.0	0.0	37.7	0.6	0.0	3.8	13.0
			Change	-8.0	-0.3	14.3	-8.1	-2.0	-15.5	-8.0
Totals	10,498		Before	416.3	6.0	17.2	235.0	130.3	342.7	416.3
			After	190.0	0.4	37.7	13.0	0.0	46.8	190.0
			Change	-226.3	-5.6	20.5	-222.0	-130.3	-295.9	-226.3

Stats based on 3 BEFORE runs & 5 AFTER runs.
 Stops based on a Stop Speed of 5 MPH.
 Total Delay based on a Normal Speed of 40 MPH.

Lincoln Hwy Corridor

SB PM

Study Name : **PM_SB_Final**
 Study Date : **10/10/2018**
 Page No. : **40**

Fuel Consumption & Emissions

Node #	Length	Node Name		Fuel (gal)	HC (grams)	CO (grams)	NOx (grams)
1	0	Oxford Valley Rd					
2	2093	Mall Jughandle	Before	0.0279	2.9643	30.5624	1.8283
			After	0.0207	2.0064	26.6367	1.3726
			Change	-0.0072	-0.9578	-3.9257	-0.4557
3	1145	Old Lincoln Hwy	Before	0.0150	1.6708	15.4837	1.1521
			After	0.0103	0.9278	9.7540	0.5743
			Change	-0.0046	-0.7430	-5.7297	-0.5778
4	1156	Woodbourne Rd	Before	0.0277	2.8710	24.2475	1.0816
			After	0.0119	1.3455	16.0537	0.9604
			Change	-0.0158	-1.5255	-8.1938	-0.1212
5	1106	L Sq East Dr	Before	0.0132	1.6832	17.6844	1.3556
			After	0.0090	0.7085	9.1917	0.3808
			Change	-0.0042	-0.9747	-8.4927	-0.9748
6	2549	L Sq West Dr	Before	0.0289	2.9968	31.5749	1.9330
			After	0.0197	1.2647	15.4882	0.5156
			Change	-0.0092	-1.7321	-16.0867	-1.4174
7	880	Highland Pk Wy	Before	0.0133	1.4788	12.9968	0.8538
			After	0.0081	0.7231	6.8917	0.4373
			Change	-0.0052	-0.7557	-6.1050	-0.4165
8	405	Flowers Mill Rd	Before	0.0075	0.9211	5.9913	0.6631
			After	0.0045	0.5559	7.0398	0.4140
			Change	-0.0031	-0.3652	1.0485	-0.2491
9	446	I95 NB Ramp	Before	0.0079	1.0353	8.4669	0.8347
			After	0.0043	0.4521	6.2871	0.3004
			Change	-0.0036	-0.5833	-2.1798	-0.5344
10	718	I95 SB Ramp	Before	0.0062	0.4601	4.4020	0.1318
			After	0.0072	0.7789	10.2947	0.5448
			Change	0.0010	0.3187	5.8927	0.4130
Totals	10,498		Before	0.1475	16.0814	151.4099	9.8341
			After	0.0956	8.7628	107.6376	5.5002
			Change	-0.0519	-7.3186	-43.7723	-4.3339

Stats based on 3 BEFORE runs & 5 AFTER runs.

Lincoln Hwy Corridor

SB PM

Study Name : **PM_SB_Final**
 Study Date : **10/10/2018**
 Page No. : **41**

Detailed Statistics By Run

Travel Time (sec) by Section

After PM-SB-001 After PM-SB-002 After PM-SB-003 After PM-SB-004 After PM-SB-005
 Before_PM-SB-001 Before_PM-SB-002 Before_PM-SB-003

Node #	Length	Node Name	Run #1	Run #2	Run #3	Run #4	Run #5	Run #6	Run #7	Run #8
1	0	Oxford Valley Rd								
2	2093	Mall Jughandle	33	35	31	36	36	85	39	89
3	1145	Old Lincoln Hwy	18	25	19	35	20	29	55	27
4	1156	Woodbourne Rd	21	21	23	26	25	102	135	102
5	1106	L Sq East Dr	19	18	19	18	18	23	23	24
6	2549	L Sq West Dr	44	40	43	42	44	69	68	72
7	880	Highland Pk Wy	21	28	15	16	17	21	50	57
8	405	Flowers Mill Rd	7	9	8	7	9	36	16	13
9	446	I95 NB Ramp	8	6	9	7	9	20	23	8
10	718	I95 SB Ramp	12	13	12	12	16	19	28	16
Totals	10498		183	195	179	199	194	404	437	408

Lincoln Hwy Corridor

SB PM

Study Name : **PM_SB_Final**
 Study Date : **10/10/2018**
 Page No. : **42**

Detailed Statistics By Run

Number of Stops by Section

After PM-SB-001 After PM-SB-002 After PM-SB-003 After PM-SB-004 After PM-SB-005
 Before_PM-SB-001 Before_PM-SB-002 Before_PM-SB-003

Node #	Length	Node Name	Run #1	Run #2	Run #3	Run #4	Run #5	Run #6	Run #7	Run #8
1	0	Oxford Valley Rd								
2	2093	Mall Jughandle	0	0	0	0	0	1	0	1
3	1145	Old Lincoln Hwy	0	0	0	1	0	1	1	0
4	1156	Woodbourne Rd	0	0	0	0	0	1	2	1
5	1106	L Sq East Dr	0	0	0	0	0	0	0	0
6	2549	L Sq West Dr	0	0	0	0	0	1	1	1
7	880	Highland Pk Wy	0	1	0	0	0	0	3	1
8	405	Flowers Mill Rd	0	0	0	0	0	1	0	0
9	446	I95 NB Ramp	0	0	0	0	0	0	1	0
10	718	I95 SB Ramp	0	0	0	0	0	0	1	0
Totals	10498		0	1	0	1	0	5	9	4

Stops based on a Stop Speed of 5 MPH.

Lincoln Hwy Corridor

SB PM

Study Name : **PM_SB_Final**
 Study Date : **10/10/2018**
 Page No. : **43**

Detailed Statistics By Run

Average Speed (MPH) by Section

After PM-SB-001 After PM-SB-002 After PM-SB-003 After PM-SB-004 After PM-SB-005
 Before_PM-SB-001 Before_PM-SB-002 Before_PM-SB-003

Node #	Length	Node Name	Run #1	Run #2	Run #3	Run #4	Run #5	Run #6	Run #7	Run #8
1	0	Oxford Valley Rd								
2	2093	Mall Jughandle	44.2	41.5	46.7	40.8	40.3	16.8	37.2	16.2
3	1145	Old Lincoln Hwy	42.2	30.6	41.2	21.3	38.5	27.2	14.1	29.0
4	1156	Woodbourne Rd	39.0	38.6	34.0	30.8	31.5	7.7	5.7	7.7
5	1106	L Sq East Dr	38.4	41.5	40.5	42.3	41.6	33.6	32.9	31.7
6	2549	L Sq West Dr	39.7	43.1	40.5	41.0	39.5	25.2	25.7	24.1
7	880	Highland Pk Wy	29.4	21.7	39.1	38.8	35.1	27.5	11.7	10.5
8	405	Flowers Mill Rd	36.1	33.2	34.8	40.7	32.4	7.8	17.6	22.1
9	446	I95 NB Ramp	38.9	47.8	35.6	42.6	32.4	15.1	13.1	36.8
10	718	I95 SB Ramp	42.8	39.1	41.2	41.4	32.6	25.9	17.4	31.0
Totals	10498		39.4	36.9	40.2	36.2	37.1	17.7	16.4	17.6

Lincoln Hwy Corridor

SB PM

Study Name : **PM_SB_Final**
 Study Date : **10/10/2018**
 Page No. : **44**

Detailed Statistics By Run

Total Delay (sec) by Section

After PM-SB-001 After PM-SB-002 After PM-SB-003 After PM-SB-004 After PM-SB-005
 Before_PM-SB-001 Before_PM-SB-002 Before_PM-SB-003

Node #	Length	Node Name	Run #1	Run #2	Run #3	Run #4	Run #5	Run #6	Run #7	Run #8
1	0	Oxford Valley Rd								
2	2093	Mall Jughandle	0	0	0	0	0	49	3	53
3	1145	Old Lincoln Hwy	0	5	0	15	0	9	35	7
4	1156	Woodbourne Rd	0	1	3	6	5	82	115	82
5	1106	L Sq East Dr	0	0	0	0	0	4	4	5
6	2549	L Sq West Dr	0	0	0	0	0	25	24	28
7	880	Highland Pk Wy	5	13	0	1	2	6	35	42
8	405	Flowers Mill Rd	0	1	1	0	2	29	9	6
9	446	I95 NB Ramp	0	0	1	0	1	12	15	0
10	718	I95 SB Ramp	0	0	0	0	3	7	16	3
Totals	10498		5	20	5	22	13	223	256	226

Total Delay based on a Normal Speed of 40 MPH.

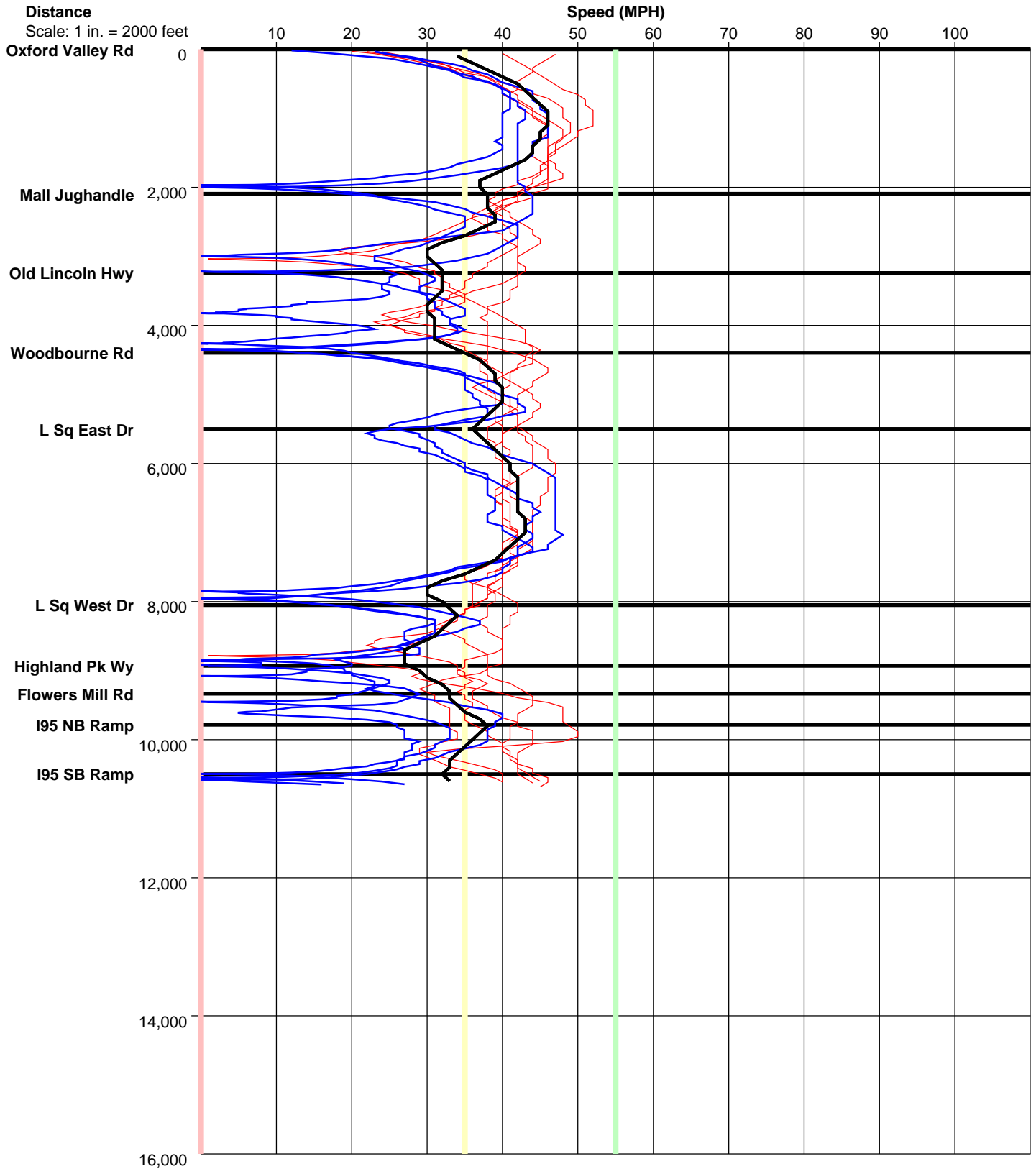
Lincoln Hwy Corridor

SB PM

Study Name : PM_SB_Final
Study Date : 10/10/2018
Page No. : 45

Speed/Distance Profiles of All Runs

Thick (blue) lines = Before Runs; Thin (red) lines = After Runs



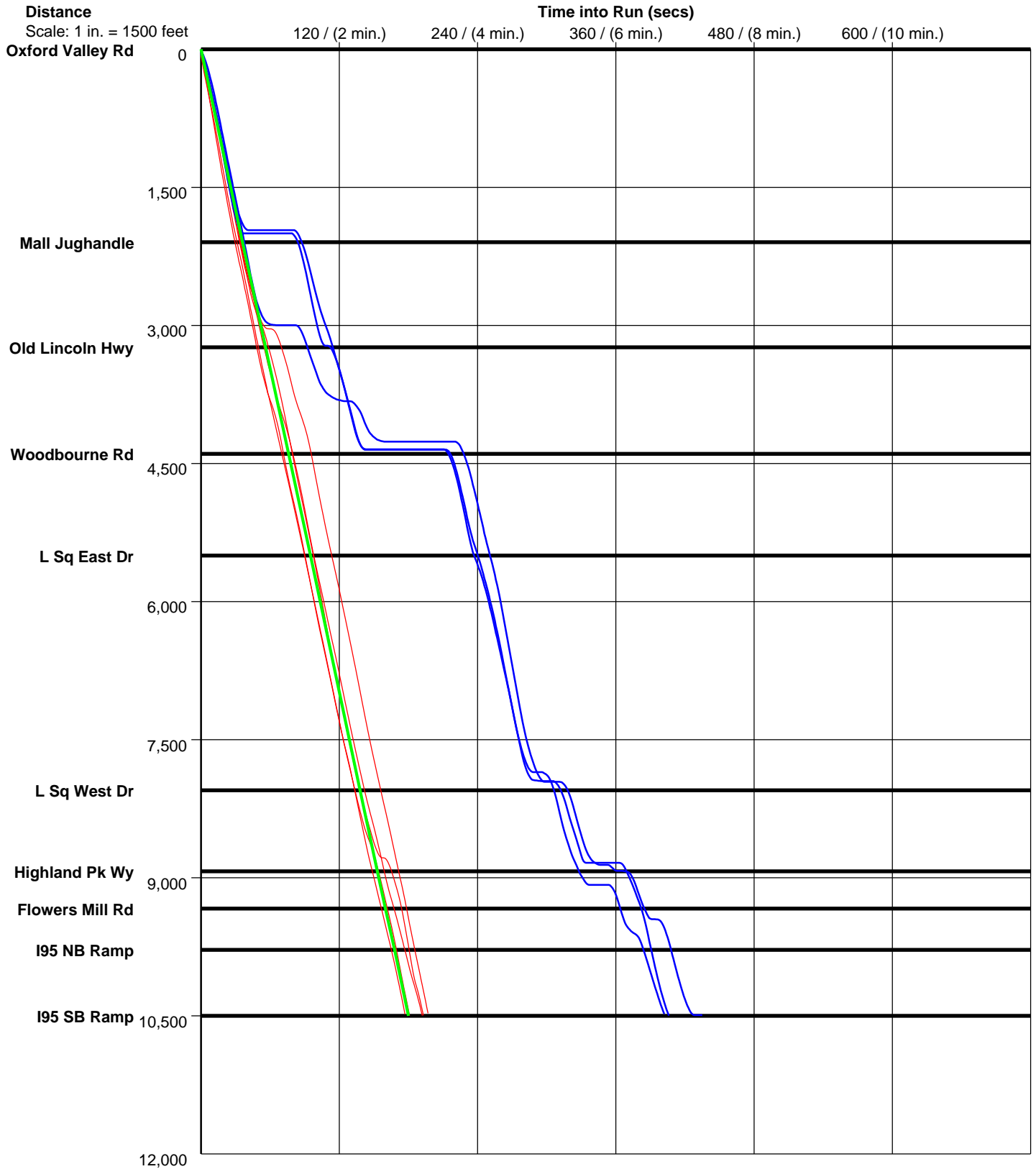
Lincoln Hwy Corridor

SB PM

Study Name : **PM_SB_Final**
 Study Date : **10/10/2018**
 Page No. : **46**

Time/Space Trajectories of All Runs

Thick (blue) lines = Before Runs; Thin (red) lines = After Runs



Solid Line is Normal Speed of 40 MPH

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