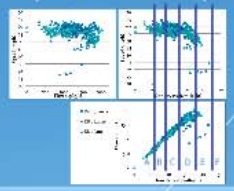
Yahara River Bridge Data Collection

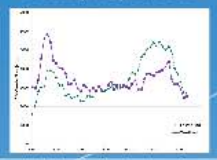
Findings

- Capacity
- Lane Usage
- Future Projects

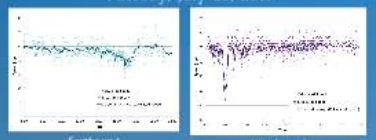
Speed, Flow, and Density



Video Camera Data
Tuesday, July 23, 2013



Bluetooth Data
Tuesday, July 23, 2013

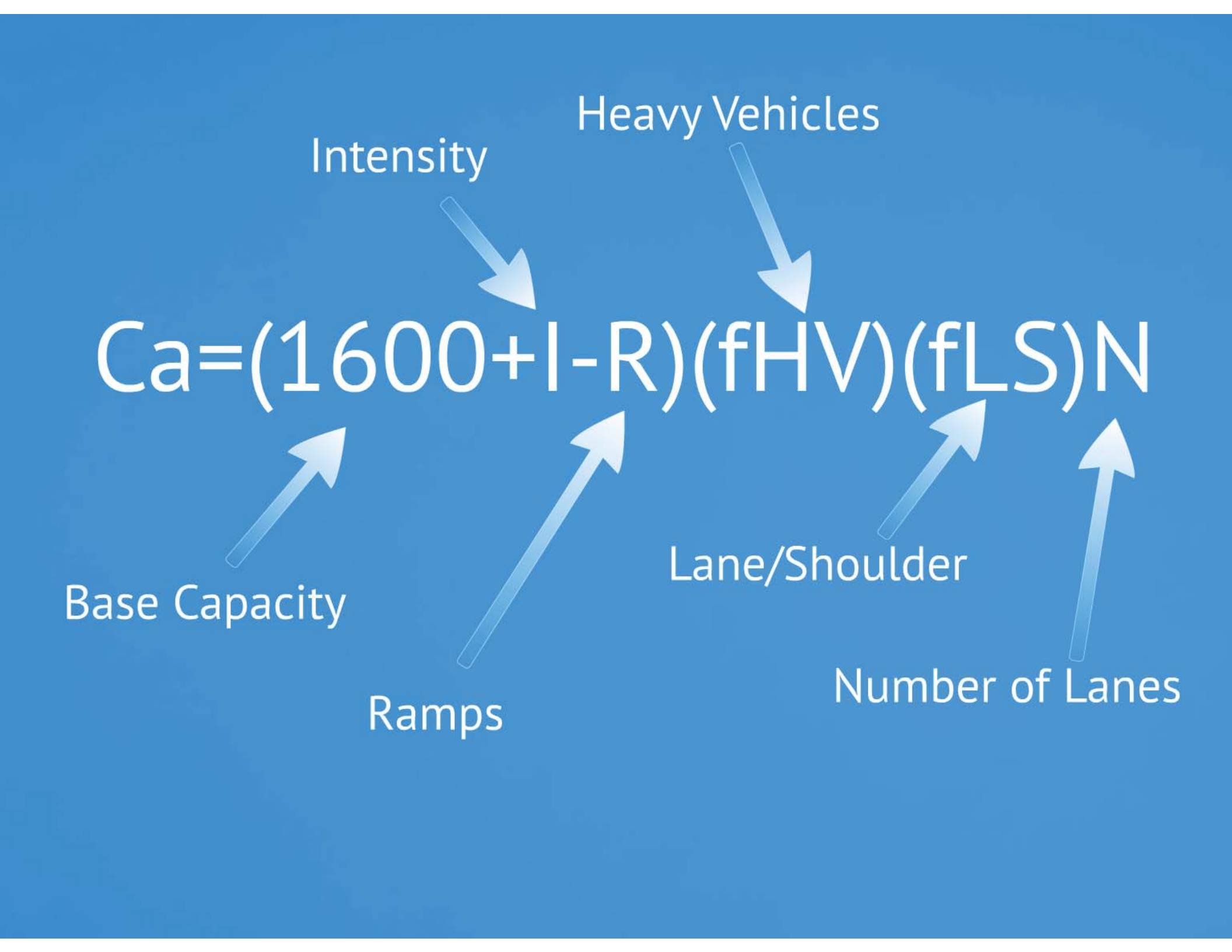


Lakeside ENGINEERS

WHY?

FDM 11-50

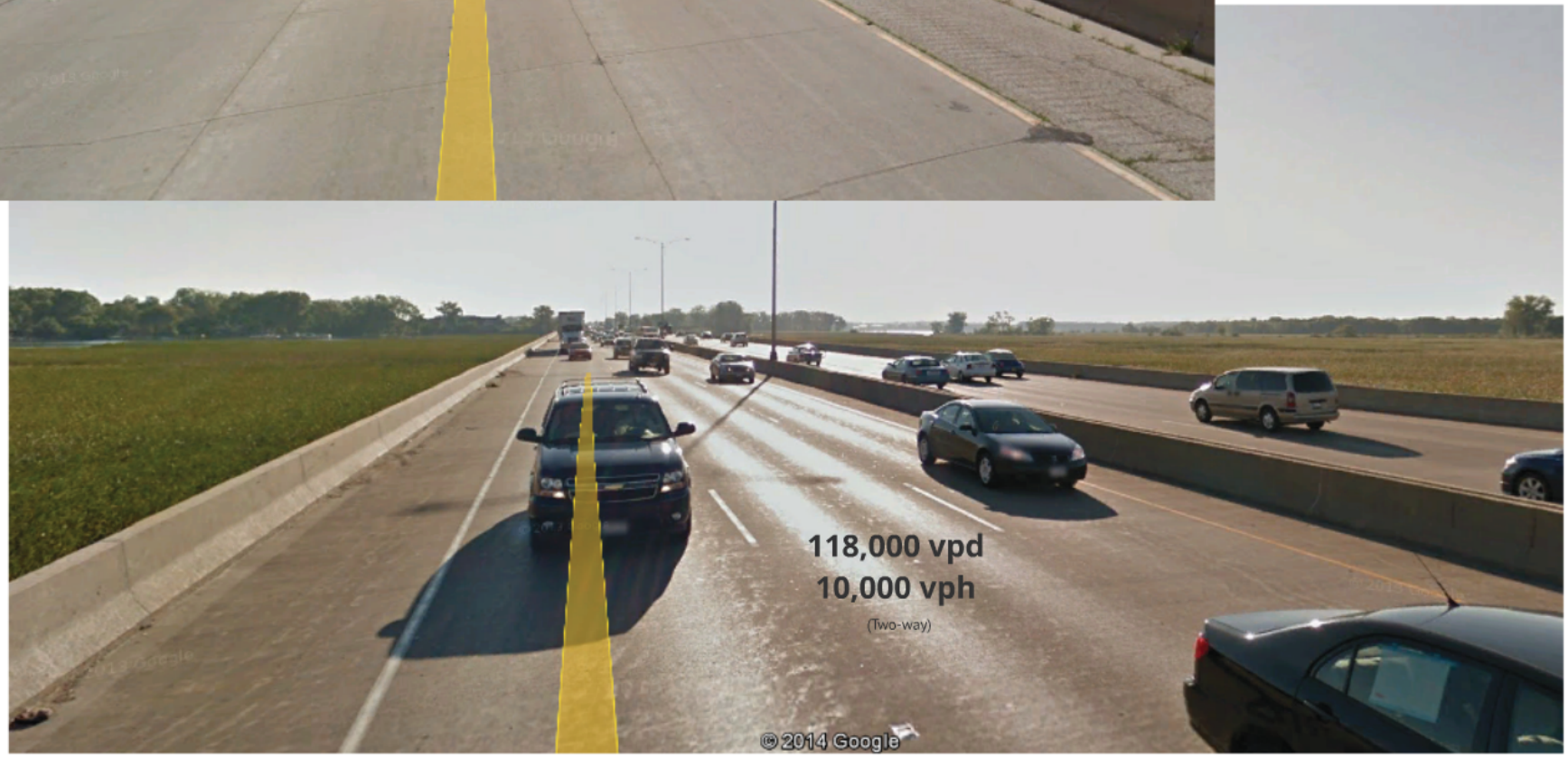
HCM 2010

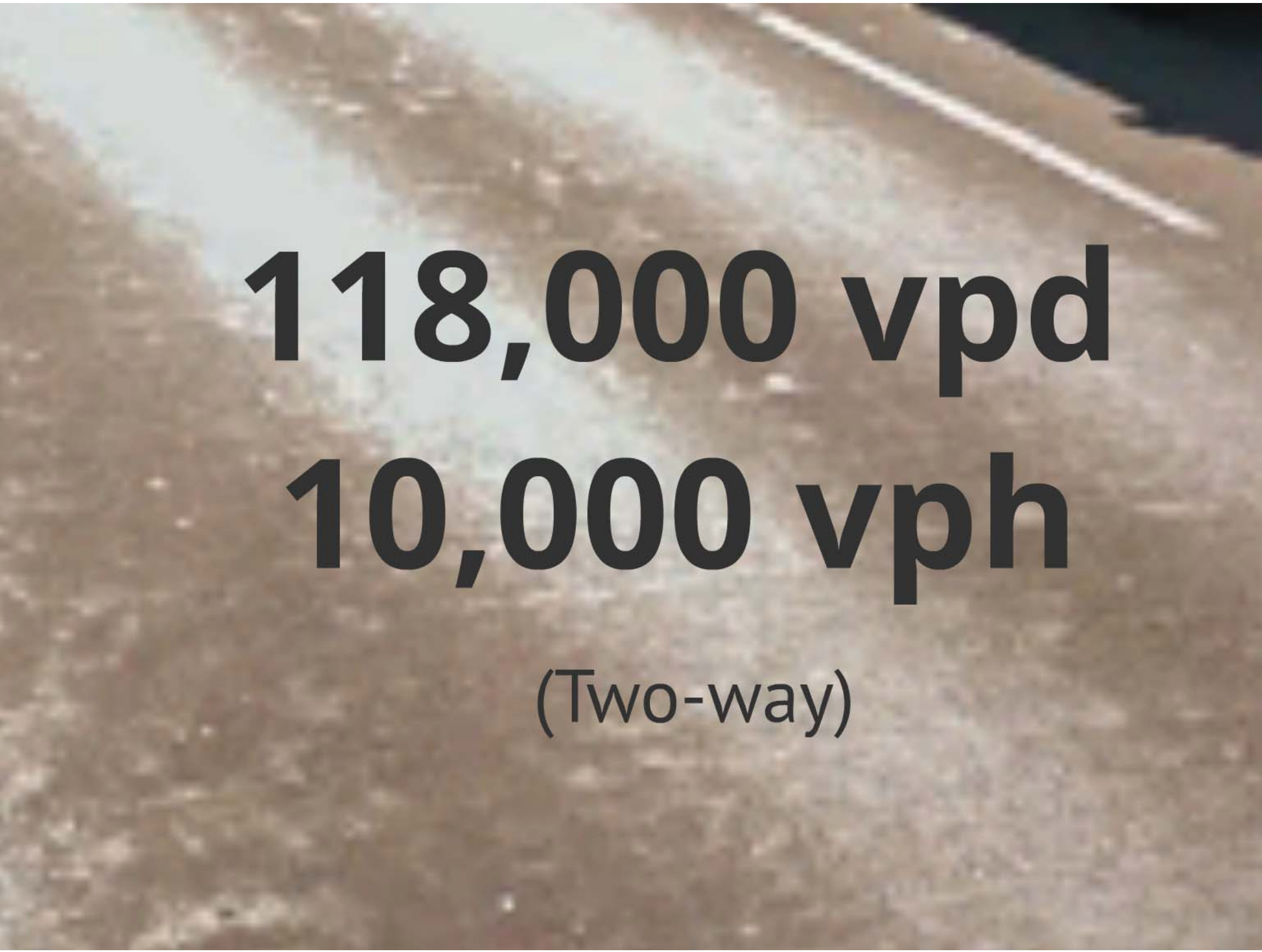

Heavy Vehicles
Intensity
Ca=(1600+I-R)(fHV)(fLS)N
Base Capacity
Ramps
Lane/Shoulder
Number of Lanes

State	Normal Lanes to Reduced Lanes					
	2 to 1	3 to 2	3 to 1	4 to 3	4 to 2	4 to 1
TX	1,340		1,170			
NC	1,690		1,640			
CT	1,500-1,800		1,500-1,800			
MO	1,240	1,430	960	1,480	1,420	
NV	1,375-1,400		1,375-1,00			
OR	1,400-1,600		1,400-1,600			
SC	950		950			
WA	1,350		1,450			
WI	1,560-1,900		1,600-2,000			
FL	1,800		1,800			
VA	1,300	1,300	1,300	1,300	1,300	1,300
IA	1,400-1,600	1,400-1,600	1,400-1,600	1,400-1,600	1,400-1,600	1,400-1,600
MA	1,340	1,490	1,170	1,520	1,480	1,170
Default	**1,400**	**1,450**	**1,450**	**1,500**	**1,450**	**1,350**

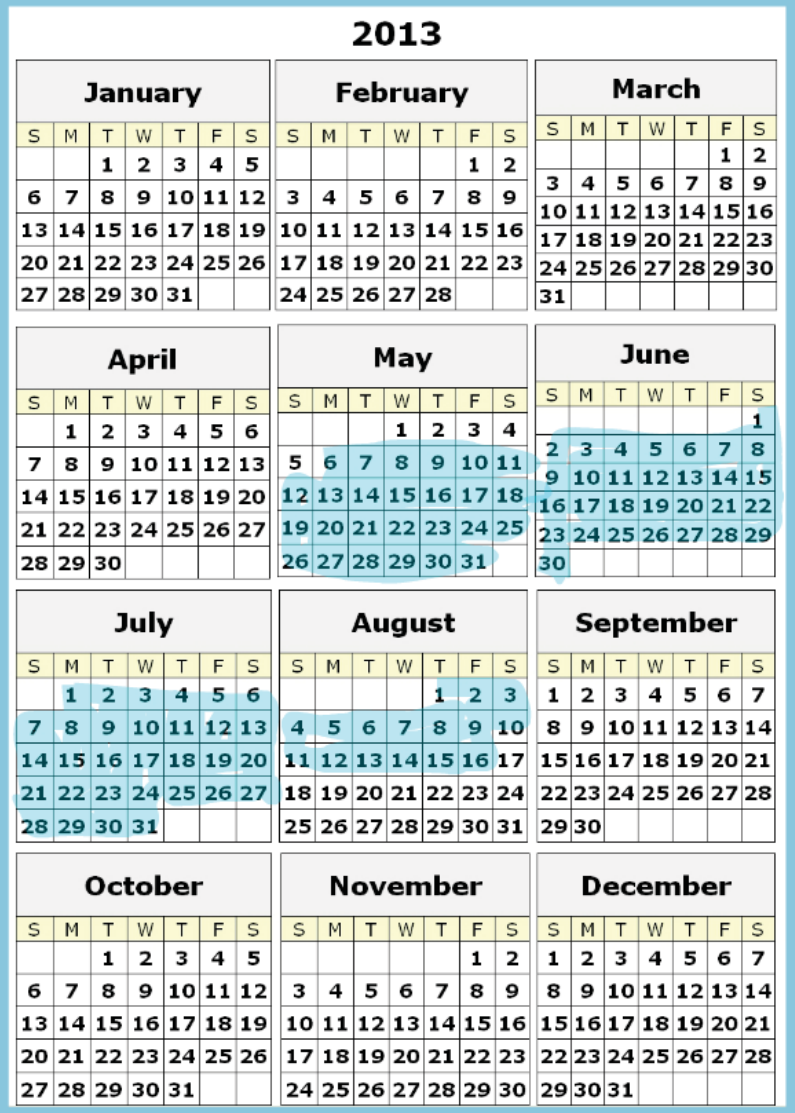
Madison
Prairie Du Sac
Sauk City
Mack Rd
Crystal Lake Rd
Lodi Marsh State Natural Area
Wangsness Rd
Bristol Rd
Smith Rd
DeForest
Muller Rd
Mueller Rd
E Main St
Kurt Rd
Windsor
Vinburn Rd
Gray Rd
Deansville State Wildlife Area
Halfway Prairie School
Indian Lake County Park
Hyer Rd
Kopp Rd
Waunakee
Woodland Dr
Token Creek County Park
Bong Rd
Berlin Rd
Sun Prairie
Canal Rd
Marshall
Yelk Rd
Empire Prairies Koch Prairie Unit State Natural Area
Cherokee Marsh State Natural Area
Balzer Rd
Northport Dr
Burke
Cross Plains
Airport Rd
Goose Lake State Wildlife Area
Old Sauk Rd
Mineral Point Rd
W Mineral Point Rd
Deerfield
Schadel Rd
Paulson Rd
Mt Horeb
Reddan Soccer Park
Verona
Smith Drumlin Prairie State Natural Area
Lake Kegonsa State Park
Donald County Park
Purcell Rd
Sun Valley Pkwy
Oregon
Rutland Dunn Town Line Rd
Lincoln Rd
Stoughton
Wittwer Rd
E Cates Rd
Frenchtown Rd
Dunkirk
Albion

Existing Facility




118,000 vpd
10,000 vph
(Two-way)

Project Details



2013

January

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

February

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28		

March

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

April

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

May

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

June

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

July

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

August

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

September

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

October

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

November

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

December

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

- Bridge rehabilitation project
- Replacement of expansion joints

27	28	29	30	31		

24	25	26	27	28		

31						

April

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

May

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

June

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

July

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

August

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

September

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

October

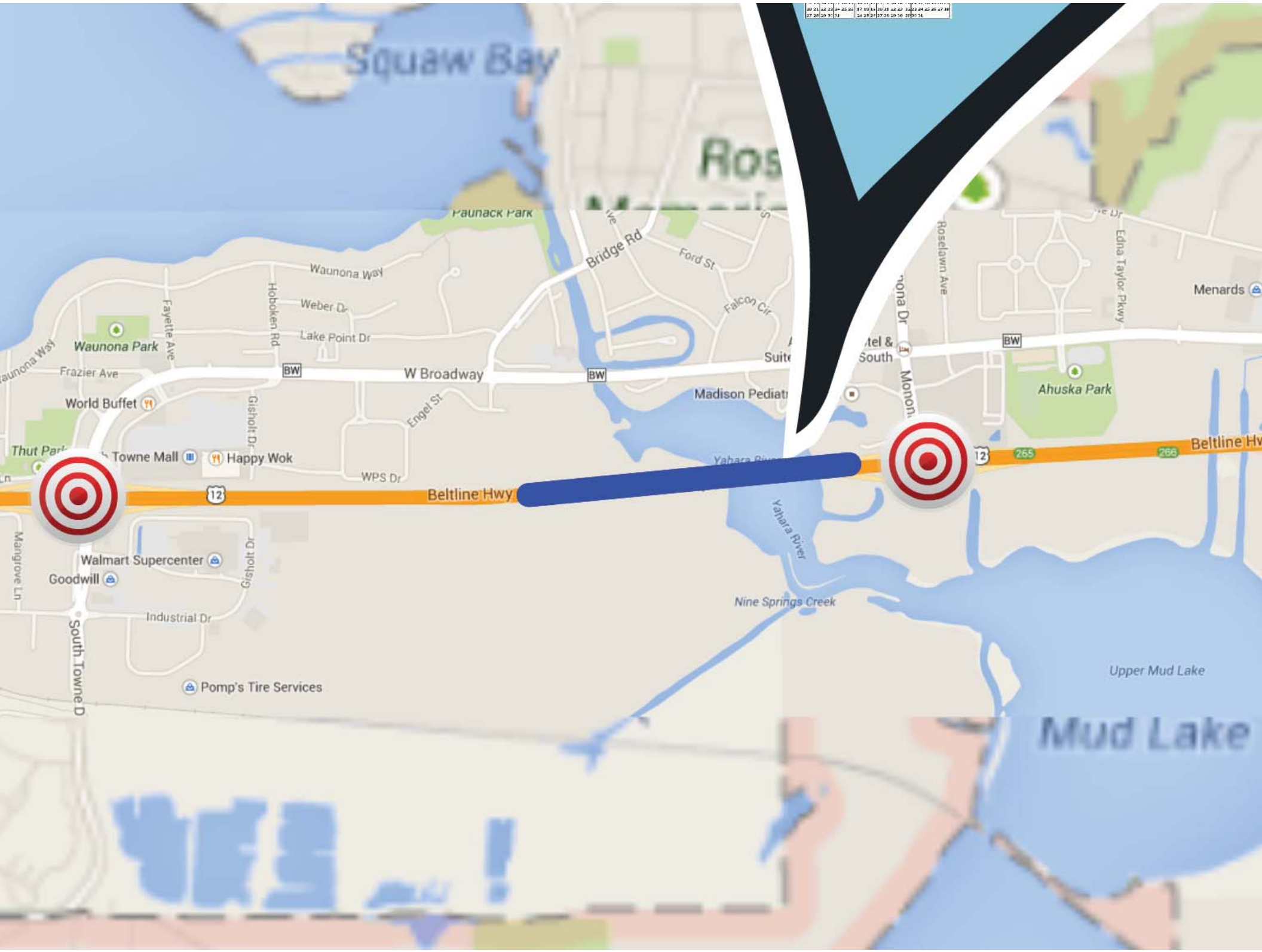
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12

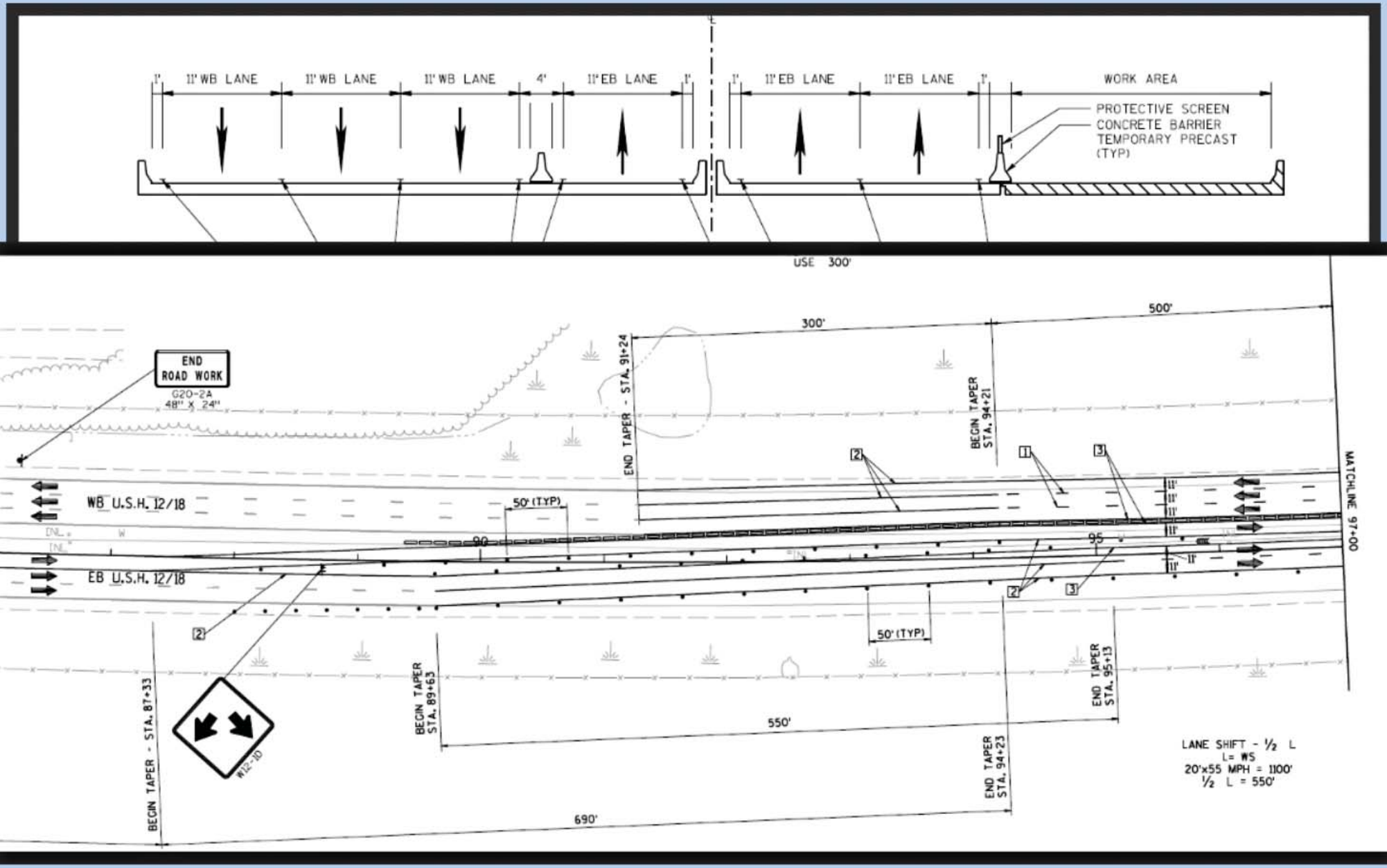
November

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9

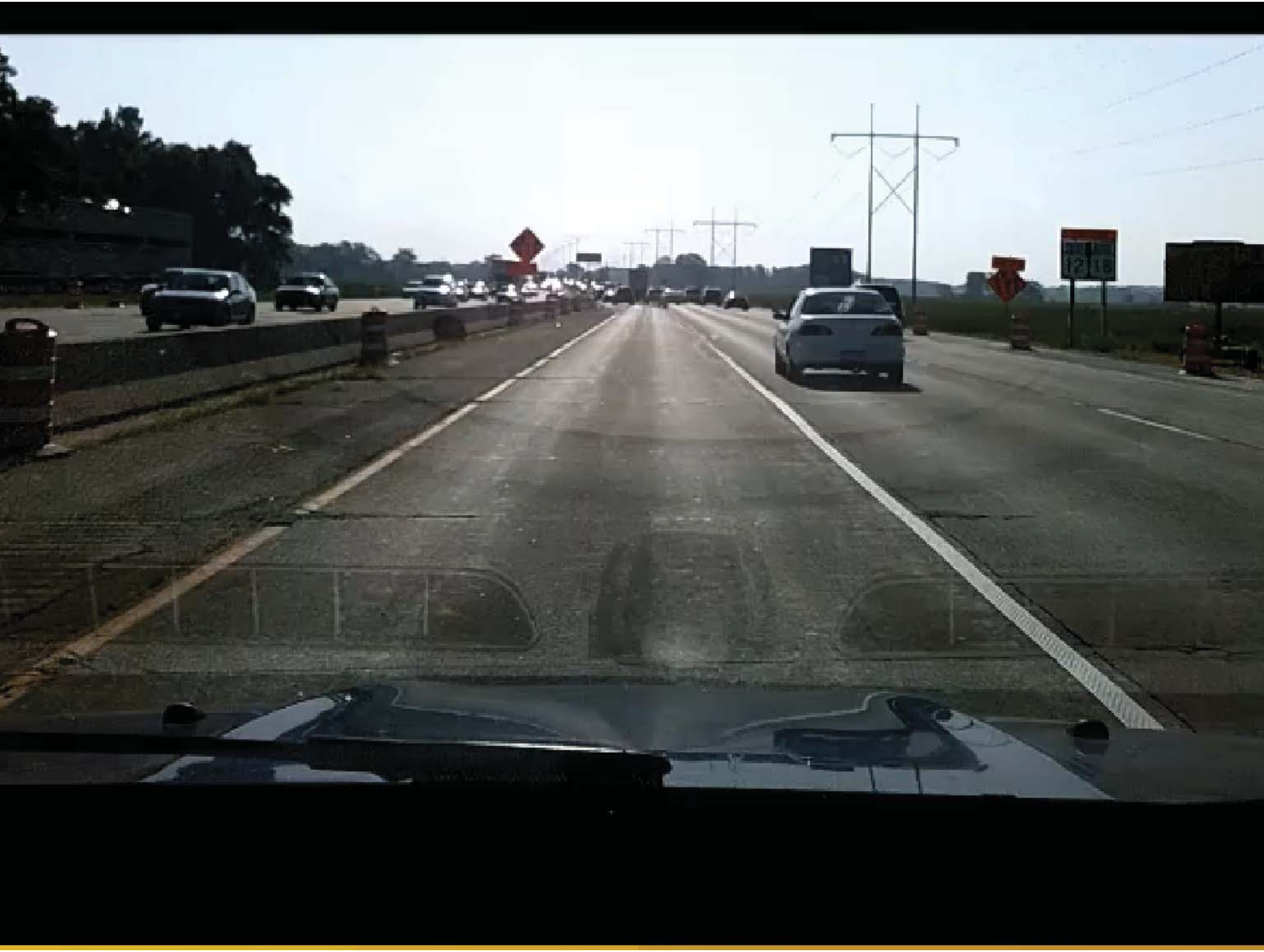
December

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14


Squaw Bay
Paunack Park
Bridge Rd
Ford St
Falcon Cir
Waunona Way
Weber Dr
Lake Point Dr
Hoboken Rd
Fayette Ave
Waunona Park
Frazier Ave
BW
W Broadway
Engel St
Gisholt Dr
World Buffet
Towne Mall
Happy Wok
WPS Dr
Beltline Hwy
12
Madison Pediatr
Roselawn Ave
Monon
Edna Taylor Pkwy
Menards
Ahuska Park
255
Yahara River
Nine Springs Creek
Walmart Supercenter
Goodwill
Industrial Dr
South Towne D
Mangrove Ln
Pomp's Tire Services
Upper Mud Lake
Mud Lake

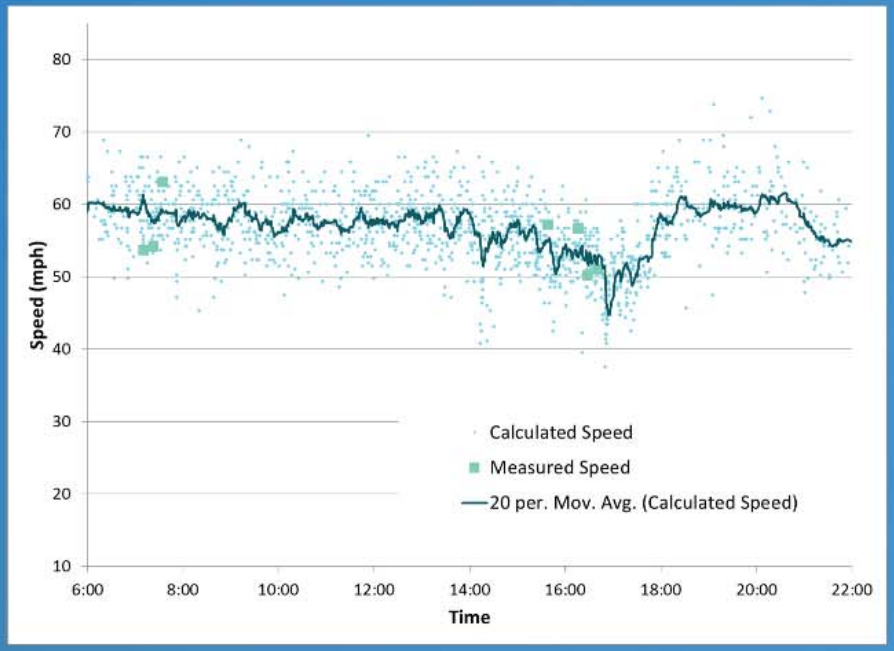

1' 11' WB LANE 11' WB LANE 11' WB LANE 4' 11' EB LANE 1'
1' 11' EB LANE 11' EB LANE 1' WORK AREA
PROTECTIVE SCREEN
CONCRETE BARRIER
TEMPORARY PRECAST
(TYP)
USE 300'
END ROAD WORK
G20-2A
48" X 24"
WB U.S.H. 12/18
EB U.S.H. 12/18
300'
500'
END TAPER - STA. 91+24
BEGIN TAPER STA. 94+21
MATCHLINE 97+00
50' (TYP)
90
95
11'
50' (TYP)
BEGIN TAPER - STA. 87+33
BEGIN TAPER STA. 89+63
END TAPER STA. 95+13
550'
END TAPER STA. 94+23
690'
W12-1D
LANE SHIFT - ½ L
L= WS
20'x55 MPH = 1100'
½ L = 550'

Upper Mud Lake
© 2013 Google
Google

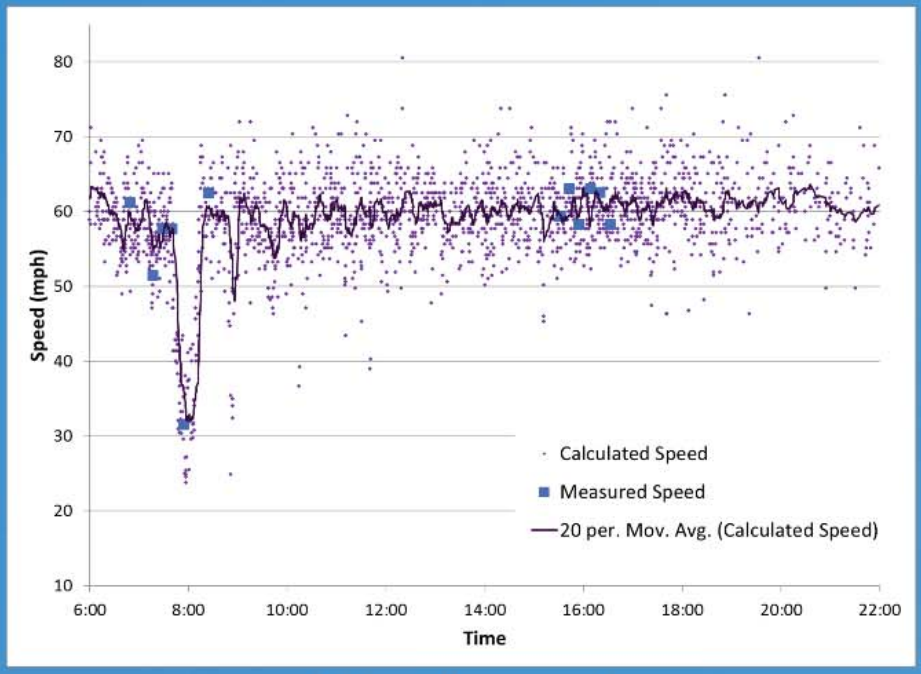


Live Video Feed
5:21 A
Back

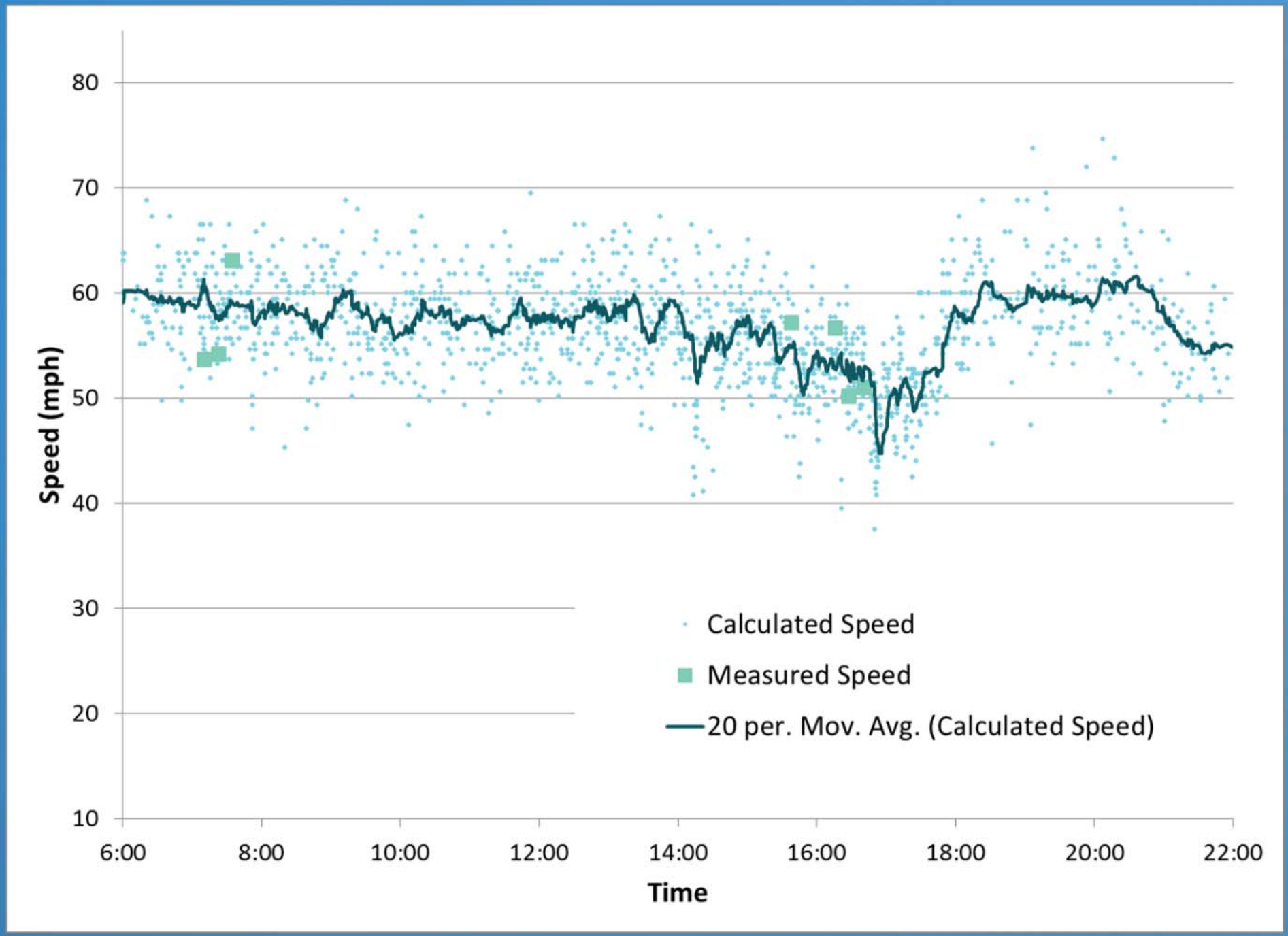
Bluetooth Data
Tuesday, July 23, 2013



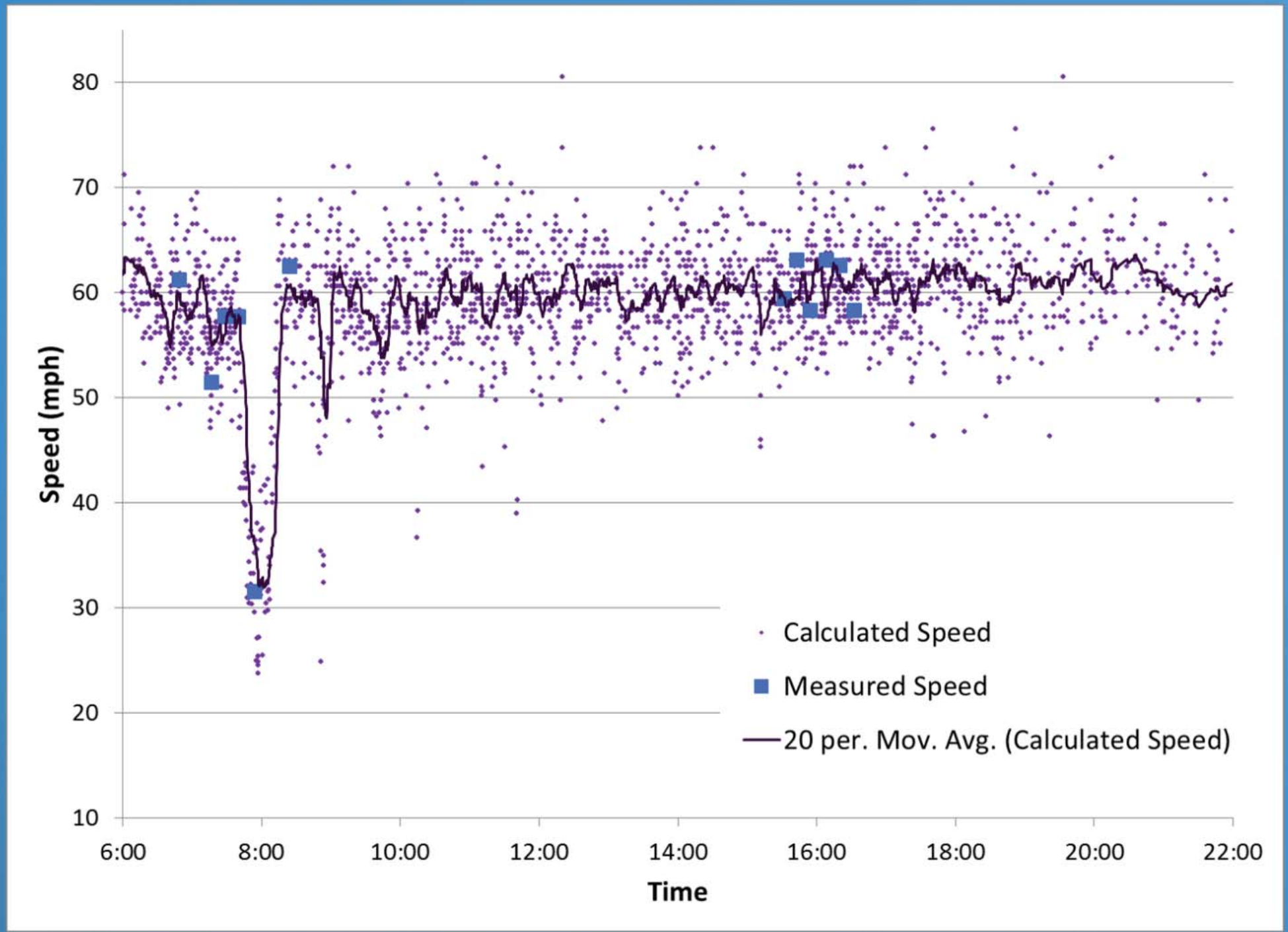
Eastbound



Westbound

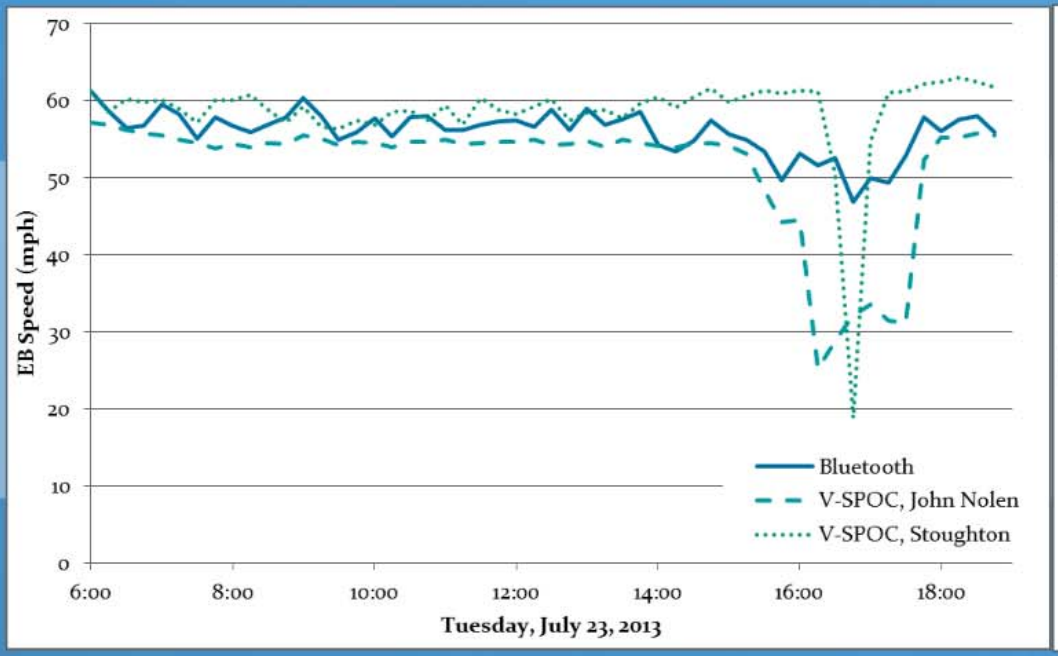

80
70
60
50
40
30
20
10
Speed (mph)
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
Time
Calculated Speed
Measured Speed
20 per. Mov. Avg. (Calculated Speed)

Eastbound

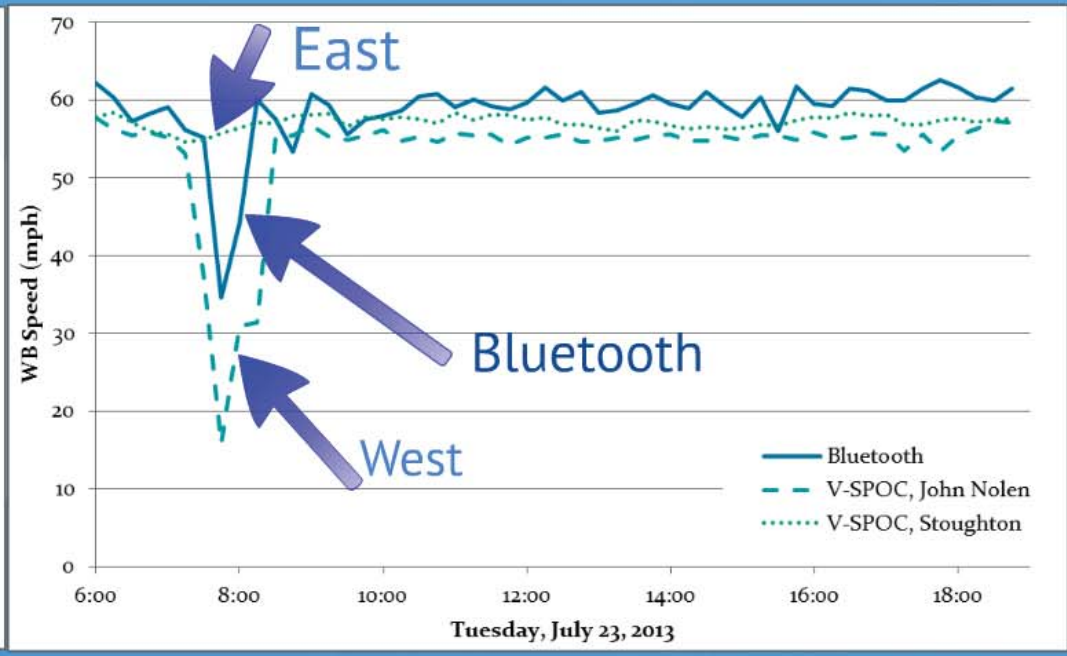

80
70
60
50
40
30
20
10
Speed (mph)
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
Time
Calculated Speed
Measured Speed
20 per. Mov. Avg. (Calculated Speed)

Westbound

Bluetooth and VSPOC

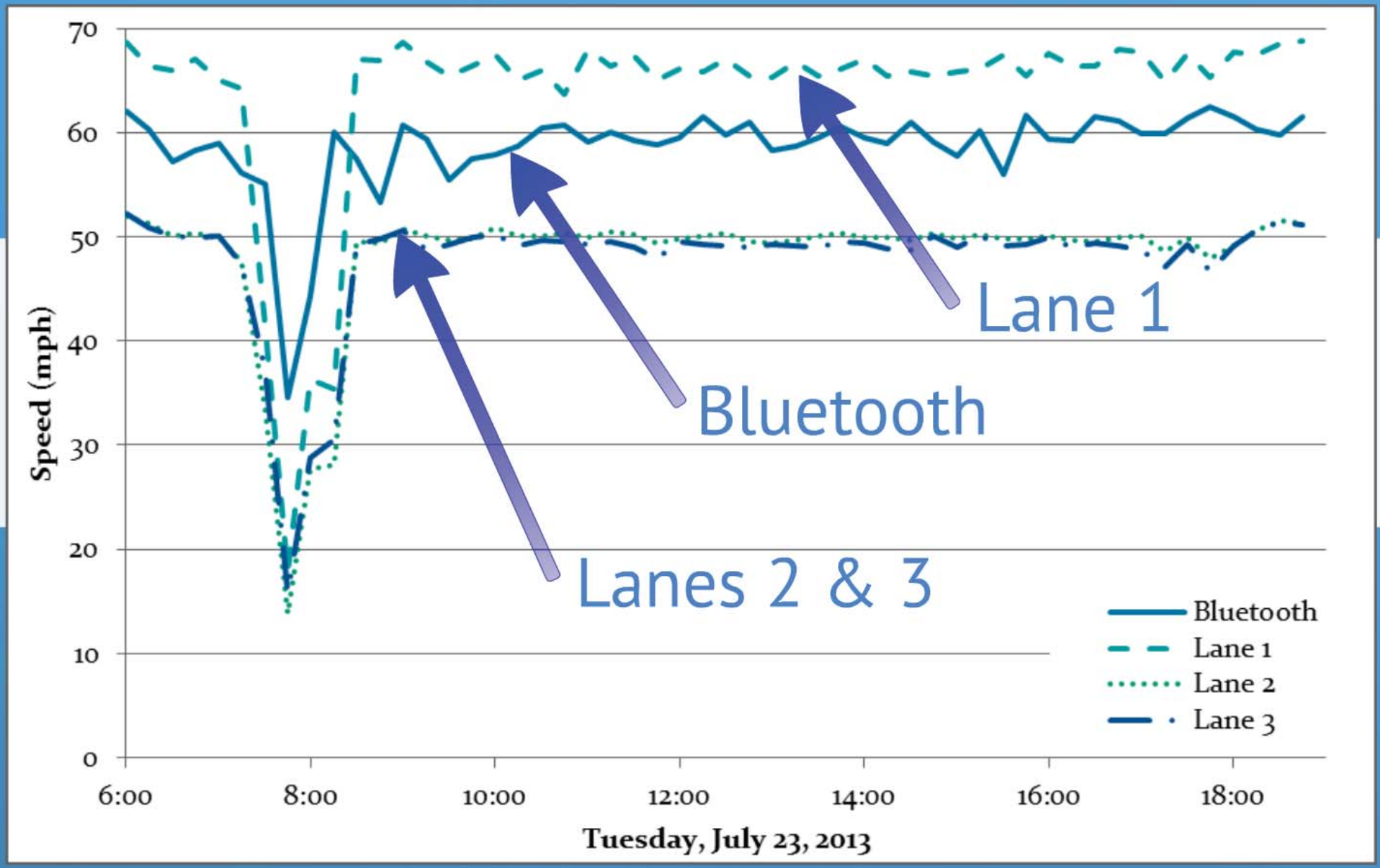


Eastbound

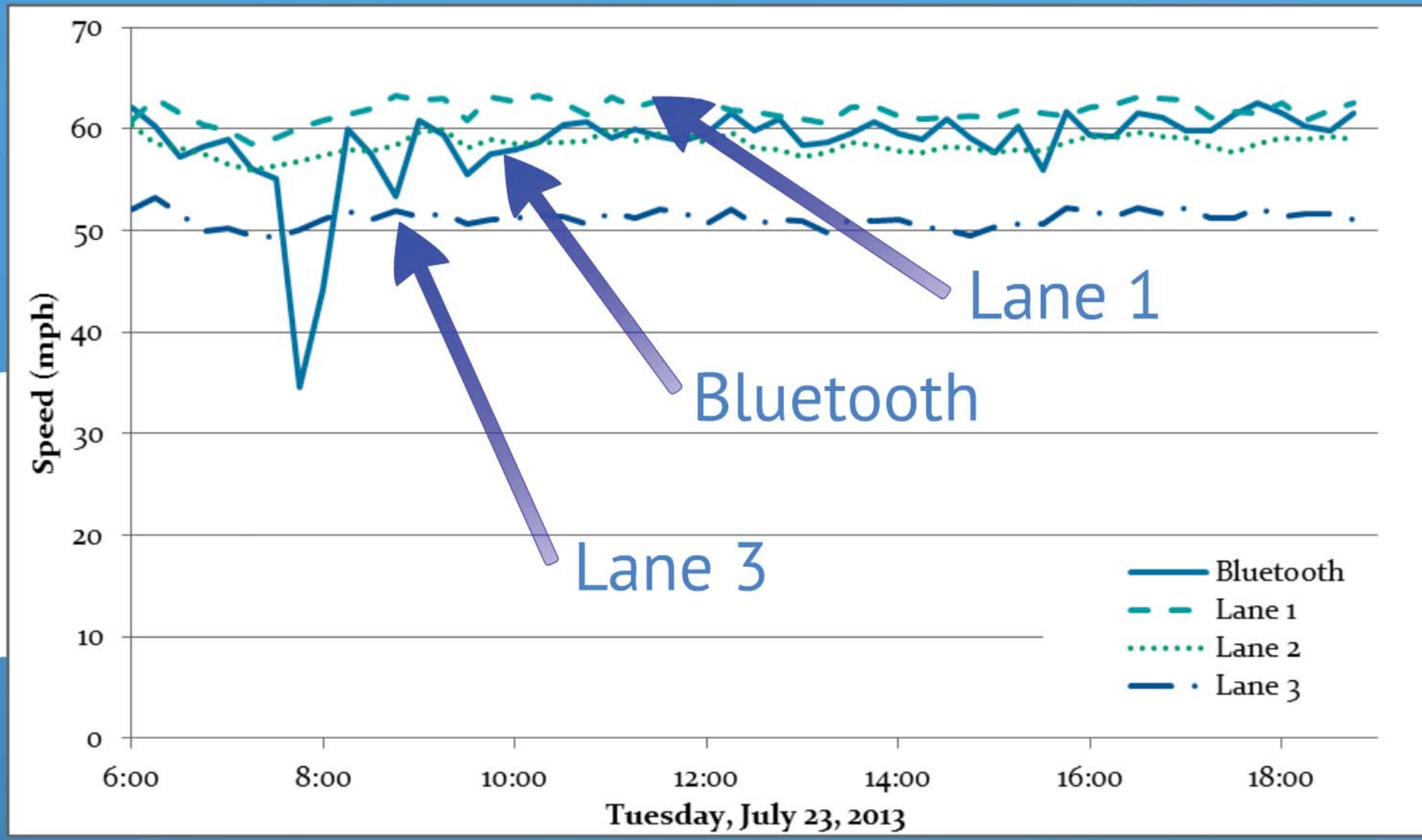


Westbound

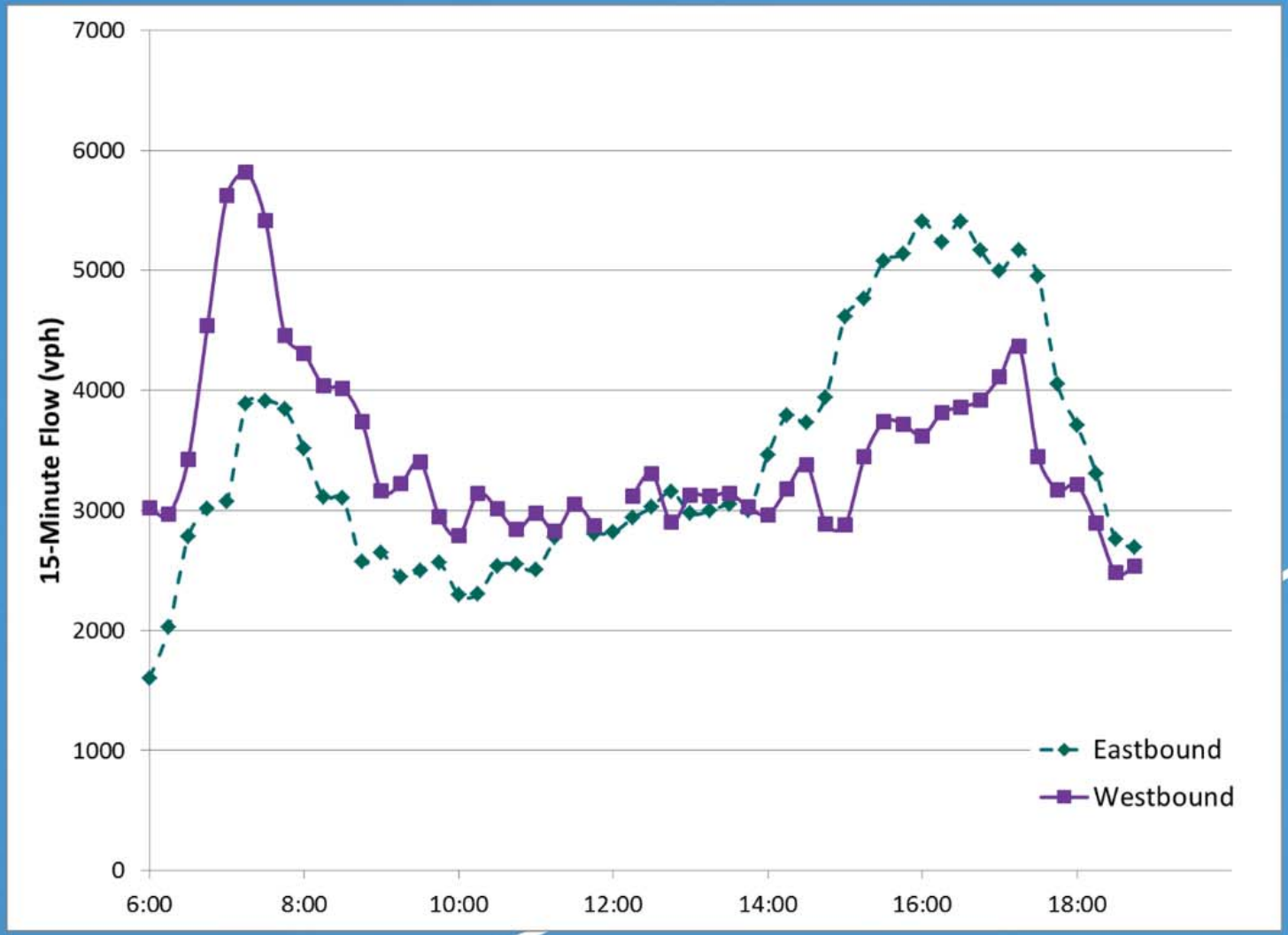
Westbound at John Nolen (West)



Westbound at Stoughton (East)



Video Camera Data
Tuesday, July 23, 2013

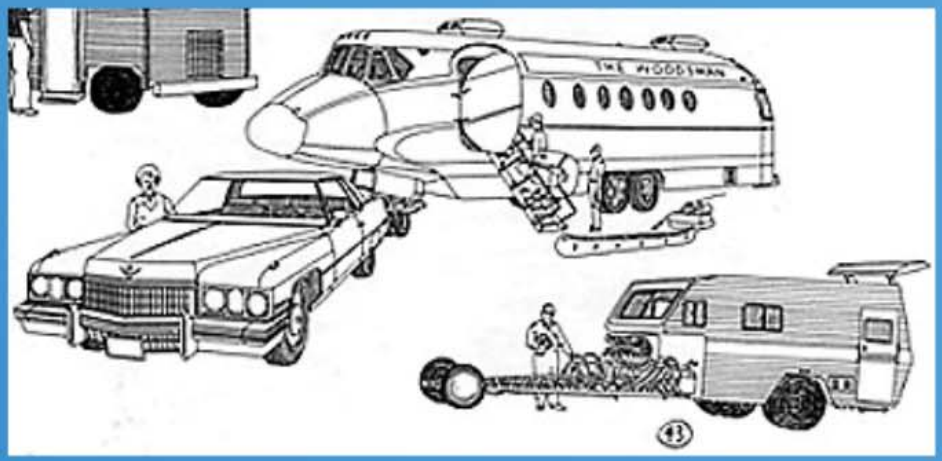


Volume Data

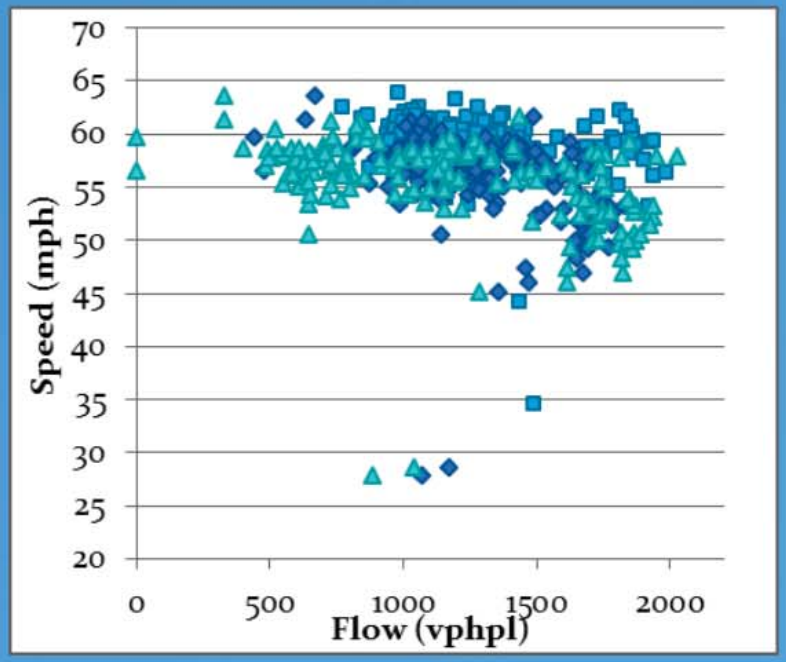
Passenger Vehicles

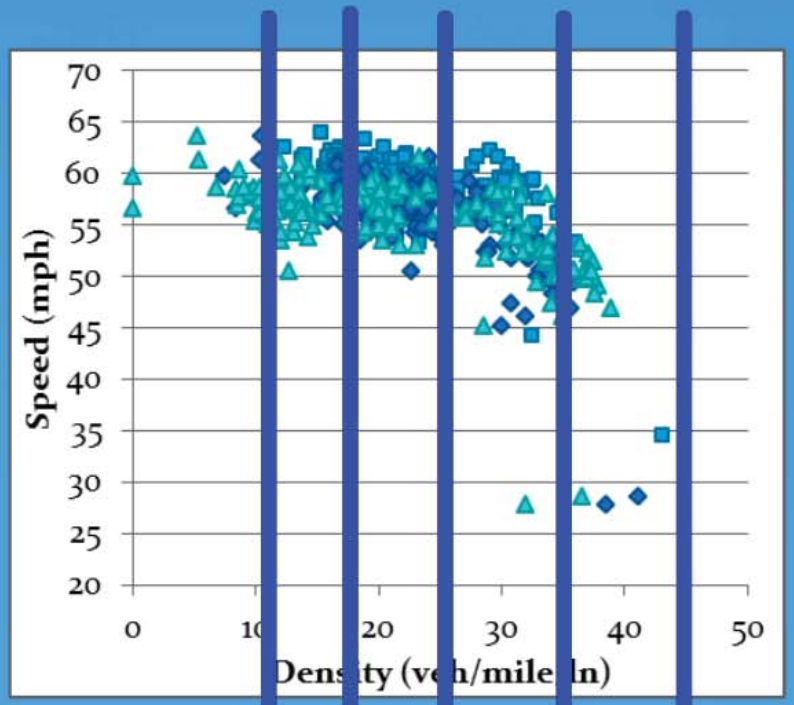
Trucks (Heavy and Medium)

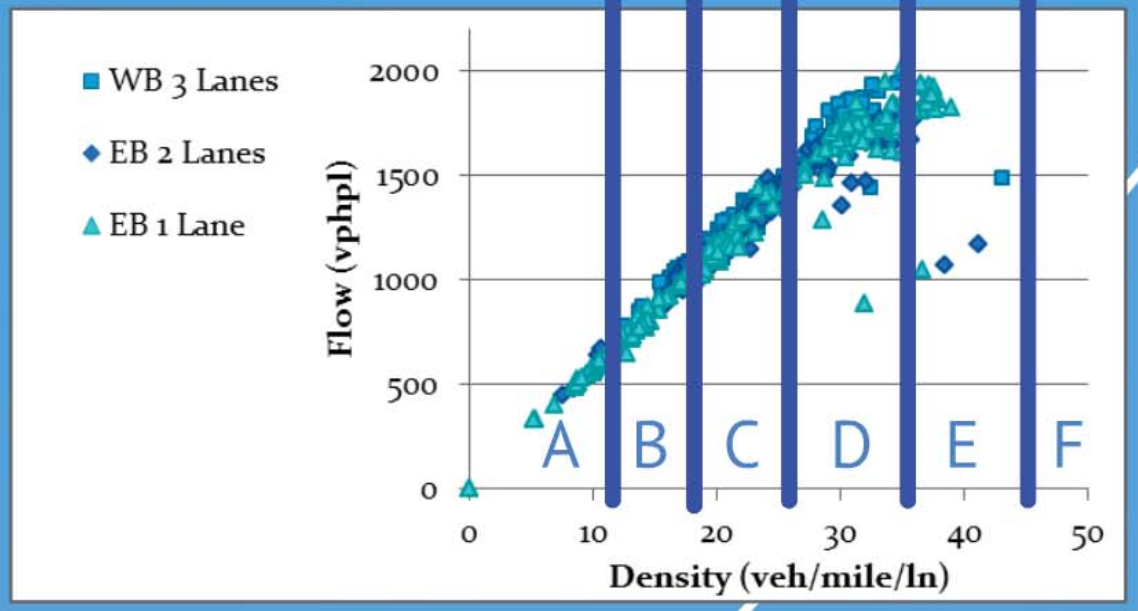
Recreational Vehicles

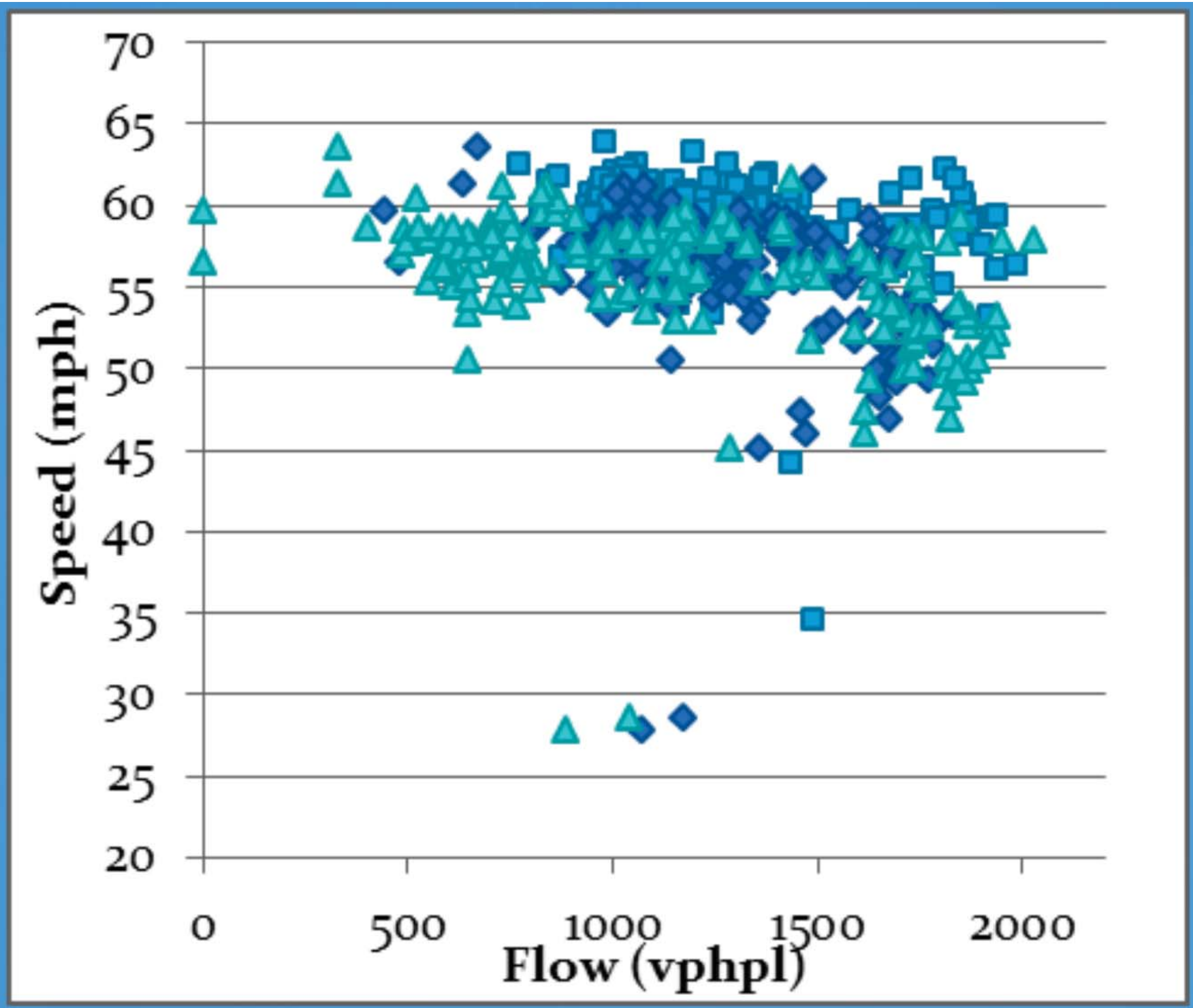


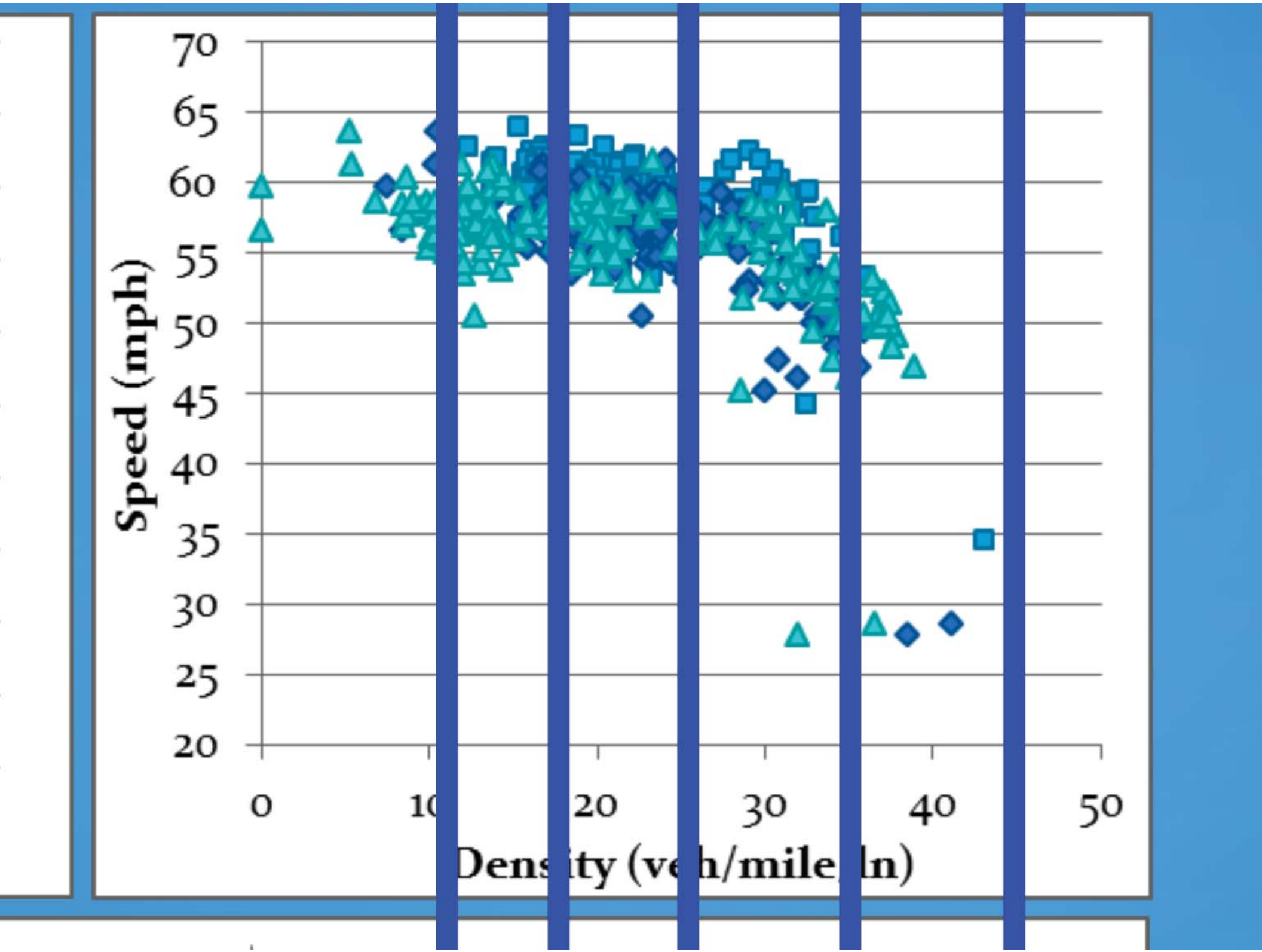
Speed, Flow, and Density

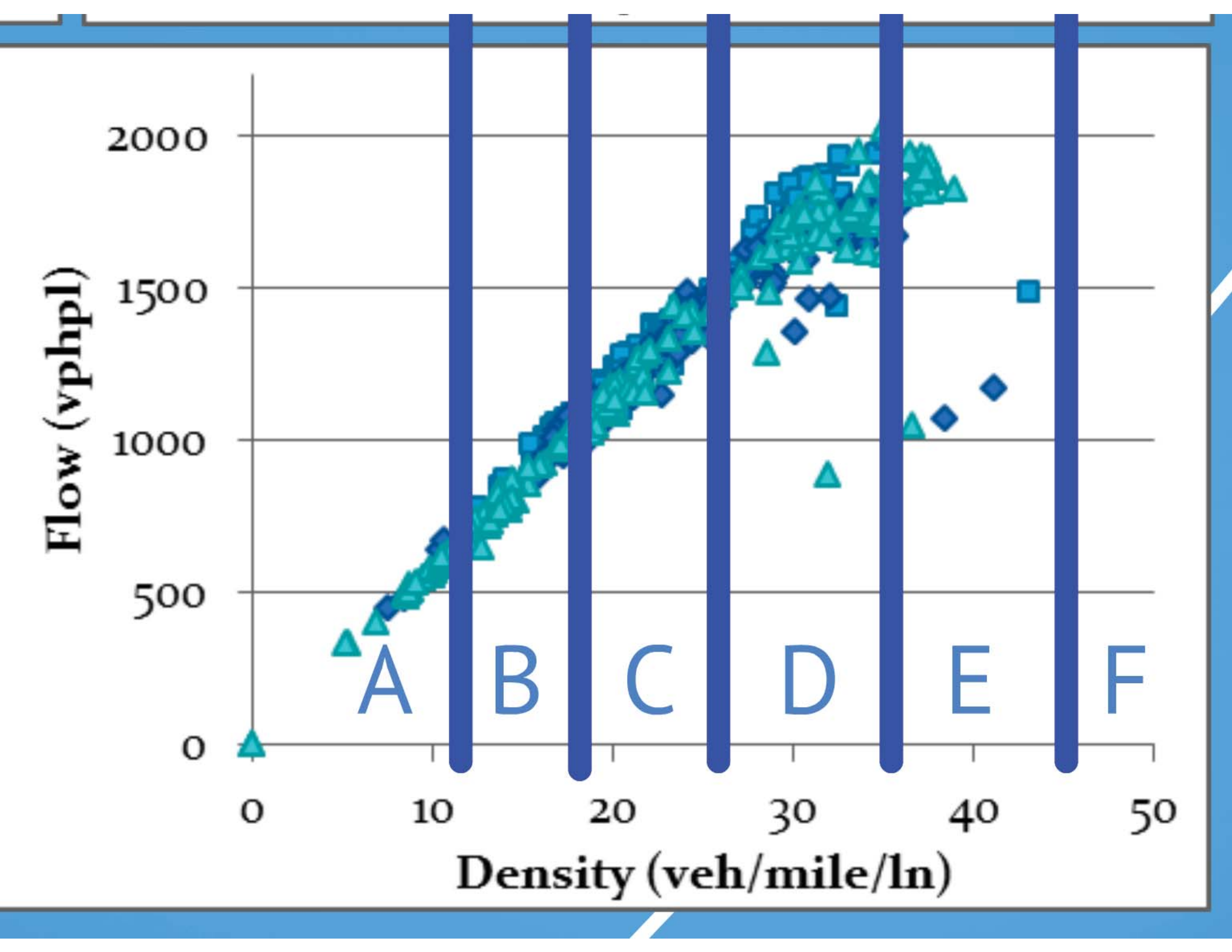







70
65
60
55
50
45
40
35
30
25
20
Speed (mph)
0
500
1000
1500
2000
Flow (vphpl)


70
65
60
55
50
45
40
35
30
25
20
Speed (mph)
0
10
20
30
40
50
Density (veh/mile/ln)


2000
1500
1000
500
0
Flow (vphpl)
A
B
C
D
E
F
0
10
20
30
40
50
Density (veh/mile/ln)

Findings

Capacity

Lane Usage

Future Projects

Capacity

Lane Configuration	Maximum			Average of top 10			Average of top 20		
	Flow (vphpl)	Truck Percent	Speed (mph)	Flow (vphpl)	Truck Percent	Speed (mph)	Flow (vphpl)	Truck Percent	Speed (mph)
EB 2-lanes	1838	4.68%	50	1775	5.44%	52	1747	5.30%	53
EB 1-lane	2098	0.39%	58	1925	1.38%	53	1887	1.24%	53
EB Combined	1867	3.43%	53	1812	4.05%	53	1782	3.79%	53
WB 3-lanes	1984	5.31%	56	1905	5.68%	58	1853	5.73%	59

TMP Capacity 1475 vphpl

Eastbound

Westbound

Lane Configuration	Maximum		
	Flow (vphpl)	Truck Percent	Speed (mph)
EB 2-lanes	1838	4.68%	50
EB 1-lane	2098	0.39%	58
EB Combined	1867	3.43%	53
WB 3-lanes	1984	5.31%	56

TMP Capacity 1475 vphpl

Eastbound

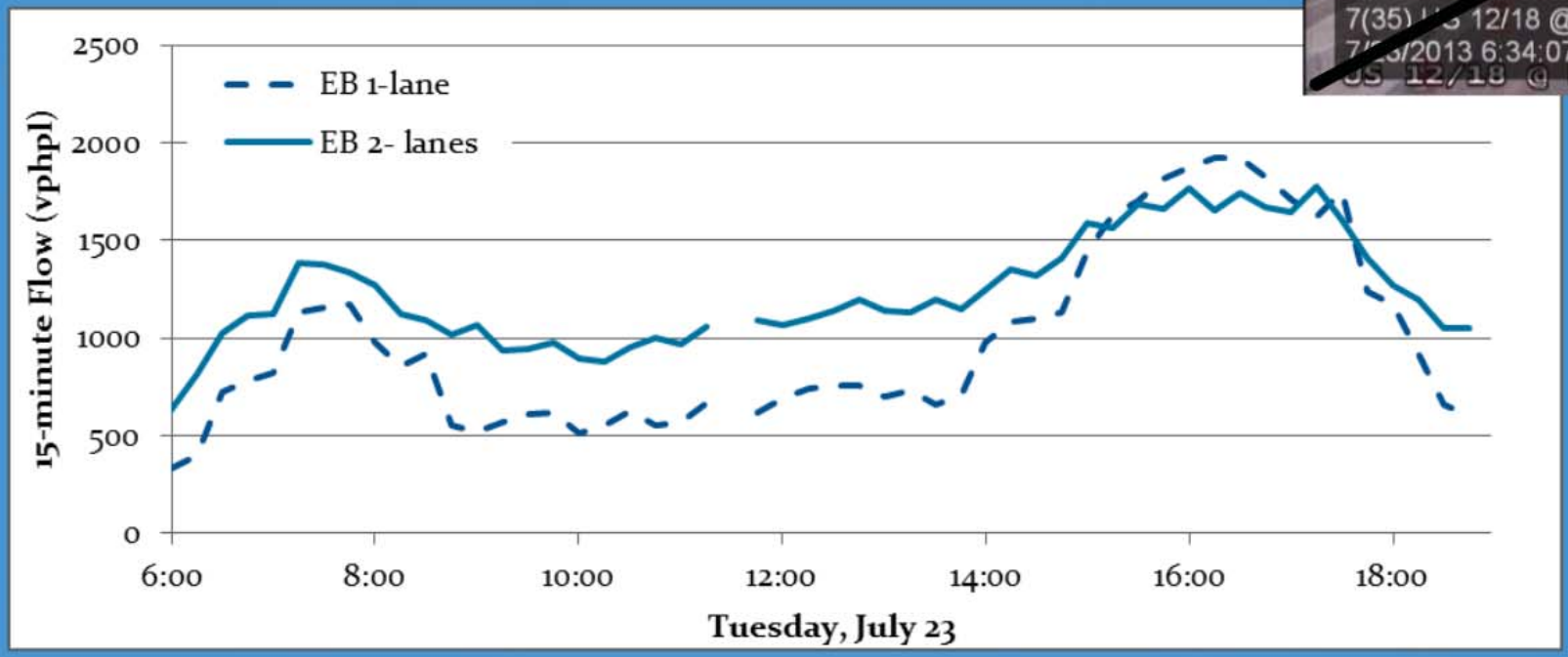
Flow (vphpl)	1838	2098	1867	1984
Per	4.0	0.3	3.7	5.3

TMP Capacity 1475 vphpl

Eastbound

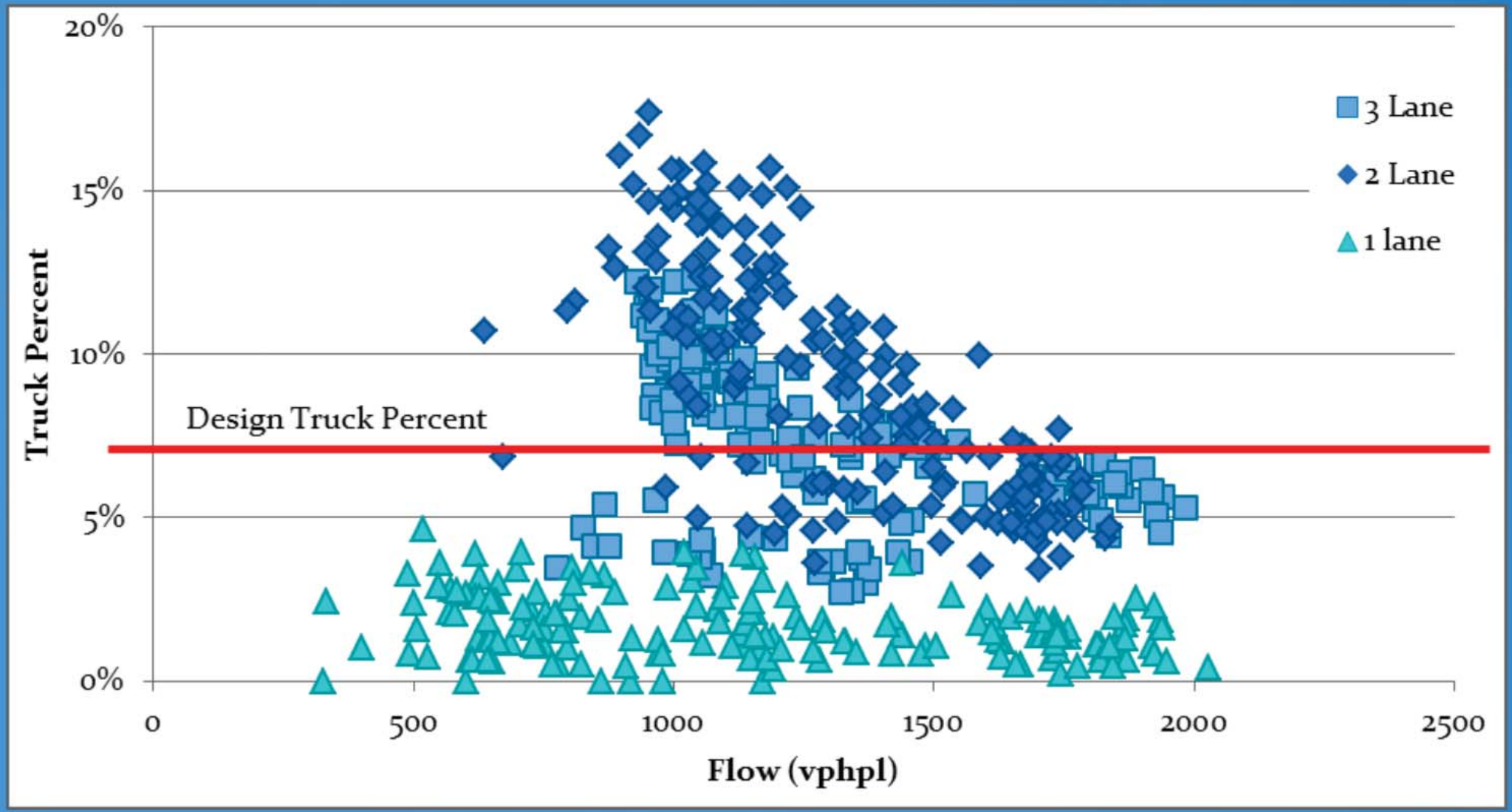
Westbound

Eastbound Lane Usage



7(35) US 12/18 @ Monona Rd
7/23/2013 6:34:07 AM
US 12/18 @ MONONA DR

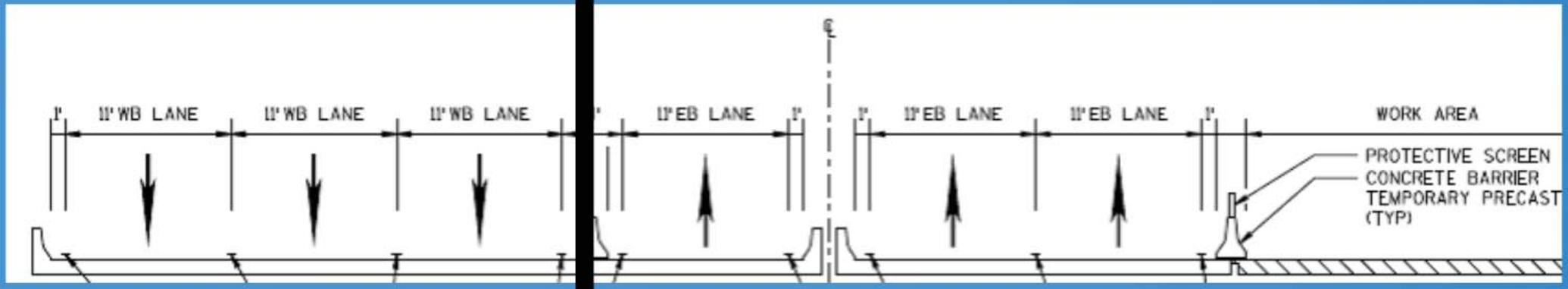
Truck Lane Usage



Contraflow Staging

3-Lanes
Reduced lane width
Reduced shoulder width

2-Lanes / 1-Lane Split
Reduced lane width
Reduced shoulder width



1,900 vphpl

1,900 vphpl

1,750 vphpl

1,800 vphpl