Friendship Heights Transportation Study Addendum

Appendix

Prepared for:
The District of Columbia Department of Transportation

Prepared by:
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June 2005

Appendix A

Estimates of Development Square Footage/Dwelling Units and Additional Trips Generated by Proposed Developments

Estimates of Additional Trips Generated by Proposed Developments

Project:

Chase Point - Proposed Development

Data:

107 Luxury Condominiums

From ITE:

	Residential - Luxury Condominium	Entering	Leaving	obs
0.56	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.23	0.77	4
0.55	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.63	0.37	4
0.5	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.54	0.46	Estimated based on Residential Condo/Townhome

Trip Rates:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Luxury Condos	Trips Per Residential Units	0.13	0.43	0.56	0.35	0.20	0.55	0.27	0.23	0.50

Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Luxury Condos	Trips Per Residential Units	14	46	60	37	22	59	29	25	54
	Total	**14**	**46**	**60**	**37**	**22**	**59**	**29**	**25**	**54**

Trip Reductions:

	Residential
Transit	40%
Internal Capture (People Walking)	10%
Pass-By trips	0%
Total	**50%**

Adjusted Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Residential Condos	Trips Per Residential Units	7	23	30	19	11	30	15	13	28
	Total	**7**	**23**	**30**	**19**	**11**	**30**	**15**	**13**	**28**

Estimates of Additional Trips Generated by Proposed Developments

Project:

Wisconsin Place - Proposed Development (renovation of Hecht's)

Data:

433	Apartments- Rental	480000	15 levels
305,000	SF - Office		
305,000	SF - Retail		4 levels underground parking
20,500	Community Center		1750 vehicles

From ITE:

		Entering	Leaving
	Residential - High-Rise Apartments		
0.30	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.25	0.75
0.35	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.61	0.39
0.4	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.57	0.43
	Office - General Office Building		
1.55	Ave. Trip Rate AM Peak Hour	0.88	0.12
1.49	Ave. Trip Rate PM Peak Hour	0.17	0.83
0.41	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.54	0.46
	Retail - Shopping Center		
1.03	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.61	0.39
3.75	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.48	0.52
4.97	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.52	0.48
	Recreational Community Center		
1.62	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.61	0.39
1.64	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.29	0.71
1.28	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.49	0.51

Trip Rates:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Residential Apartments	Trips Per Residential Units	0.08	0.23	0.30	0.21	0.14	0.35	0.23	0.17	0.40
General Office Bldg	Trips Per 1000 SF	1.36	0.19	1.55	0.25	1.24	1.49	0.22	0.19	0.41
General Office Bldg	Trips Per 1000 SF	0.63	0.40	1.03	1.80	1.95	3.75	2.58	2.39	4.97
Community Center	Trips Per 1000 SF	0.99	0.63	1.62	0.48	1.16	1.64	0.63	0.65	1.28

Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Residential Apartments	Trips Per Residential Units	32	97	129	92	59	151	99	74	173
General Office Bldg	Trips Per 1000 SF	416	57	473	77	377	454	68	58	126
General Office Bldg	Trips Per 1000 SF	192	123	315	549	595	1144	788	728	1516
Community Center	Trips Per 1000 SF	20	13	33	10	24	34	13	13	26
	Total	**660**	**290**	**950**	**728**	**1055**	**1783**	**968**	**873**	**1841**

Estimates of Additional Trips Generated by Proposed Developments

Trip Reductions:

	Residential	Commercial
Transit	40%	30%
Internal Capture (People Walking)	10%	10%
Pass-By trips	0%	10%
Total	**50%**	**50%**

Adjusted Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Residential Apartments	Trips Per Residential Units	16	49	65	46	30	76	50	37	87
General Office Bldg	Trips Per 1000 SF	208	29	237	39	189	228	34	29	63
General Office Bldg	Trips Per 1000 SF	96	62	158	275	298	573	394	364	758
Community Center	Trips Per 1000 SF	10	7	17	5	12	17	7	7	14
	Total	**330**	**147**	**477**	**365**	**529**	**894**	**485**	**437**	**922**

Trips Generated by Existing Development

Data:

176,188 SF - Retail

From ITE:

Retail - Shopping Center

1.03	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.61	0.39
3.74	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.48	0.52
4.97	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.52	0.48

Trip Rates:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Shoping Center	Trips Per 1000 SF	0.63	0.40	1.03	1.80	1.94	3.74	2.58	2.39	4.97

Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Shoping Center	Trips Per 1000 SF	111	71	182	316	593	909	455	728	1183
	Total	**111**	**71**	**182**	**316**	**593**	**909**	**455**	**728**	**1183**

Trip Reductions:

	Residential	Commercial
Transit	40%	30%
Internal Capture (People Walking)	10%	10%
Pass-By trips	0%	10%
Total	**50%**	**50%**

Estimates of Additional Trips Generated by Proposed Developments

Adjusted Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Shoping Center	Trips Per 1000 SF	56	36	92	158	297	455	228	364	592
	Total	**56**	**36**	**92**	**158**	**297**	**455**	**228**	**364**	**592**

Net Trip Addition by Proposed Development:

	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
Total	**274**	**111**	**385**	**207**	**232**	**439**	**257**	**73**	**330**

Estimates of Additional Trips Generated by Proposed Developments

Project:

Chevy Chase Center - Proposed Development

Data:

200,000	SF - Office - Headquarters	
20,000	Supermarket	412,000 total
9,000	Restaurant	
183,000	Specialty Retail Retail	

There was no information provided by the developer regarding the size of the restaurant and the supermarket. The areas were estimated based on the average size reported on the ITE manual.

From ITE:

		Entering	Leaving	
	Office - Headquarters			
1.49	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.93	0.7	
1.40	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.10	0.90	
0.13	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.44	0.56	
	Retail - Supermarket			
3.25	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.61	0.39	
10.45	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.51	0.49	
10.76	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.51	0.49	
	Retail - Quality Restaurant			
0.81	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.67	0.33	
7.49	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.67	0.33	
10.82	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.59	0.41	
	Retail - Specialty Retail Center			
0.74	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.61	0.39	Estimated based on Shopping
2.71	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.44	0.56	Center Comparison
4.20	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.51	0.49	Estimated from Saturday trips

Trip Rates:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Office - Headquarters	Trips Per 1000 SF	1.39	1.04	2.43	0.14	1.26	1.40	0.06	0.07	0.13
Supermarket	Trips Per 1000 SF	1.98	1.27	3.25	5.33	5.12	10.45	5.49	5.27	10.76
Quality Restaurant	Trips Per 1000 SF	0.54	0.27	0.81	5.02	2.47	7.49	6.38	4.44	10.82
Specialty Retail Center	Trips Per 1000 SF	0.45	0.29	0.74	1.19	1.52	2.71	2.14	2.06	4.20

Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Office - Headquarters	Trips Per 1000 SF	277	209	486	28	252	280	11	15	26
Supermarket	Trips Per 1000 SF	40	25	65	107	102	209	110	105	215
Quality Restaurant	Trips Per 1000 SF	5	2	7	45	22	67	57	89	146
Specialty Retail Center	Trips Per 1000 SF	83	53	136	218	278	496	392	377	769
	Total	**405**	**289**	**694**	**398**	**654**	**1052**	**570**	**586**	**1156**

Estimates of Additional Trips Generated by Proposed Developments

Trip Reductions:

	Residential	Commercial
Transit	0%	30%
Internal Capture (People Walking)	0%	10%
Pass-By trips	0%	10%
Total	**0%**	**50%**

Adjusted Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Office - Headquarters	Trips Per 1000 SF	139	105	244	14	126	140	6	8	14
Supermarket	Trips Per 1000 SF	20	13	33	54	51	105	55	53	108
Quality Restaurant	Trips Per 1000 SF	3	1	4	23	11	34	29	45	74
Specialty Retail Center	Trips Per 1000 SF	42	27	69	109	139	248	196	189	385
	Total	**204**	**146**	**350**	**200**	**327**	**527**	**286**	**295**	**581**

Trips Generated by Existing Development

Data:

34,361 SF - General Office Building
47,091 SF - Retail
16,700 Supermarket

From ITE:

	General Office Building	Entering	Leaving	
1.56	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.88	0.12	
1.49	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.17	0.83	
0.41	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.54	0.46	
	Retail - Specialty Retail Center			
0.74	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.57	0.43	Estimated based on Shopping
2.71	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.43	0.57	Center Comparison
4.20	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.51	0.49	Estimated from Saturday trips
	Retail - Supermarket			
3.25	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.61	0.39	
10.45	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.51	0.49	
10.76	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.51	0.49	

Trip Rates:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
General Office	Trips Per 1000 SF	1.37	0.19	1.56	0.25	1.24	1.49	0.22	0.19	0.41
Specialty Retail	Trips Per 1000 SF	0.42	0.32	0.74	1.17	1.54	2.71	2.14	2.06	4.20
Supermarket	Trips Per 1000 SF	1.98	1.27	3.25	5.33	5.12	10.45	5.49	5.27	10.76

Estimates of Additional Trips Generated by Proposed Developments

Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
General Office	Trips Per 1000 SF	47	6	53	9	42	51	8	6	14
Specialty Retail	Trips Per 1000 SF	20	15	35	55	73	128	101	97	198
Supermarket	Trips Per 1000 SF	33	21	54	89	86	175	92	88	180
	Total	**100**	**42**	**142**	**153**	**201**	**354**	**201**	**191**	**392**

Trip Reductions:

	Residential	Commercial
Transit	40%	30%
Internal Capture (People Walking)	10%	10%
Pass-By trips	0%	10%
Total	**50%**	**50%**

Adjusted Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
General Office	Trips Per 1000 SF	24	3	27	5	21	26	4	3	7
Specialty Retail	Trips Per 1000 SF	10	8	18	28	37	65	51	49	100
Supermarket	Trips Per 1000 SF	17	11	28	45	43	88	46	44	90
	Total	**51**	**22**	**73**	**78**	**101**	**179**	**101**	**96**	**197**

Net Trip Addition by Proposed Development:

	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
Total	**153**	**124**	**277**	**122**	**226**	**348**	**185**	**199**	**384**

Estimates of Additional Trips Generated by Proposed Developments

Project:

Chase Tower (Office Building)

Data:

241,223 SF - Office

From ITE:

	Office - General Office Building	Entering	Leaving
1.55	Ave. Trip Rate AM Peak Hour	0.88	0.12
1.49	Ave. Trip Rate PM Peak Hour	0.17	0.83
0.41	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.54	0.46

Trip Rates:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
General Office Bldg	Trips Per 1000 SF	1.36	0.19	1.55	0.25	1.24	1.49	0.22	0.19	0.41

Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
General Office Bldg	Trips Per 1000 SF	329	45	374	61	298	359	53	45	98
	Total	**329**	**45**	**374**	**61**	**298**	**359**	**53**	**45**	**98**

Trip Reductions:

	Residentia	Commercial
Transit	40%	30%
Internal Capture (People Walking)	10%	10%
Pass-By trips	0%	10%
Total	**50%**	**50%**

Adjusted Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
General Office Bldg	Trips Per 1000 SF	165	23	188	31	149	180	27	23	49
	Total	**165**	**23**	**188**	**31**	**149**	**180**	**27**	**23**	**49**

Estimates of Additional Trips Generated by Proposed Developments

Project:

Mazza Parking Lot

Data:

234	Luxury Condos
200,000	SF- Retail
200	Hotel

From ITE:

		Entering	Leaving	
	Residential - Luxury Condominium			
0.56	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.23	0.77	
0.55	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.63	0.37	
0.5	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.54	0.46	Estimated based on Residential Condo/Townhome
	Retail			
0.74	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.48	0.52	
2.71	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.44	0.56	
4.2	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.51	0.49	Estimated based on 10 of Daily Saturday
	Hotel			
0.67	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.58	0.42	
0.70	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.49	0.51	
0.87	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.50	0.50	

Trip Rates:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
General Office Bldg	Trips Per 1000 SF	0.13	0.43	0.56	0.35	0.20	0.55	0.27	0.23	0.50
Retail	Trips Per 1000 SF	0.36	0.38	0.74	1.19	1.52	2.71	2.14	2.06	4.20
Hotel	Occupied Rooms	0.39	0.28	0.67	0.34	0.36	0.70	0.44	0.44	0.87

Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Luxury Condos	Trips Per Residential Units	30	101	131	81	48	129	63	54	117
Retail	Trips Per 1000 SF	71	77	148	238	304	542	428	412	840
Hotel	Occupied Rooms	78	56	134	69	71	140	87	87	174
	Total	**179**	**234**	**413**	**388**	**423**	**811**	**578**	**553**	**1131**

Trip Reductions:

	Residenti	Commercial
Transit	40%	30%
Internal Capture (People Walking)	10%	10%
Pass-By trips	0%	10%
Total	**50%**	**50%**

Estimates of Additional Trips Generated by Proposed Developments

Adjusted Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
General Office Bldg	Trips Per 1000 SF	15	51	66	41	24	65	32	27	59
Retail	Trips Per 1000 SF	36	39	75	119	152	271	214	206	420
Hotel	Occupied Rooms	39	28	67	35	36	71	44	44	88
	Total	**90**	**118**	**208**	**195**	**212**	**407**	**290**	**277**	**567**

Existing Development Trip Generation

This parking lot didn't generate any trips. It accommodated trips generated by nearby land uses.

Net Trip Addition by Proposed Development:

	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
Total	**90**	**118**	**208**	**195**	**212**	**407**	**290**	**277**	**567**

Estimates of Additional Trips Generated by Proposed Developments

Project:

Lord and Taylor Parking Lot

Data:

380 Luxury Condominium Units
88,928 Specialty Retail

From ITE:

		Entering	Leaving	
	Residential - Luxury Condominium			
0.56	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.23	0.77	
0.55	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.63	0.37	
0.5	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.54	0.46	Estimated based on Residential Condo/Townhome
	Retail			
0.74	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.48	0.52	
2.71	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.44	0.56	
4.20	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.51	0.49	Estimated based on 10 of Daily Saturday

Trip Rates:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Luxury Condos	Trips Per Residential Units	0.13	0.43	0.56	0.35	0.20	0.55	0.27	0.23	0.50
Retail	Trips Per 1000 SF	0.36	0.38	0.74	1.19	1.52	2.71	2.14	2.06	4.20

Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Luxury Condos	Trips Per Residential Units	49	164	213	132	77	209	103	87	190
Retail	Trips Per 1000 SF	32	34	66	106	135	241	190	183	373
	Total	**81**	**198**	**279**	**238**	**212**	**450**	**293**	**270**	**563**

Trip Reductions:

	Residenti	Commercial
Transit	40%	30%
Internal Capture (People Walking)	10%	10%
Pass-By trips	0%	10%
Total	**50%**	**50%**

Adjusted Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Luxury Condos	Trips Per Residential Units	25	82	107	66	39	105	52	44	95
Retail	Trips Per 1000 SF	16	17	33	53	68	121	95	92	187
	Total	**41**	**99**	**140**	**119**	**107**	**226**	**147**	**136**	**282**

Existing Development Trip Generation

This parking lot didn't generate any trips. It accommodated trips generated by nearby land uses.

Net Trip Addition by Proposed Development:

	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
Total	**41**	**99**	**140**	**119**	**107**	**226**	**147**	**136**	**282**

Estimates of Additional Trips Generated by Proposed Developments

Project:

Lord & Taylor

Data:

240,106 Retail - Shopping Center
181 Luxury Condos

From ITE:

		Entering	Leaving	
	Retail - Shopping Center			
1.03	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.61	0.39	
3.75	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.48	0.52	
4.97	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.52	0.48	
	Residential - Luxury Condominium			
0.56	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.23	0.77	
0.55	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.63	0.37	
0.50	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.54	0.46	Estimated based on Residential Condo/Townhome

Trip Rates:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Retail	Trips Per 1000 SF	0.63	0.40	1.03	1.80	1.95	3.75	2.58	2.39	4.97
Luxury Condos	Trips Per Residential Units	0.13	0.43	0.56	0.35	0.20	0.55	0.27	0.23	0.50

Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Retail	Trips Per 1000 SF	151	96	247	432	468	900	621	573	1194
Luxury Condos	Trips Per Residential Units	23	78	101	63	37	100	49	42	91
	Total	**174**	**174**	**348**	**495**	**505**	**1000**	**670**	**615**	**1285**

Trip Reductions:

	Residenti	Commercial
Transit	40%	30%
Internal Capture (People Walking)	10%	10%
Pass-By trips	0%	10%
Total	**50%**	**50%**

Adjusted Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Retail	Trips Per 1000 SF	76	48	124	216	234	450	311	287	598
Luxury Condos	Trips Per Residential Units	12	39	51	32	19	51	25	21	46
	Total	**88**	**87**	**175**	**248**	**253**	**501**	**336**	**308**	**644**

Estimates of Additional Trips Generated by Proposed Developments

Trips Generated by Existing Development

Data:

153,424 Retail - Shopping Center

From ITE:

	Retail - Shopping Center	Enterin	Leaving
1.03	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.61	0.39
3.75	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.48	0.52
4.97	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.52	0.48

Trip Rates:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Shopping Center	Trips Per 1000 SF	0.63	0.40	1.03	1.80	1.95	3.75	2.58	2.39	4.97

Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Shopping Center	Trips Per 1000 SF	96	62	158	276	299	575	397	366	763
	Total	**96**	**62**	**158**	**276**	**299**	**575**	**397**	**366**	**763**

Trip Reductions:

	Residenti	Commercial
Transit	40%	30%
Internal Capture (People Walking)	10%	10%
Pass-By trips	0%	10%
Total	**50%**	**50%**

Adjusted Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Shopping Center	Trips Per 1000 SF	48	31	79	138	150	288	199	183	382
	Total	**48**	**31**	**79**	**138**	**150**	**288**	**199**	**183**	**382**

Net Trip Addition by Proposed Development:

	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
Total	**40**	**56**	**96**	**110**	**103**	**213**	**137**	**125**	**262**

Estimates of Additional Trips Generated by Proposed Developments

Project:

WMATA

Data:

158,280 Retail — Area in addition the area used for the bus depot. Same as existing

466 Luxury Condos

From ITE:

	Retail	Entering	Leaving	
0.74	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.48	0.52	
2.71	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.44	0.56	
4.20	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.51	0.49	Estimated based on 10 of Daily Saturday
	Residential - Luxury Condominium			
0.56	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.23	0.77	
0.55	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.63	0.37	
0.50	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.54	0.46	Estimated based on Residential Condo/Townhome

Trip Rates:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Retail	Trips Per 1000 SF	0.36	0.38	0.74	1.19	1.52	2.71	2.14	2.06	4.20
Luxury Condos	Trips Per Residential Units	0.13	0.43	0.56	0.35	0.20	0.55	0.27	0.23	0.50

Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Retail	Trips Per 1000 SF	56	61	117	189	240	429	339	326	665
Luxury Condos	Trips Per Residential Units	60	201	261	161	95	256	126	107	233
	Total	**116**	**262**	**378**	**350**	**335**	**685**	**465**	**433**	**898**

Trip Reductions:

	Residenti	Commercial
Transit	40%	30%
Internal Capture (People Walking)	10%	10%
Pass-By trips	0%	10%
Total	**50%**	**50%**

Adjusted Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Retail	Trips Per 1000 SF	28	31	59	95	120	215	170	163	333
Luxury Condos	Trips Per Residential Units	30	101	131	81	48	129	63	54	117
	Total	**58**	**132**	**190**	**176**	**168**	**344**	**233**	**217**	**450**

Existing Development Trip Generation

WMATA will continue with the same number of operations. No trips need to be removed.

Net Trip Addition by Proposed Development:

	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
Total	**58**	**132**	**190**	**176**	**168**	**344**	**233**	**217**	**450**

Estimates of Additional Trips Generated by Proposed Developments

Project:

Buick Site

Data:

56,250 SF - Office
63 Luxury Condos

From ITE:

	Office - General Office Building	Entering	Leaving	
1.55	Ave. Trip Rate AM Peak Hour	0.88	0.12	
1.49	Ave. Trip Rate PM Peak Hour	0.17	0.83	
0.41	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.54	0.46	
	Residential - Luxury Condominium			
0.56	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.23	0.77	
0.55	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.63	0.37	
0.50	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.54	0.46	Estimated based on Residential Condo/Townhome

Trip Rates:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
General Office Bldg	Trips Per 1000 SF	1.36	0.19	1.55	0.25	1.24	1.49	0.22	0.19	0.41
Luxury Condos	Trips Per Residential Units	0.13	0.43	0.56	0.35	0.20	0.55	0.27	0.23	0.50

Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
General Office Bldg	Trips Per 1000 SF	77	10	87	14	70	84	12	11	23
Luxury Condos	Trips Per Residential Units	8	27	35	22	13	35	17	14	31
	Total	**85**	**37**	**122**	**36**	**83**	**119**	**29**	**25**	**54**

Trip Reductions:

	Residentia	Commercial
Transit	35%	25%
Internal Capture (People Walking)	5%	10%
Pass-By trips	0%	5%
Total	**40%**	**40%**

Adjusted Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
General Office Bldg	Trips Per 1000 SF	46	6	52	8	42	50	7	7	14
Luxury Condos	Trips Per Residential Units	5	16	21	13	8	21	10	8	18
	Total	**51**	**22**	**73**	**21**	**50**	**71**	**17**	**15**	**32**

Estimates of Additional Trips Generated by Proposed Developments

Trips Generated by Existing Development

Data:

24,426 SF - Car Dealership

From ITE:

	SF - Car Dealership	Entering	Leaving
2.05	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.74	0.26
2.64	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.39	0.61
2.97	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.51	0.49

Trip Rates:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Car Dealership	Trips per 1000 SF	1.52	0.53	2.05	1.03	1.61	2.64	1.51	1.46	2.97

Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Car Dealership	Trips per 1000 SF	37	13	50	25	39	64	37	36	73
	Total	**37**	**13**	**50**	**25**	**39**	**64**	**37**	**36**	**73**

Trip Reductions:

	Residentia	Commercial
Transit	35%	25%
Internal Capture (People Walking)	5%	10%
Pass-By trips	0%	5%
Total	**40%**	**40%**

Adjusted Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Car Dealership	Trips per 1000 SF	22	8	30	15	23	38	22	22	44
	Total	**22**	**8**	**30**	**15**	**23**	**38**	**22**	**22**	**44**

Net Trip Addition by Proposed Development:

	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
Total	**29**	**14**	**43**	**6**	**27**	**33**	**-5**	**-7**	**-12**

Estimates of Additional Trips Generated by Proposed Developments

Project:

GEICO

Data:

500 Apartments
245,000 SF - Office
600,000 SF - Headquarters

From ITE:

	Residential Apartments	Entering	Leaving
0.51	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.2	0.8
0.62	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.65	0.35
0.52	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.5	0.5
	Office - General Office Building		
1.55	Ave. Trip Rate AM Peak Hour	0.88	0.12
1.49	Ave. Trip Rate PM Peak Hour	0.17	0.83
0.41	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.54	0.46
	Office - Headquarters		
1.49	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.93	0.07
1.40	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.10	0.90
0.13	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.44	0.56

Trip Rates:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Apartments	Trips Per Residential Units	0.10	0.41	0.51	0.40	0.22	0.62	0.26	0.26	0.52
Office Bldg	Trips Per 1000 SF	1.36	0.19	1.55	0.25	1.24	1.49	0.22	0.19	0.41
Headquarters	Trips Per 1000 SF	1.39	0.10	1.49	0.14	1.26	1.40	0.06	0.07	0.13

Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Apartments	Trips Per Residential Units	51	204	255	202	109	311	130	130	260
Office Bldg	Trips Per 1000 SF	334	46	380	62	303	365	54	46	100
Headquarters	Trips Per 1000 SF	831	63	894	84	756	840	34	44	78
	Total	**1216**	**313**	**1529**	**348**	**1168**	**1516**	**218**	**220**	**438**

Trip Reductions:

	Residential	Commercial
Transit	40%	30%
Internal Capture (People Walking)	10%	10%
Pass-By trips	0%	10%
Total	**50%**	**50%**

Adjusted Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Apartments	Trips Per Residential Units	26	102	128	101	55	156	65	65	130
Office Bldg	Trips Per 1000 SF	167	23	190	31	152	183	27	23	50
Headquarters	Trips Per 1000 SF	416	32	448	42	378	420	17	22	39
	Total	**609**	**157**	**766**	**174**	**585**	**759**	**109**	**110**	**219**

Estimates of Additional Trips Generated by Proposed Developments

Trips Generated by Existing Development

Data:

514,257 SF - Headquarters

From ITE:

	Office - Headquarters	Entering	Leaving
1.49	Ave. Trip Rate AM Peak Hour of Adjacent Traffic	0.93	0.07
1.40	Ave. Trip Rate PM Peak Hour of Adjacent Traffic	0.10	0.90
0.13	Ave. Trip Rate Saturday Peak Hour of Adjacent Traffic	0.44	0.56

Trip Rates:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Office Headquarters	Trips Per 1000 SF	1.39	0.10	1.49	0.14	1.26	1.40	0.06	0.07	0.13

Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Office Headquarters	Trips Per 1000 SF	713	54	767	72	648	720	29	37	66
	Total	**713**	**54**	**767**	**72**	**648**	**720**	**29**	**37**	**66**

Trip Reductions:

	Residential	Commercial
Transit	40%	30%
Internal Capture (People Walking)	10%	10%
Pass-By trips	0%	10%
Total	**50%**	**50%**

Adjusted Trip Generation:

Land Use	Units	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
		In	Out	Total	In	Out	Total	In	Out	Total
Office Headquarters	Trips Per 1000 SF	357	27	384	36	324	360	15	19	34
	Total	**357**	**27**	**384**	**36**	**324**	**360**	**15**	**19**	**34**

Net Trip Addition by Proposed Development:

	AM Peak Hour			PM Peak Hour			Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
Total	**252**	**130**	**382**	**138**	**261**	**399**	**94**	**91**	**185**

Appendix B

Definition of Level of Service

Level of service used for unsignalized intersections are different from the criteria used for signalized intersections. LOS for signalized intersections are based on average stopped delay time per vehicle. LOS for unsignalized intersections are based on critical gap, the minimum time interval between vehicles in a major traffic stream that permits side-street vehicle at a STOP-controlled approach to enter the intersection under, and estimated reserve capacity.

Level of Service Description for Signalized Intersections

Level of Service	Average Control Delay (second)	Description
A	< 10	This level of service occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	> 10 - 20	This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than for LOS A, causing higher levels of average delay.
C	> 20 - 35	These higher delays may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.
D	> 35 - 55	At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, longer cycle lengths, or high volume to capacity (v/c) ratios, Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	> 55 - 80	These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.
F	> 80	This level, considered to be unacceptable to most drivers, often occurs with over saturation, that is, when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios below 1.0 with many individual cycle failures. Poor progression and cycle lengths may also be major contributing causes to such delay levels.

Level of Service for Unsignalized Intersections

Level of Service	Average Control Delay (second)	Description
A	< 10	Few or no delays
B	> 10 – 15	Short traffic delays
C	> 15 – 25	Average traffic delays
D	> 25 – 35	Long traffic delays
E	> 35 – 50	Very long traffic delays
F	> 50	Extreme traffic delays with intersection capacity exceeded

Appendix C

Friendship Heights Transportation Study Intersection Capacity Analysis (with FHTS Improvements) with Additional Developments

Friendship Heights Transportation Study Addendum
Friendship Heights Transportation Study Intersection Capacity Analysis

"Potential Development Case"(No Signal Optimization)

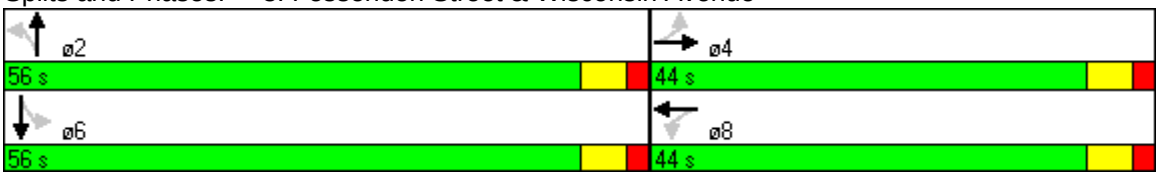
Lanes, Volumes, Timings
3: Fessenden Street & Wisconsin Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1528	0	1516	1447	0	0	4074	0	0	4348	0
Flt Permitted		0.968		0.526				0.924			0.751	
Satd. Flow (perm)	0	1483	0	835	1447	0	0	3764	0	0	3272	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			29							
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		298			276			539			499	
Travel Time (s)		8.1			7.5			10.5			9.7	
Volume (vph)	18	150	33	204	54	67	6	1217	2	71	1710	4
Confl. Peds. (#/hr)	38		38	16		16	5		5	6		6
Confl. Bikes (#/hr)												
Peak Hour Factor	0.78	0.78	0.78	0.77	0.77	0.77	0.88	0.88	0.88	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	3%	0%	0%	0%	0%	7%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	11
Parking (#/hr)									8			
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	257	0	265	157	0	0	1392	0	0	1879	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	44.0	44.0	0.0	44.0	44.0	0.0	56.0	56.0	0.0	56.0	56.0	0.0
Act Effct Green (s)		35.5		35.5	35.5			56.5			56.5	
Actuated g/C Ratio		0.36		0.36	0.36			0.57			0.57	
v/c Ratio		0.48		0.90	0.30			0.65			1.02	
Uniform Delay, d1		24.1		30.4	18.6			15.0			21.8	
Delay		23.4		37.1	17.6			13.5			51.2	
LOS		C		D	B			B			D	
Approach Delay		23.4			29.8			13.5			51.2	
Approach LOS		C			C			B			D	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 1 (1%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 33.8	Intersection LOS: C

Intersection Capacity Utilization 154.3% ICU Level of Service H

Splits and Phases: 3: Fessenden Street & Wisconsin Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1286	0	0	1426	0	0	4244	0	0	4266	0
Flt Permitted		0.984			0.846			0.674			0.932	
Satd. Flow (perm)	0	1265	0	0	1218	0	0	2872	0	0	3976	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			39			5			3	
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		269			302			395			800	
Travel Time (s)		6.1			6.9			7.7			15.6	
Volume (vph)	11	33	213	33	40	57	113	1158	13	7	1691	11
Confl. Peds. (#/hr)	82		82	33		33	14		14	20		20
Confl. Bikes (#/hr)												
Peak Hour Factor	0.74	0.74	0.74	0.88	0.88	0.88	0.89	0.89	0.89	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	11
Parking (#/hr)									8			
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	348	0	0	148	0	0	1443	0	0	1799	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	19.0	19.0	0.0	19.0	19.0	0.0	31.0	31.0	0.0	31.0	31.0	0.0
Act Effct Green (s)		15.0			15.0			27.0			27.0	
Actuated g/C Ratio		0.30			0.30			0.54			0.54	
v/c Ratio		0.90			0.38			1.00dl			0.84	
Uniform Delay, d1		16.2			9.9			10.6			9.6	
Delay		39.2			11.1			22.7			7.7	
LOS		D			B			C			A	
Approach Delay		39.2			11.1			22.7			7.7	
Approach LOS		D			B			C			A	

Intersection Summary	
Area Type:	CBD
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 9 (18%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 16.5	Intersection LOS: B

Intersection Capacity Utilization 114.0% ICU Level of Service G

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 5: Harrison Street & Wisconsin Avenue

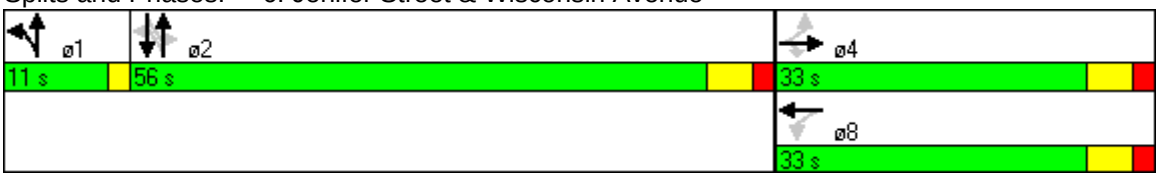
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1143	1245	0	1431	0	0	3850	0	0	4143	0
Flt Permitted		0.780			0.812			0.663			0.898	
Satd. Flow (perm)	0	894	1161	0	1167	0	0	2569	0	0	3723	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		270			354			800			736	
Travel Time (s)		7.4			9.7			15.6			14.3	
Volume (vph)	90	96	324	40	41	30	295	880	45	20	1307	55
Confl. Peds. (#/hr)	88		88	84		84	185		185	52		52
Confl. Bikes (#/hr)												
Peak Hour Factor	0.81	0.81	0.81	0.85	0.85	0.85	0.95	0.95	0.95	0.83	0.83	0.83
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	73%	2%	9%	0%	0%	14%	22%	7%	5%	5%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	11
Parking (#/hr)									8			
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	230	400	0	130	0	0	1284	0	0	1665	0
Turn Type	Perm		Perm	Perm			pm+pt			Perm		
Protected Phases		4			8		1	1 2			2	
Permitted Phases	4		4	8			1 2			2		
Total Split (s)	33.0	33.0	33.0	33.0	33.0	0.0	11.0	67.0	0.0	56.0	56.0	0.0
Act Effct Green (s)		29.0	29.0		29.0			59.0			52.0	
Actuated g/C Ratio		0.29	0.29		0.29			0.59			0.52	
v/c Ratio		0.89	1.19		0.38			2.19dl			0.86	
Uniform Delay, d1		33.9	35.5		28.4			13.6			20.8	
Delay		56.4	116.4		29.2			14.6			5.0	
LOS		E	F		C			B			A	
Approach Delay		94.5			29.2			14.6			5.0	
Approach LOS		F			C			B			A	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 90 (90%), Referenced to phase 2:NBSB and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.19	
Intersection Signal Delay: 24.4	Intersection LOS: C

Intersection Capacity Utilization 122.5% ICU Level of Service H

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 6: Jenifer Street & Wisconsin Avenue

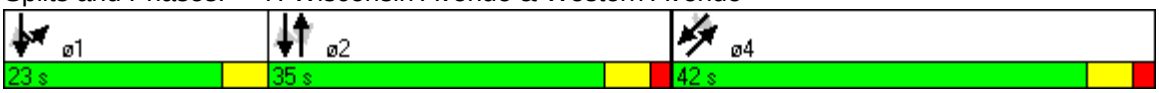


Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		1	1		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50	50	50	50			50	50
Trailing Detector (ft)		0	0	0	0	0	0	0			0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	4230	882	1472	2916	1268	1472	2926	0	0	2973	1280
Flt Permitted				0.144			0.105					
Satd. Flow (perm)	0	4230	815	219	2916	1071	163	2926	0	0	2973	1149
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			73			15		3				437
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		736			254			340			132	
Travel Time (s)		14.3			4.9			9.3			3.6	
Volume (vph)	0	936	66	375	1370	107	108	669	20	0	1008	484
Confl. Peds. (#/hr)	35		35	78		78	47		47	49		49
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.94	0.94	0.94	0.90	0.90	0.90	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	3%	33%	3%	4%	7%	3%	3%	0%	0%	2%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)			7									
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	1029	73	399	1457	114	120	765	0	0	1084	520
Turn Type			Perm	pm+pt		Perm	Perm					Perm
Protected Phases		2		1	1 2			4			4	
Permitted Phases			2	1 2		1 2	4					4
Total Split (s)	0.0	35.0	35.0	23.0	58.0	58.0	42.0	42.0	0.0	0.0	42.0	42.0
Act Effct Green (s)		31.0	31.0	50.0	54.0	54.0	38.0	38.0			38.0	38.0
Actuated g/C Ratio		0.31	0.31	0.50	0.54	0.54	0.38	0.38			0.38	0.38
v/c Ratio		0.78	0.24	1.15	0.93	0.19	1.94	0.69			0.96	0.73
Uniform Delay, d1		31.4	0.0	26.7	21.1	10.1	31.0	25.9			30.2	3.5
Delay		26.8	5.6	99.4	26.4	10.5	258.5	22.9			32.4	6.8
LOS		C	A	F	C	B	F	C			C	A
Approach Delay		25.4			40.3			54.8			24.1	
Approach LOS		C			D			D			C	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green, Master Intersection	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.94	
Intersection Signal Delay: 35.0	Intersection LOS: C

Intersection Capacity Utilization 100.6% ICU Level of Service F

Splits and Phases: 7: Wisconsin Avenue & Western Avenue



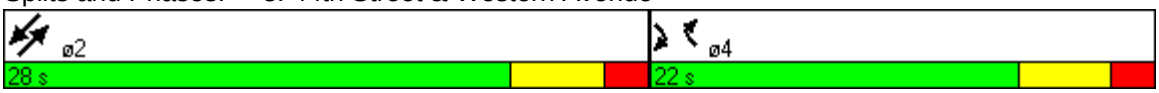
Lanes, Volumes, Timings
8: 44th Street & Western Avenue

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		2	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)			50			50		50			50	
Trailing Detector (ft)			0			0		0			0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	0	1353	0	0	2388	0	2853	0	0	2883	0
Flt Permitted												
Satd. Flow (perm)	0	0	1217	0	0	2315	0	2853	0	0	2883	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			29			147		16			3	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		170			286			405			340	
Travel Time (s)		3.9			6.5			11.0			9.3	
Volume (vph)	0	0	3	0	0	42	0	744	44	0	1191	14
Confl. Peds. (#/hr)	97		97	20		20	66		66	7		7
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.67	0.67	0.67	0.95	0.95	0.95	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	0%	5%	0%	0%	5%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	0	3	0	0	63	0	829	0	0	1282	0
Turn Type			custom			custom						
Protected Phases			4			4		2			2	
Permitted Phases			4			4						
Total Split (s)	0.0	0.0	22.0	0.0	0.0	22.0	0.0	28.0	0.0	0.0	28.0	0.0
Act Effct Green (s)			7.5			7.5		43.8			43.8	
Actuated g/C Ratio			0.15			0.15		0.88			0.88	
v/c Ratio			0.01			0.13		0.33			0.51	
Uniform Delay, d1			0.0			0.0		2.0			2.7	
Delay			0.0			0.1		2.6			4.9	
LOS			A			A		A			A	
Approach Delay		0.0			0.1			2.6			4.9	
Approach LOS		A			A			A			A	

Intersection Summary	
Area Type:	CBD
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 48 (96%), Referenced to phase 2:NESW, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 3.8	Intersection LOS: A

Intersection Capacity Utilization 59.2% ICU Level of Service A

Splits and Phases: 8: 44th Street & Western Avenue

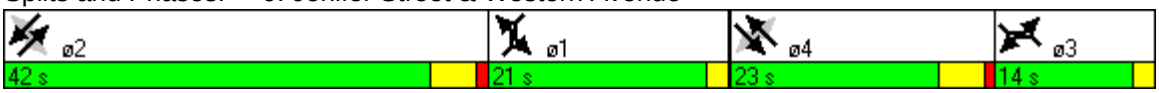


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	1		0	1		0	1		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	1501	2911	0	1353	2773	0	1472	2789	0	1330	2795	0
Flt Permitted	0.363			0.354	0.941		0.105			0.225		
Satd. Flow (perm)	561	2911	0	501	2614	0	163	2789	0	308	2795	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			9			42			39	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		490			207			1447			405	
Travel Time (s)		11.1			4.7			39.5			11.0	
Volume (vph)	129	259	62	143	261	24	136	591	168	208	802	213
Confl. Peds. (#/hr)	25		25	4		4	38		38	63		63
Confl. Bikes (#/hr)												
Peak Hour Factor	0.84	0.84	0.84	0.77	0.77	0.77	0.98	0.98	0.98	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	0%	0%	2%	0%	38%	3%	3%	4%	14%	2%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	154	382	0	167	389	0	139	774	0	214	1047	0
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	3	4		3	4		1	2		1	2	
Permitted Phases	4			4			2			2		
Total Split (s)	14.0	23.0	0.0	14.0	23.0	0.0	21.0	42.0	0.0	21.0	42.0	0.0
Act Effct Green (s)	26.8	19.0		26.8	26.8		57.2	47.3		57.2	47.3	
Actuated g/C Ratio	0.27	0.19		0.27	0.27		0.57	0.47		0.57	0.47	
v/c Ratio	0.69	0.67		0.83	0.54		0.63	0.58		0.77	0.78	
Uniform Delay, d1	33.5	34.9		35.7	27.5		25.9	17.9		22.2	21.1	
Delay	34.0	35.3		42.3	27.3		29.9	20.5		20.6	21.4	
LOS	C	D		D	C		C	C		C	C	
Approach Delay		34.9			31.8			21.9			21.2	
Approach LOS		C			C			C			C	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 47 (47%), Referenced to phase 2:NESW, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 25.5	Intersection LOS: C

Intersection Capacity Utilization 86.0% ICU Level of Service D

Splits and Phases: 9: Jenifer Street & Western Avenue

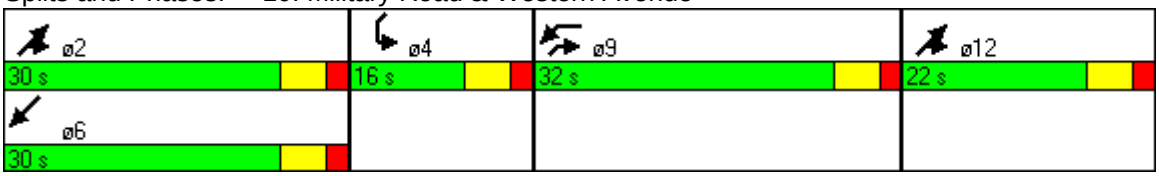


Lane Group	WBL	WBR	NET	NER	SWL	SWT	ø2	ø12
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	10	10	10	10	10	10		
Grade (%)	0%		0%			0%		
Storage Length (ft)	0	0		0	0			
Storage Lanes	2	0		1	1			
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		
Leading Detector (ft)	50		50	50	50	50		
Trailing Detector (ft)	0		0	0	0	0		
Turning Speed (mph)	15	9		9	15			
Satd. Flow (prot)	2841	0	2707	1317	1458	4150		
Flt Permitted	0.954				0.950			
Satd. Flow (perm)	2808	0	2707	1317	1283	4150		
Right Turn on Red		Yes		Yes				
Satd. Flow (RTOR)	5			329				
Link Speed (mph)	25		25			25		
Link Distance (ft)	480		132			2034		
Travel Time (s)	13.1		3.6			55.5		
Volume (vph)	608	28	429	694	105	879		
Confl. Peds. (#/hr)	18	18		3	72			
Confl. Bikes (#/hr)								
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Growth Factor	100%	100%	100%	100%	100%	100%		
Heavy Vehicles (%)	3%	4%	12%	3%	4%	5%		
Bus Blockages (#/hr)	0	0	0	0	0	0		
Parking (#/hr)								
Mid-Block Traffic (%)	0%		0%			0%		
Lane Group Flow (vph)	669	0	452	731	111	925		
Turn Type				pt+ov	Prot			
Protected Phases	9		2 12	2 9 12	4	6	2	12
Permitted Phases								
Total Split (s)	32.0	0.0	52.0	84.0	16.0	30.0	30.0	22.0
Act Effct Green (s)	27.2		49.2	80.5	11.5	31.1		
Actuated g/C Ratio	0.27		0.49	0.81	0.12	0.31		
v/c Ratio	0.86		0.34	0.65	0.66	0.72		
Uniform Delay, d1	34.3		15.4	1.8	42.4	30.4		
Delay	24.0		15.2	5.8	40.6	21.6		
LOS	C		B	A	D	C		
Approach Delay	24.0		9.4			23.7		
Approach LOS	C		A			C		

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 43 (43%), Referenced to phase 2:NET, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 17.9	Intersection LOS: B

Intersection Capacity Utilization 64.1% ICU Level of Service B

Splits and Phases: 10: Military Road & Western Avenue



Lane Group	WBL2	WBL	WBR	WBR2	NBL	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%				0%					0%	
Storage Length (ft)		0	0		0		0			0		0
Storage Lanes		2	0		0		1			0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50		50	50	50	
Trailing Detector (ft)	0	0			0	0	0		0	0	0	
Turning Speed (mph)	15	15	12	12	15		12	12	15	15		12
Satd. Flow (prot)	0	2870	0	0	0	1452	1275	0	0	0	1545	0
Flt Permitted		0.955				0.396					0.986	
Satd. Flow (perm)	0	2870	0	0	0	592	1226	0	0	0	1525	0
Right Turn on Red				Yes				Yes				No
Satd. Flow (RTOR)							11					
Link Speed (mph)		30				30					30	
Link Distance (ft)		431				667					150	
Travel Time (s)		9.8				15.2					3.4	
Volume (vph)	10	133	9	1	114	21	145	21	1	6	110	21
Confl. Peds. (#/hr)					14		14		21			21
Confl. Bikes (#/hr)												
Peak Hour Factor	0.88	0.88	0.88	0.88	0.84	0.84	0.84	0.92	0.80	0.92	0.80	0.80
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	0%	1%	1%	2%	1%	2%	0%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%				0%					0%	
Lane Group Flow (vph)	0	173	0	0	0	161	196	0	0	0	172	0
Turn Type	Perm				D.P+P		custom		Perm	Perm		
Protected Phases		10			3	3 4	3 4				4	
Permitted Phases	10				4		1		4	4		
Total Split (s)	11.0	11.0	0.0	0.0	22.0	40.0	40.0	0.0	18.0	18.0	18.0	0.0
Act Effct Green (s)		7.0				26.1	49.1				13.7	
Actuated g/C Ratio		0.07				0.26	0.49				0.14	
v/c Ratio		0.86				0.62	0.31				0.82	
Uniform Delay, d1		46.0				33.8	8.4				41.9	
Delay		68.1				33.2	8.0				55.5	
LOS		E				C	A				E	
Approach Delay		68.1				19.3					55.5	
Approach LOS		E				B					E	

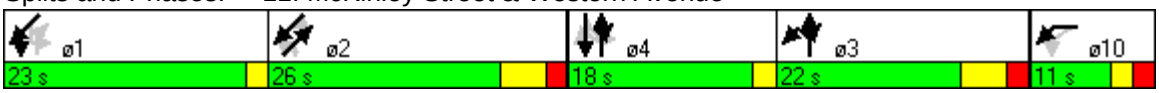
Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 92 (92%), Referenced to phase 2:NESW, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 29.7	Intersection LOS: C

Lane Group	NEL	NET	NER	NER2	SWL2	SWL	SWT	SWR
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10
Grade (%)		0%					0%	
Storage Length (ft)	0		0			0		0
Storage Lanes	0		1			0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	
Trailing Detector (ft)	0	0		0	0	0	0	
Turning Speed (mph)	15		12	12	15	15		12
Satd. Flow (prot)	0	2828	0	1357	0	0	2929	0
Flt Permitted		0.934					0.952	
Satd. Flow (perm)	0	2644	0	1321	0	0	2791	0
Right Turn on Red				No				No
Satd. Flow (RTOR)								
Link Speed (mph)		25					25	
Link Distance (ft)		2034					382	
Travel Time (s)		55.5					10.4	
Volume (vph)	6	433	9	146	1	19	992	5
Confl. Peds. (#/hr)	2			2		6		6
Confl. Bikes (#/hr)								
Peak Hour Factor	0.88	0.88	0.92	0.88	0.92	0.99	0.99	0.99
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	7%	2%	0%	2%	21%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0
Parking (#/hr)								
Mid-Block Traffic (%)		0%					0%	
Lane Group Flow (vph)	0	509	0	166	0	0	1027	0
Turn Type	Perm			Perm	custom	pm+pt		
Protected Phases		2				1	1 2	
Permitted Phases	2			2	1	1 2		
Total Split (s)	26.0	26.0	0.0	26.0	23.0	23.0	49.0	0.0
Act Effct Green (s)		27.9		27.9			46.9	
Actuated g/C Ratio		0.28		0.28			0.47	
v/c Ratio		0.69		0.45			0.77	
Uniform Delay, d1		32.2		29.7			19.6	
Delay		29.1		22.1			23.9	
LOS		C		C			C	
Approach Delay		27.4					23.9	
Approach LOS		C					C	

Intersection Summary

Intersection Capacity Utilization 82.7% ICU Level of Service D

Splits and Phases: 11: McKinley Street & Western Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50			50							
Trailing Detector (ft)		0			0							
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1550	0	0	1550	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1550	0	0	1550	0	0	0	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		999			76			352			128	
Travel Time (s)		27.2			2.1			8.0			2.9	
Volume (vph)	0	804	0	0	741	0	0	0	0	0	0	0
Confl. Peds. (#/hr)	6		6				25		25	34		34
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.89	0.89	0.89	0.76	0.76	0.76	0.81	0.81	0.81
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	8%	0%	6%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	829	0	0	833	0	0	0	0	0	0	0
Turn Type												
Protected Phases		2			2							
Permitted Phases												
Total Split (s)	0.0	63.0	0.0	0.0	63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Act Effct Green (s)		61.0			61.0							
Actuated g/C Ratio		0.61			0.61							
v/c Ratio		0.88			0.88							
Uniform Delay, d1		16.3			16.4							
Delay		29.5			8.4							
LOS		C			A							
Approach Delay		29.5			8.4							
Approach LOS		C			A							

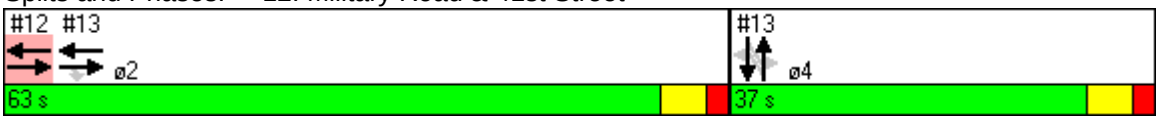
Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 34 (34%), Referenced to phase 2:EBWB and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 18.9	Intersection LOS: B

Lane Group	ø4
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	4
Permitted Phases	
Total Split (s)	37.0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Uniform Delay, d1	
Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Intersection Capacity Utilization 52.0% ICU Level of Service A

Splits and Phases: 12: Military Road & 41st Street

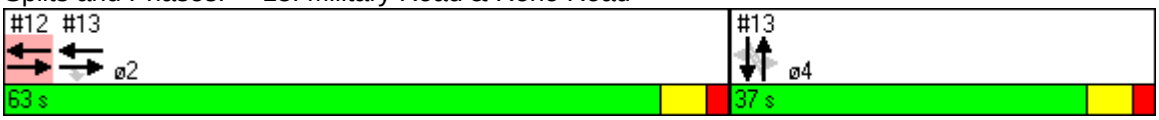


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50		50		50	50		50	50	
Trailing Detector (ft)		0	0		0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1535	1357	0	1546	0	0	2907	0	0	1589	0
Flt Permitted								0.933			0.996	
Satd. Flow (perm)	0	1535	1357	0	1546	0	0	2718	0	0	1582	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			139		1			8			1	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		76			244			206			138	
Travel Time (s)		2.1			6.7			5.6			3.8	
Volume (vph)	0	656	131	0	746	6	14	320	24	3	334	5
Confl. Peds. (#/hr)				11		11	31		31	44		44
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.87	0.87	0.87	0.79	0.79	0.79
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	4%	0%	0%	3%	17%	0%	1%	20%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	698	139	0	800	0	0	412	0	0	433	0
Turn Type			Perm				Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases			2				4			4		
Total Split (s)	0.0	63.0	63.0	0.0	63.0	0.0	37.0	37.0	0.0	37.0	37.0	0.0
Act Effct Green (s)		61.0	61.0		61.0			31.0			31.0	
Actuated g/C Ratio		0.61	0.61		0.61			0.31			0.31	
v/c Ratio		0.74	0.16		0.85			0.49			0.88	
Uniform Delay, d1		13.9	0.0		15.7			27.4			32.7	
Delay		1.5	0.0		21.9			27.2			38.0	
LOS		A	A		C			C			D	
Approach Delay		1.2			21.9			27.2			38.0	
Approach LOS		A			C			C			D	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 34 (34%), Referenced to phase 2:EBWB and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 18.6	Intersection LOS: B

Intersection Capacity Utilization 80.4% ICU Level of Service D

Splits and Phases: 13: Military Road & Reno Road



TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Dane Ismart*
Agency/Co.	
Date Performed	*4/13/2005*
Analysis Time Period	*2014 AM Peak*

Site Information

Intersection	
Jurisdiction	
Analysis Year	*2014*

Project Description *Friendship Heights Addendum*

East/West Street: *Military Road* | North/South Street: *43rd Street*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*681*	*59*	*59*	*671*	*0*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*0*	*740*	*64*	*64*	*729*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*10*	*0*	*62*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*10*	*0*	*67*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*64*		*77*				
C (m) (vph)		*829*		*293*				
v/c		*0.08*		*0.26*				
95% queue length		*0.25*		*1.03*				
Control Delay		*9.7*		*21.6*				
LOS		*A*		*C*				
Approach Delay	--	--	*21.6*					
Approach LOS	--	--	*C*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Dane Ismart*	Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*4/13/2005*	Analysis Year	*2014*
Analysis Time Period	*2014 AM Peak*		

Project Description	*Friendship Heights Addendum*
East/West Street: *Garrison Street*	North/South Street: *Wisconsin Avenue*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*38*	*1282*	*14*	*22*	*1776*	*54*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*41*	*1393*	*15*	*23*	*1930*	*58*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration	*LT*		*TR*	*LT*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*2*	*6*	*12*	*1*	*6*	*13*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*2*	*6*	*13*	*1*	*6*	*14*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*1*	*1*	*1*	*1*
Configuration	*L*	*T*	*R*	*L*	*T*	*R*

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LT*	*L*	*T*	*R*	*L*	*T*	*R*
v (vph)	*41*	*23*	*2*	*6*	*13*	*1*	*6*	*14*
C (m) (vph)	*290*	*444*	*0*	*4*	*440*	*0*	*4*	*300*
v/c	*0.14*	*0.05*		*1.50*	*0.03*		*1.50*	*0.05*
95% queue length	*0.49*	*0.16*		*1.63*	*0.09*		*1.63*	*0.15*
Control Delay	*19.4*	*13.6*			*13.4*			*17.6*
LOS	*C*	*B*	*F*	*F*	*B*	*F*	*F*	*C*
Approach Delay	--	--						
Approach LOS	--	--						

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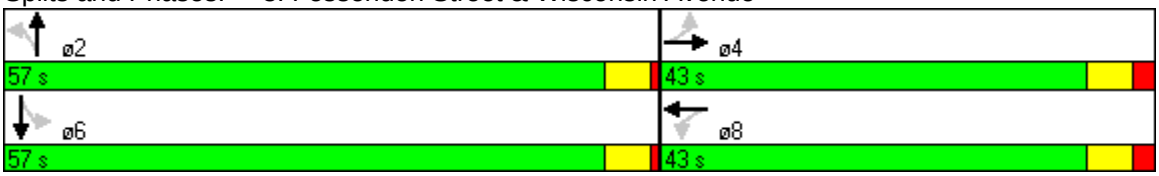
Lanes, Volumes, Timings
3: Fessenden Street & Wisconsin Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1532	0	1516	1503	0	0	4225	0	0	4157	0
Flt Permitted		0.942		0.490				0.919			0.762	
Satd. Flow (perm)	0	1446	0	774	1503	0	0	3882	0	0	3171	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			9			16			3	
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		298			276			527			499	
Travel Time (s)		8.1			7.5			12.0			11.3	
Volume (vph)	27	187	35	134	172	81	10	1664	112	41	1594	22
Confl. Peds. (#/hr)	29		29	12		12	11		11	6		6
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.87	0.87	0.87	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	2%	0%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)										0	0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	293	0	154	291	0	0	1963	0	0	1821	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	43.0	43.0	0.0	43.0	43.0	0.0	57.0	57.0	0.0	57.0	57.0	0.0
Act Effct Green (s)		27.4		27.4	27.4			64.6			64.6	
Actuated g/C Ratio		0.27		0.27	0.27			0.65			0.65	
v/c Ratio		0.73		0.73	0.69			0.78			0.89	
Uniform Delay, d1		31.7		32.9	31.5			12.5			14.7	
Delay		30.6		31.8	30.4			15.2			18.7	
LOS		C		C	C			B			B	
Approach Delay		30.6			30.9			15.2			18.7	
Approach LOS		C			C			B			B	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 19.2	Intersection LOS: B

Intersection Capacity Utilization 97.2% ICU Level of Service E

Splits and Phases: 3: Fessenden Street & Wisconsin Avenue



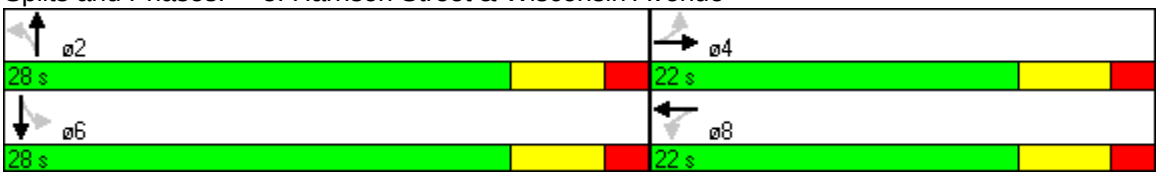
Lanes, Volumes, Timings
5: Harrison Street & Wisconsin Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1276	0	0	1438	0	0	4244	0	0	4114	0
Flt Permitted		0.960			0.794			0.661			0.802	
Satd. Flow (perm)	0	1219	0	0	1157	0	0	2816	0	0	3303	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			10			5			6	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		269			302			395			800	
Travel Time (s)		6.1			6.9			9.0			18.2	
Volume (vph)	36	60	251	39	26	33	129	1554	22	42	1510	22
Confl. Peds. (#/hr)	124		124	45		45	12		12	14		14
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.86	0.86	0.86	0.96	0.96	0.96	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)										0	0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	408	0	0	113	0	0	1776	0	0	1769	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	22.0	22.0	0.0	22.0	22.0	0.0	28.0	28.0	0.0	28.0	28.0	0.0
Act Effct Green (s)		18.0			18.0			24.0			24.0	
Actuated g/C Ratio		0.36			0.36			0.48			0.48	
v/c Ratio		0.92			0.27			1.31			1.11	
Uniform Delay, d1		15.0			10.2			12.9			13.0	
Delay		38.5			11.1			129.0			33.7	
LOS		D			B			F			C	
Approach Delay		38.5			11.1			129.0			33.7	
Approach LOS		D			B			F			C	

Intersection Summary	
Area Type:	CBD
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 20 (40%), Referenced to phase 2:NBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.31	
Intersection Signal Delay: 75.2	Intersection LOS: E

Intersection Capacity Utilization 124.8% ICU Level of Service H

Splits and Phases: 5: Harrison Street & Wisconsin Avenue



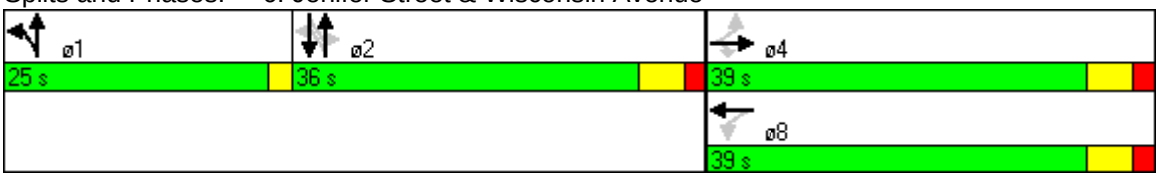
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1510	1357	0	1372	0	0	4164	0	0	3688	0
Flt Permitted		0.497			0.671			0.671			0.850	
Satd. Flow (perm)	0	757	1196	0	903	0	0	2777	0	0	3135	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		270			354			800			736	
Travel Time (s)		7.4			9.7			18.2			16.7	
Volume (vph)	170	90	503	67	143	81	407	1202	45	20	799	154
Confl. Peds. (#/hr)	58		58	165		165	216		216	183		183
Confl. Bikes (#/hr)												
Peak Hour Factor	0.79	0.79	0.79	0.77	0.77	0.77	0.90	0.90	0.90	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	3%	0%	2%	1%	1%	0%	2%	0%	0%	2%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)										0	0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	329	637	0	378	0	0	1838	0	0	1024	0
Turn Type	Perm		Perm	Perm			pm+pt			Perm		
Protected Phases		4			8		1	1 2			2	
Permitted Phases	4		4	8			1 2			2		
Total Split (s)	39.0	39.0	39.0	39.0	39.0	0.0	25.0	61.0	0.0	36.0	36.0	0.0
Act Effct Green (s)		35.0	35.0		35.0			53.0			32.0	
Actuated g/C Ratio		0.35	0.35		0.35			0.53			0.32	
v/c Ratio		1.24	1.52		1.20			1.16dl			1.02	
Uniform Delay, d1		32.5	32.5		32.5			18.9			34.0	
Delay		130.8	192.0		117.5			20.8			37.8	
LOS		F	F		F			C			D	
Approach Delay		171.1			117.5			20.8			37.8	
Approach LOS		F			F			C			D	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 36 (36%), Referenced to phase 2:NBSB and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.52	
Intersection Signal Delay: 68.1	Intersection LOS: E

Intersection Capacity Utilization 122.7% ICU Level of Service H

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 6: Jenifer Street & Wisconsin Avenue

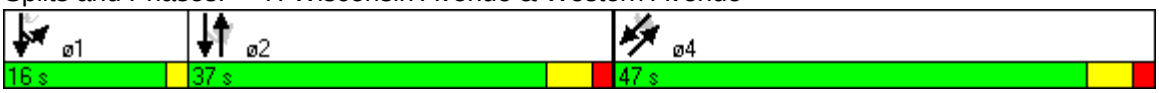


Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		0	1		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50		50	50			50	50
Trailing Detector (ft)		0	0	0	0		0	0			0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	4314	1245	1501	2750	0	1472	2926	0	0	2916	1357
Flt Permitted				0.121			0.153					
Satd. Flow (perm)	0	4314	852	191	2750	0	237	2926	0	0	2916	902
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		736			254			340			132	
Travel Time (s)		16.7			5.8			9.3			3.6	
Volume (vph)	0	1278	173	290	902	200	130	1060	43	0	980	354
Confl. Peds. (#/hr)	185		185	114		114	139		139	239		239
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.90	0.90	0.90	0.88	0.88	0.88	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	9%	1%	3%	3%	3%	2%	0%	0%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	1404	190	322	1224	0	148	1254	0	0	1010	365
Turn Type			Perm	pm+pt			Perm					custom
Protected Phases		2		1	1 2			4			4	
Permitted Phases			2	1 2			4					1 4
Total Split (s)	0.0	37.0	37.0	16.0	53.0	0.0	47.0	47.0	0.0	0.0	47.0	63.0
Act Effct Green (s)		33.0	33.0	45.0	49.0		43.0	43.0			43.0	59.0
Actuated g/C Ratio		0.33	0.33	0.45	0.49		0.43	0.43			0.43	0.59
v/c Ratio		0.99	0.68	1.33	0.91		1.45	1.00			0.81	0.69
Uniform Delay, d1		33.3	28.9	24.9	23.4		28.5	28.4			24.9	14.1
Delay		29.5	26.7	147.4	28.2		183.3	43.8			19.2	21.6
LOS		C	C	F	C		F	D			B	C
Approach Delay		29.2			53.0			58.6			19.9	
Approach LOS		C			D			E			B	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 6:, Start of Green, Master Intersection	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.45	
Intersection Signal Delay: 40.2	Intersection LOS: D

Intersection Capacity Utilization 110.2% ICU Level of Service G

Splits and Phases: 7: Wisconsin Avenue & Western Avenue

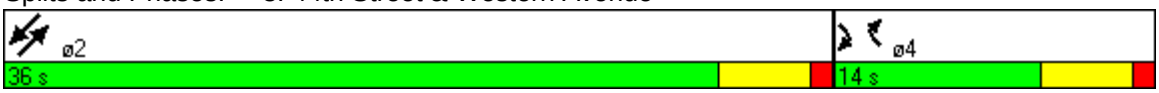


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		2	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)			50			50		50			50	
Trailing Detector (ft)			0			0		0			0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	0	1381	0	0	2231	0	2899	0	0	2886	0
Flt Permitted												
Satd. Flow (perm)	0	0	1342	0	0	2094	0	2899	0	0	2886	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			83			194		17			20	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		170			286			405			340	
Travel Time (s)		3.9			6.5			11.0			9.3	
Volume (vph)	0	0	50	0	0	102	0	1067	46	0	1063	52
Confl. Peds. (#/hr)	17		17	54		54	9		9	59		59
Confl. Bikes (#/hr)												
Peak Hour Factor	0.73	0.73	0.73	0.87	0.87	0.87	0.98	0.98	0.98	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	5%	0%	7%	0%	4%	0%	0%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	0	68	0	0	117	0	1136	0	0	1174	0
Turn Type			custom			custom						
Protected Phases			4			4		2			2	
Permitted Phases			4			4						
Total Split (s)	0.0	0.0	14.0	0.0	0.0	14.0	0.0	36.0	0.0	0.0	36.0	0.0
Act Effct Green (s)			7.2			7.2		37.7			37.7	
Actuated g/C Ratio			0.14			0.14		0.75			0.75	
v/c Ratio			0.25			0.24		0.52			0.54	
Uniform Delay, d1			0.0			0.0		3.2			3.3	
Delay			4.8			1.2		2.4			2.2	
LOS			A			A		A			A	
Approach Delay		4.8			1.2			2.4			2.2	
Approach LOS		A			A			A			A	

Intersection Summary	
Area Type:	CBD
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 12 (24%), Referenced to phase 2:NESW, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 2.3	Intersection LOS: A

Intersection Capacity Utilization 54.4% ICU Level of Service A

Splits and Phases: 8: 44th Street & Western Avenue

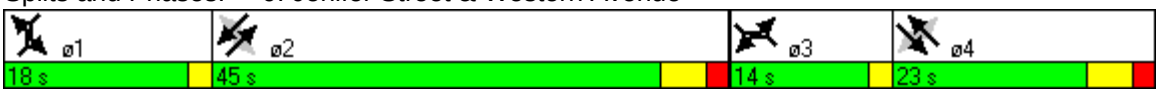


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	1		0	1		0	1		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		12	15		12	15		12	15		12
Satd. Flow (prot)	1516	2614	0	1380	2773	0	1501	2813	0	1404	2881	0
Flt Permitted	0.419			0.227	0.566		0.133			0.098		
Satd. Flow (perm)	634	2614	0	322	1582	0	210	2813	0	145	2881	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		59			12			32			40	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		490			207			1447			405	
Travel Time (s)		11.1			4.7			39.5			11.0	
Volume (vph)	200	297	127	347	279	52	132	874	194	304	743	194
Confl. Peds. (#/hr)	62		62	37		37	63		63	14		14
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.84	0.84	0.84	0.89	0.89	0.89	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	9%	1%	0%	1%	0%	1%	3%	0%	8%	1%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	235	498	0	218	589	0	148	1200	0	334	1029	0
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	3	4		3	4		1	2		1	2	
Permitted Phases	4			4			2			2		
Total Split (s)	14.0	23.0	0.0	14.0	23.0	0.0	18.0	45.0	0.0	18.0	45.0	0.0
Act Effct Green (s)	29.0	19.0		29.0	29.0		55.0	41.0		55.0	41.0	
Actuated g/C Ratio	0.29	0.19		0.29	0.29		0.55	0.41		0.55	0.41	
v/c Ratio	0.86	0.92		1.10	1.01		0.50	1.02		1.30	0.85	
Uniform Delay, d1	27.8	34.9		27.7	30.9		9.6	28.7		27.1	25.7	
Delay	46.4	48.7		99.8	60.9		20.9	30.5		145.8	31.0	
LOS	D	D		F	E		C	C		F	C	
Approach Delay		47.9			71.4			29.4			59.1	
Approach LOS		D			E			C			E	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 28 (28%), Referenced to phase 1:NESWL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.30	
Intersection Signal Delay: 50.1	Intersection LOS: D

Intersection Capacity Utilization 107.4% ICU Level of Service F

Splits and Phases: 9: Jenifer Street & Western Avenue

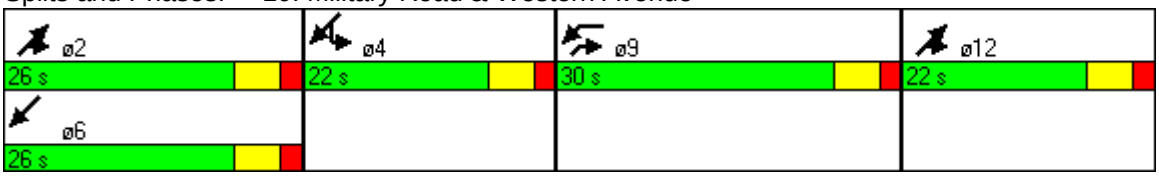


Lane Group	WBL	WBR	NET	NER	SWL	SWT	ø2	ø6	ø12
Lane Configurations									
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900			
Lane Width (ft)	10	10	10	10	10	10			
Grade (%)	0%		0%			0%			
Storage Length (ft)	0	0		0	0				
Storage Lanes	2	0		1	1				
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0			
Leading Detector (ft)	50		50	50	50	50			
Trailing Detector (ft)	0		0	0	0	0			
Turning Speed (mph)	15	9		9	15				
Satd. Flow (prot)	2888	0	2888	1343	1516	4150			
Flt Permitted	0.956				0.950				
Satd. Flow (perm)	2833	0	2888	1343	1444	4150			
Right Turn on Red		Yes		Yes					
Satd. Flow (RTOR)	8			480					
Link Speed (mph)	25		25			25			
Link Distance (ft)	480		132			2034			
Travel Time (s)	13.1		3.6			55.5			
Volume (vph)	552	44	842	604	106	752			
Confl. Peds. (#/hr)	26	26		14	51				
Confl. Bikes (#/hr)									
Peak Hour Factor	0.97	0.97	0.97	0.97	0.92	0.92			
Growth Factor	100%	100%	100%	100%	100%	100%			
Heavy Vehicles (%)	1%	0%	5%	1%	0%	5%			
Bus Blockages (#/hr)	0	0	0	0	0	0			
Parking (#/hr)									
Mid-Block Traffic (%)	0%		0%			0%			
Lane Group Flow (vph)	614	0	868	623	115	817			
Turn Type				pt+ov	Prot				
Protected Phases	9		2 12	2 9 12	4	4 6	2	6	12
Permitted Phases									
Total Split (s)	30.0	0.0	48.0	78.0	22.0	48.0	26.0	26.0	22.0
Act Effct Green (s)	26.0		46.9	76.9	15.1	44.0			
Actuated g/C Ratio	0.26		0.47	0.77	0.15	0.44			
v/c Ratio	0.81		0.64	0.54	0.50	0.45			
Uniform Delay, d1	34.2		20.2	0.7	39.0	19.5			
Delay	25.2		25.4	2.2	36.7	16.9			
LOS	C		C	A	D	B			
Approach Delay	25.2		15.7			19.3			
Approach LOS	C		B			B			

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 20 (20%), Referenced to phase 2:NET, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 18.8	Intersection LOS: B

Intersection Capacity Utilization 63.5% ICU Level of Service B

Splits and Phases: 10: Military Road & Western Avenue



Lane Group	WBL2	WBL	WBR	WBR2	NBL	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%				0%					0%	
Storage Length (ft)		0	0		0		0			0		0
Storage Lanes		2	0		0		1			0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50		50	50	50	
Trailing Detector (ft)	0	0			0	0	0		0	0	0	
Turning Speed (mph)	15	15	12	12	15		12	12	15	15		12
Satd. Flow (prot)	0	2856	0	0	0	1532	1342	0	0	0	1465	0
Flt Permitted		0.914				0.658					0.939	
Satd. Flow (perm)	0	2727	0	0	0	1027	1279	0	0	0	1381	0
Right Turn on Red				Yes				Yes				Yes
Satd. Flow (RTOR)		8					4				34	
Link Speed (mph)		30				30					30	
Link Distance (ft)		259				667					264	
Travel Time (s)		5.9				15.2					6.0	
Volume (vph)	11	107	4	11	213	45	303	21	2	8	27	27
Confl. Peds. (#/hr)					19		19		14			14
Confl. Bikes (#/hr)												
Peak Hour Factor	0.82	0.82	0.82	0.82	0.94	0.94	0.94	0.92	0.64	0.92	0.64	0.64
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	1%	2%	0%	2%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%				0%					0%	
Lane Group Flow (vph)	0	161	0	0	0	275	345	0	0	0	96	0
Turn Type	Perm				D.P+P		custom		Perm	Perm		
Protected Phases		10			3	3 4	3 4				4	
Permitted Phases	10				4		1		4	4		
Total Split (s)	16.0	16.0	0.0	0.0	11.0	33.0	33.0	0.0	22.0	22.0	22.0	0.0
Act Effct Green (s)		11.4				24.8	34.8				17.8	
Actuated g/C Ratio		0.11				0.25	0.35				0.18	
v/c Ratio		0.51				0.95	0.74				0.35	
Uniform Delay, d1		39.5				34.3	18.2				22.9	
Delay		39.7				63.7	21.8				24.4	
LOS		D				E	C				C	
Approach Delay		39.7				40.4					24.4	
Approach LOS		D				D					C	

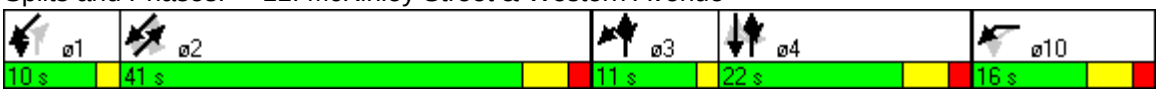
Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 54 (54%), Referenced to phase 2:NESW, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 33.4	Intersection LOS: C

Lane Group	NEL	NET	NER	NER2	SWL	SWT	SWR
Lane Configurations							
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	12
Grade (%)		0%				0%	
Storage Length (ft)	0		0		0		0
Storage Lanes	0		1		1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50	50	
Trailing Detector (ft)	0	0	0		0	0	
Turning Speed (mph)	15		12	12	15		12
Satd. Flow (prot)	0	2916	1295	0	1380	2814	0
Flt Permitted		0.954			0.108	0.766	
Satd. Flow (perm)	0	2782	1272	0	157	2160	0
Right Turn on Red				Yes			Yes
Satd. Flow (RTOR)			197			1	
Link Speed (mph)		25				25	
Link Distance (ft)		2034				382	
Travel Time (s)		55.5				10.4	
Volume (vph)	2	970	14	181	108	672	8
Confl. Peds. (#/hr)	3			3			
Confl. Bikes (#/hr)							
Peak Hour Factor	0.92	0.92	0.92	0.92	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	4%	2%	5%	0%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0
Parking (#/hr)							
Mid-Block Traffic (%)		0%				0%	
Lane Group Flow (vph)	0	1056	212	0	83	783	0
Turn Type	Perm		Perm		pm+pt		
Protected Phases		2			1	1 2	
Permitted Phases	2		2		1 2		
Total Split (s)	41.0	41.0	41.0	0.0	10.0	51.0	0.0
Act Effct Green (s)		37.8	37.8		43.8	43.8	
Actuated g/C Ratio		0.38	0.38		0.44	0.44	
v/c Ratio		1.00	0.35		0.58	0.79	
Uniform Delay, d1		31.1	1.4		14.7	22.5	
Delay		43.5	0.1		20.3	24.5	
LOS		D	A		C	C	
Approach Delay		36.2				24.1	
Approach LOS		D				C	

Intersection Summary

Intersection Capacity Utilization 97.1% ICU Level of Service E

Splits and Phases: 11: McKinley Street & Western Avenue

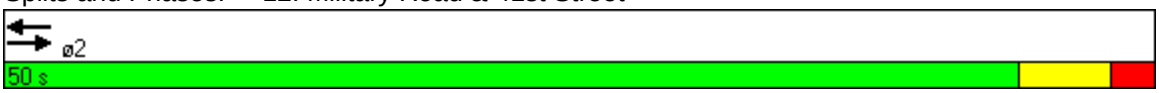


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	9	9	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50			50							
Trailing Detector (ft)		0			0							
Turning Speed (mph)	15		12	15		12	15		12	15		12
Satd. Flow (prot)	0	1524	0	0	1580	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1524	0	0	1580	0	0	0	0	0	0	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		999			76			352			128	
Travel Time (s)		27.2			2.1			8.0			2.9	
Volume (vph)	0	710	0	0	652	0	0	0	0	0	0	0
Confl. Peds. (#/hr)	20		20				55		55	24		24
Confl. Bikes (#/hr)												
Peak Hour Factor	0.99	0.99	0.99	0.96	0.96	0.96	0.92	0.92	0.92	0.72	0.72	0.72
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	717	0	0	679	0	0	0	0	0	0	0
Turn Type												
Protected Phases		2			2							
Permitted Phases												
Total Split (s)	0.0	50.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Act Effct Green (s)		50.0			50.0							
Actuated g/C Ratio		1.00			1.00							
v/c Ratio		0.47			0.43							
Uniform Delay, d1		0.0			0.0							
Delay		0.0			0.0							
LOS		A			A							
Approach Delay		0.0			0.0							
Approach LOS		A			A							

Intersection Summary	
Area Type:	CBD
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 7 (14%), Referenced to phase 2:EBWB and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 0.0	Intersection LOS: A

Intersection Capacity Utilization 45.3% ICU Level of Service A

Splits and Phases: 12: Military Road & 41st Street

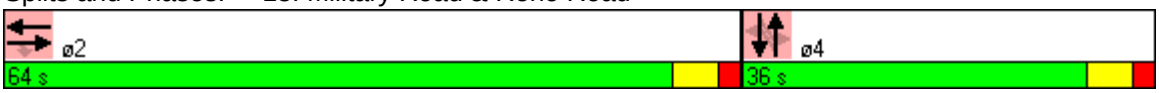


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50		50		50	50		50	50	
Trailing Detector (ft)		0	0		0		0	0		0	0	
Turning Speed (mph)	15		12	15		12	15		12	15		12
Satd. Flow (prot)	0	1565	1357	0	1570	0	0	3006	0	0	1588	0
Flt Permitted								0.941			0.989	
Satd. Flow (perm)	0	1565	1357	0	1570	0	0	2831	0	0	1572	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			77		4			4			1	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		76			244			206			138	
Travel Time (s)		2.1			6.7			5.6			3.8	
Volume (vph)	0	618	74	0	650	29	18	644	28	4	251	6
Confl. Peds. (#/hr)				3		3	6		6	13		13
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.97	0.97	0.97	0.91	0.91	0.91	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	644	77	0	700	0	0	759	0	0	280	0
Turn Type			Perm				Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases			2				4			4		
Total Split (s)	0.0	64.0	64.0	0.0	64.0	0.0	36.0	36.0	0.0	36.0	36.0	0.0
Act Effct Green (s)		61.0	61.0		61.0			31.0			31.0	
Actuated g/C Ratio		0.61	0.61		0.61			0.31			0.31	
v/c Ratio		0.67	0.09		0.73			0.86			0.57	
Uniform Delay, d1		12.9	0.0		13.6			32.3			28.8	
Delay		7.9	0.4		14.8			34.8			29.2	
LOS		A	A		B			C			C	
Approach Delay		7.1			14.8			34.8			29.2	
Approach LOS		A			B			C			C	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 92 (92%), Referenced to phase 2:EBWB and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 20.3	Intersection LOS: C

Intersection Capacity Utilization 75.2% ICU Level of Service C

Splits and Phases: 13: Military Road & Reno Road



TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Dane Ismart*
Agency/Co.	
Date Performed	*4/13/2005*
Analysis Time Period	*2014 PM Peak*

Site Information

Intersection	
Jurisdiction	
Analysis Year	*2014*

Project Description *Friendship Heights Addendum*

East/West Street: *Military Road* | North/South Street: *43rd Street*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*630*	*67*	*95*	*571*	*0*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*0*	*684*	*72*	*103*	*620*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*27*	*0*	*95*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*29*	*0*	*103*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*103*		*132*				
C (m) (vph)		*864*		*265*				
v/c		*0.12*		*0.50*				
95% queue length		*0.40*		*2.58*				
Control Delay		*9.7*		*31.3*				
LOS		*A*		*D*				
Approach Delay	--	--	*31.3*					
Approach LOS	--	--	*D*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst		Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*4/13/2005*	Analysis Year	*2014*
Analysis Time Period	*2014 PM Peak*		
Project Description	*Friendship Heights Addendum*		
East/West Street:	*Garrison Street*	North/South Street:	*Wisconsin Avenue*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*68*	*1651*	*11*	*10*	*1619*	*71*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*73*	*1794*	*11*	*10*	*1759*	*77*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration	*LT*		*TR*	*LT*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*19*	*7*	*1*	*37*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*0*	*0*	*20*	*7*	*1*	*40*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*1*	*1*	*1*	*1*
Configuration	*L*	*T*	*R*	*L*	*T*	*R*

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LT*	*L*	*T*	*R*	*L*	*T*	*R*
v (vph)	*73*	*10*	*0*	*0*	*20*	*7*	*1*	*40*
C (m) (vph)	*295*	*342*	*7*	*2*	*339*	*11*	*2*	*332*
v/c	*0.25*	*0.03*	*0.00*	*0.00*	*0.06*	*0.64*	*0.50*	*0.12*
95% queue length	*0.95*	*0.09*	*0.00*	*0.00*	*0.19*	*1.39*	*0.55*	*0.41*
Control Delay	*21.2*	*15.8*	*519.3*		*16.3*	*567.3*		*17.3*
LOS	*C*	*C*	*F*	*F*	*C*	*F*	*F*	*C*
Approach Delay	--	--	*16.3*			*145.9*		
Approach LOS	--	--	*C*			*F*		

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Friendship Heights Transportation Study
Addendum
Friendship Heights Transportation Study
Intersection Capacity Analysis

"Potential Development Case" with Signal Optimization for the Selected Intersections

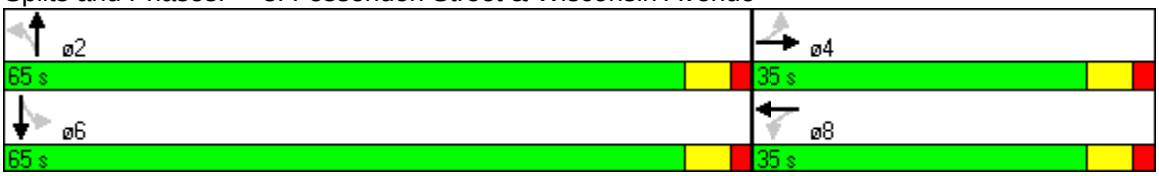
Lanes, Volumes, Timings
3: Fessenden Street & Wisconsin Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1528	0	1516	1447	0	0	4074	0	0	4348	0
Flt Permitted		0.966		0.468				0.924			0.771	
Satd. Flow (perm)	0	1480	0	743	1447	0	0	3764	0	0	3359	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			51						1	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		298			276			539			499	
Travel Time (s)		8.1			7.5			10.5			9.7	
Volume (vph)	18	150	33	204	54	67	6	1217	2	71	1710	4
Confl. Peds. (#/hr)	38		38	16		16	5		5	6		6
Confl. Bikes (#/hr)												
Peak Hour Factor	0.78	0.78	0.78	0.77	0.77	0.77	0.88	0.88	0.88	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	3%	0%	0%	0%	0%	7%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	11
Parking (#/hr)									8			
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	257	0	265	157	0	0	1392	0	0	1879	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	35.0	35.0	0.0	35.0	35.0	0.0	65.0	65.0	0.0	65.0	65.0	0.0
Act Effct Green (s)		31.0		31.0	31.0			61.0			61.0	
Actuated g/C Ratio		0.31		0.31	0.31			0.61			0.61	
v/c Ratio		0.55		1.15	0.32			0.61			0.92	
Uniform Delay, d1		27.5		34.5	17.4			12.1			17.2	
Delay		28.3		113.2	18.0			9.2			17.8	
LOS		C		F	B			A			B	
Approach Delay		28.3			77.8			9.2			17.8	
Approach LOS		C			E			A			B	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 1 (1%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.15	
Intersection Signal Delay: 21.8	Intersection LOS: C

Intersection Capacity Utilization 154.3% ICU Level of Service H

Splits and Phases: 3: Fessenden Street & Wisconsin Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1286	0	0	1426	0	0	4244	0	0	4266	0
Flt Permitted		0.984			0.846			0.674			0.932	
Satd. Flow (perm)	0	1265	0	0	1218	0	0	2872	0	0	3976	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		11			39			5			3	
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		269			302			395			800	
Travel Time (s)		6.1			6.9			7.7			15.6	
Volume (vph)	11	33	213	33	40	57	113	1158	13	7	1691	11
Confl. Peds. (#/hr)	82		82	33		33	14		14	20		20
Confl. Bikes (#/hr)												
Peak Hour Factor	0.74	0.74	0.74	0.88	0.88	0.88	0.89	0.89	0.89	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	11
Parking (#/hr)									8			
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	348	0	0	148	0	0	1443	0	0	1799	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	19.0	19.0	0.0	19.0	19.0	0.0	31.0	31.0	0.0	31.0	31.0	0.0
Act Effct Green (s)		15.0			15.0			27.0			27.0	
Actuated g/C Ratio		0.30			0.30			0.54			0.54	
v/c Ratio		0.90			0.38			1.00dl			0.84	
Uniform Delay, d1		16.2			9.9			10.6			9.6	
Delay		39.2			11.1			22.1			7.6	
LOS		D			B			C			A	
Approach Delay		39.2			11.1			22.1			7.6	
Approach LOS		D			B			C			A	

Intersection Summary	
Area Type:	CBD
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 9 (18%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 16.3	Intersection LOS: B

Intersection Capacity Utilization 114.0% ICU Level of Service G

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 5: Harrison Street & Wisconsin Avenue

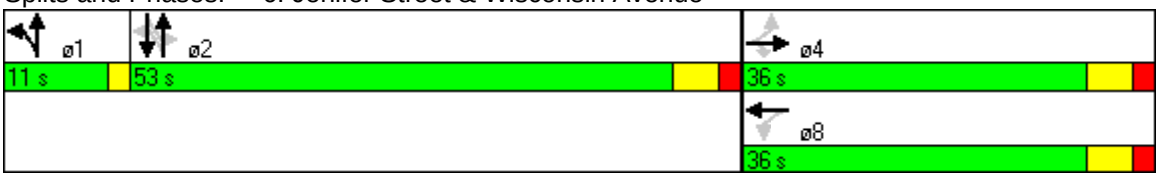
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1143	1245	0	1431	0	0	3848	0	0	4143	0
Flt Permitted		0.793			0.832			0.667			0.897	
Satd. Flow (perm)	0	909	1161	0	1196	0	0	2598	0	0	3719	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		270			354			800			736	
Travel Time (s)		7.4			9.7			15.6			14.3	
Volume (vph)	90	96	324	40	41	30	295	880	45	20	1307	55
Confl. Peds. (#/hr)	88		88	84		84	185		185	52		52
Confl. Bikes (#/hr)												
Peak Hour Factor	0.81	0.81	0.81	0.85	0.85	0.85	0.95	0.95	0.95	0.83	0.83	0.83
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	73%	2%	9%	0%	0%	14%	22%	7%	5%	5%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	11
Parking (#/hr)									8			
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	230	400	0	130	0	0	1284	0	0	1665	0
Turn Type	Perm		Perm	Perm			pm+pt			Perm		
Protected Phases		4			8		1	1 2			2	
Permitted Phases	4		4	8			1 2			2		
Total Split (s)	36.0	36.0	36.0	36.0	36.0	0.0	11.0	64.0	0.0	53.0	53.0	0.0
Act Effct Green (s)		32.0	32.0		32.0			56.0			49.0	
Actuated g/C Ratio		0.32	0.32		0.32			0.56			0.49	
v/c Ratio		0.79	1.08		0.34			2.24dl			0.91	
Uniform Delay, d1		30.9	34.0		25.9			15.8			23.5	
Delay		40.4	87.2		26.7			20.0			8.7	
LOS		D	F		C			C			A	
Approach Delay		70.1			26.7			20.0			8.7	
Approach LOS		E			C			C			A	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 90 (90%), Referenced to phase 2:NBSB and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 23.7	Intersection LOS: C

Intersection Capacity Utilization 122.5% ICU Level of Service H

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 6: Jenifer Street & Wisconsin Avenue

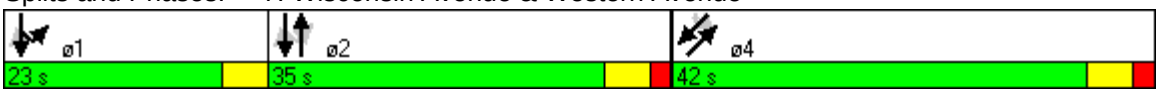


Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		1	1		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50	50	50	50			50	50
Trailing Detector (ft)		0	0	0	0	0	0	0			0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	4230	882	1472	2916	1268	1472	2926	0	0	2973	1280
Flt Permitted				0.144			0.105					
Satd. Flow (perm)	0	4230	815	219	2916	1071	163	2926	0	0	2973	1149
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			73			15		3				437
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		736			254			340			132	
Travel Time (s)		14.3			4.9			9.3			3.6	
Volume (vph)	0	936	66	375	1370	107	108	669	20	0	1008	484
Confl. Peds. (#/hr)	35		35	78		78	47		47	49		49
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.94	0.94	0.94	0.90	0.90	0.90	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	3%	33%	3%	4%	7%	3%	3%	0%	0%	2%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)			7									
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	1029	73	399	1457	114	120	765	0	0	1084	520
Turn Type			Perm	pm+pt		Perm	Perm					Perm
Protected Phases		2		1	1 2			4			4	
Permitted Phases			2	1 2		1 2	4					4
Total Split (s)	0.0	35.0	35.0	23.0	58.0	58.0	42.0	42.0	0.0	0.0	42.0	42.0
Act Effct Green (s)		31.0	31.0	50.0	54.0	54.0	38.0	38.0			38.0	38.0
Actuated g/C Ratio		0.31	0.31	0.50	0.54	0.54	0.38	0.38			0.38	0.38
v/c Ratio		0.78	0.24	1.15	0.93	0.19	1.94	0.69			0.96	0.73
Uniform Delay, d1		31.4	0.0	26.7	21.1	10.1	31.0	25.9			30.2	3.5
Delay		23.5	5.3	99.4	26.4	10.5	258.3	22.1			32.4	6.8
LOS		C	A	F	C	B	F	C			C	A
Approach Delay		22.3			40.3			54.1			24.1	
Approach LOS		C			D			D			C	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green, Master Intersection	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.94	
Intersection Signal Delay: 34.2	Intersection LOS: C

Intersection Capacity Utilization 100.6% ICU Level of Service F

Splits and Phases: 7: Wisconsin Avenue & Western Avenue

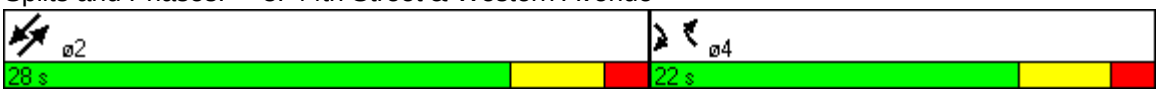


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		2	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)			50			50		50			50	
Trailing Detector (ft)			0			0		0			0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	0	1353	0	0	2388	0	2853	0	0	2883	0
Flt Permitted												
Satd. Flow (perm)	0	0	1217	0	0	2315	0	2853	0	0	2883	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			29			147		16			3	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		170			286			405			340	
Travel Time (s)		3.9			6.5			11.0			9.3	
Volume (vph)	0	0	3	0	0	42	0	744	44	0	1191	14
Confl. Peds. (#/hr)	97		97	20		20	66		66	7		7
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.67	0.67	0.67	0.95	0.95	0.95	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	0%	5%	0%	0%	5%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	0	3	0	0	63	0	829	0	0	1282	0
Turn Type			custom			custom						
Protected Phases			4			4		2			2	
Permitted Phases			4			4						
Total Split (s)	0.0	0.0	22.0	0.0	0.0	22.0	0.0	28.0	0.0	0.0	28.0	0.0
Act Effct Green (s)			7.5			7.5		43.8			43.8	
Actuated g/C Ratio			0.15			0.15		0.88			0.88	
v/c Ratio			0.01			0.13		0.33			0.51	
Uniform Delay, d1			0.0			0.0		2.0			2.7	
Delay			0.0			0.1		2.5			4.9	
LOS			A			A		A			A	
Approach Delay		0.0			0.1			2.5			4.9	
Approach LOS		A			A			A			A	

Intersection Summary	
Area Type:	CBD
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 48 (96%), Referenced to phase 2:NESW, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 3.8	Intersection LOS: A

Intersection Capacity Utilization 59.2% ICU Level of Service A

Splits and Phases: 8: 44th Street & Western Avenue

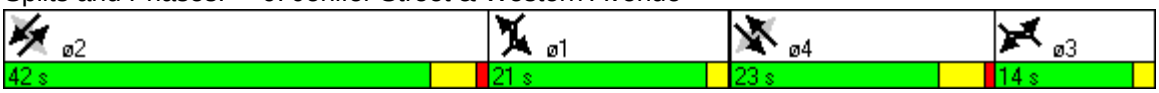


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	1		0	1		0	1		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	1501	2911	0	1353	2773	0	1472	2789	0	1330	2795	0
Flt Permitted	0.364			0.354	0.942		0.105			0.225		
Satd. Flow (perm)	562	2911	0	502	2617	0	163	2789	0	308	2795	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			9			42			39	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		490			207			1447			405	
Travel Time (s)		11.1			4.7			39.5			11.0	
Volume (vph)	129	259	62	143	261	24	136	591	168	208	802	213
Confl. Peds. (#/hr)	25		25	4		4	38		38	63		63
Confl. Bikes (#/hr)												
Peak Hour Factor	0.84	0.84	0.84	0.77	0.77	0.77	0.98	0.98	0.98	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	0%	0%	2%	0%	38%	3%	3%	4%	14%	2%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	154	382	0	168	388	0	139	774	0	214	1047	0
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	3	4		3	4		1	2		1	2	
Permitted Phases	4			4			2			2		
Total Split (s)	14.0	23.0	0.0	14.0	23.0	0.0	21.0	42.0	0.0	21.0	42.0	0.0
Act Effct Green (s)	26.9	19.0		26.9	26.9		57.1	47.3		57.1	47.3	
Actuated g/C Ratio	0.27	0.19		0.27	0.27		0.57	0.47		0.57	0.47	
v/c Ratio	0.68	0.67		0.83	0.54		0.63	0.58		0.77	0.78	
Uniform Delay, d1	33.3	34.9		35.6	27.4		25.9	18.0		22.3	21.1	
Delay	33.9	35.3		42.5	27.3		30.0	22.5		20.6	21.4	
LOS	C	D		D	C		C	C		C	C	
Approach Delay		34.9			31.9			23.7			21.2	
Approach LOS		C			C			C			C	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 47 (47%), Referenced to phase 2:NESW, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 26.0	Intersection LOS: C

Intersection Capacity Utilization 86.0% ICU Level of Service D

Splits and Phases: 9: Jenifer Street & Western Avenue

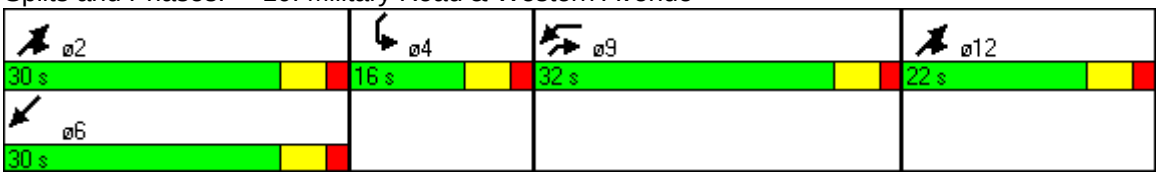


Lane Group	WBL	WBR	NET	NER	SWL	SWT	ø2	ø12
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	10	10	10	10	10	10		
Grade (%)	0%		0%			0%		
Storage Length (ft)	0	0		0	0			
Storage Lanes	2	0		1	1			
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		
Leading Detector (ft)	50		50	50	50	50		
Trailing Detector (ft)	0		0	0	0	0		
Turning Speed (mph)	15	9		9	15			
Satd. Flow (prot)	2841	0	2707	1317	1458	4150		
Flt Permitted	0.954				0.950			
Satd. Flow (perm)	2808	0	2707	1317	1283	4150		
Right Turn on Red		Yes		Yes				
Satd. Flow (RTOR)	5			329				
Link Speed (mph)	25		25			25		
Link Distance (ft)	480		132			2034		
Travel Time (s)	13.1		3.6			55.5		
Volume (vph)	608	28	429	694	105	879		
Confl. Peds. (#/hr)	18	18		3	72			
Confl. Bikes (#/hr)								
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Growth Factor	100%	100%	100%	100%	100%	100%		
Heavy Vehicles (%)	3%	4%	12%	3%	4%	5%		
Bus Blockages (#/hr)	0	0	0	0	0	0		
Parking (#/hr)								
Mid-Block Traffic (%)	0%		0%			0%		
Lane Group Flow (vph)	669	0	452	731	111	925		
Turn Type				pt+ov	Prot			
Protected Phases	9		2 12	2 9 12	4	6	2	12
Permitted Phases								
Total Split (s)	32.0	0.0	52.0	84.0	16.0	30.0	30.0	22.0
Act Effct Green (s)	27.2		49.2	80.5	11.5	31.1		
Actuated g/C Ratio	0.27		0.49	0.81	0.12	0.31		
v/c Ratio	0.86		0.34	0.65	0.66	0.72		
Uniform Delay, d1	34.3		15.4	1.8	42.4	30.4		
Delay	24.0		15.1	5.8	40.6	21.6		
LOS	C		B	A	D	C		
Approach Delay	24.0		9.3			23.7		
Approach LOS	C		A			C		

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 43 (43%), Referenced to phase 2:NET, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 17.9	Intersection LOS: B

Intersection Capacity Utilization 64.1% ICU Level of Service B

Splits and Phases: 10: Military Road & Western Avenue



Lane Group	WBL2	WBL	WBR	WBR2	NBL	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%				0%					0%	
Storage Length (ft)		0	0		0		0			0		0
Storage Lanes		2	0		0		1			0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50		50	50	50	
Trailing Detector (ft)	0	0			0	0	0		0	0	0	
Turning Speed (mph)	15	15	12	12	15		12	12	15	15		12
Satd. Flow (prot)	0	2870	0	0	0	1452	1275	0	0	0	1545	0
Flt Permitted		0.955				0.396					0.986	
Satd. Flow (perm)	0	2870	0	0	0	592	1226	0	0	0	1525	0
Right Turn on Red				Yes				Yes				No
Satd. Flow (RTOR)							11					
Link Speed (mph)		30				30					30	
Link Distance (ft)		431				667					150	
Travel Time (s)		9.8				15.2					3.4	
Volume (vph)	10	133	9	1	114	21	145	21	1	6	110	21
Confl. Peds. (#/hr)					14		14		21			21
Confl. Bikes (#/hr)												
Peak Hour Factor	0.88	0.88	0.88	0.88	0.84	0.84	0.84	0.92	0.80	0.92	0.80	0.80
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	0%	1%	1%	2%	1%	2%	0%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%				0%					0%	
Lane Group Flow (vph)	0	173	0	0	0	161	196	0	0	0	172	0
Turn Type	Perm				D.P+P		custom		Perm	Perm		
Protected Phases		10			3	3 4	3 4				4	
Permitted Phases	10				4		1		4	4		
Total Split (s)	11.0	11.0	0.0	0.0	22.0	40.0	40.0	0.0	18.0	18.0	18.0	0.0
Act Effct Green (s)		7.0				26.1	49.1				13.7	
Actuated g/C Ratio		0.07				0.26	0.49				0.14	
v/c Ratio		0.86				0.62	0.31				0.82	
Uniform Delay, d1		46.0				33.8	8.4				41.9	
Delay		68.1				33.2	8.0				55.5	
LOS		E				C	A				E	
Approach Delay		68.1				19.3					55.5	
Approach LOS		E				B					E	

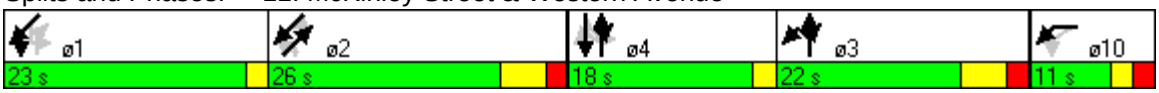
Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 92 (92%), Referenced to phase 2:NESW, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 29.6	Intersection LOS: C

Lane Group	NEL	NET	NER	NER2	SWL2	SWL	SWT	SWR
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10
Grade (%)		0%					0%	
Storage Length (ft)	0		0			0		0
Storage Lanes	0		1			0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	
Trailing Detector (ft)	0	0		0	0	0	0	
Turning Speed (mph)	15		12	12	15	15		12
Satd. Flow (prot)	0	2828	0	1357	0	0	2929	0
Flt Permitted		0.934					0.952	
Satd. Flow (perm)	0	2644	0	1321	0	0	2791	0
Right Turn on Red				No				No
Satd. Flow (RTOR)								
Link Speed (mph)		25					25	
Link Distance (ft)		2034					382	
Travel Time (s)		55.5					10.4	
Volume (vph)	6	433	9	146	1	19	992	5
Confl. Peds. (#/hr)	2			2		6		6
Confl. Bikes (#/hr)								
Peak Hour Factor	0.88	0.88	0.92	0.88	0.92	0.99	0.99	0.99
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	7%	2%	0%	2%	21%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0
Parking (#/hr)								
Mid-Block Traffic (%)		0%					0%	
Lane Group Flow (vph)	0	509	0	166	0	0	1027	0
Turn Type	Perm			Perm	custom	pm+pt		
Protected Phases		2				1	1 2	
Permitted Phases	2			2	1	1 2		
Total Split (s)	26.0	26.0	0.0	26.0	23.0	23.0	49.0	0.0
Act Effct Green (s)		27.9		27.9			46.9	
Actuated g/C Ratio		0.28		0.28			0.47	
v/c Ratio		0.69		0.45			0.77	
Uniform Delay, d1		32.2		29.7			19.6	
Delay		29.1		22.1			23.9	
LOS		C		C			C	
Approach Delay		27.4					23.9	
Approach LOS		C					C	

Intersection Summary

Intersection Capacity Utilization 82.7% ICU Level of Service D

Splits and Phases: 11: McKinley Street & Western Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50			50							
Trailing Detector (ft)		0			0							
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1550	0	0	1550	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1550	0	0	1550	0	0	0	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		999			76			352			128	
Travel Time (s)		27.2			2.1			8.0			2.9	
Volume (vph)	0	804	0	0	741	0	0	0	0	0	0	0
Confl. Peds. (#/hr)	6		6				25		25	34		34
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.89	0.89	0.89	0.76	0.76	0.76	0.81	0.81	0.81
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	8%	0%	6%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	829	0	0	833	0	0	0	0	0	0	0
Turn Type												
Protected Phases		2			2							
Permitted Phases												
Total Split (s)	0.0	63.0	0.0	0.0	63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Act Effct Green (s)		61.0			61.0							
Actuated g/C Ratio		0.61			0.61							
v/c Ratio		0.88			0.88							
Uniform Delay, d1		16.3			16.4							
Delay		29.4			8.4							
LOS		C			A							
Approach Delay		29.4			8.4							
Approach LOS		C			A							

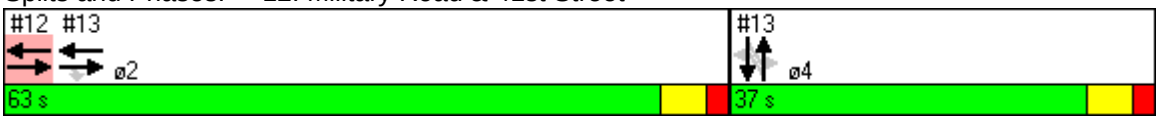
Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 34 (34%), Referenced to phase 2:EBWB and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 18.9	Intersection LOS: B

Lane Group	ø4
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	4
Permitted Phases	
Total Split (s)	37.0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Uniform Delay, d1	
Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Intersection Capacity Utilization 52.0% ICU Level of Service A

Splits and Phases: 12: Military Road & 41st Street

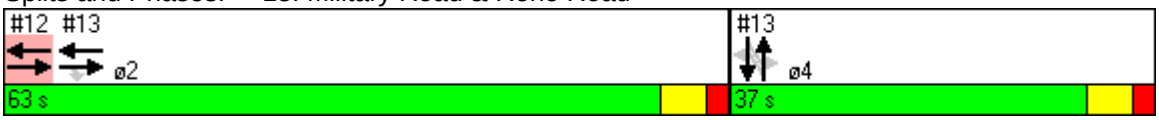


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50		50		50	50		50	50	
Trailing Detector (ft)		0	0		0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1535	1357	0	1546	0	0	2907	0	0	1589	0
Flt Permitted								0.933			0.996	
Satd. Flow (perm)	0	1535	1357	0	1546	0	0	2718	0	0	1582	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			139		1			8			1	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		76			244			206			138	
Travel Time (s)		2.1			6.7			5.6			3.8	
Volume (vph)	0	656	131	0	746	6	14	320	24	3	334	5
Confl. Peds. (#/hr)				11		11	31		31	44		44
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.87	0.87	0.87	0.79	0.79	0.79
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	4%	0%	0%	3%	17%	0%	1%	20%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	698	139	0	800	0	0	412	0	0	433	0
Turn Type			Perm				Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases			2				4			4		
Total Split (s)	0.0	63.0	63.0	0.0	63.0	0.0	37.0	37.0	0.0	37.0	37.0	0.0
Act Effct Green (s)		61.0	61.0		61.0			31.0			31.0	
Actuated g/C Ratio		0.61	0.61		0.61			0.31			0.31	
v/c Ratio		0.74	0.16		0.85			0.49			0.88	
Uniform Delay, d1		13.9	0.0		15.7			27.4			32.7	
Delay		1.5	0.0		21.9			27.2			38.0	
LOS		A	A		C			C			D	
Approach Delay		1.2			21.9			27.2			38.0	
Approach LOS		A			C			C			D	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 34 (34%), Referenced to phase 2:EBWB and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 18.6	Intersection LOS: B

Intersection Capacity Utilization 80.4% ICU Level of Service D

Splits and Phases: 13: Military Road & Reno Road



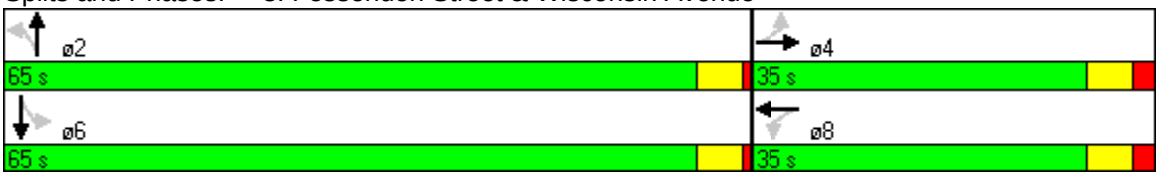
Lanes, Volumes, Timings
3: Fessenden Street & Wisconsin Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1532	0	1516	1503	0	0	4225	0	0	4157	0
Flt Permitted		0.931		0.433				0.920			0.787	
Satd. Flow (perm)	0	1430	0	685	1503	0	0	3887	0	0	3275	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8			17			19			3	
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		298			276			527			499	
Travel Time (s)		8.1			7.5			12.0			11.3	
Volume (vph)	27	187	35	134	172	81	10	1664	112	41	1594	22
Confl. Peds. (#/hr)	29		29	12		12	11		11	6		6
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.87	0.87	0.87	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	2%	0%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	7
Parking (#/hr)										0	0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	293	0	154	291	0	0	1963	0	0	1821	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	35.0	35.0	0.0	35.0	35.0	0.0	65.0	65.0	0.0	65.0	65.0	0.0
Act Effct Green (s)		27.4		27.4	27.4			64.6			64.6	
Actuated g/C Ratio		0.27		0.27	0.27			0.65			0.65	
v/c Ratio		0.74		0.82	0.68			0.78			0.86	
Uniform Delay, d1		32.0		34.0	30.4			12.5			14.1	
Delay		31.8		41.4	30.1			10.5			17.3	
LOS		C		D	C			B			B	
Approach Delay		31.8			34.0			10.5			17.3	
Approach LOS		C			C			B			B	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 16.9	Intersection LOS: B

Intersection Capacity Utilization 97.2% ICU Level of Service E

Splits and Phases: 3: Fessenden Street & Wisconsin Avenue



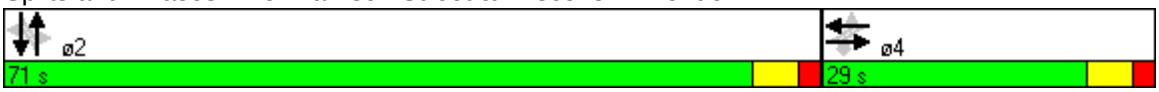
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1537	1330	0	1418	0	0	4243	0	0	4113	0
Flt Permitted		0.863			0.853			0.653			0.805	
Satd. Flow (perm)	0	1265	1011	0	1200	0	0	2781	0	0	3314	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			34		24			4			4	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		269			302			395			800	
Travel Time (s)		6.1			6.9			9.0			18.2	
Volume (vph)	36	60	251	39	26	33	129	1554	22	42	1510	22
Confl. Peds. (#/hr)	124		124	45		45	12		12	14		14
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.86	0.86	0.86	0.96	0.96	0.96	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	7
Parking (#/hr)										0	0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	113	295	0	113	0	0	1776	0	0	1769	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		4			4			2			2	
Permitted Phases	4		4	4			2			2		
Total Split (s)	29.0	29.0	29.0	29.0	29.0	0.0	71.0	71.0	0.0	71.0	71.0	0.0
Act Effct Green (s)		25.0	25.0		25.0			67.0			67.0	
Actuated g/C Ratio		0.25	0.25		0.25			0.67			0.67	
v/c Ratio		0.36	1.06		0.36			1.34dl			0.80	
Uniform Delay, d1		30.9	32.9		24.0			15.0			11.6	
Delay		31.7	88.2		24.8			16.5			7.7	
LOS		C	F		C			B			A	
Approach Delay		72.5			24.8			16.5			7.7	
Approach LOS		E			C			B			A	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 20 (20%), Referenced to phase 2:NBSB, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.06	
Intersection Signal Delay: 18.5	Intersection LOS: B

Intersection Capacity Utilization 101.5% ICU Level of Service F

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 5: Harrison Street & Wisconsin Avenue



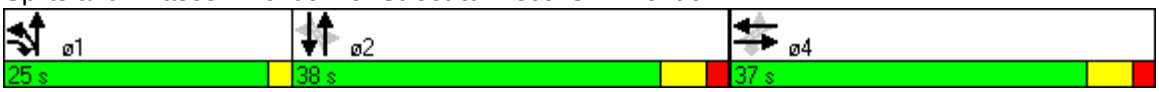
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1510	1357	0	1372	0	0	4202	0	0	3688	0
Flt Permitted		0.484			0.637			0.667			0.851	
Satd. Flow (perm)	0	738	1196	0	858	0	0	2784	0	0	3139	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		270			354			800			736	
Travel Time (s)		7.4			9.7			18.2			16.7	
Volume (vph)	170	90	503	67	143	81	407	1202	45	20	799	154
Confl. Peds. (#/hr)	58		58	165		165	216		216	183		183
Confl. Bikes (#/hr)												
Peak Hour Factor	0.79	0.79	0.79	0.77	0.77	0.77	0.90	0.90	0.90	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	3%	0%	2%	1%	1%	0%	2%	0%	0%	2%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	7
Parking (#/hr)										0	0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	329	637	0	378	0	0	1838	0	0	1024	0
Turn Type	Perm		pm+ov	Perm			pm+pt			Perm		
Protected Phases		4	1		4		1	1 2			2	
Permitted Phases	4		4	4			1 2			2		
Total Split (s)	37.0	37.0	25.0	37.0	37.0	0.0	25.0	63.0	0.0	38.0	38.0	0.0
Act Effct Green (s)		33.0	54.0		33.0			55.0			34.0	
Actuated g/C Ratio		0.33	0.54		0.33			0.55			0.34	
v/c Ratio		1.35	0.94		1.34			1.13dl			0.96	
Uniform Delay, d1		33.5	19.8		33.5			17.8			32.3	
Delay		157.7	34.9		153.8			30.6			22.4	
LOS		F	C		F			C			C	
Approach Delay		76.7			153.8			30.6			22.4	
Approach LOS		E			F			C			C	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 11 (11%), Referenced to phase 1:NBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.35	
Intersection Signal Delay: 50.3	Intersection LOS: D

Intersection Capacity Utilization 122.7% ICU Level of Service H

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 6: Jenifer Street & Wisconsin Avenue

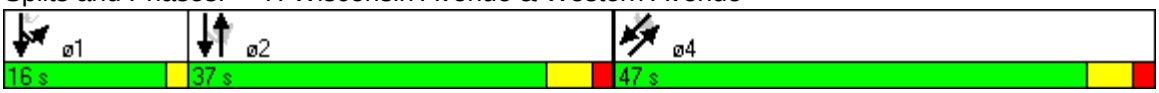


Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		0	1		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50		50	50			50	50
Trailing Detector (ft)		0	0	0	0		0	0			0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	4314	1245	1501	2750	0	1472	2926	0	0	2916	1357
Flt Permitted				0.121			0.153					
Satd. Flow (perm)	0	4314	852	191	2750	0	237	2926	0	0	2916	902
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		736			254			340			132	
Travel Time (s)		16.7			5.8			9.3			3.6	
Volume (vph)	0	1278	173	290	902	200	130	1060	43	0	980	354
Confl. Peds. (#/hr)	185		185	114		114	139		139	239		239
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.90	0.90	0.90	0.88	0.88	0.88	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	9%	1%	3%	3%	3%	2%	0%	0%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	1404	190	322	1224	0	148	1254	0	0	1010	365
Turn Type			Perm	pm+pt			Perm					custom
Protected Phases		2		1	1 2			4			4	
Permitted Phases			2	1 2			4					1 4
Total Split (s)	0.0	37.0	37.0	16.0	53.0	0.0	47.0	47.0	0.0	0.0	47.0	63.0
Act Effct Green (s)		33.0	33.0	45.0	49.0		43.0	43.0			43.0	59.0
Actuated g/C Ratio		0.33	0.33	0.45	0.49		0.43	0.43			0.43	0.59
v/c Ratio		0.99	0.68	1.33	0.91		1.45	1.00			0.81	0.69
Uniform Delay, d1		33.3	28.9	24.9	23.4		28.5	28.4			24.9	14.1
Delay		30.2	26.9	147.4	28.2		181.5	39.4			19.2	21.6
LOS		C	C	F	C		F	D			B	C
Approach Delay		29.8			53.0			54.4			19.9	
Approach LOS		C			D			D			B	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 6:, Start of Green, Master Intersection	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.45	
Intersection Signal Delay: 39.4	Intersection LOS: D

Intersection Capacity Utilization 110.2% ICU Level of Service G

Splits and Phases: 7: Wisconsin Avenue & Western Avenue

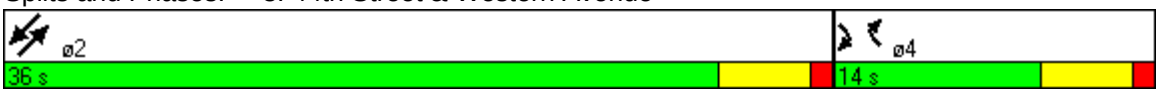


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		2	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)			50			50		50			50	
Trailing Detector (ft)			0			0		0			0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	0	1381	0	0	2231	0	2899	0	0	2886	0
Flt Permitted												
Satd. Flow (perm)	0	0	1342	0	0	2094	0	2899	0	0	2886	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			83			194		17			20	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		170			286			405			340	
Travel Time (s)		3.9			6.5			11.0			9.3	
Volume (vph)	0	0	50	0	0	102	0	1067	46	0	1063	52
Confl. Peds. (#/hr)	17		17	54		54	9		9	59		59
Confl. Bikes (#/hr)												
Peak Hour Factor	0.73	0.73	0.73	0.87	0.87	0.87	0.98	0.98	0.98	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	5%	0%	7%	0%	4%	0%	0%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	0	68	0	0	117	0	1136	0	0	1174	0
Turn Type			custom			custom						
Protected Phases			4			4		2			2	
Permitted Phases			4			4						
Total Split (s)	0.0	0.0	14.0	0.0	0.0	14.0	0.0	36.0	0.0	0.0	36.0	0.0
Act Effct Green (s)			7.2			7.2		37.7			37.7	
Actuated g/C Ratio			0.14			0.14		0.75			0.75	
v/c Ratio			0.25			0.24		0.52			0.54	
Uniform Delay, d1			0.0			0.0		3.2			3.3	
Delay			4.8			1.2		3.0			2.2	
LOS			A			A		A			A	
Approach Delay		4.8			1.2			3.0			2.2	
Approach LOS		A			A			A			A	

Intersection Summary	
Area Type:	CBD
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 12 (24%), Referenced to phase 2:NESW, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 2.6	Intersection LOS: A

Intersection Capacity Utilization 54.4% ICU Level of Service A

Splits and Phases: 8: 44th Street & Western Avenue

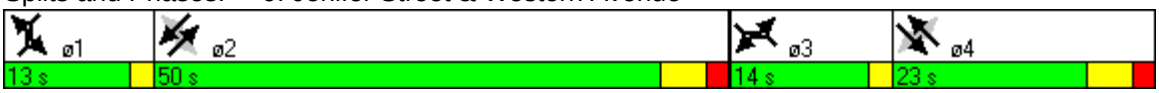


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	1		0	1		0	1		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		12	15		12	15		12	15		12
Satd. Flow (prot)	1516	2614	0	1380	2773	0	1501	2813	0	1404	2881	0
Flt Permitted	0.419			0.227	0.566		0.162			0.106		
Satd. Flow (perm)	634	2614	0	322	1582	0	256	2813	0	157	2881	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		59			12			35			43	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		490			207			1447			405	
Travel Time (s)		11.1			4.7			39.5			11.0	
Volume (vph)	200	297	127	347	279	52	132	874	194	304	743	194
Confl. Peds. (#/hr)	62		62	37		37	63		63	14		14
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.84	0.84	0.84	0.89	0.89	0.89	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	9%	1%	0%	1%	0%	1%	3%	0%	8%	1%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	235	498	0	218	589	0	148	1200	0	334	1029	0
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	3	4		3	4		1	2		1	2	
Permitted Phases	4			4			2			2		
Total Split (s)	14.0	23.0	0.0	14.0	23.0	0.0	13.0	50.0	0.0	13.0	50.0	0.0
Act Effct Green (s)	29.0	19.0		29.0	29.0		55.0	46.0		55.0	46.0	
Actuated g/C Ratio	0.29	0.19		0.29	0.29		0.55	0.46		0.55	0.46	
v/c Ratio	0.86	0.92		1.10	1.01		0.58	0.91		1.68	0.76	
Uniform Delay, d1	27.8	34.9		27.7	30.9		9.5	24.4		20.6	21.4	
Delay	46.4	48.7		99.8	60.9		14.5	17.2		218.6	25.5	
LOS	D	D		F	E		B	B		F	C	
Approach Delay		47.9			71.4			16.9			72.9	
Approach LOS		D			E			B			E	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 28 (28%), Referenced to phase 1:NESWL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.68	
Intersection Signal Delay: 50.5	Intersection LOS: D

Intersection Capacity Utilization 107.4% ICU Level of Service F

Splits and Phases: 9: Jenifer Street & Western Avenue

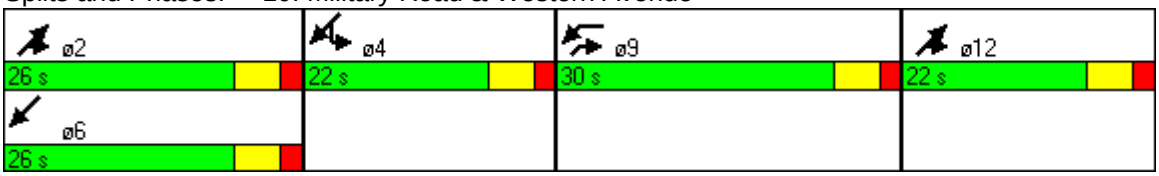


Lane Group	WBL	WBR	NET	NER	SWL	SWT	ø2	ø6	ø12
Lane Configurations									
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900			
Lane Width (ft)	10	10	10	10	10	10			
Grade (%)	0%		0%			0%			
Storage Length (ft)	0	0		0	0				
Storage Lanes	2	0		1	1				
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0			
Leading Detector (ft)	50		50	50	50	50			
Trailing Detector (ft)	0		0	0	0	0			
Turning Speed (mph)	15	9		9	15				
Satd. Flow (prot)	2888	0	2888	1343	1516	4150			
Flt Permitted	0.956				0.950				
Satd. Flow (perm)	2833	0	2888	1343	1444	4150			
Right Turn on Red		Yes		Yes					
Satd. Flow (RTOR)	8			480					
Link Speed (mph)	25		25			25			
Link Distance (ft)	480		132			2034			
Travel Time (s)	13.1		3.6			55.5			
Volume (vph)	552	44	842	604	106	752			
Confl. Peds. (#/hr)	26	26		14	51				
Confl. Bikes (#/hr)									
Peak Hour Factor	0.97	0.97	0.97	0.97	0.92	0.92			
Growth Factor	100%	100%	100%	100%	100%	100%			
Heavy Vehicles (%)	1%	0%	5%	1%	0%	5%			
Bus Blockages (#/hr)	0	0	0	0	0	0			
Parking (#/hr)									
Mid-Block Traffic (%)	0%		0%			0%			
Lane Group Flow (vph)	614	0	868	623	115	817			
Turn Type				pt+ov	Prot				
Protected Phases	9		2 12	2 9 12	4	4 6	2	6	12
Permitted Phases									
Total Split (s)	30.0	0.0	48.0	78.0	22.0	48.0	26.0	26.0	22.0
Act Effct Green (s)	26.0		46.9	76.9	15.1	44.0			
Actuated g/C Ratio	0.26		0.47	0.77	0.15	0.44			
v/c Ratio	0.81		0.64	0.54	0.50	0.45			
Uniform Delay, d1	34.2		20.2	0.7	39.0	19.5			
Delay	25.2		25.1	2.2	36.7	16.9			
LOS	C		C	A	D	B			
Approach Delay	25.2		15.6			19.3			
Approach LOS	C		B			B			

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 20 (20%), Referenced to phase 2:NET, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 18.7	Intersection LOS: B

Intersection Capacity Utilization 63.5% ICU Level of Service B

Splits and Phases: 10: Military Road & Western Avenue



Lane Group	WBL2	WBL	WBR	WBR2	NBL	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%				0%					0%	
Storage Length (ft)		0	0		0		0			0		0
Storage Lanes		2	0		0		1			0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50		50	50	50	
Trailing Detector (ft)	0	0			0	0	0		0	0	0	
Turning Speed (mph)	15	15	12	12	15		12	12	15	15		12
Satd. Flow (prot)	0	2856	0	0	0	1532	1342	0	0	0	1465	0
Flt Permitted		0.914				0.658					0.939	
Satd. Flow (perm)	0	2727	0	0	0	1027	1279	0	0	0	1381	0
Right Turn on Red				Yes				Yes				Yes
Satd. Flow (RTOR)		8					4				34	
Link Speed (mph)		30				30					30	
Link Distance (ft)		259				667					264	
Travel Time (s)		5.9				15.2					6.0	
Volume (vph)	11	107	4	11	213	45	303	21	2	8	27	27
Confl. Peds. (#/hr)					19		19		14			14
Confl. Bikes (#/hr)												
Peak Hour Factor	0.82	0.82	0.82	0.82	0.94	0.94	0.94	0.92	0.64	0.92	0.64	0.64
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	1%	2%	0%	2%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%				0%					0%	
Lane Group Flow (vph)	0	161	0	0	0	275	345	0	0	0	96	0
Turn Type	Perm				D.P+P		custom		Perm	Perm		
Protected Phases		10			3	3 4	3 4				4	
Permitted Phases	10				4		1		4	4		
Total Split (s)	16.0	16.0	0.0	0.0	11.0	33.0	33.0	0.0	22.0	22.0	22.0	0.0
Act Effct Green (s)		11.4				24.8	34.8				17.8	
Actuated g/C Ratio		0.11				0.25	0.35				0.18	
v/c Ratio		0.51				0.95	0.74				0.35	
Uniform Delay, d1		39.5				34.3	18.2				22.9	
Delay		39.7				63.7	21.8				24.4	
LOS		D				E	C				C	
Approach Delay		39.7				40.4					24.4	
Approach LOS		D				D					C	

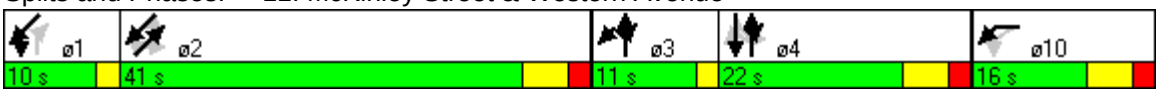
Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 54 (54%), Referenced to phase 2:NESW, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 33.4	Intersection LOS: C

Lane Group	NEL	NET	NER	NER2	SWL	SWT	SWR
Lane Configurations							
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	12
Grade (%)		0%				0%	
Storage Length (ft)	0		0		0		0
Storage Lanes	0		1		1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50	50	
Trailing Detector (ft)	0	0	0		0	0	
Turning Speed (mph)	15		12	12	15		12
Satd. Flow (prot)	0	2916	1295	0	1380	2814	0
Flt Permitted		0.954			0.108	0.766	
Satd. Flow (perm)	0	2782	1272	0	157	2160	0
Right Turn on Red				Yes			Yes
Satd. Flow (RTOR)			197			1	
Link Speed (mph)		25				25	
Link Distance (ft)		2034				382	
Travel Time (s)		55.5				10.4	
Volume (vph)	2	970	14	181	108	672	8
Confl. Peds. (#/hr)	3			3			
Confl. Bikes (#/hr)							
Peak Hour Factor	0.92	0.92	0.92	0.92	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	4%	2%	5%	0%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0
Parking (#/hr)							
Mid-Block Traffic (%)		0%				0%	
Lane Group Flow (vph)	0	1056	212	0	83	783	0
Turn Type	Perm		Perm		pm+pt		
Protected Phases		2			1	1 2	
Permitted Phases	2		2		1 2		
Total Split (s)	41.0	41.0	41.0	0.0	10.0	51.0	0.0
Act Effct Green (s)		37.8	37.8		43.8	43.8	
Actuated g/C Ratio		0.38	0.38		0.44	0.44	
v/c Ratio		1.00	0.35		0.58	0.79	
Uniform Delay, d1		31.1	1.4		14.7	22.5	
Delay		43.5	0.1		20.3	24.5	
LOS		D	A		C	C	
Approach Delay		36.2				24.1	
Approach LOS		D				C	

Intersection Summary

Intersection Capacity Utilization 97.1% ICU Level of Service E

Splits and Phases: 11: McKinley Street & Western Avenue

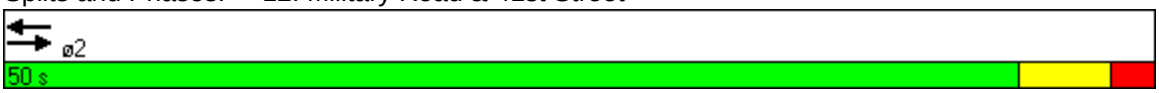


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	9	9	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50			50							
Trailing Detector (ft)		0			0							
Turning Speed (mph)	15		12	15		12	15		12	15		12
Satd. Flow (prot)	0	1524	0	0	1580	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1524	0	0	1580	0	0	0	0	0	0	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		999			76			352			128	
Travel Time (s)		27.2			2.1			8.0			2.9	
Volume (vph)	0	710	0	0	652	0	0	0	0	0	0	0
Confl. Peds. (#/hr)	20		20				55		55	24		24
Confl. Bikes (#/hr)												
Peak Hour Factor	0.99	0.99	0.99	0.96	0.96	0.96	0.92	0.92	0.92	0.72	0.72	0.72
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	717	0	0	679	0	0	0	0	0	0	0
Turn Type												
Protected Phases		2			2							
Permitted Phases												
Total Split (s)	0.0	50.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Act Effct Green (s)		50.0			50.0							
Actuated g/C Ratio		1.00			1.00							
v/c Ratio		0.47			0.43							
Uniform Delay, d1		0.0			0.0							
Delay		0.0			0.0							
LOS		A			A							
Approach Delay		0.0			0.0							
Approach LOS		A			A							

Intersection Summary	
Area Type:	CBD
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 7 (14%), Referenced to phase 2:EBWB and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 0.0	Intersection LOS: A

Intersection Capacity Utilization 45.3% ICU Level of Service A

Splits and Phases: 12: Military Road & 41st Street

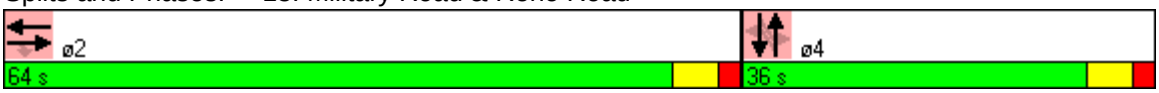


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50		50		50	50		50	50	
Trailing Detector (ft)		0	0		0		0	0		0	0	
Turning Speed (mph)	15		12	15		12	15		12	15		12
Satd. Flow (prot)	0	1565	1357	0	1570	0	0	3006	0	0	1588	0
Flt Permitted								0.941			0.989	
Satd. Flow (perm)	0	1565	1357	0	1570	0	0	2831	0	0	1572	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			77		4			4			1	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		76			244			206			138	
Travel Time (s)		2.1			6.7			5.6			3.8	
Volume (vph)	0	618	74	0	650	29	18	644	28	4	251	6
Confl. Peds. (#/hr)				3		3	6		6	13		13
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.97	0.97	0.97	0.91	0.91	0.91	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	644	77	0	700	0	0	759	0	0	280	0
Turn Type			Perm				Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases			2				4			4		
Total Split (s)	0.0	64.0	64.0	0.0	64.0	0.0	36.0	36.0	0.0	36.0	36.0	0.0
Act Effct Green (s)		61.0	61.0		61.0			31.0			31.0	
Actuated g/C Ratio		0.61	0.61		0.61			0.31			0.31	
v/c Ratio		0.67	0.09		0.73			0.86			0.57	
Uniform Delay, d1		12.9	0.0		13.6			32.3			28.8	
Delay		7.9	0.4		14.8			34.8			29.2	
LOS		A	A		B			C			C	
Approach Delay		7.1			14.8			34.8			29.2	
Approach LOS		A			B			C			C	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 92 (92%), Referenced to phase 2:EBWB and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 20.3	Intersection LOS: C

Intersection Capacity Utilization 75.2% ICU Level of Service C

Splits and Phases: 13: Military Road & Reno Road



Friendship Heights Transportation Study
Addendum
Friendship Heights Transportation Study
Intersection Capacity Analysis

"Wisconsin Avenue Corridor Transportation Study Scenario 2 with Signal Optimization for the Selected Intersections"

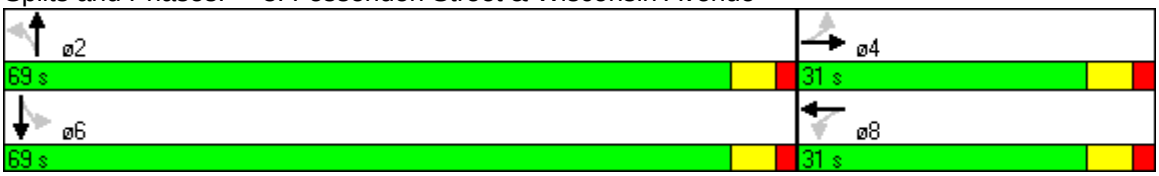
Lanes, Volumes, Timings
3: Fessenden Street & Wisconsin Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1528	0	1516	1447	0	0	4073	0	0	4348	0
Flt Permitted		0.965		0.429				0.924			0.751	
Satd. Flow (perm)	0	1478	0	681	1447	0	0	3764	0	0	3272	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			35						1	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		298			276			539			499	
Travel Time (s)		8.1			7.5			10.5			9.7	
Volume (vph)	18	150	33	204	54	67	6	1443	2	71	1880	4
Confl. Peds. (#/hr)	38		38	16		16	5		5	6		6
Confl. Bikes (#/hr)												
Peak Hour Factor	0.78	0.78	0.78	0.77	0.77	0.77	0.88	0.88	0.88	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	3%	0%	0%	0%	0%	7%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	11
Parking (#/hr)									8			
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	257	0	265	157	0	0	1649	0	0	2058	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	31.0	31.0	0.0	31.0	31.0	0.0	69.0	69.0	0.0	69.0	69.0	0.0
Act Effct Green (s)		27.0		27.0	27.0			65.0			65.0	
Actuated g/C Ratio		0.27		0.27	0.27			0.65			0.65	
v/c Ratio		0.63		1.44	0.38			0.67			0.97	
Uniform Delay, d1		30.8		36.5	22.7			10.9			16.5	
Delay		31.6		180.4	23.3			8.7			17.1	
LOS		C		F	C			A			B	
Approach Delay		31.6			121.9			8.7			17.1	
Approach LOS		C			F			A			B	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 1 (1%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.44	
Intersection Signal Delay: 24.8	Intersection LOS: C

Intersection Capacity Utilization 163.7% ICU Level of Service H

Splits and Phases: 3: Fessenden Street & Wisconsin Avenue



Lanes, Volumes, Timings
5: Harrison Street & Wisconsin Avenue

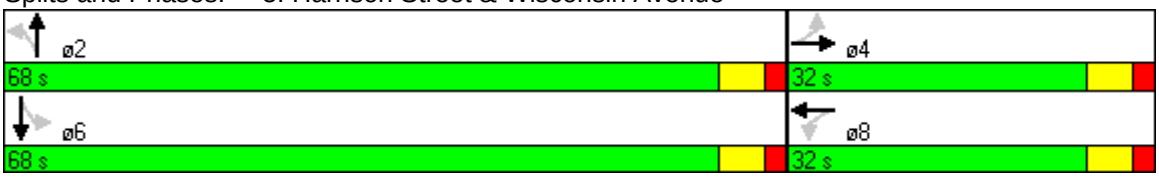
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1197	0	0	1408	0	0	4243	0	0	4265	0
Flt Permitted		0.986			0.724			0.643			0.931	
Satd. Flow (perm)	0	1178	0	0	1034	0	0	2739	0	0	3971	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			37			3			2	
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		269			302			395			800	
Travel Time (s)		6.1			6.9			7.7			15.6	
Volume (vph)	11	33	225	37	40	57	115	1366	16	7	1843	11
Confl. Peds. (#/hr)	82		82	33		33	14		14	20		20
Confl. Bikes (#/hr)												
Peak Hour Factor	0.74	0.74	0.74	0.88	0.88	0.88	0.89	0.89	0.89	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	11
Parking (#/hr)									8			
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	364	0	0	152	0	0	1682	0	0	1959	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	32.0	32.0	0.0	32.0	32.0	0.0	68.0	68.0	0.0	68.0	68.0	0.0
Act Effct Green (s)		28.0			28.0			64.0			64.0	
Actuated g/C Ratio		0.28			0.28			0.64			0.64	
v/c Ratio		1.07			0.48			1.87dl			0.77	
Uniform Delay, d1		34.3			22.1			16.7			12.8	
Delay		87.1			23.2			17.7			6.9	
LOS		F			C			B			A	
Approach Delay		87.1			23.2			17.7			6.9	
Approach LOS		F			C			B			A	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 9 (9%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.07	
Intersection Signal Delay: 18.9	Intersection LOS: B

Intersection Capacity Utilization 124.0% ICU Level of Service H

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 5: Harrison Street & Wisconsin Avenue



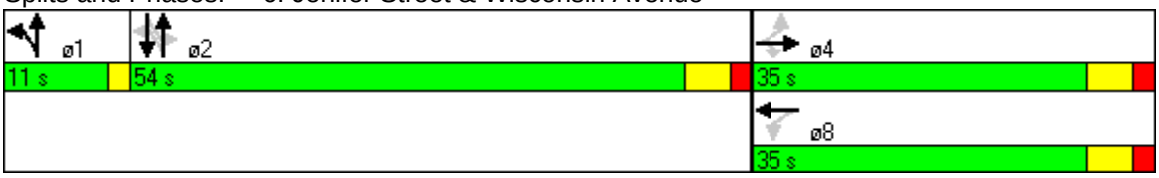
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1143	1245	0	1434	0	0	3860	0	0	4148	0
Flt Permitted		0.785			0.810			0.666			0.890	
Satd. Flow (perm)	0	900	1161	0	1167	0	0	2599	0	0	3695	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		270			354			800			736	
Travel Time (s)		7.4			9.7			15.6			14.3	
Volume (vph)	90	96	335	44	41	30	313	1060	55	20	1444	55
Confl. Peds. (#/hr)	88		88	84		84	185		185	52		52
Confl. Bikes (#/hr)												
Peak Hour Factor	0.81	0.81	0.81	0.85	0.85	0.85	0.95	0.95	0.95	0.83	0.83	0.83
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	73%	2%	9%	0%	0%	14%	22%	7%	5%	5%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	11
Parking (#/hr)									8			
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	230	414	0	135	0	0	1503	0	0	1830	0
Turn Type	Perm		Perm	Perm			pm+pt			Perm		
Protected Phases		4			8		1	1 2			2	
Permitted Phases	4		4	8			1 2			2		
Total Split (s)	35.0	35.0	35.0	35.0	35.0	0.0	11.0	65.0	0.0	54.0	54.0	0.0
Act Effct Green (s)		31.0	31.0		31.0			57.0			50.0	
Actuated g/C Ratio		0.31	0.31		0.31			0.57			0.50	
v/c Ratio		0.82	1.15		0.37			2.35dl			0.99	
Uniform Delay, d1		31.9	34.5		26.9			18.2			24.7	
Delay		44.5	105.8		27.7			28.3			10.1	
LOS		D	F		C			C			B	
Approach Delay		83.9			27.7			28.3			10.1	
Approach LOS		F			C			C			B	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 90 (90%), Referenced to phase 2:NBSB and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.15	
Intersection Signal Delay: 28.9	Intersection LOS: C

Intersection Capacity Utilization 126.1% ICU Level of Service H

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 6: Jenifer Street & Wisconsin Avenue

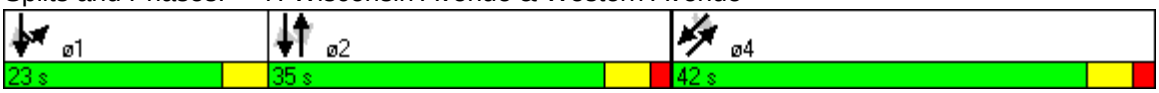


Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		1	1		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50	50	50	50			50	50
Trailing Detector (ft)		0	0	0	0	0	0	0			0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	4230	882	1472	2916	1268	1472	2923	0	0	2973	1280
Flt Permitted				0.129			0.105					
Satd. Flow (perm)	0	4230	815	200	2916	1071	163	2923	0	0	2973	1149
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			76			15		4				434
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		736			254			340			132	
Travel Time (s)		14.3			4.9			9.3			3.6	
Volume (vph)	0	1102	80	375	1505	107	108	669	22	0	1008	484
Confl. Peds. (#/hr)	35		35	78		78	47		47	49		49
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.94	0.94	0.94	0.90	0.90	0.90	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	3%	33%	3%	4%	7%	3%	3%	0%	0%	2%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)			7									
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	1211	88	399	1601	114	120	767	0	0	1084	520
Turn Type			Perm	pm+pt		Perm	Perm					Perm
Protected Phases		2		1	1 2			4			4	
Permitted Phases			2	1 2		1 2	4					4
Total Split (s)	0.0	35.0	35.0	23.0	58.0	58.0	42.0	42.0	0.0	0.0	42.0	42.0
Act Effct Green (s)		31.0	31.0	50.0	54.0	54.0	38.0	38.0			38.0	38.0
Actuated g/C Ratio		0.31	0.31	0.50	0.54	0.54	0.38	0.38			0.38	0.38
v/c Ratio		0.92	0.29	1.17	1.02	0.19	1.94	0.69			0.96	0.74
Uniform Delay, d1		33.3	3.3	27.6	23.0	10.1	31.0	25.9			30.2	3.6
Delay		29.4	7.5	105.6	44.9	10.5	258.9	22.0			32.3	7.0
LOS		C	A	F	D	B	F	C			C	A
Approach Delay		28.0			54.5			54.1			24.1	
Approach LOS		C			D			D			C	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green, Master Intersection	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.94	
Intersection Signal Delay: 40.3	Intersection LOS: D

Intersection Capacity Utilization 104.6% ICU Level of Service F

Splits and Phases: 7: Wisconsin Avenue & Western Avenue

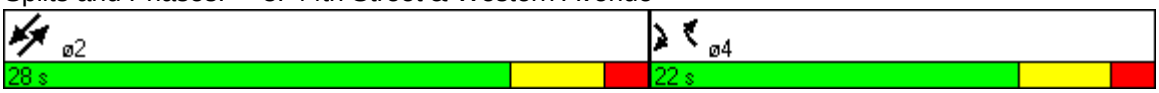


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		2	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)			50			50		50			50	
Trailing Detector (ft)			0			0		0			0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	0	1353	0	0	2388	0	2853	0	0	2883	0
Flt Permitted												
Satd. Flow (perm)	0	0	1217	0	0	2315	0	2853	0	0	2883	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			29			147		16			3	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		170			286			405			340	
Travel Time (s)		3.9			6.5			11.0			9.3	
Volume (vph)	0	0	3	0	0	42	0	744	44	0	1191	14
Confl. Peds. (#/hr)	97		97	20		20	66		66	7		7
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.67	0.67	0.67	0.95	0.95	0.95	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	0%	5%	0%	0%	5%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	0	3	0	0	63	0	829	0	0	1282	0
Turn Type			custom			custom						
Protected Phases			4			4		2			2	
Permitted Phases			4			4						
Total Split (s)	0.0	0.0	22.0	0.0	0.0	22.0	0.0	28.0	0.0	0.0	28.0	0.0
Act Effct Green (s)			7.5			7.5		43.8			43.8	
Actuated g/C Ratio			0.15			0.15		0.88			0.88	
v/c Ratio			0.01			0.13		0.33			0.51	
Uniform Delay, d1			0.0			0.0		2.0			2.7	
Delay			0.0			0.1		2.5			4.9	
LOS			A			A		A			A	
Approach Delay		0.0			0.1			2.5			4.9	
Approach LOS		A			A			A			A	

Intersection Summary	
Area Type:	CBD
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 48 (96%), Referenced to phase 2:NESW, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 3.8	Intersection LOS: A

Intersection Capacity Utilization 59.2% ICU Level of Service A

Splits and Phases: 8: 44th Street & Western Avenue

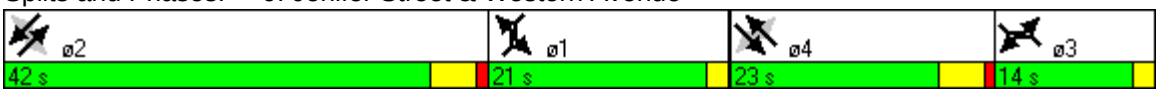


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	1		0	1		0	1		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	1501	2911	0	1353	2773	0	1472	2789	0	1330	2795	0
Flt Permitted	0.364			0.354	0.942		0.105			0.225		
Satd. Flow (perm)	562	2911	0	502	2617	0	163	2789	0	308	2795	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			9			42			39	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		490			207			1447			405	
Travel Time (s)		11.1			4.7			39.5			11.0	
Volume (vph)	129	259	62	143	261	24	136	591	168	208	802	213
Confl. Peds. (#/hr)	25		25	4		4	38		38	63		63
Confl. Bikes (#/hr)												
Peak Hour Factor	0.84	0.84	0.84	0.77	0.77	0.77	0.98	0.98	0.98	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	0%	0%	2%	0%	38%	3%	3%	4%	14%	2%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	154	382	0	168	388	0	139	774	0	214	1047	0
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	3	4		3	4		1	2		1	2	
Permitted Phases	4			4			2			2		
Total Split (s)	14.0	23.0	0.0	14.0	23.0	0.0	21.0	42.0	0.0	21.0	42.0	0.0
Act Effct Green (s)	26.9	19.0		26.9	26.9		57.1	47.3		57.1	47.3	
Actuated g/C Ratio	0.27	0.19		0.27	0.27		0.57	0.47		0.57	0.47	
v/c Ratio	0.68	0.67		0.83	0.54		0.63	0.58		0.77	0.78	
Uniform Delay, d1	33.3	34.9		35.6	27.4		25.9	18.0		22.3	21.1	
Delay	33.9	35.3		42.5	27.3		30.0	22.5		20.6	21.4	
LOS	C	D		D	C		C	C		C	C	
Approach Delay		34.9			31.9			23.7			21.2	
Approach LOS		C			C			C			C	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 47 (47%), Referenced to phase 2:NESW, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 26.0	Intersection LOS: C

Intersection Capacity Utilization 86.0% ICU Level of Service D

Splits and Phases: 9: Jenifer Street & Western Avenue

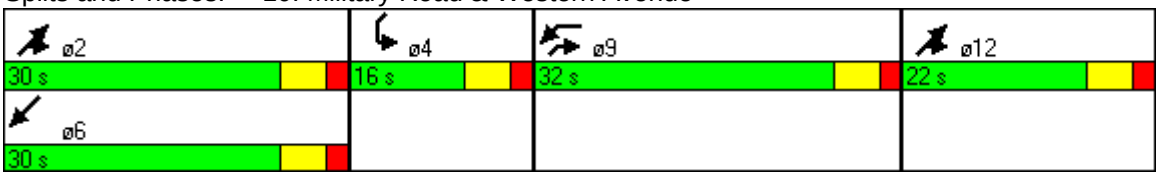


Lane Group	WBL	WBR	NET	NER	SWL	SWT	ø2	ø12
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	10	10	10	10	10	10		
Grade (%)	0%		0%			0%		
Storage Length (ft)	0	0		0	0			
Storage Lanes	2	0		1	1			
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		
Leading Detector (ft)	50		50	50	50	50		
Trailing Detector (ft)	0		0	0	0	0		
Turning Speed (mph)	15	9		9	15			
Satd. Flow (prot)	2841	0	2707	1317	1458	4150		
Flt Permitted	0.954				0.950			
Satd. Flow (perm)	2808	0	2707	1317	1284	4150		
Right Turn on Red		Yes		Yes				
Satd. Flow (RTOR)	5			329				
Link Speed (mph)	25		25			25		
Link Distance (ft)	480		132			2034		
Travel Time (s)	13.1		3.6			55.5		
Volume (vph)	608	28	434	703	105	879		
Confl. Peds. (#/hr)	18	18		3	72			
Confl. Bikes (#/hr)								
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Growth Factor	100%	100%	100%	100%	100%	100%		
Heavy Vehicles (%)	3%	4%	12%	3%	4%	5%		
Bus Blockages (#/hr)	0	0	0	0	0	0		
Parking (#/hr)								
Mid-Block Traffic (%)	0%		0%			0%		
Lane Group Flow (vph)	669	0	457	740	111	925		
Turn Type				pt+ov	Prot			
Protected Phases	9		2 12	2 9 12	4	6	2	12
Permitted Phases								
Total Split (s)	32.0	0.0	52.0	84.0	16.0	30.0	30.0	22.0
Act Effct Green (s)	27.2		49.2	80.5	11.5	30.9		
Actuated g/C Ratio	0.27		0.49	0.81	0.12	0.31		
v/c Ratio	0.86		0.34	0.66	0.66	0.72		
Uniform Delay, d1	34.3		15.4	1.8	42.4	30.6		
Delay	24.0		15.2	5.9	40.6	22.3		
LOS	C		B	A	D	C		
Approach Delay	24.0		9.4			24.2		
Approach LOS	C		A			C		

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 43 (43%), Referenced to phase 2:NET, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 18.1	Intersection LOS: B

Intersection Capacity Utilization 64.7% ICU Level of Service B

Splits and Phases: 10: Military Road & Western Avenue



Lane Group	WBL2	WBL	WBR	WBR2	NBL	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%				0%					0%	
Storage Length (ft)		0	0		0		0			0		0
Storage Lanes		2	0		0		1			0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50		50	50	50	
Trailing Detector (ft)	0	0			0	0	0		0	0	0	
Turning Speed (mph)	15	15	12	12	15		12	12	15	15		12
Satd. Flow (prot)	0	2870	0	0	0	1452	1275	0	0	0	1545	0
Flt Permitted		0.955				0.396					0.986	
Satd. Flow (perm)	0	2870	0	0	0	592	1226	0	0	0	1525	0
Right Turn on Red				Yes				Yes				No
Satd. Flow (RTOR)							11					
Link Speed (mph)		30				30					30	
Link Distance (ft)		431				667					150	
Travel Time (s)		9.8				15.2					3.4	
Volume (vph)	10	133	9	1	114	21	145	21	1	6	110	21
Confl. Peds. (#/hr)					14		14		21			21
Confl. Bikes (#/hr)												
Peak Hour Factor	0.88	0.88	0.88	0.88	0.84	0.84	0.84	0.92	0.80	0.92	0.80	0.80
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	0%	1%	1%	2%	1%	2%	0%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%				0%					0%	
Lane Group Flow (vph)	0	173	0	0	0	161	196	0	0	0	172	0
Turn Type	Perm				D.P+P		custom		Perm	Perm		
Protected Phases		10			3	3 4	3 4				4	
Permitted Phases	10				4		1		4	4		
Total Split (s)	11.0	11.0	0.0	0.0	22.0	40.0	40.0	0.0	18.0	18.0	18.0	0.0
Act Effct Green (s)		7.0				26.1	49.1				13.7	
Actuated g/C Ratio		0.07				0.26	0.49				0.14	
v/c Ratio		0.86				0.62	0.31				0.82	
Uniform Delay, d1		46.0				33.8	8.4				41.9	
Delay		68.1				33.2	8.0				55.5	
LOS		E				C	A				E	
Approach Delay		68.1				19.3					55.5	
Approach LOS		E				B					E	

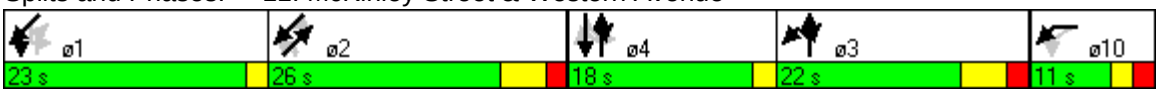
Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 92 (92%), Referenced to phase 2:NESW, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 29.5	Intersection LOS: C

Lane Group	NEL	NET	NER	NER2	SWL2	SWL	SWT	SWR
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10
Grade (%)		0%					0%	
Storage Length (ft)	0		0			0		0
Storage Lanes	0		1			0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	
Trailing Detector (ft)	0	0		0	0	0	0	
Turning Speed (mph)	15		12	12	15	15		12
Satd. Flow (prot)	0	2828	0	1357	0	0	2929	0
Flt Permitted		0.934					0.952	
Satd. Flow (perm)	0	2644	0	1321	0	0	2791	0
Right Turn on Red				No				No
Satd. Flow (RTOR)								
Link Speed (mph)		25					25	
Link Distance (ft)		2034					382	
Travel Time (s)		55.5					10.4	
Volume (vph)	6	433	9	146	1	19	992	5
Confl. Peds. (#/hr)	2			2		6		6
Confl. Bikes (#/hr)								
Peak Hour Factor	0.88	0.88	0.92	0.88	0.92	0.99	0.99	0.99
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	7%	2%	0%	2%	21%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0
Parking (#/hr)								
Mid-Block Traffic (%)		0%					0%	
Lane Group Flow (vph)	0	509	0	166	0	0	1027	0
Turn Type	Perm			Perm	custom	pm+pt		
Protected Phases		2				1	1 2	
Permitted Phases	2			2	1	1 2		
Total Split (s)	26.0	26.0	0.0	26.0	23.0	23.0	49.0	0.0
Act Effct Green (s)		27.9		27.9			46.9	
Actuated g/C Ratio		0.28		0.28			0.47	
v/c Ratio		0.69		0.45			0.77	
Uniform Delay, d1		32.2		29.7			19.6	
Delay		28.8		21.7			23.9	
LOS		C		C			C	
Approach Delay		27.0					23.9	
Approach LOS		C					C	

Intersection Summary

Intersection Capacity Utilization 82.7% ICU Level of Service D

Splits and Phases: 11: McKinley Street & Western Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50			50							
Trailing Detector (ft)		0			0							
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1550	0	0	1550	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1550	0	0	1550	0	0	0	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		999			76			352			128	
Travel Time (s)		27.2			2.1			8.0			2.9	
Volume (vph)	0	804	0	0	741	0	0	0	0	0	0	0
Confl. Peds. (#/hr)	6		6				25		25	34		34
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.89	0.89	0.89	0.76	0.76	0.76	0.81	0.81	0.81
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	8%	0%	6%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	829	0	0	833	0	0	0	0	0	0	0
Turn Type												
Protected Phases		2			2							
Permitted Phases												
Total Split (s)	0.0	63.0	0.0	0.0	63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Act Effct Green (s)		61.0			61.0							
Actuated g/C Ratio		0.61			0.61							
v/c Ratio		0.88			0.88							
Uniform Delay, d1		16.3			16.4							
Delay		29.2			8.4							
LOS		C			A							
Approach Delay		29.2			8.4							
Approach LOS		C			A							

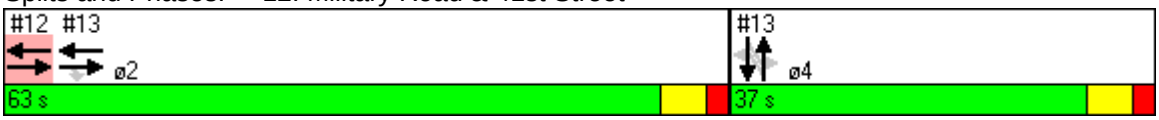
Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 34 (34%), Referenced to phase 2:EBWB and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 18.7	Intersection LOS: B

Lane Group	ø4
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	4
Permitted Phases	
Total Split (s)	37.0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Uniform Delay, d1	
Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Intersection Capacity Utilization 52.0% ICU Level of Service A

Splits and Phases: 12: Military Road & 41st Street

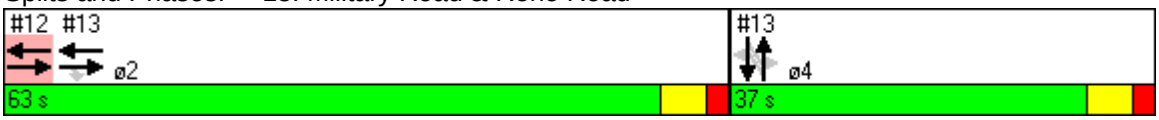


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50		50		50	50		50	50	
Trailing Detector (ft)		0	0		0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1535	1357	0	1546	0	0	2907	0	0	1589	0
Flt Permitted								0.933			0.996	
Satd. Flow (perm)	0	1535	1357	0	1546	0	0	2718	0	0	1582	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			139		1			8			1	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		76			244			206			138	
Travel Time (s)		2.1			6.7			5.6			3.8	
Volume (vph)	0	662	133	0	746	6	14	320	24	3	334	5
Confl. Peds. (#/hr)				11		11	31		31	44		44
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.87	0.87	0.87	0.79	0.79	0.79
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	4%	0%	0%	3%	17%	0%	1%	20%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	704	141	0	800	0	0	412	0	0	433	0
Turn Type			Perm				Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases			2				4			4		
Total Split (s)	0.0	63.0	63.0	0.0	63.0	0.0	37.0	37.0	0.0	37.0	37.0	0.0
Act Effct Green (s)		61.0	61.0		61.0			31.0			31.0	
Actuated g/C Ratio		0.61	0.61		0.61			0.31			0.31	
v/c Ratio		0.75	0.16		0.85			0.49			0.88	
Uniform Delay, d1		14.0	0.1		15.7			27.4			32.7	
Delay		1.6	0.0		21.9			27.2			38.0	
LOS		A	A		C			C			D	
Approach Delay		1.3			21.9			27.2			38.0	
Approach LOS		A			C			C			D	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 34 (34%), Referenced to phase 2:EBWB and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 18.6	Intersection LOS: B

Intersection Capacity Utilization 80.4% ICU Level of Service D

Splits and Phases: 13: Military Road & Reno Road



TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Dane Ismart*
Agency/Co.	
Date Performed	*4/13/2005*
Analysis Time Period	*2014 AM Peak_WACTS Scenario 2*

Site Information

Intersection	
Jurisdiction	
Analysis Year	*2014*

Project Description *Friendship Heights Addendum*

East/West Street: *Military Road* | North/South Street: *43rd Street*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*681*	*60*	*59*	*671*	*0*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*0*	*740*	*65*	*64*	*729*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*10*	*0*	*62*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*10*	*0*	*67*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*64*		*77*				
C (m) (vph)		*828*		*293*				
v/c		*0.08*		*0.26*				
95% queue length		*0.25*		*1.03*				
Control Delay		*9.7*		*21.6*				
LOS		*A*		*C*				
Approach Delay	--	--	*21.6*					
Approach LOS	--	--	*C*					

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Dane Ismart*	Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*4/13/2005*	Analysis Year	*2014*
Analysis Time Period	*2014 AM Peak_WACTS Sceanrio 2*		

Project Description	*Friendship Heights Addendum*
East/West Street: *Garrison Street*	North/South Street: *Wisconsin Avenue*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*97*	*1495*	*17*	*22*	*1994*	*54*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.90*
Hourly Flow Rate, HFR	*105*	*1624*	*18*	*23*	*2167*	*60*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration	*LT*		*TR*	*LT*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*2*	*6*	*12*	*1*	*6*	*14*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*2*	*6*	*13*	*1*	*6*	*15*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*1*	*1*	*1*	*1*
Configuration	*L*	*T*	*R*	*L*	*T*	*R*

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LT*	*L*	*T*	*R*	*L*	*T*	*R*
v (vph)	*105*	*23*	*2*	*6*	*13*	*1*	*6*	*15*
C (m) (vph)	*234*	*356*	*0*	*1*	*378*	*0*	*1*	*256*
v/c	*0.45*	*0.06*		*6.00*	*0.03*		*6.00*	*0.06*
95% queue length	*2.15*	*0.21*		*1.84*	*0.11*		*1.84*	*0.19*
Control Delay	*32.3*	*15.8*			*14.9*			*19.9*
LOS	*D*	*C*	*F*	*F*	*B*	*F*	*F*	*C*
Approach Delay	--	--						
Approach LOS	--	--						

>

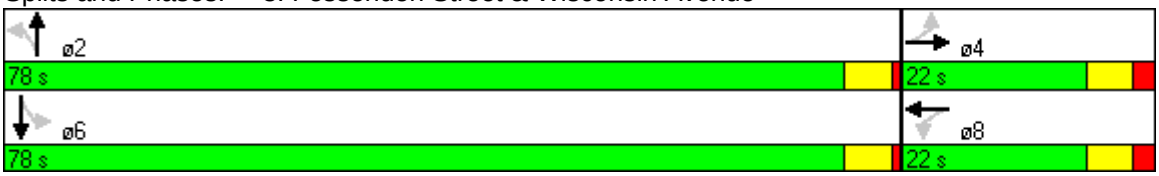
Lanes, Volumes, Timings
3: Fessenden Street & Wisconsin Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1532	0	1516	1503	0	0	4230	0	0	4157	0
Flt Permitted		0.492		0.231				0.918			0.791	
Satd. Flow (perm)	0	756	0	366	1503	0	0	3883	0	0	3292	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			21			25			5	
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		298			276			527			499	
Travel Time (s)		8.1			7.5			12.0			11.3	
Volume (vph)	27	187	35	134	172	81	10	1869	112	41	1787	22
Confl. Peds. (#/hr)	29		29	12		12	11		11	6		6
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.87	0.87	0.87	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	2%	0%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	7
Parking (#/hr)										0	0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	293	0	154	291	0	0	2188	0	0	2033	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	22.0	22.0	0.0	22.0	22.0	0.0	78.0	78.0	0.0	78.0	78.0	0.0
Act Effct Green (s)		18.0		18.0	18.0			74.0			74.0	
Actuated g/C Ratio		0.18		0.18	0.18			0.74			0.74	
v/c Ratio		2.06		2.33	1.01			0.76			0.83	
Uniform Delay, d1		39.0		41.0	38.0			7.6			8.8	
Delay		271.8		296.4	80.9			5.1			10.2	
LOS		F		F	F			A			B	
Approach Delay		271.8			155.5			5.1			10.2	
Approach LOS		F			F			A			B	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.33	
Intersection Signal Delay: 36.5	Intersection LOS: D

Intersection Capacity Utilization 103.3% ICU Level of Service F

Splits and Phases: 3: Fessenden Street & Wisconsin Avenue



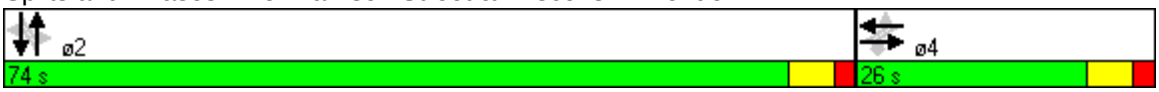
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1537	1330	0	1424	0	0	4247	0	0	4114	0
Flt Permitted		0.873			0.829			0.648			0.796	
Satd. Flow (perm)	0	1284	1011	0	1169	0	0	2760	0	0	3278	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			27		21			4			4	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		269			302			395			800	
Travel Time (s)		6.1			6.9			9.0			18.2	
Volume (vph)	36	60	264	46	26	33	130	1741	25	42	1676	22
Confl. Peds. (#/hr)	124		124	45		45	12		12	14		14
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.86	0.86	0.86	0.96	0.96	0.96	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	7
Parking (#/hr)										0	0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	113	311	0	121	0	0	1975	0	0	1955	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		4			4			2			2	
Permitted Phases	4		4	4			2			2		
Total Split (s)	26.0	26.0	26.0	26.0	26.0	0.0	74.0	74.0	0.0	74.0	74.0	0.0
Act Effct Green (s)		22.0	22.0		22.0			70.0			70.0	
Actuated g/C Ratio		0.22	0.22		0.22			0.70			0.70	
v/c Ratio		0.40	1.28		0.44			1.59dl			0.85	
Uniform Delay, d1		33.3	34.6		27.5			15.0			11.1	
Delay		34.2	142.3		28.5			29.7			7.6	
LOS		C	F		C			C			A	
Approach Delay		113.5			28.5			29.7			7.6	
Approach LOS		F			C			C			A	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 20 (20%), Referenced to phase 2:NBSB, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.28	
Intersection Signal Delay: 28.0	Intersection LOS: C

Intersection Capacity Utilization 110.3% ICU Level of Service G

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 5: Harrison Street & Wisconsin Avenue



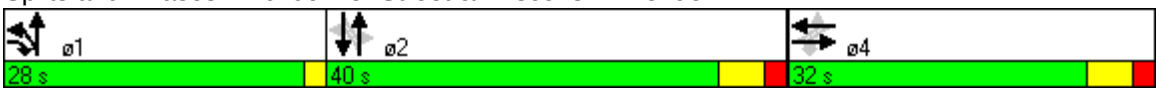
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1510	1357	0	1377	0	0	4165	0	0	3740	0
Flt Permitted		0.454			0.489			0.666			0.846	
Satd. Flow (perm)	0	708	1196	0	661	0	0	2770	0	0	3166	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		270			354			800			736	
Travel Time (s)		7.4			9.7			18.2			16.7	
Volume (vph)	170	90	524	79	143	81	425	1364	51	20	933	154
Confl. Peds. (#/hr)	58		58	165		165	216		216	183		183
Confl. Bikes (#/hr)												
Peak Hour Factor	0.79	0.79	0.79	0.77	0.77	0.77	0.90	0.90	0.90	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	3%	0%	2%	1%	1%	0%	2%	0%	0%	2%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	7
Parking (#/hr)										0	0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	329	663	0	394	0	0	2045	0	0	1165	0
Turn Type	Perm		pm+ov	Perm			pm+pt			Perm		
Protected Phases		4	1		4		1	1 2			2	
Permitted Phases	4		4	4			1 2			2		
Total Split (s)	32.0	32.0	28.0	32.0	32.0	0.0	28.0	68.0	0.0	40.0	40.0	0.0
Act Effct Green (s)		28.0	52.0		28.0			60.0			36.0	
Actuated g/C Ratio		0.28	0.52		0.28			0.60			0.36	
v/c Ratio		1.66	1.00		2.13			1.09dl			1.02	
Uniform Delay, d1		36.0	22.8		36.0			15.0			32.0	
Delay		218.3	50.8		279.3			23.7			31.2	
LOS		F	D		F			C			C	
Approach Delay		106.4			279.3			23.7			31.2	
Approach LOS		F			F			C			C	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 11 (11%), Referenced to phase 1:NBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.13	
Intersection Signal Delay: 65.4	Intersection LOS: E

Intersection Capacity Utilization 130.9% ICU Level of Service H

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 6: Jenifer Street & Wisconsin Avenue

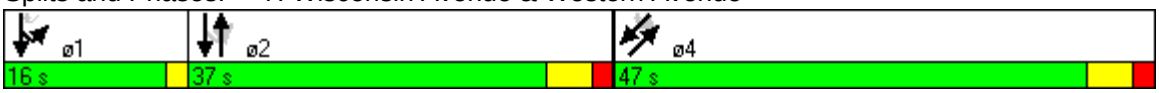


Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		0	1		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50		50	50			50	50
Trailing Detector (ft)		0	0	0	0		0	0			0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	4314	1245	1501	2770	0	1472	2919	0	0	2916	1357
Flt Permitted				0.121			0.153					
Satd. Flow (perm)	0	4314	852	191	2770	0	237	2919	0	0	2916	902
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		736			254			340			132	
Travel Time (s)		16.7			5.8			9.3			3.6	
Volume (vph)	0	1419	194	290	1029	200	130	1060	50	0	980	354
Confl. Peds. (#/hr)	185		185	114		114	139		139	239		239
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.90	0.90	0.90	0.88	0.88	0.88	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	9%	1%	3%	3%	3%	2%	0%	0%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	1559	213	322	1365	0	148	1262	0	0	1010	365
Turn Type			Perm	pm+pt			Perm					custom
Protected Phases		2		1	1 2			4			4	
Permitted Phases			2	1 2			4					1 4
Total Split (s)	0.0	37.0	37.0	16.0	53.0	0.0	47.0	47.0	0.0	0.0	47.0	63.0
Act Effct Green (s)		33.0	33.0	45.0	49.0		43.0	43.0			43.0	59.0
Actuated g/C Ratio		0.33	0.33	0.45	0.49		0.43	0.43			0.43	0.59
v/c Ratio		1.09	0.76	1.33	1.01		1.45	1.01			0.81	0.69
Uniform Delay, d1		33.5	29.9	24.9	25.5		28.5	28.5			24.9	14.1
Delay		46.0	28.8	147.4	45.9		183.0	45.7			19.1	21.6
LOS		D	C	F	D		F	D			B	C
Approach Delay		43.9			65.3			60.1			19.8	
Approach LOS		D			E			E			B	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 6:, Start of Green, Master Intersection	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.45	
Intersection Signal Delay: 48.0	Intersection LOS: D

Intersection Capacity Utilization 113.5% ICU Level of Service G

Splits and Phases: 7: Wisconsin Avenue & Western Avenue

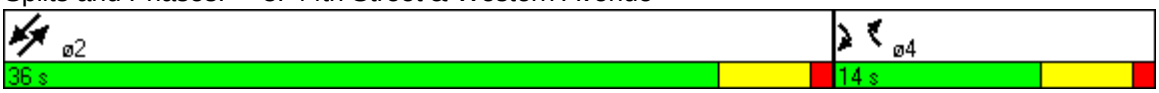


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		2	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)			50			50		50			50	
Trailing Detector (ft)			0			0		0			0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	0	1381	0	0	2231	0	2899	0	0	2886	0
Flt Permitted												
Satd. Flow (perm)	0	0	1342	0	0	2094	0	2899	0	0	2886	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			83			194		17			20	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		170			286			405			340	
Travel Time (s)		3.9			6.5			11.0			9.3	
Volume (vph)	0	0	50	0	0	102	0	1067	46	0	1063	52
Confl. Peds. (#/hr)	17		17	54		54	9		9	59		59
Confl. Bikes (#/hr)												
Peak Hour Factor	0.73	0.73	0.73	0.87	0.87	0.87	0.98	0.98	0.98	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	5%	0%	7%	0%	4%	0%	0%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	0	68	0	0	117	0	1136	0	0	1174	0
Turn Type			custom			custom						
Protected Phases			4			4		2			2	
Permitted Phases			4			4						
Total Split (s)	0.0	0.0	14.0	0.0	0.0	14.0	0.0	36.0	0.0	0.0	36.0	0.0
Act Effct Green (s)			7.2			7.2		37.7			37.7	
Actuated g/C Ratio			0.14			0.14		0.75			0.75	
v/c Ratio			0.25			0.24		0.52			0.54	
Uniform Delay, d1			0.0			0.0		3.2			3.3	
Delay			4.8			1.2		3.6			2.2	
LOS			A			A		A			A	
Approach Delay		4.8			1.2			3.6			2.2	
Approach LOS		A			A			A			A	

Intersection Summary	
Area Type:	CBD
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 12 (24%), Referenced to phase 2:NESW, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 2.8	Intersection LOS: A

Intersection Capacity Utilization 54.4% ICU Level of Service A

Splits and Phases: 8: 44th Street & Western Avenue

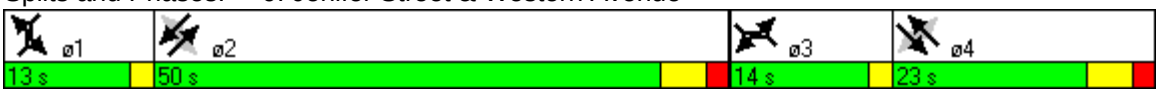


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	1		0	1		0	1		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		12	15		12	15		12	15		12
Satd. Flow (prot)	1516	2614	0	1380	2773	0	1501	2813	0	1404	2881	0
Flt Permitted	0.419			0.227	0.566		0.162			0.106		
Satd. Flow (perm)	634	2614	0	322	1582	0	256	2813	0	157	2881	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		59			12			35			43	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		490			207			1447			405	
Travel Time (s)		11.1			4.7			39.5			11.0	
Volume (vph)	200	297	127	347	279	52	132	874	194	304	743	194
Confl. Peds. (#/hr)	62		62	37		37	63		63	14		14
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.84	0.84	0.84	0.89	0.89	0.89	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	9%	1%	0%	1%	0%	1%	3%	0%	8%	1%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	235	498	0	218	589	0	148	1200	0	334	1029	0
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	3	4		3	4		1	2		1	2	
Permitted Phases	4			4			2			2		
Total Split (s)	14.0	23.0	0.0	14.0	23.0	0.0	13.0	50.0	0.0	13.0	50.0	0.0
Act Effct Green (s)	29.0	19.0		29.0	29.0		55.0	46.0		55.0	46.0	
Actuated g/C Ratio	0.29	0.19		0.29	0.29		0.55	0.46		0.55	0.46	
v/c Ratio	0.86	0.92		1.10	1.01		0.58	0.91		1.68	0.76	
Uniform Delay, d1	27.8	34.9		27.7	30.9		9.5	24.4		20.6	21.4	
Delay	46.4	48.7		99.8	60.9		19.6	24.5		218.7	25.4	
LOS	D	D		F	E		B	C		F	C	
Approach Delay		47.9			71.4			23.9			72.8	
Approach LOS		D			E			C			E	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 28 (28%), Referenced to phase 1:NESWL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.68	
Intersection Signal Delay: 52.7	Intersection LOS: D

Intersection Capacity Utilization 107.4% ICU Level of Service F

Splits and Phases: 9: Jenifer Street & Western Avenue

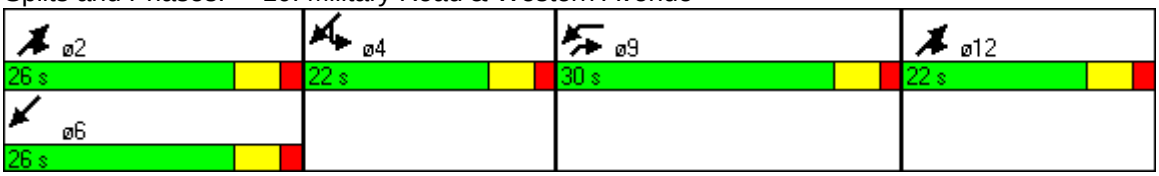


Lane Group	WBL	WBR	NET	NER	SWL	SWT	ø2	ø6	ø12
Lane Configurations									
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900			
Lane Width (ft)	10	10	10	10	10	10			
Grade (%)	0%		0%			0%			
Storage Length (ft)	0	0		0	0				
Storage Lanes	2	0		1	1				
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0			
Leading Detector (ft)	50		50	50	50	50			
Trailing Detector (ft)	0		0	0	0	0			
Turning Speed (mph)	15	9		9	15				
Satd. Flow (prot)	2888	0	2888	1343	1516	4150			
Flt Permitted	0.956				0.950				
Satd. Flow (perm)	2834	0	2888	1343	1445	4150			
Right Turn on Red		Yes		Yes					
Satd. Flow (RTOR)	8			480					
Link Speed (mph)	25		25			25			
Link Distance (ft)	480		132			2034			
Travel Time (s)	13.1		3.6			55.5			
Volume (vph)	552	44	854	613	106	752			
Confl. Peds. (#/hr)	26	26		14	51				
Confl. Bikes (#/hr)									
Peak Hour Factor	0.97	0.97	0.97	0.97	0.92	0.92			
Growth Factor	100%	100%	100%	100%	100%	100%			
Heavy Vehicles (%)	1%	0%	5%	1%	0%	5%			
Bus Blockages (#/hr)	0	0	0	0	0	0			
Parking (#/hr)									
Mid-Block Traffic (%)	0%		0%			0%			
Lane Group Flow (vph)	614	0	880	632	115	817			
Turn Type				pt+ov	Prot				
Protected Phases	9		2 12	2 9 12	4	4 6	2	6	12
Permitted Phases									
Total Split (s)	30.0	0.0	48.0	78.0	22.0	48.0	26.0	26.0	22.0
Act Effct Green (s)	26.0		46.9	76.9	15.1	44.0			
Actuated g/C Ratio	0.26		0.47	0.77	0.15	0.44			
v/c Ratio	0.81		0.65	0.55	0.50	0.45			
Uniform Delay, d1	34.2		20.3	0.8	39.0	19.5			
Delay	25.1		25.2	2.2	36.7	16.9			
LOS	C		C	A	D	B			
Approach Delay	25.1		15.6			19.3			
Approach LOS	C		B			B			

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 20 (20%), Referenced to phase 2:NET, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 18.6	Intersection LOS: B

Intersection Capacity Utilization 63.9% ICU Level of Service B

Splits and Phases: 10: Military Road & Western Avenue



Lane Group	WBL2	WBL	WBR	WBR2	NBL	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%				0%					0%	
Storage Length (ft)		0	0		0		0			0		0
Storage Lanes		2	0		0		1			0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50		50	50	50	
Trailing Detector (ft)	0	0			0	0	0		0	0	0	
Turning Speed (mph)	15	15	12	12	15		12	12	15	15		12
Satd. Flow (prot)	0	2856	0	0	0	1532	1342	0	0	0	1465	0
Flt Permitted		0.914				0.658					0.939	
Satd. Flow (perm)	0	2727	0	0	0	1027	1279	0	0	0	1381	0
Right Turn on Red				Yes				Yes				Yes
Satd. Flow (RTOR)		8					4				34	
Link Speed (mph)		30				30					30	
Link Distance (ft)		259				667					264	
Travel Time (s)		5.9				15.2					6.0	
Volume (vph)	11	107	4	11	213	45	303	21	2	8	27	27
Confl. Peds. (#/hr)					19		19		14			14
Confl. Bikes (#/hr)												
Peak Hour Factor	0.82	0.82	0.82	0.82	0.94	0.94	0.94	0.92	0.64	0.92	0.64	0.64
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	1%	2%	0%	2%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%				0%					0%	
Lane Group Flow (vph)	0	161	0	0	0	275	345	0	0	0	96	0
Turn Type	Perm				D.P+P		custom		Perm	Perm		
Protected Phases		10			3	3 4	3 4				4	
Permitted Phases	10				4		1		4	4		
Total Split (s)	16.0	16.0	0.0	0.0	11.0	33.0	33.0	0.0	22.0	22.0	22.0	0.0
Act Effct Green (s)		11.4				24.8	34.8				17.8	
Actuated g/C Ratio		0.11				0.25	0.35				0.18	
v/c Ratio		0.51				0.95	0.74				0.35	
Uniform Delay, d1		39.5				34.3	18.2				22.9	
Delay		39.7				63.7	21.8				24.4	
LOS		D				E	C				C	
Approach Delay		39.7				40.4					24.4	
Approach LOS		D				D					C	

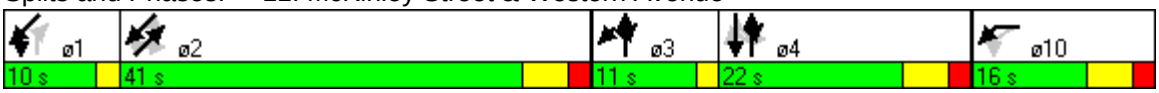
Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 54 (54%), Referenced to phase 2:NESW, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 33.3	Intersection LOS: C

Lane Group	NEL	NET	NER	NER2	SWL	SWT	SWR
Lane Configurations							
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	12
Grade (%)		0%				0%	
Storage Length (ft)	0		0		0		0
Storage Lanes	0		1		1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50	50	
Trailing Detector (ft)	0	0	0		0	0	
Turning Speed (mph)	15		12	12	15		12
Satd. Flow (prot)	0	2916	1295	0	1380	2814	0
Flt Permitted		0.954			0.108	0.766	
Satd. Flow (perm)	0	2782	1272	0	157	2160	0
Right Turn on Red				Yes			Yes
Satd. Flow (RTOR)			197			1	
Link Speed (mph)		25				25	
Link Distance (ft)		2034				382	
Travel Time (s)		55.5				10.4	
Volume (vph)	2	970	14	181	108	672	8
Confl. Peds. (#/hr)	3			3			
Confl. Bikes (#/hr)							
Peak Hour Factor	0.92	0.92	0.92	0.92	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	4%	2%	5%	0%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0
Parking (#/hr)							
Mid-Block Traffic (%)		0%				0%	
Lane Group Flow (vph)	0	1056	212	0	83	783	0
Turn Type	Perm		Perm		pm+pt		
Protected Phases		2			1	1 2	
Permitted Phases	2		2		1 2		
Total Split (s)	41.0	41.0	41.0	0.0	10.0	51.0	0.0
Act Effct Green (s)		37.8	37.8		43.8	43.8	
Actuated g/C Ratio		0.38	0.38		0.44	0.44	
v/c Ratio		1.00	0.35		0.58	0.79	
Uniform Delay, d1		31.1	1.4		14.7	22.5	
Delay		43.2	0.1		20.3	24.5	
LOS		D	A		C	C	
Approach Delay		36.0				24.1	
Approach LOS		D				C	

Intersection Summary

Intersection Capacity Utilization 97.1% ICU Level of Service E

Splits and Phases: 11: McKinley Street & Western Avenue

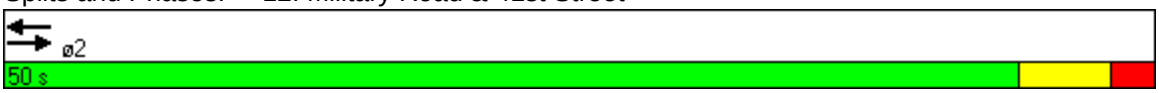


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	9	9	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50			50							
Trailing Detector (ft)		0			0							
Turning Speed (mph)	15		12	15		12	15		12	15		12
Satd. Flow (prot)	0	1524	0	0	1580	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1524	0	0	1580	0	0	0	0	0	0	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		999			76			352			128	
Travel Time (s)		27.2			2.1			8.0			2.9	
Volume (vph)	0	710	0	0	652	0	0	0	0	0	0	0
Confl. Peds. (#/hr)	20		20				55		55	24		24
Confl. Bikes (#/hr)												
Peak Hour Factor	0.99	0.99	0.99	0.96	0.96	0.96	0.92	0.92	0.92	0.72	0.72	0.72
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	717	0	0	679	0	0	0	0	0	0	0
Turn Type												
Protected Phases		2			2							
Permitted Phases												
Total Split (s)	0.0	50.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Act Effct Green (s)		50.0			50.0							
Actuated g/C Ratio		1.00			1.00							
v/c Ratio		0.47			0.43							
Uniform Delay, d1		0.0			0.0							
Delay		0.0			0.0							
LOS		A			A							
Approach Delay		0.0			0.0							
Approach LOS		A			A							

Intersection Summary	
Area Type:	CBD
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 7 (14%), Referenced to phase 2:EBWB and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 0.0	Intersection LOS: A

Intersection Capacity Utilization 45.3% ICU Level of Service A

Splits and Phases: 12: Military Road & 41st Street

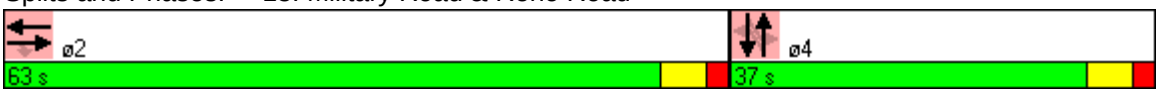


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50		50		50	50		50	50	
Trailing Detector (ft)		0	0		0		0	0		0	0	
Turning Speed (mph)	15		12	15		12	15		12	15		12
Satd. Flow (prot)	0	1565	1357	0	1570	0	0	3006	0	0	1588	0
Flt Permitted								0.941			0.989	
Satd. Flow (perm)	0	1565	1357	0	1570	0	0	2831	0	0	1572	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			78		4			5			1	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		76			244			206			138	
Travel Time (s)		2.1			6.7			5.6			3.8	
Volume (vph)	0	625	75	0	650	29	18	644	28	4	251	6
Confl. Peds. (#/hr)				3		3	6		6	13		13
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.97	0.97	0.97	0.91	0.91	0.91	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	651	78	0	700	0	0	759	0	0	280	0
Turn Type			Perm				Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases			2				4			4		
Total Split (s)	0.0	63.0	63.0	0.0	63.0	0.0	37.0	37.0	0.0	37.0	37.0	0.0
Act Effct Green (s)		60.5	60.5		60.5			31.5			31.5	
Actuated g/C Ratio		0.61	0.61		0.61			0.32			0.32	
v/c Ratio		0.69	0.09		0.74			0.85			0.56	
Uniform Delay, d1		13.4	0.0		14.0			31.8			28.4	
Delay		8.8	0.5		15.3			33.1			28.6	
LOS		A	A		B			C			C	
Approach Delay		7.9			15.3			33.1			28.6	
Approach LOS		A			B			C			C	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 92 (92%), Referenced to phase 2:EBWB, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 20.1	Intersection LOS: C

Intersection Capacity Utilization 75.2% ICU Level of Service C

Splits and Phases: 13: Military Road & Reno Road



TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Dane Ismart*
Agency/Co.	
Date Performed	*4/13/2005*
Analysis Time Period	*2014 PM Peak_WACTS Scenario 2*

Site Information

Intersection	
Jurisdiction	
Analysis Year	*2014*

Project Description *Friendship Heights Addendum*

East/West Street: *Military Road* | North/South Street: *43rd Street*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*638*	*68*	*95*	*571*	*0*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*0*	*693*	*73*	*103*	*620*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*27*	*0*	*95*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*29*	*0*	*103*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*103*		*132*				
C (m) (vph)		*856*		*262*				
v/c		*0.12*		*0.50*				
95% queue length		*0.41*		*2.62*				
Control Delay		*9.8*		*31.9*				
LOS		*A*		*D*				
Approach Delay	--	--	*31.9*					
Approach LOS	--	--	*D*					

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Dane Ismart*	Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*4/13/2005*	Analysis Year	*2014*
Analysis Time Period	*2014 PM Peak_WACTS Sceanrio 2*		

Project Description	*Friendship Heights Addendum*
East/West Street: *Garrison Street*	North/South Street: *Wisconsin Avenue*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*79*	*1843*	*13*	*10*	*1805*	*71*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*1.00*
Hourly Flow Rate, HFR	*85*	*2003*	*14*	*10*	*1961*	*71*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration	*LT*		*TR*	*LT*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*19*	*7*	*1*	*44*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*0*	*0*	*20*	*7*	*1*	*47*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*1*	*1*	*1*	*1*
Configuration	*L*	*T*	*R*	*L*	*T*	*R*

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LT*	*L*	*T*	*R*	*L*	*T*	*R*
v (vph)	*85*	*10*	*0*	*0*	*20*	*7*	*1*	*47*
C (m) (vph)	*279*	*248*	*0*	*1*	*295*	*6*	*1*	*291*
v/c	*0.30*	*0.04*		*0.00*	*0.07*	*1.17*	*1.00*	*0.16*
95% queue length	*1.25*	*0.13*		*0.00*	*0.22*	*1.68*	*0.61*	*0.57*
Control Delay	*23.5*	*20.1*			*18.1*			*19.7*
LOS	*C*	*C*	*F*	*F*	*C*	*F*	*F*	*C*
Approach Delay	--	--				*258.9*		
Approach LOS	--	--				*F*		

>

Friendship Heights Transportation Study
Addendum
Friendship Heights Transportation Study
Intersection Capacity Analysis

"Wisconsin Avenue Corridor Transportation Study Scenario 3 with Signal Optimization for the Selected Intersections"

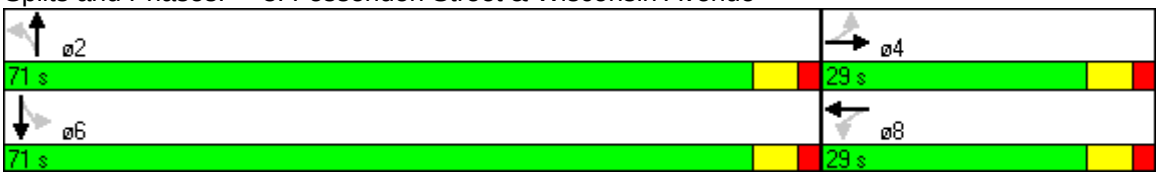
Lanes, Volumes, Timings
3: Fessenden Street & Wisconsin Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1528	0	1516	1447	0	0	4073	0	0	4348	0
Flt Permitted		0.964		0.406				0.923			0.756	
Satd. Flow (perm)	0	1477	0	645	1447	0	0	3760	0	0	3294	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			39						1	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		298			276			539			499	
Travel Time (s)		8.1			7.5			10.5			9.7	
Volume (vph)	18	150	33	204	54	67	6	1449	2	71	1956	4
Confl. Peds. (#/hr)	38		38	16		16	5		5	6		6
Confl. Bikes (#/hr)												
Peak Hour Factor	0.78	0.78	0.78	0.77	0.77	0.77	0.88	0.88	0.88	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	3%	0%	0%	0%	0%	7%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	11
Parking (#/hr)									8			
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	257	0	265	157	0	0	1656	0	0	2138	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	29.0	29.0	0.0	29.0	29.0	0.0	71.0	71.0	0.0	71.0	71.0	0.0
Act Effct Green (s)		25.0		25.0	25.0			67.0			67.0	
Actuated g/C Ratio		0.25		0.25	0.25			0.67			0.67	
v/c Ratio		0.68		1.65	0.40			0.66			0.97	
Uniform Delay, d1		32.6		37.5	23.1			9.7			15.5	
Delay		34.0		217.5	23.8			7.5			14.0	
LOS		C		F	C			A			B	
Approach Delay		34.0			145.4			7.5			14.0	
Approach LOS		C			F			A			B	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 1 (1%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.65	
Intersection Signal Delay: 25.1	Intersection LOS: C

Intersection Capacity Utilization 165.6% ICU Level of Service H

Splits and Phases: 3: Fessenden Street & Wisconsin Avenue



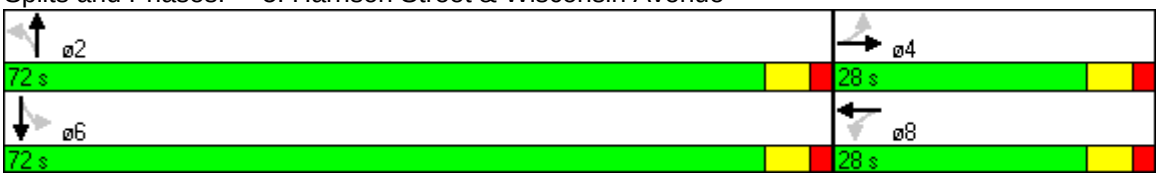
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1196	0	0	1410	0	0	4243	0	0	4265	0
Flt Permitted		0.985			0.615			0.644			0.931	
Satd. Flow (perm)	0	1176	0	0	879	0	0	2744	0	0	3971	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		18			35			3			2	
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		269			302			395			800	
Travel Time (s)		6.1			6.9			7.7			15.6	
Volume (vph)	11	33	231	38	40	57	115	1372	16	7	1912	11
Confl. Peds. (#/hr)	82		82	33		33	14		14	20		20
Confl. Bikes (#/hr)												
Peak Hour Factor	0.74	0.74	0.74	0.88	0.88	0.88	0.89	0.89	0.89	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	11
Parking (#/hr)									8			
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	372	0	0	153	0	0	1689	0	0	2032	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	28.0	28.0	0.0	28.0	28.0	0.0	72.0	72.0	0.0	72.0	72.0	0.0
Act Effct Green (s)		24.0			24.0			68.0			68.0	
Actuated g/C Ratio		0.24			0.24			0.68			0.68	
v/c Ratio		1.26			0.64			1.79dl			0.75	
Uniform Delay, d1		35.7			25.9			13.3			10.5	
Delay		135.6			29.1			9.7			6.4	
LOS		F			C			A			A	
Approach Delay		135.6			29.1			9.7			6.4	
Approach LOS		F			C			A			A	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 9 (9%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.26	
Intersection Signal Delay: 19.9	Intersection LOS: B

Intersection Capacity Utilization 126.3% ICU Level of Service H

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 5: Harrison Street & Wisconsin Avenue



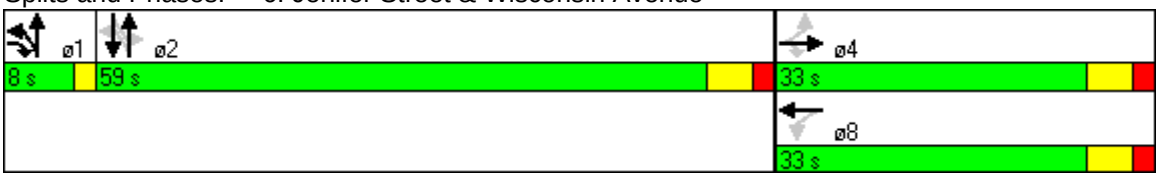
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1143	1245	0	1436	0	0	3861	0	0	4149	0
Flt Permitted		0.775			0.770			0.662			0.892	
Satd. Flow (perm)	0	889	1161	0	1111	0	0	2584	0	0	3704	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		270			354			800			736	
Travel Time (s)		7.4			9.7			15.6			14.3	
Volume (vph)	90	96	339	46	41	30	313	1065	56	20	1506	55
Confl. Peds. (#/hr)	88		88	84		84	185		185	52		52
Confl. Bikes (#/hr)												
Peak Hour Factor	0.81	0.81	0.81	0.85	0.85	0.85	0.95	0.95	0.95	0.83	0.83	0.83
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	73%	2%	9%	0%	0%	14%	22%	7%	5%	5%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	11
Parking (#/hr)									8			
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	230	419	0	137	0	0	1509	0	0	1904	0
Turn Type	Perm		pm+ov	Perm			pm+pt			Perm		
Protected Phases		4	1		8		1	1 2			2	
Permitted Phases	4		4	8			1 2			2		
Total Split (s)	33.0	33.0	8.0	33.0	33.0	0.0	8.0	67.0	0.0	59.0	59.0	0.0
Act Effct Green (s)		28.0	32.0		28.0			60.0			56.0	
Actuated g/C Ratio		0.28	0.32		0.28			0.60			0.56	
v/c Ratio		0.92	1.12		0.44			3.19dl			0.92	
Uniform Delay, d1		35.0	30.7		29.6			17.1			19.9	
Delay		57.6	89.7		29.9			28.4			4.7	
LOS		E	F		C			C			A	
Approach Delay		78.3			29.9			28.4			4.7	
Approach LOS		E			C			C			A	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 90 (90%), Referenced to phase 2:NBSB and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.12	
Intersection Signal Delay: 25.4	Intersection LOS: C

Intersection Capacity Utilization 123.2% ICU Level of Service H

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 6: Jenifer Street & Wisconsin Avenue

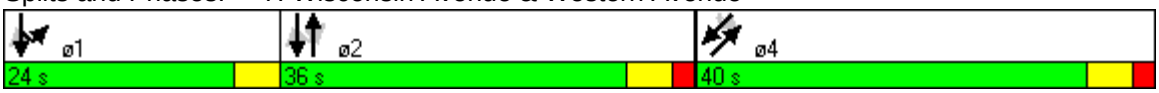


Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		1	1		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50	50	50	50			50	50
Trailing Detector (ft)		0	0	0	0	0	0	0			0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	4230	882	1472	2916	1268	1472	2922	0	0	2973	1280
Flt Permitted				0.125			0.111					
Satd. Flow (perm)	0	4230	815	194	2916	1071	172	2922	0	0	2973	1149
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			75			12		4				439
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		736			254			340			132	
Travel Time (s)		14.3			4.9			9.3			3.6	
Volume (vph)	0	1107	80	375	1566	107	108	669	23	0	1008	484
Confl. Peds. (#/hr)	35		35	78		78	47		47	49		49
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.94	0.94	0.94	0.90	0.90	0.90	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	3%	33%	3%	4%	7%	3%	3%	0%	0%	2%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)			7									
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	1216	88	399	1666	114	120	769	0	0	1084	520
Turn Type			Perm	pm+pt		Perm	Perm					Perm
Protected Phases		2		1	1 2			4			4	
Permitted Phases			2	1 2		1 2	4					4
Total Split (s)	0.0	36.0	36.0	24.0	60.0	60.0	40.0	40.0	0.0	0.0	40.0	40.0
Act Effct Green (s)		32.0	32.0	52.0	56.0	56.0	36.0	36.0			36.0	36.0
Actuated g/C Ratio		0.32	0.32	0.52	0.56	0.56	0.36	0.36			0.36	0.36
v/c Ratio		0.90	0.28	1.12	1.02	0.19	1.94	0.73			1.01	0.75
Uniform Delay, d1		32.4	3.5	27.8	22.0	9.6	32.0	27.6			32.0	3.6
Delay		30.6	8.7	93.4	44.7	9.9	260.5	24.6			46.0	7.4
LOS		C	A	F	D	A	F	C			D	A
Approach Delay		29.2			51.8			56.4			33.5	
Approach LOS		C			D			E			C	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green, Master Intersection	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.94	
Intersection Signal Delay: 42.6	Intersection LOS: D

Intersection Capacity Utilization 104.7% ICU Level of Service F

Splits and Phases: 7: Wisconsin Avenue & Western Avenue



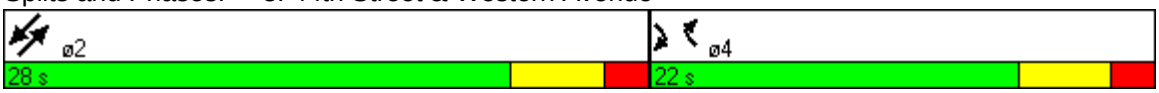
Lanes, Volumes, Timings
8: 44th Street & Western Avenue

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		2	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)			50			50		50			50	
Trailing Detector (ft)			0			0		0			0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	0	1353	0	0	2388	0	2853	0	0	2883	0
Flt Permitted												
Satd. Flow (perm)	0	0	1217	0	0	2315	0	2853	0	0	2883	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			29			147		16			3	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		170			286			405			340	
Travel Time (s)		3.9			6.5			11.0			9.3	
Volume (vph)	0	0	3	0	0	42	0	744	44	0	1191	14
Confl. Peds. (#/hr)	97		97	20		20	66		66	7		7
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.67	0.67	0.67	0.95	0.95	0.95	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	0%	5%	0%	0%	5%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	0	3	0	0	63	0	829	0	0	1282	0
Turn Type			custom			custom						
Protected Phases			4			4		2			2	
Permitted Phases			4			4						
Total Split (s)	0.0	0.0	22.0	0.0	0.0	22.0	0.0	28.0	0.0	0.0	28.0	0.0
Act Effct Green (s)			7.5			7.5		43.8			43.8	
Actuated g/C Ratio			0.15			0.15		0.88			0.88	
v/c Ratio			0.01			0.13		0.33			0.51	
Uniform Delay, d1			0.0			0.0		2.0			2.7	
Delay			0.0			0.1		2.5			5.4	
LOS			A			A		A			A	
Approach Delay		0.0			0.1			2.5			5.4	
Approach LOS		A			A			A			A	

Intersection Summary	
Area Type:	CBD
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 48 (96%), Referenced to phase 2:NESW, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 4.2	Intersection LOS: A

Intersection Capacity Utilization 59.2% ICU Level of Service A

Splits and Phases: 8: 44th Street & Western Avenue

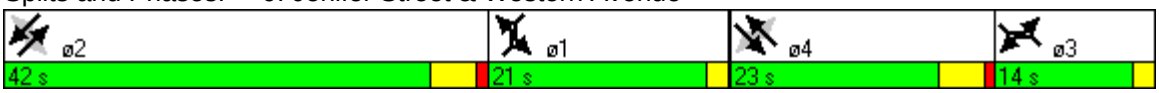


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	1		0	1		0	1		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	1501	2911	0	1353	2773	0	1472	2789	0	1330	2795	0
Flt Permitted	0.364			0.354	0.942		0.105			0.225		
Satd. Flow (perm)	562	2911	0	502	2617	0	163	2789	0	308	2795	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			9			42			39	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		490			207			1447			405	
Travel Time (s)		11.1			4.7			39.5			11.0	
Volume (vph)	129	259	62	143	261	24	136	591	168	208	802	213
Confl. Peds. (#/hr)	25		25	4		4	38		38	63		63
Confl. Bikes (#/hr)												
Peak Hour Factor	0.84	0.84	0.84	0.77	0.77	0.77	0.98	0.98	0.98	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	0%	0%	2%	0%	38%	3%	3%	4%	14%	2%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	154	382	0	168	388	0	139	774	0	214	1047	0
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	3	4		3	4		1	2		1	2	
Permitted Phases	4			4			2			2		
Total Split (s)	14.0	23.0	0.0	14.0	23.0	0.0	21.0	42.0	0.0	21.0	42.0	0.0
Act Effct Green (s)	26.9	19.0		26.9	26.9		57.1	47.2		57.1	47.2	
Actuated g/C Ratio	0.27	0.19		0.27	0.27		0.57	0.47		0.57	0.47	
v/c Ratio	0.68	0.67		0.83	0.54		0.62	0.58		0.77	0.78	
Uniform Delay, d1	33.3	34.9		35.6	27.4		25.9	18.0		22.3	21.1	
Delay	33.9	35.3		42.5	27.3		29.9	22.6		20.7	22.1	
LOS	C	D		D	C		C	C		C	C	
Approach Delay		34.9			31.9			23.7			21.9	
Approach LOS		C			C			C			C	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 47 (47%), Referenced to phase 2:NESW, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 26.2	Intersection LOS: C

Intersection Capacity Utilization 86.0% ICU Level of Service D

Splits and Phases: 9: Jenifer Street & Western Avenue

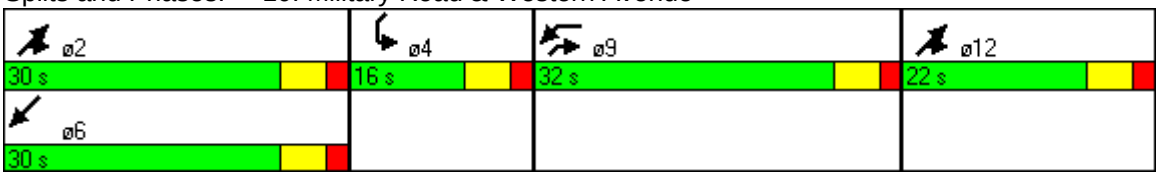


Lane Group	WBL	WBR	NET	NER	SWL	SWT	ø2	ø12
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	10	10	10	10	10	10		
Grade (%)	0%		0%			0%		
Storage Length (ft)	0	0		0	0			
Storage Lanes	2	0		1	1			
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		
Leading Detector (ft)	50		50	50	50	50		
Trailing Detector (ft)	0		0	0	0	0		
Turning Speed (mph)	15	9		9	15			
Satd. Flow (prot)	2841	0	2707	1317	1458	4150		
Flt Permitted	0.954				0.950			
Satd. Flow (perm)	2808	0	2707	1317	1284	4150		
Right Turn on Red		Yes		Yes				
Satd. Flow (RTOR)	5			329				
Link Speed (mph)	25		25			25		
Link Distance (ft)	480		132			2034		
Travel Time (s)	13.1		3.6			55.5		
Volume (vph)	608	28	434	703	105	879		
Confl. Peds. (#/hr)	18	18		3	72			
Confl. Bikes (#/hr)								
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Growth Factor	100%	100%	100%	100%	100%	100%		
Heavy Vehicles (%)	3%	4%	12%	3%	4%	5%		
Bus Blockages (#/hr)	0	0	0	0	0	0		
Parking (#/hr)								
Mid-Block Traffic (%)	0%		0%			0%		
Lane Group Flow (vph)	669	0	457	740	111	925		
Turn Type				pt+ov	Prot			
Protected Phases	9		2 12	2 9 12	4	6	2	12
Permitted Phases								
Total Split (s)	32.0	0.0	52.0	84.0	16.0	30.0	30.0	22.0
Act Effct Green (s)	27.0		49.4	80.5	11.5	31.2		
Actuated g/C Ratio	0.27		0.49	0.81	0.12	0.31		
v/c Ratio	0.87		0.34	0.66	0.66	0.71		
Uniform Delay, d1	34.5		15.3	1.8	42.4	30.4		
Delay	24.1		15.2	6.4	40.6	22.8		
LOS	C		B	A	D	C		
Approach Delay	24.1		9.8			24.7		
Approach LOS	C		A			C		

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 43 (43%), Referenced to phase 2:NET, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 18.4	Intersection LOS: B

Intersection Capacity Utilization 64.7% ICU Level of Service B

Splits and Phases: 10: Military Road & Western Avenue



Lane Group	WBL2	WBL	WBR	WBR2	NBL	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%				0%					0%	
Storage Length (ft)		0	0		0		0			0		0
Storage Lanes		2	0		0		1			0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50		50	50	50	
Trailing Detector (ft)	0	0			0	0	0		0	0	0	
Turning Speed (mph)	15	15	12	12	15		12	12	15	15		12
Satd. Flow (prot)	0	2870	0	0	0	1452	1275	0	0	0	1545	0
Flt Permitted		0.955				0.396					0.986	
Satd. Flow (perm)	0	2870	0	0	0	592	1226	0	0	0	1525	0
Right Turn on Red				Yes				Yes				No
Satd. Flow (RTOR)							11					
Link Speed (mph)		30				30					30	
Link Distance (ft)		431				667					150	
Travel Time (s)		9.8				15.2					3.4	
Volume (vph)	10	133	9	1	114	21	145	21	1	6	110	21
Confl. Peds. (#/hr)					14		14		21			21
Confl. Bikes (#/hr)												
Peak Hour Factor	0.88	0.88	0.88	0.88	0.84	0.84	0.84	0.92	0.80	0.92	0.80	0.80
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	0%	1%	1%	2%	1%	2%	0%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%				0%					0%	
Lane Group Flow (vph)	0	173	0	0	0	161	196	0	0	0	172	0
Turn Type	Perm				D.P+P		custom		Perm	Perm		
Protected Phases		10			3	3 4	3 4				4	
Permitted Phases	10				4		1		4	4		
Total Split (s)	11.0	11.0	0.0	0.0	22.0	40.0	40.0	0.0	18.0	18.0	18.0	0.0
Act Effct Green (s)		7.0				26.1	49.1				13.7	
Actuated g/C Ratio		0.07				0.26	0.49				0.14	
v/c Ratio		0.86				0.62	0.31				0.82	
Uniform Delay, d1		46.0				33.8	8.4				41.9	
Delay		68.1				33.2	8.0				55.5	
LOS		E				C	A				E	
Approach Delay		68.1				19.3					55.5	
Approach LOS		E				B					E	

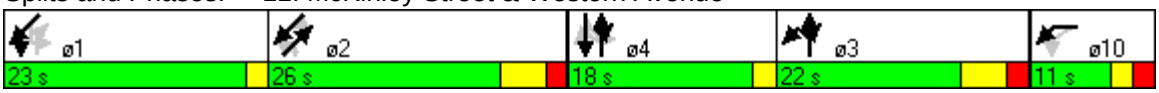
Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 92 (92%), Referenced to phase 2:NESW, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 29.7	Intersection LOS: C

Lane Group	NEL	NET	NER	NER2	SWL2	SWL	SWT	SWR
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10
Grade (%)		0%					0%	
Storage Length (ft)	0		0			0		0
Storage Lanes	0		1			0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	
Trailing Detector (ft)	0	0		0	0	0	0	
Turning Speed (mph)	15		12	12	15	15		12
Satd. Flow (prot)	0	2828	0	1357	0	0	2929	0
Flt Permitted		0.934					0.952	
Satd. Flow (perm)	0	2644	0	1321	0	0	2791	0
Right Turn on Red				No				No
Satd. Flow (RTOR)								
Link Speed (mph)		25					25	
Link Distance (ft)		2034					382	
Travel Time (s)		55.5					10.4	
Volume (vph)	6	433	9	146	1	19	992	5
Confl. Peds. (#/hr)	2			2		6		6
Confl. Bikes (#/hr)								
Peak Hour Factor	0.88	0.88	0.92	0.88	0.92	0.99	0.99	0.99
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	7%	2%	0%	2%	21%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0
Parking (#/hr)								
Mid-Block Traffic (%)		0%					0%	
Lane Group Flow (vph)	0	509	0	166	0	0	1027	0
Turn Type	Perm			Perm	custom	pm+pt		
Protected Phases		2				1	1 2	
Permitted Phases	2			2	1	1 2		
Total Split (s)	26.0	26.0	0.0	26.0	23.0	23.0	49.0	0.0
Act Effct Green (s)		27.9		27.9			46.9	
Actuated g/C Ratio		0.28		0.28			0.47	
v/c Ratio		0.69		0.45			0.77	
Uniform Delay, d1		32.2		29.7			19.6	
Delay		29.2		22.4			23.9	
LOS		C		C			C	
Approach Delay		27.6					23.9	
Approach LOS		C					C	

Intersection Summary

Intersection Capacity Utilization 82.7% ICU Level of Service D

Splits and Phases: 11: McKinley Street & Western Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50			50							
Trailing Detector (ft)		0			0							
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1550	0	0	1550	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1550	0	0	1550	0	0	0	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		999			76			352			128	
Travel Time (s)		27.2			2.1			8.0			2.9	
Volume (vph)	0	804	0	0	741	0	0	0	0	0	0	0
Confl. Peds. (#/hr)	6		6				25		25	34		34
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.89	0.89	0.89	0.76	0.76	0.76	0.81	0.81	0.81
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	8%	0%	6%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	829	0	0	833	0	0	0	0	0	0	0
Turn Type												
Protected Phases		2			2							
Permitted Phases												
Total Split (s)	0.0	63.0	0.0	0.0	63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Act Effct Green (s)		61.0			61.0							
Actuated g/C Ratio		0.61			0.61							
v/c Ratio		0.88			0.88							
Uniform Delay, d1		16.3			16.4							
Delay		30.0			8.4							
LOS		C			A							
Approach Delay		30.0			8.4							
Approach LOS		C			A							

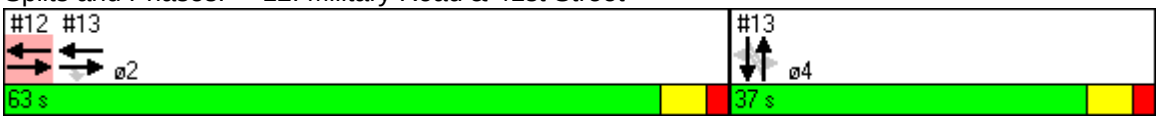
Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 34 (34%), Referenced to phase 2:EBWB and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 19.1	Intersection LOS: B

Lane Group	ø4
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	4
Permitted Phases	
Total Split (s)	37.0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Uniform Delay, d1	
Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Intersection Capacity Utilization 52.0% ICU Level of Service A

Splits and Phases: 12: Military Road & 41st Street

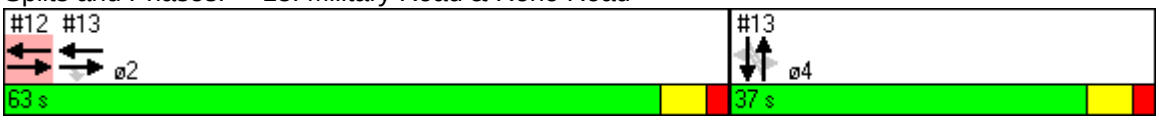


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50		50		50	50		50	50	
Trailing Detector (ft)		0	0		0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1535	1357	0	1546	0	0	2907	0	0	1589	0
Flt Permitted								0.933			0.996	
Satd. Flow (perm)	0	1535	1357	0	1546	0	0	2718	0	0	1582	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			139		1			8			1	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		76			244			206			138	
Travel Time (s)		2.1			6.7			5.6			3.8	
Volume (vph)	0	662	133	0	746	6	14	320	24	3	334	5
Confl. Peds. (#/hr)				11		11	31		31	44		44
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.87	0.87	0.87	0.79	0.79	0.79
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	4%	0%	0%	3%	17%	0%	1%	20%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	704	141	0	800	0	0	412	0	0	433	0
Turn Type			Perm				Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases			2				4			4		
Total Split (s)	0.0	63.0	63.0	0.0	63.0	0.0	37.0	37.0	0.0	37.0	37.0	0.0
Act Effct Green (s)		61.0	61.0		61.0			31.0			31.0	
Actuated g/C Ratio		0.61	0.61		0.61			0.31			0.31	
v/c Ratio		0.75	0.16		0.85			0.49			0.88	
Uniform Delay, d1		14.0	0.1		15.7			27.4			32.7	
Delay		1.6	0.0		21.9			27.2			38.0	
LOS		A	A		C			C			D	
Approach Delay		1.3			21.9			27.2			38.0	
Approach LOS		A			C			C			D	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 34 (34%), Referenced to phase 2:EBWB and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 18.6	Intersection LOS: B

Intersection Capacity Utilization 80.4% ICU Level of Service D

Splits and Phases: 13: Military Road & Reno Road



TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Dane Ismart*
Agency/Co.	
Date Performed	*4/13/2005*
Analysis Time Period	*2014 AM Peak_WACTS Scenario 3*

Site Information

Intersection	
Jurisdiction	
Analysis Year	*2014*

Project Description *Friendship Heights Addendum*

East/West Street: *Military Road* | North/South Street: *43rd Street*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*689*	*60*	*59*	*671*	*0*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*0*	*748*	*65*	*64*	*729*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*10*	*0*	*62*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*10*	*0*	*67*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*64*		*77*				
C (m) (vph)		*823*		*291*				
v/c		*0.08*		*0.26*				
95% queue length		*0.25*		*1.04*				
Control Delay		*9.7*		*21.8*				
LOS		*A*		*C*				
Approach Delay	--	--	*21.8*					
Approach LOS	--	--	*C*					

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Dane Ismart*	Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*4/13/2005*	Analysis Year	*2014*
Analysis Time Period	*2014 AM Peak_WACTS Sceanrio 3*		

Project Description	*Friendship Heights Addendum*
East/West Street: *Garrison Street*	North/South Street: *Wisconsin Avenue*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*98*	*1501*	*17*	*22*	*2020*	*54*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.90*
Hourly Flow Rate, HFR	*106*	*1631*	*18*	*23*	*2195*	*60*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration	*LT*		*TR*	*LT*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*2*	*6*	*12*	*1*	*6*	*15*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*2*	*6*	*13*	*1*	*6*	*16*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*1*	*1*	*1*	*1*
Configuration	*L*	*T*	*R*	*L*	*T*	*R*

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LT*	*L*	*T*	*R*	*L*	*T*	*R*
v (vph)	*106*	*23*	*2*	*6*	*13*	*1*	*6*	*16*
C (m) (vph)	*228*	*353*	*0*	*1*	*376*	*0*	*1*	*251*
v/c	*0.46*	*0.07*		*6.00*	*0.03*		*6.00*	*0.06*
95% queue length	*2.27*	*0.21*		*1.84*	*0.11*		*1.84*	*0.20*
Control Delay	*33.8*	*15.9*			*14.9*			*20.3*
LOS	*D*	*C*	*F*	*F*	*B*	*F*	*F*	*C*
Approach Delay	--	--						
Approach LOS	--	--						

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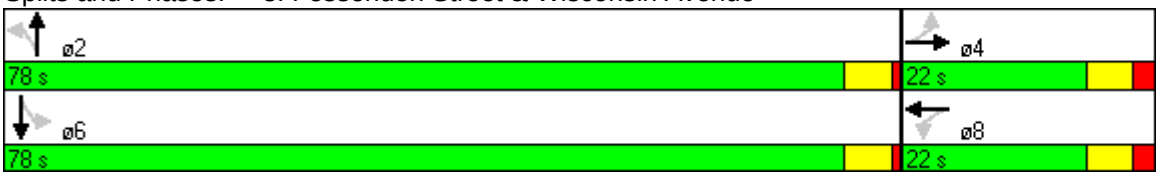
Lanes, Volumes, Timings
3: Fessenden Street & Wisconsin Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1532	0	1516	1503	0	0	4230	0	0	4157	0
Flt Permitted		0.492		0.231				0.917			0.780	
Satd. Flow (perm)	0	756	0	366	1503	0	0	3879	0	0	3246	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			16			23			4	
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		298			276			527			499	
Travel Time (s)		8.1			7.5			12.0			11.3	
Volume (vph)	27	187	35	134	172	81	10	2063	112	41	1898	22
Confl. Peds. (#/hr)	29		29	12		12	11		11	6		6
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.87	0.87	0.87	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	2%	0%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	7
Parking (#/hr)										0	0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	293	0	154	291	0	0	2401	0	0	2155	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	22.0	22.0	0.0	22.0	22.0	0.0	78.0	78.0	0.0	78.0	78.0	0.0
Act Effct Green (s)		18.0		18.0	18.0			74.0			74.0	
Actuated g/C Ratio		0.18		0.18	0.18			0.74			0.74	
v/c Ratio		2.06		2.33	1.02			0.83			0.90	
Uniform Delay, d1		39.0		41.0	38.7			8.7			10.0	
Delay		271.8		296.4	85.0			6.4			12.2	
LOS		F		F	F			A			B	
Approach Delay		271.8			158.1			6.4			12.2	
Approach LOS		F			F			A			B	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.33	
Intersection Signal Delay: 36.2	Intersection LOS: D

Intersection Capacity Utilization 106.8% ICU Level of Service F

Splits and Phases: 3: Fessenden Street & Wisconsin Avenue



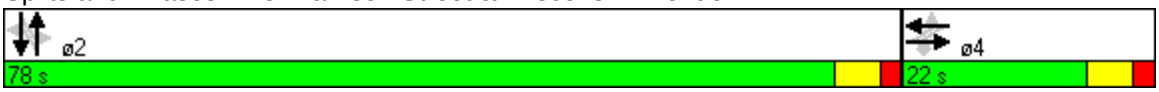
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1537	1330	0	1426	0	0	4247	0	0	4114	0
Flt Permitted		0.846			0.788			0.647			0.786	
Satd. Flow (perm)	0	1247	1011	0	1112	0	0	2756	0	0	3237	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			27		19			5			5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		269			302			395			800	
Travel Time (s)		6.1			6.9			9.0			18.2	
Volume (vph)	36	60	272	50	26	33	131	1919	29	42	1771	22
Confl. Peds. (#/hr)	124		124	45		45	12		12	14		14
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.86	0.86	0.86	0.96	0.96	0.96	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	7
Parking (#/hr)										0	0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	113	320	0	126	0	0	2165	0	0	2062	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		4			4			2			2	
Permitted Phases	4		4	4			2			2		
Total Split (s)	22.0	22.0	22.0	22.0	22.0	0.0	78.0	78.0	0.0	78.0	78.0	0.0
Act Effct Green (s)		18.0	18.0		18.0			74.0			74.0	
Actuated g/C Ratio		0.18	0.18		0.18			0.74			0.74	
v/c Ratio		0.50	1.57		0.58			1.64dl			0.86	
Uniform Delay, d1		36.9	35.5		31.6			13.0			9.3	
Delay		37.9	203.1		32.8			39.0			6.0	
LOS		D	F		C			D			A	
Approach Delay		160.0			32.8			39.0			6.0	
Approach LOS		F			C			D			A	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 20 (20%), Referenced to phase 2:NBSB, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.57	
Intersection Signal Delay: 35.6	Intersection LOS: D

Intersection Capacity Utilization 116.9% ICU Level of Service G

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 5: Harrison Street & Wisconsin Avenue



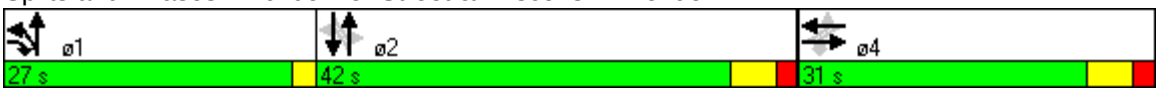
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1510	1357	0	1379	0	0	4163	0	0	3763	0
Flt Permitted		0.450			0.447			0.664			0.839	
Satd. Flow (perm)	0	702	1196	0	605	0	0	2795	0	0	3159	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		270			354			800			736	
Travel Time (s)		7.4			9.7			18.2			16.7	
Volume (vph)	170	90	535	85	143	81	443	1519	58	20	1009	154
Confl. Peds. (#/hr)	58		58	165		165	216		216	183		183
Confl. Bikes (#/hr)												
Peak Hour Factor	0.79	0.79	0.79	0.77	0.77	0.77	0.90	0.90	0.90	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	3%	0%	2%	1%	1%	0%	2%	0%	0%	2%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	7
Parking (#/hr)										0	0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	329	677	0	401	0	0	2244	0	0	1245	0
Turn Type	Perm		pm+ov	Perm			pm+pt			Perm		
Protected Phases		4	1		4		1	1 2			2	
Permitted Phases	4		4	4			1 2			2		
Total Split (s)	31.0	31.0	27.0	31.0	31.0	0.0	27.0	69.0	0.0	42.0	42.0	0.0
Act Effct Green (s)		27.0	50.0		27.0			61.0			38.0	
Actuated g/C Ratio		0.27	0.50		0.27			0.61			0.38	
v/c Ratio		1.73	1.07		2.46			1.17dl			1.04	
Uniform Delay, d1		36.5	23.7		36.5			14.7			31.0	
Delay		228.8	68.4		308.4			60.5			37.6	
LOS		F	E		F			E			D	
Approach Delay		120.8			308.4			60.5			37.6	
Approach LOS		F			F			E			D	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 11 (11%), Referenced to phase 1:NBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.46	
Intersection Signal Delay: 87.4	Intersection LOS: F

Intersection Capacity Utilization 137.4% ICU Level of Service H

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 6: Jenifer Street & Wisconsin Avenue



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		0	1		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50		50	50			50	50
Trailing Detector (ft)		0	0	0	0		0	0			0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	4314	1245	1501	2778	0	1472	2917	0	0	2916	1357
Flt Permitted				0.114			0.140					
Satd. Flow (perm)	0	4314	852	180	2778	0	217	2917	0	0	2916	902
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		736			254			340			132	
Travel Time (s)		16.7			5.8			9.3			3.6	
Volume (vph)	0	1553	215	290	1101	200	130	1060	54	0	980	354
Confl. Peds. (#/hr)	185		185	114		114	139		139	239		239
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.90	0.90	0.90	0.88	0.88	0.88	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	9%	1%	3%	3%	3%	2%	0%	0%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	1707	236	322	1445	0	148	1266	0	0	1010	365
Turn Type			Perm	pm+pt			Perm					custom
Protected Phases		2		1	1 2			4			4	
Permitted Phases			2	1 2			4					1 4
Total Split (s)	0.0	39.0	39.0	16.0	55.0	0.0	45.0	45.0	0.0	0.0	45.0	61.0
Act Effct Green (s)		35.0	35.0	47.0	51.0		41.0	41.0			41.0	57.0
Actuated g/C Ratio		0.35	0.35	0.47	0.51		0.41	0.41			0.41	0.57
v/c Ratio		1.13	0.79	1.33	1.02		1.66	1.06			0.84	0.71
Uniform Delay, d1		32.5	29.2	25.2	24.5		29.5	29.5			26.6	15.5
Delay		52.8	27.5	147.6	48.1		219.9	61.2			22.5	23.6
LOS		D	C	F	D		F	E			C	C
Approach Delay		49.7			66.2			77.8			22.8	
Approach LOS		D			E			E			C	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 6:, Start of Green, Master Intersection	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.66	
Intersection Signal Delay: 54.6	Intersection LOS: D

Intersection Capacity Utilization 116.7% ICU Level of Service G

Splits and Phases: 7: Wisconsin Avenue & Western Avenue

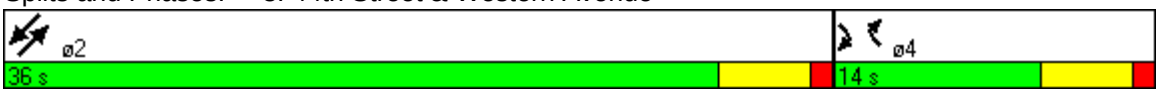
Lanes, Volumes, Timings
8: 44th Street & Western Avenue

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		2	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)			50			50		50			50	
Trailing Detector (ft)			0			0		0			0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	0	1381	0	0	2231	0	2899	0	0	2886	0
Flt Permitted												
Satd. Flow (perm)	0	0	1342	0	0	2094	0	2899	0	0	2886	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			83			194		17			20	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		170			286			405			340	
Travel Time (s)		3.9			6.5			11.0			9.3	
Volume (vph)	0	0	50	0	0	102	0	1067	46	0	1063	52
Confl. Peds. (#/hr)	17		17	54		54	9		9	59		59
Confl. Bikes (#/hr)												
Peak Hour Factor	0.73	0.73	0.73	0.87	0.87	0.87	0.98	0.98	0.98	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	5%	0%	7%	0%	4%	0%	0%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	0	68	0	0	117	0	1136	0	0	1174	0
Turn Type			custom			custom						
Protected Phases			4			4		2			2	
Permitted Phases			4			4						
Total Split (s)	0.0	0.0	14.0	0.0	0.0	14.0	0.0	36.0	0.0	0.0	36.0	0.0
Act Effct Green (s)			7.2			7.2		37.7			37.7	
Actuated g/C Ratio			0.14			0.14		0.75			0.75	
v/c Ratio			0.25			0.24		0.52			0.54	
Uniform Delay, d1			0.0			0.0		3.2			3.3	
Delay			4.8			1.2		3.6			2.4	
LOS			A			A		A			A	
Approach Delay		4.8			1.2			3.6			2.4	
Approach LOS		A			A			A			A	

Intersection Summary	
Area Type:	CBD
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 12 (24%), Referenced to phase 2:NESW, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 2.9	Intersection LOS: A

Intersection Capacity Utilization 54.4% ICU Level of Service A

Splits and Phases: 8: 44th Street & Western Avenue

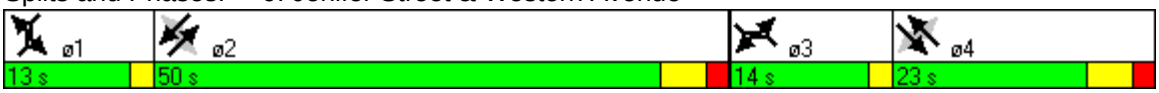


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	1		0	1		0	1		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		12	15		12	15		12	15		12
Satd. Flow (prot)	1516	2614	0	1380	2773	0	1501	2813	0	1404	2881	0
Flt Permitted	0.419			0.227	0.566		0.162			0.106		
Satd. Flow (perm)	634	2614	0	322	1582	0	256	2813	0	157	2881	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		59			12			35			43	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		490			207			1447			405	
Travel Time (s)		11.1			4.7			39.5			11.0	
Volume (vph)	200	297	127	347	279	52	132	874	194	304	743	194
Confl. Peds. (#/hr)	62		62	37		37	63		63	14		14
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.84	0.84	0.84	0.89	0.89	0.89	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	9%	1%	0%	1%	0%	1%	3%	0%	8%	1%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	235	498	0	218	589	0	148	1200	0	334	1029	0
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	3	4		3	4		1	2		1	2	
Permitted Phases	4			4			2			2		
Total Split (s)	14.0	23.0	0.0	14.0	23.0	0.0	13.0	50.0	0.0	13.0	50.0	0.0
Act Effct Green (s)	29.0	19.0		29.0	29.0		55.0	46.0		55.0	46.0	
Actuated g/C Ratio	0.29	0.19		0.29	0.29		0.55	0.46		0.55	0.46	
v/c Ratio	0.86	0.92		1.10	1.01		0.58	0.91		1.68	0.76	
Uniform Delay, d1	27.8	34.9		27.7	30.9		9.5	24.4		20.6	21.4	
Delay	46.4	48.7		99.8	60.9		19.6	24.5		218.4	27.0	
LOS	D	D		F	E		B	C		F	C	
Approach Delay		47.9			71.4			23.9			73.9	
Approach LOS		D			E			C			E	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 28 (28%), Referenced to phase 1:NESWL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.68	
Intersection Signal Delay: 53.1	Intersection LOS: D

Intersection Capacity Utilization 107.4% ICU Level of Service F

Splits and Phases: 9: Jenifer Street & Western Avenue

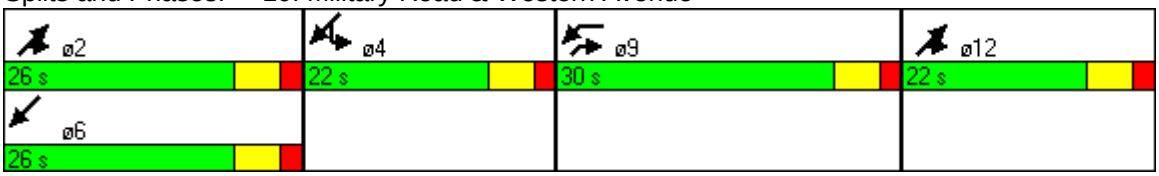


Lane Group	WBL	WBR	NET	NER	SWL	SWT	ø2	ø6	ø12
Lane Configurations									
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900			
Lane Width (ft)	10	10	10	10	10	10			
Grade (%)	0%		0%			0%			
Storage Length (ft)	0	0		0	0				
Storage Lanes	2	0		1	1				
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0			
Leading Detector (ft)	50		50	50	50	50			
Trailing Detector (ft)	0		0	0	0	0			
Turning Speed (mph)	15	9		9	15				
Satd. Flow (prot)	2888	0	2888	1343	1516	4150			
Flt Permitted	0.956				0.950				
Satd. Flow (perm)	2834	0	2888	1343	1446	4150			
Right Turn on Red		Yes		Yes					
Satd. Flow (RTOR)	8			480					
Link Speed (mph)	25		25			25			
Link Distance (ft)	480		132			2034			
Travel Time (s)	13.1		3.6			55.5			
Volume (vph)	552	44	866	622	106	752			
Confl. Peds. (#/hr)	26	26		14	51				
Confl. Bikes (#/hr)									
Peak Hour Factor	0.97	0.97	0.97	0.97	0.92	0.92			
Growth Factor	100%	100%	100%	100%	100%	100%			
Heavy Vehicles (%)	1%	0%	5%	1%	0%	5%			
Bus Blockages (#/hr)	0	0	0	0	0	0			
Parking (#/hr)									
Mid-Block Traffic (%)	0%		0%			0%			
Lane Group Flow (vph)	614	0	893	641	115	817			
Turn Type				pt+ov	Prot				
Protected Phases	9		2 12	2 9 12	4	4 6	2	6	12
Permitted Phases									
Total Split (s)	30.0	0.0	48.0	78.0	22.0	48.0	26.0	26.0	22.0
Act Effct Green (s)	26.0		46.9	76.9	15.1	44.0			
Actuated g/C Ratio	0.26		0.47	0.77	0.15	0.44			
v/c Ratio	0.81		0.66	0.56	0.50	0.45			
Uniform Delay, d1	34.2		20.4	0.8	39.0	19.5			
Delay	25.1		24.8	2.1	36.7	16.9			
LOS	C		C	A	D	B			
Approach Delay	25.1		15.3			19.3			
Approach LOS	C		B			B			

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 20 (20%), Referenced to phase 2:NET, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 18.5	Intersection LOS: B

Intersection Capacity Utilization 64.3% ICU Level of Service B

Splits and Phases: 10: Military Road & Western Avenue



Lane Group	WBL2	WBL	WBR	WBR2	NBL	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%				0%					0%	
Storage Length (ft)		0	0		0		0			0		0
Storage Lanes		2	0		0		1			0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50		50	50	50	
Trailing Detector (ft)	0	0			0	0	0		0	0	0	
Turning Speed (mph)	15	15	12	12	15		12	12	15	15		12
Satd. Flow (prot)	0	2856	0	0	0	1532	1342	0	0	0	1465	0
Flt Permitted		0.914				0.658					0.939	
Satd. Flow (perm)	0	2727	0	0	0	1027	1279	0	0	0	1381	0
Right Turn on Red				Yes				Yes				Yes
Satd. Flow (RTOR)		8					4				34	
Link Speed (mph)		30				30					30	
Link Distance (ft)		259				667					264	
Travel Time (s)		5.9				15.2					6.0	
Volume (vph)	11	107	4	11	213	45	303	21	2	8	27	27
Confl. Peds. (#/hr)					19		19		14			14
Confl. Bikes (#/hr)												
Peak Hour Factor	0.82	0.82	0.82	0.82	0.94	0.94	0.94	0.92	0.64	0.92	0.64	0.64
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	1%	2%	0%	2%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%				0%					0%	
Lane Group Flow (vph)	0	161	0	0	0	275	345	0	0	0	96	0
Turn Type	Perm				D.P+P		custom		Perm	Perm		
Protected Phases		10			3	3 4	3 4				4	
Permitted Phases	10				4		1		4	4		
Total Split (s)	16.0	16.0	0.0	0.0	11.0	33.0	33.0	0.0	22.0	22.0	22.0	0.0
Act Effct Green (s)		11.4				24.8	34.8				17.8	
Actuated g/C Ratio		0.11				0.25	0.35				0.18	
v/c Ratio		0.51				0.95	0.74				0.35	
Uniform Delay, d1		39.5				34.3	18.2				22.9	
Delay		39.7				63.7	21.8				24.4	
LOS		D				E	C				C	
Approach Delay		39.7				40.4					24.4	
Approach LOS		D				D					C	

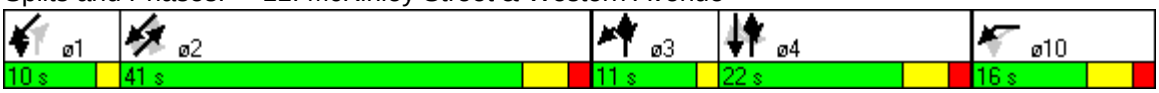
Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 54 (54%), Referenced to phase 2:NESW, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 33.2	Intersection LOS: C

Lane Group	NEL	NET	NER	NER2	SWL	SWT	SWR
Lane Configurations							
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	12
Grade (%)		0%				0%	
Storage Length (ft)	0		0		0		0
Storage Lanes	0		1		1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50	50	
Trailing Detector (ft)	0	0	0		0	0	
Turning Speed (mph)	15		12	12	15		12
Satd. Flow (prot)	0	2916	1295	0	1380	2814	0
Flt Permitted		0.954			0.108	0.766	
Satd. Flow (perm)	0	2782	1272	0	157	2160	0
Right Turn on Red				Yes			Yes
Satd. Flow (RTOR)			197			1	
Link Speed (mph)		25				25	
Link Distance (ft)		2034				382	
Travel Time (s)		55.5				10.4	
Volume (vph)	2	970	14	181	108	672	8
Confl. Peds. (#/hr)	3			3			
Confl. Bikes (#/hr)							
Peak Hour Factor	0.92	0.92	0.92	0.92	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	4%	2%	5%	0%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0
Parking (#/hr)							
Mid-Block Traffic (%)		0%				0%	
Lane Group Flow (vph)	0	1056	212	0	83	783	0
Turn Type	Perm		Perm		pm+pt		
Protected Phases		2			1	1 2	
Permitted Phases	2		2		1 2		
Total Split (s)	41.0	41.0	41.0	0.0	10.0	51.0	0.0
Act Effct Green (s)		37.8	37.8		43.8	43.8	
Actuated g/C Ratio		0.38	0.38		0.44	0.44	
v/c Ratio		1.00	0.35		0.58	0.79	
Uniform Delay, d1		31.1	1.4		14.7	22.5	
Delay		42.9	0.1		20.3	24.5	
LOS		D	A		C	C	
Approach Delay		35.7				24.1	
Approach LOS		D				C	

Intersection Summary

Intersection Capacity Utilization 97.1% ICU Level of Service E

Splits and Phases: 11: McKinley Street & Western Avenue

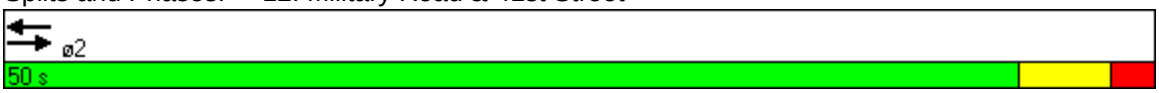


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	9	9	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50			50							
Trailing Detector (ft)		0			0							
Turning Speed (mph)	15		12	15		12	15		12	15		12
Satd. Flow (prot)	0	1524	0	0	1580	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1524	0	0	1580	0	0	0	0	0	0	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		999			76			352			128	
Travel Time (s)		27.2			2.1			8.0			2.9	
Volume (vph)	0	710	0	0	652	0	0	0	0	0	0	0
Confl. Peds. (#/hr)	20		20				55		55	24		24
Confl. Bikes (#/hr)												
Peak Hour Factor	0.99	0.99	0.99	0.96	0.96	0.96	0.92	0.92	0.92	0.72	0.72	0.72
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	717	0	0	679	0	0	0	0	0	0	0
Turn Type												
Protected Phases		2			2							
Permitted Phases												
Total Split (s)	0.0	50.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Act Effct Green (s)		50.0			50.0							
Actuated g/C Ratio		1.00			1.00							
v/c Ratio		0.47			0.43							
Uniform Delay, d1		0.0			0.0							
Delay		0.0			0.0							
LOS		A			A							
Approach Delay		0.0			0.0							
Approach LOS		A			A							

Intersection Summary	
Area Type:	CBD
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 7 (14%), Referenced to phase 2:EBWB and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 0.0	Intersection LOS: A

Intersection Capacity Utilization 45.3% ICU Level of Service A

Splits and Phases: 12: Military Road & 41st Street

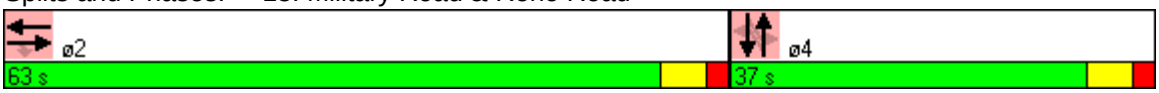


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50		50		50	50		50	50	
Trailing Detector (ft)		0	0		0		0	0		0	0	
Turning Speed (mph)	15		12	15		12	15		12	15		12
Satd. Flow (prot)	0	1565	1357	0	1570	0	0	3006	0	0	1588	0
Flt Permitted								0.941			0.989	
Satd. Flow (perm)	0	1565	1357	0	1570	0	0	2831	0	0	1572	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			79		4			5			1	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		76			244			206			138	
Travel Time (s)		2.1			6.7			5.6			3.8	
Volume (vph)	0	632	76	0	650	29	18	644	28	4	251	6
Confl. Peds. (#/hr)				3		3	6		6	13		13
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.97	0.97	0.97	0.91	0.91	0.91	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	658	79	0	700	0	0	759	0	0	280	0
Turn Type			Perm				Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases			2				4			4		
Total Split (s)	0.0	63.0	63.0	0.0	63.0	0.0	37.0	37.0	0.0	37.0	37.0	0.0
Act Effct Green (s)		60.5	60.5		60.5			31.5			31.5	
Actuated g/C Ratio		0.61	0.61		0.61			0.32			0.32	
v/c Ratio		0.69	0.09		0.74			0.85			0.56	
Uniform Delay, d1		13.4	0.0		14.0			31.8			28.4	
Delay		9.0	0.6		15.3			33.1			28.6	
LOS		A	A		B			C			C	
Approach Delay		8.1			15.3			33.1			28.6	
Approach LOS		A			B			C			C	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 92 (92%), Referenced to phase 2:EBWB, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 20.1	Intersection LOS: C

Intersection Capacity Utilization 75.2% ICU Level of Service C

Splits and Phases: 13: Military Road & Reno Road



TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Dane Ismart*
Agency/Co.	
Date Performed	*4/13/2005*
Analysis Time Period	*2014 PM Peak_WACTS Scenario 3*

Site Information

Intersection	
Jurisdiction	
Analysis Year	*2014*

Project Description *Friendship Heights Addendum*

East/West Street: *Military Road* | North/South Street: *43rd Street*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*646*	*69*	*95*	*571*	*0*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*0*	*702*	*74*	*103*	*620*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*27*	*0*	*95*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*29*	*0*	*103*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*103*		*132*				
C (m) (vph)		*849*		*258*				
v/c		*0.12*		*0.51*				
95% queue length		*0.41*		*2.69*				
Control Delay		*9.8*		*32.7*				
LOS		*A*		*D*				
Approach Delay	--	--	*32.7*					
Approach LOS	--	--	*D*					

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Dane Ismart*	Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*4/13/2005*	Analysis Year	*2014*
Analysis Time Period	*2014 PM Peak_WACTS Sceanrio 3*		

Project Description	*Friendship Heights Addendum*
East/West Street: *Garrison Street*	North/South Street: *Wisconsin Avenue*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*89*	*2025*	*14*	*10*	*1912*	*71*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.99*
Hourly Flow Rate, HFR	*96*	*2201*	*15*	*10*	*2078*	*72*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration	*LT*		*TR*	*LT*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*19*	*7*	*1*	*48*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*0*	*0*	*20*	*7*	*1*	*52*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*1*	*1*	*1*	*1*
Configuration	*L*	*T*	*R*	*L*	*T*	*R*

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LT*	*L*	*T*	*R*	*L*	*T*	*R*
v (vph)	*96*	*10*	*0*	*0*	*20*	*7*	*1*	*52*
C (m) (vph)	*251*	*205*	*0*	*1*	*258*	*4*	*1*	*269*
v/c	*0.38*	*0.05*		*0.00*	*0.08*	*1.75*	*1.00*	*0.19*
95% queue length	*1.71*	*0.15*		*0.00*	*0.25*	*1.82*	*0.61*	*0.70*
Control Delay	*28.0*	*23.5*			*20.1*			*21.6*
LOS	*D*	*C*	*F*	*F*	*C*	*F*	*F*	*C*
Approach Delay	--	--				*325.4*		
Approach LOS	--	--				*F*		

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Friendship Heights Transportation Study
Addendum
Friendship Heights Transportation Study
Intersection Capacity Analysis

"Wisconsin Avenue Corridor Transportation Study Scenario 4 with Signal Optimization for the Selected Intersections"

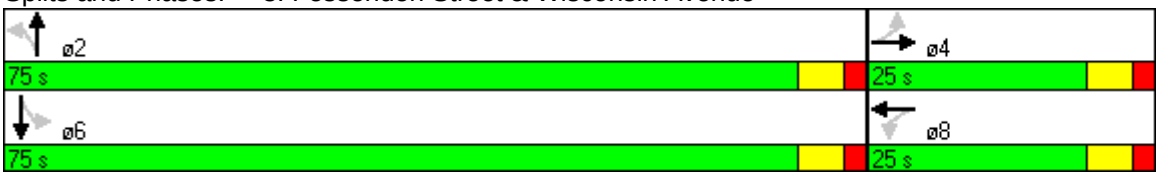
Lanes, Volumes, Timings
3: Fessenden Street & Wisconsin Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1528	0	1516	1447	0	0	4073	0	0	4348	0
Flt Permitted		0.962		0.345				0.922			0.760	
Satd. Flow (perm)	0	1474	0	548	1447	0	0	3756	0	0	3311	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			43						1	
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		298			276			539			499	
Travel Time (s)		8.1			7.5			10.5			9.7	
Volume (vph)	18	150	33	204	54	67	6	1493	2	71	2071	4
Confl. Peds. (#/hr)	38		38	16		16	5		5	6		6
Confl. Bikes (#/hr)												
Peak Hour Factor	0.78	0.78	0.78	0.77	0.77	0.77	0.88	0.88	0.88	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	3%	0%	0%	0%	0%	7%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	11
Parking (#/hr)									8			
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	257	0	265	157	0	0	1706	0	0	2259	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	25.0	25.0	0.0	25.0	25.0	0.0	75.0	75.0	0.0	75.0	75.0	0.0
Act Effct Green (s)		21.0		21.0	21.0			71.0			71.0	
Actuated g/C Ratio		0.21		0.21	0.21			0.71			0.71	
v/c Ratio		0.81		2.30	0.46			0.64			0.96	
Uniform Delay, d1		36.2		39.5	24.6			7.7			13.2	
Delay		45.4		294.7	25.4			5.6			11.9	
LOS		D		F	C			A			B	
Approach Delay		45.4			194.5			5.6			11.9	
Approach LOS		D			F			A			B	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 1 (1%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.30	
Intersection Signal Delay: 28.0	Intersection LOS: C

Intersection Capacity Utilization 169.2% ICU Level of Service H

Splits and Phases: 3: Fessenden Street & Wisconsin Avenue



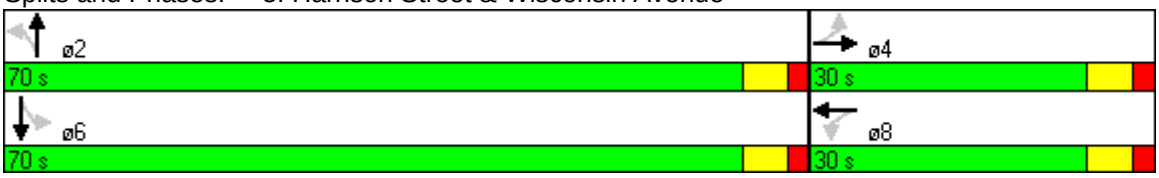
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1194	0	0	1411	0	0	4243	0	0	4265	0
Flt Permitted		0.986			0.626			0.638			0.931	
Satd. Flow (perm)	0	1175	0	0	897	0	0	2718	0	0	3971	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			34			3			2	
Link Speed (mph)		30			30			35			35	
Link Distance (ft)		269			302			395			800	
Travel Time (s)		6.1			6.9			7.7			15.6	
Volume (vph)	11	33	239	41	40	57	116	1412	17	7	2014	11
Confl. Peds. (#/hr)	82		82	33		33	14		14	20		20
Confl. Bikes (#/hr)												
Peak Hour Factor	0.74	0.74	0.74	0.88	0.88	0.88	0.89	0.89	0.89	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	11
Parking (#/hr)									8			
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	383	0	0	157	0	0	1736	0	0	2139	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	30.0	30.0	0.0	30.0	30.0	0.0	70.0	70.0	0.0	70.0	70.0	0.0
Act Effct Green (s)		26.0			26.0			66.0			66.0	
Actuated g/C Ratio		0.26			0.26			0.66			0.66	
v/c Ratio		1.22			0.61			2.03dl			0.82	
Uniform Delay, d1		35.6			25.0			16.0			12.5	
Delay		125.7			26.4			20.5			7.2	
LOS		F			C			C			A	
Approach Delay		125.7			26.4			20.5			7.2	
Approach LOS		F			C			C			A	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 9 (9%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.22	
Intersection Signal Delay: 23.4	Intersection LOS: C

Intersection Capacity Utilization 130.3% ICU Level of Service H

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 5: Harrison Street & Wisconsin Avenue



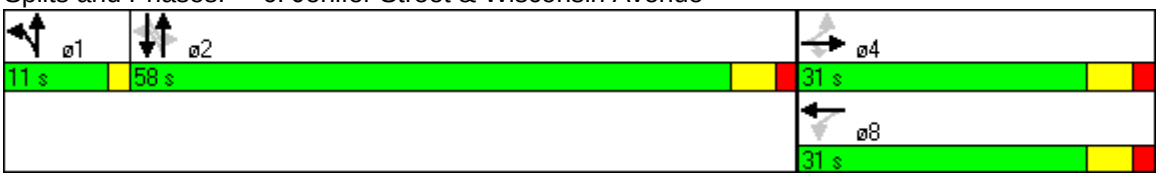
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1143	1245	0	1437	0	0	3863	0	0	4150	0
Flt Permitted		0.763			0.716			0.666			0.892	
Satd. Flow (perm)	0	875	1161	0	1034	0	0	2601	0	0	3705	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			35			35	
Link Distance (ft)		270			354			800			736	
Travel Time (s)		7.4			9.7			15.6			14.3	
Volume (vph)	90	96	347	49	41	30	317	1100	58	20	1598	55
Confl. Peds. (#/hr)	88		88	84		84	185		185	52		52
Confl. Bikes (#/hr)												
Peak Hour Factor	0.81	0.81	0.81	0.85	0.85	0.85	0.95	0.95	0.95	0.83	0.83	0.83
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	73%	2%	9%	0%	0%	14%	22%	7%	5%	5%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	11
Parking (#/hr)									8			
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	230	428	0	141	0	0	1553	0	0	2015	0
Turn Type	Perm		Perm	Perm			pm+pt			Perm		
Protected Phases		4			8		1	1 2			2	
Permitted Phases	4		4	8			1 2			2		
Total Split (s)	31.0	31.0	31.0	31.0	31.0	0.0	11.0	69.0	0.0	58.0	58.0	0.0
Act Effct Green (s)		27.0	27.0		27.0			61.0			54.0	
Actuated g/C Ratio		0.27	0.27		0.27			0.61			0.54	
v/c Ratio		0.97	1.37		0.51			2.40dl			1.01	
Uniform Delay, d1		36.1	36.5		30.8			15.3			23.0	
Delay		76.8	162.0		31.9			22.9			8.4	
LOS		E	F		C			C			A	
Approach Delay		132.2			31.9			22.9			8.4	
Approach LOS		F			C			C			A	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 79 (79%), Referenced to phase 1:NBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.37	
Intersection Signal Delay: 33.0	Intersection LOS: C

Intersection Capacity Utilization 130.1% ICU Level of Service H

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 6: Jenifer Street & Wisconsin Avenue

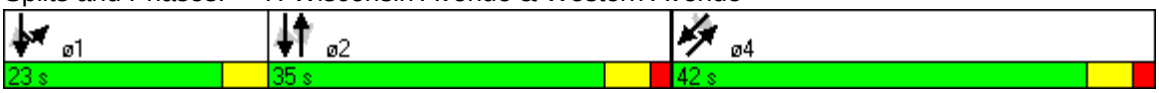


Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		1	1		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50	50	50	50			50	50
Trailing Detector (ft)		0	0	0	0	0	0	0			0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	4230	882	1472	2916	1268	1472	2922	0	0	2973	1280
Flt Permitted				0.129			0.105					
Satd. Flow (perm)	0	4230	815	200	2916	1071	163	2922	0	0	2973	1149
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			76			15		4				433
Link Speed (mph)		35			35			25			25	
Link Distance (ft)		736			254			340			132	
Travel Time (s)		14.3			4.9			9.3			3.6	
Volume (vph)	0	1139	83	375	1657	107	108	669	24	0	1008	484
Confl. Peds. (#/hr)	35		35	78		78	47		47	49		49
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.94	0.94	0.94	0.90	0.90	0.90	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	3%	33%	3%	4%	7%	3%	3%	0%	0%	2%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)			7									
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	1252	91	399	1763	114	120	770	0	0	1084	520
Turn Type			Perm	pm+pt		Perm	Perm					Perm
Protected Phases		2		1	1 2			4			4	
Permitted Phases			2	1 2		1 2	4					4
Total Split (s)	0.0	35.0	35.0	23.0	58.0	58.0	42.0	42.0	0.0	0.0	42.0	42.0
Act Effct Green (s)		31.0	31.0	50.0	54.0	54.0	38.0	38.0			38.0	38.0
Actuated g/C Ratio		0.31	0.31	0.50	0.54	0.54	0.38	0.38			0.38	0.38
v/c Ratio		0.95	0.30	1.17	1.12	0.19	1.94	0.69			0.96	0.74
Uniform Delay, d1		33.8	4.0	27.6	23.0	10.1	31.0	25.9			30.2	3.7
Delay		34.0	8.3	105.6	77.1	10.5	258.1	22.1			32.3	7.1
LOS		C	A	F	E	B	F	C			C	A
Approach Delay		32.3			78.7			53.9			24.1	
Approach LOS		C			E			D			C	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBSB, Start of Green, Master Intersection	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.94	
Intersection Signal Delay: 50.6	Intersection LOS: D

Intersection Capacity Utilization 105.4% ICU Level of Service F

Splits and Phases: 7: Wisconsin Avenue & Western Avenue

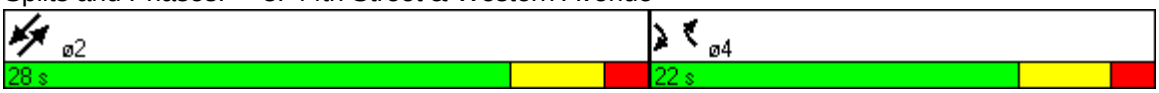


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		2	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)			50			50		50			50	
Trailing Detector (ft)			0			0		0			0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	0	1353	0	0	2388	0	2853	0	0	2883	0
Flt Permitted												
Satd. Flow (perm)	0	0	1217	0	0	2315	0	2853	0	0	2883	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			29			147		16			3	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		170			286			405			340	
Travel Time (s)		3.9			6.5			11.0			9.3	
Volume (vph)	0	0	3	0	0	42	0	744	44	0	1191	14
Confl. Peds. (#/hr)	97		97	20		20	66		66	7		7
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.67	0.67	0.67	0.95	0.95	0.95	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	0%	5%	0%	0%	5%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	0	3	0	0	63	0	829	0	0	1282	0
Turn Type			custom			custom						
Protected Phases			4			4		2			2	
Permitted Phases			4			4						
Total Split (s)	0.0	0.0	22.0	0.0	0.0	22.0	0.0	28.0	0.0	0.0	28.0	0.0
Act Effct Green (s)			7.5			7.5		43.8			43.8	
Actuated g/C Ratio			0.15			0.15		0.88			0.88	
v/c Ratio			0.01			0.13		0.33			0.51	
Uniform Delay, d1			0.0			0.0		2.0			2.7	
Delay			0.0			0.1		2.5			4.9	
LOS			A			A		A			A	
Approach Delay		0.0			0.1			2.5			4.9	
Approach LOS		A			A			A			A	

Intersection Summary	
Area Type:	CBD
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 48 (96%), Referenced to phase 2:NESW, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.51	
Intersection Signal Delay: 3.8	Intersection LOS: A

Intersection Capacity Utilization 59.2% ICU Level of Service A

Splits and Phases: 8: 44th Street & Western Avenue

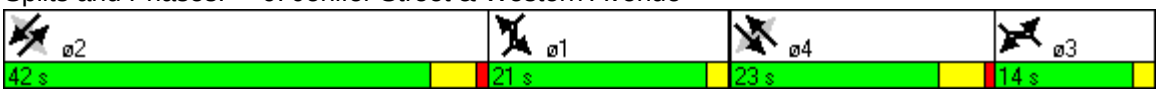


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	1		0	1		0	1		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	1501	2911	0	1353	2773	0	1472	2789	0	1330	2795	0
Flt Permitted	0.364			0.354	0.942		0.105			0.225		
Satd. Flow (perm)	562	2911	0	502	2617	0	163	2789	0	308	2795	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			9			42			39	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		490			207			1447			405	
Travel Time (s)		11.1			4.7			39.5			11.0	
Volume (vph)	129	259	62	143	261	24	136	591	168	208	802	213
Confl. Peds. (#/hr)	25		25	4		4	38		38	63		63
Confl. Bikes (#/hr)												
Peak Hour Factor	0.84	0.84	0.84	0.77	0.77	0.77	0.98	0.98	0.98	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	0%	0%	2%	0%	38%	3%	3%	4%	14%	2%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	154	382	0	168	388	0	139	774	0	214	1047	0
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	3	4		3	4		1	2		1	2	
Permitted Phases	4			4			2			2		
Total Split (s)	14.0	23.0	0.0	14.0	23.0	0.0	21.0	42.0	0.0	21.0	42.0	0.0
Act Effct Green (s)	26.9	19.0		26.9	26.9		57.1	47.3		57.1	47.3	
Actuated g/C Ratio	0.27	0.19		0.27	0.27		0.57	0.47		0.57	0.47	
v/c Ratio	0.68	0.67		0.83	0.54		0.63	0.58		0.77	0.78	
Uniform Delay, d1	33.3	34.9		35.6	27.4		25.9	18.0		22.3	21.1	
Delay	33.9	35.3		42.5	27.3		30.0	22.5		20.6	21.4	
LOS	C	D		D	C		C	C		C	C	
Approach Delay		34.9			31.9			23.7			21.2	
Approach LOS		C			C			C			C	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 47 (47%), Referenced to phase 2:NESW, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 26.0	Intersection LOS: C

Intersection Capacity Utilization 86.0% ICU Level of Service D

Splits and Phases: 9: Jenifer Street & Western Avenue

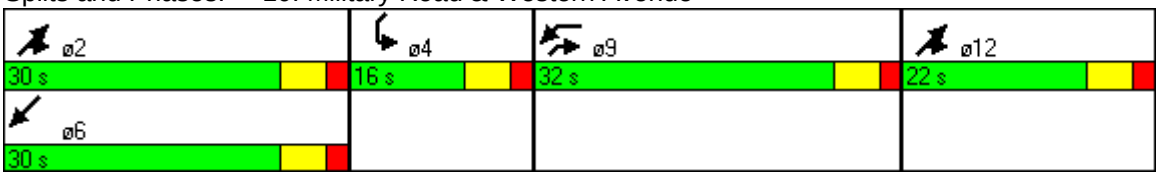


Lane Group	WBL	WBR	NET	NER	SWL	SWT	ø2	ø12
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900		
Lane Width (ft)	10	10	10	10	10	10		
Grade (%)	0%		0%			0%		
Storage Length (ft)	0	0		0	0			
Storage Lanes	2	0		1	1			
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		
Leading Detector (ft)	50		50	50	50	50		
Trailing Detector (ft)	0		0	0	0	0		
Turning Speed (mph)	15	9		9	15			
Satd. Flow (prot)	2841	0	2707	1317	1458	4150		
Flt Permitted	0.954				0.950			
Satd. Flow (perm)	2808	0	2707	1317	1284	4150		
Right Turn on Red		Yes		Yes				
Satd. Flow (RTOR)	5			329				
Link Speed (mph)	25		25			25		
Link Distance (ft)	480		132			2034		
Travel Time (s)	13.1		3.6			55.5		
Volume (vph)	608	28	435	705	105	879		
Confl. Peds. (#/hr)	18	18		3	72			
Confl. Bikes (#/hr)								
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95		
Growth Factor	100%	100%	100%	100%	100%	100%		
Heavy Vehicles (%)	3%	4%	12%	3%	4%	5%		
Bus Blockages (#/hr)	0	0	0	0	0	0		
Parking (#/hr)								
Mid-Block Traffic (%)	0%		0%			0%		
Lane Group Flow (vph)	669	0	458	742	111	925		
Turn Type				pt+ov	Prot			
Protected Phases	9		2 12	2 9 12	4	6	2	12
Permitted Phases								
Total Split (s)	32.0	0.0	52.0	84.0	16.0	30.0	30.0	22.0
Act Effct Green (s)	27.2		49.2	80.5	11.5	30.9		
Actuated g/C Ratio	0.27		0.49	0.81	0.12	0.31		
v/c Ratio	0.86		0.34	0.66	0.66	0.72		
Uniform Delay, d1	34.3		15.5	1.8	42.4	30.7		
Delay	24.0		15.3	5.9	40.6	22.7		
LOS	C		B	A	D	C		
Approach Delay	24.0		9.4			24.7		
Approach LOS	C		A			C		

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 43 (43%), Referenced to phase 2:NET, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 18.2	Intersection LOS: B

Intersection Capacity Utilization 64.9% ICU Level of Service B

Splits and Phases: 10: Military Road & Western Avenue



Lane Group	WBL2	WBL	WBR	WBR2	NBL	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%				0%					0%	
Storage Length (ft)		0	0		0		0			0		0
Storage Lanes		2	0		0		1			0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50		50	50	50	
Trailing Detector (ft)	0	0			0	0	0		0	0	0	
Turning Speed (mph)	15	15	12	12	15		12	12	15	15		12
Satd. Flow (prot)	0	2870	0	0	0	1452	1275	0	0	0	1545	0
Flt Permitted		0.955				0.396					0.986	
Satd. Flow (perm)	0	2870	0	0	0	592	1226	0	0	0	1525	0
Right Turn on Red				Yes				Yes				No
Satd. Flow (RTOR)							11					
Link Speed (mph)		30				30					30	
Link Distance (ft)		431				667					150	
Travel Time (s)		9.8				15.2					3.4	
Volume (vph)	10	133	9	1	114	21	145	21	1	6	110	21
Confl. Peds. (#/hr)					14		14		21			21
Confl. Bikes (#/hr)												
Peak Hour Factor	0.88	0.88	0.88	0.88	0.84	0.84	0.84	0.92	0.80	0.92	0.80	0.80
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	0%	1%	1%	2%	1%	2%	0%	1%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%				0%					0%	
Lane Group Flow (vph)	0	173	0	0	0	161	196	0	0	0	172	0
Turn Type	Perm				D.P+P		custom		Perm	Perm		
Protected Phases		10			3	3 4	3 4				4	
Permitted Phases	10				4		1		4	4		
Total Split (s)	11.0	11.0	0.0	0.0	22.0	40.0	40.0	0.0	18.0	18.0	18.0	0.0
Act Effct Green (s)		7.0				26.1	49.1				13.7	
Actuated g/C Ratio		0.07				0.26	0.49				0.14	
v/c Ratio		0.86				0.62	0.31				0.82	
Uniform Delay, d1		46.0				33.8	8.4				41.9	
Delay		68.1				33.2	8.0				55.5	
LOS		E				C	A				E	
Approach Delay		68.1				19.3					55.5	
Approach LOS		E				B					E	

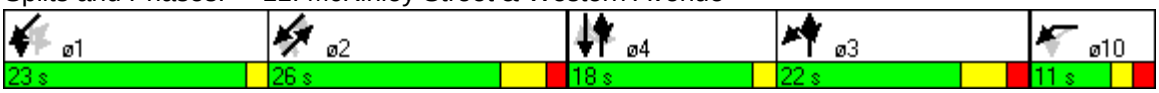
Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 92 (92%), Referenced to phase 2:NESW, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 29.6	Intersection LOS: C

Lane Group	NEL	NET	NER	NER2	SWL2	SWL	SWT	SWR
Lane Configurations								
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10
Grade (%)		0%					0%	
Storage Length (ft)	0		0			0		0
Storage Lanes	0		1			0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50	50	50	
Trailing Detector (ft)	0	0		0	0	0	0	
Turning Speed (mph)	15		12	12	15	15		12
Satd. Flow (prot)	0	2828	0	1357	0	0	2929	0
Flt Permitted		0.934					0.952	
Satd. Flow (perm)	0	2644	0	1321	0	0	2791	0
Right Turn on Red				No				No
Satd. Flow (RTOR)								
Link Speed (mph)		25					25	
Link Distance (ft)		2034					382	
Travel Time (s)		55.5					10.4	
Volume (vph)	6	433	9	146	1	19	992	5
Confl. Peds. (#/hr)	2			2		6		6
Confl. Bikes (#/hr)								
Peak Hour Factor	0.88	0.88	0.92	0.88	0.92	0.99	0.99	0.99
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	7%	2%	0%	2%	21%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0
Parking (#/hr)								
Mid-Block Traffic (%)		0%					0%	
Lane Group Flow (vph)	0	509	0	166	0	0	1027	0
Turn Type	Perm			Perm	custom	pm+pt		
Protected Phases		2				1	1 2	
Permitted Phases	2			2	1	1 2		
Total Split (s)	26.0	26.0	0.0	26.0	23.0	23.0	49.0	0.0
Act Effct Green (s)		27.9		27.9			46.9	
Actuated g/C Ratio		0.28		0.28			0.47	
v/c Ratio		0.69		0.45			0.77	
Uniform Delay, d1		32.2		29.7			19.6	
Delay		28.8		21.8			23.9	
LOS		C		C			C	
Approach Delay		27.1					23.9	
Approach LOS		C					C	

Intersection Summary

Intersection Capacity Utilization 82.7% ICU Level of Service D

Splits and Phases: 11: McKinley Street & Western Avenue



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50			50							
Trailing Detector (ft)		0			0							
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1550	0	0	1550	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1550	0	0	1550	0	0	0	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		999			76			352			128	
Travel Time (s)		27.2			2.1			8.0			2.9	
Volume (vph)	0	804	0	0	741	0	0	0	0	0	0	0
Confl. Peds. (#/hr)	6		6				25		25	34		34
Confl. Bikes (#/hr)												
Peak Hour Factor	0.97	0.97	0.97	0.89	0.89	0.89	0.76	0.76	0.76	0.81	0.81	0.81
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	3%	0%	0%	3%	0%	8%	0%	6%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	829	0	0	833	0	0	0	0	0	0	0
Turn Type												
Protected Phases		2			2							
Permitted Phases												
Total Split (s)	0.0	63.0	0.0	0.0	63.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Act Effct Green (s)		61.0			61.0							
Actuated g/C Ratio		0.61			0.61							
v/c Ratio		0.88			0.88							
Uniform Delay, d1		16.3			16.4							
Delay		29.3			8.4							
LOS		C			A							
Approach Delay		29.3			8.4							
Approach LOS		C			A							

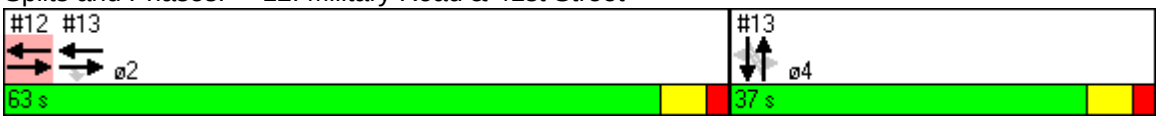
Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 34 (34%), Referenced to phase 2:EBWB and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 18.8	Intersection LOS: B

Lane Group	ø4
Lane Configurations	
Ideal Flow (vphpl)	
Lane Width (ft)	
Grade (%)	
Storage Length (ft)	
Storage Lanes	
Total Lost Time (s)	
Leading Detector (ft)	
Trailing Detector (ft)	
Turning Speed (mph)	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Right Turn on Red	
Satd. Flow (RTOR)	
Link Speed (mph)	
Link Distance (ft)	
Travel Time (s)	
Volume (vph)	
Confl. Peds. (#/hr)	
Confl. Bikes (#/hr)	
Peak Hour Factor	
Growth Factor	
Heavy Vehicles (%)	
Bus Blockages (#/hr)	
Parking (#/hr)	
Mid-Block Traffic (%)	
Lane Group Flow (vph)	
Turn Type	
Protected Phases	4
Permitted Phases	
Total Split (s)	37.0
Act Effct Green (s)	
Actuated g/C Ratio	
v/c Ratio	
Uniform Delay, d1	
Delay	
LOS	
Approach Delay	
Approach LOS	

Intersection Summary

Intersection Capacity Utilization 52.0% ICU Level of Service A

Splits and Phases: 12: Military Road & 41st Street

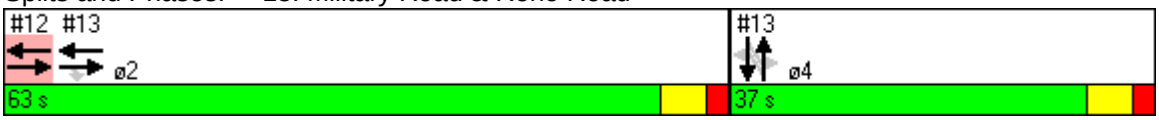


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50		50		50	50		50	50	
Trailing Detector (ft)		0	0		0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1535	1357	0	1546	0	0	2907	0	0	1589	0
Flt Permitted								0.933			0.996	
Satd. Flow (perm)	0	1535	1357	0	1546	0	0	2718	0	0	1582	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			139		1			8			1	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		76			244			206			138	
Travel Time (s)		2.1			6.7			5.6			3.8	
Volume (vph)	0	664	133	0	746	6	14	320	24	3	334	5
Confl. Peds. (#/hr)				11		11	31		31	44		44
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.87	0.87	0.87	0.79	0.79	0.79
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	4%	0%	0%	3%	17%	0%	1%	20%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	706	141	0	800	0	0	412	0	0	433	0
Turn Type			Perm				Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases			2				4			4		
Total Split (s)	0.0	63.0	63.0	0.0	63.0	0.0	37.0	37.0	0.0	37.0	37.0	0.0
Act Effct Green (s)		61.0	61.0		61.0			31.0			31.0	
Actuated g/C Ratio		0.61	0.61		0.61			0.31			0.31	
v/c Ratio		0.75	0.16		0.85			0.49			0.88	
Uniform Delay, d1		14.1	0.1		15.7			27.4			32.7	
Delay		1.7	0.0		21.9			27.2			38.0	
LOS		A	A		C			C			D	
Approach Delay		1.4			21.9			27.2			38.0	
Approach LOS		A			C			C			D	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 34 (34%), Referenced to phase 2:EBWB and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 18.6	Intersection LOS: B

Intersection Capacity Utilization 80.4% ICU Level of Service D

Splits and Phases: 13: Military Road & Reno Road



TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Dane Ismart*
Agency/Co.	
Date Performed	*4/13/2005*
Analysis Time Period	*2014 AM Peak_WACTS Scenario 4*

Site Information

Intersection	
Jurisdiction	
Analysis Year	*2014*

Project Description *Friendship Heights Addendum*

East/West Street: *Military Road* | North/South Street: *43rd Street*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*691*	*60*	*59*	*671*	*0*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*0*	*751*	*65*	*64*	*729*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*10*	*0*	*62*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*10*	*0*	*67*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*64*		*77*				
C (m) (vph)		*820*		*288*				
v/c		*0.08*		*0.27*				
95% queue length		*0.25*		*1.05*				
Control Delay		*9.8*		*22.0*				
LOS		*A*		*C*				
Approach Delay	--	--	*22.0*					
Approach LOS	--	--	*C*					

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Dane Ismart*	Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*4/13/2005*	Analysis Year	*2014*
Analysis Time Period	*2014 AM Peak_WACTS Sceanrio 4*		

Project Description	*Friendship Heights Addendum*
East/West Street: *Garrison Street*	North/South Street: *Wisconsin Avenue*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*99*	*1592*	*18*	*22*	*2133*	*54*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.90*
Hourly Flow Rate, HFR	*107*	*1730*	*19*	*23*	*2318*	*60*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration	*LT*		*TR*	*LT*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*2*	*6*	*12*	*1*	*6*	*16*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*2*	*6*	*13*	*1*	*6*	*17*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*1*	*1*	*1*	*1*
Configuration	*L*	*T*	*R*	*L*	*T*	*R*

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LT*	*L*	*T*	*R*	*L*	*T*	*R*
v (vph)	*107*	*23*	*2*	*6*	*13*	*1*	*6*	*17*
C (m) (vph)	*204*	*321*		*0*	*352*		*0*	*231*
v/c	*0.52*	*0.07*			*0.04*			*0.07*
95% queue length	*2.71*	*0.23*			*0.11*			*0.24*
Control Delay	*40.6*	*17.1*			*15.6*			*21.8*
LOS	*E*	*C*		*F*	*C*		*F*	*C*
Approach Delay	--	--						
Approach LOS	--	--						

>

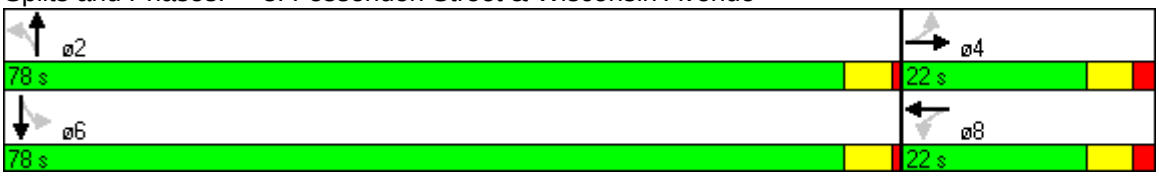
Lanes, Volumes, Timings
3: Fessenden Street & Wisconsin Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	1		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1532	0	1516	1503	0	0	4235	0	0	4157	0
Flt Permitted		0.492		0.231				0.916			0.767	
Satd. Flow (perm)	0	756	0	366	1503	0	0	3879	0	0	3192	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			11			21			4	
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		298			276			527			499	
Travel Time (s)		8.1			7.5			12.0			11.3	
Volume (vph)	27	187	35	134	172	81	10	2247	112	41	2003	22
Confl. Peds. (#/hr)	29		29	12		12	11		11	6		6
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.87	0.87	0.87	0.91	0.91	0.91	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	2%	0%	0%	1%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	7
Parking (#/hr)										0	0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	293	0	154	291	0	0	2603	0	0	2270	0
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Total Split (s)	22.0	22.0	0.0	22.0	22.0	0.0	78.0	78.0	0.0	78.0	78.0	0.0
Act Effct Green (s)		18.0		18.0	18.0			74.0			74.0	
Actuated g/C Ratio		0.18		0.18	0.18			0.74			0.74	
v/c Ratio		2.06		2.33	1.04			0.91			0.96	
Uniform Delay, d1		39.0		41.0	39.4			10.1			11.7	
Delay		271.8		296.4	89.0			9.5			14.1	
LOS		F		F	F			A			B	
Approach Delay		271.8			160.8			9.5			14.1	
Approach LOS		F			F			A			B	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 2.33	
Intersection Signal Delay: 37.1	Intersection LOS: D

Intersection Capacity Utilization 110.1% ICU Level of Service G

Splits and Phases: 3: Fessenden Street & Wisconsin Avenue



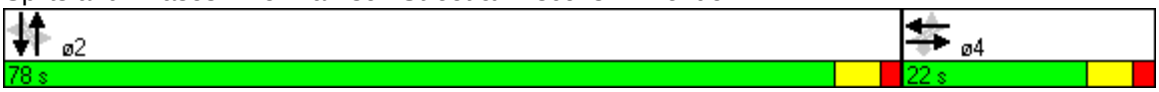
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1537	1330	0	1426	0	0	4247	0	0	4114	0
Flt Permitted		0.843			0.764			0.643			0.777	
Satd. Flow (perm)	0	1240	991	0	1076	0	0	2739	0	0	3200	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			22		18			6			5	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		269			302			395			800	
Travel Time (s)		6.1			6.9			9.0			18.2	
Volume (vph)	36	60	279	54	26	33	132	2088	32	42	1862	22
Confl. Peds. (#/hr)	124		124	45		45	12		12	14		14
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.86	0.86	0.86	0.96	0.96	0.96	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	11	0	0	7
Parking (#/hr)										0	0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	113	328	0	131	0	0	2346	0	0	2164	0
Turn Type	Perm		Perm	Perm			Perm			Perm		
Protected Phases		4			4			2			2	
Permitted Phases	4		4	4			2			2		
Total Split (s)	22.0	22.0	22.0	22.0	22.0	0.0	78.0	78.0	0.0	78.0	78.0	0.0
Act Effct Green (s)		18.0	18.0		18.0			74.0			74.0	
Actuated g/C Ratio		0.18	0.18		0.18			0.74			0.74	
v/c Ratio		0.51	1.67		0.63			1.89dl			0.91	
Uniform Delay, d1		37.0	36.4		32.5			12.9			10.4	
Delay		38.0	220.2		35.8			70.9			6.6	
LOS		D	F		D			E			A	
Approach Delay		173.5			35.8			70.9			6.6	
Approach LOS		F			D			E			A	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 20 (20%), Referenced to phase 2:NBSB, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.67	
Intersection Signal Delay: 51.5	Intersection LOS: D

Intersection Capacity Utilization 123.2% ICU Level of Service H

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 5: Harrison Street & Wisconsin Avenue



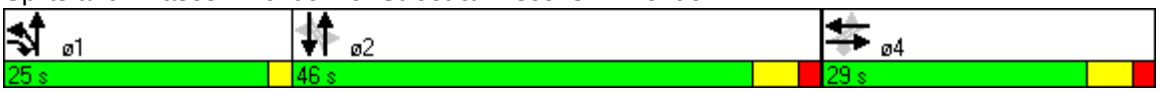
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50	50	50		50	50		50	50	
Trailing Detector (ft)	0	0	0	0	0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	1510	1357	0	1381	0	0	4165	0	0	3788	0
Flt Permitted		0.440			0.384			0.659			0.834	
Satd. Flow (perm)	0	686	1196	0	520	0	0	2772	0	0	3161	0
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		270			354			800			736	
Travel Time (s)		7.4			9.7			18.2			16.7	
Volume (vph)	170	90	547	92	143	81	459	1665	64	20	1083	154
Confl. Peds. (#/hr)	58		58	165		165	216		216	183		183
Confl. Bikes (#/hr)												
Peak Hour Factor	0.79	0.79	0.79	0.77	0.77	0.77	0.90	0.90	0.90	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	3%	0%	2%	1%	1%	0%	2%	0%	0%	2%	3%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)										0	0	0
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	329	692	0	410	0	0	2431	0	0	1323	0
Turn Type	Perm		pm+ov	Perm			pm+pt			Perm		
Protected Phases		4	1		4		1	1 2			2	
Permitted Phases	4		4	4			1 2			2		
Total Split (s)	29.0	29.0	25.0	29.0	29.0	0.0	25.0	71.0	0.0	46.0	46.0	0.0
Act Effct Green (s)		25.0	46.0		25.0			63.0			42.0	
Actuated g/C Ratio		0.25	0.46		0.25			0.63			0.42	
v/c Ratio		1.91	1.18		3.15			1.29dl			1.00	
Uniform Delay, d1		37.5	25.7		37.5			13.8			28.9	
Delay		254.3	104.6		349.3			85.3			18.5	
LOS		F	F		F			F			B	
Approach Delay		152.9			349.3			85.3			18.5	
Approach LOS		F			F			F			B	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 11 (11%), Referenced to phase 1:NBTL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 3.15	
Intersection Signal Delay: 102.5	Intersection LOS: F

Intersection Capacity Utilization 143.5% ICU Level of Service H

dl Defacto Left Lane. Recode with 1 though lane as a left lane.

Splits and Phases: 6: Jenifer Street & Wisconsin Avenue



Lane Group	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	1		0	1		0	0		1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50	50	50		50	50			50	50
Trailing Detector (ft)		0	0	0	0		0	0			0	0
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	4314	1245	1501	2786	0	1472	2911	0	0	2916	1357
Flt Permitted				0.114			0.140					
Satd. Flow (perm)	0	4314	852	180	2786	0	217	2911	0	0	2916	902
Right Turn on Red			No			No			No			No
Satd. Flow (RTOR)												
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		736			254			340			132	
Travel Time (s)		16.7			5.8			9.3			3.6	
Volume (vph)	0	1680	234	290	1171	200	130	1060	58	0	980	354
Confl. Peds. (#/hr)	185		185	114		114	139		139	239		239
Confl. Bikes (#/hr)												
Peak Hour Factor	0.91	0.91	0.91	0.90	0.90	0.90	0.88	0.88	0.88	0.97	0.97	0.97
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	9%	1%	3%	3%	3%	2%	0%	0%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	1846	257	322	1523	0	148	1271	0	0	1010	365
Turn Type			Perm	pm+pt			Perm					custom
Protected Phases		2		1	1 2			4			4	
Permitted Phases			2	1 2			4					1 4
Total Split (s)	0.0	39.0	39.0	16.0	55.0	0.0	45.0	45.0	0.0	0.0	45.0	61.0
Act Effct Green (s)		35.0	35.0	47.0	51.0		41.0	41.0			41.0	57.0
Actuated g/C Ratio		0.35	0.35	0.47	0.51		0.41	0.41			0.41	0.57
v/c Ratio		1.22	0.86	1.33	1.07		1.66	1.06			0.84	0.71
Uniform Delay, d1		32.5	30.2	25.2	24.5		29.5	29.5			26.6	15.5
Delay		76.7	31.0	147.6	62.8		219.7	62.9			22.5	23.6
LOS		E	C	F	E		F	E			C	C
Approach Delay		71.1			77.6			79.2			22.8	
Approach LOS		E			E			E			C	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 0 (0%), Referenced to phase 1:SBTL, Start of Green, Master Intersection	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.66	
Intersection Signal Delay: 64.7	Intersection LOS: E

Intersection Capacity Utilization 119.7% ICU Level of Service G

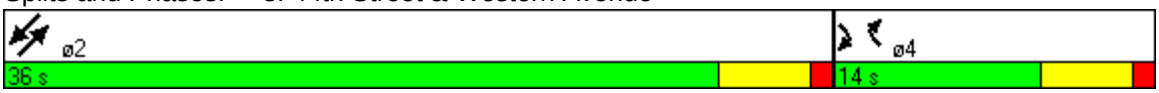
Splits and Phases: 7: Wisconsin Avenue & Western Avenue

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		2	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)			50			50		50			50	
Trailing Detector (ft)			0			0		0			0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	0	1381	0	0	2231	0	2899	0	0	2886	0
Flt Permitted												
Satd. Flow (perm)	0	0	1342	0	0	2094	0	2899	0	0	2886	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			83			194		17			20	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		170			286			405			340	
Travel Time (s)		3.9			6.5			11.0			9.3	
Volume (vph)	0	0	50	0	0	102	0	1067	46	0	1063	52
Confl. Peds. (#/hr)	17		17	54		54	9		9	59		59
Confl. Bikes (#/hr)												
Peak Hour Factor	0.73	0.73	0.73	0.87	0.87	0.87	0.98	0.98	0.98	0.95	0.95	0.95
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	0%	0%	5%	0%	7%	0%	4%	0%	0%	4%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	0	68	0	0	117	0	1136	0	0	1174	0
Turn Type			custom			custom						
Protected Phases			4			4		2			2	
Permitted Phases			4			4						
Total Split (s)	0.0	0.0	14.0	0.0	0.0	14.0	0.0	36.0	0.0	0.0	36.0	0.0
Act Effct Green (s)			7.2			7.2		37.7			37.7	
Actuated g/C Ratio			0.14			0.14		0.75			0.75	
v/c Ratio			0.25			0.24		0.52			0.54	
Uniform Delay, d1			0.0			0.0		3.2			3.3	
Delay			4.8			1.2		3.6			2.4	
LOS			A			A		A			A	
Approach Delay		4.8			1.2			3.6			2.4	
Approach LOS		A			A			A			A	

Intersection Summary	
Area Type:	CBD
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 12 (24%), Referenced to phase 2:NESW, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 2.9	Intersection LOS: A

Intersection Capacity Utilization 54.4% ICU Level of Service A

Splits and Phases: 8: 44th Street & Western Avenue

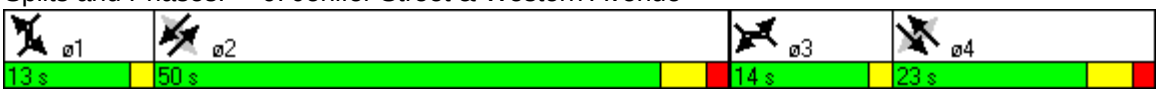


Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	1		0	1		0	1		0	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50		50	50		50	50		50	50	
Trailing Detector (ft)	0	0		0	0		0	0		0	0	
Turning Speed (mph)	15		12	15		12	15		12	15		12
Satd. Flow (prot)	1516	2614	0	1380	2773	0	1501	2813	0	1404	2881	0
Flt Permitted	0.419			0.227	0.566		0.162			0.106		
Satd. Flow (perm)	634	2614	0	322	1582	0	256	2813	0	157	2881	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		59			12			35			43	
Link Speed (mph)		30			30			25			25	
Link Distance (ft)		490			207			1447			405	
Travel Time (s)		11.1			4.7			39.5			11.0	
Volume (vph)	200	297	127	347	279	52	132	874	194	304	743	194
Confl. Peds. (#/hr)	62		62	37		37	63		63	14		14
Confl. Bikes (#/hr)												
Peak Hour Factor	0.85	0.85	0.85	0.84	0.84	0.84	0.89	0.89	0.89	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	9%	1%	0%	1%	0%	1%	3%	0%	8%	1%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	235	498	0	218	589	0	148	1200	0	334	1029	0
Turn Type	pm+pt			pm+pt			pm+pt			pm+pt		
Protected Phases	3	4		3	4		1	2		1	2	
Permitted Phases	4			4			2			2		
Total Split (s)	14.0	23.0	0.0	14.0	23.0	0.0	13.0	50.0	0.0	13.0	50.0	0.0
Act Effct Green (s)	29.0	19.0		29.0	29.0		55.0	46.0		55.0	46.0	
Actuated g/C Ratio	0.29	0.19		0.29	0.29		0.55	0.46		0.55	0.46	
v/c Ratio	0.86	0.92		1.10	1.01		0.58	0.91		1.68	0.76	
Uniform Delay, d1	27.8	34.9		27.7	30.9		9.5	24.4		20.6	21.4	
Delay	46.4	48.7		99.8	60.9		19.6	24.5		218.4	27.0	
LOS	D	D		F	E		B	C		F	C	
Approach Delay		47.9			71.4			23.9			73.9	
Approach LOS		D			E			C			E	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 28 (28%), Referenced to phase 1:NESWL, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.68	
Intersection Signal Delay: 53.1	Intersection LOS: D

Intersection Capacity Utilization 107.4% ICU Level of Service F

Splits and Phases: 9: Jenifer Street & Western Avenue

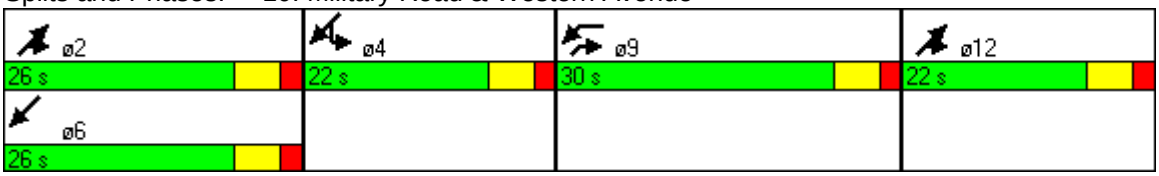


Lane Group	WBL	WBR	NET	NER	SWL	SWT	ø2	ø6	ø12
Lane Configurations									
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900			
Lane Width (ft)	10	10	10	10	10	10			
Grade (%)	0%		0%			0%			
Storage Length (ft)	0	0		0	0				
Storage Lanes	2	0		1	1				
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0			
Leading Detector (ft)	50		50	50	50	50			
Trailing Detector (ft)	0		0	0	0	0			
Turning Speed (mph)	15	9		9	15				
Satd. Flow (prot)	2888	0	2888	1343	1516	4150			
Flt Permitted	0.956				0.950				
Satd. Flow (perm)	2835	0	2888	1343	1447	4150			
Right Turn on Red		Yes		Yes					
Satd. Flow (RTOR)	8			480					
Link Speed (mph)	25		25			25			
Link Distance (ft)	480		132			2034			
Travel Time (s)	13.1		3.6			55.5			
Volume (vph)	552	44	876	631	106	752			
Confl. Peds. (#/hr)	26	26		14	51				
Confl. Bikes (#/hr)									
Peak Hour Factor	0.97	0.97	0.97	0.97	0.92	0.92			
Growth Factor	100%	100%	100%	100%	100%	100%			
Heavy Vehicles (%)	1%	0%	5%	1%	0%	5%			
Bus Blockages (#/hr)	0	0	0	0	0	0			
Parking (#/hr)									
Mid-Block Traffic (%)	0%		0%			0%			
Lane Group Flow (vph)	614	0	903	651	115	817			
Turn Type				pt+ov	Prot				
Protected Phases	9		2 12	2 9 12	4	4 6	2	6	12
Permitted Phases									
Total Split (s)	30.0	0.0	48.0	78.0	22.0	48.0	26.0	26.0	22.0
Act Effct Green (s)	26.0		46.9	76.9	15.1	44.0			
Actuated g/C Ratio	0.26		0.47	0.77	0.15	0.44			
v/c Ratio	0.81		0.67	0.57	0.50	0.45			
Uniform Delay, d1	34.2		20.5	0.9	39.0	19.5			
Delay	25.1		24.9	2.0	36.7	16.9			
LOS	C		C	A	D	B			
Approach Delay	25.1		15.3			19.3			
Approach LOS	C		B			B			

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 20 (20%), Referenced to phase 2:NET, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 18.5	Intersection LOS: B

Intersection Capacity Utilization 64.6% ICU Level of Service B

Splits and Phases: 10: Military Road & Western Avenue



Lane Group	WBL2	WBL	WBR	WBR2	NBL	NBT	NBR	NBR2	SBL2	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%				0%					0%	
Storage Length (ft)		0	0		0		0			0		0
Storage Lanes		2	0		0		1			0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50	50	50		50	50	50	
Trailing Detector (ft)	0	0			0	0	0		0	0	0	
Turning Speed (mph)	15	15	12	12	15		12	12	15	15		12
Satd. Flow (prot)	0	2856	0	0	0	1532	1342	0	0	0	1465	0
Flt Permitted		0.914				0.658					0.939	
Satd. Flow (perm)	0	2727	0	0	0	1027	1279	0	0	0	1381	0
Right Turn on Red				Yes				Yes				Yes
Satd. Flow (RTOR)		8					4				34	
Link Speed (mph)		30				30					30	
Link Distance (ft)		259				667					264	
Travel Time (s)		5.9				15.2					6.0	
Volume (vph)	11	107	4	11	213	45	303	21	2	8	27	27
Confl. Peds. (#/hr)					19		19		14			14
Confl. Bikes (#/hr)												
Peak Hour Factor	0.82	0.82	0.82	0.82	0.94	0.94	0.94	0.92	0.64	0.92	0.64	0.64
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	0%	0%	1%	2%	0%	2%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%				0%					0%	
Lane Group Flow (vph)	0	161	0	0	0	275	345	0	0	0	96	0
Turn Type	Perm				D.P+P		custom		Perm	Perm		
Protected Phases		10			3	3 4	3 4				4	
Permitted Phases	10				4		1		4	4		
Total Split (s)	16.0	16.0	0.0	0.0	11.0	33.0	33.0	0.0	22.0	22.0	22.0	0.0
Act Effct Green (s)		11.4				24.8	34.8				17.8	
Actuated g/C Ratio		0.11				0.25	0.35				0.18	
v/c Ratio		0.51				0.95	0.74				0.35	
Uniform Delay, d1		39.5				34.3	18.2				22.9	
Delay		39.7				63.7	21.8				24.4	
LOS		D				E	C				C	
Approach Delay		39.7				40.4					24.4	
Approach LOS		D				D					C	

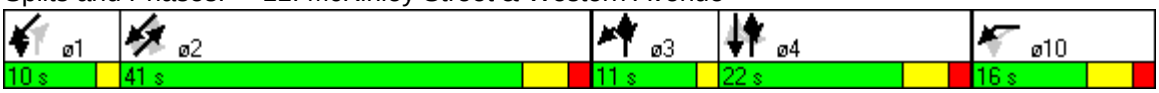
Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 54 (54%), Referenced to phase 2:NESW, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 33.2	Intersection LOS: C

Lane Group	NEL	NET	NER	NER2	SWL	SWT	SWR
Lane Configurations							
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	12
Grade (%)		0%				0%	
Storage Length (ft)	0		0		0		0
Storage Lanes	0		1		1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50	50		50	50	
Trailing Detector (ft)	0	0	0		0	0	
Turning Speed (mph)	15		12	12	15		12
Satd. Flow (prot)	0	2916	1295	0	1380	2814	0
Flt Permitted		0.954			0.108	0.766	
Satd. Flow (perm)	0	2782	1272	0	157	2160	0
Right Turn on Red				Yes			Yes
Satd. Flow (RTOR)			197			1	
Link Speed (mph)		25				25	
Link Distance (ft)		2034				382	
Travel Time (s)		55.5				10.4	
Volume (vph)	2	970	14	181	108	672	8
Confl. Peds. (#/hr)	3			3			
Confl. Bikes (#/hr)							
Peak Hour Factor	0.92	0.92	0.92	0.92	0.91	0.91	0.91
Growth Factor	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	4%	2%	5%	0%	3%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0
Parking (#/hr)							
Mid-Block Traffic (%)		0%				0%	
Lane Group Flow (vph)	0	1056	212	0	83	783	0
Turn Type	Perm		Perm		pm+pt		
Protected Phases		2			1	1 2	
Permitted Phases	2		2		1 2		
Total Split (s)	41.0	41.0	41.0	0.0	10.0	51.0	0.0
Act Effct Green (s)		37.8	37.8		43.8	43.8	
Actuated g/C Ratio		0.38	0.38		0.44	0.44	
v/c Ratio		1.00	0.35		0.58	0.79	
Uniform Delay, d1		31.1	1.4		14.7	22.5	
Delay		43.0	0.1		20.3	24.5	
LOS		D	A		C	C	
Approach Delay		35.8				24.1	
Approach LOS		D				C	

Intersection Summary

Intersection Capacity Utilization 97.1% ICU Level of Service E

Splits and Phases: 11: McKinley Street & Western Avenue

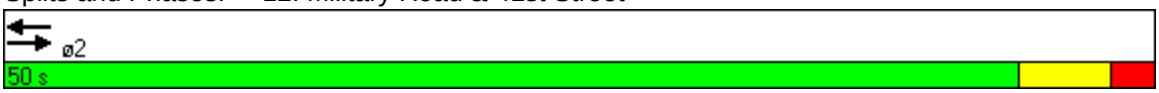


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	9	9	9	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50			50							
Trailing Detector (ft)		0			0							
Turning Speed (mph)	15		12	15		12	15		12	15		12
Satd. Flow (prot)	0	1524	0	0	1580	0	0	0	0	0	0	0
Flt Permitted												
Satd. Flow (perm)	0	1524	0	0	1580	0	0	0	0	0	0	0
Right Turn on Red			No			Yes			Yes			Yes
Satd. Flow (RTOR)												
Link Speed (mph)		25			25			30			30	
Link Distance (ft)		999			76			352			128	
Travel Time (s)		27.2			2.1			8.0			2.9	
Volume (vph)	0	710	0	0	652	0	0	0	0	0	0	0
Confl. Peds. (#/hr)	20		20				55		55	24		24
Confl. Bikes (#/hr)												
Peak Hour Factor	0.99	0.99	0.99	0.96	0.96	0.96	0.92	0.92	0.92	0.72	0.72	0.72
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	1%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	717	0	0	679	0	0	0	0	0	0	0
Turn Type												
Protected Phases		2			2							
Permitted Phases												
Total Split (s)	0.0	50.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Act Effct Green (s)		50.0			50.0							
Actuated g/C Ratio		1.00			1.00							
v/c Ratio		0.47			0.43							
Uniform Delay, d1		0.0			0.0							
Delay		0.0			0.0							
LOS		A			A							
Approach Delay		0.0			0.0							
Approach LOS		A			A							

Intersection Summary	
Area Type:	CBD
Cycle Length: 50	
Actuated Cycle Length: 50	
Offset: 7 (14%), Referenced to phase 2:EBWB and 6:, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 0.0	Intersection LOS: A

Intersection Capacity Utilization 45.3% ICU Level of Service A

Splits and Phases: 12: Military Road & 41st Street

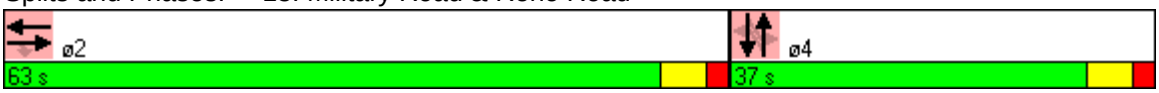


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		1	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50	50		50		50	50		50	50	
Trailing Detector (ft)		0	0		0		0	0		0	0	
Turning Speed (mph)	15		12	15		12	15		12	15		12
Satd. Flow (prot)	0	1565	1357	0	1570	0	0	3006	0	0	1588	0
Flt Permitted								0.941			0.989	
Satd. Flow (perm)	0	1565	1357	0	1570	0	0	2831	0	0	1572	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			80		4			5			1	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		76			244			206			138	
Travel Time (s)		2.1			6.7			5.6			3.8	
Volume (vph)	0	639	77	0	650	29	18	644	28	4	251	6
Confl. Peds. (#/hr)				3		3	6		6	13		13
Confl. Bikes (#/hr)												
Peak Hour Factor	0.96	0.96	0.96	0.97	0.97	0.97	0.91	0.91	0.91	0.93	0.93	0.93
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	666	80	0	700	0	0	759	0	0	280	0
Turn Type			Perm				Perm			Perm		
Protected Phases		2			2			4			4	
Permitted Phases			2				4			4		
Total Split (s)	0.0	63.0	63.0	0.0	63.0	0.0	37.0	37.0	0.0	37.0	37.0	0.0
Act Effct Green (s)		60.5	60.5		60.5			31.5			31.5	
Actuated g/C Ratio		0.61	0.61		0.61			0.32			0.32	
v/c Ratio		0.70	0.09		0.74			0.85			0.56	
Uniform Delay, d1		13.6	0.0		14.0			31.8			28.4	
Delay		9.3	0.7		15.3			33.1			28.6	
LOS		A	A		B			C			C	
Approach Delay		8.4			15.3			33.1			28.6	
Approach LOS		A			B			C			C	

Intersection Summary	
Area Type:	CBD
Cycle Length: 100	
Actuated Cycle Length: 100	
Offset: 92 (92%), Referenced to phase 2:EBWB, Start of Green	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 20.2	Intersection LOS: C

Intersection Capacity Utilization 75.2% ICU Level of Service C

Splits and Phases: 13: Military Road & Reno Road



TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*Dane Ismart*
Agency/Co.	
Date Performed	*4/13/2005*
Analysis Time Period	*2014 PM Peak_WACTS Scenario 4*

Site Information

Intersection	
Jurisdiction	
Analysis Year	*2014*

Project Description *Friendship Heights Addendum*

East/West Street: *Military Road* | North/South Street: *43rd Street*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*0*	*654*	*70*	*95*	*571*	*0*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*0*	*710*	*76*	*103*	*620*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*27*	*0*	*95*	*0*	*0*	*0*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*29*	*0*	*103*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	EB	WB	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*		*LR*				
v (vph)		*103*		*132*				
C (m) (vph)		*842*		*255*				
v/c		*0.12*		*0.52*				
95% queue length		*0.42*		*2.73*				
Control Delay		*9.9*		*33.3*				
LOS		*A*		*D*				
Approach Delay	--	--	*33.3*					
Approach LOS	--	--	*D*					

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*Dane Ismart*	Intersection	
Agency/Co.		Jurisdiction	
Date Performed	*4/13/2005*	Analysis Year	*2014*
Analysis Time Period	*2014 PM Peak_WACTS Sceanrio 4*		

Project Description	*Friendship Heights Addendum*
East/West Street: *Garrison Street*	North/South Street: *Wisconsin Avenue*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume	*99*	*2198*	*16*	*10*	*2014*	*71*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.99*
Hourly Flow Rate, HFR	*107*	*2389*	*17*	*10*	*2189*	*72*
Percent Heavy Vehicles	*1*	--	--	*1*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration	*LT*		*TR*	*LT*		*TR*
Upstream Signal		*0*			*0*	

Minor Street	Westbound			Eastbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume	*0*	*0*	*19*	*7*	*1*	*51*
Peak-Hour Factor, PHF	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*	*0.92*
Hourly Flow Rate, HFR	*0*	*0*	*20*	*7*	*1*	*55*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*1*	*1*	*1*	*1*
Configuration	*L*	*T*	*R*	*L*	*T*	*R*

Delay, Queue Length, and Level of Service

Approach	NB	SB	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*	*LT*	*L*	*T*	*R*	*L*	*T*	*R*
v (vph)	*107*	*10*	*0*	*0*	*20*	*7*	*1*	*55*
C (m) (vph)	*227*	*170*		*0*	*227*		*0*	*250*
v/c	*0.47*	*0.06*			*0.09*			*0.22*
95% queue length	*2.32*	*0.19*			*0.29*			*0.82*
Control Delay	*34.2*	*27.5*			*22.4*			*23.4*
LOS	*D*	*D*		*F*	*C*		*F*	*C*
Approach Delay	--	--						
Approach LOS	--	--						

>

Appendix D

Peak Hour Turning Movement Counts

O.R. George & Associates, Inc.
10210 Greenbelt Road, Suite 310
Lanham, Maryland 20706
Tel: (301) 794-7700 Fax: (301) 794-4400
orgassoc@aol.com

Passenger Vehicles

Date : 8-Feb-05
Location : River Road @ Western Avenue

City: Washington, D.C.
Weather: Cold/Cloudy/Dry

End Time	---------- From North ---------- River Road				---------- From South ---------- River Road				---------- From East ---------- Western Avenue				---------- From West ---------- Western Avenue				Total
	Left	*Thru*	*Right*	*U-Turn*	*Left*	*Thru*	*Right*	*U-Turn*	*Left*	*Thru*	*Right*	*U-Turn*	*Left*	*Thru*	*Right*	*U-Turn*	
6:45	30	99	11	0	0	47	4	0	4	79	25	0	9	56	4	0	368
7:00	52	112	18	0	0	52	3	0	3	75	46	0	11	62	5	0	439
total	***82***	***211***	***29***	***0***	***0***	***99***	***7***	***0***	***7***	***154***	***71***	***0***	***20***	***118***	***9***	***0***	***807***
7:15	91	166	11	0	0	49	5	0	3	69	54	0	10	58	3	0	519
7:30	84	228	25	0	0	66	6	0	10	79	44	0	12	77	2	0	633
7:45	83	279	27	0	0	82	10	0	15	83	49	0	14	98	7	0	747
8:00	78	296	25	0	1	94	8	0	18	97	35	0	25	100	10	0	787
total	***336***	***969***	***88***	***0***	***1***	***291***	***29***	***0***	***46***	***328***	***182***	***0***	***61***	***333***	***22***	***0***	***2686***
8:15	82	279	25	0	0	83	10	0	17	77	32	0	28	122	15	0	770
8:30	80	283	28	0	0	95	16	0	22	85	30	0	23	117	5	0	784
8:45	88	266	17	0	0	91	18	0	21	68	34	0	26	122	4	0	755
9:00	85	273	16	0	0	85	27	0	15	83	48	0	21	129	5	0	787
total	***335***	***1101***	***86***	***0***	***0***	***354***	***71***	***0***	***75***	***313***	***144***	***0***	***98***	***490***	***29***	***0***	***3096***
9:15	83	206	22	0	0	96	13	0	22	90	27	0	21	92	5	0	677
9:30	74	192	12	0	0	78	6	0	27	81	40	0	22	99	5	0	636
total	***157***	***398***	***34***	***0***	***0***	***174***	***19***	***0***	***49***	***171***	***67***	***0***	***43***	***191***	***10***	***0***	***1313***
15:45	47	136	27	0	0	174	31	0	16	105	70	0	21	115	0	0	742
16:00	50	153	16	0	0	145	25	0	25	85	62	0	22	117	1	0	701
total	***97***	***289***	***43***	***0***	***0***	***319***	***56***	***0***	***41***	***190***	***132***	***0***	***43***	***232***	***1***	***0***	***1443***
16:15	38	125	18	0	0	158	15	0	15	93	53	0	22	123	0	0	660
16:30	35	121	22	0	0	135	12	0	20	98	64	0	23	121	1	0	652
16:45	54	120	29	0	0	137	13	0	21	89	67	0	19	113	3	0	665
17:00	42	119	28	0	0	148	18	0	21	110	54	0	26	116	0	0	682
total	***169***	***485***	***97***	***0***	***0***	***578***	***58***	***0***	***77***	***390***	***238***	***0***	***90***	***473***	***4***	***0***	***2659***
17:15	42	146	30	0	0	158	17	0	27	97	71	0	20	115	1	0	724
17:30	48	135	19	0	0	195	25	0	28	126	88	0	27	131	0	0	822
17:45	51	144	29	0	0	189	19	0	19	144	64	0	25	124	4	0	812
18:00	40	132	21	0	0	213	13	0	15	155	57	0	16	101	3	0	766
total	***181***	***557***	***99***	***0***	***0***	***755***	***74***	***0***	***89***	***522***	***280***	***0***	***88***	***471***	***8***	***0***	***3124***
18:15	44	118	23	0	0	188	15	0	27	144	81	0	20	108	2	0	770
18:30	40	167	15	0	0	179	12	0	28	132	69	0	24	118	5	0	789
total	***84***	***285***	***38***	***0***	***0***	***367***	***27***	***0***	***55***	***276***	***150***	***0***	***44***	***226***	***7***	***0***	***1559***

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Trucks

Date : 8-Feb-05
Location : River Road @ Western Avenue

City: Washington, D.C.
Weather: Cold/Cloudy/Dry

End Time	From North River Road				From South River Road				From East Western Avenue				From West Western Avenue				Total
	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	
6:45	2	3	1	0	0	1	0	0	0	0	4	0	0	1	0	0	12
7:00	4	3	0	0	0	2	0	0	0	2	2	0	0	1	0	0	14
total	*6*	*6*	*1*	*0*	*0*	*3*	*0*	*0*	*0*	*2*	*6*	*0*	*0*	*2*	*0*	*0*	*26*
7:15	5	4	0	0	0	1	0	0	0	1	4	0	1	0	0	0	16
7:30	1	1	0	0	0	3	0	0	1	3	8	0	0	0	0	0	17
7:45	2	2	0	0	0	1	0	0	0	0	3	0	0	0	0	0	8
8:00	1	2	1	0	0	1	0	0	0	3	1	0	2	1	0	0	12
total	*9*	*9*	*1*	*0*	*0*	*6*	*0*	*0*	*1*	*7*	*16*	*0*	*3*	*1*	*0*	*0*	*53*
8:15	2	1	1	0	0	2	0	0	0	2	1	0	0	2	0	0	11
8:30	0	4	2	0	0	2	0	0	0	3	0	0	0	0	0	0	11
8:45	2	3	1	0	0	1	0	0	1	2	4	0	0	0	0	0	14
9:00	3	3	1	0	0	2	1	0	0	4	0	0	0	0	0	0	14
total	*7*	*11*	*5*	*0*	*0*	*7*	*1*	*0*	*1*	*11*	*5*	*0*	*0*	*2*	*0*	*0*	*50*
9:15	1	3	0	0	0	1	1	0	1	3	4	0	1	1	0	0	16
9:30	3	0	2	0	0	1	0	0	0	1	2	0	0	1	0	0	10
total	*4*	*3*	*2*	*0*	*0*	*2*	*1*	*0*	*1*	*4*	*6*	*0*	*1*	*2*	*0*	*0*	*26*
15:45	1	1	1	0	0	1	0	0	0	1	1	0	2	1	0	0	9
16:00	2	1	1	0	0	2	0	0	1	2	2	0	1	0	0	0	12
total	*3*	*2*	*2*	*0*	*0*	*3*	*0*	*0*	*1*	*3*	*3*	*0*	*3*	*1*	*0*	*0*	*21*
16:15	2	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	5
16:30	0	2	1	0	0	0	0	0	0	0	1	0	0	1	0	0	5
16:45	1	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0	4
17:00	1	0	0	0	0	0	0	0	0	0	2	0	0	3	0	0	6
total	*4*	*3*	*1*	*0*	*0*	*1*	*0*	*0*	*0*	*2*	*4*	*0*	*1*	*4*	*0*	*0*	*20*
17:15	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	3
17:30	2	1	0	0	0	0	0	0	0	1	2	0	0	0	0	0	6
17:45	1	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	4
18:00	4	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	7
total	*7*	*2*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*4*	*3*	*0*	*1*	*2*	*0*	*0*	*20*
18:15	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3
18:30	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1
total	*1*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*0*	*0*	*4*

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Buses

Date : 8-Feb-05
Location : River Road @ Western Avenue

City: Washington, D.C.
Weather: Cold/Cloudy/Dry

End Time	---------- From North ----------				---------- From South ----------				---------- From East ----------				---------- From West ----------				Total
	River Road				River Road				Western Avenue				Western Avenue				
	Left	*Thru*	*Right*	*U-Turn*	*Left*	*Thru*	*Right*	*U-Turn*	*Left*	*Thru*	*Right*	*U-Turn*	*Left*	*Thru*	*Right*	*U-Turn*	
6:45	1	0	0	0	0	1	0	0	0	3	1	0	0	2	0	0	8
7:00	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	4
total	***1***	***0***	***0***	***0***	***0***	***1***	***0***	***0***	***0***	***5***	***1***	***0***	***0***	***4***	***0***	***0***	***12***
7:15	1	1	0	0	0	0	0	0	0	3	0	0	1	3	0	0	9
7:30	0	0	0	0	0	2	0	0	0	6	1	0	1	2	0	0	12
7:45	0	0	0	0	0	0	0	0	0	5	0	0	1	1	0	0	7
8:00	0	1	0	0	0	0	0	0	1	3	0	0	0	1	0	0	6
total	***1***	***2***	***0***	***0***	***0***	***2***	***0***	***0***	***1***	***17***	***1***	***0***	***3***	***7***	***0***	***0***	***34***
8:15	0	0	0	0	0	0	0	0	0	3	0	0	0	2	0	0	5
8:30	1	0	0	0	0	0	0	0	0	4	0	0	0	4	0	0	9
8:45	0	1	0	0	0	0	0	0	0	0	0	0	0	3	0	0	4
9:00	0	0	1	0	0	0	0	0	0	3	0	0	0	0	0	0	4
total	***1***	***1***	***1***	***0***	***0***	***0***	***0***	***0***	***0***	***10***	***0***	***0***	***0***	***9***	***0***	***0***	***22***
9:15	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0	4
9:30	0	2	0	0	0	1	0	0	0	2	0	0	0	2	0	0	7
total	***0***	***2***	***0***	***0***	***0***	***1***	***0***	***0***	***0***	***3***	***0***	***0***	***0***	***5***	***0***	***0***	***11***
15:45	1	1	0	0	0	0	0	0	0	2	1	0	0	4	0	0	9
16:00	1	3	0	0	0	0	0	0	0	1	0	0	0	2	0	0	7
total	***2***	***4***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***3***	***1***	***0***	***0***	***6***	***0***	***0***	***16***
16:15	0	0	0	0	0	2	0	0	0	3	0	0	0	1	0	0	6
16:30	0	2	0	0	0	0	0	0	0	2	0	0	0	2	0	0	6
16:45	0	1	0	0	0	1	0	0	0	3	0	0	0	2	0	0	7
17:00	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2
total	***0***	***3***	***0***	***0***	***0***	***3***	***0***	***0***	***0***	***9***	***0***	***0***	***0***	***6***	***0***	***0***	***21***
17:15	0	1	0	0	0	0	0	0	0	2	0	0	0	2	0	0	5
17:30	0	0	0	0	0	1	0	0	0	2	0	0	0	3	0	0	6
17:45	0	0	0	0	0	0	0	0	0	2	0	0	0	1	0	0	3
18:00	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	2
total	***0***	***1***	***0***	***0***	***0***	***1***	***0***	***0***	***0***	***7***	***0***	***0***	***0***	***7***	***0***	***0***	***16***
18:15	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0	0	3
18:30	0	0	0	0	0	0	0	0	0	2	0	0	0	4	0	0	6
total	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***3***	***0***	***0***	***0***	***6***	***0***	***0***	***9***

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Total Traffic

Date : 8-Feb-05
Location : River Road @ Western Avenue

City: Washington, D.C.
Weather: Cold/Cloudy/Dry

End Time	---------- From North ---------- River Road				---------- From South ---------- River Road				---------- From East ---------- Western Avenue				---------- From West ---------- Western Avenue				Total
	Left	*Thru*	*Right*	*U-Turn*	*Left*	*Thru*	*Right*	*U-Turn*	*Left*	*Thru*	*Right*	*U-Turn*	*Left*	*Thru*	*Right*	*U-Turn*	
6:45	33	102	12	0	0	49	4	0	4	82	30	0	9	59	4	0	388
7:00	56	115	18	0	0	54	3	0	3	79	48	0	11	65	5	0	457
total	***89***	***217***	***30***	***0***	***0***	***103***	***7***	***0***	***7***	***161***	***78***	***0***	***20***	***124***	***9***	***0***	***845***
7:15	97	171	11	0	0	50	5	0	3	73	58	0	12	61	3	0	544
7:30	85	229	25	0	0	71	6	0	11	88	53	0	13	79	2	0	662
7:45	85	281	27	0	0	83	10	0	15	88	52	0	15	99	7	0	762
8:00	79	299	26	0	1	95	8	0	19	103	36	0	27	102	10	0	805
total	***346***	***980***	***89***	***0***	***1***	***299***	***29***	***0***	***48***	***352***	***199***	***0***	***67***	***341***	***22***	***0***	***2773***
8:15	84	280	26	0	0	85	10	0	17	82	33	0	28	126	15	0	786
8:30	81	287	30	0	0	97	16	0	22	92	30	0	23	121	5	0	804
8:45	90	270	18	0	0	92	18	0	22	70	38	0	26	125	4	0	773
9:00	88	276	18	0	0	87	28	0	15	90	48	0	21	129	5	0	805
total	***343***	***1113***	***92***	***0***	***0***	***361***	***72***	***0***	***76***	***334***	***149***	***0***	***98***	***501***	***29***	***0***	***3168***
9:15	84	209	22	0	0	97	14	0	23	94	31	0	22	96	5	0	697
9:30	77	194	14	0	0	80	6	0	27	84	42	0	22	102	5	0	653
total	***161***	***403***	***36***	***0***	***0***	***177***	***20***	***0***	***50***	***178***	***73***	***0***	***44***	***198***	***10***	***0***	***1350***
15:45	49	138	28	0	0	175	31	0	16	108	72	0	23	120	0	0	760
16:00	53	157	17	0	0	147	25	0	26	88	64	0	23	119	1	0	720
total	***102***	***295***	***45***	***0***	***0***	***322***	***56***	***0***	***42***	***196***	***136***	***0***	***46***	***239***	***1***	***0***	***1480***
16:15	40	125	18	0	0	161	15	0	15	96	54	0	23	124	0	0	671
16:30	35	125	23	0	0	135	12	0	20	100	65	0	23	124	1	0	663
16:45	55	122	29	0	0	138	13	0	21	94	67	0	19	115	3	0	676
17:00	43	119	28	0	0	148	18	0	21	111	56	0	26	120	0	0	690
total	***173***	***491***	***98***	***0***	***0***	***582***	***58***	***0***	***77***	***401***	***242***	***0***	***91***	***483***	***4***	***0***	***2700***
17:15	42	148	30	0	0	158	17	0	27	100	71	0	20	118	1	0	732
17:30	50	136	19	0	0	196	25	0	28	129	90	0	27	134	0	0	834
17:45	52	144	29	0	0	190	19	0	19	146	65	0	26	125	4	0	819
18:00	44	132	21	0	0	213	13	0	15	158	57	0	16	103	3	0	775
total	***188***	***560***	***99***	***0***	***0***	***757***	***74***	***0***	***89***	***533***	***283***	***0***	***89***	***480***	***8***	***0***	***3160***
18:15	45	119	23	0	0	188	15	0	27	146	81	0	20	110	2	0	776
18:30	40	167	15	0	0	179	12	0	28	135	69	0	24	122	5	0	796
total	***85***	***286***	***38***	***0***	***0***	***367***	***27***	***0***	***55***	***281***	***150***	***0***	***44***	***232***	***7***	***0***	***1572***

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Passenger Vehicles

Date : 9-Feb-05
Location : River Road @ Garrison Street

City: Washington, D.C.
Weather: Cold/Cloudy/Dry

End Time	---------- From North ---------- River Road				---------- From South ---------- River Road				---------- From East ---------- Garrison Street				---------- From West ---------- 46th Street				Total
	Left	*Thru*	*Right*	*U-Turn*	*Left*	*Thru*	*Right*	*U-Turn*	*Left*	*Thru*	*Right*	*U-Turn*	*Left*	*Thru*	*Right*	*U-Turn*	
6:45	1	73	10	0	0	16	0	0	0	0	3	0	7	0	0	0	110
7:00	0	127	20	0	0	28	0	0	0	0	5	0	4	0	0	0	184
total	***1***	***200***	***30***	***0***	***0***	***44***	***0***	***0***	***0***	***0***	***8***	***0***	***11***	***0***	***0***	***0***	***294***
7:15	0	157	16	0	0	40	0	0	0	0	6	0	17	1	0	0	237
7:30	0	205	24	0	1	45	0	0	0	0	13	0	14	0	0	0	302
7:45	0	220	39	0	1	48	1	0	0	1	33	0	28	1	0	0	372
8:00	0	230	41	0	0	48	1	0	0	0	44	0	21	4	0	0	389
total	***0***	***812***	***120***	***0***	***2***	***181***	***2***	***0***	***0***	***1***	***96***	***0***	***80***	***6***	***0***	***0***	***1300***
8:15	0	305	49	0	3	55	1	0	0	0	23	0	28	3	0	0	467
8:30	0	240	57	0	3	38	0	0	0	0	27	0	30	5	0	0	400
8:45	0	229	46	0	2	61	0	0	0	0	15	0	39	7	1	0	400
9:00	0	234	58	0	1	56	0	0	0	0	11	0	29	6	3	0	398
total	***0***	***1008***	***210***	***0***	***9***	***210***	***1***	***0***	***0***	***0***	***76***	***0***	***126***	***21***	***4***	***0***	***1665***
9:15	0	205	55	0	1	51	0	0	0	0	7	0	32	3	0	0	354
9:30	0	174	47	0	1	48	0	0	0	0	9	0	28	2	0	0	309
total	***0***	***379***	***102***	***0***	***2***	***99***	***0***	***0***	***0***	***0***	***16***	***0***	***60***	***5***	***0***	***0***	***663***
15:45	1	127	29	0	0	120	0	0	0	0	22	0	49	3	0	0	351
16:00	1	103	39	0	2	120	0	0	0	1	9	0	48	0	1	0	324
total	***2***	***230***	***68***	***0***	***2***	***240***	***0***	***0***	***0***	***1***	***31***	***0***	***97***	***3***	***1***	***0***	***675***
16:15	0	90	30	0	1	119	3	0	0	0	10	0	28	2	1	0	284
16:30	0	118	30	0	0	116	1	0	0	0	12	0	33	2	0	0	312
16:45	1	113	35	0	1	119	0	0	0	0	6	0	40	4	1	0	320
17:00	0	110	35	0	0	124	0	0	1	0	8	0	36	2	0	0	316
total	***1***	***431***	***130***	***0***	***2***	***478***	***4***	***0***	***1***	***0***	***36***	***0***	***137***	***10***	***2***	***0***	***1232***
17:15	0	112	34	0	1	138	1	0	0	0	13	0	50	7	0	0	356
17:30	0	105	60	0	1	159	0	0	0	0	15	0	39	5	0	0	384
17:45	0	120	43	0	0	154	0	0	0	0	9	0	43	2	1	0	372
18:00	0	127	41	0	0	148	0	0	0	0	11	0	21	1	1	0	350
total	***0***	***464***	***178***	***0***	***2***	***599***	***1***	***0***	***0***	***0***	***48***	***0***	***153***	***15***	***2***	***0***	***1462***
18:15	0	115	39	0	1	154	2	0	0	0	10	0	41	1	0	0	363
18:30	0	119	30	0	0	119	0	0	0	0	15	0	39	2	1	0	325
total	***0***	***234***	***69***	***0***	***1***	***273***	***2***	***0***	***0***	***0***	***25***	***0***	***80***	***3***	***1***	***0***	***688***

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Trucks

Date : 9-Feb-05
Location : River Road @ Garrison Street

City: Washington, D.C.
Weather: Cold/Cloudy/Dry

End Time	---------- From North ---------- River Road				---------- From South ---------- River Road				---------- From East ---------- Garrison Street				---------- From West ---------- 46th Street				Total
	Left	*Thru*	*Right*	*U-Turn*	*Left*	*Thru*	*Right*	*U-Turn*	*Left*	*Thru*	*Right*	*U-Turn*	*Left*	*Thru*	*Right*	*U-Turn*	
6:45	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
7:00	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	4
total	*0*	*4*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*6*
7:15	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:30	0	4	0	0	0	2	0	0	0	0	0	0	0	0	0	0	6
7:45	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
8:00	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	4
total	*0*	*8*	*1*	*0*	*0*	*4*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*13*
8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30	0	2	0	0	1	2	0	0	0	0	0	0	1	0	0	0	6
8:45	0	3	1	0	0	2	0	0	0	0	0	0	0	0	0	0	6
9:00	0	4	2	0	0	2	0	0	0	0	0	0	0	0	0	0	8
total	*0*	*9*	*3*	*0*	*1*	*6*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*20*
9:15	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3
9:30	0	1	0	0	0	6	0	0	0	0	0	0	0	0	0	0	7
total	*0*	*3*	*0*	*0*	*0*	*7*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*10*
15:45	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	3
16:00	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	3
total	*0*	*1*	*1*	*0*	*0*	*3*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*6*
16:15	0	0	0	0	0	3	0	0	0	0	1	0	0	0	0	0	4
16:30	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	4
16:45	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
17:00	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2
total	*0*	*1*	*0*	*0*	*0*	*9*	*1*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*12*
17:15	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	4
17:30	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
total	*0*	*0*	*0*	*0*	*0*	*5*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*6*
18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	3
total	*0*	*0*	*0*	*0*	*0*	*3*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*3*

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Buses

Date : 9-Feb-05
Location : River Road @ Garrison Street

City: Washington, D.C.
Weather: Cold/Cloudy/Dry

End Time	---------- From North ---------- River Road				---------- From South ---------- River Road				---------- From East ---------- Garrison Street				---------- From West ---------- 46th Street				Total
	Left	*Thru*	*Right*	*U-Turn*	*Left*	*Thru*	*Right*	*U-Turn*	*Left*	*Thru*	*Right*	*U-Turn*	*Left*	*Thru*	*Right*	*U-Turn*	
6:45	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
total	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*
7:15	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:30	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2
7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
total	*0*	*1*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*4*
8:15	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:30	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
total	*0*	*1*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*3*
9:15	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
9:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
total	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*1*
15:45	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	3
16:00	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	2
total	*0*	*0*	*1*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*5*
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	3
16:45	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
total	*0*	*1*	*0*	*0*	*0*	*2*	*0*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*0*	*0*	*4*
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
total	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
total	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*

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Total Traffic

Date : 9-Feb-05
Location : River Road @ Garrison Street

City: Washington, D.C.
Weather: Cold/Cloudy/Dry

End Time	---------- From North ---------- River Road				---------- From South ---------- River Road				---------- From East ---------- Garrison Street				---------- From West ---------- 46th Street				Total
	Left	*Thru*	*Right*	*U-Turn*	*Left*	*Thru*	*Right*	*U-Turn*	*Left*	*Thru*	*Right*	*U-Turn*	*Left*	*Thru*	*Right*	*U-Turn*	
6:45	1	76	10	0	0	16	0	0	0	0	3	0	7	0	0	0	113
7:00	0	129	20	0	0	30	0	0	0	0	5	0	4	0	0	0	188
total	***1***	***205***	***30***	***0***	***0***	***46***	***0***	***0***	***0***	***0***	***8***	***0***	***11***	***0***	***0***	***0***	***301***
7:15	0	158	17	0	0	40	0	0	0	0	6	0	17	1	0	0	239
7:30	0	209	24	0	1	47	0	0	0	0	13	0	16	0	0	0	310
7:45	0	221	39	0	1	49	1	0	0	1	33	0	28	1	0	0	374
8:00	0	233	42	0	0	49	1	0	0	0	44	0	21	4	0	0	394
total	***0***	***821***	***122***	***0***	***2***	***185***	***2***	***0***	***0***	***1***	***96***	***0***	***82***	***6***	***0***	***0***	***1317***
8:15	0	306	50	0	3	55	1	0	0	0	23	0	28	3	0	0	469
8:30	0	242	57	0	4	40	0	0	0	0	27	0	32	5	0	0	407
8:45	0	232	47	0	2	63	0	0	0	0	15	0	39	7	1	0	406
9:00	0	238	60	0	1	58	0	0	0	0	11	0	29	6	3	0	406
total	***0***	***1018***	***214***	***0***	***10***	***216***	***1***	***0***	***0***	***0***	***76***	***0***	***128***	***21***	***4***	***0***	***1688***
9:15	0	207	55	0	1	53	0	0	0	0	7	0	32	3	0	0	358
9:30	0	175	47	0	1	54	0	0	0	0	9	0	28	2	0	0	316
total	***0***	***382***	***102***	***0***	***2***	***107***	***0***	***0***	***0***	***0***	***16***	***0***	***60***	***5***	***0***	***0***	***674***
15:45	1	128	30	0	0	122	1	0	0	0	22	0	50	3	0	0	357
16:00	1	103	40	0	2	123	0	0	0	1	9	0	49	0	1	0	329
total	***2***	***231***	***70***	***0***	***2***	***245***	***1***	***0***	***0***	***1***	***31***	***0***	***99***	***3***	***1***	***0***	***686***
16:15	0	90	30	0	1	122	3	0	0	0	11	0	28	2	1	0	288
16:30	0	120	30	0	0	121	1	0	0	0	12	0	33	2	0	0	319
16:45	1	113	35	0	1	121	0	0	0	0	6	0	41	4	1	0	323
17:00	0	110	35	0	0	125	1	0	1	0	8	0	36	2	0	0	318
total	***1***	***433***	***130***	***0***	***2***	***489***	***5***	***0***	***1***	***0***	***37***	***0***	***138***	***10***	***2***	***0***	***1248***
17:15	0	112	34	0	1	142	1	0	0	0	13	0	50	7	0	0	360
17:30	0	105	60	0	1	160	0	0	0	0	15	0	39	5	0	0	385
17:45	0	120	43	0	0	154	0	0	0	0	9	0	43	2	2	0	373
18:00	0	127	41	0	0	148	0	0	0	0	11	0	21	1	1	0	350
total	***0***	***464***	***178***	***0***	***2***	***604***	***1***	***0***	***0***	***0***	***48***	***0***	***153***	***15***	***3***	***0***	***1468***
18:15	0	115	39	0	1	154	2	0	0	0	10	0	41	1	0	0	363
18:30	0	119	30	0	0	122	0	0	0	0	15	0	39	2	1	0	328
total	***0***	***234***	***69***	***0***	***1***	***276***	***2***	***0***	***0***	***0***	***25***	***0***	***80***	***3***	***1***	***0***	***691***

Appendix E

Queuing Observation Record

O.R. George & Associates, Inc.

Traffic Engineers - Transportation Planners

QUEUING STUDY SHEET

LOCATION:	Western Ave @ River Rd
LANE:	Westbound
DATE:	3/17/2005
STUDY PERIOD:	5:15 PM - 6:15 P.M.
WEATHER:	Cold/Cloudy/Dry
STUDY BY:	AL
CYCLE LENGTH:	99 Seconds

TIME	CYCLE	QUEUE BEGINNING	# CLEARED	NOTES
5:15 PM	1	30	21	
	2	37	27	
	3	44	24	
	4	42	28	
	5	31	28	
	6	27	26	
	7	37	27	
	8	40	30	
	9	37	24	
	10	47	26	
	11	44	27	
	12	42	26	
	13	42	23	
	14	38	25	
	15	39	28	
	16	42	25	
	17	48	27	
	18	46	26	
	19	43	25	
	20	40	29	
	21	46	27	
	22	26	26	
	23	28	8	
	24	27	27	
	25	32	25	
	26	21	21	
	27	22	22	
	28	17	17	
	29	13	13	
	30	12	12	
	31	18	18	
	32	20	15	
	33	36	28	
	34	34	27	
	35	32	29	
	36	28	25	

TOTAL		1208	862	
MIN.		12	8	
MAX.		48	30	
AVERAGE		34	24	

O.R. George & Associates, Inc.

Traffic Engineers - Transportation Planners

QUEUING STUDY SHEET

LOCATION:	River Rd @ Western Ave
LANE:	Southbound
DATE:	3/17/2005
STUDY PERIOD:	5:15 PM - 6:15 P.M.
WEATHER:	Cold/Cloudy/Dry
STUDY BY:	NL
CYCLE LENGTH:	100 Secs

TIME	CYCLE	QUEUE BEGINNING	# CLEARED	NOTES
	1	16	15	
	2	12	12	
	3	13	13	
	4	21	17	
	5	26	26	
	6	15	15	
	7	25	25	
	8	18	15	
	9	17	11	
	10	21	15	
	11	29	29	
	12	25	20	
	13	26	24	
	14	35	32	
	15	20	18	
	16	25	20	
	17	30	27	
	18	25	20	
	19	17	13	
	20	25	25	
	21	19	17	
	22	20	19	
	23	28	23	
	24	35	25	
	25	35	29	
	26	40	36	
	27	35	30	
	28	33	17	
	29	41	31	
	30	26	16	
	31	19	15	
	32	20	12	
	33	36	25	
	34	37	25	
	35	36	25	
	36	29	21	

TOTAL		930	758	
MIN.		12	11	
MAX.		41	36	
AVERAGE		26	21	

O.R. George & Associates, Inc.

Traffic Engineers - Transportation Planners

QUEUING STUDY SHEET

LOCATION:	River Rd @ Western Ave
LANE:	Northbound
DATE:	3/17/2005
STUDY PERIOD:	5:15 PM - 6:15 P.M.
WEATHER:	Cold/Cloudy/Dry
STUDY BY:	MO
CYCLE LENGTH:	100 Secs

TIME	CYCLE	QUEUE BEGINNING	# CLEARED	NOTES
	1	14	14	
	2	6	6	
	3	4	4	
	4	13	13	
	5	8	8	
	6	1	1	
	7	10	10	
	8	5	5	
	9	17	17	
	10	13	13	
	11	5	5	
	12	8	8	
	13	9	9	
	14	6	6	
	15	6	6	
	16	13	13	
	17	12	12	
	18	19	19	
	19	8	8	
	20	8	8	
	21	5	5	
	22	9	9	
	23	5	5	
	24	7	7	
	25	7	7	
	26	2	2	
	27	6	6	
	28	9	9	
	29	7	7	
	30	8	8	
	31	12	12	
	32	8	8	
	33	12	12	
	34	10	10	
	35	7	7	
	36	11	11	

TOTAL		310	310	
MIN.		1	1	
MAX.		19	19	
AVERAGE		9	9	

O.R. George & Associates, Inc.

Traffic Engineers - Transportation Planners

QUEUING STUDY SHEET

LOCATION:	River Rd @ Western Ave
LANE:	Northbound
DATE:	3/17/2005
STUDY PERIOD:	7:45 AM - 8:45 A.M.
WEATHER:	Cold/Cloudy/Dry
STUDY BY:	MO
CYCLE LENGTH:	100 Secs

TIME	CYCLE	QUEUE BEGINNING	# CLEARED	NOTES
	1	14	12	
	2	13	12	
	3	8	8	
	4	9	9	
	5	12	11	
	6	15	12	
	7	17	14	
	8	15	12	
	9	19	16	
	10	17	10	
	11	18	15	
	12	14	14	
	13	14	12	
	14	15	13	
	15	13	13	
	16	7	7	
	17	6	6	
	18	10	10	
	19	11	11	
	20	11	11	
	21	10	10	
	22	9	9	
	23	9	9	
	24	5	5	
	25	13	11	
	26	14	13	
	27	11	11	
	28	17	14	
	29	13	13	
	30	20	16	
	31	18	12	
	32	19	14	
	33	18	18	
	34	13	13	
	35	9	9	
	36	8	8	

TOTAL		464	413	
MIN.		5	5	
MAX.		20	18	
AVERAGE		13	11	

O.R. George & Associates, Inc.

Traffic Engineers - Transportation Planners

QUEUING STUDY SHEET

LOCATION:	Western Ave @ River Rd
LANE:	Westbound
DATE:	3/17/2005
STUDY PERIOD:	7:45 AM - 8:45 A.M.
WEATHER:	Cold/Cloudy/Dry
STUDY BY:	AL
CYCLE LENGTH:	100 Secs

TIME	CYCLE	QUEUE BEGINNING	# CLEARED	NOTES
7:45 AM	1	34	13	
	2	50	18	
	3	48	17	
	4	42	16	
	5	58	15	
	6	51	17	
	7	46	12	
	8	50	17	
	9	54	14	
	10	50	18	
	11	60	15	
	12	55	13	
	13	54	14	
	14	58	16	
	15	60	18	
	16	48	16	
	17	44	15	
	18	47	19	
	19	46	15	
	20	46	16	
	21	42	17	
	22	48	18	
	23	46	15	
	24	42	15	
	25	42	17	
	26	41	17	
	27	37	20	
	28	35	14	
	29	30	13	
	30	44	15	
	31	43	19	
	32	42	12	
	33	44	17	
	34	41	14	
	35	40	16	
	36	38	18	

TOTAL		1656	571	
MIN.		30	12	
MAX.		60	20	
AVERAGE		46	16	

O.R. George & Associates, Inc.

Traffic Engineers - Transportation Planners

QUEUING STUDY SHEET

LOCATION:	Western Ave @ River Rd
LANE:	Eastbound
DATE:	3/17/2005
STUDY PERIOD:	5:15 PM - 6:15 P.M.
WEATHER:	Cold/Cloudy/Dry
STUDY BY:	GC
CYCLE LENGTH:	100 Seconds

TIME	CYCLE	QUEUE BEGINNING	# CLEARED	NOTES
5:15 PM	1	18	17	
	2	14	14	
	3	13	13	
	4	14	14	
	5	10	10	
	6	18	16	
	7	20	17	
	8	21	19	
	9	12	12	
	10	8	8	
	11	11	11	
	12	17	16	
	13	10	10	
	14	14	14	
	15	10	10	
	16	20	16	
	17	18	14	
	18	20	17	
	19	24	18	
	20	27	18	
	21	22	18	
	22	26	16	
	23	32	19	
	24	21	17	
	25	22	16	
	26	27	18	
	27	23	17	
	28	28	15	
	29	23	17	
	30	24	18	
	31	26	18	
	32	31	17	
	33	30	18	
	34	26	19	
	35	30	17	
	36	26	18	

TOTAL		736	562	
MIN.		8	8	
MAX.		32	19	
AVERAGE		20	16	

O.R. George & Associates, Inc.

Traffic Engineers - Transportation Planners

QUEUING STUDY SHEET

LOCATION:	River Rd @ Western Ave
LANE:	Southbound
DATE:	3/17/2005
STUDY PERIOD:	7:45 AM -8:45 A.M.
WEATHER:	Cold/Cloudy/Dry
STUDY BY:	NL
CYCLE LENGTH:	100 Seconds

TIME	CYCLE	QUEUE BEGINNING	# CLEARED	NOTES
	1	30	30	
	2	34	34	
	3	35	35	
	4	27	27	
	5	30	30	
	6	29	29	
	7	30	30	
	8	25	25	
	9	16	16	
	10	23	23	
	11	24	24	
	12	17	17	
	13	21	21	
	14	35	35	
	15	36	33	
	16	29	29	
	17	33	33	
	18	33	33	
	19	27	27	
	20	37	37	
	21	33	33	
	22	22	22	
	23	36	36	
	24	18	18	
	25	20	20	
	26	31	31	
	27	18	18	
	28	22	22	
	29	19	19	
	30	14	14	
	31	9	9	
	32	32	32	
	33	18	18	
	34	30	30	
	35	28	28	
	36	21	21	

TOTAL		942	939	
MIN.		9	9	
MAX.		37	37	
AVERAGE		26	26	

O.R. George & Associates, Inc.

Traffic Engineers - Transportation Planners

QUEUING STUDY SHEET

LOCATION:	Western Ave @ River Rd
LANE:	Eastbound
DATE:	3/17/2005
STUDY PERIOD:	7:45 AM - 8:45 A.M.
WEATHER:	Cold/Cloudy/Dry
STUDY BY:	GC
CYCLE LENGTH:	100 Seconds

TIME	CYCLE	QUEUE BEGINNING	# CLEARED	NOTES
7:45 AM	1	17	16	
	2	20	17	
	3	23	19	
	4	14	14	
	5	17	16	
	6	14	14	
	7	21	17	
	8	26	20	
	9	17	15	
	10	22	16	
	11	26	17	
	12	24	16	
	13	28	17	
	14	25	15	
	15	28	16	
	16	26	17	
	17	26	16	
	18	27	18	
	19	29	17	
	20	31	18	
	21	30	15	
	22	32	25	
	23	34	13	
	24	38	17	
	25	36	14	
	26	34	17	
	27	40	16	
	28	38	15	
	29	34	14	
	30	34	16	
	31	38	15	
	32	40	14	
	33	38	16	
	34	40	16	
	35	29	16	
	36	24	15	

TOTAL		1020	585	
MIN.		14	13	
MAX.		40	25	
AVERAGE		28	16	

Appendix F

Accident Data

DDOT: Accident Summary Report (R-4)

Date:

Prepared By:
P. EVANS

Location:

Quadrant:

RIVER RD And WESTERN AVE NW

Summary for the time period of: 1/1/2000 To: 12/31/2003

Total Number of Accident 3

Total Number of Injuries 1

Contributing Factors:

Driver:		Vehicle:		Roadway:		Unknown:	
1	33.33%	0	0.00%	0	0.00%	2	66.67%

Collision Types:

Right Angle:	Left Turn:	Right Turn:	Rear End:	Side Swiped:	Head On:	Parked
2	0	0	1	0	0	0

Fixed Object	Ran Off Road:	Pedestrian:	Backing	Non Collision:	Other:
0	0	0	0	0	0

Accident Times:

Time	Number	Percent
07:30-09:30	0	0.00%
09:30-11:30	1	33.33%
11:30-13:30	0	0.00%
13:30-16:00	1	33.33%
16:00-18:30	0	0.00%
18:30-07:30	1	33.33%
Weekday:	1	33.33%
Weekend:	2	66.67%

DDOT: Accident Summary Report (R-4)

Date:

Prepared By:
P. EVANS

Location:

RIVER RD And GARRISON ST

Quadrant:
NW

Summary for the time period of: 1/1/2000 To: 12/31/2003

Total Number of Accident 2

Total Number of Injuries 2

Contributing Factors:

Driver:		Vehicle:		Roadway:		Unknown:	
2	100.00%	0	0.00%	0	0.00%	0	0.00%

Collision Types:

Right Angle:	Left Turn:	Right Turn:	Rear End:	Side Swiped:	Head On:	Parked
0	0	0	2	0	0	0

Fixed Object	Ran Off Road:	Pedestrian:	Backing	Non Collision:	Other:
0	0	0	0	0	0

Accident Times:

Time	Number	Percent
07:30-09:30	1	50.00%
09:30-11:30	0	0.00%
11:30-13:30	0	0.00%
13:30-16:00	1	50.00%
16:00-18:30	0	0.00%
18:30-07:30	0	0.00%
Weekday:	1	50.00%
Weekend:	1	50.00%

DDOT: Accident Summary Report (R-4)

Date:

Prepared By:
P. EVANS

Location:

RIVER RD And 46TH ST

Quadrant:
NW

Summary for the time period of: 1/1/2000 To: 12/31/2003

Total Number of Accident 1

Total Number of Injuries 0

Contributing Factors:

Driver:		Vehicle:		Roadway:		Unknown:	
1	100.00%	0	0.00%	0	0.00%	0	0.00%

Collision Types:

Right Angle:	Left Turn:	Right Turn:	Rear End:	Side Swiped:	Head On:	Parked
0	0	0	0	1	0	0

Fixed Object	Ran Off Road:	Pedestrian:	Backing	Non Collision:	Other:
0	0	0	0	0	0

Accident Times:

Time	Number	Percent
07:30-09:30	0	0.00%
09:30-11:30	0	0.00%
11:30-13:30	0	0.00%
13:30-16:00	0	0.00%
16:00-18:30	0	0.00%
18:30-07:30	1	100.00%
Weekday:	1	100.00%
Weekend:	0	0.00%

Appendix G

Pedestrian Counts

O.R GEORGE & ASSOCIATES, INC.

Traffic Engineers - Transportation Planners

Location: River Road, NW @ Western Avenue, NW
Date: February 8, 2005

City/County: Washington, DC
Counted by : ORGA-NL, MO

PEDESTRIAN SURVEY

END TIME	NORTH LEG River Road, NW		SOUTH LEG River Road, NW		END TIME	EAST LEG Western Avenue, NW		WEST LEG Western Avenue, NW	
	Children	Adult	Children	Adult		Children	Adult	Children	Adult
6:45 AM	0	1	0	1	6:45	0	1	0	1
7:00 AM	0	3	0	1	7:00	0	1	0	0
7:15 AM	0	0	1	2	7:15	0	2	0	0
7:30 AM	0	2	2	2	7:30	0	0	1	1
7:45 AM	0	2	1	3	7:45	0	0	0	0
8:00 AM	0	8	3	7	8:00	0	5	0	0
8:15 AM	0	3	2	7	8:15	0	1	0	1
8:30 AM	1	9	2	10	8:30	0	1	0	0
8:45 AM	0	6	0	7	8:45	0	0	0	0
9:00 AM	0	6	2	8	9:00	0	0	0	0
9:15 AM	1	4	0	6	9:15	0	2	0	0
9:30 AM	0	4	0	5	9:30	0	4	0	1
TOTAL	2	48	13	59	***TOTAL***	0	17	1	4
AM PK HR	0	22	0	0	***AM PK HR***	0	0	0	0
3:45 PM	1	2	0	0	3:45 PM	2	2	0	0
4:00 PM	3	4	0	1	4:00 PM	0	0	0	1
4:15 PM	2	5	0	1	4:15 PM	0	1	1	1
4:30 PM	0	2	0	1	4:30 PM	0	1	0	0
4:45 PM	4	2	1	1	4:45 PM	0	1	0	0
5:00 PM	1	3	0	0	5:00 PM	0	2	0	2
5:15 PM	2	1	0	1	5:15 PM	18	1	0	0
5:30 PM	2	4	2	2	5:30 PM	2	3	0	2
5:45 PM	1	6	2	4	5:45 PM	0	4	0	1
6:00 PM	1	9	0	2	6:00 PM	0	1	0	1
6:15 PM	0	5	0	4	6:15 PM	0	4	0	0
6:30 PM	0	5	0	6	6:30 PM	0	2	0	0
TOTAL	17	48	5	23	***TOTAL***	22	22	1	8
PM PK HR	0	0	0	0	***PM PK HR***	0	0	0	4

O.R GEORGE & ASSOCIATES, INC.

Traffic Engineers - Transportation Planners

Location: River Road, NW @ Garrison Street/46th Street, NW **City/County:** Washington, DC
Date: February 9, 2005 **Counted by :** ORGA-NL, AL

PEDESTRIAN SURVEY

END TIME	NORTH LEG River Road, NW		SOUTH LEG River Road, NW		END TIME	EAST LEG Garrison Street, NW		WEST LEG 46th Street, NW	
	Children	Adult	Children	Adult		Children	Adult	Children	Adult
6:45 AM	0	1	0	0	6:45	0	0	0	0
7:00 AM	0	0	0	0	7:00	0	0	0	0
7:15 AM	0	0	0	1	7:15	0	0	0	0
7:30 AM	0	0	0	2	7:30	0	0	0	1
7:45 AM	0	0	0	0	7:45	0	0	0	0
8:00 AM	0	3	0	2	8:00	0	0	0	0
8:15 AM	0	0	0	2	8:15	0	0	0	2
8:30 AM	0	2	1	3	8:30	0	0	0	0
8:45 AM	0	0	0	1	8:45	0	0	0	0
9:00 AM	0	1	0	0	9:00	0	0	0	0
9:15 AM	0	0	0	1	9:15	0	2	0	1
9:30 AM	0	1	0	1	9:30	0	2	0	0
TOTAL	0	8	1	13	***TOTAL***	0	4	0	4
AM PK HR	0	5	0	0	***AM PK HR***	0	0	0	0
3:45 PM	0	0	0	0	3:45 PM	0	0	0	0
4:00 PM	0	0	0	0	4:00 PM	0	0	0	0
4:15 PM	0	0	1	1	4:15 PM	0	1	0	0
4:30 PM	0	0	0	1	4:30 PM	0	0	0	0
4:45 PM	0	0	1	1	4:45 PM	0	1	0	1
5:00 PM	0	0	0	0	5:00 PM	0	0	0	0
5:15 PM	0	1	0	1	5:15 PM	0	0	0	1
5:30 PM	0	0	0	0	5:30 PM	0	0	0	0
5:45 PM	0	0	1	1	5:45 PM	0	0	0	0
6:00 PM	0	0	0	2	6:00 PM	0	0	0	3
6:15 PM	0	0	0	0	6:15 PM	0	0	0	0
6:30 PM	0	0	0	1	6:30 PM	0	0	0	1
TOTAL	0	1	3	8	***TOTAL***	0	2	0	6
PM PK HR	0	0	0	0	***PM PK HR***	0	0	0	3

Appendix H

2005 and 2014 Intersection Capacity Analysis for River Road Intersections:

2005 Existing Condition

2014 Future Condition

2014 Future Condition with Signal Optimization and Improvements

Friendship Heights Transportation Study
Addendum
River Road Intersections Capacity Analysis

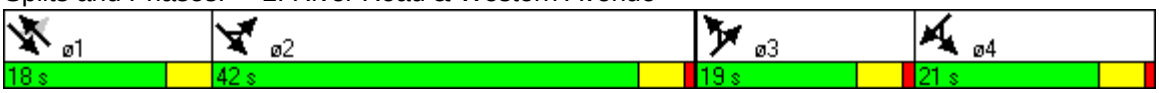
2005 Condition

Lanes, Volumes, Timings
2: River Road & Western Avenue

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50		50	50		50	50	
Trailing Detector (ft)	0	0			0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	3469	0	0	3451	0	0	3149	0	0	3254	0
Flt Permitted		0.578						0.993			0.992	
Satd. Flow (perm)	0	2027	0	0	3451	0	0	3149	0	0	3254	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			19			43			4	
Link Speed (mph)		30			25			25			25	
Link Distance (ft)		741			324			195			1447	
Travel Time (s)		16.8			8.8			5.3			39.5	
Volume (vph)	343	1113	92	0	361	72	76	334	149	98	501	29
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	1683	0	0	470	0	0	608	0	0	684	0
Turn Type	D.P+P						Split			Split		
Protected Phases	2	1 2			1		3	3		4	4	
Permitted Phases	1											
Total Split (s)	42.0	60.0	0.0	0.0	18.0	0.0	19.0	19.0	0.0	21.0	21.0	0.0
Act Effct Green (s)		52.0			14.0			15.0			17.0	
Actuated g/C Ratio		0.52			0.14			0.15			0.17	
v/c Ratio		1.05			0.94			1.19			1.23	
Uniform Delay, d1		25.5			40.8			38.9			41.2	
Delay		55.5			20.3			117.5			133.6	
LOS		E			C			F			F	
Approach Delay		55.5			20.3			117.5			133.6	
Approach LOS		E			C			F			F	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Offset: 43 (43%), Referenced to phase 1:NWSE, Start of Green	
Control Type: Pretimed	
Maximum v/c Ratio: 1.23	
Intersection Signal Delay: 77.1	Intersection LOS: E
Intersection Capacity Utilization 110.9%	ICU Level of Service G

Splits and Phases: 2: River Road & Western Avenue



Lanes, Volumes, Timings
14: Garrison Street & 46th Street

Lane Group	WBL	WBR	SEL	SET	SER	NWL	NWT	NWR	NEL	NER	NER2
Lane Configurations											
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%			0%			0%		0%		
Storage Length (ft)	0	0	0		0	0		0	0	0	
Storage Lanes	0	1	0		1	0		0	1	0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50		50	50	50	50		50	50	
Trailing Detector (ft)		0		0	0	0	0		0	0	
Turning Speed (mph)	15	9	15		9	15		9	15	9	9
Satd. Flow (prot)	0	1611	0	1863	1583	0	1857	0	1770	1583	0
Flt Permitted							0.443		0.950		
Satd. Flow (perm)	0	1611	0	1863	1583	0	824	0	1770	1583	0
Right Turn on Red		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		283			233					4	
Link Speed (mph)	25			25			25		25		
Link Distance (ft)	492			324			832		413		
Travel Time (s)	13.4			8.8			22.7		11.3		
Volume (vph)	0	76	0	1018	214	10	216	1	128	21	4
Confl. Peds. (#/hr)											
Confl. Bikes (#/hr)											
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)											
Mid-Block Traffic (%)	0%			0%			0%		0%		
Lane Group Flow (vph)	0	83	0	1107	233	0	247	0	139	27	0
Turn Type		custom			custom	Perm			Split		
Protected Phases		1		1 2	1		2		4	4	
Permitted Phases		1			2	2					
Total Split (s)	0.0	57.0	0.0	79.0	57.0	22.0	22.0	0.0	21.0	21.0	0.0
Act Effct Green (s)		53.0		75.0	75.0		18.0		17.0	17.0	
Actuated g/C Ratio		0.53		0.75	0.75		0.18		0.17	0.17	
v/c Ratio		0.08		0.79	0.19		1.67		0.46	0.10	
Uniform Delay, d1		0.0		7.7	0.0		41.0		37.4	29.8	
Delay		0.0		7.6	0.3		222.6		38.0	31.6	
LOS		A		A	A		F		D	C	
Approach Delay	0.0			6.3			222.6		37.0		
Approach LOS	A			A			F		D		

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Offset: 28 (28%), Referenced to phase 2:NWSE, Start of Green	
Control Type: Pretimed	
Maximum v/c Ratio: 1.67	
Intersection Signal Delay: 37.9	Intersection LOS: D
Intersection Capacity Utilization 77.4%	ICU Level of Service C

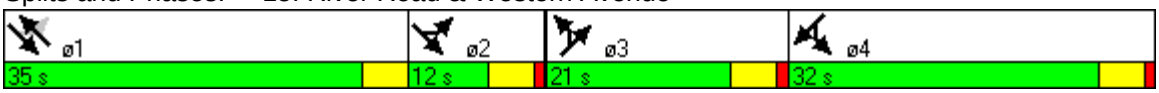
Splits and Phases: 14: Garrison Street & 46th Street

Lanes, Volumes, Timings
15: River Road & Western Avenue

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50		50	50		50	50	
Trailing Detector (ft)	0	0			0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	3437	0	0	3493	0	0	3504	0	0	3360	0
Flt Permitted		0.530						0.992			0.995	
Satd. Flow (perm)	0	1844	0	0	3493	0	0	3504	0	0	3360	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			10			1			69	
Link Speed (mph)		30			25			25			25	
Link Distance (ft)		564			324			366			1447	
Travel Time (s)		12.8			8.8			10.0			39.5	
Volume (vph)	191	531	92	0	787	72	89	472	9	89	579	293
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	885	0	0	933	0	0	620	0	0	1044	0
Turn Type	D.P+P						Split			Split		
Protected Phases	2	1 2			1		3	3		4	4	
Permitted Phases	1											
Total Split (s)	12.0	47.0	0.0	0.0	35.0	0.0	21.0	21.0	0.0	32.0	32.0	0.0
Act Effct Green (s)		39.0			31.0			17.0			28.0	
Actuated g/C Ratio		0.39			0.31			0.17			0.28	
v/c Ratio		1.03			0.86			1.04			1.05	
Uniform Delay, d1		29.6			32.0			41.4			33.5	
Delay		61.5			25.2			78.1			75.1	
LOS		E			C			E			E	
Approach Delay		61.5			25.2			78.1			75.1	
Approach LOS		E			C			E			E	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Offset: 88 (88%), Referenced to phase 2:SETL and 6:, Start of Green	
Control Type: Pretimed	
Maximum v/c Ratio: 1.05	
Intersection Signal Delay: 58.8	Intersection LOS: E
Intersection Capacity Utilization 112.3%	ICU Level of Service G

Splits and Phases: 15: River Road & Western Avenue



Lanes, Volumes, Timings
14: Garrison Street & 46th Street

Lane Group	WBL	WBR	SEL	SET	SER	NWL	NWT	NWR	NEL	NER	NER2
Lane Configurations											
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%			0%			0%		0%		
Storage Length (ft)	0	0	0		0	0		0	0	0	
Storage Lanes	0	1	0		1	0		1	1	0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50		50	50	50	50	50	50		
Trailing Detector (ft)		0		0	0	0	0	0	0		
Turning Speed (mph)	15	9	15		9	15		9	15	9	9
Satd. Flow (prot)	0	1611	0	1863	1583	0	1863	1583	1763	0	0
Flt Permitted							0.999		0.956		
Satd. Flow (perm)	0	1611	0	1863	1583	0	1861	1583	1763	0	0
Right Turn on Red		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		278			199			2	1		
Link Speed (mph)	25			25			25		25		
Link Distance (ft)	696			324			318		294		
Travel Time (s)	19.0			8.8			8.7		8.0		
Volume (vph)	0	45	0	467	183	2	616	2	144	9	3
Confl. Peds. (#/hr)											
Confl. Bikes (#/hr)											
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)											
Mid-Block Traffic (%)	0%			0%			0%		0%		
Lane Group Flow (vph)	0	49	0	508	199	0	672	2	170	0	0
Turn Type		custom			Perm	Perm		Perm	Prot		
Protected Phases		1		6			2		4		
Permitted Phases		1			6	2		2			
Total Split (s)	0.0	15.0	0.0	75.0	75.0	60.0	60.0	60.0	25.0	0.0	0.0
Act Effct Green (s)		11.0		71.0	71.0		56.0	56.0	21.0		
Actuated g/C Ratio		0.11		0.71	0.71		0.56	0.56	0.21		
v/c Ratio		0.12		0.38	0.17		0.64	0.00	0.46		
Uniform Delay, d1		0.0		5.8	0.0		15.1	0.0	34.3		
Delay		0.0		1.0	0.0		15.7	7.0	34.9		
LOS		A		A	A		B	A	C		
Approach Delay	0.0			0.7			15.7		34.9		
Approach LOS	A			A			B		C		

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Offset: 42 (42%), Referenced to phase 2:NWTL and 6:SET, Start of Green	
Control Type: Pretimed	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 10.6	Intersection LOS: B
Intersection Capacity Utilization 72.0%	ICU Level of Service C

Splits and Phases: 14: Garrison Street & 46th Street

Friendship Heights Transportation Study
Addendum
River Road Intersections Capacity Analysis

2014 Condition (No Signal Optimization)

Lanes, Volumes, Timings
14: Garrison Street & 46th Street

Lane Group	WBL	WBR	SEL	SET	SER	NWL	NWT	NWR	NEL	NER	NER2
Lane Configurations											
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%			0%			0%		0%		
Storage Length (ft)	0	0	0		0	0		0	0	0	
Storage Lanes	0	1	0		1	0		0	1	0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50		50	50	50	50		50	50	
Trailing Detector (ft)		0		0	0	0	0		0	0	
Turning Speed (mph)	15	9	15		9	15		9	15	9	9
Satd. Flow (prot)	0	1611	0	1863	1583	0	1857	0	1770	1583	0
Flt Permitted							0.428		0.950		
Satd. Flow (perm)	0	1611	0	1863	1583	0	796	0	1770	1583	0
Right Turn on Red		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		262			246					4	
Link Speed (mph)	30			30			30		30		
Link Distance (ft)	580			324			776		454		
Travel Time (s)	13.2			7.4			17.6		10.3		
Volume (vph)	0	80	0	1075	226	11	228	1	135	22	4
Confl. Peds. (#/hr)											
Confl. Bikes (#/hr)											
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)											
Mid-Block Traffic (%)	0%			0%			0%		0%		
Lane Group Flow (vph)	0	87	0	1168	246	0	261	0	147	28	0
Turn Type		custom			custom	Perm			Split		
Protected Phases		1		1 2	1		2		4	4	
Permitted Phases		1			2	2					
Total Split (s)	0.0	57.0	0.0	79.0	57.0	22.0	22.0	0.0	21.0	21.0	0.0
Act Effct Green (s)		53.0		75.0	75.0		18.0		17.0	17.0	
Actuated g/C Ratio		0.53		0.75	0.75		0.18		0.17	0.17	
v/c Ratio		0.09		0.84	0.20		1.83		0.49	0.10	
Uniform Delay, d1		0.0		8.4	0.0		41.0		37.6	30.0	
Delay		0.0		8.6	0.2		243.8		38.2	31.8	
LOS		A		A	A		F		D	C	
Approach Delay	0.0			7.2			243.8		37.2		
Approach LOS	A			A			F		D		

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Offset: 28 (28%), Referenced to phase 2:NWSE, Start of Green	
Control Type: Pretimed	
Maximum v/c Ratio: 1.83	
Intersection Signal Delay: 41.4	Intersection LOS: D
Intersection Capacity Utilization 80.7%	ICU Level of Service D

Splits and Phases: 14: Garrison Street & 46th Street

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50		50	50		50	50	
Trailing Detector (ft)	0	0			0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	3469	0	0	3451	0	0	3169	0	0	3257	0
Flt Permitted		0.581						0.994			0.993	
Satd. Flow (perm)	0	2038	0	0	3451	0	0	3169	0	0	3257	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			19			34			4	
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		507			324			511			1447	
Travel Time (s)		11.5			7.4			11.6			39.5	
Volume (vph)	362	1176	97	0	381	76	80	435	157	104	558	31
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	1776	0	0	497	0	0	731	0	0	754	0
Turn Type	D.P+P						Split			Split		
Protected Phases	2	1 2			1		3	3		4	4	
Permitted Phases	1											
Total Split (s)	42.0	60.0	0.0	0.0	18.0	0.0	19.0	19.0	0.0	21.0	21.0	0.0
Act Effct Green (s)		52.0			14.0			15.0			17.0	
Actuated g/C Ratio		0.52			0.14			0.15			0.17	
v/c Ratio		1.10			1.00			1.45			1.35	
Uniform Delay, d1		25.5			41.3			39.6			41.2	
Delay		73.8			22.3			180.7			157.7	
LOS		E			C			F			F	
Approach Delay		73.8			22.3			180.7			157.7	
Approach LOS		E			C			F			F	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Offset: 43 (43%), Referenced to phase 1:NWSE, Start of Green	
Control Type: Pretimed	
Maximum v/c Ratio: 1.45	
Intersection Signal Delay: 104.6	Intersection LOS: F
Intersection Capacity Utilization 119.7%	ICU Level of Service G

Splits and Phases: 15: River Road & Western Avenue

Lanes, Volumes, Timings
14: Garrison Street & 46th Street

Lane Group	WBL	WBR	SEL	SET	SER	NWL	NWT	NWR	NEL	NER	NER2
Lane Configurations											
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%			0%			0%		0%		
Storage Length (ft)	0	0	0		0	0		0	0	0	
Storage Lanes	0	1	0		1	0		1	1	0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50		50	50	50	50	50	50	50	
Trailing Detector (ft)		0		0	0	0	0	0	0	0	
Turning Speed (mph)	15	9	15		9	15		9	15	9	9
Satd. Flow (prot)	0	1611	0	1863	1583	0	1863	1583	1770	1583	0
Flt Permitted							0.999		0.950		
Satd. Flow (perm)	0	1611	0	1863	1583	0	1861	1583	1770	1583	0
Right Turn on Red		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		259			210			2		3	
Link Speed (mph)	30			30			30		30		
Link Distance (ft)	502			324			432		372		
Travel Time (s)	11.4			7.4			9.8		8.5		
Volume (vph)	0	48	0	493	193	2	651	2	152	10	3
Confl. Peds. (#/hr)											
Confl. Bikes (#/hr)											
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)											
Mid-Block Traffic (%)	0%			0%			0%		0%		
Lane Group Flow (vph)	0	52	0	536	210	0	710	2	165	14	0
Turn Type		custom			Perm	Perm		Perm	Split		
Protected Phases		1		6			2		4	4	
Permitted Phases		1			6	2		2			
Total Split (s)	0.0	15.0	0.0	75.0	75.0	60.0	60.0	60.0	25.0	25.0	0.0
Act Effct Green (s)		11.0		71.0	71.0		56.0	56.0	21.0	21.0	
Actuated g/C Ratio		0.11		0.71	0.71		0.56	0.56	0.21	0.21	
v/c Ratio		0.13		0.41	0.18		0.68	0.00	0.44	0.04	
Uniform Delay, d1		0.0		5.9	0.0		15.6	0.0	34.4	24.6	
Delay		0.0		11.5	4.0		16.3	7.0	35.1	27.7	
LOS		A		B	A		B	A	D	C	
Approach Delay	0.0			9.4			16.2		34.5		
Approach LOS	A			A			B		C		

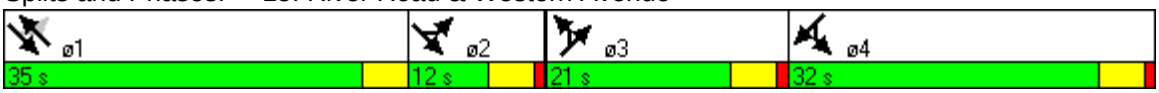
Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Offset: 42 (42%), Referenced to phase 1:WBR and 6:SET, Start of Green	
Control Type: Pretimed	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 14.7	Intersection LOS: B
Intersection Capacity Utilization 74.0%	ICU Level of Service C

Splits and Phases: 14: Garrison Street & 46th Street

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50		50	50		50	50	
Trailing Detector (ft)	0	0			0		0	0		0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	0	3437	0	0	3493	0	0	3277	0	0	3145	0
Flt Permitted		0.534						0.994			0.996	
Satd. Flow (perm)	0	1858	0	0	3493	0	0	3277	0	0	3145	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16			10			1			62	
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		500			324			336			1447	
Travel Time (s)		11.4			7.4			7.6			39.5	
Volume (vph)	202	561	97	0	831	76	94	641	10	94	659	310
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	0	935	0	0	986	0	0	810	0	0	1155	0
Turn Type	D.P+P						Split			Split		
Protected Phases	2	1 2			1		3	3		4	4	
Permitted Phases	1											
Total Split (s)	12.0	47.0	0.0	0.0	35.0	0.0	21.0	21.0	0.0	32.0	32.0	0.0
Act Effct Green (s)		39.0			31.0			17.0			28.0	
Actuated g/C Ratio		0.39			0.31			0.17			0.28	
v/c Ratio		1.09			0.90			1.45			1.25	
Uniform Delay, d1		29.6			32.7			41.4			33.6	
Delay		75.2			33.4			182.0			135.5	
LOS		E			C			F			F	
Approach Delay		75.2			33.4			182.0			135.5	
Approach LOS		E			C			F			F	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Offset: 88 (88%), Referenced to phase 1:NWSE, Start of Green	
Control Type: Pretimed	
Maximum v/c Ratio: 1.45	
Intersection Signal Delay: 104.8	Intersection LOS: F
Intersection Capacity Utilization 123.6%	ICU Level of Service H

Splits and Phases: 15: River Road & Western Avenue



Friendship Heights Transportation Study
Addendum
River Road Intersections Capacity Analysis

2014 Condition with Signal Optimization

Lanes, Volumes, Timings
14: Garrison Street & 46th Street

Lane Group	WBL	WBR	SEL	SET	SER	NWL	NWT	NWR	NEL	NER	NER2
Lane Configurations											
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10
Grade (%)	0%			0%			0%		0%		
Storage Length (ft)	0	0	0		0	0		0	0	0	
Storage Lanes	0	1	0		1	0		0	1	0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50		50	50	50	50		50	50	
Trailing Detector (ft)		0		0	0	0	0		0	0	
Turning Speed (mph)	15	9	15		9	15		9	15	9	9
Satd. Flow (prot)	0	1504	0	1739	1478	0	1733	0	1652	1478	0
Flt Permitted							0.502		0.950		
Satd. Flow (perm)	0	1504	0	1739	1478	0	872	0	1652	1478	0
Right Turn on Red		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		350			246					4	
Link Speed (mph)	30			30			30		30		
Link Distance (ft)	562			324			510		353		
Travel Time (s)	12.8			7.4			11.6		8.0		
Volume (vph)	0	80	0	1075	226	11	228	1	135	22	4
Confl. Peds. (#/hr)											
Confl. Bikes (#/hr)											
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)											
Mid-Block Traffic (%)	0%			0%			0%		0%		
Lane Group Flow (vph)	0	87	0	1168	246	0	261	0	147	28	0
Turn Type		custom			custom	Perm			Split		
Protected Phases		1		1 2	1		2		4	4	
Permitted Phases		1			2	2					
Total Split (s)	0.0	47.0	0.0	78.0	47.0	31.0	31.0	0.0	22.0	22.0	0.0
Act Effct Green (s)		43.0		74.0	74.0		27.0		18.0	18.0	
Actuated g/C Ratio		0.43		0.74	0.74		0.27		0.18	0.18	
v/c Ratio		0.10		0.91	0.21		1.11		0.49	0.10	
Uniform Delay, d1		0.0		10.3	0.0		36.5		36.9	29.3	
Delay		0.0		14.4	0.0		105.4		37.6	31.1	
LOS		A		B	A		F		D	C	
Approach Delay	0.0			11.9			105.4		36.6		
Approach LOS	A			B			F		D		

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Offset: 28 (28%), Referenced to phase 2:NWSE, Start of Green	
Control Type: Pretimed	
Maximum v/c Ratio: 1.11	
Intersection Signal Delay: 26.2	Intersection LOS: C
Intersection Capacity Utilization 80.7%	ICU Level of Service D

Splits and Phases: 14: Garrison Street & 46th Street

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	1		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50		50	50	50	50	50	
Trailing Detector (ft)	0	0			0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	1770	3500	0	0	3451	0	1770	3539	1583	1770	3511	0
Flt Permitted	0.333						0.950			0.950		
Satd. Flow (perm)	620	3500	0	0	3451	0	1770	3539	1583	1770	3511	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			19				149		5	
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		387			324			504			1447	
Travel Time (s)		8.8			7.4			11.5			39.5	
Volume (vph)	362	1176	97	0	381	76	80	435	157	104	558	31
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	393	1383	0	0	497	0	87	473	171	113	641	0
Turn Type	D.P+P						Split		Perm	Split		
Protected Phases	2	1 2			1		3	3		4	4	
Permitted Phases	1								3			
Total Split (s)	43.0	59.0	0.0	0.0	16.0	0.0	20.0	20.0	20.0	21.0	21.0	0.0
Act Effct Green (s)	51.0	55.0			12.0		16.0	16.0	16.0	17.0	17.0	
Actuated g/C Ratio	0.51	0.55			0.12		0.16	0.16	0.16	0.17	0.17	
v/c Ratio	0.51	0.72			1.15		0.31	0.84	0.45	0.38	1.07	
Uniform Delay, d1	19.2	16.5			42.1		37.1	40.7	4.6	36.8	41.1	
Delay	19.8	16.9			96.8		37.7	46.0	9.2	31.0	79.4	
LOS	B	B			F		D	D	A	C	E	
Approach Delay		17.5			96.8			36.4			72.2	
Approach LOS		B			F			D			E	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Offset: 40 (40%), Referenced to phase 1:NWSE, Start of Green	
Control Type: Pretimed	
Maximum v/c Ratio: 1.15	
Intersection Signal Delay: 42.6	Intersection LOS: D
Intersection Capacity Utilization 77.9%	ICU Level of Service C

Splits and Phases: 15: River Road & Western Avenue

Lanes, Volumes, Timings
14: Garrison Street & 46th Street

Lane Group	WBL	WBR	SEL	SET	SER	NWL	NWT	NWR	NEL	NER	NER2
Lane Configurations											
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%			0%			0%		0%		
Storage Length (ft)	0	0	0		0	0		0	0	0	
Storage Lanes	0	1	0		1	0		1	1	0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50		50	50	50	50	50	50	50	
Trailing Detector (ft)		0		0	0	0	0	0	0	0	
Turning Speed (mph)	15	9	15		9	15		9	15	9	9
Satd. Flow (prot)	0	1611	0	1863	1583	0	1863	1583	1770	1583	0
Flt Permitted							0.999		0.950		
Satd. Flow (perm)	0	1611	0	1863	1583	0	1861	1583	1770	1583	0
Right Turn on Red		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		259			210			2		3	
Link Speed (mph)	30			30			30		30		
Link Distance (ft)	489			324			545		386		
Travel Time (s)	11.1			7.4			12.4		8.8		
Volume (vph)	0	48	0	493	193	2	651	2	152	10	3
Confl. Peds. (#/hr)											
Confl. Bikes (#/hr)											
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)											
Mid-Block Traffic (%)	0%			0%			0%		0%		
Lane Group Flow (vph)	0	52	0	536	210	0	710	2	165	14	0
Turn Type		custom			Perm	Perm		Perm	Split		
Protected Phases		1		6			2		4	4	
Permitted Phases		1			6	2		2			
Total Split (s)	0.0	15.0	0.0	75.0	75.0	60.0	60.0	60.0	25.0	25.0	0.0
Act Effct Green (s)		11.0		71.0	71.0		56.0	56.0	21.0	21.0	
Actuated g/C Ratio		0.11		0.71	0.71		0.56	0.56	0.21	0.21	
v/c Ratio		0.13		0.41	0.18		0.68	0.00	0.44	0.04	
Uniform Delay, d1		0.0		5.9	0.0		15.6	0.0	34.4	24.6	
Delay		0.0		1.4	0.0		16.3	7.0	35.1	27.7	
LOS		A		A	A		B	A	D	C	
Approach Delay	0.0			1.0			16.2		34.5		
Approach LOS	A			A			B		C		

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Offset: 42 (42%), Referenced to phase 1:WBR and 6:SET, Start of Green	
Control Type: Pretimed	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 10.9	Intersection LOS: B
Intersection Capacity Utilization 74.0%	ICU Level of Service C

Splits and Phases: 14: Garrison Street & 46th Street

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	1		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50		50	50	50	50	50	
Trailing Detector (ft)	0	0			0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	1770	3461	0	0	3493	0	1652	3303	1478	1652	3145	0
Flt Permitted	0.143						0.950			0.950		
Satd. Flow (perm)	266	3461	0	0	3493	0	1652	3303	1478	1652	3145	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		23			10				11		78	
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		362			324			374			1447	
Travel Time (s)		8.2			7.4			8.5			39.5	
Volume (vph)	202	561	97	0	831	76	94	641	10	94	659	310
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	220	715	0	0	986	0	102	697	11	102	1053	0
Turn Type	D.P+P						Split		Perm	Split		
Protected Phases	2	1 2			1		3	3		4	4	
Permitted Phases	1								3			
Total Split (s)	11.0	43.0	0.0	0.0	32.0	0.0	25.0	25.0	25.0	32.0	32.0	0.0
Act Effct Green (s)	35.0	39.0			28.0		21.0	21.0	21.0	28.0	28.0	
Actuated g/C Ratio	0.35	0.39			0.28		0.21	0.21	0.21	0.28	0.28	
v/c Ratio	1.11	0.52			1.00		0.29	1.00	0.03	0.22	1.12	
Uniform Delay, d1	22.5	22.5			35.6		33.2	39.5	0.0	27.6	33.0	
Delay	99.5	22.8			51.3		33.9	66.6	16.3	22.6	83.2	
LOS	F	C			D		C	E	B	C	F	
Approach Delay		40.9			51.3			61.8			77.9	
Approach LOS		D			D			E			E	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Offset: 78 (78%), Referenced to phase 1:NWSE, Start of Green	
Control Type: Pretimed	
Maximum v/c Ratio: 1.12	
Intersection Signal Delay: 58.9	Intersection LOS: E
Intersection Capacity Utilization 94.5%	ICU Level of Service E

Splits and Phases: 15: River Road & Western Avenue

Friendship Heights Transportation Study
Addendum
River Road Intersections Capacity Analysis

2014 Condition with Signal Optimization and Improvements

Lanes, Volumes, Timings
14: Garrison Street & 46th Street

Lane Group	WBL	WBR	SEL	SET	SER	NWL	NWT	NWR	NEL	NER	NER2
Lane Configurations											
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	10	10	10	10	10	10	10	10	10	10	10
Grade (%)	0%			0%			0%		0%		
Storage Length (ft)	0	0	0		0	0		0	0	0	
Storage Lanes	0	1	0		1	0		0	1	0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50		50	50	50	50		50	50	
Trailing Detector (ft)		0		0	0	0	0		0	0	
Turning Speed (mph)	15	9	15		9	15		9	15	9	9
Satd. Flow (prot)	0	1504	0	1739	1478	0	1733	0	1652	1478	0
Flt Permitted							0.502		0.950		
Satd. Flow (perm)	0	1504	0	1739	1478	0	872	0	1652	1478	0
Right Turn on Red		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		350			246					4	
Link Speed (mph)	30			30			30		30		
Link Distance (ft)	562			324			510		353		
Travel Time (s)	12.8			7.4			11.6		8.0		
Volume (vph)	0	80	0	1075	226	11	228	1	135	22	4
Confl. Peds. (#/hr)											
Confl. Bikes (#/hr)											
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)											
Mid-Block Traffic (%)	0%			0%			0%		0%		
Lane Group Flow (vph)	0	87	0	1168	246	0	261	0	147	28	0
Turn Type		custom			custom	Perm			Split		
Protected Phases		1		1 2	1		2		4	4	
Permitted Phases		1			2	2					
Total Split (s)	0.0	47.0	0.0	78.0	47.0	31.0	31.0	0.0	22.0	22.0	0.0
Act Effct Green (s)		43.0		74.0	74.0		27.0		18.0	18.0	
Actuated g/C Ratio		0.43		0.74	0.74		0.27		0.18	0.18	
v/c Ratio		0.10		0.91	0.21		1.11		0.49	0.10	
Uniform Delay, d1		0.0		10.3	0.0		36.5		36.9	29.3	
Delay		0.0		14.4	0.0		105.4		37.6	31.1	
LOS		A		B	A		F		D	C	
Approach Delay	0.0			11.9			105.4		36.6		
Approach LOS	A			B			F		D		

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Offset: 28 (28%), Referenced to phase 2:NWSE, Start of Green	
Control Type: Pretimed	
Maximum v/c Ratio: 1.11	
Intersection Signal Delay: 26.2	Intersection LOS: C
Intersection Capacity Utilization 80.7%	ICU Level of Service D

Splits and Phases: 14: Garrison Street & 46th Street

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12	12
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	1		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50		50	50	50	50	50	
Trailing Detector (ft)	0	0			0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	1770	3500	0	0	3451	0	1770	3539	1583	1770	3511	0
Flt Permitted	0.333						0.950			0.950		
Satd. Flow (perm)	620	3500	0	0	3451	0	1770	3539	1583	1770	3511	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			19				149		5	
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		387			324			504			1447	
Travel Time (s)		8.8			7.4			11.5			39.5	
Volume (vph)	362	1176	97	0	381	76	80	435	157	104	558	31
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	393	1383	0	0	497	0	87	473	171	113	641	0
Turn Type	D.P+P						Split		Perm	Split		
Protected Phases	2	1 2			1		3	3		4	4	
Permitted Phases	1								3			
Total Split (s)	43.0	59.0	0.0	0.0	16.0	0.0	20.0	20.0	20.0	21.0	21.0	0.0
Act Effct Green (s)	51.0	55.0			12.0		16.0	16.0	16.0	17.0	17.0	
Actuated g/C Ratio	0.51	0.55			0.12		0.16	0.16	0.16	0.17	0.17	
v/c Ratio	0.51	0.72			1.15		0.31	0.84	0.45	0.38	1.07	
Uniform Delay, d1	19.2	16.5			42.1		37.1	40.7	4.6	36.8	41.1	
Delay	19.8	16.9			96.8		37.7	46.0	9.2	31.0	79.4	
LOS	B	B			F		D	D	A	C	E	
Approach Delay		17.5			96.8			36.4			72.2	
Approach LOS		B			F			D			E	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Offset: 40 (40%), Referenced to phase 1:NWSE, Start of Green	
Control Type: Pretimed	
Maximum v/c Ratio: 1.15	
Intersection Signal Delay: 42.6	Intersection LOS: D
Intersection Capacity Utilization 77.9%	ICU Level of Service C

Splits and Phases: 15: River Road & Western Avenue

Lanes, Volumes, Timings
14: Garrison Street & 46th Street

Lane Group	WBL	WBR	SEL	SET	SER	NWL	NWT	NWR	NEL	NER	NER2
Lane Configurations											
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	12	12	12	12	12
Grade (%)	0%			0%			0%		0%		
Storage Length (ft)	0	0	0		0	0		0	0	0	
Storage Lanes	0	1	0		1	0		1	1	0	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)		50		50	50	50	50	50	50	50	
Trailing Detector (ft)		0		0	0	0	0	0	0	0	
Turning Speed (mph)	15	9	15		9	15		9	15	9	9
Satd. Flow (prot)	0	1611	0	1863	1583	0	1863	1583	1770	1583	0
Flt Permitted							0.999		0.950		
Satd. Flow (perm)	0	1611	0	1863	1583	0	1861	1583	1770	1583	0
Right Turn on Red		Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		259			210			2		3	
Link Speed (mph)	30			30			30		30		
Link Distance (ft)	489			324			545		386		
Travel Time (s)	11.1			7.4			12.4		8.8		
Volume (vph)	0	48	0	493	193	2	651	2	152	10	3
Confl. Peds. (#/hr)											
Confl. Bikes (#/hr)											
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)											
Mid-Block Traffic (%)	0%			0%			0%		0%		
Lane Group Flow (vph)	0	52	0	536	210	0	710	2	165	14	0
Turn Type		custom			Perm	Perm		Perm	Split		
Protected Phases		1		6			2		4	4	
Permitted Phases		1			6	2		2			
Total Split (s)	0.0	15.0	0.0	75.0	75.0	60.0	60.0	60.0	25.0	25.0	0.0
Act Effct Green (s)		11.0		71.0	71.0		56.0	56.0	21.0	21.0	
Actuated g/C Ratio		0.11		0.71	0.71		0.56	0.56	0.21	0.21	
v/c Ratio		0.13		0.41	0.18		0.68	0.00	0.44	0.04	
Uniform Delay, d1		0.0		5.9	0.0		15.6	0.0	34.4	24.6	
Delay		0.0		4.6	0.7		16.3	7.0	35.1	27.7	
LOS		A		A	A		B	A	D	C	
Approach Delay	0.0			3.5			16.2		34.5		
Approach LOS	A			A			B		C		

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Offset: 42 (42%), Referenced to phase 1:WBR and 6:SET, Start of Green	
Control Type: Pretimed	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 12.1	Intersection LOS: B
Intersection Capacity Utilization 74.0%	ICU Level of Service C

Splits and Phases: 14: Garrison Street & 46th Street

Lane Group	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width (ft)	12	12	12	12	12	12	10	10	10	10	10	10
Grade (%)		0%			0%			0%			0%	
Storage Length (ft)	0		0	0		0	0		0	0		0
Storage Lanes	1		0	0		0	1		1	1		0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Leading Detector (ft)	50	50			50		50	50	50	50	50	
Trailing Detector (ft)	0	0			0		0	0	0	0	0	
Turning Speed (mph)	15		9	15		9	15		9	15		9
Satd. Flow (prot)	1770	3461	0	0	3493	0	1652	3303	1478	1652	3145	0
Flt Permitted	0.138						0.950			0.950		
Satd. Flow (perm)	257	3461	0	0	3493	0	1652	3303	1478	1652	3145	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			10				11		82	
Link Speed (mph)		30			30			30			25	
Link Distance (ft)		362			324			374			1447	
Travel Time (s)		8.2			7.4			8.5			39.5	
Volume (vph)	202	561	97	0	831	76	94	641	10	94	659	310
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Lane Group Flow (vph)	220	715	0	0	986	0	102	697	11	102	1053	0
Turn Type	D.P+P						Prot		custom	Prot		
Protected Phases	2	1 2			1		3	4		3	4	
Permitted Phases	1								3 4			
Total Split (s)	13.0	46.0	0.0	0.0	33.0	0.0	18.0	36.0	54.0	18.0	36.0	0.0
Act Effct Green (s)	38.0	42.0			29.0		14.0	32.0	50.0	14.0	32.0	
Actuated g/C Ratio	0.38	0.42			0.29		0.14	0.32	0.50	0.14	0.32	
v/c Ratio	0.94	0.49			0.97		0.44	0.66	0.01	0.44	0.99	
Uniform Delay, d1	19.8	20.3			34.6		39.4	29.3	0.0	39.4	31.2	
Delay	56.5	20.6			43.1		40.1	29.7	6.5	38.5	39.1	
LOS	E	C			D		D	C	A	D	D	
Approach Delay		29.0			43.1			30.7			39.0	
Approach LOS		C			D			C			D	

Intersection Summary	
Area Type:	Other
Cycle Length: 100	
Offset: 78 (78%), Referenced to phase 1:NWSE, Start of Green	
Control Type: Pretimed	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 35.9	Intersection LOS: D
Intersection Capacity Utilization 94.5%	ICU Level of Service E

Splits and Phases: 15: River Road & Western Avenue

Appendix I

Scope of Work

Friendship Heights Transportation Study Addendum
Scope of Work
March, 2005

Background for Development of Friendship Heights Transportation Study Addendum (Friendship Heights Addendum)

The DC Office of Planning (OP) requested additional analysis of the area studied in the District Department of Transportation's (DDOT) Friendship Heights Transportation Study (FHTS). The request is based on OP's recommendations as outlined in the revised Upper Wisconsin Avenue Corridor Study (UWACS) Strategic Framework Plan, specifically, to identify potential impacts on future traffic conditions and the need for traffic management and/or infrastructure improvements beyond those already prescribed in the FHTS for selected sites in the Friendship Heights area. OP requested that the following sites be studied at a planned unit development (PUD) build-out level for the zoning identified (Table 1). OP does not believe that redevelopment of all of these sites is likely to occur, especially during the ten-year timeframe of the FHTS, but requested that DDOT study them to provide OP and the community with a maximum scenario analysis based on the UWACS Plan's recommendations.

Table 1: Identified Sites for the Friendship Heights Addendum PUD Build-out Level Analysis

Sites in the Friendship Heights Area	Current Zoning	Zoning to Analyze
Mazza Gallerie	C-3-A	C-R (PUD Max)
Parking Lot behind Mazza Gallerie	C-3-A	C-R (PUD Max)
Lord and Taylor	C-2-A	C-2-C/ C-2-A (PUD Max)
Lord and Taylor Parking Lot/Garage	C-2-A; R-5-B; R-2	C-2-A; R-5-B; R4 (PUD Max)
SW Corner of 44th and Jenifer Streets	C-2-A	C-2-C (PUD Max)
SW Corner of Wisconsin Avenue and Jenifer Street	C-2-B	C-2-C (PUD Max)
WMATA Bus Garage	C-2-B;R-5-B	C-2-C/ R-5-B (PUD Max)
Buick Dealership	R-5-B	C-2-C (PUD Max)
NW Corner of Wisconsin Avenue and Harrison Street	R-5-B	C-2-A (PUD Max)

Source: DC Office of Planning

The District Department of Transportation (DDOT) also proposes that the Friendship Heights Addendum investigate transportation management improvements for selected River Road corridor intersections near the Maryland border. This effort is in response to Ward 3 citizen concerns regarding traffic congestion, neighborhood cut-through traffic along River Road, and the potential exacerbation of these issues related to anticipated development in the Friendship Heights and Tenleytown Metro areas.

Purpose

There are two main purposes for the addendum. First, the study will identify potential impacts on future traffic conditions and the need for traffic management and/or infrastructure improvements

beyond those already prescribed in the FHTS for selected sites (identified by the Office of Planning) in the Friendship Heights area. Second, the study will examine existing and future traffic conditions for the selected River Road corridor intersections and determine short-term and long-term traffic management and infrastructure improvements to reduce traffic congestion, especially during peak morning and evening travel hours; improve traffic and pedestrian safety; and protect surrounding residential streets from traffic impacts.

Definition of Work

The contractor will identify the traffic impacts of multiple development sites identified by the District of Columbia Office of Planning. The contractor will also examine existing and projected traffic conditions for the selected three River Road corridor intersections at: Western Avenue, Garrison Street, and 46th Street and make recommendations to improve mobility and traffic safety. New peak hour traffic counts will be collected at the River Road intersections. The addendum will be conducted concurrently with the Wisconsin Avenue Corridor Transportation Study.

Description of Work to be Performed

Task 1: Scoping Meeting

The contractor will have a coordination meeting with the staff of the District Department of Transportation and the Office of Planning. The aim of this meeting will be to discuss methodology and assumptions to be used for the traffic impact analysis and to finalize the scope of work to determine the final output of the addendum.

The contractor will also post study information on the DDOT web site.

Task 2: Collect and Consolidate Data for River Road Intersections

- Collect existing traffic volumes and any materials available from the DC Office of Planning, DC Department of Transportation Traffic Services and Transportation Planning, which includes mapping and aerial photography.

- Conduct field reconnaissance along River Road corridor near Maryland border noting existing land uses, existing roadway geometric and traffic control conditions, traffic flow patterns, transit facilities and services, pedestrian facilities, bicycle facilities (if any), as well as opportunities and constraints pertaining to access from the intersecting sidestreets and driveways.

- Perform turning movement counts at intersections along River Road during the morning and afternoon peak periods on typical weekdays. Three key intersections are as follows:

    1. River Road at Western Avenue
    2. River Road at 46th Street
    3. River Road at Garrison Street

    Peak hour pedestrian counts will be conducted at the same intersections.

- Review DDOT's Traffic Services Administration (TSA) traffic accident data covering the most recent three-year period.

- Observe queuing along River Road near the Maryland border using visual observations during a typical weekday morning and afternoon peak hours. The principal effort will take place congruent with the turning movement counts.

- Perform existing condition analysis at the above intersections using SYNCHRO software.

Task 3: Trip Generation Estimates for Selected Potential PUDs in the Friendship Heights Area (WACTS Scenario 2)

In an effort to respond to Ward 3 resident concerns, the contractor will review recommendations included in the Friendship Heights Transportation Study (FHTS) final report with developments which have high development potential over next 10 years. Office of Planning identified high potential areas for PUD zoning development in the Friendship Heights area as Scenario 2 (higher development potential over the next 10 years): mid-range development scenario, for Wisconsin Avenue Corridor Transportation Study. The following list shows high potential redevelopment sites (PUDs) in the Friendship Heights area. The contractor will update the square footage and number of dwelling unit data for the WMATA and Buick sites based on information provided by the Office of Planning.

- Mazza Gallerie Parking Lot
- Lord & Taylor Parking Lot
- Lord & Taylor
- WMATA
- Buick

The contractor will employ the ITE site impact procedures to conduct the traffic impact analyses. The square footage and number of units (housing) proposed or estimated for each development will be multiplied by the appropriate trip generation rates for each land use type (ITE Trip Generation 7th Edition manual) to estimate the number of trips produced. Based on the ITE procedure, these trip rates will be adjusted to account for specific local circumstances, such as availability of an alternative mode of transportation (other than the automobile). Additional potential PUD generated trips will then be assigned to the road network as an input to the Wisconsin Avenue Corridor Transportation Study development scenario 2.

The contractor will use traffic impact analysis results with high potential developments in the Friendship Heights area to adequately reflect future improvement needs by comparing to the recommendations included in the FHTS.

Task 4: Trip Generation Estimates for Friendship Heights Addendum PUDs (WACTS Scenarios 3 and 4)

The contractor will conduct traffic impact analyses for the all parcels/sites in Table 1 that were identified by the Office of Planning as part of the Friendship Heights Transportation Study

addendum. The contractor will also update the square footage and number of dwelling unit data for the WMATA and Buick sites based on information provided by the Office of Planning.

Additional PUD-generated trips will then be assigned to the road network as an input to the Wisconsin Avenue Corridor Transportation Study development scenarios 3 and 4.

Task 5: Future Traffic Condition Analysis

5A: River Road
The contractor will conduct existing (2005) and 2014 future traffic condition analyses for three River Road corridor intersections at Western Avenue, Garrison Street, and 46th Street. The traffic condition analysis will include additional trips generated by the high potential PUDs examined as part of the Friendship Heights Addendum. Note that the analysis does not include all PUD developments.

5B: FHTS
Using the future traffic volumes estimated in Task 3: Trip Generation Estimates for Selected Potential PUDs in the Friendship Heights Area (WACTS Scenario 2), the contractor will rerun the future traffic condition analysis for the all twelve (12) FHTS intersections. The future analysis of these intersections will be conducted with improvements as recommended in the previously completed FHTS. The future traffic impact analysis for the Wisconsin Avenue Corridor Transportation Study will be based on 2014 future traffic volumes. In order to maintain consistency, the addendum analysis will use the future year 2014.

Task 6: Short-Term and Long-Term Improvements

5A: River Road Intersections
The contractor will analyze the current and future vehicular, bicycle, and pedestrian traffic conditions at the three River Road intersections and develop short-term and long-term improvements. Short-term options are defined as an improvement which may be implemented within 12 months to improve mobility, safety and reduce congestion, such as traffic control measures, traffic calming measures, improved signage, signalization, channelization, etc. Long-term options are defined as projects which takes longer than 12-month and improve mobility, safety and reduce congestion, such as road widening, intersection modification and other long-term improvements. The analysis will review the mobility, safety, and level of service at the selected three River Road intersections. The contractor shall also analyze average delays along the River Road corridor with and without the recommended improvements previously analyzed in the Friendship Heights Transportation Study. The analysis will use Synchro software (traffic signal program).

5B: FHTS
The contractor will analyze the current and future vehicular, bicycle, and pedestrian traffic.

The contractor will review and adjust short-term and long-term improvement recommendations included in the FHTS final report. Adjustments will be based on the traffic impact analysis for the 12 FHTS intersections with the high potential development.

Task7: Draft Report

The contractor will prepare a draft report. This will include the selected River Road intersection analysis, future condition results with selected PUD developments, and short-term and long-term recommendation improvements. The FHTS section will include future condition analysis results with selected PUD developments and modification to the short-term and long-term FHTS recommendations as appropriate. The contractor will make 20 copies available to District and Federal agencies, and stakeholder groups.

Task 8: Meeting

The contractor will conduct a final meeting to review the draft report with the appropriate representatives from DDOT administrations and OP. The purpose of this meeting is to discuss the findings and the traffic impact implication of the potential PUDs in the Friendship Heights area. The meeting will be coordinated with the agency meeting for the Wisconsin Avenue Corridor Transportation Study.

Task 9: Final Report

The contractor will incorporate comments from the District and Federal agencies into a final report and make 20 copies available to District and Federal agencies, and stakeholder groups.

Deliverables

- Detailed scope of work and study schedule and project budget.
- Draft report of findings, short-term, and long-term improvements
- Final report of findings, short-term, and long-term improvements
- Visual aids including maps or aerial photos of study area as needed
- Monthly progress reports

Coordination

The contractor will work closely with the DDOT and the DC Office of Planning.

Key Dates/Schedule

The addendum will be conducted concurrently with the Wisconsin Avenue Corridor Transportation Study.

Appendix J

Planning Cost Estimates

FRIENDSHIP HEIGHTS TRANSPORTATION STUDY ADDENDUM

PRELIMINARY PLANNING COST ESTIMATES

SHORT & LONG TERM IMPROVEMENTS

Location		Description	Unit	Quantity	Unit Price (A)	Total
5.1 - River Road and Western Avenue						
SHORT TERM IMPROVEMENTS						
	-	Relocate "Speed Limit" signs (1)	SF	1.5	$80	$120
	-	Restripe pedestrian crossing (4 crossings)	LF	235	$3	$705
	-	Restripe all approaches	LF	4000	$0.70	$2,800
	-	Trim vegetation	LS	1	$1,000	$1,000
	-	Optimize signal timings	LS	1	$5,000	$5,000
	-	Install signal mast arms	EA	4	$5,000	$20,000
LONG TERM IMPROVEMENTS						
	-	Reconstruct wheel chair ramp(s) to ADA standards	EA	1	$5,000	$5,000
	-	Construct new sidewalk	SF	5000	$25	$125,000
	-	Widen road to construct Left Turn lane River Road	LF	500	$300	$150,000
	-	Widen road to construct Left Turn lanes Western Ave	LF	700	$300	$210,000
	-	Add lane use pavement markings (Arrows/Words)	SF	84	$6	$504
				Intersection Subtotal =>		***$520,129***
5.2 - River Road and Garrison Street / 46th Street						
SHORT TERM IMPROVEMENTS						
	-	Install "No Parking" signs (4)	SF	6	$80	$480
	-	Install Parking Restriction signs (4)	SF	6	$80	$480
	-	Replace faded sign(s) (1)	SF	1.5	$80	$120
	-	Add lane use sign(s) (4)	SF	25	$80	$2,000
	-	Add parking "L" striping	LF	16	$0.70	$11
	-	Restripe pedestrian crossing (1 crossing)	LF	55	$3	$165
	-	Restripe all approaches	LF	935	$0.70	$655
	-	Adjust signal head alignment	EA	1	$1,000	$1,000
	-	Install optically programmed signal heads for Garrison Street approach	EA	3	$1,000	$3,000
	-	Install signal mast arms	EA	2	$5,000	$10,000
LONG TERM IMPROVEMENTS						
	-	Widen road to construct 2nd thru lane on River Road	LF	200	$300	$60,000
	-	Add lane use pavement markings (Arrows/Words)	SF	52	$6	$312
				Intersection Subtotal =>		***$78,223***
						$598,352
						$600,000

Notes:

A) Unit prices developed based on information provided by the District of Columbia Department of Public Works and other recent metro-area construction pricing sources

B) Sketch-plan estimates. Actual improvement cost estimates to be calculated upon design completion of each improvement. All costs exclusive of Right-of-Way acquisition costs