

Tom Sullivan  
60 Hawley Street  
PO Box 1766  
Binghamton, NY 13902

August 26, 2015

Carolyn Price  
Supervisor  
68 White Birch Lake Rd.  
Windsor, NY 13865

Dear Ms. Price,

This letter is in response to your recent inquiry submitted to the Binghamton Metropolitan Transportation Study (BMTS) regarding traffic operations in the vicinity of the newly constructed Dollar General store in the Town of Windsor.

A brief summary of the analysis performed as well as recommendations for improvements has been attached. Traffic counts conducted by the Binghamton Metropolitan Transportation Study (BMTS) from June and August of 2015 have also been attached.

Should you have questions or require additional traffic information, please feel free to contact me at this office.

Sincerely,



Tom Sullivan, P.E.  
Traffic Engineer

Enclosures

cc: Leslie Bolton, P.E. – Broome County DPW  
File

The town of Windsor requested assistance from the Binghamton Metropolitan Transportation Study (BMTS) in assessing site impact of the recently constructed Dollar General store within its borders. Town officials requested that BMTS review the developed condition for safety as well as traffic operation and make recommendations for what measures, if any, should be taken.

**Existing Conditions**

The Dollar General in Windsor was constructed in 2015. It is a 9,100 sf retail space and is located approximately 700 feet north of NYS 17/I-86 on the west side of North Road. The site is adjacent to several commercial properties including McDonald’s and a Sunoco gas station. North Road is classified as a rural minor collector and has an estimated average annual daily traffic volume of 2200 as of 2012. The posted speed limit along North Road in the vicinity of Dollar General is 45 mph. An analysis of the project area using the New York State Accident Location Information System (ALIS) for the years 2012-2014 does not indicate an accident pattern in this area.

**Traffic Analysis**

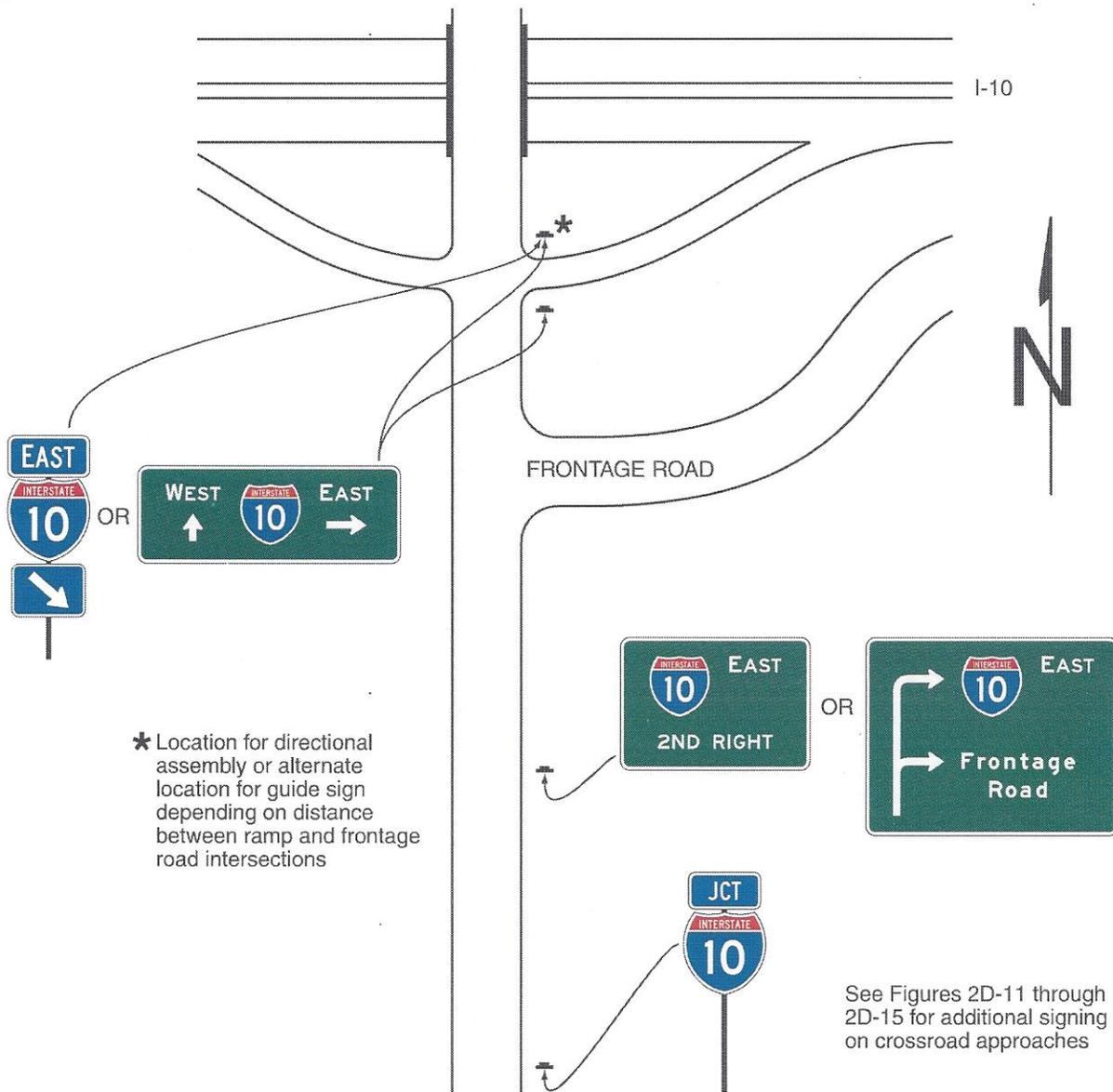
Traffic counts were conducted for pre and post-development conditions at the intersection of North Road and the NYS 17/I-86 westbound ramps. The following table summarizes the data from those counts.

North Road and NYS 17/I-86 WB Ramps			
Date of Traffic Count	6/15/15 (Pre-development)	8/19/15 (Post-development)	Volume Increase
AM Peak Hour Traffic Volume	384	456	72
PM Peak Hour Traffic Volume	439	460	21

**Conclusions & Recommendations**

- a) **Traffic** - Traffic count data and observations made by BMTS staff indicate that traffic volume increases are largely within the expected range for a development of this nature. The additional traffic volume does not affect the intersection with NYS 17/I-86 in a meaningful way from an operational or safety standpoint. Sight distances from the Dollar General entrance/exit appear to be adequate for the posted speed limit and we do not anticipate any significant increase in accident rate due to the construction of Dollar General.
- b) **Signage** – Liberty Highway is a local road and is oriented in an east-west direction to the north of NYS 17/I-86. The local road is located approximately 100 feet north of the westbound on ramp to NYS 17/I-86. This creates an ambiguous situation for southbound drivers approaching the interchange. Driver expectancy for typical on ramp location causes many motorists to turn right onto Liberty Highway westbound as they approach the interchange. To improve driver expectancy we recommend the use of additional guide signage in this area as shown in Figure 2D-16 of the 2009 Federal Manual for Uniform Traffic Control Devices. The installation of an additional Street Name Sign (D3-1) on the east side of North Road at its intersection with Liberty Highway might also help northbound traffic distinguish it from the I-86 westbound on ramp.

**Figure 2D-16. Example of Crossroad Signing for an Entrance Ramp with a Nearby Frontage Road**



**Standard:**

12 If used, the post-mounted Advance Entrance Direction diagrammatic guide sign shall display only the two successive turns from the same side of the roadway, one of which shall be the entrance ramp. The post-mounted Advance Entrance Direction sign shall depict only the successive turns and shall not depict lane use with lane lines, multiple arrow shafts for the approach roadway, action messages, or other representations.

**Support:**

13 Section 2D.46 contains information regarding the use of a Directional assembly or a FREEWAY ENTRANCE sign to mark the entrance to a freeway or expressway at the far corner of an intersection.

**Section 2D.46 Freeway Entrance Signs (D13-3 and D13-3a)**

**Option:**

01 FREEWAY ENTRANCE (D13-3) signs or FREEWAY ENTRANCE with downward pointing diagonal arrow (D13-3a) signs (see Figure 2D-14) may be used on entrance ramps near the crossroad to inform road users of the freeway or expressway entrance, as appropriate.

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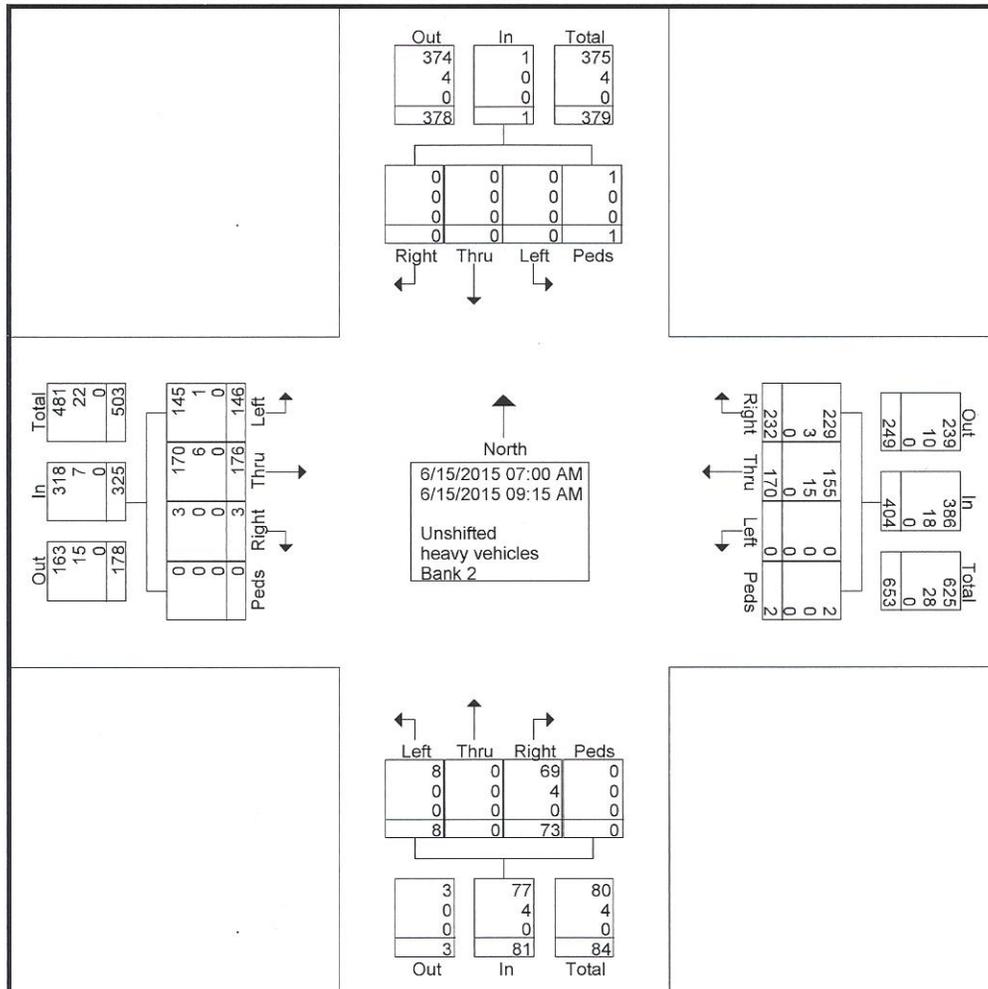
*Your Tagline Here*

Lucille Dellos  
North Road On Ramp  
City of Windsor  
cloudy, clear, humid

File Name : North Road On Ramp AM 2015  
Site Code : 00000000  
Start Date : 6/15/2015  
Page No : 1

Groups Printed- Unshifted - heavy vehicles - Bank 2

Start Time	From North					From East					From South					From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	0	0	0	0	0	36	13	0	2	51	6	0	0	0	6	0	29	16	0	45	102
07:15 AM	0	0	0	0	0	30	21	0	0	51	12	0	0	0	12	0	24	29	0	53	116
07:30 AM	0	0	0	0	0	24	19	0	0	43	6	0	5	0	11	0	13	16	0	29	83
07:45 AM	0	0	0	0	0	11	8	0	0	19	1	0	1	0	2	3	6	9	0	18	39
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>101</b>	<b>61</b>	<b>0</b>	<b>2</b>	<b>164</b>	<b>25</b>	<b>0</b>	<b>6</b>	<b>0</b>	<b>31</b>	<b>3</b>	<b>72</b>	<b>70</b>	<b>0</b>	<b>145</b>	<b>340</b>
08:00 AM	0	0	0	0	0	11	5	0	0	16	1	0	0	0	1	0	7	4	0	11	28
08:15 AM	0	0	0	1	1	30	20	0	0	50	10	0	0	0	10	0	30	25	0	55	116
08:30 AM	0	0	0	0	0	27	27	0	0	54	13	0	0	0	13	0	14	8	0	22	89
08:45 AM	0	0	0	0	0	22	27	0	0	49	12	0	0	0	12	0	19	14	0	33	94
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>90</b>	<b>79</b>	<b>0</b>	<b>0</b>	<b>169</b>	<b>36</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>36</b>	<b>0</b>	<b>70</b>	<b>51</b>	<b>0</b>	<b>121</b>	<b>327</b>
09:00 AM	0	0	0	0	0	24	19	0	0	43	9	0	2	0	11	0	16	16	0	32	86
09:15 AM	0	0	0	0	0	17	11	0	0	28	3	0	0	0	3	0	18	9	0	27	58
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>232</b>	<b>170</b>	<b>0</b>	<b>2</b>	<b>404</b>	<b>73</b>	<b>0</b>	<b>8</b>	<b>0</b>	<b>81</b>	<b>3</b>	<b>176</b>	<b>146</b>	<b>0</b>	<b>325</b>	<b>811</b>
Apprch %	0	0	0	100		57.4	42.1	0	0.5		90.1	0	9.9	0		0.9	54.2	44.9	0		
Total %	0	0	0	0.1	0.1	28.6	21	0	0.2	49.8	9	0	1	0	10	0.4	21.7	18	0	40.1	
Unshifted	0	0	0	1	1	229	155	0	2	386	69	0	8	0	77	3	170	145	0	318	782
% Unshifted	0	0	0	100	100	98.7	91.2	0	100	95.5	94.5	0	100	0	95.1	100	96.6	99.3	0	97.8	96.4
heavy vehicles	0	0	0	0	0	3	15	0	0	18	4	0	0	0	4	0	6	1	0	7	29
% heavy vehicles																					
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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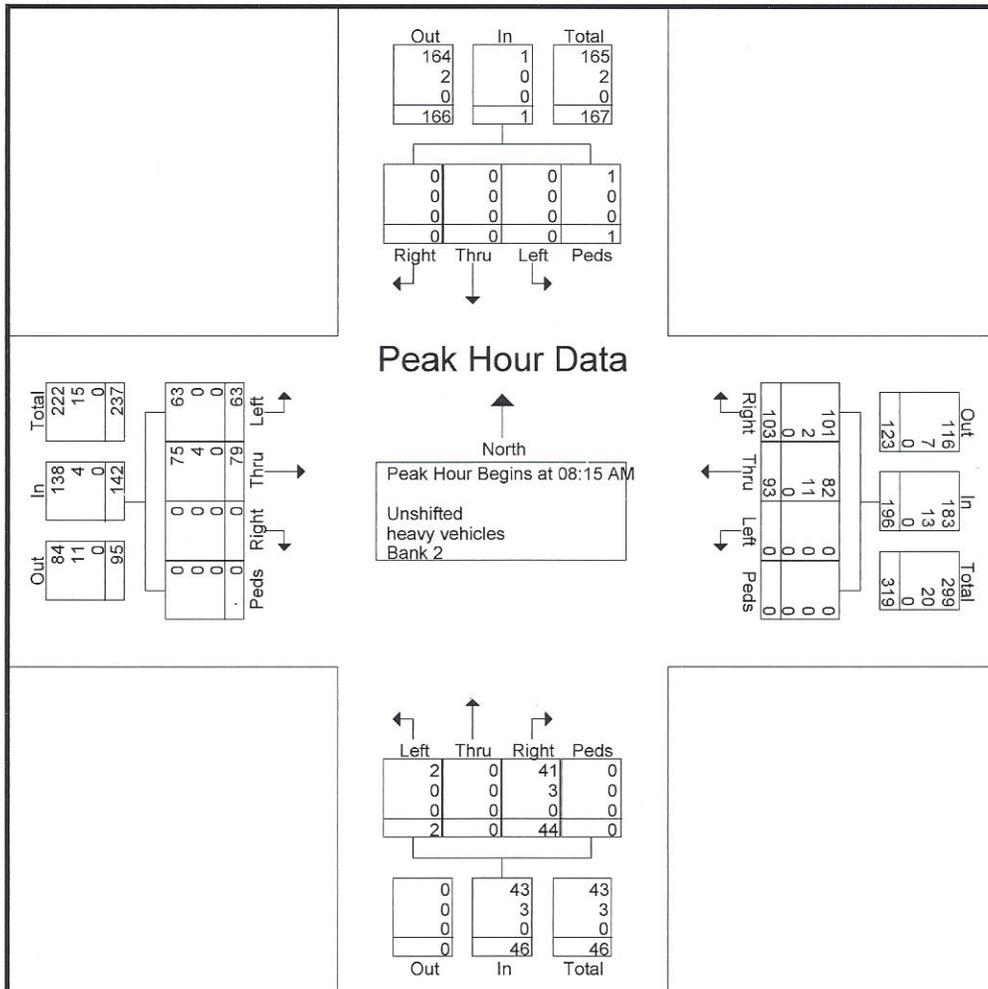
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Peak Hour Analysis From 07:00 AM to 09:15 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 08:15 AM																					
08:15 AM	0	0	0	1	1	30	20	0	0	50	10	0	0	0	10	0	30	25	0	55	116
08:30 AM	0	0	0	0	0	27	27	0	0	54	13	0	0	0	13	0	14	8	0	22	89
08:45 AM	0	0	0	0	0	22	27	0	0	49	12	0	0	0	12	0	19	14	0	33	94
09:00 AM	0	0	0	0	0	24	19	0	0	43	9	0	2	0	11	0	16	16	0	32	86
Total Volume	0	0	0	1	1	103	93	0	0	196	44	0	2	0	46	0	79	63	0	142	385
% App. Total	0	0	0	100		52.6	47.4	0	0		95.7	0	4.3	0		0	55.6	44.4	0		
PHF	.000	.000	.000	.250	.250	.858	.861	.000	.000	.907	.846	.000	.250	.000	.885	.000	.658	.630	.000	.645	.830
Unshifted	0	0	0	1	1	101	82	0	0	183	41	0	2	0	43	0	75	63	0	138	365
% Unshifted	0	0	0	100	100	98.1	88.2	0	0	93.4	93.2	0	100	0	93.5	0	94.9	100	0	97.2	94.8
heavy vehicles	0	0	0	0	0	2	11	0	0	13	3	0	0	0	3	0	4	0	0	4	20
% heavy vehicles	0	0	0	0	0	1.9	11.8	0	0	6.6	6.8	0	0	0	6.5	0	5.1	0	0	2.8	5.2
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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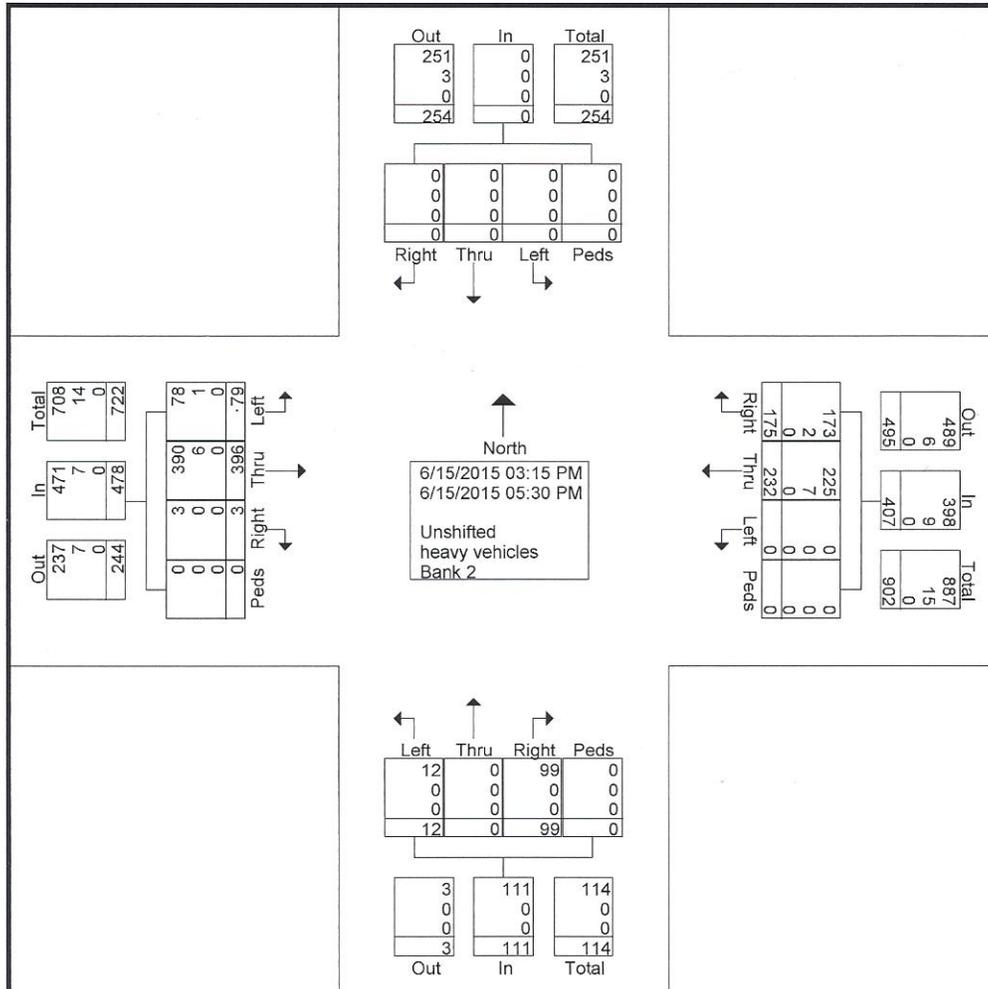
*Your Tagline Here*

Lucille Dellos  
North Road  
City of Windsor  
rainy

File Name : North Road On Ramp 2015 PM  
Site Code : 00000000  
Start Date : 6/15/2015  
Page No : 1

Groups Printed- Unshifted - heavy vehicles - Bank 2

Start Time	From North					From East					From South					From West					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
03:15 PM	0	0	0	0	0	27	28	0	0	55	17	0	1	0	18	0	44	9	0	53	126
03:30 PM	0	0	0	0	0	21	30	0	0	51	13	0	0	0	13	0	42	9	0	51	115
03:45 PM	0	0	0	0	0	11	19	0	0	30	8	0	1	0	9	1	21	10	0	32	71
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>59</b>	<b>77</b>	<b>0</b>	<b>0</b>	<b>136</b>	<b>38</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>40</b>	<b>1</b>	<b>107</b>	<b>28</b>	<b>0</b>	<b>136</b>	<b>312</b>
04:00 PM	0	0	0	0	0	16	20	0	0	36	6	0	2	0	8	0	24	5	0	29	73
04:15 PM	0	0	0	0	0	13	20	0	0	33	7	0	0	0	7	0	35	5	0	40	80
04:30 PM	0	0	0	0	0	16	12	0	0	28	12	0	1	0	13	0	47	4	0	51	92
04:45 PM	0	0	0	0	0	13	25	0	0	38	10	0	1	0	11	1	42	9	0	52	101
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>58</b>	<b>77</b>	<b>0</b>	<b>0</b>	<b>135</b>	<b>35</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>39</b>	<b>1</b>	<b>148</b>	<b>23</b>	<b>0</b>	<b>172</b>	<b>346</b>
05:00 PM	0	0	0	0	0	16	12	0	0	28	11	0	2	0	13	1	44	10	0	55	96
05:15 PM	0	0	0	0	0	25	47	0	0	72	8	0	2	0	10	0	52	7	0	59	141
05:30 PM	0	0	0	0	0	17	19	0	0	36	7	0	2	0	9	0	45	11	0	56	101
<b>Grand Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>175</b>	<b>232</b>	<b>0</b>	<b>0</b>	<b>407</b>	<b>99</b>	<b>0</b>	<b>12</b>	<b>0</b>	<b>111</b>	<b>3</b>	<b>396</b>	<b>79</b>	<b>0</b>	<b>478</b>	<b>996</b>
Apprch %	0	0	0	0	0	43	57	0	0	100	89.2	0	10.8	0	100	0.6	82.8	16.5	0	100	
Total %	0	0	0	0	0	17.6	23.3	0	0	40.9	9.9	0	1.2	0	11.1	0.3	39.8	7.9	0	48	
Unshifted	0	0	0	0	0	173	225	0	0	398	99	0	12	0	111	3	390	78	0	471	980
% Unshifted	0	0	0	0	0	98.9	97	0	0	97.8	100	0	100	0	100	100	98.5	98.7	0	98.5	98.4
heavy vehicles	0	0	0	0	0	2	7	0	0	9	0	0	0	0	0	0	6	1	0	7	16
% heavy vehicles																					
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



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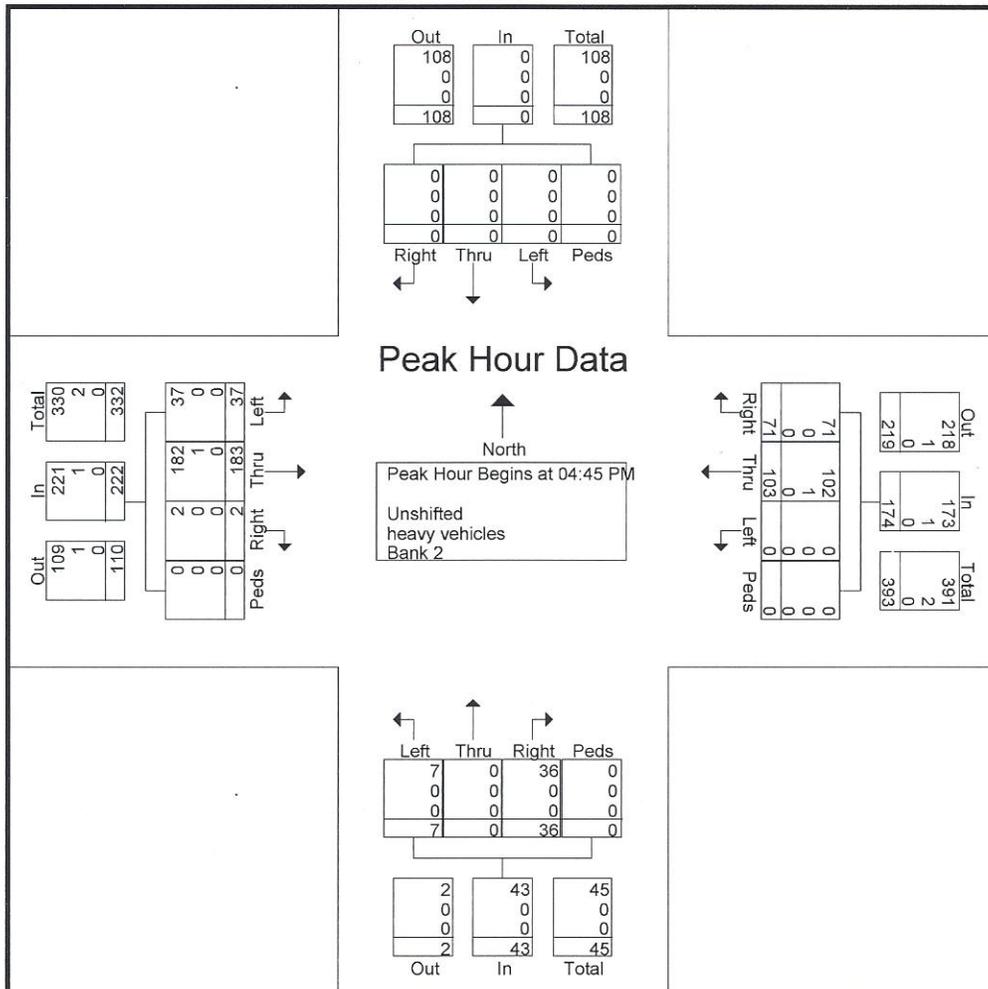
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	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
Peak Hour Analysis From 03:15 PM to 05:30 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:45 PM																					
04:45 PM	0	0	0	0	0	13	25	0	0	38	10	0	1	0	11	1	42	9	0	52	101
05:00 PM	0	0	0	0	0	16	12	0	0	28	11	0	2	0	13	1	44	10	0	55	96
05:15 PM	0	0	0	0	0	25	47	0	0	72	8	0	2	0	10	0	52	7	0	59	141
05:30 PM	0	0	0	0	0	17	19	0	0	36	7	0	2	0	9	0	45	11	0	56	101
Total Volume	0	0	0	0	0	71	103	0	0	174	36	0	7	0	43	2	183	37	0	222	439
% App. Total	0	0	0	0	0	40.8	59.2	0	0		83.7	0	16.3	0		0.9	82.4	16.7	0		
PHF	.000	.000	.000	.000	.000	.710	.548	.000	.000	.604	.818	.000	.875	.000	.827	.500	.880	.841	.000	.941	.778
Unshifted	0	0	0	0	0	71	102	0	0	173	36	0	7	0	43	2	182	37	0	221	437
% Unshifted	0	0	0	0	0	100	99.0	0	0	99.4	100	0	100	0	100	100	99.5	100	0	99.5	99.5
heavy vehicles	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	1	2
% heavy vehicles	0	0	0	0	0	0	1.0	0	0	0.6	0	0	0	0	0	0	0.5	0	0	0.5	0.5
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0





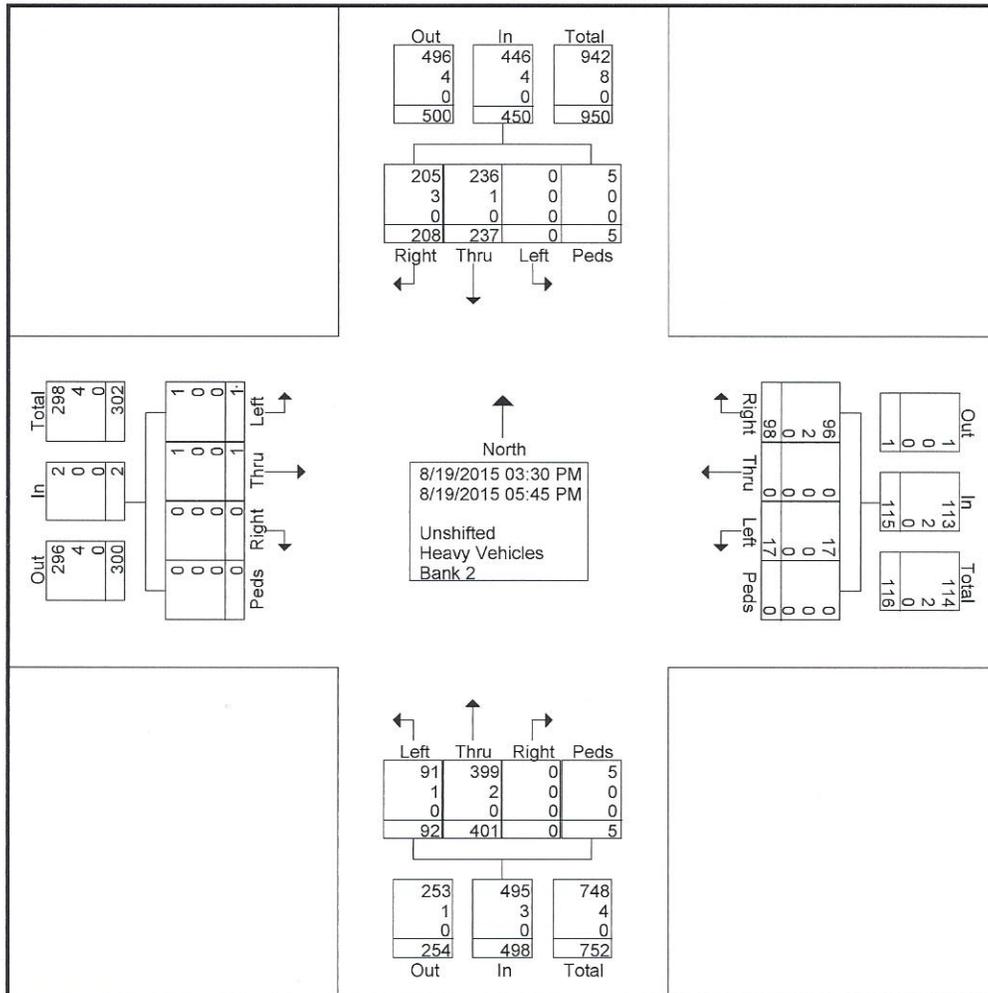
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PO Box 1766  
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*Your Tagline Here*

Bobby Portorsnok  
North Rd and Exit 77 on ramp  
West Windsor  
The very last count

File Name : Not Named 1  
Site Code : Unsignal  
Start Date : 8/19/2015  
Page No : 2



# Binghamton Metropolitan Transportation Study

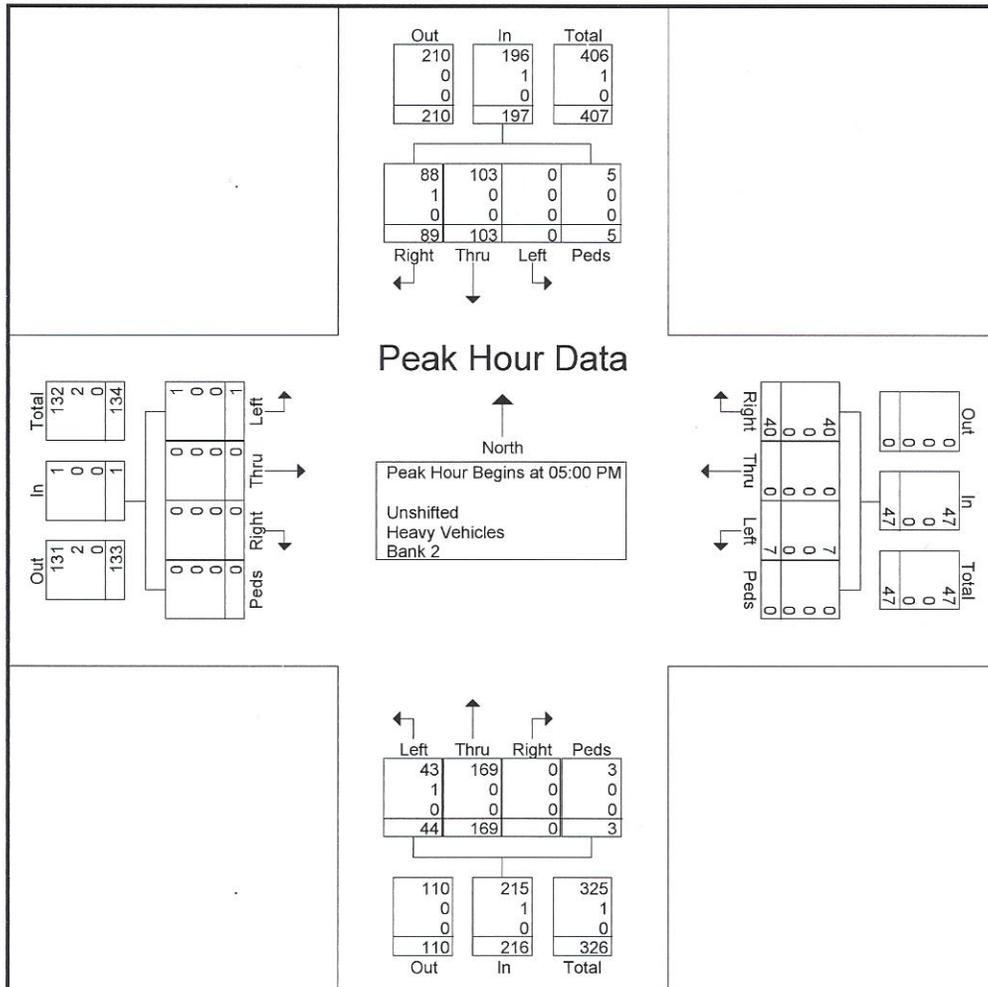
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Peak Hour Analysis From 03:30 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 05:00 PM																					
05:00 PM	26	32	0	0	58	7	0	1	0	8	0	47	12	0	59	0	0	0	0	0	126
05:15 PM	18	20	0	0	38	13	0	0	0	13	0	46	17	3	66	0	0	0	0	0	117
05:30 PM	18	24	0	2	44	7	0	0	0	7	0	34	9	0	43	0	0	0	0	0	94
05:45 PM	27	27	0	3	57	13	0	6	0	19	0	42	6	0	48	0	0	0	0	0	124
Total Volume	89	103	0	5	197	40	0	7	0	47	0	169	44	3	216	0	0	1	0	1	461
% App. Total	45.2	52.3	0	2.5		85.1	0	14.9	0		0	78.2	20.4	1.4		0	0	100	0		
PHF	.824	.805	.000	.417	.849	.769	.000	.292	.000	.618	.000	.899	.647	.250	.818	.000	.000	.250	.000	.250	.915
Unshifted	88	103	0	5	196	40	0	7	0	47	0	169	43	3	215	0	0	1	0	1	459
% Unshifted	98.9	100	0	100	99.5	100	0	100	0	100	0	100	97.7	100	99.5	0	0	100	0	100	99.6
Heavy Vehicles	1	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	2
% Heavy Vehicles	1.1	0	0	0	0.5	0	0	0	0	0	0	0	2.3	0	0.5	0	0	0	0	0	0.4
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0





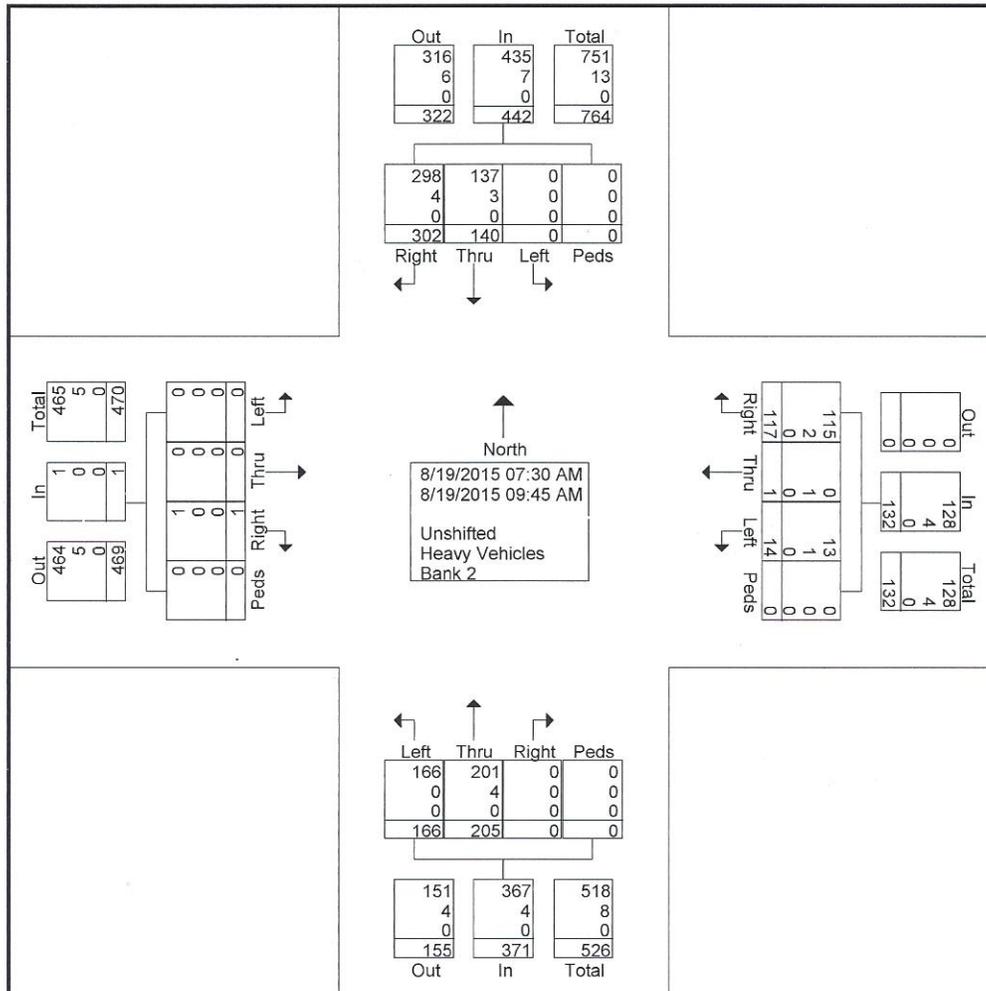
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07:30 AM	28	13	0	0	41	14	0	1	0	15	0	25	21	0	46	0	0	0	0	0	102
07:45 AM	33	14	0	0	47	15	0	0	0	15	0	12	23	0	35	0	0	0	0	0	97
08:00 AM	63	15	0	0	78	23	0	3	0	26	0	22	23	0	45	0	0	0	0	0	149
08:15 AM	40	12	0	0	52	15	0	4	0	19	0	16	21	0	37	0	0	0	0	0	108
Total Volume	164	54	0	0	218	67	0	8	0	75	0	75	88	0	163	0	0	0	0	0	456
% App. Total	75.2	24.8	0	0		89.3	0	10.7	0		0	46	54	0		0	0	0	0		
PHF	.651	.900	.000	.000	.699	.728	.000	.500	.000	.721	.000	.750	.957	.000	.886	.000	.000	.000	.000	.000	.765
Unshifted	163	52	0	0	215	66	0	8	0	74	0	74	88	0	162	0	0	0	0	0	451
% Unshifted	99.4	96.3	0	0	98.6	98.5	0	100	0	98.7	0	98.7	100	0	99.4	0	0	0	0	0	98.9
Heavy Vehicles	1	2	0	0	3	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	5
% Heavy Vehicles	0.6	3.7	0	0	1.4	1.5	0	0	0	1.3	0	1.3	0	0	0.6	0	0	0	0	0	1.1
Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bank 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

