Broadway Corridor Study
Bangor, Maine

Existing Transportation Conditions
Technical Memorandum

Prepared for:
Bangor Area Comprehensive Transportation

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1.0 INTRODUCTION

T.Y. Lin International (TYLI) is under contract with the Bangor Area Comprehensive Transportation (BACTS) to perform a study of the Broadway Corridor in Bangor, Maine as shown in **Figure 1** (all figures are located in **Appendix A** at the conclusion of this report). The study area extends from the southerly intersection of the Interstate 95 Northbound On/Off-Ramp approximately 0.8 miles north to the intersection of Broadway and Grandview Avenue.

Maine Department of Transportation (MaineDOT) provides a functional classification for roadways reflecting their balance between providing land access versus their mobility. From I-95 to the intersection with Alden Street, Broadway is categorized by MaineDOT as an Other Principal Arterial; from Alden Street north, Broadway is a Minor Arterial. These designations indicate I-95 is a Principal Arterial Interstate and both Center Street and Grandview Avenue are Major/Urban Collectors. Broadway serves as a central link between Interstate 95 and major towns including Glenburn and Brewer. In the City of Bangor, Broadway is also an important internal link between major commercial, residential, educational and recreational land uses within the community.

The primary study goals are the following:

- To preserve existing roadway capacity over the long term (2035 design year) to facilitate through traffic movement and minimize congestion while providing safe vehicular access to new and existing development along Broadway; and
- To maintain the functional integrity and safety of the corridor, while accommodating the public and private needs for access and adjacent land parcels.
- Pedestrian, cyclist and ADA concerns shall be integrated into any recommendations – while noting that the ROW is already maximized, but all opportunities to improve the pedestrian experience should be explored.

This document serves to inform the user on the existing transportation conditions in the corridor prior to a discussion of future traffic growth and recommendations.

2.0 Existing Transportation Data

2.1 Existing Average Annual Daily Traffic Volumes

Average Annual Daily Traffic (AADT) is a measure of the total volume of vehicle traffic at a particular location divided by 365 days per year and is an indication of how much traffic is seen by the location. For Broadway, existing AADT from 2006 – 2013 was obtained from MaineDOT Count Books. **Figure 2** provides a graphical summary of the most current AADT volumes within the study area and **Table 1** shows the historical trends for various streets in the corridor. Side streets from Broadway range from 800 to nearly 7,000 vehicles per day while Broadway sees nearly 25,000 vehicles on average per day indicating that this is a busy corridor serving a significant volume of vehicles each day.

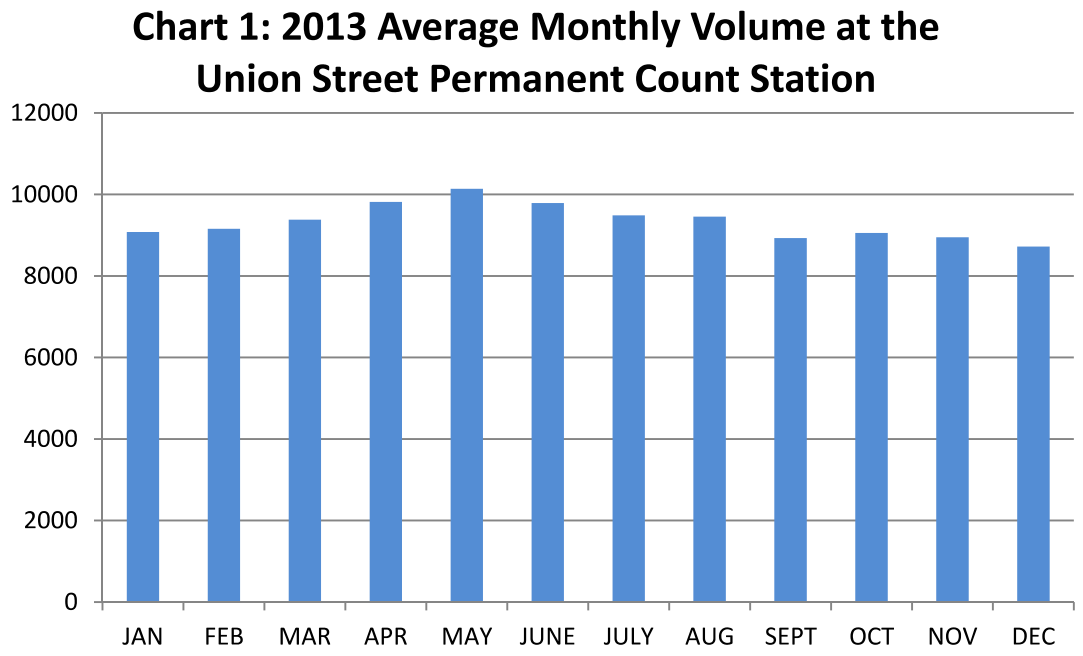
Table 1: Historical Average Annual Daily Traffic

Location	AADT							
	06	07	08	09	10	11	12	13
Broadway se/o Center Street/I-95 NB Ramps	13,700	--	12,570	--	--	13,650	--	--
SR 15 (Broadway) se/o Falvey Street	25,140	25,480	24,480	--	--	--	--	--
SR 15 (Broadway) nw/o Falvey Street	--	--	24,930	--	--	--	--	--
SR 15 (Broadway) se/o I-95 SB Ramps	--	--	22,200	--	--	--	--	--
I-95 SB n/o Off Ramp to SR 15 (Broadway)	--	--	--	--	--	--	--	24,730
I-95 SB On Ramp from Broadway	--	--	5,150	6,280	--	6,310	--	6,130
I-95 SB Off Ramp to Broadway	--	--	4,100	5,260	--	5,250	--	--
I-95 NB n/o On Ramp from SR 15/15B (Broadway)	--	--	--	--	--	--	--	24,650
I-95 NB Off Ramp to Broadway	--	--	4,990	6,010	--	5,900	--	--
I-95 NB On Ramp from Broadway	--	--	4,150	5,380	--	5,160	--	--
Alden Street e/o SR 15 (Broadway)	--	--	1,160	--	--	--	--	--
Center Street s/o Poplar Street	6,820	--	6,440	--	--	5,790	--	--
Falvey Street sw/o SR 15 (Broadway)	--	--	1,840	--	--	2,010	--	--
Poplar Street w/o Center Street	1,000	--	850	--	--	--	--	--
School Street ne/o SR 15 (Broadway)	3,670	--	3,470	--	--	--	--	--

2.2 Existing Monthly Traffic Volume Variation

Permanent count stations provide information regarding seasonal and weekday variations as well as a daily traffic variation. While there are no permanent count stations in the study corridor, there is a permanent count station located on Union Street, southeast of Jackson Street. This count station provides insight into travel patterns within the community due to its proximity to the study area, however it should be cautioned that Broadway has more than double the traffic volume than Union Street and has more commercial land uses.

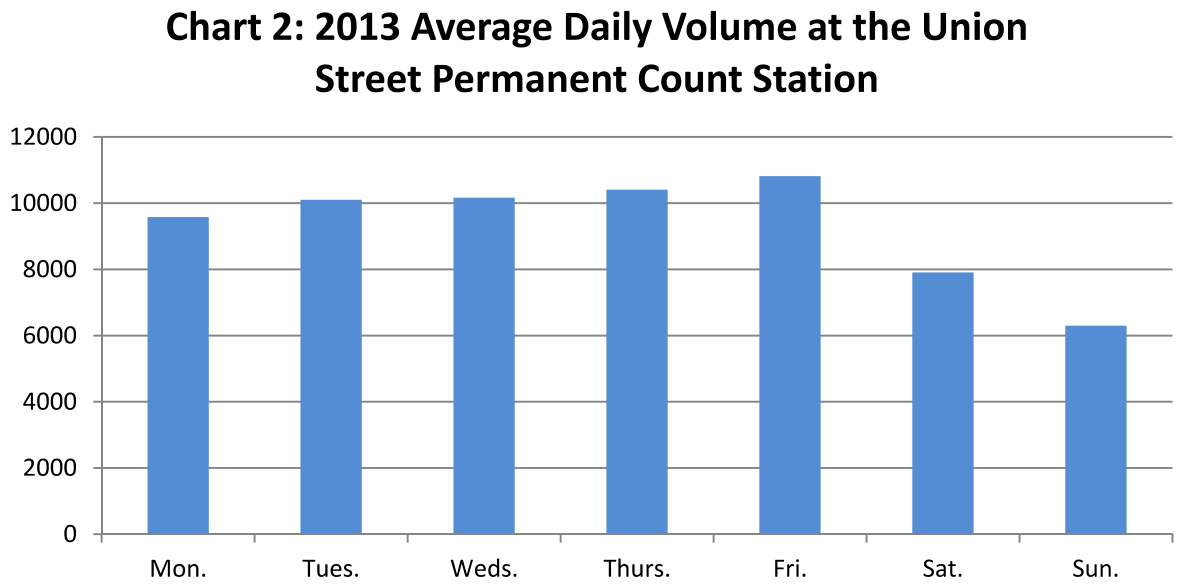
Average monthly traffic variation was derived from data collected at the Union Street Permanent Count Station. Reports from the count station for 2013 are contained within **Appendix D.** To create **Chart 1** (following), the average volume at the Union Street permanent count station for each month was calculated and plotted. The month of May shows the greatest volume of vehicles, followed by April and June. While this chart does illustrate some seasonal variation during the summer months, this variation is minimal. Per direction from BACTS, no seasonal adjustments were applied to the data collected during the month of September (data collection within the corridor is described further in **Section 2.5**).



2.3 Existing Daily Traffic Volume Variation

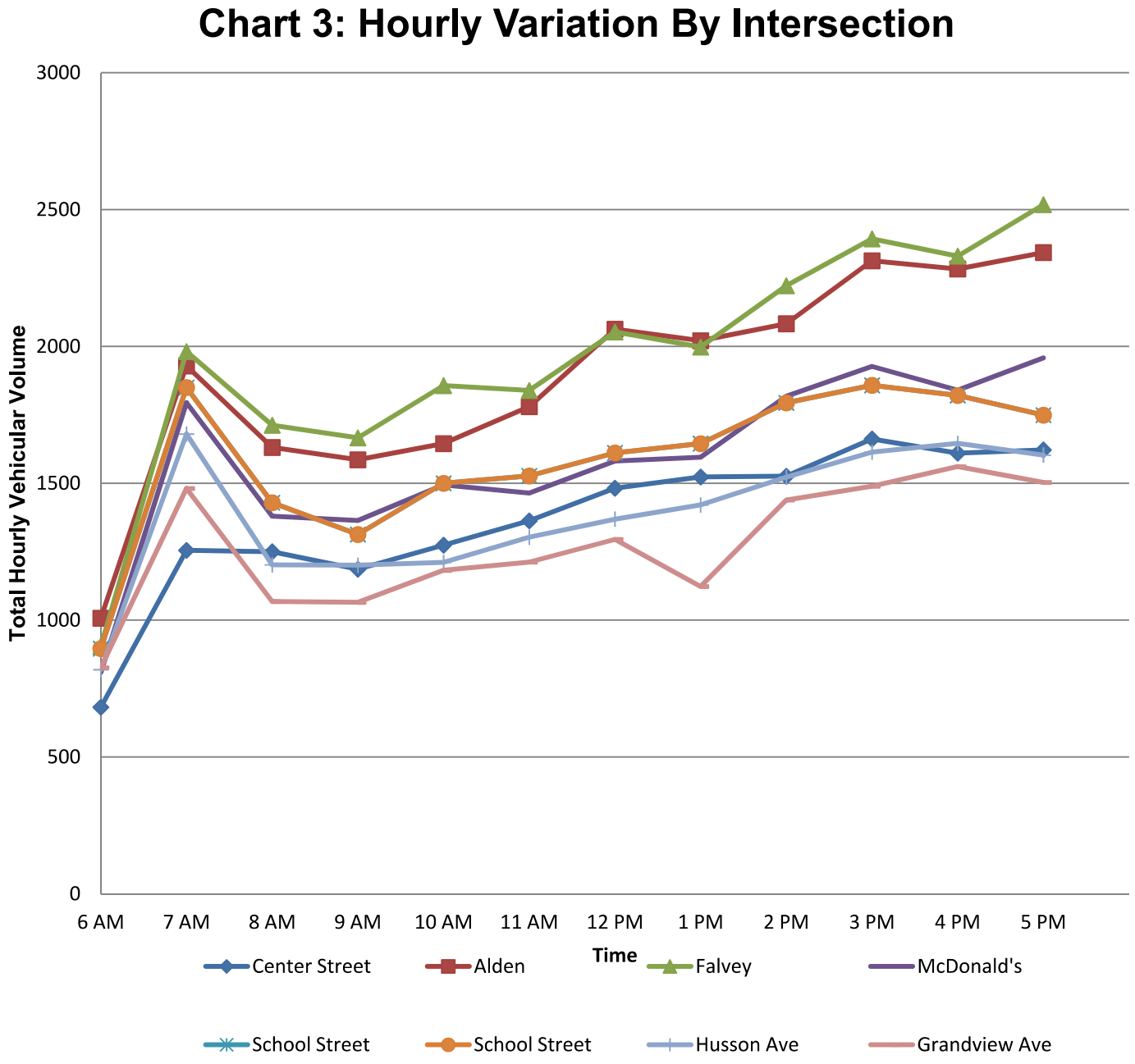
Volume variation by day of the week was also analyzed from the Union Street Permanent Count Station. The average total volume variation for each day of the week is shown on **Chart 2**. Each day in the chart below represents the average of that day throughout the entire year – for instance all Mondays from January to December were averaged together to achieve the average Monday represented on the chart.

From this chart it is seen that Friday holds the most volume through the corridor and Sunday the least. As will be discussed further in **Section 2.5**, vehicle volumes were collected on Tuesday – Thursday (average weekdays) and no counts were performed on the weekends to reflect the average weekday travel.



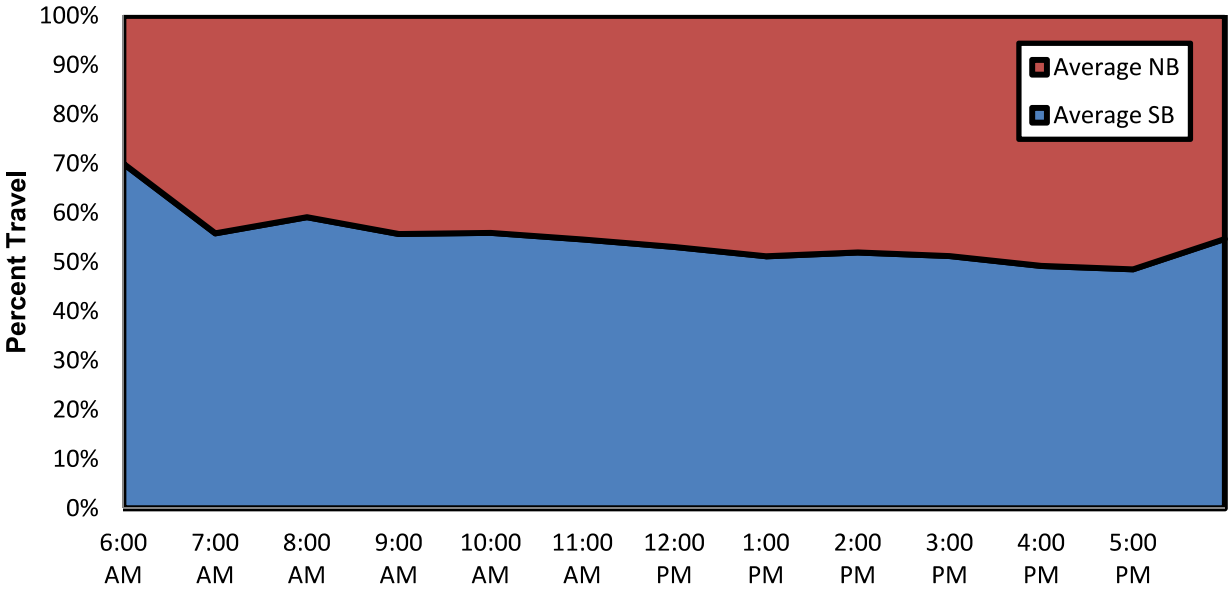
2.4 Existing Hourly Traffic Volume Variation

As will be described further in the next section, 12 hour counts were collected at each of the seven signalized intersections. Using these counts, the actual distribution of vehicular volume throughout the day in the study area was determined. The total volume for each hour (combined northbound and southbound) at the signalized intersections was used. **Chart 3**, below, shows a graphical depiction comparing the peaks along the corridor. While there is a significant morning peak, most intersection volumes grow steadily throughout the afternoon, peaking during the evening commute time period.



Directional distribution between northbound and southbound vehicles is also a key to understanding traffic conditions throughout the corridor. The chart below was created using the average of the seven signalized intersection volumes thoughout the day. As can be seen in **Chart 4,** the distribution is relatively equal with a slight increase in southbound vehicles during the AM and PM Peaks.

Chart 4: Directional Distribution



2.5 Existing Intersection Turning Movement Volumes

As previously discussed, twelve hour intersection turning movement counts were collected by BACTS in September 2014. Exact locations and dates are noted in **Table 2**. The counts were conducted from Tuesday to Thursday at each of the signalized intersections. Printouts of these turning movement counts are provided in **Appendix E**.

Table 2: Turning Movement Count Dates and Locations

Mainline	Minor Street	Start	End	Day	Date
Broadway	Center Street and I-95 NB	6:00 AM	6:00 PM	Thursday	9/25/14
Broadway	Alden Street and I-95 SB	6:00 AM	6:00 PM	Thursday	9/25/14
Broadway	Falvey Street	6:00 AM	6:00 PM	Tuesday	9/23/14
Broadway	Shopping Center/McDonald's	6:00 AM	6:00 PM	Tuesday	9/23/14
Broadway	School Street	6:00 AM	6:00 PM	Wednesday	9/17/14
Broadway	Husson Avenue	6:00 AM	6:00 PM	Tuesday	9/16/14
Broadway	Grandview Avenue	6:00 AM	6:00 PM	Thursday	9/18/14

Using this data, peak hours for each location were calculated and an overall peak was determined to help balance volumes throughout the corridor (although intermediate drives prevent full balancing). These results are noted in **Table 3**.

Table 3: Peak Hours from Turning Movement Counts					
Mainline	Minor Street	AM Peak	PM Peak	Date	Day
Broadway	Center Street and I-95 NB	7:15 - 8:15	4:30 – 5:30	9/25/14	Thursday
Broadway	Alden Street and I-95 SB	7:15 - 8:15	4:30 – 5:30	9/25/14	Thursday
Broadway	Falvey Street	7:15 - 8:15	4:45 – 5:45	9/23/14	Tuesday
Broadway	Shopping Center/McDonald's	11:45 – 12:45	4:30 – 5:30	9/23/14	Tuesday
Broadway	School Street	7:15 - 8:15	4:15 - 5:15	9/17/14	Wednesday
Broadway	Husson Avenue	7:00 - 8:00	4:30 – 5:30	9/16/14	Tuesday
Broadway	Grandview Avenue	7:00 - 8:00	4:30 – 5:30	9/18/14	Thursday
Overall Corridor Peak		**7:15 - 8:15**	**4:30 – 5:30**		

Based on the permanent count station and direction from BACTS, no seasonal adjustment to the traffic volumes was incorporated to estimate Design Hour Volumes (DHVs). Volumes were, however, adjusted to balance accordingly between drives as necessary. **Figure 3** illustrates the 2014 Existing Design Hour Volumes during the AM and PM peak hours at the study locations. It should be noted that a count was not performed at the McDonald's Entrance and this volume was estimated by using the actual exiting volumes and applying the percentage of entering vehicles recommended by the 9th Edition of the ITE Trip Generation Manual.

2.6 Existing Vehicle Classification

Heavy truck percentages were recorded as part of turning movement counts in the corridor. **Table 6** summarizes each approach at the signalized intersections. For the 6:00am to 6:00pm count periods, the major intersections of the corridor do not see an unusually high volume of trucks. Minor streets carry similarly low heavy truck percentages as the mainline. In **Table 4**, the 12 hour count volume totals are provided followed by a percentage in parenthesis.

Table 4: Heavy Vehicle Percentage by Approach (6am to 6pm)					
Broadway/Center Street/I-95 NB Ramps					
	Broadway from North	I-95 Off and On Ramps	Broadway from the South	Center Street	Total
Buses	68 (0.6%)	19 (0.4%)	27 (0.5%)	29 (1.1%)	143 (0.6%)
Single Unit Trucks	105 (1%)	125 (2.6%)	69 (1.3%)	39 (1.5%)	338 (1.4%)
Articulated Trucks	33 (0.3%)	51 (1.1%)	21 (0.4%)	0 (0%)	105 (0.4%)
Broadway/Alden Street/I-95 SB Ramps					
	Broadway from South	Broadway from North	Alden Street	I-95 SB Off Ramp	Total
Buses	68 (0.7%)	81 (0.6%)	0 (0%)	28 (0.6%)	177 (0.6%)
Single Unit Trucks	189 (1.9%)	187 (1.5%)	9 (2.2%)	50 (1.2%)	435 (1.6%)
Articulated Trucks	74 (0.7%)	99 (0.8%)	0 (0%)	23 (0.5%)	196 (0.7%)
	Broadway from South	Broadway from North	Falvey Street		Total
Buses	84 (0.7%)	84 (0.7%)	11 (1.4%)		179 (0.7%)
Single Unit Trucks	178 (1.6%)	198 (1.6%)	13 (1.6%)		389 (1.6%)
Articulated Trucks	65 (0.6%)	77 (0.6%)	0 (0%)		142 (0.6%)
Broadway/Shopping Center Entrance/McDonald's Exit					
	Broadway from South	Broadway from North	Shopping Center	McDonald's Exit	Total
Buses	82 (0.8%)	88 (0.9%)	0 (0%)	1 (0.1%)	171 (0.7%)
Single Unit Trucks	156 (1.6%)	170 (1.8%)	10 (0.4%)	7 (0.6%)	343 (1.5%)
Articulated Trucks	57 (0.6%)	71 (0.8%)	5 (0.2%)	0 (0%)	133 (0.6%)
Broadway/School Street/Walgreens					
	School Street	Broadway from Southeast	Walgreens Parking	Broadway from Northwest	Total
Buses	50 (3.4%)	45 (0.5%)	0 (0%)	42 (0.4%)	137 (0.7%)
Single Unit Trucks	23 (1.6%)	175 (2%)	8 (1.2%)	191 (1.9%)	397 (1.9%)
Articulated Trucks	3 (0.2%)	69 (0.8%)	2 (0.3%)	68 (0.7%)	142 (0.7%)
Broadway/Husson Ave/Access Road					
	Access Road from East	Broadway from Southeast	Husson Avenue	Broadway from Northwest	Total
Buses	1 (0.8%)	53 (0.6%)	16 (0.4%)	48 (0.6%)	118 (0.6%)
Single Unit Trucks	2 (1.6%)	164 (1.9%)	19 (0.5%)	161 (2.1%)	346 (1.7%)
Articulated Trucks	0 (0%)	56 (0.6%)	2 (0.1%)	61 (0.8%)	119 (0.6%)
Broadway/Grandview					
	Grandview Avenue from East	Broadway from Southeast	Grandview Avenue from West	Broadway from Northwest	Total
Buses	20 (1.4%)	43 (0.6%)	2 (3.5%)	38 (0.5%)	103 (0.6%)
Single Unit Trucks	11 (0.8%)	142 (2%)	1 (1.8%)	159 (1.9%)	313 (1.9%)
Articulated Trucks	0 (0%)	80 (1.1%)	0 (0%)	65 (0.8%)	145 (0.9%)

2.7 Existing Pedestrian Volumes

Table 5 notes a relatively low daily volume of pedestrians. Most pedestrians were seen walking along Broadway near I-95 and up near Husson and Bangor High School.

Table 5: Pedestrian Volumes by Approach (6am to 6pm)					
Broadway/Center Street/I-95 NB Ramps					
	Broadway from North	I-95 Off and On Ramps	Broadway from the South	Center Street	Total
Pedestrians	0	22	3	9	34
Broadway/Alden Street/I-95 SB Ramps					
	Broadway from South	Broadway from North	Alden Street	I-95 SB Off Ramp from Southeast	Total
Pedestrians	49	32	0	0	81
Broadway/Falvey Street					
	Broadway from South	Broadway from North	Falvey Street		Total
Pedestrians	0	14	6		20
Broadway/Shopping Center Entrance/McDonald's Exit					
	Broadway from South	Broadway from North	Shopping Center	McDonald's Exit	Total
Pedestrians	1	0	26	36	63
Broadway/School Street/Walgreens					
	School Street	Broadway from Southeast	Walgreens	Broadway from Northwest	Total
Pedestrians	12	1	39	9	61
Broadway/Husson Avenue/Access Road					
	Access Road	Broadway from Southeast	Husson Avenue	Broadway from Northwest	Total
Pedestrians	14	42	4	1	61
Broadway/Grandview Avenue					
	Grandview Avenue from East	Broadway from Southeast	Grandview Avenue from West	Broadway from Northwest	Total
Pedestrians	7	34	4	1	46

2.8 Crash History

The term High Crash Location (HCL) has been created in order to indicate an intersection with safety concerns. To be classified as an HCL, MaineDOT has established two criteria: there must be 8 or more crashes during a three year study period and the location must have a critical rate factor (CRF) greater than or equal to 1.0. The critical rate factor is a statistical comparison of the frequency of crashes at the study location with other comparable locations in the state.

Crash reports were obtained from MaineDOT for the years of 2011 – 2013. From this data three intersections and four segments were identified as HCLs. The official crash reports are provided in **Appendix F**. **Table 6** summarizes the 2011-2013 crash data for the study intersections. High Crash

Locations are highlighted. **Figures 4 and 5** graphically summarize this information separately for intersections and road segments.

Table 6: Crash History				
Intersections with Broadway				
Node	Node Description		# Crashes	CRF
41187	Center Street/I-95 NB		30	1.07
39710	Center Street/Earle Avenue		26	3.78
41299	I-95 SB Off (Right)/On		23	0.72
39711	Falvey Street		34	1.18
39712	Shopping Center Entrance (Salvation Army)		1	0.13
40618	Shopping Center/McDonald's Exit		20	0.71
39713	School Street/Walgreens		15	0.60
41576	Husson Avenue		19	0.78
39714	Grandview Avenue		18	0.88
Segments along Broadway				
Node	Node Description	Length	# Crashes	CRF
41187-39710	I-95 NB Ramps to Earle Avenue	0.04	5	1.19
39710-65239	Earle Ave to I-95 SB (Left)	0.11	19	1.96
65239-41299	I-95 SB Off (Left) to I-95 SB Off (Right) and On	0.02	1	0.40
41584-39711	Alden Street to Falvey Street	0.08	3	0.35
39711-39712	Falvey Street to Shopping Center Entrance (Salvation Army)	0.03	4	0.95
39712-40618	Shopping Center Entrance (Salvation Army) to Shopping Center/McDonald's Exit	0.08	11	1.28
40618-39713	Shopping Center McDonald's Exit to School Street/Walgreens	0.19	23	1.52
39713-41576	School Street/Walgreens to Husson Avenue	0.09	10	1.30
41576-39714	Husson Avenue to Grandview Avenue	0.14	5	0.51

It is imperative to look at the cause of crashes when HCLs are identified to look for correctable patterns. Two key factors are important: the severity of the crashes and the crash patterns. The locations identified in **Table 6** are discussed further below.

- **Center Street and I-95 NB:** There were 30 crashes total: 3 with minor injuries, 4 with possible injuries, and the remainder were property damage only. Three crash patterns were evident at this intersection: rear-end collisions involving vehicles traveling southbound on Broadway (9), vehicles changing lanes as they exit the interstate (4), and vehicles turning left from Broadway onto the interstate colliding with vehicles traveling northbound on Broadway (3). To reduce the quantity of crashes, visibility of traffic signals should be verified for vehicles traveling southbound on Broadway, advanced signage and pavement markings should be verified on the interstate off ramp, and analysis should be run regarding changing the southbound left from protected/permissive to protected only to reduce the conflict of that movement with oncoming vehicles.
- **Center Street and Earle Ave:** There were 26 crashes total: 2 serious injuries, 1 minor injury, 8 possible injuries, and the remainder property damage only. Nearly every crash (16) was the result of northbound vehicles on Broadway turning left onto Earle Street being struck by southbound vehicles on Broadway. This unsignalized intersection is approximately 100 feet north of the Center Street intersection and is at the beginning of the channelized right turn onto Center Street.

- **Falvey Street:** There are 34 total crashes, 2 with minor injuries, 13 with possible injuries, and the remainder property damage only. Nearly all crashes (24) were rear end collisions southbound on Broadway. Visibility of signals and cycle information should be checked at this location.
- **Segment from Earle Ave to I-95 SB on Broadway**: There were 19 crashes total: 1 with minor injuries, 3 with possible injuries, and the remainder property damage only. Nearly all crashes are left in or left out of drives.
- **Segment from the Shopping Center Entrance (Salvation Army) to the Signalized Shopping Center with McDonald's**: There were 11 crashes total: 1 with minor injuries, 2 with possible injuries and the remainder were property damage only. Left turning vehicles into drives colliding with vehicles traveling straight on Broadway continue to be the cause of most crashes. Of the 11 crashes there were 4 northbound and 1 southbound. The remainder of crashes showed no discernible pattern.
- **Segment from the Signalized Shopping Center/McDonald's Exit to School Street/Walgreens Entrance**: There were 10 crashes total; 1 with minor injuries, 1 with possible injuries and the remainder property damage only. Rear-end collisions caused 3 of the crashes in the corridor, left turn movements into and out of Rite Aid caused 3 of the crashes, and improper lane changes caused 2 of the crashes.
- **Segment from School Street to Husson Avenue**: There were 23 total crashes: 3 with possible injuries and the remainder property damage only. Again the crash pattern centers around left turning vehicles. It varies which drive people are making left turning movements into and out of, but 13 of the crashes involved left turning movements.

2.9 Existing Intersection Level of Service

The standard used to evaluate traffic operating conditions of the transportation system is referred to as Level of Service (LOS). This is a qualitative assessment of the quantitative effect of factors such as speed, volume of traffic, geometric features, traffic interruptions, delays, and freedom to maneuver. LOS analysis was based upon procedures detailed in the 2010 Highway Capacity Manual, Transportation Research Board.

Level of Service provides a measurement of the delay experienced at an intersection as a result of traffic operations at that intersection. In general, there are six levels of service: Level of Service A to Level of Service F. The highest, Level of Service A, describes a condition of free-flow operations where the effects of incidents are easily absorbed. Level of Service B, describes a state in which maneuverability and speed limits are beginning to be restricted by other motorists although level of comfort is still high. In Level of Service C, experienced drivers are still comfortable but maneuverability is noticeably restricted. Level of Service D brings noticeable congestion and driver comfort levels decrease. In Level of Service E, roadway capacity is reached and disruptions are much more prevalent – driver comfort has declined. Finally, Level of Service F is the result of volumes greater than roadway capacity with congestion and possible stopped conditions. MaineDOT has determined that Levels of Service A-D are acceptable conditions for intersections.

The measures of delay for each level of service rating for unsignalized and signalized intersections are found in **Table 7**.

Table 7: Level of Service Criteria		
Level of Service	Unsignalized Average Delay Per Vehicle (sec.)	Signalized Average Delay Per Vehicle (sec.)
A	≤10	≤10
B	>10 and ≤20	>10 and ≤20
C	>20 and ≤30	>20 and ≤35
D	>30 and ≤40	>35 and ≤55
E	>40 and ≤50	>55 and ≤80
F	>50	>80

Synchro and SimTraffic computer models were used to analyze the study intersections. For SimTraffic, the Trafficware standard output was used (based on 5 runs of 60 minutes of simulation). Results varied between Synchro and SimTraffic. Because SimTraffic more closely represented conditions observed in the field, it is represented in the following tables. All queues in the results tables represent 95th percentile queues, indicating that 95% of the time the queues will be less than this length. The report printouts can be found in **Appendix G** and **Figure 6** also depicts the results.

Table 8 summarizes the results at the signalized intersection of Broadway, I-95 NB, and Center Street. There are no failing movements at this intersection however there are several queues that exceed the space allotted.

Table 8: Broadway/Center Street/I-95 NB 2014 Existing Level of Service Summary												
		Center St		I-95 NB			Broadway		Broadway			Overall
		EBL	EBTR	WBL	WBTR	WBR	NBT	NBTR	SBL	SBT	SBTR	
AM Peak	Delay (s)	37.9	44.3	38.0	26.8	4.6	19.5	12.9	12.8	7.6	0.2	16.6
	LOS	D	D	D	C	A	B	B	B	A	A	B
	Queue (ft)	93	88	188	280	202	188	131	190	214	97	
PM Peak	Delay (s)	44.3	48.7	41.4	33.9	7.5	31.0	22.7	32.2	34.6	6.5	28.3
	LOS	D	D	D	C	A	C	C	C	C	A	C
	Queue (ft)	67	76	172	277	213	203	170	266	702	553	
Available Lane Storage (ft)			40	240			200		200			

Table 9 summarizes the results of the signalized intersection Broadway, I-95 SB, and Alden Street. Several failing movements are seen during the AM and PM Peak hours as highlighted in the following table. Queues exceed available storage during the AM Peak hour on all approaches except Alden Street.

Table 9: Broadway/I-95 SB/Alden Street 2014 Existing Level of Service Summary												
		I-95 SB Off			Broadway			Broadway			Alden St	Overall
		WBL	WBR	WBR	NBL	NBT	NBTR	SBL	SBT	SBTR	SWLR	
AM Peak	Delay (s)	18.9	129.6	37.1	70.2	34.8	16.9	35.1	23.0	18.3	46.7	29.1
	LOS	B	F	D	E	C	B	D	C	B	D	C
	Queue (ft)	66	316	272	62	381	361	41	384	403	68	
PM Peak	Delay (s)	18.2	82.4	38.2	53.5	66.0	16.3	43.9	26.1	21.7	65.6	32.2
	LOS	B	F	D	D	E	B	D	C	C	E	C
	Queue (ft)	66	359	303	60	501	748	36	470	477	58	
Available Queue (ft)			40		240		200	200				

Table 10 summarizes the results of the signalized intersection Broadway and Falvey Street. Several substandard movements are seen during the AM and PM Peak hours and queues exceed available storage on the Falvey Street approach.

Table 10: Broadway/Falvey Street 2014 Existing Level of Service Summary									
		Falvey Street		Broadway			Broadway		Overall
		EBL	EBR	NBL	NBT	NBT	SBT	SBTR	
AM Peak	Delay (s)	67.5	10.9	10.9	0.5	0.5	0.4	0.5	1.5
	LOS	E	B	B	A	A	A	A	A
	Queue (ft)	75	61	44	86	92	72	86	
PM Peak	Delay (s)	95.1	59.7	10.2	0.7	0.6	3.1	3.6	3.8
	LOS	F	E	B	A	A	A	A	A
	Queue (ft)	92	75	72	108	109	197	226	
Available Queue (ft)		60	460	120	280		520		

Table 11 summarizes the results of the signalized intersection of Broadway, the Broadway Shopping Center and McDonald's. Several substandard movements are seen during the AM and PM Peak hours and queues exceed available storage.

Table 11: Broadway/Shopping Center/McDonald's Exit
2014 Existing Level of Service Summary

		McDonald's		Shopping Center			Broadway		Broadway			Overall
		EBL	EBTR	WBL	WBLT	WBR	NBT	NBTR	SBL	SBT	SBT	
AM Peak	Delay (s)	56.2	17.3	58.8	56.3	5.6	0.5	0.2	9.6	0.5	0.5	4.1
	LOS	E	B	E	E	A	A	A	A	A	A	A
	Queue (ft)	54	85	112	68	23	54	29	7	60	66	
PM Peak	Delay (s)	59.0	9.2	55.5	50.1	11.5	35.4	15.6	18.9	2.8	2.8	19.3
	LOS	E	A	E	D	B	D	B	B	A	A	B
	Queue (ft)	101	56	182	168	52	530	507	39	86	90	
Available Queue (ft)		100		160			520		40	850		

Table 12 summarizes the results of the signalized intersection of Broadway, School Street and Walgreens. Several substandard movements are seen during the AM and PM Peak hours. Queues exceed available storage during the PM Peak.

Table 12: Broadway/School Street/Walgreens
2014 Existing Level of Service Summary

		Walgreens		School Street		Broadway			Broadway			Overall
		EBLT	EBR	WBLT	WBR	NBL	NBT	NBTR	SBL	SBT	SBTR	
AM Peak	Delay (s)	0.0	49.1	60.5	12.8	51.9	11.5	4.8	60.9	0.6	0.7	6.1
	LOS	A	D	E	B	D	B	A	E	A	A	A
	Queue (ft)	5	23	65	68	56	390	280	55	55	68	
PM Peak	Delay (s)	71.1	53.3	56.6	12.3	64.9	1.7	0.8	75.4	5.1	4.4	9.0
	LOS	E	D	E	B	E	A	A	E	A	A	A
	Queue (ft)	94	58	121	101	53	128	61	99	238	244	
Available Queue (ft)		60		90		120	850		80	350		

Table 13 summarizes the results of the signalized intersection of Broadway and Husson Avenue. Several substandard movements are seen during the AM and PM Peak hours. Queues exceed available storage during the AM and PM Peak hours.

Table 13: Broadway/Husson Avenue

		Husson		Driveway		Broadway			Broadway			Overall
		EBLT	EBR	WBL	WBTR	NBL	NBT	NBTR	SBL	SBT	SBTR	
AM Peak	Delay (s)	60.7	8.5	33.4	21.5	47.3	26.5	8.1	45.7	8.4	8.1	18.7
	LOS	E	A	C	C	D	C	A	D	A	A	B
	Queue (ft)	100	87	7	15	136	482	401	10	212	223	
PM Peak	Delay (s)	79.6	38.7	57.4	57.0	24.0	4.0	4.4	0.0	20.9	18.4	20.1
	LOS	E	D	E	E	C	A	A	A	C	B	C
	Queue (ft)	125	464	21	28	262	304	205	4	269	265	
Available Queue (ft)			100	40		230	350		100	620		

Table 14 summarizes the results of the signalized intersection of Broadway and Grandview Avenue. Several substandard movements are seen during the AM and PM Peak hour.

Table 14: Broadway/Grandview Avenue 2014 Existing Level of Service Summary

		Grandview	Grandview	Broadway		Broadway		Overall
		EBLTR	WBLTR	NBLT	NBR	SBL	SBTR	
AM Peak	Delay (s)	6.1	53.4	15.5	3.7	63.2	5.6	16.7
	LOS	A	D	B	A	E	A	B
	Queue (ft)	18	204	405	93	145	469	
PM Peak	Delay (s)	12.8	46.4	7.4	1.1	13.5	2.4	8.7
	LOS	B	E	A	A	B	A	A
	Queue (ft)	25	198	468	38	91	232	
Available Queue (ft)		600	730	640		100		

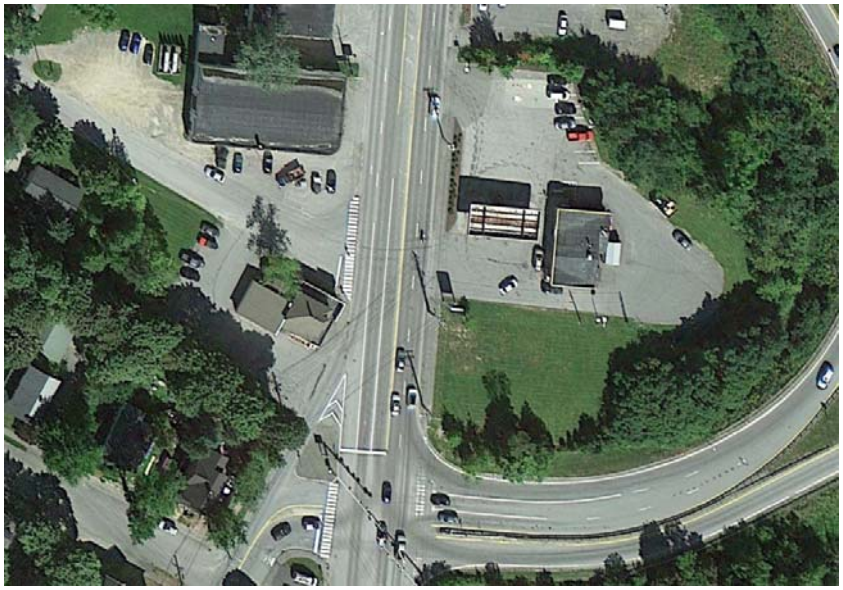
2.10 Existing Transportation Infrastructure Inventory

2.10.1 Geometry

The roadway has been divided into several sections to discuss geometry and other distinct features of each area. All signals are coordinated through the corridor and have a cycle length of 140 seconds. Signal heads are mounted to mast arms with lane use signs unless otherwise noted.

I-95 NB/Center Street Intersection: This signalized four-leg intersection is the southerly end of the study area. With the exception of the channelized right turn southbound lane on Broadway and the permissive right-turn northbound lane on Broadway all turning movements operate under permissive/ protected signal phasing, which means that they have a protected phase (green arrow) and can also make movements under a permissive phase (green ball) where opposing traffic exists. There is a controller cabinet mounted to the mast arm on the westerly side of the intersection in the raised island. The channelized right turn from Broadway yields to oncoming traffic when it reaches Center Street.

- From the south, on Broadway, this 64 foot wide approach contains two receiving lanes that taper to one about 100 feet after the intersection. There are two approach lanes: a through and through/right lane, and a painted island to shadow the left turn lane from the north. Lane striping begins approximately 125 feet south of the intersection. Directional signs indicate I-95 and Route 15.
- From the east, on the I-95 ramps, this 56 foot wide approach contains one receiving lane and three approach lanes: a left lane, a through lane, and a right lane. Lane striping beings approximately 200 feet prior to the intersection. Directional signs indicate Route 15 North. Lane use signs indicate the through lane only. Guardrail separates traffic on the ramp.
- From the north, on Broadway, this 70 foot wide approach contains two receiving lanes and three approach lanes: a left, a through, and a through/right lane. Right turning traffic exits before the intersection in a free movement onto Center Street and yields as it approaches Poplar Street. The left turn bay opens approximately 200 feet north of the intersection. The right turn bay appears right after Tri City Pizza. A directional sign indicating I-95 North is at the island to the right of the lanes.
- From the west, on Center Street, this 80 foot wide approach contains one receiving lane and two approach lanes: a left and a through/right lane. There is a small flush mount island separating incoming and exiting traffic. Striping begins approximately 40 feet before the intersection and begins right after the bend.



- **Earle Avenue:** Earle Avenue is a stop controlled intersection just to the north of Tri-City Pizza. The approach is 64 feet wide and has a block crosswalk running perpendicular to the approach. The center-two-way-left-turn-lane (CTWLTL) is not open in this location and vehicles turning left must cross 3 lanes of oncoming traffic. It is 125 feet from the I-95 NB intersection and directly across from one of the Irving gas station entrances.

- **From Earle Avenue to I-95 SB:** This is a 30 foot wide approach of CTWLTL as this stretch of road approaches the I-95 overpass. Just before the bridge the CTWLTL develops into a northbound left turn lane. This five lane section is approximately 55 feet wide with 11 foot lanes. There are sidewalks on both sides of Broadway.

- **I-95 SB/Alden Street Intersection:** This five-leg intersection is just north of the I-95 overpass. It is unusually long as Broadway through traffic has a distance of more than 250 feet between stop bars. All dedicated turning movements are protected, meaning that there is no conflicting traffic while they are turning, with the exception of the southbound left-turn onto Alden Street which has permissive left-turn phasing only. Traffic from the I-95 SB ramp cannot turn on red, but according to the traffic count, a large percentage of vehicles ignore this sign. Alden Street and the turnpike movements are split, meaning they do not happen at the same time. There is a controller cabinet mounted to the mast arm on the westerly side of the intersection. Pedestrian crosswalks, ramps, and signals have been updated, to be discussed further in the following sections.

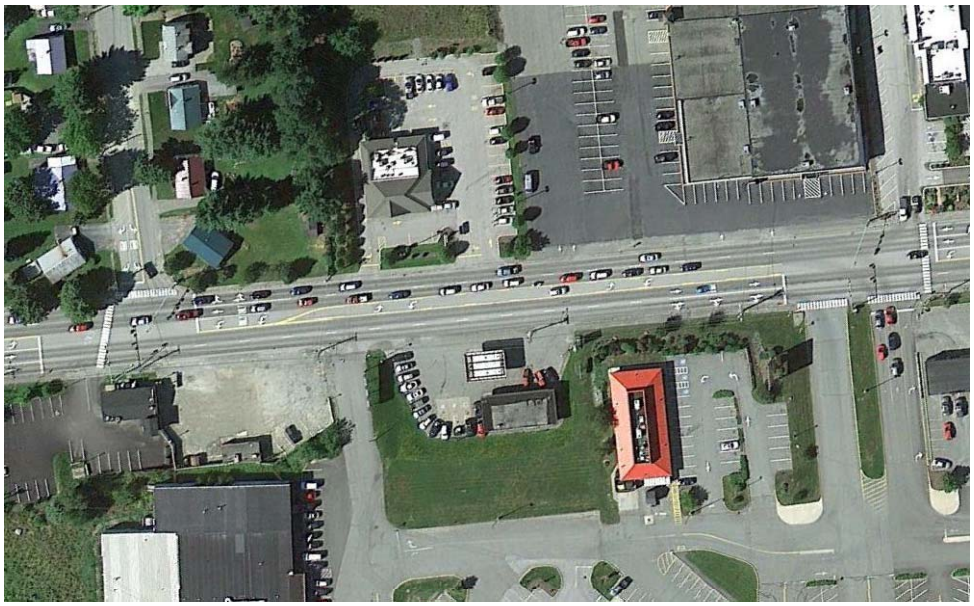
  - From the south, on Broadway, this 62 foot wide approach contains two receiving lanes and three approach lanes: a left and two through lanes. The left turn bay begins just before the bridge and a "STOP HERE ON RED" sign indicated where vehicles should stop to avoid conflict. Lane use signs are visible for left turning vehicles only.
  - From the east, on the I-95 ramp, this 86 foot wide approach contains three approach lanes: a left lane, and two right turn lanes. Lane striping beings approximately 250 feet west of the intersection and the left turning vehicles have approximately a one car length pocket around a raised island. Wayfinding signs indicate the business district, Brewer and E Corinth, Husson University, Bangor Theological Seminary, the hospital, Route 15, and I-95 North. There is also a No Turn on Red sign for vehicles turning right.
  - From the north, on Broadway, this 56 foot wide approach contains two receiving lanes and three approach lanes: a left and two through lanes. The left turn bay opens approximately 80 feet north of the intersection and a "STOP HERE ON RED" sign indicated where vehicles should stop to avoid conflict and has a do not block intersection sign.
  - From the northeast, on Alden Street, this 48 foot wide approach contains one receiving lane and one approach lane.

- **From I-95 SB to Falvey Street:** This is a 280 foot wide approach of back-to-back left turn lanes connects the I-95 Southbound Ramps to Falvey Street. There are sidewalks on both sides of Broadway.

- **Falvey Street Intersection:** This three leg intersection is just north of the I-95 Southbound On Ramp. Northbound Broadway signal phasing permissive/protected, which means that they have a protected phase (green arrow) and can also make movements when there is opposing traffic (green ball). The southbound left movement is a permissive phase. The left from Falvey Street is a protected phase and has no conflicting movements when it is green (the Chinese restaurant is not controlled by the signal). There is a controller cabinet mounted to the mast arm on the easterly side of the intersection. There are two driveways in the vicinity of the intersection <u>not</u> controlled by the signal – the Chinese restaurant and the empty lot next to it that was previously a gas station.

    - From the south, on Broadway, this 58 foot wide approach contains two receiving lanes and three approach lanes: a left and two through lanes. The left turn bay is approximately 125 feet long. There are signs indicating where to stop at the intersection.
    - From the west, on Falvey Street, this 38 foot wide approach contains two approach lanes: a left and right turn lane. Lane striping beings approximately 60 feet east of the intersection.
    - From the north, on Broadway, this 56 foot wide approach contains two receiving lanes and three approach lanes: a left, a through, and a combined through-right lane. The left turn bay opens approximately 60 feet north of the intersection. There are signs indicating where to stop at the intersection.

- **From Falvey Street to the Shopping Center/McDonald's:** This is a 54 foot wide approach consists of CTWLTL and short left turn bays as the intersections for Falvey Street and the



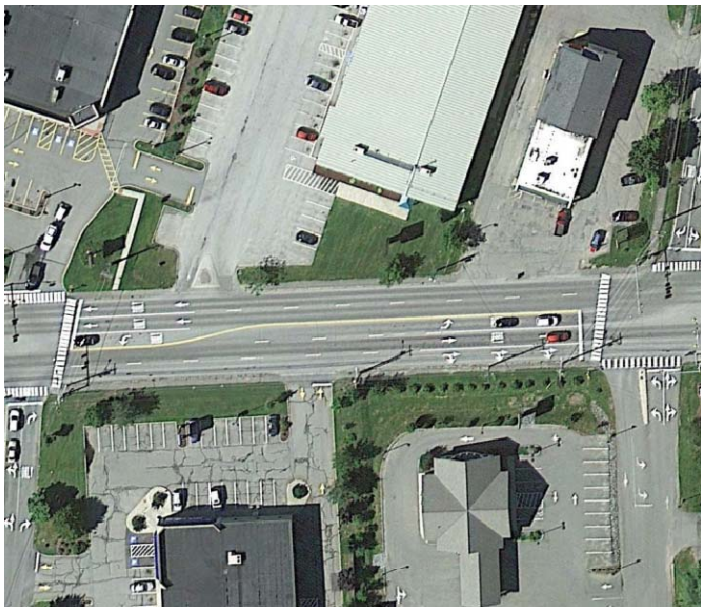
Shopping Center approach. This five lane section is approximately 60 feet wide with 12 foot lanes. There are multiple drives and sidewalks on either side of Broadway.

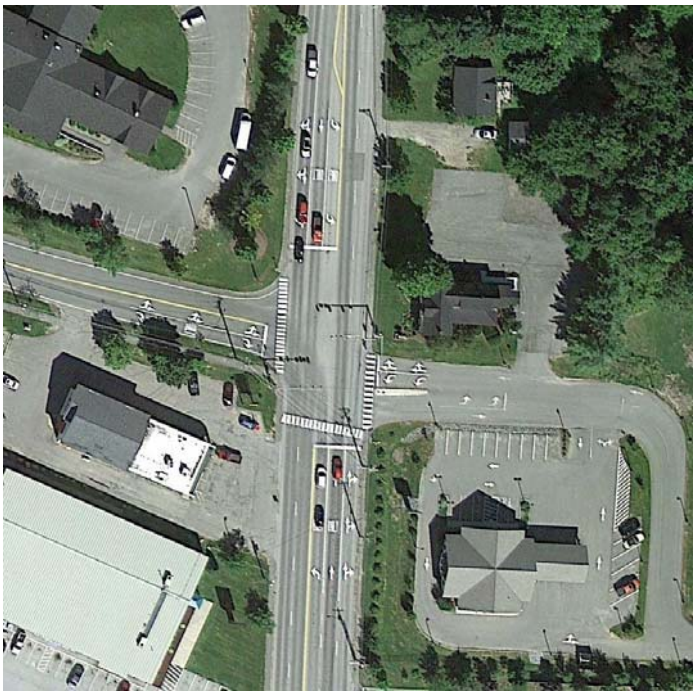
- **Shopping Center/McDonald's Exit Intersection:** All dedicated turning movements with the exception of the left southbound on Broadway are protected at this four-leg intersection. This means there are no conflicting vehicles during these movements. The left from Broadway SB is a permissive-protected phase and has no conflicting movements when it is a green arrow but also allows for turns when northbound traffic is moving. There is a controller cabinet mounted to the mast arm pole in the island dividing the Broadway Shopping Center. Movements into the McDonald's are especially challenging in this location as vehicles must nearly cross into the southbound left turn lane to enter McDonald's from the south.

    - From the south, on Broadway, this 61 foot wide approach contains two receiving lanes, a CTWLTL and two approach lanes: a through and combined through-right lane.
    - From the east, from the Shopping Center, this 97 foot wide approach contains a wide receiving lane, a grassed median, and three approach lanes: a left, a combing left-through, and a right turn lane. Lane striping beings approximately 140 feet west of the intersection.
    - From the north, on Broadway, this 56 foot wide approach contains two receiving lanes and three approach lanes: a left and two through lanes. The left turn bay opens approximately 40 feet north of the intersection.
    - From the west, from the McDonald's Exit, this 26 foot exit contains two approach lanes, a left and right turn lane. Lane striping begins approximate 25 feet east of the intersection.
- **From Broadway Shopping Center to School Street/Walgreens:** This is a 350 foot wide approach of CTWLTL and left turn bays as the intersections for the Shopping Center and School Street. This five lane section is approximately 60 feet wide with 12 foot lanes. There are multiple drives and sidewalks on either side of Broadway.

- **School Street/Walgreens Intersection:** Left turns on Broadway have protected signal phases (green arrow only), which means there are no conflicting vehicles. The left from School Street has permissive/protected signal phasing and has no conflicting movements when it has a green arrow. Movements from Walgreens are permissive only. Signals are mounted onto mast arms with lane use signs. There is a controller cabinet mounted to the mast arm pole in the northeast corner.
    - From the south, on Broadway, this 60 foot wide approach contains two receiving lanes and three approach lanes: a left, through and combined through-right lane. The left turn lane begins approximately 140 feet to the south of the intersection, but requires restriping as it was placed in a previously marked CTWLTL.
    - From the east, on School Street, this 48 foot wide approach contains one receiving lane, and two approach lanes: a combined left-through and a right turn lane. Lane striping beings approximately 100 feet west of the intersection.
    - From the north, on Broadway, this 58 foot wide approach contains two receiving lanes and three approach lanes: a left and two through lanes. The left turn bay opens approximately 80 feet north of the intersection.
    - From the west, from Walgreens, this 37 foot wide approach contains one receiving lane and two approach lanes: a left/through and right turn lanes. Lane striping begins approximate 25 feet east of the intersection. This lot contains connections to the nearby shopping center allowing drivers to exit at a signalized intersection.

- **From School Street/Walgreens to Husson Avenue:** This is a 350 foot wide approach of back to back left turns lanes is approximately 55 feet wide with 11 foot lanes. There are multiple drives and sidewalks on either side of Broadway.





- **Husson Avenue Intersection:** All dedicated turning movements on Broadway are protected, which means there are no conflicting vehicles during these movements. Dedicated turn movements on Husson and from the bank are permissive-protected phase and have no conflicting movements when it is a green arrow but also allows for turns when opposing traffic is flowing. Signals are mounted onto mast arms with lane use signs. There is a controller cabinet mounted to the mast arm pole in the northeast corner.
    - From the south, on Broadway, this 56 foot wide approach contains two receiving lanes and three approach lanes: a left, through and combined through-right lane. The left turn lane begins approximately 225 feet to the south of the intersection.
    - From the east, from the bank/dentist office, this 52 foot wide approach contains two receiving lanes and two approach lanes: a left turn lane and a combined through-right lane. Lane striping beings approximately 40 feet west of the intersection.
    - From the north, on Broadway, this 56 foot wide approach contains two receiving lanes and three approach lanes: a left, a through, and a combined through-right lane. The left turn bay opens approximately 100 feet north of the intersection.
    - From the west, from Husson Avenue, this 44 foot contains one receiving lane and two approach lanes: a combined through-left lane and a right turn lane. Lane striping begins approximate 100 feet east of the intersection.

- **From Husson Avenue to Grandview Avenue:** This is a 750 foot wide approach is a four lane section that opens to five lanes at the southerly Husson Avenue approach as described in the previous section. The section is approximately 51 feet wide with 12-13 foot lanes. This section becomes residential and as will be discussed in the next section, the sidewalk ends about halfway down on the westerly side of Broadway.

- **Grandview Avenue Intersection:** The southbound left turn from Broadway is a permissive/protected phase and has no conflicting movements when it is a green arrow but also allows for turns when opposing traffic is flowing. The northbound Broadway and Grandview Avenue movements have permissive signal phasing. Signals are mounted onto mast arms with lane use signs. There is a controller cabinet is ground mounted in the northeast corner.
    - From the south, on Broadway, this 56 foot wide approach contains one receiving lane and two approach lanes: a combing through-left and a right turn lane. A painted island shadows the left turn from the northerly approach on Broadway.
    - From the east, on Grandview Avenue, this 30 foot wide approach contains one receiving lane and one approach lane.
    - From the north, on Broadway, this 50 foot wide approach contains one receiving lane and two approach lanes: a left and a combined through-right lane. The left turn bay opens approximately 80 feet north of the intersection.
    - From the west, from Grandview Avenue, this 32 foot contains one receiving lane and one approach lane.

2.10.2 Existing Sidewalks

Sidewalks line both sides of the corridor and are made of bituminous concrete pavement. They are 5 feet in width. Some sections have been upgraded but many are in poor condition with obstructions, cracked pavement, low sections that pool water, pedestrian signals that don't work properly, and no detectable warning panels. Pedestrians cross concurrently with traffic (meaning that traffic yields to pedestrians). A more detailed description follows:

- **I-95 Northbound Intersection:** Sidewalks are found on all approaches to the intersection with the exception of the I-95 ramps. Sidewalks are bituminous concrete and are 5 feet in width. Obstructions such as utility poles are commonly found in the sidewalks. Connections to crosswalks (discussed further in the next section) do not meet ADA compliance and end with no connection to the north of the I-95 ramps.

- **Earle Avenue Intersection:** Sidewalks pick up at the approach from Earle Avenue to the intersection and line both sides of Broadway. The sidewalk in front of Tri City Pizza turns into the parking lot/roadway and the sidewalk in front of the redemption center is at the same level at the roadway offering pedestrians no separation from vehicles.
- **From Earle Avenue to I-95 NB:** Sidewalks line both sides of Broadway along this stretch. They ramp down for drive through the corridor but suffer from obstructions in the sidewalk. Sidewalks have no protection from parking lots.

- **I-95 SB and Alden Street Intersection:** A sidewalk picks up on the right side of Alden Street just before the intersection and there are no sidewalks along the I-95 Southbound Ramps. Sidewalks line Broadway on both sides. There have been recent updates to pedestrian facilities in the area that include ramps, detectable warning tiles, and pedestrian countdown heads. At the time of the field walk, these new signals were not functioning properly.
- **Falvey Street Intersection:** Sidewalks are on all approaches to the intersection. On Falvey Street, sidewalks line the residential street separated by esplanades that open into Broadway. There are sidewalks on both sides of Broadway. Ramps open to the two crosswalks that cross Broadway and Falvey Streets from the west but on the east, the sidewalk receives the Broadway crosswalks at the entrance to the Chinese restaurant. Ramps do not contain detectable warning tiles or updated pedestrian heads. Utility poles and signs continue to impede sidewalks.

- **Between Falvey Street and the Shopping Center:** Sidewalks line Broadway and continue to be impeded by utility poles. Sidewalks are the same level as parking lots in some locations such as the picture below at the Citgo.

- **Shopping Center/McDonald's Exit Intersection:** There are sidewalks along Broadway with a gap at the shopping center island. There is also a stretch of sidewalk along the northerly side of the shopping center entrance. The sidewalk at the shopping center entrance has a stretch of guardrail blocking the full width. Detectable warning tiles and updated pedestrian signals are not present.

- **From Broadway Shopping Center to School Street/Walgreens:** Sidewalks line Broadway and continue to be impeded by utility poles. Ramps that have no crosswalk are present.

- **School Street/Walgreens Intersection:** There are sidewalks along Broadway and a concrete sidewalk separated from traffic by esplanade connects pedestrians to Broadway. There is no sidewalk along School Street beyond the intersection. Some sidewalks are level with parking lots. Detectable warning tiles and updated pedestrian signals are not present.

- **From School Street/Walgreens to Husson Avenue:** Sidewalks line Broadway and continue to be impeded by utility poles. Sidewalks crossing major drives with islands did not have pedestrian refuge.

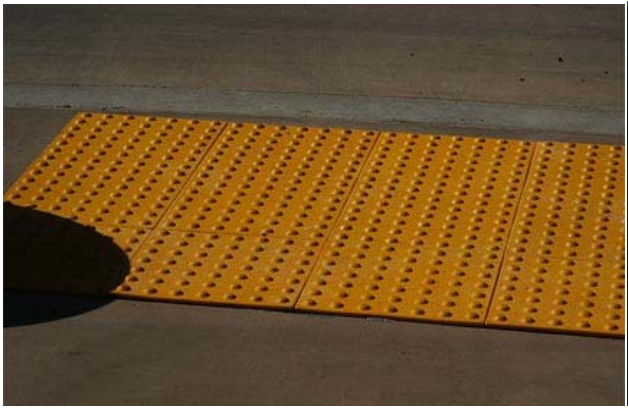
- **Husson Avenue Intersection:** There are sidewalks along Broadway and sidewalk along the southerly side Husson Avenue separated by an esplanade. There is no sidewalk along the entrance to the bank and dentist office. Detectable warning tiles and updated pedestrian signals are not present. Utility poles continue to be in the sidewalk.

- **From Husson to Grandview Avenue:** There are sidewalks for part of the way on the westerly side of Broadway that end approximately 250 feet north of the Husson intersection. Sidewalks continue for the entire length of Broadway on the easterly side. There are conflicts on the easterly side from mailboxes and utility poles.

- **Grandview Avenue Intersection:** There are sidewalks at this intersection only at the southeast corner by Bangor High School

2.10.3 Existing Crosswalks

There are several crosswalks in the corridor. These will be evaluated in the following sections. Several items are evaluated including American Disabilities Act (ADA) compliance. ADA compliance requires pedestrian push button and countdown heads, appropriate ramps, and detectable warning tiles. See the images below. As mentioned previously, all pedestrian signals are concurrently phased.



- **Broadway/Center Street/I-95 NB:** Block style crosswalk crosses the southerly side of Broadway and I-95 Northbound and Center Streets. There is no crosswalk across the Broadway southbound approach or from the raised island on Center Street to sidewalks north of the intersection. There are also no detectable warning panels and many connections with the sidewalks lack ramps and curb cuts. There is no connection from the island across Center Street to the existing sidewalk. Existing pedestrian signals are not countdown heads.

- **Broadway/Earle Avenue:** There is a block style crosswalk across Earle Avenue at this stop-controlled intersection. Ramps direct users into the intersection with Broadway rather than across Earle Avenue as shown in the picture below.

- **Broadway/I-95 SB/Alden Street:** There are block style crosswalks across I-95 SB separated by a small island. There are also block crosswalks across Alden Street and the I-95 SB On Ramp. Facilities have been updated however the push buttons for the I-95 SB Off Ramp and Alden Street were not working at the time of site evaluation.

- **Broadway/Falvey Street:** There are block style crosswalks across the southerly end of Broadway and across Falvey Street. The Broadway crosswalk is diagonal across the intersection increasing the amount of time needed for a pedestrian to cross the intersection. There are no detectable warning tiles present. Existing pedestrian signals are not countdown heads.

- **Broadway/Shopping Center Entrance/McDonald's Exit:** There are block style crosswalks across the shopping center and the northerly side of Broadway. The crosswalk breaks at the shopping center but does not have a pedestrian refuge or full 5 foot sidewalk at the island location. Ramps, particularly at the intersection are awkward and do not have updated countdown pedestrian heads or detectable warning tiles.

- **Broadway/ School Street/Walgreens:** There are block crosswalks across School Street, Walgreens, and the northerly side of Broadway. There are no detectable warning tiles at this crossing and pedestrian signals are not countdown type.

- **Broadway/Husson Avenue:** There are block style crosswalks across the Husson Avenue, the entrance to the bank, and across the southern side of Broadway. There are no detectable warning tiles at this location.

- **Broadway/Grandview Avenue:** There are no crosswalks at this location.

2.10.4 Existing Bicycle Facilities

There are no existing bicycle facilities in the corridor. Shoulders are not wide enough for bicycle lanes and do not include shared use striping.

2.11 MaineDOT Customer Service Levels

MaineDOT has developed a process for prioritizing highway and bridge candidate projects for the biennial work plan according to Customer Service Levels (CSL). MaineDOT has provided CSL ratings regarding Safety, Condition, and Service. Facilities are rated on an A-B-C-D-E-F scale. **Figures 7 - 9** present the ratings for each of these categories with a summary noted below.

CSL/Condition - The Condition CSL includes consideration of Pavement Condition, Roadway Strength, Bridge Condition, and Ride Quality. As shown on **Figure 7**, the corridor ranges from A to C for this

category. Center Street has a condition rating of A. The condition deteriorates to a level of service of B along Broadway due to ride quality and small shoulders from the I-95 NB ramps up to School Street. Broadway from School Street to Grandview experiences a level of service C with some lane markings and pavement conditions deteriorating.

CSL/Service - The Service CSL includes consideration of posted roads and congestion. As shown in **Figure 8**, the corridor ranges from A to C for this category. The I-95 NB and SB Ramps along with Grandview Ave at the northerly portion of Center Street experience a service rating of A. The study portion of Broadway from I-95 NB to I-95 SB experiences a level of service B with some minor congestion and narrow shoulders seen. From I-95 SB to the north, Broadway experiences a service level of C due to the increased congestion.

CSL/Safety - The Safety CSL includes consideration of Crash History, Paved Roadway Width, Pavement Rutting, and Bridge Reliability. As shown in **Figure 9**, the corridor ranges from A-C for this category. Center Street experiences a safety rating of A. From the I-95 northbound ramps to Husson Avenue, Broadway experiences a safety rating of B. Grandview Ave and Broadway from Husson Avenue to Grandview Ave experience a safety rating C.

2.12 Access Management

Existing access management deficiencies within the study corridor were generally noted following a review of MaineDOT and City standards. An assessment of existing driveway conditions was performed and consisted of reviewing: the number of driveways provided for each property; the width of driveways; the spacing of driveways; and how close driveways are to intersections (corner clearance). The purpose of access management is to provide vehicular access to land development in a manner that preserves the safety and efficiency of a transportation system.

MaineDOT Standards

Minimum Entrance Spacing Standards

Posted Speed (MPH)	Entrance Separation (Feet)
25 or less	Not applicable
30	Not applicable
35	Not applicable
40	175
45	265
50	350
55 or more	525

Arterial Corner Clearance - The minimum corner clearance for entrances onto Arterials must be 125 feet.

Number of Entrances - Except for forestry management and farming activities, lots on Arterials will be limited to one two-way or two one-way entrances.

Entrance Width - If 30% or less of the traffic projected to use the proposed entrance will be larger vehicles, the width of a two-way entrance within the highway right of way must be between 22 and 30 feet inclusive. If more than 30% of the traffic projected to use the proposed entrance will be larger

vehicles, the width of a two-way entrance within the highway right of way must be between 30 and 42 feet.

City of Bangor Standards

Zoning Ordinance

§271-42 Not more than two driveways for the same property on the same street will be allowed per 100 feet of frontage.

§271-43 Where two driveways are provided for the same property on the same street, a safety island of not less than 10 feet at the outer edge of the walk shall be provided.

§271-45 The width of any driveway shall not exceed 36 feet at the curb.

§271-46 No driveway shall be built within five feet of the intersection of two street lines except upon recommendation by the City Engineer and approval of the City Manager.

Based upon a review of both MaineDOT and City standards, **Table 15** highlights some general deficiencies in the corridor.

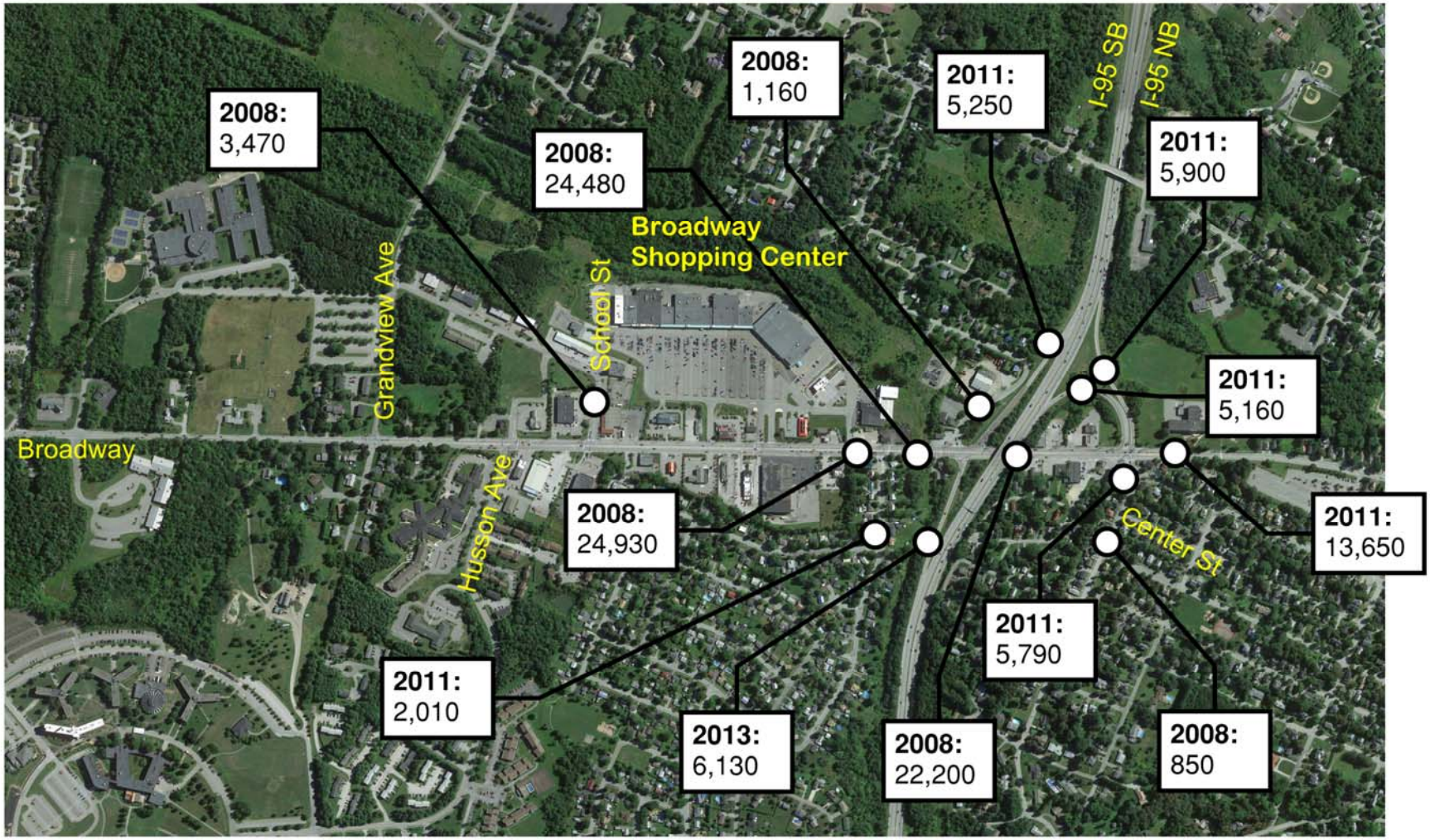
Table 15: Access Management Deficiencies

Type	Frontage	# Drives	Drive Width	Deficiency	Standards not Met:	
					City of Bangor	MDOT
Tri City Pizza				<125 ft corner clearance		X
Irving Circle K (Gas Station)	196 ft	2	42 ft	Exceeds allotted width	X	
			50 ft	Exceeds allotted width	X	X
				More than one two-way entrance		X
Larry Baron's Propane	94 ft	1	50 ft	Exceeds allotted width	X	X
Jiffy Print	150 ft	2	40 ft	Exceeds allotted width	X	X
			50 ft	Exceeds allotted width	X	X
				More than one two-way entrance		X
Residence		1		<125 ft corner clearance		X
Campaign Headquarters	129 ft	2	48 ft	Exceeds allotted width	X	X
Chinese Restaurant	102 ft	1	34 ft	Entrance is too close to intersection street lines	X	X
Empty Lot	150 ft	2	40 ft	Exceeds allotted width <125 ft corner clearance	X	X
			40 ft	Exceeds allotted width	X	X
				More than one two-way entrance		X
Prompto				<125 ft corner clearance		X
Citgo				More than one two-way entrance		X
The Furniture Gallery				More than one two-way entrance		X
McDonald's Entrance				<125 ft corner clearance		X
Amatos (Restaurant)	100 ft	1	50 ft	Exceeds allotted width	X	X
Kelley Car and Truck	150 ft	1	40 ft	Exceeds allotted width/ <125 ft corner clearance/ More than one two-way entrance	X	X
Benjamin Moore				<125 ft corner clearance		X

Appendix A:

Figures

Figure 2:
Average Annual Daily Traffic Volumes
Source: MaineDOT

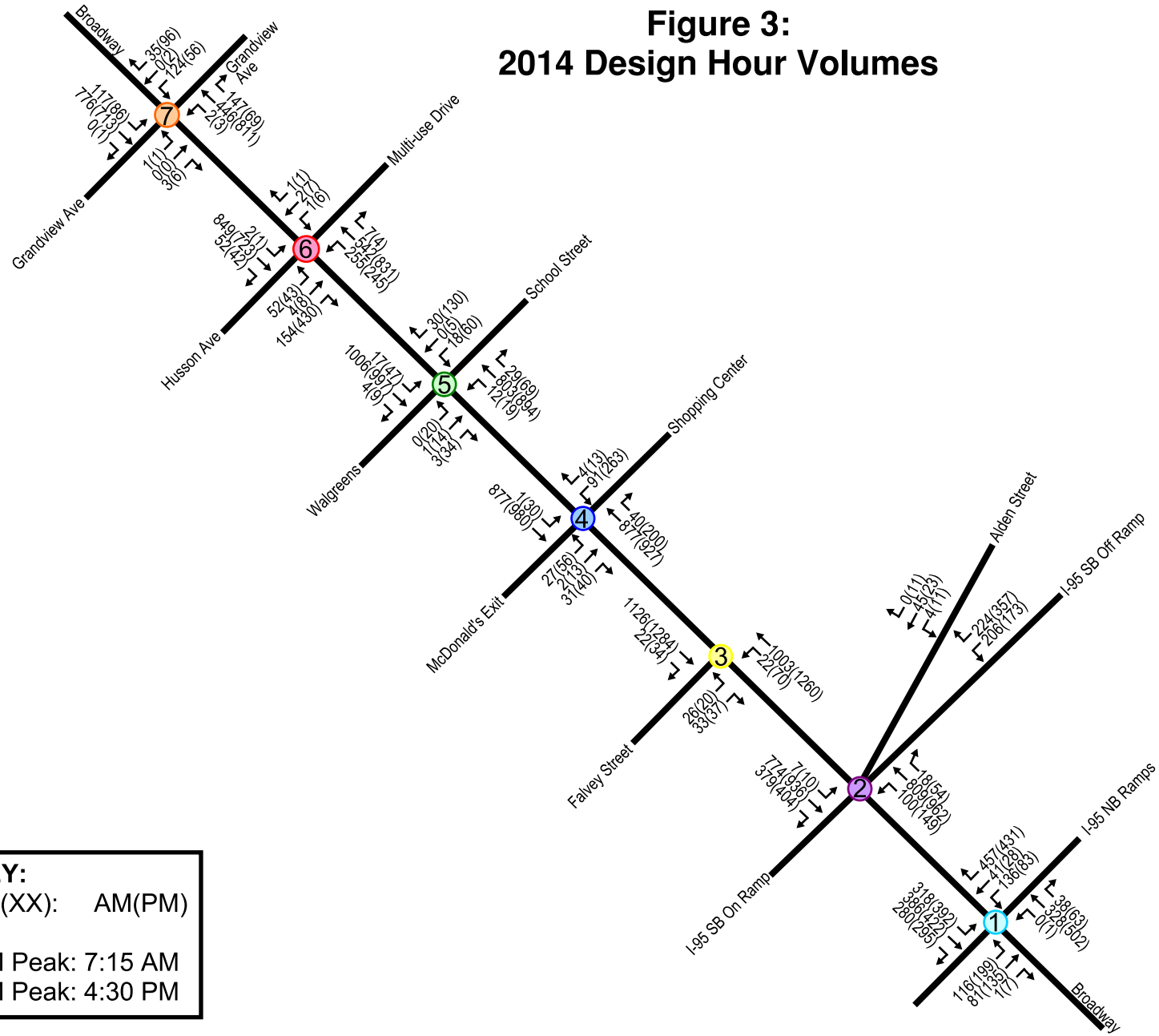


BANGOR AREA COMPREHENSIVE BACTS TRANSPORTATION SYSTEM

Broadway Corridor Study

City of Bangor Maine

Figure 3:
2014 Design Hour Volumes



KEY:
XX(XX): AM(PM)

AM Peak: 7:15 AM
PM Peak: 4:30 PM

BANGOR AREA COMPREHENSIVE BACTS TRANSPORTATION SYSTEM

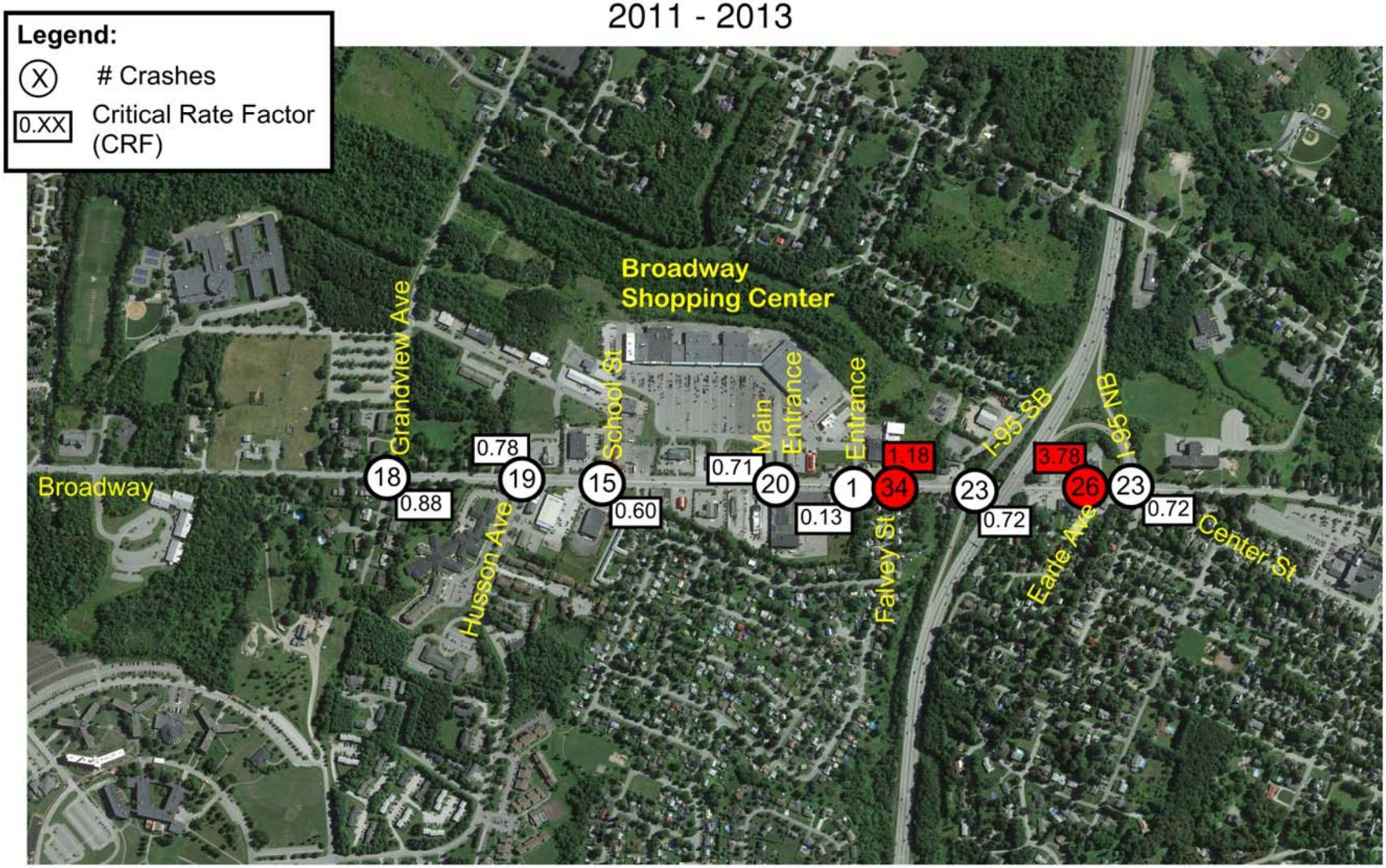
Broadway Corridor Study

City of Bangor Maine

Figure 4:
Intersection Crash Data

Source: MaineDOT

2011 - 2013

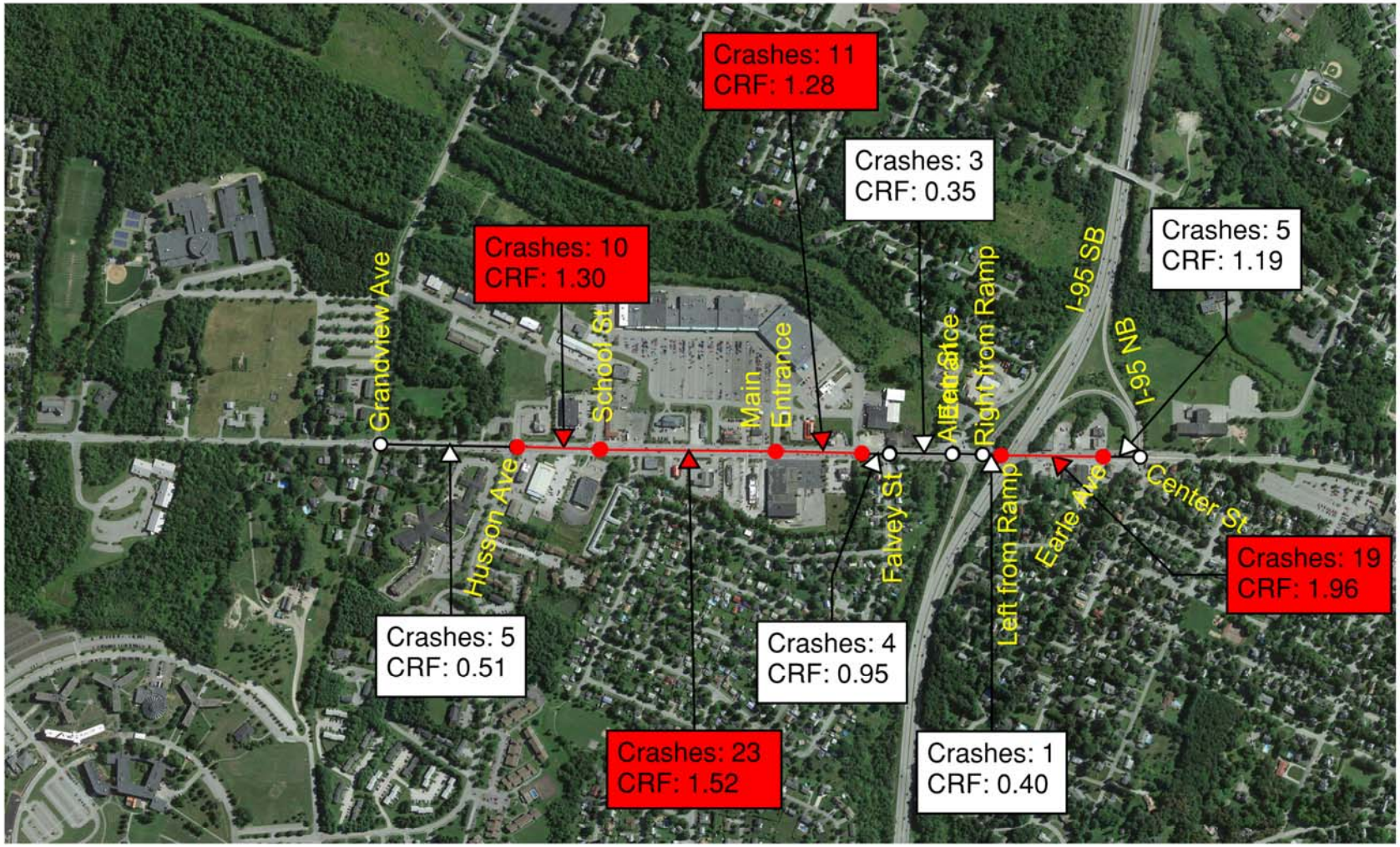


BANGOR AREA COMPREHENSIVE BACTS TRANSPORTATION SYSTEM

Broadway Corridor Study

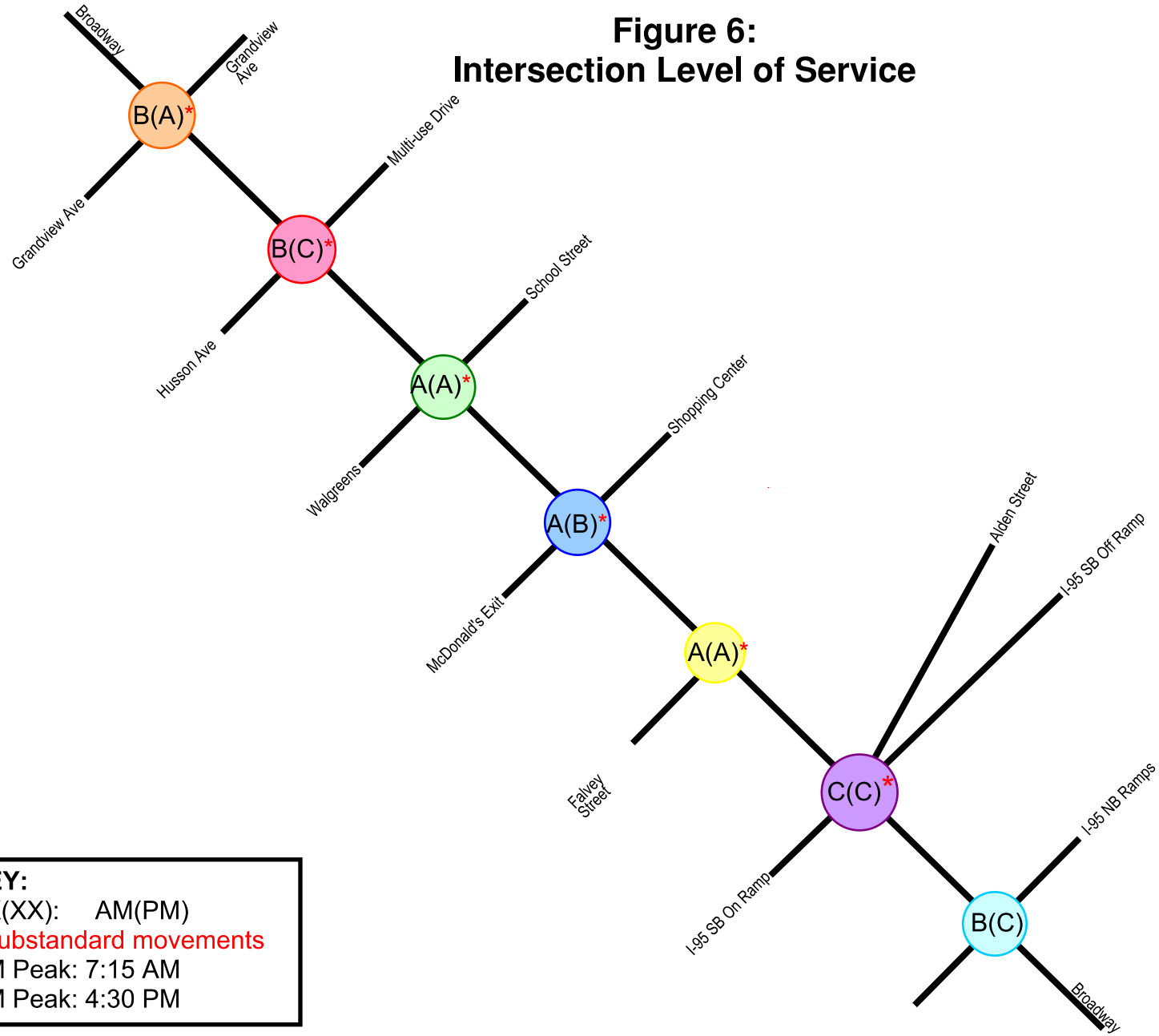
City of Bangor Maine

Figure 5:
Segment Crash Data
Source: MaineDOT
2011 - 2013



Broadway Corridor Study

Figure 6:
Intersection Level of Service



KEY:
XX(XX): AM(PM)
* substandard movements
AM Peak: 7:15 AM
PM Peak: 4:30 PM

BANGOR AREA COMPREHENSIVE BACTS TRANSPORTATION SYSTEM

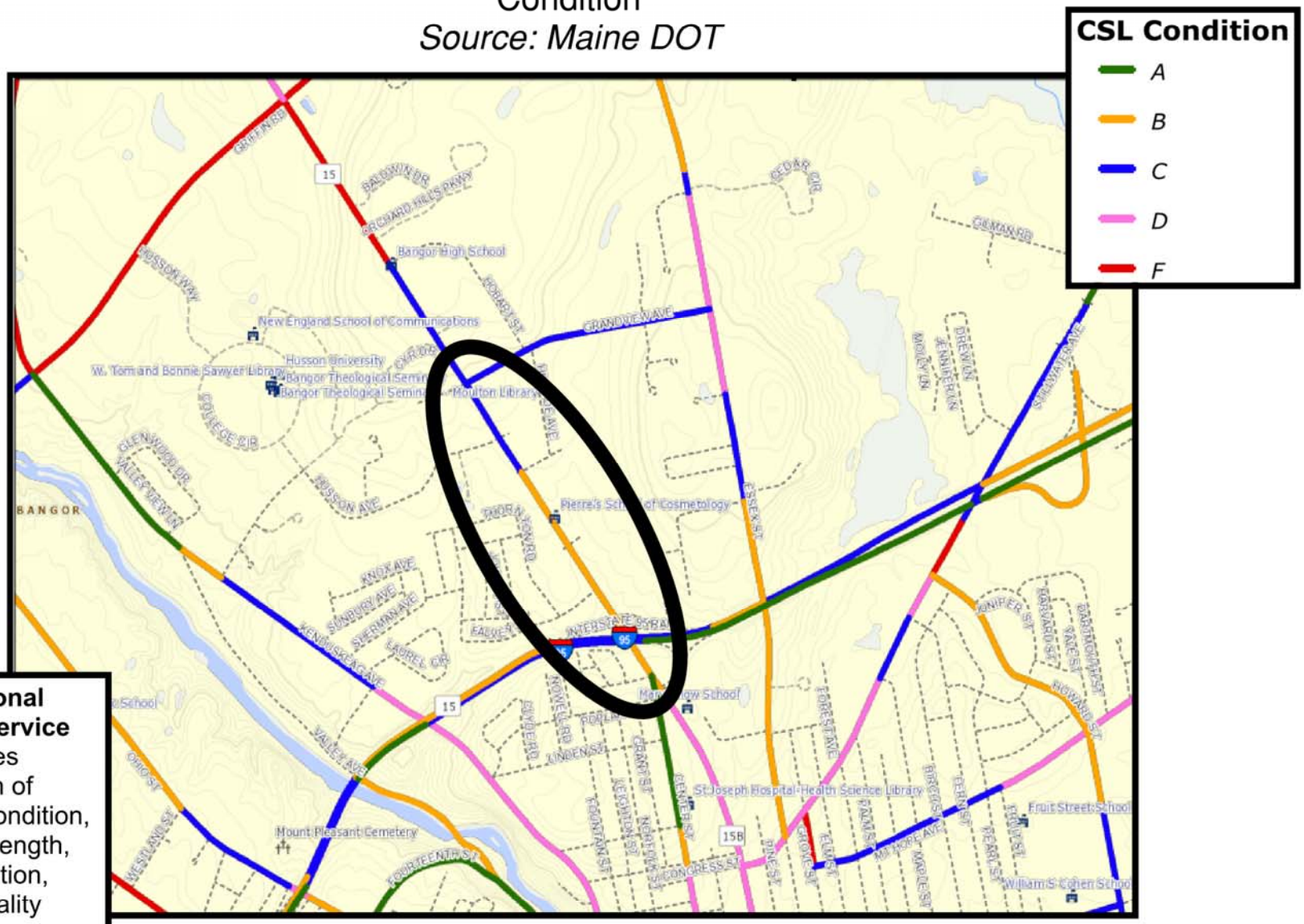
Broadway Corridor Study

City of Bangor Maine

Figure 7: Customer Service Level:

Condition

Source: Maine DOT

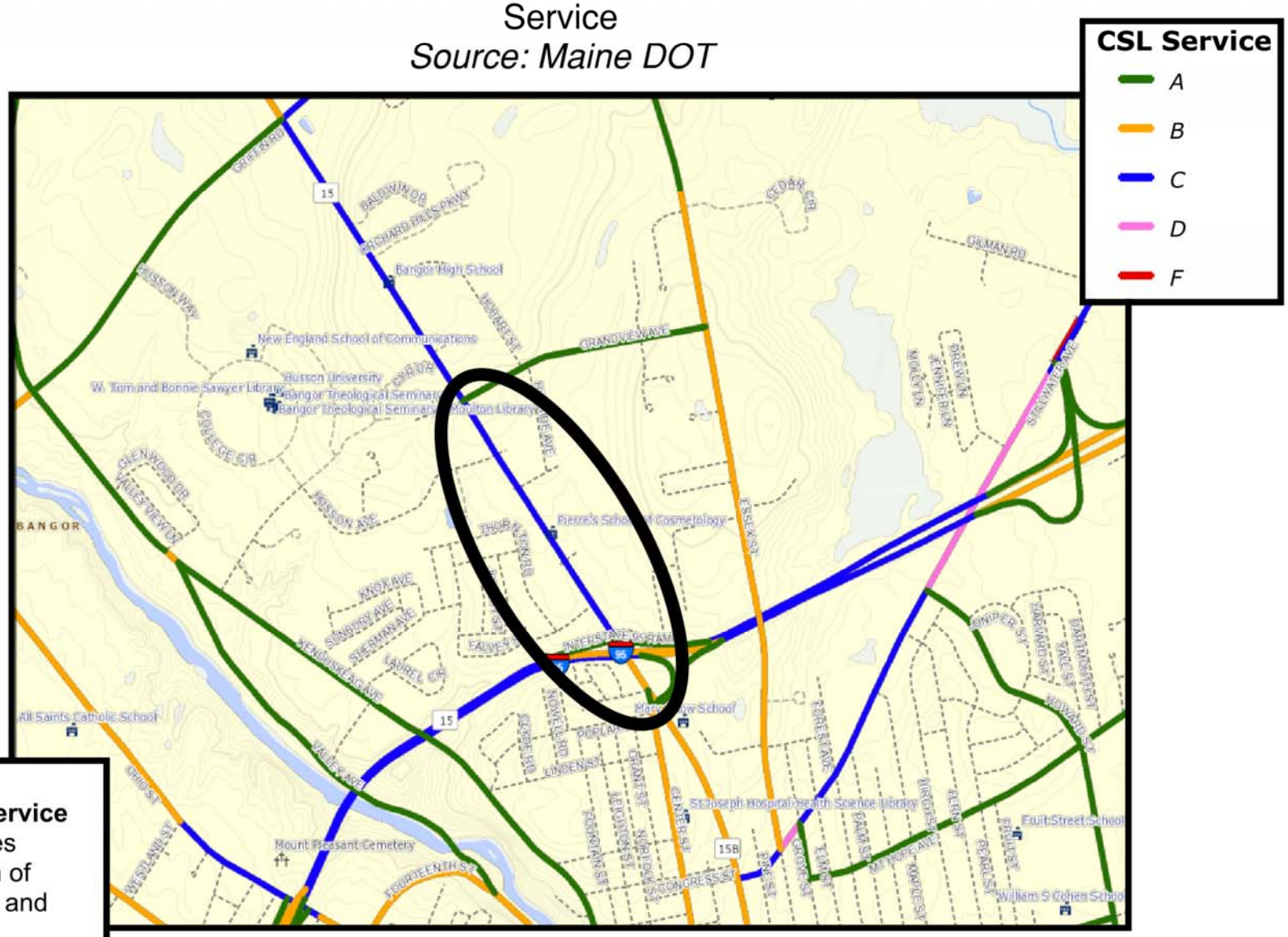


The **Conditional Customer Service Level** includes consideration of Pavement Condition, Roadway Strength, Bridge Condition, and Ride Quality

Figure 8: Customer Service Level:

Service

Source: Maine DOT



The **Service Customer Service Level** includes consideration of posted roads and congestion

BANGOR AREA COMPREHENSIVE BACTS TRANSPORTATION SYSTEM

Broadway Corridor Study

November 2014

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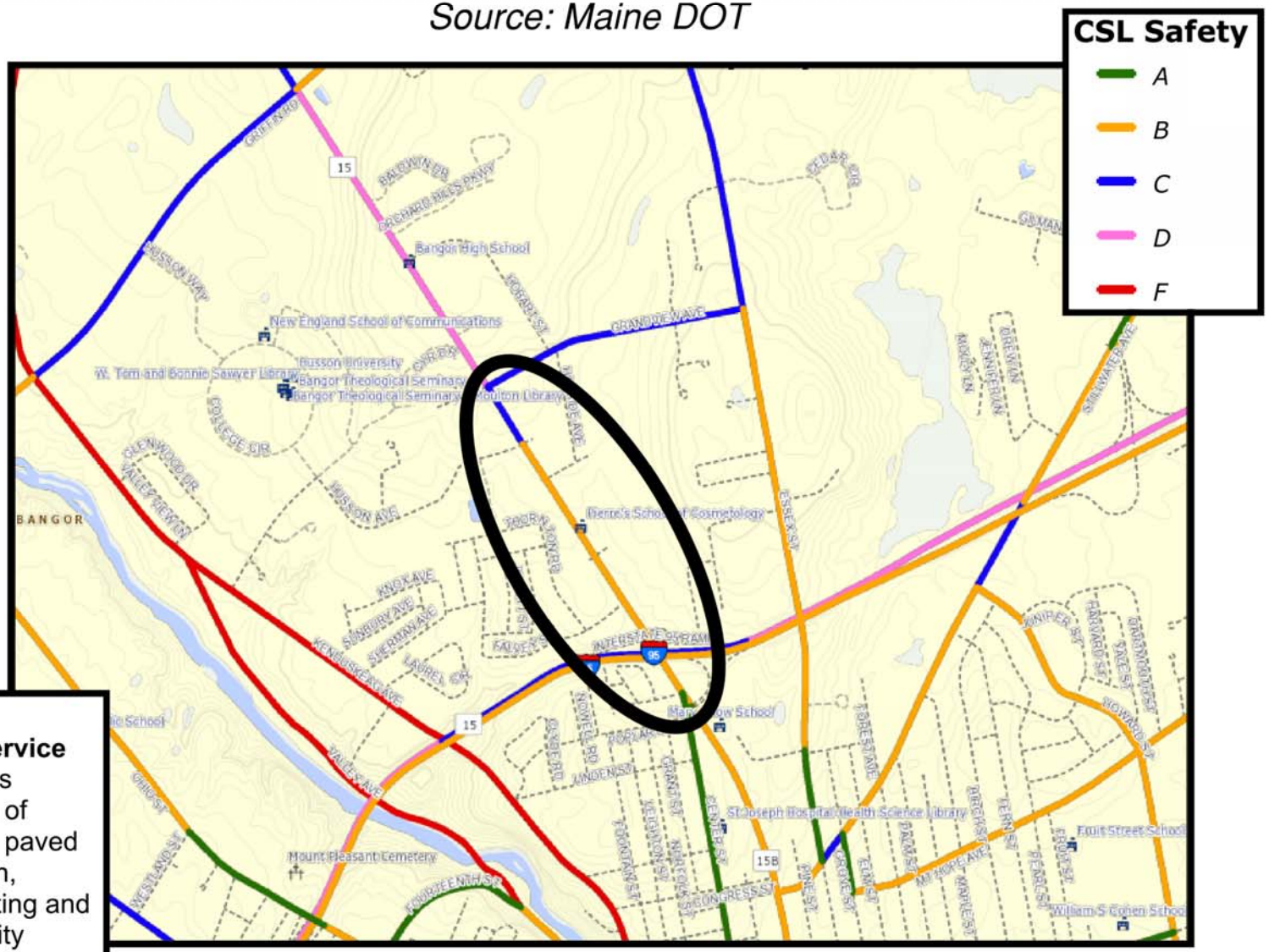
Figure 9: Customer Service Level:

Safety

Source: Maine DOT



The **Service Customer Service Level** includes consideration of crash history, paved roadway width, pavement rutting and bridge reliability

Appendix B:
Site Visit Notes

Figure: Field Notes

October 16, 2014 Site Visit

From Northerly Ramp to the Bridge

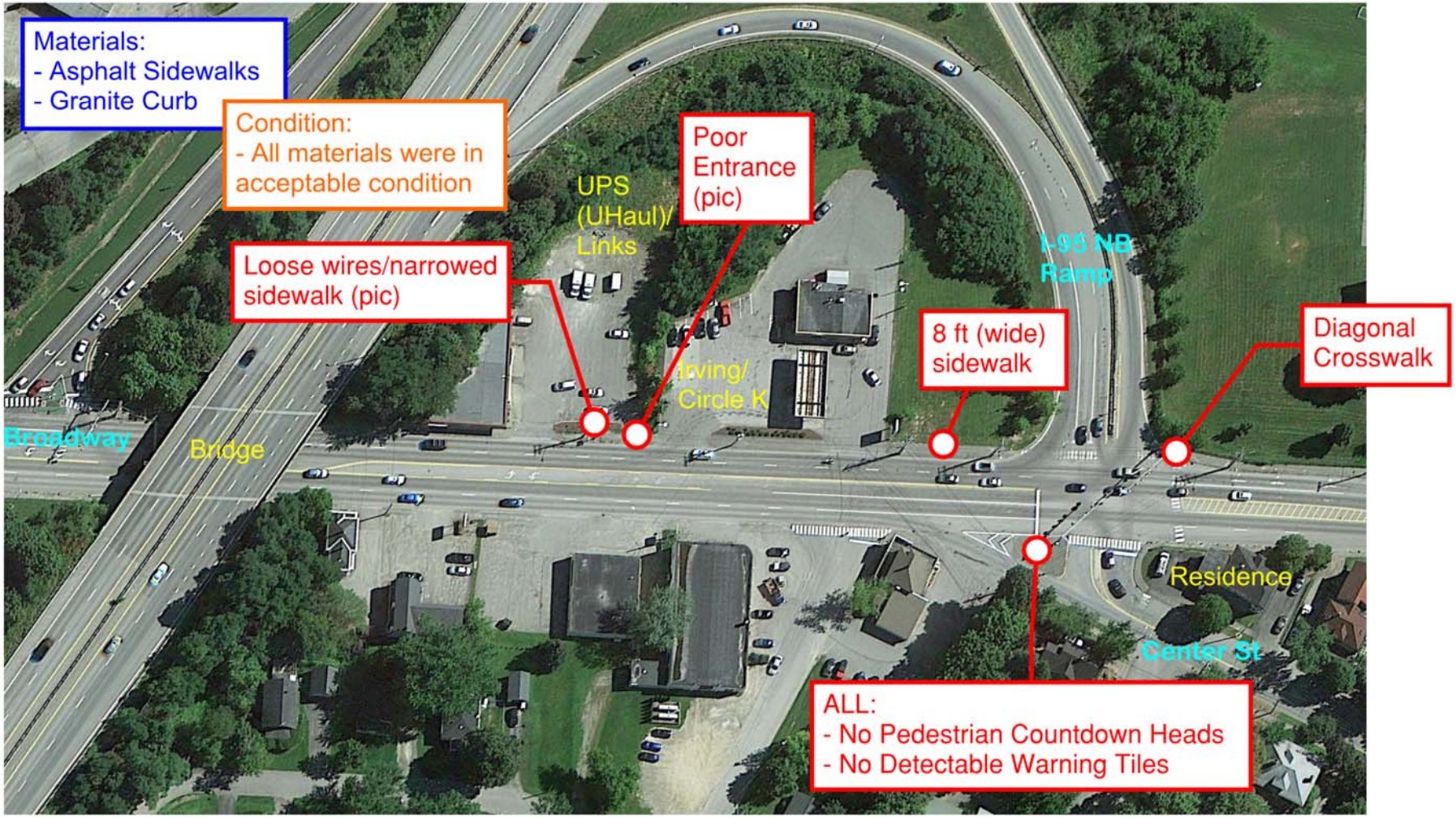


Figure: Field Notes
October 16, 2014 Site Visit
From Northerly Ramp to the Bridge

Figure: Diagonal Crosswalk

Figure: Poor Entrance

Figure: Diagona

ure: Poor Entrance

Figure: Field Notes
October 16, 2014 Site Visit
From Northerly Ramp to the Bridge

Figure: Narrowed Crosswalk

Figure: Loose Wires

Figure: Field Notes
October 16, 2014 Site Visit
From Northerly Ramp to the Bridge

Figure: Poor Crosswalk Alignment

Figure: Poor Cross

Figure: Field Notes

October 16, 2014 Site Visit

The Bridge to the Southerly Ramp

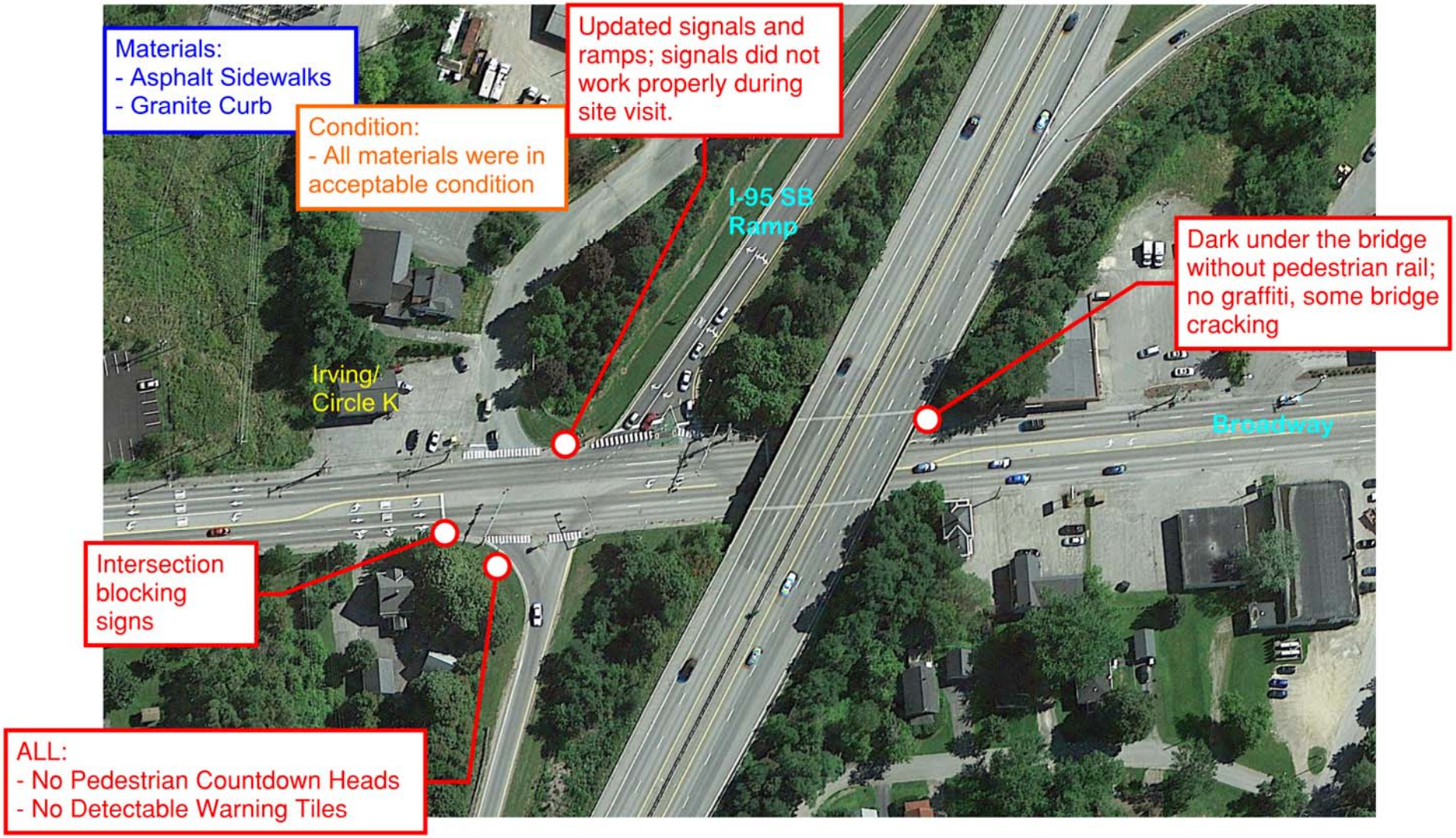


Figure: Field Notes
October 16, 2014 Site Visit
From the Bridge to the Southerly Ramp

Figure: Bridge

Figure: No Lighting

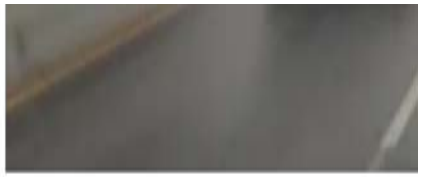


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Figure

Figure: No Lighting

Figure: Field Notes
October 16, 2014 Site Visit
From the Bridge to the Southerly Ramp

Figure: Some updates;
cycling properly

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engineers | planners | scientists

Figure: Field Notes
October 16, 2014 Site Visit
Falvey Street Intersection

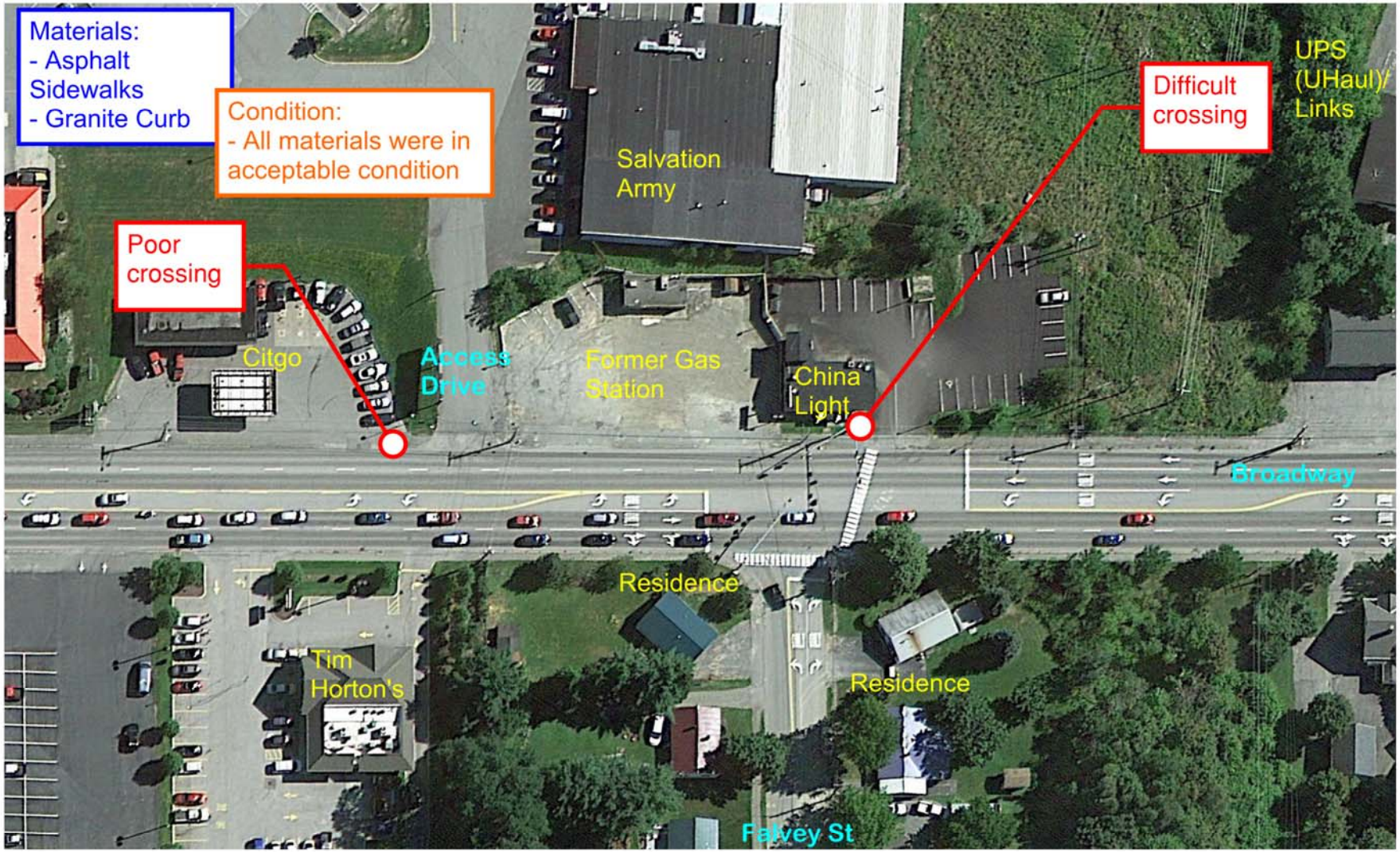

Figure: Field Notes
October 16, 2014 Site Visit
Falvey Street

Figure: Pothole

Figure: Poor curb cut, obstruction,

Figure: Field Notes

October 16, 2014 Site Visit

Intersection with Broadway Shopping Center and McDonald's Exit

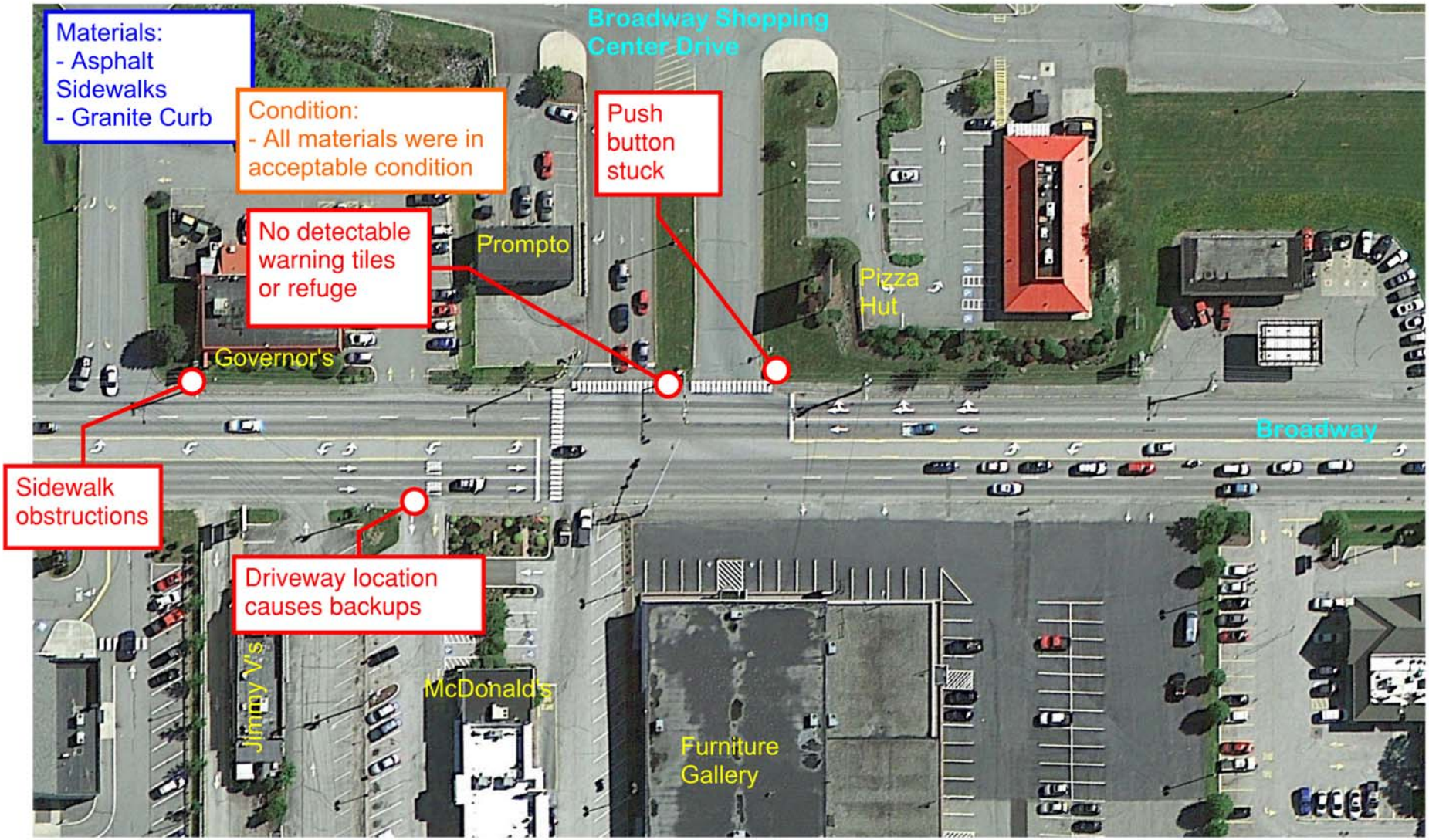

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Figure: Field Notes
October 16, 2014 Site Visit
Governor's Crosswalk

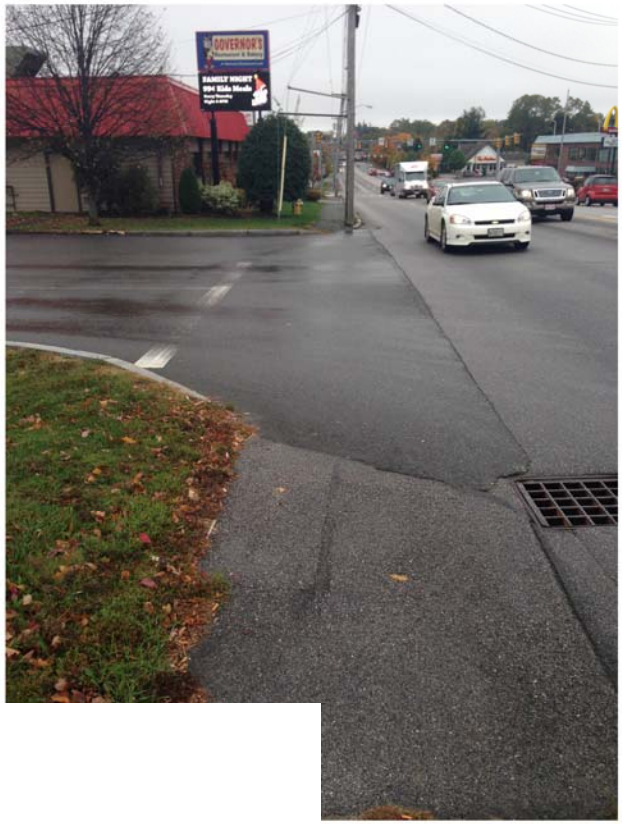


Figure: Governor's Crosswalk

Figure: Pizza Hut Crossing

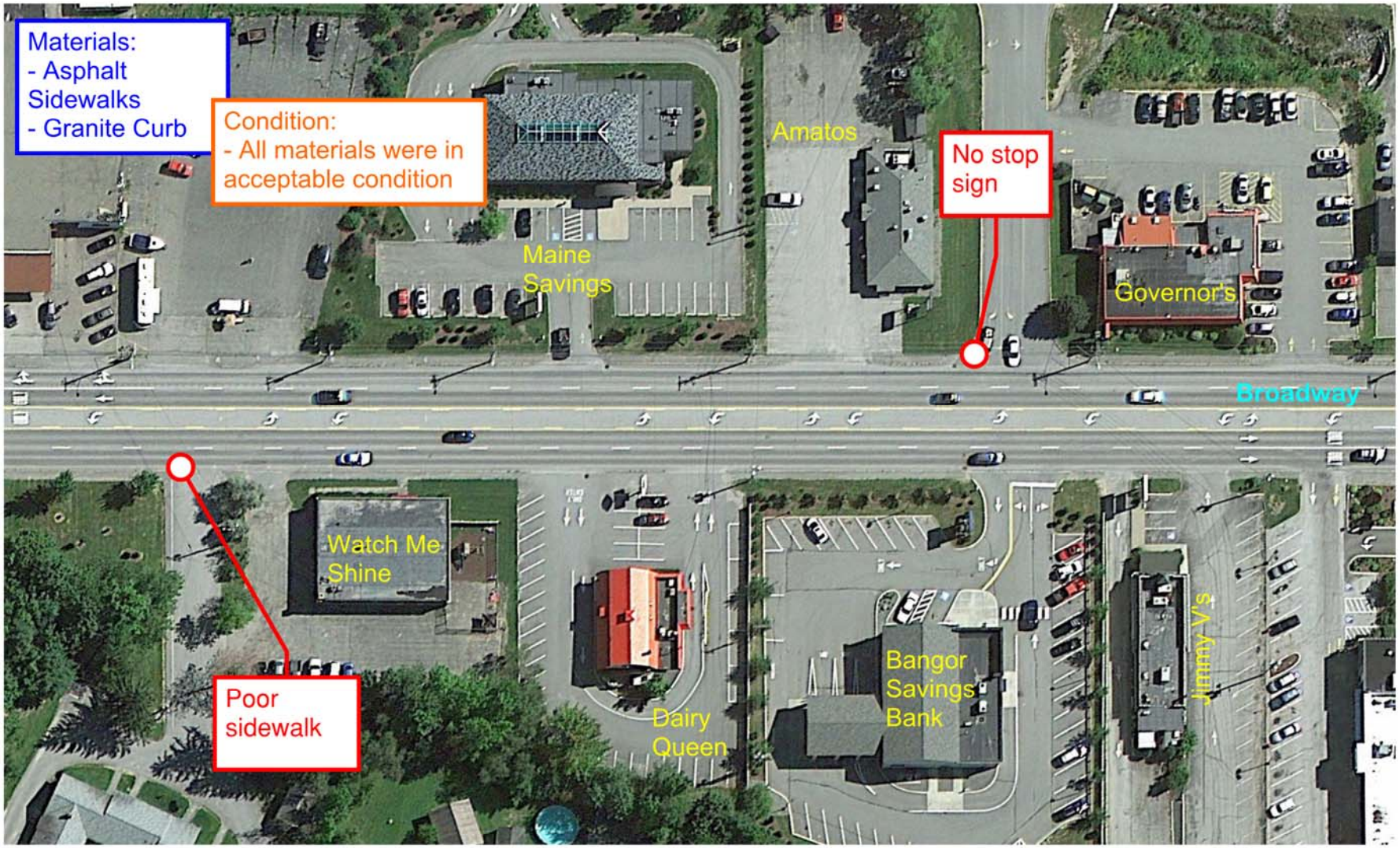
Figure: Governo

ure: Pizza Hut Crossing

Figure: Field Notes

October 16, 2014 Site Visit

Between the Shopping Center and School Street



BANGOR AREA COMPREHENSIVE BACTS TRANSPORTATION SYSTEM

Broadway Corridor Study

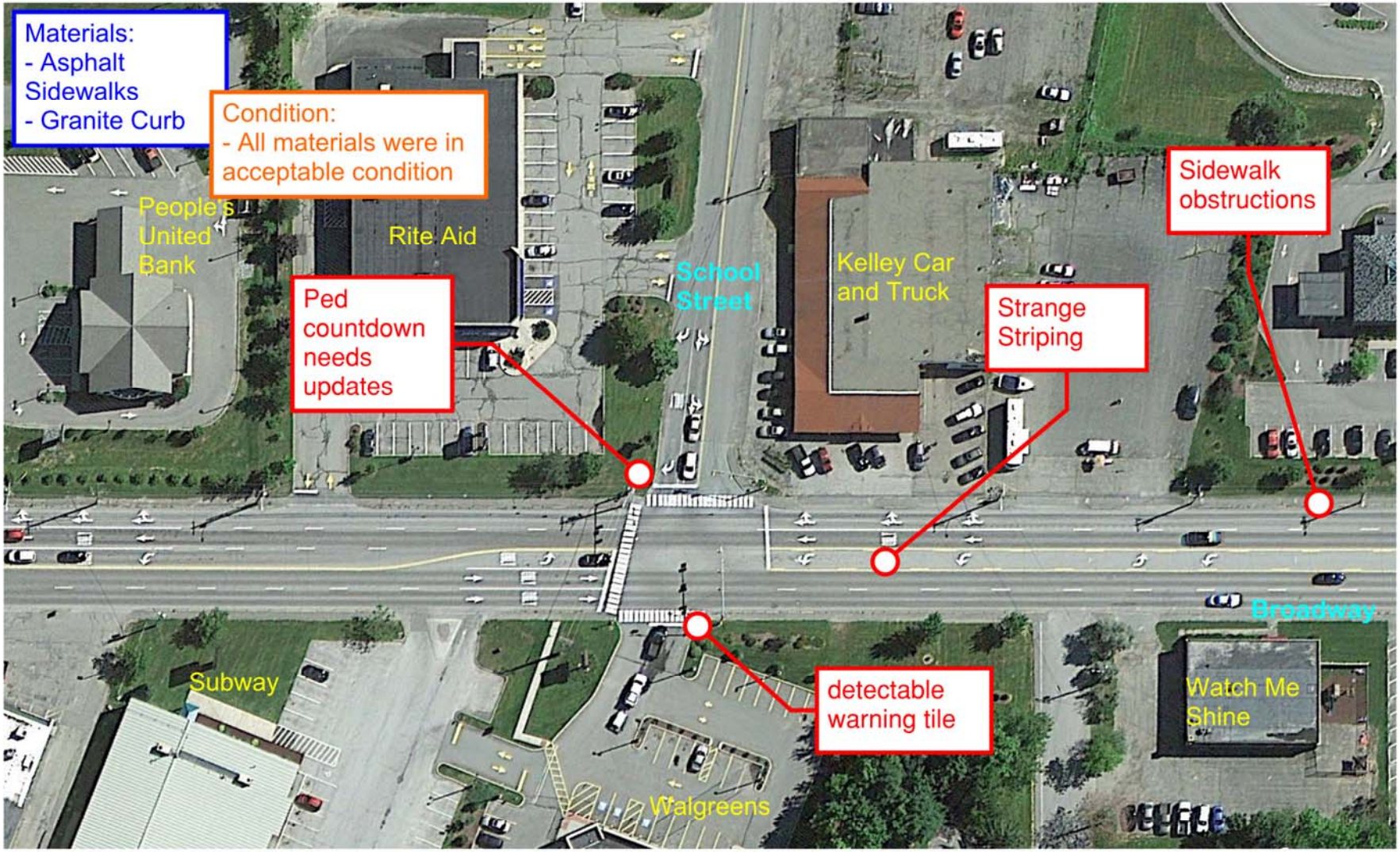
City of Bangor Maine

Figure: Field Notes
October 16, 2014 Site Visit
Between Shopping Center and School Street

Figure: Concrete disrepair

Figure: Con

Figure: Field Notes
October 16, 2014 Site Visit
School Street Intersection



BANGOR AREA COMPREHENSIVE BACTS TRANSPORTATION SYSTEM

Broadway Corridor Study

City of Bangor Maine

Figure: Field Notes
October 16, 2014 Site Visit
School Street

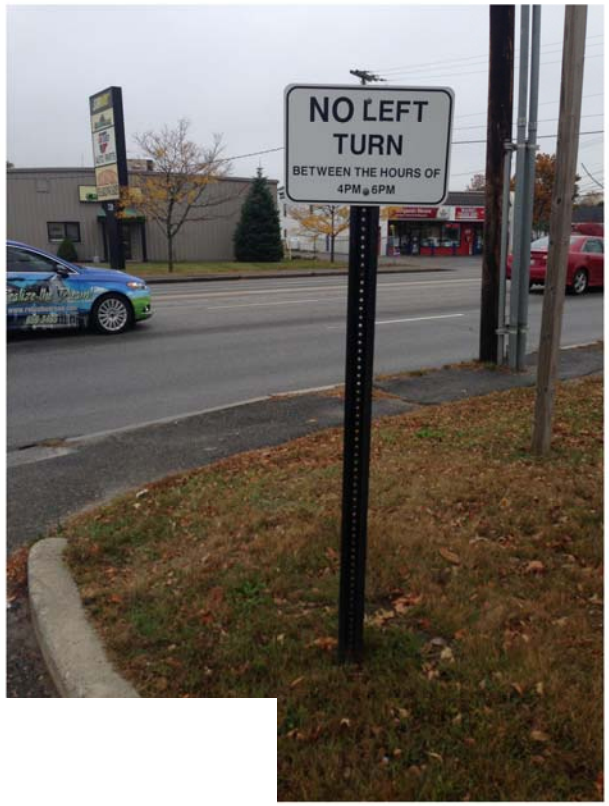


Figure: Sign

Figure: Sidewalk Obstructions

Figu

re: Sidewalk Obstructions

Figure: Field Notes
October 16, 2014 Site Visit
School Street

Figure: Detectable warning tile at Walgreens

Figure: Poor sidewalk condition

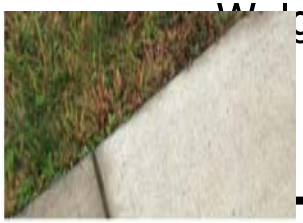


Figure: Field Notes
October 16, 2014 Site Visit
Intersection with Husson Ave

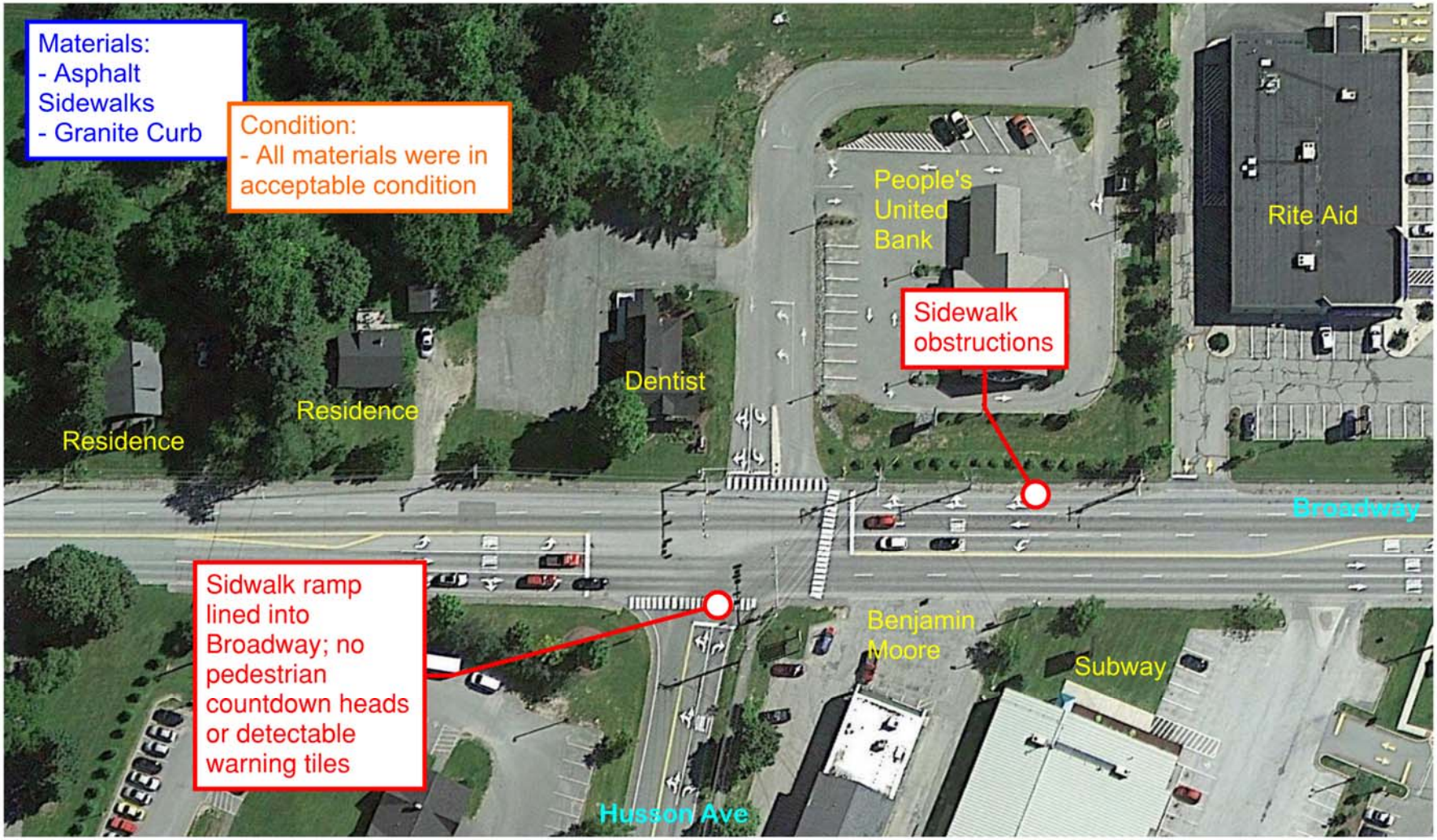


Figure: Field Notes
October 16, 2014 Site Visit
Husson Ave

Figure: Sidewalk Obstruction

Figure: Sidewalk Obstruction

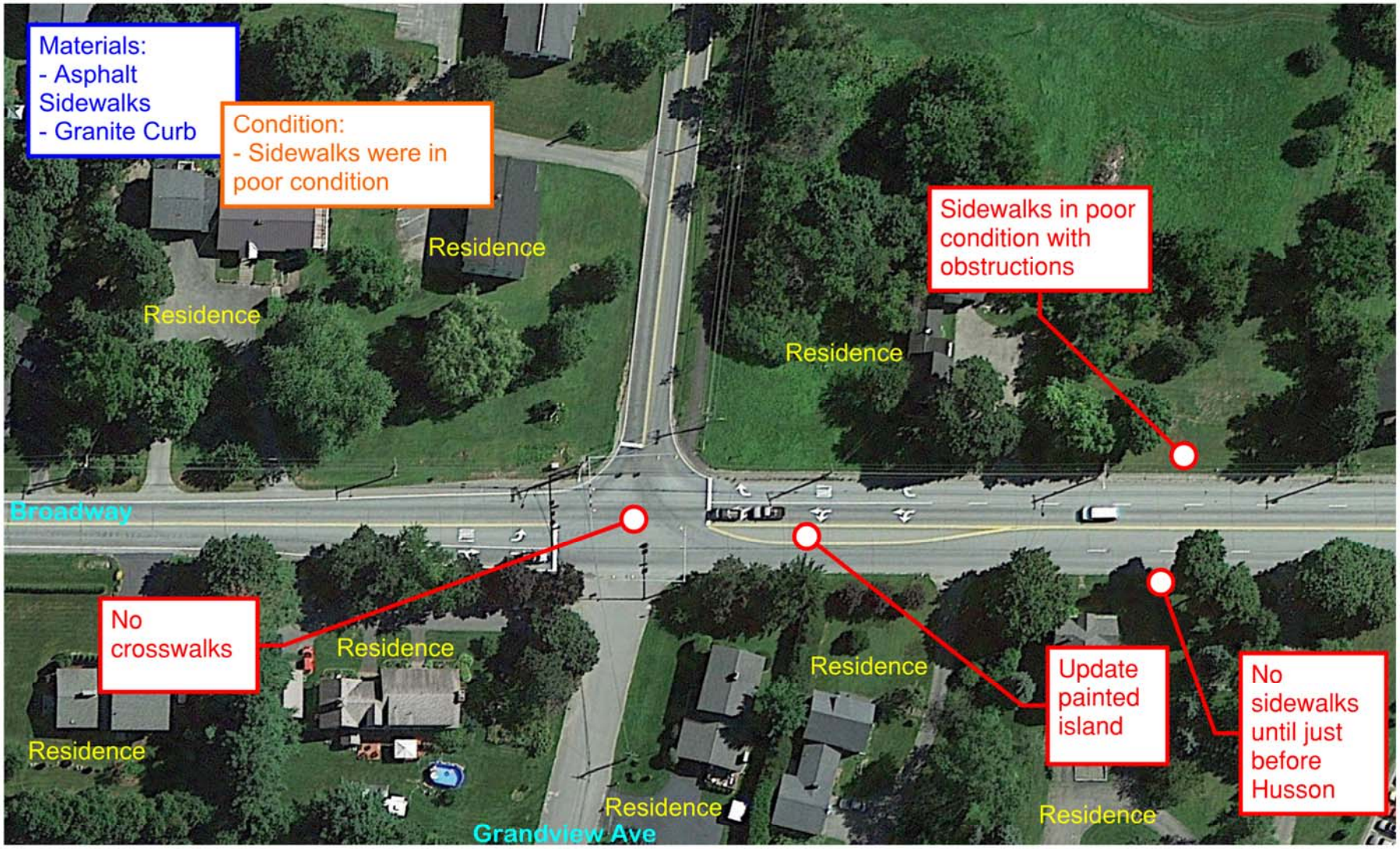
Figure: Sidev

ıre: Sidewalk Obstruction

Figure: Field Notes

October 16, 2014 Site Visit

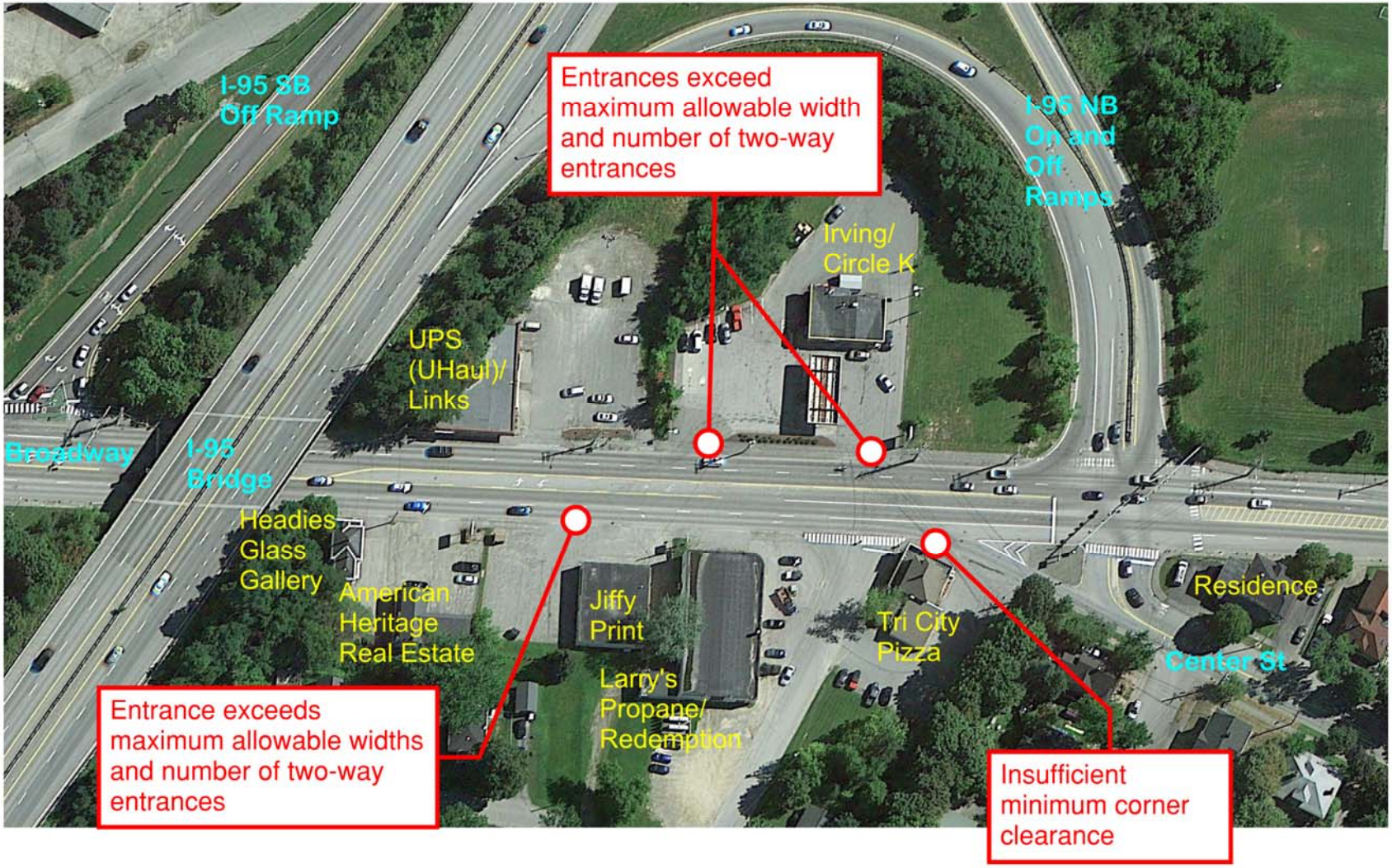
Intersection with Grandview Ave



Broadway Corridor Study

Access Management

From Northerly Ramp to the Bridge



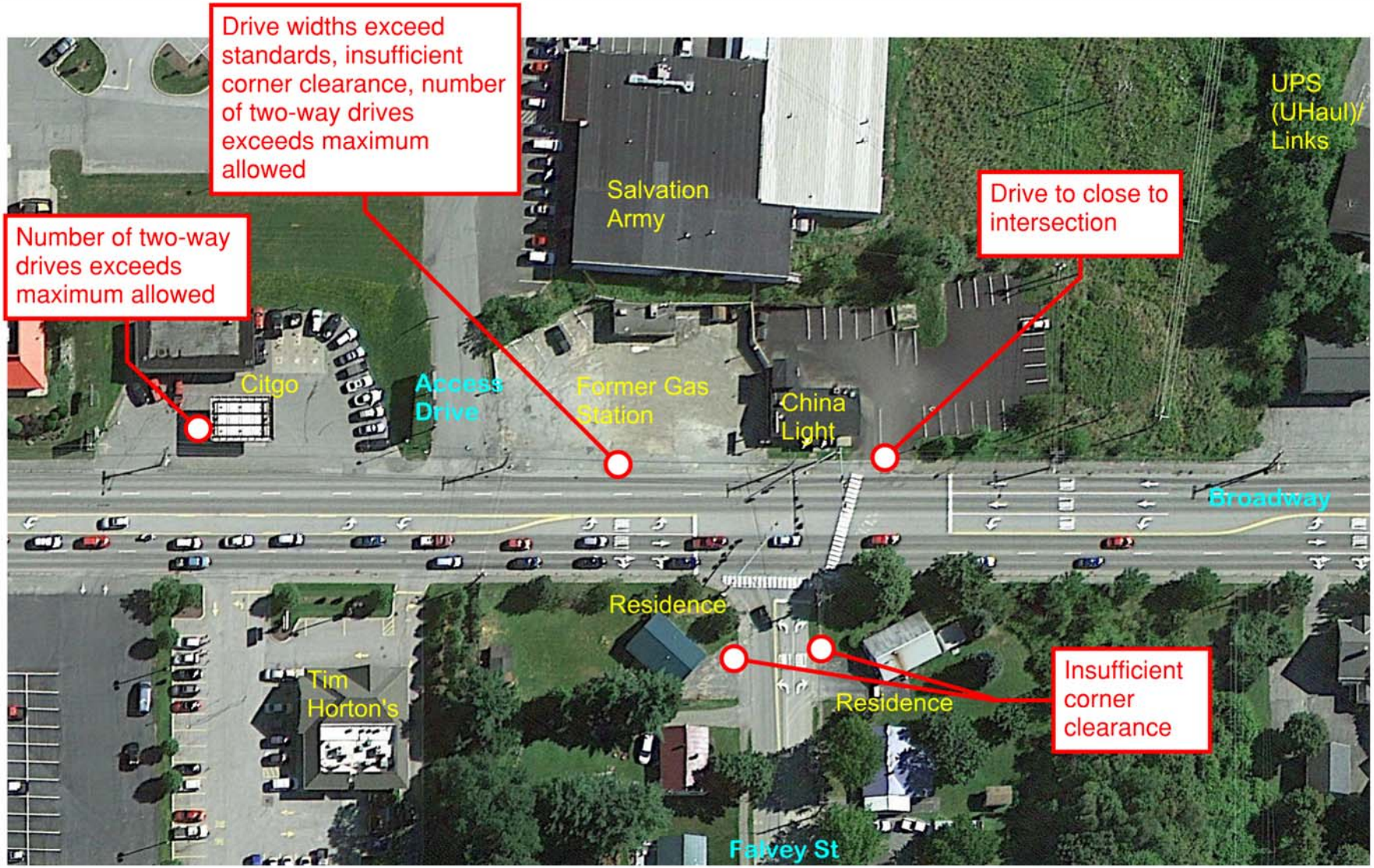
BANGOR AREA COMPREHENSIVE BACTS TRANSPORTATION SYSTEM

Broadway Corridor Study

City of Bangor Maine

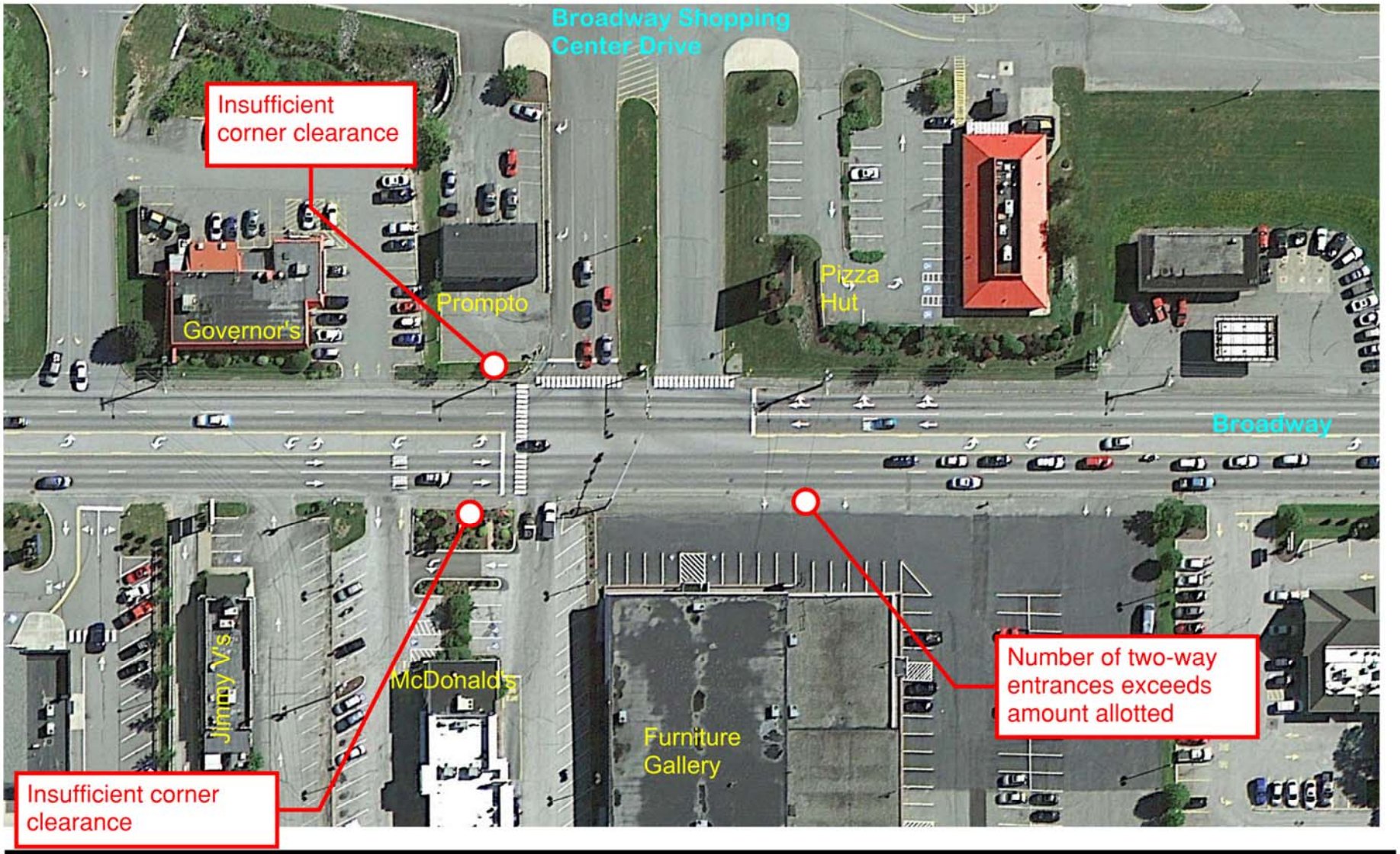
Access Management

Falvey Street Intersection



Access Management

Intersection with Broadway Shopping Center and McDonald's Exit



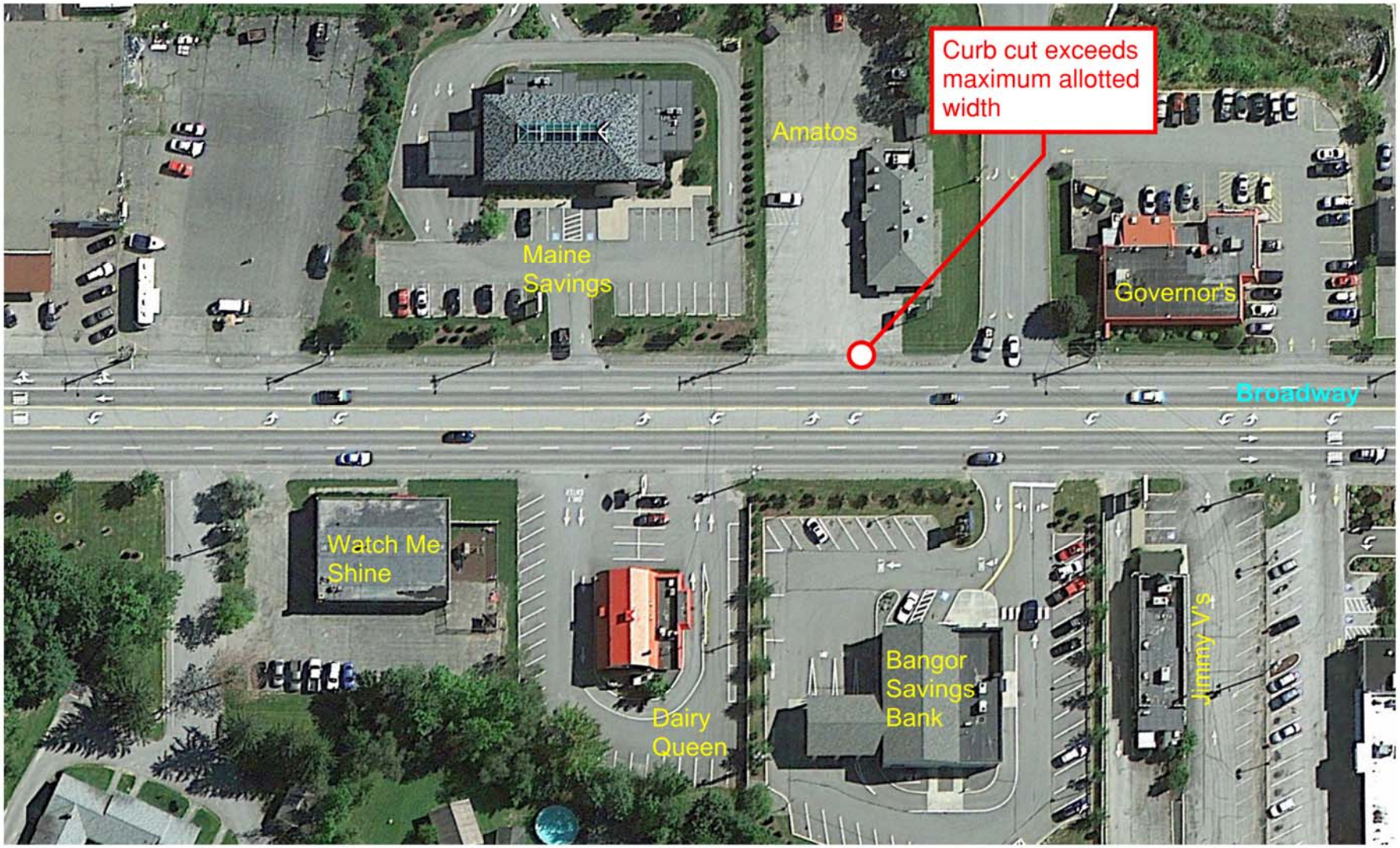
BANGOR AREA COMPREHENSIVE BACTS TRANSPORTATION SYSTEM

Broadway Corridor Study

City of Bangor Maine

Access Management

Between the Shopping Center and School Street



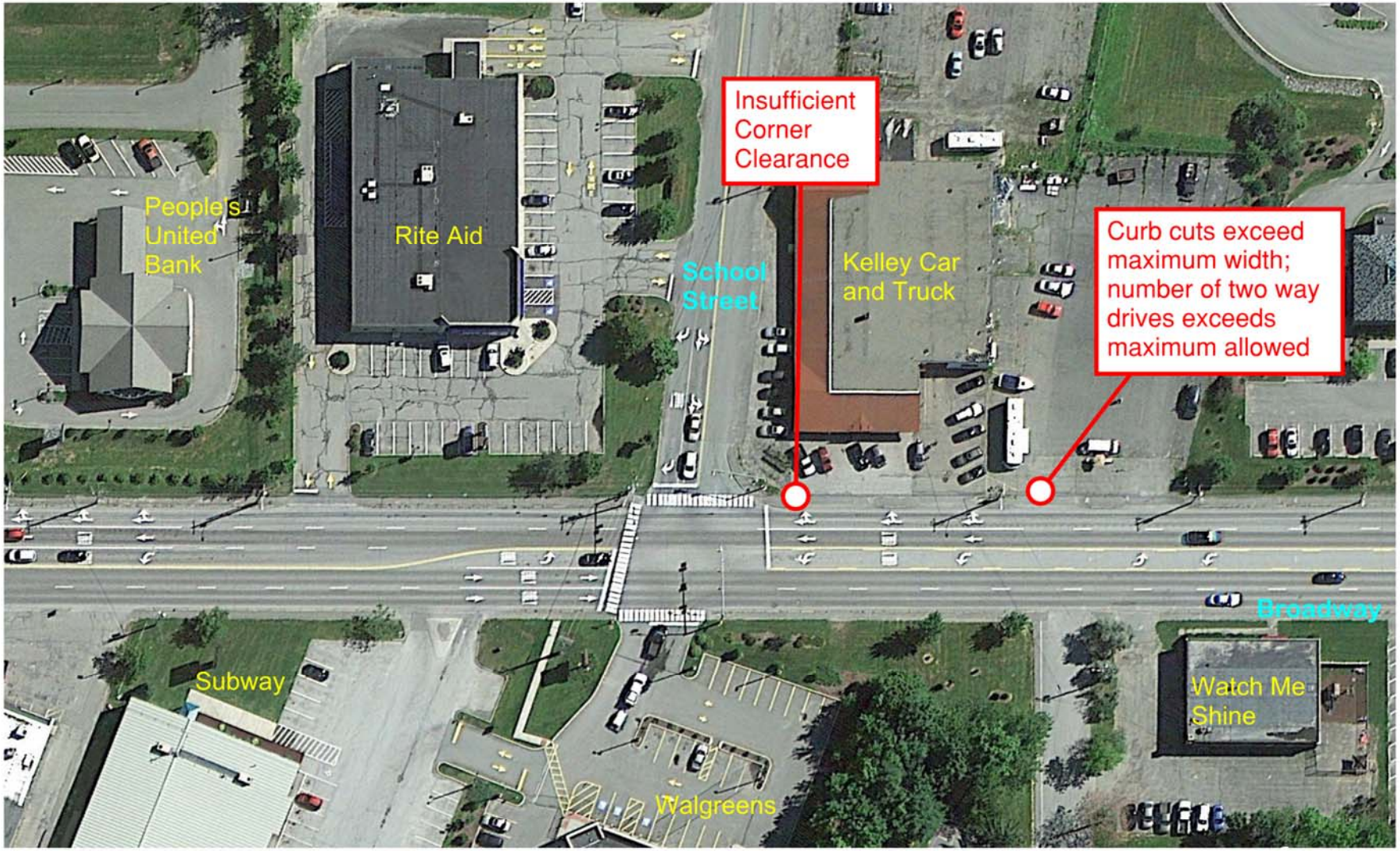
BANGOR AREA COMPREHENSIVE BACTS TRANSPORTATION SYSTEM

Broadway Corridor Study

City of Bangor Maine

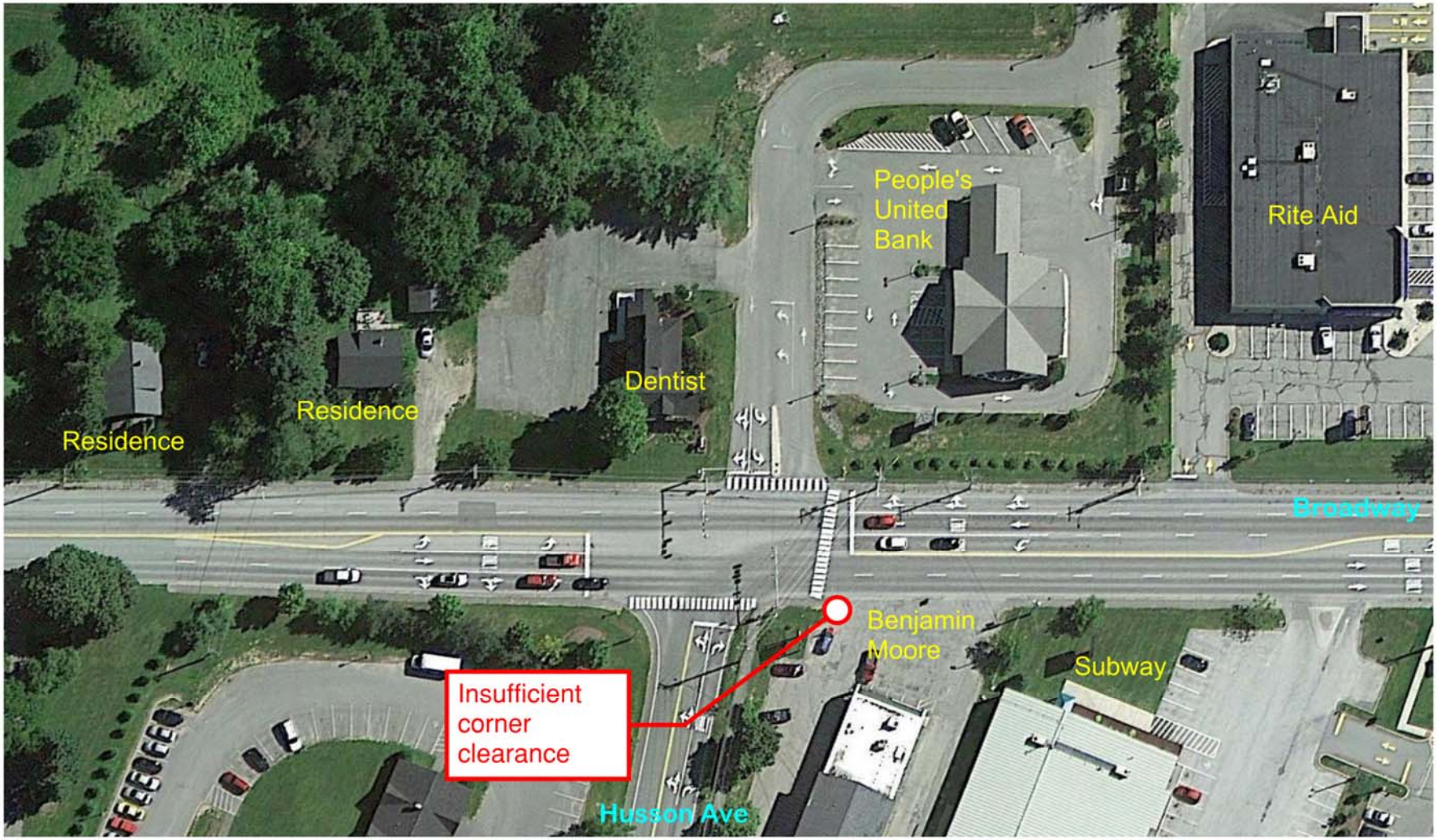
Access Management

School Street Intersection



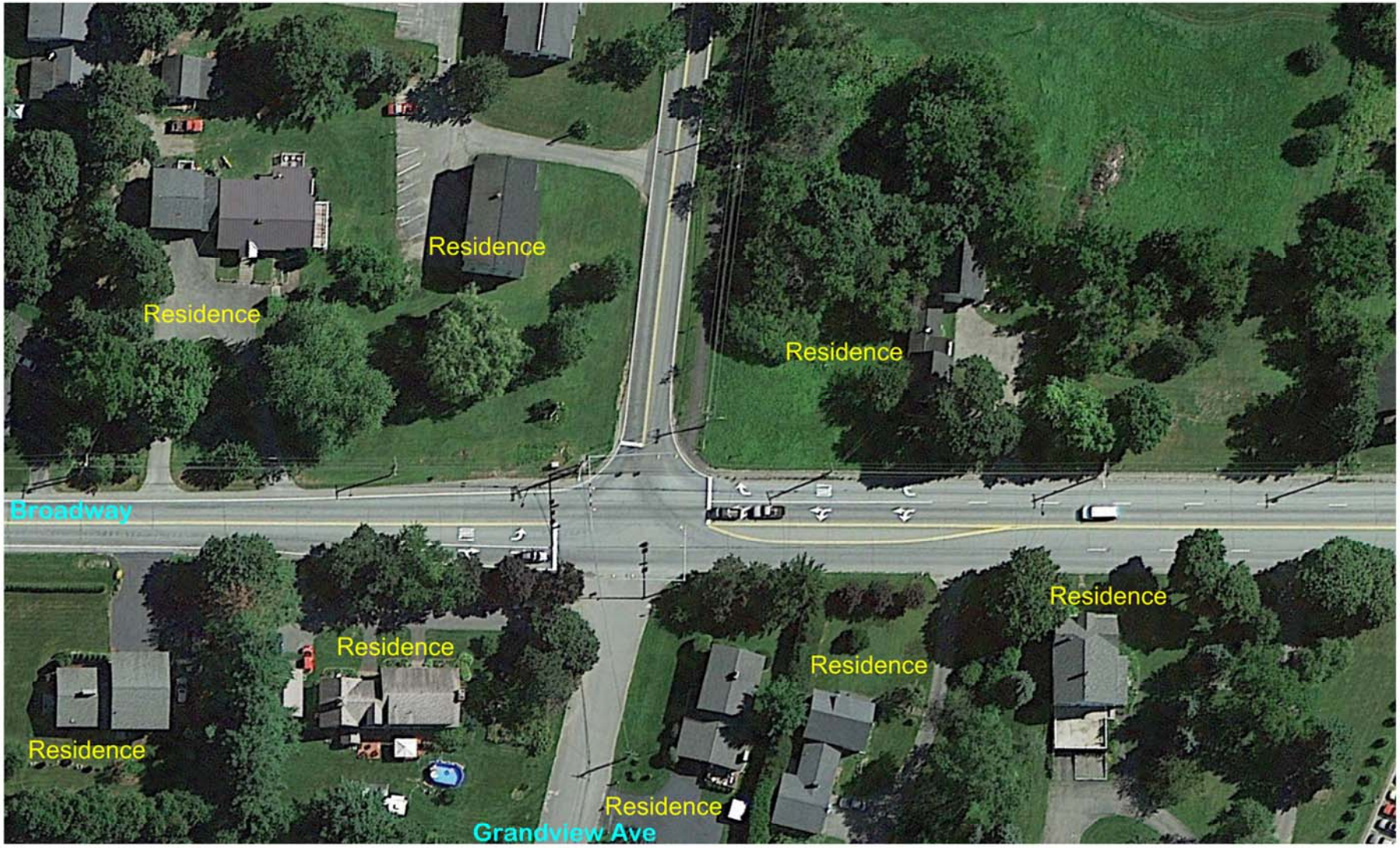
Access Management

Intersection with Husson Ave



Access Management

Intersection with Grandview Ave



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Broadway Corridor Study

City of Bangor Maine