

Evaluation and Recommendations for High Crash Locations in Kennebec County

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Draft, December, 2016; Revised, with DOT Action Plan added, June, 2017

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Introduction:

The evaluation of High Crash Locations (HCL) was completed at the request of the Maine Department of Transportation (DOT). The purpose of the study was to identify and prioritize HCL's in Kennebec County and, through a combination of crash analysis, local knowledge and expertise, and site viewing, provide recommendations to address identified hazards. Recommendations are intended to be limited to low-cost, short-term fixes, but in some cases a capital project may be suggested.

The prioritization process consisted of identifying the top 20 or so HCL intersections (nodes) and roadway sections, then eliminating some because of recent or planned changes or because they were in high-traffic, urban areas where few low-cost improvements could be expected, and combining some that were adjacent or in proximity. The selection process resulted in 23 HCL's in 17 locations, although Augusta's Western Ave. was later dropped from analysis.

Site visits were conducted on all locations. The visits included the DOT regional traffic engineer and regional planner, and local officials usually including some combination of town manager, public safety representative, and public works representative. Local problems and issues were discussed, which in many situations included roadway issues not directly associated with the HCL.

Each individual report includes an analysis of the roadways involved and crash history (diagrams in Appendix), the observations from the site visit, and a set of recommendations. Data boxes include DOT-reported daily traffic loads (AADT), trend (if any) in traffic volume (e.g. = increasing), DOT's customer service levels (CSL) with "major factors," if any, and critical rate factors (CRF). Accompanying images help to illustrate roadway conditions. The order of the locations in the report is the order in which they were viewed by the team and should not be construed to represent priority.

MONMOUTH: Intersection of Routes 202 and 132 (Main Street) – Node 27882

This intersection is located along a high-speed arterial corridor in a rural portion of Monmouth. The intersecting roads serve Monmouth and North Monmouth villages. The intersection is currently controlled by a flashing signal. There is light commercial development at two of the four corners.

Route Description:

Route 202 is a mobility corridor/retrograde arterial, constructed to NHS standards. The alignment is moderately hilly but straight, with an upgrade westbound towards the intersection. It is used for commuter access and as an alternate route between Augusta and Lewiston-Auburn. There is no speed reduction through Monmouth.

Route 132 (Main Street) originates at Route 202 and runs southward to Monmouth village and towards Sabattus. It is a major collector listed as a highway priority 4. Although it provides primarily local access, traffic volumes have been increasing. Local officials predicted that traffic would grow as a result of the Sabattus Maine Turnpike interchange.

Blaisdell Road is the cross street to Main Street. It is a town way and serves local traffic to North Monmouth. Traffic volumes are under 1,000 AADT and road width is below standard.

Crash Summary (Diagram page 53):

Of the 11 crashes at the intersection, five resulted in injury. There appear to be a variety of causes, with no clear trend. All but two involve turning movements. Five of the 11 occurred in the early evening.

Site Assessment:

The hazards at this intersection clearly involve vehicles turning while other vehicles are travelling at highway speeds. Although well-signaled, the intersection is at the top of a grade, where westbound left-turning vehicles often stand while waiting for oncoming traffic to clear. This includes tractor-trailers turning on to Main Street bound for the Sabattus interchange, which must also negotiate a wide turn if vehicles are standing at the stop line on Main Street. Following

By the Numbers: Route 202	
Func.Class/ jurisdiction	Minor arterial
Priority	1
AADT	6,090 ↘
Speed Limit	55
CSL Levels	
Safety	B
Service	A
Condition	B

By the Numbers: Route 132	
Func.Class/ jurisdiction	Major coll./ state aid
Priority	4
AADT	3,096 ↗
Speed Limit	45
CSL Levels	
Safety	C (crash history)
Service	A
Condition	B

Crash History – Node 27882	
Total Crashes	11
CRF	3.38
Rank in County	10

traffic often passes in the breakdown lane. It was noted during the site visit that one of the flashing beacon lights was inoperative.

An open driveway cut on the northwest corner has recently been closed. There was some concern about sight distance to the west standing at Main Street due to vegetation.

Recommendations:

- Repair inoperative flashing beacon light.
- Clear right-of-way vegetation in distance from southwest corner.
- Evaluate need for left-turn pocket westbound on Route 202.
- Widen throat at Main Street leg to accommodate the swing of large trucks.



Monmouth: Looking east on Route 202 towards Main Street intersection on right



*Monmouth: Route 202/Main Street (to south)/Blaisdell Street (to north)
(Image: Google Earth)*

MONMOUTH: Intersection of Routes 202 and Bog/Blue Roads – Node 27880

This intersection is located along a high-speed arterial corridor in a rural portion of Monmouth. The intersecting roads serve Monmouth village and Leeds. Traffic is controlled by STOP signs on Blue and Bog legs. There is light commercial development on two of the corners.

Route Description:

Route 202 is a mobility corridor/retrograde arterial, constructed to NHS standards. The alignment is moderately hilly with a very slight curve through the intersection. It is used for commuter access and as an alternate route between Augusta and Lewiston-Auburn. There is no speed reduction through Monmouth.

Bog Road and Blue Road are town ways, with traffic below 1,000 AADT. The speed limit on Blue Road is 40 MPH, on Bog Road it is 45. Blue Road leads directly into Monmouth village, but both roads serve primarily local traffic.

Crash Summary(Diagram page 53):

Of the 14 crashes at the intersection, 7 resulted in injury, two serious. Four crashes were attributed to failure to yield, with one “disregarding traffic sign.” Snow appears to be a factor and most occurred January through March. There is no time-of-day trend.

Site Assessment:

The hazards at this intersection are typical of a high speed, low-volume rural crossing. There is a slight reduction of sight distance on Route 202 heading east into the intersection due to a gradual curve and vegetation on the northwest corner. Additional evergreen vegetation south of 202 and along Blue Road may contribute to icy conditions, but may be located on private property. The business on the northeast corner is a fireworks store, seasonally busy, and the tier of parking along the curb when occupied interferes with sight distance.

Recommendations:

- Clear vegetation on right-of-way west from northwest corner.
- Evaluate trees on Blue Road and southeast corner of intersection for shading, and remove if in right-of-way.
- Extend double yellow striping on Bog Road closer to Route 202 shoulder to encourage cars to move closer to the intersection.

By the Numbers: Route 202	
Func.Class/ jurisdiction	Minor arterial
Priority	1
AADT	6,400 ↘
Speed Limit	55
CSL Levels	
Safety	B
Service	A
Condition	B
Crash History – Node 27880	
Total Crashes	14
CRF	5.25
Rank in County	5

- Relocate the STOP Bar closer to the Rte. 202 shoulder line and relocate the STOP signs to increase their visibility.
- Consider adding oversized STOP signs on Bog Road to improve visibility.
- Negotiate removal or relocation of parking tier with business owner on northeast corner (may be in state r/w).



Monmouth: Intersection of Route 202/Blue Road (to southeast)/Bog Road (to northwest). Note fireworks store on north corner and tall vegetation close to road (Image: Google Earth)



Looking southwest on Route 202 towards Bog Road on right from fireworks parking lot.

WINTHROP: Intersection of Routes 202 and Main Street – Node P28703

This is a complex intersection, located along high-speed Route 202 and the primary access into downtown Winthrop. At the intersection, both Route 202 and Main Street are separated, but all legs cross at grade with no signalization, creating two crossroads, two slip lanes, and four yield points, all with fairly short stacking. There is high-volume commercial development accessible on both corners from the Main Street leg. The intersection is to be reconfigured under a current MaineDOT project.

Route Description:

Route 202 is a mobility corridor/retrograde arterial, constructed to NHS standards. It is a separated, four-lane highway, although a portion of both lanes is used for acceleration/deceleration at the junction. The junction is at the top of a small ridge, with a significant upgrade approaching from both directions. The highway is used as a commercial and commuter route as well as an alternate route from Augusta to Lewiston-Auburn. It was built as a bypass of downtown Winthrop, and there is no speed reduction in the vicinity of the intersection.

Main Street formerly served as the Route 202 entrance to downtown Winthrop, now downgraded to a collector road. It has been widened and separated for the purpose of the intersection. The road is lined with commercial development and is the commercial growth area skirting the downtown.

Crash Summary:

Crash diagram not requested because the planned change in geometry will change the intersection dynamics.

Site Assessment:

The new design for the intersection was discussed with town manager, police chief and emergency service director. The new design allows for separated acceleration and deceleration lanes for eastbound Route 202. This still retains high-speed crossing movements with westbound Route 202.

Recommendations:

- Improve visibility of STOP and YIELD signs for Main Street traffic entering Route 202.

By the Numbers: Route 202	
Func.Class/ jurisdiction	Minor arterial
Priority	1
AADT	5,230 \uparrow EB 3,682 \uparrow WB
Speed Limit	55
CSL Levels	
Safety	B (crash history)
Service	B EB, A WB
Condition	A

By the Numbers: Main Street	
Func.Class/ jurisdiction	Major coll./ state aid
Priority	4
AADT	9,090 \uparrow
Speed Limit	35
CSL Levels	
Safety	A
Service	A/B
Condition	A/B

Crash History – Node P28703	
Total Crashes	25
CRF	4.78
Rank in County	7



Winthrop: Intersection of Main Street and Route 202, current design. (Image: Google Earth)

WINTHROP: Route 135 (Winthrop Center Road) from Narrows Pond Road to Monmouth Town Line -- Section 3943572

This is a minor collector road in a rural location, with low traffic volumes and design issues typical of “unbuilt” sections.

Route Description:

Route 135 is a rural highway, providing access primarily to lakefront properties along Cobbossee Lake. There are no clusters of development along any portion of the segment, although there are at least seven intersections with camp roads. It is a narrow, two lane road with gravel shoulders. The alignment is flat and straight at the northern end, somewhat hilly with curves to the south.

By the Numbers: Route 135	
Func.Class/ jurisdiction	Minor coll./ state aid
Priority	5
AADT	918
Speed Limit	45
CSL Levels	
Safety	C (crash history)
Service	C (posting)
Condition	B (ride quality)

Crash Summary(Diagram page 48):

Of the 13 crashes, 6 resulted in injury. Only one involved more than one vehicle. Three involved an animal. Six involved unsafe speed – almost all in snowy conditions. There is no trend in time of day or year.

Crash History – Segment 3943572	
Total Crashes	13
CRF	1.51
Rank in County	18

Site Assessment:

The issues are with the hilly section between Longfellow Lane and Pine Point Lane. A lot of accidents are run-off-the-road. The road is narrow, with gravel shoulders and vegetation close to the road. The road is crowned, even on curve sections. There is generally a bank (cut slope) on one side and a fill on the other, but the fill is not steep nor long enough to warrant guide rail. Given the heavily-wooded ridge running along the west side of the road, it is easy to see how the road could become icy for extended periods in winter.

Recommendations:

- Provide curve warning signs where warranted.
- Work with adjoining landowners to remove some of the trees to open up the road to more winter sun.
- Increase winter maintenance to reduce icy conditions.
- At the next Light Capital Paving, grind the crown or build up the outside on curves, to eliminate the slight reverse superelevation.



Winthrop Center Road north of Pine Point Lane, looking north.

MANCHESTER: Route 202 (Western Ave.) from Readfield Road to Old Winthrop Road – Sections 3108742, 3115993

US Route 202 through Manchester is a high-traffic corridor serving commuter traffic into Augusta as well as commercial traffic between Augusta and Lewiston-Auburn. The referenced segment is about 1,000 feet long and encompasses six road intersections and nine commercial driveways. It has been a four-lane highway with a center left turn lane, but the DOT has been testing different configurations and controls to better manage traffic. The intersection of Route 202 and Readfield Road has a full signal, with a slip lane off of Route 202 westbound. The intersection of Route 202 and Granite Hill Road is also signalized.

Route Description:

US Route 202 is a minor arterial with a high traffic count, serving the center and commercial areas of Manchester. It is a mobility corridor/retrograde arterial, constructed to NHS standards. It has a history of congestion and safety issues, though being designed for high traffic volumes. This is probably due to the high frequency of curb cuts.

This segment of Route 202 intersects with one state highway, two state aid roads, two town ways and one private road (industrial park.) Route 17 (Readfield Road) is the most heavily traveled, and includes a broad slip lane for westbound Route 202 traffic. The opposing street is Pond Road, a minor collector with an AADT of 3170 and a spring weight limit posting.

Granite Hill Road is a major collector/state aid road. It is the direct route from Manchester to Hallowell. It is a fairly narrow road with gravel shoulders and has been rated poorly for pavement quality.

Kerns Hill, Puddledock, and Old Winthrop Roads are all town ways. Puddledock Road has an AADT of 1,250; the other roads are below 1,000.

Crash Summary(Diagrams pages 49, 54):

The high crash locations are distinct and non-adjacent: section 3115993 between the Route 17 slip lane and the Route 17 signal (approx. 250 feet), and section 3108742 between Granite Hill Road and Old Winthrop Road (approx. 800 feet).

By the Numbers: Route 202	
Func.Class/ jurisdiction	Minor arterial
Priority	1
AADT	19,930
Speed Limit	35
CSL Levels	
Safety	A
Service	B/A
Condition	A

By the Numbers: Route 17	
Func.Class/ jurisdiction	Major coll. state aid
Priority	3
AADT	6,270
Speed Limit	35
CSL Levels	
Safety	B – crash history
Service	B – congestion
Condition	B – pavement

By the Numbers: Granite Hill Rd.	
Func.Class/ jurisdiction	Major coll./ state aid
Priority	4
AADT	3,750 ↑
Speed Limit	45
CSL Levels	
Safety	B – rutting
Service	C – posting
Condition	B – ride quality

Section 3115993 adjoins a busy intersection that is not an HCL, but within the section, there have been eight crashes in the three-year period. Of the eight crashes, seven of them appear to be associated with turning movements into or out of the convenience store/Dunkin Donuts. Six are attributed to “failure to yield.” All occurred during daylight hours.

Crash History – Section 3115993	
Total Crashes	8
CRF	1.95
Rank in County	11

Section 3108742 experienced 13 crashes during the three-year period, four of which resulted in injury. All but one of the 13 appear to be associated with turning movements into or out of the J & S Oil service station. All of those are attributed to “failure to yield.” Three vehicles were attempting to enter the development from eastbound Route 202; of the nine exiting, five were attempting to turn left to eastbound, one was turning right but into the left-hand lane, and three were unclear from the crash diagram. There did not seem to be a discernable pattern in time of day or year.

Crash History – Section 3108742	
Total Crashes	13
CRF	1.42
Rank in County	21

Site Assessment:

The convenience store between the Route 17 intersection and the slip lane is busy and in a very inconvenient location. It has four, broad curb cuts. The business is making improvements, and in the process will move the westernmost access point eastward and shrink the width of curb cuts. The J & S Oil service station is similarly busy, and has two, broad entrances, but does not have the immediate conflict with an adjoining intersection.

The portion of Route 202 east of the Granite Hill intersection was reconfigured in 2015 to allow for a single lane eastbound. Crash data does not cover the period since, but anecdotally local officials believe the action has slowed traffic. However, the center left-turn pockets have been adjusted several times, leaving traces of previous paint, which could confuse drivers. It also appears as if the left turn pocket eastbound turning into J&S is too short, requiring quick thinking by drivers and possible stacking issues during busy periods.

It appears as if the signals at Route 17 and Granite Hill Road are not synchronized. If they were, it could create larger gaps for entering/exiting traffic.

Recommendations:

- Coordinate traffic signals between Granite Hill Road and Route 17 to permit larger gaps in traffic. Note that the municipality has collected \$10,000 in impact fees for this purpose.
- Grind out old striping and repaint center-road striping.
- Evaluate left turn pocket for westbound turn into Granite Hill Road and eastbound center lane to see if transition can move further westward.



Manchester Route 202 east of Route 17 (Image: Google Earth)



Manchester, Route 202 looking east through curb cuts at Mulligans/Dunkin Donuts



Manchester, Route 202 looking east at J & S Oil western curb cut

AUGUSTA: Intersection of Routes 27 and Summerhaven Road – Node 28048

This is a rural intersection on Route 27 near the town line with Sidney. It is a “T” type intersection, with one low-volume commercial development directly across from Summerhaven Road.

Route Description:

Route 27 is a minor arterial used primarily for commuting traffic into Augusta and some commercial traffic. In the area of the intersection, it is a straight two-lane road with a slight hill just to the north of the intersection.

Summerhaven Road is a town way connecting to some gravel pits and subdivisions, and Summerhaven Pond. It has an AADT of 2,374 and growing. It is a narrow, paved road with gravel shoulders.

By the Numbers: Route 27	
Func.Class/ jurisdiction	Minor arterial
Priority	2
AAADT	9,567 ↘
Speed Limit	45
CSL Levels	
Safety	A
Service	B
Condition	B

Crash Summary(Diagram page 47):

The intersection experienced nine crashes over a three-year period, only one of which resulted in injury. Two of the nine were rear-enders with cars waiting to turn left from Route 27 in the early afternoon. The remaining seven were exiting out of Summerhaven Road. Four of those seven appear to be cars going out of control over snowy or slippery roads. Five were rear-end collisions, with three of the five attributed to “following too close. Six of the seven occurred between 8 and 9 AM.

Crash History – Node 28048	
Total Crashes	9
CRF	1.94
Rank in County	20

Site Assessment:

The Summerhaven leg of the intersection is fairly wide. Summerhaven Road approaches the intersection over a slight hill and at a fairly pronounced downward grade. This could definitely contribute to loss of control on wet or snowy roads if vehicles came over the hill without slowing. A STOP AHEAD sign on Summerhaven Road is located about 550 feet from the intersection. The hill to the north on Route 27 contributes to a lack of sight distance. This could cause uncertainty on the part of drivers entering from Summerhaven Road.

Recommendations:

- Place a second, oversized STOP sign on the left side of the Sumerhaven Road to aid visibility, and increase the size of the right-hand sign, moving it closer to the edge of the road and STOP bar.
- Extend the double yellow line on Summerhaven Road so that it approaches the Route 27 edge-of-travelled-way, and add a stop bar.



Augusta: Intersection of Route 27 (top to bottom) and Summerhaven Road (Image: Google Earth)



On Summerhaven Road, approach to intersection with Route 27

AUGUSTA: Water Street from the intersection with Bond Street to Commercial Street – Node 27986 and Sections 3108358-59.

This is a heavily urbanized and congested segment in downtown Augusta. It includes three high-priority crash locations in close proximity: the intersection with Bond Street, and two sections to the south. One of these sections runs beneath a railroad bridge, and is subject of a project under design to provide overhead collision warnings. The entire segment is walled-in with high-density commercial and residential development, with sidewalks on both sides.

Route Description:

Water Street is classified as a minor arterial, within the Augusta urban compact area. It is a two-lane road, with a left turn pocket for Bond Street and a left-right lane choice at the Bridge Street end. It connects the downtown and Father Curran Bridge with the north side of Augusta. Along the segment are a railroad underpass, sidewalks on both sides, and two crosswalks. The total length of this segment is approximately 900 feet, with another 250 feet from the Laurel Street intersection to Bond Street.

Bond Street links Water Street with Route 27 (Mount Vernon Ave.) It shares many of the same features as Water Street, though with half the traffic volume. The T-type intersection is controlled by a STOP sign for Bond Street, with a left-right lane choice.

Laurel Street is a town way, with an AADT of less than 500.

Crash Summary(Diagrams pages 51, 54):

There are three high crash locations in this segment. The intersection of Water Street with Bond Street and Northern Ave. has experienced 13 crashes in the three-year period, two of which resulted in injury. Six of the crashes resulted from left-turning traffic failing to yield, with another three crashes being northbound traffic following too close to left-turning stopped vehicles. Two crashes involved pedestrians in crosswalks (one after dark). There was no pattern in time of day or year.

Adjacent segments 3108358-59 together accounted for 22 crashes within a distance of 900 feet. Seven of these crashes resulted from over-height trucks impacting the railroad bridge, and are being addressed by a proposed signage project. Interestingly, all three of the southbound

By the Numbers: Water Street	
Func.Class/ jurisdiction	Minor art./ urban
Priority	2
AADT	13,100 ↘
Speed Limit	25
CSL Levels	
Safety	B – rutting
Service	C – congestion
Condition	D – ride quality

By the Numbers: Bond Street	
Func.Class/ jurisdiction	Minor art./ urban
Priority	2
AADT	6,120 ↘
Speed Limit	25
CSL Levels	
Safety	C – crash history
Service	A
Condition	C – ride quality

Crash History – Node 27986	
Total Crashes	13
CRF	2.41
Rank in County	15

Crash History – Section 3108358	
Total Crashes	8
CRF	1.62
Rank in County	13

bridge hits occurred between 1:00 and 1:30 in the afternoon, while three out of the four northbound hits occurred between 8:35 and 8:55 in the morning.

Crash History – Section 3108359	
Total Crashes	14
CRF	2.09
Rank in County	10

Of the remaining 15 crashes, seven involved pedestrians or bicycles in a crosswalk, one resulting in serious injury. In two cases, pedestrians were directly involved; in the other five, a vehicle stopped for the crossing and was impacted by another following too closely. Six of the seven occurred during daylight hours. Three of the crosswalk-involved crashes (including the only two direct-pedestrian hits) occurred as northbound vehicles emerged from the railroad bridge in early evening; it is possible that visibility was restricted.

Site Assessment:

Since the bridge hazard is being addressed, attention was focused on the crosswalks. The crosswalk to the south is a mid-block crosswalk. While it would be safer to move it further from the Bridge Street intersection, it serves specific businesses whose customers would probably ignore the crosswalk otherwise. All three pedestrian incidents took place on the northbound lane. Visibility is somewhat impeded by a parking tier on the east side. The sign northbound is mounted to a light pole actually 20 feet beyond the crosswalk.

The mid-block crosswalk to the north connects a public parking lot with high density development and is located far enough from street intersections to avoid interference. Three of the four pedestrian incidents were in the northbound lane, as vehicles emerge from the rail underpass. It is likely that going through the underpass is a distraction sufficient to divert attention from pedestrians.

The intersection of Water and Bond Streets is a busy intersection with a large number of left turn movements. Almost all of the crashes involved left turn movements. The configuration is adequate to accommodate all movements; it is either very difficult for drivers to gauge speed of oncoming vehicles or they just get too impatient.

Recommendations:

- The crosswalks should both be marked with rectangular rapid flashing beacons (RRFB) for northbound traffic. This is particularly important at the mid-block crosswalk located north of the railroad overpass, where the railroad bridge seems to impede visibility.
- The pedestrian crossing sign northbound at the southern crosswalk should be moved closer to the actual crosswalk.
- Consider relocating the southern crosswalk if business locations change.
- At the Water/Bond Street intersection, extend the Water Street double-yellow striping further into the intersection.



Augusta: Water Street (Image Google Earth)

Augusta: Mid-block crosswalk between Bridge and Commercial Street intersections.



Augusta: Midblock crosswalk north of underpass



Augusta: Water/Bridge Street intersection (Image: Google Earth)

Augusta: North end of Water Street, looking towards Bond Street on left



AUGUSTA: Western Avenue (Route 202) from Woodside Drive to Old Winthrop Road – Sections 3945002, 3945118, 3945120, 3944948

This section of Western Avenue lies west of the I-95 interchanges and prior to Pelton Hill. It consists of four individual sections with a CRF over 1, plus one intervening section that does not show up as an HCL (Shuman intersection to Brann intersection). The frontage is heavily developed, primarily with car dealerships, although the entrances are fairly well separated. It includes a section where two westbound lanes merge into one and a section where the center lane is designated for left turns. Eastbound is one lane only throughout the segment. The total length of the segment, including the non-HCL section, is 0.38 miles. A major reconstruction project was recently completed along Western Avenue. It is expected the project will address most of the safety concerns along this roadway section.

Route Description:

Western Avenue (Route 202) is a minor arterial within the Augusta Urban Compact area. It has high traffic volumes and is separated for a portion of the segment. The road is a significant commuter route into Augusta, as well as serving a number of mid-volume commercial establishments. Within the .38 mile segment, there are three road intersections (in addition to the two at the endpoints) and nine commercial driveways. Alternate-merge signage and road work appear to have been effective in reducing PM congestion.

By the Numbers: Route 202	
Func.Class/ jurisdiction	Minor arterial
Priority	1
AADT	26,818 ↗
Speed Limit	35
CSL Levels	
Safety	A
Service	A
Condition	A

Old Winthrop Road joins Western Ave. at the eastern end of the segment and connects to Leighton Road and the airport. The intersection has been problematic in the past, but does not show up as an HCL.

By the Numbers: Old Winthrop Road	
Func.Class/ jurisdiction	Major coll./ state aid
Priority	4
AADT	3,380
Speed Limit	25
CSL Levels	
Safety	A
Service	B – congestion
Condition	B – ride quality

Smith Street, Brann Ave., and Woodside Road are town ways serving development behind the strip. They all carry less than 500 AADT.

Shuman Ave. is a private road serving the car dealership and a shopping mall. It carries 1,500 AADT. The intersection of Shuman Ave. and Western Ave. is controlled by a full signal.

Crash Summary(Diagrams not included):

Within the four HCL sections of this roadway, there were a total of 41 crashes in a three-year period, excluding the non-HCL segment and any intersection crashes. None of the intersections have been identified as HCL's, so it would appear as if the issues are with the roadways rather

Crash History – Element 3944948	
Total Crashes	12
CRF	1.37
Rank in County	24

than the intersections.

Of the 41 crashes, 12 resulted in injury and two resulted in fatalities. Eight appear to have involved turning movements with four of these caused by entering or turning traffic failing to yield.

A large fraction of the westbound crashes seem to have been caused by a failure to keep in line. Eight of 14 non-turning crashes are of this variety, and all eight occurred between 2 and 8 PM. The majority of eastbound crashes occurred as a result of following too closely. Seventeen of the 22 eastbound crashes, including two turning-movement crashes, were of this type. These generally took place in the AM rush or the early afternoon but were almost all in dry conditions.

Site Assessment:

Not assessed.

Recommendations:

None – revisit the crash history once the impacts of the reconstruction have cycled through (c.2020).

Crash History – Element 3945120	
Total Crashes	8
CRF	1.44
Rank in County	13

Crash History – Element 3945118	
Total Crashes	11
CRF	2.55
Rank in County	8

Crash History – Element 3945002	
Total Crashes	10
CRF	1.38
Rank in County	23

HALLOWELL – Water Street, from Winthrop Street to Dummers Lane – Section 3119402

Water Street (US Route 201) is the main thoroughfare for downtown Hallowell. It is walled-in with commercial construction on both sides, creating a narrow corridor. There are crosswalks on either end of the segment and parking stalls on both sides. All of Water Street, including this segment, is in design for a reconstruction project.

Route Description:

Water Street is a minor arterial in an urban setting, with a closed drainage system and urban template. The segment has a total length of 200 feet. It experiences heavy traffic much of the day, as it serves commuting traffic between Augusta and southern suburbs as well as local urban traffic.

This section of road is bounded on the north by the intersection with Winthrop Street. Winthrop Street is a steep downgrade approach and carries AADT just under 6,000 at this point, making it a busy intersection with a small fraction of left-turning traffic. The intersection is controlled by a STOP sign.

Crash Summary(Diagram page 55):

Of the nine total crashes in this segment, only one resulted in injury, pedestrians in a sidewalk. One other crash involved a pedestrian in a crosswalk. Of the four southbound crashes, three involved cars in the parking tier. Of the five northbound crashes, three resulted from following too closely, possibly initiated by vehicles slowed or stopping to turn left onto Winthrop Street. All three of these crashes occurred between 3:30 and 3:45 in the afternoon, when southbound traffic would be fairly heavy, and a left-turning queue could be expected.

Site Assessment:

Water Street is busy and congested much of the day. This segment is typical of the downtown area in general which, along with heavy left-turning movements at Winthrop Street, crossing pedestrians, and parallel parking both sides, creates considerable hazards. In addition, the road segment is designated as part of the Kennebec River Rail Trail for bicycle travel. One side of the street is considerably lower than the other, creating an exaggerated crown and side-to-side slopes.

A major reconstruction is scheduled for 2018, addressing the roadway geometrics as well as parking and bicycle and pedestrian travel. The project is still in design, allowing for any safety concerns not previously observed to be addressed. The project at the moment calls for 18-foot parallel parking spaces (4 feet less than standard) and eliminates an existing crosswalk at

By the Numbers: Water Street	
Func. Class/ jurisdiction	Minor arterial
Priority	1
AADT	13,922
Speed Limit	40
CSL Levels	
Safety	B – crash history
Service	B – congestion
Condition	B

Crash History – Section 3119402	
Total Crashes	9
CRF	2.81
Rank in County	5

Dummer's Lane. According to the crash summary, parking movements are an issue, as well as crossing pedestrians.

The City has a plan to create off-street parking behind a tier of buildings on the west side of the street, perhaps connecting with the street through Dummer's Lane as a pedestrian promenade and creating more demand for the proximate crosswalk. Crosswalks are currently highlighted with removable pedestrian pylons. Bicycle movements are acknowledged with *sharrows*, but this year's markings were not the MUTCD design.

Recommendations:

- Place an RRFB at the crosswalk adjacent to Winthrop Street. Complement it with another placed at the south end of downtown, where the rail trail merges onto the street.
- Mark crosswalks with raised reflectors as well as the standard paint design.
- In design, increase parking stall length from 18 to 20 feet.
- In design, retain the Dummer's Lane crosswalk.
- Mark sharrows with standard design paint and signage.



Water Street in Hallowell from Dummer's Lane (left side) to Winthrop Street (right side) (Image: Google Earth)

Hallowell: Water Street looking south



RANDOLPH – Intersection of Water Street (Route 27) and Windsor Street (Route 226) – Node P27466

The intersection of Water and Windsor streets is the principal downtown intersection in Randolph. It consists of a T-type intersection with a slip lane for north-turning Route 226 traffic. The intersection is surrounded by commercial development, with a new hardware store close to the southeast corner and a filling station/convenience store proposed for the northeast corner. The status of the intersection has been debated for years as to whether a signal is necessary. Currently, it is controlled by a STOP sign for 226 traffic turning south.

Route Description:

Water Street (Route 27) is a minor arterial functioning as the main thoroughfare in Randolph. It parallels the Kennebec River and feeds the bridge into Gardiner. For this reason, traffic to the north of the intersection is almost 50 percent higher than to the south – the addition coming from Windsor Street. There is a left-turn pocket for southbound traffic on Water Street. While the grade is flat, there is a slight curve just south of the intersection, which limits sight distance.

Windsor Street (Route 226) runs through Randolph and into Chelsea, feeding local development as well as acting as a route towards Togus V. A. Hospital. The intersection is at the base of a long, gradual downgrade.

Crash Summary(Diagram page 52):

There have been 15 crashes at this intersection between 2013 and 2015. Of these, only two involved injury. Of the 15, eleven were identical – a rear end collision on the slip lane. These almost always occurred during busy times of the day, and may be precipitated by the lead driver hesitating to come out onto Water Street traffic.

Site Assessment:

The intersection is constrained by tight circumstances. The right-of-way does not extend beyond the edge of the sidewalk on the east side. The auto repair shop on the southeast corner is wedged in and cars are parked immediately adjacent to the shoulder line, obstructing sight distance.

Permits have expired for the proposed development on the northeast corner, but approvals were conditioned on mitigation to the intersection, including the slip lane.

By the Numbers: Water Street	
Func.Class/ jurisdiction	Minor arterial
Priority	2
AADT	16,835 to north 11,500 to south
Speed Limit	30
CSL Levels	
Safety	B
Service	B/C - congestion
Condition	C

By the Numbers: Windsor Street	
Func.Class/ jurisdiction	Major collector
Priority	3
AADT	6,710
Speed Limit	30
CSL Levels	
Safety	A
Service	A (B in slip lane)
Condition	C – ride quality

Crash History – Node 27466	
Total Crashes	15
CRF	2.77
Rank in County	13

Recommendations:

- The island separating the intersection from the slip lane can be extended closer to the shoulder line with STOP and YIELD lines coming out correspondingly, allowing drivers from Windsor Street to venture further past the sight obstruction. The anticipated expense of doing so would likely make this a capital project.
- The light pole located within the traffic island should be moved to the west side of Water Street.
- Mitigation for the new development should focus on redesign of the slip lane with a longer merge onto Water Street.
- The business on the southeast corner should prohibit parking up against the right-of-way.



Intersection of Windsor Street (to top) with Water Street (left to right) in Randolph. (Image: Google Earth)



Randolph: On Water Street looking north towards Windsor Street intersection. Note cars parked close to corner.

VASSALBORO: Route 202 (North Belfast Ave.) from Stone Road/Legion Park Road to Three Mile Pond Road – Section 3124107

Route 202 connects Augusta to mid-coastal towns, carrying commuter traffic, recreational traffic and, until recently, a larger fraction of heavy truck traffic. The area adjacent to this segment is relatively undeveloped. The intersection of the highway with Stone/Legion Park has been noted as problematic in the past, due to being at the top of a grade with a passing lane westbound merging in just before the intersection.

Route Description:

Route 202 is a principal arterial built to NHS standards. At the western end of the segment, there is a long incline, with a climbing lane terminating just before the peak of the incline.

Stone Road, Legion Park Road, and Three Mile Pond Road are all town ways carrying an AADT of 500 or less.

Crash Summary(Diagram page 52):

Of the 12 total crashes, two resulted in injury. Five were deer hits or loss of control avoiding deer – all at night. Four were loss of control in snowy conditions – three westbound. In four cases, drivers left the road and one resulted in a head-on collision in snow.

By the Numbers: Route 202	
Func.Class/ jurisdiction	Principal arterial
Priority	1
AADT	8,710
Speed Limit	55
CSL Levels	
Safety	D – crash history
Service	B
Condition	A

Crash History – Section 3124107	
Total Crashes	12
CRF	2.21
Rank in County	9

Site Assessment:

Although this segment is showing up as the HCL, clearly the hazardous portion of this roadway is the intersection at the southwestern end. It is one of the two intersections in Maine with two separate fatal crashes. Part of the cause is the lack of sight distance for entering traffic at the crest of the hill, part is the two lanes of westbound traffic to cross, and part is the speeds along the roadway. The climbing lane is too short to accomplish much and vehicles are speeding up to finish a pass and merge; entering vehicles must gauge closing speeds with less-than-ideal sight distance.

An additional hazard on the road is the proximity of trees shading the road in winter. However, the snow-related crashes were on the north side, having received more sun than the south side. There were no indications of deer crossing signs in the area.

Recommendations:

- Eliminate the climbing lane, which is too short to fulfill its function, and consider restriping the roadway to allow for the addition of left turn lanes within the existing travel way footprint.

- Evaluate for the possibility of installing deer crossing signs.
- Install flashing beacons.



North Belfast Ave. (Route 202) looking westward (Image: Google Earth)



Vassalboro: North Belfast Ave. westbound top end of climbing lane approaching Stone Road intersection.

Vassalboro: North Belfast Ave. looking east through Stone Road intersection at top of hill.



VASSALBORO: Bog Road, from Route 201 (Riverside Drive) to Webber Pond Road – Section 202630

Bog Road is a rural road with traffic concerns due to an elementary school at the eastern end and general housing growth.

Route Description:

Bog Road is a well-travelled town way connecting Route 201 with rural housing development and the Vassalboro Community School. It is a narrow, paved road with gravel shoulders. Long stretches of the road are wooded or farm fields. The western half is flat and straight; the eastern section has hills and curves and is closely bounded by vegetation.

By the Numbers: Bog Road	
Func.Class/ jurisdiction	Town way
Priority	6
AADT	1,200 ↘
Speed Limit	35
CSL Levels	
Safety	n/a
Service	n/a
Condition	n/a

Crash Summary(Diagram page 48):

Of the 16 total crashes on the road between 2013 and 2015, three involved injury, and one resulted in a fatality. The fatality was impact with a tree during a police pursuit. All of the injuries also involved running off the road into a tree or other object.

Crash History – Section 202630	
Total Crashes	16
CRF	1.53
Rank in County	17

Of the 16 crashes, seven were either hitting an animal or avoiding one. Five involved slipping off the road in snowy or icy conditions. One was a sideswipe due to failure to keep in lane. Twelve of the 16 occurred at the eastern end of the segment. There was no trend in time of day.

Site Assessment:

The eastern end of the segment has vegetation close to the road, with curves and hills, leading to a buildup of snow and ice. The right-of-way is too narrow for much vegetation removal. The road is also subject to speeding traffic. The speed limit of 35 MPH is below what drivers would expect on the road, but a suggestion to increase it to 45 met with local resistance. The police chief noted he only tickets speeders at 55 MPH or greater. There are indications of nearby deer habitat, and it could be a significant crossing area.

Recommendations:

- Improve winter road maintenance, including use of salt priority.
- Install curve warning signs in appropriate locations.
- Consult Inland Fisheries and Wildlife to evaluate installation of deer crossing signs.
- Raise the speed limit to 45.



Looking west on Bog Road from Cross Hill Road (on bottom) to Riverside Drive (top)(Image: Google Earth)



Vassalboro: Bog Road looking west

WINSLOW: China Road (Route 137) from Bay Street (Route 201) to Cushman Road (Route 32) – Section 3129962

China Road at its western terminus intersects with Route 201 at a very busy corner that has been reconfigured over the years. Adjoining this road segment with curb cuts are a supermarket, convenience store, and fast food establishment.

Route Description:

China Road (Route 137) is a busy, state aid road serving local commercial traffic as well as commuter traffic into Winslow and Waterville. There are traffic signals at both ends of the segment, which measures about 550 feet, and a crosswalk mid-block. The segment is four lanes in width, with each right-hand lane being designated for right-turn only at the section endpoints. Shoulders are minimal and curbed, with sidewalks on both sides.

By the Numbers: Route 137	
Func.Class/ jurisdiction	Major coll./ state aid
Priority	3
AADT	11,393 ↘
Speed Limit	25
CSL Levels	
Safety	A
Service	B – congestion
Condition	B – ride quality

Crash Summary(Diagram page 50):

Of the eight crashes on this section between 2013 and 2015, two resulted in minor injuries. Four of the eight involved vehicles turning out of or into the supermarket; all four of these occurred in the afternoon. Two of the eight were turning out of McDonalds.

Crash History – Section 3129962	
Total Crashes	8
CRF	1.56
Rank in County	16

Site Assessment:

This section is perennially busy, with multiple turning movements and no assistance from turning lanes or channelized traffic. A person accessing or exiting the market, for instance, has very little time or space to find openings to cross multiple lanes of traffic. Traffic turning left off of Bay Street jockey for position into two lanes of the road. A center left turn lane is not feasible because it would cut off the necessary lane options at the Bay Street intersection. A midblock crosswalk between the market and McDonalds seems superfluous, but apparently is used regularly. An RRFB at the crosswalk may open up some gaps further down the street.

Recommendations:

- Install a RRFB at the crosswalk.
- Install lane-keeping striping for the left turn from Bay Street onto China Road.
- Consider permitting a left turn option from the right-hand Bay Street lane in conjunction with lane-keeping striping.



China Road (Route 137) from Bay Street (left) to Cushman Road. Midblock crosswalk striping is not visible (paint worn). (Image: Google Earth)



Winslow: On China Road looking towards Bay Street intersection.



Winslow: China Road, crosswalk in foreground, supermarket entrances on right.

OAKLAND: Main Street (Route 137) from Center St. to Pleasant St – Section 3118040

This segment is downtown Oakland, probably the most heavily commercially-developed portion of downtown. There are 14 commercial properties, including the post office, within the 750’ segment of road, together with several homes.

Route Description:

Main Street in Oakland (Routes 11/137) is a major collector and downtown nexus. It serves local commercial traffic as well as commuting traffic to Waterville. There are curbed sections and sidewalks on both sides of the road, with three mid-block crosswalks. On-street parking alternates between parallel and angle, and business curb cuts are in some cases wide enough to permit head-in parking to the business. The segment immediately to the east of this one is rated “F” for condition due to roadway strength.

By the Numbers: Oakland Main Street	
Func. Class/ jurisdiction	Major coll./ state aid
Priority	3
AADT	5,335 ↱
Speed Limit	35
CSL Levels	
Safety	B – rutting
Service	A
Condition	B/C ride quality

Crash Summary(Diagram page 49):

There were 11 crashes in this 750’ section between 2013 and 2015. Of these, three resulted in minor injuries. Five of the crashes were attributed to improper backing from the angled parking and one was a two vehicle collision where one tried to cross traffic to get to the angled parking stall. There was one rear-end collision as a result of stopping for a pedestrian at the easternmost crosswalk and one collision between a driveway-exiting vehicle and a bike going the wrong direction on the sidewalk. The crashes related to the angle parking all occurred in the afternoon or early evening. Five of the crashes occurred in 2015.

Crash History – Section 3118040	
Total Crashes	11
CRF	2.79
Rank in County	6

Site Assessment:

This is the most densely developed and most active block in Oakland. There are three midblock crosswalks plus crosswalks at either endpoint, a distance of 750 feet. All but one have some issues with either visibility or safe landing area. Crosswalks are indicated only with a pedestrian road marking.

The angled parking is in front of two long-standing local businesses, with a high volume of quick-trip traffic and little off-street parking. This accounts for the high number of late-afternoon crashes. The row of parking stalls located from the pharmacy west is slightly obscured in sight distance by the road curvature.

Recommendations:

- Improve the design of the midblock crosswalks, including ADA design, post signage, and an RRFB at the grocery store.

- Eliminate the crosswalk in front of the café.
- Convert angled parking in front of the grocery to parallel and promote off-street parking availability.
- Improve the crosswalk across the mouth of Pleasant Street to access the sidewalk.
- Designate a pedestrian walkway across the café driveways and the property immediately to the east.



*Oakland: Main Street from Center Street (southwest) to Pleasant Street (northeast)
(Image: Google Earth)*



Oakland: Main Street looking west along angled parking tier in front of supermarket.

WATERVILLE: Kennedy Memorial Drive (Route 11) from Jefferson Street to Washington St. – Section 3108391

Kennedy Memorial Drive (KMD) is a well-travelled thoroughfare serving commercial uses in southern Waterville, as well as being a principal commuter access into the city. This 800’ segment accommodates four high-volume commercial developments and one mid-volume, plus one vacant property. One of the eight curb cuts is unidirectional. Immediately to the west of this segment is the I-95 interchange.

Route Description:

KMD consists of four lanes of traffic plus a center left turn lane. Although daily traffic volumes exceed 20,000, they have been dropping, and are likely to drop further with the establishment of the new interchange at Trafton Road. Sidewalks are intermittent on the north side of the road, non-existent on the south side. The Jefferson Street intersection to the north serves two businesses; the Washington Street intersection is signalized and feeds several additional businesses.

By the Numbers: Kennedy Memorial Drive	
Func.Class/ jurisdiction	Minor arterial
Priority	3
AADT	22,508 ↘
Speed Limit	35
CSL Levels	
Safety	B – rutting
Service	C – congestion
Condition	B – ride quality

Crash Summary(Diagram page 49):

Twenty-four crashes occurred between 2103 and 2015, five of them resulting in minor injury. Twenty of the 24 occurred in the westbound lanes, which is where the business entrances are, with another two involving vehicles attempting to turn left across eastbound lanes. Eighteen directly involved driveway entering or exiting, three from Burger King, six apparently from McDonalds, and eight apparently from Irving. Almost all of these occurred in the late afternoon. Eleven were caused by vehicles attempting to cross traffic to turn into the eastbound lane.

Crash History – Section 3108391	
Total Crashes	24
CRF	1.74
Rank in County	12

Site Assessment:

There is a lot of activity with turning movements along this segment, as evidenced by the majority of crashes being driveway-related into westbound traffic. Vehicles are accelerating westbound at the same time as others are turning into or out of the businesses. Vehicles eastbound are still travelling at highway speeds as they enter the congested area. The crash diagram is a classic example of access-induced crashes (westbound) versus clear road (eastbound).

The center refuge lane is not shown on the crash diagram, but does not appear to be fully utilized. Overhead lane marking signage is old and askew, not lining up with the lanes. The westbound lane marker for left turns is wrong, as there is no westbound left turn allowed in this segment.

The vacant property has attracted some interest in redevelopment, and is in an important location. The ideal situation would be access only from the Mardens entrance.

Recommendations:

- Replace overhead lane marking signage. Replace westbound center lane arrows with an “X”.
- Install temporary changeable message speed notification sign eastbound.
- Enforce permit conditions for road improvements imposed on T&B Celebration Center.
- Limit exiting movements as condition of permit when vacant property is redeveloped.



Waterville: Kennedy Memorial Drive from Washington Street (east) to Jefferson Street (Image: Google Earth)



Waterville: Kennedy Memorial Drive looking west, note overhead lane markings and commercial entrances (Image: Google Earth)

Waterville: Intersection of Drummond Ave and High Street – Node 25750

This is an intersection of two town ways in a neighborhood with a commercial business at one corner, a pocket park at another corner and an elementary school nearby. There are crosswalks on two of the four legs of the intersection. STOP signs control traffic on the High Street legs.

Route Description:

Drummond Avenue is a town way connecting northern neighborhoods of Waterville with Fairfield. It carries about 1,500 vehicles per day, but is busy to the south of this intersection with an automotive service business. It is curbed with sidewalks on both sides, except that in front of the auto shop the access is wide open to the road.

High Street is a local road serving the neighborhood and connecting to an entrance of the elementary school. High Street eastbound approaches the intersection at an angle and downgrade into the intersection. Traffic averages 1,150 vehicles per day. There are curbs and sidewalks on both sides of the road, except that the sidewalk to the southwest of the intersection was removed in 2011.

Crash Summary(Diagram page 47):

Of the eight crashes that occurred at this intersection between 2013 and 2015, six of them resulted in injury. All eight were side collisions coded as either “failure to yield” or “ran stop sign.” Six of the eight were vehicles westbound on High Street, although the two with serious injuries were the only two involving eastbound vehicles.

Site Assessment:

Although this is a low-volume intersection, traffic is fairly steady through the day, with some peaks from the nearby school. Crosswalks were formerly staffed by crossing guards at certain hours, but now are not. The STOP sign at High Street westbound does not meet minimum size standard and is obscured by a pedestrian sign about 15 feet away. Local residents are advocating for a flashing yellow or LEDs for the STOP signs.

Recommendations:

- Replace High Street STOP signs with larger signs.
- Relocate pedestrian crossing signs so as not to obstruct visibility of the STOP signs.

By the Numbers: Drummond Rd.	
Func.Class/ jurisdiction	Town way
Priority	6
AADT	1,516
Speed Limit	25
CSL Levels	
Safety	n/a
Service	n/a
Condition	n/a

By the Numbers: High Street	
Func.Class/ jurisdiction	Town way
Priority	6
AADT	1,150
Speed Limit	25
CSL Levels	
Safety	n/a
Service	n/a
Condition	n/a

Crash History – Node 25750	
Total Crashes	8
CRF	5.71
Rank in County	4

- Add STOP bars on both High Street legs.



*Intersection of Drummond Street (top to bottom) with High Street (left to right)
(Image: Google Earth)*



Waterville: On High Street looking west towards Drummond Ave. intersection, undersized STOP sign

Waterville: On High Street

WATERVILLE: Intersection of Drummond, Hazelwood, and Armory Sts. – Node 25753

This intersection is at the junction of two collector roads that serve important local traffic functions. Armory Road and Hazelwood Ave. are continuations of the same road, linking Route 201 (College Ave.) in Waterville to Waterville’s northern I-95 interchange and shopping district. Drummond Ave. connects northern neighborhoods in Waterville with Fairfield. The intersection is influenced by an elementary school on the southwest corner and the Waterville Armory on the northwest corner.

Route Description:

Drummond Avenue, in the urban compact area, is a town way south of this intersection and a major collector to the north. The segment immediately to the north was rehabilitated in 2016. The section is fully curbed, with sidewalks on the northbound right-side and southbound right-side. Striped shoulders to the north of the intersection are wide enough to accommodate bicycles.

Hazelwood/Armory Roads carry approximately 25 percent more traffic on the Armory (west) side than the Hazelwood side. The Armory leg has a very slight downgrade. Armory Road is curbed whereas Hazelwood is not. Sidewalks are located only on the north side.

Crash Summary(Diagram page 50):

A four-way stop was installed at this intersection relatively recently, and drivers’ adjustment to it may still show up in crash statistics. The intersection was formerly controlled by STOP signs on Drummond Ave.

Of the 11 crashes at this intersection between 2013 and 2015, six resulted in injury. Nine of the 11 were side-collisions attributed to running a stop sign or failure to yield. The majority came out of the Hazelwood leg. The two rear-end collisions were also on the Hazelwood leg, although one was attributed to distraction. There was no trend with regard to time of year but eight of the eleven crashes occurred between 10 AM and 2 PM.

Site Assessment:

This intersection is in almost constant use. The time of day trend with crashes seems to indicate mid-day errands rather than school or commuting-related. It is surprising

By the Numbers: Drummond Ave.	
Func.Class/ jurisdiction	Major coll./ state aid
Priority	5
AADT	3300
Speed Limit	25
CSL Levels	
Safety	A
Service	A
Condition	A

By the Numbers: Hazelwood Ave.	
Func.Class/ jurisdiction	Major coll./ state aid
Priority	4
AADT	6500
Speed Limit	25
CSL Levels	
Safety	A
Service	B – congestion
Condition	B – ride quality

By the Numbers: Armory Road	
Func.Class/ jurisdiction	Major coll./ state aid
Priority	4
AADT	7,980
Speed Limit	35
CSL Levels	
Safety	B – crash history
Service	B – congestion
Condition	A

Crash History – Node 25753	
Total Crashes	11
CRF	2.76
Rank in County	14

there have been no pedestrian incidents; with a multi-family housing development on the northeast corner and the school on the southwest, there is a lot of pedestrian traffic. The overhead flasher should do a good enough job of controlling the four-way intersection, but in some cases, the STOP bars have been painted too far back. STOP signs need to be at least seven feet above the ground in pedestrian areas.

Recommendations:

- Raise STOP signs so that they are seven feet off the ground.
- Move STOP bar on Drummond northbound leg 10 feet closer to intersection.
- Upgrade the flashing beacons to current standards (dual alternating flashing beacons on each leg of the intersection).



Intersection of Drummond Street (north to south) with Hazelwood Street (right of intersection) and Armory Road (left of intersection) (Image: Google Earth)



Waterville: Drummond Street (foreground) looking towards Hazelwood, with STOP bar too far back

Proposed Action Plan

The Proposed Action Plan included on the following pages has been summarized by MaineDOT for internal discussions and potential work assignments but has not yet been formally adopted.

MaineDOT will contact the municipalities directly once the formal Action Plan has been approved. In the interim, municipal officials can contact MaineDOT Regional Planner Gerry Audibert at 624-3315 or via e-mail at gerry.audibert@maine.gov for further information.

Field Code Changed

ID#	Town	Location Description	Recommendation	MaineDOT Concurrence	Work Type	Lead Party	Timeframe	Date Completed	Comments
1	Monmouth	Rte. 202 @ Rte. 132 (Main St.), Node 27882	1. Clear right-of-way vegetation in distance from southwest corner.	Yes	Maintenance	Region Traffic Engineer	2017		Utilize staff if possible, 2018 if contract required
			2. Evaluate need for left-turn pocket westbound on Route 202.	Yes	Capital - Add on	Planning Bureau	Next paving		
			3. Widen throat at Main Street leg to accommodate the swing of large trucks.	Yes	Capital - Add on	Planning Bureau	Next paving		
			4. Repair failed flashing beacon light	Yes	Local	Town	Immediate		Flashing Beacon is Town responsibility
2	Monmouth	Rte. 202 @ Bog & Blue Roads, Node 27880	1. Clear vegetation on right-of-way west from northwest corner.	Yes	Maintenance	Region Traffic Engineer	2017		Utilize staff if possible, 2018 if contract required
			2. Evaluate trees on Blue Road and southeast corner of intersection for shading, and remove if in right-of-way	Yes	Maintenance	Region Traffic Engineer	2017		Utilize staff if possible, 2018 if contract required
			3. Extend double yellow striping on Bog Road closer to Route 202 shoulder to encourage cars to move closer to the intersection.	Yes	Maintenance	Region Traffic Engineer	2017		Next Painting opportunity
			4. Negotiate removal or relocation of parking tier with business owner on northeast corner (may be in state r/w).	Yes	Maintenance	Region Traffic Engineer	2017		Meet with property owner
			5. Move STOP bars closer to Rte. 202 shoulder line and relocate STOP signs to increase their visibility	Yes	Maintenance	Region Traffic Engineer	2017		Next Painting opportunity
			6. Consider adding STOP signs on opposite side of the road on Bog Rd.	Yes	Maintenance	Region Traffic Engineer	2017		
3	Winthrop	Rte. 202 @ Main St., Node P28703	1. Improve visibility of STOP and YIELD signs for Main Street traffic entering Route 202.	Yes	Maintenance	Region Traffic Engineer	2017	X	Temporary Beacon added to STOP sign under current project
4	Winthrop	Rte. 135 (Winthrop Narrows Rd.) from Narrows	1. Work with adjoining landowners to remove some of the trees to open up the road to more winter sun.	Yes	Local	Town	TBD		Town to discuss with property owner

		Pond Rd. to Monmouth Town Line	2. Provide curve warning signs where warranted	Yes	Maintenance	Region Traffic Engineer	2017		No additional signs are warranted
			3. Increase winter maintenance (Town responsibility)	Yes	Local	Town	2017		This is an ongoing issue due to winter shading and terrain
			4. At the next Light Capital Paving, grind the crown or build up the outside on curves, to eliminate the slight reverse superelevation.	Yes	Capital - Add on	Planning Bureau	Next capital project		
5	Manchester	Rte. 202 (Wesem Ave.) from Readfield Rd. to Old Winthrop Rd., Segments 3108742 & 3115993	1. Coordinate traffic signals between Granite Hill Road and Route 17 to permit larger gaps in traffic.	Yes	Capital	M&O	Next capital project		\$10,000 in traffic impact fees is available for this work.
			2. Grind out old striping and repaint center-road striping.	Yes	Maintenance	Region Traffic Engineer	2017		Next Painting opportunity
			3. The Two-Way Center Left Turn Lane leading to J&S Oil is causing traffic conflicts with traffic turning left onto Granite Hill Road. Check to see if the left turn pocket into Granite Hill Road can be shortened.	See Comments					MaineDOT's Traffic Engineer has stated the left turn pocket to Granite Hill Road cannot be shortened as it currently is too short as is.
6	Augusta	Rte. 27 @ Summerhaven Rd., Node 28048	1. Place a second STOP sign on the left side of the Sumerhaven Road to aid visibility. Increase the size of the right-hand sign.	Yes	Maintenance	Region Traffic Engineer	2017	X	
			2. Extend the double yellow line on Summerhaven Road so that it approaches the Route 27 edge-of-travelled-way, and add a stop bar	Yes	Maintenance	Town	2017		Town Responsibility
7	Augusta	Water St. from Bond St. to Commercial St., Node 27986 and Road Segments 3108358 & 3108359	1. The crosswalks should both be marked with rectangular rapid flashing beacons (RRFB) for northbound traffic. This is particularly important for the northern crosswalk, where the railroad bridge seems to impede visibility.	Yes	Maintenance	Town	2017		Town Responsibility. Potential MPI (50/50 funding) project.
			2. The pedestrian crossing sign northbound at the southern crosswalk should be moved closer to the actual crosswalk.	Yes	Local	Town	2017		Town Responsibility. Potential MPI (50/50 funding) project.

			3. Consider relocating the southern crosswalk if business locations change.	See Comments		Town			Town Responsibility. Business relocation is not expected
			4. At the Water/Bond Street intersection, extend the Water Street double-yellow striping further into the intersection.	Yes	Maintenance	Town	2017		Town Responsibility.
8	Augusta	Western Ave. from Woodside Dr. to Old Winthrop Rd.	1. Recently reconstructed - revisit crash history after sufficient time has elapsed since construction completion	Yes	Planning Study	Planning Bureau	TBD		Review crash history 3 years after construction completion (2020)
9	Hallowell	Water St. from Winthrop St. to Dummers Lane, Road Segment 3119402	1. Place an RRFB at the crosswalk adjacent to Winthrop Street. Complement it with another placed at the south end of downtown, where the rail trail merges onto the street.	Yes	Capital - Add on	Town	2017		Town to coordinate with MaineDOT on upcoming reconstruction project.
			2. Mark crosswalks with raised reflectors as well as the standard paint design.	Yes	Capital - Add on	Town	2017		Town to coordinate with MaineDOT on upcoming reconstruction project.
			3. In design, increase parking stall length from 18 to 20 feet.	See Comments	Capital - Add on	Town			Town to coordinate with MaineDOT on upcoming reconstruction project.
			4. In design, retain the Dummers Lane crosswalk.	See Comments	Capital - Add on	Town			Town to coordinate with MaineDOT on upcoming reconstruction project.
			5. Mark sharrows with standard design paint and signage.	See Comments	Capital - Add on	Town			Town to coordinate with MaineDOT on upcoming reconstruction project.
10	Randolph	Rte. 27 (Water St.) @ Rte. 226 (Windsor St.)	1. The island separating the intersection from the slip lane could be extended closer to the shoulder line with STOP and YIELD lines coming out correspondingly, allowing drivers from Windsor Street to venture further past the sight obstruction. This is probably a capital project due to cost.	Yes	Capital - Add on	Planning Bureau	Next paving		
			2. The light pole should be moved to the west side of Water Street.	Yes	Capital - Add on	Planning Bureau	Next paving		
			3. Mitigation for the new development should focus on redesign of the slip lane with a longer merge into Water Street.	Yes	Capital - Add on	Planning Bureau	Next paving		

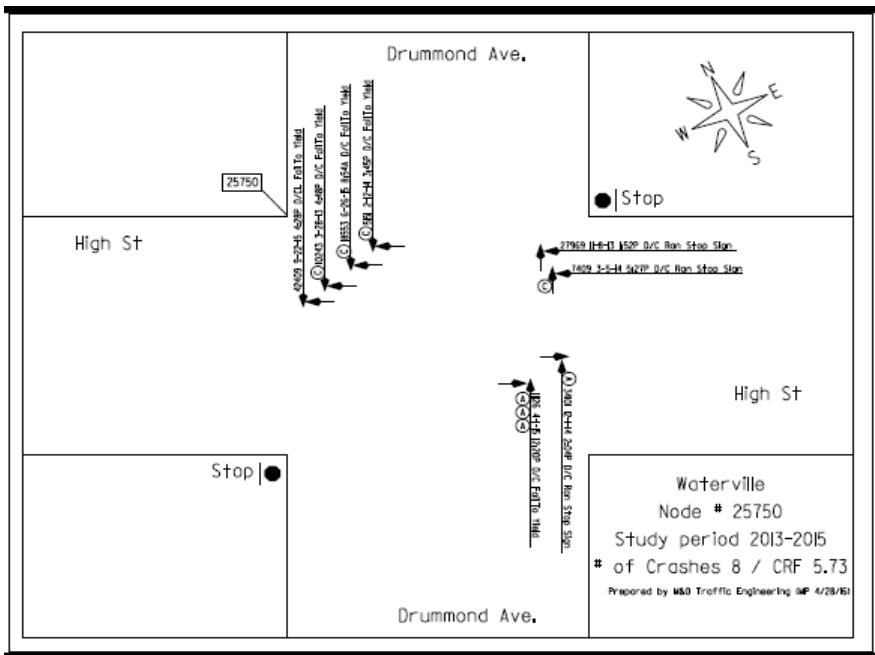
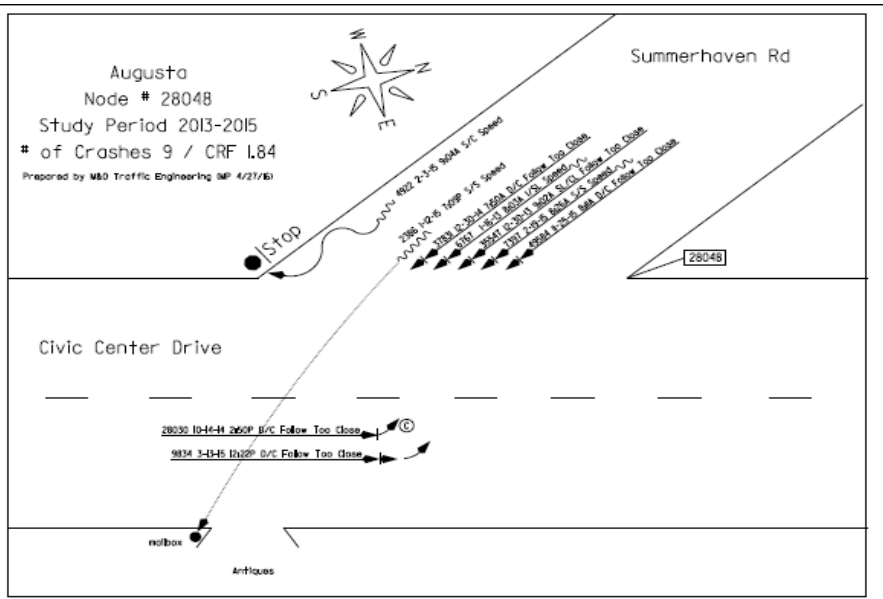
			4. The business on the southeast corner should prohibit parking up against the right-of-way.	Yes	Local	Town	2017		Town should discuss options with the property owner
11	Vassalboro	Rte. 202 (North Belfast Ave.) from Stone Rd. & Legion Park Rd. to Three Mile Pond Rd., Road Segment 3124107	1. Eliminate the climbing lane, which is too short to fulfill its function, and consider adding left turn lanes using the excess pavement.	Yes	Capital - Add on	Planning Bureau	2017		Next Paving Project
			2. Evaluate for the possibility of installing deer crossing signs.	See Comments	Local	Town	2017	N.A.	Evaluated with DIF&W; not warranted
			3. Install Flashing Beacons	See Comments	Planning Study	Region Traffic Engineer	Next capital project	N.A.	Evaluated; not warranted
12	Vassalboro	Bog Rd. from Rte. 201 (Riverside Drive) to Webber Pond Rd., Road Segment 202630	1. Improve winter road maintenance, including use of salt priority.	Yes	Local	Town	2017		This is an ongoing issue due to winter shading and terrain
			2. Install curve warning signs in appropriate locations.	Yes	Maintenance	Town	2017	N.A.	Local Road Center recently evaluated signs - not warranted
			3. Consult Inland Fisheries and Wildlife to evaluate installation of deer crossing signs.	See Comments	Local	Town	2017		Town to coordinate meeting with DIF&W and MaineDOT
			4. Raise the speed limit to 45.	See Comments	Maintenance	Town	2017		Town must reuest MaineDOT to conduct a speed study
13	Winslow	Rte. 137 (China Rd.) from Rte. 201 (Bay St.) to Rte. 32 (Cushman Rd.), Road Segment 3129962	1. Install a RRFB at the crosswalk.	Yes	Maintenance	Town	2017		Town can request a RRFB from MaineDOT
			2. Install lane-keeping striping for the left turn from Bay Street onto China Road.	Yes	Maintenance	Town	2017		Coordinate with MaineDOT under current project
			3. Consider permitting a left turn option from the right-hand Bay Street lane in conjunction with lane-keeping striping.	No				N.A.	Not warranted
14	Oakland	Rte. 137 (Main St.) from Center St. to Pleasant St., Road Segment 3118040	1. Improve the design of the midblock crosswalks, including ADA design, post signage, and an RRFB at the grocery store.	Yes	Capital - Add on	Planning Bureau	Next paving		
			2. Eliminate the crosswalk in front of the café.	Yes	Local	Town	2017		Town to coordinate meeting with Café owner and MaineDOT
			3. Convert angled parking in front of the grocery to parallel and promote off-street parking availability.	Yes	Local	Town	2017		Town to coordinate meeting with store owner and MaineDOT

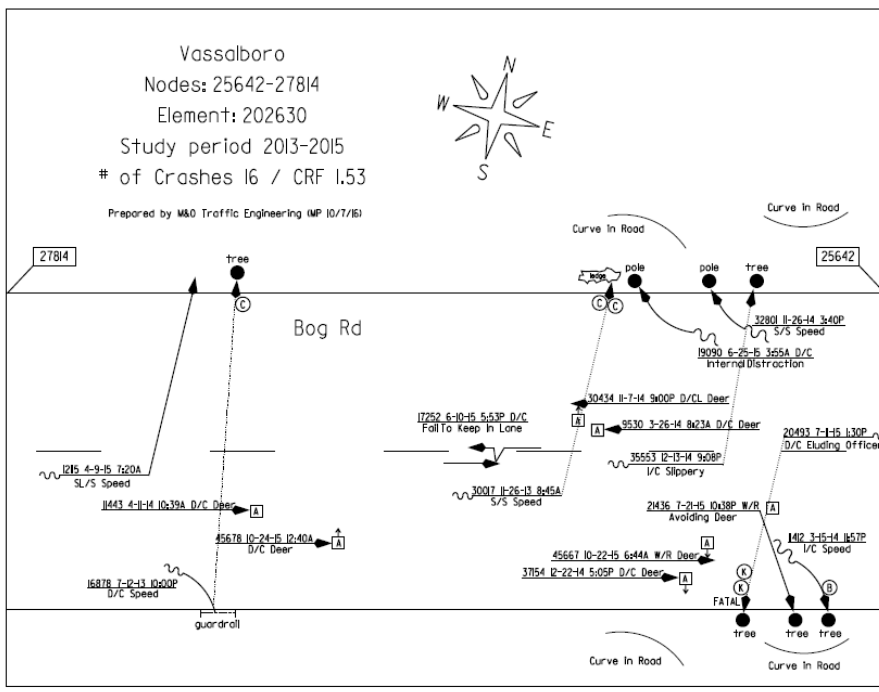
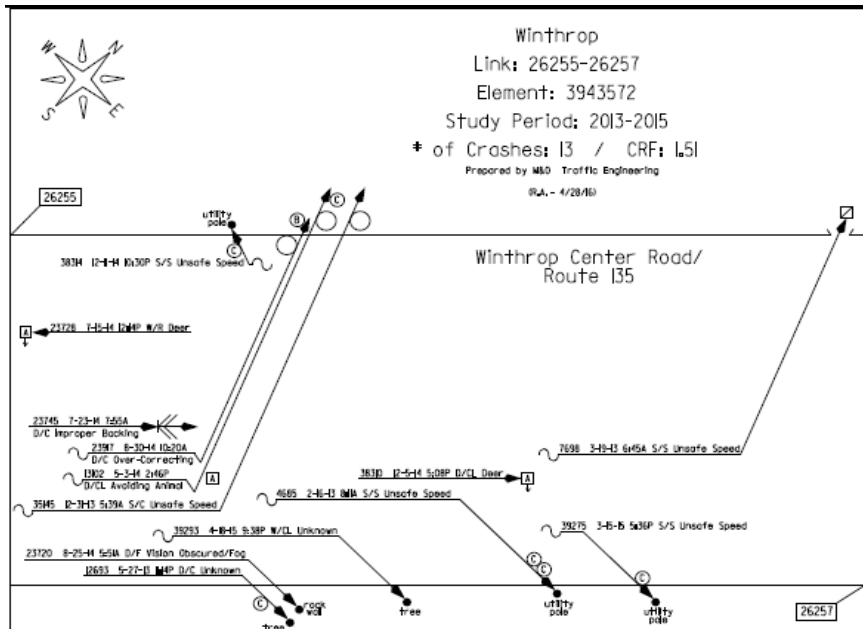
			4. Improve the crosswalk across the mouth of Pleasant Street to access the sidewalk.	Yes	Capital - Add on	Planning Bureau	Next paving		
			5. Designate a pedestrian walkway across the café driveways and the property immediately to the east.	Yes	Capital - Add on	Planning Bureau	Next paving		
15	Waterville	Rte. 11 (Kennedy Memorial Drive) from Jefferson St. to Washington St., Road Segment 3108391	1. Replace overhead lane marking signage. Replace westbound center lane arrows with an "X".	Yes	Maintenance	Town	2017		
			2. Install temporary changeable message speed notification sign eastbound.	Yes	Maintenance	Town	2017		Town can request MaineDOT to loan the sign to Waterville
			3. Enforce permit conditions for road improvements imposed on T&B Celebration Center.	Yes	Local	Town	2017		
			4. Limit exiting movements as condition of permit when vacant property is redeveloped.	See Comments					Town and MaineDOT to coordinate when the property is redeveloped
16	Waterville	Drummond St. @ High St., Node 25750	1. Replace High Street STOP signs with larger signs.	Yes	Local	Town	2017		
			2. Relocate pedestrian crossing signs.	Yes	Local	Town	2017		The ped crossing signs are obscuring view of the STOP signs
17	Waterville	Drummond St. @ Hazelwood & Armory Sts., Node 25753	1. Raise STOP signs so that they are seven feet off the ground.	Yes	Local	Town			
			2. Move STOP bar on Drummond northbound leg 10 feet closer to intersection.	Yes	Local	Town			
			3. Upgrade flashing beacons to current standards (alternating lights each leg)	Yes	Capital	Planning Bureau			Upgrade signs to alternating flashing beacons

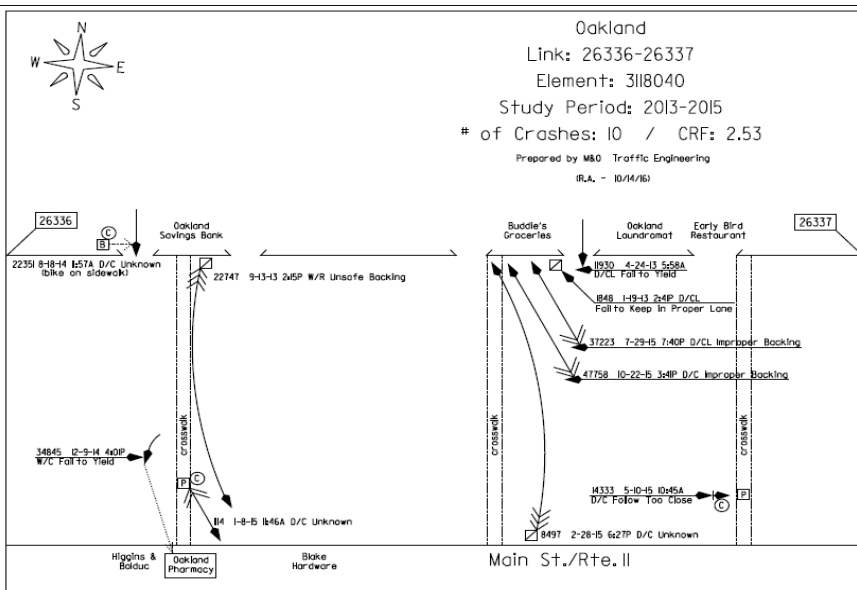
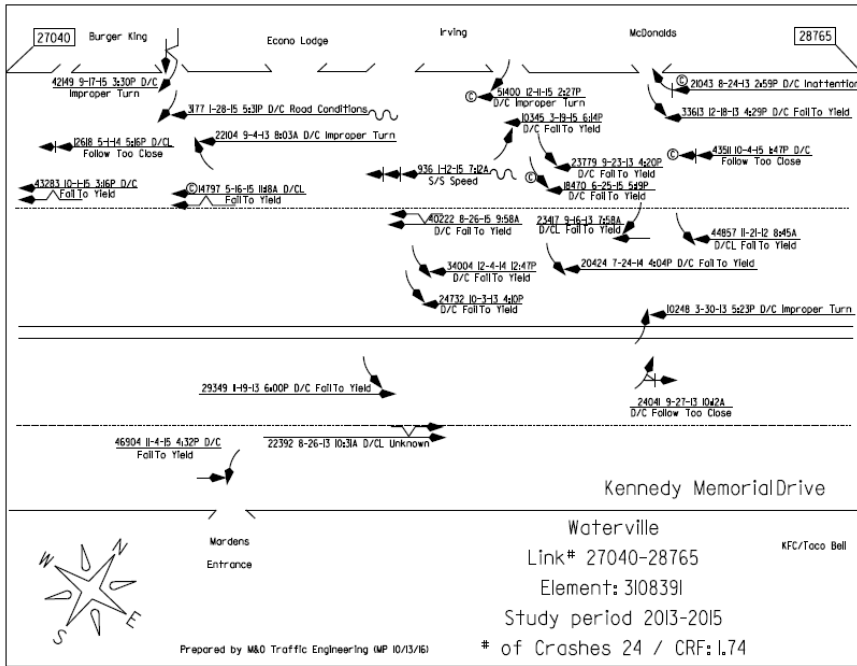
- Capital Candidates for work plan highway, bridge, or multi-modal capital funding as a stand-alone project.
- Capital - Add on Candidates to be added to a planned capital project on the same corridor or intersection.
- Maintenance Maintenance activities such as striping or vegetative clearing which gets planned as part of the annual work plan process.
- Simple Maintenance Relatively simple maintenance such as brush or limb removal or winter maintenance that is typically performed by regional crews on demand.

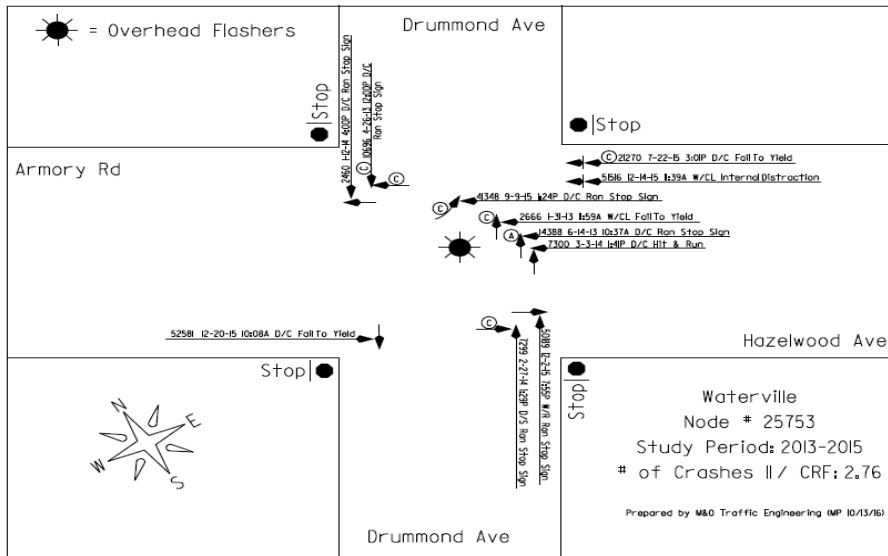
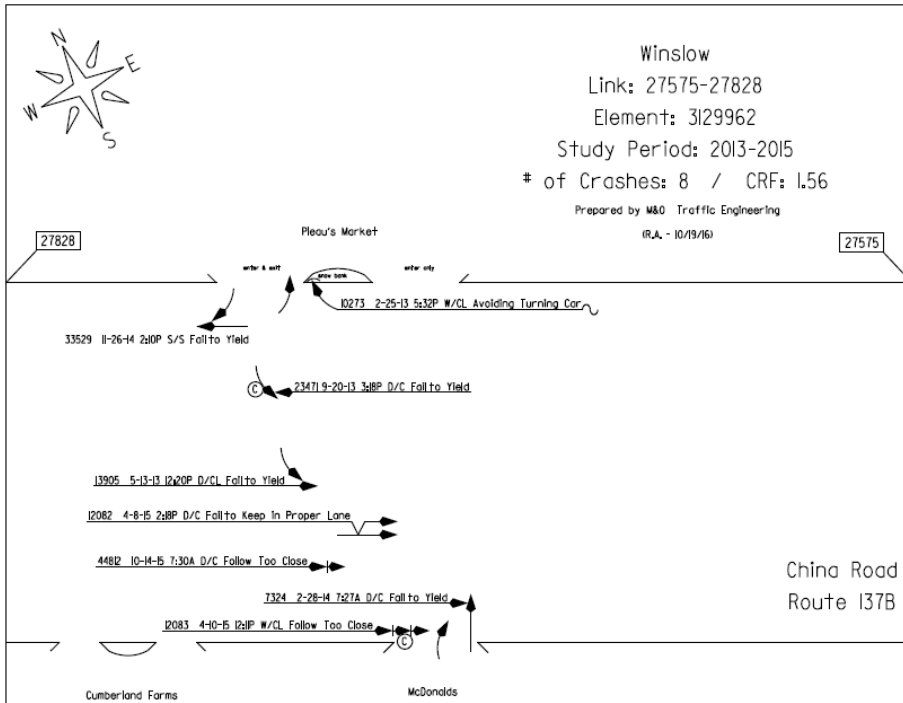
Signage	An improvement that would involve the modification or installation of one or more signs.
Local	Issue, location or project that is not on the state system or is primarily the responsibility of a municipality or its property owners.
Other	Utility or other entity
Planning Study	Candidate for a Bureau of Planning Scoping Project

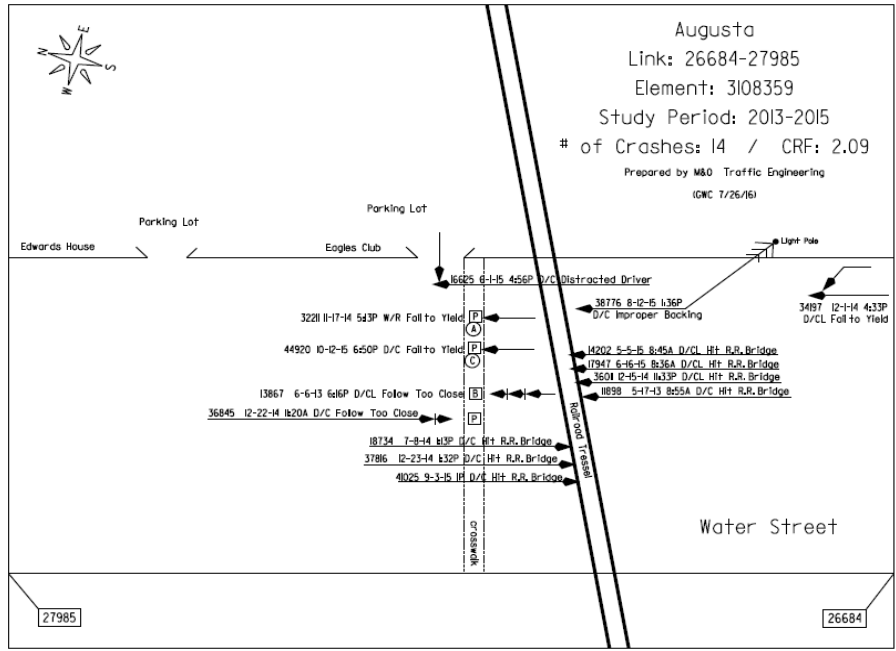
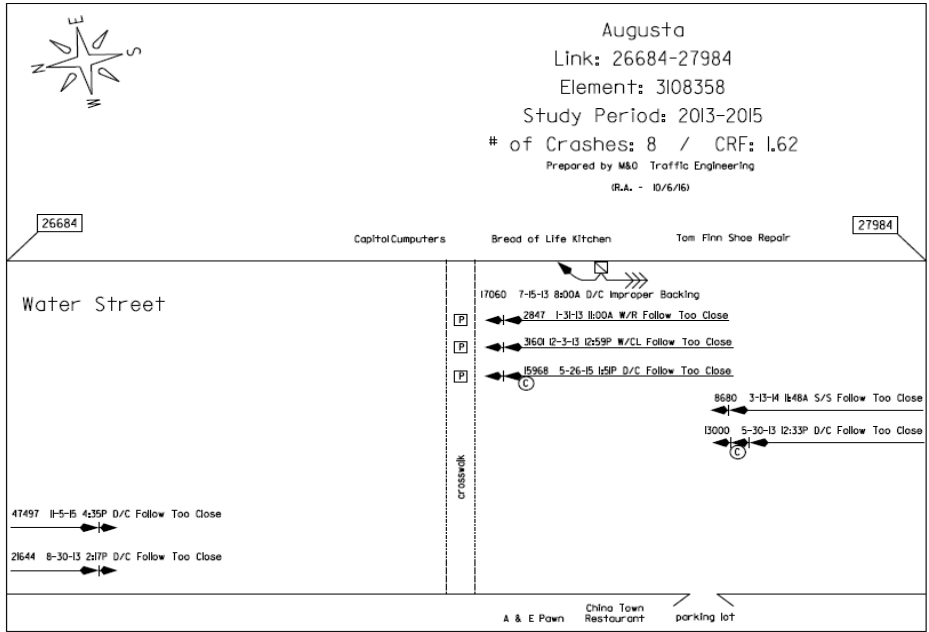
APPENDIX:
COLLISION DIAGRAMS

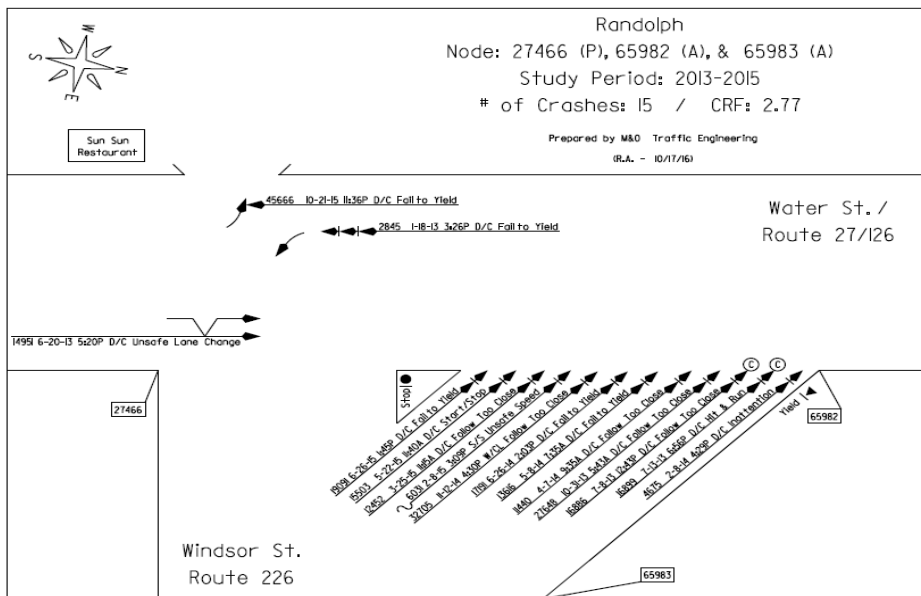
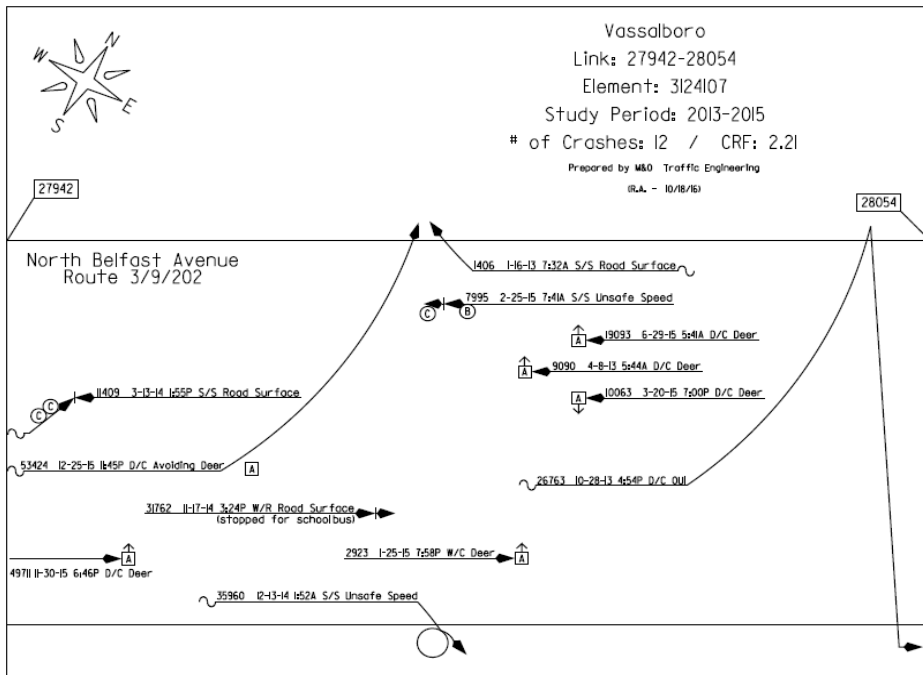


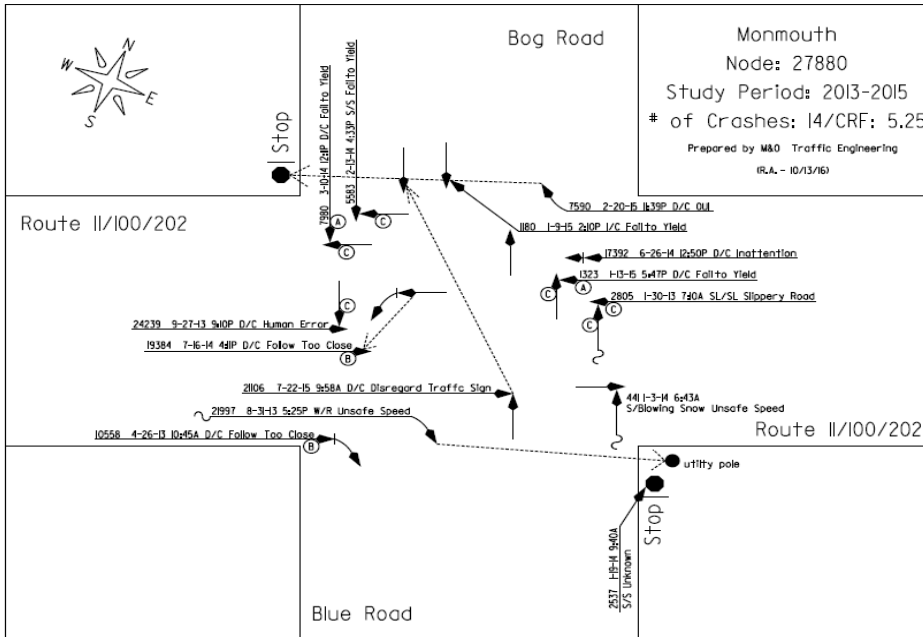




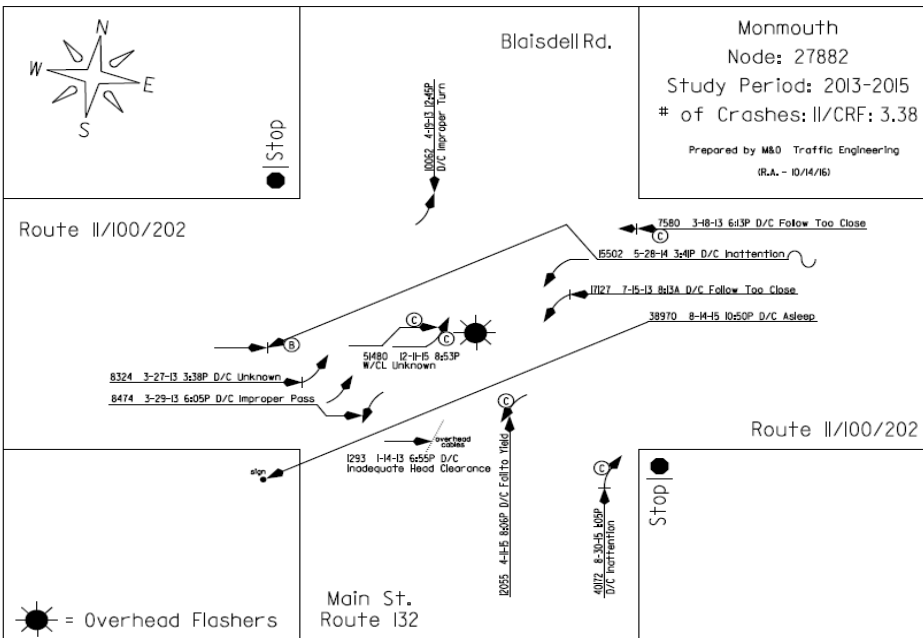








Monmouth
Node: 27880
Study Period: 2013-2015
of Crashes: 14/CRF: 5.25
Prepared by M&O Traffic Engineering
(R.A. - 10/13/16)



Monmouth
Node: 27882
Study Period: 2013-2015
of Crashes: 11/CRF: 3.38
Prepared by M&O Traffic Engineering
(R.A. - 10/14/16)

