

Exeter Intersection Evaluations

Town wide evaluations and recommendations

PREPARED FOR



Town of Exeter
Public Works Department
13 Newfields Road
Exeter, NH, 03833

PREPARED BY



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Suite 200
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July 5, 2021

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Traffic an Safety Evaluations

1

Introduction

This study was conducted in response to the Town of Exeter's desire to conduct a safety and operations-based town-wide evaluation of intersections on Town roadways that would inform decisions on the expenditure of funds from the Town's Capital Improvement Plan (CIP). This study includes conceptual design plans and associated cost estimates for the four focus intersections.

1.1 Traffic and Safety Evaluations

The first phase of this study included an evaluation of crash data provided by the Exeter Police Department. Eighty-eight intersections were ranked in descending order according to the number of recorded crashes and a top ten list with the highest crash history was generated.

VHB then examined traffic congestion at the intersections based on historic peak hour traffic conditions as shown on the Google Maps platform. (A historic lookback was performed since the evaluations were conducted during the pandemic when traffic volumes were suppressed.)

VHB cross referenced the ten highest crash rate intersections, the six 2018 Master Plan priority intersections and the four 2019 Warrant Article intersections with the crash data.

VHB also conducted field reviews of these twenty intersections to help understand the factors that may be contributing to the congestion and the crash rates.

Subsequent to providing the Town with a memorandum that summarized the traffic and safety observations VHB was instructed to focus on the four 2019 Warrant Article intersections for the conceptual design evaluations. A copy of the traffic and safety evaluation memo is attached for informational purposes. Below is a table showing the crash rankings and data and operational characteristics of the four intersections. The times listed under the “Weekday Time Periods of Traffic Delays” column represent those periods that typically experience delays during the critical time periods (i.e., 7-8 AM, 8-9 AM, 11 AM-2 PM, 4-5 PM, and 5-6 PM).

2019 Warrant Article 23 Intersections

Overall Town-Wide Crash Ranking and Intersection	Reported Collisions (Total/Annual Average) ^a	Traffic Control Type	Jurisdiction ^b	Weekday Time Periods of Traffic Delays ^c
2. Water Street (NH 111A) and Front Street (NH 108/111)	36/5.8	Unsignalized	Town of Exeter	7:55 AM 8:45 AM 12:15 PM 4 PM 5 PM
27. Front Street (NH 111A), Pine Street, and Linden Street	6/1.0	Unsignalized	Town of Exeter	7:35 AM 8:30 AM 1:45 PM 4:30 PM 5:10 PM
28. Water Street (NH 27), High Street (NH 27), Clifford Street, and Franklin Street	6/1.0	Unsignalized	Town of Exeter	7:55 AM 8:45 AM 12:15 PM 4 PM 5 PM
53. Winter Street, Railroad Avenue, and Columbus Avenue	3/0.5	Unsignalized	Town of Exeter	7 AM 8 AM 11:40 AM 4 PM

A complete listing of crash data from 2014 to 2020 is shown on the following two pages. Intersections are ranked by number of reported crashes in descending order.

Rank	Main Roadway	Intersecting Road	Crashes
1	Epping	Rt. 101	41
2	Front	Water	36
3	Portsmouth	Holland	27
4	Newfields	RR Bridge	27
5	Epping	Brentwood	25
6	North Hampton	Rt. 101	20
7	Hampton	Holland	19
8	Portsmouth	Alumni	19
9	Epping	Industrial (Front Row)	17
10	Epping	Beech Hill	15
11	Epping	Cronin (AllTown)	14
12	High	Portsmouth	13
13	Newfields	Rt. 101	13
14	Epping	Park	9
15	Epping	Winter St.	9
16	High	Gilman	9
17	High	Pleasant	9
18	Epping	Blue Hawk	8
19	Hampton	Ashbrook	8
20	Front	Court	8
21	Epping	Watson	7
22	High	Buzzel	7
23	Portsmouth	Auburn	7
24	Front	Arches	7
25	Hampton Falls	Ashbrook	6
26	Front	Lincoln	6
27	Front	Linden / Pine	6
28	Water	Clifford	6
29	Kingston	Powder Mill	6
30	Main	Winter / Epping	6
31	Portsmouth	Greenhill	5
32	Main	Tan	5
33	Main	Lincoln	5
34	Epping	Kings Way	4
35	Epping	Continental	4
36	Epping	Pine	4
37	High	Drinkwater	4
38	Brentwood	Washington	4
39	Front	Washington	4
40	Court	Gary	4
41	Newfields	Walter's Way	4
42	Hampton	Guinea	3
43	Hampton	North Hampton	3
44	Front	Elm / Spring	3

Rank	Main Roadway	Intersecting Road	Crashes
45	Front	Elliot	3
46	Front	Center	3
47	Water	Summer	3
48	Water	Center	3
49	Water	Main	3
50	Kingston	John West	3
51	Court	Maple	3
52	Linden	Gary	3
53	Winter	Columbus / Railroad	3
54	Newfields	Swasey	3
55	Epping	Old Town Farm	2
56	Epping	Colcord Pond	2
57	North Hampton	Nathaniel	2
58	High	Hall Ct	2
59	High	Hampton Falls	2
60	Portsmouth	Highland	2
61	Brentwood	Crestview	2
62	Front	Winter St.	2
63	Front	Tan	2
64	Front	Gukk	2
65	Kingston	Ernest	2
66	Kingston	Tamirind	2
67	Kingston	Cross	2
68	Court	Gilman	2
69	Linden	Gill	2
70	Epping	Comings Ct.	1
71	Epping	Anna Louise	1
72	Epping	McKay	1
73	Epping	Brookside	1
74	Hampton	Exeter Farms	1
75	Hampton	Acadia	1
76	Hampton	Fuller	1
77	High	Windmere	1
78	High	Appledore	1
79	High	Marlboro	1
80	High	Wheelwright	1
81	High	Folsum	1
82	Brentwood	Little River	1
83	Brentwood	Dollof Farm	1
84	Brentwood	Greenleaf	1
85	Brentwood	Dogtown	1
86	Front	Hobart	1
87	Front	School	1
88	Linden	Kimball	1

2

Focus Intersections

The following four intersections were identified by the Town for potential improvements based on previously established Town priorities and supported by the results of the traffic and safety findings.

- Front Street, Pine Street and Linden Street
- Water Street - High Street (NH Route 27), Clifford Street, and Franklin Street
- Winter Street, Columbus Avenue, and Railroad Avenue
- Water Street (NH Route 111) and Front Street (NH Route 111A)

The sections that follow provide a summary of findings and recommendations for each of these intersections.

2.1 Front Street / Pine Street / Linden Street

Crash Ranking: 27



2.1.1 Observed Deficiencies:

2.1.1.1 Operations

Front Street operates under free flow conditions and Linden Street and Pine Street each operate under stop control. Congestion is generally not a concern other than during periods when the two side streets may experience delay waiting for gaps in the Front Street traffic flow. It is very unlikely that this intersection would meet traffic signal warrants.

2.1.1.2 Safety

The unique geometry of this intersection contributes to safety concerns for vehicles turning on and off Front Street from the side streets. This is largely due to the skewed Linden Street approach merging with the Pine Street approach as they both enter Front Street. This creates a large expanse of pavement with undefined travel paths. Motorists on the approaches may become unsure of who has the right of way, and it forces them to advance well past their respective stop lines and crosswalks to be able to merge onto Front Street.

There are sidewalks on all three roadways but there is no marked crosswalk across Front Street from Linden or Pine Streets. There are crosswalks within approximately 200 feet of the intersection in either direction along Front Street.

2.1.2 Improvements Considered

2.1.2.1 Minor Improvements

No minor geometric improvements were identified that would address the safety and operational concerns at this intersection in a meaningful way. There was discussion about potentially making Linden Street one-way away from Front Street between Front Street and Gill Street however there were concerns with adding traffic to Gill Street because it is a one-way narrow residential street. Such a change would only partially solve the concerns at the intersection.

2.1.2.2 Major Improvements

A roundabout concept was developed as a full build solution as shown on the attached concept plan. This concept improves access for the side streets without the need for traffic signals, and it slows traffic speeds on Front Street through the intersection. It also provides good pedestrian access with shorter crossings. It is expected that the roundabout would improve safety because it controls traffic better than the current configuration and because it would reduce conflicts and travel speeds.

These improvements are estimated to cost approximately \$ 720,000.

Advantages

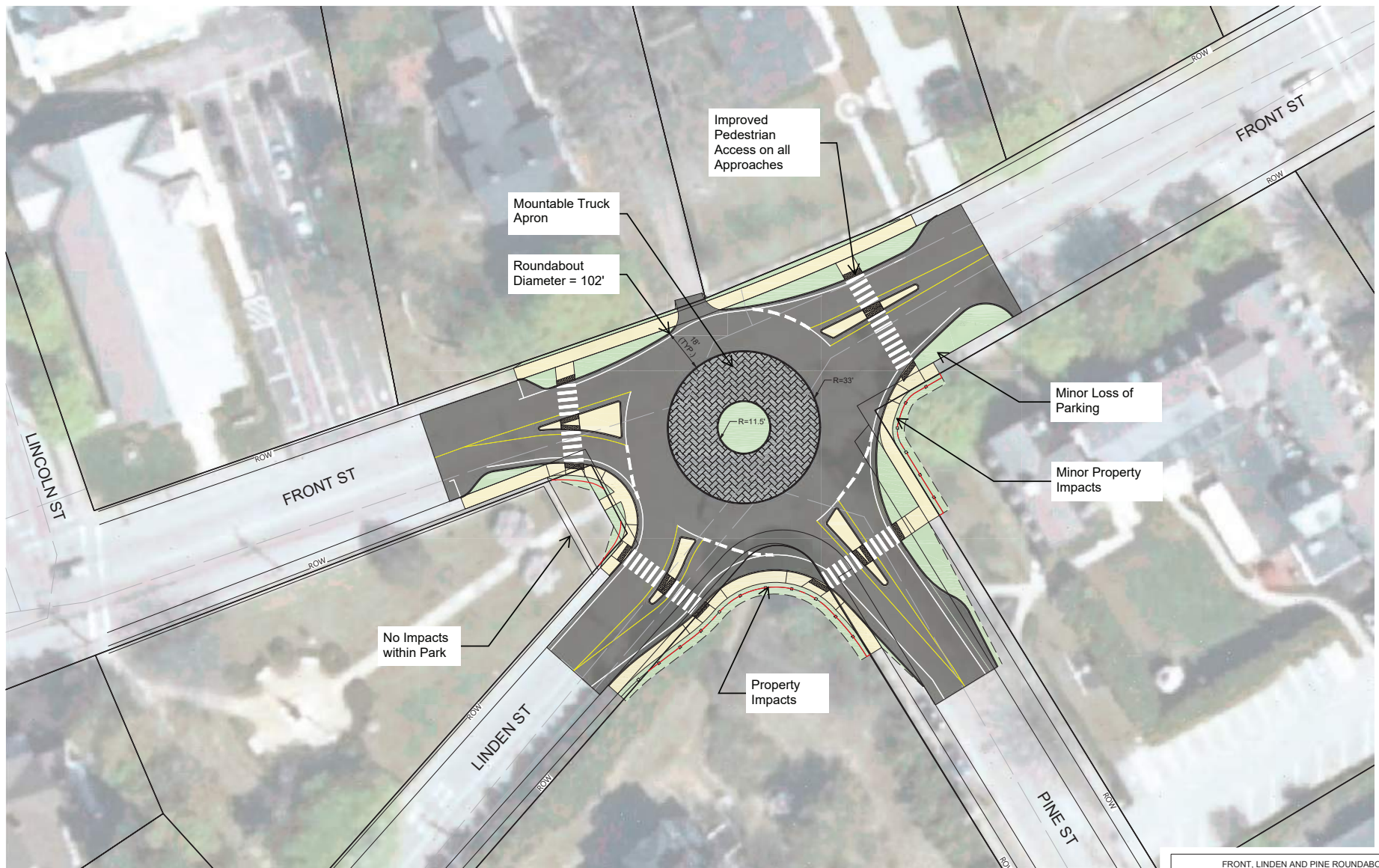
- Addresses the noted operational and safety concerns well

Disadvantages

- Cost.
- Minor property impacts
- Minor loss of parking

2.1.3 Recommendations

The roundabout solution is recommended, as funding allows, since there do not appear to be minor short term improvement options that would effectively address the concerns.



CONCEPTUAL PLAN
 SUBJECT TO CHANGE
 DATE 8/20/2021

- Legend**
- EXISTING WATER LINE
 - s— EXISTING SEWER LINE
 - PROPOSED FENCE
 - - - PROPOSED RIGHT-OF-WAY



DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
20-Aug-21	52688	52688-S1_Roll	-	1	1

FRONT, LINDEN AND PINE ROUNDABOUT
 CITY OF EXETER, NEW HAMPSHIRE

CONCEPTUAL PLAN

2.2 Water Street / High Street (NH Route 27) / Clifford Street / Franklin Street

Crash Ranking: 28



2.2.1 Observed Deficiencies

2.2.1.1 Operations

Water Street and High Street operate under free flow conditions and Clifford Street is a stop controlled one-way approach to the intersection. Franklin Street is one-way away from the intersection. The intersection does experience congestion, but this is largely due to heavy peak hour traffic on Water Street and High Street and not attributable to this intersection alone. Congestion on Water Street and High Street causes delays on the Clifford Street approach during peak hours. Left turns out of Clifford Street would be particularly problematic during peak traffic periods however they are currently prohibited through no left turn signage.

2.2.1.2 Safety

The safety concerns within this intersection are partially the result of the skewed approaches and the combining of the Clifford Street and Franklin Street approaches at Water / High

Street. The Clifford Street stop line is set well back from Water Street / High Street and as a result motorists must move up several car lengths to be able to see vehicles coming from their left on Water Street. This places them in conflict with the vehicles accessing Franklin Street from Water and High Streets.

2.2.2 Improvements Considered

2.2.2.1 Operational

The unconventional crossing of incoming vehicles to Franklin street with outgoing vehicles from Clifford Street could be eliminated by making Franklin Street one-way out toward Water / High Streets and Clifford Street one-way in instead of one-way out. With this change the northbound stop line from Franklin Street would be moved up close to High Street instead of the existing stop line that is set back on Clifford Street. More importantly, this would eliminate the need for incoming and outgoing vehicles to cross. At first glance this appears to be a relatively easy change in traffic pattern to implement. What is unknown is whether there would be any unintended consequences at outlying roadways or intersections. It does not appear there would be any geometric constraints to making this change.

2.2.2.2 Safety

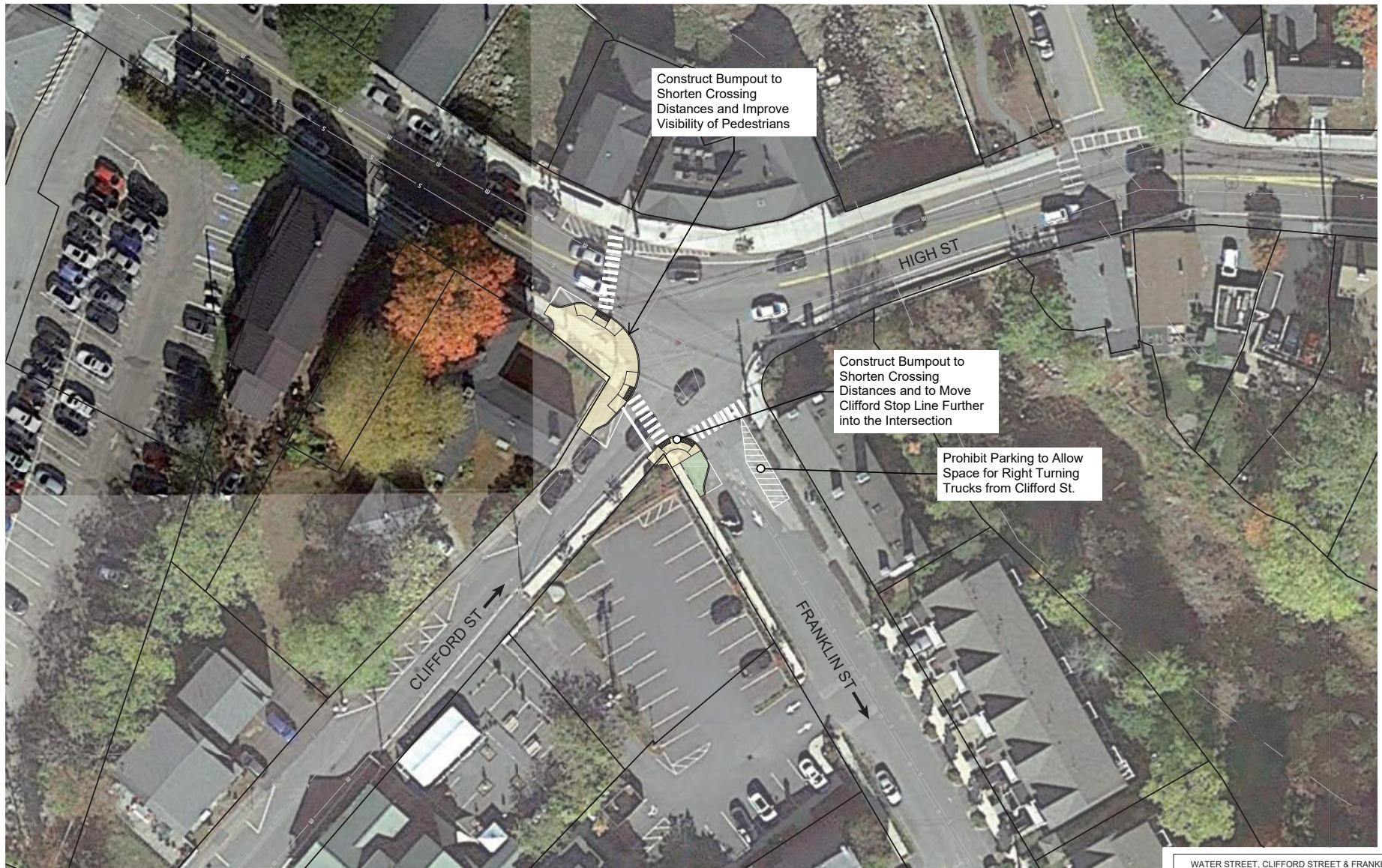
If the current one-way pattern is maintained there are some minor geometric changes that could be implemented to address safety concerns. These include expanding the sidewalk spaces at the corners of Clifford Street and Water Street and Clifford Street at Franklin Street. The first would help deflect and slow vehicles turning right onto Franklin Street from Water Street. It would also shorten the pedestrian crossing across Water Street. The expansion of the sidewalk landing at the nose between Clifford and Franklin Street would allow the Clifford Street stop line to be moved up slightly closer to Water / High Street and it could improve the pedestrian crossings. These modifications would likely result in a minor loss of on street parking (approx. 2 spaces). The anticipated project cost would be between \$100,000 and \$150,000.

2.2.3 Recommendations

The directional reversals on Franklin and Clifford Streets were considered since this would provide the greatest safety benefit by reducing conflicts on the side street approaches. However, the Town revealed that in the past the one-way directions were the reverse of what they are today and there were operational reasons why the current directions were implemented. The primary reason was that a significant number of westbound vehicles on High Street would take a left onto Clifford Street, and this would cause lengthy delays on High Street because there is a steady flow of opposing eastbound traffic preventing the left turns. For this reason, the reversal of the one-ways is not recommended. The Town may still consider the minor geometric modifications depicted on the attached concept plan should be considered, recognizing that the improvements will only be incremental.

The issue of frequent and severe congestion on Water and High Street is a much larger topic that should be examined on a corridor-wide basis. There may be opportunities to divert

traffic or change local patterns, or to improve signal coordination, but these are beyond the scope of this intersection study.



CONCEPTUAL PLAN
 SUBJECT TO CHANGE
 DATE 6/17/2021

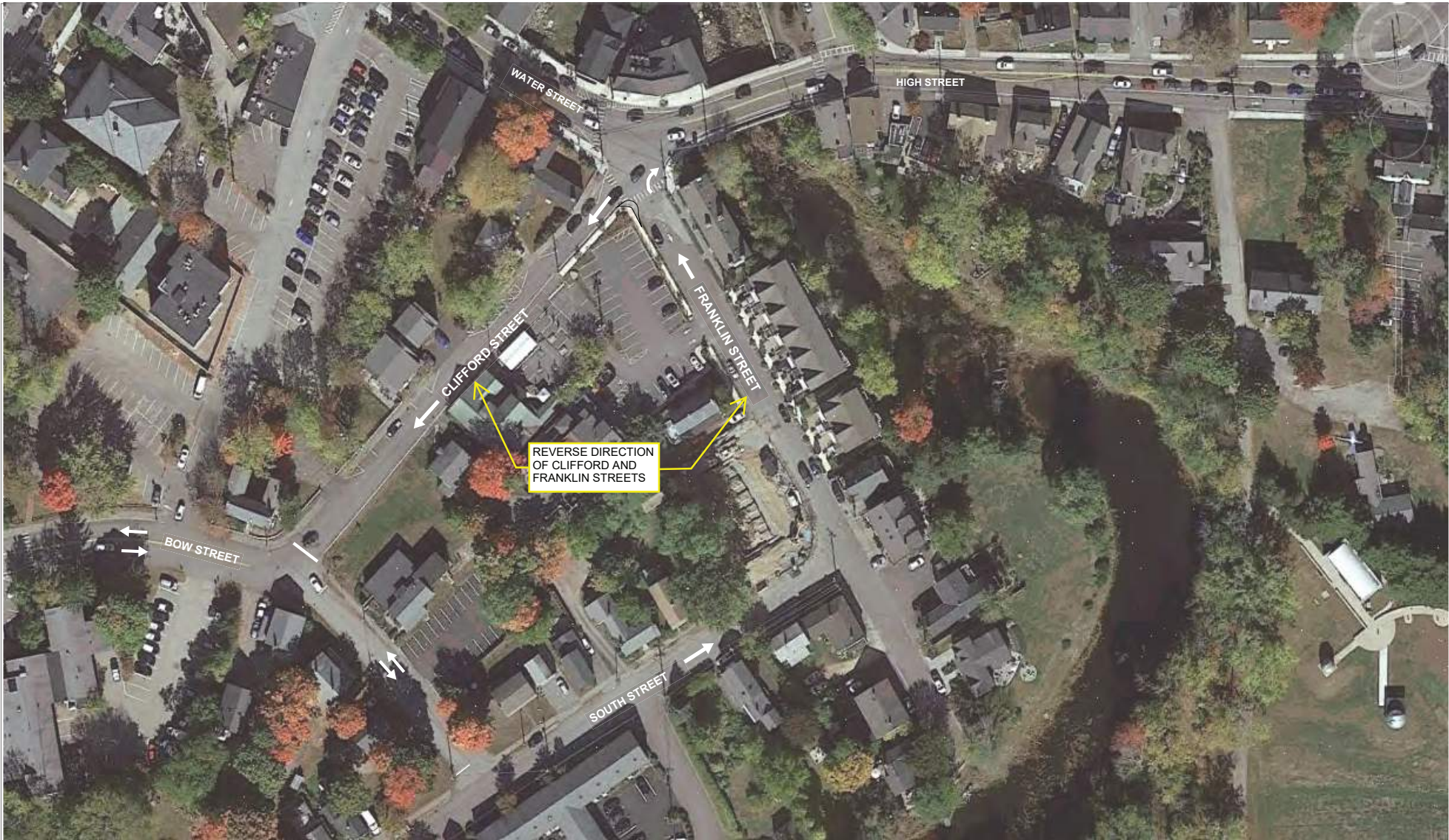
Legend
 —●— EXISTING WATER LINE
 —s— EXISTING SEWER LINE




DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
17-Jun-21	52688	52668-S3_Roll	-	1	1

WATER STREET, CLIFFORD STREET & FRANKLIN STREET
 CITY OF EXETER, NEW HAMPSHIRE

CONCEPTUAL PLAN



CONCEPTUAL PLAN
 SUBJECT TO CHANGE
 DATE 6/17/2021

					
WATER STREET, CLIFFORD STREET & FRANKLIN STREET CITY OF EXETER, NEW HAMPSHIRE					
CONCEPTUAL PLAN					
DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
17-Jun-21	52688	52668-S3_Roll	-	1	1

2.3 Winter Street / Columbus Avenue / Railroad Avenue

Crash Ranking: 53



2.3.1 Observed Deficiencies

2.3.1.1 Operations

Winter Street operates under free flow conditions in the southbound direction and is stop controlled in the northbound direction at its intersection with Railroad Avenue. Railroad Avenue to Winter Street is free flow in both directions. Congestion is generally not a concern other than periods when the Columbus Avenue side street experiences delay waiting for gaps in the Winter Street traffic, or when northbound vehicles on Winter Street must wait to enter the Winter/Railroad free flow condition. It should be noted that the recent TAP project at the Brentwood Rd / Epping Rd / Columbus Ave intersection will likely result in fewer cars using Columbus Avenue as a connector between Epping Road and Winter Street.

2.3.1.2 Safety

The intersection geometry contributes to safety concerns. The northbound Winter Street stop line is set too far back for motorists to gain a clear view of free-flowing traffic on Winter Street / Railroad Avenue. Similarly, the Columbus Avenue stop line is set back such that motorists have difficulty seeing southbound Winter Street traffic without moving up beyond

the stop line to see around the fence to their left. The commercial driveway opposite Columbus Avenue effectively makes this a five-legged intersection and adds to the potential conflict points. Note that the only sidewalk in the area is on the west side of Winter Street so there is currently low demand for adding crosswalks in the intersection. The Columbus Avenue residents that attended a May 31, 2022 public presentation confirmed that sight lines and vehicle speeds are a concern when entering the intersection from Columbus Avenue.

2.3.2 Improvements Considered

2.3.2.1 Minor Improvements

Option 1:

Minor geometric improvements can be made to enhance safety as follows and as shown on the attached concept plan as "Option 1".

- Extend the island nose on the north end of the triangular island at Winter Street and Railroad Ave. This will allow the northbound Winter Street stop line to be moved further into the intersection, affording motorists improved sight lines, especially to the south on Railroad Ave.
- Shift the western Winter Street curb line slightly east into the roadway in the vicinity of Columbus Avenue to make southbound traffic more visible to the vehicles entering the intersection from Columbus Avenue and to potentially slow southbound traffic.
- Add stop signs and stop bars on the short connector road between Railroad Avenue and Winter Street.

These improvements are estimated to cost under \$ 50,000.

2.3.2.2 Major Improvements

Option 2:

A roundabout concept was developed as a full build solution as shown on the attached "Option 2" concept plan. This concept balances access for the three main streets without the need for traffic signals, and it slows traffic speeds along Winter Street and Railroad Avenue through the intersection. It is expected that the roundabout would improve safety because it reduces conflicts and travel speeds. It should also reduce delays on the minor streets.

These improvements are estimated to cost approximately \$ 910,000.

Advantages

- Addresses the noted operational and safety concerns very well

Disadvantages

- Cost
- Minor property impacts

Option 3:

Another full build solution is shown on the attached "Option 3" concept plan. This concept realigns the northbound Winter Street approach to form more of a 90-degree Tee intersection with Winter Street and Railroad Ave. The northbound approach would remain under Stop control. This concept also improves the Columbus Ave approach by moving its stop line further east, improving sight lines in both directions.

These improvements are estimated to cost approximately \$377,000.

Advantages

- Addresses the noted operational and safety concerns
- Less costly than Option 2 and with no property impacts

Disadvantages

- Does not slow traffic on the Winter/Railroad main movement compared to Option 2

2.3.3 Recommendations

This intersection has a low crash history ranking and traffic on Columbus Avenue is likely lower now that the TAP project at Brentwood Road was completed, so it is questionable whether the full build roundabout option is worth the considerable cost. The minor improvements should be considered in the near term to at least help address the noted sight line deficiencies. Option 3 appears to be a good mid-cost option for the Town to consider. If the crash rate increases or traffic patterns change the roundabout option should be revisited.



Construct Bumpouts to Deflect and Slow Southbound Winter St Vehicles and to Improve Columbus Approach Sight Lines

Extend Island Nose to Allow Northbound Stop Line to Move Further into the Intersection

Add Stop Lines and Stop Signs

CONCEPTUAL PLAN
SUBJECT TO CHANGE
DATE 8/6/2021

Legend
 EXISTING WATER LINE
 EXISTING SEWER LINE

20 0 20 40
SCALE IN FEET

WINTER STREET, RAILROAD AVENUE & COLUMBUS AVENUE
CITY OF EXETER, NEW HAMPSHIRE

CONCEPTUAL PLAN - OPTION 1



DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
6-Aug-21	52688	52688-S2_Roll_1	-	1	1




CONCEPTUAL PLAN
 SUBJECT TO CHANGE
 DATE 6/16/2021

Legend

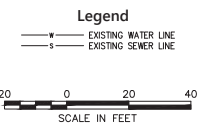
—#— EXISTING WATER LINE
 —\$— EXISTING SEWER LINE

20 0 20 40
 SCALE IN FEET

					
WINTER STREET, RAILROAD AVENUE & COLUMBUS AVENUE CITY OF EXETER, NEW HAMPSHIRE					
CONCEPTUAL PLAN - OPTION 2					
DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
16-Jun-21	52688	52688-S2_Roll_2	-	1	1



CONCEPTUAL PLAN
 SUBJECT TO CHANGE
 DATE 8/20/2021



WINTER STREET, RAILROAD AVENUE & COLUMBUS AVENUE
 CITY OF EXETER, NEW HAMPSHIRE

		CONCEPTUAL PLAN - OPTION 3				
		DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.
20-Aug-21		52688	52668-S2_Roll_1	-	1	1

2.4 Water Street (NH Route 27) / Front Street (NH Route 111)

Crash Ranking: 2



2.4.1 Observed Deficiencies

2.4.1.1 Operations

Operations within this intersection have evolved from past years when traffic reportedly circulated around the bandstand. There have been recent improvements where sidewalks, crosswalks and pavement markings were enhanced to the current condition which provided better definition of pedestrian spaces, travel lanes and parking. Notwithstanding these recent improvements, weekday peak hour and Saturday traffic congestion is the norm at this intersection.

2.4.1.2 Safety

This intersection has the second highest crash history in Town. It is believed that there are several contributing factors including:

- Multiple conflict points within a small space

- Diagonal on-street parking within the intersection with narrow adjacent travel lanes
- Sight distance constraints associated with the bandstand
- High traffic volumes and congestion that can lead to more aggressive motorist behavior

Speed does not appear to be a factor due to the constrained setting and stop controls.

2.4.2 Improvements Considered

This intersection has been studied in the past. In 2003 Civil Design Engineering Consultants developed two design alternatives. The first maintained the basic intersection layout but added streetscape enhancements such as brick sidewalks and crosswalks and landscaping. Their second alternative reestablished traffic circulation around the bandstand. This would require loss of parking on Water and Front streets, and it would make the bandstand essentially inaccessible to pedestrians. Our understanding is that this alternative was not endorsed for these reasons. It is not known whether traffic operations were ever analyzed for this circulating pattern around the bandstand using current traffic conditions, but our expectation is that there would still be peak hour congestion and that certain approaches would suffer because the opposing traffic volumes would be high.

In 2007 CLD Consulting Engineers provided a historic downtown restoration plan that was very similar to the 2003 restoration plan. It appears that some aspects of that plan, such as improved pedestrian spaces and crosswalks, were implemented by the Town as part of a recent downtown sidewalk project. The Town also formalized the current lane configurations which include the short westbound left turn lane on Water Street that serves left turns onto Front Street.

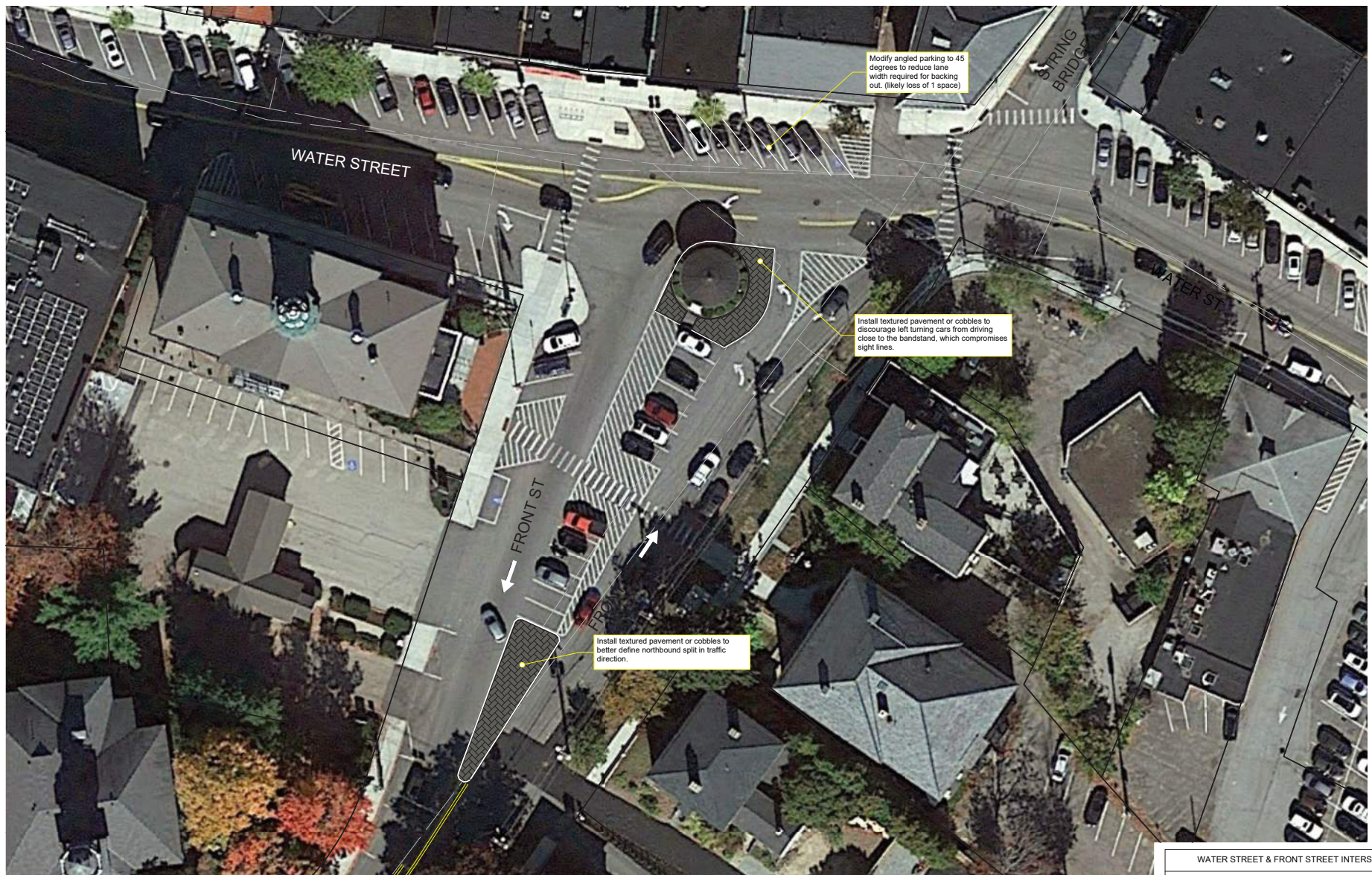
The current intersection configuration appears to make the most of the limited space. We considered whether meaningful operational or safety improvements could be realized if the bandstand were shifted or removed but its removal does not solve the circulation issues unless a traffic signal is installed, and that option would also result in a loss of parking, and it would not solve the peak hour congestion on Water Street. The bandstand construction does not lend itself to relocation and we understand the bandstand is an iconic symbol of the heart of the downtown and we are not suggesting its removal.

The concept plan that is included with this report suggests minor enhancements in the vicinity of the bandstand consisting of adding either brick or cobblestone pavers in an apron surrounding the bandstand where the crosshatched pavement markings exist today. The intent would be to more strongly encourage motorists to shy away from the bandstand, thus improving sight, especially for those vehicles turning left onto Water Street from Front Street. The apron would be mountable for trucks but would discourage automobiles. An apron is also suggested on Front Street where the north and southbound lanes merge/diverge. The intent of this is to visually reinforce that the road splits and northbound vehicles are to keep right. This apron would be flush with the pavement so vehicles could still freely enter and exit the Citizen's Bank. The cost of the improvements shown on the concept plan could be as much as \$100,000 depending on material choices.

Another potential safety enhancement would be to realign the 9 diagonal parking spaces that currently exist within the intersection on the north side of Water Street. These spaces appear to be set at approximately 60 degrees to the curb line. This alignment requires approximately 35' of width including the parking spaces and travel lane, whereas only 29' exists today. Changing the parking angle to 45 degrees would reduce the width that is required and potentially reduce parking related crashes. It would likely also reduce the number of parking spaces by at least one.

2.4.3 Recommendations

If the bandstand is to remain in its current location, we believe very limited minor modifications are possible over what the Town has already installed, and the benefits are questionable. If the Town finds that the diagonal parking on the north side of Water Street is contributing to the high crash rate, we recommend re-striping it to 45-degrees to provide some relief to the constrained conditions. As with the Water/High/Clifford/Franklin intersection, the traffic congestion is a NH 27 corridor-wide condition that is accentuated in the downtown where there is on street parking and pedestrian activity.



CONCEPTUAL PLAN
 SUBJECT TO CHANGE
 DATE 10/6/2021

Legend
 ——— EXISTING WATER LINE
 - - - EXISTING SEWER LINE



DATE PLOTTED	VHB PROJECT NO.	DRAWING	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
6-Oct-21	52688	52668-S4_Roll	-	1	1

WATER STREET & FRONT STREET INTERSECTION
 CITY OF EXETER, NEW HAMPSHIRE

CONCEPTUAL PLAN

Appendix

Traffic and Safety Evaluations



To: Mr. Paul Vlasich, P.E.
Exeter Town Engineer
13 Newfields Road
Exeter, NH 03833

Date: December 31, 2020

Memorandum

Project #: 52688.00

From: Gregory L. Bakos, P.E., NCICS
Jason Plourde, P.E., PTP

Re: Town-Wide Intersection Evaluations
Preliminary Traffic and Safety Findings
Exeter, New Hampshire

The Town of Exeter has engaged the services of Vanasse Hangen Brustlin, Inc. (VHB) to evaluate existing intersections for potential transportation improvements. The intent of this initial phase is to identify traffic congestion and safety concerns at intersections throughout the Town. This process is aimed at helping to develop a short list of 4 to 6 intersections to be prioritized for improvements. To help prioritize the safety and operational deficient locations within the community, crash data were provided from the Exeter Police Department and typical traffic conditions were researched through Google Maps. Based on this information, VHB conducted field reconnaissance at the top 10 problematic intersections to help identify potential contributing factors, such as geometry, traffic controls, and context-related issues.

Crash History

Crash data were obtained from the Exeter Police Department for roadway collisions throughout the Town of Exeter. This information identifies the total number of reported incidents that occurred within the community between January 1, 2014 and March 9, 2020. A summary of the 10 highest number of vehicular crash intersections is provided in Table 1. In addition, Tables 2 and 3 list the number of reported for the six intersections identified within the 2018 Exeter Master Plan where congestion or alignment are considered problematic outside of the downtown area, and for the four intersections listed in the 2019 Warrant Article 23 (Intersection Improvements Plan Funding). These intersections consist of the following:

- 2018 Exeter Master Plan Intersections:
 - Hampton Road (NH Route 27) and Guinea Road
 - Epping Road (NH Route 27), Brentwood Road (NH Route 111A), and Columbus Avenue
 - Hampton Road (NH Routes 27/111), High Street (NH Routes 27/111), and Holland Way (NH Route 88)
 - Front Street (NH Route 111A), Pine Street, and Linden Street
 - Epping Road (NH Route 27), Park Street, and Winter Street
 - Brentwood Road (NH Route 111A) and Dogtown Road
- 2019 Warrant Article 23 Intersections:
 - Front Street (NH Route 111A), Pine Street, and Linden Street – also listed in the 2018 Exeter Master Plan
 - Water Street (NH Route 111) and Front Street (NH Route 111A)

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- Water Street (NH Route 27), High Street (NH Route 27), Clifford Street, and Franklin Street
- Winter Street, Columbus Avenue, and Railroad Avenue

Traffic Congestion

Due to the current coronavirus disease 2019 (COVID-19) pandemic that the world is currently experiencing, traffic volumes are uncharacteristically lower than normal travel conditions. Therefore, typical traffic conditions were researched through reported data found on Google Maps. This mapping system was used to locate those intersections where congestion typically occurs. VHB conducted this exercise at the 10 highest number of vehicular crash intersections, the 6 intersections identified within the 2018 Exeter Master Plan, and the 4 intersections listed in the 2019 Warrant Article 23. In addition to listing the number of reported incidents, Tables 1 through 3 identify the typical time periods when congested conditions occur at the study intersections.

Field Conditions

After reviewing the Exeter Police Department crash data and the Google Maps for typical traffic conditions, VHB conducted field visits to help identify possible contributing factors to the safety deficiencies and the traffic congestion at the 10 highest number of vehicular crash intersections, the 6 intersections identified within the 2018 Exeter Master Plan, and the 4 intersections listed in the 2019 Warrant Article 23.

Top 10 Crash Locations

1 Epping Road (NH Route 27) and NH Route 101 Interchange (Exit 9)

The heavy traffic volumes entering and exiting from the NH Route 101 ramps and traveling along Epping Road (NH Route 27) during the weekday morning and evening commuter peak periods (i.e., 7-9 AM and 4-6 PM) and the weekday midday peak (12-1 PM) could result in motorists attempting turning maneuvers with less than desirable gaps in the traffic stream. Field visits identified a potential concern with the Epping Road (NH Route 27) median south of the NH Route 101 westbound off-ramp as motorists turning left from the off-ramp may turn sharply and collide with the center island. Should the Town opt to investigate potential measures to improve safety and operations at this interchange, further study is recommended to include collecting traffic counts, conducting a vehicle speed study, performing a traffic signal warrant analysis, and evaluating more detailed crash data. Since this interchange is under state jurisdiction, any improvements would require the review and approval of NHDOT.



Table 1 – Top 10 Crash Intersections

Overall Town-Wide Crash Ranking and Intersection	Reported Collisions (Total/Annual Average) ^a	Traffic Control Type	Jurisdiction ^b	Weekday Time Periods of Traffic Delays ^c
1. Epping Road (NH 27) and NH 101 Interchange	41/6.6	2 Unsignalized Intersections	NHDOT	7 AM 8 AM 12 PM 4:45 PM 5 PM
2. Water Street (NH 111A) and Front Street (NH 108/111)	36/5.8	Unsignalized	Town of Exeter	7:55 AM 8:45 AM 12:15 PM 4 PM 5 PM
3. Portsmouth Avenue (NH 108) and Holland Way (NH 88)	27/4.4	Signalized	Town of Exeter	7:55 AM 8:30 AM 1:30 PM 4 PM 5 PM
4. Newfield Road (NH 85) and Railroad Bridge	27/4.4	Unsignalized	NHDOT	None

^a Crash data from Exeter Police Department between 1/1/2014 and 3/9/2020; annual average based on approximately 6.2 years.

^b Source: NHDOT GIS Planning: NH Roads.

^c Typical weekday peak traffic delays identified through Google Maps between 7-8 AM, 8-9 AM, 11 AM-2 PM, 4-5 PM, and 5-6 PM.

Table 1 (continued) – Top 10 Crash Intersections

Overall Town-Wide Crash Ranking and Intersection	Reported Collisions (Total/Annual Average) ^a	Traffic Control Type	Jurisdiction ^b	Weekday Time Periods of Traffic Delays ^c
5. Epping Road (NH 27), Brentwood Road (NH 111A), and Columbus Avenue	25/4.0	Unsignalized Intersection	Town of Exeter	7 AM 4:40 PM
6. North Hampton Road (NH 111) and NH Route 101 Interchange	20/3.2	2 Unsignalized Intersections	NHDOT	7:45 AM 8:20 AM 4:45 PM 5:45 PM
7. Hampton Road (NH 27/111), High Street (NH 27/111), and Holland Way (NH 88)	19/3.1	Unsignalized Intersection	Town of Exeter	7 AM 8:30 AM 12:10 PM 4 PM 5 PM
8. Portsmouth Avenue (NH 108) and Alumni Drive	19/3.1	Signalized Intersection	Town of Exeter	7:45 AM 8:55 AM 12 PM 4:45 PM 5 PM

^a Crash data from Exeter Police Department between 1/1/2014 and 3/9/2020; annual average based on approximately 6.2 years.

^b Source: NHDOT GIS Planning: NH Roads.

^c Typical weekday peak traffic delays identified through Google Maps between 7-8 AM, 8-9 AM, 11 AM-2 PM, 4-5 PM, and 5-6 PM.

Table 1 (continued) – Top 10 Crash Intersections

Overall Town-Wide Crash Ranking and Intersection	Reported Collisions (Total/Annual Average) ^a	Traffic Control Type	Jurisdiction ^b	Weekday Time Periods of Traffic Delays ^c
9. Epping Road (NH 27) and Industrial Drive north	17/2.7	Unsignalized Intersection	Town of Exeter	11:30 AM 4 PM
10. Epping Road (NH 27) and Beech Hill Road	15/2.4	Unsignalized Intersection	NHDOT	None

^a Crash data from Exeter Police Department between 1/1/2014 and 3/9/2020; annual average based on approximately 6.2 years.

^b Source: NHDOT GIS Planning: NH Roads.

^c Typical weekday peak traffic delays identified through Google Maps between 7-8 AM, 8-9 AM, 11 AM-2 PM, 4-5 PM, and 5-6 PM.

Table 2 – 2018 Exeter Master Plan Intersections

Overall Town-Wide Crash Ranking and Intersection	Reported Collisions (Total/Annual Average) ^a	Traffic Control Type	Jurisdiction ^b	Weekday Time Periods of Traffic Delays ^c
5. Epping Road (NH 27), Brentwood Road (NH 111A), and Columbus Avenue	25/4.0	Unsignalized Intersection	Town of Exeter	7 AM 4:40 PM
7. Hampton Road (NH 27/111), High Street (NH 27/111), and Holland Way (NH 88)	19/3.1	Unsignalized Intersection	Town of Exeter	7 AM 8:30 AM 12:10 PM 4 PM 5 PM
14. Epping Road (NH 27), Park Street, and Winter Street	9/1.4	Unsignalized	Town of Exeter	7:45 AM 8:30 AM 4:30 PM 5 PM
27. Front Street (NH 111), Pine Street, and Linden Street	6/1.0	Unsignalized	Town of Exeter	7:35 AM 8:30 AM 1:45 PM 4:30 PM 5:10 PM

^a Crash data from Exeter Police Department between 1/1/2014 and 3/9/2020; annual average based on approximately 6.2 years.

^b Source: NHDOT GIS Planning: NH Roads.

^c Typical weekday peak traffic delays identified through Google Maps between 7-8 AM, 8-9 AM, 11 AM-2 PM, 4-5 PM, and 5-6 PM.

Table 2 (continued) – 2018 Exeter Master Plan Intersections

Overall Town-Wide Crash Ranking and Intersection	Reported Collisions (Total/Annual Average) ^a	Traffic Control Type	Jurisdiction ^b	Weekday Time Periods of Traffic Delays ^c
42. Hampton Road (NH 27) and Guinea Road	3/0.5	Unsignalized Intersection	Town of Exeter	7:10 AM 8 AM 1:55 PM 4 PM 5 PM
85. Brentwood Road (NH 111A) and Dogtown Road	1//0.2	Unsignalized Intersection	NHDOT	None

^a Crash data from Exeter Police Department between 1/1/2014 and 3/9/2020; annual average based on approximately 6.2 years.

^b Source: NHDOT GIS Planning: NH Roads.

^c Typical weekday peak traffic delays identified through Google Maps between 7-8 AM, 8-9 AM, 11 AM-2 PM, 4-5 PM, and 5-6 PM.

Table 3 – 2019 Warrant Article 23 Intersections

Overall Town-Wide Crash Ranking and Intersection	Reported Collisions (Total/Annual Average) ^a	Traffic Control Type	Jurisdiction ^b	Weekday Time Periods of Traffic Delays ^c
2. Water Street (NH 111A) and Front Street (NH 108/111)	36/5.8	Unsignalized	Town of Exeter	7:55 AM 8:45 AM 12:15 PM 4 PM 5 PM
27. Front Street (NH 111A), Pine Street, and Linden Street	6/1.0	Unsignalized	Town of Exeter	7:35 AM 8:30 AM 1:45 PM 4:30 PM 5:10 PM
28. Water Street (NH 27), High Street (NH 27), Clifford Street, and Franklin Street	6/1.0	Unsignalized	Town of Exeter	7:55 AM 8:45 AM 12:15 PM 4 PM 5 PM
53. Winter Street, Railroad Avenue, and Columbus Avenue	3/0.5	Unsignalized	Town of Exeter	7 AM 8 AM 11:40 AM 4 PM

^a Crash data from Exeter Police Department between 1/1/2014 and 3/9/2020; annual average based on approximately 6.2 years.

^b Source: NHDOT GIS Planning: NH Roads.

^c Typical weekday peak traffic delays identified through Google Maps between 7-8 AM, 8-9 AM, 11 AM-2 PM, 4-5 PM, and 5-6 PM.

2 Water Street (NH Route 111A) and Front Street (NH Routes 108/111)

Front Street (NH Routes 108/111) intersects Water Street (NH Route 111A) from the south to form an unsignalized intersection. The Front Street (NH Routes 108/111) northbound approach consists of an exclusive left-turn lane under stop sign control and an exclusive right-turn lane under stop sign control. A gazebo is in the center of the intersection with on-street parking extending southerly along the center of Front Street (NH Route 108/111). The gazebo and the in-street parking separate directional flow (northbound approaching and southbound departing) on Front Street (NH Routes 108/111) for approximately 180 feet. This intersection design layout may result in driver confusion and contribute to collisions (e.g., Water Street [NH Route 111A] eastbound vehicles turning left on the wrong side of the gazebo).



String Bridge is located approximately 50 feet to the east of Front Street (NH Routes 108/ 111) that adds more vehicular conflicts within a small area. On-street parking is provided along the north side of Water Street (NH Route 111A) and crosswalks are striped across Water Street (NH Route 111A) between Front Street (NH Routes 108/111) and String Bridge, across Water Street (NH Routes 111A) west of Front Street (NH Routes 108/111), and across Front Street (NH Routes 108/111) south of the middle in-street parking area. These factors are expected to have contributed to the high number of reported collisions at this intersection (36 incidents over a 3.6 year period. Should the Town pursue potential solutions for this area, further study should be conducted to alleviate congestion and improve safety by collecting traffic counts, evaluating more detailed crash data, and identifying capacity improvements on other roadways for motorists to bypass this area.

3 Portsmouth Avenue (NH Route 108) and Holland Way (NH Route 88)

Holland Way (NH Route 88) and Stoneybrook Connector intersect Portsmouth Avenue (NH Route 108) from the south and north, respectively, to form a four-way signalized intersection. The Holland Way (NH Route 88) and Stoneybrook Connector approaches are under permissive traffic signal phasing with a 155 foot distance for through vehicles to traverse. Should the Town choose to evaluate improvements at this intersection, further research should be conducted of the Exeter Police Department records to determine



crash patterns and to then be able to develop safety improvements. In addition, traffic counts should be collected to determine improvements to alleviate operational deficiencies during the critical time periods (7-9 AM, 1:20-2:20 PM, and 4-6 PM).

4 Newfield Road (NH Route 85) and Railroad Bridge

Railroad Bridge crosses over Newfield Road (NH Route 85) approximately 155 feet north of the Exeter Public Works Department driveway. There is a shift in the horizontal alignment along Newfield Road (NH Route 85) approaching and under Railroad Bridge. Any changes to the alignment of Newfield Road (NH Route 85) or to the bridge and abutments would require the review and approval of NHDOT. The alignment is the likely cause of the high number of reported collisions in this area as there are no conflicting movements or vehicle delays that would be found at intersections. Should the Town choose to consider improvements at this intersection, the design of existing bridge structure should be researched, discussions should be held with NHDOT officials, and a vehicle speed study should be conducted.



5 Epping Road (NH Route 27), Brentwood Road (NH Route 111A), and Columbus Avenue

Brentwood Road (NH Route 111A) and Columbus Avenue intersect Epping Road (NH Route 27) from the southwest and southeast, respectively, to form this unsignalized intersection. The overall intersection consists of three minor intersections:

- To the northwest, vehicles from Brentwood Road (NH Route 111A) and Columbus Avenue destined for Epping Road (NH Route 27) to the west intersect Epping Road (NH Route 27) and operate under stop sign control, with Epping Road (NH Route 27) eastbound right turns channelized.
- To the northeast, vehicles from Brentwood Road (NH Route 111A) and Columbus Avenue destined for Epping Road (NH Route 27) to the east intersect Epping Road (NH Route 27) and operate under stop sign control, with Epping Road (NH Route 27) westbound left turns permitted for continued access to Brentwood Road (NH Route 111A) and Columbus Avenue.
- To the south, right turns from Epping Road (NH Route 27) eastbound and the Columbus Avenue north-westbound approaches are under stop sign



control, with the left turns from Epping Road (NH Route 27) westbound and the Brentwood Road (NH Route 111A) north-eastbound approaches operating under free flow conditions.

The several conflict points within a short distance can contribute to the number of reported incidents. As part of the Transportation Alternatives Program (TAP) grant, New Hampshire municipalities can use federal funds through NHDOT to improve non-motorized transportation infrastructure (sidewalk, bicycle routes, rail trails) to be safe, accessible, and capable of reducing traffic congestion. The Town of Exeter is using the TAP grant to address pedestrian safety at the Epping Road (NH Route 27), Brentwood Road (NH Route 111A), and Columbus Avenue intersection. These improvements are envisioned to eliminate the northwest intersection, restrict Columbus Avenue to allow right-turns in/right-turns out only (with restricted movements diverted to Winter Street or Washington Street), stripe a crosswalk across the Epping Road (NH Route 27) and Brentwood Road (NH Route 111A) intersection (northeast), and construct a median island Brentwood Road (NH Route 111A) to restrict left turns at Columbus Avenue and serve as a pedestrian refuge area for the crosswalk. These improvements are intended to improve safety and not increase vehicular capacity. Should the Town pursue measures to reduce vehicular delays and queueing, traffic counts should be collected, a vehicle speed study should be conducted, and a traffic signal warrant analysis should be performed.

6 North Hampton Road (NH Route 111) and NH Route 101 Interchange (Exit 12)

Similar to the Epping Road (NH Route 27) and NH Route 101 interchange, the heavy traffic volumes entering and exiting from the NH Route 101 eastbound and westbound ramps and traveling along North Hampton Road (NH Route 111) during the weekday morning and evening commuter peak periods (i.e., 7-9 AM and 4-6 PM) could result in motorists attempting turning maneuvers with less than desirable gaps in the traffic stream. Should the Town desire to investigate potential measures to improve safety and operations at this interchange, further study is recommended to include collecting traffic counts, conducting a vehicle speed study, performing a traffic signal warrant analysis, and evaluating more detailed crash data. Since this interchange is under state jurisdiction, any improvements would require the review and approval of NHDOT.



7 Hampton Road (NH Route 27/111), High Street (NH Route 27/111), and Holland Way (NH Route 88)

Holland Way (NH Route 88) intersects Hampton Road (NH Routes 27/111) and High Street (NH Routes 27/111) from the north to form a three-legged unsignalized intersection. The High Street (NH Routes 27/111) eastbound approach and the Hampton Road (NH Routes 27/111) westbound approach are under free-flow traffic control

with a yellow flashing light on a post to warn motorists of the Holland Way (NH Route 88) intersection. Hampton Road (NH Routes 27/111) westbound right turns are channelized from the intersection by way of a raised island. The Holland Way (NH Route 88) southbound approach is under stop sign control and consists of an exclusive left-turn lane and an exclusive right-turn lane. Holland Way (NH Route 88) is located along the outside of the mainline's horizontal curve.

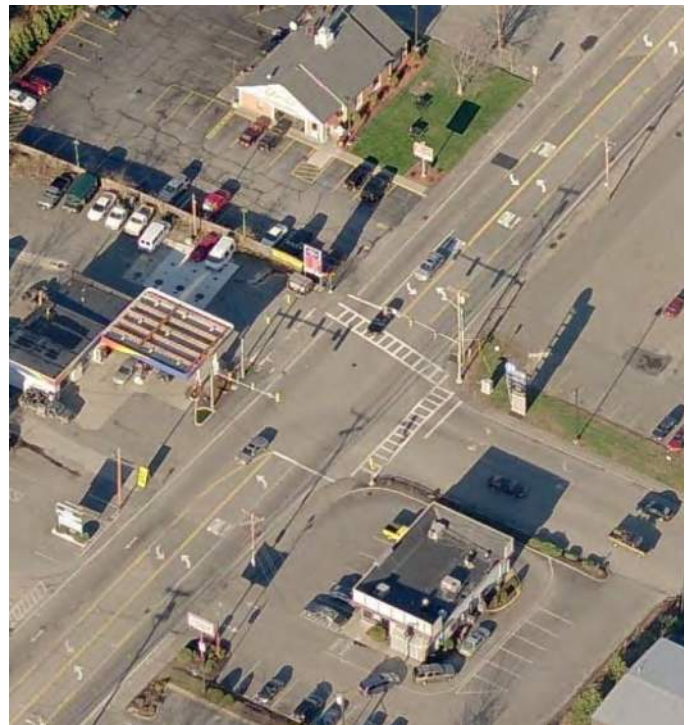


Should the Town of Exeter choose to pursue potential safety improvements at the intersection, further research needs to be conducted with the Exeter Police Department records to determine crash patterns. In addition, traffic counts should be collected to determine improvements to alleviate operational deficiencies during the critical time periods (7-9 AM, 12:10-1:10 PM, and 4-6 PM). It is the understanding that this intersection may be within the Urban Compact area; therefore, research should be conducted to determine deed restrictions.

8 Portsmouth Avenue (NH Route 108) and Alumni Drive

Alumni Drive and a driveway for a gas station intersect Portsmouth Avenue (NH Route 108) from the east and west, respectively, to form a four-way signalized intersection. Sidewalks are provided along both sides of Portsmouth Avenue (NH Route 108) and along the north side of Alumni Drive. Crosswalks are striped across the Portsmouth Avenue (NH Route 108) north leg and across Alumni Drive. The pedestrian facilities do not appear to be compliant with Americans with Disabilities Act (ADA) standards (e.g., curb ramps, slopes, landings, etc.).

The Portsmouth Avenue (NH Route 108) northbound and southbound approaches each consist of an exclusive left-turn lane and a shared through/right-turn lane. There is a shared center turn lane (aka, two-way left-turn lane) striped along Portsmouth Avenue (NH Route 108) north of the intersection and a double center turn lane south of the intersection. The Portsmouth Avenue (NH Route 108) northbound



center turn lane transitions to an exclusive left-turn lane at the Alumni Drive and gas station driveway intersection.

Should the Town decide to investigate safety improvements at this intersection, further research needs to be conducted with the Exeter Police Department records to determine crash patterns (e.g., turning movement incidents from within the double center-turn lane south of the intersection, sideswipe collisions between northbound vehicles within the center turn lane and the exclusive left-turn lane, etc.). In addition, traffic counts should be collected to determine improvements to alleviate operational deficiencies (traffic signal timing adjustments, signal phasing modifications) during the critical time periods (7-9 AM, 12-1 PM, and 4-6 PM).

9 Epping Road (NH Route 27) and Industrial Drive (north)

The northern junction of Epping Road (NH Route 27) and Industrial Drive meet at an unsignalized intersection, with the Industrial Drive westbound approach under stop sign control. A 70 +/- foot wide driveway providing access for 140 Epping Road (Dearbon Park and Walsh Management Company, Inc.) is slightly offset less than 20 feet to the south on the west side of Epping Road (NH Route 27). A secondary access for 140 Epping Road is provided less than 20 feet to the north of the Industrial Drive intersection. An entrance only driveway for Daniel B. Stockbridge Funeral Home is located on the east side of Epping Road (NH Route 27) less than 20 feet north of Industrial Drive. A commercial plaza for 137 Epping Road (Front Row Italian Pizzeria & Sports Bar, Karate International, Charlotte's Web Fine Yarns, Just Doo It Hair Salon, and Rockingham Visiting Nurse Association & Hospice) is located on the southeast quadrant of the intersection with a full access driveway provided approximately 110 feet to the south along Epping Road (NH Route 27).



The numerous conflict points along Epping Road (NH Route 27) may contribute to the high number of reported collisions at the Epping Road (NH Route 27) and Industrial Drive intersection. Should the Town pursue safety improvements at this intersection, further research needs to be conducted with the Exeter Police Department records to determine crash patterns (e.g., location of the incidents) and vehicle speed data should be collected along Epping Road (NH Route 27). In addition, traffic counts should be collected to determine improvements to alleviate operational deficiencies during the critical time periods (11:30 AM-12:30 PM, and 4-5 PM).

10 Epping Road (NH Route 27) and Beech Hill Road

Beech Hill Road intersects Epping Road (NH Route 27) from the northeast to form a three-legged unsignalized intersection. The Beech Hill Road approach is under stop sign control. The Barking Dog is located on the southeast quadrant and NH Route 101 is located to the west of the intersection.

Should the Town pursue safety improvements at this intersection, a vehicle speed study should be conducted to determine how fast motorists are traveling along Epping Road (NH Route 27) approaching Beech Hill Road. Then, a sight distance evaluation should be conducted due Beech Hill Road being located on the inside of a horizontal curve along the Epping Road (NH Route 27) and sight lines may be limited looking at northbound approaching vehicles. Since this intersection is under state jurisdiction, any improvements would require the review and approval of NHDOT.



2018 Exeter Master Plan Intersections

The following provides a summary of the findings for those intersections identified in the 2018 Exeter Master Plan that were not listed within the 10 highest crash locations throughout the Town. The overall Town-wide crash ranking is listed with each intersection.

14. Epping Road (NH Route 27), Park Street, and Winter Street

Park Street and Winter Street intersect Epping Road (NH Route 27) from the east and west, respectively, to form a four-legged unsignalized intersection. The Park Street westbound approach and the Winter Street eastbound approach are under stop sign control. An overhead flashing beacon is present at the intersection to supplemental the traffic control (i.e., free flow along the Epping Road [NH Route 27] approaches and stop control along the Park Street and Winter Street approaches).

In the vicinity of the intersection, Epping Road (NH Route 27) has a slight horizontal curve to the north with Winter Street located on the inside of that curve. Should the Town desire to implement safety measures at this intersection, a vehicle speed study and a sight distance evaluation should be conducted to determine if available sight lines are limited to see Epping Road (NH Route 27) southbound approaching vehicles. In addition,



traffic counts should be collected to determine intersection operations and potential geometric improvements for better vehicle progression during the weekday commuter peak periods (7-9 AM and 4-6 PM).

27. Front Street (NH Route 111), Pine Street, and Linden Street

Pine Street and Linden Street intersect Front Street (NH Route 111) from the southeast and southwest, respectively, to form a four-legged unsignalized intersection. The Linden Street north-eastbound approach and the Pine Street north-westbound approach are under stop sign control. Crosswalks are striped across Pine Street and Linden Street, with sidewalks provided along both sides of Front Street (NH Route 111), along both sides of Linden Street, and along the east side of Pine Street.

There is a large open space (85 +/- foot diameter) within the center of the unsignalized intersection. The layout of the intersection is unique with two minor street approaches intersecting Front Street (NH Route 111) from the south. There are angled parking spaces adjacent to The Exeter Inn along Front Street (NH Route 111) beginning approximately 20 feet to the east of Pine Street. There is a Cooperative Alliance for Seacoast Transportation (COAST) stop for Bus 7 in front of the entrance for The Exeter Inn along Front Street (NH Route 111). An entrance for St. Michael Church is located approximately 60 feet to the west of Linden Street and allows for four lanes of stacking on the church property. These conditions can cause safety concerns for motorists with numerous conflicts within a short area, confusion on which vehicle has the right of way, and limited sight lines to Front Street (NH Route 111) due to the angled alignment of the minor streets.



Should the Town pursue improvements at this intersection, a vehicle speed study should be conducted to determine how fast motorists are traveling along Front Street (NH Route 111) approaching Pine Street and Linden Street. Then, a sight distance evaluation should be conducted from both Pine Street and Linden Street due the layout of the intersection (i.e., motorists may need to look over their shoulders to see Front Street [NH Route 111] approaching vehicles). Traffic counts should be collected to determine intersection operations and potential geometric improvements for better vehicle progression during the weekday commuter peak periods (7-9 AM and 4-6 PM). In addition, a vehicle tracking study could be conducted to determine the volume of vehicles that turn left from Linden Street (one-way northbound) onto Gill Street (one-way northbound) to access Front Street (NH Route 111) as a way to avoid the Front Street (NH Route 111), Pine Street, and Linden Street intersection.

42. Hampton Road (NH Route 27) and Guinea Road

Guinea Road intersects Hampton Road (NH Route 27) from the north to form a three-legged unsignalized intersection. The Guinea Road approach is under stop sign control. Vegetation along the north side Hampton Road (NH Route 27) appears to hinder sight lines from Guinea Road.

Should the Town decide to investigate improvements at this intersection, a vehicle speed study should be conducted to determine how fast motorists are traveling along Hampton Road (NH Route 27) approaching Guinea Road. Then, a sight distance evaluation should be conducted at the intersection to identify areas that may limit sight lines. Traffic counts should be collected to assess intersection operations and then develop improvement alternatives.



85. Brentwood Road (NH Route 111A) and Dogtown Road

Dogtown Road intersects Brentwood Road (NH Route 111A) from the south to form a three-legged unsignalized intersection, with the Dogtown Road northbound approach under stop sign control. A utility pole is in the center of the Dogwood Road leg without raised barrier for protection (e.g., curbing). The utility pole separates Dogwood Road approaching and departing vehicles. Vegetation along the south side Brentwood Road (NH Route 111A) appears to hinder sight lines from Guinea Road. Dogwood Road is located on the outside of a horizontal curve along Brentwood Road (NH Route 111A). Since this intersection is under state jurisdiction, any improvements would require the review and approval of NHDOT.

Should the Town decide to consider potential safety improvements at this intersection, a vehicle speed study should be conducted along Brentwood Road (NH Route 111A) and sight lines should be evaluated to and from Dogwood Road.



2018 Exeter Master Plan Intersections

The following provides a summary of the findings for those intersections identified in the 2019 Warrant Article 23 that were not listed within the 10 highest crash locations throughout the Town or within the 2018 Exeter Master Plan. The overall Town-wide crash ranking is listed with each intersection.

28. Water Street (NH Route 27), High Street (NH Route 27), Clifford Street, and Franklin Street

Clifford Street and Franklin Street intersect Water Street (NH Route 27) and High Street (NH Route 27) from the southwest and southeast, respectively, to form a four-legged unsignalized intersection. Clifford Street is a one-way roadway approaching the intersection that is under stop sign control and restricts left turns onto Water Street (NH Route 27) westbound. Franklin Street is a one-way roadway departing the intersection. Crosswalks are striped across the Water Street (NH Route 27) west leg, as well as across Clifford Street and Franklin Street. Sidewalks are provided along both sides of the Water Street (NH Route 27) west leg, the High Street (NH Route 27) east leg, Clifford Street, and Franklin Street.

Vehicle traffic congestion occurs along the Water Street (NH Route 27) westbound approach and along the High Street (NH Route 27) eastbound approach typically during the weekday commuter time periods (7-9 AM and 4-6 PM) as well as during the weekday midday peak (12:15-1:15 PM). Based on the unique geometric layout of the intersection and a slight horizontal curvature of Water Street (NH Route 27) to the west, motorists on the Clifford Street approach may need to encroach beyond the stop line to see approaching Water Street (NH Route 27) eastbound vehicles that could create a conflict with Water Street (NH Route 27) right turns and High Street (NH Route 27) left turns onto Franklin Street. Should the Town wish to implement safety improvements at this intersection, traffic counts and sight distance measurements should be collected.



53. Winter Street, Railroad Avenue, and Columbus Avenue

Winter Street, Railroad Avenue, and Columbus Avenue intersect to form three unsignalized intersections. The intersections consist of:

- To the southwest, a connector road between Winter Street and Railroad Avenue intersects Winter Street from the east. There are no pavement markings along these roadways, nor a stop sign on the Railroad Avenue connector westbound approach.
- To the southeast, the connector road intersects Railroad Avenue from the west and a driveway for 10 Railroad Avenue (R.E. Prescott Company) intersects Railroad Avenue from the east. There are no pavement markings along these roadways, nor a stop sign on the Railroad Avenue connector eastbound approach.
- To the north, Winter Street, Railroad Avenue, Columbus Avenue, and a driveway for Cote's Auto Body intersect to form a five-legged unsignalized intersection. The mainline consists of the Railroad Avenue southeast leg and the Winter Street north leg, with stop signs posted on the Winter Street north-eastbound approach and on the Columbus Avenue eastbound approach. Other than stop bars striped on the Winter Street north-eastbound and Columbus Avenue eastbound approaches, no other pavement markings are present.

Sidewalks are provided along the west side of the Winter Street southwest and north legs, as well as along the east side of the Winter Street north leg north of Rockingham Street. There are no crosswalks striped at the intersection. The pedestrian facilities do not appear to be compliant with ADA standards (e.g., curb ramps, slopes,

landings, etc.). Due to the lack of pavement marking and signage in the area, confusion over right of way and direction could result for motorists. In addition, the industrial uses along Railroad Avenue could generate trucks in the area that may conflict with pedestrians along Winter Street and Columbus Avenue.

Should the Town want to pursue improvements at these intersections, a vehicle speed study should be conducted to determine how fast motorists are traveling along the Railroad Avenue northbound approach and along the Winter Street southbound approach. Then, a sight distance evaluation should be conducted at the intersection to identify areas that may limit sight lines to and from the minor street approaches (i.e., Winter Street northbound and Columbus Avenue). Traffic counts should be collected to determine intersection operations and potential geometric improvements for better vehicle progression during the weekday commuter peak periods (7-9 AM and 4-6 PM) and during the weekday midday peak (11:40 AM-12:40 PM). To alleviate deficiencies, potential safety and operational measures could consist of reconstructing sidewalks, installing pavement markings, and constructing a roundabout.



Next Steps

After coordination with Exeter's Town Engineer and Town Planner on the documentation presented in this Preliminary Traffic and Safety Findings memorandum, the 16 intersections presented may be prioritized for further evaluation. Although the COVID-19 pandemic has impacted traffic patterns and volumes, typical traffic conditions were researched through reported data found on Google Maps and the total number of reported incidents within the community were obtained from the Exeter Police Department crash records. These efforts combined with the local knowledge of Town officials will help determine the top intersections for potential transportation improvements.

Subsequent to collaborating with Exeter officials, the next phase in the process is to collect traffic counts and review more detailed Exeter Police Department crash records to better identify intersection operations and crash patterns at approximately 5 intersections that are of the highest priority to the Town. This information would then be used to develop appropriate conceptual improvement plans and associated order of magnitude costs for the Town to consider implementing with potential project funding.