Final Report

Biddeford Route 111 Transportation Alternatives/South Street Connections Study

Prepared: December 2022

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

Study Background

The City of Biddeford and York County are experiencing significant economic growth, with these trends likely to continue. This growth has placed added pressure on accessibility to the downtown area and commercial destinations on Route 111 and interior York County. The Maine Turnpike provides accessibility to the City and York County at Exit 32; recurring traffic congestion is a problem, particularly during commuter peak hours. This study assesses the feasibility of improving safety and traffic flow in the corridor through other means (alternatives) detailed in this document and connectivity to the downtown via the construction of a connector roadway from Exit 32 to South Street. The MTA has prepared an initial interchange planning study however this study does not include an assessment of interchange/freeway/toll conditions. The study origin is based on a request by the City of Biddeford for a three-party partnership with MaineDOT and the Maine Turnpike Authority (MTA).

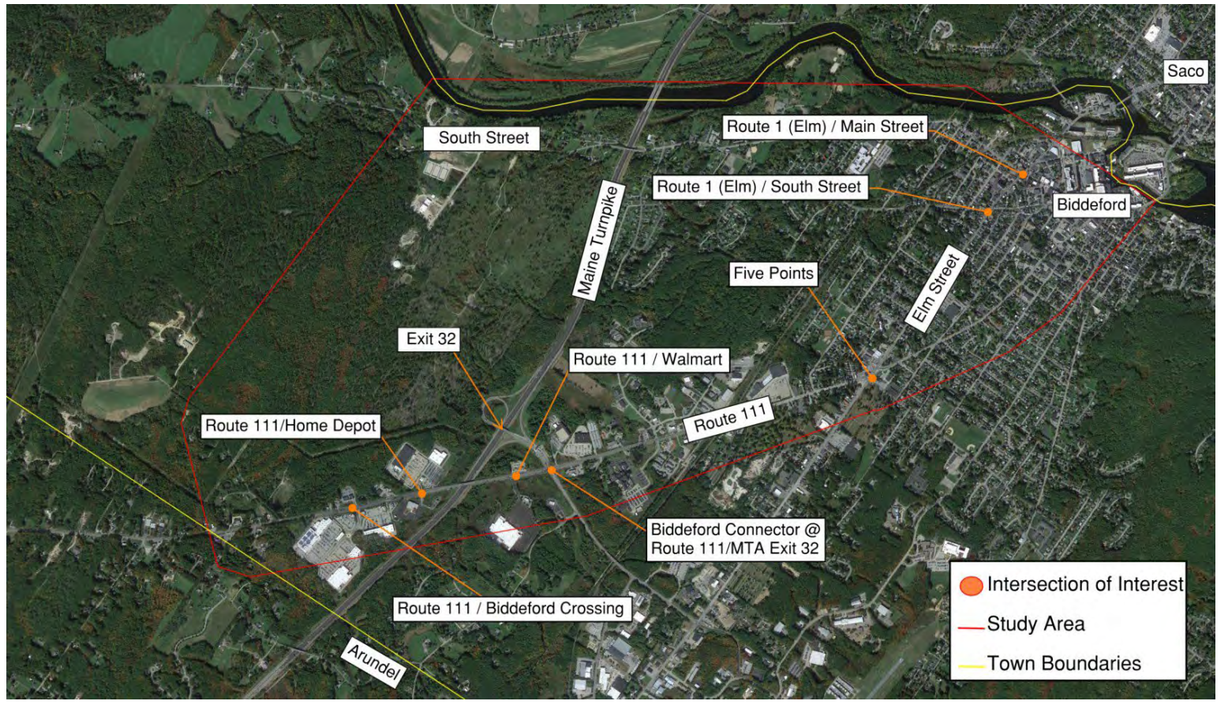


Figure ES.1 Study Area

Study Area

The study area as depicted on **Figure ES.1** generally comprises Route 111 from Arundel to Route 1; Route 1 from Route 111 to Main Street; Main Street/South Street to River Road; and the Maine Turnpike in the Exit 32 area.

Study Purpose and Need

Study Purpose

The primary purpose of the proposed action is to relieve congestion and improve safety along Route 111/Route 1 and to support Biddeford's economic development goals. Other desirable outcomes would be to improve connectivity to I-95 via Exit 32, South Street, and downtown Biddeford; improve more direct access to the interstate for Biddeford and Saco through-traffic; and reduce neighborhood traffic impacts. The preferred alternative will be feasible given reasonable available state, local, federal, and MTA funding.

Study Need

The need for the proposed action is demonstrated through current failing Customer Service Levels at existing intersections indicative of insufficient capacity and high instances of crashes. Congestion is observable at or near peak times, particularly at Route 111/Exit 32 and the Five Points. It is further demonstrated by existing safety issues at intersections and along Route 111 and Route 1.

Existing Conditions

Section 2.0 presents existing conditions with the following summary.

- The Turnpike is the busiest roadway in the study area. Route 111 east of Biddeford Crossing carries the highest volume on a non-freeway facility.
- Traffic volumes have generally increased in the 5-year period reviewed. Elm Street increased by 3.1% over a 5-year period. Route 111 increased by 1.6% over three years. South Street experienced declining traffic volumes since 2019 and this may be related to changes in travel with COVID-19 restrictions.
- A level of service analysis was performed at the study intersections during the weekday AM and PM peak hours. Many of the study area intersections have movements that operate at an unacceptable level of service.
- A safety evaluation was performed and determined that there are six intersections and four roadway segments within the study area that are classified as a high crash location per MaineDOT criteria.
- A review of sidewalk availability was performed. There are no sidewalks on Route 111 west of Exit 32. East of Exit 32, there are some sidewalks, but a continuously sidewalk is not provided. Route 1 has sidewalks on both sides of the street. South Street has a continuously sidewalk on the north side, which transitions to the south side near Main Street. The sidewalk continues to Cathedral Oaks Drive. No sidewalks are provided west of Cathedral Oaks Drive. Main Street includes sidewalks on both sides between Elm Street and Highland Street. The sidewalk continues on the north side to South Street.
- There are no formal on-road bike lanes in the study area. Route 111 does have some shoulder space in some areas, but there are a number of sections where shoulder space is not available. Elm Street has very narrow shoulders and no shoulders in some locations, particularly at intersections where turning lanes are provided. South Street also does not have marked shoulders. Near Elm Street, on-street parked vehicles require bicyclist to ride in the travel lane. In locations where vehicles are not parked, space is limited, where total pavement width is approximately 30 feet.
- The area where possible roadway connection alternatives will be located include the following existing zones B2: Business 2 along Route 111 from the Exit 32 intersection to Andrews Road; RF: Rural Farm, the largest zone west of the turnpike between Route 111 and South Street; MHP: Mobile Home Parks near South Street; and SR1: Suburban Residential bordering South Street from the Turnpike to the west.

Alternatives for Consideration

No-Build

This assumes no changes to the existing transportation system with the exception of programmed improvements. This includes the MTA traffic signal phasing and timing improvements along Route 111 to be implemented in 2023. Additionally, MTA has improvements planned at Exit 32 anticipated in 2028. This improvement consists of an extension of the Turnpike Southbound Off-Ramp to Route 111 somewhere in the area of Andrews Road/Biddeford Crossing (actual location yet to be determined). (See **Figure ES.2**)

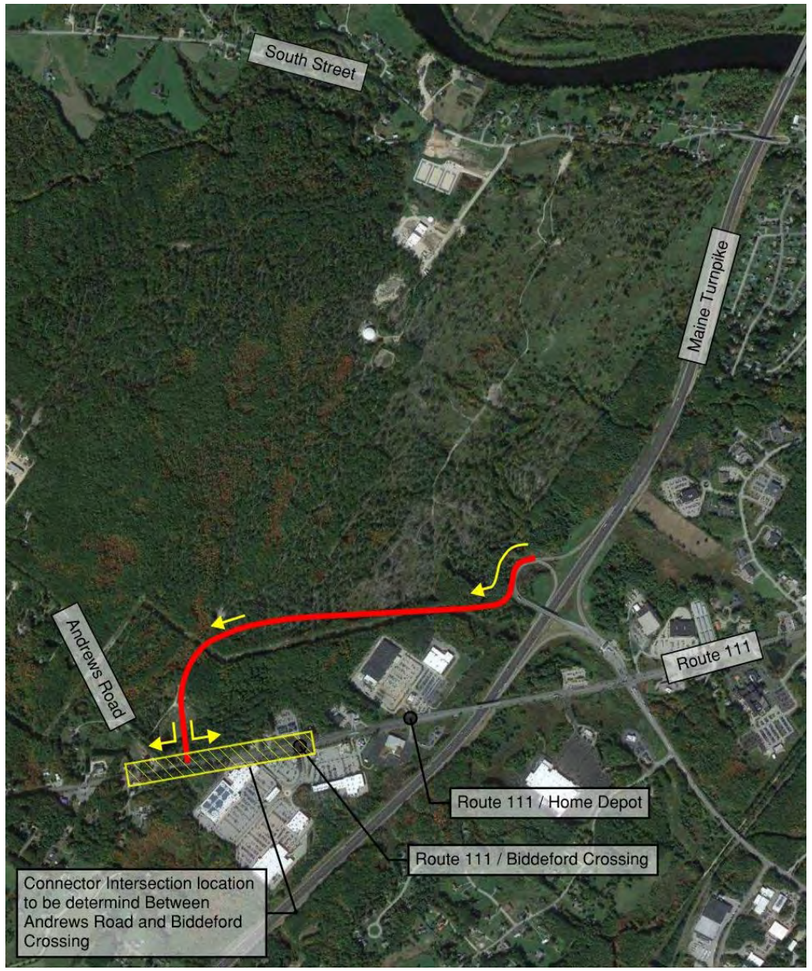


Figure ES.2 2028 MTA Exit 32 Planned Improvements

Alternative 1: Transportation Demand Management Improvement Strategies (TDM)

Transportation Demand Management (TDM) programs provide tools for commuting travelers to reduce the demand for vehicular transportation, i.e., reduce the number of vehicles on the road. These tools include rideshare programs, park and ride lots (which can support rideshare programs), model shifts to transit, walking, and biking, and work from home opportunities, all of which either make it easier to rideshare or to stay off the road altogether.

Alternative 2: Transportation System Management Improvements (TSM)

Transportation System Management (TSM) improvements address the mobility and safety deficiencies of the system. TSM improvements can be made alone or in combination with other improvements. These tend to be small or low cost treatments at intersections and may include traffic signal phasing/timing adjustments, adding or improving turn lanes, and adding/enhancing signage and pavement markings.

Alternative 3: South Street Connector with 2028 MTA Exit 32 Planned Improvements

This Alternative consists of providing a new South Street Connector from the 2028 Exit 32 Southbound Ramp Extension/Route 111 to South Street. (**See Figure ES.3)**

General details include:

- Assumes the planned 2028 MTA Turnpike Southbound Off-Ramp Extension Improvement in constructed.
- Constructing a new road from the MTA Ramp Extension to South Street. This road would be the extension of the Maine Water Company Drive that was recently constructed.
- Convert the 2028 MTA Southbound Off-Ramp Extension to Two-Way traffic from the South Street Connector to Route 111.
- The Connection to Route 111 is to be determined in conjunction with the MTA Ramp Extension project but would be expected in the area of Andrews Road/Biddeford Crossing and will be determined as part of the 2028 MTA improvements.
- The South Street Connector would have 11 to 12 foot travel lanes, 3 to 5 foot shoulders, a shared-use path, and a design speed of 40 MPH. The road would be a limited access facility with carefully planned access points.

Alternative 4: South Street Connector with Full Exit 32 Interchange Improvements

This Alternative consists of providing a new South Street Connector and Exit 32 Interchange Improvements between Exit 32 and Route 111. (**See Figure ES.4)**

General details include:

- Improving the Exit 32 Interchange by fully expanding two-way traffic (details will be developed in a future study).
- Constructing the South Street Connector from the Exit 32 Connector to South Street. This road would be extension of the Maine Water Company Drive that was recently constructed.
- Constructing a two-way roadway from the Route 111/Biddeford Connector Road intersection to Route 111 in the Andrews Road/Biddeford Crossing area (actual location to be determined in conjunction with the MTA Ramp extension project).
- The South Street Connector would have 11 to 12 foot travel lanes, 3 to 5 foot shoulders, a shared-use path, and a design speed of 40 MPH. The road would be a limited access facility with carefully planned access points.

This alternative is provided for informational purposes only, as details on interchange improvements have not been identified and are not part of this study. A future interchange feasibility study will be required. Accordingly, it was not reviewed against the Study Purpose and Need.

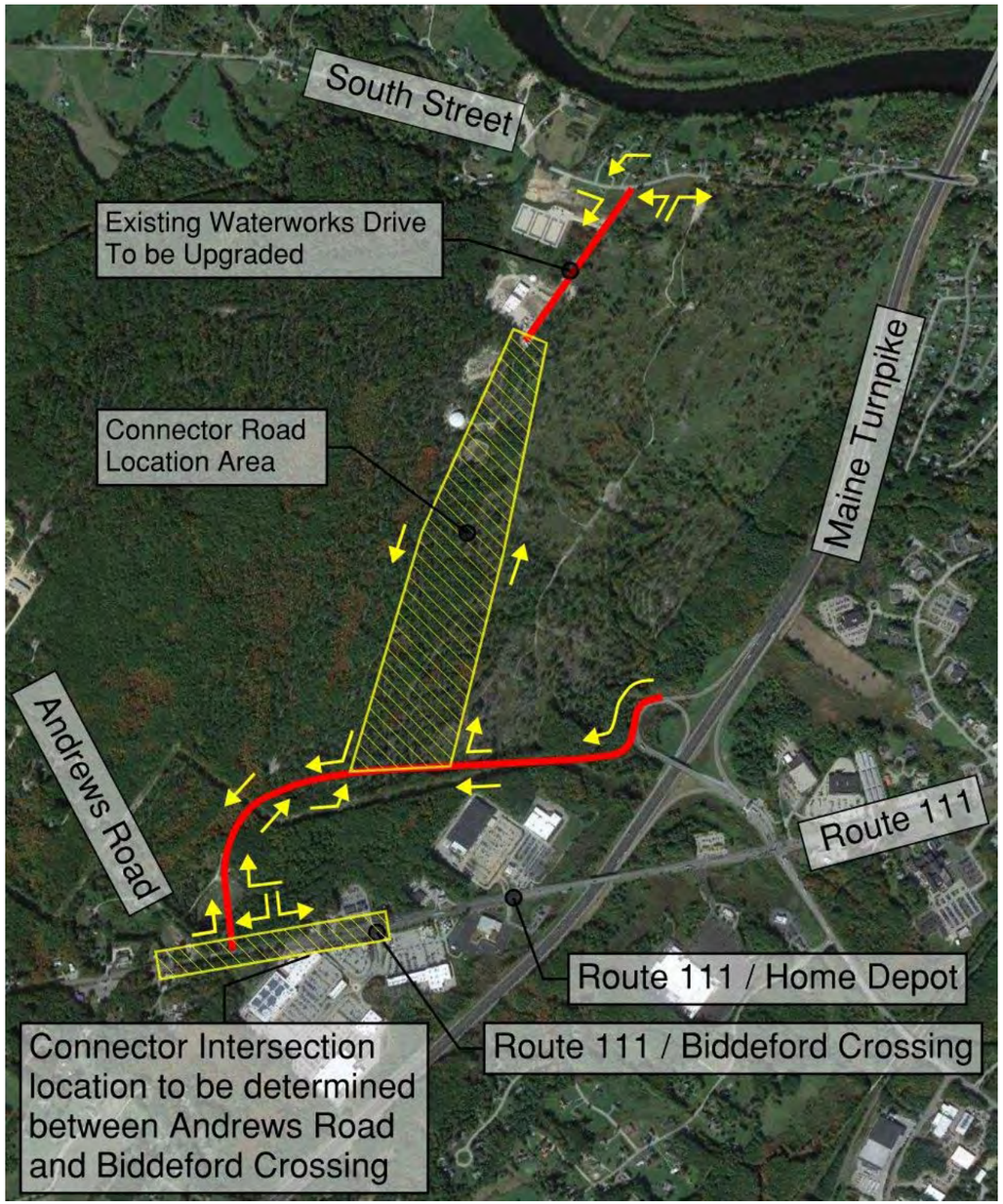


Figure ES.3 Alternative 3 South Street Connector with 2028 MTA Exit 32 Planned Improvements

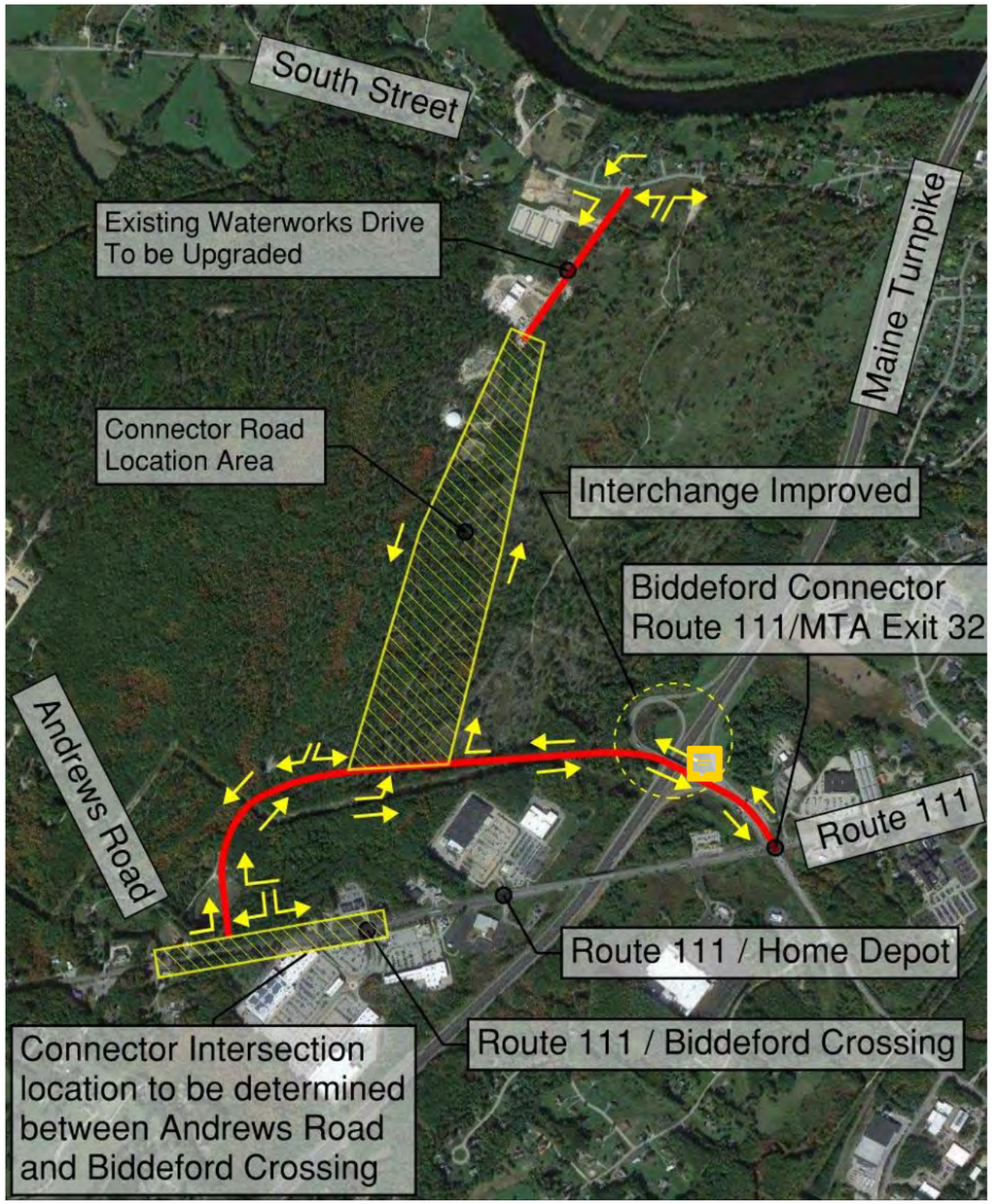


Figure ES.4 Alternative 4 South Street with Full Exit 32 Interchange Improvements

Alternatives Evaluation Criteria

Transportation

The specific transportation criteria evaluated are noted below.

- Vehicle Miles Traveled (VMT) – The VMT values represent daily reductions.
- Vehicle Hours Traveled (VHT) – The VHT values represent daily reductions.
- Improves Level of Service (LOS) and Delay at Key Local intersections – At Route 111/Exit 32/Biddeford Connector and 5 Points.
- Safety – Change in volume at High Crash Locations.
- South Street Traffic Impact - Increase or decrease in traffic volume.
- May Street Traffic Impact – Increase or decrease in traffic volume.
- Saco-Biddeford cut Through Traffic – Increase or decrease in traffic volume on Route 1 between Biddeford and Saco.
- Potential for Improving Bicycle and Pedestrian Conditions – Improved connectivity and reduced volume on streets.

Land Use Measures

The specific property impact criteria evaluated are noted below. These were qualitative as a specific alignment has not been determined.

- Number of Homes/Buildings with Direct Impact
- Number of Private Lots Impacted
- Right-of-Way Acquisition Needed - Acres

Environmental Resource Measures

Based on a likely roadway alignment corridor, the following environmental resources were reviewed for potential impact.

- Potential for Impacts to Archeological and Historic Resources
- Potential for impacts to Vernal Pools
- Potential for impact to Deer Wintering Areas
- Potential for Wetland and Stream Impacts – Acres of impact.
- Potential for Conservation Land and 4(f) Land Impacts – Impact to identified resources.
- Potential for Impacts to Rare, Threatened, Endangered, and Special Concern Plant Species and Habitats

Cost and Funding Measures

A planning-level cost estimate was determined and used in a benefit/cost analysis.

- Construction Cost - This total is the construction cost (current dollars only) to implement each improvement/alternative and does not include right-of-way.
- Benefit/Cost Measure – This is the ratio of the benefit of each alternative quantified according to safety and mobility improvements on a cost basis versus implementation cost.

Purpose and Need

An important element of the evaluation was the determination if an alternative addressed the study purpose and need. Accordingly, the study purpose and need statement (see below) established for the project was reviewed for each alternative.

Study Purpose

The primary purpose of the proposed action is to relieve congestion and improve safety along Route 111/Route 1 and to support Biddeford's economic development goals. Other desirable outcomes would be to improve connectivity to I-95 via Exit 32, South Street, and downtown Biddeford; improve more direct access to the interstate for Biddeford and Saco through-traffic; and reduce neighborhood traffic impacts. The preferred alternative will be feasible given reasonable available state, local, federal and MTA funding.

Study Need

The need for the proposed action is demonstrated through current failing Customer Service Levels at existing intersections indicative of insufficient capacity and high instances of crashes. Congestion is observable at or near peak times, particularly at Route 111/Exit 32 and Five Points. It is further demonstrated by existing safety issues at intersections and along Route 111 and Route 1.

Alternatives Analysis

The following is a brief summary of the evaluation conducted for each alternative.

Alternative 1: Transportation Demand Management (TDM)

No substantial changes to traffic volumes are expected with this alternative. As it relates to this study and the purpose and need statement, Transportation Demand Management strategies will not fully meet the objectives of the study. These strategies should be considered in conjunction with other alternatives (or as separate initiatives) as their benefits offer the provision of a balanced transportation system with mode choices.

Biddeford-Saco Concept Transit-Oriented Development Study

The Biddeford-Saco Concept TOD Study, GPCOG identified a number of strategies to make walking and biking easier and safer, improve transit and reduce vehicle demand. These actions include:

- Address Gaps In The Pedestrian Network
- Extend The Riverwalk Trail
- Make Walking And Biking Safe And Appealing On Major Corridors
- Develop A Bike Network
- Create A Streets Master Plan

Demand Management Strategies

The Biddeford-Saco Concept TOD Study identified a number of strategies to reduce reliance on driving and these actions include:

- Establishing a Transportation Management Association (TMA).
- Requiring Transportation Demand Management (TDM) plans.
- Working with GO MAINE.
- Rethinking paid parking.
- Establishing transit incentive programs.
- Promoting bike incentive programs.
- Providing more secure bike parking.
- Piloting a bike share program.

The Biddeford-Saco Concept TOD Study also established several goals that outline investments that would offer demand reduction results. Some include:

- Invest in public transit
- Make walking and biking easier and safer
- Support Multimodal mobility

Alternative 2: Transportation System Management

Most study area intersections are expected to operate at an acceptable level of service (A to D). The Route 111/Biddeford Connector/Exit 32 and the Five Points intersections are expected to continue to have unacceptable congestion (level of service E or F) in the future. Both locations would require significant capacity expansion and the scale of these projects are not considered system management improvements. Additionally, the Elm Steet intersections with South Street and Main Street have some movements that operate poorly (overall they are operating at an acceptable level of service), but given the built-up urban area, TSM improvements do not appear possible. There are some suggested TSM safety improvements that include signal equipment changes, access management, creating all-way STOP intersections and enhancing a pedestrian crosswalk. Otherwise, this alternative does not meet the purpose and need for the study.

Alternative 3: South Street Connector with 2028 MTA Exit 32 Planned Improvements

Transportation

This alternative will shift traffic from westbound Route 111 to the MTA Exit 32 Ramp and improve intersections from Exit 32/Biddeford Connector to Biddeford Crossing. Additionally, the South Street Connector will shift traffic from the west and Exit 32 Southbound to Downtown and reduce traffic on Route 111 through Five Points. The Route 111/Biddeford Connector/Exit 32 and the Five Points intersections will see reduced delay as levels of service improves. The South Street Connector would be expected to carry about 4,000 vehicles per day and would add 100 vehicles during the AM peak hour and 200 vehicles during the PM peak hour to South Street east of the Connector.

Property Impacts

Although a specific alignment has not been identified, a new roadway will have impacts to private property. Approximately 6 acres of right-of-way acquisition will likely be required. There may be building impacts at the Route 111/Exit 32 Connector location, but it is assumed that it would be part of the MTA Ramp Extension project.

Environmental

The conceptual alignment for the South Street Connector:

- Avoids impacts to the Red Maple Swamp.
- Generally, avoids impacts to MaineDEP identified vernal pools.
- Has potential to impact some vernal pools identified by Biddeford's GIS, the extent of which would be determined as design/permitting progresses beyond feasibility analysis.
- Will impact Deer Wintering Areas in this location.
- Has potential to impact some conserved land in the area, but the majority of this impact falls on the existing Waterworks Drive.

Cost

The cost for this alternative is $12,360,000. A benefit-cost ratio is 1.28 is estimated.

Purpose and Need

This alternative meets the study purpose and need as improvement in congestion and safety are expected. It will also provide improved connectivity to downtown and roadway system redundancy. It is not expected to significantly reduce Saco-Biddeford through traffic, and it has mixed neighborhood impact results as it will reduce traffic on May Street but will increase traffic on South Street.

Alternative 4: South Street Connector with Full Exit 32 Interchange Improvements

<u>This alternative is provided for informational purposes only, as details on interchange improvements have not been identified and are not part of this study. A future interchange feasibility study will be required.</u>

Transportation

This alternative will have similar traffic volume changes as Alternative 3 but will see greater volume changes due to improvements to the Exit 32 interchange and allowing full two-way flow between the Maine Turnpike and the South Street Connector. The Route 111/Biddeford Connector/Exit 32 and the Five Points intersections will see reduced delay as levels of service improve. The South Street Connector would be expected to carry about 7,000 vehicles per day and would add 200 vehicles during the AM peak hour and 300 vehicles during the PM peak hour to South Street east of the Connector. As compared to Alternative 3, the increase in traffic on the South Street Connector is associated with traffic being able to access Exit 32 from the new roadway system. Additionally, motorists will be permitted to travel between the Route 111/Biddeford Connector intersection and the South Street/Connector intersection (motorist could travel from South Street to South Maine Medical Center as an example).

Property Impacts

Although a specific alignment has not been identified, a new roadway will have impacts to private property. Approximately 6 acres of right-of-way acquisition will likely be required. There may be building impacts at Route 111/Exit 32 Connector location, but it is assumed that it would be part of the MTA 2028 project.

Environmental

Similar impacts as Alternative 3 would be expected, although the Exit 32 Interchange Improvements and Ramp Extension projects are not known.

Cost

This alternative was not evaluated for benefit and cost as the Exit 32 Interchange improvements have not been identified and not part of this study.

Purpose and Need

This alternative meets the study purpose and need as improvement in congestion and safety are expected. It will also provide improved connectivity to downtown and roadway system redundancy. It is not expected to significantly reduced Saco-Biddeford through traffic ,and it has mixed neighborhood impact results as it will reduce traffic on May Street but will increase traffic on South Street.

Recommendations

Based on the alternatives evaluation it is recommended that the following actions be considered:

1. Alternative 3: South Street Connector with the 2028 MTA Exit 32 Planned Improvements should be advanced to additional detailed study given that it meets the study Purpose and Need. The following should be considered for inclusion in that future study:
   - South Street detailed traffic/safety study and identification of mitigation strategies.
   - In terms of traffic conditions, consider broader study area outside of Biddeford.
   - Full natural resource inventory and property impacts.
   - Assessment of economic development goals vs. environmental impacts.
   - Updated traffic information to reflect on-going City development.
2. Alternative 1: Transportation Demand Management improvement strategies should be advanced as a separate initiative. These strategies are considered independent of the Connector project and are assumed to be necessary to accommodate future growth in the City.
3. Alternative 2: Transportation System Management improvement strategies should be advanced as a separate initiative. These improvements are considered independent of the Connector project and are assumed to be necessary to address existing deficiencies and accommodate future growth in the City.
4. South Street improvements should be implemented. These improvements are considered independent of the Connector Project and are assumed to be necessary to accommodate future growth in the City.

1.0 INTRODUCTION

Study Background

The City of Biddeford and York County are experiencing significant economic growth, with these trends likely to continue. This growth has placed added pressure on accessibility to the downtown area and commercial destinations on Route 111 and interior York County. The Maine Turnpike provides accessibility to the City and York County at Exit 32; recurring traffic congestion is a problem, particularly during commuter peak hours. This study assesses the feasibility of improving safety and traffic flow in the corridor through other means (alternatives) detailed in this document and improved connectivity to the downtown via the construction of a connector roadway from Exit 32 to South Street. The MTA has prepared an initial interchange planning study however this study does not include an assessment of interchange/freeway/toll conditions. The study origin is based on a request by the City of Biddeford for a three-party partnership with MaineDOT and the Maine Turnpike Authority (MTA).

Study Area

The study area as depicted on **Figure 1.1** generally comprises Route 111 from Arundel to Route 1; Route 1 from Route 111 to Main Street; Main Street/South Street to River Road; and the Maine Turnpike in the Exit 32 area.

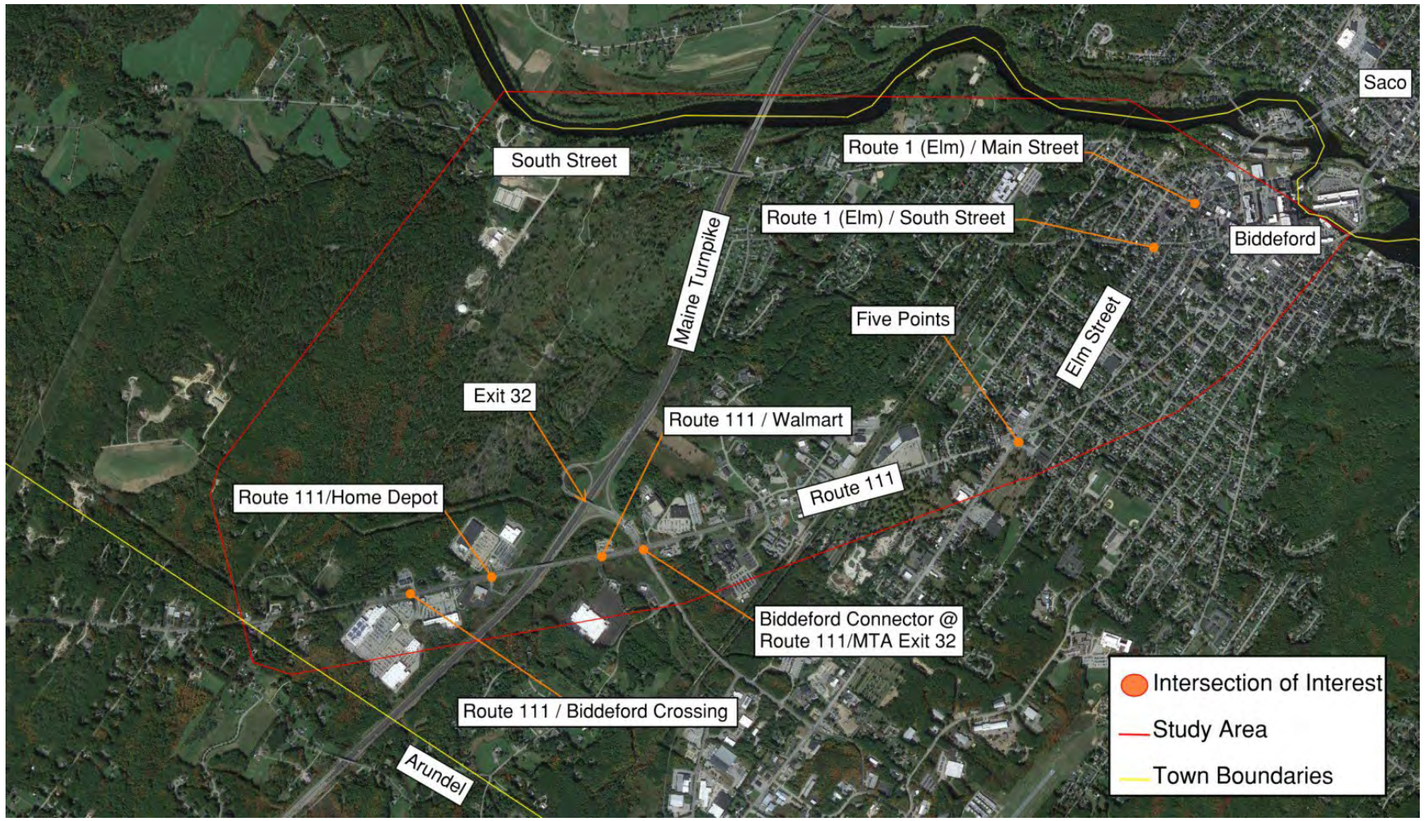


Figure 1.1 Study Area

Study Purpose and Need

Study Purpose

The primary purpose of the proposed action is to relieve congestion and improve safety along Route 111/Route 1 and to support Biddeford's economic development goals. Other desirable outcomes would be to improve connectivity to I-95 via Exit 32, South Street, and downtown Biddeford; improve more direct access to the interstate for Biddeford and Saco through-traffic; and reduce neighborhood traffic impacts. The preferred alternative will be feasible given reasonable available state, local, federal, and MTA funding.

Study Need

The need for the proposed action is demonstrated through current failing Customer Service Levels at existing intersections indicative of insufficient capacity and high instances of crashes. Congestion is observable at or near peak times, particularly at Route 111/Exit 32 and the Five Points. It is further demonstrated by existing safety issues at intersections and along Route 111 and Route 1.

Advisory Committee

An Advisory Committee has been formed to help guide the study and the members include:

- Greg Mitchell, City of Biddeford
- Jeff Demers, City of Biddeford
- Steve Tartre, Maine Turnpike Authority
- Erin Courtney, Maine Turnpike Authority
- Martin Rooney, MaineDOT
- Ian Gorecki, MaineDOT
- Stephanie Carver, SMPDC
- Tom Errico, T.Y. Lin International
- Shawn Davis, T.Y. Lin International
- Carol Morris, Morris Communications
- Kevin Hooper, Kevin Hooper Associates
- Randy Dunton, Gorrill Palmer
- Dana Valleau, TRC
- Duane Choquette, TRC

2.0 EXISTING TRANSPORTATION CONDITIONS

2.1 Existing Transportation Data Sources

Related Studies:

- MTA Exit 32 Safety and Capacity Improvements Study, March 22, 2021
- Route 111 Signal Coordination Project, MTA, 2019
- Central York County Connections Study, April 2016

2.2 Traffic Volumes

Intersection Turning Movement Volumes

Intersection turning movement counts were conducted at key intersections in the study area in 2019 and 2021. A list of the intersections and count dates are provided below:

Primary Study Area

- Route 111/Biddeford Connector/MTA Exit 32 – Thursday June 6, 2019 [Gorrill Palmer 6AM-9AM/3PM-6PM]
- Five Points (Route 1/Route 111/West Street intersections) - Thursday , August 5, 2021 [MaineDOT 6AM-6PM]
- Route 1 (Elm)/South Street - Thursday , August 5, 2021 [MaineDOT 6AM-6PM]
- Route 1 (Elm)/Main Street - Thursday , August 5, 2021 [MaineDOT 6AM-6PM]
- Route 111/Walmart - Thursday June 6, 2019 [Gorrill Palmer 6AM-6PM]
- Route 111/Home Depot - Thursday June 6, 2019 [Gorrill Palmer 6AM-9AM/3PM-6PM]
- Route 111/Biddeford Crossing – Thursday June 6, 2019, and Thursday , August 5, 2021 [Gorrill Palmer 6AM-6PM/6AM-9AM/3PM-6PM]

Other Locations

- Route 111/Andrews Road – Thursday , August 5, 2021 [Gorrill Palmer 6AM-9AM/3PM-6PM]
- Route 111/Barra Road/West Cole Road – Thursday , August 5, 2021 [Gorrill Palmer 6AM-9AM/3PM-6PM]

Traffic volumes collected in 2019 were increased by 2% to estimate 2021 conditions. **Figure 2.1** presents the weekday AM and PM peak hour traffic volumes at the study area intersections.

Hourly Traffic Volume Variation

A review of hourly traffic volume variation was investigated to understand how traffic volume levels change throughout the day. **Tables 2.1 and 2.2** illustrate the hourly traffic volume variation. Two locations were reviewed, Route 111 west of Barra Road and Elm Street south of South Street. For both Route 111 and Elm Street locations, volumes build during the day and peak in the afternoon. The Route 111 locations peak hour occurred between 4:00 and 5:00PM and Elm Street had a peak hour between 3:00 and 4:00PM.

Table 2.1
Route 111 (Alfred Street) W/O Barra Road
Tuesday, August 3 to Thursday, August 5, 2021

Time	Eastbound	Westbound	Total
00:00:00	58	44	102
01:00:00	31	32	62
02:00:00	30	29	59
03:00:00	22	44	66
04:00:00	32	119	150
05:00:00	88	267	354
06:00:00	294	462	756
07:00:00	581	727	1308
08:00:00	647	716	1363
09:00:00	640	824	1464
10:00:00	732	926	1657
11:00:00	806	970	1777
12:00:00	853	952	1805
13:00:00	836	928	1764
14:00:00	824	958	1782
15:00:00	904	1060	1964
16:00:00	889	1103	1992
17:00:00	828	951	1778
18:00:00	652	622	1274
19:00:00	522	527	1049
20:00:00	394	328	722
21:00:00	259	220	479
22:00:00	148	118	267
23:00:00	90	68	158

Table 2.2
Route 1 (Elm Street) S/O South Street
Tuesday, August 3 to Thursday, August 5, 2021

Time	NB	SB	Total
00:00:00	28	40	68
01:00:00	20	26	46
02:00:00	18	26	44
03:00:00	16	20	36
04:00:00	36	58	94
05:00:00	72	128	201
06:00:00	185	304	489
07:00:00	310	442	752
08:00:00	354	442	797
09:00:00	391	516	906
10:00:00	482	572	1054
11:00:00	534	585	1119
12:00:00	557	562	1119
13:00:00	549	566	1115
14:00:00	574	578	1152
15:00:00	627	612	1240
16:00:00	668	564	1232
17:00:00	617	530	1147
18:00:00	449	462	911
19:00:00	386	317	702
20:00:00	290	236	526
21:00:00	188	156	344
22:00:00	115	105	220
23:00:00	66	60	126

Daily Traffic Volume Variation

The Route 111 Signal Coordination project collected traffic data in early June 2019 during the weekday and on a Saturday. **Table 2.3** summarizes the peak hour volumes at a few locations along Route 111. As noted, the weekday PM peak hour has the highest volume during the week.

Table 2.3
Route 111 Peak Hour Volumes (2019)

Hour	West of Exit 32	East of Exit 32	East of Barra Road
AM	1,820	1,250	1,492
PM	2,903	2,501	2,016
Saturday	2,794	2,110	1,949

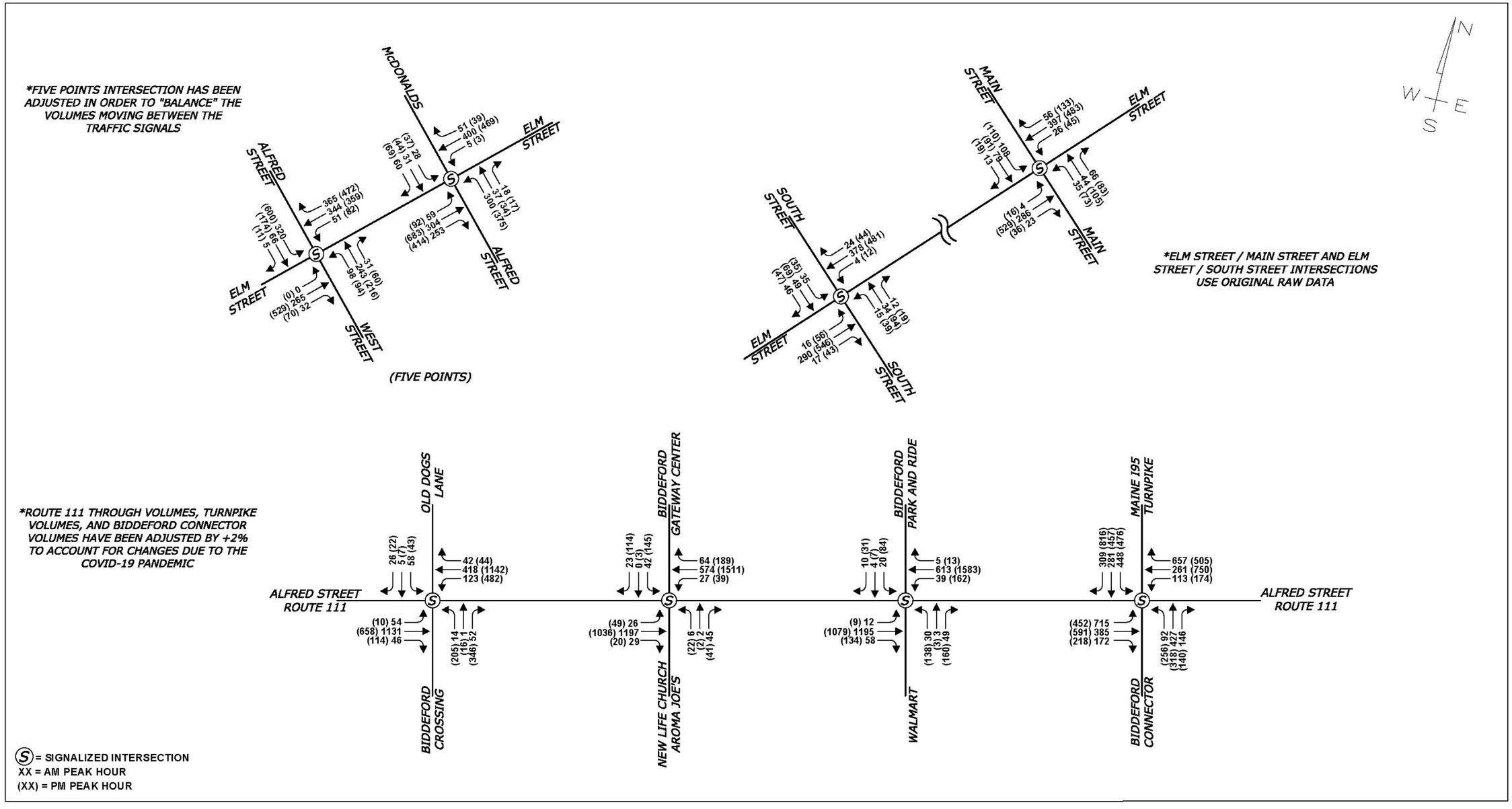


Figure 2.1 2021 Design Hour Traffic Volumes

Seasonal Traffic Volume Variation

Biddeford area roadways generally experience higher traffic volumes during the summer months given recreation and tourism activity. The Turnpike has higher traffic volumes during the summer as presented in **Table 2.4**. According to monthly traffic volume data at Exit 32, August has the highest monthly volume.

Table 2.4
Seasonal Traffic Volume Data at Exit 32

Month	2019 Total Volume
January	414,320
February	385,129
March	443,343
April	451,632
May	506,932
June	508,349
July	555,272
August	573,910
September	500,871
October	515,262
November	449,843
December	431,753

Average Annual Daily Traffic Volumes

Average Annual Daily Traffic Volumes (AADT) were obtained from MaineDOT and MTA as shown in **Table 2.5**. AADT is the total volume of vehicle traffic on a roadway for a year divided by 365 days. AADT is a useful and simple measurement of how busy a road is. As noted, and expected the Turnpike is the busiest roadway in the study area. Route 111 east of Biddeford Crossing carries the highest volume on a non-freeway facility.

Table 2.5
Existing AADT

Location	2021
MTA n/o Exit 32	73,300 (2019)
MTA s/o Exit 32	56,900 (2019)
Elm St. n/o South St.	12,910
Elm St. s/o South St.	13,260
South St. w/o of Elm St.	3,510
South St. e/o of Elm St.	2,480
Main St. e/o Elm St.	5,040
Elm St. s/o Main St.	13,440
Main St. n/o Elm St.	4,970
Rt. 111 w/o Arena Dr.	20,430
Elm St. n/o Rt. 111	13,090
Rt. 111 e/o Elm St.	9,540
West St. e/o Rt. 1	7,430
Rt. 1 s/o West St.	11,270
Rt. 111 w/o Rt. 1	16,310
W. Cole Rd s/e Hospital Entrance	2,520
Barra Rd. n/o Rt. 111	4,380
Rt. 111 w/o Barra Rd.	20,790
Old Dogs Lane w/o Rt. 111	1,810
Rt. 111 e/o Biddeford Crossing	24,360
Biddeford Crossing s/o Rt. 111	11,360
Rt. 111 w/o Biddeford Crossing	19,430
Rt. 111 w/o Andrews Rd.	19,400
Andrews Rd. n/o Rt. 111	190

Historical Traffic Volume Growth

MaineDOT and MTA have collected traffic volume data in the study area that provides some insight into traffic volume growth and how traffic may increase in the future. **Table 2.6** illustrates historical growth at a few study area locations. As noted, traffic volumes have generally increased in the 5-year period reviewed. Elm Street increased by 3.7% over a 5-year period. Route 111 increased by 1.6% over three years. South Street experienced declining traffic volumes since 2019 and this may be related to changes in travel with COVID-19 restrictions.

Table 2.6
Historical Average Annual Daily Traffic Volumes

	Exit 32	South St. w/o Main	Rt. 111 e/o Exit 32	Elm St. s/o South St.
2016	TBD	5,340	25,200	12,790
2019	28,100	5,220	25,600	13,190
2021	TBD	3,510		13,260

MTA Traffic Volumes

Figure 2.2 presents 2019 daily, AM and PM traffic volumes at Exit 32. As noted, traffic to and from the north is much higher than to and from the south.

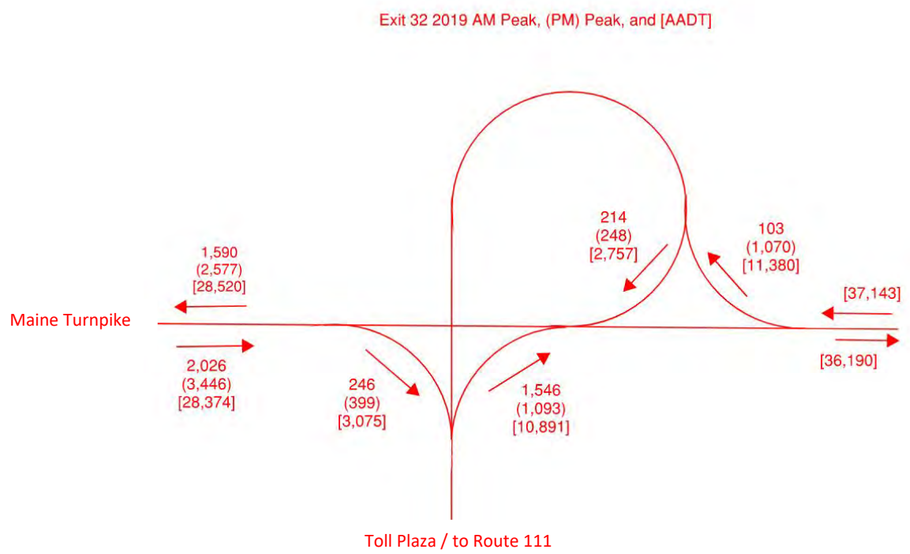


Figure 2.2 Exit 32 Traffic Volumes

Vehicle Classification

Vehicle classification data provides information on the types of vehicles traveling on area roadways. Heavy vehicles or trucks have an impact on traffic mobility and require roadway design considerations, particularly turning space and pavement design. Truck data is available from detailed classification counts conducted on Elm Street south of Amherst Street and Route 111 at the Biddeford/Arundel town boundary. (see **Tables 2.7 and 2.8 located in the Appendix**). For Route 1 truck volume percentages are approximately 5% when overall volumes are low in the morning and decline to about 3% in the afternoon. On Route 111 truck percentages are higher than Route 1 and are approximately 7% of the morning peak hour volume and about 4% of the afternoon peak hour.

2.3 Traffic Mobility

Intersection Capacity Analysis

The standard used to evaluate traffic operating conditions of the transportation system is referred to as the Level of Service (LOS). This is a qualitative assessment of the quantitative effect of factors such as speed, volume of traffic, geometric features, traffic interruptions, delays, and freedom to maneuver.

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

The measures of delay for each Level of Service rating for unsignalized and signalized intersections are found in **Table 2.9**.

Table 2.9
LOS CRITERIA

LOS	Signalized Intersection	Unsignalized Intersection
A	≤10 sec	≤10 sec
B	10–20 sec	10–15 sec
C	20–35 sec	15–25 sec
D	35–55 sec	25–35 sec
E	55–80 sec	35–50 sec
F	>80 sec	>50 sec

SimTraffic computer models were used to analyze the study intersections. For SimTraffic, the Trafficware version 9 standard output was used, based on 5 runs of 60 minutes of simulation. Existing traffic signal timing from MTA or from signal plans developed for Route 1 intersections by MaineDOT were used.

Table 2.10 summarizes the overall level of service at the study intersections during the weekday AM and PM peak hours. As noted, many of the study area intersections have movements that operate at an unacceptable level of service.

Table 2.10
Existing Overall Level of Service Summary

Intersection	AM Peak Hour	PM peak Hour
Route 111/Biddeford Crossing	B (some movements at D)	C (some movements at D)
Route 111/Home Depot	B (some movements at C)	C (some movements at E)
Route 111/Walmart	B (some movements at E)	B (some movements at D)
Route 111/Biddeford Connector/MTA Exit 32	D (some movements at E)	D (some movements at E)
Route 111/Route 1/West Street	D (some movements at F)	D (some movements at F)
Route 111/Route 1/McDonald's	C (some movements at D)	C (some movements at D)
Route 1 (Elm)/Main Street	B (some movements at E)	C (some movements at E)
Route 1 (Elm)/South Street	B (some movements at D)	C (some movements at E)

Detailed level of service and vehicle queue information is provided in the **Appendix**.

2.4 Safety Assessment

To complete the safety review, information presented on the Maine Public Crash Query Tool and the MaineDOT Public Map Viewer was reviewed for the three-year period of 2018-2020. To evaluate whether a location has a crash problem, MaineDOT uses two criteria to define a High Crash Location (HCL). Both criteria must be met to be classified as an HCL. The criteria are as follows:

1. A critical rate factor (CRF) of 1.00 or more for a three-year period. A CRF compares the actual crash rate to the rate for similar intersections in the state, A CRF of less than 1.00 indicates a rate of less than average **and:**

2. A minimum of eight crashes over the same three-year period.

Based on this evaluation, there are six intersections and four roadway segments within the study area that are classified as a high crash location. There is a fifth roadway segment on South Street that starts within the study area but continues westerly primarily outside of the study area. The locations are shown graphically on **Figure 2.3**. The high crash locations are shown in red (circles for intersections and lines for roadway segments) and locations that met one of the two criteria above but are not a HCL are highlighted in yellow. **Table 2.11 in the Appendix** presents crash details.

To further evaluate potential crash patterns, collision diagrams (see **Appendix**) were obtained from the MaineDOT Public Map Viewer. Typically, a crash pattern is considered three or more similar crashes within the three-year time period being reviewed. Since the three-year time period includes the impacts from the pandemic, it is unclear if the decreasing pattern in crashes is due to decreasing volumes on the road as a result of the pandemic, or that the contributing factor to the crashes has resolved itself. A brief description of each high crash location pattern is provided as follows:

Intersections

- **Elm Street/Orchard Street/Union Street** – Overall intersection 11 crashes, CRF 1.99
  - Elm Street northbound rear-end crashes (3 crashes)
  - Angle crash between left turns from Union Street and southbound Elm Street (3 crashes)

- **Route 111/Edwards Avenue** – Overall intersection 31 crashes, CRF 1.13
  - Angle crash between eastbound left turning Alfred Street into 5 Points Shopping Center and westbound through traffic (6 crashes)
  - Route 111 westbound rear-end (8 crashes)
  - Route 111 eastbound rear-end (6 crashes)

- **Route 111/Precourt Street /Exit 32** – Overall intersection 77 crashes, CRF 1.58
  - Angle crash between left from ramp and straight from ramp (3 crashes)
  - Angle crash between left onto Precourt Street and northbound Route 111 (6 crashes)
  - Route 111 westbound rear-end (20 crashes)
  - Route 111 eastbound rear-end (15 crashes)
  - Precourt Street rear-end (3 crashes)

- **South Street/May Street** – Overall intersection 8 crashes, CRF 1.98
  - May Street northbound rear-end (3 crashes)

- **Main Street/Bradbury Street/St. Mary's Street** – Overall intersection 8 crashes, CRF 2.34
  - Angle crash between northbound Bradbury straight to St. Mary's Street and westbound Main Street (3 crashes)

- **Route 111/Elm Street/West Street/McDonalds** – Overall intersection 46 crashes, 1.29
  - Route 111 eastbound rear-end (7 crashes)
  - Elm Street northbound rear-end (11 crashes)
  - Route 111 westbound rear-end (8 crashes)
  - Elm Street southbound rear-end (6 crashes)
  - Angle crash between eastbound left onto Route 111 and northbound Elm Street (3 crashes)
  - Sideswipe southbound Elm Street (4 crashes)
  - Angle crash between westbound left from Route 111 and southbound Elm Street (3 crashes)

Roadway Segments:

- **Route 111 from May Street to Edwards Avenue** – Overall intersection 25 crashes, CRF 1.19)
  - Angle crash between lefts from Five Points Shopping Center and westbound on Alfred Street (4 crashes)
  - Route 111 westbound rear-end (4 crashes)
  - Route 111 westbound sideswipe (3 crashes)
  - Route 111 eastbound rear-end (3 crashes)

- **Elm Street from Route 111 to Dartmouth Street** – Overall intersection 23 crashes, CRF 3.37)
  - Angle crash between lefts exiting shopping plaza and southbound Elm Street (8 crashes)
  - Elm Street northbound sideswipe (3 crashes)
  -

- **West Street from Route 111 to Graham Street** – Overall intersection 20 crashes, CRF 3.96)
  - Angle crash between lefts from Burger King and eastbound on West Street (14 crashes)

- **Toll Booth area from Route 111 to I-95 Ramp** – Overall intersection 17 crashes, CRF 2.69)
  - On Ramp sideswipe (3 crashes)
  - Exit Ramp sideswipe (8 crashes)

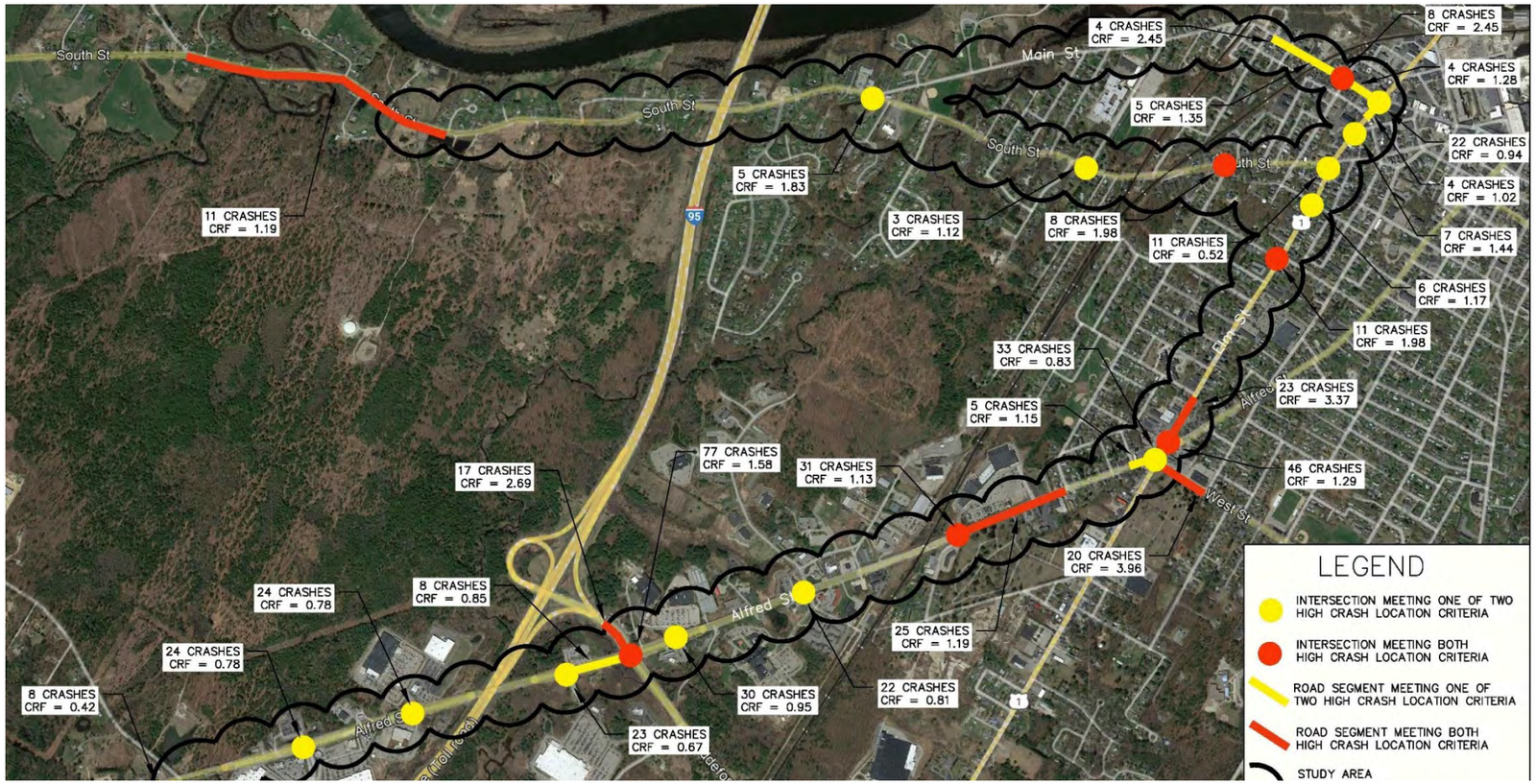


Figure 2.3 High Crash Locations

2.5 Bicycle and Pedestrian Facilities

Sidewalks

Figure 2.4 depicts sidewalks in the study area. As noted there no sidewalks on Route 111 west of Exit 32. East of Exit 32, there are some sidewalks, but a continuously sidewalk is not provided. Route 1 has sidewalks on both sides of the street. South Street has a continuously sidewalk on the north side, which transitions to the south side near Main Street. The sidewalk continues to Cathedral Oaks Drive. No sidewalks are provided west of Cathedral Oaks Drive. Main Street includes sidewalks on both sides between Elm Street and Highland Street. The sidewalk continues on the north side to South Street.

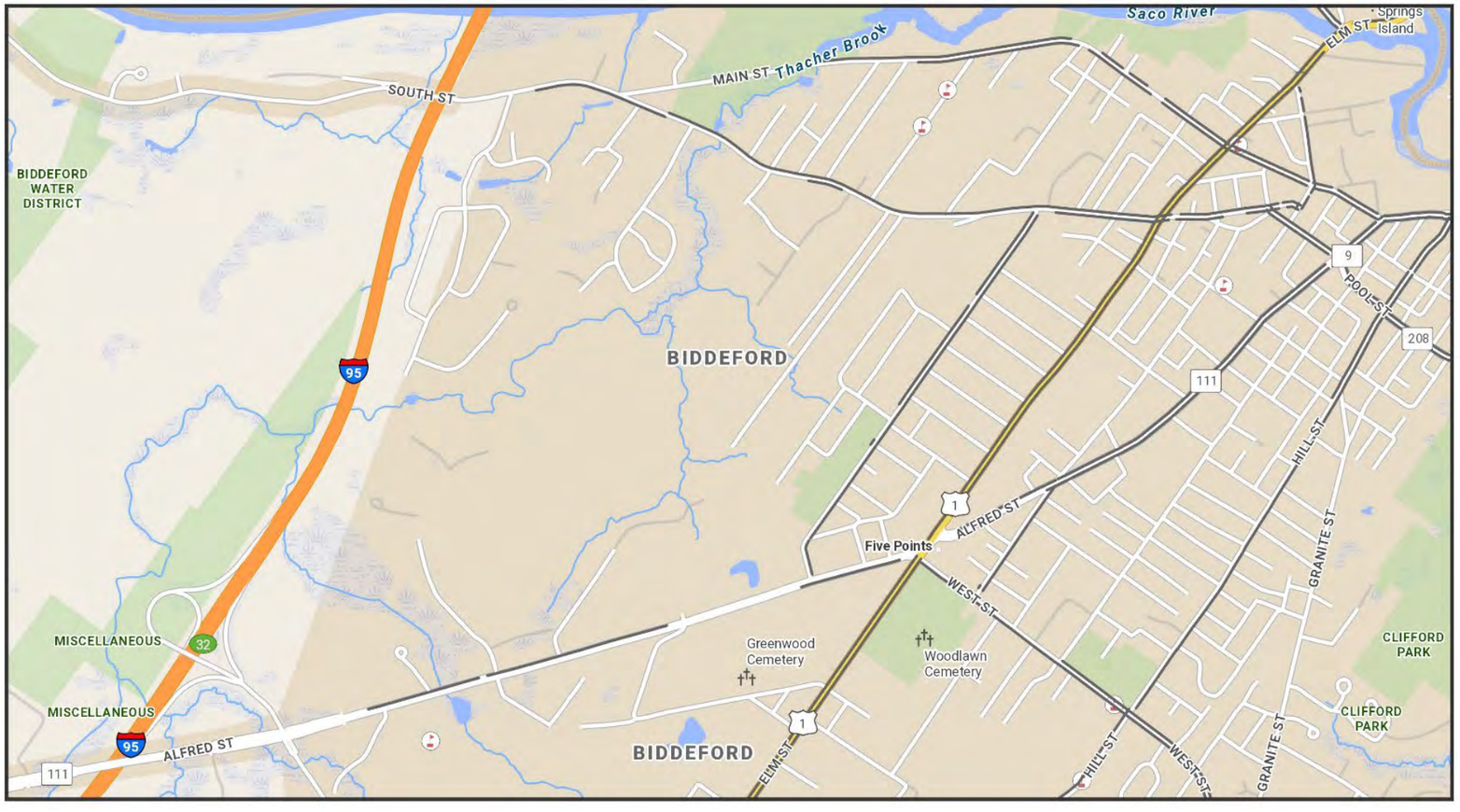


Figure 2.4 Sidewalks

Bicycle Facilities

There are no formal on-road bike lanes in the study area. Route 111 does have some shoulder space in some areas, but there are a number of sections where shoulder space is not available. Elm Street has very narrow shoulders and no shoulders in some locations, particularly at intersections where turning lanes are provided. South Street also does not have marked shoulders. Near Elm Street, on-street parked vehicles require bicyclist to ride in the travel lane. In locations where vehicles are not parked, space is limited, where total pavement width is approximately 30 feet.

There are off road trails in the study area, with the popular Eastern Trail (both on and off routes) located in the study area. **Figure 2.5** illustrates trails in the City.

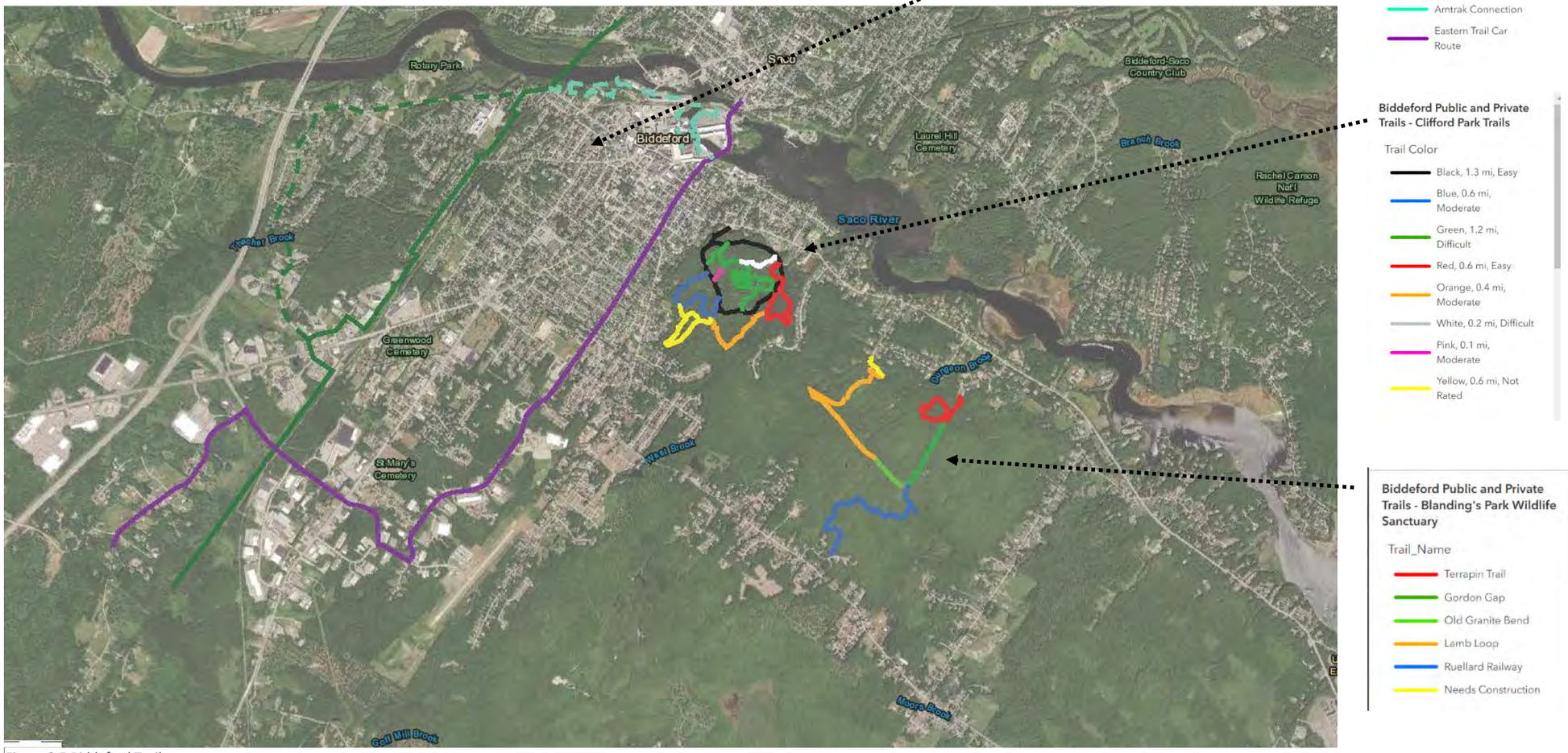


Figure 2.5 Biddeford Trails

3.0 ENVIRONMENTAL RESOURCES

The following describes the methodology and results of a desktop analysis performed to identify historic, archaeological, and natural resources that are known to occur within and nearby the Transportation Alternatives and South Street Connections Study Area. The purpose of this desktop analysis is to provide baseline information on the presence of these protected resources within the Study Area, and to help inform decision making on potential project alternatives. As the Transportation Alternatives and South Street Connections Feasibility Study (the Study) progresses and potential scopes of work are defined, a more focused review of protected resources may be conducted to determine additional studies and permitting requirements that may be needed for individual improvement projects.

STUDY AREA

An overall Study Area was established by TYLin **(Figure 3.1 – Site Location – All Figures for this section are located in the Appendix)** to review the area surrounding Exit 32 to improve connectivity between I-95 via Exit 32, and South Street and downtown Biddeford. For the purposes of analyzing existing historic and environmental resources, the study was defined to focus on areas of potential roadway improvement work and connectivity to reduce traffic congestion. This study area comprises approximately 3025.5 acres, as shown on **Figure 3.2** – Study Area.

The Study Area is predominantly developed, primarily consisting of roadways, mixed commercial/residential spaces (mostly in the downtown business district), single-family residences (including those within small, closely developed neighborhoods), and conservation/recreation lands located west of I-95. In general, residential developments are predominantly located in the eastern half of the survey area, between I-95 and Route 111. Most of the conservation lands are allocated west of I-95 or along the southern bank of the Saco River.

3.1 HISTORIC AND ARCHAEOLOGICAL RESOURCES

The following section provides a discussion of regulatory requirements for projects impacting historic or archaeological resources and provides an overview of the historic and archaeological resources documented within the Study Area. A discussion of the data sources and methodology used for the analysis is also included below.

ARCHAEOLOGICAL AND HISTORIC CONTEXT OF THE STUDY AREA

Compiling data and awaiting official response from Maine Historical Preservation Commission (MHPC)

REGULATORY BACKGROUND

SECTION 106

Pursuant to Section 106 of the National Historic Preservation Act of 1966 (Section 106), any project, activity, or program either funded, permitted, licensed, or approved by a Federal Agency is required to assess and consider the effects of the activity on "historic properties". "Historic properties" include prehistoric or historic districts, sites, buildings, structures, or objects included in or eligible for inclusion in the National Register of Historic Places (National Register). "Historic properties" can include properties or features of traditional religious and cultural importance to an Indian tribe, if they also meet the criteria for listing in the National Register.

In Maine, the Section 106 process is coordinated by the Maine Historic Preservation Commission (MHPC). The MHPC assesses the effects of any federally funded, permitted, or licensed undertaking on "historic properties." The goal of this consultation process is to identify the presence of significant historic buildings, structures, districts, and archaeological sites and take steps to avoid, minimize, or mitigate adverse effects (Maine Historic Preservation Plan, MHPC 2005).

NATIONAL REGISTER OF HISTORIC PLACES

Properties are nominated to the National Register, or determined "eligible", under one or more criteria of significance. They can be related to local contexts, or in some cases to subjects of statewide or national importance. The four general criteria are:

- Association with important events or historic trends;
- Significance by way of association with important persons;
- Significance for architecture and design; and
- Potential to yield important information in history or prehistory (usually through archaeology).

The National Register documentation is on file at the National Park Service (NPS), National Register of Historic Places in Washington, D.C. and at the MHPC.

MAINEDOT PROGRAMMATIC AGREEMENT

In 2004, the Federal Highway Administration (FHWA), Federal Transit Administration (FTA), the Advisory Council on Historic preservation, the MHPC, and the Maine Department of Transportation (MaineDOT) entered into a programmatic agreement regarding implementation of Section 106 on MaineDOT projects that receive federal funding. Pursuant to that agreement, MaineDOT is responsible for initiating the Section 106 process, in particular MaineDOT is responsible for defining the area of potential effect (APE) for each undertaking, identifying historic properties within the APE using MHPC Historic Buildings/Structures survey forms, and evaluating the eligibility of any historic properties for inclusion in the National Register. Documentation is forwarded to the MHPC for concurrence and entered in the MHPC survey files.

METHODOLOGY

Archaeological and historic resource identification within the Study Area involved outreach to the MHPC to inquire about the presence of known or potential historic or archaeological resources within the Study Area. Additionally, the analysis collected data on historic buildings, structures, and districts currently listed or previously determined to be eligible for listing in the National Register from the NPS's online interactive mapping application. Finally, the desktop analysis also included a review of information displayed on the Cultural Architectural Resource Management Archive (CARMA). CARMA is an on-line architectural survey database for Maine's historic above ground resources. Developed and underwritten by the MaineDOT for the MHPC, CARMA enables architectural historians, survey consultants, and the public to search for surveyed properties and identify properties that have been evaluated for listing in the National Register of Historic Places.

LIMITS OF AVAILABLE DATA

Because existing determinations of National Register eligibility (per NPS or CARMA) were made only for properties immediately within earlier projects' APEs, the complete status of the potentially historic buildings in the Study Area remains undetermined. Similarly, archaeological excavations are conducted when disturbance is threatened, but other currently unknown archaeological sites may exist within the Study Area.

SUMMARY OF FINDINGS AND RECOMMENDATIONS

ARCHAEOLOGICAL

Compiling data and awaiting official response from Maine Historical Preservation Commission (MHPC). **Figure 3.3** – Cultural Resources

NRHP ELIGIBLE STRUCTURES

Compiling data and awaiting official response from Maine Historical Preservation Commission (MHPC).

RECOMMENDATIONS

Compiling data and awaiting official response from Maine Historical Preservation Commission (MHPC).

3.2 NATURAL RESOURCES

This section provides an overview of methods and findings for identifying natural resources that are regulated by Federal and State agencies as well as the non-regulated resources considered important to the environment and character of the Study Area.

NATURAL RESOURCES WITHIN THE STUDY AREA

The Study Area is located within the Saco Watershed in Biddeford, and contains segments of the Saco River, Thatcher Brook and Swan Pond Brook sub-watersheds. The Saco River flows west to east along the northern boundary of the Study Area, with Swan Pond Brook and Thatcher brook both class B tributaries of the Saco River. Thatcher Brook is an Urban Impaired Stream and flows south to north until it reaches the Saco River. Swan Pond Brook flows southwest to northeast until it reaches the Saco River

The majority of the Study Area has been developed for residential, commercial, industrial, and transportation uses and infrastructure. Most of the upland areas located within the Study Area have been developed, and many of the wetlands in this area have been altered over time to facilitate development and drainage. Soils within the Study Area are predominantly glaciolacustrine silt loam deposits derived from siltstone and/or fine-silty marine deposits **(Attachment 3.1 Study Soils)**.

REGULATORY BACKGROUND

At the state level, the Maine Department of Environmental Protection (MDEP) reviews developments that may have a substantial effect on the environment under the Site Location of Development Act (Site Law, 38 M.R.S.A. §§ 481-490). MDEP regulates impacts to wetlands, waterbodies, and other protected natural resources under the Natural Resources Protection Act (NRPA, 38 M.R.S.A §§480-A to 480-HH). Site Law incorporates stormwater permitting. For Projects that do not require a Site Law permit but still meet the requirements for stormwater permitting, applicants must meet the provisions of Maine's Stormwater Law (Chapter 500). MaineDOT and Maine Turnpike Authority (MTA) Projects also have a General Permit for the Discharge of Stormwater from MaineDOT and MTA Municipal Separate Storm Sewer Systems (MS4). Compliance with the General Permit authorizes MaineDOT and MTA to discharge stormwater, pursuant to Water Pollution Control Law, 38 M.R.S.A. §413.

At the federal level, the U.S. Army Corps of Engineers (USACE) regulates the placement of dredged or fill material in waters of the United States, which include wetlands and surface waters, under Sections 404 and 401 of the Clean Water Act (CWA, 33 CFR §1341 and 1344).

The Maine Floodplain Management Program (a division of the Department of Agriculture, Conservation, and Forestry) works with other state agencies (e.g., MDEP) to ensure that development under state review is designed and developed to reduce future flood damages. Additionally, federally-funded agencies (such as MaineDOT) are required to comply with Executive Order 11988. This requires federal agencies to avoid, to the extent possible, the long and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.

WETLANDS AND STREAMS

The NRPA identifies certain wetlands areas as Wetlands of Special Significance (WOSS). Impacts to WOSS require more rigorous review and permitting than non-WOSS wetlands and frequently require compensation through restoration, enhancement, or preservation. MDEP also has jurisdiction over projects with stream impacts. Under the NRPA, MDEP may require permitting for direct and indirect impacts to streams, including crossings, and for certain activities within 75 feet of streams and a subset of wetlands.

The USACE has jurisdiction over rivers, streams, and wetlands. Section 404 of the CWA requires that projects that impact wetlands follow the sequential process of first avoiding adverse impacts to wetlands and surface waters, then minimizing impacts that cannot be practicably avoided, and finally compensating for those impacts that cannot be further minimized.

VERNAL POOLS

The MDEP regulates a subset of naturally created vernal pools known as significant vernal pools. The term "significant vernal pool" includes the vernal pool basin plus a 250-foot surrounding "critical terrestrial habitat". The Maine Chapter 335, Significant Wildlife Habitat, defines a vernal pool as:

> *Whether a vernal pool is a significant vernal pool is determined by the number and type of pool-breeding amphibian egg masses in a pool, the presence of fairy shrimp, use by rare, threatened, or endangered species, or other criteria as specified in Section 9(B). Significant vernal pool habitat consists of a vernal pool depression and that portion of the critical terrestrial habitat within 250 feet of the spring or fall high water mark of the depression. An activity that takes place in, on, or over a significant vernal pool habitat must meet the standards of this chapter.*

The USACE's Maine General Permit (2015-2020) defines a vernal pool as:

A vernal pool, also referred to as a seasonal forest pool, is a temporary to semi-permanent body of water occurring in a shallow depression that typically fills during the spring or fall and may dry during the summer. Vernal pools have no permanent inlet or outlet and no viable populations of predatory fish. A vernal pool may provide the primary breeding habitat for wood frogs (Rana sylvatica), spotted salamanders (Ambystoma maculatum), blue-spotted salamanders (Ambystoma laterale), and fairy shrimp (Eubranchipus sp.), as well as valuable habitat for other plants and wildlife, including several rare, threatened, and endangered species. A vernal pool intentionally created for the purposes of compensatory mitigation is included in this definition.

The USACE has the discretionary authority to review and authorize or deny impacts within any vernal pool that meets the definition above. However, the USACE, working with the U.S. Fish and Wildlife Service (USFWS) as their primary biology consultation agency, tends to only regulate vernal pools of natural or manmade origin that have particularly high productivity for vernal pool indicator species. In certain circumstances, the USACE may regulate activities in the terrestrial area surrounding a vernal pool out to 750 feet beyond the vernal pool depression, generally depending on the quality of the surrounding habitat and productivity of the feature.

THREATENED AND ENDANGERED SPECIES

Section 7 of the Endangered Species Act (ESA) requires that for any project in which there is a federal action that "may affect" listed threated or endangered species or their critical habitat, the action agency must consult with either the USFWS or National Marine Fisheries Service (NMFS). The ESA directs all Federal agencies to conserve threatened and endangered species and, in consultation with other agencies, ensure that their actions do not jeopardize the continued existence of a listed species or destroy or adversely affect designated critical habitat. Additionally, in cooperation with federal agencies, MaineDOT and MTA have developed specific programmatic agreements for certain species, such as the federally endangered Gulf of Maine Distinct Population Segment of the Atlantic salmon, that allows for expedited review of certain types of projects. The Maine Department of Inland Fisheries and Wildlife (MDIFW) oversees the Maine Endangered Species Act (MESA), which includes a state-specific list of threatened and endangered species. Under Site Law, the Maine DEP generally consults with MDIFW regarding Site Law projects' potential effects on MESA-listed species and encourages applicants to work with MDIFW on avoidance and minimization of impacts to MESA species.

WILDLIFE

USFWS has primary responsibility for bald eagle management under the Bald and Golden Eagle Protection Act (BGEPA, 16 CFR §668-668c). NMFS is responsible under the ESA, as well as the Marine Mammal Protection Act (MMPA), for protecting marine mammals and threatened and endangered marine species. Additionally, USFWS regulates wildlife habitat under the Fish and Wildlife Coordination Act, which involves evaluation of impacts to fish and wildlife from water resource development projects.

Under NRPA Chapter 335, Significant Wildlife Habitat includes: seabird nesting island; significant vernal pool habitat; MDIFW-mapped moderate

and high-value inland waterfowl/wading bird habitats and MDIFW-mapped shorebird nesting, feeding and staging areas. These are regulated by the MDEP with MDIFW acting as a consulting and commenting agency for the MDEP.

OTHER CONSTRAINED LANDS (E.G. CONSERVED LANDS AND SECTION 4(F) PROPERTIES)

Conserved properties, public lands and designated open spaces may provide obstacles to successful siting and routing when they are in the vicinity or path of proposed linear transportation projects. Additionally, Section 4(f) of the Department of Transportation Act of 1966 (49. U.S.C. §303 and 23 U.S.C. §138) requires that the FHWA and other DOT agencies avoid siting projects on publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites, unless there is no feasible alternative, or the use of the property will have a de minimis impact. Section 4(f) applies to projects that receive funding or require approvals from federal agencies.

METHODOLOGY

Publicly available data was obtained to identify known locations of Federal and State regulated natural resources as well as non-regulated resources that are considered important to the environment and character of the H/E Study Area. The following data sources were consulted:

- MDIFW
- MNAP
- USFWS' Information, Planning and Consultation System (IPaC)
- MHPC
- Maine Office of GIS
- Federal Emergency Management Agency (FEMA) - Floodplain Flood Map Service Center
- USFWS National Wetland Inventory (NWI)
- US Geologic Survey (USGS) National Hydrography Dataset (NHD)
- Natural Resources Conservation Service (NRCS) Soil Maps

LIMITS OF AVAILABLE DATA

It is important to note that publicly available data are not general based on field study, rather they are devised through remote sensing and aerial photography interpretation. These data are meant for planning purposes only.

SUMMARY OF FINDINGS AND RECOMMENDATIONS

WETLANDS AND WATERBODIES

NWI wetlands are shown on **Figure 3.4 – Wetlands and Waterbodies**. Numerous NWI wetlands and mapped hydric soils occur throughout the Study Area. The NWI and hydric soils data indicate wetlands are located primarily along the Saco River and stream banks. A large, forested wetland is in the southwestern corner of the Study Area, north of Andrews Road. There are some small wetlands in both the developed and undeveloped portions of the Study Area. Additionally, NWI indicates most wetlands are forested or shrub wetlands, with a few freshwater emergent wetlands associated with old fields or stream flood basins.

The Study Area has five mapped waterways with associated NWI wetlands:

Saco River – runs west to east and along the northern boundary of the Survey Area, where it skirts Rotary Park, continues east under the Market Street and Route 1 bridges, passes Spring Island, and then continues east out of the project area to Saco Bay. The stretch of Saco River within the Study Area is both a mix of 1% annual chance flood hazard and 0.2% annual chance flood hazard area.

Thatcher Brook – located mainly in the developed area of Biddeford east of Interstate 95, south of the Saco River. Thatcher Brook watershed drains both residential and industrially developed areas and is ranked as an urban impaired stream.

Swan Pond Brook – originated west of the study area, flowing northeast from a mosaic of forest and agricultural land and enters the Study area in the northwestern corner before emptying into the Saco River.

Unnamed tributaries to Saco River (2) – two small, unnamed tributaries of the Saco River are located within the Study Area. One is located on the western side of I-95, where it parallels the highway and collects runoff while flowing north to the Saco River. The second is located east of I-95, originating at a small pond on Deer Run Drive, flowing north through residential communities and into the Saco River.

Prior to final planning for any project that expands existing roadway infrastructure or adds new infrastructure, a complete field delineation should be conducted to determine and map the boundaries of jurisdictional wetlands and streams. Once locations are determined, project planners can implement the appropriate measures to avoid and minimize impacts.

VERNAL POOLS

According to data received from MDIFW, there are no mapped significant vernal pools in the vicinity of the Study Area **(Attachment 3.2 – MDIFW Environmental Review _CONFIRM with official MDIFW response but should match online database)**. No significant vernal pools and four non-significant vernal pools are found in the Study Area based on the Maine Geolibrary Data Catalog. The City of Biddeford Conservation Commission identifies another seventeen vernal pools in the Study area that have yet to be verified by the Maine DEP. A field survey for potential vernal pools would be necessary prior to project design and permitting. This study could take place concurrent with the wetland delineation suggested in the previous section. If potential vernal pools are identified proximal to potential impact areas, a breeding season survey (approximately late April through early June) would be required to ascertain the productivity of each feature.

THREATENED AND ENDANGERED SPECIES

NOTE: Awaiting MIFW official response for animal species, likely to add Blanding's turtle, anadromous fish species (sturgeon/salmon), among others **(pending Attachment 3.3 MIFW Response)**.

Table 3.1 in the Appendix provides a listing of rare, threatened, or endangered (RTE) species known to occur, or with the potential to occur, within the Study Area. This table was assembled based on data received from MNAP, MDIFW and USFWS IPaC research. According to data received from the agencies, there are limited known occurrences of RTE species within the Study Area.

According to a preliminary IPaC research, one protected species, northern long-eared bat (NLEB) (*Myotis* septentrionalis), and one candidate species, monarch butterfly (*Danaus* plexippus) that occur within the Study Area. NLEB may occur in the Study Area. However, there are no mapped critical habitats for the NLEB, and no documented maternity roosts occur in the State. The Study Area is located more than 50 miles from the nearest known hibernacula. Therefore, a potential transportation project occurring within the Study Area is not likely to have an adverse effect on this species and additional consultation or study would not be required. Additional consultation with MIFW will be needed to confirm the potential presence of additional species and should take place prior to any work.

The Maine Natural Areas Program identified one unique botanical feature (see Wildlife Habitat, below) within the project area and another forty botanical species and natural communities present within 4 miles of the Study area. Additional consultation with MNAP **(Attachment 3.2 – MNAP Consultation)** will be needed to confirm the potential presence of additional species and should take place prior to any work. Targeted botanical surveys for potential botanical species present in the final design should be considered.

WILDLIFE HABITAT

The Maine Natural Areas Program (MNAP) identified the presence of one rare or unique botanical feature, a red maple – Sensitive Fern Swamp **(Attachment 3.2 – MNAP consultation)**. This feature is unique as it has an occurrence rank of "A" meaning it is a large, exemplary example of this type of habitat for the state. MNAP recommends avoiding development

within 250 feet of this exemplary red maple swamp, including altering the hydrology or focusing stormwater runoff into the mapped area.

MDIFW usually requires projects to utilize Best Management Practices to avoid erosion, sedimentation, flow alteration, and other impacts to instream work. It is also recommended that any instream work be done between July 15th and October 1st to minimize potential impacts to fisheries habitat.

OTHER CONSTRAINED LANDS (E.G. CONSERVED LANDS AND SECTION 4(F) PROPERTIES)

On the north side of South Street, along the Saco River there are four conserved lands within the study area. To the west there is a parcel owned by the Maine Water Company (Map ID: 2-40) that is designated as Water Supply Lands. The center parcel of conserved land is Rotary Park (32-2) and the portion to the south of South Street is Miscellaneous Municipal Lands (32-4) both owned by the City of Biddeford. Rotary Park is 72-acres and includes walking trails, two playgrounds, a softball field with lights, a youth football field, a dog park, a skate park, a boat launch, a picnic area with tables and grills, a swimmer's beach with seasonal lifeguards, a teen center, a sand volleyball court, and a 9-hole disc golf course. The fourth parcel north of South Street is along the Saco River and is listed as Miscellaneous Municipal Lands (37-15 and 40-25-2). There is an unnamed walking trail that runs parallel to the river, and it is owned by the City of Biddeford.

On the western side of I-95 in the survey area there are 7 parcels of conserved lands. The western most parcel that trails outside of the survey area is owned by the City of Biddeford with the property location of 50 Andrews Road (2-1) and its designation is Miscellaneous Municipal Lands. Abutting this property is an elongated parcel (2-19) that extends to South Street. This parcel and the small parcel off 24 Andrews Road (2-19-1) are both owned by the Maine Water Company and are designated as Water Supply Lands. The small parcel adjacent to the Maine Water Company parcels was donated to the Saco Valley Trust (SVLT). It is located within the 1500-acre undeveloped block between Andrews Road and Rte. 111 that is home to the cottontail rabbit and several uncommon plant communities, is a recent donation by the Woodman family of ten acres. There are three conserved land parcels located just west of I-95. The outer two (2-37-1 and 2-39-1) are owned by the Maine Department of Environmental Protection and are designated as Miscellaneous State Lands. The center parcel (2-39) is owned by the City of Biddeford and is designated as Miscellaneous Municipal Lands.

There are two conserved land parcels located south of Alfred Street. The parcel that is just east of I-95 and is mostly outside of the survey area is called Taylor Estates (2-63-1) and is owned by SVLT. This parcel was donated to SVLT as part of a subdivision set-aside and is located on Autumn Lane, off Mountain Road. There are 28 acres in two pieces of woods and marsh, and it fronts the Maine Turnpike on the back side. There is no formal parking and no trails. The parcel that abuts Route 1 and is partially out of the survey area, is called Woodlawn Cemetery (21-78) and is owned by the City of Biddeford. The final conserved land in the survey area is a small parcel west of Route 1 and north of Alfred Street. The parcel is Memorial Park (Mayfield) off May Street (27-34) and it is owned by the City of Biddeford. The park amenities include basketball courts, a little league softball field, the Middle baseball field, tennis courts, the West Biddeford baseball field and a playground. This project will likely not require the taking and use of these lands under Section 4(f) and therefore, Section 4(f) is likely not applicable.

4.0 ZONING AND LAND USE

Existing land use and zoning in the Exit 32 area from Route 111 to South Street is presented as follows. The following zoning districts exist in the interchange area.

Zoning Districts

- RF = Rural Farm
- B2 = Business 2
- LRF = Limited Rural Farm
- I3 = Industrial 2
- MHP = Mobile Home Parks
- SR1 = Suburban Residential
- RP-1 = Resource Protection-1

Figure 4.1 presents the zoning in the study area. The area where possible roadway connection alternatives will be located include B2: Business 2 along Route 111 from the Exit 32 intersection to Andrews Road; RF: Rural Farm, the largest zone west of the turnpike between Route 111 and South Street; MHP: Mobile Home Parks near South Street; and SR1: Suburban Residential bordering South Street from the Turnpike to the west. A brief description of each study area zone follows:

- B-2: These are highway-oriented commercial areas. Residential development is prohibited from this zone.
- Rural-Farm Zone (R-F): Allows for agricultural and residential uses, and under special circumstances some commercial uses.
- Suburban Residential Zone (SR-1): This zone is generally limited to single-family residential use, with provisions for professional offices in the home under special circumstances. These areas are typically large lot single-family homes on public sewer and water, or at least public water.

Land Use

Dense commercial highway oriented land uses exist along Route 111. This includes big box retail stores west of the Turnpike, and smaller commercial uses to the east. Southern Maine Medical Center and supporting health care facilities are located in the Exit 32 immediate area. South Street and Main Street from the Turnpike to Elm Street are primarily residential. Exceptions include Biddeford High School and recreation facilities. Elm Street from Main Street to Route 111 is a mix of multi-family and single-family housing and commercial uses.

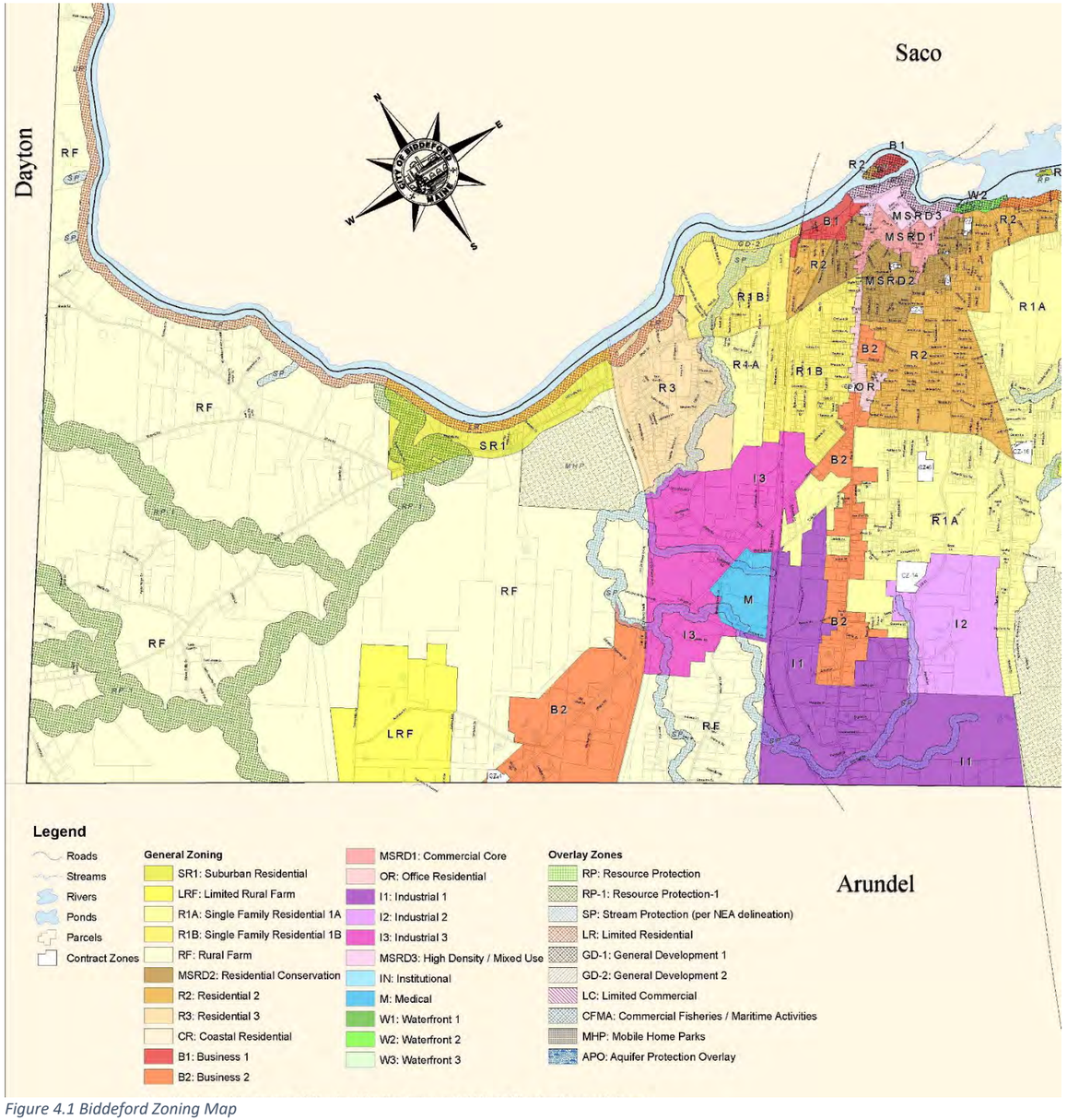


Figure 4.1 Biddeford Zoning Map

Property Ownership

A review of Biddeford tax records was performed to identify ownership of properties located in the general vicinity of Exit 32 between Route 111 and South Street. **Table 4.1** notes property ownership and a key number with locations depicted on **Figure 4.2.** The purpose of this information is to identify potential property impacts and acquisition needs.

Table 4.1
Property Ownership in Exit 32 Area

Key Number	Property Owner
1	State of Maine
2	City of Biddeford
3	South Street Village, LLC
4	The Maine Water Co.
5	Alexander White
6	CMP
7	HD Development of Maryland, Inc
8	W/S Alfred Road Properties, LLC
9	New Life Christian Fellowship
10	Priscilla Spang
11	Daniel L. Spang
12	James P. Boyle
13	Saco Valley Land Trust

Figure 4.2 Property Ownership

5.0 ALTERNATIVE TRANSPORTATION

Transportation Demand Management (TDM) programs provide tools for commuting travelers to reduce the demand for transportation, i.e., reduce the number of vehicles on the road. These tools include rideshare programs, park and ride lots (which can support rideshare programs), work from home opportunities, enhanced transit services and providing a connected and comprehensive bicycle and pedestrian infrastructure system all of which either make it easier to rideshare or to stay off the road altogether. Examples of TDM strategies are noted as follows.

- GO MAINE TDM Program
- Carpool and Vanpool
- Ride-Matching System
- Emergency Ride Home
- Information on local and regional bus, ferry, and rail services
- Media Releases and Commuter e-news
- Transit
- Expanded and/or increased frequency of current service.
- Park and Ride Lots
- Bicycle and Pedestrian Facilities

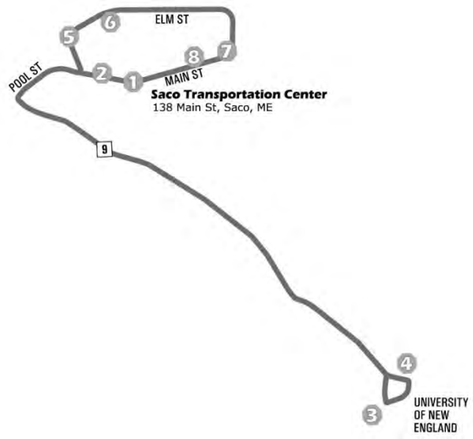
Bus Transportation

Biddeford Saco Old Orchard Beach (BSOOB) Transit is a fixed route service that primarily runs in the "tri-town" communities of Biddeford, Saco and Old Orchard Beach. BSOOB offers multiple bus routes traveling through Biddeford. According to census track data included in the Biddeford-Saco Concept TOD Plan only 1.0% of all commuting trips in Biddeford were transit based. The following is a brief description of each route.

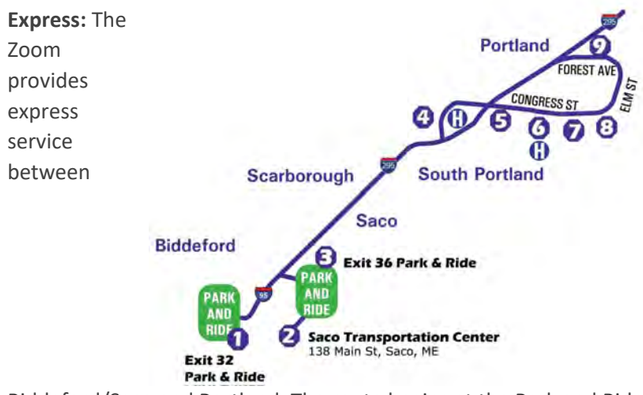
The **Orange/Black Line:** These overlapping routes primarily serve Biddeford. The routes begin at the Saco Transportation Center and turn

around at the Market Basket just west of I-95, making a variety of stops on Elm Street (Route 1) and Alfred Street (Route 111) along the way.

The **Silver Line:** this route incorporates the former Yellow Line into the new Downtown Circulator. The route still provides service to the University of New England (UNE) campus, but it now makes a short loop through Downtown Biddeford and Saco using Main Street, Lincoln Street, and Elm Street. The circulator is free to ride.



The **Zoom Express:** The Zoom provides express service between Biddeford/Saco and Portland. The route begins at the Park and Ride at Exit 32 in Biddeford, makes a stop at the Saco Transportation Center, then continues on I-95 to Portland.



Prior to the pandemic, BSOOB Transit was expanding its services and experiencing growing ridership. In 2014, BSOOB Transit recorded 160,900 boardings, whereas in 2019 the agency recorded 366,527 boardings — a 28% increase. In 2020, ridership plummeted as a result of the COVID-19 pandemic. BSOOB Transit temporarily suspended service then operated limited trips with no fare requirement. Presently, the service is back up and running at pre-pandemic levels although it will likely take some time for ridership to recover. Amidst the pandemic, the agency also launched an electronic fare payment system called DiriGo TouchPass. Under this system, riders pay their fare by holding up a credit card sized "smart card" or mobile app to a scanner as they board the bus. On top of the added convenience, the DiriGo TouchPass is safer since it is contactless.

Rail Transportation

The Amtrak Downeaster is a passenger rail service that provides five daily round trips between Brunswick and Boston with stops in 12 communities in Maine, New Hampshire, and Massachusetts. It is managed by the Northern New England Passenger Rail Authority (NNEPRA) and operated by Amtrak. As mentioned previously, the Downeaster stops at the Saco Transportation Center. In 2019, over half a million riders took the Downeaster, resulting in the highest ridership in Downeaster history. The Saco Transportation Center is the third busiest stop in Maine (behind Portland and Wells respectively) with almost 50,000 boardings in 2019. In 2020, the COVID-19 pandemic forced Amtrak to temporarily suspend Downeaster service for a period of time, then operate limited trips. In the Spring of 2021, Amtrak returned to its prepandemic schedule to once again operate five round trips a day. Although riders use the Downeaster mostly for longer-distance trips to New Hampshire and Massachusetts, through marketing and incentive programs NNEPRA is encouraging residents to use the Downeaster for shorter trips within the Greater Portland region as well. Presently, fares to travel from Saco to Portland are now $3 for a one-way trip.

Carpooling

GO MAINE is the statewide commuter program funded by the Maine Turnpike Authority and MaineDOT. GO MAINE is administered by the MaineDOT.

- Go MaineGO MAINE offers ridematching online to find carpool or vanpool partners
- GO MAINE rewards commuters whenever they take a green trip (that is walking, biking, carpooling, vanpooling, taking transit or telecommuting). Rewards are vouchers for local, online, and national retailers.
- GO MAINE members are eligible for Emergency Ride Home benefit, to use in case of a workday emergency.
- GO MAINE can help employers spread the word about alternative commuting.
- GO MAINE holds Way 2 GO MAINE in October, a business-to-business challenge to encourage and reward alternative commuting.
- All of GO MAINE's services are free.

6.0 ALTERNATIVES FOR CONSIDERATION

The following provides a summary of the Alternatives that were evaluated.

No-Build

This assumes no changes to the existing transportation system with the exception of programmed improvements. This includes the MTA traffic signal phasing and timing improvements along Route 111 to be implemented in 2023. Additionally, MTA has improvements planned at Exit 32 anticipated in 2028. This improvement consists of an extension of the Turnpike Southbound Off-Ramp to Route 111 somewhere in the area of Andrews Road/Biddeford Crossing (actual location yet to be determined). (See **Figure 6.1**)

Alternative 1: Transportation Demand Management Improvement Strategies (TDM)

Transportation Demand Management (TDM) programs provide tools for commuting travelers to reduce the demand for vehicular transportation, i.e., reduce the number of vehicles on the road. These tools include rideshare programs, park and ride lots (which can support rideshare programs), model shifts to transit, walking, and biking, and work from home opportunities, all of which either make it easier to rideshare or to stay off the road altogether. Examples of TDM strategies are noted as follows.

- GO MAINE TDM Program
  - Carpool and Vanpool
  - Ride-Matching System
  - Emergency Ride Home
  - Information on local and regional bus, ferry, and rail services
  - Media Releases and Commuter e-news
- Transit
  - Expanded and/or increased frequency of current service
- Park and Ride Lots
- Improving and expanding Bicycle and Pedestrian Facilities

For this study, TDM recommendations identified in the Biddeford Saco Transit-Oriented Development Concept Plan created by, GPCOG are presented. That study identified recommendations that consider the following goals:

- Invest in public transit
- Make walking and biking easier and safer
- Support Multimodal mobility

Alternative 2: Transportation System Management Improvements (TSM)

Transportation System Management (TSM) improvements address the mobility and safety deficiencies of the system. TSM improvements can be made alone or in combination with other improvements. These tend to be small or low cost treatments at intersections and may include traffic signal phasing/timing adjustments, adding or improving turn lanes, and adding/enhancing signage and pavement markings. Specific TSM improvements are discussed in **Section 8.0** and these focus on safety improvements.

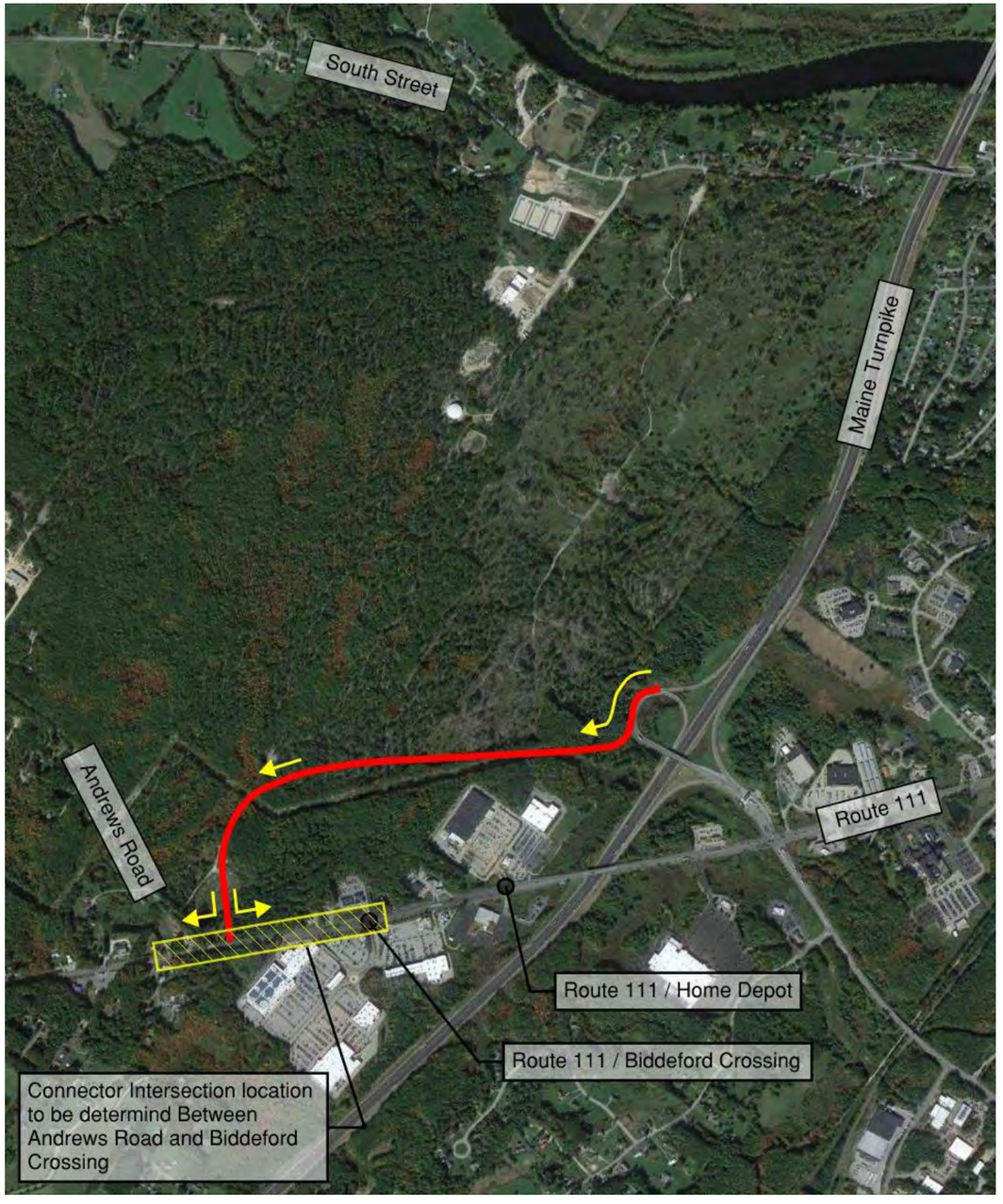


Figure 6.1 2028 MTA Exit 32 Planned Improvements

Alternative 3: South Street Connector with 2028 MTA Exit 32 Planned Improvements

This Alternative consists of providing a new South Street Connector from the 2028 Exit 32 Southbound Ramp Extension/Route 111 to South Street. **(See Figure 6.2)**

General details include:

- Assumes the planned 2028 MTA Turnpike Southbound Off-Ramp Extension Improvement in constructed.
- Constructing a new road from the MTA Ramp Extension to South Street. This road would be the extension of the Maine Water Company Drive that was recently constructed.
- Convert the 2028 MTA Southbound Off-Ramp Extension to Two-Way traffic from the South Street Connector to Route 111.
- The Connection to Route 111 is to be determined in conjunction with the MTA Ramp Extension project but would be expected in the area of Andrews Road/Biddeford Crossing and will be determined as part of the 2028 MTA improvements.
- The South Street Connector would have 11 to 12 foot travel lanes, 3 to 5 foot shoulders, a shared-use path, and a design speed of 40 MPH. The road would be a limited access facility with carefully planned access points.

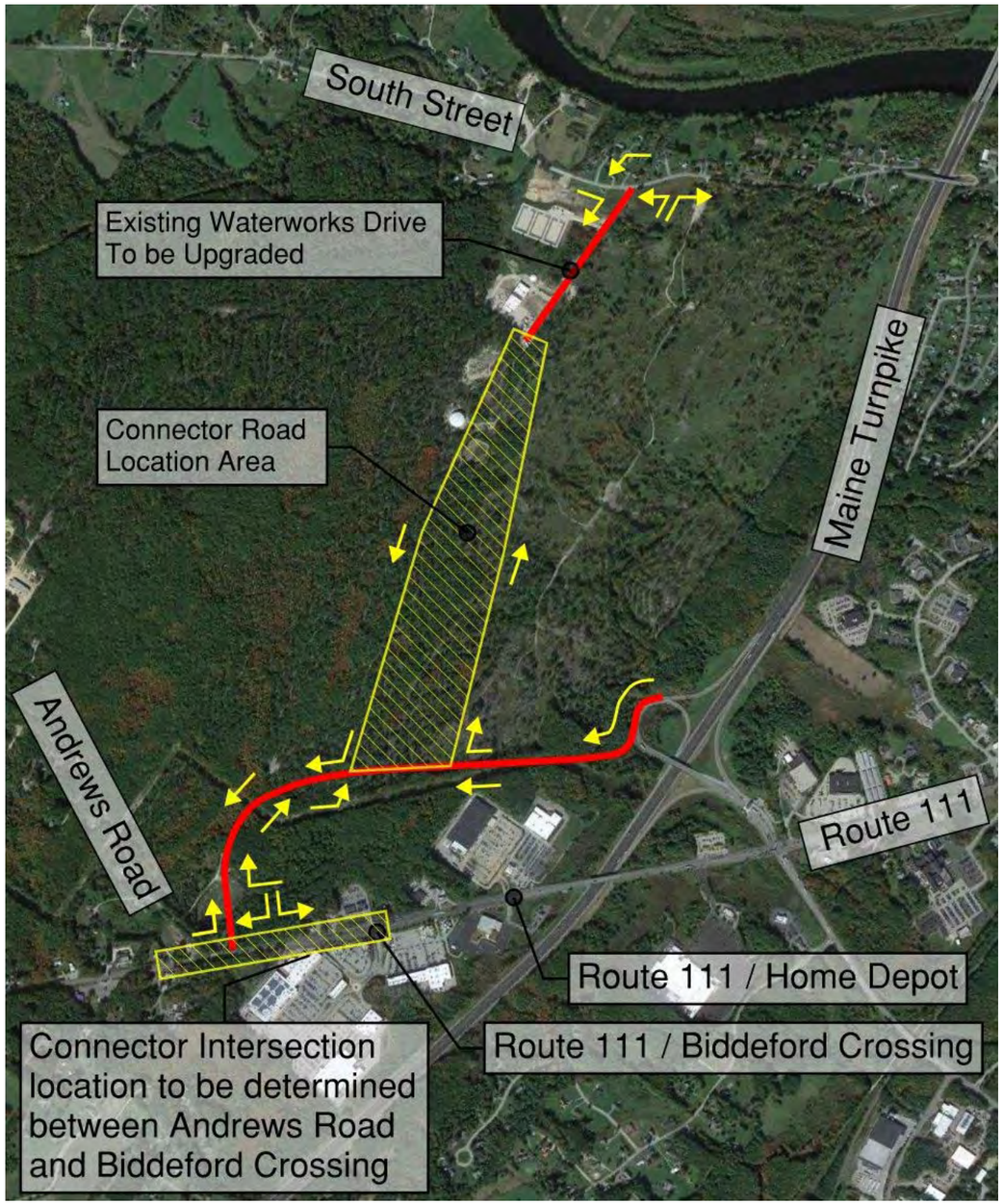


Figure 6.2 Alternative 3 South Street Connector with 2028 MTA Exit 32 Planned Improvements

Alternative 4: South Street Connector with Full Exit 32 Interchange Improvements

This Alternative consists of providing a new South Street Connector and Exit 32 Interchange Improvements between Exit 32 and Route 111. (**See Figure 6.3)**

General details include:

- Improving the Exit 32 Interchange by fully expanding two-way traffic (details will be developed in a future study).
- Constructing the South Street Connector from the Exit 32 Connector to South Street. This road would be extension of the Maine Water Company Drive that was recently constructed.
- Constructing a two-way roadway from the Route 111/Biddeford Connector Road intersection to Route 111 in the Andrews Road/Biddeford Crossing area (actual location to be determined in conjunction with the MTA Ramp extension project).
- The South Street Connector would have 11 to 12 foot travel lanes, 3 to 5 foot shoulders, a shared-use path, and a design speed of 40 MPH. The road would be a limited access facility with carefully planned access points.

This alternative is only provided for informational purposes only, as details on interchange improvements have not been identified and are not part of this study. A future interchange feasibility study will be required.

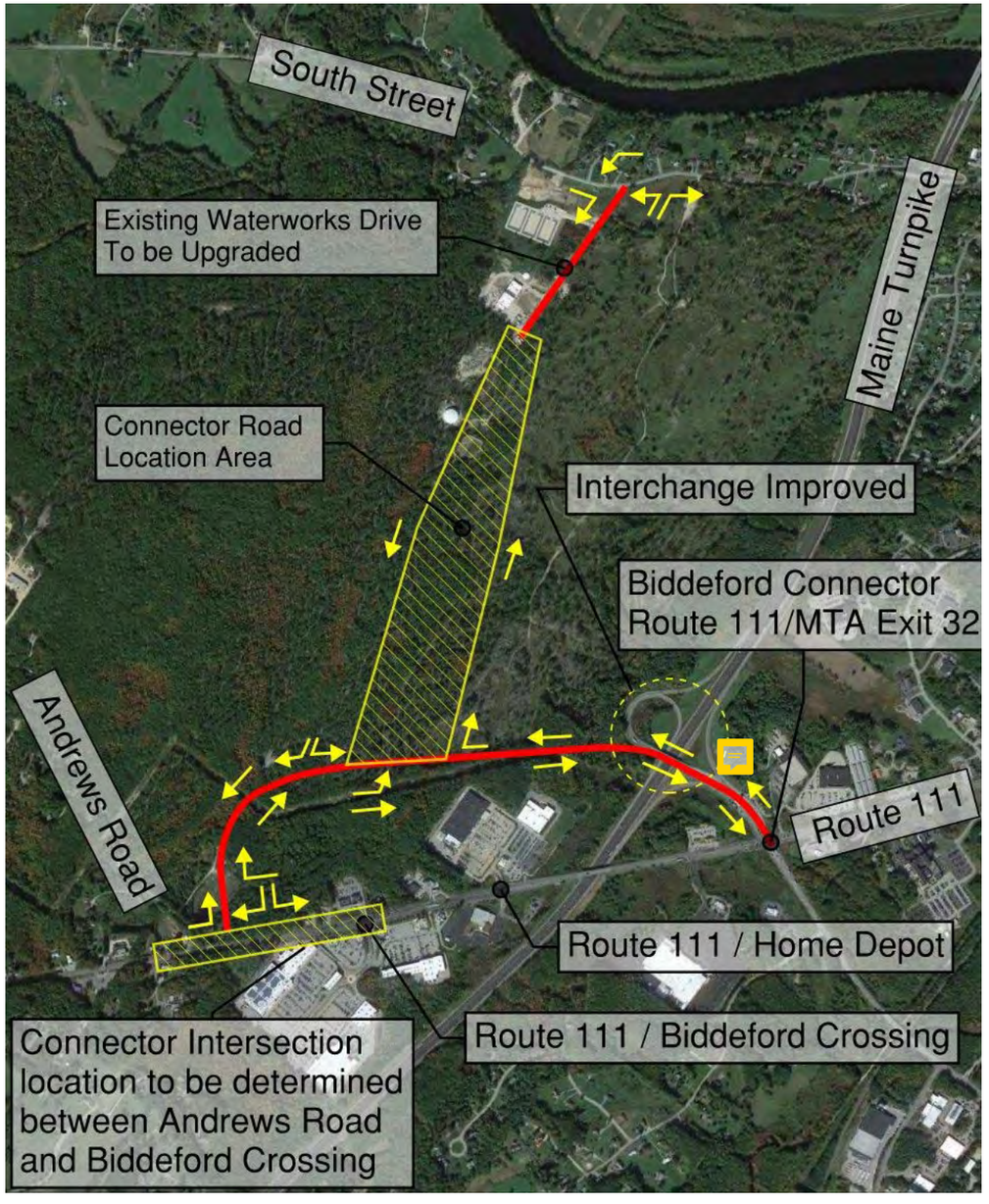


Figure 6.3 Alternative 4 South Street with Full Exit 32 Interchange Improvements

7.0 2045 FUTURE TRAFFIC CONDITIONS

The Maine Statewide Travel Demand Model was used to develop year 2045 traffic volume forecasts. The traffic forecasts prepared for this project reflect the population and employment growth forecasts updated by PACTS in the year 2017. That forecast has Biddeford growing roughly 500 households in 20 years (or 25 per year). The model has 1.5 million square feet of additional commercial space (or 75,000 square feet per year). GPCOG is updating the PACTS model during calendar year 2022 with a target completion date in December 2022. There are three salient points to be made about land use forecasts and the traffic forecast prepared for this study.

First, growth in commercial development in the current PACTS model does correspond well to currently known development anticipated in Biddeford.

Development square footage and land use mix for Diamond Match, 3 Lincoln, Gooch Street, Pepperell, and Riverdam are all compatible with the base PACTS land use growth assumptions.

Second, the initial draft population forecast for the PACTS model update has higher growth in Biddeford than what is in the current model. It is expected that a revised forecast prepared in the year 2023 with the updated household growth forecast will produce slightly higher daily traffic volumes than the current forecast. But the order of magnitude of the difference should be relatively small, only a few percentage points.

Third, the forecast prepared for the study does reflect the manufactured home development proposed for a location between Route 111 and South Street. Manual adjustments were made to reflect the trips expected to be generated by the development.

Forecasts were developed for the study area intersections and proposed new intersections created by the alternatives. Forecasts were developed for three distinct future transportation system scenarios (forecasts were not developed for TDM and TSM alternatives).

- *No-Build*
- *Alternative 1 – Transportation Demand Management*
- *Alternative 2 – Transportation System Management*
- *Alternative 3 – South Street Connector with Planned 2028 MTA Improvements*
- *Alternative 4 – South Street Connector with Full Exit 32 Interchange Improvements*

Alternative 1-Transportation Demand Management is not expected to substantially impact traffic volume levels in the future. Recommendations that seek to improve bicycle, pedestrian, and transit modes as well as demand management strategies will offer broad-based travel alternatives to a larger population. Long-term growth to 2045 would not be expected to change significantly. Alternative 2-Transportation System Management improvement would also not be expected to change traffic patterns substantially. And for this study it appears to be beneficial for safety mitigation only.

7.1 2045 No-Build Peak Hour Traffic Volumes

Figure 7.1 presents AM and PM peak hour changes between Existing 2021 and Base 2045 volume forecasts. In the Route 111/Exit 32 area, growth is expected to be around 15%. Higher growth, 30%, is expected on South Street and Main Street near Elm Street. A summary of key locations is noted below.

- Route 111 near Home Depot is expected to grow by 15% in the AM peak hour and 18% in the PM peak hour.
- Route 111 near Five Points is expected to grow by 15% in the AM peak hour and 17% in the PM peak hour.
- South Street west of the Turnpike is expected to grow by 25% in the AM peak hour and 50% in the PM peak hour.
- South Street near Elm Street is expected to grow by 30% during both the AM and PM peak hours.
- Elm Street near Main Street is expected to grow by 29% during the AM peak hour and 25% during the PM peak hour.

MTA has planned improvements at the Exit 32 interchange for the year 2028. The improvement consists of extending the existing Turnpike Southbound Off-Ramp to the west, parallel to Route 111, and connecting to Route 111 in the area of Andrews Road/Biddeford Crossing. This change is expected to have the following impacts on the 2045 No-Build Traffic volumes.

- During the AM peak hour approximately 100 vehicles will be shifted from Route 111 westbound to the extended ramp. In essence 100 vehicles will be removed from Route 111 at the Exit 32/Biddeford Connector (right-turn from Exit 32) and Wal-Mart, Home Depot, and Biddeford Crossing intersections (westbound through-movement).
- During the PM peak hour approximately 400 vehicles will be shifted from Route 111 westbound to the extended ramp. In essence 400 vehicles will be removed from the Route 111 at the Biddeford Connector (right-turn from Exit 32) and, Wal-Mart, Home Depot, and Biddeford Crossing intersections (westbound through-movement).

Figure 7.2 presents the traffic volume shift expected with the improvements. **Figures 7.3 and 7.4** present the 2045 No-Build intersection turning movement volumes at the study area intersections during the AM and PM peak hours (this includes the 2028 MTA Improvement).

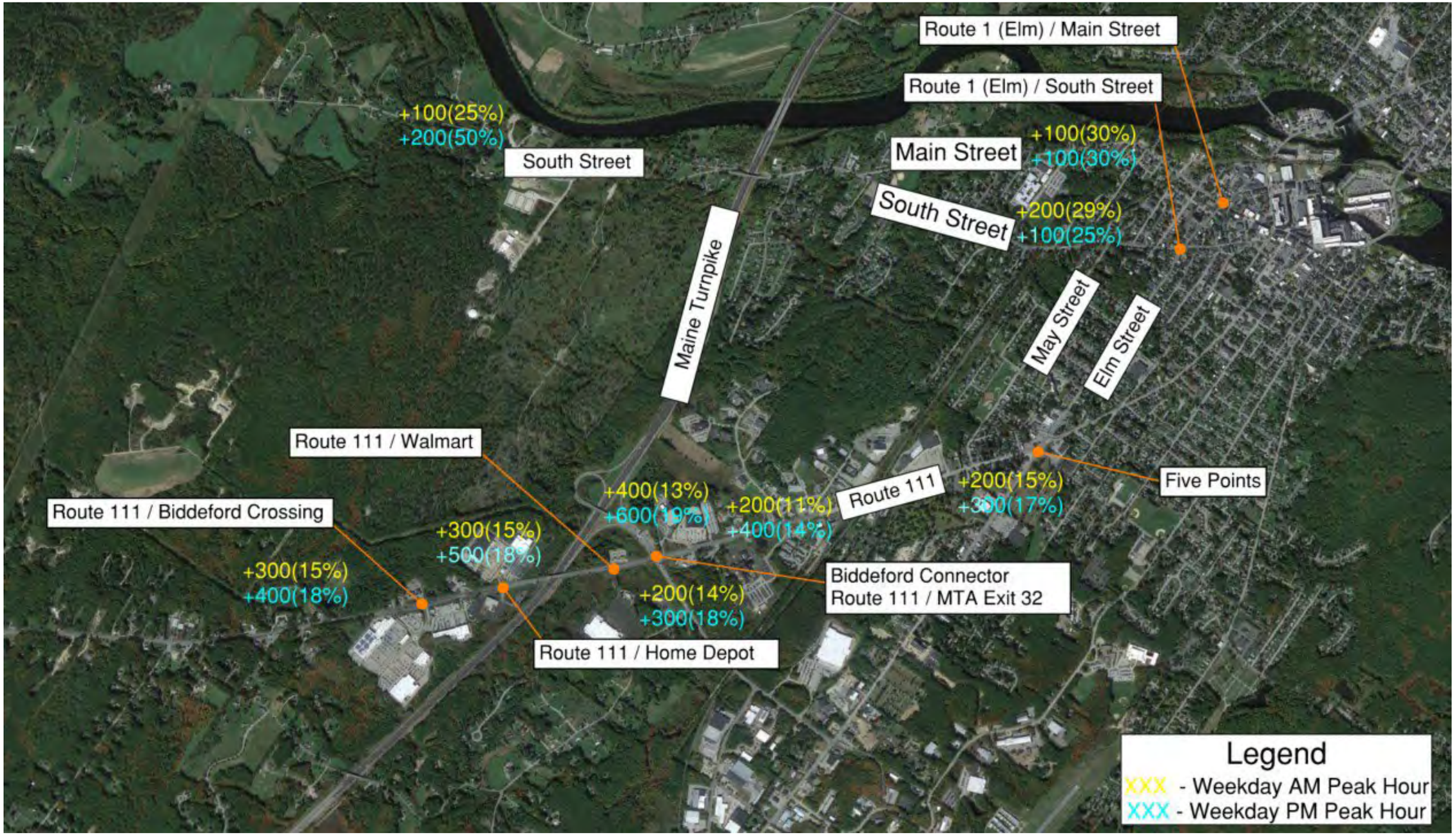


Figure 7.1 Peak Hour Volume Change between 2021 and 2045

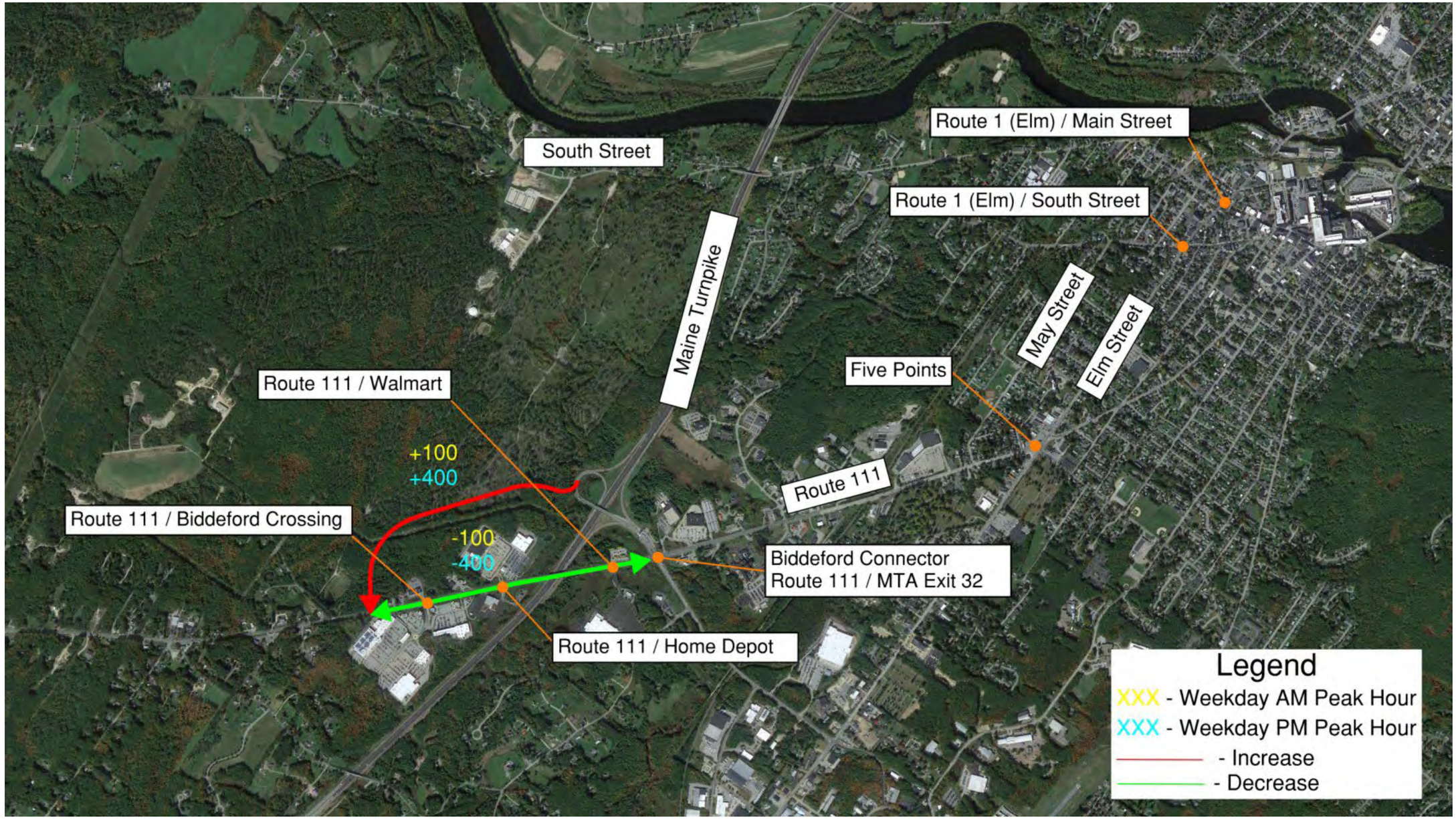


Figure 7.2 Traffic Volume Shift with 2028 MTA Exit 32 Planned Improvements

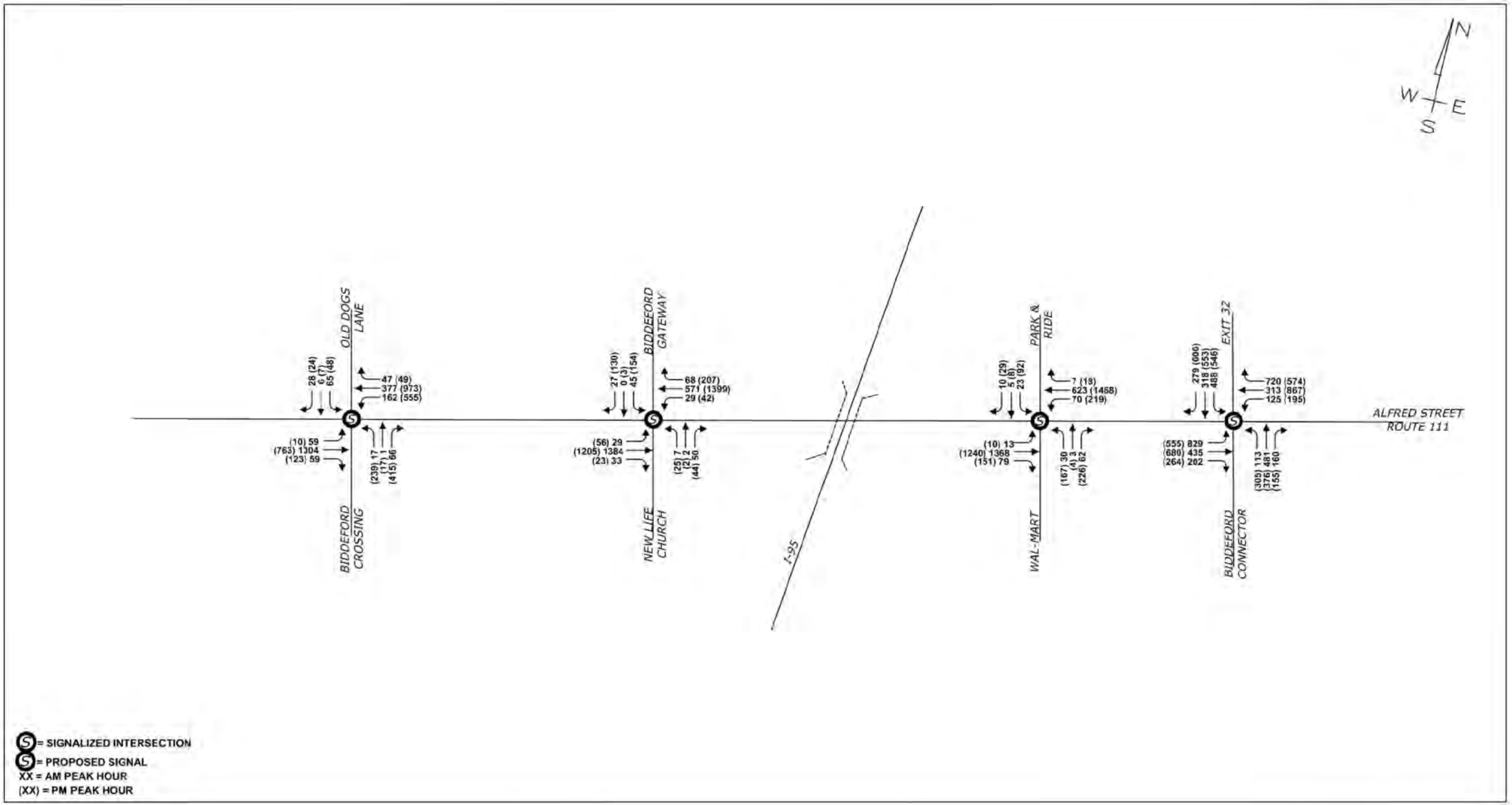


Figure 7.3 2045 No-Build Traffic Volumes

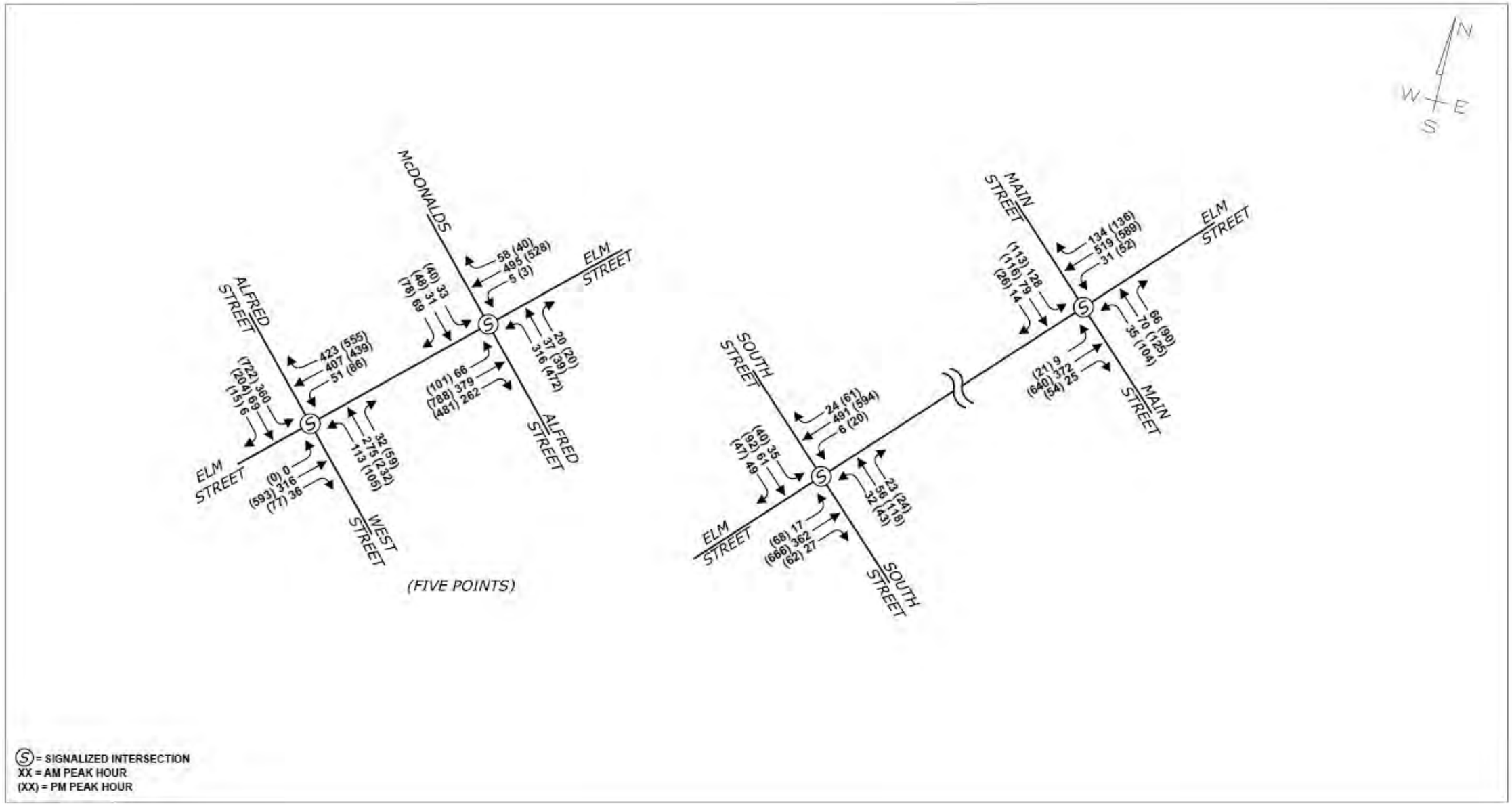


Figure 7.4 2045 Elm Street 2045 No-Build Traffic Volumes

7.5 Alternative 3: South Street Connector with 2028 MTA Exit 32 Planned Improvements - Peak Hour Traffic Volumes in 2045

Construction of a South Street Connector and providing a full two-way roadway from the Connector to the west results in the following changes in traffic volumes shown below. For the purposes of estimating traffic volumes, it is assumed the MTA Ramp Extension will intersect Route 111 in the vicinity of Andrews Road.

- Reduces traffic on Route 111 west of Exit 32 by 300 AM and 500 PM peak hour vehicles.
- The South Street Connector is estimated to carry 300 AM and 500 PM peak hour vehicles. This corresponds to a daily volume of about 4,000 vehicles.
- South Street east of the Connector will see an increase of 100 vehicles during the AM peak hour and 200 vehicles during the PM peak hour.
- Reduces traffic on Route 111 east of Exit 32 by 200 AM and 300 PM peak hour vehicles.
- Reduces traffic at Five Points by 100 AM and PM peak hour vehicles.
- Reduces traffic on May Street by 100 AM and PM peak hour vehicles.

Figure 7.6 shows AM and PM peak hour volume changes between A3 and the 2045 No-Build volume forecasts. **Figures 7.7** and **7.8** present the 2045 AM and PM peak hour intersection turning movement volumes with this Alternative.

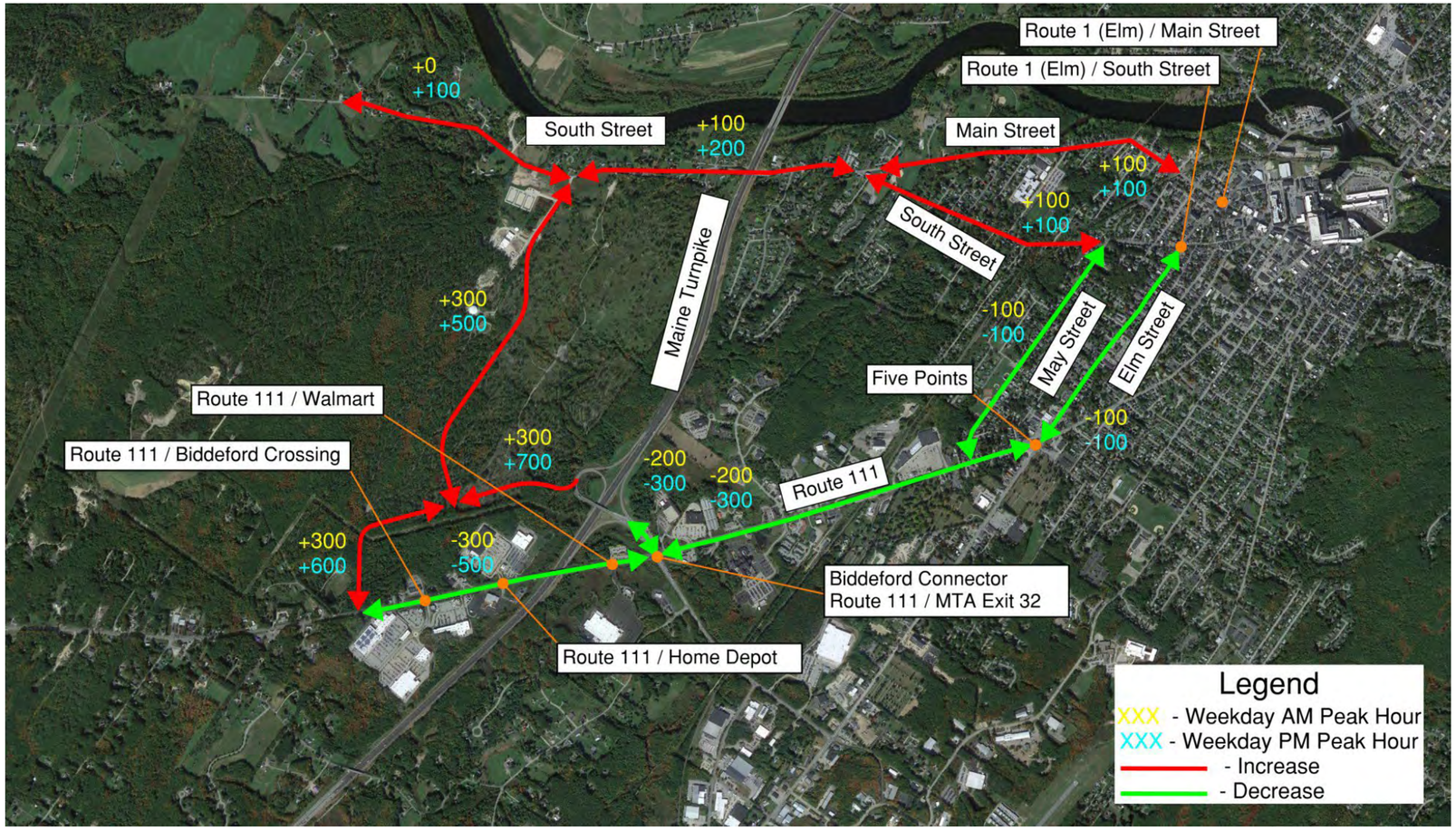


Figure 7.6 A3 South Street Connector with 2028 MTA Exit 32 Planned Improvements Peak Hour Volume Change

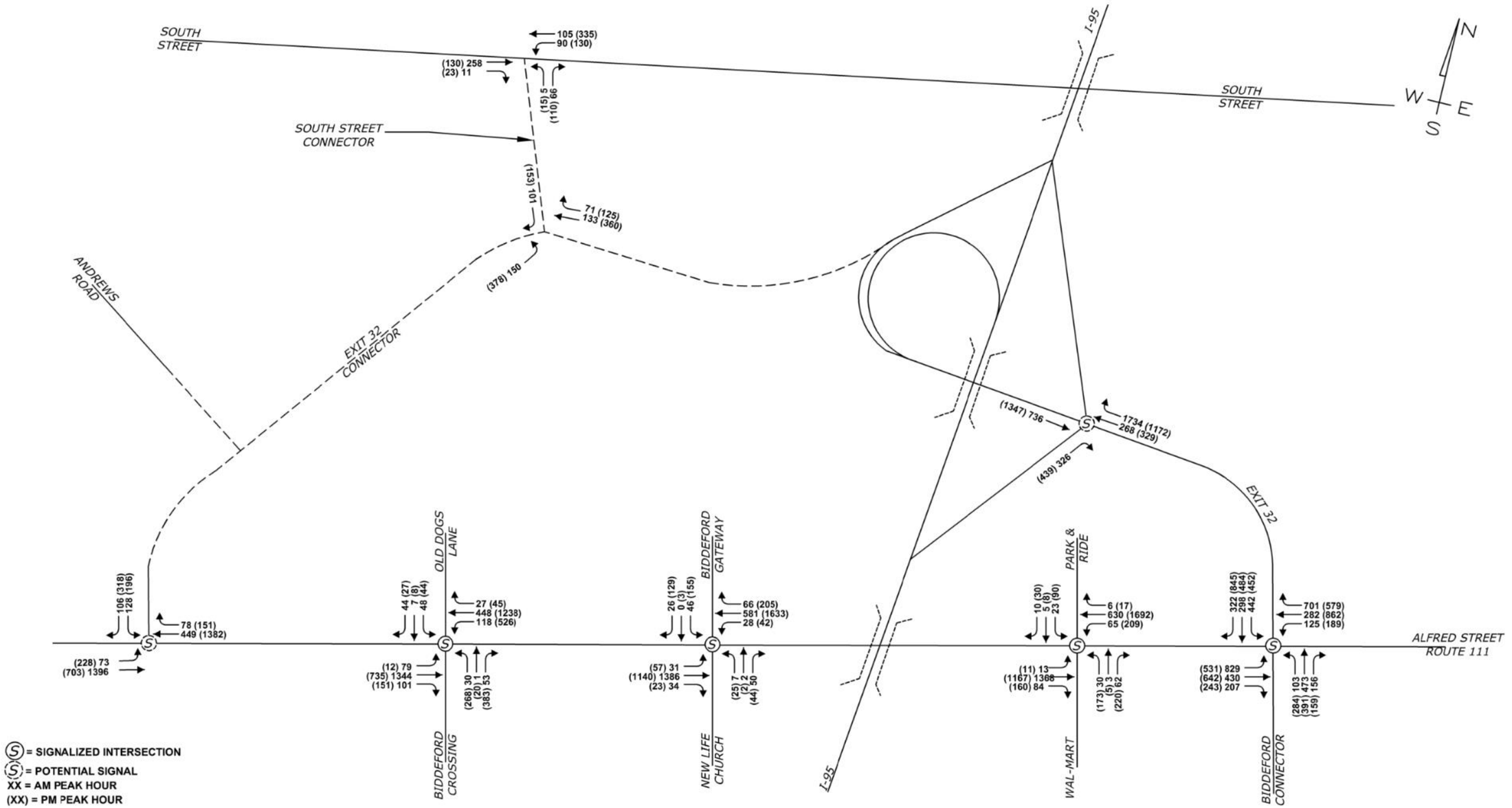


Figure 7.7 2045 Traffic Volumes for Alternative 3

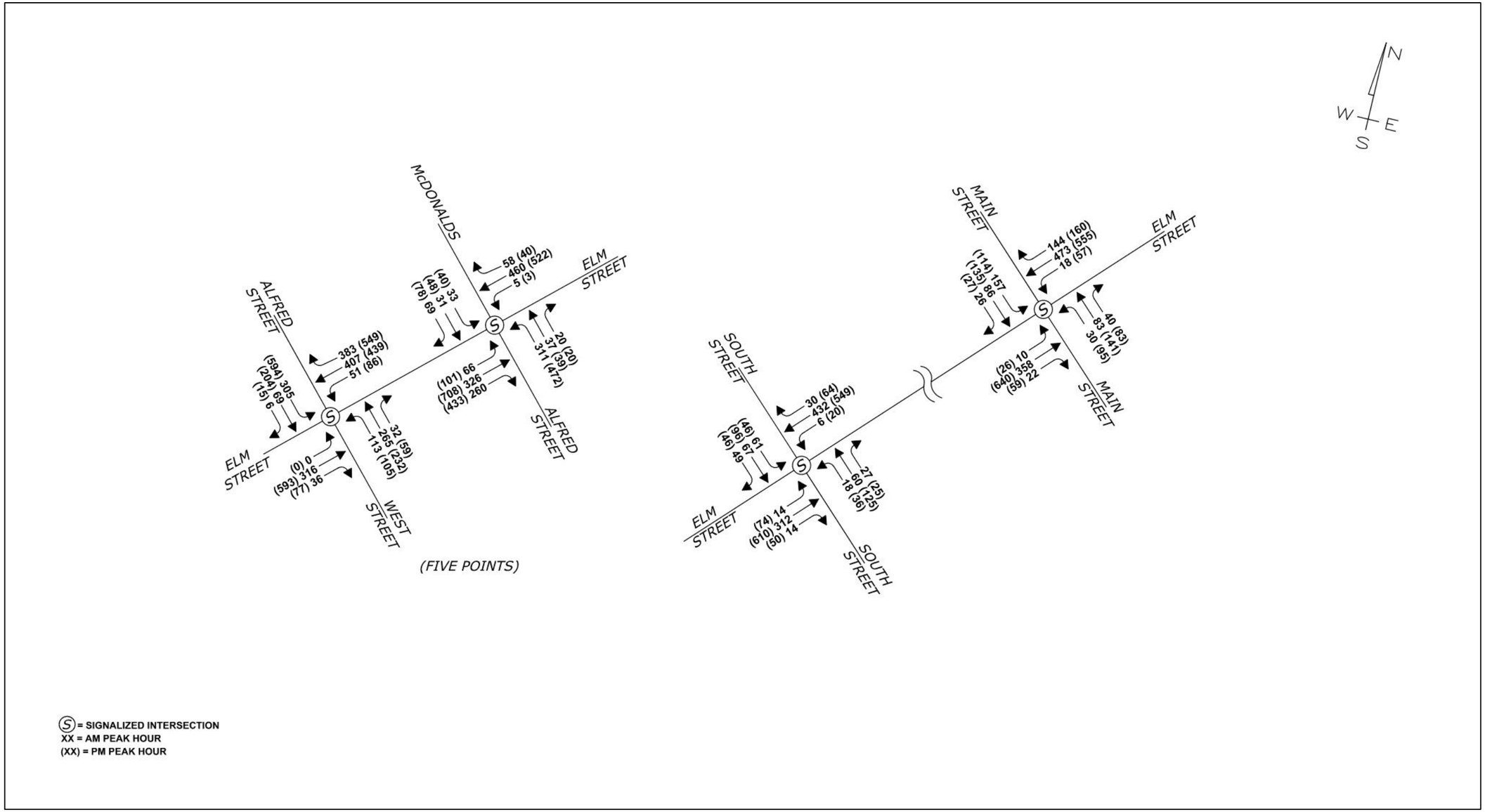


Figure 7.8 2045 Traffic Volumes for Alternative 3 on Elm Street

7.6 Alternative 4: South Street Connector with Full Exit 32 Interchange Improvements - Peak Hour Traffic Volumes in 2045

The construction of a South Street Connector, and Full Exit 32 Interchange improvements results in the following changes in traffic volumes shown below. For the purposes of estimating traffic volumes, it is assumed the MTA Ramp Extension will intersect Route 111 in the vicinity of Andrews Road.

- Route 111 west of Exit 32 will see a reduction of 500 vehicles during the AM peak hour and 700 vehicles during the PM peak hour.
- Five Points will see a reduction of 100 vehicles during AM peak hour and 200 vehicles during the PM peak hour.
- The South Street Connector is estimated to carry 600 AM and 800 PM peak hour vehicles. The corresponds to a daily volume of about 7,000 vehicles.
- South Street east of the Connector will see an increase of 200 vehicles during the AM peak hour and 300 vehicles during the PM peak hour.
- May Street will see a decrease of 100 vehicles during the AM peak hour and 200 vehicles during the PM peak hour.

Figure 7.9 presents AM and PM peak hour volume changes between A4 and the 2045 No-Build volume forecasts. **Figures 7.10** and **7.11** present the 2045 AM and PM peak hour intersection turning movement volumes with this Alternative.

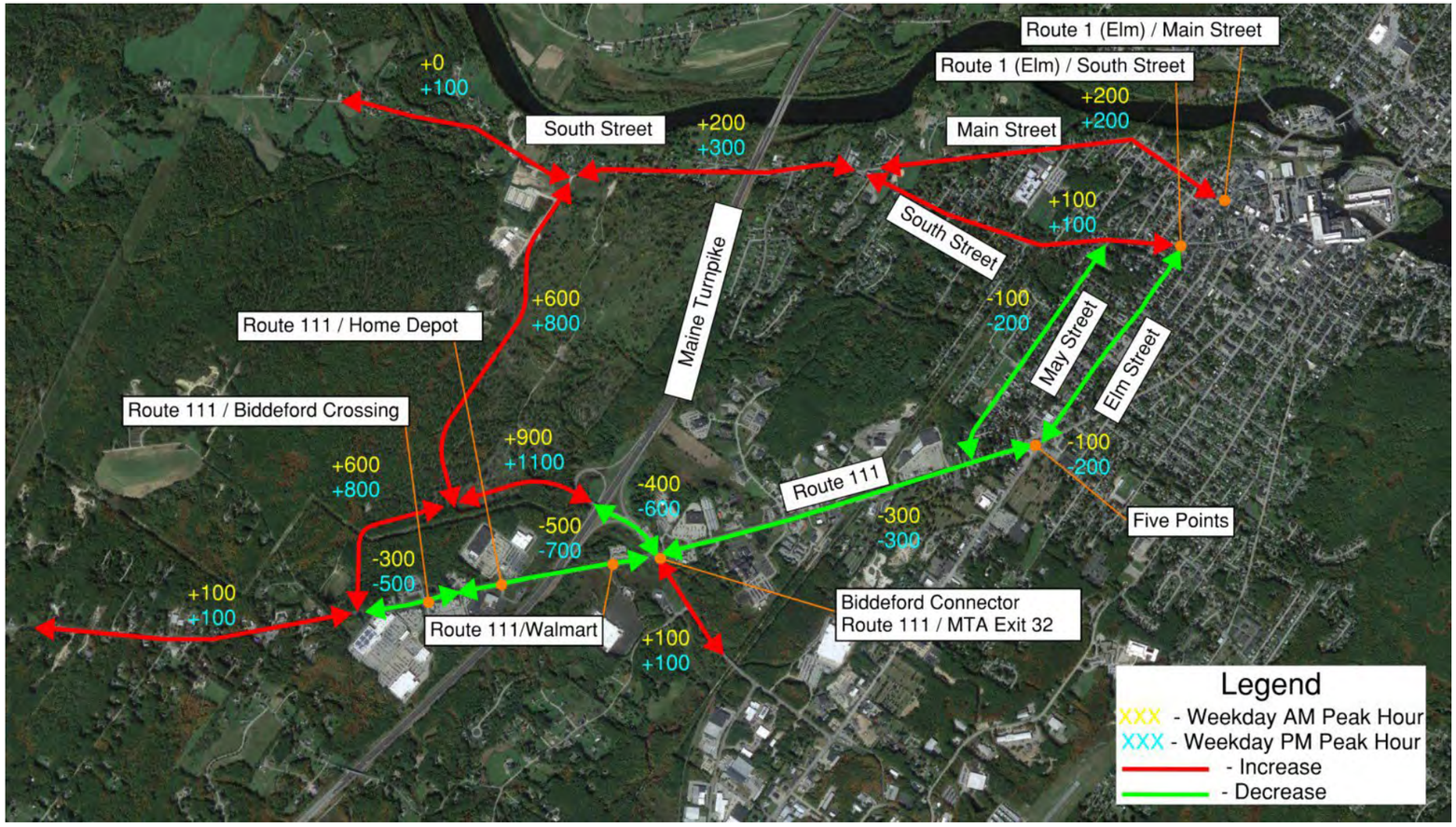


Figure 7.9 A4 South Street Connector with Full Exit 32 Interchange Improvements Peak Hour Volume Change

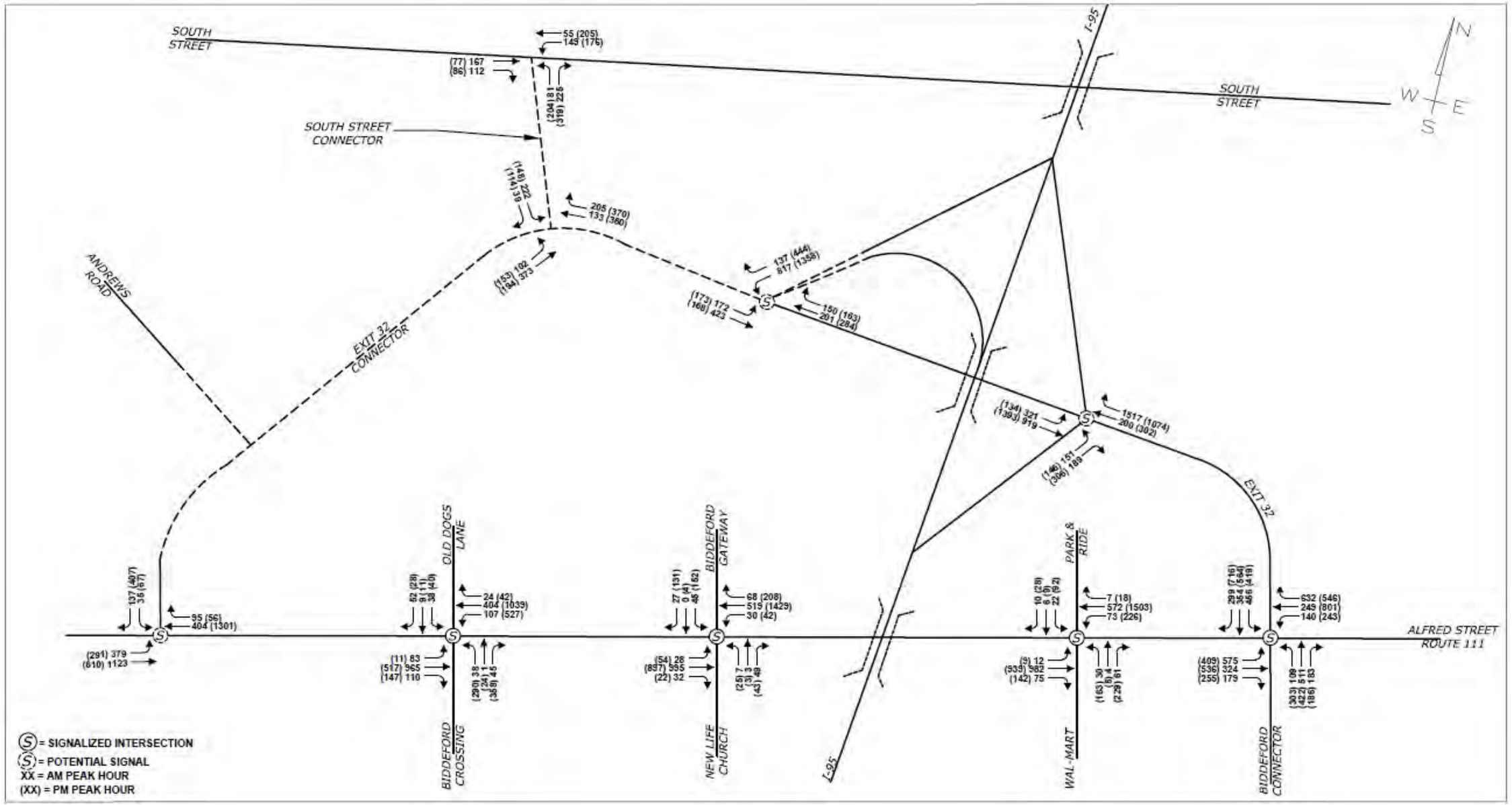


Figure 7.10 2045 Traffic Volumes for Alternative 4

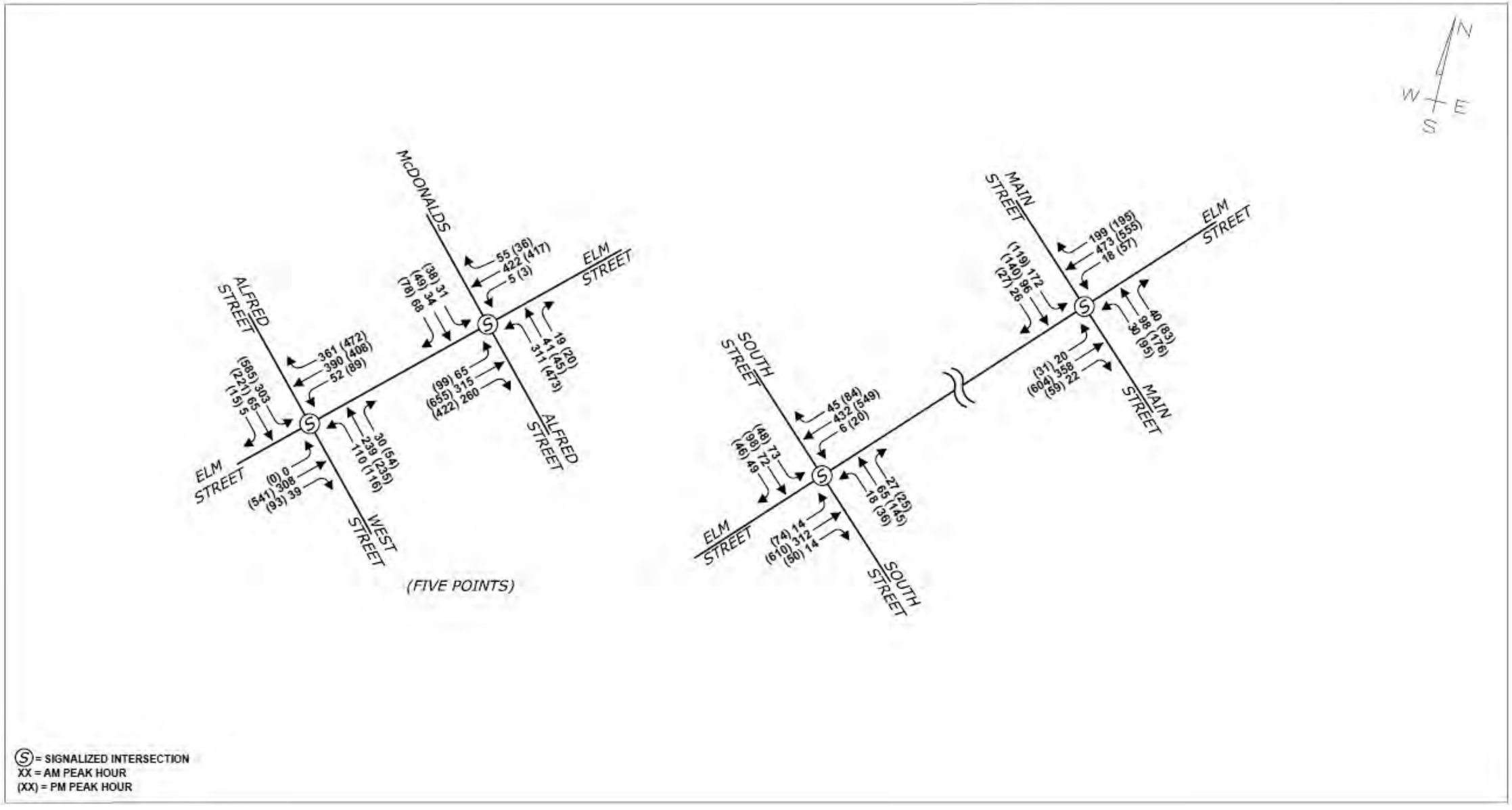


Figure 7.11 2045 Traffic Volumes for Alternative 4 along Elm Street

8.0 EVALUATION OF ALTERNATIVES

8.1 Traffic Operations

A SimTraffic analysis was conducted at the study intersections for the 2045 PM peak hour condition to determine intersection level of service conclusions (the PM peak hour is the worst-case volume scenario). See **Section 2.0** for Level of Service Methodology. MaineDOT has determined that Levels of Service A-D are acceptable conditions for intersections.

2045 No-Build

The following summarizes the anticipated level of service conditions at the study area intersections. It should be noted that the following results assumes the implementation of traffic signal phasing and timing improvements by MTA along Route 111 scheduled for implementation by the spring of 2023. Additionally, it assumed the 2028 MTA project to extend the Southbound Off-Ramp to Route 111 will be implemented.

- **Route 111/Biddeford Crossing**: This location is projected to have acceptable conditions overall, but some movements are projected to operate at level of service E, indicative of congestion.
- **Route 111/Biddeford Gateway Center**: This location is projected to have acceptable conditions overall, but some movements are projected to operate at level of service E, indicative of congestion.
- **Route 111/Walmart**: This location is projected to have acceptable conditions overall, but some movements are projected to operate at level of service E, indicative of congestion.
- **Route 111/Exit 32/Biddeford Connector:** This location is projected to have level of service E conditions during the PM peak hour and several movements are projected to operate at level of service F.
- **Route 111/Elm Street/West Street (Five Points):** This location is projected to have level of service F conditions during the PM peak hour.
- **Elm Street/McDonalds/Alfred Street (Five Points)**: This location is expected to have movements that operate at an unacceptable level of service and given that it operates in coordination with the Route 111/Elm Street/West Street intersection, unacceptable congestion is expected.
- **Elm Street/South Street**: This location is projected to have acceptable conditions overall, but some movements are projected to operate at level of service F, indicative of congestion.
- **Elm Street/Main Street**: This location is projected to have acceptable conditions overall, but some movements are projected to operate at level of service E, indicative of congestion.

Alternative 1: Transportation Demand Management (TDM)

TDM is not expected to have a significant impact on traffic operations given minor change to traffic volumes. A capacity analysis was not performed. Refer to **Section 6.0** for TDM information.

Alternative 2: Transportation System Management (TSM)

Improvements were considered at the intersections that were found to have mobility issues as described below:

- **Route 111/Biddeford Crossing**: The 2028 MTA project is expected to improve level of service conditions.
- **Route 111/Biddeford Gateway Center**: The 2028 MTA project is expected to improve level of service conditions.
- **Route 111/Walmart**: The 2028 MTA project is expected to improve level of service conditions.
- **Route 111/Exit 32/Biddeford Connector:** Limited space is available for TSM type improvements. The scope of improvements at this location necessary for mitigating congestion would be significant and not within a TSM type project.
- **Route 111/Elm Street/West Street (Five Points):** Limited space is available for TSM type improvements. The scope of improvements at this location necessary for mitigating congestion would be significant and not within a TSM type project.
- **Elm Street/McDonalds/Alfred Street (Five Points)**: Limited space is available for TSM type improvements. The scope of improvements at this location necessary for mitigating congestion would be significant and not within a TSM type project.
- **Elm Street/South Street**: Limited space is available for TSM improvements.
- **Elm Street/Main Street**: Limited space is available for TSM improvements.

Alternative 3: South Street Connector with 2028 MTA Exit 32 Planned Improvements

The construction of a South Street Connector with the extended Exit 32 Southbound Off-Ramp would have the following mobility results.

- **Route 111/Biddeford Crossing**: This intersection will see a slight decrease in overall intersection delay (1 second). All movements will operate at an acceptable level of service.
- **Route 111/Biddeford Gateway Center**: No change in level of service or delay is expected as compared to the No-Build condition.
- **Route 111/Walmart**: This intersection will see a slight decrease (1 second) in overall intersection delay. A reduction in the number of movements operating at level of service E is projected (from 2 to 1).
- **Route 111/Exit 32/Biddeford Connector:** This intersection will experience reduced overall intersection delay (from 64 seconds to 58 seconds), although overall level of service E conditions would be expected. The number of movements that operate at level of service F decreases from six to four.
- **Route 111/Elm Street/West Street (Five Points):** This intersection will experience reduced intersection delay (overall delay reduced from 84 seconds per vehicle to 58 seconds per vehicle), although level of service E conditions would be expected.
- **Elm Street/McDonalds/Alfred Street (Five Points)**: This intersection will experience reduced intersection delay.
- **Elm Street/South Street**: This intersection will operate at acceptable level of service conditions overall. Intersection delay will decrease.
- **Elm Street/Main Street**: No change in overall intersection level of service and delay is expected

Alternative 4: South Street Connector with Full Exit 32 Interchange Improvements

The construction of a South Street Connector, and Full Exit 32 interchange improvements would have the following mobility results:

- **Route 111/Biddeford Crossing**: This intersection will operate at acceptable levels of service with this alternative.
- **Route 111/Biddeford Gateway Center**: This intersection will operate at acceptable levels of service with this alternative.
- **Route 111/Walmart**: This intersection will operate at acceptable levels of service with this alternative with the exception of the left-turn into the Park & Ride lot due to traffic signal timing optimization.
- **Route 111/Exit 32/Biddeford Connector:** The intersection will see improvement in congestion as it will improve from level of service F to E. While it is an improvement, congestion will continue.
- **Route 111/Elm Street/West Street (Five Points):** The intersection will see improvement in congestion as it will improve from level of service F to E. While it is an improvement, congestion will continue.
- **Elm Street/McDonalds/Alfred Street (Five Points)**: The location will see some reduction in delay, but congestion will continue.
- **Elm Street/South Street**: This location will see increased delay with overall level of service dropping from C to D.
- **Elm Street/Main Street**: This location will see increased delay with overall level of service dropping from C to D.

Table 8.1
Level of Service (Delay seconds/vehicle) Comparison Summary
PM Peak Hour

Intersection	Existing	2045 No-Build	Alternative 3	Alternative 4
Route 111/Biddeford Crossing	C (35)	C (31)	C (30)	C (27)
Route 111/Home Depot	C (29)	C (29)	C (29)	C (25)
Route 111/Walmart	B (20)	C (24)	C (23)	C (21)
Route 111/Biddeford Connector/MTA Exit 32	D (44)	E (64)	E (58)	E (64)
Route 111/Route 1/West Street	D (43)	F (84)	E (58)	E (68)
Route 111/Route 1/McDonald's	C (25)	C (33)	C (29)	C (25)
Route 1 (Elm)/Main Street	C (28)	D (38)	D (38)	D (36)
Route 1 (Elm)/South Street	C (24)	D (40)	C (33)	D (36)

South Street Connector New Intersections

Two new intersections will be created on either end of the new roadway.

- South Street Connector/Exit 32 Connector: The Exit 32 Connector will be the main roadway and the South Street Connector will T into the roadway. The model assumed STOP control. Two lanes will be provided on each approach. Traffic signalization is likely given LOS E conditions for minor street movements.

- South Street/South Street Connector: The Connector will T into South Street. Two lanes are suggested on the Connector approach (a left lane and a right lane). The model assumed STOP control. Although the Peak Hour Warrant contained in the Manual on Uniform Traffic Control Devices, FHWA is not met for the future 2045 condition, signalization is possible given LOS E projections for the minor street approach.

8.2 Safety

An evaluation of safety benefits was performed for the proposed alternatives. This included specific mitigation strategies for Alternative 2 Transportation System Management and the potential benefit of volume reductions from Alternatives 3 and 4 at High Crash Locations. It should be noted that Alternative 1 Transportation Demand Management would not have a substantial impact on safety conditions.

Alternative 2 Transportation System Management

In conjunction with Alternative 2 Transportation System Management, a safety evaluation of High Crash Locations was performed. Crash data was obtained from MaineDOT for the most recent three-year period (2018-2020). MaineDOT has established criteria for establishing High Crash Locations (HCL) where an intersection or road segment has 8 or more crashes and a Critical Rate Factor (CRF) greater than or equal to 1.0 over a three-year period. The CRF is a comparison of the study locations with other comparable locations in the State. Refer to **Figure 2.2 in Section 2.4** which summarizes the High Crash Locations for intersections and roadway segments for the three-year period 2018-2020. **Table 8.2** presents the High Crash Locations and identification of mitigation strategies given crash patterns. The improvement strategies are generally lower cost actions that do not require significant roadway widening or geometric changes.

Alternatives 3 and 4

For feasibility type studies the change in traffic volume is a metric sometimes used to broadly determine if alternatives reduce traffic volume and thus likely improve safety conditions. The following summarizes the change in PM peak hour volumes at the High Crash Locations. As noted most High Crash Locations will see a reduction in traffic volumes and thus improved safety conditions. The exceptions are South Street from River Road to Fox Hollow Drive and the Main Street/Bradbury Street/St. Mary's Street intersection, where traffic volumes are projected to increase. A few locations will see no change in traffic volumes, South Street/May Street and the MTA Toll Booth entry area for Alternative 3, and West Street for both alternatives.

- Elm Street/Orchard Street /Union Street
  - Alternative 3: -100 vehicles
  - Alternative 4:-200 vehicles
- Route 111/Edwards Avenue
  - Alternative 3: - 200 vehicles
  - Alternative 4: - 300 vehicles
- Route 111/Exit 32/Biddeford Connector
  - Alternative 3: -100 vehicles
  - Alternative 4: -350 vehicles
- South Street/ May Street
  - Alternative 3: No Change
  - Alternative 4: -100 vehicles
- Main Street/Bradbury Street/St. Mary's Street
  - Alternative 3: +100 vehicles
  - Alternative 4: +200 vehicles
- Route 111/Elm Street/West Street/McDonalds
  - Alternative 3: -100 vehicles
  - Alternative 4: -200 vehicles
- Route 111 from May Street to Edwards Avenue
  - Alternative 3: -200 vehicles
  - Alternative 4: -300 vehicles
- Elm St from Route 111 to Dartmouth Street
  - Alternative 3: -100 vehicles
  - Alternative 4: -200 vehicles
- West Street from Route 111 to Graham Street
  - Alternative 3: No Change
  - Alternative 4: No Change
- Toll Booth area from Route 111 to I-95 Ramp
  - Alternative 3: No Change
  - Alternative 4: -100
- South Street from River Road to Fox Hollow Drive
  - Alternative 3: +100 vehicles
  - Alternative 4: +100 vehicles

Table 8.2
Safety Data Summary and Possible Mitigation Strategies

Location	Number of Crashes	Critical Rate Factor	Crash Pattern	Possible Mitigation Strategy
Elm Street/Orchard Street /Union Street	11	1.99	Two pedestrian crashes at crosswalk and rear end crashes.	▪ Install Rectangular Rapid Flash Beacon (RRFB).
Route 111/Edwards Avenue	31	1.13	Left turn crashes entering shopping center and rear end crashes.	▪ Install Flashing Left Arrow signal head. ▪ Install backplates with reflective borders. ▪ Review and revise traffic clearance timings.
Route 111/Exit 32/Biddeford Connector	77	1.58	Rear end crashes	▪ Patterns indicative of a congested intersection. ▪ No specific TSM strategy identified.
South Street/ May Street	8	1.98	Rear end crashes on May St. and left from May St. crashes	▪ Consider a multi-way STOP intersection.
Main Street/Bradbury Street/St. Mary's Street	8	2.34	Crashes involving vehicles turning from side streets	▪ Consider a multi-way STOP intersection.
Route 111/Elm Street/West Street/McDonalds	46	1.29	Rear end crashes	▪ Patterns indicative of a congested intersection. ▪ No specific TSM strategy identified.
Route 111 from May Street to Edwards Avenue	25	1.19	Turn crashes at driveways	▪ Close or restrict movements at the Biddeford Shopping Center easterly driveway.
Elm St from Route 111 to Dartmouth Street	23	3.37	Turn crashes at driveways	▪ TSM type access management improvements should be considered.
West Street from Route 111 to Graham Street	20	3.96	Left-turn crashes from Burger King	▪ Close westerly Burger King Driveway.
Toll Booth area from Route 111 to I-95 Ramp	17	2.69	Side swipe and rear end crashes	▪ Patterns indicative of a congested location and lane change movements. ▪ No specific TSM strategy identified.
South Street from River Road to Fox Hollow Drive	11	1.19	Single vehicle run off the road crashes. No specific contributing factor.	▪ No TSM improvement strategy identified.

8.3 Roadway Design for Alternatives

The conceptual design of the South Street Connector was derived using American Association of Highway and Transportation Officials (AASHTO) standards and assumed to be a Highway Corridor Priority 2 by MaineDOT standards. As such, geometry and cost estimating were derived assuming two 12-foot travel lanes with 4-foot shoulders and an ADA compliant shared-use path on one side.

The general location of the South Street Connector was selected with consideration to property owner impacts, environmental impacts, and existing topography.

Horizontal curves were set to meet the minimum criteria of a posted speed of 45 MPH, except near the intersection with South Street, where this approach will meet for 25 MPH.

The approach on the South Street Connector to the Exit 32 Ramp Extension roadway was derived such that the through movement would be that of the Exit 32 Ramp Extension, with southbound travelers on the South Street connector stopping/yielding to oncoming traffic.

The intersection of the South Street Connector and South Street is anticipated to be signalized at some point in the future. South Street would be widened to accommodate a left-turn onto the South Street Connector and a through lane when approaching from the east.

The roadway structure for the South Street Connector was assumed to be comprised of 6" of Hot-Mix Asphalt (HMA) atop 24" of gravel. Closed drainage would be required beneath the gutter line created by the shared-use path.

The future widening of the Exit 32 Ramp Extension between the South Street Connector and the assumed intersection at Andrews Road was conceptualized to, in its final state, consist of two 12-foot lanes and 4-foot shoulders, with a structure similar to that of the South Street Connector.

8.4 South Street Improvement Needs

An initial review of conditions on South Street was performed to determine the adequacy of the roadway to accommodate additional traffic volumes. The Customer Service Level (CSL) measures the state's highway assets in three areas. The CSL uses customer-focused engineering measures to track highway Safety, Condition and Serviceability, and grades them similar to a report card (A to F). *It should be noted that these levels of service measures differ from that of an intersection capacity analysis as presented previously.* The following lists the individual measure that make up the overall service level grade.

Safety

- Crash History
- Rutting Pavement
- Paved Roadway Width
- Bridge Reliability

South Street is rated at levels of service B and C. West of the Maine Turnpike, the level of service is F, which is based on the presence of a high crash location at South Street between River Road and Fox Hollow Drive.

Condition

- Ride Quality
- Pavement Condition
- Roadway Strength
- Bridge Condition

South Street and Main Street have condition levels of service of A and B with some short segments at level of service C.

Service

- Posted Road
- Posted Bridge
- Congestion

South Street and Main Street have condition levels of service of A and B with some short segment of South Street west of May Street at level of service C.

Conclusion

South Street generally has capacity for additional traffic volume growth. However, the study partners will need to consider or further evaluate improvements to South Street including but not limited to the following if a build alternative is ultimately selected:

- **The South Street/Main Street intersection would need to be improved**.
- The sidewalk should be extended on South Street from Cathedral Oaks to the Connector (may be needed for the Hidden Hills modular home development).
- Roadway shoulder Improvements are suggested from Main Street to the Connector.
- Spot geometric improvements (sight distance, curves, etc.) may be necessary.
- Crosswalk/ADA improvements are needed.
- Shoulder/bike lane opportunities east of Main Street/South Street intersection are limited.

8.5 Environmental Resource Impacts of Alternatives

The conceptual alignment for the South Street Connector:

- Avoids impacts to the Red Maple Swamp.
- Generally, avoids impacts to MaineDEP identified vernal pools.
- Has potential to impact some vernal pools identified by Biddeford's GIS, the extent of which would be determined as design/permitting progresses beyond feasibility analysis.
- Will impact Deer Wintering Areas in this location.
- Has potential to impact some conserved land in the area, but the majority of this impact falls on the existing Waterworks Drive.

8.6 Cost Estimates of Alternatives (2022 Dollars)

SOUTH STREET CONNECTOR

- SUB TOTAL = $6,011,860
- PE/CE 20% = $1,600,000
- ROW = $240,000
- 20% contingency = $1,202,372
- 20% MOT = $1,202,372
- TOTAL = $10,256,604

Round = $10,260,000

WIDEN THE MTA RAMP EXTENSION FROM THE SOUTH STREET CONENCTOR TO ANDREWS ROAD

- SUB TOTAL = $1,237,000
- PE/CE = $ 350,000
- 20% contingency = $247,400
- 20% MOT = $247,400
- TOTAL = $2,081,800

Round = $2,100,000

*Construction Costs in 2022 Dollars
*PE/CE – Design and Construction Engineering
*Additional Planning Studies and Permitting will be required before design can begin.
*Does not include improvements at the Route 111 intersection. This is to be included in the MTA Ramp Extension Project.

SOUTH STREET IMPROVEMENTS

- **Improving Main/South Intersection**: **$500,000**
- Sidewalk and roadway improvements from Cathedral Oaks to South Street Connector: **$1,350,000** (does not include improvements to MTA Bridge)

*These improvements are considered independent of the Connector Project and are assumed to be necessary to accommodate future growth in the City.

8.7 Benefit-Cost Analysis

A benefit costs analysis was performed to quantify the mobility and safety benefits of Alternative 3. A benefit costs analysis was not performed for Alternative 2 as TSM improvements were not identified to have mobility improvements and Alternative 4, as it includes Exit 32 interchange modifications that will be studied in the future. The mobility benefits were based on the changes in network-wide vehicle delay at the Study area intersections when comparing the No-Build condition to the improvement Alternative.

Alternative 2: Transportation System Management

There were no mobility improvements identified. The safety benefits of implementing the recommendations are noted in **Table 8.2**. This alternative was not evaluated for benefits as no mobility benefits are expected with the identified safety improvements.

Alternative 3: South Street Connector with 2028 MTA Exit 32 Planned Improvements

Total Implementation Cost = $12,360,000

Benefit-Cost Ratio = 1.28 (mobility and safety benefits)

Alternative 4: South Street Connector with full Exit 32 Interchange Improvements

This alternative was not evaluated for benefits and costs as the Exit 32 Interchange improvements have not been identified and not part of this study.

9.0 ALTERNATIVES EVALUATION CRITERIA

The evaluation of alternatives was based on the assessment of transportation, land use, environmental resources, cost and how the alternatives address the purpose and need statement.

9.1 - Transportation Measures

For transportation measures, alternatives were evaluated regarding changes in traffic volumes on existing and new roadways; improving or worsening congestion and safety; neighborhood or local street impacts; and improving bicycle and pedestrian conditions. The specific transportation criteria evaluated are noted below.

- Vehicle Miles Traveled (VMT) – The VMT values represent daily reductions.
- Vehicle Hours Traveled (VHT) – The VHT values represent daily reductions.
- Improves Level of Service (LOS) and Delay at Key Local intersections – At Route 111/Exit 32/Biddeford Connector and 5 Points.
- Safety – Change in volume at High Crash Locations.
- South Street Traffic Impact - Increase or decrease in traffic volume.
- May Street Traffic Impact – Increase or decrease in traffic volume.
- Saco-Biddeford cut Through Traffic – Increase or decrease in traffic volume on Route 1 between Biddeford and Saco.
- Potential for Improving Bicycle and Pedestrian Conditions – Improved connectivity and reduced volume on streets.

9.2 - Land Use Measures

The new roadways will have an impact on properties and determination on property and building impacts will be based on a likely roadway alignment. The specific property impact criteria evaluated are noted below. These were qualitative as a specific alignment has not been determined.

- Number of Homes/Buildings with Direct Impact
- Number of Private Lots Impacted
- Right-of-Way Acquisition Needed - Acres

9.3 - Environmental Resource Measures

The new roadways will likely have an impact on environmental resources. An inventory of existing information was obtained and documented. Based on a likely roadway alignment corridor, the following environmental resources were reviewed for potential impact.

- Potential for Impacts to Archeological and Historic Resources
- Potential for impacts to Vernal Pools
- Potential for impact to Deer Wintering Areas
- Potential for Wetland and Stream Impacts – Acres of impact.
- Potential for Conservation Land and 4(f) Land Impacts – Impact to identified resources.
- Potential for Impacts to Rare, Threatened, Endangered, and Special Concern Plant Species and Habitats

9.4 - Cost and Funding Measures

A planning-level cost estimate for each alternative was determined and used in a benefit/cost analysis.

- Construction Cost - This total is the construction cost (current dollars only) to implement each improvement/alternative and does not include right-of-way.
- Benefit/Cost Measure – This is the ratio of the benefit of each alternative quantified according to safety and mobility improvements on a cost basis versus implementation cost.

9.5 - Purpose and Need

An important element of the evaluation was the determination if an alternative addressed the study purpose and need. Accordingly, the study purpose and need statement (see below) established for the project was reviewed for each alternative.

Study Purpose

The primary purpose of the proposed action is to relieve congestion and improve safety along Route 111/Route 1 and to support Biddeford's economic development goals. Other desirable outcomes would be to improve connectivity to I-95 via Exit 32, South Street, and downtown Biddeford; improve more direct access to the interstate for Biddeford and Saco through-traffic; and reduce neighborhood traffic impacts. The preferred alternative will be feasible given reasonable available state, local, federal and MTA funding.

Study Need

The need for the proposed action is demonstrated through current failing Customer Service Levels at existing intersections indicative of insufficient capacity and high instances of crashes. Congestion is observable at or near peak times, particularly at Route 111/Exit 32 and Five Points. It is further demonstrated by existing safety issues at intersections and along Route 111 and Route 1.

9.6 - Evaluation Matrix

Table 9.1 presents a comparison matrix and includes the following measures for assessing outcomes of each Alternative. In addition, the measures were qualitatively color-coded for positive impacts (green), negative impacts (red) and neutral impacts (yellow).

The following is a brief summary of the evaluation conducted for each alternative.

Alternative 1: Transportation Demand Management (TDM)

No substantial changes to traffic volumes are expected with this alternative. As it relates to this study and the purpose and need statement, Transportation Demand Management strategies will not fully meet the objectives of the study. These strategies should be considered in conjunction with other alternatives (or as separate initiatives) as their benefits offer the provision of a balanced transportation system with mode choices.

Biddeford-Saco Concept Transit-Oriented Development Study

The Biddeford-Saco Concept TOD Study, GPCOG identified a number of strategies to make walking and biking easier and safer, improve transit and reduce vehicle demand. These actions include:

Address Gaps In The Pedestrian Network

- Conduct a walking/biking safety audit of the area with community members, municipal staff, and elected officials.
- Draft/adopt a Complete Streets Policy.
- Review/update technical design manuals to identify opportunities to improve the pedestrian environment. For example, in urban areas the manuals should have continuous sidewalk policies (the sidewalk extends across driveways), 8' minimum widths when the sidewalk is adjacent to moving traffic, and sidewalks provided on both sides of all streets.
- Develop an Americans with Disabilities Act (ADA) Transition Plan

Extend The Riverwalk Trail

Make Walking And Biking Safe And Appealing On Major Corridors

Develop A Bike Network

Create A Streets Master Plan

Demand Management Strategies

The Biddeford-Saco Concept TOD Study identified a number of strategies to reduce reliance on driving and these actions include:

- Establishing a Transportation Management Association (TMA): A TMA is a nonprofit, member-driven organization that works to reduce congestion and address commuter issues in a defined geographic area. TMA members typically include local businesses and anchor institutions. TMAs coordinate a variety of potential services and education and incentive programs to encourage more efficient use of transportation and parking resources.
- Requiring Transportation Demand Management (TDM) plans: TDM is the general term used for strategies to encourage people to more efficiently use all modes of the transportation system. Many cities across the country (including require that all commercial or institutional development of a certain size include a TDM plan complete with strategies to reduce single-occupancy vehicle trips.

- Working with GO MAINE: A collaboration of the Maine Turnpike Authority and the MaineDOT, GO MAINE helps employers by providing free ride matching services for commuters, helping to form carpools or vanpools, and rewarding commuters that log their green commutes with benefits.
- Rethinking paid parking: Many towns and cities across the country are rethinking their free parking policies. Paid parking creates more turnover which results in more free spaces, helps raise money to pay for sidewalk and streetscape improvements, and allows access to parking data to better understand parking and congestion trends.
- Establishing transit incentive programs: In many urban areas, large employers, and residential developments partner with transit agencies to provide benefit programs, such as discounted or free passes, to their employees or tenants.
- Promoting bike incentive programs: Bicycle Benefits is a well-known national program where participating businesses offer discounts to patrons who show up on their bike with the Bike Benefits helmet sticker.
- Providing more secure bike parking: Dedicated indoor bike storage in residential and office buildings makes owning and commuting by bike easier, while more bike parking in public places promotes cycling for shopping, errands, and daily trips.
- Piloting a bike share program: Bike share programs are especially useful for visitors and tourists who arrive to an area by transit

The Biddeford-Saco Concept TOD Study also established several goals that outline investments that would offer demand reduction results. Some include:

1. Invest in public transit
2. Make walking and biking easier and safer
3. Support Multimodal mobility

Alternative 2: Transportation System Management

Most study area intersections are expected to operate at an acceptable level of service (A to D). The Route 111/Biddeford Connector/Exit 32 and the Five Points intersections are expected to continue to have unacceptable congestion (level of service E or F) in the future. Both locations would require significant capacity expansion and the scale of these projects are not considered system management improvements. Additionally, the Elm Steet intersections with South Street and Main Street have some movements that operate poorly (overall they are operating at an acceptable level of service), but given the built-up urban area, TSM improvements do not appear possible. As noted in **Table 8.2**, there are some suggested TSM safety improvements that include signal equipment changes, access management, creating all-way STOP intersections and enhancing a pedestrian crosswalk. Otherwise, this alternative does not meet the purpose and need for the study.

Alternative 3: South Street Connector with 2028 MTA Exit 32 Planned Improvements

Transportation

This alternative will shift traffic from westbound Route 111 to the MTA Exit 32 Ramp and improve intersections from Exit 32/Biddeford Connector to Biddeford Crossing. Additionally, the South Street Connector will shift traffic from the west and Exit 32 Southbound to Downtown and reduce traffic on Route 111 through Five Points. The Route 111/Biddeford Connector/Exit 32 and the Five Points intersections will see reduced delay as levels of service improves. The South Street Connector would be expected to carry about 4,000 vehicles per day and would add 100 vehicles during the AM peak hour and 200 vehicles during the PM peak hour to South Street east of the Connector.

Property Impacts

Although a specific alignment has not been identified, a new roadway will have impacts to private property. Approximately 6 acres of right-of-way acquisition will likely be required. There may be building impacts at the Route 111/Exit 32 Connector location, but it is assumed that it would be part of the MTA Ramp Extension project.

Environmental

The conceptual alignment for the South Street Connector:

- Avoids impacts to the Red Maple Swamp.
- Generally, avoids impacts to MaineDEP identified vernal pools.
- Has potential to impact some vernal pools identified by Biddeford's GIS, the extent of which would be determined as design/permitting progresses beyond feasibility analysis.
- Will impact Deer Wintering Areas in this location.
- Has potential to impact some conserved land in the area, but the majority of this impact falls on the existing Waterworks Drive.

Cost

The cost for this alternative is $12,360,000. A benefit-cost ratio is 1.28 is estimated.

Purpose and Need

This alternative meets the study purpose and need as improvement in congestion and safety are expected. It will also provide improved connectivity to downtown and roadway system redundancy. It is not expected to significantly reduce Saco-Biddeford through traffic, and it has mixed neighborhood impact results as it will reduce traffic on May Street but will increase traffic on South Street.

Alternative 4: South Street Connector with Full Exit 32 Interchange Improvements

This alternative will have similar traffic volume changes as Alternative 3 but will see greater volume changes due to improvements to the Exit 32 interchange and allowing full two-way flow between the Maine Turnpike and the South Street Connector. The Route 111/Biddeford Connector/Exit 32 and the Five Points intersections will see reduced delay as levels of service improve. The South Street Connector would be expected to carry about 7,000 vehicles per day and would add 200 vehicles during the AM peak hour and 300 vehicles during the PM peak hour to South Street east of the Connector. As compared to Alternative 3, the increase in traffic on the South Street Connector is associated with traffic being able to access Exit 32 from the new roadway system. Additionally, motorists will be permitted to travel between the Route 111/Biddeford Connector intersection and the South Street/Connector intersection (motorist could travel from South Street to South Maine Medical Center as an example).

Property Impacts

Although a specific alignment has not been identified, a new roadway will have impacts to private property. Approximately 6 acres of right-of-way acquisition will likely be required. There may be building impacts at Route 111/Exit 32 Connector location, but it is assumed that it would be part of the MTA 2028 project.

Environmental

Similar impacts as Alternative 3 would be expected, although the Exit 32 Interchange Improvements and Ramp Extension projects are not known.

Cost

This alternative was not evaluated for benefit and cost as the Exit 32 Interchange improvements have not been identified and not part of this study.

Purpose and Need

This alternative meets the study purpose and need as improvement in congestion and safety are expected. It will also provide improved connectivity to downtown and roadway system redundancy. It is not expected to significantly reduced Saco-Biddeford through traffic ,and it has mixed neighborhood impact results as it will reduce traffic on May Street but will increase traffic on South Street.

Category	Transportation Measures								City Planning Policy	Property Impacts	Environmental Impacts					Cost	
Description of Alternative	Vehicle Miles Traveled (VMT)	Vehicle Hours Traveled (VHT)	Safety	Level of Service and Delay	South Street Traffic Impact	May Street Traffic Impact	Saco-Biddeford Cut Through Traffic	Bicycle and Pedestrian Conditions		Right-of-Way Acquisition	Potential for Impacts to Historic and Archaeological Resources	Potential for Impacts to Vernal Pools/Wetland/Streams	Deer Wintering Area	Potential for Impacts to Constrained Lands	Potential for Impacts to Threatened and Endangered Species	Total Estimated Cost	Benefit/Cost Measure
Future (2045) No-Build w/MTA 2027 Improvements	N/A	N/A	2 locations reduced	1) LOS = E (64) 2) LOS = F (86)	No Change	No Change	No Change	No Change	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Alternative 1: Transportation Demand Management (TDM)	No Change	No Change	No Change	1) LOS = E (64) 2) LOS = F (86)	No Change	No Change	No Change	No Change	Yes	None	None	None	None	None	None	N/A	N/A
Alternative 2: Transportation System Management (TSM)	No Change	No Change	Improved at Some Locations	1) LOS = E (64) 2) LOS = F (86)	No Change	No Change	No Change	No Change	Yes	Some	None	None	None	None	None	TBD	N/A
Alternative 3: South St. Connector, 2027 MTA Improvements, and Connection to Rt. 111	Regionwide -0.01% Biddeford +0.32%	Regionwide -0.05% Biddeford -0.09%	7 locations reduced and 2 locations increased	1) LOS = E (58) 2) LOS =E (68)	+100(+200)	-100 (-100)	Some diversion	provides routing alternative to outer Route 111 and some volume reductions on Route 111, May St. and Elm St.	Yes	Approximately 5 acres	None	Potential for two Vernal Pools to be impacted and the crossing of Thatcher Brook	Potential for 23.3 Acres	Potential for 13.2 Acres (includes land along Water Works Drive)	Potential for impacts to: Insects, Reptiles, Bats, Plants, Fisheries, Deer Yards, and Significant Natural Communities	$12,360,000	1.28
Alternative 4: South St. Connector, Exit 32 Connector and Interchange Improvements	Regionwide -0.03% Biddeford +0.98%	Regionwide -0.15% Biddeford -0.27%	7 locations reduced and 2 locations increased	1) LOS = E (64) 2) LOS =E (68)	+200(+300)	-100(-200)	Some diversion	provides routing alternative to outer Route 111 and volume reductions on Route 111, May St. and Elm St.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
How Alternative will be measured	Annual Change	Annual Change	Change in Volume at HCL	PM LOS/Delay at: 1) Rt. 111/Exit 32 and 2)5 Points	Change in AM (PM) Peak Hour Volume on South St.	Change in AM (PM) Peak Hour Volume on May St.	Change in AM (PM) Peak Hour Volume on Rt. 1 Bridge.	Improved Connectivity and reduced volume on streets	City Council Policy or Consistent with Comprehensive Plan	Right-of-Way Needed	Identification of Historic and Archaeological Resource Impacted (MHPC, NPS, CARMA)	Identified Vernal Pools (MDIFW) Impacted from 250 ft. corridor Quantification of NWI Wetlands Affected from 250 ft. corridor	Data from MNAP, MDIFW, USFWS	Identification of Constrained Land Impacted from 250 ft. corridor	Data from MNAP, MDIFW,	2022 Dollars	

Positive change

Neutral or little change

Negative Change

10.0 PUBLIC OUTREACH

Summary of public feedback

An unusual aspect of public response to this study was that the amount of interest and number of comments from the public increased over the life of the study, with the last public meeting generating the highest number of participants. The content of the feedback remained consistent throughout, however.

While many people appeared to have an open mind and were interested in reducing traffic congestion in the study area, there were questions as to whether these study alternatives – in particular, those that added more traffic to South Street – would be the best solution. Concerns about increasing traffic along South Street and its adjacent neighborhoods – especially without adding significant safety amenities for pedestrians and bicyclists – were heard throughout the study. Environmental impacts on natural resources and a lack of focus on climate change-friendly solutions were also consistent comments. The possibility of Turnpike access closer to downtown was generally seen as a positive, but many felt that what was perceived as the limited traffic benefits of the proposed new Connector did not outweigh neighborhood and environmental concerns. It was clear that the recent strong resurgence of economic activity and influx of newcomers in Biddeford was both welcome and troubling to residents.

Purpose of public outreach for this study.

The public outreach goal for this study was to create transparency and awareness around the evaluation of the various alternatives. The South Street Connection alternative (Alternative 3 and 4), in particular, as a new road that would result in some level of environmental impacts and potentially change traffic patterns, had already gained attention from members of the Biddeford Conservation Commission. The City worked with the team to create an online presence for the study and to underscore its willingness to engage in discussion on the issues that would emerge.

Building awareness and understanding.

The first step of the program was to create a comprehensive web page on the City of Biddeford web site. The page included the usual description of the study, notice of meetings and meeting minutes, and also offered multiple opportunities to provide opinions and comments. The comments were responded to individually, and responses were generally posted online within 48 hours. These comments and the responses are included in the study appendices; a summary follows. In addition, a *Frequently Asked Questions* section drew from these public comments and created a set of responses prominently featured on the page.

The defining characteristic of a feasibility study is that it is an early, high-level look at a series of potential solutions to transportation and development challenges. The preliminary nature of the work is typically hard for non-planners to understand, which can be frustrating when definitive answers and data – and immediate solutions – are not necessarily forthcoming. To provide clarification, and to manage expectations for the public, the team created a video for the website and social media that explained the basis of the study – and also the limitations of a feasibility study. The video was launched prior to the second meeting, at which data was presented.

Three hybrid public meetings

The first public meeting for the study was in December 2021, which marked the point at which the first in-person meetings after the Covid-19 pandemic were beginning to be allowed by City of Biddeford. However, because public participation had generally increased during the pandemic due to the convenance of online platforms such as Zoom, the City determined that all the study meetings should be hybrid, i.e., the public could elect to attend and speak in person or could participate remotely, with the same ability to comment or ask questions in real time.

The City's social media accounts and the local newspaper were utilized to launch the study, announce meetings, and post written meeting minutes, powerpoint presentations, and videos of the full meeting. For the second meeting, the City added a Variable Message Board (VMB) on South Street a week before the meeting date to increase awareness. For the third meeting, the City added a second location for the VMB adjacent to and visible to commuters exiting Exit 32 and at Five Points.

Meeting 1 - December 14, 2021

This meeting outlined the study's purpose and need, study tasks, potential alternatives, and existing conditions in the study area, but the primary purpose was to listen to individuals' concerns and answer questions. Eight individuals attended in person and 17 more via Zoom.

General Comments:

- **A new road is OK, but add bike-ped amenities and transit**: We have good transit, need bike ped amenities/Fix South Street – is unsafe now for bike and peds.
- **All new roads are bad:** Roads do not solve problems / BSOOB comment - We need better transit and also more jobs in Biddeford so people don't have to travel.
- **This particular road is bad:** This new road too expensive, will change character of South Street and will ruin natural habitat/This road will damage valuable habitat.

Meeting 2 - June 22, 2022

This meeting provided detail on the alternatives that had been developed, including detailed traffic impacts throughout the study area. Twelve individuals attended in person; 25 more via Zoom.

General Comments:

- **The scope of the study has limitations, and this is a problem:** Looking at the Purpose statement, it is clear that the strategy was developed in such a way that only a new road could reasonably fulfill the study purpose, as opposed to the TDM strategies/Some conclusions were problematic based on limitations of the study. In terms of managing peak demand, we should not build roads around two hours of peak use every day - advocates regional efforts to address growth. There is a lot of energy around the Maine Climate Council and the GPCOG Transit Tomorrow Plan, none of which is factored into this study.
- **South Street is already unsafe and this road will make it worse as well as decrease quality of life for residents:** South Street is already unsafe and loud, with traffic increasing and speeding occurring on a regular basis, and minimal sidewalks for walking. Adding hundreds of cars more a day would ruin what is actually a neighborhood, making it chaotic/A new road that would increase traffic in one of the most dangerous locations in the city, all for the purpose of reducing traffic congestion by a 20-second maximum, with no strategies to improve safety on the local road it would impact. On a per vehicle basis, the savings in time compared to the investment in time, process, and money is not favorable/Concerned with the City and state's disregard for people who live on South Street, and that vehicles and "progress" are taking priority over the neighborhood and people who live here/The report shows a connector road will increase traffic on South Street, which is already a high crash, high traffic area. Directing additional traffic to South Street with no safety mitigation strategies, no improvement strategies identified is a real problem.
- **The environmental impacts of this road are unacceptable:** This new road will have a cascade of negative community impacts, including encouraging major development in a valuable environmental area. It will not be a net positive for the environment and pumping more fossil fuels into the air is not a win/Concern is natural resources – both farmland and forest. The new Comprehensive Plan is supposed to develop goals and policies to protect rural areas. He has no confidence that this will be so. The conclusion looking at this road in 2000 was that it would cause too much environmental damage and was too expensive. The conclusion should be the same this time.
- **New road is unnecessary:** Often travels on all these roads during rush hour, and there is generally no more than a couple of minutes wait at Five Points and Biddeford Crossing – it flows pretty well.

Meeting 3 – November 28, 2022:

This meeting presented the completed analysis of the traffic data and provided a detailed matrix assessing whether Alternative 3 met the Purpose and Need of the study. The assessment indicated that Alternative 3 did meet Purpose and Need with a benefit cost ratio of 1.44; the recommendation was to do further study to better understand environmental and property impacts. This meeting had the highest level of attendance with 20 people attending in person and 38 additional individuals on Zoom.

General comments:

- **Negative impacts on South Street and Highland Avenue:** Concerns about additional traffic in what is perceived as a residential area, causing safety issues especially for pedestrians and bicyclists were one of the major themes heard during this meeting. People also talked about Highland Avenue being turned into a neighborhood cut-through, which would exacerbate the existing speeding issues perceived as a problem.
- **Concerns about environmental impacts:** There was general awareness that the proposed road would go through a conservation area, and that raised concerns not just about the impacts of the road itself, but that it would open this rural area up to further development.
- **Overall benefit does not warrant negative effects:** There were concerns voiced that the sum total of negatives were considerable, and were not offset by what was perceived as minimal traffic improvements along Route 111 and at Five Points.
- **Concerns were expressed about the safety of the Andrews Road and Route 111 intersection:** These pertained both to the new ramp and the new development proposed at that location, since Route 111 is generally already perceived as unsafe at that location.
- **Improvement is needed, here is better idea for exit and road:** Exit 32 and 36 both bad, but connector won't work, need new exit on South Street/Jobs are north of Biddeford and a bypass road will have minimal effect. May Street sees increasing traffic. How about an EZPass only Northbound entrance to the Turnpike? Along with a Southbound exit to South Street.
- **All roads are bad:** No new roads, proven to not solve problem, will pollute more/Should not be short term fix. New road will only shift problem. South Street not designed for this much traffic and will become bottleneck. Westward growth means should look at regionally. Problem with "generated/induced" traffic. Should reduce trips first. These areas are not designed for bike/walk traffic and should be. GPCOG land use plan should be adhered to. Factor in new Exit 36 work. Factor in climate change analysis/New road will increase VMT due to induced demand. Don't do it. Build housing closer to work.
- **This road is bad:** Road is bad idea, already too much traffic on South Street/New road would desecrate natural habitat – this is not a growth area even though new water facility and trailer park are going in there.

Comments received online

Forty-One online comments, plus an additional hand-written letter to City Hall, were received between December 2021 and December 9, 2022.

Summary of online comments:

- **New road is good:** Favor new road for safety and congestion reasons-keep people out of downtown and congested areas, and fix bottleneck between Deering Lumber and bridge/Want new road – take pressure off May Street – need sidewalks/Want better exit so as not to go through Exit 32 or Five Points
- **Road idea is OK, add bike-ped amenities and transit:** Elm Street not safe to bike/If you are going to add more traffic to South Street, make it safe for bikes and peds/Concern only about Route 111 – exit should be one way south to Route 111 west of Market Basket

11. RECOMMENDATIONS

Based on the alternatives evaluation it is recommended that the following actions be considered:

1. **Alternative 3: South Street Connector with the 2028 MTA Exit 32 Planned Improvements** should be advanced to additional detailed study given that it meets the study Purpose and Need. This alternative will shift traffic from westbound Route 111 to the MTA Exit 32 Ramp and improve intersections from Exit 32/Biddeford Connector to Biddeford Crossing. Additionally, the South Street Connector will shift traffic from the west and Exit 32 Southbound to Downtown and reduce traffic on Route 111 through Five Points. The Route 111/Biddeford Connector/Exit 32 and the Five Points intersections will see reduced delay as levels of service improves. The South Street Connector would be expected to carry about 4,000 vehicles per day and would add 100 vehicles during the AM peak hour and 200 vehicles during the PM peak hour to South Street east of the Connector.

   Property Impacts

   Although a specific alignment has not been identified, a new roadway will have impacts to private property. Approximately 6 acres of right-of-way acquisition will likely be required. There may be building impacts at the Route 111/Exit 32 Connector location, but it is assumed that it would be part of the MTA Ramp Extension project.

   Environmental

   The conceptual alignment for the South Street Connector:

   - Avoids impacts to the Red Maple Swamp.
   - Generally, avoids impacts to MaineDEP identified vernal pools.
   - Has potential to impact some vernal pools identified by Biddeford's GIS, the extent of which would be determined as design/permitting progresses beyond feasibility analysis.
   - Will impact Deer Wintering Areas in this location.
   - Has potential to impact some conserved land in the area, but the majority of this impact falls on the existing Waterworks Drive.

   Cost

   The cost for this alternative is $12,360,000. A benefit-cost ratio is 1.28 is estimated.

2. The following should be considered for inclusion in that future study:
   - South Street detailed traffic/safety study and identification of mitigation strategies.
   - In terms of traffic conditions, consider broader study area outside of Biddeford.
   - Full natural resource inventory and property impacts.
   - Assessment of economic development goals vs. environmental impacts.
   - Updated traffic information to reflect on-going City development.

2. **Alternative 1: Transportation Demand Management** improvement strategies should be advanced as a separate initiative. The Biddeford-Saco Concept TOD Study, GPCOG identified a number of strategies to make walking and biking easier and safer, improve transit and reduce vehicle demand. These actions include:

   - Address Gaps In The Pedestrian Network
   - Extend The Riverwalk Trail
   - Make Walking And Biking Safe And Appealing On Major Corridors
   - Develop A Bike Network
   - Create A Streets Master Plan

   The Biddeford-Saco Concept TOD Study also identified a number of strategies to reduce reliance on driving and these actions include:

   - Establishing a Transportation Management Association (TMA).
   - Requiring Transportation Demand Management (TDM) plans.
   - Working with GO MAINE.
   - Rethinking paid parking.
   - Establishing transit incentive programs.
   - Promoting bike incentive programs.
   - Providing more secure bike parking.
   - Piloting a bike share program.

   The Biddeford-Saco Concept TOD Study also established several goals that outline investments that would offer demand reduction results. Some include:

   - Invest in public transit
   - Make walking and biking easier and safer
   - Support Multimodal mobility

   These strategies are considered independent of the Connector project and are assumed to be necessary to accommodate future growth in the City.

3. **Alternative 2: Transportation System Management** improvement strategies should be advanced as a separate initiative. There are some suggested TSM safety improvements that include signal equipment changes, access management, creating all-way STOP intersections and enhancing a pedestrian crosswalk. Otherwise, this alternative does not meet the purpose and need for the study.

   These improvements are considered independent of the Connector project and are assumed to be necessary to address existing deficiencies and accommodate future growth in the City.

4. **South Street improvements** should be implemented. These improvements are considered independent of the Connector Project and are assumed to be necessary to accommodate future growth in the City.

APPENDIX

APPENDIX 1 – TRAFFIC ANALYSIS

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TRAFFIC EVALUATION – YEAR 2045 CONDITIONS
BIDDEFORD CONNECTOR STUDY
SEPTEMBER 10, 2022

CAPACITY ANALYSIS

Table 1 - Level of Service Criteria for Signalized Intersections

Level of Service	Control Delay per Vehicle (s)
A	Less than 10.0
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 55.0
E	55.1 to 80.0
F	Greater than 80.0

Table 2 – Capacity Analysis Results

Intersection Movement	2045 No Build Weekday PM Peak Hour LOS / Delay (seconds)	2045 Alternate 3 Weekday PM Peak Hour LOS / Delay (seconds)
Andrews Road / Route 111	**Signalized**	
Route 111 EB L	---	D 47
Route 111 EB T	A 10	A 9
Route 111 EB T	A 10	A 8
Route 111 WB T	B 13	C 26
Route 111 WB T	B 13	C 30
Route 111 WB R	---	A 5
Andrews SB Left	C 28	D 44
Andrews SB Right	B 19	C 24
Overall Intersection	**B 13**	**C 24**
Biddeford Crossing / Route 111	**Signalized**	
Route 111 EB L	E 56	D 52
Route 111 EB T	D 42	D 38
Route 111 EB T	D 49	D 42
Route 111 EB R	A 8	A 7
Route 111 WB L	C 28	C 30
Route 111 WB L	C 34	D 37
Route 111 WB T	C 25	C 24

Intersection Movement	2045 No Build Weekday PM Peak Hour LOS / Delay (seconds)	2045 Alternate 3 Weekday PM Peak Hour LOS / Delay (seconds)
Route 111 WB TR	C 24	C 24
Biddeford Crossing NB L	D 49	D 52
Biddeford Crossing NB LT	D 39	D 45
Biddeford Crossing NB R	C 21	B 19
Biddeford Crossing NB R	B 16	B 16
Old Dog SB L	D 53	D 51
Old Dog SB TR	C 24	C 26
Overall Intersection	**C 31**	**C 30**
Biddeford Gateway Center / Route 111	**Signalized**	
Route 111 EB L	C 33	D 42
Route 111 EB L	D 49	D 50
Route 111 EB T	C 22	B 19
Route 111 EB TR	C 23	B 20
Route 111 WB L	D 54	E 56
Route 111 WB T	C 35	C 35
Route 111 WB T	C 35	D 37
Route 111 WB R	A 3	A 3
Church / Aroma Joes NB LT	E 58	D 55
Church / Aroma Joes NB R	B 17	B 13
Bidd. Gateway SB L	D 40	D 43
Bidd. Gateway SB LTR	D 37	D 38
Overall Intersection	**C 29**	**C 29**
WalMart / Route 111	**Signalized**	
Route 111 EB L	E 64	E 67
Route 111 EB T	C 27	C 27
Route 111 EB T	C 32	C 29
Route 111 EB TR	B 18	B 17
Route 111 WB L	E 56	D 50
Route 111 WB T	B 17	B 18
Route 111 WB TR	B 16	B 18
WalMart NB LT	D 44	D 45
WalMart NB R	B 13	B 11
Park n Ride SB LTR	D 42	D 40
Overall Intersection	**C 24**	**C 23**
Exit 32 / Biddeford Connector / Route 111	**Signalized**	

Biddeford Connector Study
09-10-22
Page 3

Intersection Movement	2045 No Build Weekday PM Peak Hour LOS / Delay (seconds)	2045 Alternate 3 Weekday PM Peak Hour LOS / Delay (seconds)
Route 111 EB L	E 64	E 69
Route 111 EB L	E 76	F 84
Route 111 EB T	D 48	C 30
Route 111 EB TR	E 62	D 41
Route 111 WB L	F 90	E 69
Route 111 WB T	F 126	F 136
Route 111 WB T	F 96	F 104
Route 111 WB R	C 22	C 22
Biddeford Connector NB L	D 55	E 62
Biddeford Connector NB LT	F 87	F 92
Biddeford Connector NB T	E 70	E 71
Biddeford Connector NB R	A 10	A 10
I-95 Exit 32 SB L	E 64	D 50
I-95 Exit 32 SB LT	F 105	E 70
I-95 Exit 32 SB T	F 97	E 66
I-95 Exit 32 SB R	C 21	C 22
I-95 Exit 32 SB R	B 17	B 17
Overall Intersection	**E 64**	**E 58**
Route 111 / Elm St / West St	**Signalized (Part of 5 Points)**	
Route 111 EB L	F 139	E 69
Route 111 EB LTR	F 231	F 139
West St WB L	F 93	F 104
West St WB TR	D 53	E 60
Elm St NB T	E 77	E 68
Elm St NB TR	F 81	E 74
Elm St SB LT	B 17	B 15
Elm St SB T	B 11	B 11
Elm St SB R	A 2	A 2
Overall Intersection	**F 84**	**E 58**
Elm St / McDonalds / Alfred	**Signalized (Part of 5 Points)**	
McDonalds EB LT	D 46	D 43
McDonalds EB R	A 9	A 7
Alfred St WB L	D 49	D 49
Alfred St WB LT	E 57	D 54
Alfred St WB R	A 2	A 2
Elm St NB LT	C 24	B 20
Elm St NB T	B 15	B 14

Biddeford Connector Study
09-10-22
Page 4

Intersection Movement	2045 No Build Weekday PM Peak Hour LOS / Delay (seconds)	2045 Alternate 3 Weekday PM Peak Hour LOS / Delay (seconds)
Elm St NB R	A 3	A 3
Elm St SB LT	D 48	D 38
Elm St SB TR	E 57	D 48
Overall Intersection	**C 33**	**C 29**
Elm St / South St	**Signalized**	
South St EB LT	E 58	E 57
South St EB R	D 47	D 47
South St WB LTR	D 52	D 51
Elm St NB L	F 128	F 103
Elm St NB TR	B 12	A 10
Elm St SB L	F 270	F 145
Elm St SB TR	B 20	B 19
Overall Intersection	**D 40**	**C 33**
Elm St / Main St	**Signalized**	
Main St EB L	E 58	D 55
Main St EB TR	D 47	D 45
Main St WB L	E 59	E 60
Main St WB TR	D 50	D 51
Elm St NB L	E 74	E 74
Elm St NB TR	C 29	C 30
Elm St SB L	E 72	E 73
Elm St SB TR	C 32	C 29
Overall Intersection	**D 38**	**D 38**

NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound,
L = Left, T = Thru, R = Right
XX = Level of Service "E" or below

Biddeford Connector Study
09-10-22
Page 5

QUEUE ANALYSIS

Table 3 – 95th Percentile Queue Results

Intersection Movement	Available Queue (feet)	2045 No Build Weekday PM Peak Hour	2045 Alternate 3 Weekday PM Peak Hour
Andrews Road / Route 111		**Signalized**	
Route 111 EB L	500	---	250
Route 111 EB T		170	135
Route 111 EB T		185	150
Route 111 WB T		275	475
Route 111 WB T		295	495
Route 111 WB R	500	---	185
Andrews SB L	500	40	240
Andrews SB R		230	235
Biddeford Crossing / Rt 111		**Signalized**	
Route 111 EB L	200	85	35
Route 111 EB T		325	310
Route 111 EB T		345	320
Route 111 EB R	525	90	80
Route 111 WB L	300	220	220
Route 111 WB L	300	245	235
Route 111 WB T		360	340
Route 111 WB TR		370	365
Biddeford Crossing NB L		170	170
Biddeford Crossing NB LT		150	160
Biddeford Crossing NB R		170	150
Biddeford Crossing NB R	200	150	130
Old Dog SB L		85	80
Old Dog SB TR		60	65
Biddeford Gateway Center / Rt 111		**Signalized**	
Route 111 EB L	315	40	40
Route 111 EB L	315	105	65
Route 111 EB T		375	320
Route 111 EB TR		405	350
Route 111 WB L	325	215	195
Route 111 WB T		565	615
Route 111 WB T		570	615
Route 111 WB R	500	295	305

Biddeford Connector Study
09-10-22
Page 6

Intersection Movement	Available Queue (feet)	2045 No Build Weekday PM Peak Hour	2045 Alternate 3 Weekday PM Peak Hour
Church / Aroma Joes NB LT		55	60
Church / Aroma Joes NB R	120	55	45
Bidd. Gateway SB L		130	125
Bidd. Gateway SB LTR		185	180
WalMart / Rt 111		**Signalized**	
Route 111 EB L	150	65	80
Route 111 EB T		320	310
Route 111 EB T		345	305
Route 111 EB TR	300	315	300
Route 111 WB L	210	300	285
Route 111 WB T		405	435
Route 111 WB TR		410	440
WalMart NB LT		195	205
WalMart NB R	240	135	140
Park n Ride SB LTR		155	150
Exit 32 / Bidd. Connector / Rt 111		**Signalized**	
Route 111 EB L	300	300	325
Route 111 EB L		395	365
Route 111 EB T		505	305
Route 111 EB TR		545	350
Route 111 WB L		645	600
Route 111 WB T		715	710
Route 111 WB T		700	695
Route 111 WB R	475	540	560
Biddeford Connector NB L	400	235	255
Biddeford Connector NB LT		290	295
Biddeford Connector NB T		275	280
Biddeford Connector NB R		100	90
I-95 Exit 32 SB L	250	325	315
I-95 Exit 32 SB LT		685	410
I-95 Exit 32 SB T		640	375
I-95 Exit 32 SB R		355	205
I-95 Exit 32 SB R	250	195	200
Route 111 / Elm St / West St		**Signalized (Part of 5 Points)**	
Route 111 EB L		1190	835
Route 111 EB LTR		1195	930
West St WB L		435	460

Intersection Movement	Available Queue (feet)	2045 No Build Weekday PM Peak Hour	2045 Alternate 3 Weekday PM Peak Hour
West St WB TR	130	295	295
Elm St NB T		435	365
Elm St NB TR		470	405
Elm St SB LT		95	90
Elm St SB T		90	85
Elm St SB R		---	---
Elm St / McDonalds / Alfred St		**Signalized (Part of 5 Points)**	
McDonalds EB LT		115	110
McDonalds EB R		60	65
Alfred St WB L	250	290	280
Alfred St WB LT		350	310
Alfred St WB R	75	100	90
Elm St NB LT		225	215
Elm St NB T		220	200
Elm St NB R	160	80	70
Elm St SB LT		490	430
Elm St SB TR	195	805	485
Elm St / South St		**Signalized**	
South St EB LT		200	185
South St EB R	120	110	110
South St WB LTR		225	230
Elm St NB L		365	270
Elm St NB TR		310	245
Elm St SB L	75	655	465
Elm St SB TR		170	175
Elm St / Main St		**Signalized**	
Main St EB L		155	160
Main St EB TR		185	185
Main St WB L	45	165	170
Main St WB TR		295	295
Elm St NB L	60	65	70
Elm St NB TR		395	410
Elm St SB L	60	105	110
Elm St SB TR		580	570

NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound,
L = Left, T = Thru, R = Right
XX = queues that exceed available by more than one vehicle (25 feet)

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MEMORANDUM
TRAFFIC EVALUATION – EXISTING CONDITIONS
BIDDEFORD CONNECTOR STUDY
January 18, 2022

INTRODUCTION

This traffic evaluation provides the following; summarizes the capacity of the intersections, identifies the queuing of traffic, and summarizes the results of the safety review. The following explains the data and information used, the methodology, and the results of the evaluation.

EXISTING TRAFFIC VOLUMES

The existing traffic volumes used for this project are based on the following;

Five Points:

Turning movement counts were completed on Thursday, August 5, 2021 from 6:00 AM to 6:00 PM by MaineDOT and conveyed to GP via TY Lin. The raw volumes presented on drawing number 1, Raw Volumes, are the unadjusted volumes recorded by MaineDOT. These volumes are also available on the MaineDOT's interactive website. To obtain the "2021 Design Hour Volumes" presented in drawing number 2, minor (1-3% during AM peak hour and 6-7% during PM peak hour) adjustments to the raw volumes were made so the volumes between the closely spaced intersections would "balance". Because the turning movement counts were completed in the peak month of August, and in the design year of 2021, no seasonal or annual adjustments were needed.

Elm Street:

Turning movement counts were performed on Thursday, August 5, 2021 from 6:00 AM to 6:00 PM by MaineDOT and conveyed to GP via TY Lin. The raw volumes presented on drawing number 1, Raw Volumes, are the unadjusted volumes recorded by MaineDOT. These volumes are also available on the MaineDOT's interactive website. Because the turning movement counts were completed in the peak month of August, and in the design year of 2021, no seasonal or annual adjustments were needed.

Route 111:

Turning movement counts were completed on Thursday, June 6, 2019 by Gorrill Palmer as part of the Route 111 Signal Coordination traffic study which was completed for the MTA. A seasonal adjustment of 2.38% based on MaineDOT Weekly Group Mean Factors was applied to the June 6, 2019 traffic volumes. In reviewing AADT values for the area presented in the MaineDOT's 2019 traffic report showed a slight decrease in traffic volumes over this time period, a 1% per year (2% total 2019 to 2021) growth factor was assumed and applied to the data. Therefore, the original data was increased by a combined approximately 4.4% to account for a seasonal change and yearly growth from 2019 to 2021 to yield volumes presented on drawing number 1, Raw Volumes. After discussion with Study Team members, these volumes were then increased by an additional 2% to account for changes in traffic volumes during the COVID-19 Pandemic to obtain the volumes presented on drawing number 2, 2021

Design Hour Volumes. This area was identified as different from the other two locations identified above due to the strong retail and commercial influences of the uses in the area.

COMPUTER MODELING RESULTS

Capacity Analysis:

Computer modeling was completed for the study area intersections using the 2021 Design Hour Volumes (AM & PM peak hours).

The computer modeling used the Synchro/SimTraffic computer analysis software (Version 11). Level of service (LOS) rankings are similar to the academic ranking system where an 'A' is good with little control delay and an 'F' represents poor traffic conditions. If the level of service falls below a 'D,' an evaluation should be made to determine if mitigation is warranted. The following table summarizes the relationship between control delay per vehicle and level of service for a signalized intersection:

Table 1 - Level of Service Criteria for Signalized Intersections

Level of Service	Control Delay per Vehicle (s)
A	Less than 10.0
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 55.0
E	55.1 to 80.0
F	Greater than 80.0

The capacity analysis results are based on the average of five SimTraffic simulations. The timing and phasing of the four Route 111 intersections are based on the Route 111 traffic study that was completed for the MTA. The timing and phasing of the four Elm Street intersections was provided in VHB recent evaluations that were completed for Elm Street. The following table summarizes the results of the capacity analysis for the study area intersections (delay is rounded up to the nearest second). The yellow highlights identifies those movements that are failing and the tan highlights those movements that are within 5 seconds of being a failing movement.

Table 2 – Capacity Analysis Results

Intersection Movement	2021 Weekday AM Peak Hour LOS / Delay (seconds)	2021 Weekday PM Peak Hour LOS / Delay (seconds)
Biddeford Crossing / Route 111	**Signalized**	
Route 111 EB L	C / 33	D / 55
Route 111 EB T	B / 15	C / 31
Route 111 EB T	B / 17	D / 36

Intersection Movement	2021 Weekday AM Peak Hour LOS / Delay (seconds)	2021 Weekday PM Peak Hour LOS / Delay (seconds)
Route 111 EB R	A / 3	A / 5
Route 111 WB L	C / 23	C / 35
Route 111 WB L	C / 34	D / 43
Route 111 WB T	B /19	D / 39
Route 111 WB TR	B / 17	D / 37
Biddeford Crossing NB L	C / 34	D / 53
Biddeford Crossing NB LT	D / 38	D / 43
Biddeford Crossing NB R	C / 23	C / 24
Biddeford Crossing NB R	C / 21	B / 19
Old Dog SB L	C / 35	D / 55
Old Dog SB TR	B / 11	B / 20
Overall Intersection	B / 19	C / 35
Biddeford Gateway Center / Route 111	**Signalized**	
Route 111 EB L	B / 16	C / 35
Route 111 EB L	C / 30	D / 53
Route 111 EB T	B / 13	B / 18
Route 111 EB TR	B / 15	B / 20
Route 111 WB L	C / 26	E / 57
Route 111 WB T	B / 13	D / 37
Route 111 WB T	B / 13	D / 37
Route 111 WB R	A / 2	A / 3
Church / Aroma Joes NB LT	C / 32	D / 51
Church / Aroma Joes NB R	B / 11	B / 12
Bidd. Gateway SB L	C / 27	D / 40
Bidd. Gateway SB LTR	B / 13	C / 32
Overall Intersection	B / 14	C / 29
WalMart / Route 111	**Signalized**	
Route 111 EB L	E / 64	D / 51
Route 111 EB T	B / 13	C / 25
Route 111 EB T	B / 17	C / 27
Route 111 EB TR	A / 7	B / 16
Route 111 WB L	D / 44	D / 40
Route 111 WB T	A / 8	B / 14
Route 111 WB TR	A / 9	B / 14
WalMart NB LT	E / 58	D / 40

Biddeford Connector Study
01-18-22
Page 4

Intersection Movement	2021 Weekday AM Peak Hour LOS / Delay (seconds)	2021 Weekday PM Peak Hour LOS / Delay (seconds)
WalMart NB R	A / 9	A / 8
Park n Ride SB LTR	C / 34	C / 34
Overall Intersection	B / 13	B / 20
Exit 32 / Biddeford Connector / Route 111	**Signalized**	
Route 111 EB L	D / 36	D / 50
Route 111 EB L	D / 45	E / 57
Route 111 EB T	C / 29	C / 34
Route 111 EB TR	C / 29	D / 43
Route 111 WB L	D / 54	E / 57
Route 111 WB T	D / 50	D / 51
Route 111 WB T	E / 66	D / 55
Route 111 WB R	D / 51	B / 17
Biddeford Connector NB L	D / 44	D / 50
Biddeford Connector NB LT	E / 79	E / 72
Biddeford Connector NB T	E / 73	E / 56
Biddeford Connector NB R	C / 33	A / 10
I-95 Exit 32 SB L	D / 39	D / 49
I-95 Exit 32 SB LT	D / 51	E / 73
I-95 Exit 32 SB T	D / 41	E / 66
I-95 Exit 32 SB R	A / 10	C / 23
I-95 Exit 32 SB R	A / 8	B / 16
Overall Intersection	D / 44	D / 44
Route 111 / Elm St / West St	**Signalized (Part of 5 Points)**	
Route 111 EB L	C / 21	D / 41
Route 111 EB LTR	C / 32	F / 85
West St WB L	F / 355	F / 88
West St WB TR	F / 82	D / 50
Elm St NB T	C / 27	D / 52
Elm St NB TR	C / 29	D / 51
Elm St SB LT	A / 8	B / 14
Elm St SB T	A / 6	A / 7
Elm St SB R	A / 2	A / 2
Overall Intersection	D / 42	D / 43
Elm St / McDonalds / Alfred St	**Signalized (Part of 5 Points)**	
McDonalds EB LT	D / 39	D / 46

Biddeford Connector Study
01-18-22
Page 5

Intersection Movement	2021 Weekday AM Peak Hour LOS / Delay (seconds)	2021 Weekday PM Peak Hour LOS / Delay (seconds)
McDonalds EB R	A / 5	A / 6
Alfred St WB L	C / 25	D / 46
Alfred St WB LT	D / 41	D / 50
Alfred St WB R	A / 2	A / 2
Elm St NB LT	A / 9	B / 17
Elm St NB T	B / 11	B / 14
Elm St NB R	A / 3	A / 3
Elm St SB LT	D / 36	C / 32
Elm St SB TR	D / 36	D / 42
Overall Intersection	C / 24	C / 25
Elm St / South St	**Signalized**	
South St EB LT	D / 43	E / 59
South St EB R	D / 43	D / 49
South St WB LTR	D / 42	D / 48
Elm St NB L	D / 43	D / 50
Elm St NB TR	A / 8	A / 6
Elm St SB L	C / 30	E / 66
Elm St SB TR	A / 6	B / 14
Overall Intersection	B / 17	C / 24
Elm St / Main St	**Signalized**	
Main St EB L	D / 44	E / 56
Main St EB TR	C / 32	D / 43
Main St WB L	D / 49	E / 56
Main St WB TR	C / 29	D / 46
Elm St NB L	E / 65	E / 77
Elm St NB TR	B / 11	B / 20
Elm St SB L	D / 51	E / 69
Elm St SB TR	B / 11	B / 15
Overall Intersection	B / 19	C / 28

XX = Level of Service "E" or below
XX = LOS within 5 seconds of failing
NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound,
L = Left, T = Thru, R = Right

As can be seen from Table 3, there are 23 movements that are operating at unacceptable (shown in yellow highlight) levels of service "E" or "F" and an additional 15 movements (shown in tan) that are within 5 seconds of failing.

Queue Analysis:

Similar to the capacity analysis, a queue analysis was completed using the same computer modeling. Based on that modeling, the following queues are forecast, with the locations that exceed their available queue length shown in yellow highlight. Queues have been rounded to the nearest five foot interval.

Table 3 – 95th Percentile Queue Results

Intersection Movement	Available Queue (feet)	2021 Weekday AM Peak Hour Forecast Queue	2021 Weekday PM Peak Hour Forecast Queue
Bidd. Crossing / Rt 111			
Route 111 EB L	200	105	45
Route 111 EB T		245	270
Route 111 EB T		270	285
Route 111 EB R	525	40	65
Route 111 WB L	300	60	225
Route 111 WB L	300	90	265
Route 111 WB T		200	430
Route 111 WB TR		145	425
Biddeford Crossing NB L		40	170
Biddeford Crossing NB LT		10	135
Biddeford Crossing NB R		60	165
Biddeford Crossing NB R	200	35	140
Old Dog SB L		80	80
Old Dog SB TR		45	50
Bidd. Gateway Center / Rt 111			
Route 111 EB L	315	15	35
Route 111 EB L	315	45	65
Route 111 EB T		245	280
Route 111 EB TR		255	315
Route 111 WB L	325	50	245
Route 111 WB T		175	605
Route 111 WB T		160	615
Route 111 WB R	500	45	305
Church / Aroma Joes NB LT		20	50
Church / Aroma Joes NB R	120	40	45

Intersection Movement	Available Queue (feet)	2021 Weekday AM Peak Hour Forecast Queue	2021 Weekday PM Peak Hour Forecast Queue
Bidd. Gateway SB L		55	110
Bidd. Gateway SB LTR		45	160
WalMart / Rt 111			
Route 111 EB L	150	45	65
Route 111 EB T		245	260
Route 111 EB T		175	260
Route 111 EB TR	300	160	260
Route 111 WB L	210	75	200
Route 111 WB T		145	325
Route 111 WB TR		160	325
WalMart NB LT		65	160
WalMart NB R	240	60	90
Park n Ride SB LTR		75	145
Exit 32 / Bidd. Connector / Rt			
Route 111 EB L	300	295	245
Route 111 EB L		320	265
Route 111 EB T		190	315
Route 111 EB TR		245	365
Route 111 WB L		140	215
Route 111 WB T		165	320
Route 111 WB T		505	325
Route 111 WB R	475	560	265
Biddeford Connector NB L	400	135	200
Biddeford Connector NB LT		265	240
Biddeford Connector NB T		265	230
Biddeford Connector NB R		165	85
I-95 Exit 32 SB L	250	215	295
I-95 Exit 32 SB LT		235	350
I-95 Exit 32 SB T		220	330
I-95 Exit 32 SB R		80	180
I-95 Exit 32 SB R	250	80	185
Route 111 / Elm St / West St			
Route 111 EB L		135	565
Route 111 EB LTR		210	715
West St WB L		460	380
West St WB TR	130	160	285

Biddeford Connector Study
01-18-22
Page 8

Intersection Movement	Available Queue (feet)	2021 Weekday AM Peak Hour Forecast Queue	2021 Weekday PM Peak Hour Forecast Queue
Elm St NB T		85	270
Elm St NB TR		120	295
Elm St SB LT		45	80
Elm St SB T		55	55
Elm St SB R		---	---
Elm St / McDonalds / Alfred St			
McDonalds EB LT		90	110
McDonalds EB R		50	60
Alfred St WB L	250	190	215
Alfred St WB LT		240	255
Alfred St WB R	75	85	70
Elm St NB LT		80	190
Elm St NB T		35	170
Elm St NB R	160	35	60
Elm St SB LT		205	330
Elm St SB TR	195	240	300
Elm St / South St			
South St EB LT		105	150
South St EB R	120	80	85
South St WB LTR		85	175
Elm St NB L		70	150
Elm St NB TR	75	140	195
Elm St SB L		65	270
Elm St SB TR	75	120	175
Elm St / Main St			
Main St EB L		135	160
Main St EB TR		105	150
Main St WB L	45	65	125
Main St WB TR		115	230
Elm St NB L	60	20	55
Elm St NB TR		155	280
Elm St SB L	60	70	85
Elm St SB TR		235	330

NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound,
L = Left, T = Thru, R = Right
XX = queues that exceed available by more than one vehicle (25 feet)

APPENDIX 2 – VEHICLE CLASSIFICATION

Table 2.7
MaineDOT Vehicle Classification Count
April 30 to May 2, 2019
US 1 (Elm Street) SW/O Amherst Street

Start Time	Average Flow	Motorcycles	Cars	2A-4T	Buses	2A-SU	3A-SU	4A-SU	4A-ST	5A-ST	6A-ST	5A-MT	6A-MT	7A-MT	None	Other	%Truck
00:00:00	62	0	46	14	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00:00	28	0	22	5	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00:00	21	0	15	5	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00:00	30	0	22	4	0	2	0	0	0	0	0	0	0	0	0	0	6.8
04:00:00	98	0	73	20	1	2	0	0	0	2	0	0	0	0	0	0	4.1
05:00:00	231	0	158	59	2	8	2	0	0	1	0	0	0	0	0	0	4.8
06:00:00	498	3	315	146	4	21	5	0	4	0	0	0	0	0	0	0	6
07:00:00	869	11	636	174	6	28	4	0	4	3	0	0	0	2	0	1	4.7
08:00:00	908	8	666	179	6	29	6	0	6	4	1	0	0	0	0	2	5.1
09:00:00	912	8	668	186	4	28	6	2	5	6	0	0	0	0	0	0	5
10:00:00	442	8	327	82	5	12	4	0	2	2	0	0	0	0	0	1	4.3
11:00:00	1041	10	795	186	6	26	2	1	4	6	1	0	0	2	0	2	4.1
12:00:00	524	6	390	106	2	10	4	0	4	2	0	0	0	0	0	0	3.9
13:00:00	513	6	400	78	2	17	1	0	6	1	1	0	0	0	0	2	5
14:00:00	530	10	394	92	4	13	4	1	4	4	2	0	0	0	0	2	5.4
15:00:00	588	6	454	96	6	17	2	0	2	2	1	0	0	1	0	2	4.2
16:00:00	1194	10	936	194	4	21	6	1	12	4	3	0	0	1	0	1	3.9
17:00:00	1142	10	910	182	2	26	2	0	4	5	2	0	0	0	0	0	3.3
18:00:00	818	6	672	124	0	12	0	0	1	2	0	0	0	0	0	0	1.8
19:00:00	658	5	552	86	1	10	0	0	1	2	0	0	0	0	0	0	2.1
20:00:00	455	4	378	63	0	4	1	0	2	2	0	0	0	0	0	0	2.2
21:00:00	253	0	213	32	0	6	0	0	0	0	0	0	0	0	0	0	2.8
22:00:00	172	2	146	18	1	2	0	0	0	2	0	0	0	0	0	0	2.6
23:00:00	96	0	78	13	0	3	0	0	0	0	0	0	0	0	0	0	3.7

Table 2.8
MaineDOT Vehicle Classification Count
September 17 to 18, 2019
Route 111 at Biddeford/Arundel TL

Start Time	Average Flow	Motorcycles	Cars	2A-4T	Buses	2A-SU	3A-SU	4A-SU	4A-ST	5A-ST	6A-ST	5A-MT	6A-MT	7A-MT	None	Other	%Truck
00:00:00	86	0	70	10	0	1	1	0	0	2	2	0	0	0	0	0	7
01:00:00	49	0	36	10	1	1	1	0	0	0	0	0	0	0	0	0	4.1
02:00:00	45	0	27	11	0	1	0	1	0	1	4	0	0	0	0	0	15.6
03:00:00	62	0	42	8	2	1	1	0	0	4	4	0	0	0	0	0	16.1
04:00:00	233	0	159	50	3	4	2	0	4	5	6	0	0	0	0	0	9
05:00:00	506	0	322	144	5	17	6	1	0	7	4	0	0	0	0	0	6.9
06:00:00	1165	2	774	306	5	49	11	2	1	8	7	0	0	0	0	0	6.7
07:00:00	1725	7	1266	347	17	57	6	2	6	14	3	0	0	0	0	0	5.1
08:00:00	1327	2	921	296	11	66	6	1	4	9	11	0	0	0	0	0	7.3
09:00:00	1159	4	806	268	6	44	8	1	5	8	9	0	0	0	0	0	6.5
10:00:00	1121	4	814	222	6	46	8	4	4	8	5	0	0	0	0	0	6.6
11:00:00	1146	2	814	246	8	40	9	2	6	14	4	0	0	0	0	0	6.5
12:00:00	1260	3	924	246	11	48	8	1	2	11	6	0	0	0	0	0	6
13:00:00	1274	2	906	284	11	42	6	0	6	14	4	0	0	0	0	0	5.6
14:00:00	1402	4	1022	285	8	52	6	1	6	14	4	0	0	0	0	0	5.8
15:00:00	1713	8	1207	398	13	62	6	0	6	10	3	0	0	0	0	0	5.1
16:00:00	1894	6	1384	420	7	57	5	0	2	8	4	0	0	0	0	0	4
17:00:00	1784	8	1372	344	4	40	4	0	2	9	0	0	0	0	0	0	3.1
18:00:00	1071	1	812	212	1	25	4	0	3	7	5	0	1	0	0	0	4.2
19:00:00	786	1	597	155	2	25	2	0	3	1	0	0	0	0	0	0	3.9
20:00:00	524	1	422	90	0	10	0	0	0	0	1	0	0	0	0	0	2.1
21:00:00	295	1	238	46	1	4	0	0	0	3	2	0	0	0	0	0	3.1
22:00:00	205	1	173	25	0	2	0	0	2	2	0	0	0	0	0	0	2.9
23:00:00	130	1	106	17	0	2	0	0	3	1	0	0	0	0	0	0	4.6

APPENDIX 3 – SAFETY DATA

Table 2.11
Summary of High Crash Location Patterns

Location/Pattern			Pedestrians Involved? X = Yes	Year / Day of Week / Time of Day / Time of Year			
Node(s)	Intersections	Signalized (S) Unsignalized (U)		Year of Crash	W = Weekday WE = Weekend	Note 1	Note 2
56633	Elm St/ Orchard St/Union St (11 crashes, CRF = 1.99)	U	X				
Elm St NB rear-end (3)				2018 (2), 2019 (1), 2020 (0)	W (2), WE (1)	AM (0), Midday (1), PM (2), Other (0)	Spring (1), Summer (1), Fall (0), Winter (1)
Angle crash Left out of Union St - SB Elm St (3)				2018 (1), 2019 (1), 2020 (1)	W (3), WE (0)	AM (1), Midday (1), PM (1), Other (0)	Spring (2), Summer (0), Fall (1), Winter (0)
56882	Alfred St/ Edwards Ave (31 crashes CRF = 1.13)	S					
Angle crash left into 5 Points - WB on Alfred (6)				2018 (3), 2019 (2), 2020 (1)	W (5), WE (1)	AM (0), Midday (1), PM (1), Other (4)	Spring (2), Summer (0), Fall (2), Winter (2)
Alfred St WB rear-end (8)				2018 (2), 2019 (3), 2020 (3)	W (7), WE (1)	AM (2), Midday (4), PM (2), Other (0)	Spring (3), Summer (1), Fall (2), Winter (2)
Alfred St EB rear-end (6)				2018 (4), 2019 (1), 2020 (1)	W (6), WE (0)	AM (0), Midday (1), PM (1), Other (4)	Spring (5), Summer (1), Fall (0), Winter (0)
58334	Alfred St/Precourt St/Exit 32 Ramp (77 crashes, CRF = 1.58)	S	X				
Angle Crash Left out of ramp - Straight out of ramp (3)				2018 (2), 2019 (0), 2020 (1)	W (2), WE (1)	AM (0), Midday (1), PM (2), Other (0)	Spring (1), Summer (1), Fall (1), Winter (0)
Angle Crash Left onto Precourt St NB on Alfred (6)				2018 (2), 2019 (3), 2020 (1)	W (3), WE (3)	AM (0), Midday (1), PM (4), Other (1)	Spring (0), Summer (1), Fall (2), Winter (3)
Alfred St WB rear-end (20)				2018 (11), 2019 (8), 2020 (1)	W (16), WE (4)	AM (2), Midday (3), PM (10), Other (5)	Spring (4), Summer (7), Fall (3), Winter (6)
Alfred St EB rear-end (15)				2018 (4), 2019 (6), 2020 (5)	W (10), WE (5)	AM (5), Midday (3), PM (2), Other (5)	Spring (1), Summer (6), Fall (4), Winter (4)
Precourt St rear-end (3)				2018 (1), 2019 (1), 2020 (1)	W (2), WE (1)	AM (0), Midday (0), PM (1), Other (2)	Spring (1), Summer (0), Fall (2), Winter (0)
58469	South St/May St (8 crashes, CRF = 1.98)	U					
May St NB rear-end (3)				2018 (1), 2019 (2), 2020 (0)	W (3), WE (0)	AM (1), Midday (0), PM (0), Other (2)	Spring (0), Summer (1), Fall (0), Winter (2)
58492	Main St/Bradbury St/St Mary's St (8 crashes, CRF = 2.34)	U	X				
Angle between NB Bradbury to St Mary's and WB Main (3)				2018 (1), 2019 (1), 2020 (1)	W (3), WE (0)	AM (1), Midday (0), PM (0), Other (2)	Spring (1), Summer (0), Fall (1), Winter (1)
64989 / 56625	Alfred St/Elm St/West St/McDonalds (46 crashes, CRF = 1.29)	S	X				
Alfred St EB rear-end (7)				2018 (4), 2019 (3), 2020 (0)	W (7), WE (0)	AM (1), Midday (1), PM (3), Other (2)	Spring (2), Summer (2), Fall (2), Winter (1)
Elm St NB rear-end (11)				2018 (3), 2019 (3), 2020 (5)	W (11), WE (0)	AM (0), Midday (6), PM (5), Other (0)	Spring (2), Summer (3), Fall (2), Winter (4)
Alfred St WB rear-end (8)				2018 (5), 2019 (2), 2020 (1)	W (6), WE (2)	AM (0), Midday (1), PM (1), Other (6)	Spring (1), Summer (3), Fall (1), Winter (3)
Elm St SB rear-end (6)				2018 (4), 2019 (2), 2020 (0)	W (5), WE (1)	AM (0), Midday (3), PM (2), Other (1)	Spring (1), Summer (2), Fall (1), Winter (2)
Angle crash left onto Alfred St EB - Elm St NB (3)				2018 (1), 2019 (2), 2020 (1)	W (2), WE (1)	AM (0), Midday (0), PM (1), Other (2)	Spring (0), Summer (1), Fall (1), Winter (1)
SB on Elm St sideswipe (4)				2018 (2), 2019 (1), 2020 (1)	W (3), WE (1)	AM (1), Midday (2), PM (0), Other (1)	Spring (0), Summer (0), Fall (2), Winter (2)
Angle crash left out of Alfred St WB - Elm St SB (3)				2018 (2), 2019 (1), 2020 (0)	W (2), WE (1)	AM (1), Midday (0), PM (0), Other (2)	Spring (0), Summer (1), Fall (1), Winter (1)
Node(s)	**Roadway Segments**		**Pedestrians Involved?**	**Year of Crash**	**W = Weekday WE = Weekend**	**Note 1**	**Note 2**

Table 2.11
Summary of High Crash Location Patterns

		X = Yes				
56883 - 56882	Alfred St from May St to Edwards Ave (25 crashes, CRF = 1.19)	X				
Angle crash Left out of Five Points - WB on Alfred (4)			2018 (1), 2019 (1), 2020 (2)	W (4), WE (0)	AM (0), Midday (1), PM (1), Other (2)	Spring (1), Summer (1), Fall (0), Winter (2)
Alfred St WB rear-end (4)			2018 (1), 2019 (2), 2020 (1)	W (3), WE (1)	AM (0), Midday (1), PM (3), Other (0)	Spring (3), Summer (0), Fall (0), Winter (1)
Alfred St WB sideswipe (3)			2018 (1), 2019 (1), 2020 (1)	W (3), WE (0)	AM (1), Midday (0), PM (2), Other (0)	Spring (2), Summer (0), Fall (1), Winter (0)
Alfred St EB rear-end (3)			2018 (1), 2019 (2), 2020 (0)	W (2), WE (1)	AM (0), Midday (1), PM (2), Other (0)	Spring (0), Summer (1), Fall (1), Winter (1)
65578 - 56627	Elm St from Alfred St to Dartmouth St (23 crashes, CRF = 3.37)					
Angle crash left exiting shopping plaza - SB on Elm (8)			2018 (3), 2019 (5), 2020 (0)	W (8), WE (0)	AM (1), Midday (1), PM (3), Other (3)	Spring (3), Summer (2), Fall (0), Winter (3)
Elm St NB sideswipe (3)			2018 (2), 2019 (1), 2020 (0)	W (3), WE (0)	AM (0), Midday (1), PM (1), Other (1)	Spring (0), Summer (1), Fall (1), Winter (1)
56625 - 58431	West St from Alfred St to Graham St (20 crashes, CRF = 3.96)					
Angle crash left exiting Burger King - EB West St (14)			2018 (10), 2019 (2), 2020 (2)	W (10), WE (4)	AM (0), Midday (4), PM (7), Other (3)	Spring (5), Summer (6), Fall (2), Winter (1)
58334 - 58875	Toll booth area from Alfred St to I-95 NB on/off ramp (17 crashes CRF = 2.69)					
On ramp sideswipe (3)			2018 (2), 2019 (1), 2020 (0)	W (3), WE (0)	AM (0), Midday (3), PM (0), Other (0)	Spring (0), Summer (1), Fall(1), Winter (1)
Exit Ramp sideswipe (8)			2018 (2), 2019 (5), 2020 (1)	W (7), WE (1)	AM (1), Midday (1), PM (4), Other (2)	Spring (3), Summer (1), Fall(2), Winter (2)
	Patterns that have consistently decreased over the past three years					

H. C. L.
CRASH COLLISION DIAGRAM
DATA PACKAGE

COUNTY: **YORK** TOWN: **BIDDEFORD**

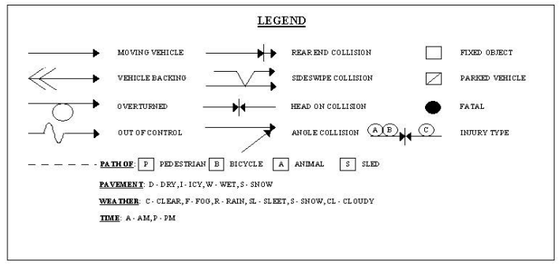
LOW NODE: **43449** HIGH NODE: **59192** REGION: **1** U/R: **URBAN**

DESCRIPTION: **South St from River Rd to Fox Hollow Dr**

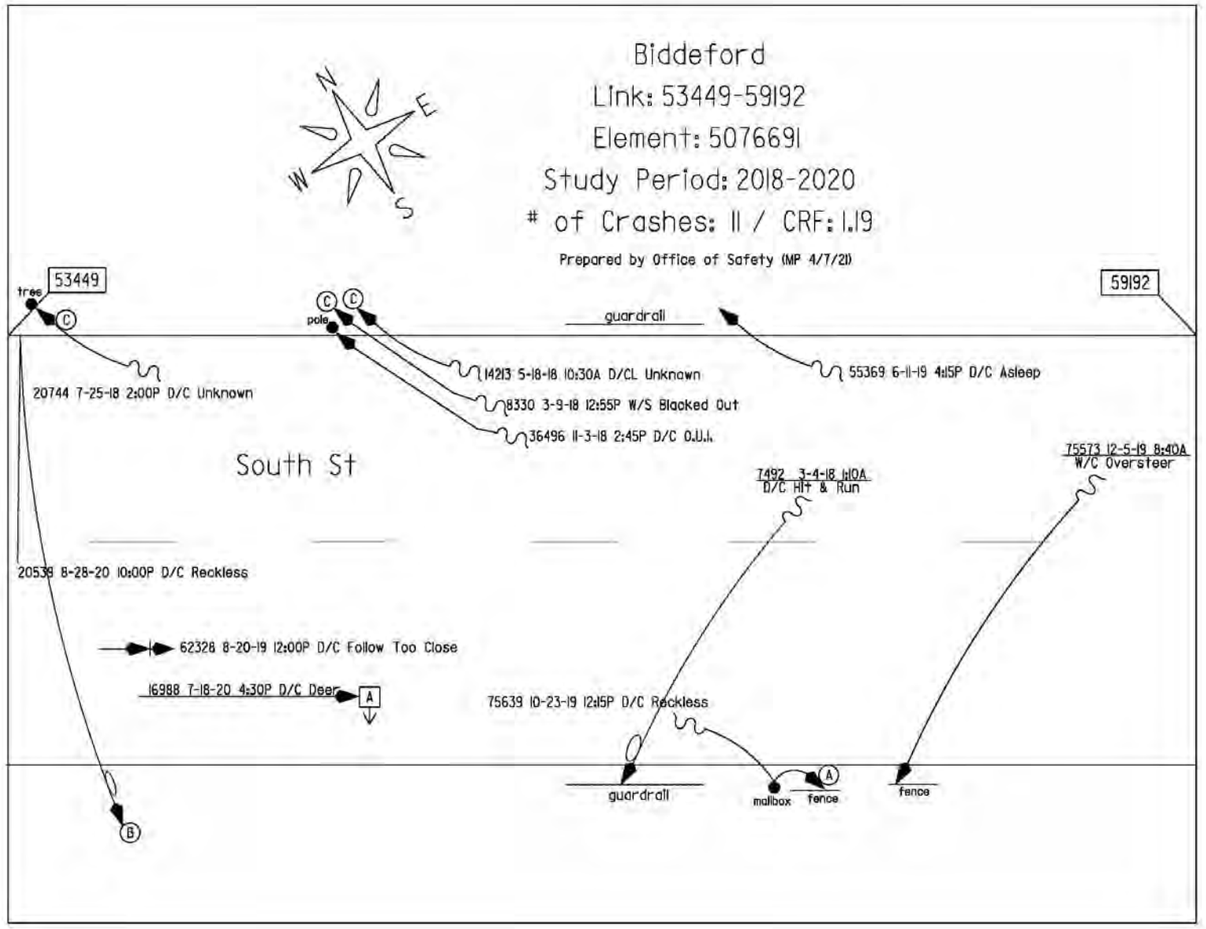
RTE # / RD #: **3110891** DATE DRAWN: **4/7/2021** DRAWN BY: **Michelle**

STUDY FROM: **1/1/2018** STUDY TO: **12/31/2020**

CRASH RATE: **483.81** CRF: **1.19** % INJURY: **45.5** TOTAL CRASHES: **11**



Wednesday, April 7, 2021 MDOT -OFFICE OF SAFETY - CRASH RECORDS



H. C. L.
CRASH COLLISION DIAGRAM
DATA PACKAGE

COUNTY: **YORK** TOWN: **BIDDEFORD**

LOW NODE: **54726** HIGH NODE: **0000** REGION: **1** U/R: **URBAN**

DESCRIPTION: **Jct of Alfred St & Graham St**

RTE # / RD #: **0111X** DATE DRAWN: **4/13/2021** DRAWN BY: **Michelle**

STUDY FROM: **1/1/2018** STUDY TO: **12/31/2020**

CRASH RATE: **0.76** CRF: **1.96** % INJURY: **40** TOTAL CRASHES: **10**

LEGEND

MOVING VEHICLE
VEHICLE BACKING
OVERTURNED
OUT OF CONTROL
REAR END COLLISION
SIDESWIPE COLLISION
HEAD ON COLLISION
ANGLE COLLISION (A) (B) (C)
FIXED OBJECT
PARKED VEHICLE
FATAL
INJURY TYPE

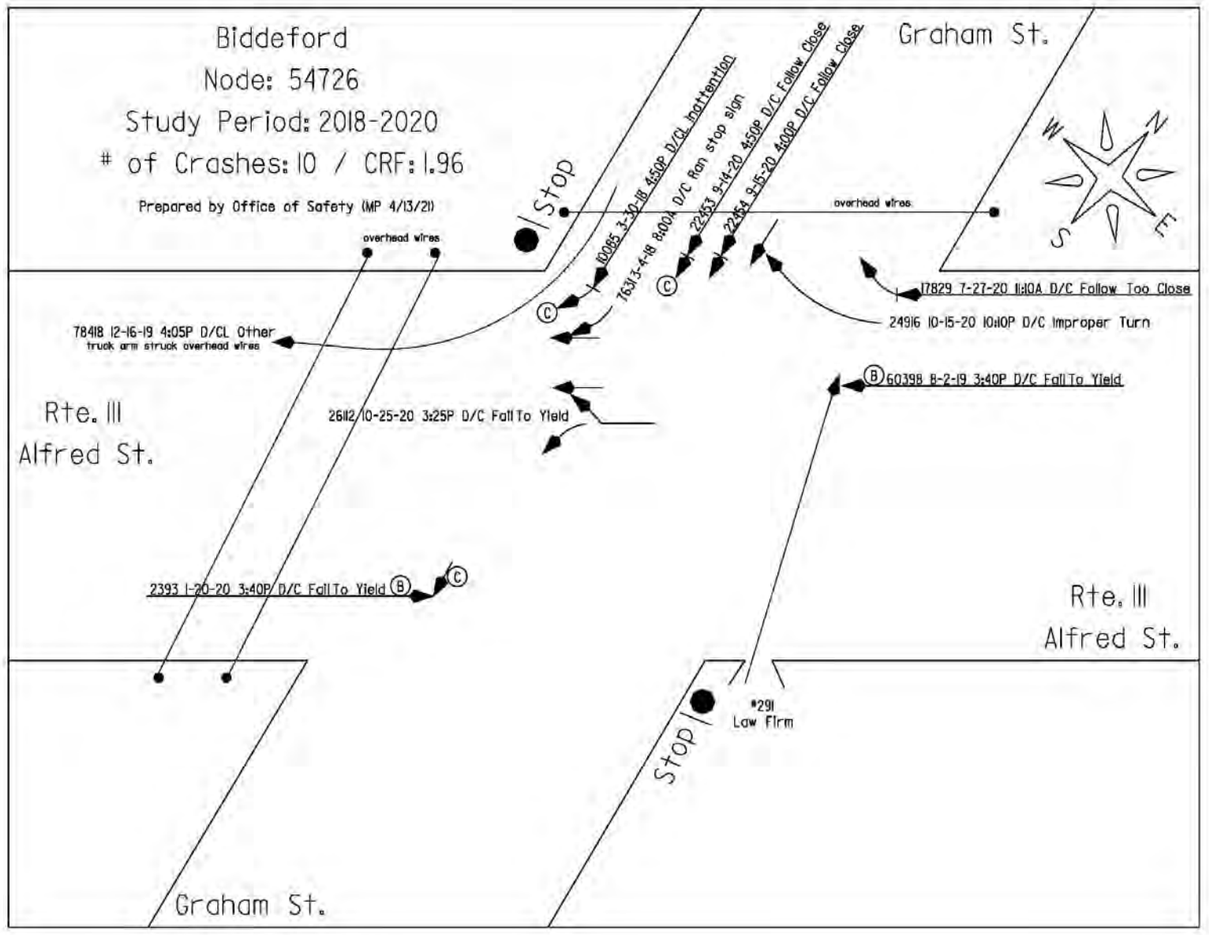
PATH OF: P PEDESTRIAN B BICYCLE A ANIMAL S SLED

PAVEMENT: D - DRY, I - ICY, W - WET, S - SNOW

WEATHER: C - CLEAR, F - FOG, R - RAIN, SL - SLEET, S - SNOW, CL - CLOUDY

TIME: A - AM, P - PM

Tuesday, April 13, 2021 MDOT -OFFICE OF SAFETY - CRASH RECORDS



H. C. L.
CRASH COLLISION DIAGRAM
DATA PACKAGE

COUNTY: **YORK** TOWN: **BIDDEFORD**

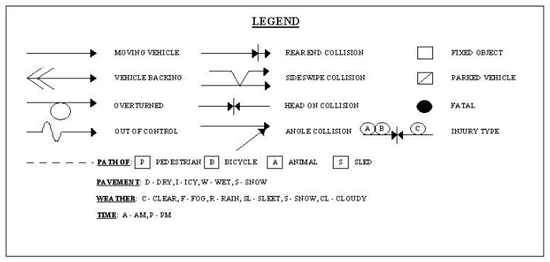
LOW NODE: **54742** HIGH NODE: **54743** REGION: **1** U/R: **URBAN**

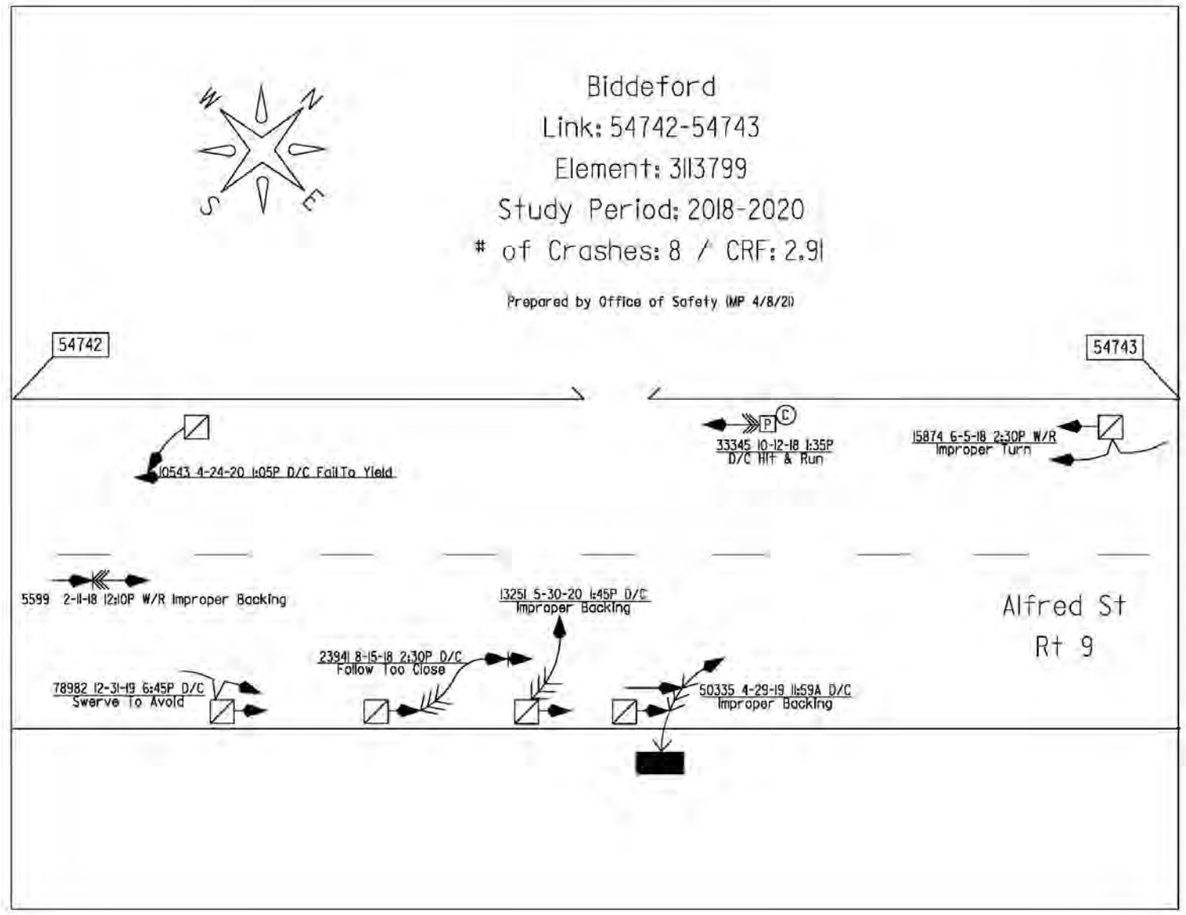
DESCRIPTION: **Alfred St from Bacon St to Main St**

RTE # / RD #: **0009X** DATE DRAWN: **4/8/2021** DRAWN BY: **Michelle**

STUDY FROM: **1/1/2018** STUDY TO: **12/31/2020**

CRASH RATE: **1687.21** CRF: **2.91** % INJURY: **12.5** TOTAL CRASHES: **8**





H. C. L.
CRASH COLLISION DIAGRAM
DATA PACKAGE

COUNTY: **YORK** TOWN: **BIDDEFORD**

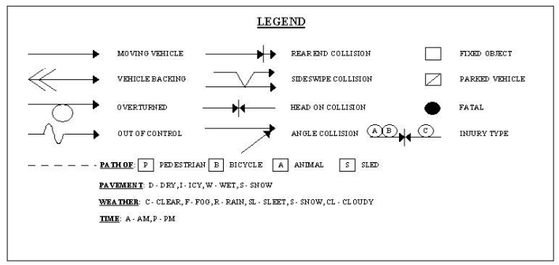
LOW NODE: **54743** HIGH NODE: **0000** REGION: **1** U/R: **URBAN**

DESCRIPTION: **Jct of Main St & Alfred St**

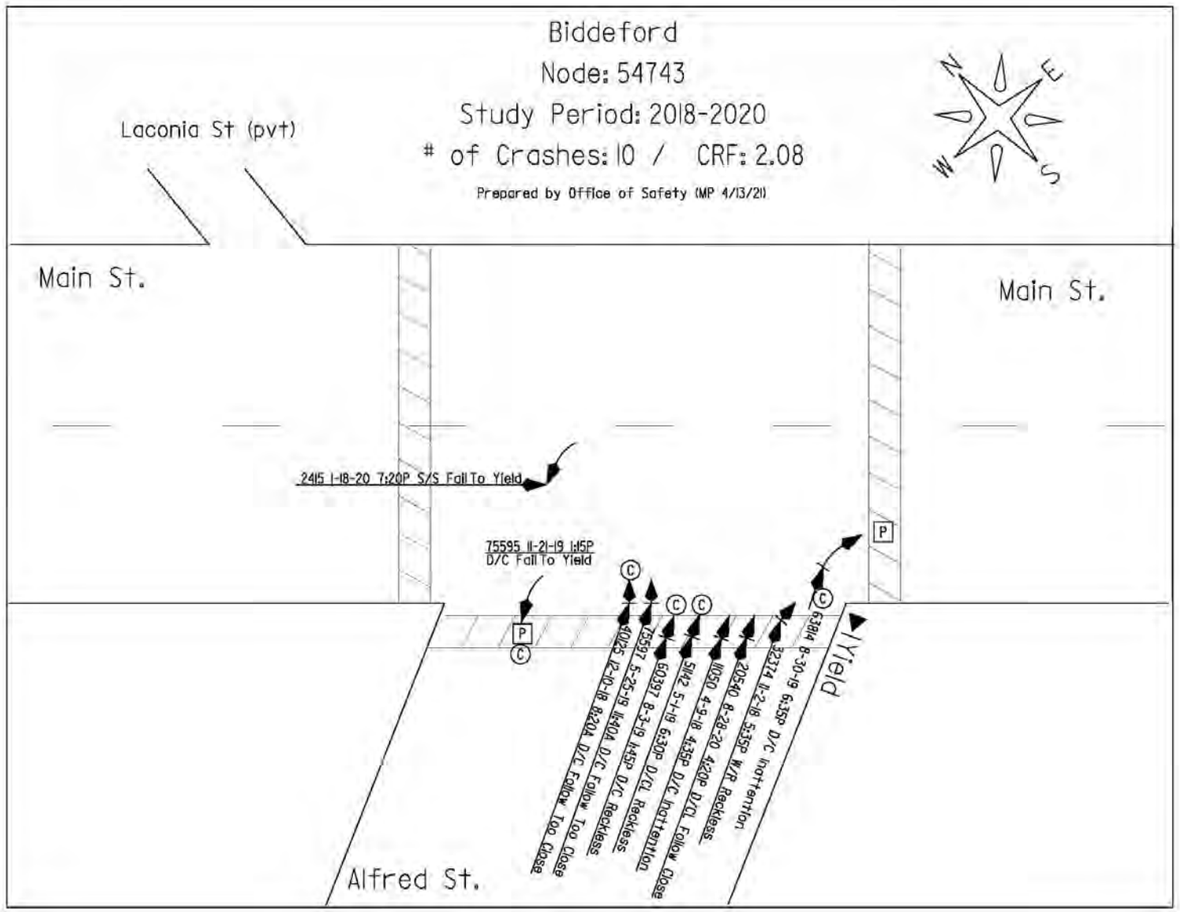
RTE # / RD #: **0009X** DATE DRAWN: **4/13/2021** DRAWN BY: **Michelle**

STUDY FROM: **1/1/2018** STUDY TO: **12/31/2020**

CRASH RATE: **0.82** CRF: **2.08** % INJURY: **50** TOTAL CRASHES: **10**



Tuesday, April 13, 2021 MDOT -OFFICE OF SAFETY - CRASH RECORDS



H. C. L.
CRASH COLLISION DIAGRAM
DATA PACKAGE

COUNTY: **YORK** TOWN: **BIDDEFORD**

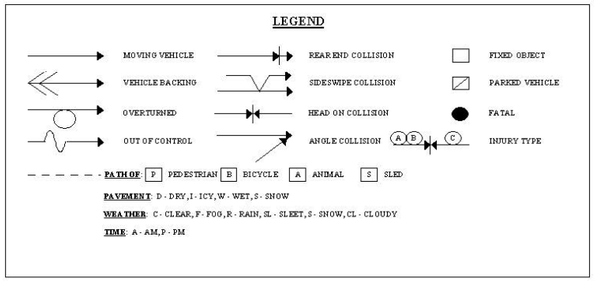
LOW NODE: **56633** HIGH NODE: **0000** REGION: **1** U/R: **URBAN**

DESCRIPTION: **Jct of Elm St & Orchard St/Union St**

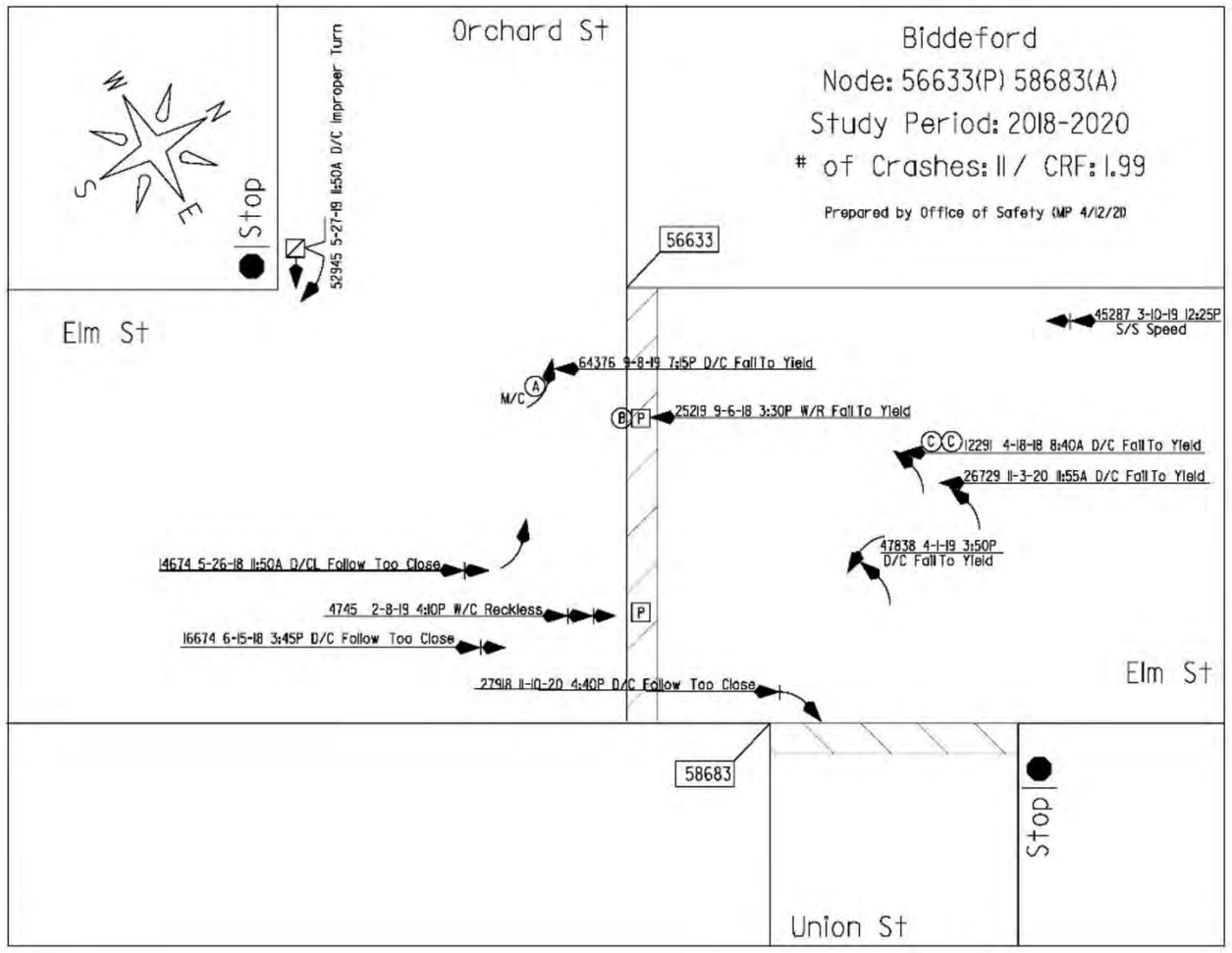
RTE # / RD #: **0001X** DATE DRAWN: **4/12/2021** DRAWN BY: **Michelle**

STUDY FROM: **1/1/2018** STUDY TO: **12/31/2020**

CRASH RATE: **0.8** CRF: **1.99** % INJURY: **27.3** TOTAL CRASHES: **11**



Monday, April 12, 2021 MDOT -OFFICE OF SAFETY - CRASH RECORDS



H. C. L.
CRASH COLLISION DIAGRAM
DATA PACKAGE

COUNTY: **YORK** TOWN: **BIDDEFORD**

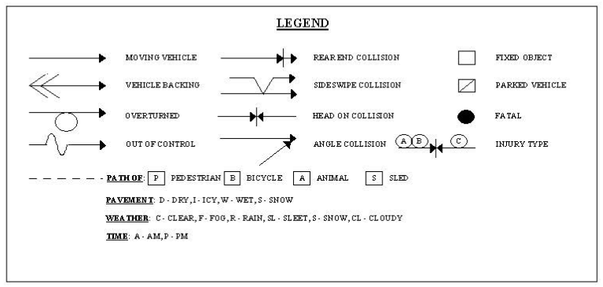
LOW NODE: **56644** HIGH NODE: **0000** REGION: **1** U/R: **URBAN**

DESCRIPTION: **Jct of Elm St & Lincoln St**

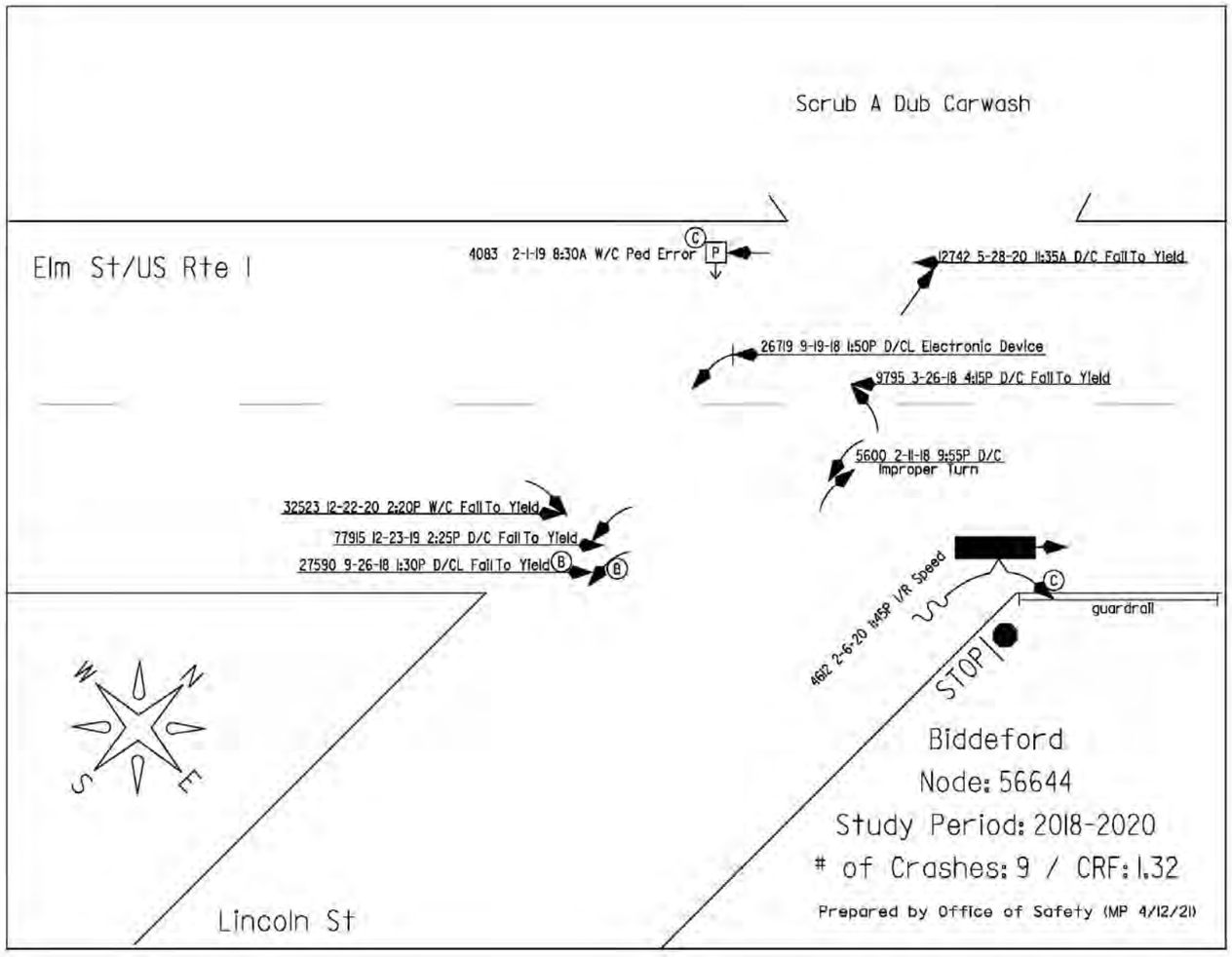
RTE # / RD #: **0001X** DATE DRAWN: **4/12/2021** DRAWN BY: **Michelle**

STUDY FROM: **1/1/2018** STUDY TO: **12/31/2020**

CRASH RATE: **0.49** CRF: **1.32** % INJURY: **33.3** TOTAL CRASHES: **9**



Monday, April 12, 2021 MDOT -OFFICE OF SAFETY - CRASH RECORDS



H. C. L.
CRASH COLLISION DIAGRAM
DATA PACKAGE

COUNTY: **YORK** TOWN: **BIDDEFORD**

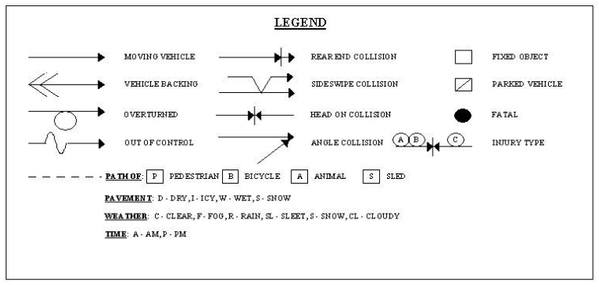
LOW NODE: **56648** HIGH NODE: **0000** REGION: **1** U/R: **URBAN**

DESCRIPTION: **Jct of Elm St & Pine St**

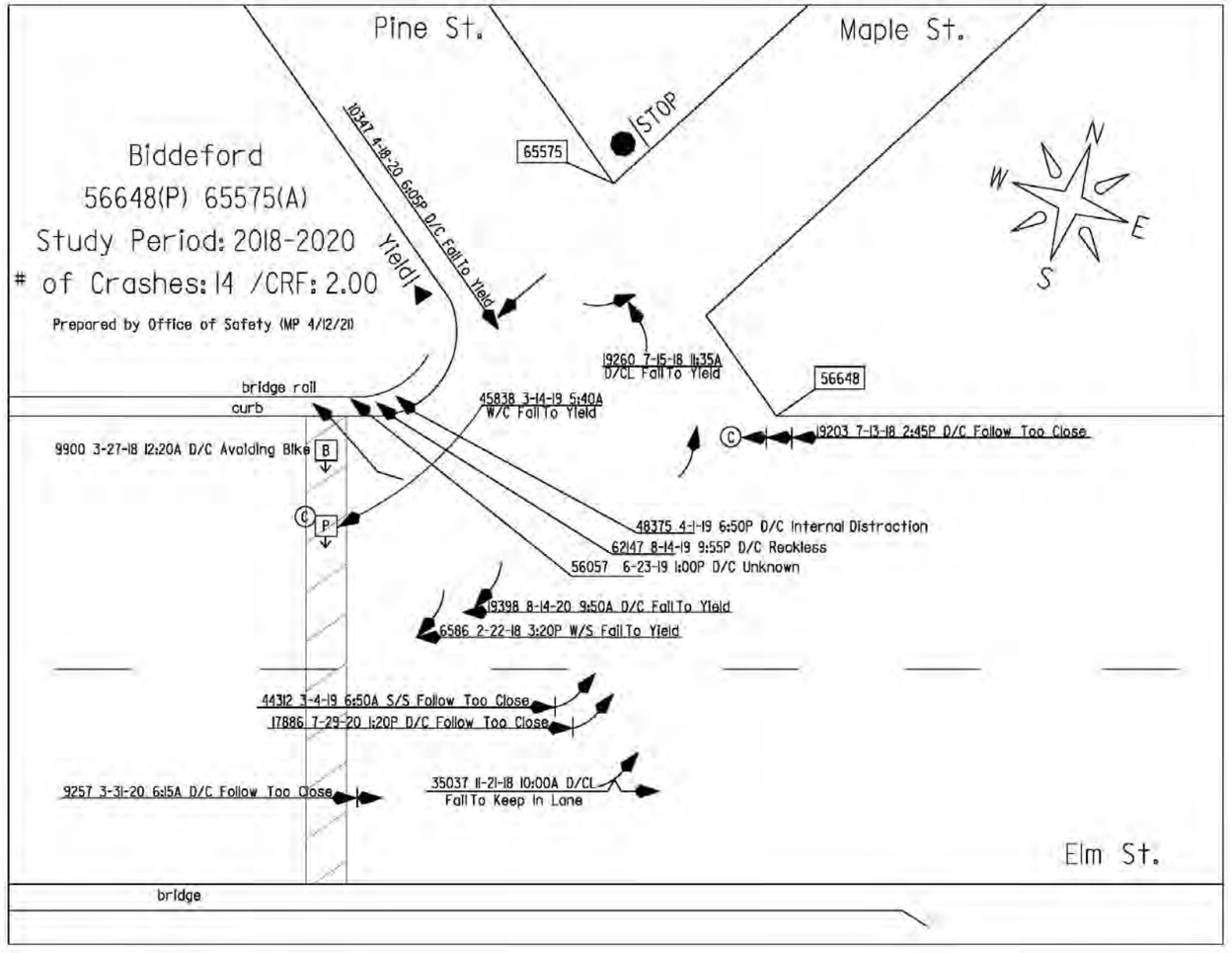
RTE # / RD #: **0001S** DATE DRAWN: **4/12/2021** DRAWN BY: **Michelle**

STUDY FROM: **1/1/2018** STUDY TO: **12/31/2020**

CRASH RATE: **0.74** CRF: **2** % INJURY: **14.3** TOTAL CRASHES: **14**



Monday, April 12, 2021 MDOT -OFFICE OF SAFETY - CRASH RECORDS



H. C. L.
CRASH COLLISION DIAGRAM
DATA PACKAGE

COUNTY: **YORK** TOWN: **BIDDEFORD**

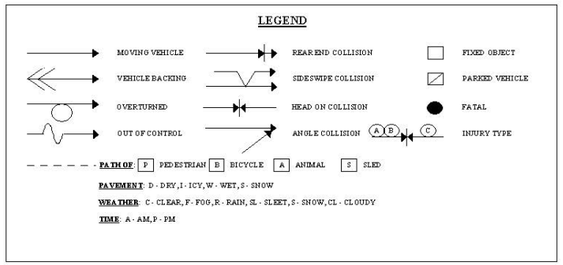
LOW NODE: **56882** HIGH NODE: **0000** REGION: **1** U/R: **URBAN**

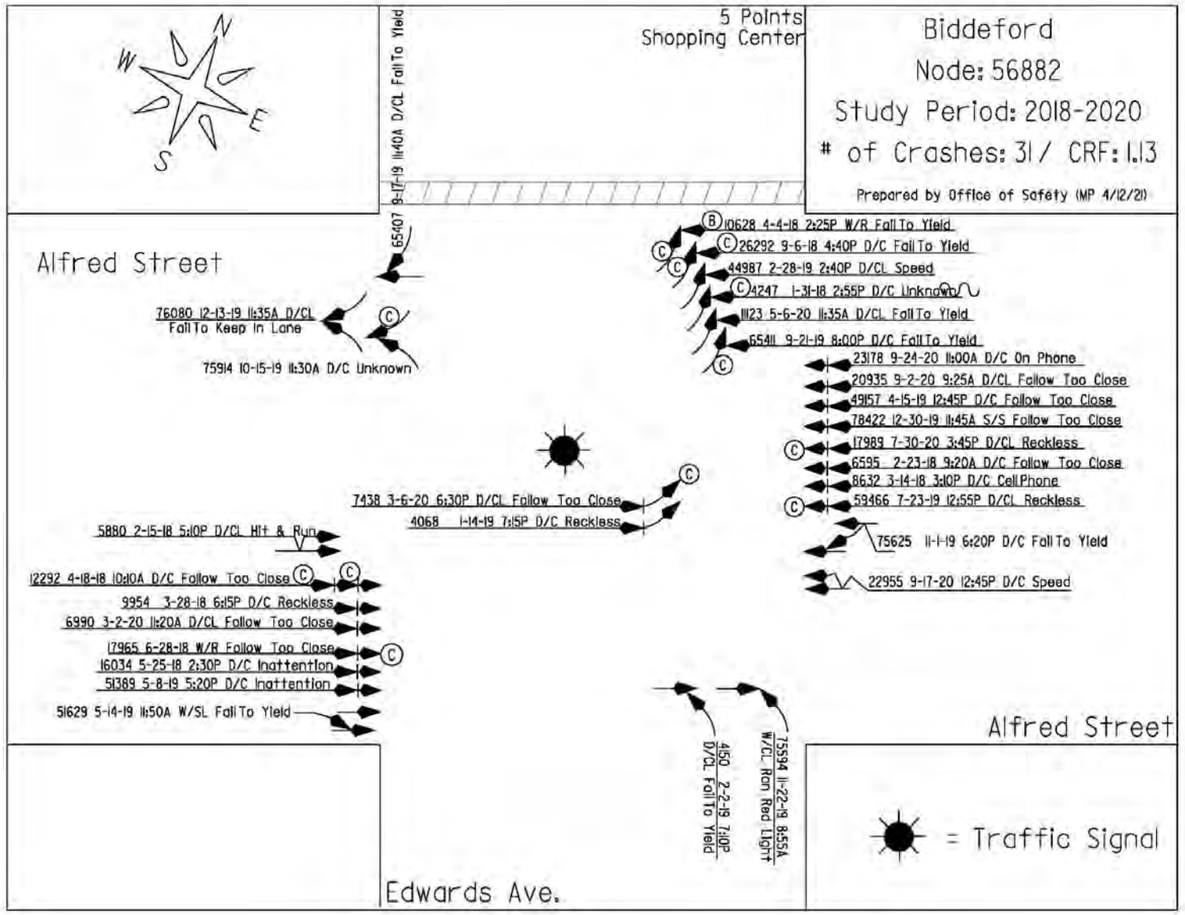
DESCRIPTION: **Jct of Alfred St & Edwards Ave**

RTE # / RD #: **0111X** DATE DRAWN: **4/12/2021** DRAWN BY: **Michelle**

STUDY FROM: **1/1/2018** STUDY TO: **12/31/2020**

CRASH RATE: **1.39** CRF: **1.13** % INJURY: **32.3** TOTAL CRASHES: **31**





H. C. L.
CRASH COLLISION DIAGRAM
DATA PACKAGE

COUNTY: **YORK** TOWN: **BIDDEFORD**

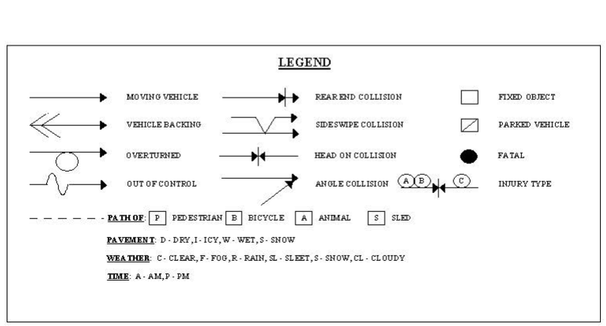
LOW NODE: **56883** HIGH NODE: **56882** REGION: **1** U/R: **URBAN**

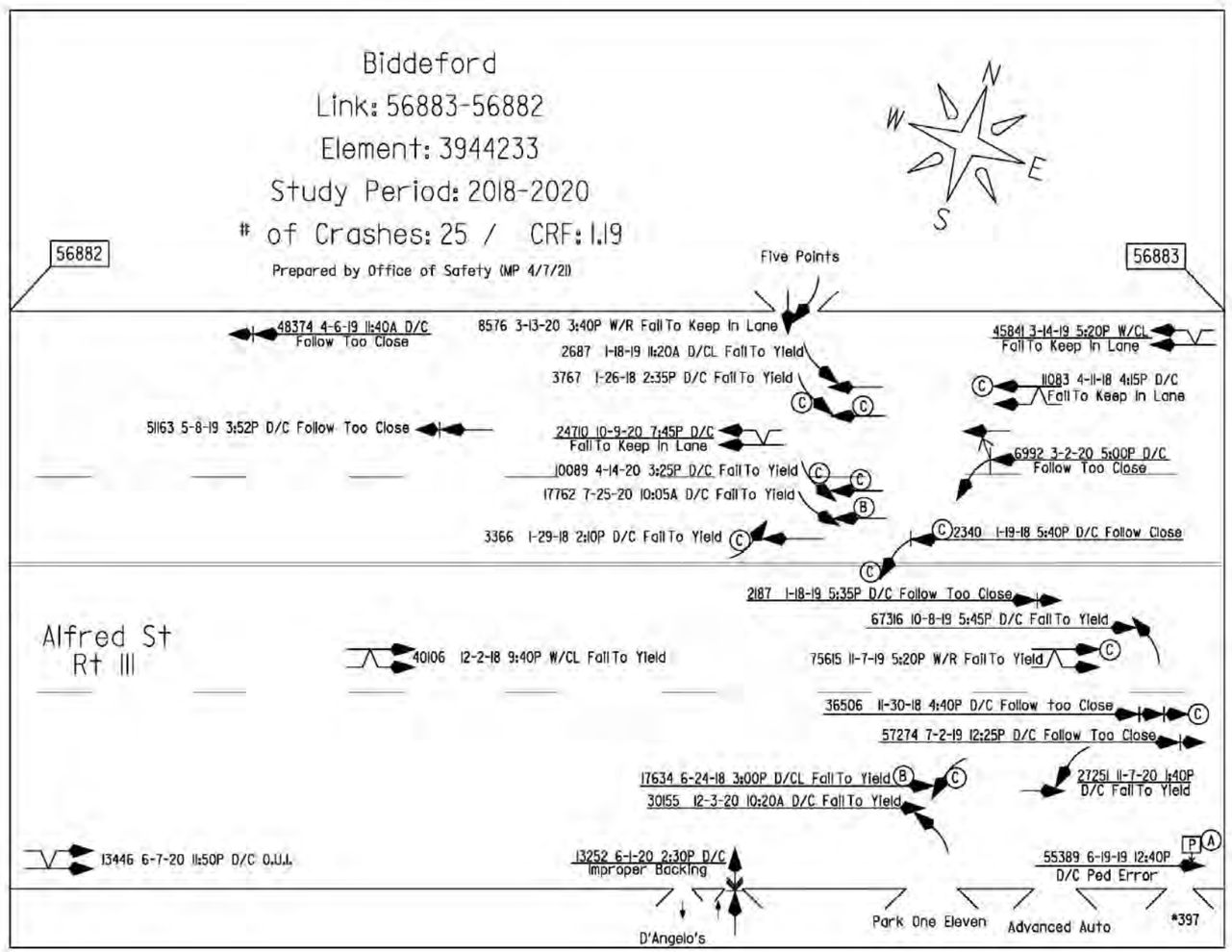
DESCRIPTION: **Alfred St from May St to Edwards Ave**

RTE # / RD #: **0111X** DATE DRAWN: **4/7/2021** DRAWN BY: **Michelle**

STUDY FROM: **1/1/2018** STUDY TO: **12/31/2020**

CRASH RATE: **462.43** CRF: **1.19** % INJURY: **40** TOTAL CRASHES: **25**





Wednesday, April 7, 2021 MDOT -OFFICE OF SAFETY - CRASH RECORDS

H. C. L.
CRASH COLLISION DIAGRAM
DATA PACKAGE

COUNTY: **YORK** TOWN: **BIDDEFORD**

LOW NODE: **58334** HIGH NODE: **0000** REGION: **1** U/R: **URBAN**

DESCRIPTION: **Jct of Alfred St & Precourt St**

RTE # / RD #: **0111E** DATE DRAWN: **4/12/2021** DRAWN BY: **Michelle**

STUDY FROM: **1/1/2018** STUDY TO: **12/31/2020**

CRASH RATE: **1.73** CRF: **31.2** % INJURY: **1.58** TOTAL CRASHES: **77**

LEGEND

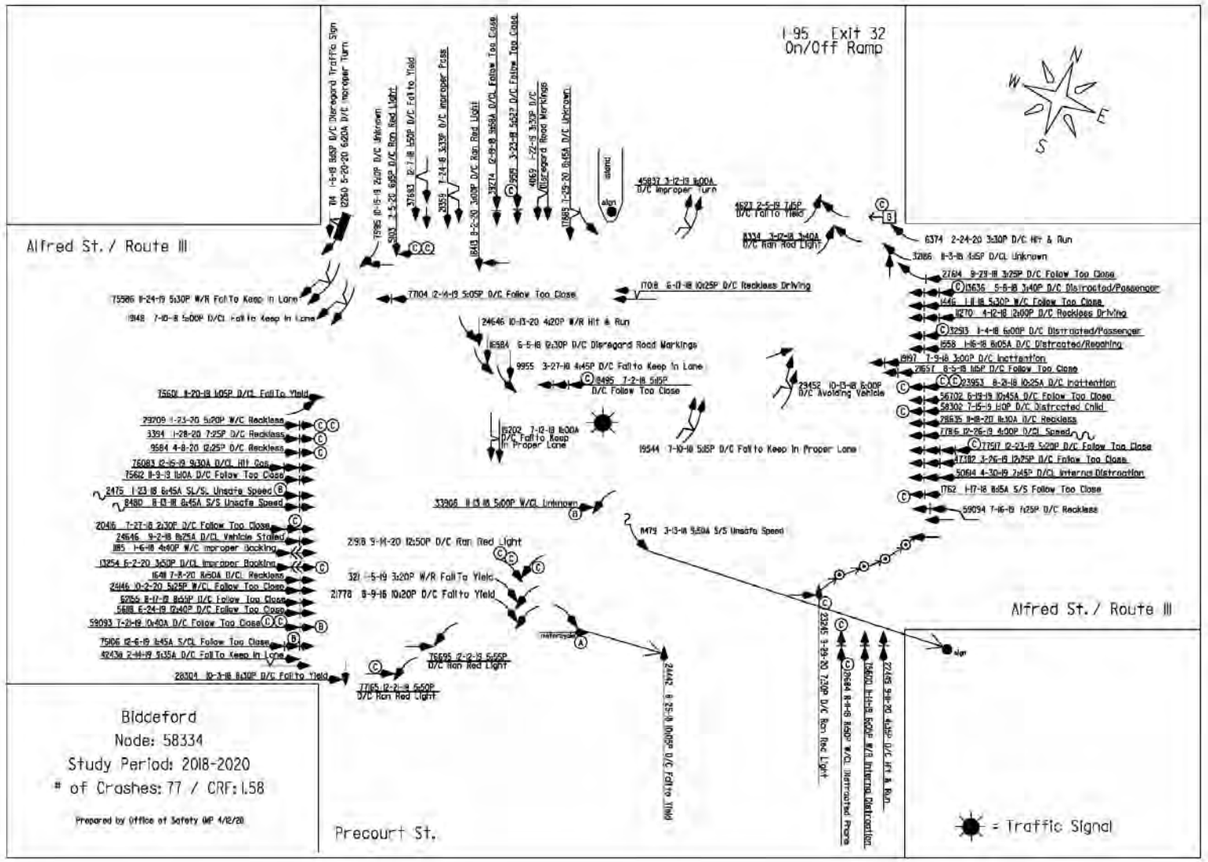
MOVING VEHICLE — REAR END COLLISION — FIXED OBJECT
VEHICLE BACKING — SIDESWIPE COLLISION — PARKED VEHICLE
OVERTURNED — HEAD ON COLLISION — FATAL
OUT OF CONTROL — ANGLE COLLISION (A B C) — INJURY TYPE

- - - - - - **PATH OF:** P PEDESTRIAN B BICYCLE A ANIMAL S SLED

PAVEMENT: D - DRY, I - ICY, W - WET, S - SNOW

WEATHER: C - CLEAR, F - FOG, R - RAIN, SL - SLEET, S - SNOW, CL - CLOUDY

TIME: A - AM, P - PM



Monday, April 12, 2021 MDOT -OFFICE OF SAFETY - CRASH RECORDS

H. C. L.
CRASH COLLISION DIAGRAM
DATA PACKAGE

COUNTY: **YORK** TOWN: **BIDDEFORD**

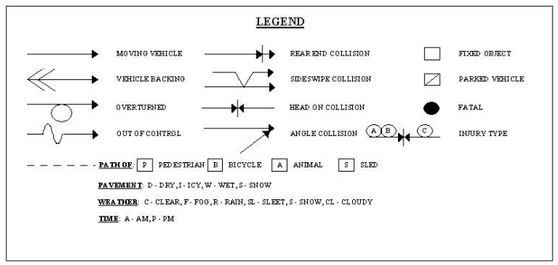
LOW NODE: **58469** HIGH NODE: **0000** REGION: **1** U/R: **URBAN**

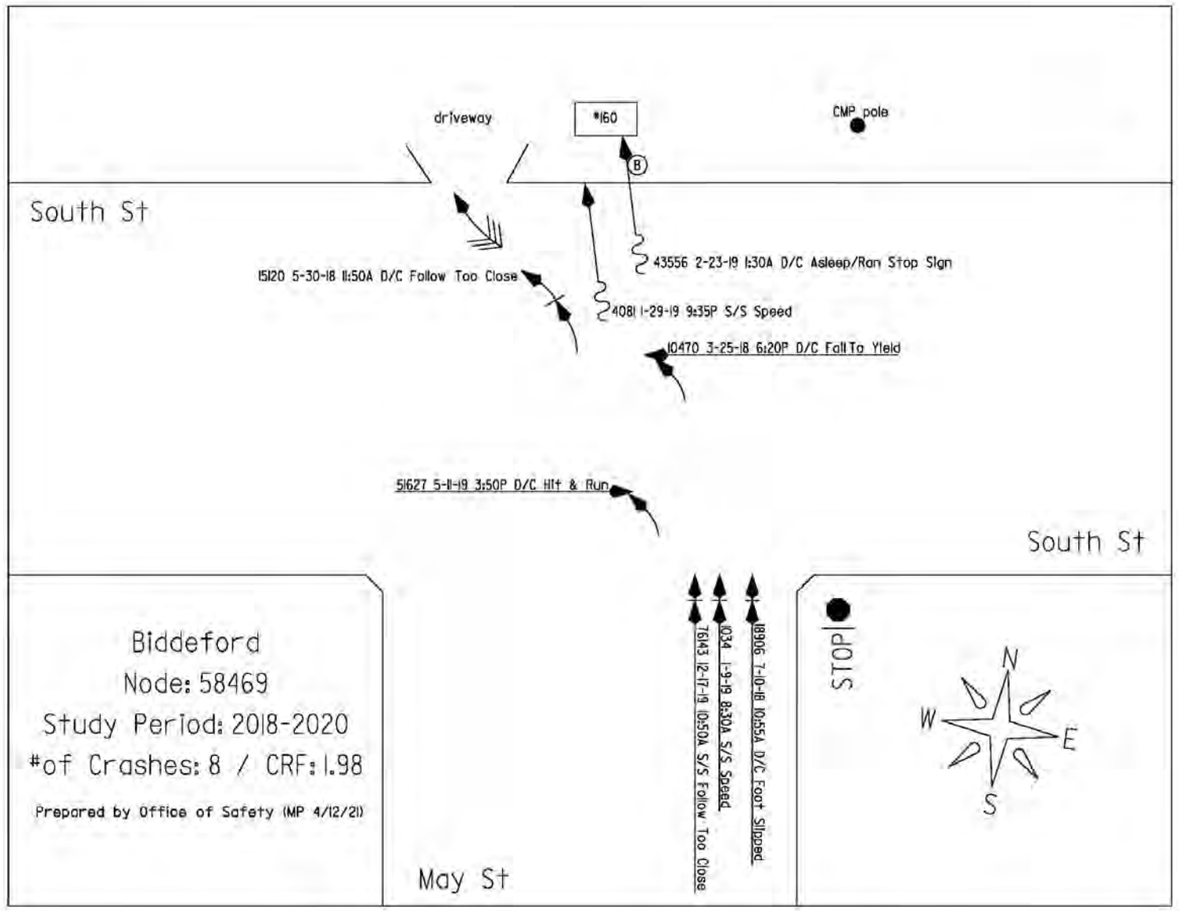
DESCRIPTION: **Jct of South St & May St**

RTE # / RD #: **3110112** DATE DRAWN: **4/12/2021** DRAWN BY: **Michelle**

STUDY FROM: **1/1/2018** STUDY TO: **12/31/2020**

CRASH RATE: **0.83** CRF: **1.98** % INJURY: **12.5** TOTAL CRASHES: **8**





Monday, April 12, 2021 MDOT -OFFICE OF SAFETY - CRASH RECORDS

H. C. L.
CRASH COLLISION DIAGRAM
DATA PACKAGE

COUNTY: **YORK** TOWN: **BIDDEFORD**

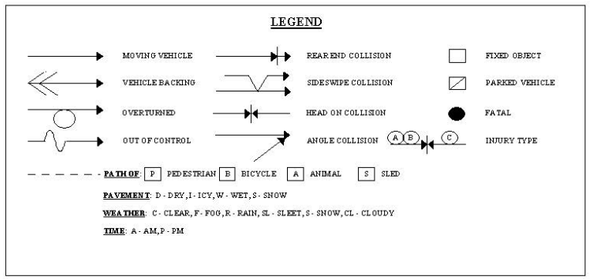
LOW NODE: **58492** HIGH NODE: **0000** REGION: **1** U/R: **RURAL**

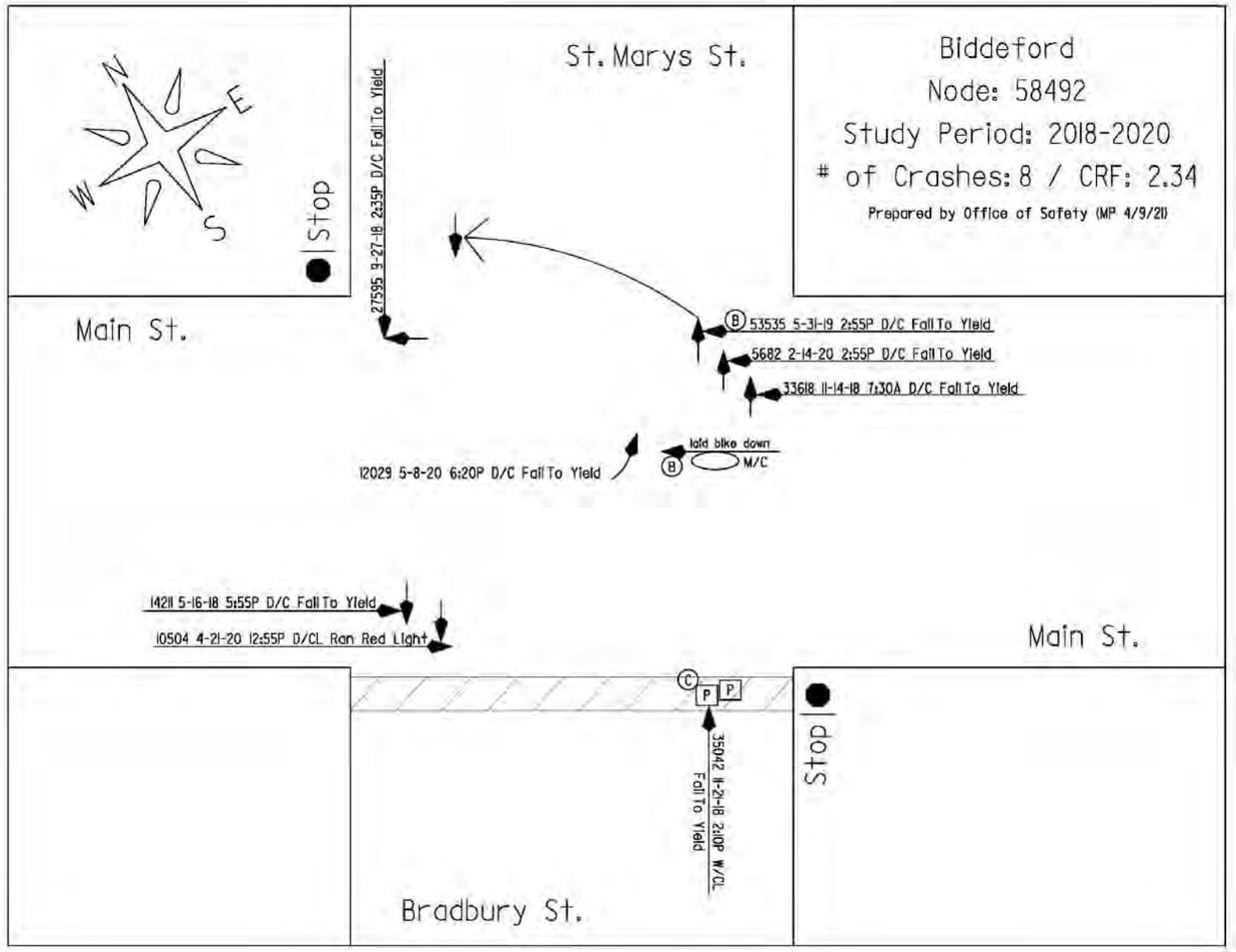
DESCRIPTION: **Jct Main St & Bradbury St/Marys St**

RTE # / RD #: **3110018** DATE DRAWN: **4/9/2021** DRAWN BY: **Michelle**

STUDY FROM: **1/1/2018** STUDY TO: **12/31/2020**

CRASH RATE: **1.11** CRF: **2.34** % INJURY: **37.5** TOTAL CRASHES: **8**





Friday, April 9, 2021 MDOT -OFFICE OF SAFETY - CRASH RECORDS

H. C. L.
CRASH COLLISION DIAGRAM
DATA PACKAGE

COUNTY: **YORK** TOWN: **BIDDEFORD**

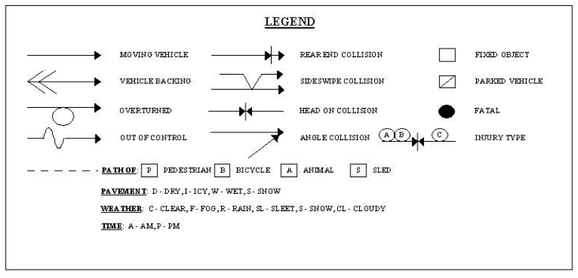
LOW NODE: **58493** HIGH NODE: **0000** REGION: **1** U/R: **URBAN**

DESCRIPTION: **Jct of Main St & Jefferson St**

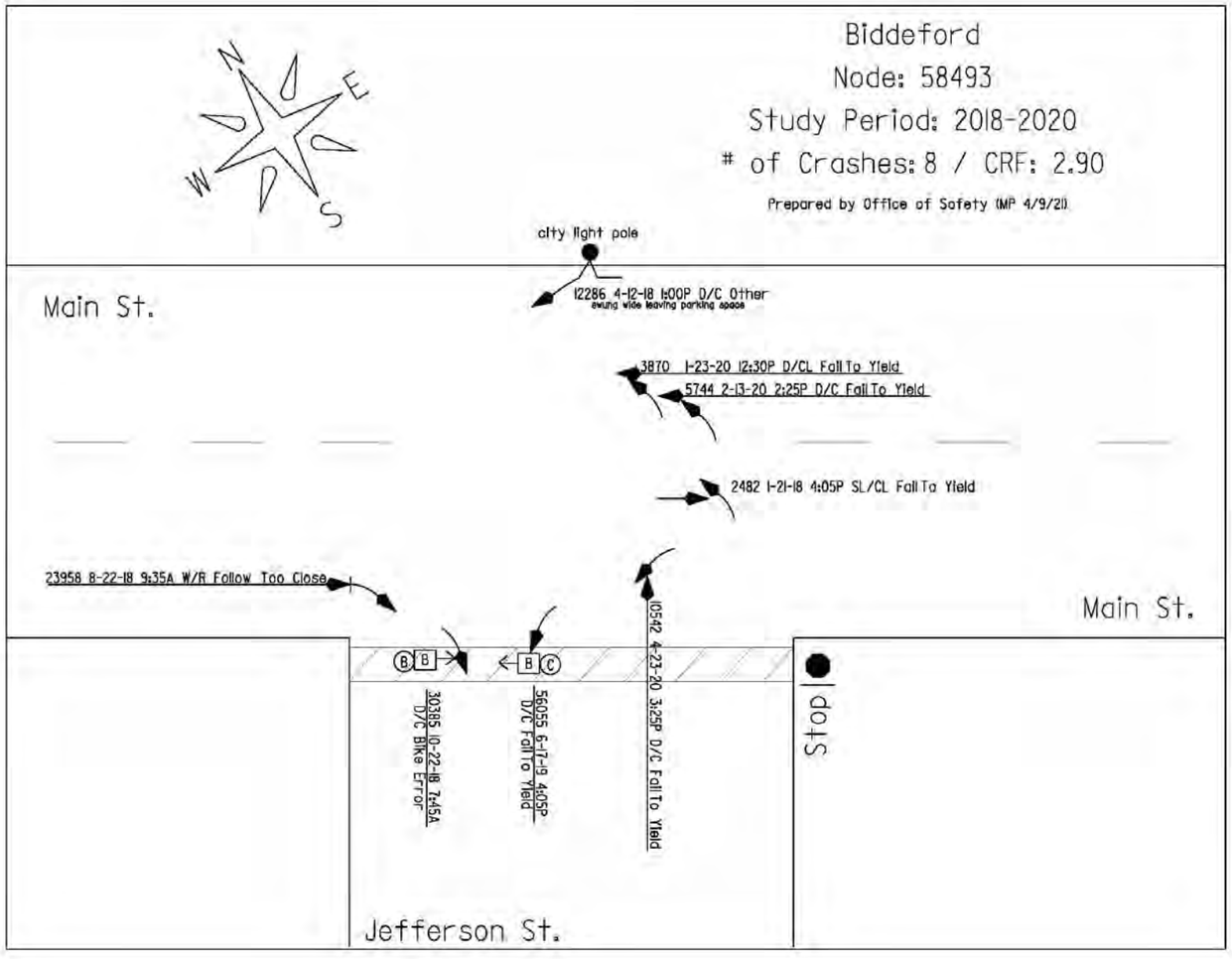
RTE # / RD #: **3110086** DATE DRAWN: **4/9/2021** DRAWN BY: **Michelle**

STUDY FROM: **1/1/2018** STUDY TO: **12/31/2020**

CRASH RATE: **1.39** CRF: **2.9** % INJURY: **25** TOTAL CRASHES: **8**



Friday, April 9, 2021 MDOT -OFFICE OF SAFETY - CRASH RECORDS



H. C. L.
CRASH COLLISION DIAGRAM
DATA PACKAGE

COUNTY: **YORK** TOWN: **BIDDEFORD**

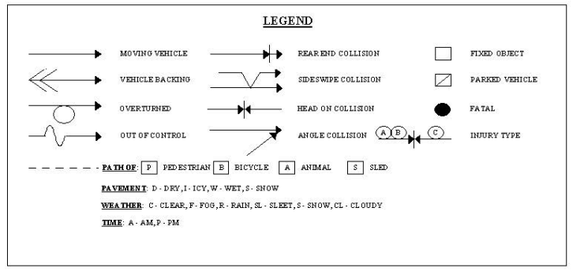
LOW NODE: **58494** HIGH NODE: **0000** REGION: **1** U/R: **URBAN**

DESCRIPTION: **Jct of Main St & Adams St/Lincoln St**

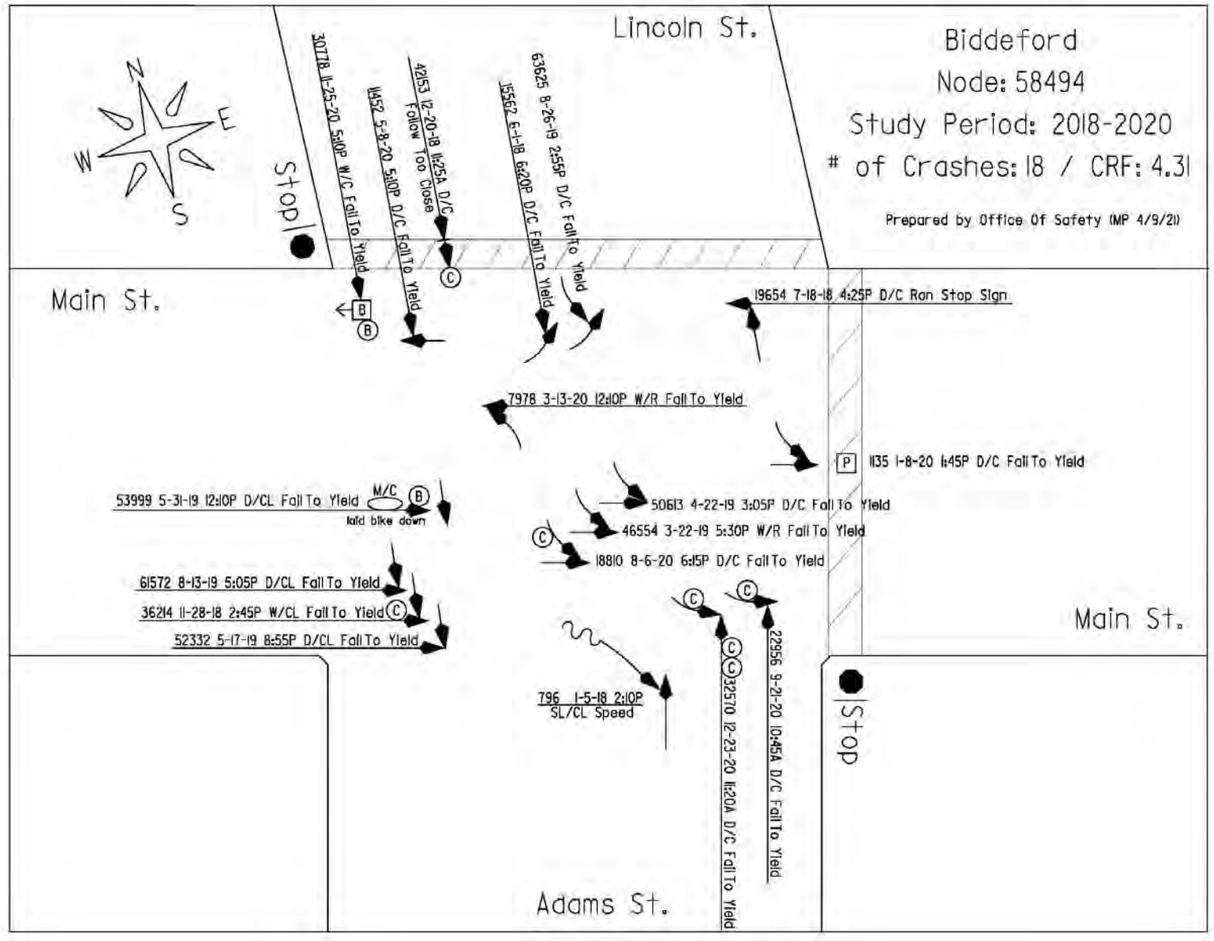
RTE # / RD #: **3110002** DATE DRAWN: **4/9/2021** DRAWN BY: **Michelle**

STUDY FROM: **1/1/2018** STUDY TO: **12/31/2020**

CRASH RATE: **1.79** CRF: **4.31** % INJURY: **38.9** TOTAL CRASHES: **18**



Friday, April 9, 2021 MDOT -OFFICE OF SAFETY - CRASH RECORDS



H. C. L.
CRASH COLLISION DIAGRAM
DATA PACKAGE

COUNTY: **YORK** TOWN: **BIDDEFORD**

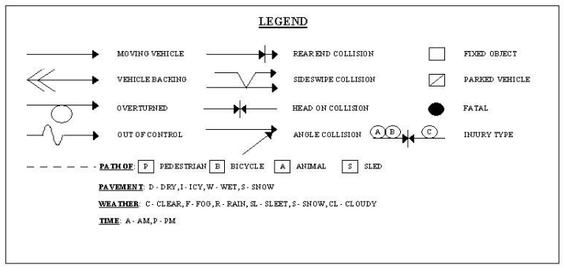
LOW NODE: **64989** HIGH NODE: **0000** REGION: **1** U/R: **URBAN**

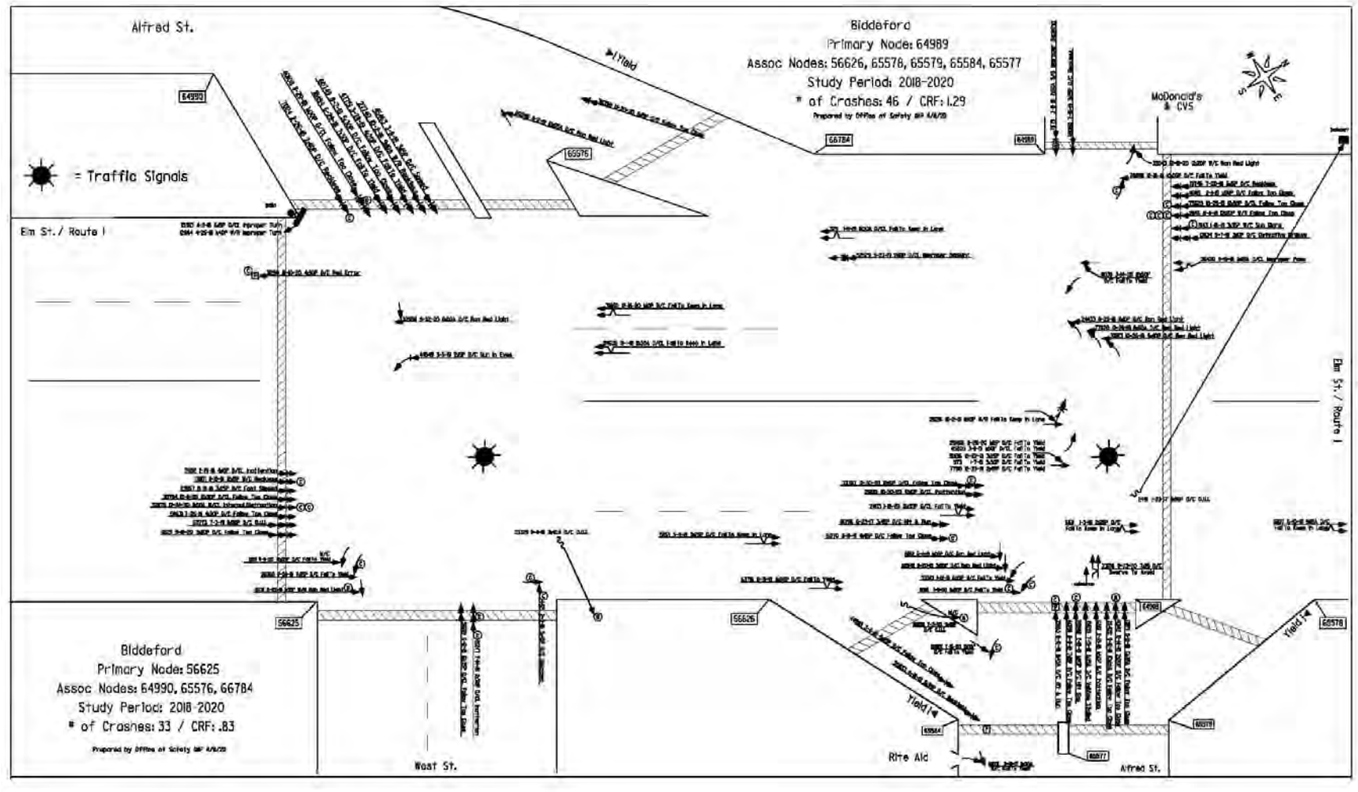
DESCRIPTION: **Jct of Alfred St & Elm St/McDonalds**

RTE # / RD #: **0001X** DATE DRAWN: **4/9/2021** DRAWN BY: **Michelle**

STUDY FROM: **1/1/2018** STUDY TO: **12/31/2020**

CRASH RATE: **1.5** CRF: **1.29** % INJURY: **26.1** TOTAL CRASHES: **46**





Friday, April 9, 2021 MDOT -OFFICE OF SAFETY - CRASH RECORDS

H. C. L.
CRASH COLLISION DIAGRAM
DATA PACKAGE

COUNTY: **YORK** TOWN: **BIDDEFORD**

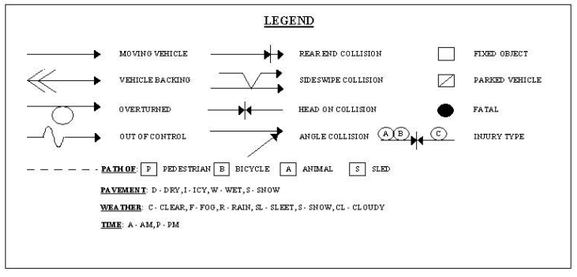
LOW NODE: **65578** HIGH NODE: **56627** REGION: **1** U/R: **URBAN**

DESCRIPTION: **Elm St from Alfred St to Dartmouth St**

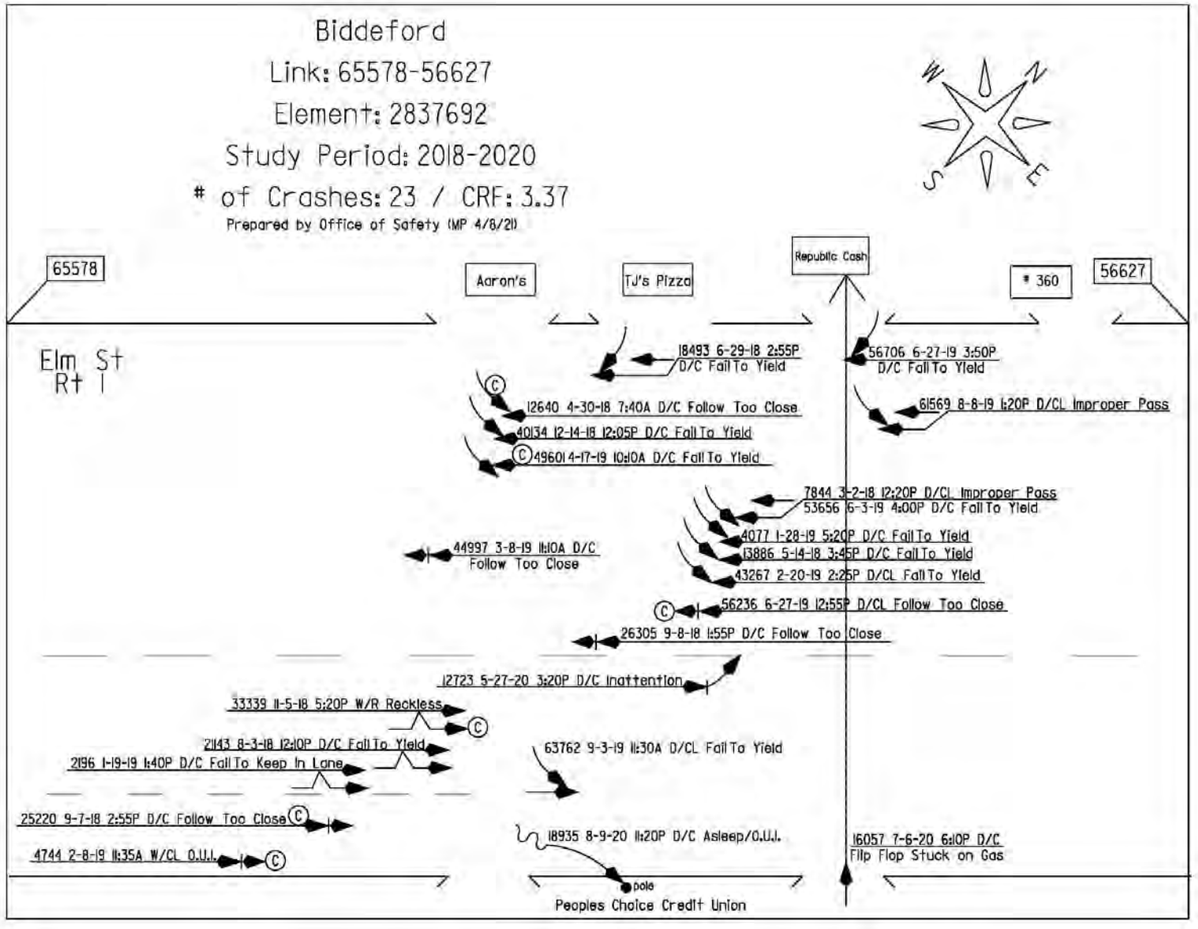
RTE # / RD #: **0001X** DATE DRAWN: **4/8/2021** DRAWN BY: **Michelle**

STUDY FROM: **1/1/2018** STUDY TO: **12/31/2020**

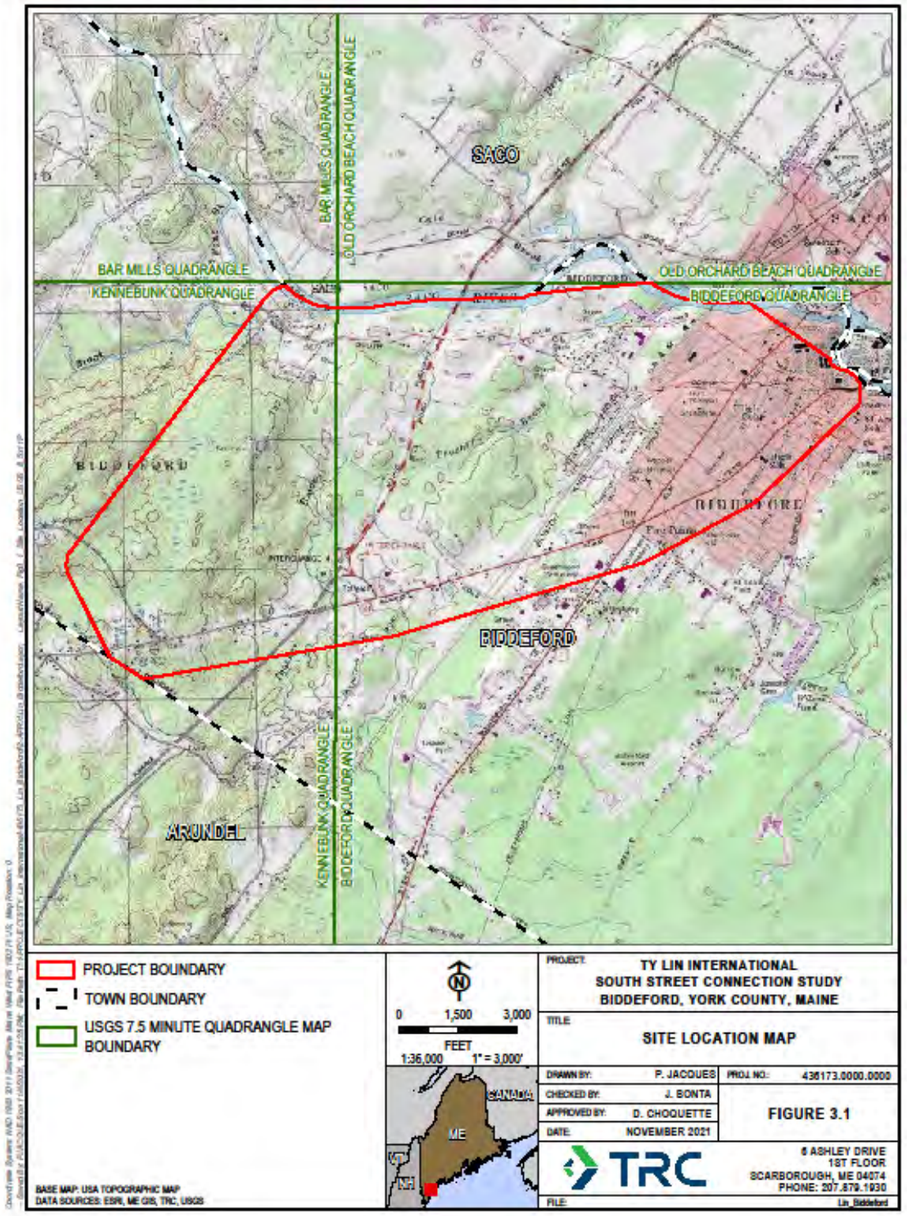
CRASH RATE: **1814.18** CRF: **3.37** % INJURY: **26.1** TOTAL CRASHES: **23**

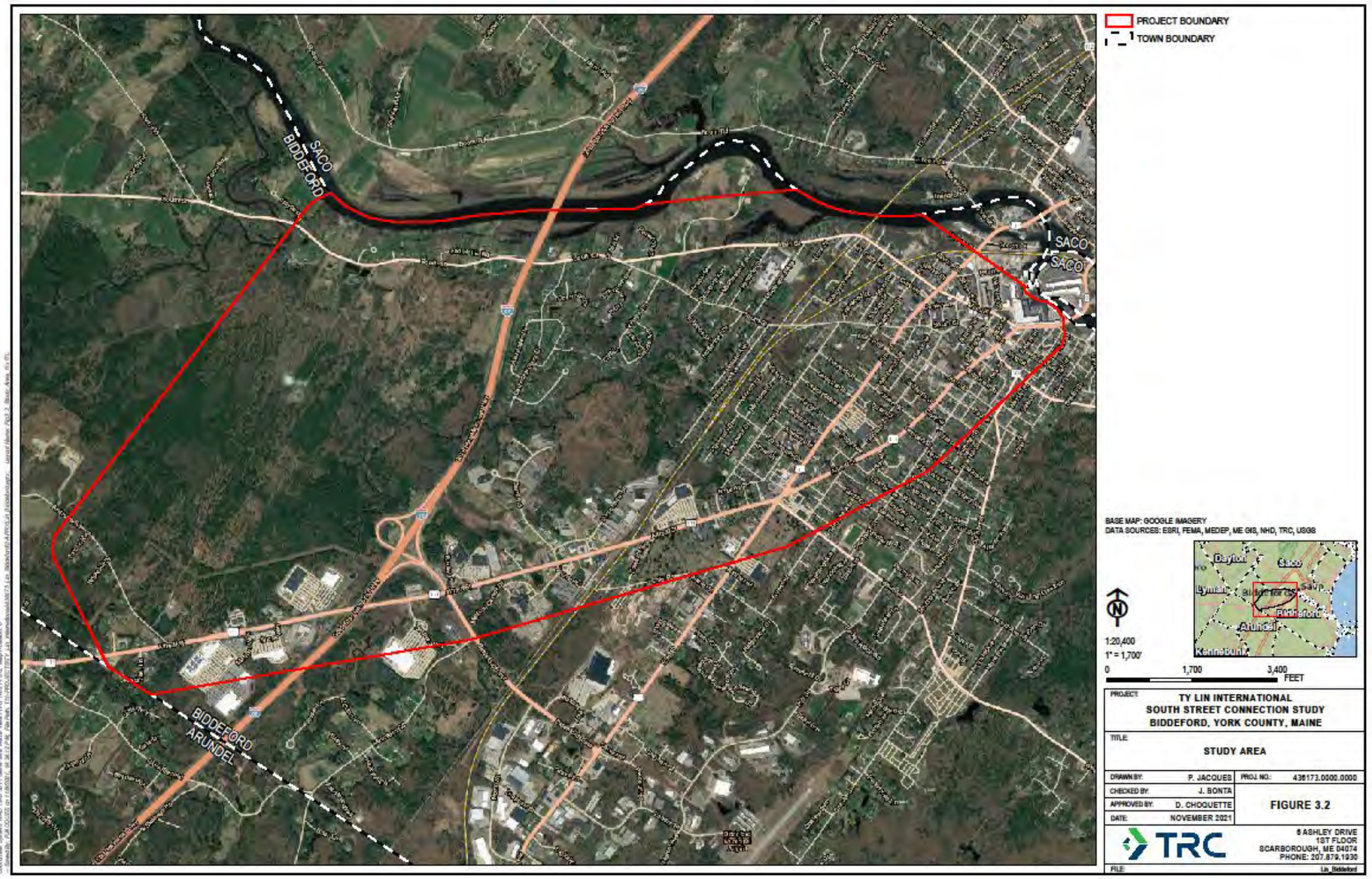


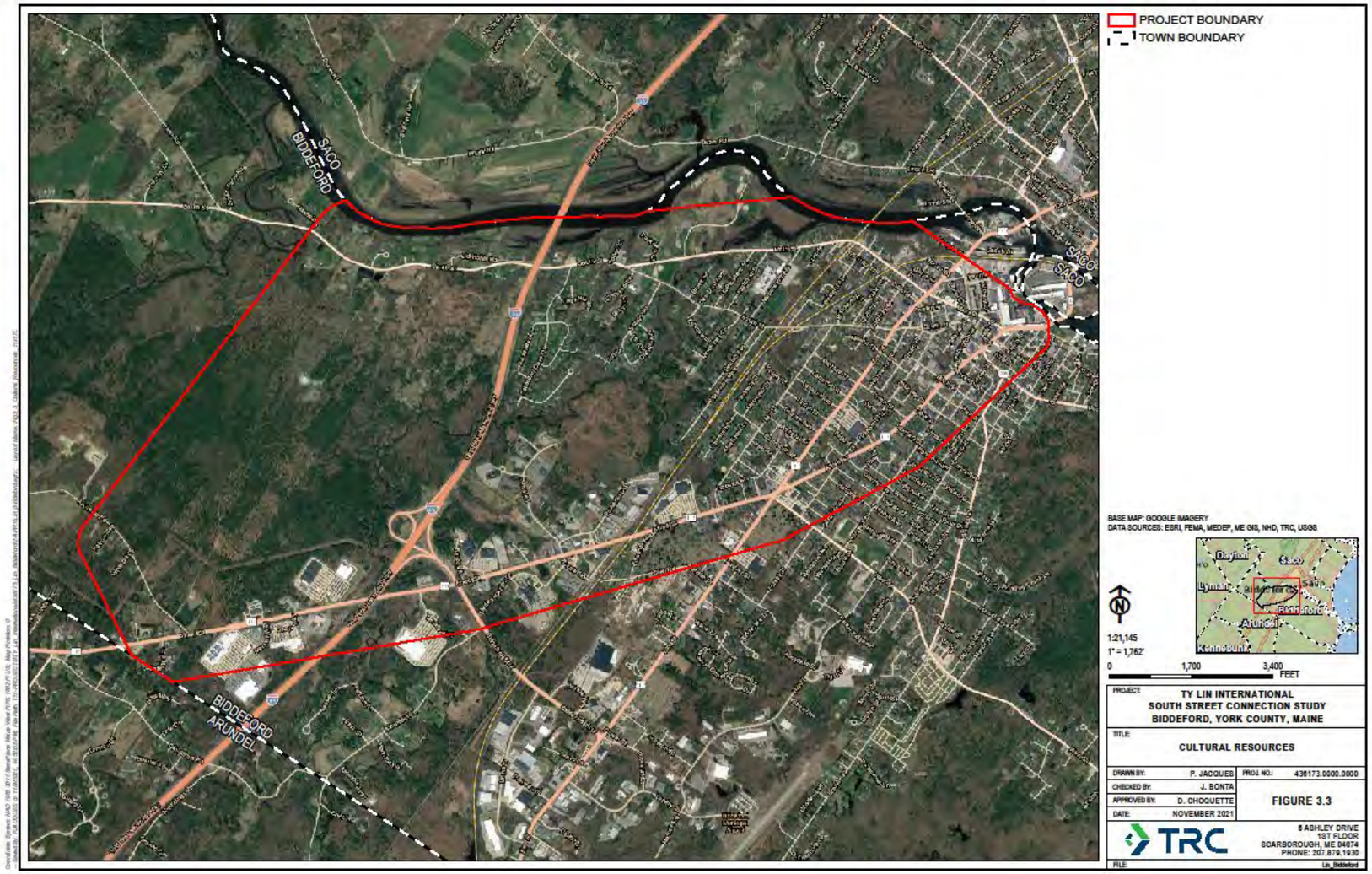
Thursday, April 8, 2021 MDOT -OFFICE OF SAFETY - CRASH RECORDS

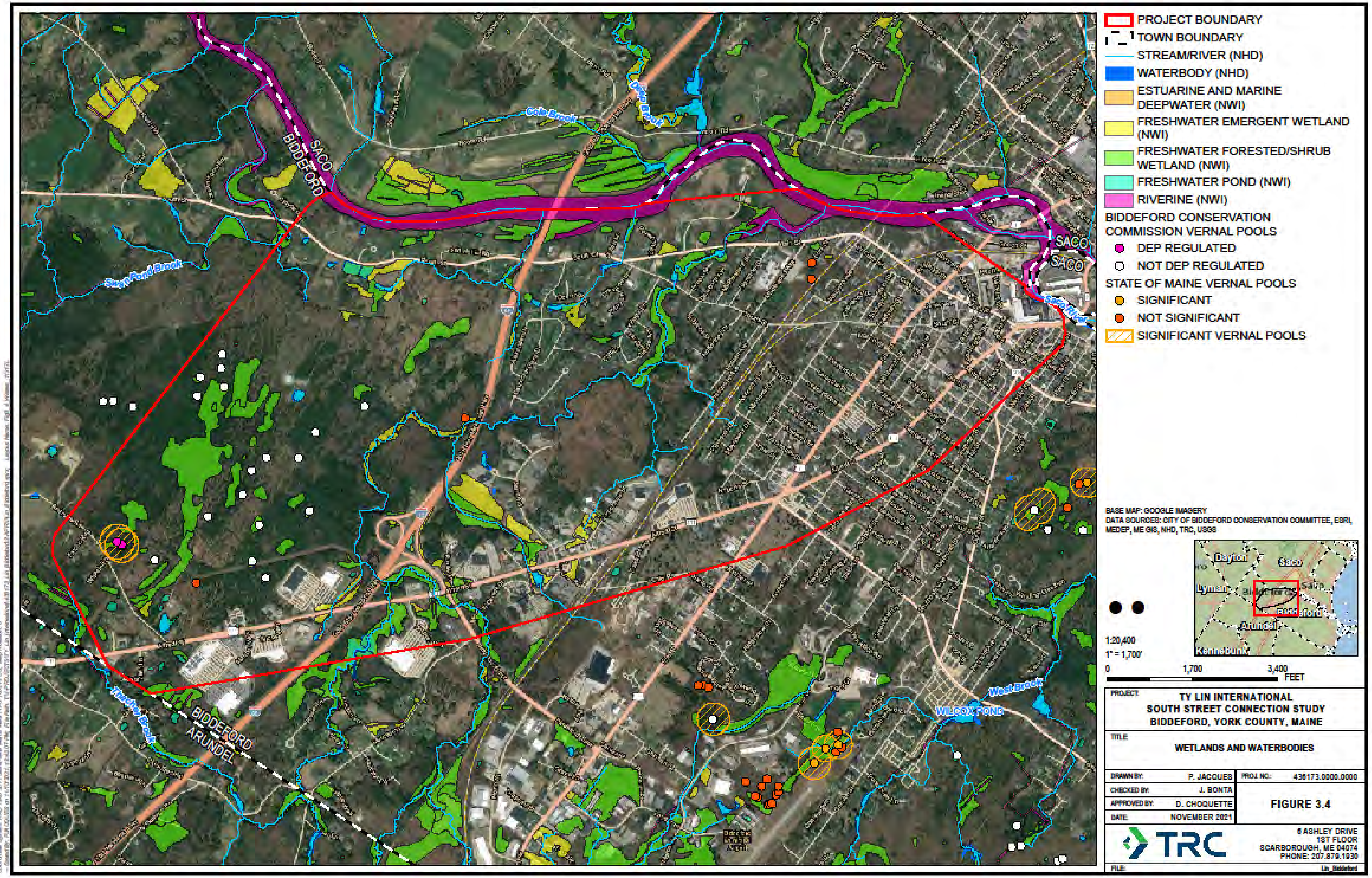


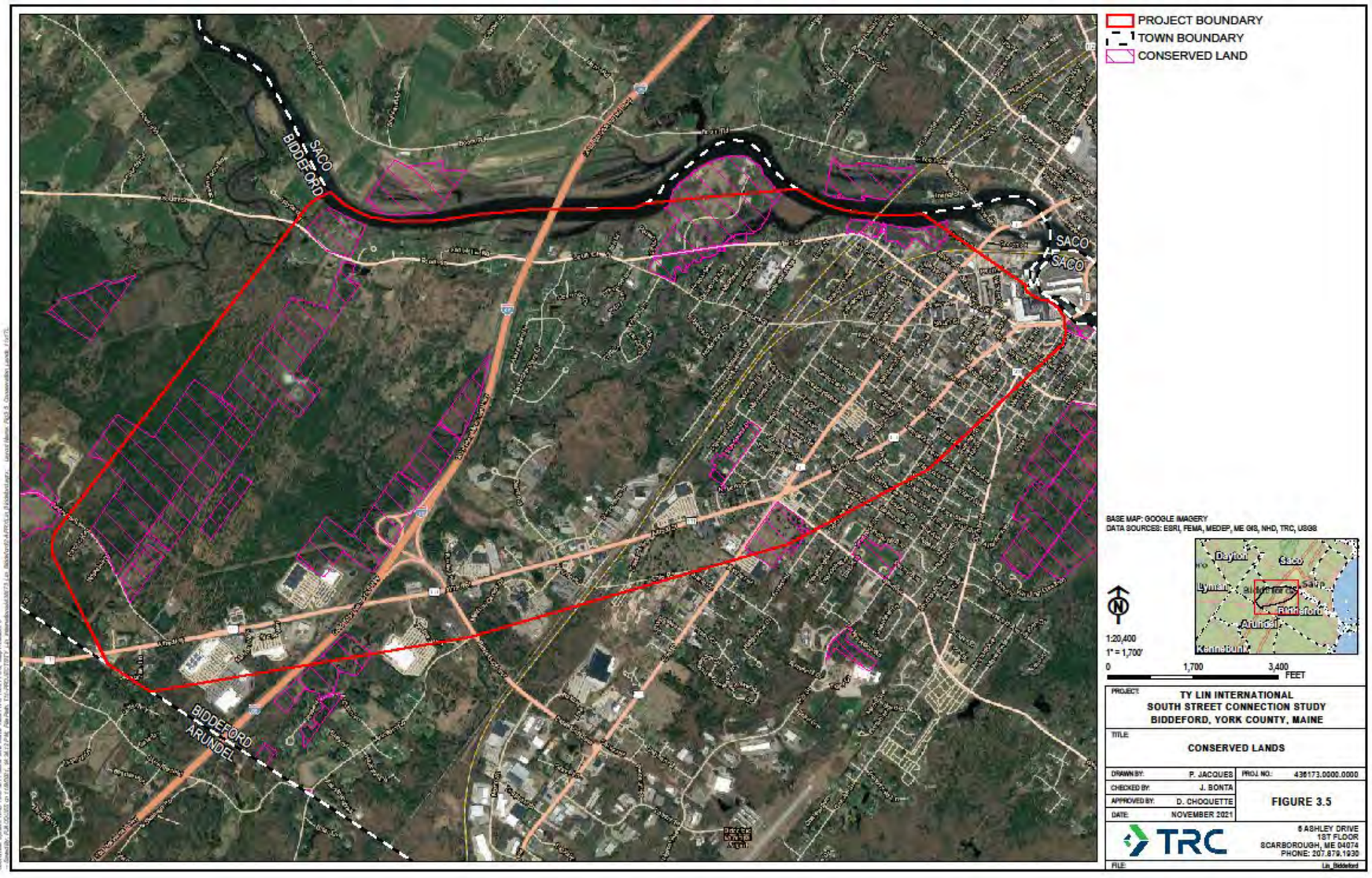
APPENDIX 4 - ENVIRONMENTAL DATA

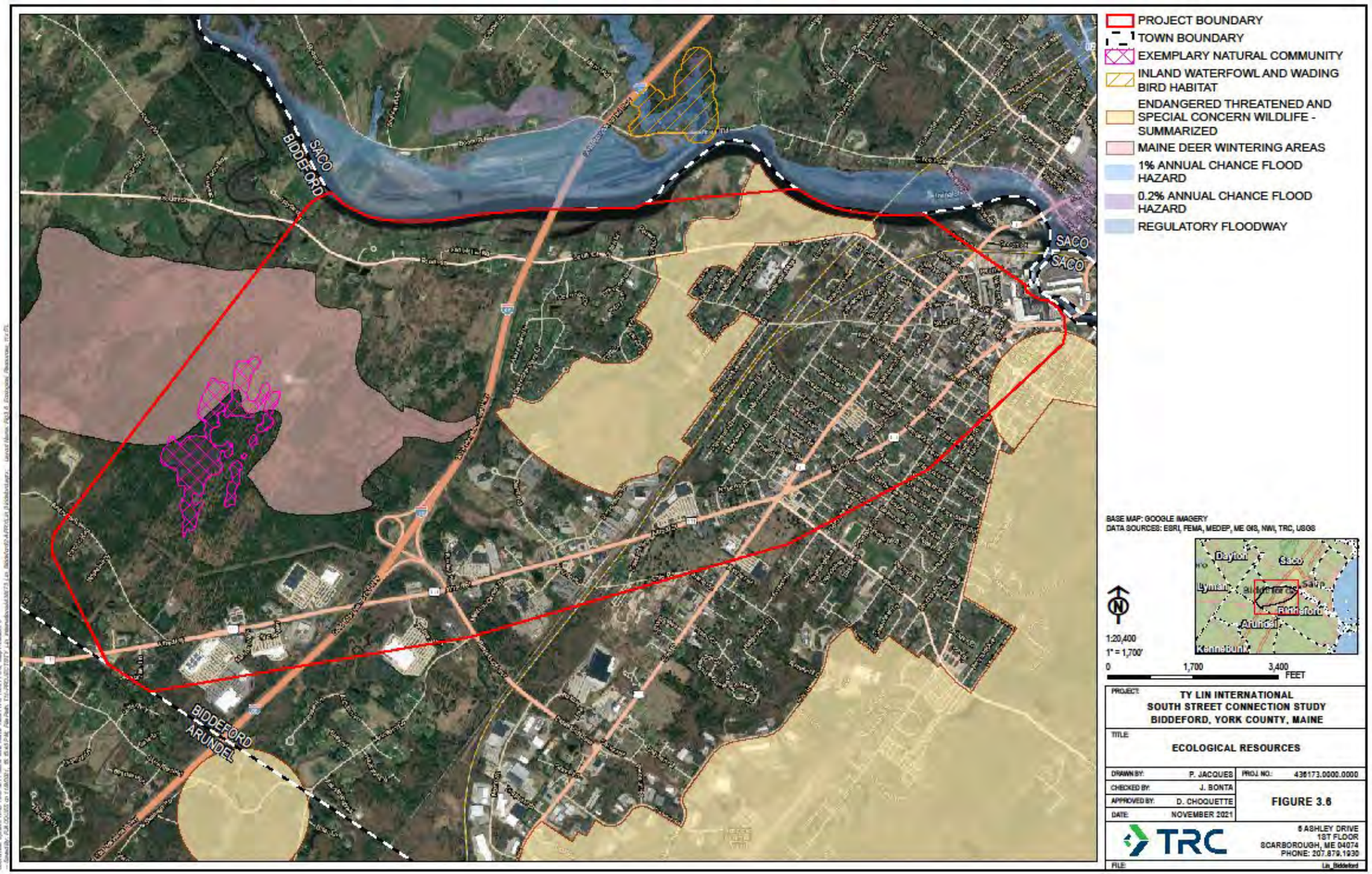

SACO
BAR MILLS QUADRANGLE
OLD ORCHARD BEACH QUADRANGLE
KENNEBUNK QUADRANGLE
BIDDEFORD QUADRANGLE
BIDDEFORD
ARUNDEL
PROJECT BOUNDARY
TOWN BOUNDARY
USGS 7.5 MINUTE QUADRANGLE MAP BOUNDARY
0 1,500 3,000
FEET
1:36,000 1" = 3,000'
CANADA
ME
NH
BASE MAP: USA TOPOGRAPHIC MAP
DATA SOURCES: ESRI, ME GIS, TRC, USGS
PROJECT: TY LIN INTERNATIONAL
SOUTH STREET CONNECTION STUDY
BIDDEFORD, YORK COUNTY, MAINE
TITLE: SITE LOCATION MAP
DRAWN BY: P. JACQUES
CHECKED BY: J. BONTA
APPROVED BY: D. CHOQUETTE
DATE: NOVEMBER 2021
PROJ. NO.: 436173.0000.0000
FIGURE 3.1
TRC
6 ASHLEY DRIVE
1ST FLOOR
SCARBOROUGH, ME 04074
PHONE: 207.879.1930
FILE: Lin_Biddeford


PROJECT BOUNDARY
TOWN BOUNDARY
SACO
BIDDEFORD
SACO
BIDDEFORD
ARUNDEL
BASE MAP: GOOGLE IMAGERY
DATA SOURCES: ESRI, FEMA, MEDEP, ME GIS, NHD, TRC, USGS
Dayton
Saco
Lyman
Biddeford
Arundel
Kennebunk
1:20,400
1" = 1,700'
0
1,700
3,400
FEET
PROJECT:
TY LIN INTERNATIONAL
SOUTH STREET CONNECTION STUDY
BIDDEFORD, YORK COUNTY, MAINE
TITLE:
STUDY AREA
DRAWN BY: P. JACQUES
PROJ. NO.: 436173.0000.0000
CHECKED BY: J. BONTA
APPROVED BY: D. CHOQUETTE
FIGURE 3.2
DATE: NOVEMBER 2021
TRC
6 ASHLEY DRIVE
1ST FLOOR
SCARBOROUGH, ME 04074
PHONE: 207.879.1930
FILE:
Us_Biddeford


PROJECT BOUNDARY
TOWN BOUNDARY
SACO
BIDDEFORD
BIDDEFORD
ARUNDEL
BASE MAP: GOOGLE IMAGERY
DATA SOURCES: ESRI, FEMA, MEDEP, ME GIS, NHD, TRC, USGS
Dayton
Saco
Lyman
Biddeford
Arundel
Kennebunk
1:21,145
1" = 1,762'
0
1,700
3,400
FEET
PROJECT:
TY LIN INTERNATIONAL
SOUTH STREET CONNECTION STUDY
BIDDEFORD, YORK COUNTY, MAINE
TITLE:
CULTURAL RESOURCES
DRAWN BY: P. JACQUES
PROJ NO.: 436173.0000.0000
CHECKED BY: J. BONTA
APPROVED BY: D. CHOQUETTE
FIGURE 3.3
DATE: NOVEMBER 2021
TRC
6 ASHLEY DRIVE
1ST FLOOR
SCARBOROUGH, ME 04074
PHONE: 207.879.1930
FILE:


PROJECT BOUNDARY
TOWN BOUNDARY
STREAM/RIVER (NHD)
WATERBODY (NHD)
ESTUARINE AND MARINE DEEPWATER (NWI)
FRESHWATER EMERGENT WETLAND (NWI)
FRESHWATER FORESTED/SHRUB WETLAND (NWI)
FRESHWATER POND (NWI)
RIVERINE (NWI)
BIDDEFORD CONSERVATION COMMISSION VERNAL POOLS
DEP REGULATED
NOT DEP REGULATED
STATE OF MAINE VERNAL POOLS
SIGNIFICANT
NOT SIGNIFICANT
SIGNIFICANT VERNAL POOLS
SACO
BIDDEFORD
ARUNDEL
Cole Brook
Swamp Pond Brook
West Brook
WILCOX POND
BASE MAP: GOOGLE IMAGERY
DATA SOURCES: CITY OF BIDDEFORD CONSERVATION COMMITTEE, ESRI, MEDEP, ME GIS, NHD, TRC, USGS
Dayton
Saco
Lyman
Arundel
Kennebunk
1:20,400
1" = 1,700'
0
1,700
3,400
FEET
PROJECT:
TY LIN INTERNATIONAL
SOUTH STREET CONNECTION STUDY
BIDDEFORD, YORK COUNTY, MAINE
TITLE:
WETLANDS AND WATERBODIES
DRAWN BY: P. JACQUES
CHECKED BY: J. BONTA
APPROVED BY: D. CHOQUETTE
DATE: NOVEMBER 2021
PROJ NO.: 436173.0000.0000
FIGURE 3.4
TRC
6 ASHLEY DRIVE
1ST FLOOR
SCARBOROUGH, ME 04074
PHONE: 207.879.1930
FILE: Lin_Biddeford


PROJECT BOUNDARY
TOWN BOUNDARY
CONSERVED LAND
SACO
BIDDEFORD
SACO
SACO
BIDDEFORD
ARUNDEL
BASE MAP: GOOGLE IMAGERY
DATA SOURCES: ESRI, FEMA, MEDEP, ME GIS, NHD, TRC, USGS
Dayton
Saco
Lyman
Biddeford
Arundel
Kennebunk
1:20,400
1" = 1,700'
0
1,700
3,400
FEET
PROJECT:
TY LIN INTERNATIONAL
SOUTH STREET CONNECTION STUDY
BIDDEFORD, YORK COUNTY, MAINE
TITLE:
CONSERVED LANDS
DRAWN BY: P. JACQUES
PROJ. NO: 436173.0000.0000
CHECKED BY: J. BONTA
APPROVED BY: D. CHOQUETTE
DATE: NOVEMBER 2021
FIGURE 3.5
TRC
5 ASHLEY DRIVE
1ST FLOOR
SCARBOROUGH, ME 04074
PHONE: 207.879.1930
FILE:
Lo_Biddeford


PROJECT BOUNDARY
TOWN BOUNDARY
EXEMPLARY NATURAL COMMUNITY
INLAND WATERFOWL AND WADING BIRD HABITAT
ENDANGERED THREATENED AND SPECIAL CONCERN WILDLIFE - SUMMARIZED
MAINE DEER WINTERING AREAS
1% ANNUAL CHANCE FLOOD HAZARD
0.2% ANNUAL CHANCE FLOOD HAZARD
REGULATORY FLOODWAY
SACO
BIDDEFORD
SACO
SACO
BIDDEFORD
ARUNDEL
BASE MAP: GOOGLE IMAGERY
DATA SOURCES: ESRI, FEMA, MEDEP, ME GIS, NWI, TRC, USGS
Dayton
Saco
Lyman
Biddeford
Arundel
Kennebunk
1:20,400
1" = 1,700'
0
1,700
3,400
FEET
PROJECT:
TY LIN INTERNATIONAL
SOUTH STREET CONNECTION STUDY
BIDDEFORD, YORK COUNTY, MAINE
TITLE:
ECOLOGICAL RESOURCES
DRAWN BY: P. JACQUES
CHECKED BY: J. BONTA
APPROVED BY: D. CHOQUETTE
DATE: NOVEMBER 2021
PROJ. NO.: 436173.0000.0000
FIGURE 3.6
TRC
5 ASHLEY DRIVE
1ST FLOOR
SCARBOROUGH, ME 04074
PHONE: 207.879.1930
FILE: Lo_Biddeford

APPENDIX 5 – PUBLIC MEETING NOTES

Biddeford Route 111 Transportation Alternatives / South Street Connections Study

Public Meeting

6:00 pm – 7:30 pm, December 14, 2021

Biddeford City Hall Council Chambers

In-Person/Remote ZOOM Access

Staff/Consultants Attending in Person: Mathew Eddy and Nan Whitten, City of Biddeford; Steve Tartre, Maine Turnpike Authority; Dale Doughty and Ian Gorecki, Maine Department of Transportation; Stephanie Carver, Southern Maine Planning and Development Commission; Tom Errico, T.Y. Lin; Carol Morris, Morris Communications

Staff attending via Zoom: Erin Courtney, Maine Turnpike Authority

Public attending: Eight individuals attended in person; 17 more via Zoom

The meeting began at 6 pm.

Mathew Eddy opened the meeting, welcoming the public and explaining the background of the study and what the City of Biddeford and its partners (Maine Turnpike Authority and Maine Department of Transportation) are trying to achieve.

Carol Morris provided instructions on how to comment and ask questions both online and in person, and presented the study's Purpose Statement, explaining that it is a concise statement of the outcomes the study is aiming to achieve – all the potential solutions (called alternatives) will be measured against this statement. It is:

The primary purpose of the proposed action is to relieve congestion and improve safety along Route 111/Route 1 and to support Biddeford's economic development goals. Other desirable outcomes would be to improve connectivity to I-95 via Exit 32, South Street, and downtown Biddeford; improve more direct access to the interstate for Biddeford and Saco through-traffic; and reduce neighborhood traffic impacts. The preferred alternative will be feasible given reasonable available state, local, federal and MTA funding.

Carol then turned the meeting over to Tom Errico, study manager, who gave a 20-minute presentation on Existing Conditions in the study area. The PowerPoint from the presentation can be seen **here** and the more detailed Draft Existing Conditions Report it was drawn from can be found **here.**

Once Tom's presentation was complete, Carol opened the meeting to questions and comments, noting that the purpose of the meeting is to hear from the public, and at the May public meeting, the team will present alternatives for the public to provide specific feedback.

- The first commenter encouraged a good hard look at Transportation Demand Management (TDM) and Transportation Systems Management (TSM) - two of the alternatives presented - advocating a fiscally conservative approach as well as not burdening the state with more road maintenance costs. He reminded the meeting that many of the successes currently taking place in Biddeford harken back to solutions and patterns from earlier times and encouraging additional driving by adding new roads is counter to that. He indicated that creating more road capacity does not solve problems over the long term.
- A resident asked a question about the alternatives presented: In term of no-build, does it include the MTA exit improvement and if so, does that mean that the purpose of that alternative would solely be to assess the impact of a new connector road to South Street. Tom indicated that that was correct, the study assumes the base condition includes programmed improvements, as at Exit 32, and alternatives would be compared to that base condition.
- A resident pointed out that there is a great transit system in Biddeford now but that there is minimal pedestrian infrastructure (sidewalks, crosswalks) to allow people to safely take advantage of it. She asked that the study address this.
- A South Street resident noted that he had been a participant in the earlier York County Connections Study and it was thought at that time that the South Street connection was too expensive and had too much environmental impact. He is a member of the Saco River Land Trust, and he detailed some of the natural resources in the study area close to where a new road might go, including multiple vernal pools and a red maple swamp ecosystem that includes very large tupelo trees that are hundreds of years old. He asked that a 250-foot setback be included to protect these assets. He also expressed concerns about increased taxes to pay for a connector road, and noted how much such a connection would change the character of South Street by increasing the number of vehicles on the road.
- The executive director of BSOOB Transit indicated that he thought the alternatives were reasonable but asked that the study prioritize TDM. He noted the lack of crosswalks and safe bus stops in town and noted that all these contribute to reduced transit use. The ability to invest in transit will not just enhance transit users lives but will reduce vehicle hours and miles. He asked for study members to reach out to his agency as part of their analysis. He also noted the proven existence of induced demand, which shows that larger roads encourage more people to use their automobiles, and indicated he believes that the city should encourage more job growth in Biddeford so people do not have to drive as far.
- A resident expressed concern about existing congestion on South Street, saying it is unsafe now for pedestrians and bicycles; additional vehicles will make this worse. As a cyclist, he feels South Street is scary to ride on and adding more traffic will make it worse. A significant amount of work will be needed to make the road safe for more traffic. Construction of the new water plant will also contribute. Please take this into consideration.
- A resident pointed out that this is adding more pavement, and he believes that is not a popular choice in Maine, based on the previous widening of the Turnpike. People said then that if you build it they will come at high rates of speed – they were right and it will happen here as well. Public infrastructure is a subsidy for business. Downtowns all over the country have emptied out due to the internal combustion engine. He wondered why we are talking about building more road if we are trying to reduce emissions – how is further expanding pavement going to help us with climate change and why do we keep doing things the way we have been before. We have a downtown that has plenty of capacity and people can walk to things. When this idea was proposed before, no one was talking about climate realities. As chair of the Saco Valley Land Trust, he can say they have properties in this area and hope to have more. It is the largest unpenetrated land block in Biddeford. Simply providing corridors for wildlife is not enough.

Carol asked if there were any other comments, and seeing none, thanked everyone for participating.

The meeting ended at 7.00 pm.

Biddeford Route 111 Transportation Alternatives / South Street Connections Study

Public Meeting

6:00 pm – 7:30 pm, June 22, 2022

Biddeford City Hall Council Chambers

In-Person/Remote ZOOM Access

Staff/Consultants Attending in Person: Greg Mitchell and Brian Phinney, Jeff Demers, City of Biddeford; Steve Tartre and Erin Courtney, Maine Turnpike Authority; Ian Gorecki, Maine Department of Transportation; Tom Errico, TYLin; Carol Morris, Morris Communications

Staff attending via Zoom: Stephanie Carver, Southern Maine Planning and Development Commission; Martin Rooney, Maine Department of Transportation.

Public attending: Twelve individuals attended in person; 25 more via Zoom

The meeting began at 6 pm.

Greg Mitchell opened the meeting on behalf of Biddeford, welcoming the public and explaining the background of the study and what the City of Biddeford and its partners (Maine Turnpike Authority and Maine Department of Transportation) are trying to achieve. He noted that as a feasibility study, it is a high level look at whether any of the alternatives are effective enough – in terms of meeting the study purpose – to move ahead with more detailed analysis.

Carol Morris provided instructions on how to comment and ask questions both online and in person, and presented the study's Purpose Statement, explaining that it is a concise statement of the outcomes the study is aiming to achieve – all the potential solutions (called alternatives) will be measured against this statement when deciding whether or not to move ahead. It is:

The primary purpose of the proposed action is to relieve congestion and improve safety along Route 111/Route 1 and to support Biddeford's economic development goals. Other desirable outcomes would be to improve connectivity to I-95 via Exit 32, South Street, and downtown Biddeford; improve more direct access to the interstate for Biddeford and Saco through-traffic; and reduce neighborhood traffic impacts. The preferred alternative will be feasible given reasonable available state, local, federal and MTA funding.

Carol also went over the feedback received to date, both from the December public meeting and online. The study team has heard that:

- *A new road would be ok accompanied by bike/ped/transit*
- *A new road would be good to take pressure off other roads*
- *This road will not work, we need a whole new exit, jobs are north of here*
- *New roads don't solve problems*
- *This road in particular won't work and is costly both in $$ and environmental impacts*

Carol emphasized that infrastructure projects need public support to be funded and noted that there has been no public consensus based on comments so far.

She then turned the meeting over to Tom Errico, study manager, who gave a 25-minute presentation on the traffic data – both current and projected – and how it would be affected by the alternatives included in the study. The PowerPoint from the presentation, which includes this data, can be seen **here** and the more detailed Draft Alternatives Evaluation report it was drawn from can be found **here.**

Once Tom's presentation was complete, Carol opened the meeting to questions and comments. She also explained that comments would be heard alternating between people attending in person and people attending online.

- An individual who lives on South Street said that South Street is already unsafe and loud, with traffic increasing and speeding occurring on a regular basis, and minimal sidewalks for walking. Adding hundreds of cars more a day would ruin what is actually a neighborhood, making it chaotic. He was strongly against diverting more traffic to this road and was already concerned about the proposed Hidden Hills development. He also added that there would be not just more traffic but truck traffic and with the High School, Rotary Park, the dog park on South Street, it would be especially unsafe. He is against any large commercial vehicles using the road.

  Clarification was asked in regards to the traffic numbers - when the study team talks about 300 new vehicles, is that per hour or per day? Tom responded that it was per hour but is comprised of traffic going in both directions. The resident asked if it would be possible to get total numbers so he could understand the comparative increases and decreases. Tom indicated he would do so.

  A resident from River Road asked for information on the Hidden Hills development. Greg Mitchell explained that this is a 200-unit manufactured housing development, located south of South Street off the Water District Road, currently in front of the Planning Board for review. The resident's second comment noted that he travels South Street daily and while traveling the speed limit he is often honked at and passed by other vehicles. He wondered if there could be increased police enforcement on South Street. Greg indicated that he would follow up.

  A resident expressed disappointment in the way the study was developed. He said looking at the Purpose statement, it is clear that the strategy was developed in such a way that only a new road could reasonably fulfill the study purpose, as opposed to the TDM strategies that were outlined earlier in the meeting. He felt this made the new road a foregone conclusion. He expressed general hesitation about a new road that would increase traffic in one of the most dangerous locations in the city, all for the purpose of reducing traffic congestion by a 20-second maximum, with no strategies to improve safety on the local road it would impact. He stated that the large impacts on neighborhood, community, and environmental diversity are concerning. He said the road would break up the largest uninterrupted parcel in the city. He noted that the community has the opportunity to change the dynamic of how we look at and plan for transportation and we are simply continuing the status quo. He believes that on a per vehicle basis, the savings in time compared to the investment in time, process, and money is not favorable.

  Carol responded that while Alternatives 1 and 2 did not jump out as sufficient to fulfill the Purpose of the study, they certainly include worthwhile actions. She also stated that no one in the room would say that a new road was a foregone conclusion.

- A resident from Ward 3 noted that this is a large unpenetrated block in the state focus area. He considers a new road to be a subsidy to business, and not something that will help the average citizen. He has not perceived a change in America's attitude towards its car culture, which is why even a minor decrease in delay is considered a good thing. This new road will have a cascade of negative community impacts, including encouraging major development in a valuable environmental area. It will not be a net positive for the environment and pumping more fossil fuels into the air is not a win.

  He also noted that the meeting was not listed on the city calendar and as a public meeting it should have been.

  Carol apologized, as a city employee had been ill and did not get the meeting on the city calendar in a timely manner as is usual and

expected. She added it had been posted on the study webpage, the city Facebook page, in the newspaper, and via a variable message board on South Street.

- A resident noted that she was similarly disappointed in some aspects of the study and some conclusions were problematic based on limitations of the study. She could not see in Alternative 1 any emphasis on what an improved public transit system could do to improve traffic congestion – a weakness in the study scope. She would like to see more details on how transit could be incorporated – she noted that there was lots of information on active transportation but not transit. She said there was also no discussion of induced demand and reminded the audience that you cannot build your way out of congestion. She had asked for an assessment of induced demand at the December meeting. In terms of managing peak demand, she said she does not believe we should build roads around two hours of peak use every day and is an advocate of regional efforts to address growth –an exit by exit approach does not make sense. She said there is a lot of energy around the Maine Climate Council and the GPCOG Transit Tomorrow Plan, none of which is factored into this study. She noted that because of this, it is designed to make road building make more sense - climate change requires a better approach.

  Carol noted that the resident's comments on the scope of the study are accurate, in at by the time of the December meeting, the study scope had been finalized, but comments heard tonight can be looked at in broader context; city and state officials are here to do so.

- A resident from South Street was disappointed because the study seems to discount the quality of life of people who live on South Street. She concurs with the first gentleman –she walks South Street often – it is busy, though it could take more traffic, and it does get congested closer to Main Street, but she is mostly concerned with the City and state's disregard for people who live on South Street, and that vehicles and "progress" are taking priority over the neighborhood and people who live here.

- A resident of Cathedral Oaks said he had heard of an exit talked about that would be located right at South Street. He thought this would serve the large subdivisions and residents west of Biddeford well and eliminate traffic at Exit 32. It would not have as much environmental impact on the large area of woods as a new road; he also does not think a new road will be very effective in reducing congestion.

  Carol said that looking at a South Street interchange was not in the scope of this study but MTA did look at this option years ago. The feeling at that time was that the geometry of a new interchange there would be very large and because of the proximity to the river, there would be more environmental impact. Steve Tarte, MTA, agreed, adding that there was a high-level look at a new exit in the early 2000s and there were significant right-of-way and environmental issues. This option, of adding onto an existing interchange, was seen as a potentially lower impact option.

- A resident of South Street who owns property that would be impacted based on December information referenced the study goal is to increase safety and decrease traffic. He noted that this is a noble goal, but he does not think this will be the result for people on South Street. The report shows a connector road will increase traffic on South Street, which is already a high crash, high traffic area. Directing additional traffic to the road with no safety mitigation strategies, no improvement strategies identified is a real problem and makes him uneasy. He noted that people have driven off road and crashed into his yard. His family already feels disconnected because there are no sidewalks. He would love to walk to Rotary Park but right now sidewalks only go to Cathedral Oaks. In the study, sidewalks only go to the connector, so this is not for those of us who already live here, it is for potential developments. Finally, his business is in developing shopping centers, and owners/purchasers of these want traffic - why pull it off Rte. 111 and push it into a residential area?

- A resident had several questions – where does Biddeford's Climate Task force sit on this issue? She is disappointed in the City not doing more to support public transit for residents. It is vital that any development should include transportation for those who live in impacted areas. There should be a bus stop for people who live in the South Street neighborhood. She noted that she often travels on all these roads during rush hour, and there is generally no more than a couple of minutes wait at Five Points and Biddeford Crossing – it flows pretty well. A major change like this should be thoroughly thought though before signing on bottom line.

- A South St. resident who lives a mile and a half from the River Rd connection since 1985 has seen lots of change and growth in housing and traffic has increased. Concern is natural resources – both farmland and forest. The new Comp Plan is supposed to develop goals and policies to protect rural areas. He has no confidence that this will be so. A South Street Connecter will draw more development in this area, a large 2,800-acre parcel. He understands the Water Company move and new road was necessary due to flooding and water quality, but it is a shame the way that whole block is being developed. The conclusion looking at this road in 2000 was that it would cause too much environmental damage and was too expensive. The conclusion should be the same this time.

Carol asked if there were any more questions, and seeing none, reiterated that the next meeting would take place in September and that the public could sign up for email updates online. She also emphasized that if anyone wanted to go online to comment on anything, including items outside the purview of the study scope, that would be useful in terms of future planning.

The meeting ended at 7:30 pm.

Biddeford Route 111 Transportation Alternatives / South Street Connections Study

Public Meeting

6:00 pm – 7:30 pm, November 28, 2022

Biddeford City Hall Council Chambers

In-Person/Remote ZOOM Access

Staff/Consultants Attending in Person: Greg Mitchell and Tim Boston, City of Biddeford; Steve Tartre and Erin Courtney, Maine Turnpike Authority; Martin Rooney, Maine Department of Transportation; Tom Errico, T.Y. Lin; Carol Morris, Morris Communications

Staff attending via Zoom: Stephanie Carver, Southern Maine Planning and Development Commission

Public attending: Twenty individuals attended in person; 38 via Zoom

The meeting began at 6 pm.

Greg Mitchell opened the meeting on behalf of Biddeford, welcoming the public and explaining the background of the study and what the City of Biddeford and its partners (Maine Turnpike Authority and Maine Department of Transportation) are trying to achieve. He then introduced Carol Morris as public outreach lead.

Carol provided instructions on how to comment and ask questions both online and in person and noted that tonight's meeting is the final one of three public meetings held throughout the study. She presented the study's Purpose Statement, explaining that it is a summary of the outcomes the study is aiming to achieve – all the potential solutions (called alternatives) will be measured against this statement when deciding whether or not to move ahead with any of the alternatives. It is:

The primary purpose of the proposed action is to relieve congestion and improve safety along Route 111/Route 1 and to support Biddeford's economic development goals.

Other desirable outcomes would be to improve connectivity to I-95 via Exit 32, South Street, and downtown Biddeford; improve more direct access to the interstate for Biddeford and Saco through-traffic; and reduce neighborhood traffic impacts. The preferred alternative will be feasible given reasonable available state, local, federal and MTA funding.

Carol also went over the feedback received to date, both from the December and June public meetings and online. The study team has heard:

- *A new road would be ok accompanied by bike/ped/transit*
- *A new road would be good to take pressure off other roads*
- *A new road would be an easier way to get to the Turnpike*
- *This road will not work, we need a whole new exit, jobs are north of here*
- *New roads don't solve problems*
- *This road is costly both in $$ and environmental impacts*
- *South Street impacts: less safe for bikes/peds, creates noise, discounts quality of life for residents*
- *Add more police enforcement on South Street*
- *Need whole new exit, jobs are north*
- *The P&N favors a new road, insufficient analysis of improved public transit in study*
- *Does not take climate change/Maine Won't Wait into account*
- *The road may destroy natural resources – Comp Plan is supposed to protect rural areas*

She then turned the meeting over to Tom Errico, study manager, to give a 25-minute presentation on the traffic data – both current and projected – and how it would be affected by the alternatives included in the study. The PowerPoint from the presentation, which includes this data, can be seen on the study webpage. A more detailed Draft Final Alternatives Evaluation report, on which the Powerpoint was based, can be found on the study webpage.

As part of the presentation, Tom included three charts that showed an evaluation of Alternative 3, the proposed connector road. The charts are below:

Alternatives Analysis – Alternative 3

Transportation					
Safety Change in volume at HCL's	Level of Service and Delay 1)Rt.111/Exit 32 2)Five Points	South Street Traffic Impact Change in PM volume	May Street Traffic Impact Change in PM volume	Saco-Biddeford Cut Through Traffic	Bicycle and Pedestrian Conditions
7 locations will see reduced volume and 2 locations will see increased volume	Delay decreases from 64s to 58s Delay decreases from 84s to 58s	+100(+200)	-100 (-100)	Some diversion	Provides routing alternative to outer Route 111 and some volume reductions on Route 111, May St. and Elm St.

TYLin

Alternatives Analysis – Alternative 3

Environmental Impacts				
Potential for Impacts to Historic and Archaeological Resources	Potential for Impacts to Vernal Pools/Wetland/Streams	Deer Wintering Area	Potential for Impacts to Constrained Lands	Potential for Impacts to Threatened and Endangered Species
None	Potential for two Vernal Pools to be impacted and the crossing of Thatcher Brook	Potential for 23.3* Acres	Potential for 13.2* Acres (includes land along Water Works Drive)	Potential for impacts to: Insects, Reptiles, Bats, Plants, Fisheries, Deer Yards, and Significant Natural Communities

*approximate as roadway alignment not determined

TYLin

Alternatives Analysis – Alternative 3

Property Impacts	City Planning Policy	Cost		Meet Purpose and Need
Right-of-Way Acquisition	Council Resolve	Total Estimated Cost	Benefit/Cost Measure	
Approximately 5 acres*	Yes	$10,950,000	1.44	Yes

*approximate as roadway alignment not determined

TYLin

Based on the analysis in the charts, Tom noted that the proposed South Street Connector has demonstrated benefits as it relates to:

- Traffic mobility – it improves travel times in several locations.
- Redundancy in the transportation system (there would be more than one route providing access to the Turnpike)
- To some extent, the Connector reduces non-local through-traffic in downtown Biddeford

Based on this, he said the Connector does meet the Purpose and Need Statement. What this means is that according to the study findings, the

Connector should be further evaluated in greater detail to better understand potential impacts to environmental resources and property. He added that as part of this, traffic analysis should be updated to reflect ongoing changes in traffic conditions.

Once Tom's presentation was complete, Carol opened the meeting to questions and comments. She explained that she would alternate between calling on people attending in person and people attending online.

- A resident noted that May Street traffic counts done by city were much higher and to him, 2% growth a year sounds too low. He also wondered if the housing projections used in the study (25 per year) match up with City Council goals. Tom said he would look into these issues and respond on the study website.
    - **Follow-up Note from November 28 Public Meeting:** A resident noted during the meeting that city-collected traffic data showed a 68% increase in traffic between August 2021 and May 2022. Tom Errico, T.Y. Lin Study Manager, promised to look into the data and assess why it is so different than the 1% to 2% annual increase over 20 years used in the study. The city data is below:
        - The Biddeford Police Department conducted a traffic count from August 4, 2021 to August 28, 2021 and recorded 73,271 vehicles. This was over 24 days for an average daily volume of 3,053 vehicles.
        - The Biddeford Police Department conducted a traffic count from May 17, 2022 to June 7, 2022 and recorded 107,958 vehicles. This was over 21 days for an average daily volume of 5,141 vehicles.

      Tom did research to find other similar local data that would provide additional perspective on the two above data points. He found that:

        - MaineDOT conducted a traffic count on May Street north of Route 111 on August 10, 2022 and recorded 5,198 vehicles, which is consistent with the Police Department count.
        - MaineDOT conducted a traffic count on May Street north of Route 111 on September 19 and 20, 2019 and recorded 5,304 vehicles, slightly higher than the 2022 counts.

      Tom's general conclusion is the 2021 count is not consistent with the other three sets of data collected and may have been impacted by COVID travel patterns, system impacts (construction) or equipment malfunction. For data collected during such a short period, it is not uncommon to have wide variations. Looking at the past traffic growth, a 2% annual increase is considered to be on the high side; past studies over the last ten years have typically projected 1-1.5% annual growth.
- A resident asked where would the traffic on a new Connector travel from? East or west? Tom said that it would be a combination: vehicles would originate from the downtown area and head towards Arundel or Market Basket, for example, along with the reverse movement. There would also be increased traffic coming from the west, but less than would originate from the east. Additionally, he added that some people would use Exit 32 instead of Exit 36 in Saco.
- A resident expressed concerns about the safety at the intersection of South Street and Main Street. Tom agreed that this area will need upgrades, whether the Connector is built or not. He noted that the intersection would likely require a geometric improvement as opposed to simply a stop sign.
- A Highland Street resident expressed concern about excessive traffic on South Street resulting from a new Connector. She said that South Street is a narrow road with no room for a bike lane, and the Main Street/South Street intersection needs major reconstruction.
- A resident asked a question about what is included in the $11 million cost quoted in the report. Tom indicated that the cost estimate assumes building the Connector from the one-way ramp off the Turnpike down to South Street, plus, making the ramp two way from the Connector to Route 111. The resident asked what the Biddeford taxpayer share of the cost would be, and Tom indicated that the sources of funding are not yet known.
- A Highland Street resident noted that the street will become an attractive cut-through should the Connector be built, with vehicles traveling at high speeds on a road where many children live. He asked if there would there be mitigating factors, such as a stop sign. Tom indicted that he had not considered those but would do so and include suggestions in the final report.
- A former employee of the City of Saco expressed concern that no discussions with Saco had apparently taken place in terms of regional traffic solutions. He added that MTA should be involved in regional solutions as well. Greg Mitchell indicated that Biddeford and Saco work cooperatively to plan regionally through PACTS, the regional transportation planning organization. This happens on an ongoing basis. Erin Courtney, MTA, added that MTA is committed to helping to solve problems: they have taken over responsibility for the Route 111 traffic lights near Exit 32, and an expansion of Saco's Exit 36 is about to go out to bid, which is a $35-$40 million interchange that resulted from a study like this one three years ago. She added that the 2028 upgrade of the Exit 32 discussed as part of this study is also a Turnpike investment.
- A resident does not support Connector based on the purpose and need – it is saving about 45 seconds going through Five Points and it is an $11 million project for which we do not yet understand the full environmental implications. He said there will be an increase of traffic on South Street – if the Connector decreases safety on that road it does not meet purpose and need. He noted that we would be looking at the economic development goal versus the environmental impact on outstanding natural resources and negative potential effect on the water quality of the Saco River due to increase of impervious surfaces. In the next study he recommends increasing the scope of the next study to look beyond our small border on the impacts of traffic in Saco and neighboring communities, look at how people get to the Turnpike outside of Biddeford, make sure we involve local government and our conservation commission in the decision, have a full natural resources inventory, and develop a mitigation strategy for safety on South Street. He does like some of ideas on additional bike and pedestrian access, but street size is limited. And he added, the actual cost of the project and the cost to residents of Biddeford in current economic climate are a major consideration.
- A resident who lives off South Street reiterated that South Street is essentially a residential street; a lot of children walk it, it carries school buses, has a playing field, a school. It is a street that people use to walk on. In her opinion making this street busier is not worth a 26-second time saving. She hopes there are other solutions to the traffic problems.
- A resident who lives in Ward 1 noted that the City has made many infrastructure improvements to support active transportation, and it appears that based on the maps showing where traffic numbers will increase, those occur where most active transportation improvements are concentrated. This does not seem like there is an alignment between City strategy and regional strategy. Additionally, the Connector encourages people not to stop in Biddeford, and this is also different from past City conversations. We are asking people to make behavior changes in neighborhoods for minimal time savings, he added, saying that he has not heard from anyone living in the study area who would use the Connector, so it is for use of those in upcoming housing or people who are not residents. Any upcoming scope should include analysis of the effect of the Connector on business activity he added. The resident asked if this would be a City-owned or state-owned road. Tom responded that it would be a combination, like South Street, the road would be maintained by the City, but

MaineDOT would have oversight given its likely functional classification – it is not just a local road but important as it relates to traffic getting in and out of the City.

- A resident who lives on Highland expressed concerns that once you build a road, the vernal pools and wildlife are never coming back – and if you decrease traffic on Route 111, the increase goes to South Street and the neighborhoods. She has noticed that Highland is already a cut through – which means a lot of speeding and very little enforcement. With more traffic , she asked how will an already shorthanded police department step up to the need for more enforcement?
- A River Road resident for 25 years pointed out that the Connector seems to benefit Sanford and Arundel but not Biddeford. He asked if elected officials from the City of Biddeford are happy with this proposal and do they feel it is serving the needs of Biddeford? Tom responded that he had been emphasizing the Sanford and Arundel movements in his presentation, but the road provides advantages in terms of getting to the Turnpike from downtown Biddeford as well, so benefits are not just regional but local as well. Greg Mitchell added that he cannot speak for elected officials, but from his perspective, in view of the growth that is happening not just in the downtown but outside the downtown, improving access from Exit 32 directly into the downtown is a benefit to the community.
- A resident noted that it may be a benefit to get people into downtown, but first they have to go down South Street or Route 111 to get there. She said before you build in that beautiful area of wildlife, you should fix the problems: put a traffic circle at May Street, there is a big problem there. The Connector won't do anything good for the people at Highland either. She came tonight with an open mind but now feels it is not right to destroy all that wildlife.
- A South Street resident feels for the people on May Street but that is a wide street with great visibility. People on South Street want to keep their rural living – don't send traffic to downtown through South and Main Streets, Route 1 is supposed to carry that traffic.
- A resident wanted to reiterate what was said at earlier meetings, that the tremendous environmental cost does not come into the cost/benefit analysis. He said there is marginal benefit at a couple of intersections, but induced demand will make that short lived and this proposal is out of line with the City's commitment to addressing climate change. He added that this will facilitate more cars and SOVs, we need a smarter regional approach that do not simply enhance the status quo of more cars. He supports the previous regional approach to transit combined with transit alternatives, he is not in favor of Alternative 3.
- A resident from Ward 3 noted that the projections are at odds with traffic done by Biddeford – the projected growth estimates used here are wildly conservative. He said that Biddeford is gentrifying at warp speed and a previous study looking at this kind of spur serving Sanford was turned aside because of environmental concerns that are now being swept away. He added that the council voted, and it did pass, but by one vote, and the council is known to be eager to build out Biddeford. He said the Connector will facilitate more growth in Biddeford, and increasingly in areas that serve an environmental function, and which create a past that those who have lived here all their lives value. Finally, he noted that the new road does not take climate change into account.
- A resident said the presentation included the comment that in a benefit/cost ratio, anything over 1 is worth looking at, but this ratio is barely over 1. Tom noted there are no hard and fast rules, but in the recent Saco study that resulted in the expanded interchange, the benefit/cost ratio came in at less than 2, so they vary.
- A resident suggested that the MTA eliminate tolls between Saco and Biddeford to make it more attractive for people to take the Turnpike from Saco to get to Biddeford Crossing – this would relieve traffic on local roads and downtown.
- A resident asked if the current developments off South Street and Andrews Road are approved and noted that they will produce traffic on the roads in question – on the outskirts of town – regardless of whether the Connector is built. Greg Mitchell responded that the developments are at the planning board process, and both require traffic studies that are available to the public.
- An Alfred Street resident has concerns about pushing safety issues further up Route 111, adding that that section is very dangerous today and tens of thousands of cars come past his driveway, more will come down Andrews Road and the angle of the sun is a hazard spring and fall. Tom noted that that intersection is not part of this study but that the Andrews Road development requires a traffic movement permit study, currently in review by the City – which will define the intersection improvements required as part of this development. And, he said, when the Turnpike connects to that roadway in 2028, more improvements would likely be done by MTA to manage the additional traffic. Tom added that all the concerns the resident mentioned are accurate and will be considered.
- A resident wanted to reemphasize what a previous commenter said about induced demand: all the positives shown in the study will encourage more driving, as it makes it more efficient for people to travel by car. He asked if induced demand and latent demand were considered and asked the City to elevate consideration of mass transit on the road and train tracks. Tom responded that the regional travel demand model does factor induced demand trends into its calculations by including local changes in development and driving patterns.
- A resident reminded listeners that the York County Connections Study a decade ago made the finding that this Connector was too expensive and too costly environmentally, but that new potential developments are the nail in coffin for natural resources in this section of Biddeford. He added that as he said at an earlier meeting, the goal of Biddeford's Comprehensive Plan is to devise strategies to protect farmland and forest, but this option increases development pressure in rural Biddeford and is contrary to the goals of the Comprehensive Plan.
- A final speaker came to the microphone to state that he was not for or against this proposal, but as a local real estate broker, he observes that people move to Maine because they want a slow pace and a safe place to live. He noted that 1,000 houses a year are sold in Biddeford, the vast majority to people from out of state. Maine is not a secret, he said, millions visit every summer and a lot want to come back here to live. This will continue and it is a challenge that must be addressed by every town and every citizen who lives in the state – it is a long-term challenge.

Carol thanked everyone for providing such a diverse and impassioned set of comments. She noted that the public has until December 9 to comment. The final report will be out by the end of December, and then the City will decide whether to adopt recommendations and to approach MTA and MaineDOT to implement the study recommendations.

The meeting closed at 7:30 pm.

APPENDIX 6 – COST ESTIMATES

ALTERNATIVE	3
Travel Lane width	12
Number Lanes	2
Shoulder width	5
Total Pavement Width	34
Total Avg Footprint Width	88*
Total Length	6370
Sidewalk width	5
number sidewalks	2
total width of sidewalk	10

*Footprint width assumes average HOF to be 2', with a 30" depth to subgrade, open drainage 1' below subgrade, 4:1 inslopes and 2:1 backslopes

Pavement

Length	6370 Ft	
Depth	0.5 Ft	
Width	34 ft	
Volume	108290 CF	
	4010.740741 CY	
Mass Factor	1.98 Ton/CY	
Mass	7941.266667 Tons	
Say	8000 Tons	
	$ 125.00	
	$ 1,000,000.00	

Gravel

Length	6370 Ft	
Section SA	92.11 SF	
Volume	586740.7 CF	
	21731.13704 CY	
Say	21800 CY	
	$ 40.00	
	$ 872,000.00	

Clearing

Area	637000 SF	
Area	14.62350781 Acres	
Say	15 Acres	
	$ 15,000.00	
	$ 225,000.00	

Excavation

Assume 1.25x gravel quantity

Volume	27163.9213 CY	
Say	27200 CY	
	$ 38.00	
	$ 1,033,600.00	

South Street Intersection

Assume Price

Signal	$300,000	
Widening	5950 SF	
Assume	$ 22.00	per sf
	$130,900.00	

Exit 32 Connector Road Intersection

Assume Price

Signal	$300,000	
Widening	10880 SF	
Assume	$ 22.00	per sf
	$239,360.00	

Sidewalk

Assume sidewalk from Exit 32 Connector to South Street

Length	6370 Ft	
2 sides	2	
Cost per F	$ 150.00	
Total	$1,911,000.00	

SUB TOTAL =	$ 6,011,860.00
20% contingenc	$ 1,202,372.00
20% MOT	$ 1,202,372.00
PE	
PE & CE	$1,600,000
ROW	$ 240,000.00
TOTAL =	$10,256,604.00
Round =	**$ 10,260,000.00**

*Construction Costs only in 2022 Dollars

Pavement

Length	3100	ft
Depth	0.5	Ft
Width	17	ft
Volume	26350	CF
	975.9259259	CY
Mass Fact	1.98	Ton/CY
Mass	1932.333333	Tons
Say	1950	Tons
	$ 125.00	
	$ 243,750.00	

Gravel

Length	3100	Ft
Section SA	92.11	SF
Volume	285541	CF
	10575.59259	CY
Say	10600	CY
	$ 40.00	
	$424,000.00	

Clearing

Length	3100	Ft
Assume	50	Ft clearing limit
Area	155000	SF
Area	3.558310376	Acres
Say	3.75	Acres
	$ 15,000.00	
	$ 56,250.00	

Excavation
Assume 1.25x gravel quantity

Volume	13219.49074	CY
Say	13500	CY
	$ 38.00	
	$ 513,000.00	

Andrews Road Intersection
Assume no additional work to be done at Andrews Road

Signal		
Widening		SF
Assume	$ 22.00	per sf
	$ -	

Sidewalk
Assume sidewalk from South Street Connector to Andrews Road

Length	0	Ft
Cost per Ft	$ 150.00	
Total	$ -	

SUB TOTAL =	$ 1,237,000.00
20% contingency	$ 247,400.00
20% MOT	$ 247,400.00
PE/CE	$ 350,000.00
TOTAL =	$ 2,081,800.00
Round =	**$ 2,100,000.00**

*Construction Costs only in 2022 Dollars