FINAL REPORT

Saco Route 112/Exit 36 Area Transportation Study

Prepared: July 22, 2019

CITY OF Saco

MaineDOT

MAINE TURNPIKE

T·Y·LIN INTERNATIONAL

ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

The Purpose of the Study is to evaluate and identify long-term solutions to regional transportation issues in the vicinity of Exit 36 of I-95. Specifically, the purpose of the Study is to evaluate the potential for managing and improving access to Route 112, making safety improvements at intersections, maintaining and improving easy access to and from the Turnpike, and separating local and through traffic as much as practicable. Recommendations are subject to foreseeable funding and in the context of safety and mobility needs statewide.

The Study documents existing conditions and evaluates Alternatives that address transportation congestion and safety deficiencies. Alternatives were evaluated based on transportation measures, environmental resources, land use, cost and funding and property impacts. Ultimately both Short and Long-term improvements were identified.

EXISTING CONDITIONS SUMMARY

- The Turnpike is the busiest roadway in the study area. Route 112 west of Industrial Park Road carries the highest volume on a non-freeway facility other than on Route 1 north of downtown Saco.
- Travel time surveys were conducted during both AM and PM peak hours. Route 112 from Jenkins Road to Industrial Park Road experienced the highest average morning travel time. The segment from Industrial Park Road to the I-195 westbound ramps experienced the highest average afternoon travel time. The highest travel time overall was approximately 15 minutes between Jenkins Road and Industrial Park Road.
- The Route 112/I-95 Exit 36 area experiences significant congestion. Spring Street, Franklin Street, Tasker Street, Industrial Park Road, Garfield Street, Lund Road, Jenkins Road, and the I-195 Eastbound Ramps all have approaches below an acceptable Level of Service.
- The peak hours in the corridor occur between 7:30-8:30 AM and 4:45-5:45 PM. These peak hours are driven largely by commuters destined northbound on I-95 in the morning and returning southbound from I-95 in the afternoon.
- The intersections of Route 112/Jenkins Road, Route 112/Garfield Street, Route 112/Industrial Park Road, Route 112/Spring Street, Route 112/Elm Street and Route 112 between Lund Road and Garfield Street are all high crash locations.
- The Exit 36 I-95 northbound On-Ramp and the southbound Off-Ramp have unacceptable Levels of Service. The I-195 Ramps at Industrial Park Road operate at acceptable levels of service when considered in isolation. During the PM peak hour, the eastbound Off-Ramp experiences backups from the Industrial Park Road traffic signal. During the AM peak hour, the westbound On-ramp experiences delay from toll plaza lane movements.
- Key deficiencies for cyclists and pedestrians in the study area include; No sidewalks on Route 112 to the east of Chantelle Way; There are no crosswalks across Route 112 from Jenkins Road to Tasker Street, although crosswalks at Industrial Park Road will be added soon; Minor intersections often lack crosswalks; and Industrial Park Road has no sidewalks with partial shoulders.

ALTERNATIVES EVALUATED

A1 - TRANSPORTATION DEMAND MANAGEMENT/TRANSIT IMPROVEMENT STRATEGIES (TDM):

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 ride share programs, park and ride lots (which can support rideshare programs), and work from home opportunities, all of which either make it easier to rideshare or to stay off the road altogether.

A2 - TRANSPORTATION SYSTEM MANAGEMENT IMPROVEMENTS (TSM):

Transportation Systems Management (TSM) addresses the capacity and safety deficiencies of the system. TSM improvements can be made alone or in addition to other improvements.

A3 - EXTENSION OF I-195:

Consists of extending I-195 from Exit 36 of the Maine Turnpike to Route 112 west of the Middle School. It does not include a vehicle connection to Jenkin Road. See **Figure ES.1**. The Cloverleaf Interchange Configuration was determined to be a feasible configuration from a traffic operations and design perspective. This configuration utilizes collector-distributer roads to minimize the impact of weave sections associated with cloverleaf interchanges.

A4 - MODIFICATION OF EXIT 36:

Consists of providing full Turnpike access at Route 112 with a collector-distributor roadway on the Turnpike between Route 112 and Exit 36. See **Figure ES.2**. Access to the Turnpike is to be provided at Lund Road (with signals) and at a new signalized intersection west of the Turnpike. The new interchange will be linked to the existing Exit 36 interchange using collector-distributor roads to eliminate the risks associated with weave movements.

A5 - ROUTE 112/ROUTE 5 CONNECTOR ROAD:

Consists of a new roadway between Route 112 and Route 5 just west of the Middle School. See **Figure ES.3**. This alternative is intended to reduce traffic through residential neighborhoods by creating a convenient link between Route 5 to Route 112 and vice versa.

A6 - MODIFICATION OF EXIT 36 AND ROUTE 112/ROUTE 5 CONNECTOR ROAD:

Implementing both Alternatives 5 and 6. See **Figure ES.4**.

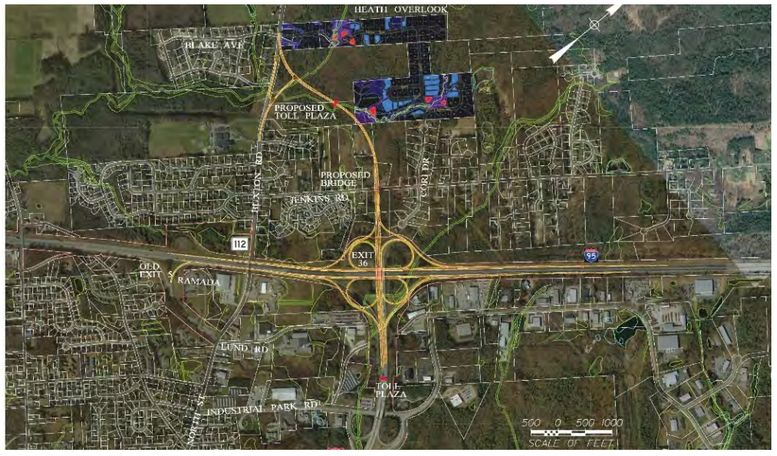


Figure ES.1: A3 - Extension of I-95

Figure ES.2: A4 - Modification of Exit 36

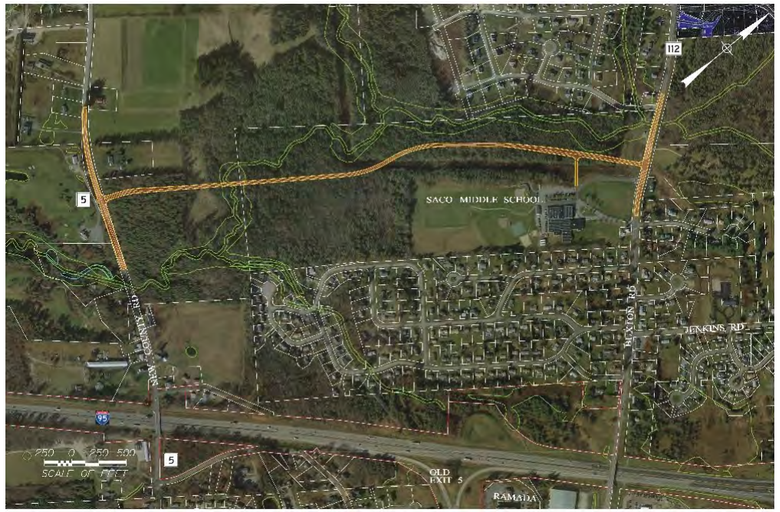


Figure ES.3: A5 - Route 112/Route 5 Connector Road

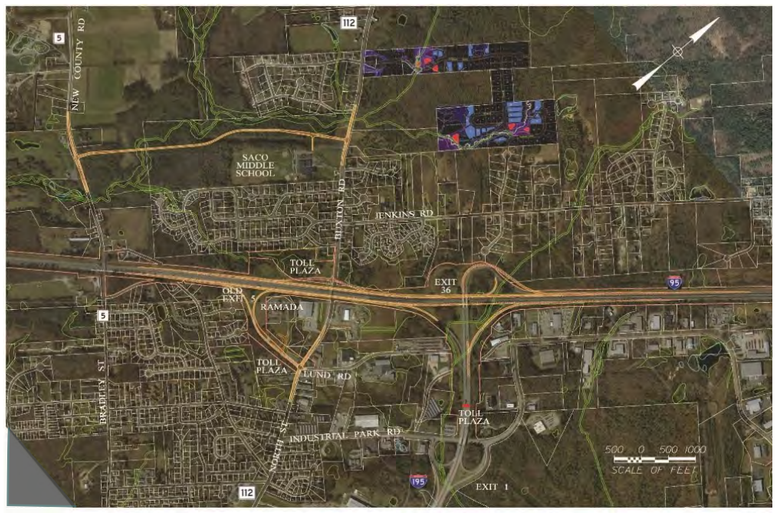


Figure ES.4: A6 - Modification of Exit 36 and Route 112 Route 5 Connector

ALTERNATIVES EVALUATION CONSIDERATIONS

The evaluation of Alternatives was based on the following criteria.

TRANSPORTATION MEASURES

- Vehicle Miles Traveled (VMT) – The number of miles traveled during the AM Peak Hour on non-Interstate highways in Saco. An increase in VMT for an alternative could indicate that motorists are following longer, but faster, routes for their trips; a decrease in VMT for the alternative could indicate more direct routes are being provided and are being utilized.
- Vehicle Hours Traveled (VHT) – The number of hours driven by vehicles during the AM Peak Hour on non-Interstate highways in Saco. Because all of the alternatives are designed to reduce traffic congestion at one or more locations, VHT decreases for each alternative because shorter travel times are produced for some travel patterns.
- Improves Level of Service and Delay at Key Local intersections – Number of study area intersections where LOS is improved.
- Potential to Reduce Traffic on Garfield Street - Change in traffic volumes during the AM and PM peak hours between 2040 No-Build and Alternative conditions.
- Potential to Reduce Traffic on Neighborhood Streets – Change in traffic volumes during the AM and PM peak hours between 2040 No-Build and Alternative conditions on Tasker Street, Franklin Street and Spring Street.
- Industrial Park Road Traffic Volume – Change in total AM and PM peak hour volume between 2040 No-Build and Alternative conditions.
- Route 112 Traffic Volume east Lund Road - Change in total AM and PM peak hour volume between 2040 No-Build and Alternative conditions.
- Route 112 Traffic Volume west of Turnpike - Change in total AM and PM peak hour volume between 2040 No-Build and Alternative conditions.
- Potential for Improving Bicycle and Pedestrian Conditions – Consideration of traffic volume levels and roadway capacity expansion which likely degrades bicycle and pedestrian conditions.

LAND USE MEASURES

- Number of Homes/Buildings with Direct Impact – as noted.
- Number of Private Lots Impacted – as noted.
- Compatible with Comprehensive Plan – The following are relevant implementation strategies from the 2018 Comprehensive Plan Update were reviewed qualitatively.
- Potential for Farmland Impact – Does the Alternative directly impact farmland.

ENVIRONMENTAL RESOURCE MEASURES

- Potential for Impacts to Archeological and Historic Resources – Impact to identified resources.
- Potential for Wetland 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 – Impact to identified resources.

COST AND FUNDING MEASURES

- Construction Cost - This total is the construction cost and includes design, construction engineering and right-of-way.
- Construction Funding Viability – Ability to obtain funds given overall magnitude and Agency responsibility.
- Benefit/Cost Measure – A benefit-cost analysis was performed to measure economic advantages (benefits) and disadvantages (costs) for each alternative.

PURPOSE AND NEED

Is the study purpose addressed using this alternative?

"Evaluate and identify long-term solutions to regional transportation issues associated with westerly connections from I-95 in the vicinity of Exit 36. Specifically, the purpose of the Study is to evaluate the potential for managing and improving access to Route 112, making safety improvements at intersections, maintaining and improving easy access to and from the Turnpike, and separating local and through traffic as much as practicable. Recommendations are subject to foreseeable funding and in the context of safety and mobility needs statewide."

Table ES.1, on page 4, provides a qualitative comparison of Alternatives using some of the noted criteria. Alternative A6 provides the greatest benefits when considering the study purpose and need.

RECOMMENDATIONS

Recommendations were identified for possible improvements that could be implemented in 2 to 5 years (short-term) and long-term improvements that are likely in a 10+ year horizon. The short-term improvements were identified as part of the Transportation System Management Alternative. Based upon the purpose and need, technical analysis and public feedback the following improvements are recommended for further consideration.

SHORT-TERM IMPROVEMENTS

ROUTE 112/JENKINS ROAD

Based upon existing safety and vehicle delay it is recommended the following be implemented.

- Installation of a traffic signal
- Construction of a dedicated left-turn lane on the Route 112 eastbound approach
- Widening of the Jenkin Road approach for left and right-turn lanes
- Implementation of access management improvements at the Hillview Market
- Consider closing the Hillview Avenue roadway. This should be evaluated during the design process.

Cost: $820,000

ROUTE 112/GARFIELD STREET

Based upon existing safety and vehicle delay it is recommended the following be implemented.

- Prohibit left-turn movements from Garfield Street
- Prohibit left-turn movements onto Garfield Street
- To accomplish the turn prohibitions, installation of a raised channelization island on Garfield Street and an island or treatment on Route 112 should be constructed. Traffic may divert to other neighborhood streets and therefore a local traffic monitoring and management plan shall be included.

Cost: $90,000

ROUTE 112/FRANKLIN STREET

Based upon existing congestion issues and the proximity of the intersection midway between downtown and Industrial Park Road it is recommended the following be implemented.

- Installation of a traffic signal
- Provision of dedicated left-turn lanes on the Route 112
- Restripe Route 112 between Franklin Street and Tasker Street to provide a three-lane section and accommodate vehicle turns into General Dynamics and Central Fire Station. The curb-to-curb width is approximately 43 feet and it is recommended that three 11-foot lanes and 5-foot shoulders be provided. On-street parking will need to be prohibited in this section.

Cost: $570,000

MONITOR THE ROUTE 112/SPRING STREET INTERSECTION

This location should be monitored following the installation of a traffic signal at the Franklin Street intersection. If the monitoring study determines that existing safety and vehicle delay is not improved, it is recommended the following be implemented.

- Installation of a traffic signal
- Construction of a dedicated left-turn lane on the Route 112 westbound approach
- Widening of the Spring Street approach for left and right-turn lanes

Cost: $820,000 (Study Cost $15,000)

LONG-TERM IMPROVEMENTS

Based on the Alternatives Analysis and Purpose and Need the Modification of Exit 36 and the Route 112/Road 5 Connector Alternative (A6) should be further explored for implementation. The following details the improvements.

MODIFICATION OF EXIT 36

Consists of providing full Turnpike access at Route 112 with a collector-distributor roadway on the Turnpike between Route 112 and Exit 36. Access to the Turnpike is to be provided at Lund Road (with signals) and at a new signalized intersection west of the Turnpike. The new interchange will be linked to the existing Exit 36 interchange using collector-distributor roads to minimize the risks associated with weave movements between motorists entering and exiting the Turnpike. It is noted that it may be possible to construct the collector distributor roads in phases at a later date when traffic volumes are predicted to negatively influence weave conditions.

ROUTE 112/LUND ROAD/NEW NORTHBOUND TURNPIKE RAMPS

The introduction of a new access point on Route 112 for Maine Turnpike northbound on and off movements will require improvements. The improvements will consist of the following:

- Installation of a traffic signal
- Providing turn lanes on Route 112
- Widening Lund Road
- Widening the existing Part & Ride approach
- Providing a new Park & Ride lot to replace the existing lot at the Ramada Inn entrance. The lot will be designed to allow for future expansion to be phased based on projected need.

ROUTE 112/NEW SOUTHBOUND TURNPIKE RAMPS

The introduction of a new access point on Route 112 for Maine Turnpike southbound on and off movements will require improvements. The improvements will consist of the following:

- Installation of a traffic signal
- Providing turn lanes on Route 112

Cost: $38,000,000

ROUTE 112/ROUTE 5 CONNECTOR

Consists of a new roadway between Route 112 and Route 5 just west of the Middle School. This alternative is intended to reduce traffic through residential neighborhoods by creating a convenient place for traffic to move from Route 5 to Route 112 and vice versa.

Cost: $5,000,000

IMPLEMENTATION

It is recommended that the Modification of Exit 36 be implemented first. Given right-of-way needs and local coordination with possible school expansion plans, the Route 112/Route 5 Connector should be implemented under a separate schedule

TABLE ES.1 - Qualitative Comparison of Alternatives

Impact Description	A1 Transportation Demand Management (TDM)	A2 Transportation System Management (TSM)	A3 Extension of I-195	A4 Modification to Exit 36	A5 Route 112/ Route 5 Connector	A6 Modification of Exit 36 and Rte.112/Rte. 5 Connector
Reduce Traffic on Route 112 between Turnpike and Jenkins	●	●	✚	▬	✚	✚
Reduce Traffic on Route 112 near Industrial Park Road	●	●	✚	✚	✚	✚
Reduce Traffic on Industrial Park Road	●	●	✚	✚	●	✚
Potential to Reduce Traffic on Garfield Street	●	●	✚	●	✚	✚
Reduce Traffic on Neighborhood Streets East of Industrial Park Road	●	●	✚	✚	✚	✚
Potential to Improve Bicycle and Pedestrian Conditions	●	▬	✚	✚ ▬	▬	✚ ▬
Property Impacts	●	▬	▬ ▬	▬	▬	▬
Environmental Impacts	●	●	▬	▬	▬	▬
Funding Viability	▬	▬	▬ ▬	✚	▬	✚ ▬
Meet Purpose and Need	▬	▬	✚	✚	▬	✚
COST	N/A	$9.7M	$63M	$38M	$9.6M	$43.5M

LEGEND
No Change: ●
Minor Negative Outcome: ▬
Minor Positive Outcome: ✚
Positive Outcome: ✚
Negative Outcome: ▬

1.0 INTRODUCTION

1.1 STUDY BACKGROUND

The City of Saco, Maine Turnpike Authority (MTA) and Maine Department of Transportation (MaineDOT) have been working collaboratively for years to address regional transportation issues in the vicinity of Exit 36 of I-95. Previous studies and reports have identified high crash locations, intersections operating at unacceptable levels of service, safety issues on local streets as cut-through traffic seeks alternate routes and traffic backing up through the MTA toll plaza and even on the main line. In late 2016, Saco approached the MTA and MaineDOT to evaluate long-term solutions to mitigate traffic congestion approaching I-95 Exit 36 from the west including Interchange improvements and a new tolled controlled access connector road.

1.2 STUDY AREA

The study area as depicted on **Figure 1.1** generally comprises of Route 112 from Route 1 to Louden Road; Industrial Park Road from Route 112 to I-195; I-195 from Route 1 to the Maine Turnpike; and the Maine Turnpike in the Exit 36 area

1.3 STUDY PURPOSE AND NEED

STUDY PURPOSE

The Purpose of the Study is to evaluate and identify long-term solutions to regional transportation issues associated with westerly connections from I-95 in the vicinity of Exit 36. Specifically, the purpose of the Study is to evaluate the potential for managing and improving access to Route 112, making safety improvements at intersections, maintaining and improving easy access to and from the Turnpike, and separating local and through traffic as much as practicable. Recommendations are subject to foreseeable funding and in the context of safety and mobility needs statewide.

STUDY NEED

Previous studies and reports have identified high crash locations, intersections operating at unacceptable levels of service, safety/ livability issues on local streets as cut-through traffic seeks alternate routes and traffic congestion at the MTA toll plaza and on mainline I-95. Additionally, Route 112 lacks bicycle and pedestrian amenities.

Specific deficiencies include:

Route 112 Corridor Study Update:

- Poor Levels of Service (LOS) at all Route 112 intersections (except Middle School and Louden Road)
- Poor LOS at Industrial Park Drive/I-195 WB Ramp
- Long vehicle queues at Industrial Park Road/I-195 Ramps
- Two High Crash Locations (Route 112/Garfield Street and Route 112/ Franklin Street). Route 112/Industrial Park Road is nearly a HCL
- No shoulder or bicycle lanes and limited pedestrian accommodations

MTA Needs Assessment –Safety and Capacity, May 2016:

- HCL at Toll Plaza to I-195 Exit 1
- Exit 36 SB off diverge LOS E/F in future
- Exit 36 SB off ramp LOS E/F in future
- Exit 36 NB on-ramp Merge LOS E/F in future

STUDY ALTERNATIVE COMPARISON MEASURES

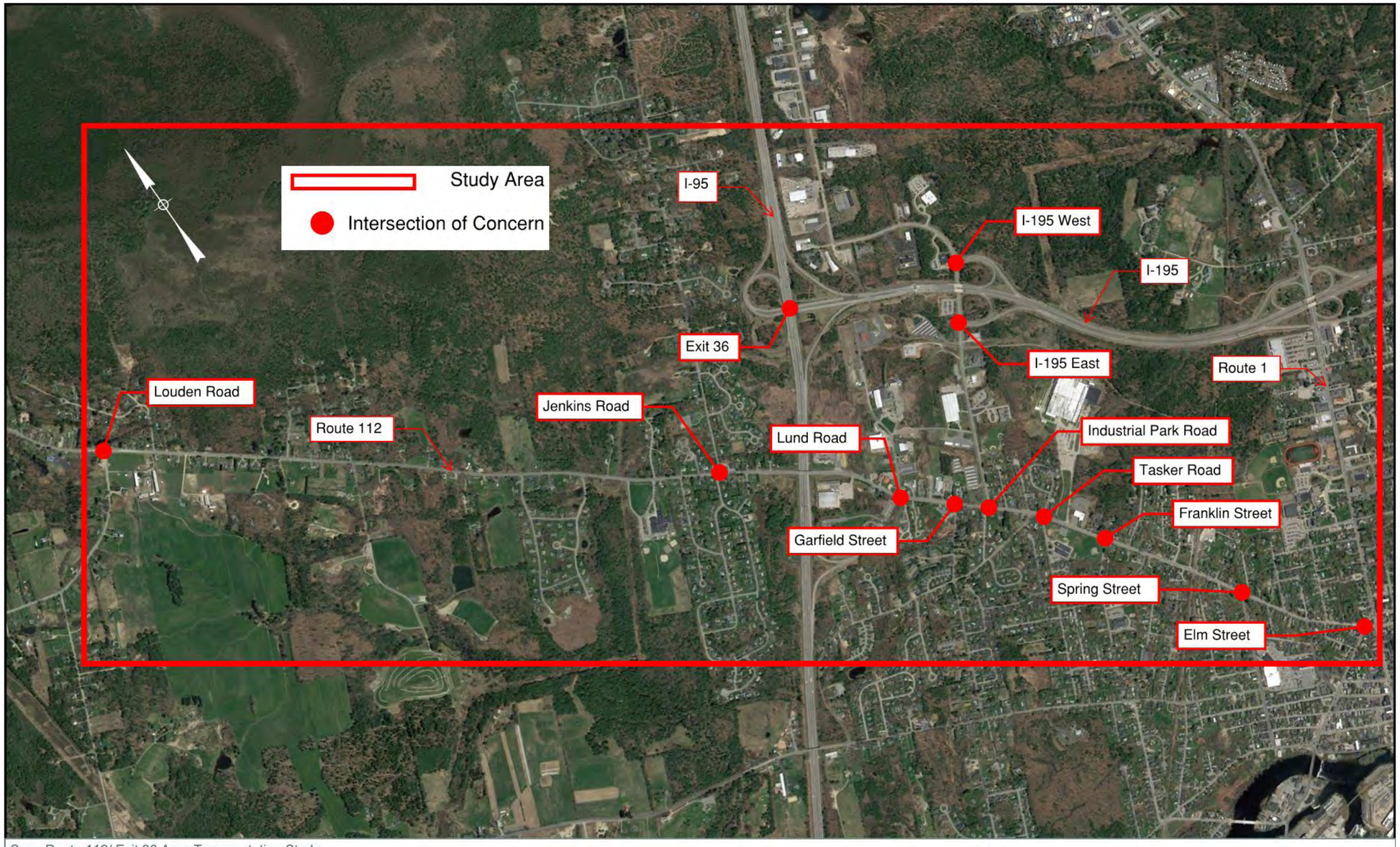
The following measures were used to evaluate Alternatives.

- Transportation Efficiency Improved over existing condition (Vehicle hours traveled (VHT)/Vehicle Miles traveled (VMT))
- Safety Improved over existing condition
- Traffic Operations Improved over existing condition (LOS/Delay)
- Turnpike Maintenance Costs
- Construction Cost Estimate
- Environmental/Cultural Resources
  - » Wetlands
  - » Water Quality
  - » Floodplain Aquifer
  - » Farmland and other open space (e.g. parks, schools, land trust properties, 4f land)
  - » Rare, Threatened, Endangered Species/Habitat
  - » Historic & Archaeological Resource
- Permitting (feasibility/difficulty, costs, timeline)
- Hazardous Materials
- Funding Viability
- Analysis of Benefit/Cost

1.4 ADVISORY COMMITTEE

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

ADVISORY COMMITTEE MEMBERS	
Joe Laverriere	City of Saco
Pat Fox	City of Saco
Bruce Van Note	MaineDOT
Nate Howard	MaineDOT
Ed Hanscom	MaineDOT
Ralph Norwood	MTA



Saco Route 112/ Exit 36 Area Transportation Study
Figure 1.1 - Study Area

2.0 EXISTING TRANSPORTATION CONDITIONS

2.1 EXISTING TRANSPORTATION DATA SOURCES

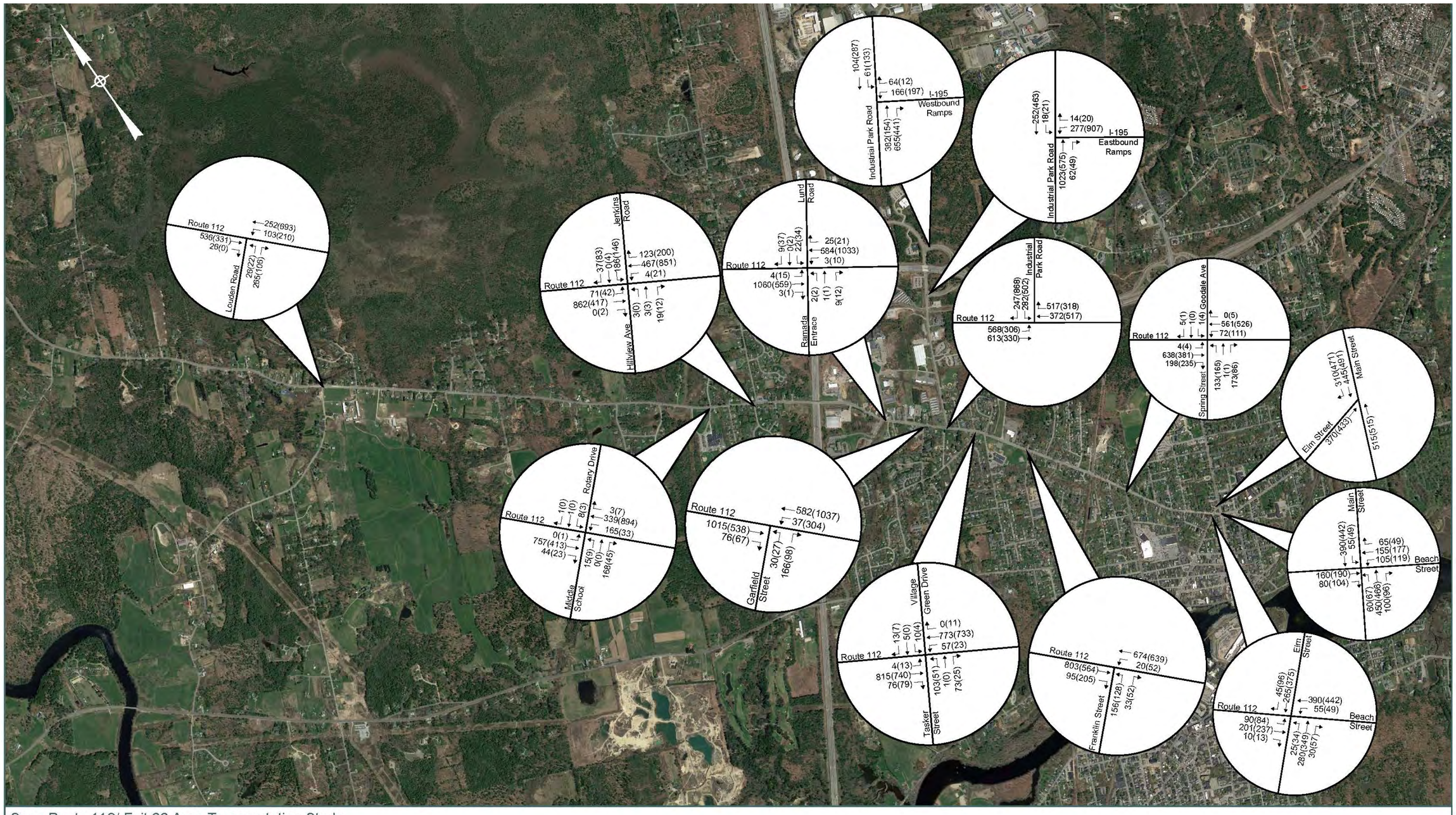
RELATED STUDIES:

- Route 112 Corridor Study, September 2005
- Destination Tomorrow Linking Our Communities – Advancing Our Region, 2006
- Tri-Community Transportation Study, 2009
- Saco Comprehensive Plan, 2011
- Gorham East/West Corridor Feasibility Study, 2012
- Central York County Connections Study
- Maine Turnpike Authority Needs Assessment, 2016
- Preliminary Interchange Justification Report, 2013
- Maine Turnpike Authority Ten Year Planning Report, 2014
- Maine Turnpike Authority 4 Year Capital Investment Plan, 2017-2020
- Route 112 Corridor Update Study performed by Gorrill-Palmer, latest revision May 2015
- Route 112/Route 1 (VHB Signal Project)
- Maine Turnpike Authority Policy for Initiating Studies of Existing and New Interchanges and Access Roads

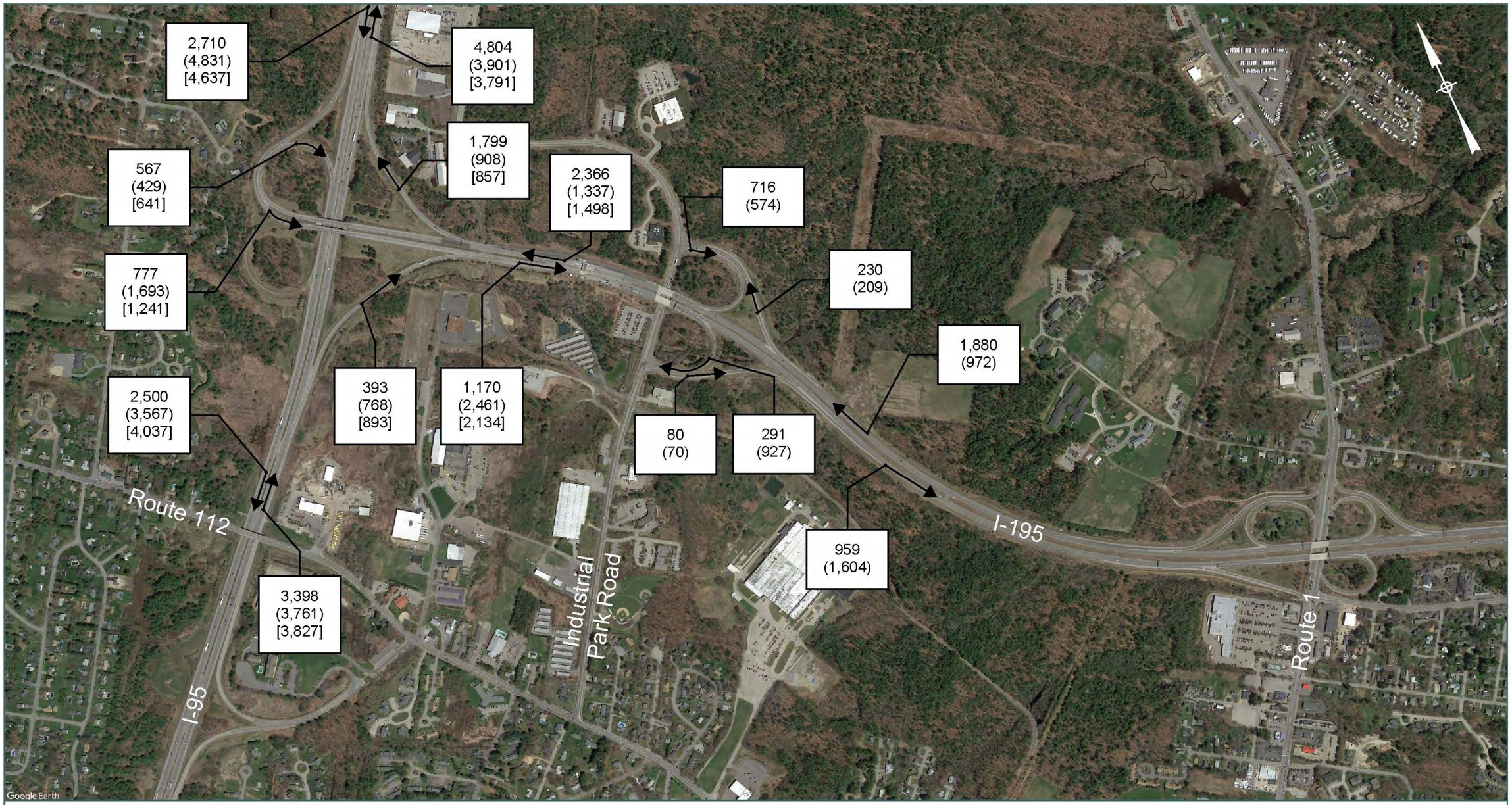
2.2 TRAFFIC VOLUMES

HOURLY TRAFFIC VOLUMES

Intersection turning movement counts were conducted at key intersections in the study area in 2014 with some locations updated in June 2018. **Figure 2.1** presents the Weekday AM and PM peak hour traffic volumes. Traffic volumes in 2014 were collected during January, April, May and August and adjusted to reflect Design Hour or summertime conditions. In addition to intersection turning movements counts, hourly traffic volumes at Turnpike Exit 36 and on I-195 from Industrial Park Road to Route 1 were obtained. Traffic volumes on I-195 were collected by MaineDOT in August 2016 and the Weekday AM and PM peak hours are depicted in **Figure 2.2**. At Exit 36, Design Hour traffic volumes were estimated from MTA 2017 data. Weekday AM and PM peak hours and for the Friday Afternoon peak hour, where mainline Turnpike volumes control traffic operating conditions are illustrated on **Figure 2.2**.



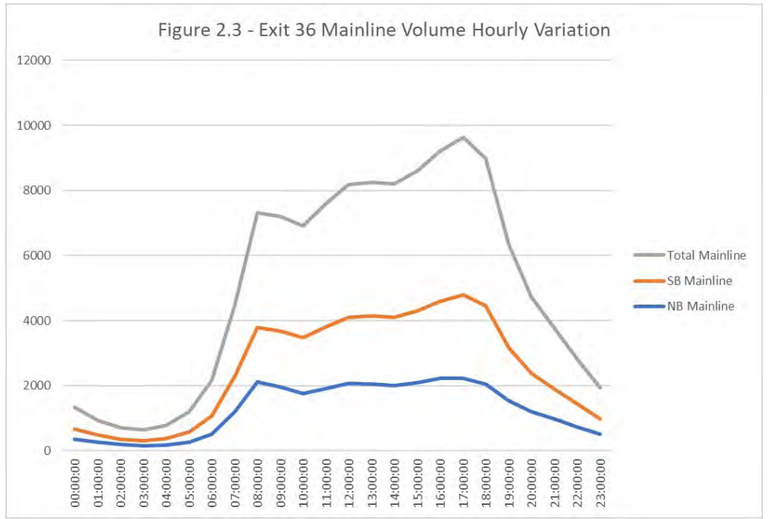
Saco Route 112/ Exit 36 Area Transportation Study
Figure 2.1 - Existing Turning Movement Volumes
XXX - Weekday AM Peak Hour
(XXX) - Weekday PM Peak Hour

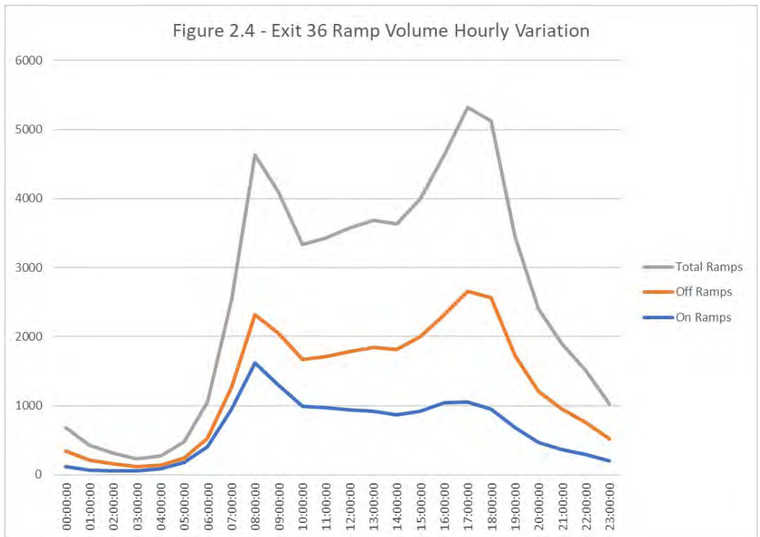


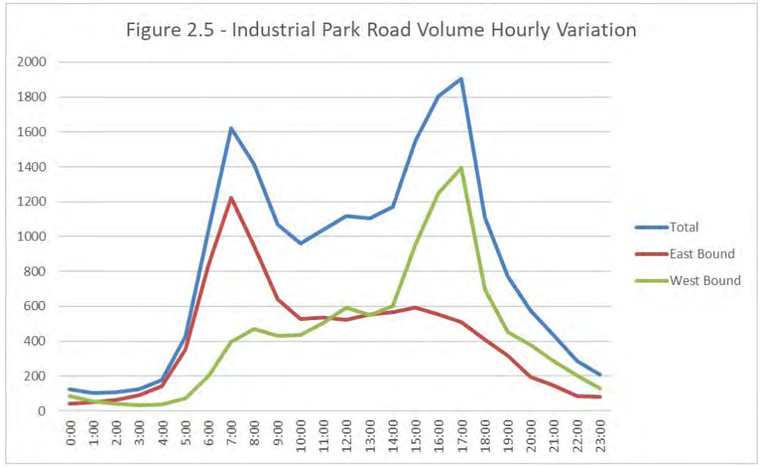
Saco Route 112/ Exit 36 Area Transportation Study
Figure 2.2 - Existing Peak Hour Volumes
XXX - Weekday AM
(XXX) - Weekday PM
[XXX] - Friday Afternoon

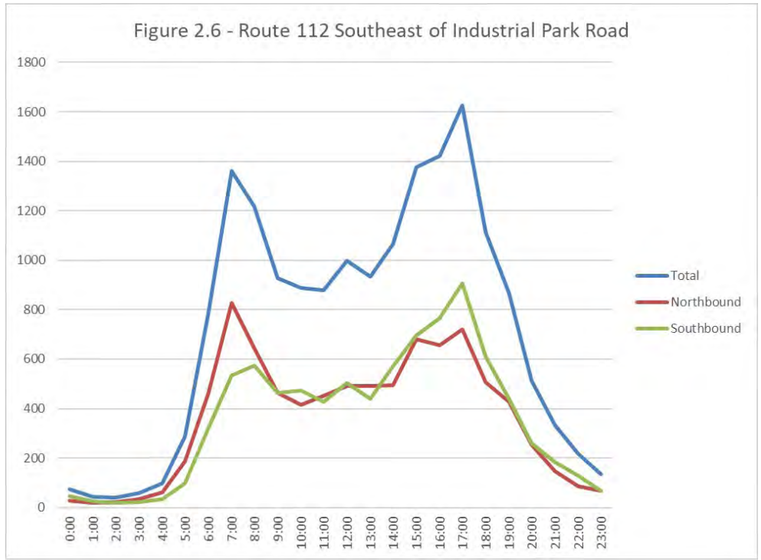
HOURLY TRAFFIC VOLUME VARIATION

A review of hourly traffic volume variation was investigated to understand how traffic volume levels change throughout the day. A review of traffic volumes over a 24-hour period was performed for Route 112 east and west of Industrial Park Road; Industrial Park Road; for the Maine Turnpike and I-195. **Figures 2.3 - 2.6** illustrate the traffic volume variation. As illustrated, there are distinctive AM and PM volume peaks that correspond to commuter time-periods.

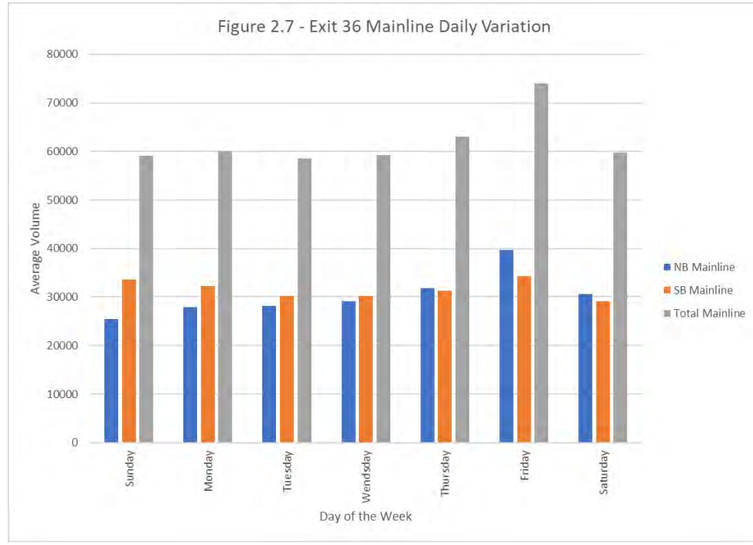


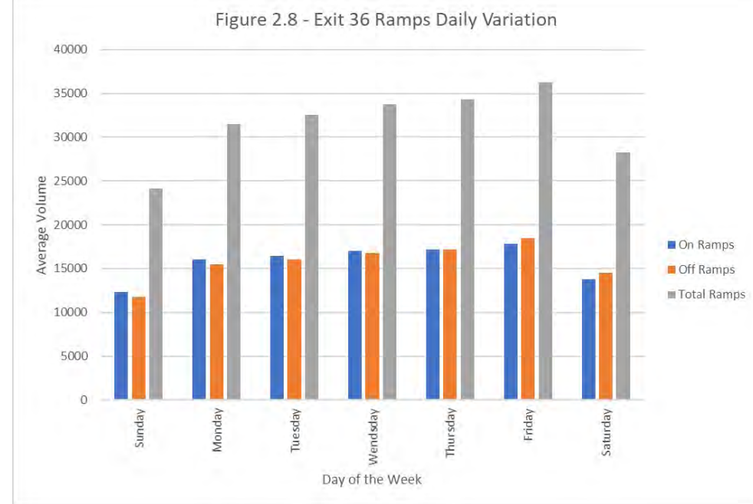






Exit 36 Northbound On-Ramp in the morning and Southbound Off-Ramp in the evening carry the highest volumes due to travel to and from the Portland area. As noted the afternoon peak hour is the highest volume time of the day.





DAILY TRAFFIC VOLUME VARIATION

Little data on local roads is available for understanding traffic volume variation during the week. MTA data indicates Friday is the busiest day of the week. Weekdays carry the greatest volumes at Exit 36, with weekend traffic the lowest volumes of the week. This would suggest that weekday commuter traffic influences traffic volume patterns. **Figures 2.7 and 2.8** depict daily volume variation.

SEASONAL TRAFFIC VOLUME VARIATION

Saco area roadways generally experience higher traffic volumes during the summer months given recreation and tourism activity. The Turnpike and I-195 have higher traffic volumes during summer as presented on **Figures 2.9 and 2.10.** According to monthly traffic volume data on the Turnpike, August has the highest monthly volume. July is the highest volume month for I-195. Seasonal data is not available for Route 112, but east of Industrial Park Road, similar trends are likely. Route 112 west of Industrial Park Road may experience higher traffic volumes in the summer shoulder months (June and September), when schools are in session and commuter traffic levels are not reduced due to higher vacation activity.

Figure 2.9- Exit 36 Mainline Seasonal Variation

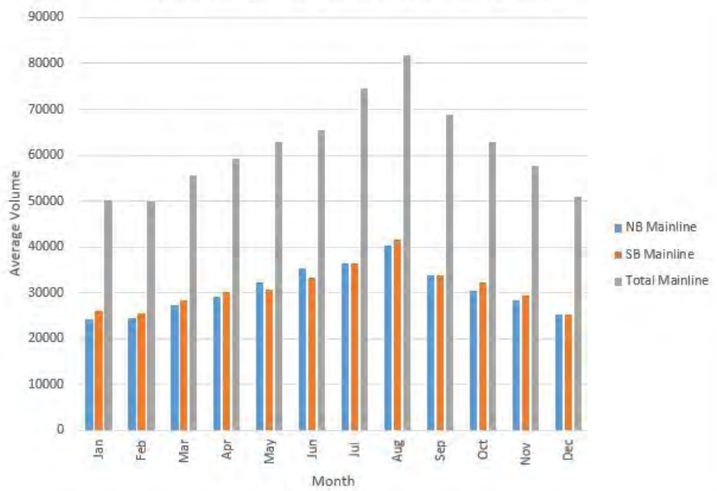
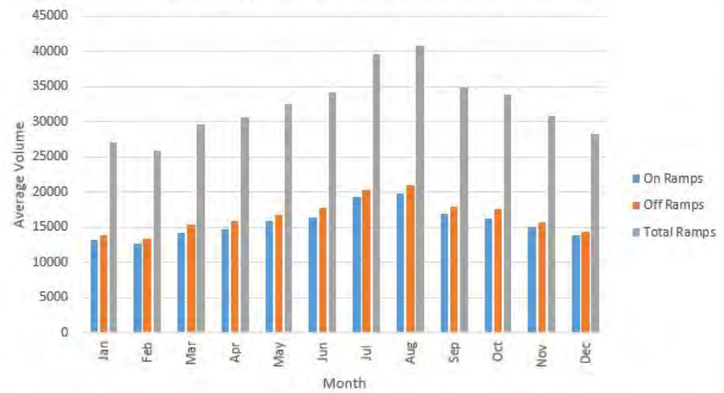
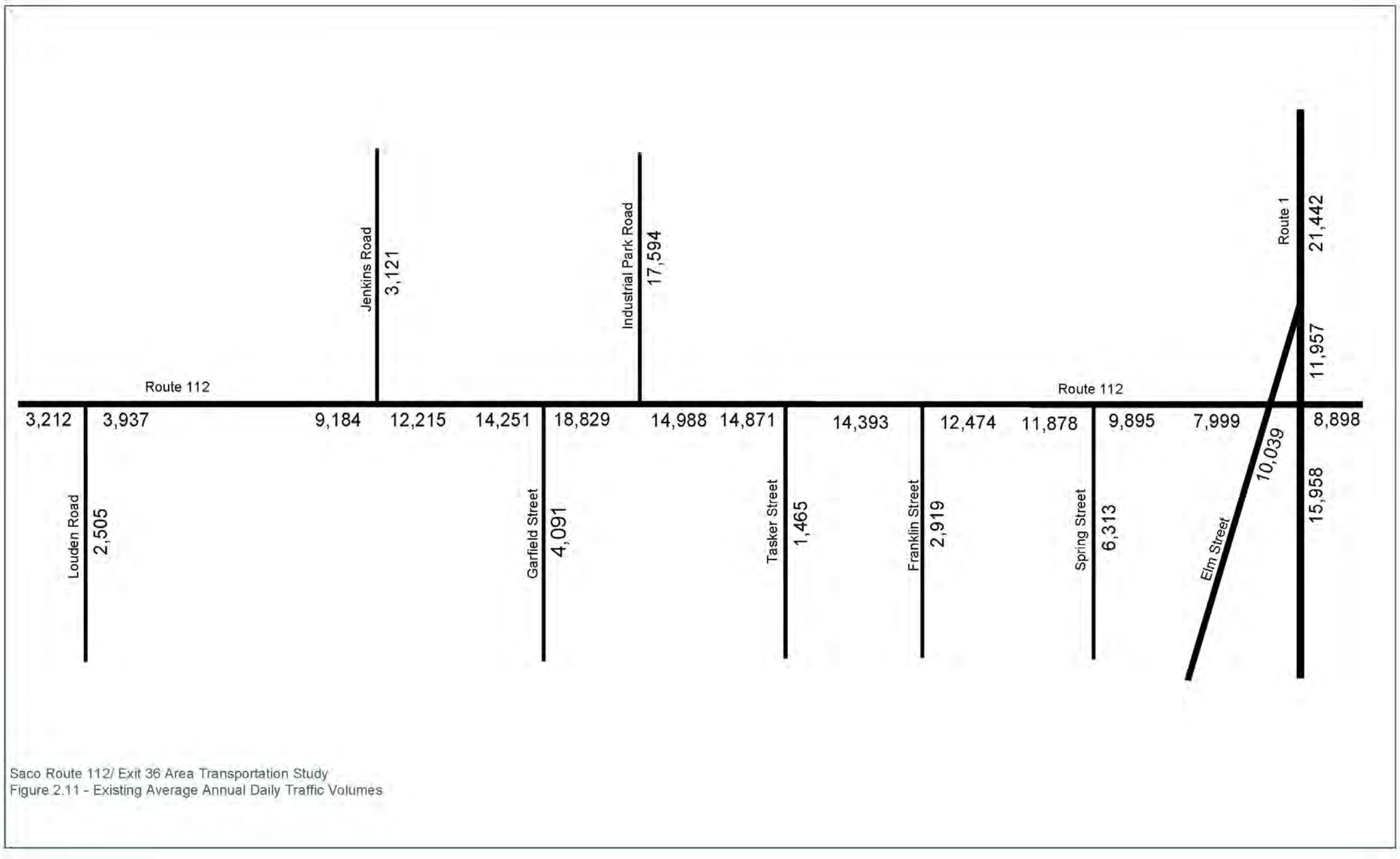


Figure 2.10 - Exit 36 Ramp Seasonal Variation



AVERAGE ANNUAL DAILY TRAFFIC VOLUMES

Average Annual Daily Traffic Volumes (AADT) were obtained from MaineDOT and MTA as depicted on **Figures 2.11 and 2.12.** 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 112 west of Industrial Park Road carries the highest volume on a non-freeway facility other than on Route 1 north of downtown Saco.



Saco Route 112/ Exit 36 Area Transportation Study
Figure 2.11 - Existing Average Annual Daily Traffic Volumes

Saco Route 112/ Exit 36 Area Transportation Study
Figure 2.12 - 2016 I-95/I-195 Existing Average Annual Daily Traffic Volumes

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 2.1** illustrates historical growth at a few study area locations. As noted, traffic volumes have grown significantly over a 30-year period.

Table 2.1: Historical Average Annual Daily Traffic Volumes Between 1985 and 2016

Industrial Park Road e/o Route 112	1985	1992	2005	2014	2016	% Change 1985 to 2016
	5,905	10,010	16,380	17,070	17,420	295%
Route 112 w/o Industrial Park Road	1985	2013	2014	2016	n/a	% Change 1985 to 2014
	7,110	18,480	18,820	n/a	n/a	265%
Route 112 e/o Industrial Park Road	1985	1992	2005	2014	2016	% Change 1985 to 2016
	7,805	11,140	15,530	15,920	14,840	190%

Historical Average Annual Daily Traffic Volumes Between 2011 and 2016

MTA Exit 36	2011	2013	2015	2016	n/a	% Change 2011 to 2016
	25,610	26,320	29,350	30,610	n/a	20%

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 a detailed count conducted on Route 112 west of Franklin Street **(see Table 2.2 and corresponding pie chart)** and from the daily intersection turning movement counts **(see Table 2.3)**. The daily counts in **Table 2.3** include light vehicles towing trailers as heavy vehicles. As noted for Route 112 west of Franklin Street, trucks represent approximately 4 percent of the daily traffic volumes, and this is a typical statewide percentage for this type of facility. Based upon the turning movement data overall truck percentages are approaching 9% of the total volumes for some locations on Route 112 west of Industrial Park Road.

Table 2.2: Route 112 west of Franklin Street Vehicle Classification

FHWA Vehicle Class	Description	Average 8/31/16 Total	Estimated 2016 AADT	Percent of AADT
1	Motorcycle	134	116	0.81%
2	Passenger Vehicle	12374	10694	75.05%
3	Pick-up or Panel	3183	2751	19.30%
4	Buses	111	111	0.78%
5	2 Axle, 6 Tired Single Unit	394	394	2.76%
6	3 Axle Single Unit	70	70	0.49%
7	4 or More Axle Single Unit	9	9	0.06%
8	4 or Less Axle Single Trailer	46	46	0.32%
9	5 Axle Single Trailer	50	50	0.35%
10	6 or More Axle Single Trailer	5	5	0.04%
11	5 or Less Axle Multi-Trailer	1	1	0.01%
12	6 Axle Multi-Trailer	0	0	0.00%
13	7 or More Axle Multi Trailer	3	3	0.02%

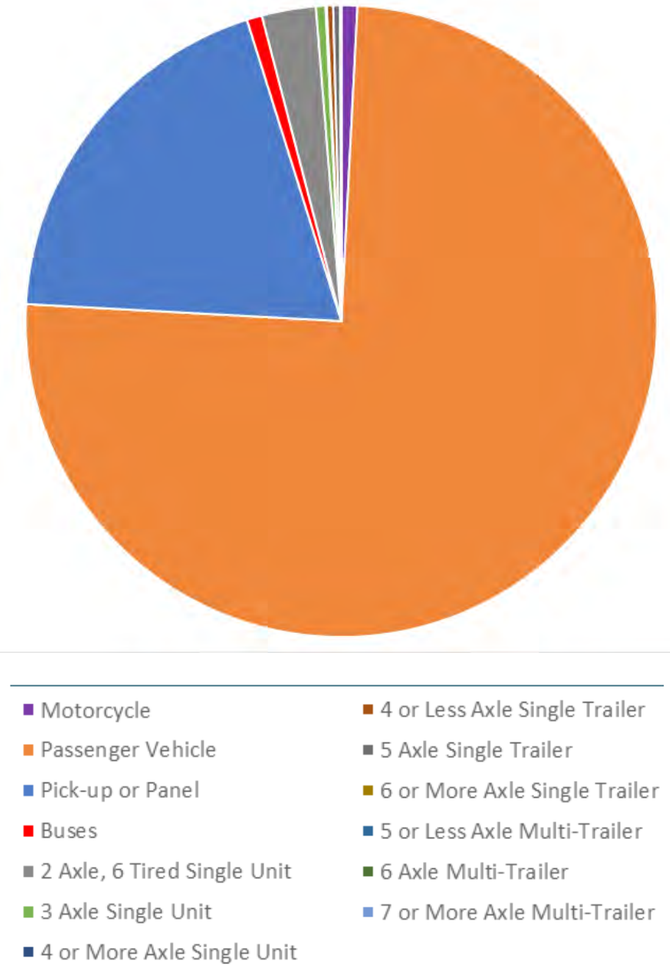
Table 2.3: Intersection Vehicle Classification

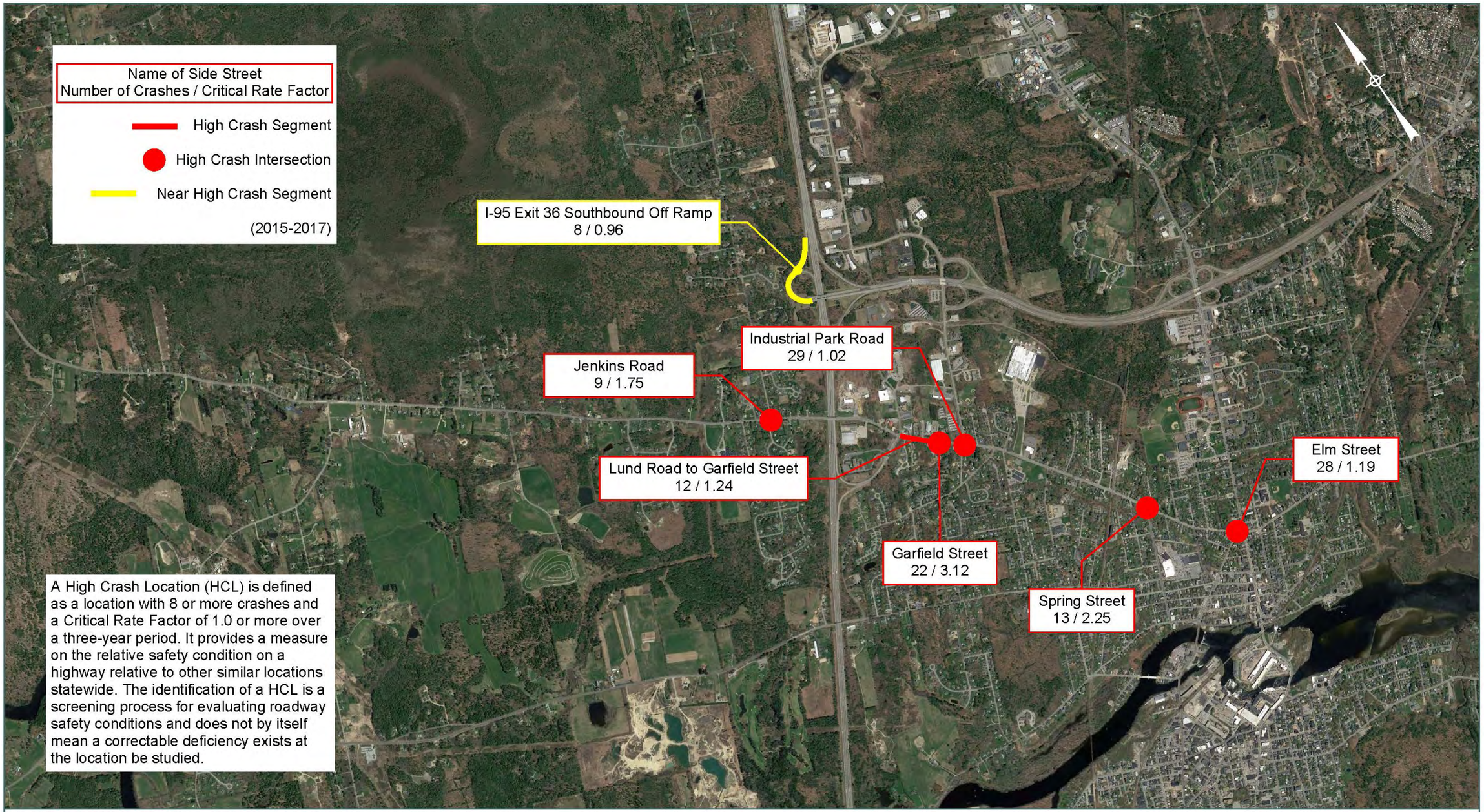
Intersection	Daily % HV
Route 112/Jenkins Road	8.5%
Route 112/Lund Road	8.6%
Route 112/Garfield Street	6.9%
Route 112/Spring Street	3.5%
Industrial Park Road/I-195 Westbound Ramp	8.7%

2.3 SAFETY

Crash data was obtained from MaineDOT for the most recent three-year period (2015-2017). 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. **Figure 2.13** summarizes the High Crash Locations or locations with significant crash numbers for intersections and roadway segments for the three-year period 2015-2017. A summary of each location is presented as follows.

Route 112 West of Franklin Street Vehicle Classification

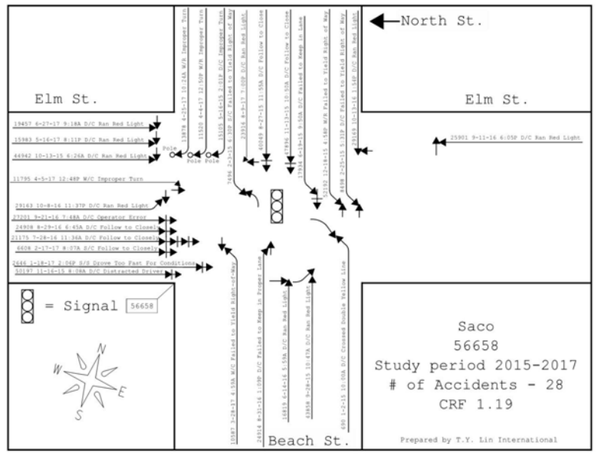




Saco Route 112/ Exit 36 Area Transportation Study
Figure 2.13 - High Crash Locations

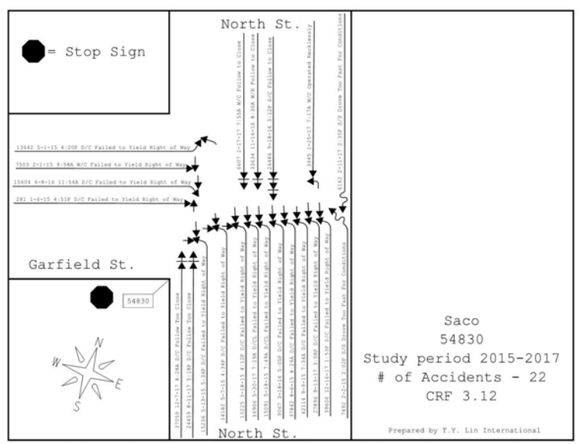
ROUTE 112/ELM STREET

There were 28 crashes at the intersection in the three-year period with a CRF of 1.19. Eight of these crashes were the result of drivers running red lights. Eight of these crashes were the result of trailing vehicles driving too closely or too fast. Four of these crashes were the result of drivers shifting lanes. These patterns indicate drivers are not prepared for a signal or stop at this location. Additionally, the pole on the northwest corner was struck three times by right turning trucks.



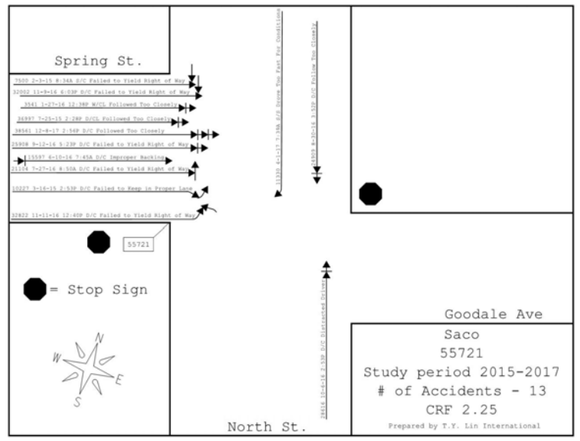
ROUTE 112/GARFIELD STREET

There were 22 crashes at this intersection with a CRF of 3.12 during the three-year period. This was the highest critical rate factor in the corridor. Ten of these crashes were the result of a northbound left-turning driver failing to yield to southbound traffic.



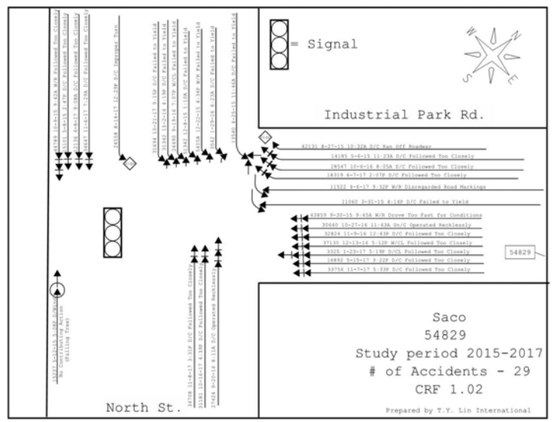
ROUTE 112/SPRING STREET

There were 13 crashes at this intersection with a CRF of 2.25 during the three-year period. Ten of these crashes were the fault of drivers turning from Spring Street onto North Street. A commonality between most crashes was the inability of the eastbound driver to find suitable gaps, resulting in a collision with North Street traffic, or a collision with trailing traffic that assumed they would go. This implies eastbound traffic is anxious. Investigate installing a signal at this intersection. Additionally, investigate if sight lines are adequate.



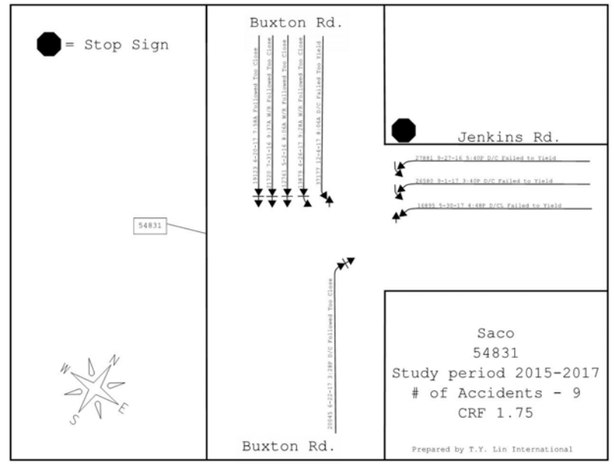
ROUTE 112/ INDUSTRIAL PARK ROAD

There were 29 crashes at this intersection with a CRF of 1.02 during the three-year period. This was the highest number of crashes in the corridor. Seven of these crashes were the result of southbound left-turning traffic failing to yield to northbound through traffic. Investigate removing the permissive left turn phase at this intersection.



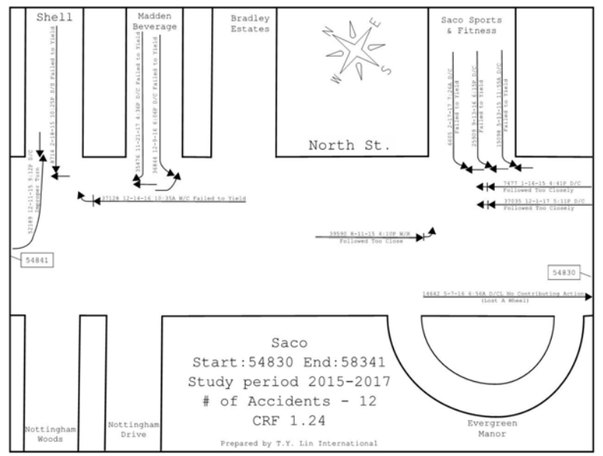
ROUTE 112/JENKINS ROAD

There were 9 crashes at this intersection with a CRF of 1.75 during the three-year period. Four of these crashes were the result of a driver failing to yield the right of way. The other 5 crashes were the result of stopping or slowing traffic and the following driver not braking in time.



ROUTE 112/BETWEEN LUND ROAD AND GARFIELD STREET.

There were 12 crashes in this segment during the three-year period with a CRF of 1.24. Seven of these crashes were the result of drivers entering North Street from a driveway or parking lot with an insufficient gap.



2.4 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 2.4.**

Table 2.4: Level of Service 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

Queue represents the distance of vehicles waiting at the stop bar for the light to change. Most commonly reported is the 95th percentile queue, in other words the queue that will not be exceeded 95% of the time. A vehicle length of 20 feet can be used to visualize the queues. While it does not impact the level of service directly, it is another measure of the effectiveness of the intersection.

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. It should be noted that the analysis is based upon an optimized signal timing scenario as intersections are currently being retimed. The results are seen in the **Tables 2.5 and 2.6. Figure 2.14** on the following page, depicts a summary of locations that operate at unacceptable levels of service or have long vehicle queues.

Table 2.5: Level of Service

	AM	PM
Route 112/Spring Street		
Route 112 NB	A	A
Route 112 SB	A	A
Spring Street	F (713)	F (801)
Route 112/Franklin Street		
Route 112 NB	A	A
Route 112 SB	A	A
Franklin Street	F (270)	F (82)
Route 112/Tasker Street		
Route 112 NB	A	A
Route 112 SB	A	A
Tasker Street	F (785)	F (65)
Drive WB	E (47)	C
Route 112/Industrial Park Road		
Route 112 NB	D	E (65)
Route 112 SB	D	B
Industrial Park Rd	C	F (134)
Route 112/Middle School Entrance		
Route 112 NB	A	A
Route 112 SB	A	A
Route 112/Louden Road		
Route 112 NB	A	B
Route 112 SB	A	A
Louden Road	D	C
Industrial Park Road/I-195 EB Ramps		
I-195 Ramp	C	F (217)
Industrial Park Rd. NE	F (218)	F (119)
Industrial Park Rd. SW	A	C
Industrial Park Road/I-195 WB Ramps		
I-195 Ramp	D	D
Industrial Park Rd. NB	A	A
Industrial Park Rd. SB	A	A

**LOS (Delay Seconds/Vehicle)*
** Delay reported for LOS E and F only*

	AM	PM
Route 112/Garfield Street		
Route 112 NB	A	C
Route 112 SB	F (88)	B
Garfield Street	F (621)	F (759)
Route 112/Lund Road		
Route 112 NB	A	A
Route 112 SB	A	A
Lund Road WB	E (42)	E (38)
Driveway	C	B
Route 112/Jenkins Road		
Route 112 NB	A	B
Route 112 SB	A	A
Jenkins Road	F (695)	F (875)
Route 112/Middle School Exit		
Route 112 NB	A	A
Route 112 SB	A	A
School Drive	B	A
Rotary Drive	B	A

**LOS (Delay Seconds/Vehicle)*
** Delay reported for LOS E and F only*

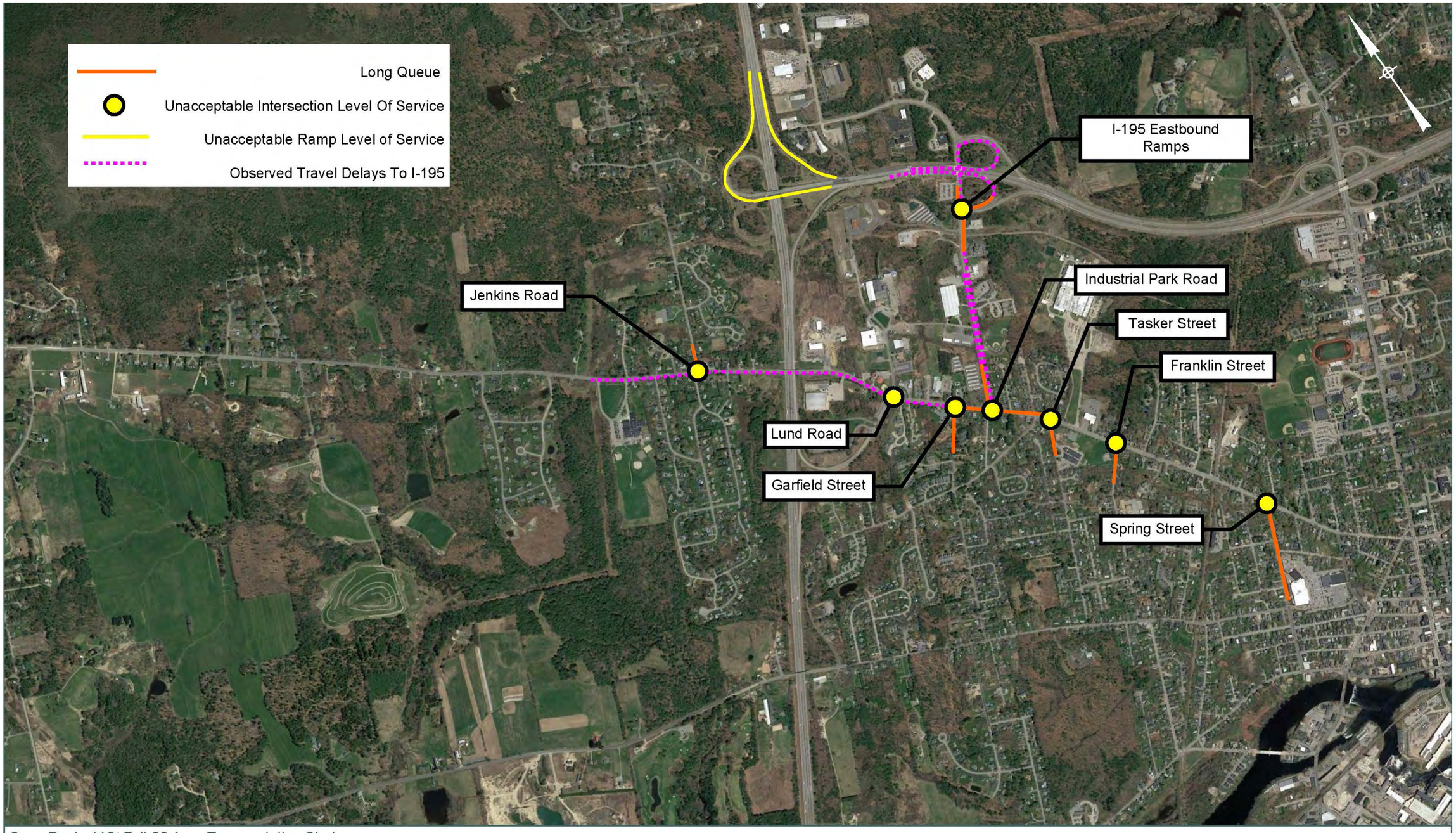
Table 2.6: Intersection 95% Queue Length

	AM	PM
Route 112/Spring Street		
Spring Street	3290 feet	2965 feet
Route 112/Franklin Street		
Franklin Street	735 feet	335 feet
Route 112/Tasker Street		
Tasker Street	1905 feet	140 feet
Route 112/Industrial Park Road		
Route 112 NB Through	925 feet	855 feet
Route 112 SB Left	580 feet	210 feet
Industrial Park Rd.	190 feet	2605 feet
Route 112/Garfield Street		
Route 112 NB	295 feet	510 feet
Garfield Street	2190 feet	1785 feet
Industrial Park Road/I-195 EB Ramps		
I-195 Ramp	175 feet	3710 feet
Industrial Park Rd. NE	3440 feet	1245 feet
Industrial Park Rd. SW	125 feet	305 feet
Industrial Park Road/I-195 WB Ramps		
I-195 Ramp	165 feet	185 feet
Industrial Park Rd. NB	75 feet	75 feet
Industrial Park Rd. SB	95 feet	110 feet

**Queue times are rounded up to nearest 5 feet.*

	AM	PM
Route 112/Lund Road		
Route 112 NB	5 feet	25 feet
Route 112 SB	15 feet	35 feet
Lund Road WB	75 feet	95 feet
Driveway	30 feet	30 feet
Route 112/Jenkins Road		
Route 112 NB	20 feet	35 feet
Route 112 SB	55 feet	45 feet
Jenkins Road	2125 feet	2960 feet
Route 112/Middle School Exit		
School Drive Right	105 feet	50 feet
Route 112/Middle School Entrance		
Route 112 NB	195 feet	85 feet
Route 112/Louden Road		
Route 112 NB	65 feet	75 feet
Louden Road	185 feet	120 feet

**Queue times are rounded up to nearest 5 feet.*



Saco Route 112/ Exit 36 Area Transportation Study
Figure 2.14 - Existing Traffic Mobility Problem Locations

FREEWAY OPERATIONS

Interchange capacity adequacy is also analyzed through Level of Service. Unlike intersections, interchange LOS is based on the average density for a given 15-minute period. **Tables 2.7 and 2.8** present the LOS results for each of the interchanges in the study area. The Exit 36 I-95 northbound On-Ramp and the southbound Off-Ramp have unacceptable LOS. The I-195 Ramps at Industrial Park Road operate at acceptable levels of service when considered in isolation. During the PM peak hour, the eastbound Off-Ramp experiences backups from the Industrial Park Road traffic signal. During the AM peak hour, the westbound On-Ramp does experience from toll plaza lane movements.

Table 2.7:
I-95 Exit 36 Merge/Diverge Analysis

AM		PM		FRIDAY	
Average Density (pc/mi/ln)	LOS	Average Density (pc/mi/ln)	LOS	Average Density (pc/mi/ln)	LOS
I-95 Southbound Off-Ramp					
14.3	B	-	F	19.4	C
I-95 Southbound On-Ramp					
11.4	A	18.2	B	17.7	B
I-95 Northbound Off-Ramp					
17.4	A	16.3	B	23.4	C
I-95 Northbound On-Ramp					
-	F	16.8	B	21.5	C

Table 2.8:
I-195/Industrial Park Road Merge/Diverge Analysis

AM		PM	
Average Density (pc/mi/ln)	LOS	Average Density (pc/mi/ln)	LOS
I-195 Eastbound Off-Ramp			
14.8	A	31.8	C
I-195 Eastbound On-Ramp			
9.3	B	15.9	B
I-195 Westbound Off-Ramp			
18.9	B	8.4	A
I-195 Westbound On-Ramp			
29.8	C	15.1	B

TRAVEL TIME AND DELAY SURVEYS

Travel time surveys were conducted by driving the corridor during both AM and PM peak hours and timing segments using a stopwatch. (See **Tables 2.9 - 2.11**.) The segment from Jenkins Road to Industrial Park Road experienced the highest average morning travel time. The segment from Industrial Park Road to the I-195 westbound ramps experienced the highest average afternoon travel time. This highest travel time overall was 15:31.37, which occurred between Jenkins Road and Industrial Park Road on April 25, 2018 in the morning. The minimum, maximum, and average travel times are depicted in **Figure 2.15** on page 18.

Table 2.9:
Travel Time: Louden Road to I-195 Westbound ramp
Date: 4/25/2017 Day: Wednesday
Start Time: 7:00 AM

Begin and End Point	Travel Time
Louden Road to Foss Road	0:56
Foss Road to Jenkins Road	1:19
Jenkins Road to Industrial Park Road	2:25
Industrial Park Road to I-195 Westbound Ramp	1:48
Total	**5:48**

Begin and End Point	Travel time
I-195 Westbound Ramp to Route 112	1:22
Industrial Park Road to Jenkins Road	1:15
Jenkins Road to Foss Road	1:34
Foss Road to Louden Road	1:06
Total	**4:77**

Begin and End Point	Travel time
Louden Road to Foss Road	2:10
Foss Road to Jenkins Road	1:49
Jenkins Road to Industrial Park Road	2:43
Industrial Park Road to I-195 Westbound Ramp	2:53
Total	**8:55**

Begin and End Point	Travel time
I-195 Westbound Ramp to Route 112	1:32
Industrial Park Road to Jenkins Road	1:29
Jenkins Road to Foss Road	1:29
Foss Road to Louden Road	1:15
Total	**5:05**

Begin and End Point	Travel time
Louden Road to Foss Road	1:01
Foss Road to Jenkins Road	2:22
Jenkins Road to Industrial Park Road	15:31
Industrial Park Road to I-195 Westbound Ramp	5:51
Total	**24:05**

Begin and End Point	Travel time
I-195 Westbound Ramp to Route 112	2:57
Industrial Park Road to Jenkins Road	2:54
Jenkins Road to Foss Road	2:18
Foss Road to Louden Road	1:10
Total	**8:39**

Begin and End Point	Travel time
Louden Road to Foss Road	1:05
Foss Road to Jenkins Road	1:59
Jenkins Road to Industrial Park Road	2:28
Industrial Park Road to I-195 Westbound Ramp	1:46
Total	**6:38**

Begin and End Point	Travel time
I-195 Westbound Ramp to Route 112	1:53
Industrial Park Road to Jenkins Road	1:27
Jenkins Road to Foss Road	1:34
Foss Road to Louden Road	1:16
Total	**5:30**

Table 2.10:
Travel Time: Louden Road to I-195 Westbound Ramp
Date: 5/15/2017 Day: Tuesday
Start Time: 4:00 PM

Begin and End Point	Travel Time
Louden Road to Foss Road	1:00
Foss Road to Jenkins Road	1:27
Jenkins Road to Industrial Park Road	1:58
Industrial Park Road to I-195 Westbound Ramp	2:14
Total	**5:99**

Table 2.10:
Travel Time: Louden Road to I-195 Westbound Ramp
Date: 5/15/2017 Day: Tuesday
Start Time: 4:00 PM

Begin and End Point	Travel time
I-195 Westbound Ramp to Route 112	1:47
Industrial Park Road to Jenkins Road	1:35
Jenkins Road to Foss Road	1:30
Foss Road to Louden Road	1:07
Total	**5:19**

Begin and End Point	Travel time
Louden Road to Foss Road	0:57
Foss Road to Jenkins Road	1:34
Jenkins Road to Industrial Park Road	1:49
Industrial Park Road to I-195 Westbound Ramp	2:41
Total	**5:81**

Begin and End Point	Travel time
I-195 Westbound Ramp to Route 112	1:40
Industrial Park Road to Jenkins Road	1:35
Jenkins Road to Foss Road	1:33
Foss Road to Louden Road	1:05
Total	**5:13**

Begin and End Point	Travel time
Louden Road to Foss Road	0:56
Foss Road to Jenkins Road	1:39
Jenkins Road to Industrial Park Road	2:10
Industrial Park Road to I-195 Westbound Ramp	3:52
Total	**7:57**

Begin and End Point	Travel time
I-195 Westbound Ramp to Route 112	2:58
Industrial Park Road to Jenkins Road	1:25
Jenkins Road to Foss Road	1:28
Foss Road to Louden Road	1:07
Total	**6:18**

Begin and End Point	Travel time
Louden Road to Foss Road	0:56
Foss Road to Jenkins Road	1:28
Jenkins Road to Industrial Park Road	2:24
Industrial Park Road to I-195 Westbound Ramp	2:40
Total	**6:48**

Begin and End Point	Travel time
I-195 Westbound Ramp to Route 112	3:24
Industrial Park Road to Jenkins Road	1:58
Jenkins Road to Foss Road	1:34
Foss Road to Louden Road	1:05
Total	**7:21**

Begin and End Point	Travel time
Louden Road to Foss Road	0:59
Foss Road to Jenkins Road	1:27
Jenkins Road to Industrial Park Road	1:53
Industrial Park Road to I-195 Westbound Ramp	1:34
Total	**4:73**

Begin and End Point	Travel time
I-195 Westbound Ramp to Route 112	2:36
Industrial Park Road to Jenkins Road	1:43
Jenkins Road to Foss Road	1:31
Foss Road to Louden Road	1:04
Total	**6:14**

Table 2.11:
Travel Time: Louden Road to I-195 Westbound ramp
Date: 5/16/2017 Day: Wednesday
Start Time: 7:00 AM

Begin and End Point	Travel Time
Louden Road to Foss Road	1:19
Foss Road to Jenkins Road	1:38
Jenkins Road to Industrial Park Road	1:26
Industrial Park Road to I-195 Westbound Ramp	3:31
Total	**7:14**

Begin and End Point	Travel time
I-195 Westbound Ramp to Route 112	1:52
Industrial Park Road to Jenkins Road	1:19
Jenkins Road to Foss Road	1:30
Foss Road to Louden Road	1:01
Total	**5:02**

Begin and End Point	Travel time
Louden Road to Foss Road	0:59
Foss Road to Jenkins Road	1:30
Jenkins Road to Industrial Park Road	3:24
Industrial Park Road to I-195 Westbound Ramp	2:44
Total	**7:57**

Begin and End Point	Travel time
I-195 Westbound Ramp to Route 112	2:03
Industrial Park Road to Jenkins Road	1:29
Jenkins Road to Foss Road	1:34
Foss Road to Louden Road	1:38
Total	**6:04**

Begin and End Point	Travel time
Louden Road to Foss Road	1:04
Foss Road to Jenkins Road	2:03
Jenkins Road to Industrial Park Road	2:57
Industrial Park Road to I-195 Westbound Ramp	1:35
Total	**6:99**

Begin and End Point	Travel time
I-195 Westbound Ramp to Route 112	1:24
Industrial Park Road to Jenkins Road	1:34
Jenkins Road to Foss Road	2:01
Foss Road to Louden Road	1:11
Total	**5:70**

Begin and End Point	Travel time
Louden Road to Foss Road	1:01
Foss Road to Jenkins Road	2:22
Jenkins Road to Industrial Park Road	2:42
Industrial Park Road to I-195 Westbound Ramp	1:52
Total	**7:17**

Table 2.11:
Travel Time: Louden Road to I-195 Westbound ramp
Date: 5/16/2017 Day: Wednesday
Start Time: 7:00 AM

Begin and End Point	Travel time
I-195 Westbound Ramp to Route 112	1:48
Industrial Park Road to Jenkins Road	1:37
Jenkins Road to Foss Road	1:57
Foss Road to Louden Road	1:04
Total	**5:46**

Table 2.12:
Travel Time: Louden Road to I-195 Westbound ramp
Date: 6/14/2018 Day: Thursday
Start Time: 4:00 PM

Begin and End Point	Travel Time
Louden Road to Foss Road	0:58
Foss Road to Jenkins Road	1:29
Jenkins Road to Industrial Park Road	1:33
Industrial Park Road to I-195 Westbound Ramp	1:05
Total	**4:25**

Begin and End Point	Travel time
I-195 Westbound Ramp to Route 112	1:12
Industrial Park Road to Jenkins Road	1:28
Jenkins Road to Foss Road	1:32
Foss Road to Louden Road	1:03
Total	**4:75**

Begin and End Point	Travel time
Louden Road to Foss Road	0:57
Foss Road to Jenkins Road	1:29
Jenkins Road to Industrial Park Road	2:36
Industrial Park Road to I-195 Westbound Ramp	3:43
Total	**7:65**

Begin and End Point	Travel time
I-195 Westbound Ramp to Route 112	0:58
Industrial Park Road to Jenkins Road	1:16
Jenkins Road to Foss Road	1:25
Foss Road to Louden Road	0:55
Total	**3:54**

Begin and End Point	Travel time
Louden Road to Foss Road	0:58
Foss Road to Jenkins Road	1:27
Jenkins Road to Industrial Park Road	2:35
Industrial Park Road to I-195 Westbound Ramp	2:09
Total	**6:29**

Begin and End Point	Travel time
I-195 Westbound Ramp to Route 112	1:28
Industrial Park Road to Jenkins Road	1:28
Jenkins Road to Foss Road	1:27
Foss Road to Louden Road	0:58
Total	**4:41**

Begin and End Point	Travel time
Louden Road to Foss Road	0:55
Foss Road to Jenkins Road	1:28
Jenkins Road to Industrial Park Road	1:57
Industrial Park Road to I-195 Westbound Ramp	2:15
Total	**5:55**

Begin and End Point	Travel time
I-195 Westbound Ramp to Route 112	1:01
Industrial Park Road to Jenkins Road	1:23
Jenkins Road to Foss Road	1:17
Foss Road to Louden Road	1:28
Total	**4:69**

BICYCLE AND PEDESTRIAN FACILITIES

Route 112 has a sidewalk on both sides from Route 1 to Madden Beverage past Industrial Park Road. The south sidewalk continues west until Hilltop Market. Sidewalks briefly extend on both sides of the street briefly before and after Jenkins Road to help pedestrians cross the road using a rectangular rapid-flashing beacon (RRFB). The south sidewalk continues until Chantelle Way. There is no sidewalk past Chantelle Way.

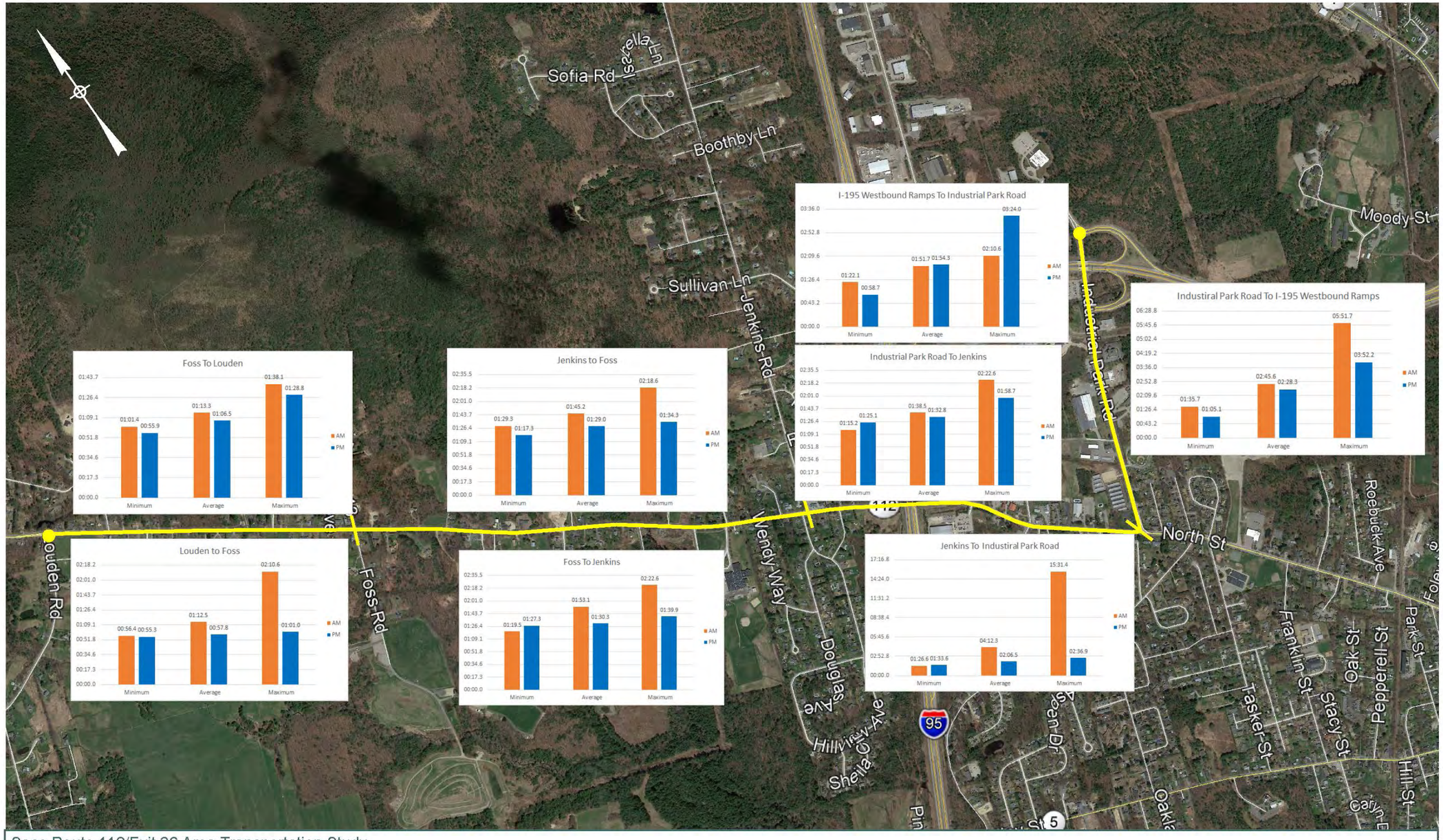
There are shoulders on both sides of Route 112 except when infringed by a turn lane. Turn lanes exist both east and west of Industrial Park Road and just west of Elm Street. Additionally, the north shoulder narrows between Nott Street and Scammon Extension.

Industrial Park Road has no sidewalks and shoulder on the west side. The east shoulder is often interrupted.

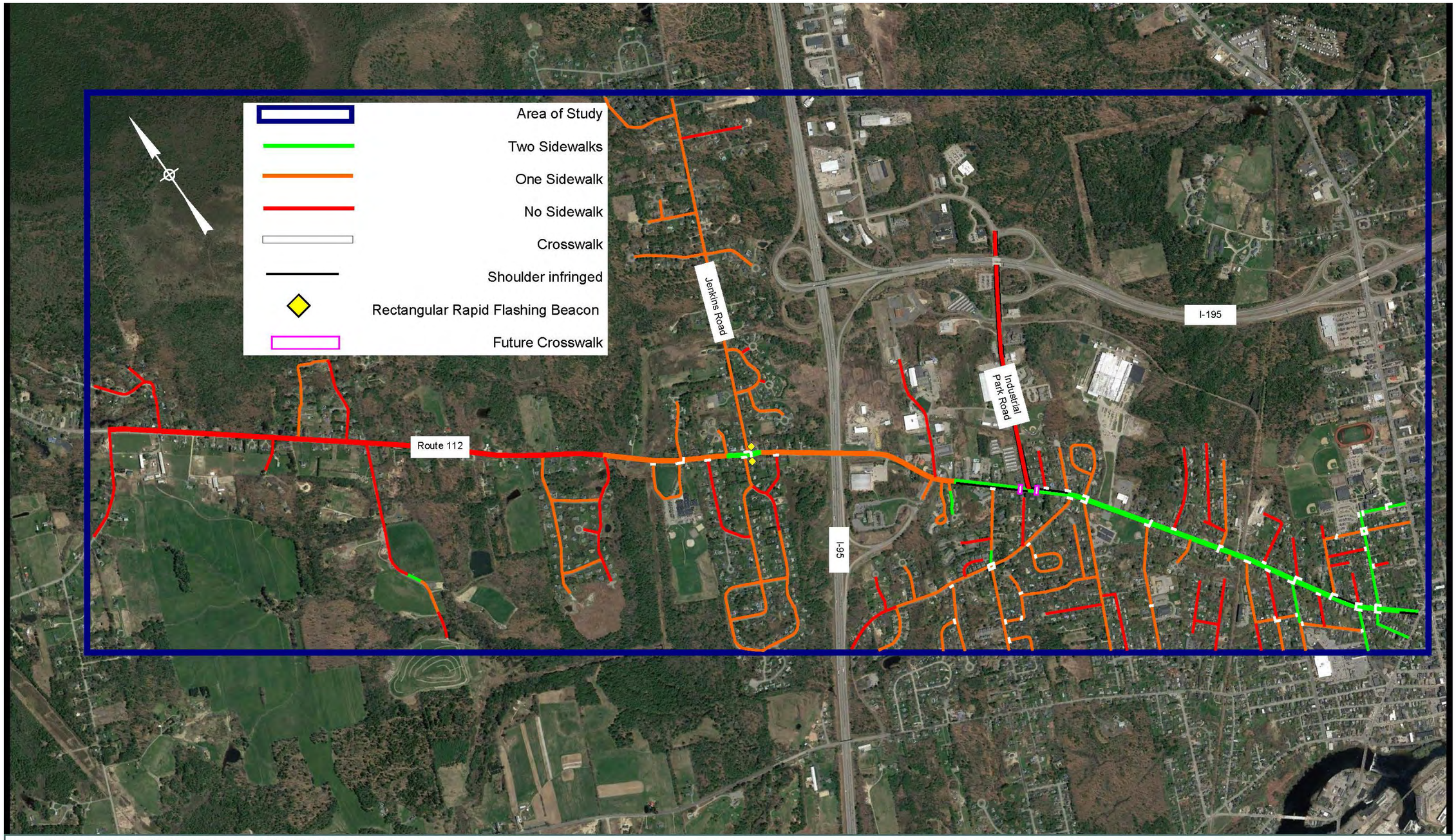
Most side streets have one or no sidewalks as shown in **Figure 2-16**.

Key deficiencies for cyclists and pedestrians in the corridor are:

- No sidewalks to the east of Chantelle Way
- There is no crosswalk across Route 112 from Jenkins Road to Tasker Road, although crosswalks at Industrial Park Road will be added soon
- Minor intersections often lack crosswalks
- Industrial Park Road has neither sidewalks or shoulders



Saco Route 112/Exit 36 Area Transportation Study
Figure 2.15 - Travel Time Per Segment



Saco Route 112/ Exit 36 Area Transportation Study
Figure 2.16- Existing Bicycle and Pedestrian Facilities

3.0 ENVIRONMENTAL RESOURCES

The following section 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 Saco Route 112 / I-95 Exit 36 Transportation 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 Saco Route 112 / I-95 Exit 36 Transportation 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 Saco Route 112 / I-95 Exit 36 Transportation Study Area, as originally defined by TYLI (**Figure 1.1**) was designed to review a large area approximately centered on the I-95 Exit 36 Interchange for potential traffic pattern improvements. For the purposes of analyzing existing historic and environmental resources, a more focused study was defined to focus on areas of potential roadway improvement work within the overall Study Area and eliminate constrained lands (e.g. large areas of conserved lands). This smaller, focused study area represents the Historic/Environmental Study Area (H/E Study Area), and comprises approximately 2,000 acres, as shown on **Figure 3.1.**

The H/E Study Area is mostly developed, with development primarily consisting of roadways, single-family residences (including those within small, closely developed neighborhoods), mixed commercial/residential spaces (mostly along U.S. Route 1), and commercial/industrial areas (north of Route 112 and east of I-95). In general, residential developments are present north and south of Route 112 (west of I-95) and south of Route 112 (east of I-95). Commercial and industrial businesses (e.g. warehouses and manufacturing facilities) are generally located north of Route 112 where it is on the eastern side of I-95, and closer to Route 1 in the eastern section of the H/E Study Area.

The H/E Study Area includes a portion of the Saco Historic District, as shown on Figure 3.2, in which many of the buildings were built in the 19th century. While some of the roadways and development within the H/E Study Area have existed since the late 18th and early 19th century (e.g. the Historic District, Route 112, and Jenkins Road), much of the development within the H/E Study Area is relatively recent. I-95, the Maine Turnpike, was constructed in the late 1940s. In the 1980s, I-195 was constructed, and the City of Saco developed the Saco Industrial Park along Industrial Park Road.

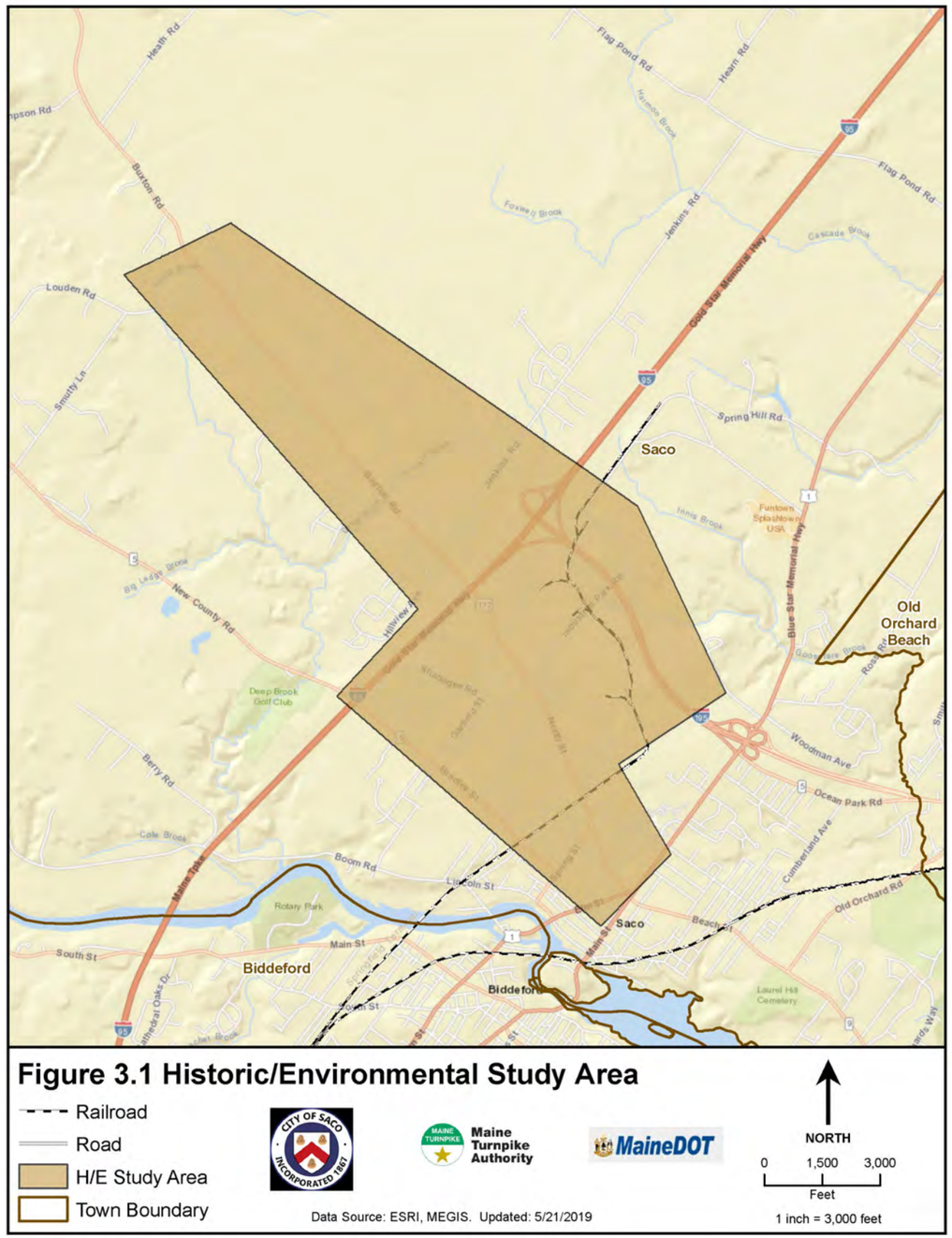


Figure 3.1: Historic/Environmental Study Area

Today, the Saco Industrial Park includes manufacturing facilities, warehouse, storage, and distribution facilities, a hotel, and office spaces. In more recent years, residential development has become Saco's largest growth sector. Since 2000, multiple residential subdivisions have been constructed to the west of I-95.

3.1 HISTORIC AND ARCHAEOLOGICAL RESOURCES

The following 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 H/E Study Area. A discussion of the data sources and methodology used for the analysis is also included below.

ARCHAEOLOGICAL AND HISTORIC CONTEXT OF THE H/E STUDY AREA

The Saco River is approximately 1/10 miles south of the H/E Study area at its nearest point. Historic mapping and archaeological evidence indicate that the Saco River had significant Native American activity, both in prehistoric times and during the contact period (the time of initial encounters between Europeans and Native Americans in the late 16th and 17th centuries). More recently, in the 17th and 18th centuries, Native Americans lived seasonally in several areas of Saco. The most notable location was Factory Island, which was known in colonial times as Indian Island.

As European settlement extended inland from the coast, however, the settlers and Native Americans often clashed, and eventually the Native American populations receded from historic campsites and migration routes along the Saco River and its tributaries. By the middle of the 18th century, the downtown and riverfront portions of the City of Saco had become a busy hub of textile and manufacturing industries. Outlying areas, including the H/E Study Area, were heavily cut over and converted to agriculture to provide food, fuel, and building materials for Saco's industrial growth. One hundred years ago, the H/E Study Area was primarily an agricultural area, populated by larger farms and a few homesteads.

In more recent years, residential development has been Saco's largest growth sector. While the large neighborhoods south of Route 112 and east of I-95 were primarily constructed in the 1960s and 1970s, several residential subdivisions have been constructed since 2000, including areas west of I-95, off Jenkins Road and Route 112.

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, as long as 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.

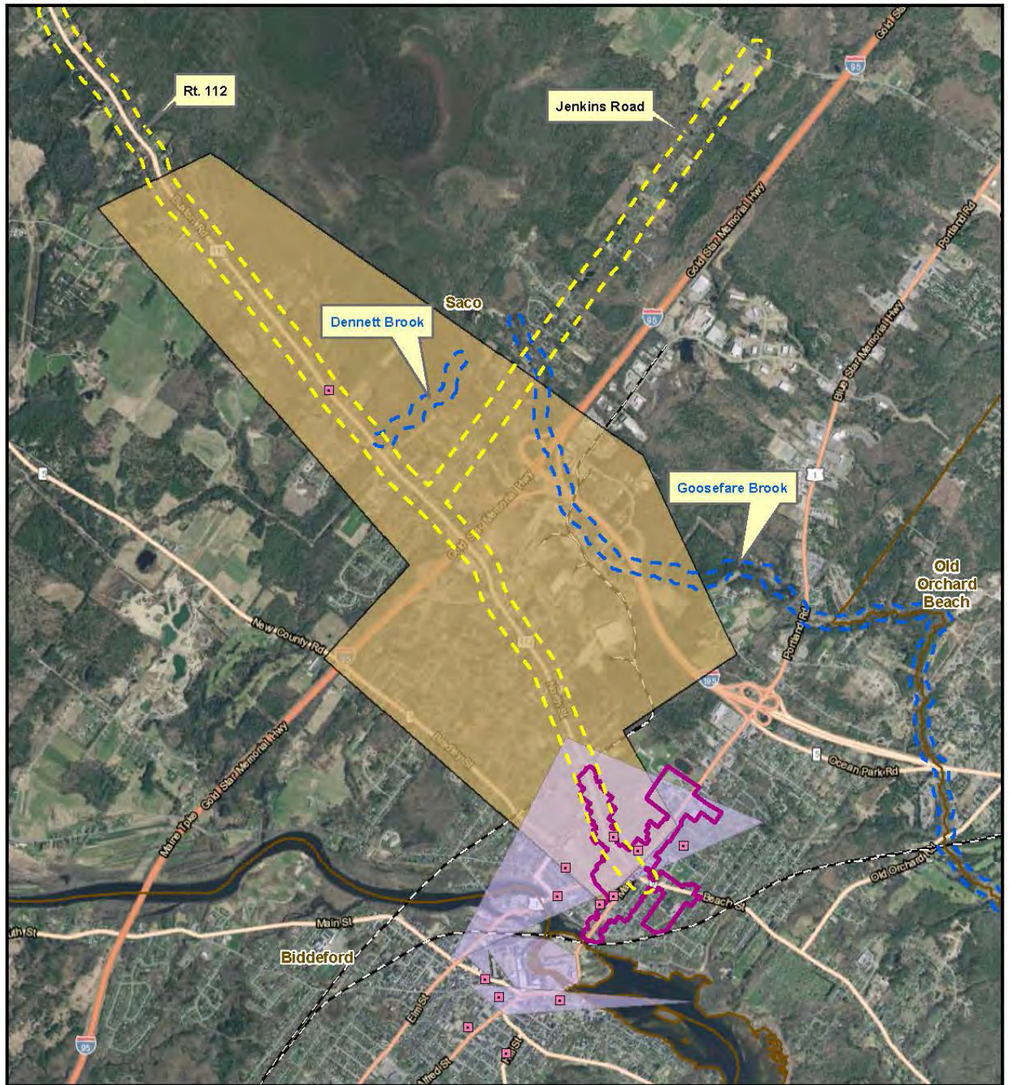


Figure 3.2: Historic and Archaeological Resources

METHODOLOGY

Archaeological and historic resource identification within the H/E Study Area involved outreach to the MHPC to inquire about the presence of known or potential historic or archaeological resources within the H/E 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 H/E Study Area remains undetermined. Similarly, archaeological excavations are conducted when disturbance is threatened, but other currently unknown archaeological sites may exist within the H/E Study Area.

SUMMARY OF FINDINGS AND RECOMMENDATIONS

ARCHAEOLOGICAL

According to correspondence with Dr. Arthur Speiss, Senior Archaeologist with the MHPC, there are no known prehistoric or historic archaeological sites within the H/E Study Area. However, the MHPC considers land within 50 meters of streams the size of Dennett and Goosefare Brook to be sensitive areas for prehistoric archaeology.

NRHP ELIGIBLE STRUCTURES

Based on review of current NPS data, there are six properties within the H/E Study Area currently listed on the National Register (**Figure 3.2** on the previous page). Five properties are located within the Saco Historic District in downtown Saco and one property is located to the west of I-95 (the "Way Way Store" on Route 112). However, as described above in the Limits of Available Data section, there may be other properties in the H/E Study Area that are potentially eligible for listing on the National Register.

MHPC indicated that 18th century and early 19th century historic archaeological or architectural sites are likely to be found along, or within 100 yards of, the older transportation routes within the Study Area including Route 112 and Jenkins Road. According to CARMA review, many properties within the H/E Study Area have been assessed for previous projects. Data forms, including photographs, are included for the structure data in the CARMA database, however no determinations have been made for many of the structures assessed.

RECOMMENDATIONS

The need and extent of required follow-up study and correspondence will depend on the scope of road improvement work ultimately defined and implemented. If soil disturbance is proposed within or near undeveloped sections of the larger streams in the H/E Study Area, or if significant alterations of the viewshed or current infrastructure are required along Route 112 and Jenkins Road, where there are several potentially eligible structures, then additional consultation with the MHPC, and further archaeological and historic architectural investigations, may be warranted. Follow-up consultation with the MHPC and additional study, as necessary, would proceed under the MaineDOT programmatic agreement described above.

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 H/E Study Area.

NATURAL RESOURCES WITHIN THE H/E STUDY AREA

The H/E Study Area is located within the Saco Bay watershed and Saco River and Goosefare Brook subwatersheds. The Saco River flows west to east to the south of the H/E Study Area. Goosefare Brook, flowing under I-95 and I-195 near the Exit 36 Interchange, flows west to east along the eastern portion of the H/E Study area. Saco Bay is approximately three miles from the H/E Study Area. Soils within the H/E Study Area are predominantly derived from sandy glaciofluvial deposits and silt loam glaciomarine deposits.

The majority of the H/E Study Area has been developed for residential, commercial, industrial, and transportation uses and infrastructure. Most of the upland areas located east of I-95 have been developed, and many of the remaining, undeveloped wetlands in this area have been altered over time to facilitate development and drainage. Unfragmented and contiguous forested cover is limited within the H/E Study Area to the east of I-95. Two pockets of undeveloped forest occur on the north and south side of I-195 within the H/E Study Area. An electric powerline corridor crosses the forested area, running north to south across I-195 and through a portion of the H/E Study Area.

Lands along the south side of Route 112 to the west of I-95 are mostly developed with large, single-family residential lots, residential subdivisions, and the Saco Middle School. Land to the north of Route 112 and west of I-95, is less developed, with single family homes and farms located along Route 112 and Jenkins Road. A large forested area with several streams and wetlands is located in the northeastern corner of the H/E Study Area, abutting the Saco Heath (described below).

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, M.R.S.A. §§ 481-490). MDEP regulates impacts to wetlands, waterbodies and other protected natural resources under the Natural Resources Protection Act (NRPA, 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. Note, the current General Permit authorization is set to expire on June 30, 2018.

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 (WSS). Impacts to WSS require more rigorous review and permitting than non-WSS 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*

1. https://www.nps.gov/maps/full.html?mapId=7ad17cc9-b808-4ff8-a2f9-a99909164466 2. http://medotmaps.maine.gov/mapviewer/

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 Eagle 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, MDIFW-mapped deer wintering areas; 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 located 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 3.3 - NWI, NHD, FEMA, and Soils** on the following page. Numerous NWI wetlands and mapped hydric soils occur throughout the H/E Study Area. It is important to note that hydric soils appear more widespread than wetlands, based on this data. However, many of the areas with hydric soils have been developed and it is likely that wetlands have historically been drained, cleared, filled, or otherwise altered in the H/E Study Area for various developments. The NWI and hydric soils data indicate wetlands are located primarily in the undeveloped areas outside of the forested lands, on both sides of I-95 between Route 112 and the exiting Exit 36 Interchange. Additionally, NWI indicates a large shrub and forested wetland is located between Route 112 and I-195, adjacent to Industrial Park Road. NWI wetlands and hydric soils are also mapped within the large forested area to the west of I-95. These generally appear to be associated with Deep Brook and its tributaries to the west of I-95 and north of Route 112.

The H/E Study Area has four mapped streams with associated NWI wetlands:

- Dennett Brook – located in the undeveloped and forested area north of Route 112 and west of I-95. A portion of Dennett Brook is also mapped by FEMA as a 100-year Flood Zone.
- Deep Brook – also located in the undeveloped and forested area north of Route 112 and west of I-95. A portion of Deep Brook is also mapped by FEMA as a 100-year Flood Zone.
- Goosefare Brook – runs north to south under portions of the I-195 ramps then east through the H/E Study Area. A portion of Goosefare Brook is also mapped by FEMA as a 100-year Flood Zone.
- Sandy Brook – flows from a forested wetland on the north side of Rte 112, west of I-95 in the far western portion of the H/E Study Area.

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 two mapped significant vernal pools in the vicinity of the H/E Study Area (Attachment 3.1 – MDIFW Environmental Review). One is located just outside the southeastern edge of the H/E Study Area, adjacent to the Eastern Trail. The second significant vernal pool is located just south of the H/E Study

Area within an area protected as conservation land. Neither of these mapped significant vernal pool features appear to be in areas that would be affected by the project; therefore, these known resources should not pose a permitting constraint for the project.

It is important to note that only significant vernal pools identified as part of other project survey efforts have been mapped by MDIFW. MDEP data indicate the presence of serveral non-significant vernal pools just outside the study area **(Figure 3.3)**. A comprehensive field investigation of the study area has not been conducted and 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 May) would be required to ascertain the productivity of each feature.

THREATENED AND ENDANGERED SPECIES

Table 3.1 on the following page provides a listing of rare, threatened or endangered (RTE) species known to occur, or with the potential to occur, within the H/E Study Area. This table was assembled based on data received from MNAP, MDIFW and USFWS. According to data received from the agencies, there are limited known occurrences of RTE species within the H/E Study Area. Additionally, the majority of RTE species occurrences located in the H/E Study Area are within the conserved lands of the Saco Heath. If impacts to the Saco Heath are avoided, these species should not require additional study or pose additional permitting constraints for a potential transportation project.

Two protected species that occur within the H/E Study Area but outside of the Saco Heath are clothed sedge (Carex vestita) and RTE bats. Clothed sedge, listed as endangered in Maine, is a disturbance-loving plant species that occurs on an existing electric transmission line corridor to the east of the Exit 36 Interchange. As such, the presence of this species in this area would likely not impact project design or permitting requirements. Although this species tends to favor disturbance areas, it is unlikely to be found on roadsides due to the compaction, salts, and frequent and ongoing impacts. Nonethless, the data provided by MNAP is not considered comprehensive and MDEP may require field surveys for this and other rare/threatened/endangered plant species within the project survey footprint. These surveys could occur during the growing season, footprint. These surveys could occur during the growing season, concurrently or just after the other field surveys (e.g. wetlands).

MDIFW indicated during their review that while several of the state-listed bat species occur within the area during migration and/or breeding season, they do not anticipate significant impacts to the species as a result of a potential transportation project. Further, MDIFW defers consultation to the USFWS for the northern long-eared bat (NLEB). According to the official species list obtained from the USFWS IPaC system (Attachment 3.3 – IPaC Official Species List), NLEB may occur in the H/E Study Area. However, there are no mapped critical habitats for the NLEB and no documented maternity roosts occur in the State. The H/E Study Area is located more than 20 miles from the nearest known hibernacula. Therefore, a potential transportation project occurring within the H/E Study Area is not likely to have an adverse effect on this species and additional study would not be required and any consultation would likely occur through the streamlined process.

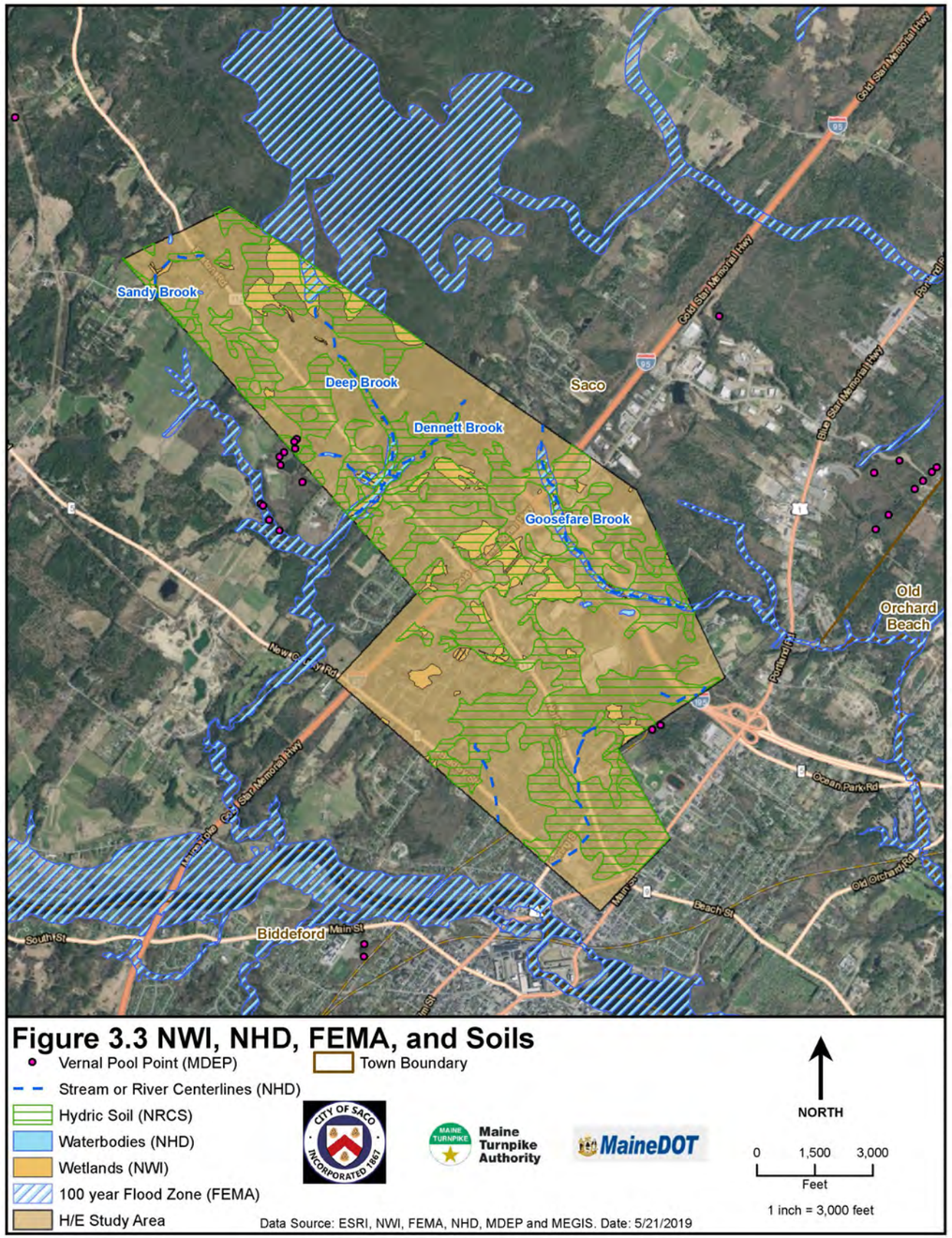


Figure 3.3. NWI, NHD, FEMA, and Soils

WILDLIFE HABITAT

In their review of the H/E Study Area (Attachment 3.1), the MDIFW noted that several streams are mapped within the H/E Study Area. The MDIFW recommended maintaining a 100-foot undisturbed vegetated buffer along the streams in the H/E Study Area to protect fisheries habitat. If stream crossings are necessary, the MDIFW recommends following Construction Best Management Practices to design the crossing to provide full fish passage. In general, if a future transportation project would require any site disturbance, then further agency consultation is recommended to ensure avoidance and minimization of impacts on stream resources. There are no mapped deer wintering areas or inland waterfowl/wading bird habitats found within the H/E Study Area.

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

The northern portion of the H/E Study Area overlaps two conserved properties **(Figure 3.4 – Conservation Areas and Potential 4(f) Lands)** on the following page. The largest tract of undeveloped conservation land in the H/E Study Area is comprised of a mature forest located west of I-95 and north of Route 112. This forested area is connected to the Saco Heath, an approximately 1,200-acre preservation area managed by the Nature Conservancy. The Saco Heath itself is located on the west/northwest corner of the H/E Study Area. The second protected area, owned by the City of Saco, surrounds and includes the City's transfer station and capped landfills on Foss Road (south of Route 112).

Three playground and ballfield areas are located within the H/E Study Area and may be subject to Section 4(f) requirements. Future transportation projects will likely not require the taking and use of these lands under Section 4(f) and therefore, Section 4(f) is likely not applicable.

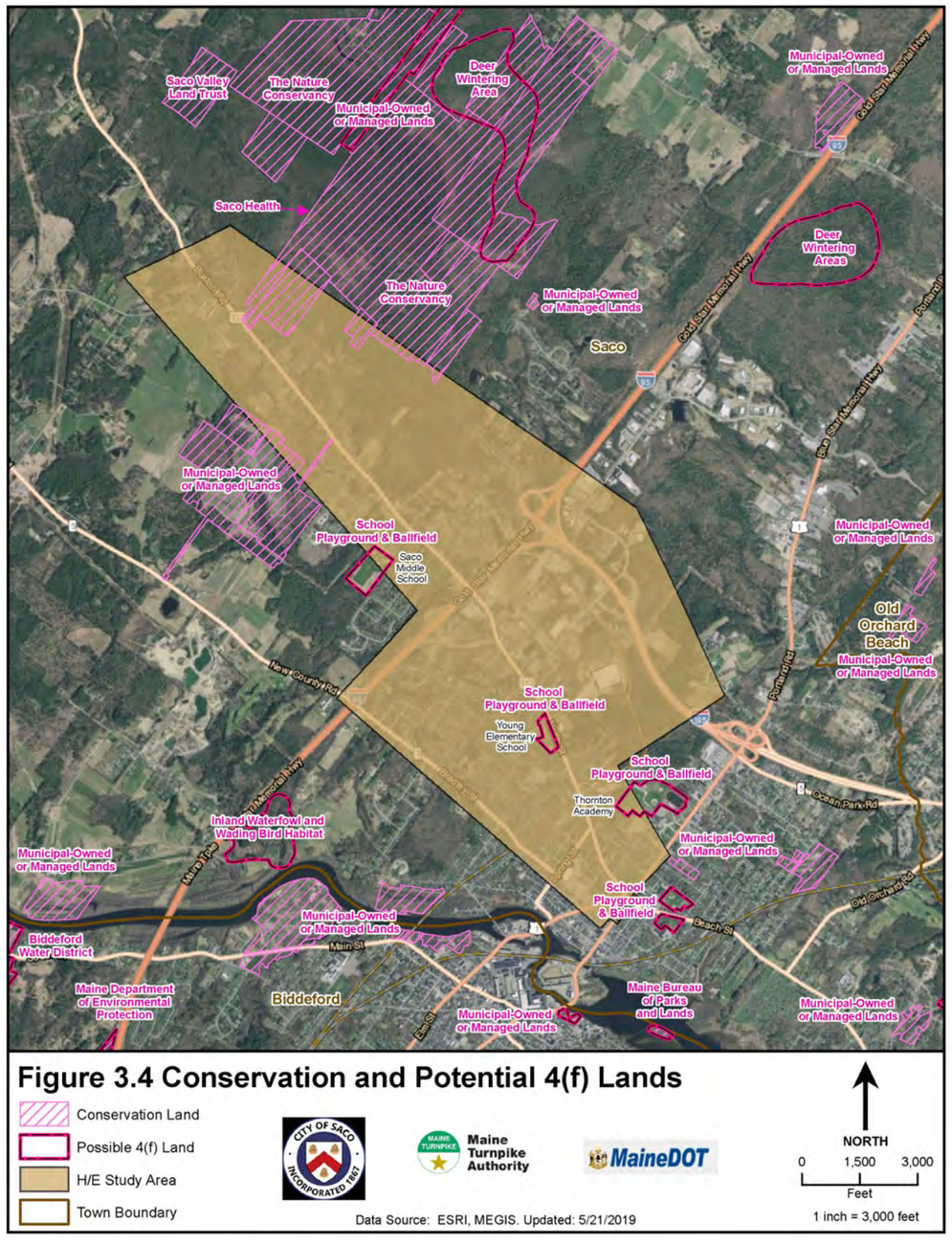


Figure 3.4. Conservation and Potential 4(f) Lands

Table 3.1: Rare, Threatened, Endangered, and Special Concern Plant Species and Habitats

Resource	Source of Data	State Status*	Site Name
Insects			
Hessel's Hairstreak (Callophrys hesseli)	MDIFW	E	Saco Heath
Animals			
Bats	USFWS, MDIFW	T, E, SC (NLEB – Federal T)	Forested Areas
Malleated Vertigo (Vertigo malleata)	MDIFW	SC	Saco Heath
Habitats			
Raised Level Bog Ecosystem	MNAP	N/A	Saco Heath
Pitch Pine Bog	MNAP	N/A	Saco Heath
Plants			
Atlantic White Cedar (Chamaecyparis thyoides)	MNAP	SC	Saco Heath
Button Sedge (Carex bullata)	MNAP	SC	Saco Heath
Long's Bulrush (Scirpus longii)	MNAP	T	Saco Heath
Clothed Sedge (Carex vestita)	MNAP	E	CMP Powerline

* State legal status is defined according to Title 12 Section 544, and Title 12 Section 544 B:

- E ENDANGERED; Rare and in danger of being lost from the state in the foreseeable future; or federally listed as Endangered.
- T THREATENED; Rare and, with further decline, could become endangered; or federally listed as Threatened.
  Non-Legal status:
- SC SPECIAL CONCERN; Rare in Maine, based on available information, but not sufficiently rare to be considered Threatened or Endangered.
- PE Potentially Extirpated; Species has not been documented in Maine in past 20 years or loss of last known occurrence has been documented.

4.0 ZONING AND LAND USE

4.1 ZONING DISTRICTS

- R-1 = Low Density District
- R-2 = Medium Density District
- R-3 = High Density District
- B-2 = Highway Business District
- B-8 = Office Park District
- I-1 = Industrial Park District
- I-2 = Industrial Business District
- C-1 = Conservation District
- RP = Resource Protection District

The study area contains a mix residential, business, and industrial zoning districts. From Elm Street to the rail line west of Park Street is a R-3 district. R-3 districts are heavily developed already with access to central water and sewer. The R-3 district contains almost exclusively single-family homes. Just north of this district are a R-1B and a B-2C district. R-1 districts are single family homes, not guaranteed to have access to central water or sewer. Development in R-1 districts is restricted to low-density residential or associated uses. This R-1B district contains Thornton Academy and single-family homes. B-2 districts require large vehicle volumes away from the downtown core. This B-2 district contains only Gagne & Son Concrete Blocks.

From the rail line to Lund Road to the south and from the rail line to Industrial Park Road to the north is an R-2 district. R-2 districts have access to central water and sewer and have room to harmoniously install new facilities. This R-2 district contains single family homes, Young School, and the Saco Community Center in the southern portion and single-family homes and the Saco Fire Department in the northern section.

Directly north of the R-2 district is an I-1 district. I-1 districts are designed for industrial installations and offices in a campus-like arrangement. This I-1 district contains a General Dynamics Weapon Systems manufacturing facility. From Industrial Park Road to I-95 is an I-2 district surrounding a B-2C district ending at the restaurant just past Lund Rd. The I-2 district acts as a transition zone for non-retail commercial use and manufacturing uses. This I-2 district contains self-storage facilities, an enclosed sports facility, Sure Winner Foods, Der-Tex foam manufacturing, small medical facilities, PeoplesChoice Credit Union, Saco Public Works, and a few municipal facilities. The B-2C district contains a gym, condos, a veterinary clinic, a gas station, and a liquor store.

From Lund Road to I-95 to the south is a B-8 district. B-8 districts are intended to provide attractive locations for high-quality economic growth near the Maine Turnpike. This B-8 district contains a gym and a hotel.

West of I-95 is an R-1D district with C-1 and RP districts as you move north or south from Route 112. This R-1D district contains single family homes, Hillview Markey, the Way Way General Store, Saco Middle School, Saco Waste-Transfer Station, soccer fields, an equestrian facility, and the entrance to Saco Heath nature preserve. C-1 districts are designed to promote and preserve agriculture open space while permitting low-density residential use. RP districts to protect ecological systems that if developed would reduce water quality, disrupt ecosystems, and are necessary for natural flood protection. The RP district includes the Saco Heath wetlands, Sandy Brook, Goosefare Brook, and Foxwell Brook. **Figure 4.1** on the following page, presents the zoning in the study area.

A plan **(Figure 4.2** on page 29**)** was prepared that depicts property boundaries and buildings (residential, commercial, school) in the area west of Industrial Park Road for use in assessing impacts associated with improvement alternatives.

5.0 ALTERNATIVE TRANSPORTATION

5.1 BUS TRANSPORTATION

Shuttlebus-Zoom offers multiple bus routes traveling through Saco. The Shuttlebus Local offers stops between Biddeford Crossing in Biddeford and Cascade Plaza in Old Orchard Beach. In Saco, the local Shuttlebus offers stops at Saco Transportation Center, Saco Valley Plaza, and Main and Ocean Park. Other stops outside of Saco include Southern Maine Health Center (SMHC) in Biddeford and the Old Orchard Beach Chamber of Commerce which is adjacent to the Old Orchard Beach Pier. Rides are offered hourly.

Shuttlebus Zoom Turnpike route offers rides onto the Portland peninsula. The bus picks up at the Park and Ride lot on Industrial Park Road. This bus stops at the Greyhound bus Station on Congress Street, the intersection of Bramhall and Congress Street, the intersection of High and Congress Street, Monument Square, Portland City Hall, and the intersection of Bedford Street and Forest Avenue. This route provides rides to major employers such as Maine Medical Center, Bank of America, TD Bank, Portland City Hall, Oakhurst Dairy, and other retailers in the area. The bus arrives at the park and ride lot every 30 to 40 minutes starting at 6:26AM.

The Shuttlebus-Zoom Intercity route offers rides from Saco through Old Orchard, Scarborough, to the Maine Mall, and into downtown Portland. This route only leaves out of Saco from Main Street and only leaves at 6:40AM.

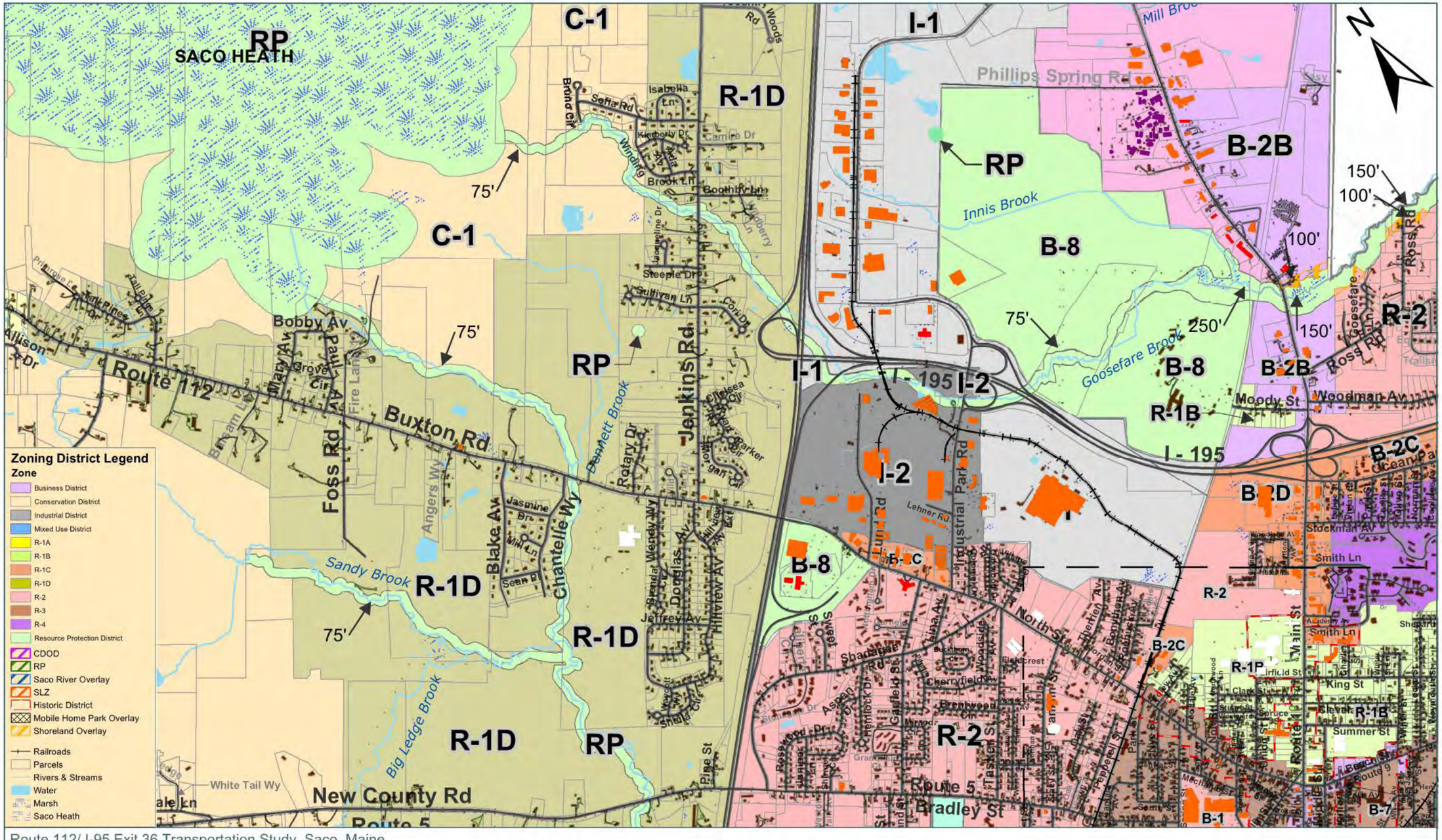
The Shuttlebus-Zoom UNE Nor'Easter route offers rides every hour from the Saco Transportation Center to the University of New England Campus in Biddeford.

5.2 RAIL TRANSPORTATION

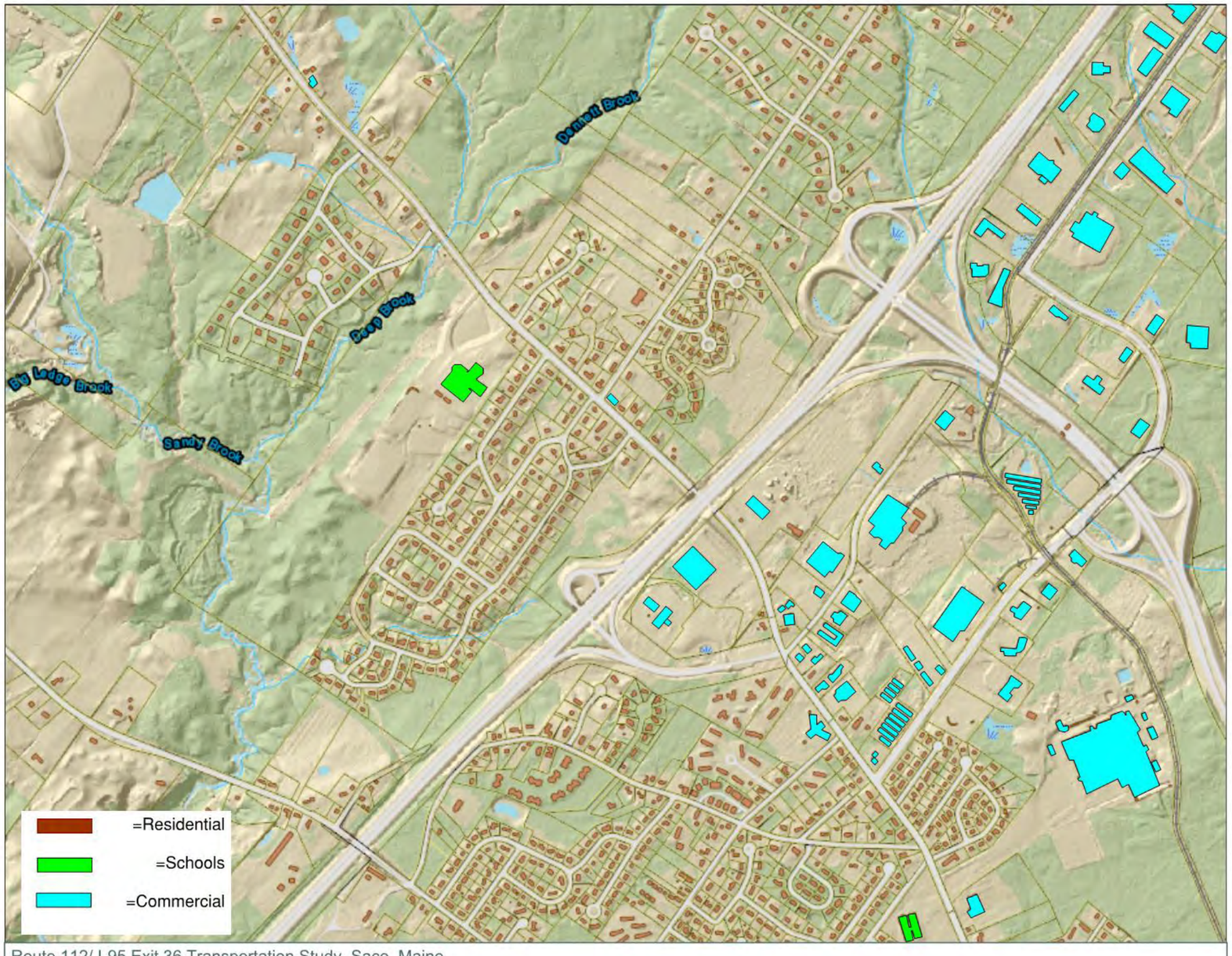
The Amtrak Downeaster stops in the Saco Transportation Center. The train runs north to Brunswick with stops in Old Orchard Beach, Portland, and Freeport. The train runs south to Boston with stops in Wells, New Hampshire, and Massachusetts. Morning commute trains leave at 5:42AM for Boston. No practical morning commute exists into Portland.

5.3 CARPOOLING

GOMaine offers carpooling options for commuters statewide. GOMaine rewards those who make Ecofriendly commuting choices with retailer discounts, restaurant coupons, and tickets to events. GOMaine currently carpools from Saco to locations between Newington, NH and Lewiston, ME. Destinations include Portsmouth Naval Shipyard, IDEXX, Maine Medical Center, and Bath Iron Works.



Route 112/ I-95 Exit 36 Transportation Study, Saco, Maine
Figure 4.1 - Zoning Area



Route 112/ I-95 Exit 36 Transportation Study, Saco, Maine
Figure 4.2: Lots and Building Plan Near Exit 36

6.0 ALTERNATIVES FOR CONSIDERATION

The following provides a summary of each Alternative that has been evaluated.

6.1 SUMMARY OF ALTERNATIVES

FUTURE NO-BUILD:

No changes to the existing transportation system.

- Future Base Condition (No-Build):
  - » No changes to the local roadway network
  - » Widen I-95 to eight lanes between Exits 32 and 44
  - » Widen I-95 to six lanes between Exits 44 and 48
  - » Widen Exit 36 northbound entry and southbound exit ramps to two lanes

A1 - TRANSPORTATION DEMAND MANAGEMENT/TRANSIT IMPROVEMENT STRATEGIES (TDM):

Transportation Demand Management (TDM) programs provide tools to for commuting travelers to reduce the demand for transportation, i.e., reduce the number of vehicles on the road. These tools include ride share programs, park and ride lots (which can support rideshare programs), and work from home opportunities, all of which either make it easier to rideshare or to stay off the road altogether. Example 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:
  - » ShuttleBus Zoom Turnpike Express
  - » Intercity Shuttle
  - » ShuttleBus Local
- Park and Ride Lots
- Amtrak Downeaster Passenger Rail

A2 - TRANSPORTATION SYSTEM MANAGEMENT IMPROVEMENTS (TSM):

Transportation Systems Management (TSM) addresses the capacity and safety deficiencies of the system. TSM improvements can be made alone or in addition to other improvements. **Table 6.1** identifies recommended TSM improvements. Further detail on the SimTraffic analysis that supports these improvements is provided in Section 8.0.

Table 6.1
TSM Improvements

Middle School Entrance / Rt. 112
Route 112 NB Add Left Turn Lane
Hillview Ave / Jenkins Rd / Rt. 112
Route 112 NB Add Through-Right Lane
Route 112 SB Add Left Turn Lane
Jenkins Road WB Add Left Turn Lane
Install Traffic Signal
Lund Rd / Rt. 112
Route 112 SB Add Left Turn Lane
Lund Road WB Add Right Turn Lane
Lund Road WB Existing LTR Lane to a LT Lane
Lund Road WB Add Right Turn Lane
Garfield St / Rt. 112
Garfield Street Right-In / Right-Out
Industrial Park Rd / Rt. 112
Route 112 SB Additional Left Turn Lane / Receiving Lane
Industrial Park Road WB Channelize Right Turn Lane
Industrial Park Road WB Additional Left Turn Lane / Receiving Lane
Coordinate Signal with Tasker Street and Franklin Street
Make Master Intersection in Coordinated System
Industrial Park Rd / I-195 EB Ramps
I-195 Eastbound Ramps NWB Additional Left Turn Lane / Receiving Lane
Tasker St / Village Green Dr. / Rt. 112
Route 112 NB Add Left Turn Lane
Route 112 SB Add Left Turn Lane
Tasker Street EB Add Right Turn Lane
Signalize / Coordinate with Industrial Park Road and Franklin Street[4]
Franklin St / Rt. 112
Route 112 NB Add Left Turn Lane
Signalize / Coordinate with Industrial Park Road and Tasker Street[4]
Spring St / Goodale St / Rt. 112
Route 112 NB Add Left Turn Lane
Route 112 NB Add Through-Right Lane
Route 112 SB Add Left-Through Lane
Spring Street EB Add Right Turn lane
Signalize[4]

A3 - EXTENSION OF I-195:

Consists of extending I-195 from Exit 36 of the Maine Turnpike to Route 112 west of the Middle School. It does not include a vehicle connection to Jenkins Road. The **Cloverleaf Interchange Configuration** (See **Figure 6.1**) was determined to be a feasible configuration from a traffic operations and design perspective. This configuration utilizes collector-distributer (CD) roads to minimize the impact of weave sections associated with cloverleaf interchanges.

An alternative to extend I-195 westerly to Route 112 to reduce traffic on Route 112 between Industrial Park Road and Blake Avenue would require a complete reconstruction of the Exit 36 interchange. As currently configured, an additional approach from the west cannot be accommodated. A full cloverleaf interchange with loop ramps and diamond ramps in all four quadrants would be needed to provide access to and from all directions. In addition, CD roads would be needed adjacent to I-95 in both directions to safely accommodate weaving movements between the closely spaced on and off ramps. The interchange would be much bigger than the existing interchange, requiring acquisition of several private properties, construction of two new bridges and involve complex maintenance of traffic to construct. The extension of I-195 as a two-lane roadway to the west would be approximately 0.9 miles long and include a bridge over Jenkins Road and two new intersections with Route 112 at the its westerly end.

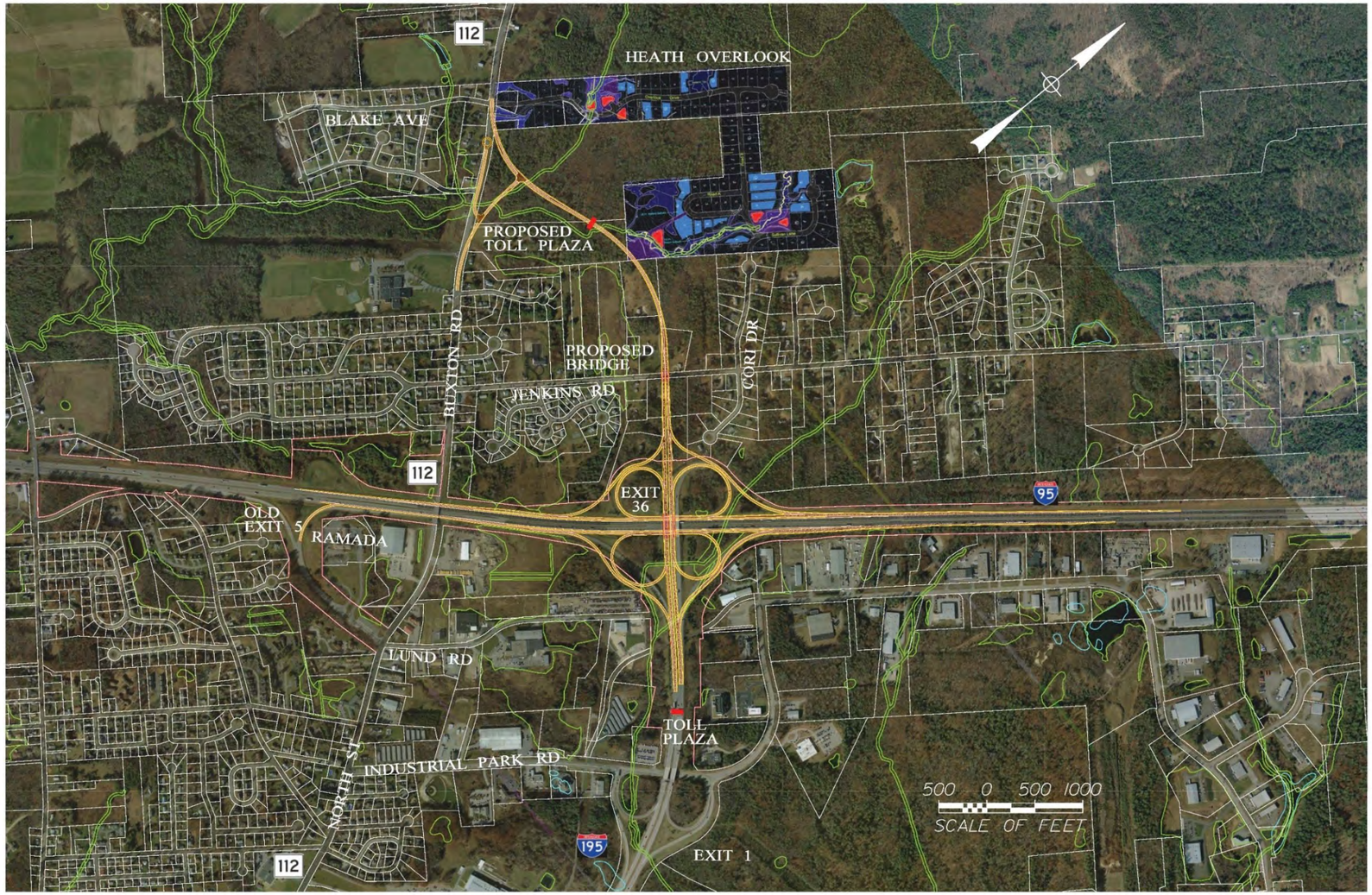


Figure 6.1: A3 - Extension of I-95

A4 - MODIFICATION OF EXIT 36:

Consists of providing full Turnpike access at Route 112 with a collector-distributor roadway on the Turnpike between Route 112 and Exit 36. Access to the Turnpike is to be provided at Lund Road (with signals) and at a new signalized intersection west of the Turnpike. The new interchange will be linked to the existing Exit 36 interchange using collector-distributor roads to eliminate the risks associated with weave movements.
(See **Figure 6.2**).

The modified Exit 36 Alternative was developed to provide direct access from the I-95 Maine Turnpike to Route 112 by taking advantage of the existing northbound ramps at the Ramada Inn. The northbound ramps would be reconnected to Route 112 and modified to connect to a new collector distributor (CD) road that would run parallel to I-95 northbound. Further north, the CD road would connect to the existing off-ramp to I-195 eastbound before merging with I-95 northbound. The CD road would operate at lower speeds and traffic volumes than the I-95 mainline providing safer conditions for the weaving movements between traffic entering and exiting the Turnpike. A similar CD road would be provided in the southbound direction for connections to the Exit 36 southbound ramps and a pair of new southbound ramps to and from Route 112. The reduced speeds and traffic volumes on the southbound CD road would improve merging conditions for the traffic from the slow speed Exit 36 loop on-ramp as well as conditions for the southbound weaving movements. It is noted that it may be possible to construct the CD Roads at a later date when traffic volumes are predicted to negatively influence weave conditions.

Like most locations along the Turnpike, access onto I-95 from Route 112 will include a toll plaza on both the northbound and southbound on ramps. The plazas are expected to include three toll lanes.

The modified Exit 36 Alternative has several advantages over other types of interchange modifications at this location, including minimal right-of-way and environmental impacts, conventional ramp geometry that meets driver expectations, substantial use of existing infrastructure thereby minimizing construction cost, and providing access to two separate cross roads which will help balance or spread out the traffic volumes on the City's local streets.

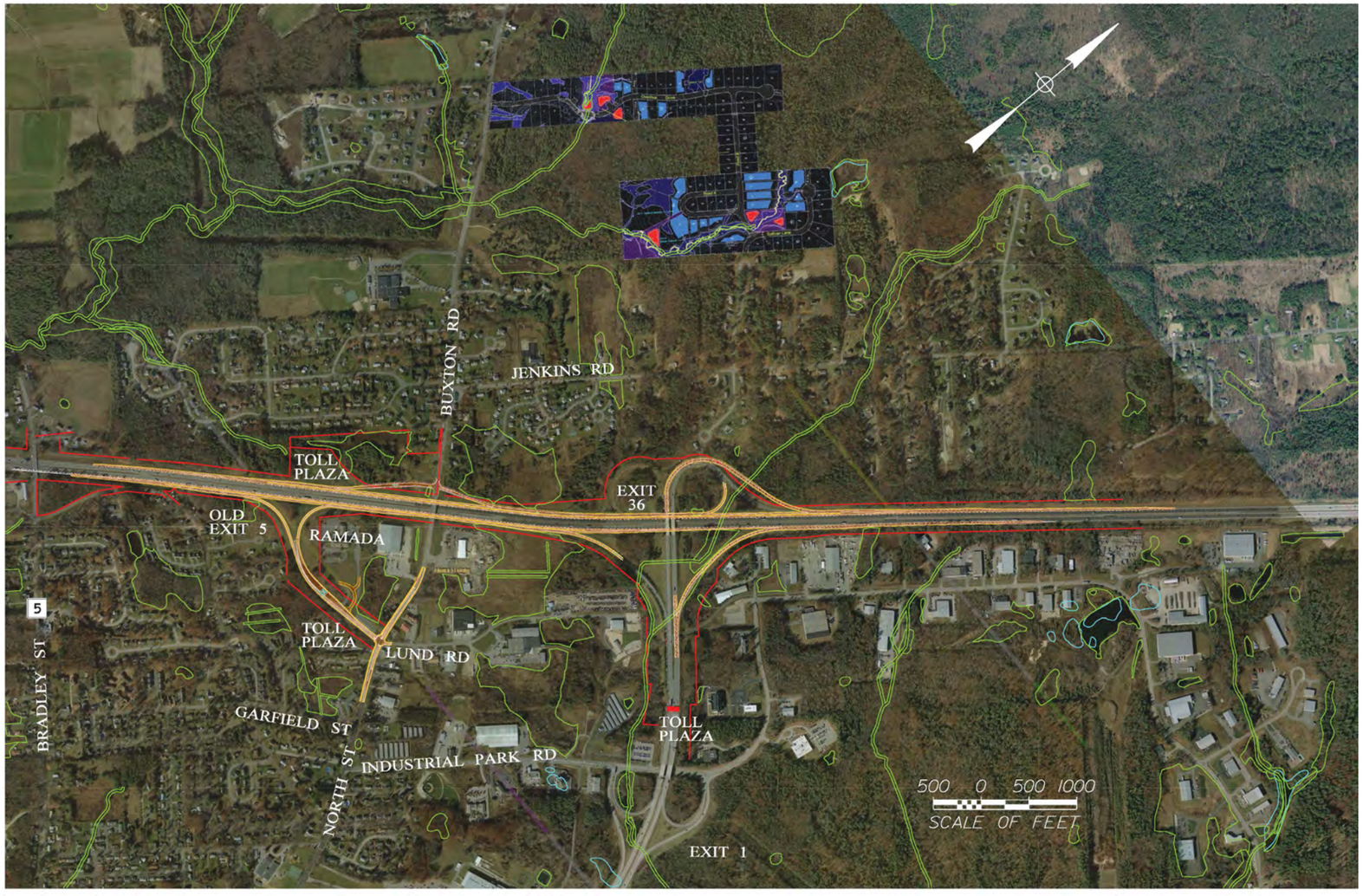


Figure 6.2: A4 - Modification of Exit 36

A5 - ROUTE 112/ROUTE 5 CONNECTOR ROAD:

Consists of a new roadway between Route 112 and Route 5 just west of the Middle School. This alternative is intended to reduce traffic through residential neighborhoods by creating a convenient link between Route 5 to Route 112 and vice versa. (See **Figure 6.3**).

The Route 112 to Route 5 Connector was developed to provide an alternative for motorists who travel through the Garfield Street and Tasker Street neighborhoods for access to and from the Turnpike via Industrial Park Road. The alternative's layout was developed on currently vacant land on two parcels just west of the Saco Middle School's entrance and the adjacent electrical transmission line easement. The Connector would be an approximately one mile long north-south two lane roadway with signalized intersections at each end. Left turn lanes would be provided on both Route 5 and Route 112 to facilitate turning movements to the Connector. The Connector would include one driveway to the Middle School as its only access point and the school's westerly entrance would be closed in favor of this new entrance.

Figure 6.3: A5 - Route 112/Route 5 Connector Road

A6 - MODIFICATION OF EXIT 36 AND ROUTE 112/ROUTE 5 CONNECTOR ROAD:

Implementing both Alternatives 5 and 6. (See **Figure 6.4**).

Adding the Route 112 to Route 5 Connector Road Alternative to the Modified Exit 36 Interchange Alternative further improves traffic operations at several local intersections and together fulfill the Study's Purpose and Need to a greater extent. Traffic modeling shows that the Connector Road reduces cut-through traffic on Garfield Street, the neighborhood streets east of Industrial Park Road and works as a more direct connection between Route 5 and Route 112 than the existing Louden Road connection 1.5 miles to the west. In addition, the provision of the Connector Road results in a more balanced distribution of turning movements and vehicle queues at the Route 112 Interchange ramps intersections.

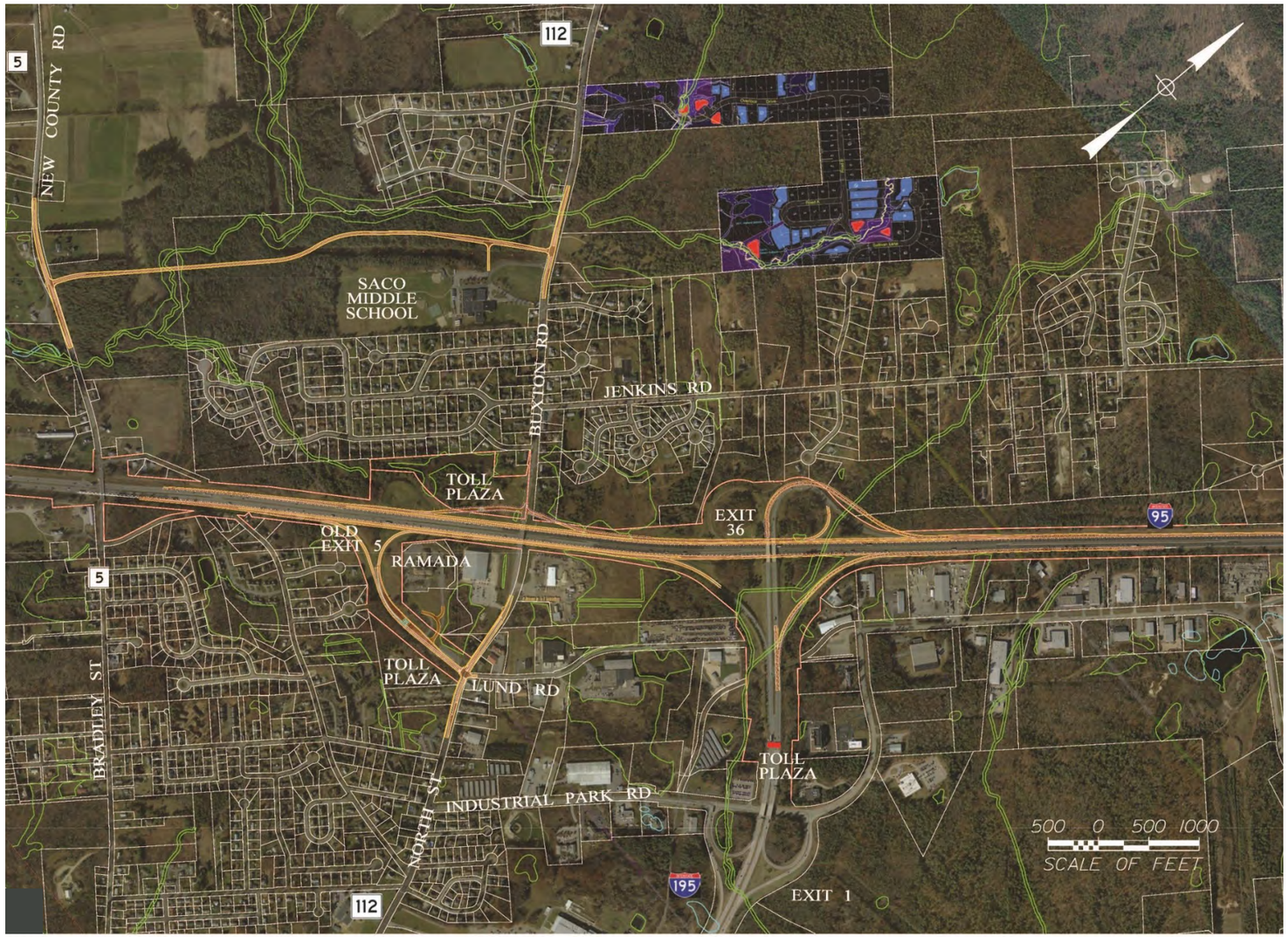


Figure 6.4: A6 - Modification of Exit 36 and Route 112/Route 5 Connector Road

6.2 ALTERNATIVES CONSIDERED AND ELIMINATED

The following is a list of Alternatives that were identified during the Study process and were eliminated from considerations.

- **Extension of Lund Road to Industrial Park Road -** As an independent Alternative, it did not meet Purpose and Need for the Study. It also did not compliment other Alternatives.
- **Route 5 to Route 112 Roadway via Shadagee Road to Lund Road** – While this Alternative would likely provide Garfield Street traffic reduction benefits, it would not be compatible with any Alternative that provides access to the Turnpike in the Old Exit 5 area.
- **Open MTA Old Exit 5 Interchange Ramps** – The existing ramps as currently configured or as previously existed do not meet State and Federal design standards. It should be noted that A4-Modification of Exit 36 requires improvements to the Old Exit 5 Ramp system to bring it up to current design standards.
- **MTA Flag Pond Road Interchange** – This Alternative did not meet Purpose and Need for this Study.

There were several Exit 36 interchange configurations that were investigated. The Cloverleaf Interchange Configuration was determined to be a feasible configuration from a traffic operations and design perspective. This configuration utilizes collector-distributer roads to minimize the impact of weave sections associated with cloverleaf interchanges. The following interchanges were eliminated primarily due to traffic operational problems from the need to signalize ramps.

- **Partial Cloverleaf Signalized Interchange Configuration** (See **Figure 6.5**). This concept was developed by the City of Saco prior to the start of this study that includes traffic signals at the ramp intersections on I-195.
- **Diverging Diamond Signalized Interchange Configuration** (See **Figure 6.6**). This concept utilizes a diverging diamond interchange (DDI) on I-195 over I-95. This configuration is signalized.
- **Cloverleaf with No Southbound Ramps Configuration** - This concept is an unsignalized configuration. The volumes on the southbound ramps are low, so eliminating them would reduce cost.

Figure 6.5 Partial Cloverleaf Signalized Interchange Configuration

Figure 6.6 Diverging Diamond Signalized Interchange Configuration

7.0 2040 TRAFFIC VOLUME FORECAST

The PACTS Travel Demand Model was used to develop year 2040 traffic volume forecasts. Forecasts were developed for the study area intersections, for the Maine Turnpike, and for I-195. Forecasts were developed for four distinct future transportation system scenarios.

- Future Base Condition (No-Build):
  - » No changes to the local roadway network
  - » Widen I-95 to eight lanes between Exits 32 and 44
  - » Widen I-95 to six lanes between Exits 44 and 48
  - » Widen Exit 36 northbound entry and southbound exit ramps to two lanes
- Extension of I-195 – No-Build condition plus:
  - » Extend I-195 as a limited-access two-lane roadway between its existing interchange with I-95 to a new intersection with Route 112
  - » Reconstruct Exit 36 as a full interchange accommodating all movements between I-95, I-195, and the Extended Roadway
- Modification of Exit 36 – No-Build condition plus:
  - » Provide a northbound exit ramp from I-95 to Route 112 at the location of the Old Exit 5
  - » Provide a northbound entry ramp to I-95 from Route 112 at the location of the Old Exit 5
  - » Provide I-95 southbound exit and entry ramps to and from Route 112 between I-95 and Jenkins Road
- Route 112 and Route 5 Connector:
  - » Provide a two-lane roadway connecting Routes 112 and 5 to the immediate west of the middle school

7.1 2040 NO-BUILD TRAFFIC VOLUMES

Figure 7.1 presents the AM and PM peak hour intersection turning movement volumes. **Figures 7.2 and 7.3** present AM and PM peak hour changes between Existing 2018 and Base 2040 volume forecasts. With the above noted model assumptions traffic is expected to increase on area roadways from approximately 10% to 35%. Growth for key study area roadways are estimated to be:

- Route 112 west of the Maine Turnpike is forecast to grow by 20% during the AM and PM peak hours. Route 112 east of Industrial Park Road is forecast to grow by 28% during the AM peak hour and 22% during the PM peak hour.
- Industrial Park Road is forecast to grow by 20% during the AM peak hour and 16% during the PM peak hour.
- Garfield Street is forecast to grow by 39% during the AM peak hour and 23% during the PM peak hour.
- Jenkins Road is forecast to grow by 11% during the AM peak hour and 18% during the PM peak hour.
- Louden Road is forecast to grow by 21% during the AM peak hour and 16% during the PM peak hour.

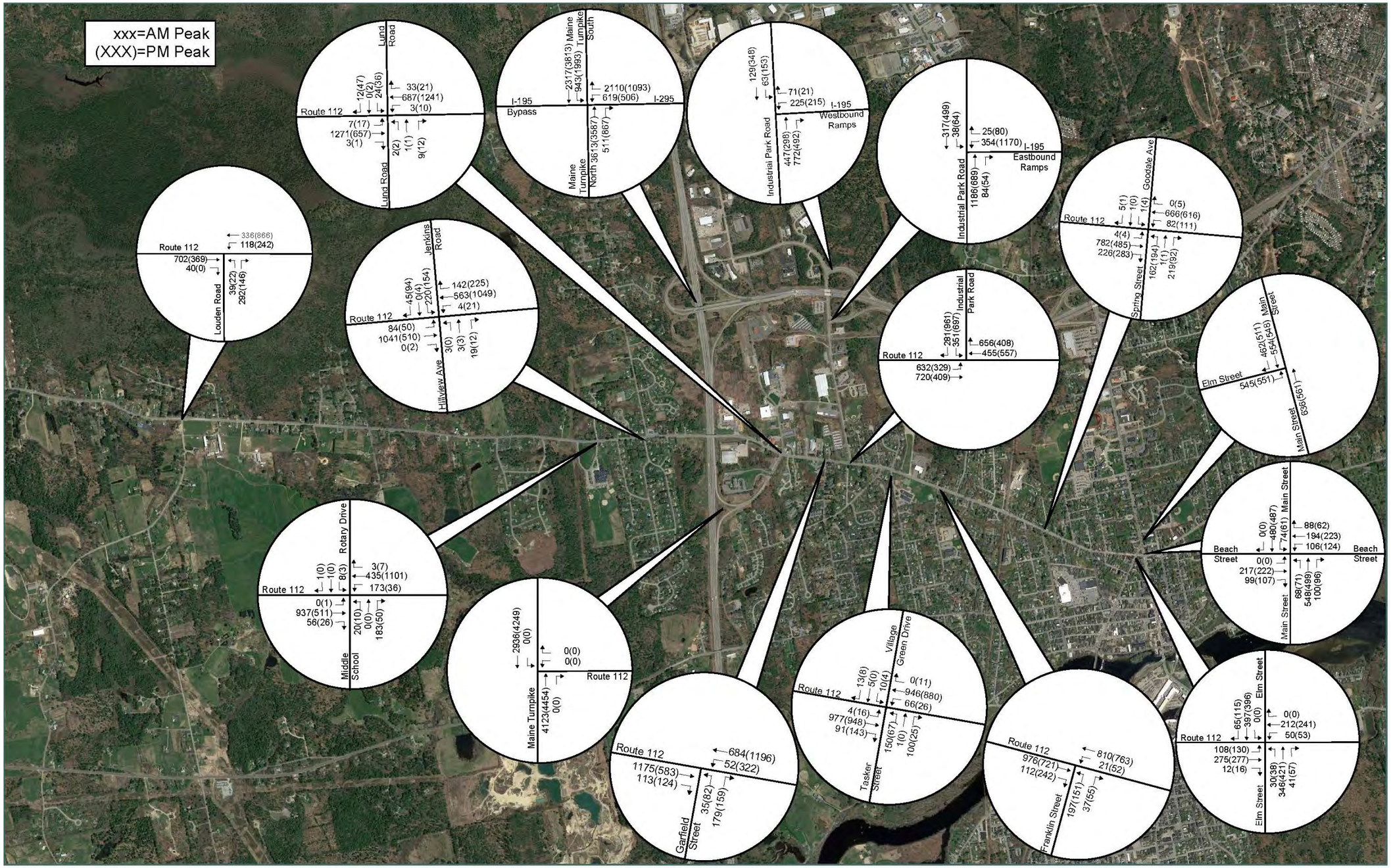


Figure 7.1 2040 No-Build AM and PM Peak Hour Volumes

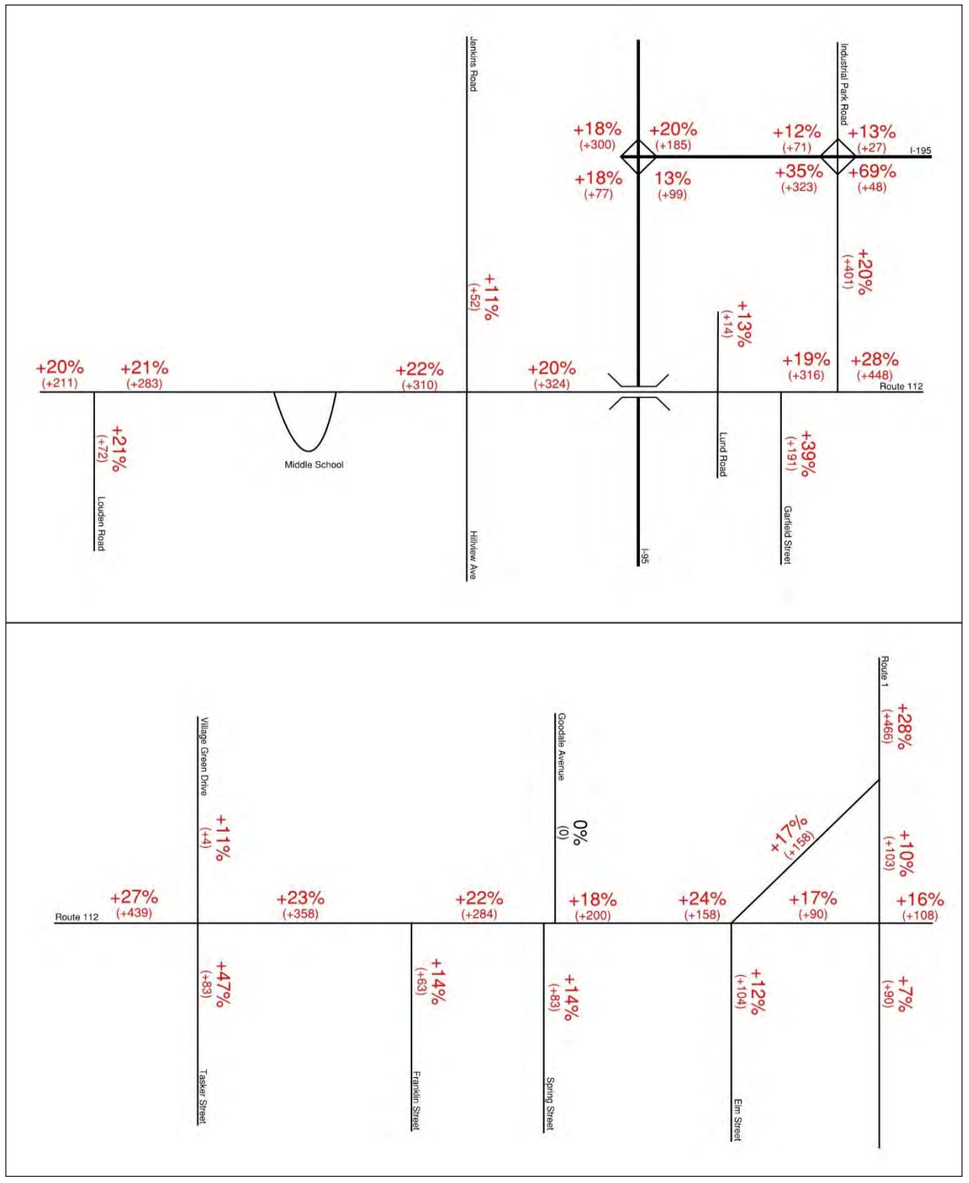


Figure 7.2 AM Peak Hour Change between Existing 2018 and 2040 No-Build

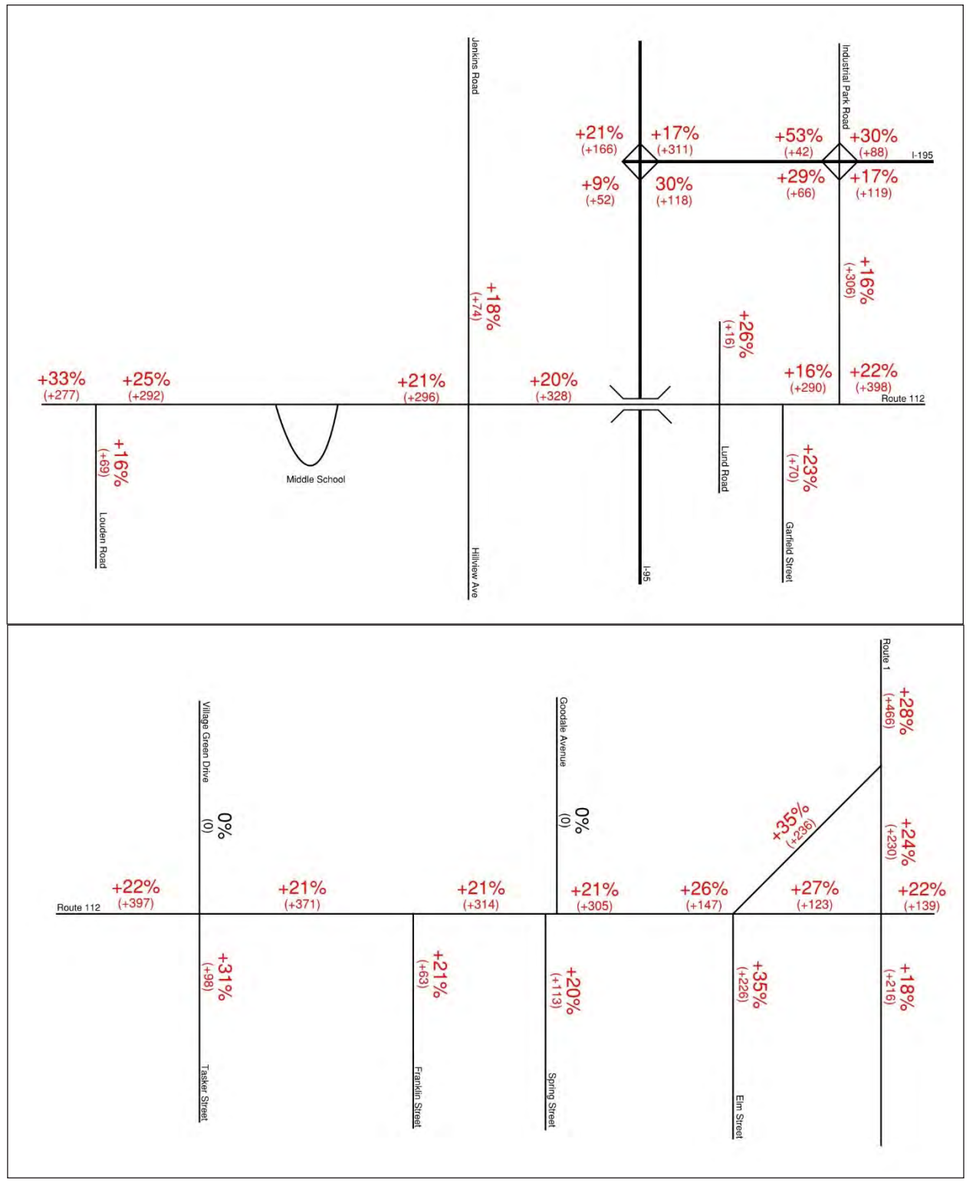


Figure 7.3 PM Peak Hour Change between Existing 2018 and 2040 No-Build

7.2 2040 TRAFFIC VOLUMES EXTENSION OF I-195 (A3)

The extension of I-195 to a point along Route 112 west of the Maine Turnpike will result in traffic shifts in the study area. The following examples demonstrate some of the traffic shifts.

- The current primary travel path between outer Route 112 and the Maine Turnpike (north and south) follows Route 112 to Industrial Park Road to I-195 to Exit 36 of the Maine Turnpike. With the I-195 Extension, this traffic is likely to divert directly to the I-195 Extension at its intersection with Route 112. Traffic is diverted from the section of Route 112 that passes Saco Middle School, Jenkins Road, Garfield Street, and Industrial Park Road and from Industrial Park Road.
- One current travel path between outer Route 112 and Route 1 north of Route 112 follows Route 112 directly to Route 1. With the I-195 Extension, some of this traffic will likely divert from Route 112 to I-195 at its intersection west of the Maine Turnpike. Traffic is diverted from the section of Route 112 that passes Saco Middle School, Jenkins Road, Garfield Street, Industrial Park Road, and continues to Route 1.
- One current travel path between outer Route 5 and the Maine Turnpike (north and south) follows Route 5 to Garfield Street to Route 112 to Industrial Park Road to I-195 to Exit 36. With the I-195 Extension, some of this traffic will likely divert to a path along Louden Road to Route 112 to the I-195 Extension. Traffic is diverted from Route 5, Garfield Street, Route 112 between Garfield Street and Industrial Park Road, and Industrial Park Road.
- As noted in the above examples, the extension of I-195 will result in changes in several current travel patterns. The result is a reduction in traffic congestion along several roads and at several intersections in the study area. With this reduction in traffic congestion, there is a likelihood that other localized traffic patterns that had been diverted away from the study area will return and, in effect, reduce the traffic reduction directly the result of the I-195 Extension. **Figure 7.4** presents the AM and PM peak hour intersection turning movement volumes. **Figures 7.5 and 7.6** present AM and PM peak hour changes between A3 and the 2040 No-Build volume forecasts. As noted the extension of I-195 will carry about 930 two-way vehicles during the AM peak hour and about 1,030 two-way vehicles during the PM peak hour. Traffic will decline on Industrial Park Road and Route 112 to the west by between 22 and 37 percent as vehicles use the new roadway for westerly travel. Garfield Street will see significant PM peak hour traffic reductions (-39%). Some traffic reductions (mostly less than 10%) are expected on in-town neighborhood streets and Route 1.

7.3 TOLLING IMPACTS TO EXTENSION OF I-195 ALTERNATIVE

Traffic forecasts have been developed for a scenario that includes both (1) an extension of I-195 west of the Maine Turnpike Exit 36 to a point along Route 112 and (2) a toll for all vehicles on the extension whether or not the vehicle travels on the Turnpike. For the purpose of the traffic forecast, an eastbound toll plaza was placed on the extension at a point west of the Turnpike. The existing westbound plaza on I-195 remained in place. The effect is that all vehicles that use the extension pay a toll, as do all vehicles that enter the Turnpike (whether northbound or southbound) from either I-195 or the I-195 Extension.

When comparing an extension of I-195 with and without a toll, the effect of the toll is a reduction in vehicle volume on the I-195 Extension. During the morning peak hour, the reduction is about 50 vehicles. This diversion is roughly 5 percent of the total traffic on the extension or 14 percent of the traffic using only the extension and I-195 (i.e., not entering or exiting the Turnpike). During the PM peak hour, the diversion is nearly 200 vehicles or about 20 percent of the total volume and 45 percent of the local (i.e., non-Turnpike) usage of the extension. The effect of diverting traffic back to Route 112 from the extension during the AM peak period is likely to be minor. However, the PM traffic shift is likely to reduce the Level of Service along Route 112.

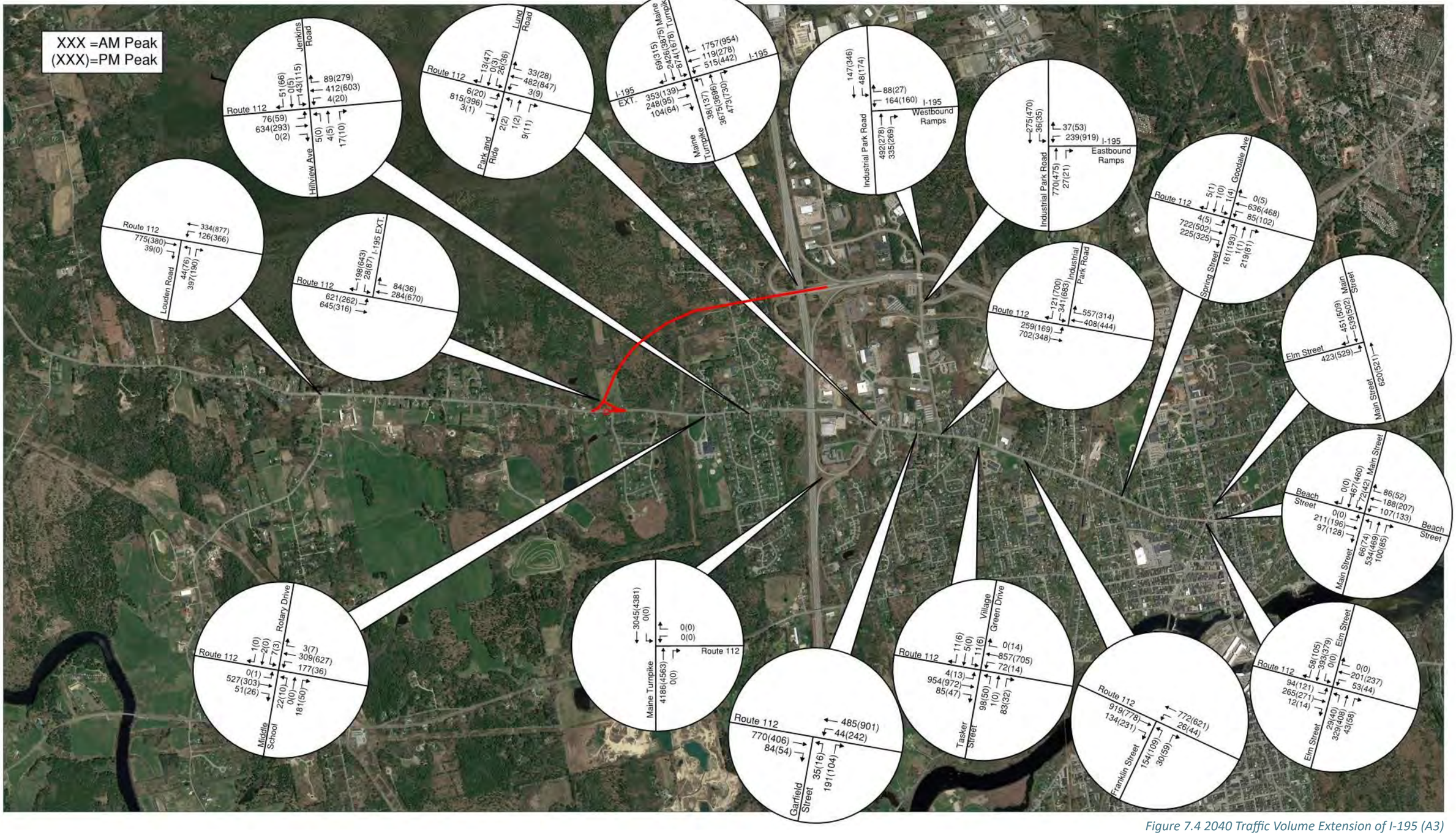


Figure 7.4 2040 Traffic Volume Extension of I-195 (A3)

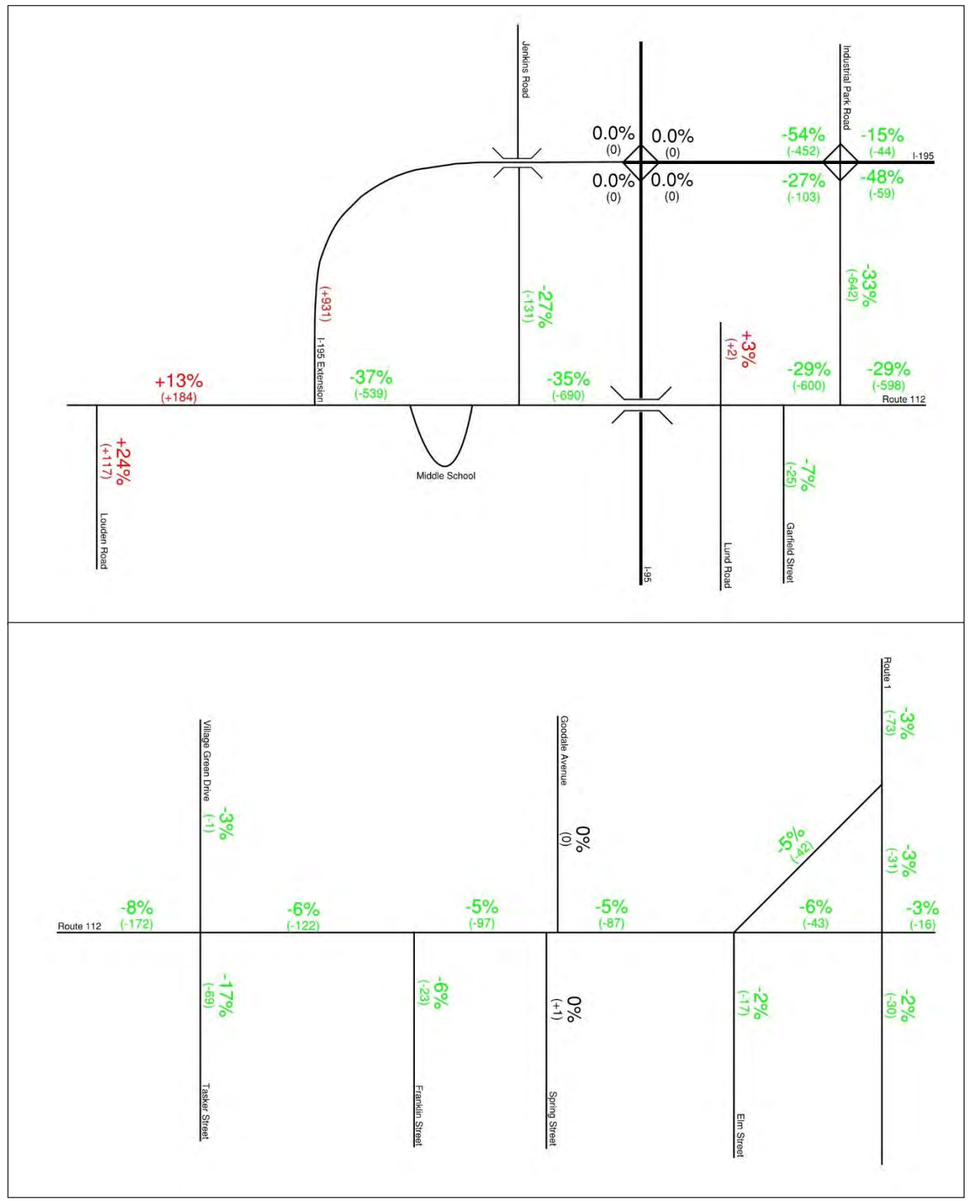


Figure 7.5 AM Peak Hour Comparison between A3 and 2040 No Build Volumes

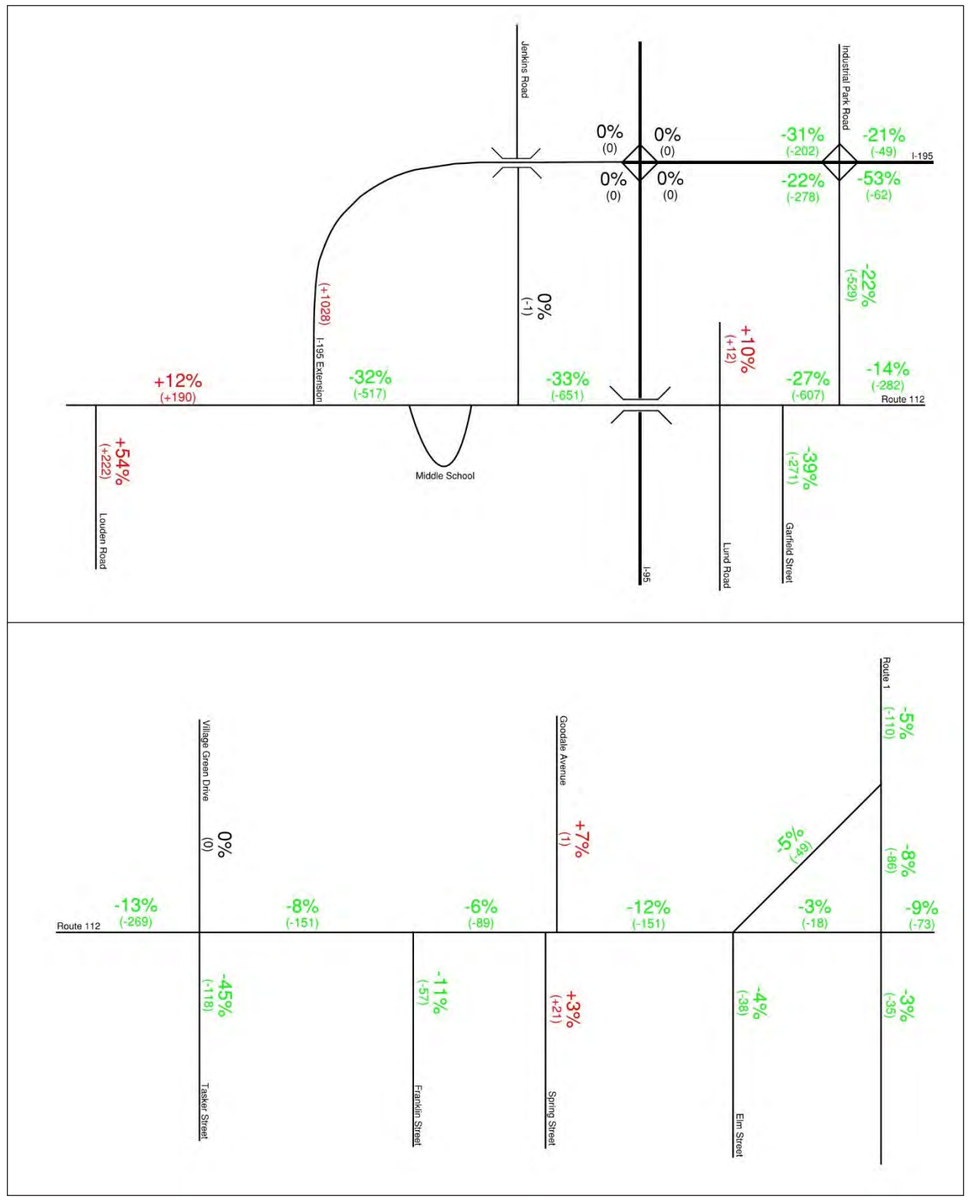


Figure 7.6 PM Peak Hour Comparison between A3 and 2040 No Build Volumes

7.4 2040 TRAFFIC VOLUMES MODIFICATION OF EXIT 36 (A4)

The modification of Maine Turnpike Exit 36 will result in traffic shifts in the study area. The following examples demonstrate some of the traffic shifts.

- The current primary travel path between outer Route 112 and the Maine Turnpike (north and south) follows Route 112 to Industrial Park Road to I-195 to Exit 36 of the Maine Turnpike. With the modification of Exit 36, this traffic can enter or exit the Maine Turnpike at the new ramps located on Route 112. Traffic is diverted from the section of Route 112 between Lund Road and Industrial Park Road, from Industrial Park Road, and from I-195.
- Current travel path options between outer Route 5 and the Maine Turnpike (north and south) include (1) via Route 5 to Garfield Street to Route 112 to Industrial Park Road to I-195 to Exit 36 and (2) via Louden Road to Route 112 to Industrial Park Road to I-195 to Exit 36. With the modification of Exit 36, much of this traffic will access the Maine Turnpike at the new ramps to and from Route 112. Traffic is diverted from the section of Route 112 east of Lund Road, Industrial Park Road, and I-195.
- Some of the current traffic that travels between the Maine Turnpike south of Exit 36 and southwest Scarborough uses Exit 42 as its access point. With the modification of Exit 36, some of this traffic shifts to the new ramps located on Route 112. One of the paths taken to the modified Exit 36 potentially adds traffic to Jenkins Road and Hearns Road.
- Some of the current traffic between the Maine Turnpike and the Route 1 corridor and the Saco and Biddeford central business districts uses Exit 36 and follows a path that includes I-195, Industrial Park Road, Route 112, and potentially some local in-town neighborhood streets. With the modification of Exit 36, this traffic can divert to the new ramps on Route 112. Traffic will increase on Route 112 east of the Maine Turnpike and will decrease on Industrial Park Road and I-195.
- As noted in the previous examples, the modification of Exit 36 will result in changes in several current travel patterns. The result is a reduction in traffic congestion along several roads and at several intersections in the study area. With this reduction in traffic congestion, there is a likelihood that other localized traffic patterns that had been diverted away from the study area will return and, in effect, reduce the traffic reduction directly the result of the Exit 36 modification.

Figure 7.7 presents the AM and PM peak hour intersection turning movement volumes. **Figures 7.8 and 7.9** present AM and PM peak hour changes between A4 and the 2040 No-Build volume forecasts. As noted this alternative will decrease traffic on Industrial Park Road by between 28% and 36% as motorists shift to the new ramps on Route 112. Route 112 west of Industrial Park Road will see traffic decline slightly in the AM peak hour (WB motorists from the east shift from Industrial Park Road to Route 112 west to access the Turnpike at Lund Road thus offsetting the reductions from traffic for those originating from the west) and decline significantly in the PM peak hour. Traffic volumes on Route 112 west of the Turnpike are projected to increase slightly given the attractiveness of the new Turnpike access location. Little traffic volume change is expected for Garfield Street and in-town neighborhood streets. Minor traffic volume increases are projected for North Street and Route 1.

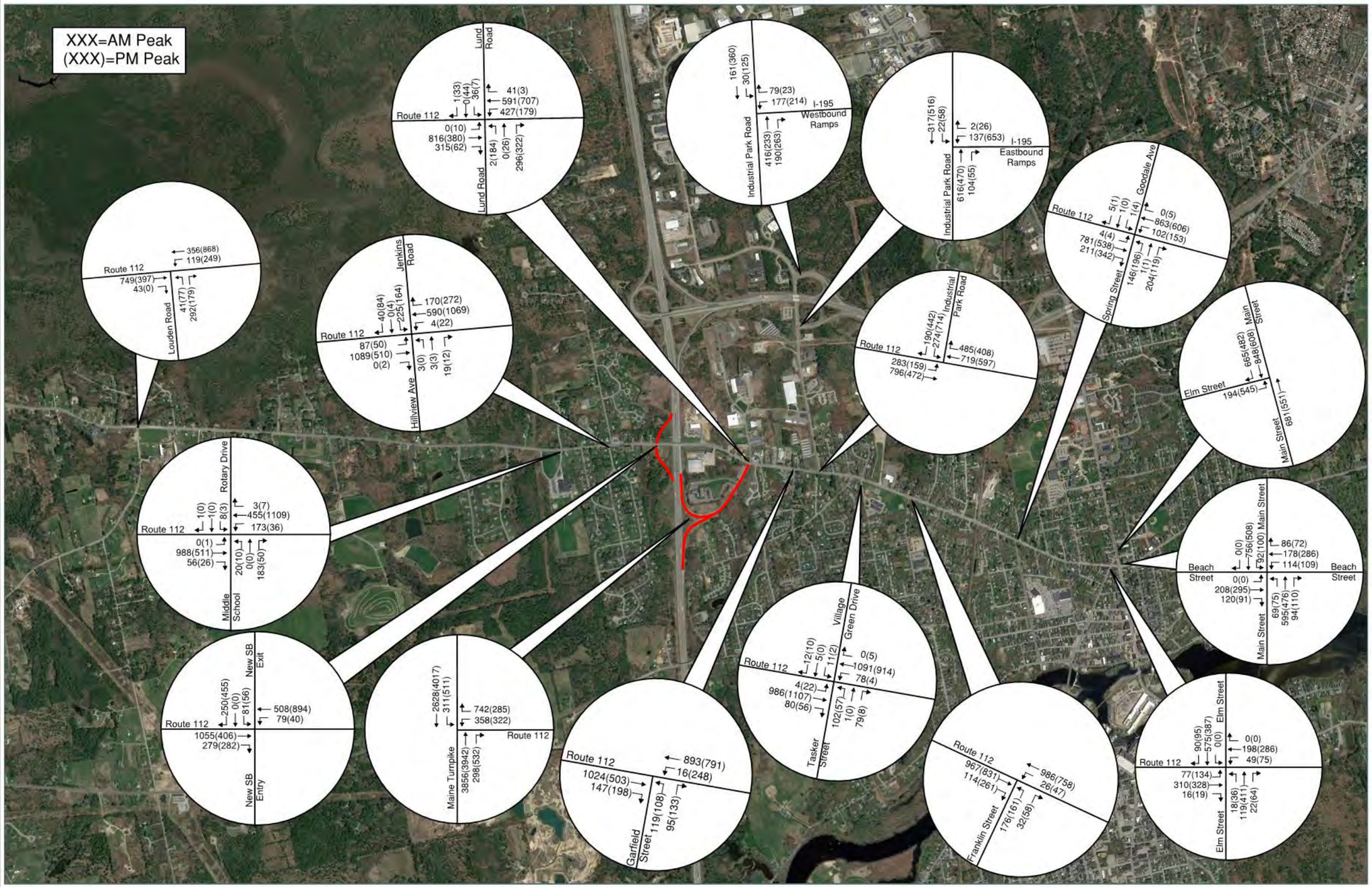


Figure 7.7 2040 Traffic Volumes Modification of Exit 36 (A4)

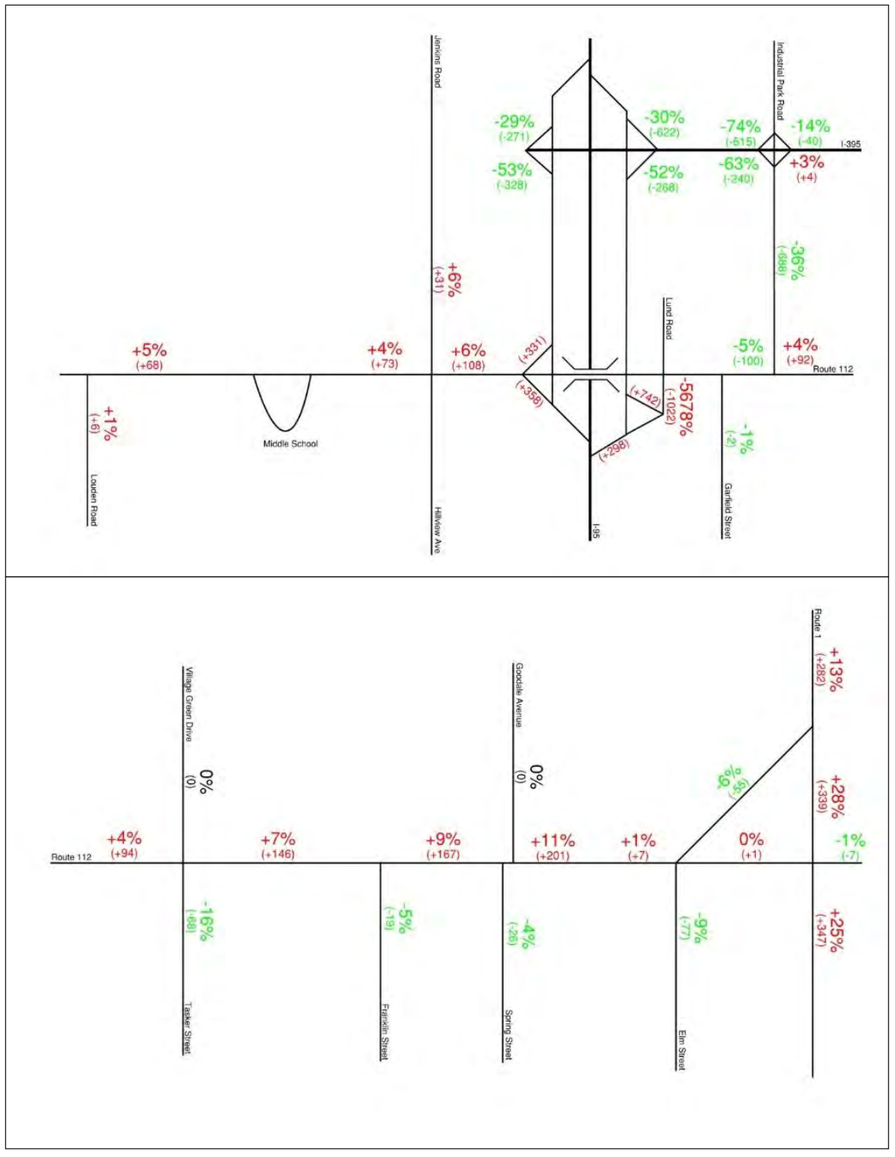


Figure 7.8 AM Peak Hour Comparison between A4 and 2040 No-Build Volumes

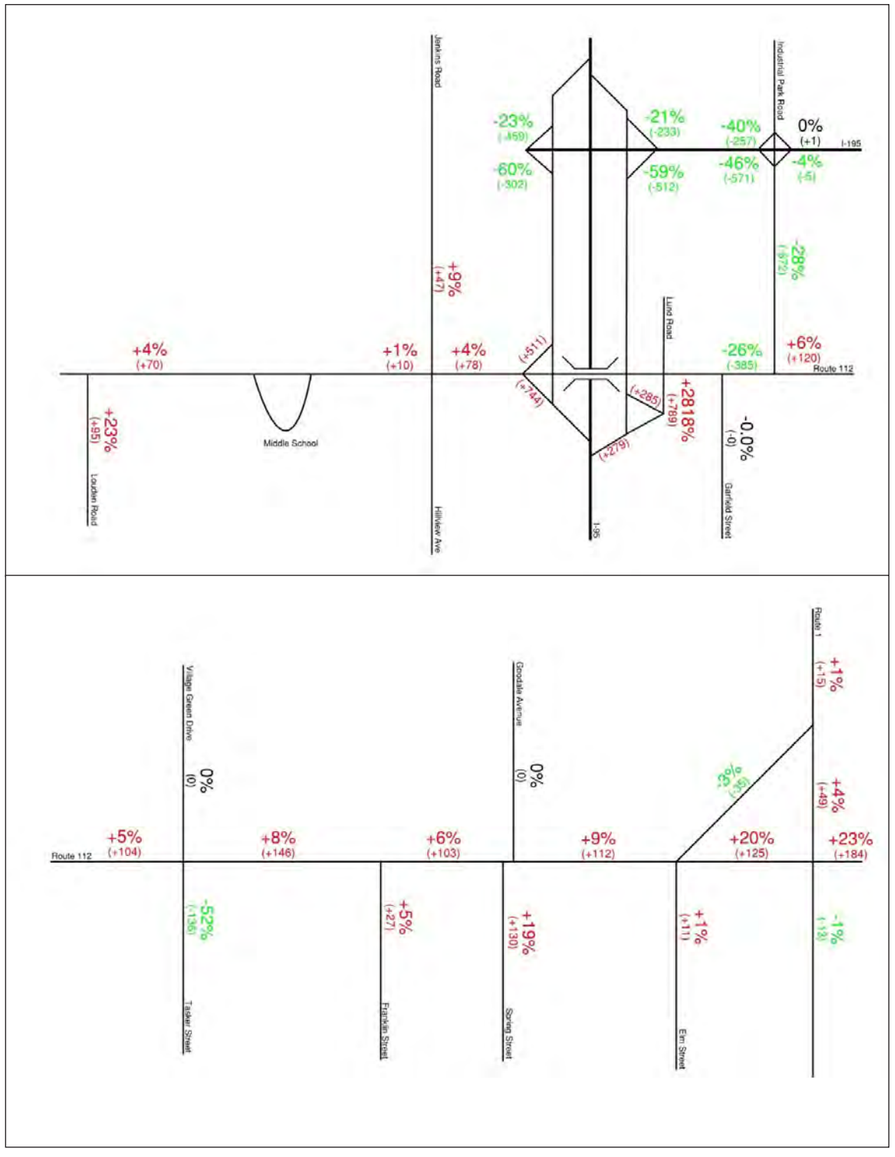


Figure 7.9 PM Peak Hour Comparison between A4 and 2040 No-Build Volumes

7.5 2040 TRAFFIC VOLUMES ROUTE 112/ROUTE 5 CONNECTOR (A5)

The provision of a connector road between Route 112 and Route 5 west of the Saco Middle School will result in traffic shifts in the study area. The following examples demonstrate some of the traffic shifts.

- Several of the current potential travel paths between outer Route 112 and the Saco and Biddeford central business districts and the Route 1 corridor follow neighborhood streets as a connection between Routes 112 and 5. With a Route 112/Route 5 Connector Road, this traffic is diverted to the connector road and away from neighborhood streets.
- One current travel path between outer Route 5 and Route 1 north of I-195 follows Route 5, Garfield Street or another neighborhood street, Route 112 and either Industrial Park Road and I-195 or Route 1. With a Route 112/Route 5 connector road, some of this traffic will likely divert to a path along the connector road to Route 112. Traffic is diverted from the neighborhood streets.
- Traffic between the Saco Middle School and intown Saco must travel the Route 112 corridor. With a Route 112/Route 5 connector, some of this traffic can shift its travel path to Route 5 and the connector as its access route.

Figure 7.10 presents the AM and PM peak hour intersection turning movement volumes. **Figures 7.11 and 7.12** presents AM and PM peak hour changes between A5 and 2040 No-Build volume forecasts. As noted the Alternative has little impact on Industrial Park Road. It does indicate a slight reduction (about -10%) on Route 112 west of Industrial Park Road. Garfield Street does show a significant reduction in volumes (50 to 60%) as the connector provides an alternative routing between Route 5 and Route 112. Traffic is also expected to slightly decline on Route 112 east of Industrial Park Road and on in-town neighborhood streets.

7.6 2040 TRAFFIC VOLUMES MODIFICATION OF EXIT 36 AND ROUTE 112/ROUTE 5 CONNECTOR (A6)

Figure 7.13 presents the AM and PM peak hour intersection turning movement volumes. **Figures 7.14 and 7.15** present AM and PM peak hour changes between Existing A6 and 2040 No-Build volume forecasts.

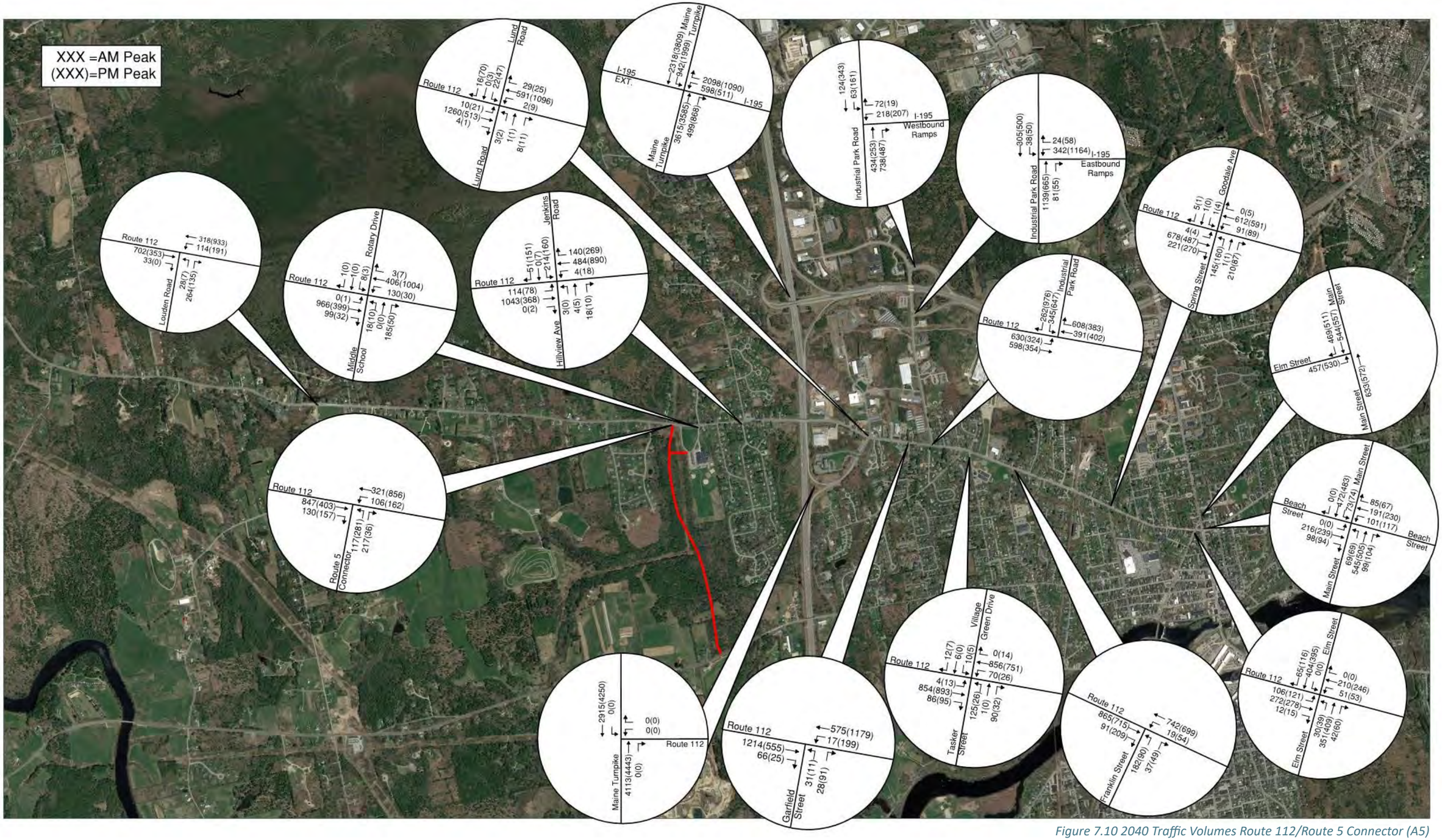


Figure 7.10 2040 Traffic Volumes Route 112/Route 5 Connector (A5)

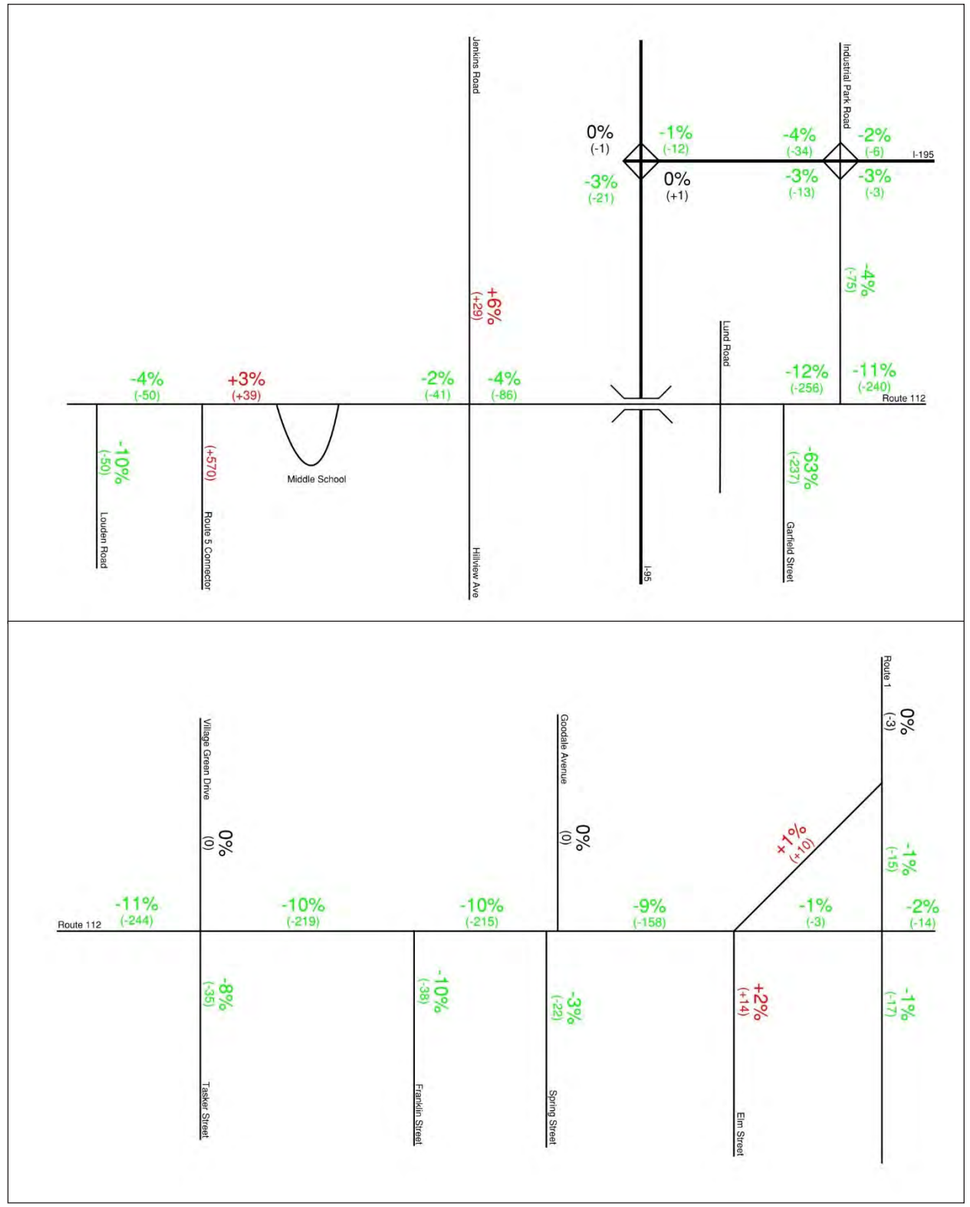


Figure 7.11 AM Peak Hour Comparison between A5 and 2040 No-Build Traffic Volume

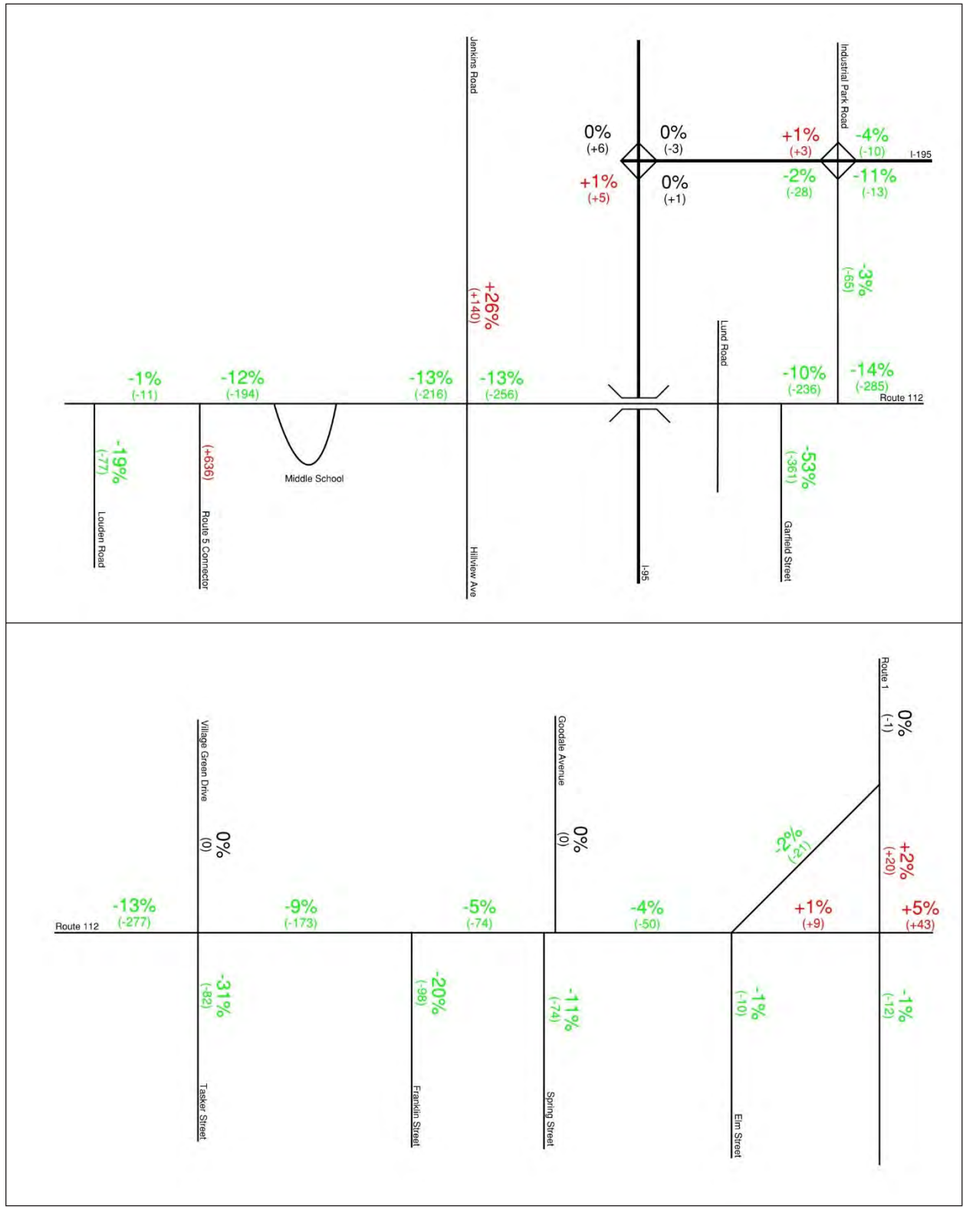


Figure 7.12 PM Peak Hour Comparison between A5 and 2040 No-Build Traffic Volume

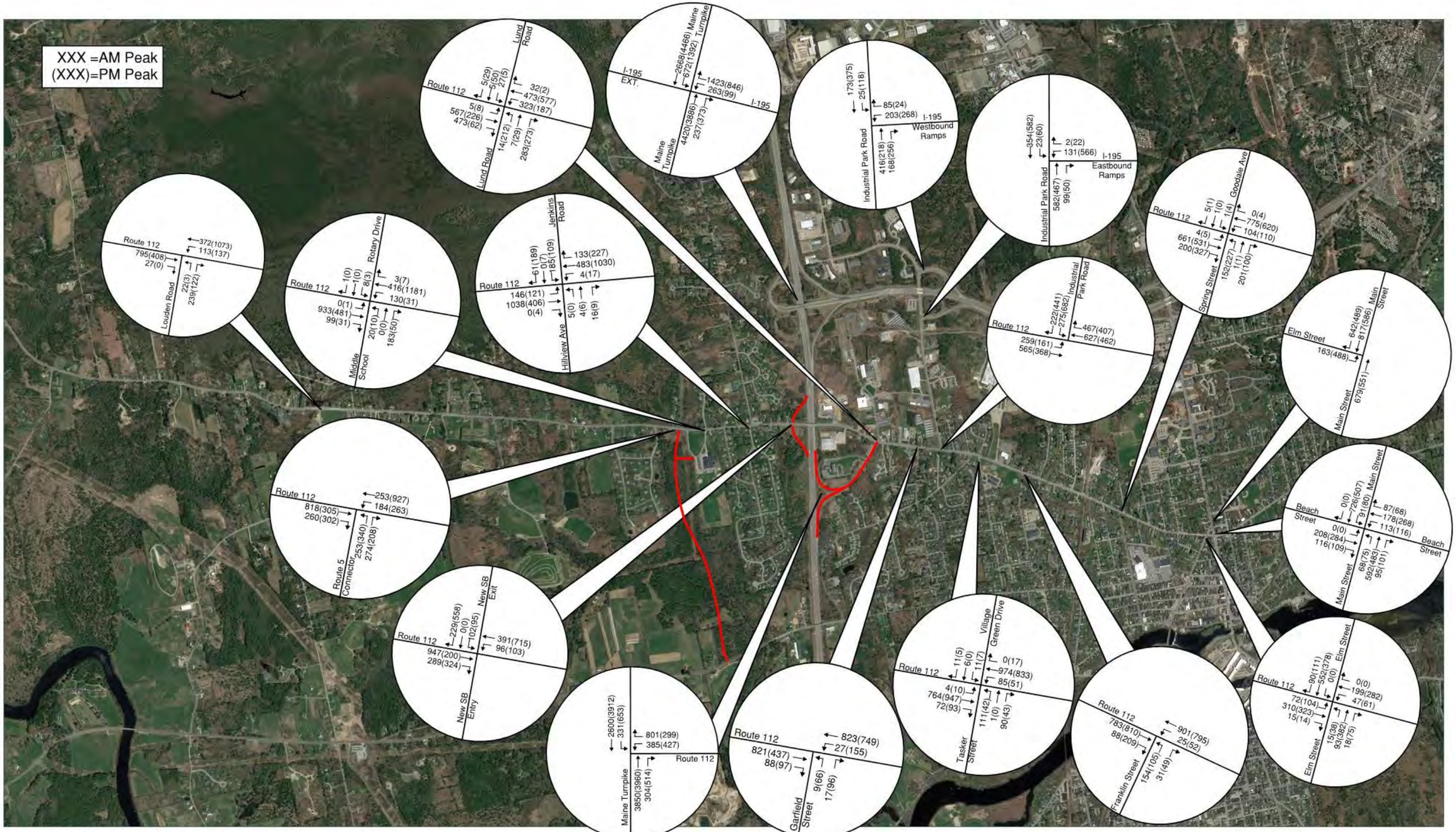


Figure 7.13 2040 Traffic Volumes Modification of Exit 36 and Route 112/Route 5 Connector (A6)

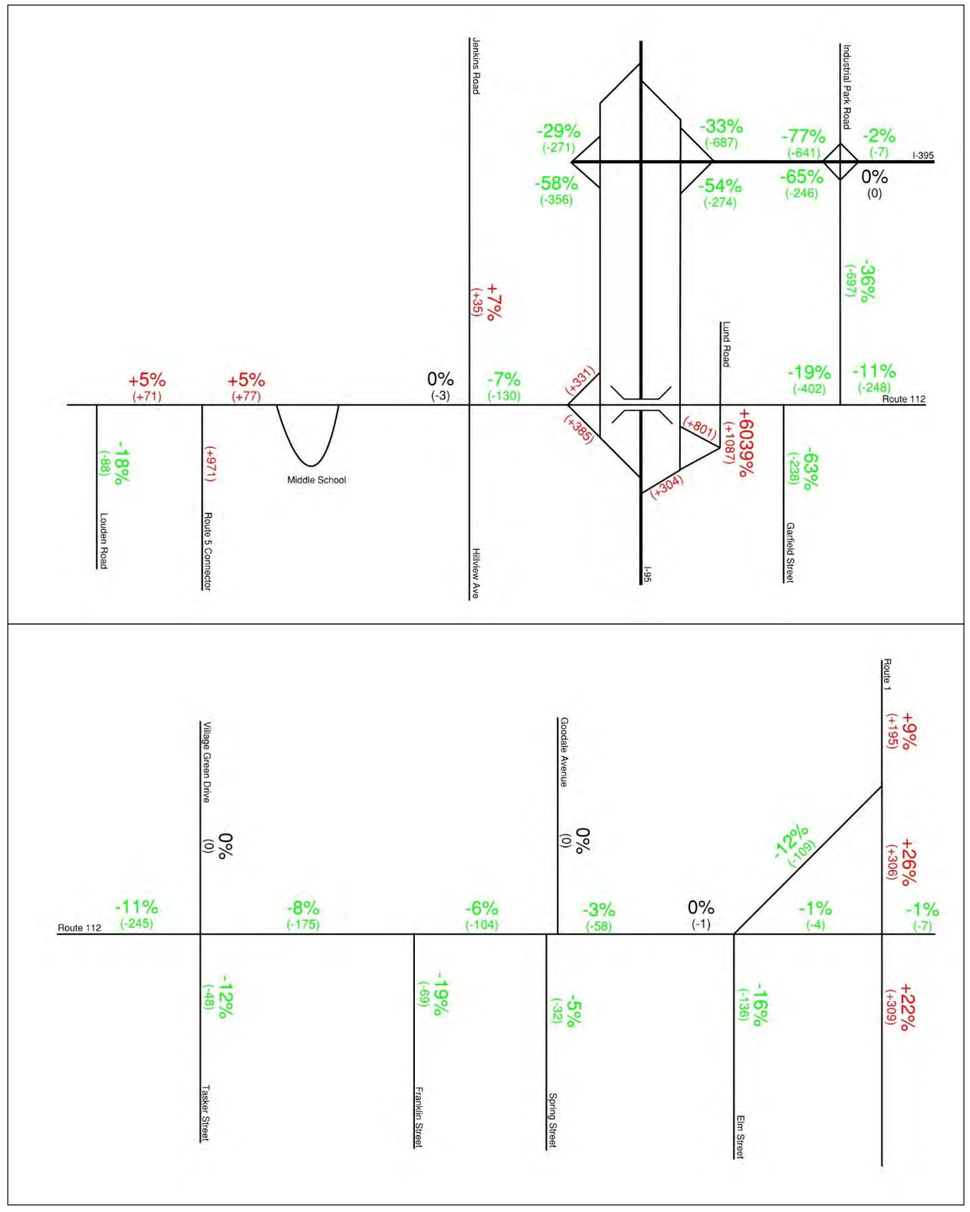


Figure 7.14 AM Peak Hour Comparison between A6 and 2040 No-Build Traffic Volumes

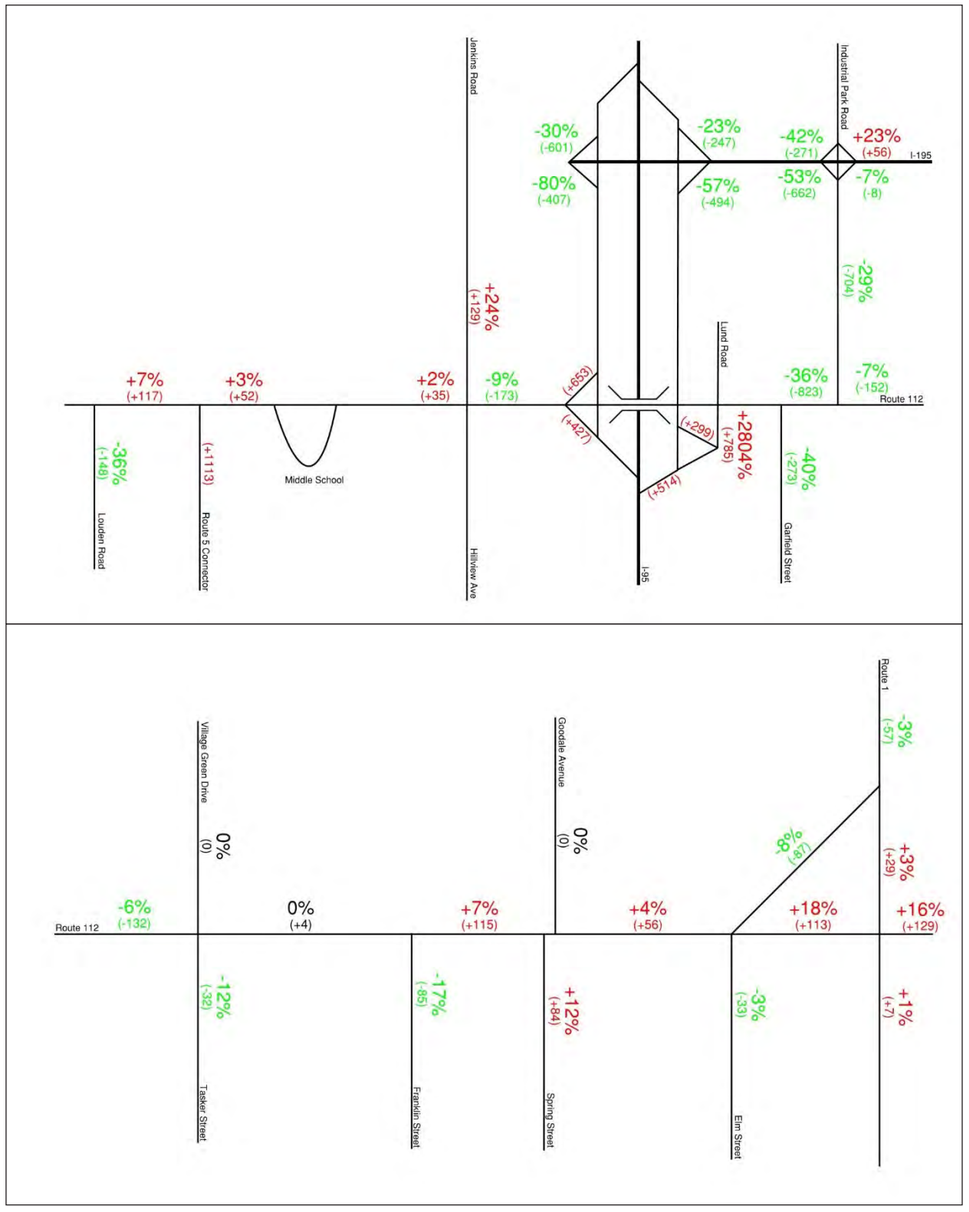


Figure 7.15 PM Peak Hour Comparison between A6 and 2040 No-Build Traffic Volumes

8.0 ALTERNATIVES ANALYSIS – TRAFFIC OPERATIONS

A SimTraffic analysis was conducted at the study intersections for the 2040 AM and PM peak hour conditions. **Table 8.1** summarizes the Level of Service (LOS) at key intersections within the study area. **Table 8.2** presents the potential Intersection Improvements for all Alternatives to attain an acceptable level of service. Traffic analysis conclusions for each Alternative are provided as follows.

A2 - TSM

The traffic analysis assumed the improvements presented in **Table 6.1** are implemented. As noted most intersections will operate at an acceptable level of service with the exception of the unsignalized intersections of Route 112/Lund Road and Industrial Park Road/I-195 Westbound Ramps. It should be noted that a significant improvement program is required and as noted later in this report, the Purpose and Need is not met.

A3 - EXTENSION OF I-195

The traffic analysis indicates many study area intersections will experience level of service improvements with this Alternative. The extent of roadway improvements in the study area to attain acceptable levels of service is substantially less, given diversion of traffic to the extended I-195.

A4 - MODIFICATION OF EXIT 36

The traffic analysis indicates that many of the intersections east of the Turnpike will be improved. Improvements will be required at Route 112 intersections from Lund Road westerly.

A5 - ROUTE 112/ROUTE 5 CONNECTOR

The traffic analysis indicates that most intersections continue to operate poorly and will require implementation of improvements presented in **Table 8.2**. Traffic reductions on Garfield Street are expected.

A6 - MODIFICATION OF EXIT 36 AND ROUTE 112/ ROUTE 5 CONNECTOR

This results in a combination of benefits to intersections east of the Turnpike and Garfield Street volume reductions. Improvements will be required at Route 112 intersections from Lund Road westerly.

Table 8.1: Level of Service Summary

Approach[1]	2040 No-Build		A2 TSM Only		A3 Extend I-195		A4 Modified Exit 36		A5 Route 112-5 Connector		A6 Modified Exit 36 + Connector	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Louden Rd. / Route 112 (U)												
Route 112 SE	A	A	C	B	A	A	A	A	A	A	A	A
Route 112 NW	C	C	B	C	A	C	C	C	C	C	C	C
Louden Road NE	D	A	E	C	F	E	E	E	D	A	D	A
Proposed Connector / Route 112 (S)												
Route 112 SE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	D	C	D	C
Route 112 NW	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	A	B	B	B
Connector NE	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	C	C	C	C
Overall	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	C	B	C	B
Middle School Entrance / Route 112 (U)												
Route 112 NB	C	A	A	A	A	A	C	A	A	A	C	A
Route 112 SB	C	C	B	A	A	B	C	C	A	A	A	A
Middle School Exit / Rotary Dr. / Route 112 (U)												
School Exit EB	C	A	C	B	A	A	E	A	D	B[4]	E[4]	B[4]
Rotary Drive WB	C	C	C	E	B	A	E	D	D	C	D	D
Route 112 NB	A	A	A	A	A	A	B	A	A	A	A	A
Route 112 SB	A	A	A	A	A	A	A	A	A	A	A	A
Hillview Ave. / Route 112 (U)												
Hillview Avenue EB	C	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Route 112 NB	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Route 112 SB	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Approach[1]	2040 No-Build		A2 TSM Only		A3 Extend I-195		A4 Modified Exit 36		A5 Route 112-5 Connector		A6 Modified Exit 36 + Connector	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Jenkins Rd. / Route 112 (U)												
Jenkins Road WB	F	F	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Route 112 NB	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Route 112 SB	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Hillview Ave. / Jenkins Rd. / Route 112 (S)												
Hillview Avenue EB	N/A	N/A	C	C	B	B	D	D	C	C	D	D
Jenkins Road WB	N/A	N/A	D	C	C	C	D	E	D	D	D	E
Route 112 NB	N/A	N/A	B	B	C	C	B	C	C	D	B	C
Route 112 SB	N/A	N/A	B	A	C	D	C	A	C	B	C	B
Overall	N/A	N/A	C	B	C	C	C	C	C	D	C	C
Proposed I-95 SB Ramps / Route 112 (S)												
Route 112 SE	N/A	N/A	N/A	N/A	N/A	N/A	C	A	N/A	N/A	C	B
Route 112 NW	N/A	N/A	N/A	N/A	N/A	N/A	C	E	N/A	N/A	B	E
SB Ramps SW	N/A	N/A	N/A	N/A	N/A	N/A	B	A	N/A	N/A	B	A
Overall	N/A	N/A	N/A	N/A	N/A	N/A	C	D	N/A	N/A	C	C
Lund Rd. / Route 112 (U/S)[3]												
Lund Road EB	F	E	D	F	A	B	B	B	D	C	B	B
Lund Road WB	F	F	E	F	C	C	E	B	E	E	C	B
Route 112 NB	A	A	A	A	A	A	B	C	A	A	B	B
Route 112 SB	F	A	A	A	A	A	C	B	A	A	B	B
Overall	N/A	N/A	N/A	N/A	N/A	N/A	C	C	N/A	N/A	B	B
Garfield St. / Route 112 (U)												
Route 112 NB	B	C	A	A	A	A	A	A	A	A	A	A
Route 112 SB	F	A	A	A	A	A	A	A	A	A	A	A
Garfield Street NE	F	F	C	B	C	A	B	B	B	B	A	A
Industrial Park Road / Route 112 (S)												
Industrial Park Road WB	C	F	C	D	C	C	D	E	D	D	C	C
Route 112 NB	C	F	B	C	B	C	B	B	C	C	B	B
Route 112 SB	E	B	C	C	C	D	B	C	C	D	A	B
Overall	D	F	C	C	C	C	B	D	C	D	B	C
Industrial Park Road / I-195 EB Ramps (S)												
1-95 EB Ramps NW	C	F	C	D	C	C	B	C	D	D	B	B
Industrial Park Road NE	F	F	B	C	C	C	B	D	C	D	B	C
Industrial Park Road SW	B	C	A	C	A	B	A	B	A	B	A	B
Overall	F	F	B	C	C	C	B	C	C	D	B	C
Industrial Park Road / I-195 WB Ramps (U)												
Industrial Park Road NB	A	A	A	A	A	A	A	A	A	A	A	A
Industrial Park Road SB	A	B	B	B	A	A	A	A	A	B	A	A
1-95 WB Ramps NW	D	F	E	F	D	D	A	C	F	F	B	C

Approach[1]	2040 No-Build		A2 TSM Only		A3 Extend I-195		A4 Modified Exit 36		A5 Route 112-5 Connector		A6 Modified Exit 36 + Connector	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Tasker St. / Village Green Dr. / Route 112 (U/S)[2]												
Tasker Street EB	F	F	D	D	D	C	D	D	D	C	C	C
Village Green Drive WB	F	F	D	C	D	C	C	B	D	C	C	C
Route 112 NB	A	C	C	A	B	A	C	A	B	A	B	A
Route 112 SB	A	A	B	B	B	A	C	B	C	A	B	B
Overall	N/A	N/A	C	B	B	A	C	B	C	A	B	B
Franklin St. / Route 112 (U/S)[2]												
Route 112 NB	A	A	B	B	B	B	B	B	B	B	B	B
Route 112 SB	A	A	B	C	B	B	B	C	B	B	B	C
Franklin Street NE	F	F	D	E	D	D	D	D	D	D	C	C
Overall	N/A	N/A	C	C	B	B	C	C	B	B	B	B
Spring St. / Route 112 (U)												
Route 112 NB	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Route 112 SB	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Spring Street NE	F	F	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Goodale St. / Route 112 (U)												
Route 112 NB	B	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Route 112 SB	A	A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Goodale Street SW	A	B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Spring St. / Goodale St. / Route 112 (S)												
Route 112 NB	N/A	N/A	D	D	B	B	D	C	B	B	D	D
Route 112 SB	N/A	N/A	C	C	C	B	D	E	B	C	D	C
Spring Street NE	N/A	N/A	D	C	B	B	E	D	B	B	D	D
Goodale Street SW	N/A	N/A	D	B	B	C	D	D	C	C	D	D
Overall	N/A	N/A	C	C	B	B	D	D	C	B	D	D

[1]Previously identified as warranted by others

[2]If MUTCD warrants are met

[3]Other options are still being explored

[4]This intersection previously met signal warrants in a PACTS application

Table 8.2: Potential Intersection Improvement Summary

Approach	Intersection Improvements				
	A2 TSM Only	A3 Extend I-195	A4 Modified Exit 36	A5 Route 112-5 Connector	A6 Modified Exit 36 + Connector
Louden Rd / Rt. 112					
Louden Road NEB Add Right Turn Lane		400’			
Route 112 NB Add Left Turn Lane		125’		125’	
Route 5 Connector / Rt. 112					
Connector Road NEB Right Turn Lane				175’	200’
Route 112 NWB Add Left Turn Lane to Middle School Entrance				Yes	Yes
Route 112 SEB Add Right Turn Lane				270’	175’
Signalize[2]				Yes	Yes
Middle School Entrance / Rt. 112					
Route 112 NB Add Left Turn Lane	125’			125’	
Hillview Ave / Jenkins Rd / Rt. 112					
Route 112 NB Add Through-Right Lane	280’		75’		100’
Route 112 NB Add Right Lane				To New SB Ramps	
Route 112 SB Add Left Turn Lane	105’		50’	75’	50’
Jenkins Road WB Add Left Turn Lane	280’	125’	75’		75’
Jenkins Road WB Add Right Turn Lane				175’	
Signalize[1]	Yes	Yes	Yes	Yes	Yes
New SB Ramps / Rt. 112					
New Ramps SWB Channelize Right Turn Lane			Yes		Yes
Free Flowing right turn traffic off New Ramps with additional receiving lane			Yes		Yes
Route 112 NB Add Left Turn Lane			25’		50’
Signalize[2]			Yes’		Yes
Lund Rd / Rt. 112					
Route 112 NB Add Two Left Turn Lane		25’	285’		285’
Route 112 SB Add Left Turn Lane	50’	50’			
Route 112 SB Add Right Turn Lane			570’		570’
Lund Road WB Add Right Turn Lane	75’				
Lund Road WB Existing LTR Lane to a LT Lane	Yes				
Lund Road WB Add Right Turn Lane	300’				
Signalize[2]			Yes		Yes
Garfield St / Rt. 112					
Garfield Street Right-In / Right-Out[3]	Yes	Yes	Yes	Yes	Yes

Approach	Intersection Improvements				
	A2 TSM Only	A3 Extend I-195	A4 Modified Exit 36	A5 Route 112-5 Connector	A6 Modified Exit 36 + Connector
Industrial Park Rd / Rt. 112					
Route 112 SB Additional Left Turn Lane / Receiving Lane	Yes				
Industrial Park Road WB Channelize Right Turn Lane	Yes (575’)	Yes (575’)		Yes (575’)	
Industrial Park Road WB Additional Left Turn Lane / Receiving Lane	Yes				
Coordinate Signal with Tasker Street and Franklin Street	Yes	Yes	Yes	Yes	Yes
Make Master Intersection in Coordinated System	Yes	Yes	Yes	Yes	Yes
Industrial Park Rd / I-195 EB Ramps					
I-195 Eastbound Ramps NWB Additional Left Turn Lane / Receiving Lane	350’	225’		350’	
Tasker St / Village Green Dr. / Rt. 112					
Route 112 NB Add Left Turn Lane	25’	125’	25’	75’	25’
Route 112 SB Add Left Turn Lane	To Industrial Park Road	50’		75’	
Tasker Street EB Add Right Turn Lane	175’	125’		125’	
Signalize / Coordinate with Industrial Park Road and Franklin Street[4]	Yes	Yes	Yes	Yes	Yes
Franklin St / Rt. 112					
Route 112 NB Add Left Turn Lane	75’	75’	25’	75’	25’
Franklin Street EB Add Right Turn Lane					
Signalize / Coordinate with Industrial Park Road and Tasker Street[4]	Yes	Yes	Yes	Yes	Yes
Spring St / Goodale St / Rt. 112					
Route 112 NB Add Left Turn Lane	Yes	Yes	25’	150’	25’
Route 112 NB Add Right Turn Lane					
Route 112 NB Add Through-Right Lane	175’	200’		150’	
Route 112 SB Add Right Lane		250’	25’		25’
Route 112 SB Add Left-Through Lane	200’			175’	
Spring Street EB Add Right Turn lane	200’	125’		130’	
Signalize[4]	Yes	Yes	Yes	Yes	Yes

[1]Previously identified as warranted by others

[2]If MUTCD warrants are met

[3]Other options are still being explored

[4]This intersection previously met signal warrants in a PACTS application

9.0 ALTERNATIVES COMPARISON EVALUATION

The evaluation of Alternatives was based on the following criteria.

9.1 - TRANSPORTATION MEASURES

- *Vehicle Miles Traveled (VMT)* – The number of miles traveled during the AM Peak Hour on non-Interstate highways in Saco. An increase in VMT for an alternative could indicate that motorists are following longer, but faster, routes for their trips; a decrease in VMT for the alternative could indicate more direct routes are being provided and are being utilized.
- *Vehicle Hours Traveled (VHT)* – The number of hours driven by vehicles during the AM Peak Hour on non-Interstate highways in Saco. Because all of the alternatives are designed to reduce traffic congestion at one or more locations, VHT decreases for each alternative because shorter travel times are produced for some travel patterns.
- *Improves Level of Service and Delay at Key Local intersections* – Number of study area intersections where LOS is improved.
- *Potential to Reduce Traffic on Garfield Street* - Change in traffic volumes during the AM and PM peak hours between 2040 No-Build and Alternative conditions
- *Potential to Reduce Traffic on Neighborhood Streets* – Change in traffic volumes during the AM and PM peak hours between 2040 No-Build and Alternative conditions on Tasker Street, Franklin Street and Spring Street.
- *Industrial Park Road Traffic Volume* – Change in total AM and PM peak hour volume between 2040 No-Build and Alternative conditions.
- *Route 112 Traffic Volume east Lund Road* - Change in total AM and PM peak hour volume between 2040 No-Build and Alternative conditions.
- *Route 112 Traffic Volume west of Turnpike* - Change in total AM and PM peak hour volume between 2040 No-Build and Alternative conditions.
- Potential for Improving Bicycle and Pedestrian Conditions – Consideration of traffic volume levels and roadway capacity expansion which likely degrades bicycle and pedestrian conditions.

9.2 - LAND USE MEASURES

- Number of Homes/Buildings with Direct Impacted – as noted.
- Number of Private Lots Impacted – as noted.
- Compatible with Comprehensive Plan – The following are relevant implementation strategies from the 2018 Comprehensive Plan Update and were reviewed qualitatively:
  - » Work with the Maine Turnpike Authority to address current and future Exit 36 capacity issues and possible projects to improve traffic flow and lessen congestion at peak commuting hours.
  - » Support expansion of the MDOT-owned Park & Ride facility on Industrial Park Road.
  - » Work with MaineDOT to Improve traffic flow on Industrial Park Road and Route 112.
  - » The City should explore routes for the establishment of a new connector road west of the Turnpike linking Routes 5 and 112, designed as an arterial with the potential for access control.
  - » Focus on improving bicycle and pedestrian infrastructure along Elm Street (Route 1), Main Street (Route 1), Beach Street (Route 9), and North Street from General Dynamics westward to Colonial Drive and Garfield Street.
  - » Provide paved shoulders for use by cyclists when collector and arterial roads in the downtown focus area are upgraded, and upgrade bicycle infrastructure along Routes One, 112, 9, and 5 cooperatively with the Maine Department of Transportation.
  - » Explore the feasibility and traffic impacts of the proposed Shuttlebus route changes and "Pulse" project, along with creating a "hub" for the system at the Saco Transportation Center.
  - » Explore the possibility of other modes of transportation at the Transportation Center such as bikeshare, Zipcars, and Trailways or Greyhound service, etc.
  - » Continue annual funding commitment for Shuttlebus service with member communities Biddeford and Old Orchard Beach. Work toward involving Scarborough as a full member community.
  - » Work with Shuttlebus to provide bus shelters at key points in the system.
  - » Increase service to and from the Portland area and work toward seamless connections with the Portland and South Portland transit services.
  - » Work with Downeaster staff to create more promotional material, ticket discount options and package deals focused on Saco area opportunities, activities and events.
  - » Work with Downeaster staff to explore options for future commuter service to and from Portland.
- Right-of-Way Acquisition – Area of impact.
- Potential for Farmland Impact – Does the Alternative directly impact farmland?

9.3 - ENVIRONMENTAL RESOURCE MEASURES

- Potential for Impacts to Archeological and Historic Resources – Impact to identified resources.
- Potential for Wetland 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 – Impact to identified resources.

9.4 - COST AND FUNDING MEASURES

- Construction Cost - This total is the construction cost only to implement each improvement/alternative and does not include design, right-of-way or construction engineering in the estimates.
- Construction Funding Viability – Ability to obtain funds given overall magnitude and Agency responsibility.
- Benefit/Cost Measure – A benefit-cost analysis was performed to measure economic advantages (benefits) and disadvantages (costs) for each alternative. A benefit-cost ratio greater than 1 indicates the benefit is greater than the cost and the alternative is viable.

9.5 - PURPOSE AND NEED

Is the study purpose addressed using this alternative?

"Evaluate and identify long-term solutions to regional transportation issues associated with westerly connections from I-95 in the vicinity of Exit 36. Specifically, the purpose of the Study is to evaluate the potential for managing and improving access to Route 112, making safety improvements at intersections, maintaining and improving easy access to and from the Turnpike, and separating local and through traffic as much as practicable. Recommendations are subject to foreseeable funding and in the context of safety and mobility needs statewide."

9.6 - DETAILED EVALUATION MATRIX

Table 9.1 presents a comparison matrix that was prepared and included 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).

Table 9.1 Detailed Evaluation Matrix

Category / Alternative	Future (2040) No-Build - Benchmark	A1 Transportation Demand Management (TDM)	A2 Transportation System Management (TSM)	A3 Extension of I-195	A4 Modification of Exit 36	A5 Route 112/Route 5 Connector	A6 Modification of Exit 36 and Route 112/Route 5 Connector
TRANSPORTATION MEASURES							
Vehicle Miles Traveled (VMT)	N/A	No Change	No Change	Increase	Reduced	No Change	Reduced
	N/A	N/A	N/A	+107 miles on non-IS (0.3% increase)	-194 miles on non-IS (0.6% reduction)	-4 miles on non-IS (0.0% reduction)	-202 miles on non-IS (0.6% reduction)
Vehicle Hours Traveled (VHT)	N/A	No Change	No Change	Reduced	Reduced	No Change	Reduced
	N/A	N/A	N/A	-14 hours on non-IS (1.5% reduction)	-11 hours on non-IS (1.2% reduction)	-2 hours on non-IS (0.3% reduction)	-15 hours on non-IS (1.5% reduction)
Reduction in Crashes	No	No	Reduced	Slight Reduction	No Change	Slight Reduction	Slight Reduction
	N/A	N/A	15% Reduction	2% Reduction		3% Reduction	5% Reduction
Improves Level of Service and Delay at Key Local intersections	No	No	Yes	Yes	Yes	No	Yes
	N/A	N/A	9 intersections with improve-ment	10 intersections with improvement	9 intersections with improvement	8 intersections with improvement	10 intersections with improvement
Potential to Reduce Traffic on Garfield Street	No	No	Some	Yes	No	Yes	Yes
	N/A	N/A	Restrict Movements at Route 112	Up to 39% PM Reduction	No Change	Up to 63% AM Reduction	Up to 63% AM Reduction
Potential to Reduce Traffic on Neighborhood Streets east of Industrial Park Road	No	No	No	Some	Some	Some	Some
	N/A	N/A	N/A	Up to 11% PM Reduction	Up to 8% AM Reduction	Up to 18% PM Reduction	Up to 10% AM Reduction
Industrial Park Road Traffic Volume	No Change	No Change	No Change	Reduced	Reduced	No Change	Reduced
	N/A	N/A	N/A	Up to 33% AM Reduction	Up to 36% AM Reduction	Up to 4% AM Reduction	Up to 36% AM Reduction
Route 112 Traffic Volume east of Lund Road	No Change	No Change	No Change	Reduced	Reduced	Slight Decrease	Reduced
	N/A	N/A	N/A	Up to 29% AM reduction	Up to 26% PM reduction	Up to 12% AM reduction	Up to 36% PM reduction

Color Key		
Positive Impacts	Negative Impacts	Neutral Impacts

Category / Alternative	Future (2040) No-Build - Benchmark	A1 Transportation Demand Management (TDM)	A2 Transportation System Management (TSM)	A3 Extension of I-195	A4 Modification of Exit 36	A5 Route 112/Route 5 Connector	A6 Modification of Exit 36 and Route 112/Route 5 Connector
Jenkins Road Traffic Volumes	No Change	No Change	No Change	Reduced	Slight Increased	Increased	Increased
	N/A	N/A	N/A	Up to 27% AM Reduction	Up to 9% AM Increase	Up to 26% PM Increase	Up to 24% PM Increase
Route 112 Traffic Volume Between the Turnpike and Jenkins Rd	No Change	No Change	No Change	Reduced	Slight Increase	Slight Decrease	Slight Decrease
	N/A	N/A	N/A	Up to 35% AM reduction	Up to 6% AM increase	Up to 13% PM reduction	Up to 9% PM reduction
Potential for Improving Bicycle and Pedestrian Conditions	No	No	Worse	Improved	Worse/Improved	No	Worse/Improved
	N/A	N/A	Several intersections need expansion	Lower traffic volumes and no need for wide road	Route 112 volumes west of Turnpike unchanged and Lund Expansion	N/A	N/A
PROPERTY IMPACTS							
Number of Homes/Residences with Direct Impacted	None	None	None	10	None	None	None
	N/A	N/A	N/A	More will indirectly impacted	N/A	N/A	N/A
Number of Private Lots Impacted	None	None	12	16	4	1	5
	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compatible with Comprehensive Plan	N/A	Yes	Yes	Yes	Yes	Yes	Yes
	N/A	Met 10 Strategies	Met 1 Strategy	Met 3 Strategies	Met 3 Strategies	Met 1 Strategy	Met 4 Strategies
Right-of-Way Acquisition Needed	No	No	Yes	Yes	Yes	Yes	Yes
	N/A	N/A	0.5 Acres	28.5 Acres	1 Acres	1 Acres	2.5 Acres
ENVIRONMENTAL RESOURCE MEASURES							
Potential for Impacts to Archeological and Historic Resources	None	None	None	None Known	None Known	None Known	None Known
	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Color Key		
Positive Impacts	Negative Impacts	Neutral Impacts

Category / Alternative	Future (2040) No-Build - Benchmark	A1 Transportation Demand Management (TDM)	A2 Transportation System Management (TSM)	A3 Extension of I-195	A4 Modification of Exit 36	A5 Route 112/Route 5 Connector	A6 Modification of Exit 36 and Route 112/Route 5 Connector
Potential for Wetland Impacts	N/A	N/A	None	Yes	Yes	Yes	Yes
	N/A	N/A	N/A	Approximately 1 Acres	Approximately 0.3 Acres	Approximately 0.2 Acres	Approximately 0.5 Acres
Stream Crossings	N/A	N/A	None	Yes	Yes	Yes	Yes
	N/A	N/A	N/A	Approximately 8	At least 1	At least 1	At least 2
Potential for Conservation Land and 4 (f) Land Impacts	N/A	N/A	None	None Known	None Known	None Known	None Known
	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Potential for Impacts to Rare, Threatened, Endangered, and Special Concern Plant Species and Habitats	N/A	N/A	None	Yes	None Known	Yes	Yes
	N/A	N/A	N/A	MNAP Indicated Potential Presence nearby	N/A	MNAP Indicated Potential Presence nearby	MNAP Indicated Potential Presence nearby
COST AND FUNDING MEASURES							
Construction Cost	N/A	N/A	$9,700,000	$63,000,000	$38,000,000	$9,600,000	$43,500,000
Construction Funding Viability	N/A	N/A	No	No	Yes	No	Some
Benefit/Cost Measure	N/A	N/A	Yes (9.6)	Yes (1.6)	Yes (2.5)	Yes (8.9)	Yes (3.2)
STUDY PURPOSE AND NEED							
Does it Address Purpose and Need?	No	No	No	Yes	Yes	No	Yes

*Additional Field Study would be required to confirm presence/absence of protected or significant features

Color Key		
Positive Impacts	Negative Impacts	Neutral Impacts

9.7 - QUALITATIVE COMPARISON MATRIX SUMMARY

To assist in evaluating the Alternatives, Qualitative Comparison Matrices were developed.

A1 – TRANSPORTATION DEMAND MANAGEMENT

As noted in **Table 9.2** this Alternative will not have a significant impact on many of the evaluation metrics. TDM strategies should be considered as a compliment to the recommended Alternative. This Alternative does not meet study purpose and need.

TABLE 9.2 - ALTERNATIVE 1 Transportation Demand Management Improvements

Impact Description	Impact	Measure
Reduce Traffic on Route 112 between Turnpike and Jenkins	●	No Change
Reduce Traffic on Route 112 near Industrial Park Road	●	No Change
Reduce Traffic on Industrial Park Road	●	No Change
Potential to Reduce Traffic on Garfield Street	●	No Change
Reduce Traffic on Neighborhood Streets East of Industrial Park Road	●	No Change
Potential to Improve Bicycle and Pedestrian Conditions	●	No Change
Property Impacts	●	No Change
Environmental Impacts	●	No Change
Funding Viability	▭	Will be competitive through state and federal sources
Meet Purpose and Need	▭	N/A
COST	N/A	Not Estimated

LEGEND
No Change: ●
Minor Negative Outcome: ▭
Minor Positive Outcome: ✚
Positive Outcome: ✚
Negative Outcome: ▭

A2 – TRANSPORTATION SYSTEM MANAGEMENT

As noted in **Table 9.3** this Alternative will not have a significant impact on changes to volumes patterns and thus does not meet many of objectives of this study. This Alternative generally does not meet study purpose and need.

TABLE 9.3 - ALTERNATIVE 2 Transportation System Management Improvements

Impact Description	Impact	Measure
Reduce Traffic on Route 112 between Turnpike and Jenkins		No Change
Reduce Traffic on Route 112 near Industrial Park Road		No Change
Reduce Traffic on Industrial Park Road		No Change
Potential to Reduce Traffic on Garfield Street		No Change
Reduce Traffic on Neighborhood Streets East of Industrial Park Road		No Change
Potential to Improve Bicycle and Pedestrian Conditions		Wider intersections/roadways make conditions difficult. Traffic volumes remain high.
Property Impacts		12 properties impacted
Environmental Impacts		None
Funding Viability		Will be competitive through state and local programs
Meet Purpose and Need		N/A
COST	$9.7M	

LEGEND
No Change:
Minor Negative Outcome:
Minor Positive Outcome:
Positive Outcome:
Negative Outcome:

A3 – EXTENSION OF I-195

As noted in **Table 9.4** this Alternative will have positive impacts on reducing traffic volumes on area roadways but will have significant property impacts, environmental impacts and the cost will have funding challenges. This Alternative generally meets study purpose and need.

TABLE 9.4 - ALTERNATIVE 3 Extension of I-195 to Route 112

Impact Description	Impact	Measure
Reduce Traffic on Route 112 between Turnpike and Jenkins	✚	35% reduction during AM peak hour
Reduce Traffic on Route 112 near Industrial Park Road	✚	29% reduction during AM peak hour
Reduce Traffic on Industrial Park Road	✚	33% reduction during AM peak hour
Potential to Reduce Traffic on Garfield Street	✚	39% reduction during PM peak hour
Reduce Traffic on Neighborhood Streets East of Industrial Park Road	✚	11% reduction during PM peak hour
Potential to Improve Bicycle and Pedestrian Conditions	✚	Reduces traffic volumes and eliminates needs for expanded roadways
Property Impacts	▬ ▬	10 buildings/16 properties/30 acres
Environmental Impacts	▬	1 Acre of wetlands/8 stream crossings/rare species
Funding Viability	▬ ▬	$60M cost very expensive
Meet Purpose and Need	✚	N/A
COST	$63M	

LEGEND
No Change: ●
Minor Negative Outcome: ▭
Minor Positive Outcome: ✚
Positive Outcome: ✚
Negative Outcome: ▬

A4 – MODIFICATION OF EXIT 36

As noted on **Table 9.5** this Alternative will have positive impacts on reducing traffic volumes on area roadways but does not address neighborhood traffic issues and volumes levels on Route 112 west of the Maine Turnpike. This Alternative generally meets study purpose and need.

TABLE 9.5 - ALTERNATIVE 4 Modification of Exit 36 Interchange

Impact Description	Impact	Measure
Reduce Traffic on Route 112 between Turnpike and Jenkins	▭	6% increase during AM peak hour
Reduce Traffic on Route 112 near Industrial Park Road	✚	26% reduction during PM peak hour
Reduce Traffic on Industrial Park Road	✚	36% reduction during AM peak hour
Potential to Reduce Traffic on Garfield Street	●	No Change
Reduce Traffic on Neighborhood Streets East of Industrial Park Road	✚	8% reduction during AM peak hour
Potential to Improve Bicycle and Pedestrian Conditions	✚ ▭	Reduces traffic on some roadways, but does not reduce volume near school and Lund Road will be widened
Property Impacts	▭	4 properties impacted
Environmental Impacts	▭	Some wetland impacts and 1 stream crossing
Funding Viability	✚	Future funding by MTA under consideration
Meet Purpose and Need	✚	Yes, but less benefit to neighborhood streets and Rt. 112 west of Turnpike
COST	$38M	

LEGEND
No Change: ●
Minor Negative Outcome: ▭
Minor Positive Outcome: ✚
Positive Outcome: ✚
Negative Outcome: ▭

A5 – ROUTE 112/ROUTE 5 CONNECTOR

As noted on T**able 9.6** this Alternative will have positive impacts on reducing traffic volumes on some neighborhood streets but has little mobility and safety benefits in the majority of the study area. This Alternative generally does not meet study purpose and need.

TABLE 9.6 - ALTERNATIVE 5 Route 112/Route 5 Connector

Impact Description	Impact	Measure
Reduce Traffic on Route 112 between Turnpike and Jenkins		13% reduction during PM peak hour
Reduce Traffic on Route 112 near Industrial Park Road		12% reduction during AM peak hour
Reduce Traffic on Industrial Park Road		No change
Potential to Reduce Traffic on Garfield Street		63% reduction during AM peak hour
Reduce Traffic on Neighborhood Streets East of Industrial Park Road		18% reduction during PM peak hour
Potential to Improve Bicycle and Pedestrian Conditions		Improved connectivity between Routes 112 and 5
Property Impacts		1 property impacted
Environmental Impacts		Some wetlands/1 stream crossings/rare species
Funding Viability		Cost will likely be locally sourced
Meet Purpose and Need		N/A
COST	$9.6M	

LEGEND
No Change:
Minor Negative Outcome:
Minor Positive Outcome:
Positive Outcome:
Negative Outcome:

A6 – MODIFICATION OF EXIT 36 AND ROUTE 112/ROUTE 5 CONNECTOR

As noted on **Table 9.7** this Alternative will have positive impacts on reducing traffic volumes on area roadways and combined with the Connector Road has neighborhood traffic reduction benefits. This Alternative generally meets study purpose and need.

TABLE 9.7 - ALTERNATIVE 6 Modification of Exit 36 and Route 112/Route 5 Connector

Impact Description	Impact	Measure
Reduce Traffic on Route 112 between Turnpike and Jenkins	✚	9% reduction during PM peak hour
Reduce Traffic on Route 112 near Industrial Park Road	✚	36% reduction during PM peak hour
Reduce Traffic on Industrial Park Road	✚	36% reduction during AM peak hour
Potential to Reduce Traffic on Garfield Street	✚	63% reduction during AM peak hour
Reduce Traffic on Neighborhood Streets East of Industrial Park Road	✚	10% reduction during AM peak hour
Potential to Improve Bicycle and Pedestrian Conditions	✚ ▬	Improved connectivity and reduced volume on some streets
Property Impacts	▬	5 properties impacted
Environmental Impacts	✚ ▬	Some wetlands/2 stream crossings/rare species
Funding Viability	✚	Future funding by MTA under consideration
Meet Purpose and Need	✚	N/A
COST	$43.5M	

LEGEND
No Change: ●
Minor Negative Outcome: ▬
Minor Positive Outcome: ✚
Positive Outcome: ✚
Negative Outcome: ▬

ALTERNATIVE COMPARISON

TABLE 9.8 - Qualitative Comparison of Alternatives

Impact Description	A1 Transportation Demand Management (TDM)	A2 Transportation System Management (TSM)	A3 Extension of I-195	A4 Modification to Exit 36	A5 Route 112/ Route 5 Connector	A6 Modification of Exit 36 and Rte.112/Rte. 5 Connector
Reduce Traffic on Route 112 between Turnpike and Jenkins	●	●	✚	▬	✚	✚
Reduce Traffic on Route 112 near Industrial Park Road	●	●	✚	✚	✚	✚
Reduce Traffic on Industrial Park Road	●	●	✚	✚	●	✚
Potential to Reduce Traffic on Garfield Street	●	●	✚	●	✚	✚
Reduce Traffic on Neighborhood Streets East of Industrial Park Road	●	●	✚	✚	✚	✚
Potential to Improve Bicycle and Pedestrian Conditions	●	▬	✚	✚ ▬	▬	✚ ▬
Property Impacts	●	▬	▬ ▬	▬	▬	▬
Environmental Impacts	●	●	▬	▬	▬	▬
Funding Viability	▬	▬	▬ ▬	✚	▬	✚ ▬
Meet Purpose and Need	▬	▬	✚	✚	▬	✚
COST	N/A	$9.7M	$63M	$38M	$9.6M	$43.5M

LEGEND

- No Change: ●
- Minor Negative Outcome: ▬
- Minor Positive Outcome: ✚
- Positive Outcome: ✚
- Negative Outcome: ▬

10.0 PUBLIC INVOLVEMENT

The objectives for the study were to evaluate and identify short and long-term solutions to ongoing morning and evening traffic congestion occurring on Route 112 near Turnpike Exit 36 and west of Route 1, and on surrounding roads. Study recommendations also included bicycle and pedestrian improvements at key locations. The goals of the study included improving access to Route 112, making safety improvements at intersections, improving easy access to and from the Turnpike, and separating local and through-traffic as much as is practical.

These goals and objectives, as described in the Study Purpose, were presented and reiterated to the public at the start of each public meeting and as part of the website copy.

STEERING COMMITTEE

A Steering Committee was formed to help guide the study and provide feedback throughout in terms of data findings, public outreach, and final recommendations. Steering Committee members included representatives from the City of Saco, the Maine Turnpike Authority and the Maine Department of Transportation. These entities were the funders of the study and decision-makers for final recommendations. Other Steering Committee members included representatives from PACTS and the participating consultant groups. Final recommendations would be influenced by public feedback gathered during the public outreach program. The committee met six times during the 13-month study.

CREATING AWARENESS OF THE STUDY: MEDIA, SOCIAL MEDIA, WEBSITES, POSTERS, EMAIL

The study was launched publicly via a press release to local media in June 2018. The release included the date of the first public session, information about study objectives, partners, timing, and data to be gathered, as well as directing people to a customized web page on the City web site, which included detailed study information and a link where interested parties could sign up for email updates. Information on the study and the meeting appeared in the Journal Tribune, the Portland Press Herald and the Biddeford-Saco Courier. The town offices of surrounding communities - Buxton, Dayton, Hollis, Biddeford and Old Orchard Beach - were contacted to request placement of a public meeting notice on their town websites. The City also employed their well-developed social media program and email lists to increase awareness of the study and the meeting. Finally, posters were placed in high-traffic locations within the study area prior to the meeting to attract additional residents to the meeting. This first meeting was billed as a Listening Session.

FIRST PUBLIC MEETING: JUNE 14, 2018

The first public meeting took place on June 14 at 6 pm at Saco City Hall Auditorium. The purpose was to provide attendees with information about existing conditions in the study area and more importantly, hear from them about specific issues they were encountering. Around 100 residents of Saco and a few from surrounding towns attended. It immediately became clear that frustration with commuter traffic congestion, truck traffic and noise had been building for some time. While the City had commissioned two previous studies to gather data and general recommendations, neither had included a formal public outreach program. Consequently, this was the first time that local concerns, exacerbated by a significant increase in new development along Route 112, had been aired in a public session.

The details of the meeting are included in the meeting report in the appendix of this report; however in summary, audience participation was very strong, with many people reporting frustration with the lack of action on fixing traffic congestion, the amount of Poland Spring-related truck traffic, the problems at multiple local intersections (particularly Jenkins Road), cut-through traffic on neighborhood roads, and danger to student pedestrians in the area near the Saco Middle School on Route 112. The study scope included only two public meetings, but at the request of residents at this first meeting, a third was added to give the study team the opportunity to check in with the public at the time when the team would begin to home in on potential recommendations.

ADDITIONAL OUTREACH

The study team reached out to Poland Spring, the principal of Saco Middle School, and the Saco police force in order to better understand various aspects of the challenges within the study area. A meeting took place with Poland Spring to understand the truck schedules, volumes, routes, and capacity for change. A phone conversation with the Middle School principal established the level of bus usage, parental drop-off attitudes, and possible expansion plans on this school site. The meeting with the police force provided the study team with an understanding of how tasks are prioritized and whether or how additional enforcement or traffic control might be possible. The team endeavored to reach out to General Dynamics regarding a possible change of shift times, but this was unsuccessful as no one returned multiple calls.

CREATING AWARENESS OF THE SECOND PUBLIC MEETING

The second public meeting, scheduled for the end of September, employed all of the earlier communications tactics (press release to local media, update on City web page and social media, posters) with the addition of an email alert to the 121 individuals who had either signed up online for updates or signed in with an email address at the first public meeting.

SECOND PUBLIC MEETING: SEPTEMBER 27, 2018

The second public meeting took place on September 27 at 6 pm at Saco City Hall Auditorium, with approximately 80 individuals attending. As in the first meeting, a presentation was made, detailing which potential solutions (alternatives) the study team intended to move forward and which had been deemed less useful. The team made it clear that no decisions had been made yet, and gathered additional information from residents on current issues. Detailed meeting notes are included in the Appendices.

CREATING AWARENESS OF THE THIRD PUBLIC MEETING

The third public meeting, originally scheduled for December, was pushed back to February in order to finish analysis of several complex alternatives. This provided the team with the opportunity to send a detailed email update to meeting attendees and residents, many of whom expressed appreciation.

As for earlier meetings, all communications tactics were employed (press release to local media, update on City web page, social media, posters) as well as email reminders to the now 146 individuals who had signed up online for updates or signed in at the first two public meetings.

THIRD PUBLIC MEETING: FEBRUARY 13, 2019

The final public meeting took place on February 13 at 6 pm at Saco City Hall Auditorium. It was attended by approximately 90 individuals. The team presented the final array of potential solutions, handing out a simplified matrix to illustrate how each had been evaluated (**Table ES.1**). The point was made that specific public feedback was needed on the alternatives in order to move forward with a final set of recommendations and that the decision on final recommendations would be made by the City, MTA and MaineDOT. The public asked many questions and after discussion, most seemed amenable to a reconfiguration of Exit 36, which was related to an early suggestion to open the old Exit 5. Several other solutions designed to discourage neighborhood cut-through traffic were also positively received. In general, attendees showed an understanding of the challenges of finding funding for improvements and were respectful and appreciative of the study effort and results. Detailed meeting notes are included in the Appendices.

FINAL RECOMMENDATIONS

Based on feedback at the February 2019 public meeting and from the Steering Committee at their April 2019 meeting, study recommendations were finalized and made available to the public via a post on the city web page and Facebook page, email to those who had attended meetings or signed up for updates, and a final press release directing interested parties to the City web page for details.

TABLE ES.1 - Qualitative Comparison of Alternatives

Impact Description	A1 Transportation Demand Management (TDM)	A2 Transportation System Management (TSM)	A3 Extension of I-195	A4 Modification to Exit 36	A5 Route 112/ Route 5 Connector	A6 Modification of Exit 36 and Rte.112/Rte. 5 Connector
Reduce Traffic on Route 112 between Turnpike and Jenkins	●	●	✚	−	✚	✚
Reduce Traffic on Route 112 near Industrial Park Road	●	●	✚	✚	✚	✚
Reduce Traffic on Industrial Park Road	●	●	✚	✚	●	✚
Potential to Reduce Traffic on Garfield Street	●	●	✚	●	✚	✚
Reduce Traffic on Neighborhood Streets East of Industrial Park Road	●	●	✚	✚	✚	✚
Potential to Improve Bicycle and Pedestrian Conditions	●	−	✚	✚ −	−	✚ −
Property Impacts	●	−	− −	−	−	−
Environmental Impacts	●	●	−	−	−	−
Funding Viability	−	−	− −	✚	−	✚ −
Meet Purpose and Need	−	−	✚	✚	−	✚
COST	N/A	$9.7M	$63M	$38M	$9.6M	$43.5M

11.0 RECOMMENDATIONS

Recommendations were identified for possible improvements that could be implemented in 2 to 5 years (short-term) and long-term improvements that are likely in a 10+ year horizon. The short-term improvements were identified as part of the Transportation System Management Alternative. Based upon the purpose and need, technical analysis and public feedback the following improvements are recommended for further consideration.

11.1 - SHORT-TERM IMPROVEMENTS

ROUTE 112/JENKINS ROAD

Based upon existing safety and vehicle delay it is recommended the following be implemented (see **Figure 11.1**).

- Installation of a traffic signal
- Construction of a dedicated left-turn lane on the Route 112 eastbound approach
- Widening of the Jenkin Road approach for left and right-turn lanes
- Implementation of access management improvements at the Hillview Market
- Consider closing the Hillview Avenue roadway. This should be evaluated during the design process.

Cost: $820,000

Figure 11.1 Route 112/Jenkins Road Short-term Improvements

ROUTE 112/GARFIELD STREET

Based upon existing safety and vehicle delay it is recommended the following be implemented (See **Figure 11.2**).

- Prohibit left-tur movements from Garfield Street
- Prohibit left-turn movements onto Garfield Street
- To accomplish the turn prohibitions, install a raised channelization island on Garfield Street and an island or treatment on Route 112. Traffic may divert to other neighborhood streets and therefore a local traffic monitoring and management plan shall be included.

Cost: $90,000

Figure 11.2 Route 112/Garfield Street Short-term Improvements

ROUTE 112/FRANKLIN STREET

Based upon existing congestion issues and the proximity of the intersection midway between downtown and Industrial Park Road it is recommended the following be implemented (see **Figure 11.3**).

- Installation of a traffic signal
- Provision of dedicated left-turn lanes on the Route 112
- Restripe Route 112 between Franklin Street and Tasker Street to provide a three-lane section and accommodate vehicle turns into General Dynamics and Central Fire Station. The curb-to-curb width is approximately 43 feet and it is recommended that three 11-foot lanes and 5-foot shoulders be provided. On-street parking will need to be prohibited in this section.

Cost: $570,000

Figure 11.3 Route 112/Franklin Street Short-Term Improvements

MONITOR THE ROUTE 112/SPRING STREET INTERSECTION

This location should be monitored following the installation of a traffic signal at the Franklin Street intersection. If the monitoring study determines that existing safety and vehicle delay is not improved, it is recommended the following be implemented (see **Figure 11.4**).

- Installation of a traffic signal
- Construction of a dedicated left-turn lane on the Route 112 westbound approach
- Widening of the Spring Street approach for left and right-turn lanes

Cost: $820,000 (Study Cost $15,000)

Figure 11.4 Route 112/Spring Street Short-Term Improvements

11.2 - LONG-TERM IMPROVEMENTS

Based on the Alternatives Analysis and Purpose and Need the Modification of Exit 36 and the Route 112/Road 5 Connector Alternative (A6) should be further explored for implementation. The following details the improvements.

MODIFICATION OF EXIT 36

Consists of providing full Turnpike access at Route 112 with a collector-distributor roadway on the Turnpike between Route 112 and Exit 36. Access to the Turnpike is to be provided at Lund Road (with signals) and at a new signalized intersection west of the Turnpike. The new interchange will be linked to the existing Exit 36 interchange using collector-distributor roads to minimize the risks associated with weave movements. It is noted that it may be possible to construct the collector distributor roads in phases at a later date when traffic volumes are predicted to negatively influence weaving conditions. (see **Figure 11.5**)

Figure 11.5 Route 112/Maine Turnpike Ramp Intersection Improvements Concept A6

ROUTE 112/LUND ROAD/NEW NORTHBOUND TURNPIKE RAMPS

The introduction of a new access point on Route 112 for Maine Turnpike northbound on and off movements will require improvements. The improvements will consist of the following (see **Figure 11.6**):

- Installation of a traffic signal
- Providing turn lanes on Route 112
- Widening Lund Road
- Widening the existing Park & Ride approach
- Providing new Park & Ride lot to replace the existing lot at the Ramada Inn entrance. The lot will be designed to allow for future expansion to be phased based on projected need.

ROUTE 112/NEW SOUTHBOUND TURNPIKE RAMPS

The introduction of a new access point on Route 112 for Maine Turnpike southbound on and off movements will require improvements. The improvements will consist of the following (see **Figure 11.7**):

- Installation of a traffic signal
- Providing turn lanes on Route 112

Cost: $38,000,000

Figure 11.6 Exit 36 Lund Intersection

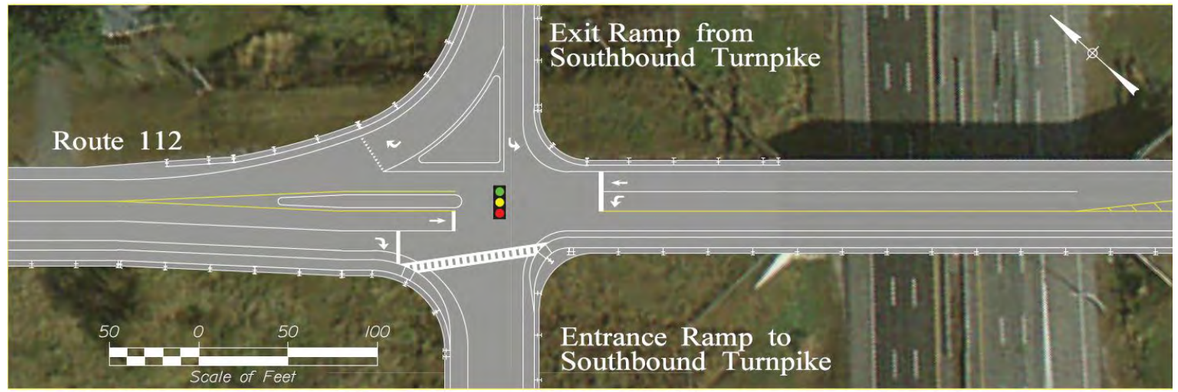


Figure 11.7 Exit 36 Route 112 Intersection

ROUTE 112/ROUTE 5 CONNECTOR

Consists of a new roadway between Route 112 and Route 5 just west of the Middle School. This alternative is intended to reduce traffic through the neighborhood by creating a convenient place for traffic to move from Route 5 to Route 112 and vice versa.

Cost: $9,600,000

IMPLEMENTATION

It is recommended that the Modification of Exit 36 be implemented first. Given right-of-way needs and local coordination with possible school expansion plans, the Route 112/Route 5 Connector would be implemented under a separate schedule.

Figure 6.3: A5 - Route 112/Route 5 Connector Road