

SERVICE ROAD STUDY WINDHAM, MAINE



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Executive Summary

This Executive Summary is prepared for the reader's convenience, but is not intended to be a substitute for reading the full report.

Gorrill-Palmer Consulting Engineers, Inc. was retained by the Town of Windham to complete a preliminary evaluation for potential service roads parallel to and on the east side of Route 302 (Roosevelt Trail). A northerly service road would link the end of Franklin Drive southerly to Route 115 (Tandberg Trail). A southerly service road would link Route 115 southerly to potentially the cul-de-sac at the end of Commons Avenue, as well as Turning Leaf Drive, Taylor Lane and Drive-In Lane.

The scope of this study calls for the service roads to be evaluated in two phases; Phase I is the northerly service road from Franklin to Route 115, hereafter called the "northerly" service road and Phase II is the southerly service road from Route 115 to the cul-de-sac at the end of Commons Avenue, hereafter called the "southerly" service road.

The key intersections considered to be included in the study area are:

- Route 302 at Route 115/35
- Route 302 at Shaw's Plaza
- Route 302 at Landing Road
- Route 302 at Franklin Drive
- Route 302 at River Road
- Route 115 at newly created or modified intersections

The project was completed with a Purpose and Need Statement co-prepared by Town staff, Town Council, and Gorrill-Palmer Consulting Engineers Inc. This statement spoke to the issues of the need for the service roads, the concerns of traffic utilizing the adjacent roadway network, and the importance of alternative connector roads for purposes of: reducing congestion on the adjacent roadway network, improving vehicular safety, preserving roadway capacity, improving vehicular access and providing additional pedestrian access.

A project of this nature is successful only when the public has a significant role in the process. Completion of this project was performed with input from Town staff, Town Council, general public and local neighborhoods, and Gorrill-Palmer Consulting Engineers Inc. The alignment and phasing of the service roads included 4 northerly alternatives and 3 southerly alternatives. Each of the alternatives have relatively the same positive and negative impacts and the final alternative will most likely be the one with the most public support.

The 2006 traffic volumes used for the capacity analysis portion of the study are based on different developer studies that were just recently approved with some supplemental turning movement counts performed for any outstanding intersections. The 2017 traffic volumes are based on a projection of the 2006 volumes using historical growth in the area. In addition to projecting 2006 volumes to 2017, a portion of the currently undeveloped property in the immediate area was also considered to be developed. It should be noted that the current undeveloped property in the immediate area is expected to be developed regardless of the construction of the service roads. The service roads will serve to direct and control the traffic from the development rather than letting individual developments access directly onto Route 302 or Route 115 as they otherwise would without this planning effort.

To evaluate the alternatives, three major categories were evaluated: transportation, environmental, and neighborhoods. Because each of the northerly alternatives start and end at approximately the same location and each of the southerly alternatives start and end at approximately the same location, the transportation evaluation was focused more on whether the service roads would have a positive or negative impact on the adjacent roadway network. Based on the traffic evaluation, the service roads will have a positive impact on the local roadway network in the following ways:

- Improve capacity / mobility
- Improve safety
- Reduce emergency response time
- Provide alternative routes for incident management
- Provide managed access to undeveloped property
- Increase mobility and alternatives for pedestrian / bicycle access

Based on the preliminary environmental evaluation, there were no significant environmental issues that were identified. None of the alternatives were identified as better or worse from an environmental standpoint. It should be noted that a full, in-depth environmental evaluation including a detailed field survey will need to be done once an alternative is identified. That level of review is far beyond the scope of this study.

The third category that needs to be considered in the evaluation of the alternatives is the impacts to the neighborhoods. This evaluation has not yet been completed and will benefit from additional public meetings and discussions with Town representatives as the process proceeds. The transportation evaluation showed the benefit of the service roads in general since the effects of each would be the same, and the environmental evaluation did not isolate any alternative as better than any other; therefore, the neighborhood impact will be a dominating factor in the alternative chosen.

Conclusions:

The following is a summary of the conclusions reached in this preliminary evaluation of the proposed service roads:

- The critical intersection within the study area from an operational perspective is the intersection of Route 302 / Route 35 / Route 115 (Boody's Corner)
- Regardless of any additional Windham development, the Route 302 corridor, and especially Boody's Corner, will continue to decrease in level of service due to growth in through traffic volumes
- Regardless of any additional Windham development, the service roads will have a positive impact in preserving existing capacity and improving mobility in the immediate area
- As property in the immediate area is developed, lack of service roads will result in significant degradation of the overall level of service at Boody's Corner
- Each of the northerly alternatives would have relatively the same length
- Each of the southerly alternatives would have relatively the same length
- Based on the capacity analysis, each of the four northerly alternatives will have the same capacity impacts
- Based on the capacity analysis, each of the three southerly alternatives will have the same capacity impacts
- The service roads can reduce emergency response time and provide an alternate route during times of incident management
- None of the alternatives are expected to have significant environmental impacts
- The service roads will have an overall positive impact for the corridor. However, some additional mitigation may be necessary at the Franklin Road intersection if the northerly service road is constructed, and at the River Road intersection if the southerly service road is constructed

This project, the Purpose and Need Statement, and the recommended alternatives are considered an initial stage in the evaluation process. Further investigations, such as site walks, survey, and other field work will be necessary to complete the evaluation process, as well as arriving at a final alternative, design, and construction of the new service roads.

I. Introduction

Study Area

North Windham is centered around the signalized intersection of Route 35 / Route 115 / Route 302 (Boody's Corner). This intersection experiences over 35,000 vehicles a day on average throughout the year. Contributory toward this traffic volume is a combination of new development in the immediate area over the past several years as well as increases in traffic volume due to residential and commercial growth in the surrounding areas. In addition, Route 302 is a primary route used to service recreational facilities to the north and experiences significant increases in traffic in the summer time, and to some degree in the winter time for winter recreational activities. This increase in traffic volume puts a significant burden on the Route 302 corridor and more specifically the Boody's Corner signalized intersection. A map of the study area is shown on Figures 1 and 2 of Appendix A.

Key Study Area Intersections

During meetings with the Town Staff and Council, the study area for the project was identified to include the following intersections:

- *Route 302 at Route 115/35*
- *Route 302 at Shaw's Plaza*
- *Route 302 at Landing Road*
- *Route 302 at Franklin Drive*
- *Route 302 at River Road*
- *Route 115 at newly created or modified intersections*

Gorrill-Palmer Consulting Engineers, Inc. collected turning movement data in the summer of 2006 for the above locations either under separate contract or for previous studies in the area. Traffic counts for the area were compiled and adjusted to reflect year 2006 peak seasonal summer conditions as shown of Figures 1 & 2 in Appendix C. The 2006 traffic volumes were increased by 1.5 percent per year to arrive at projected 2017 year volumes as shown on Figures 5 & 6 of Appendix C.

Purpose and Need

When the Town approached Gorrill-Palmer Consulting Engineers Inc. with their concerns for the area and the concept of service roads, we were already very familiar with this area through recent work in and around the Route 302 corridor, as well as involvement in previous studies for this area. Based on meetings with the Town on May 17, 2006 and

August 1, 2006 we gained a further understanding that the Town would like to preserve the right of way needed and to plan for the funding of future service roads to accomplish the objectives identified herein.

We understand that the Town envisions funding of the service roads through the use of private developer funds, Town funds through tax increment financing, or through impact fees to be paid by new development. Since the use of State or Federal funding is not anticipated, it will not be necessary to follow the National Environmental Policy Act or State Sensible Transportation Act procedures. However, this work that is being done can provide a basis for the further efforts that would be necessary to include Federal or State funding.

A purpose and need document was co-drafted in November of 2006 by Town Staff and Gorrill-Palmer Consulting Engineers Inc. This document was created to tabulate the specific reasons for the creation of the service roads. The needs were drafted with current and future transportation requirements in mind, and include the following issues:

Needs:

Traffic Congestion

- Excessive traffic congestion exists on Route 302 during peak summer conditions particularly on Friday evenings and Saturdays. The most significant delays occur at the Route 302 intersections with Routes 115 / 35 (Boody's Corner) and at Whites Bridge Road. The MaineDOT reconstructed Boody's Corner in 1995 and has a planned project at the Whites Bridge Road intersection. The Boody's corner intersection generally operates at or over capacity during peak periods, even with these past improvements.

Safety Deficiencies

- Fire/Emergency response times to and through the developing commercial area could become an issue as congestion increases and first responders cannot get to their destination as quickly.
- Crashes along the corridor could be addressed by reducing congestion along Route 302. Particularly the high crash location between Boody's Corner and Shaw's Plaza where forty crashes occurred from 2003-2005.

Inadequate Access

- Direct access from the east side of Route 302 to the commercial corridor is generally not possible without entering onto Route 302, which is not desirable for local trips. Many of these trips necessitate uncontrolled left turns out of driveways, creating safety concerns.

- Access to existing commercially zoned areas is not adequate. There are large undeveloped areas, which if developed with access only from Route 302 or Route 115 would greatly impact mobility and increase safety concerns. It can be expected that
- This undeveloped area will be developed with or without the construction of the service roads and therefore is an issue that needs to be addressed, regardless of the outcome of this study.

Purpose:

This analysis, on a preliminary basis, has examined potential roadways that could serve as a future connector road to address the above-stated needs. In addition, the needs were resolved into the following evaluation criteria for this project:

- Reduce congestion
- Improve safety
- Preserve roadway capacity
- Improve vehicular access
- Provide pedestrian access

The Windham Parallel Service Road Study was completed in accordance with this purpose and need statement. Although not intended for a Draft Environmental Impact Study (DEIS) or Final Environmental Impact Study (FEIS), many of the components in this statement and the resulting report and recommendations are similar. Many of the resource investigations, such as mapping of soils, wetlands and correspondence with various local, state and federal agencies were completed.

II. Public Participation Process

As discussed in the introduction portion of this report, the initial intent of this project was to determine the most appropriate service road alignment parallel to and on the east side of Route 302, both north and south of Route 115. The Purpose and Needs Statement identified the objectives and goals of the service roads. The determination of the best alignment evolves from several criteria, including traffic, environmental, neighborhood impacts and cost information.

Almost all data for the project was to have come from existing sources of information, ranging from aerial photographs to traffic counts. A large portion of the project was to determine the traffic, environmental and cost feasibility of potential service road alternatives as well as meeting with neighborhood groups and individuals. It was anticipated that seven alternatives would be investigated, with two preferred alternatives to be recommended for further evaluation, one for the north service road and one for the south service road.

A project of this nature is successful only when the public has a significant role in the process. Gorrill-Palmer Consulting Engineers Inc. has worked closely with Town Staff in

evaluating the possible alternatives. In addition to working with Town Staff, prior to this Draft study, a Council Workshop was held on January 16, 2007 and a Public Meeting was held on February 28, 2007 to receive guidance and direction, and identify concerns. It is anticipated that this preliminary draft study and evaluation will be reviewed again by the Town Staff and Council and presented to the public for additional feedback prior to making the study final.

Such public involvement is crucial to the success of such a project. With public participation, the end result is one that benefits the public and reflects the knowledge of those familiar with the area based on everyday experience. Furthermore, if a service road concept moves into a permitting and funding phase, public support is critical to the continuation of these processes toward construction of an actual roadway. The meeting notes are available for reference in Appendix C of this report.

III. Selection of Alignment Alternatives

Determination of Locations

The first objective of this study was to locate potential alignments for service roads in keeping with the Windham Service Roads Purpose and Need Statement. The alternatives were selected based on proximity to existing roadways, the potential for reuse of existing rights-of-ways, minimizing residential neighborhood impacts and to minimize environmental impact. The process involved input from Town officials as well as the public. Initially, four Alternatives were identified for the northerly service road and three Alternatives were identified for the southerly service road. Each Alternative alignment is shown on Figures 1 and 2 of Appendix A and described in more detail as follows:

Northerly Service Road:

Alternative 1 – This alternative starts at the cul-de-sac of Franklin Drive (where Home Depot is located) and traverses southerly approximately 1,650 feet toward Sandbar Road where it intersects and travels over Sandbar Road for another approximately 1,650 feet to where it intersects with Route 115. This alternative would include upgrading Sandbar Road to accommodate additional traffic, which may include items such as removing sharp curves, additional pavement width, base reconstruction etc. The total length of this alternative is approximately 3,300 feet.

Alternative 2 – Alternative 2 is identical to Alternative 1 for the first approximately 1,650 feet to where it intersects Sandbar Road. From here instead of following Sandbar Road as did Alternative 1, it diverges to the southeast through undeveloped property for approximately 2,000 feet where it intersects Route 115 approximately 200 feet to the west of the intersection with Sabbady Point Road and directly opposite Dunridge Circle, creating a four way intersection at Route 115. The total length of this alternative is approximately 3,650 feet.

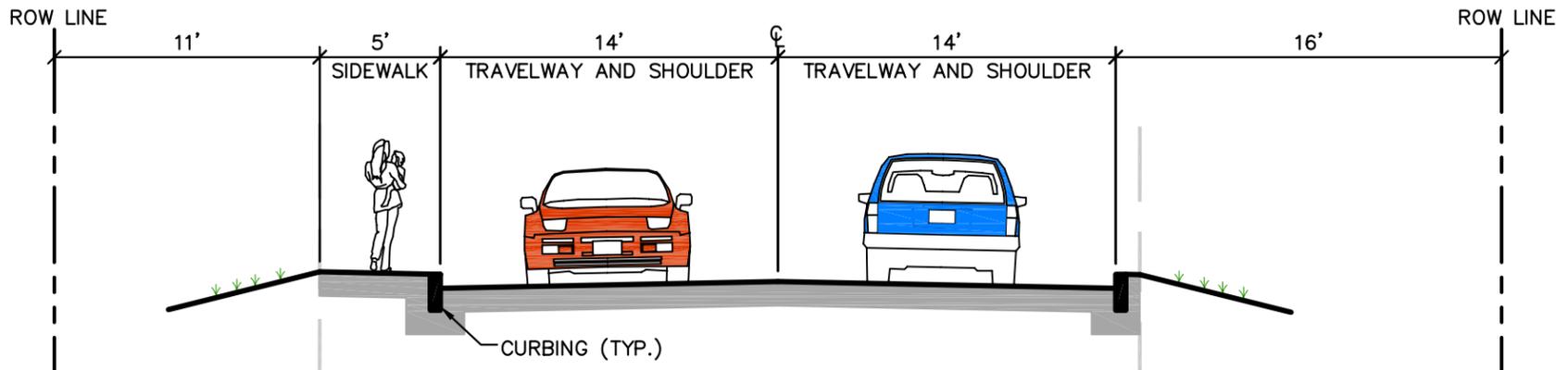
Alternative 3 – Alternative 3 is identical to Alternative 1 for the first approximately 1,650 feet to where it intersects Sandbar Road. From Sandbar Road it diverges to the east almost bisecting the distance between Alternative 1 and 2 and travels through primarily undeveloped land for approximately 2,000 feet where it intersects Route 115 approximately 450 feet west of the intersection with Sabbady Point Road. The total length of this alternative is approximately 3,650.

Alternative 4 – This Alternative is the same as Alternative 1 for the first approximately 500 feet where it diverges to the southeast for another approximately 750 feet and intersects Sandbar Road at approximately 90 degrees. It then continues across Sandbar Road for approximately 2,100 feet in a southeast direction across undeveloped land where it intersects and travels the same path as Alternative 2 for another approximately 200 feet before intersecting with Route 115. The total length of this alternative is approximately 3,550 feet. This Alternative is the only Northerly Service Road alternative that does not have the potential to continue as a Southerly Service Road alternative as do Alternatives 1,2, and 3.

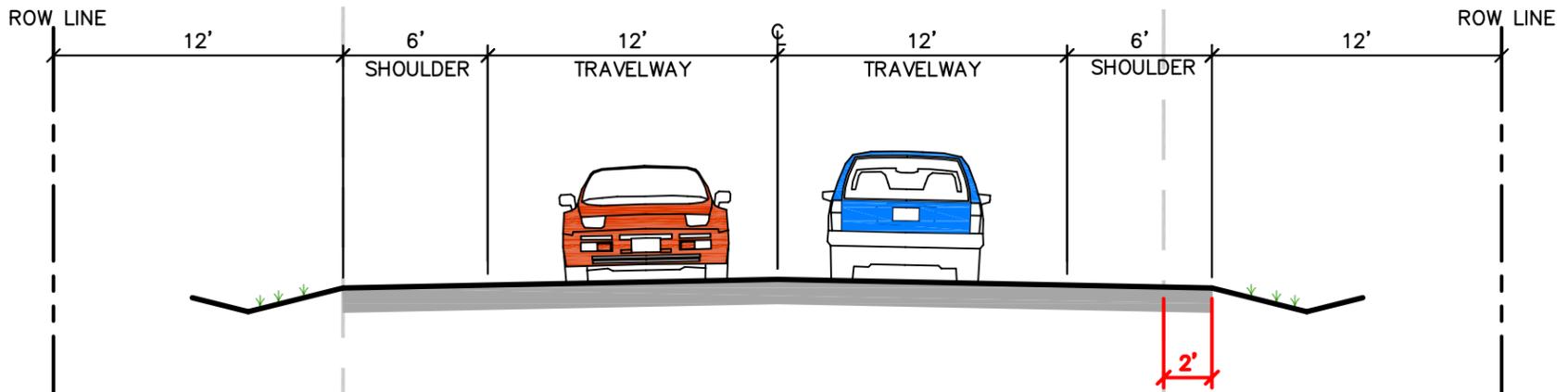
Southerly Service Road:

Each of Alternatives 1, 2, and 3 starts at Route 115 directly opposite where the Northerly Service Road Alternatives 1, 2, and 3 ended. The intent of this is to allow the creation of a four way intersection on Route 115 such that drivers wanting to travel from the Southerly Service Road to the Northerly Service Road or vice versa do not have to make turning movements onto or off from Route 115. They would need only travel directly across Route 115, decreasing the impact to the capacity of Route 115 and increasing the safety from off-set intersections. This could also potentially make it easier to warrant traffic signals in the future. However, we do not preclude the possibility that the Northerly and Southerly Service Roads could have different end points at Route 115.

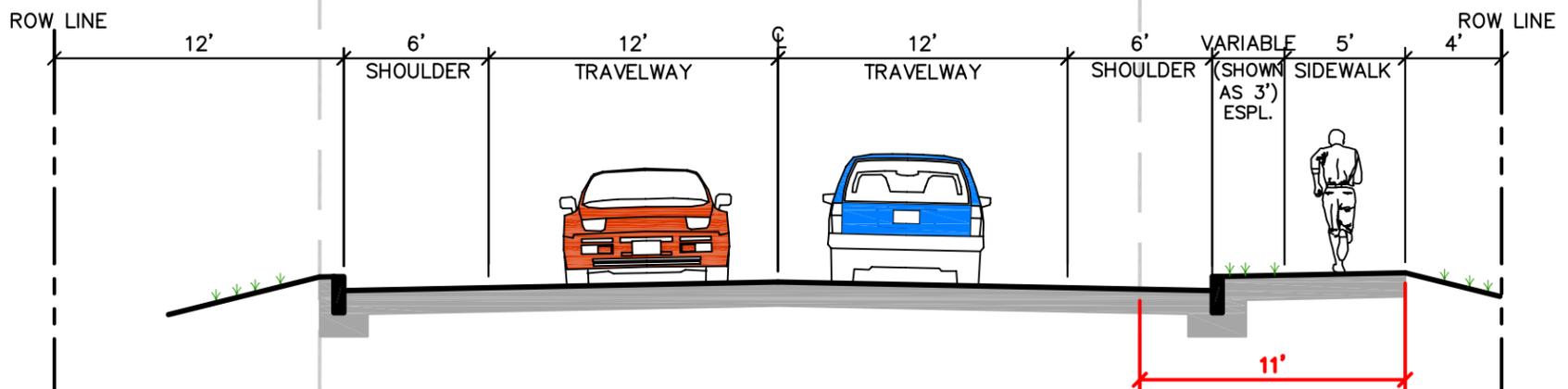
Alternative 1 – This Alternative starts at Route 115 and travels along a proposed realigned Collins Pond Road for approximately 600 feet before Collins Pond Road diverges to the east and the service road continues southerly an additional approximately 2,550 feet across primarily undeveloped property to where it is proposed to intersect with a cul-de-sac at the end of Turning Leaf Drive. Turning Leaf Drive is a commercial subdivision road that intersects Route 302 at a signalized intersection opposite River Road. This portion of the service road is proposed to cross the easterly most portion of a baseball field directly behind the Manchester Elementary School. From the cul-de-sac at Turning Leaf Drive, the service road continues southerly approximately 900 feet where it terminates at the cul-de-sac on the end of Commons Avenue. Although Drive In Lane, located between Turning Leaf Drive and Commons Avenue, does not currently extend far enough back from Route 302 to intersect with the proposed service road, it is recommended that this be a requirement for future development on this road. The total length of this Alternative is approximately 4,050 feet.



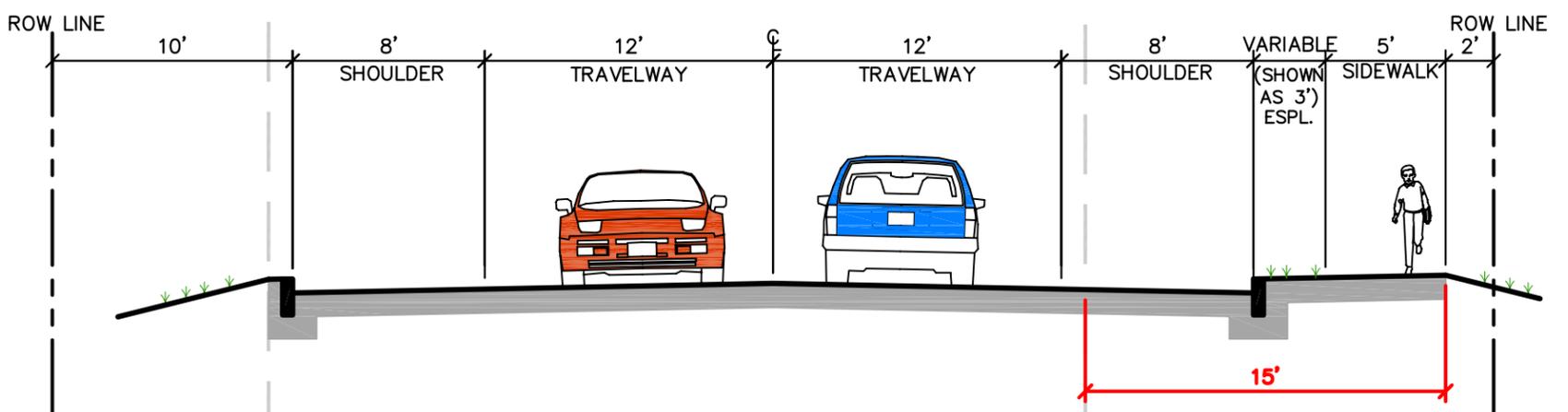
PROPOSED SERVICE ROADS



EXISTING MANCHESTER DRIVE



EXISTING ROUTE 115



TOWN STANDARD FOR MAJOR STREET

Design: RED	Date: MAY 07
Draft: DB	Job No.: 1606
Checked: PAH	Scale: NONE
File Name: 1606-TYPICALS	

GP Gorrill-Palmer Consulting Engineers, Inc.
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Drawing Name: **Typical Roadway Cross Sections**

Project: **ROUTE 302 PARALLEL SERVICE ROAD, WINDHAM, MAINE**

Figure No.
A

Alternative 2 – Alternative 2 starts at Route 115 and travels along Dunridge Circle for approximately 650 feet at which point Dunridge Circle ends and the service road continues southerly for another approximately 300 feet to where it intersects Collins Pond Road. It then continues southerly for approximately 850 feet where it joins the path of Alternative 1 for another 1,450 feet intersecting with the cul-de-sac at the end of Turning Leaf Drive, and then another approximately 900 feet ending at Commons Avenue. The total length of this alternative is approximately 4,150 feet.

Alternative 3 – This Alternative starts at Route 115 and traverses southerly along a private drive for approximately 350 feet to a point where the private drive ends and the service road continues for another approximately 550 feet where it intersects with Collins Pond Road. From this point it continues across Collins Pond Road southerly approximately 200 feet to where it joins the same route as Alternative 2 for another approximately 650 feet to a point where Alternative 2 intersected with Alternative 1 and continues for another approximately 1,450 feet intersecting with the cul-de-sac at the end of Turning Leaf Drive. From here, it continues another approximately 900 feet ending at Commons Avenue. The total length of this Alternative is approximately 4,100 feet.

Although not shown on Figure 2 of Appendix A as an identified alternative, should the Manchester Elementary School be relocated in the future, this may lead to other potential routes for a connector between Route 115 and Route 302.

All Southerly Service Roads – As identified in the above descriptions and shown on the aerial, all of the southern service roads are the same for approximately the southern most 2,450 feet. The second similarity is that they all either use or must intersect Collins Pond Road. The primary difference between the three alternatives is their intersecting point on Route 115.

Additional Alternatives

It should be noted that although many alternatives are described above, the alternatives do not have to be constructed as a whole in order to be effective. If money or resources are limited, portions of the alternatives could be constructed in a phased approach. For instance, as development occurs, the Town can review the chosen alternative and have that portion of the alternative that directly benefits the developer construct that portion of the alternative or provide the right of way necessary for the future construction of the alternative.

Roadway Cross Section

For the purposes of this report, the proposed service roads were considered to include a 12 foot travel lane in each direction with 2 foot curb offset and a 5 foot wide sidewalk on one side. The Typical Roadway Cross Sections shown on Figure A following this page compares the proposed service roads with what a driver would experience either on Manchester Drive, Route 115, or what would be expected based on the Town Standards for a Major

Street. As can be seen from the cross sections, the proposed service roads are anticipated to have less impact than other similar roads in the area. This could result in lower construction costs, less impact to neighborhoods, less environmental impact, and slower travel speeds.

IV. Determination of Future Traffic Volumes

Base Volumes:

As was discussed in the Introduction, volumes were obtained for several of the study area intersections from prior traffic studies, with additional counts completed to obtain volumes for the remaining intersections. The volumes were adjusted for annual growth and seasonal variation to result in the 2006 design hourly volumes (DHV) which typically occur in the summer months. The 2006 volumes were then increased based on historical growth in the area to arrive at 2017 DHV. Once the 2006 and the 2017 volumes were determined, they were assigned to the service roads. Since the northerly service road is anticipated to be constructed first, the northerly service road was evaluated for the 2006 and the 2017 conditions. Since the southerly service road is expected to take longer to reach fruition, the southerly service road was only reviewed for the 2017 condition. These volumes can be found on the turning movement diagrams that are provided in Appendix C.

Additional Development Volumes:

In addition to the service roads allowing alternate routes for drivers to more directly access existing destinations, they can also serve to access undeveloped property that currently would have to access directly onto only Route 302 or only Route 115, which would exacerbate the existing traffic conditions. It can be expected that the undeveloped areas to the east of Route 302, both north and south of Route 115 will be developed regardless of the construction of the service roads. The purpose of the service roads is to **direct** the newly generated traffic such that it minimizes the traffic impact to the adjacent Route 302 and Route 115 corridors. This planning effort will also allow the Town to guide the location of these roadways to minimize the neighborhood impacts. Because these service roads could potentially serve as an access to future development, the location of undeveloped property was reviewed as part of this evaluation. Assumptions were made as to the size and use of the undeveloped property to determine what increases in traffic might be realized due to development of portions of the undeveloped property which is currently zoned for commercial use.

V. Evaluation of Alternatives

As previously stated, the purpose of this study was to provide a preliminary evaluation of various proposed alternatives in order to determine a northern and southern alternative warranting further investigation. The alternatives were evaluated with consideration of three major categories: transportation, environment and neighborhoods. Because each of

the alternatives for both the north and south service roads primarily start and end at the same points, the transportation part of the evaluation focuses more on the benefits of the service roads in general rather than isolating any individual alternative as “preferred”. For instance, for the north service road alternatives, they all would start at the end of Franklin Drive and end within the relatively same area on Route 115. Therefore, each of the alternatives would service the same volume of traffic, have the same impact on Route 115 and have the same impact on Route 302. The transportation results will quantify the benefits associated with the construction of the service roads so that the Town can decide whether to pursue the service roads at all. A full discussion of the evaluation based on each category follows.

Transportation

The transportation evaluation was based on two specific criteria; what positive impacts will they have on the existing roadway network and what negative impacts, if any, will be created by the introduction of the new service roads? The positive and negative impacts are measured as level of service of the movements at either the existing primary intersections or newly created or modified intersections.

It should be noted that other than the introduction of the service roads where indicated, no other physical improvements were made to the corridor or intersections to improve the level of service. Possible improvements that could be made would include, but not be limited to: closure of existing driveways, additional lanes, revised signal timing or signal system coordination, and increased alternative transit use such as the use of buses or shuttles.

Capacity Analysis:

Levels of service (LOS) rankings are similar to the academic ranking system where an ‘A’ is very good with little control delay and an ‘F’ represents very poor conditions. At an unsignalized intersection, if the level of service falls below a ‘D’, an evaluation should be made to determine if a traffic signal is warranted. The following table summarizes the relationship between control delay and level of service (LOS) for a signalized intersection:

Level of Service Criteria for Signalized Intersections

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

The following table summarizes the relationship between delay and level of service (LOS) for an unsignalized intersection:

Level of Service	Control Delay per Vehicle (sec)
A	Up to 10.0
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	Greater than 50.0

Because each of the alternatives in the northerly section as well as those in the southerly section start at relatively the same point and end at the same point, each alternative was not independently reviewed since they will have the same results. The scenarios analyzed are listed as follows:

- A. 2006 No service roads – used as a benchmark in which to evaluate the impacts of the improvements
- B. 2006 North service road constructed with no additional properties developed. No southerly service road constructed

All of the 2017 scenarios include typical background growth between 2006 and 2017:

- C. 2017 No service roads – used as a benchmark in which to evaluate the impacts of the improvements. This scenario does NOT include any additional development as identified in scenarios D, E, and F.
- D. 2017 No service roads, but with 50 % Development to the North of Route 115 and 25 % Development to the South of Route 115
- E. 2017 North service road constructed with 50 % of the initial undeveloped land developed, no southerly service road constructed
- F. 2017 North service road with 50% of the currently undeveloped land developed and the southerly service road with 25 % of the currently undeveloped land developed – Comparison of this option with option “D” shows the benefits of the service roads should development occur without the service roads in place.

The capacity analyses were performed based on the existing geometries in the field today with the exception of the proposed Route 115 / Service Road intersection which is proposed. The timings for each scenario were optimized to reflect the best LOS available given the existing geometries. The weekday PM peak hour was considered to be the most critical time period for the corridors and therefore was the time period chosen for analysis. The results of the capacity analyses utilizing Synchro software is summarized as follows. The detailed analyses are included in Appendix C.

LOS for Rt. 302 at Routes 35 and 115 – PM Peak Hour

Lane Group	Scenario					
	A	B	C	D	E	F
	LOS	LOS	LOS	LOS	LOS	LOS
Route 302 NB LT	D	D	E	E	F	F
Route 302 NB TH, TH	E	D	E	F	E	E
Route 302 NB RT	A	A	B	A	B	A
Route 302 SB LT	E	D	E	F	F	F
Rt. 302 SB TH, TH/RT	C	B	B	C	C	B
Route 35 EB LT	E	D	F	F	F	F
Route 35 EB TH	D	D	F	F	F	F
Route 35 EB RT	B	A	B	C	B	B
Route 115 WB LT	E	E	F	F	F	F
Route 115 WB TH	E	D	F	E	E	E
Route 115 WB RT	B	B	C	B	B	B
Overall	D (42)	C (31)	E (58)	F (100)	E (69)	E (69)

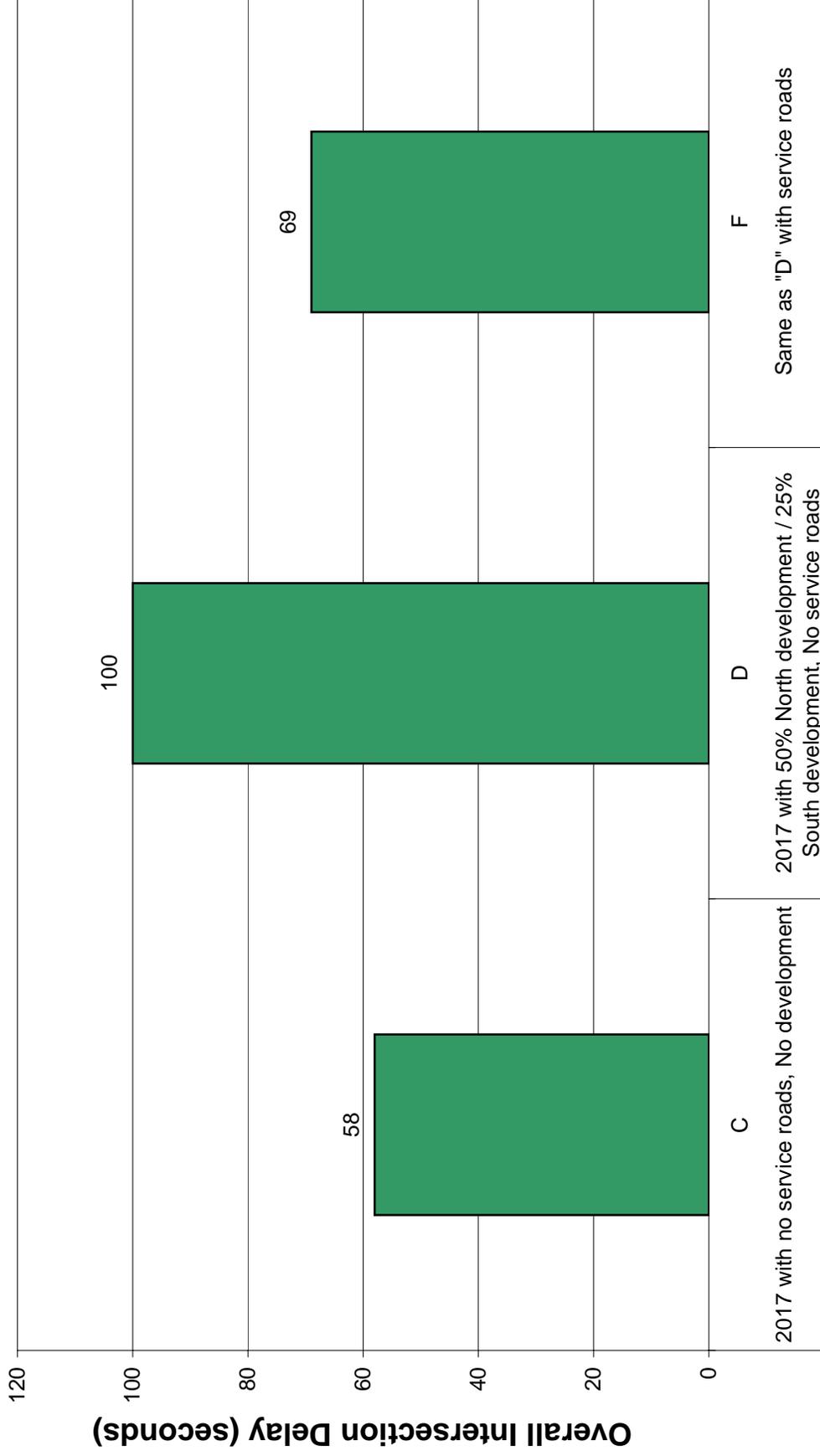
(XX) = the overall intersection delay in seconds per vehicle

Scenarios:

- A. 2006 No Service Roads
- B. 2006 North Service Road Only
- C. 2017 No Service Roads
- D. 2017 No Service Roads, but 50% of undeveloped land to North and 25% of undeveloped land to the South developed.
- E. 2017 North Service Road with 50% of undeveloped land developed
- F. 2017 Same as “D” with North and South Service Roads constructed

Based on the previous table, it can be identified between scenarios A and B that the north service road will have a positive impact to this intersection. In reviewing scenarios D and F, it can be identified that the service roads will be of significant benefit if development occurs in the undeveloped portions of land to the east of Route 302 and to the north or south of Route 115. It should also be noted that the intersection operation breaks down (reaches gridlock) if additional development occurs without the construction of the service roads (Scenario D). The bar chart following this page graphically shows the benefits of the service roads should additional development occur.

Route 35 / 115 / 302 Intersection Capacity Analysis Results



2017 with no service roads, No development

2017 with 50% North development / 25% South development, No service roads

Same as "D" with service roads

Scenarios

**LOS for Rt. 302 at Shaw's Plaza and Windham Shopping Plaza – PM
Peak Hour**

Lane Group	Scenario					
	A	B	C	D	E	F
	LOS	LOS	LOS	LOS	LOS	LOS
Route 302 NB LT	D	B	D	D	B	B
Route 302 NB TH, TH/RT	A	A	A	A	A	A
Route 302 SB LT	C	C	E	D	D	D
Route 302 SB TH, TH/RT	A	B	B	B	B	B
Shaw's Plaza EB LT/TH	D	D	E	E	E	D
Shaw's Plaza EB RT	A	A	A	A	A	A
Windham Plaza WB LT	D	C	E	E	D	D
Windham Plaza WB TH/RT	B	B	C	C	B	B
Overall	B (13)	B (11)	B (16)	B (17)	B (14)	B (14)

(XX) = the overall intersection delay in seconds per vehicle

Scenarios:

- A. 2006 No Service Roads
- B. 2006 North Service Road Only
- C. 2017 No Service Roads
- D. 2017 No Service Roads, but 50% of undeveloped land to North and 25% of undeveloped land to the South developed.
- E. 2017 North Service Road with 50% of undeveloped land developed
- F. 2017 Same as "D" with North and South Service Roads constructed

Based on the previous table, it can be identified between scenarios A and B that the north service road will have a positive impact to this intersection. In reviewing scenarios C through F, it can be identified that development on either of the two service roads will have a relatively minor impact on this intersection.

LOS for Rt. 302 at Landing Road and Windham Mall – PM Peak Hour

Lane Group	Scenario					
	A	B	C	D	E	F
	LOS	LOS	LOS	LOS	LOS	LOS
Route 302 NB LT	C	D	D	D	E	E
Route 302 NB TH, TH	B	A	C	A	A	A
Route 302 NB RT	A	A	A	A	A	A
Route 302 SB LT	D	C	F	E	D	D
Route 302 SB TH, TH	B	B	B	C	C	B
Route 302 SB RT	A	A	A	B	B	B
Landing Road EB LT	D	D	E	E	E	D
Landing Road EB LT/TH	D	D	E	E	E	D
Landing Road EB RT	A	A	A	A	A	A
Windham Mall WB LT	E	D	E	E	E	E
Windham Mall WB LT/TH	E	D	E	E	E	D
Windham Mall WB RT	B	A	A	B	B	B
Overall	B (19)	B (15)	C (28)	C (26)	C (25)	C (34)

(XX) = the overall intersection delay in seconds per vehicle

Scenarios:

- A. 2006 No Service Roads
- B. 2006 North Service Road Only
- C. 2017 No Service Roads
- D. 2017 No Service Roads, but 50% of undeveloped land to North and 25% of undeveloped land to the South developed.
- E. 2017 North Service Road with 50% of undeveloped land developed
- F. 2017 Same as “D” with North and South Service Roads constructed

Based on the previous table, it can be identified between scenarios A and B that the north service road will have a positive impact to this intersection. In reviewing scenarios C through F, it can be identified that development on either of the two service roads will have a relatively minor impact on this intersection.

LOS for Rt. 302 at Franklin Drive – PM Peak Hour

Lane Group	Scenario					
	A	B	C	D	E	F
	LOS	LOS	LOS	LOS	LOS	LOS
Route 302 NB LT	B	B	B	E	E	E
Rt. 302 NB TH, TH/RT	A	A	A	C	B	C
Route 302 SB LT	D	D	D	D	D	C
Rt. 302 SB TH, TH/RT	B	B	C	A	A	A
D'Angelos EB LT/TH/RT	C	C	C	C	C	C
Franklin Dr WB LT/TH	D	D	E	F	E	E
Franklin Dr WB RT	B	C	C	D	D	E
Overall	B (12)	B (12)	B (13)	C (29)	C (21)	C (34)

(XX) = the overall intersection delay in seconds per vehicle

Scenarios:

- A. 2006 No Service Roads
- B. 2006 North Service Road Only
- C. 2017 No Service Roads
- D. 2017 No Service Roads, but 50% of undeveloped land to North and 25% of undeveloped land to the South developed.
- E. 2017 North Service Road with 50% of undeveloped land developed
- F. 2017 Same as “D” with North and South Service Roads constructed

Based on the previous table, it can be identified between scenarios A and B that the north service road will have a relatively minor impact to this intersection. In reviewing scenarios C and D, it can be identified that development on either of the two service roads will have a negative impact on this intersection. This is because this intersection would serve as the primary northerly signalized access to the service roads. As identified at the beginning of this section, other than the introduction of the service roads, no other physical improvements were incorporated into the analysis. The level of service of this intersection may be improved by minor changes to the intersection. In comparing scenarios D and F, it can again be seen that the service roads will have a negative impact to the intersection with all other factors equal.

Although this intersection will experience a slight decrease in LOS due to the service roads, the overall positive benefits and increase in LOS for the corridor more than offset the negative impacts at this intersection.

LOS for Rt. 302 at River Road and Turning Leaf – PM Peak Hour

Lane Group	Scenario					
	A	B	C	D	E	F
	LOS	LOS	LOS	LOS	LOS	LOS
Rt. 302 NB LT/TH, TH/RT	B	B	C	C	C	C
Rt. 302 SB LT/TH, TH/RT	C	C	D	F	E	F
River Road EB LT/TH	D	C	E	F	E	F
River Road EB RT	A	A	A	A	A	A
Turning Leaf WB LT/TH/RT	A	A	A	D	A	F
Overall	C (23)	C (23)	D (43)	F (116)	D (54)	F (112)

(XX) = the overall intersection delay in seconds per vehicle

Scenarios:

- A. 2006 No Service Roads
- B. 2006 North Service Road Only
- C. 2017 No Service Roads
- D. 2017 No Service Roads, but 50% of undeveloped land to North and 25% of undeveloped land to the South developed.
- E. 2017 North Service Road with 50% of undeveloped land developed
- F. 2017 Same as “D” with North and South Service Roads constructed

Based on the previous table, it can be identified between scenarios A and B that the north service road will have a relatively minor impact to this intersection. In reviewing scenarios D, E and F, it can be identified that future development will have a negative impact on this intersection; however, the intersection LOS is improved by the construction of the service roads as seen by comparing scenarios D and F. As identified at the beginning of this section, other than the introduction of the service roads, no other physical improvements were incorporated into the analysis. The level of service of this intersection may be improved by the addition of a southbound left turn lane on Route 302 and an additional exit lane on Turning Leaf Drive.

LOS for Rt. 115 at Service Road Intersections – PM Peak Hour

Lane Group	Scenario					
	A	B	C	D	E	F
	LOS	LOS	LOS	LOS	LOS	LOS
South Connector NB LT/TH						B
South Connector NB RT						A
North Connector SB LT					C	
North Connector SB LT/TH		B				D
North Connector SB RT		B			B	A
Route 115 EB LT/TH		A				
Route 115 EB LT					C	D
Route 115 EB TH					B	
Route 115 EB TH/RT						C
Route 115 WB LT						D
Route 115 WB TH/RT		A				
Route 115 WB TH					B	B
Route 115 WB RT					A	A
Overall	N/A	A (10)	N/A	N/A	B (15)	C (20)

(XX) = the overall intersection delay in seconds per vehicle

Blank spaces indicate that these movements do not exist for the given scenario.

Scenarios:

- A. 2006 No Service Roads
- B. 2006 North Service Road Only
- C. 2017 No Service Roads
- D. 2017 No Service Roads, but 50% of undeveloped land to North and 25% of undeveloped land to the South developed.
- E. 2017 North Service Road with 50% of undeveloped land developed
- F. 2017 Same as "D" with North and South Service Roads constructed

This would be a new intersection created by the intersection of the new service roads with Route 115. This intersection was considered to be signalized for all the scenarios. Scenarios A, C and D were the no-build conditions so therefore do not have a LOS. As the table identifies, the number and designation of the lane uses was changed from the different scenarios to reflect what would be expected to be required as the service roads were constructed and as development occurred. For Route 115 these would include left and right turn lanes for westbound traffic and left turn lane for eastbound traffic. As the table identifies, each of the scenarios is expected operate at acceptable levels.

Volume Change at Boody's Corner:

The most congested intersection for the North Windham centralized area is the intersection of Route 302 / 115 / 35, also known as Boody's Corner. This criterion examined the impact of the north and south service roads for the given scenarios identified previously. Each of the northerly alternatives will all have the same impact on the

adjacent roadway network. This also holds true for each of the southerly service road alternatives. Therefore, the results presented below do not necessarily aid in choosing an alternative as much as they help determine if the Town would like to move forward with a service road. The measure for this evaluation is the “total entering volume” (TEV). This is the sum of all the traffic approaching the intersection during the design hour.

Route 302 / 115 / 35 - Total Entering Volume

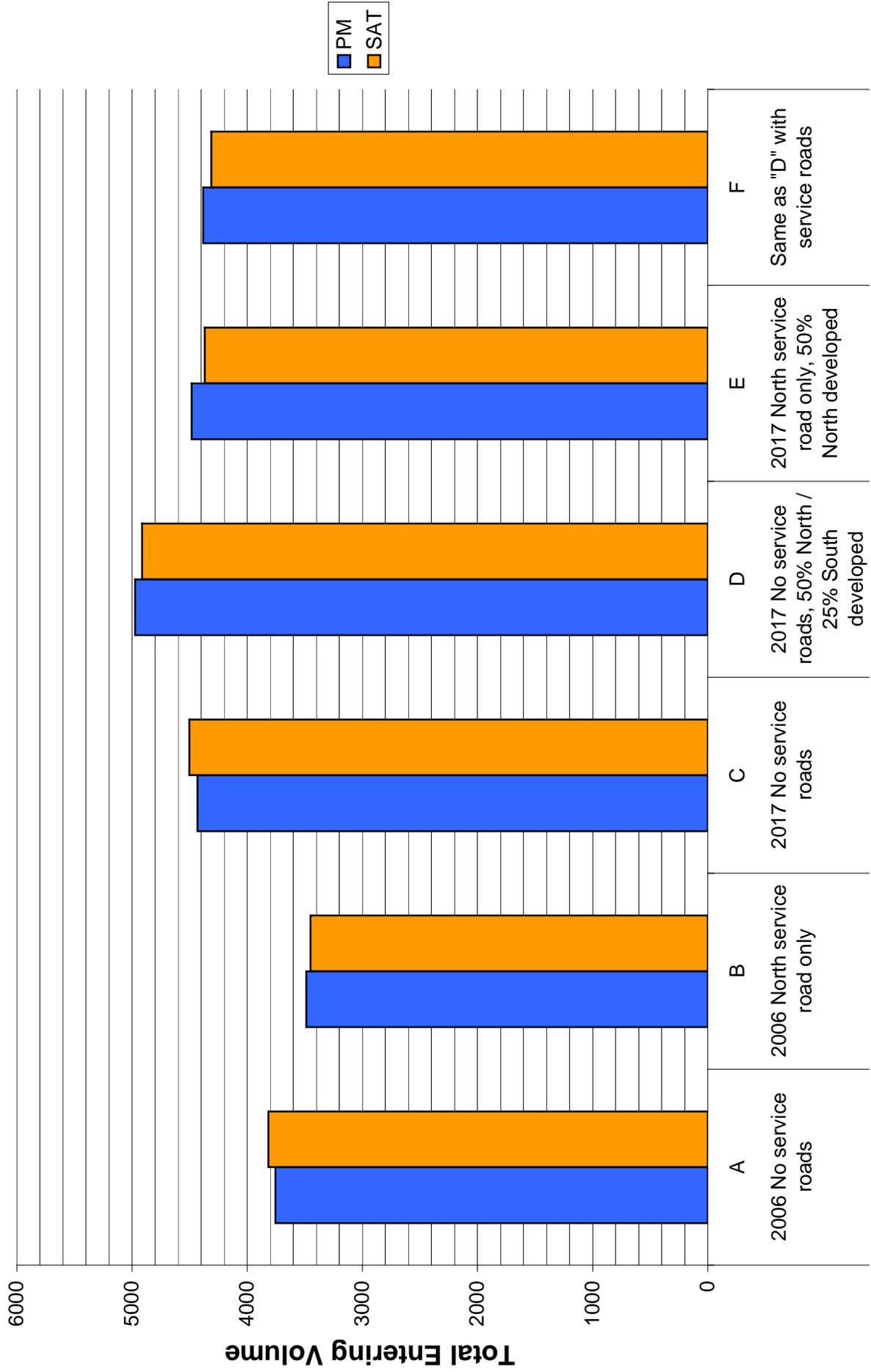
Scenario	Total Entering Volume	
	PM	Sat
A – 2006 No Service Roads	3754	3815
B – 2006 North Service, No Development	3486	3450
C – 2017 No Service Roads	4431	4502
D – 2017 No Service Roads, 50% North/25% South Development	4972	4911
E – 2017 North Service with 50% Development	4482	4368
F – 2017 North Service with 50% Development and South Service with 25% Development	4381	4311

As can be seen from the above table, in comparing the scenarios with and without the service roads, the service roads will decrease the total entering volumes traveling through the intersection. In comparing scenarios C and F, it can be seen that even with 50 % north and 25 % south of the currently undeveloped land occupied in the future, the total entering volume through the intersection is maintained after development, indicating the service road allowed for the circumventing of the intersection. Alternatively, without the service roads and with future development that will likely occur, volumes through the intersection are 10% higher. We should also note that approximately half the volume removed from the intersection by the service roads would be left turning traffic, which is the most significant to intersection operation and safety. The bar chart following this page graphically shows the information provided in the table.

Emergency Response Time:

As identified in the Purpose and Need Statement discussed previously, one of the goals of the service roads was to improve the emergency vehicle response time. This can be accomplished in two ways. The first way to reduce response time is to reduce the congestion and delay on the adjacent roadway network so that emergency vehicles can navigate more easily and quickly through the corridor. As shown in the previous tables the delay at the intersections has decreased due to the service roads with the total entering volume (TEV) also having decreased.

Route 302 / 115 / 35 Total Entering Volume



Scenarios

The second way to improve the emergency response time is to provide alternative routes for the emergency vehicles. Although it is difficult to quantify, providing the service roads can help to circumvent busier portions of Route 302, especially during peak times of the day or year.

An additional benefit to the service roads is to provide alternate emergency routes for incident management should something happen along the Route 302 or Route 115 corridors that would prevent through traffic. The service roads could be used as detour routes, significantly reducing the potential for gridlock.

Access to Undeveloped Property:

As identified in the Purpose and Needs Statement, one of the identified Needs was “Inadequate Access”. Currently, almost all development along Route 302 and Route 115 has direct access to Route 302 or Route 115. With each direct access, both the capacity and safety of the corridors decreases. Currently, there are large parcels of undeveloped properties on the east side of Route 302 that would most likely seek to access directly onto Route 302 or Route 115, thus decreasing the capacity and safety of the corridor. It can be expected that regardless of the outcome of this study and the construction of the service roads, the undeveloped land will be developed. Should the service roads be constructed, they can serve as “collector” roads for many properties such that all the turning movements into and out of the facilities are not occurring separately along Route 302 or Route 115. The collected traffic can then be directed to specific locations along Route 302 and Route 115. A second benefit to the service road is that it serves as an “internal connector” between properties. Although the service roads are public ways and not technically “internal”, they will serve as a connector to go from one property to another without requiring the driver to use Route 302 or Route 115. For example, if two larger currently undeveloped parcels were developed without a service road in place and they each had access out to Route 302, it is possible a driver could take a left out of one property, travel through a signalized intersection and then take a left into the other facility. This would require two left turning movements and use up capacity of a signalized intersection on Route 302. If both the accesses were on a service road, that trip from one facility to another would not have any impact on Route 302 or Route 115. A second example would be the connection of the three dead end roads (Turning Leaf Drive, Drive In Lane, and Commons Avenue) proposed to be connected by the southerly service road. With construction of the service road, any trips between the three roads would not have to use Route 302.

Pedestrian/Bicycle Access:

Pedestrian and Bicycle access was not identified specifically as a need for the service roads; however, they can serve as alternate routes for pedestrians and bicyclists to avoid the busier Route 302 corridor. There are several residential areas in and around the service roads that could use these facilities to access destinations along Route 302 while minimizing exposure to Route 302 traffic. One specific location that may benefit from the

service roads is students getting to and from the Manchester Elementary School, not only for attending school but for use of the athletic fields as well. The Town will need to decide the ultimate cross section of the road; i.e. shoulder widths, sidewalks etc. as desired to accommodate pedestrians and bicyclists. The ultimate cross section (sidewalks on one or both sides, bike shoulders, etc.) chosen will have impacts on other items such as drainage, right of way needed, costs, environmental impacts etc. For the purposes of this evaluation, a roadway width of 28 feet with curb was assumed, this would include a 12 foot travel lane and 2 foot paved offset in each direction. Sidewalk on one side was also assumed as shown on the typical sections provided previously. This is a relatively low impact cross section as compared to Manchester Drive, Route 115 and the Town standards.

Environmental

Any discussion of this evaluation should be prefaced with the knowledge that a full environmental and cost evaluation would require a level of involvement that exceeds the scope of this preliminary evaluation. A full assessment would require detailed field surveys for each alternative, a laborious and time-consuming task. The goal of the project and this report was to provide an initial evaluation of the major environmental and cost considerations of each alternative utilizing existing sources of information.

To assist in this initial evaluation, Gorrill-Palmer Consulting Engineers, Inc. drafted letters to various state and federal agencies inquiring about the environmental and archeological sensitivity of the study area. This matrix does not utilize a standardized ranking or importance system. However, examination of the matrix makes clear the relative impacts and costs associated with each alternative. The categories for evaluation include the following:

Wetlands

This category is a determination of the probable total wetland impact as a result of the construction of a given alternative. The results for this category are given in length of road. Data utilized for this category was based on United States Geological Survey topographical and soils maps as well as National Wetlands Inventory (NWI) maps. The NWI maps were prepared by reviewing aerial photography and do not take the place of on-site wetland delineations. It is not uncommon for NWI maps to significantly underestimate the wetland areas. It is critical to note that the anticipated range of wetland impacts may vary significantly from those presented in this report upon completion of actual field delineations. The following are the results of the preliminary wetland evaluation:

North Service Road

Alternate 1 – No Impact identified based on NWI maps

Alternate 2 – No Impact identified based on NWI maps

Alternate 3 – No Impact identified based on NWI maps

Alternate 4 – Approximately 400 linear feet

South Service Road

Alternate 1 – No Impact identified based on NWI maps

Alternate 2 – No Impact identified based on NWI maps

Alternate 3 – No Impact identified based on NWI maps

Wildlife (Flora and Fauna)

This criterion refers to the potential impact to federally listed endangered species, either plant or animal. Two sources of information were utilized for this category. The first was a letter from Scott Lindsay with the United States Department of the Interior. The second was a letter from Raquel Goodrich of the State of Maine Department of Conservation. A summary of their responses are provided as follows with letters provided in Appendix B.

Responses:

Dept. of Interior – *“A northern black racer snake was observed near the project area. This species is listed as endangered by Maine Inland Fisheries and Wildlife.”*

Dept. of Conservation – *“...there is a good quality example of a Red Maple – Sensitive Fern Natural Community just north of the study area...In designing a service road in this area, we would strongly recommend not encroaching on this habitat and minimizing any new sources of storm water runoff that would drain into it.”*

Fisheries

Similar to the wildlife criterion, Fisheries refers to impact to significant fisheries resources adjacent to a specific alignment. Information on this category was based on a letter from Brian Lewis of the Department of Inland Fisheries and Wildlife. A summary of the response is provided as follows with letter provided in Appendix C.

Response:

“...there are no known threatened/endangered fish species or habitat in the vicinity of the proposed project. However, Ditch Brook and an unnamed tributary to Tarkill Pond flow through parts of the proposed project area. While we have no data regarding the unnamed tributary, Ditch Brook supports wild populations of brook trout and brown trout as well as numerous other species.”

Historic/Archeological

This category examines the potential for any of the alternatives to impact either historic sites or structures, or sites with archeological content. Information for this category was obtained via a letter from Earle G. Shettleworth, Jr. of the Maine Historical Preservation Commission. A summary of the response is provided as follows with letter provided in Appendix C.

Response:

“Based on the materials submitted, I have concluded that the project area is sensitive for prehistoric archeological sites, and that a Phase I archeological survey will be necessary to determine whether such sites exist.”

Lakes Most at Risk from New Development

In addition to the above environmental issues, Tarkill Pond and Collins Pond were reviewed to determine if they fell into the Department of Environmental Protection (DEP) category of a waterbody at risk from development. Being included in this category requires the construction or development to meet additional requirements above and beyond the standard “best management practices” (BMPs). One example of the additional requirements would be the need to design for phosphorus.

Based on a review of the available material, neither Tarkill Pond nor Collins Pond falls into the category of a waterbody at risk from development. It should be noted that although the ponds do not fall into this category, the service roads would be constructed using standard BMPs, including but not limited to, stormwater and erosion control measures.

Takings

A potentially critical category for the success or failure of a given alternative, “takings” addresses the potential for an alternative to result in the moving and/or removal altogether of specific structures or series of structures. Such a necessity could require the utilization of the power of eminent domain. The currently identified alignments can be accomplished without the taking of structures.

State Permitting

Gorrill-Palmer Consulting Engineers, Inc. contacted the Maine DEP to discuss state permitting associated with the construction of a service road. It is our understanding (and Maine DEP has preliminarily confirmed) that such a project would be exempt from the Site Location of Development Act Statute (38 M.R.S.A. §§ 481-490), § 488, subparagraph 10, which states:

Roads and Railroad Tracks. A structure consisting only of a road or a road together with the structure area within a residential lot, as described in subsection 17 is exempt from the requirements of this article. Railroad tracks other than tracks within yards or stations are exempt from review under this article.

However, the project would trigger the Maine DEP Stormwater Law because it would disturb one acre or more. In addition, depending on the amount of wetland impacts, the project may trigger the Maine DEP Natural Resource Protection Act.

Should the service roads be constructed in a phased approach as part of a public or private subdivision, additional permitting may be required to that identified herein.

Results of Environmental Evaluation

On many levels, the environmental evaluation may result in an opposing view from that of the transportation evaluation. The no-build option, rated lowest for transportation benefits, is clearly the least expensive and least impacting option from an environmental impact standpoint. No construction results in no direct impacts. However, inaction can increase the cost and environmental impacts due to congestion along the Route 302 corridor. The other alternatives are discussed below on a case-by-case basis.

Neighborhoods

The impact of the alternative service roads on the local neighborhoods is a critical item that needs to be considered in not only choosing an alternative, but also the final location and alignment of the alternative chosen. Since the transportation evaluation identified the benefit of the service roads in general and did not identify a specific alternative, and the environmental evaluation did not isolate any alternative as better than any other, the neighborhood impact will be a dominating factor in the alternative chosen. Ideally, the alternative chosen should have the least neighborhood impact. This evaluation is an on-going process and will be further refined as the process continues, including additional public meetings to receive feedback and comments and further discussions with the Town Staff.

VI. Recommended Alternatives

Following the evaluation of transportation, environmental, and neighborhood impacts, the process of selecting the preferred North Service Road and South Service Road alternatives for further study will be pursued.

This section will identify the two recommended alternatives (one northerly alignment and one southerly alignment) and the reasons they were selected as a result of the public process and staff input.

VII. Conclusions

This preliminary report is intended to provide the data necessary to present alignment options for parallel services roads to be located on the east side of Route 302. The northerly service road would connect from Route 115 to Franklin Street in the vicinity of Home Depot. The southerly service road would connect from Route 115 to Commons Avenue.

This report provides traffic capacity evaluations to assist the Town in assessing the traffic flow benefits of each of the alignments, and options for potential alignment of these service roads. The traffic analysis clearly shows benefits to traffic flow, particularly at Boody's corner for all conditions that include the northerly service road. The southerly Route shows less benefit at Boody's corner and is likely more important as the southeast quadrant of Route 302 and Route 115 continues to develop.

We anticipate that the overall impacts of these alignments will be considered by Town Staff, Town Boards and residents to determine which, if any, alignments are desirable for further analysis and inclusion in the final report.

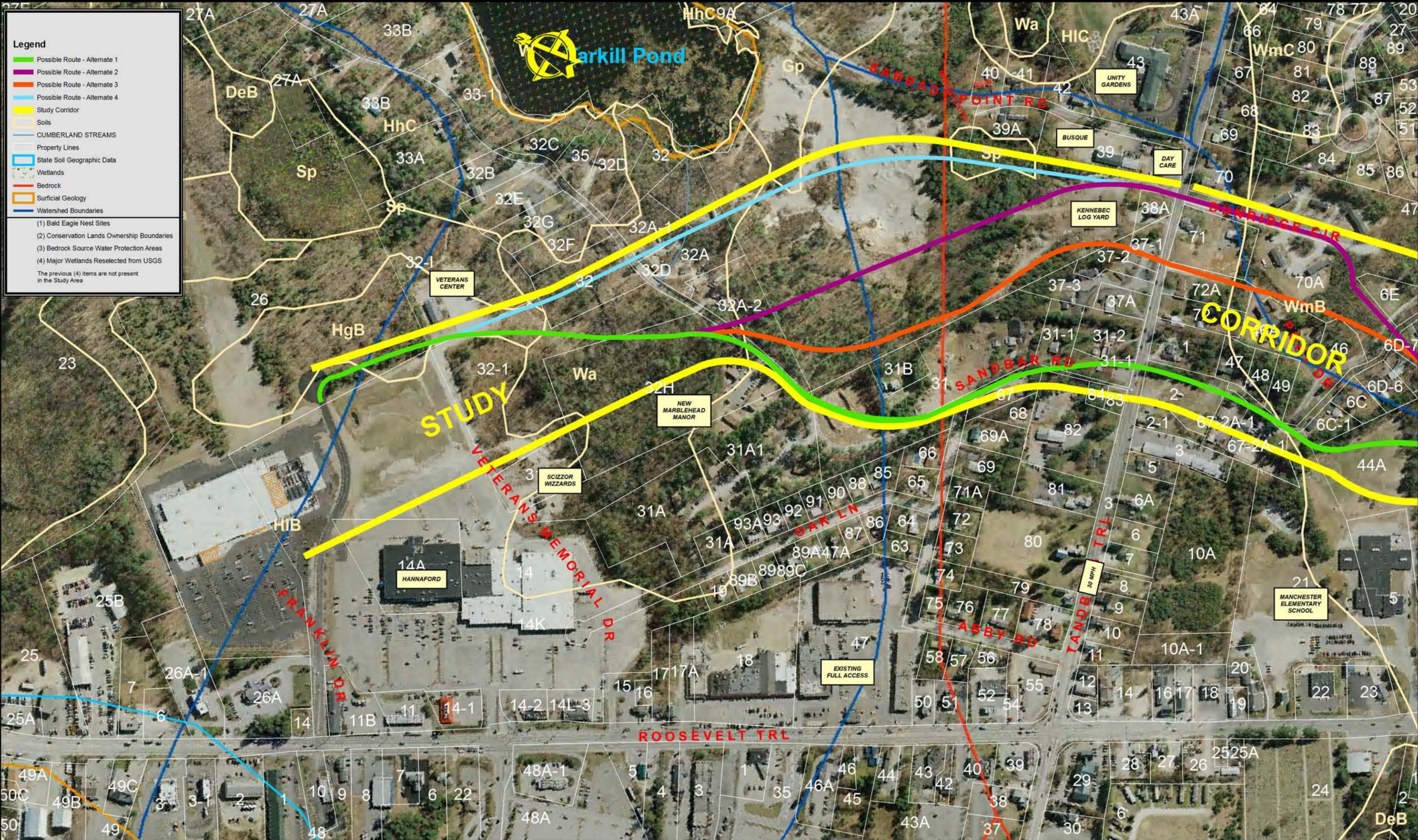
Appendix A

Alternatives Location Map
Turning Movement Diagrams

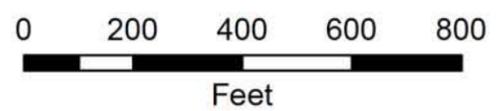
Legend

- Possible Route - Alternate 1
- Possible Route - Alternate 2
- Possible Route - Alternate 3
- Possible Route - Alternate 4
- Study Corridor
- Soils
- CUMBERLAND STREAMS
- Property Lines
- State Soil Geographic Data
- Wetlands
- Bedrock
- Surficial Geology
- Watershed Boundaries

(1) Bald Eagle Nest Sites
 (2) Conservation Lands Ownership Boundaries
 (3) Bedrock Source Water Protection Areas
 (4) Major Wetlands Reselected from USGS
 The previous (4) items are not present in the Study Area

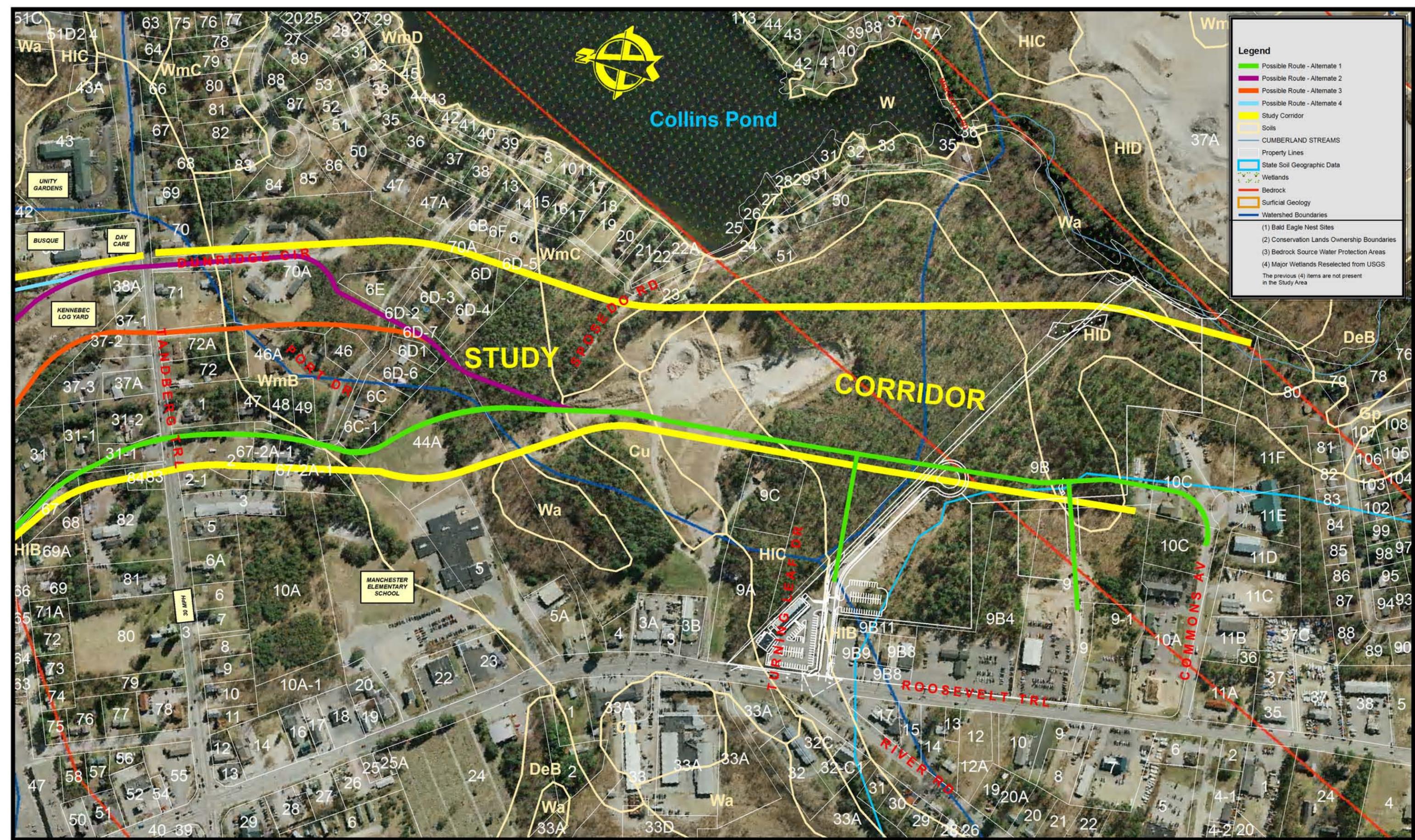


ROUTE 302 PARALLEL SERVICE ROAD, WINDHAM, MAINE - SECTION 1

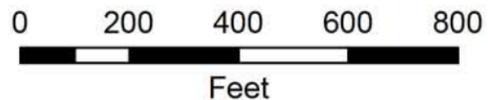


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 SOURCE: MAINE GIS WEBSITE
 FILE: 1606_AERIAL_SHT1.MXD

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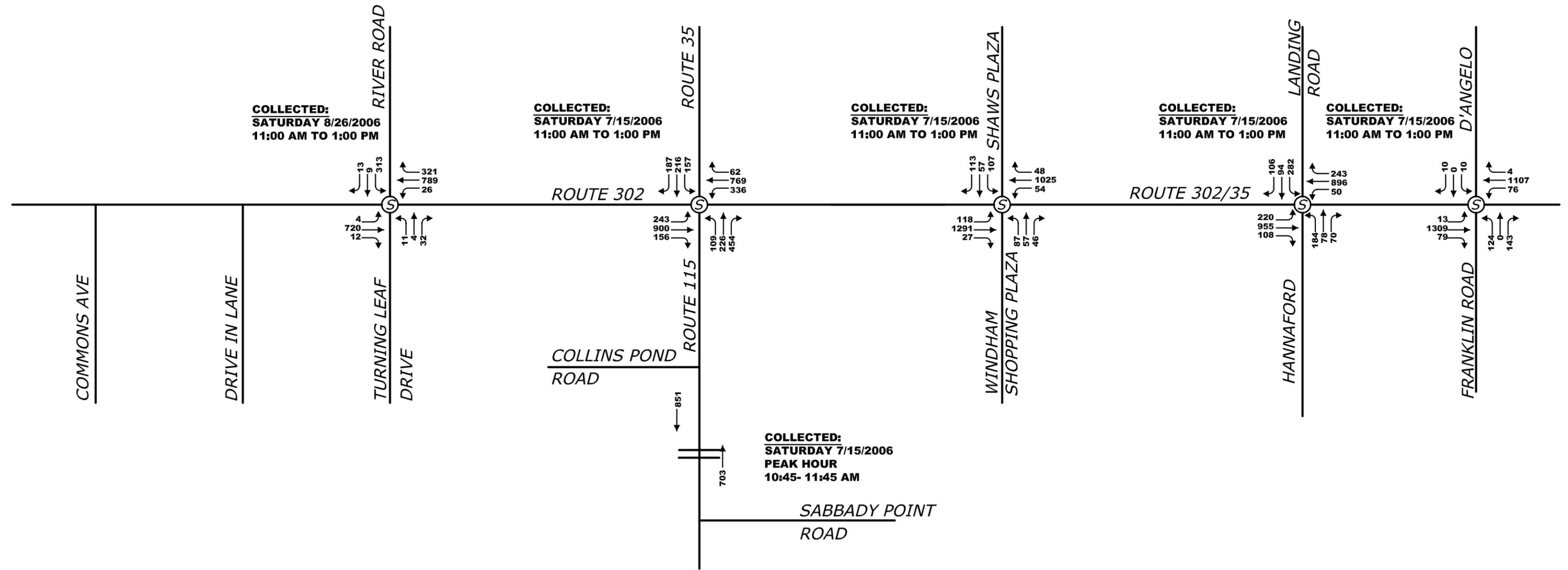
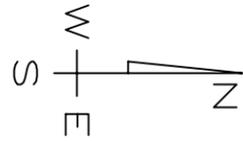
ROUTE 302 PARALLEL SERVICE ROAD, WINDHAM, MAINE - SECTION 2



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 SOURCE: MAINE GIS WEBSITE
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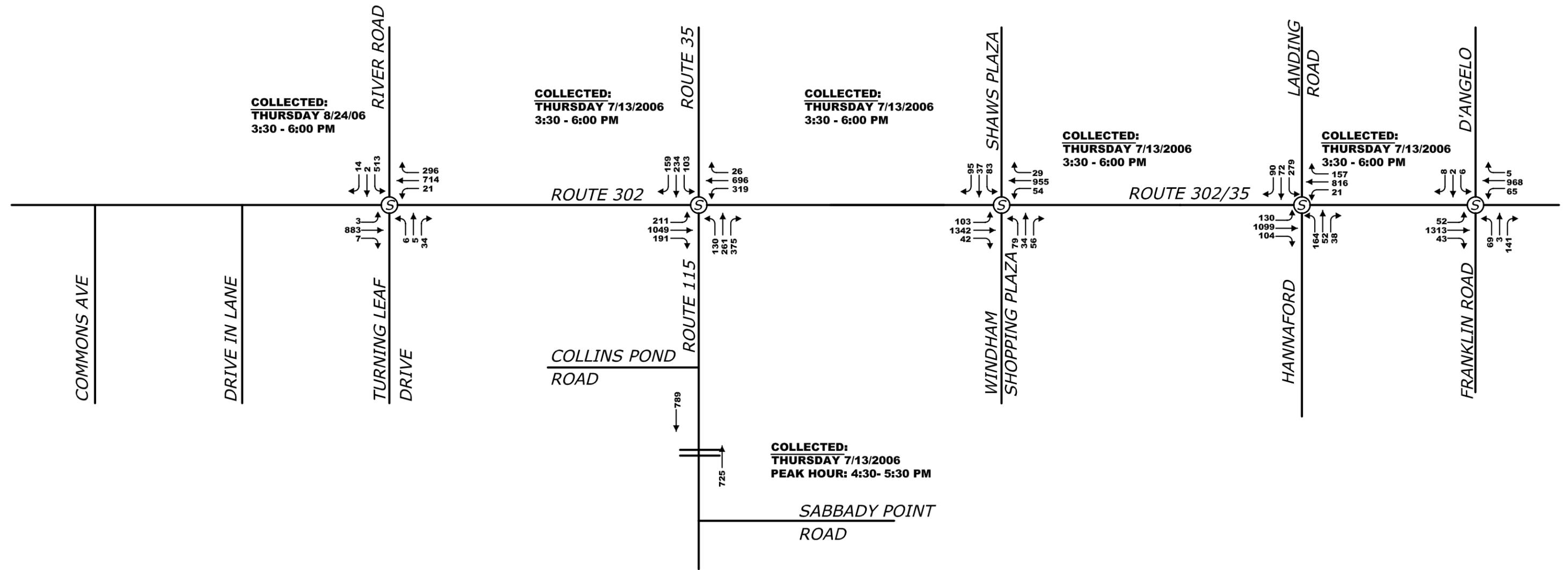
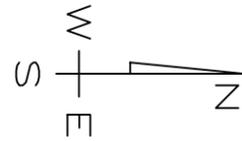
2006 Summer Volumes - Saturday Peak Hour



Ⓢ DENOTES SIGNALIZED INTERSECTION

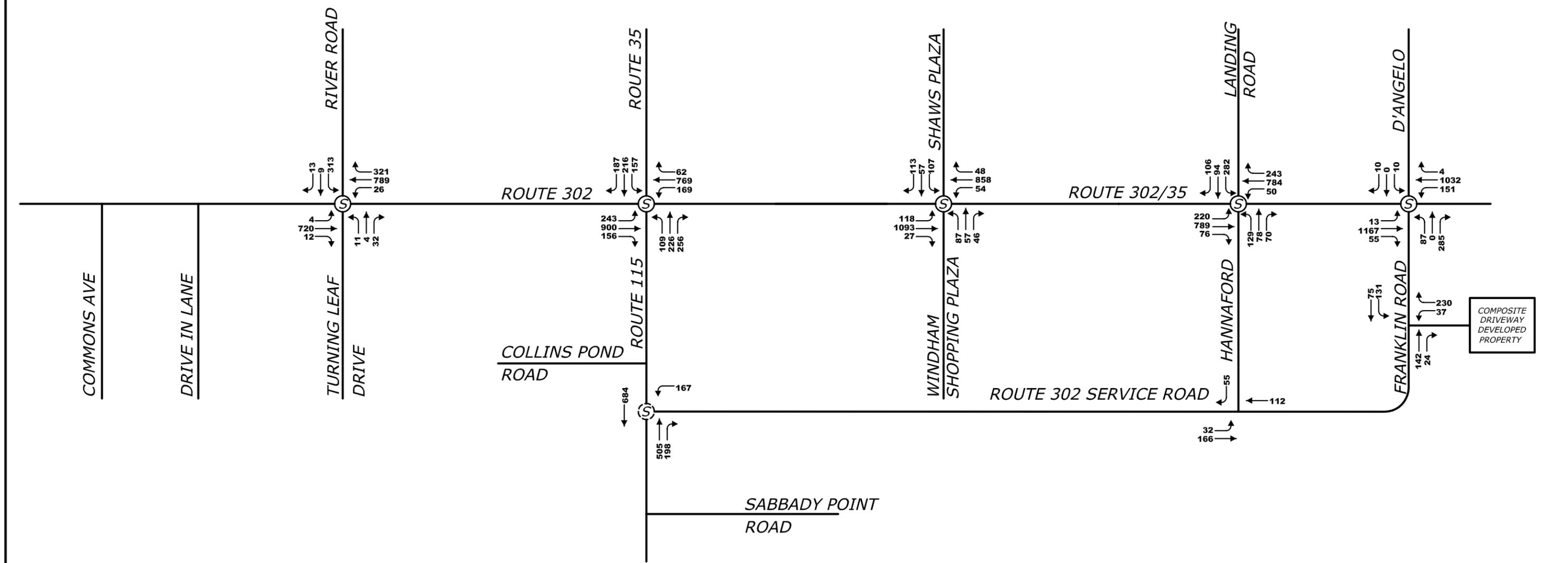
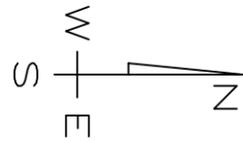
== ATR LOCATION

**SYSTEM PEAK HOUR:
11:00 AM - 12:00 PM**



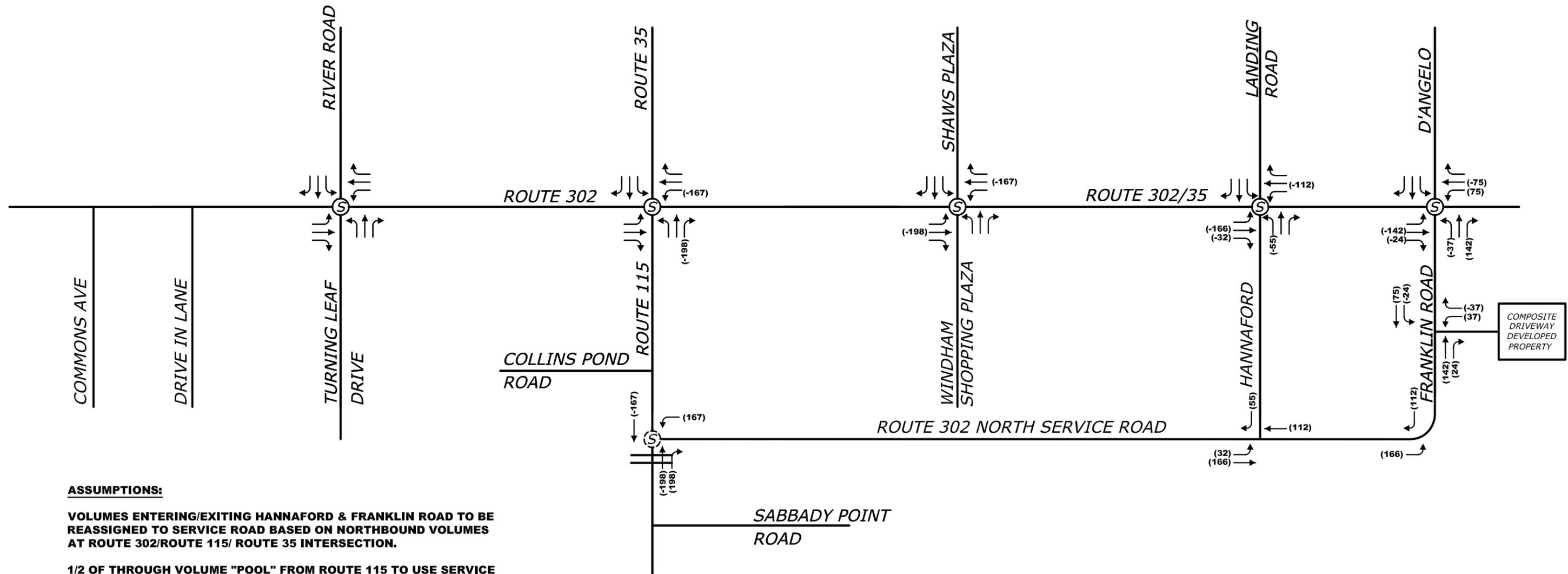
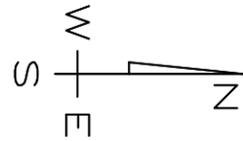
Ⓢ DENOTES SIGNALIZED INTERSECTION

2006 Post Service Road Volumes - Saturday Peak Hour



Ⓢ DENOTES SIGNALIZED INTERSECTION
 Ⓢ DENOTES FUTURE/ PROPOSED SIGNALIZED INTERSECTION

ROUTE 302 PARALLEL SERVICE ROAD WINDHAM, MAINE



ASSUMPTIONS:

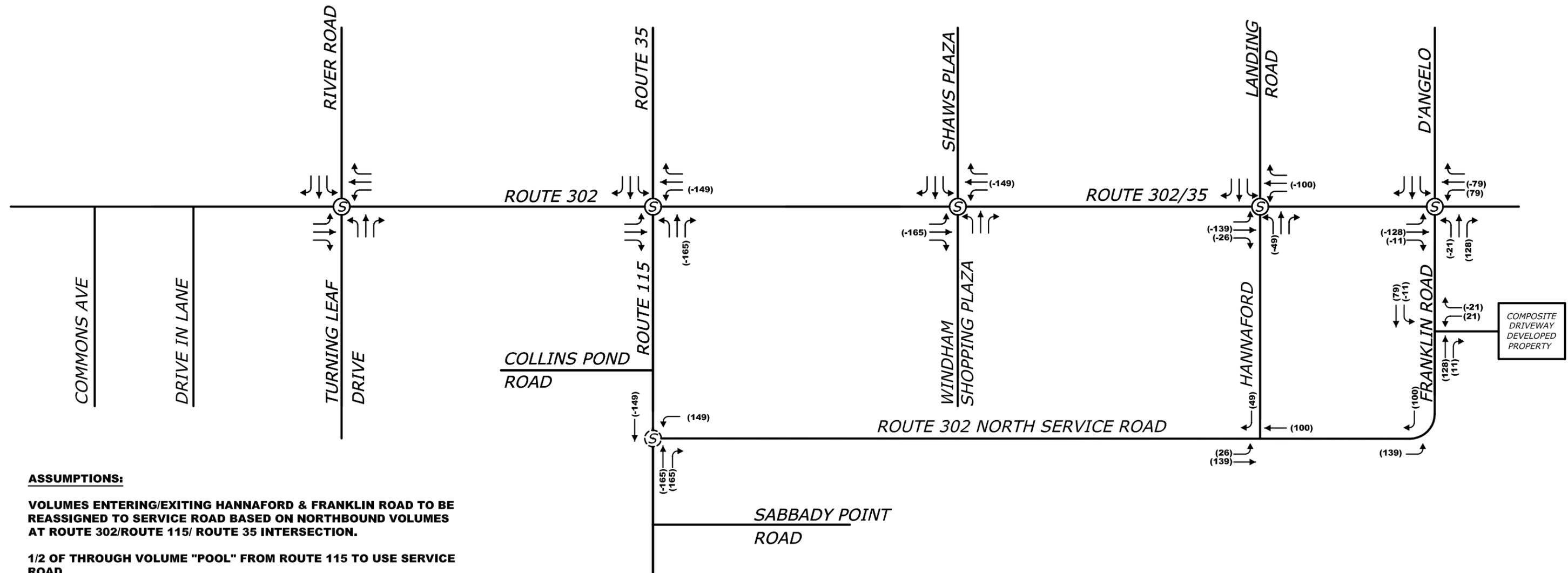
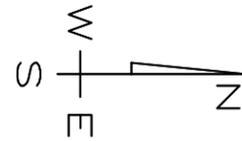
VOLUMES ENTERING/EXITING HANNAFORD & FRANKLIN ROAD TO BE REASSIGNED TO SERVICE ROAD BASED ON NORTHBOUND VOLUMES AT ROUTE 302/ROUTE 115/ ROUTE 35 INTERSECTION.

1/2 OF THROUGH VOLUME "POOL" FROM ROUTE 115 TO USE SERVICE ROAD

NO CONNECTION WITH WINDHAM SHOPPING PLAZA AND SERVICE ROAD.

- Ⓢ DENOTES SIGNALIZED INTERSECTION
- Ⓢ DENOTES PROPOSED SIGNALIZED INTERSECTION

2006 Service Road Reassignment - PM Peak Hour



ASSUMPTIONS:

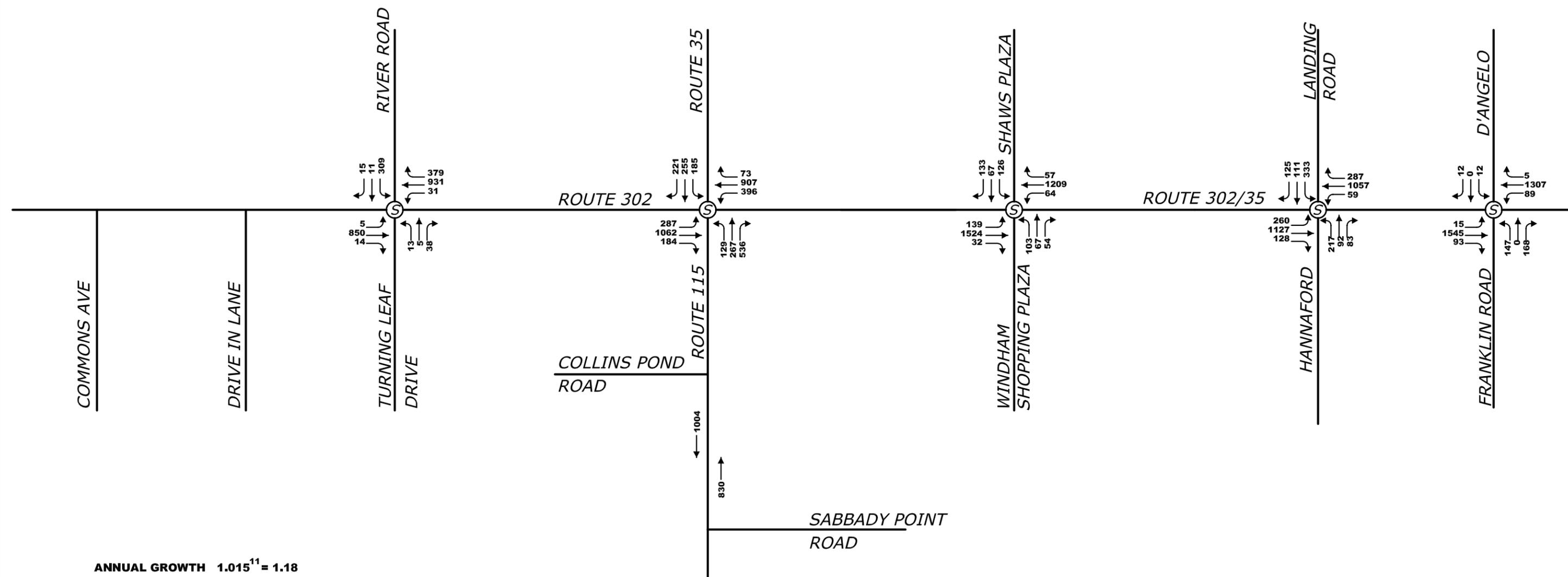
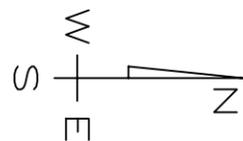
VOLUMES ENTERING/EXITING HANNAFORD & FRANKLIN ROAD TO BE REASSIGNED TO SERVICE ROAD BASED ON NORTHBOUND VOLUMES AT ROUTE 302/ROUTE 115/ ROUTE 35 INTERSECTION.

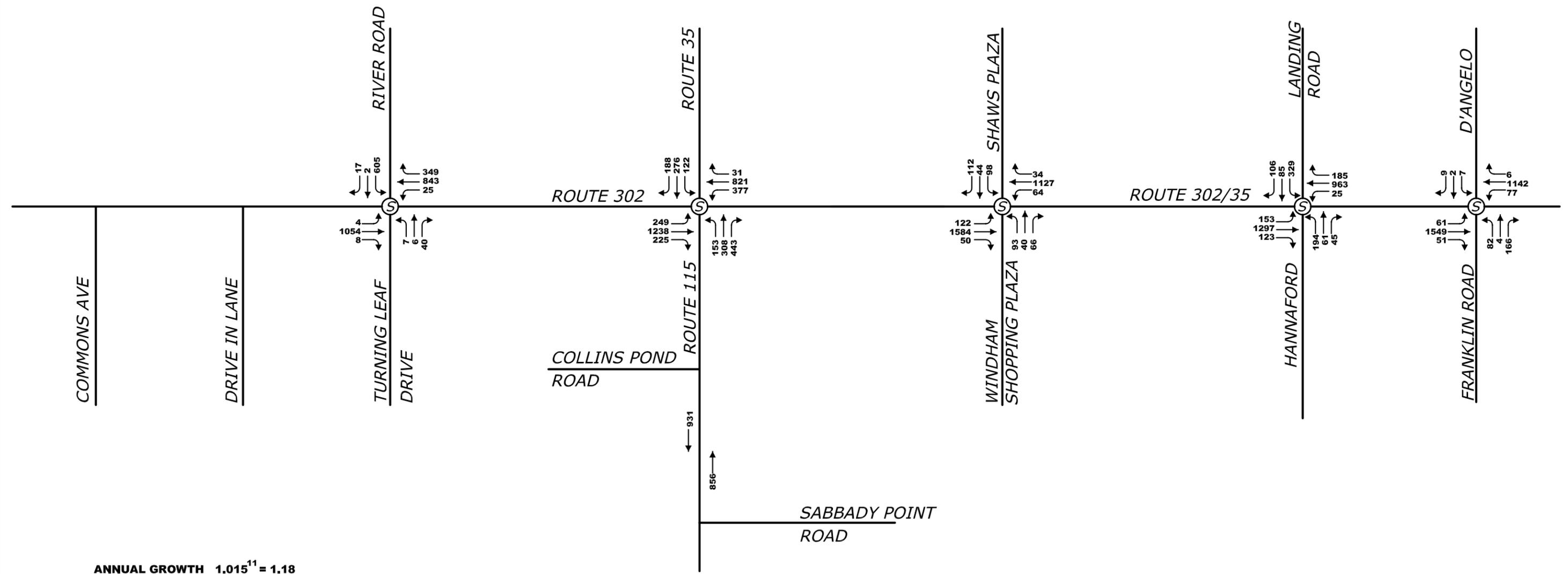
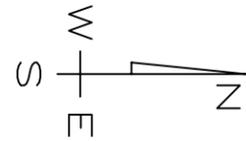
1/2 OF THROUGH VOLUME "POOL" FROM ROUTE 115 TO USE SERVICE ROAD

NO CONNECTION WITH WINDHAM SHOPPING PLAZA AND SERVICE ROAD.

-  DENOTES SIGNALIZED INTERSECTION
-  DENOTES PROPOSED SIGNALIZED INTERSECTION

ROUTE 302 PARALLEL SERVICE ROAD WINDHAM, MAINE



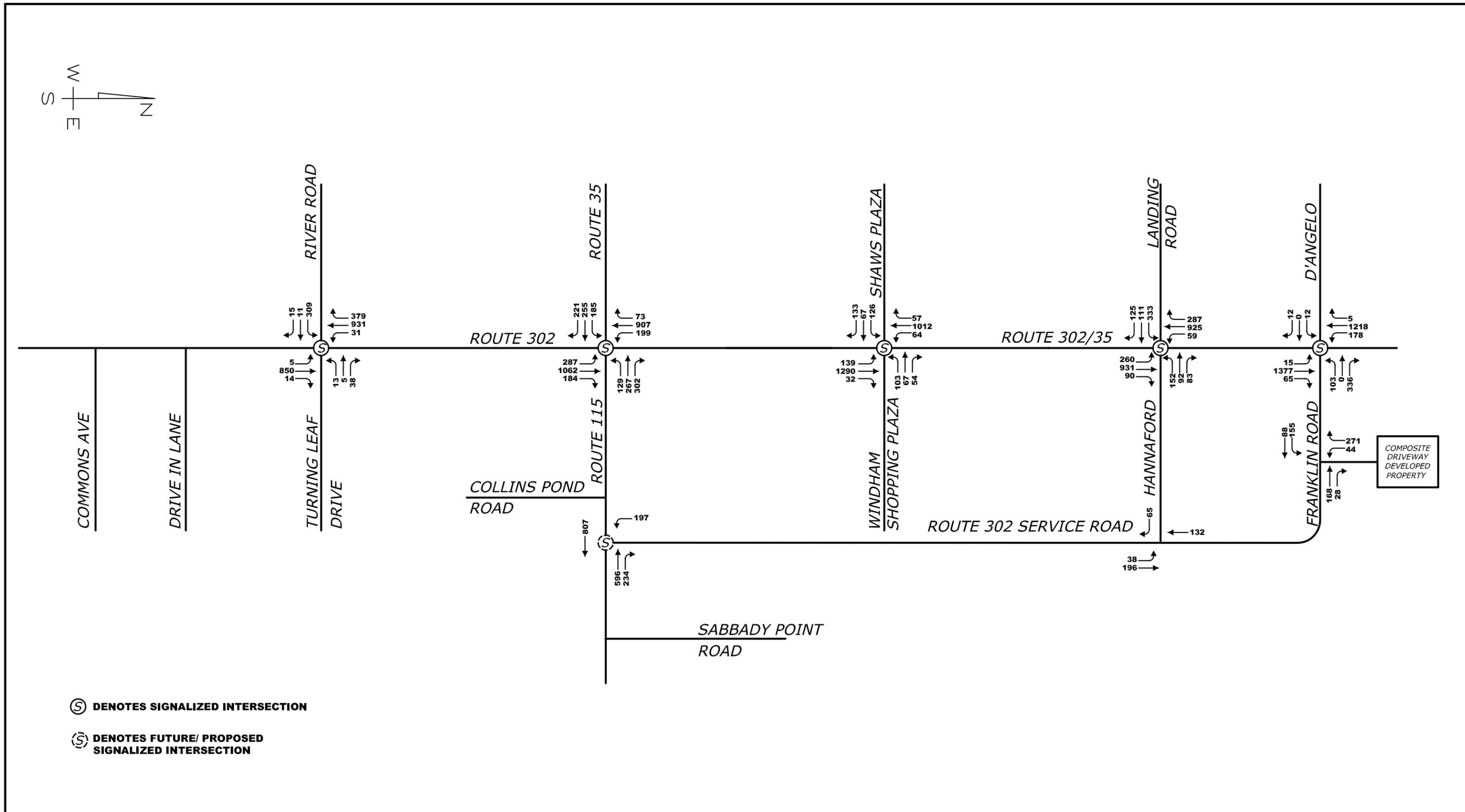
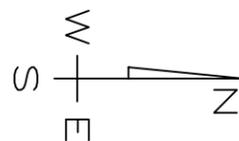


ANNUAL GROWTH $1.015^{11} = 1.18$

- (S)** DENOTES SIGNALIZED INTERSECTION
- (S)** DENOTES FUTURE/ PROPOSED SIGNALIZED INTERSECTION

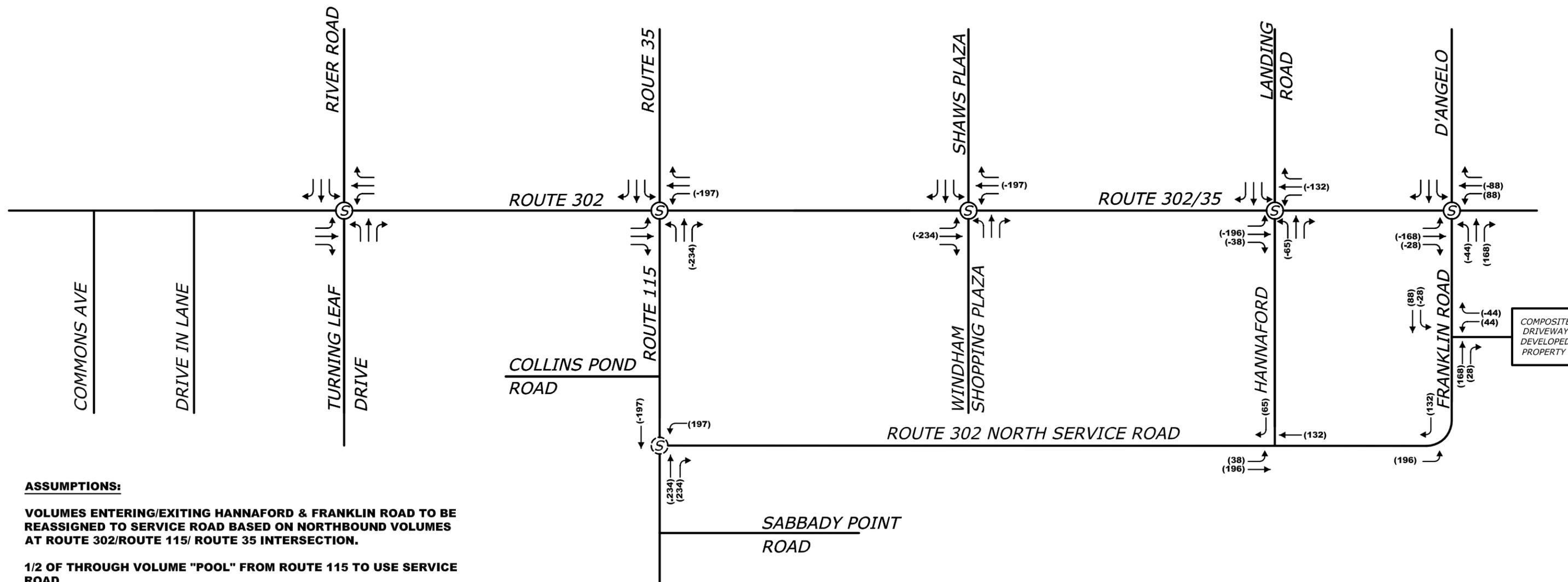
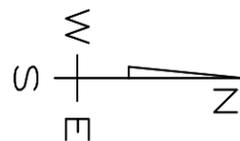
ROUTE 302 PARALLEL SERVICE ROAD WINDHAM, MAINE

2017 Post Service Road Volumes Without Development - Saturday Peak Hour



ROUTE 302 PARALLEL SERVICE ROAD WINDHAM, MAINE

2017 Service Road Reassignment - Saturday Peak Hour



ASSUMPTIONS:

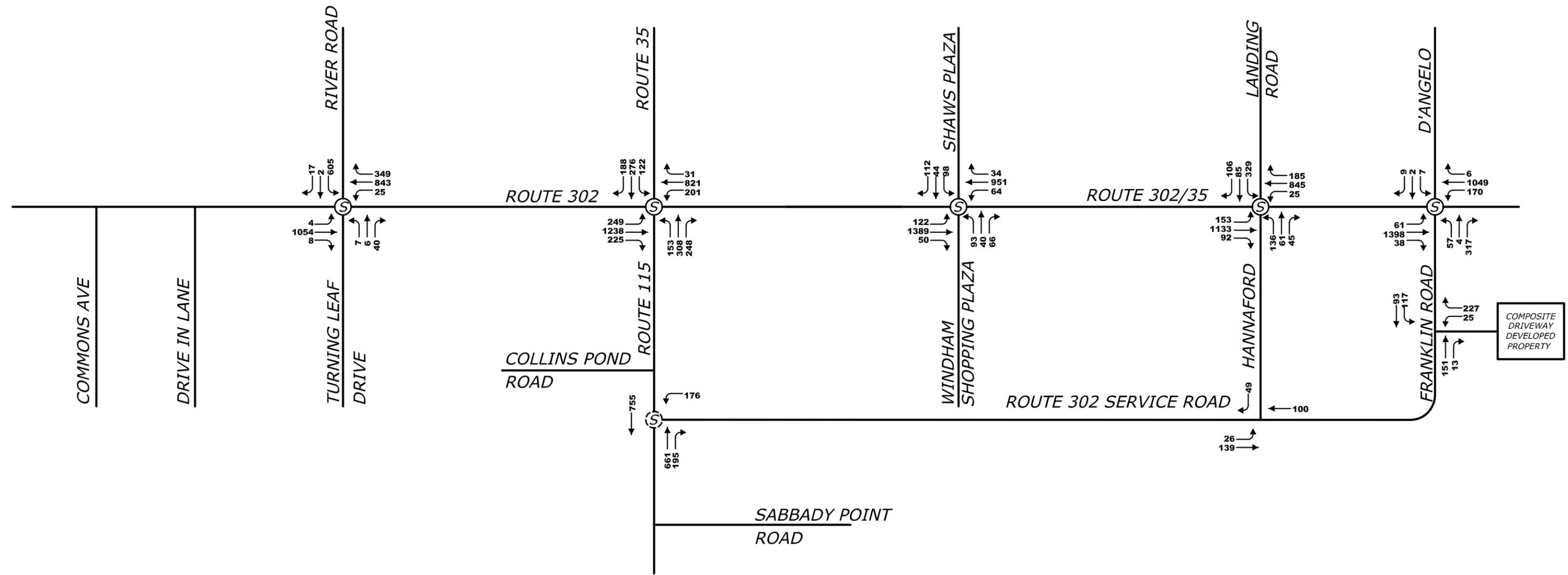
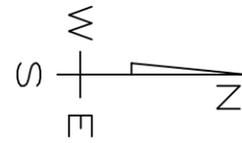
VOLUMES ENTERING/EXITING HANNAFORD & FRANKLIN ROAD TO BE REASSIGNED TO SERVICE ROAD BASED ON NORTHBOUND VOLUMES AT ROUTE 302/ROUTE 115/ ROUTE 35 INTERSECTION.

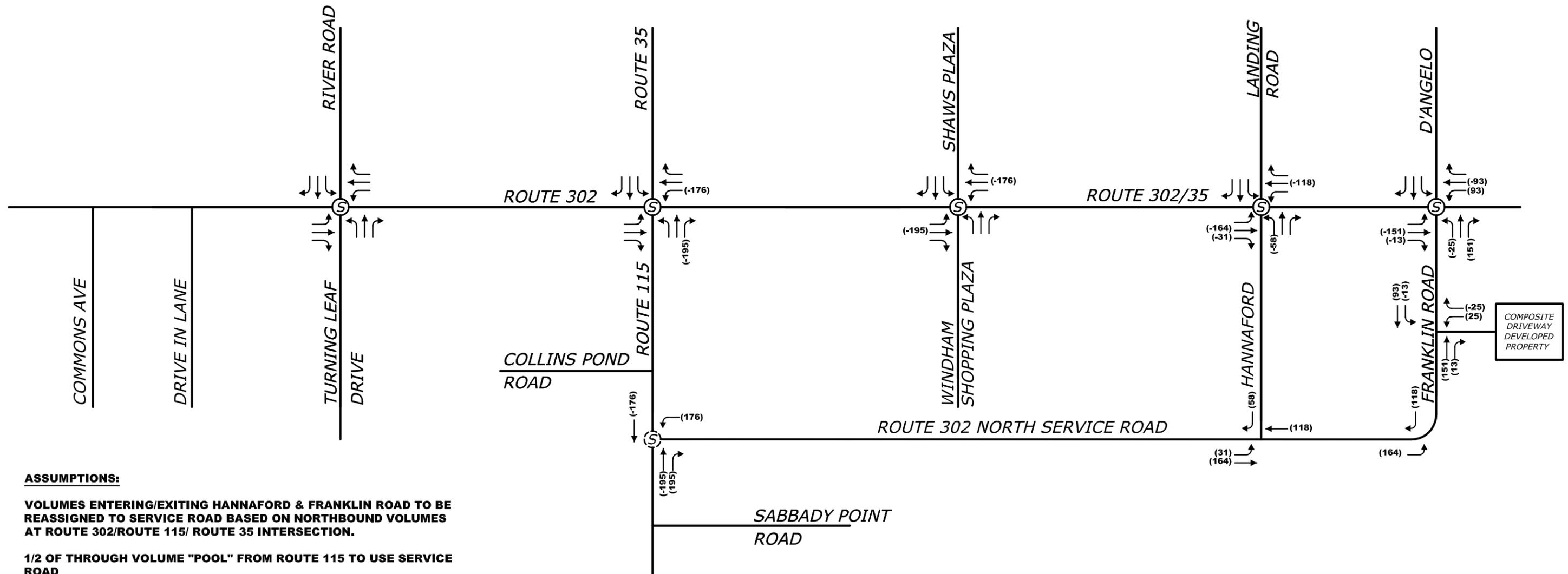
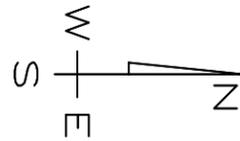
1/2 OF THROUGH VOLUME "POOL" FROM ROUTE 115 TO USE SERVICE ROAD

NO CONNECTION WITH WINDHAM SHOPPING PLAZA AND SERVICE ROAD.

- Ⓢ DENOTES SIGNALIZED INTERSECTION
- Ⓢ DENOTES PROPOSED SIGNALIZED INTERSECTION

2017 Post Service Road Volumes Without Development - PM Peak Hour





ASSUMPTIONS:

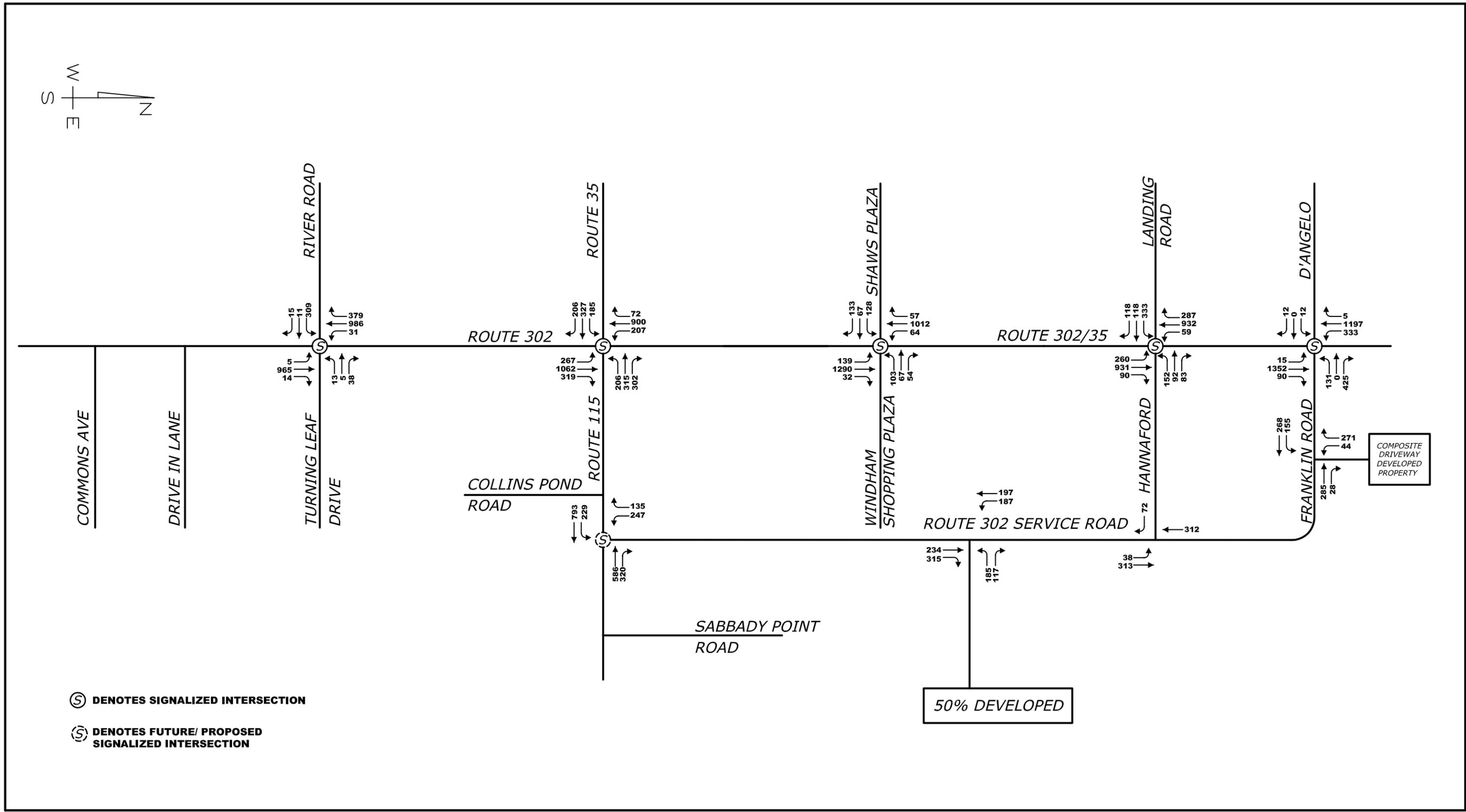
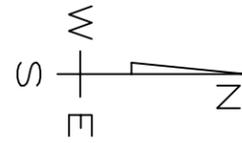
VOLUMES ENTERING/EXITING HANNAFORD & FRANKLIN ROAD TO BE REASSIGNED TO SERVICE ROAD BASED ON NORTHBOUND VOLUMES AT ROUTE 302/ROUTE 115/ ROUTE 35 INTERSECTION.

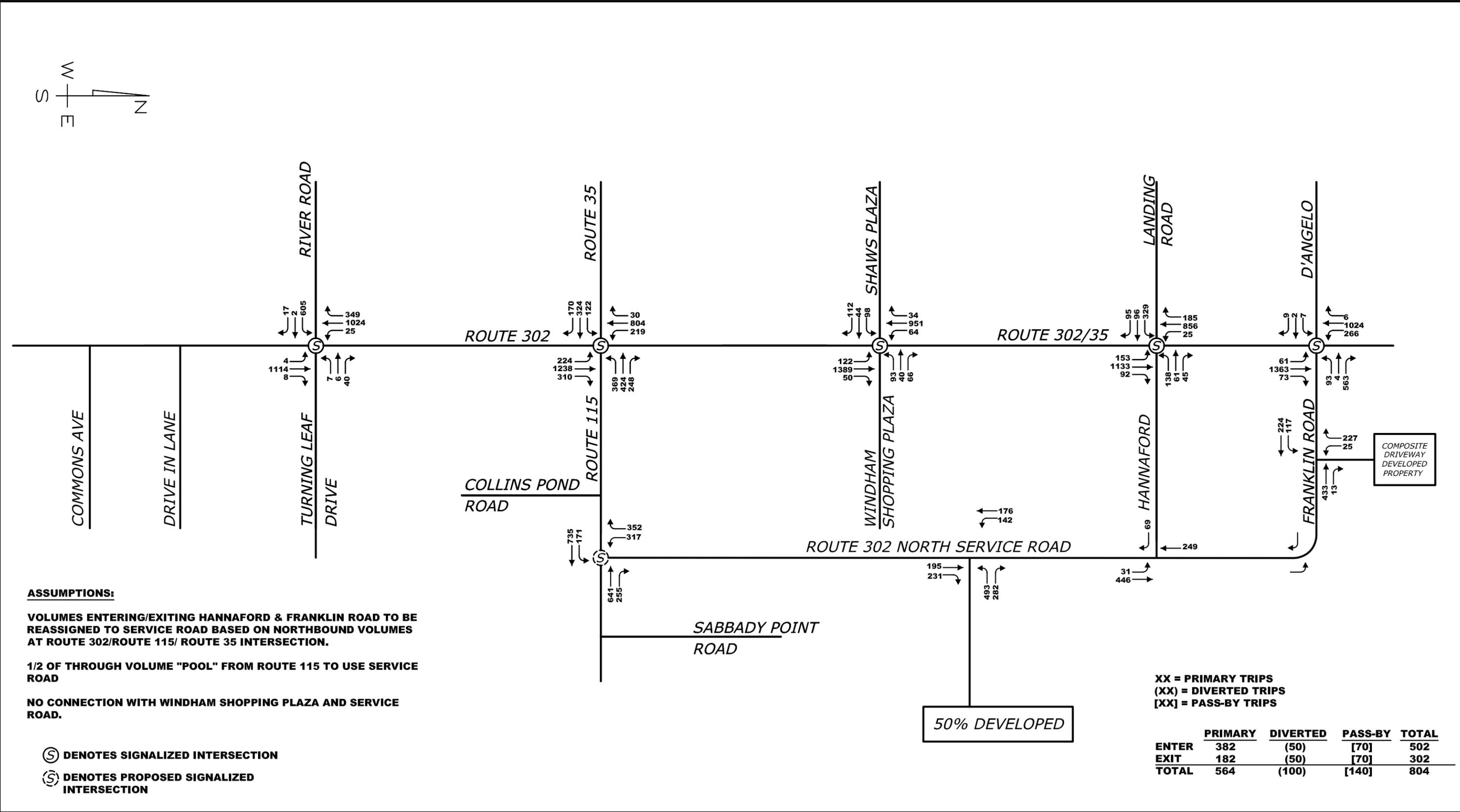
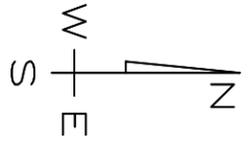
1/2 OF THROUGH VOLUME "POOL" FROM ROUTE 115 TO USE SERVICE ROAD

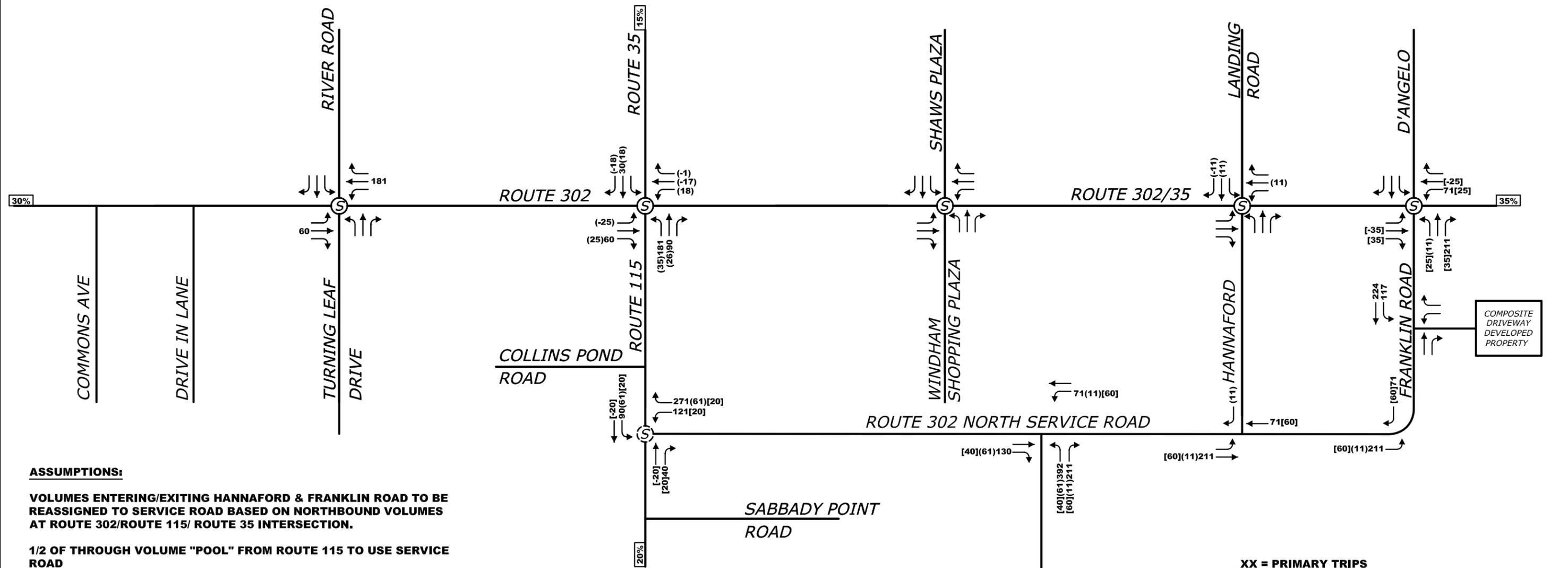
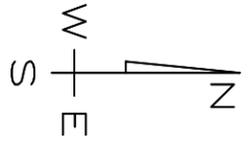
NO CONNECTION WITH WINDHAM SHOPPING PLAZA AND SERVICE ROAD.

- Ⓢ DENOTES SIGNALIZED INTERSECTION
- Ⓢ DENOTES PROPOSED SIGNALIZED INTERSECTION

2017 Post Service Road Volumes 50% Development - Saturday Peak Hour







ASSUMPTIONS:

VOLUMES ENTERING/EXITING HANNAFORD & FRANKLIN ROAD TO BE REASSIGNED TO SERVICE ROAD BASED ON NORTHBOUND VOLUMES AT ROUTE 302/ROUTE 115/ ROUTE 35 INTERSECTION.

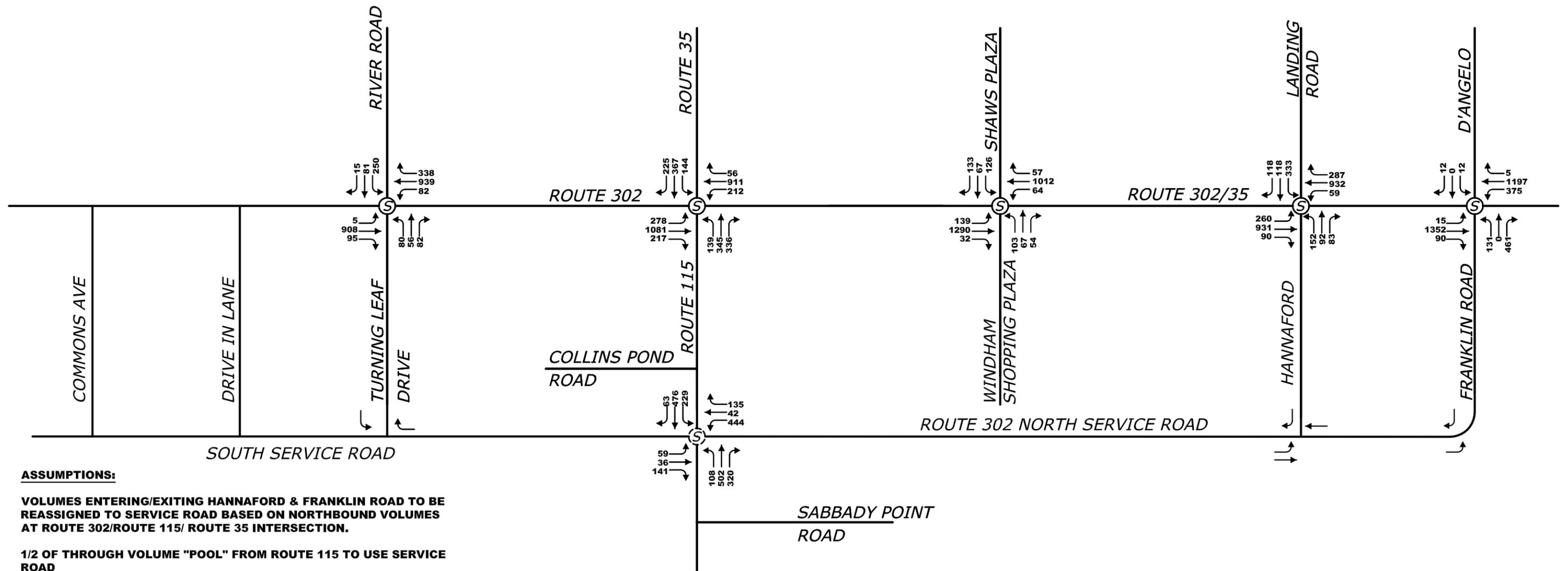
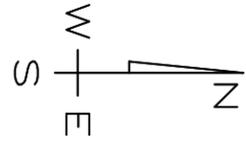
1/2 OF THROUGH VOLUME "POOL" FROM ROUTE 115 TO USE SERVICE ROAD

NO CONNECTION WITH WINDHAM SHOPPING PLAZA AND SERVICE ROAD.

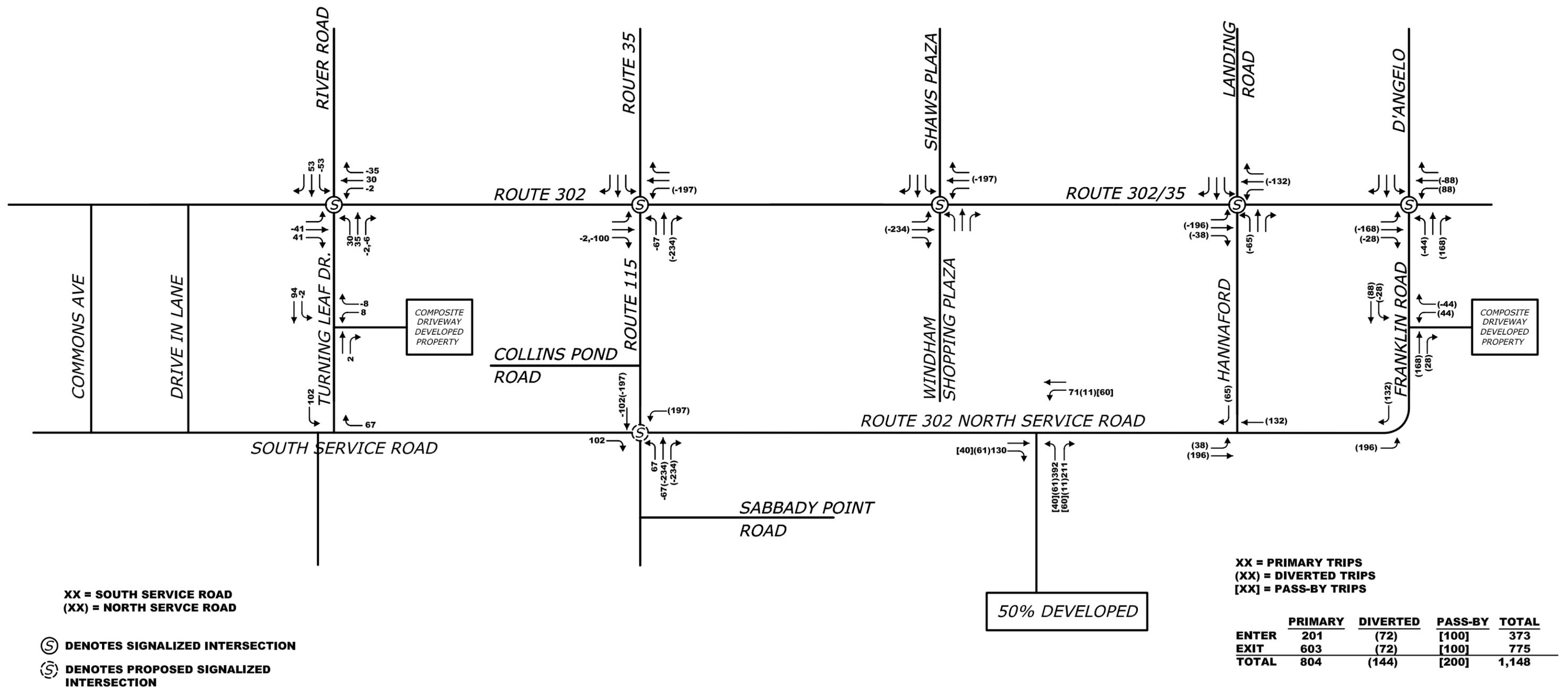
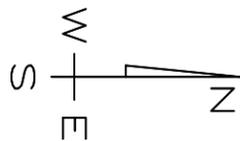
- ⊙ DENOTES SIGNALIZED INTERSECTION
- ⊙ DENOTES PROPOSED SIGNALIZED INTERSECTION

XX = PRIMARY TRIPS
 (XX) = DIVERTED TRIPS
 [XX] = PASS-BY TRIPS

	PRIMARY	DIVERTED	PASS-BY	TOTAL
ENTER	201	(72)	[100]	373
EXIT	603	(72)	[100]	775
TOTAL	804	(144)	[200]	1,148

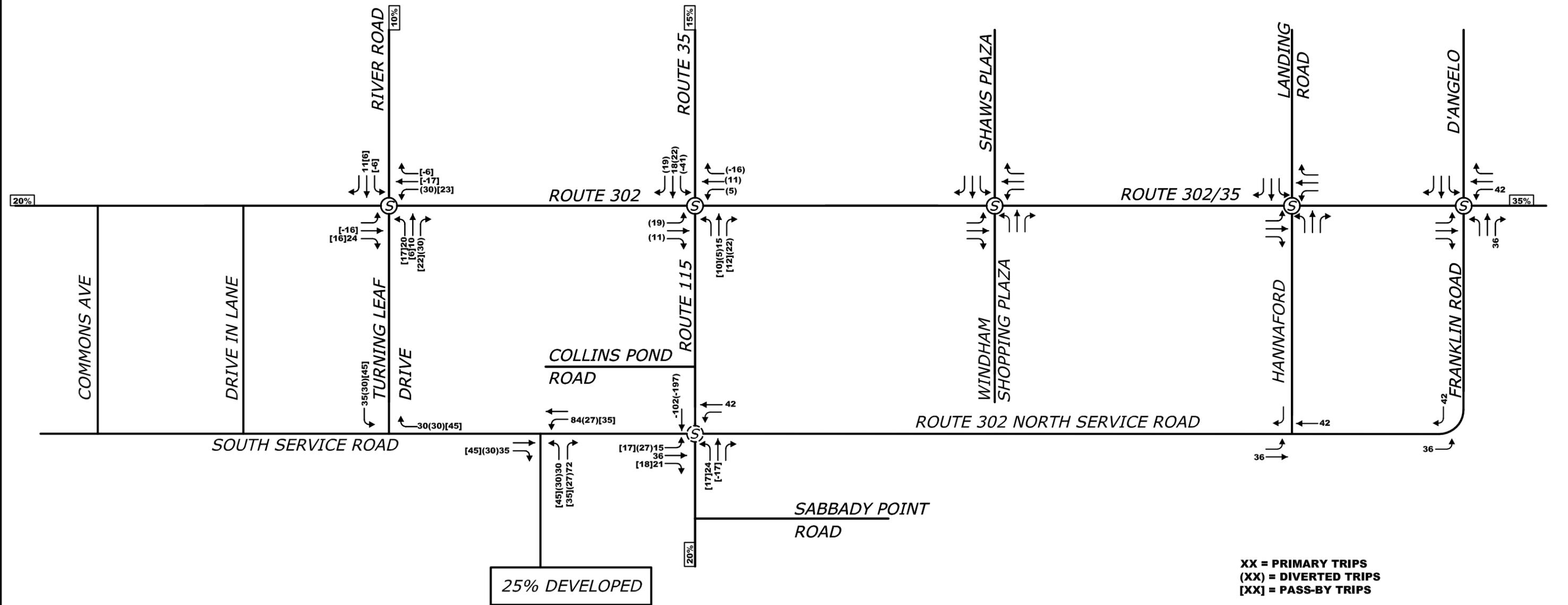
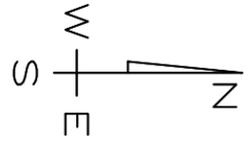


2017 Service Road Reassignment - Saturday Peak Hour



ROUTE 302 PARALLEL SERVICE ROAD WINDHAM, MAINE

2017 25% Development on South Connector - Saturday Peak Hour

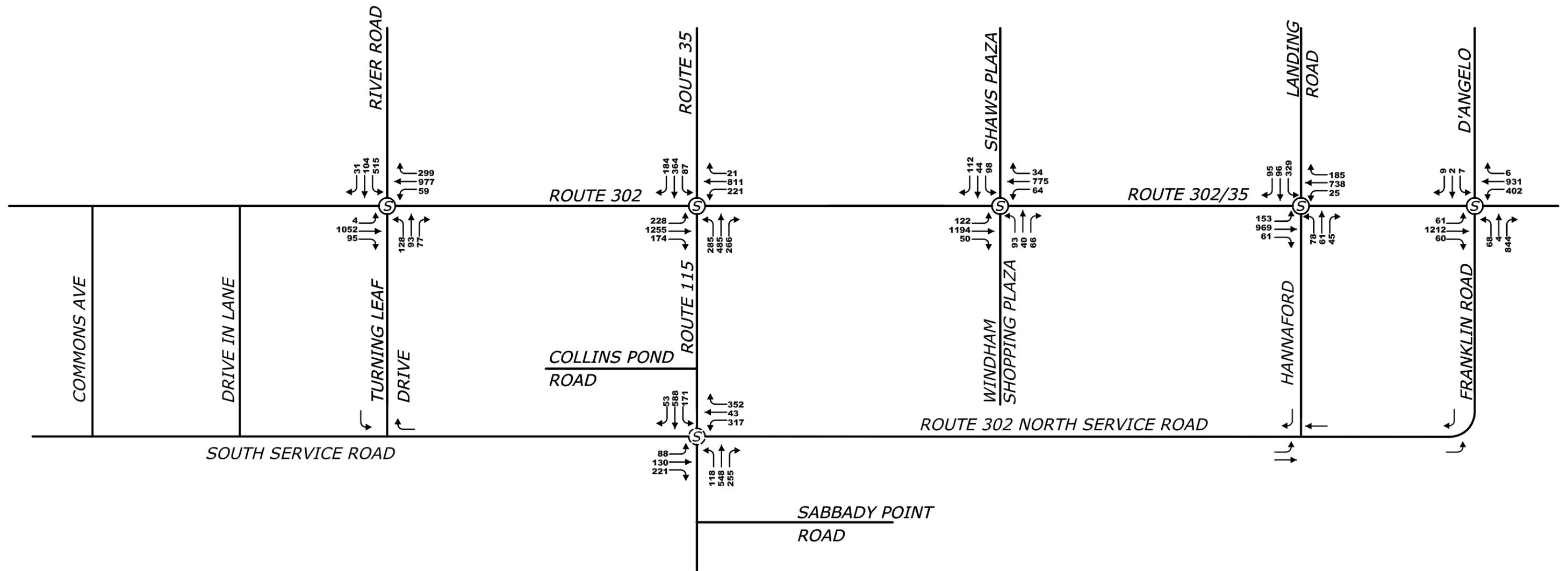
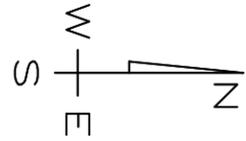


XX = PRIMARY TRIPS
 (XX) = DIVERTED TRIPS
 [XX] = PASS-BY TRIPS

	PRIMARY	DIVERTED	PASS-BY	TOTAL
ENTER	119	(57)	[80]	256
EXIT	102	(57)	[80]	239
TOTAL	221	(114)	[160]	495

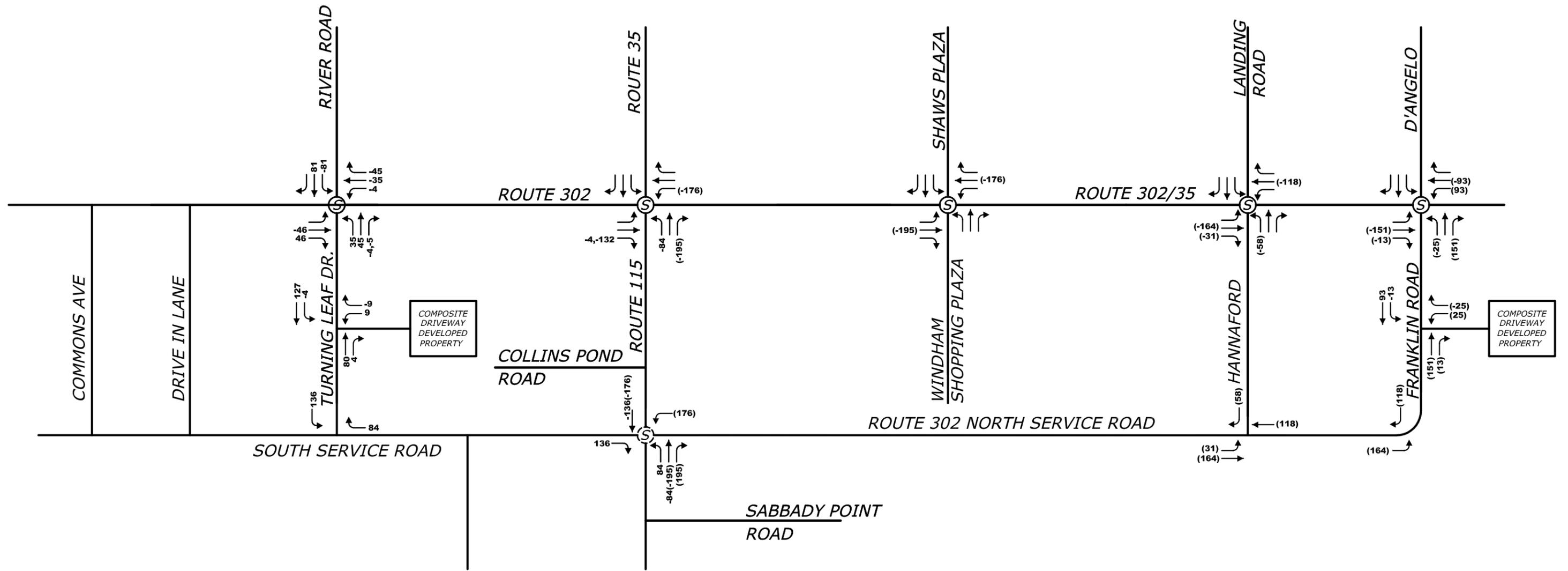
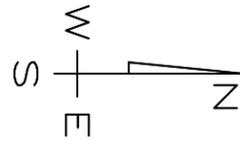
(S) DENOTES SIGNALIZED INTERSECTION
 (S) DENOTES PROPOSED SIGNALIZED INTERSECTION

ROUTE 302 PARALLEL SERVICE ROAD WINDHAM, MAINE



Ⓢ DENOTES SIGNALIZED INTERSECTION
 Ⓢ DENOTES PROPOSED SIGNALIZED INTERSECTION

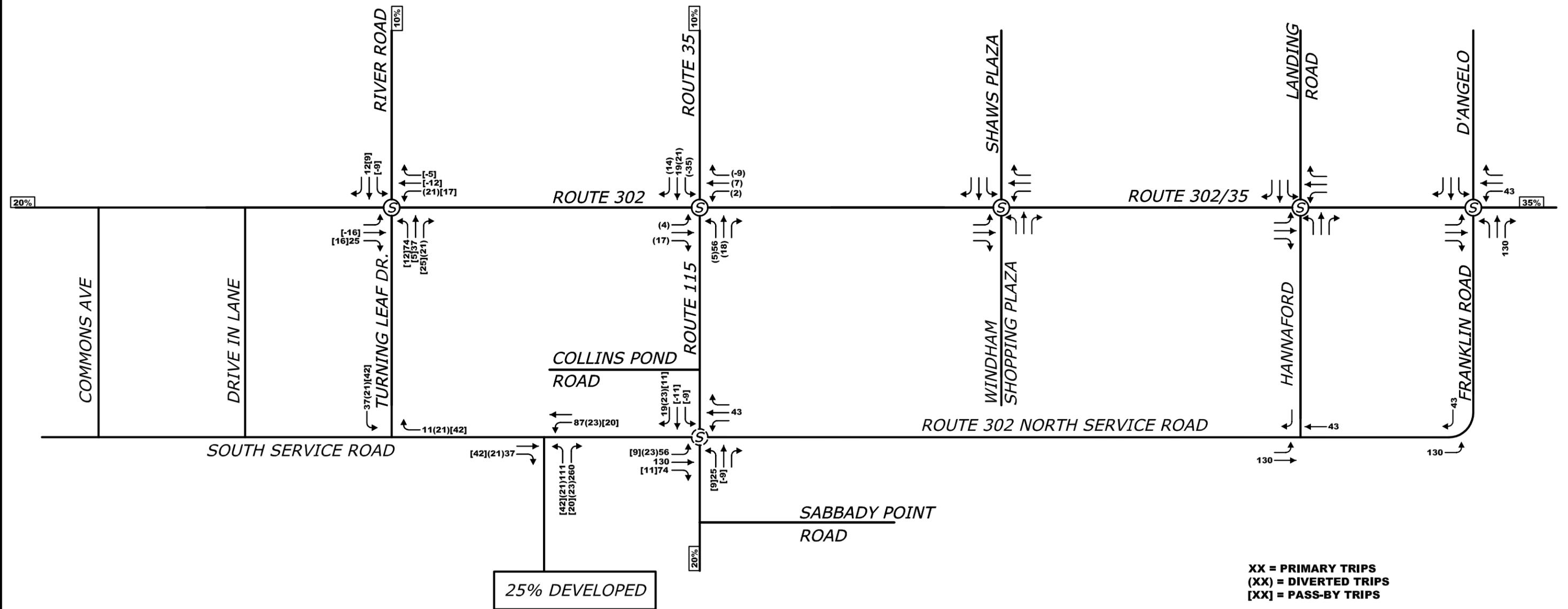
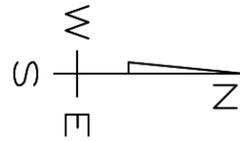
**ROUTE 302 PARALLEL SERVICE ROAD
 WINDHAM, MAINE**



XX = SOUTH SERVICE ROAD
 (XX) = NORTH SERVICE ROAD

Ⓢ DENOTES SIGNALIZED INTERSECTION
 Ⓢ DENOTES PROPOSED SIGNALIZED INTERSECTION

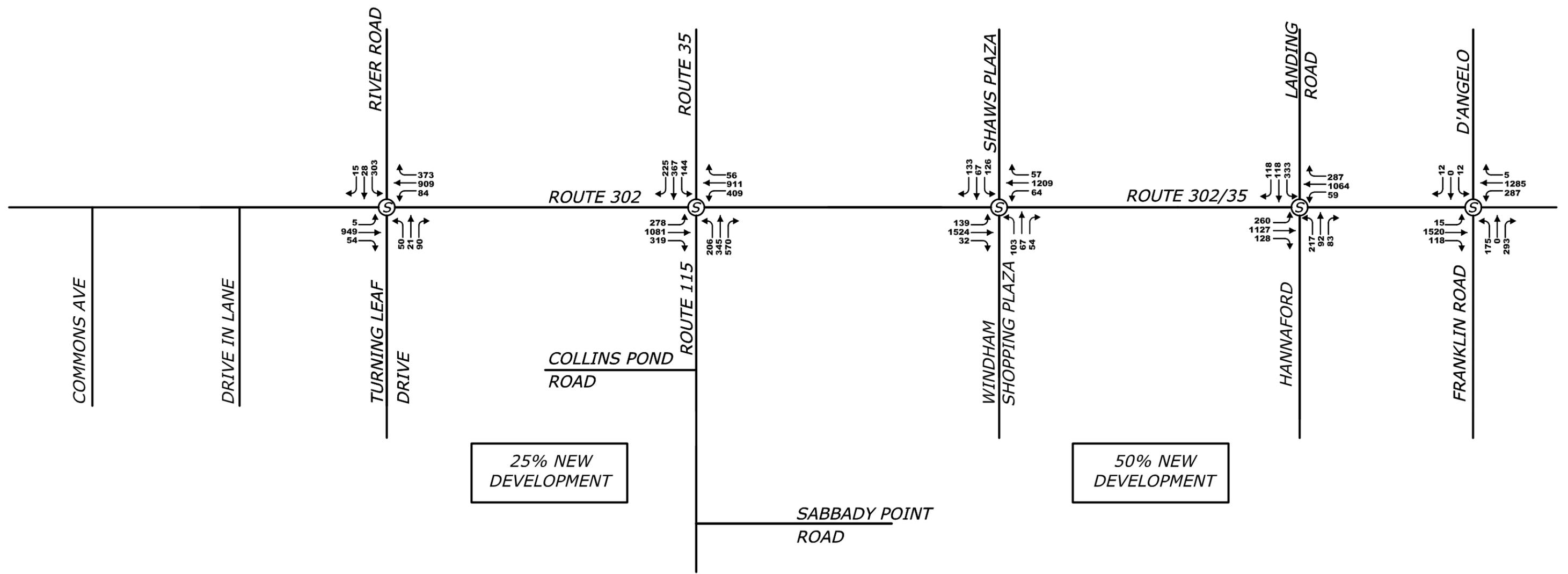
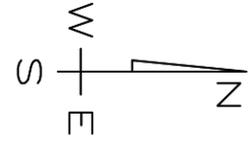
ROUTE 302 PARALLEL SERVICE ROAD WINDHAM, MAINE



XX = PRIMARY TRIPS
 (XX) = DIVERTED TRIPS
 [XX] = PASS-BY TRIPS

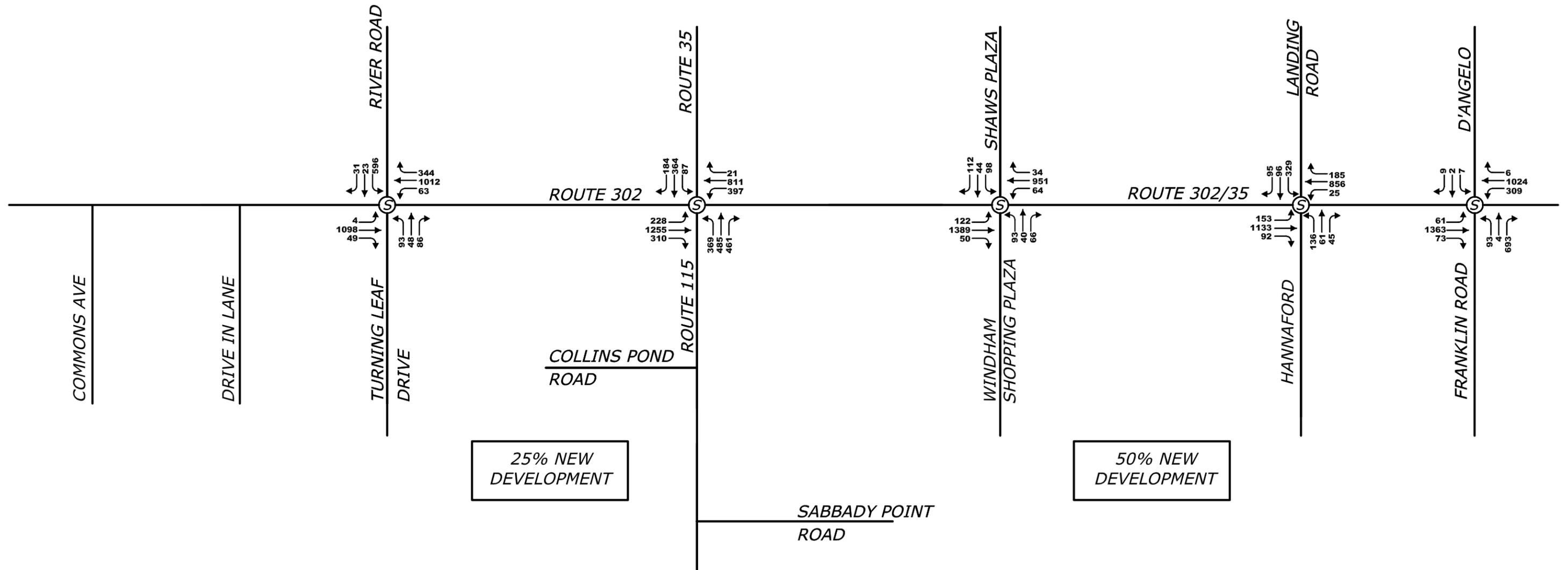
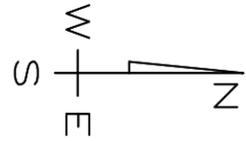
⊙ DENOTES SIGNALIZED INTERSECTION
 ⊙ DENOTES PROPOSED SIGNALIZED INTERSECTION

	PRIMARY	DIVERTED	PASS-BY	TOTAL
ENTER	124	(44)	[62]	230
EXIT	371	(44)	[62]	477
TOTAL	495	(88)	[124]	707



Ⓢ DENOTES SIGNALIZED INTERSECTION
 Ⓢ DENOTES PROPOSED SIGNALIZED INTERSECTION

ROUTE 302 PARALLEL SERVICE ROAD WINDHAM, MAINE



Ⓢ DENOTES SIGNALIZED INTERSECTION
 Ⓢ DENOTES PROPOSED SIGNALIZED INTERSECTION

**ROUTE 302 PARALLEL SERVICE ROAD
 WINDHAM, MAINE**

Appendix B

Capacity Analysis Results
Provided Under Separate Cover

Appendix C
Correspondence

Resource Letters –Status

Route 302 Parallel Service Road – Windham Maine

JN 1606

Letters sent on 11-14-06

Entity	Contact Person	Received Reply?	Date of Reply	Comment
United States Dept of Interior	Mark McCollough	Yes	12-11-06	"A northern black racer snake was observed near the project area. This species is listed as endangered by Maine Inland and Fisheries."
ME Dept of Inland Fisheries and Wildlife (Wildlife)	Bill Woodward			
ME Dept of Inland Fisheries and Wildlife (Fisheries)	Brian Lewis	Yes	11-30-06	"..no known threatened/endangered fish species or habitat in the vicinity of the proposed project." Ditch Brook and unmanned tributary to Tarkill Pond.
ME Historic Preservation Commission	Earle Shettleworth	Yes	11-30-06	"..the project area is sensitive for prehistoric archaeological sites, and that a Phase 1 archaeological survey will be necessary to determine whether such sites exist." Request photos of any structure 50 years or older.
ME Department of Conservation	Raquel Goodrich	Yes	12-6-06	"there is a good quality example of a Red Maple – Sensitive Fern Natural Community just north of the study area" Recommend not encroaching any on this habitat and minimizing any new sources of storm water runoff that would drain to it. We request the opportunity to review plans for the road if the proposed alignment comes within 250 feet of the Red Maple community.



MAINE HISTORIC PRESERVATION COMMISSION
 55 CAPITOL STREET
 65 STATE HOUSE STATION
 AUGUSTA, MAINE
 04333

JOHN ELIAS BALDACCI
 GOVERNOR

EARLE G. SHETTLEWORTH, JR.
 DIRECTOR

November 30, 2006

Paul D. Ostrowski, P.E.
 Gorrill-Palmer Consulting Engineers, Inc.
 15 Shaker Rd. / P.O. Box 1237
 Gray, ME 04039

2006

Project: MHPC #2895-06 - proposed Route 302 Parallel Service Road
 Town: Windham, ME

Dear Mr. Ostrowski:

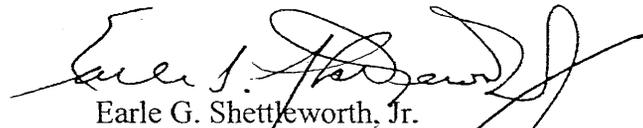
In response to your recent request, I have reviewed the information received November 17, 2006 to initiate consultation on the above referenced project in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended.

Based on the materials submitted, I have concluded that the project area is sensitive for prehistoric archaeological sites, and that a Phase I archaeological survey will be necessary to determine whether such sites exist.

With regard to architectural resources, we are requesting photos of any buildings over fifty years of age that are on, adjacent to, or across the street from the project site and any associated access roads. All photos should be keyed to a 7.5' U.S.G.S. quad map and submitted on the enclosed *Maine Historic Preservation Commission Historic Building/Structure Survey Form* with lines 3-5 filled out. If no such buildings exist, please indicate this in writing.

When we have received the archaeological survey report and the information requested, we will forward a response regarding the results of our evaluation. A list of qualified archaeologists is enclosed along with material explaining the Phase I/II/III approach to archaeological survey. This office must approve any proposal for archaeological fieldwork. Please contact Mike Johnson of my staff if we can be of further assistance in this matter.

Sincerely,


 Earle G. Shettleworth, Jr.
 State Historic Preservation Officer

enc:



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CONTRACT ARCHAEOLOGY GUIDELINES

June 10, 2002

This document is provided as background information to agencies, corporations, professional consultants or individuals needing contract archaeological services (also known as Cultural Resources Management archaeology) in Maine. These guidelines are based on state rules (94-089 Chapter 812).

Finding an Archaeologist

At the time that MHPC issues a letter requiring archaeological survey work, MHPC will also supply one (or more) lists of archaeologists (Levels 1 and/or 2, historic or prehistoric) appropriate to the type of work (Phase I, II, III, historic or prehistoric). **Archaeologists on the Level 2 Approved Lists can do projects of any level, including Phase I archaeological survey projects.** Level 1 archaeologists are restricted to doing Phase I surveys, and certain planning projects for municipal governments.

MHPC maintains lists of archaeologists interested in working in different geographic areas of Maine, and those who are qualified in different types of work. The archaeologists themselves indicate their availability (except for short-term absence) to MHPC on a periodic basis, so archaeologists on the list can be expected to respond to inquiries. The applicant should solicit proposals or bids for work from archaeologists whose names appear on the list supplied by MHPC.

These archaeologists' names are taken from lists of archaeologists approved for work in Maine by MHPC under a set of rules establishing minimal qualifications, such as previous supervisory experience in northern New England, and an appropriate graduate degree. *However, the inclusion of an archaeologist on one of these lists should not be interpreted as an endorsement by the MHPC beyond these limited qualification criteria. Moreover, the MHPC cannot recommend the services of an individual archaeologist.*

Project Types

The vast majority of contract archaeology survey work falls into one of three categories. **Phase I** surveys are designed to determine whether or not archaeological sites exist on a particular piece of land. Such work involves checking records of previous archaeology in the area, walking over the landscape to inspect land forms and look for surface exposures of soil and possible archaeological material, and the excavation of shovel test pits in areas of high probability.

Phase II surveys are designed to focus on one or more sites that are already known to exist, find site limits by digging test pits, and determine site content and preservation. Information from Phase II survey work is used by the Maine Historic Preservation Commission (MHPC) to determine site significance (eligibility for listing in the National Register of Historic Places). **Phase III** archaeological work, often called data recovery, is careful excavation of a significant archaeological site to recover the artifacts and information it contains in advance of construction or other disturbance.



Archaeological sites are further divided into two broad categories of culture, **prehistoric** (or Native American), and **historic** (or European-American). Different archaeological specialists are usually needed for prehistoric or historic sites because the nature of content and preservation and site locations are quite different.

Scope of Work

In responding to a project submission, the MHPC may issue a letter specifying which type of archaeological survey is needed (prehistoric, historic or both) and at what level (Phase I, II, or III). Often the response letter contains further information, such as the suspected presence of an historic site of a certain age, or a statement that only a portion of the project parcel in question is sensitive for prehistoric sites and only that portion needs archaeological survey.

Once the project applicant has one or more scopes of work (proposals) from appropriate archaeologists (see below), the applicant should submit their preferred proposal (*without attached financial information or bid total*) to the MHPC for approval. MHPC will not comment upon cost, but will comment on the appropriateness of the scale and scope of the work. An approval from MHPC of the scope of work is the applicant's guarantee that, if the field and laboratory work are done according to the scope, and appropriately described in writing, the results will be accepted by MHPC.

The final written report on the project must also be submitted to MHPC for review and comment.

Project Final Report

Whatever the archaeological survey result, a final report on the project should be submitted by the applicant to the MHPC. The MHPC will review the report, and issue further guidance or issue a "clearance" letter for the project.



JOHN ELIAS BALDACCI
GOVERNOR

MAINE HISTORIC PRESERVATION COMMISSION
55 CAPITOL STREET
65 STATE HOUSE STATION
AUGUSTA, MAINE

**Prehistoric Archaeologists Approved List:
Review and Compliance Consulting/Contracting (Active)**
July 12, 2006

EARLE G. SHETTLEWORTH, JR.
DIRECTOR

LEVEL 1

Ms Edna Feighner (207-879-9496)
NH Division of Historical Resources
PO Box 2043
Concord NH 03302-2043
Efeighner@NHCHR.state.nh.us

Rebecca Cole-Will (207-288-8728)
Acadia National Park
P. O. Box 177
Bar Harbor, ME 04609
Rebecca_Cole-Will@nps.gov

James A Clark (207-667-4055)
TRC/Northeast Cultural Resources
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clark@midcoast.com

Mr. Michael Brigham (207-778-7012)
Archaeology Research Center
University of Maine at Farmington
139 Quebec St
Farmington ME 04938
brigham@maine.edu

Richard P Corey (207-778-7012)
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E Wilton ME 04234-0068
rcorey@maine.edu

Edward Kitson (207-778-7012)
Archaeology Research Center
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kitson@maine.edu

Mr Brian Valimont (207-251-9467)
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Kennebunk ME 04043
newarch1@verizon.net

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vbi@worldpath.net

Dr Bruce J Bourque (207-287-3909)
Maine State Museum
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Augusta ME 04333-0083
bourque@abacus.bates.edu

Dr Leslie Shaw (207-725-3815)
Dept of Sociology & Anthropology
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Brunswick ME 04011
e-mail: lshaw@bowdoin.edu

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Chapman ME 04757
qaavik@ainop.com
putnamd@umpi.maine.edu

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University of Southern Maine
Orham ME 04038

Dr William R Belcher
US Army CILHI
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Hickam AFB HI 96853-5530
wbelcher@msn.com

Dr Steven L Cox (207-342-7790)
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Searsport ME 04973
stevencox@fairpoint.net

Eraldine Baldwin (914-271-0897)
John Milner Associates Inc
Croton Point Ave Ste B
Croton-on-Hudson NY 10520
FAX: 914-271-0898
eraldineBaldwin@aol.com



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MHPC USE ONLY

INVENTORY NO. _____

MAINE HISTORIC PRESERVATION COMMISSION
Historic Building/Structure Survey Form

1. PROPERTY NAME (HISTORIC): _____

2. PROPERTY NAME (OTHER): _____

3. STREET ADDRESS: _____

4. TOWN: _____

5. COUNTY: _____

6. DATE RECORDED: _____

7. SURVEYOR: _____

8. OWNER NAME: _____

ADDRESS: _____

9. PRIMARY USE (PRESENT):

- | | | | |
|---|---------------------------------------|--|--------------------------------------|
| <input type="checkbox"/> SINGLE FAMILY | <input type="checkbox"/> AGRICULTURE | <input type="checkbox"/> COMMERCIAL/TRADE | <input type="checkbox"/> FUNERARY |
| <input type="checkbox"/> MULTI-FAMILY | <input type="checkbox"/> GOVERNMENTAL | <input type="checkbox"/> EDUCATION | <input type="checkbox"/> HEALTH CARE |
| <input type="checkbox"/> INDUSTRY | <input type="checkbox"/> RELIGIOUS | <input type="checkbox"/> HOTEL | <input type="checkbox"/> LANDSCAPE |
| <input type="checkbox"/> TRANSPORTATION | <input type="checkbox"/> DEFENSE | <input type="checkbox"/> SUMMER COTTAGE/CAMP | <input type="checkbox"/> SOCIAL |
| <input type="checkbox"/> RECREATION/CULTURE | <input type="checkbox"/> UNKNOWN | | |
| <input type="checkbox"/> OTHER _____ | | | |

10. CONDITION: GOOD FAIR POOR DESTROYED, DATE / /

ARCHITECTURAL DATA

11. PRIMARY STYLISTIC CATEGORY:

- | | | | |
|---|---|---|--|
| <input type="checkbox"/> COLONIAL | <input type="checkbox"/> STICK STYLE | <input type="checkbox"/> NEO-CLASSICAL REV. | <input type="checkbox"/> FOUR SQUARE |
| <input type="checkbox"/> FEDERAL | <input type="checkbox"/> QUEEN ANNE | <input type="checkbox"/> RENAISSANCE REV. | <input type="checkbox"/> ART DECO |
| <input type="checkbox"/> GREEK REVIVAL | <input type="checkbox"/> SHINGLE STYLE | <input type="checkbox"/> 19TH/20TH C. REVIVAL | <input type="checkbox"/> INTERNATIONAL |
| <input type="checkbox"/> GOTHIC REVIVAL | <input type="checkbox"/> R. ROMANESQUE | <input type="checkbox"/> ARTS & CRAFTS | <input type="checkbox"/> RANCH |
| <input type="checkbox"/> ITALIANATE | <input type="checkbox"/> ROMANESQUE | <input type="checkbox"/> BUNGALOW | <input type="checkbox"/> VERNACULAR |
| <input type="checkbox"/> SECOND EMPIRE | <input type="checkbox"/> HIGH VIC. GOTHIC | <input type="checkbox"/> OTHER _____ | |

12. OTHER STYLISTIC CATEGORY:

- | | | | |
|---|---|---|--|
| <input type="checkbox"/> COLONIAL | <input type="checkbox"/> STICK STYLE | <input type="checkbox"/> NEO-CLASSICAL REV. | <input type="checkbox"/> FOUR SQUARE |
| <input type="checkbox"/> FEDERAL | <input type="checkbox"/> QUEEN ANNE | <input type="checkbox"/> RENAISSANCE REV. | <input type="checkbox"/> ART DECO |
| <input type="checkbox"/> GREEK REVIVAL | <input type="checkbox"/> SHINGLE STYLE | <input type="checkbox"/> 19TH/20TH C. REVIVAL | <input type="checkbox"/> INTERNATIONAL |
| <input type="checkbox"/> GOTHIC REVIVAL | <input type="checkbox"/> R. ROMANESQUE | <input type="checkbox"/> ARTS & CRAFTS | <input type="checkbox"/> RANCH |
| <input type="checkbox"/> ITALIANATE | <input type="checkbox"/> ROMANESQUE | <input type="checkbox"/> BUNGALOW | <input type="checkbox"/> VERNACULAR |
| <input type="checkbox"/> SECOND EMPIRE | <input type="checkbox"/> HIGH VIC. GOTHIC | <input type="checkbox"/> OTHER _____ | |

13. HEIGHT:

- 1 STORY 1 1/2 STORY 2 STORY 2 1/2 STORY 3 STORY 4 STORY
 5 STORY OVER 5 ()

14. PRIMARY FACADE WIDTH (MAIN BLOCK; USE GROUND FLOOR):

- 1 BAY 2 BAY 3 BAY 4 BAY 5 BAY MORE THAN 5 ()

15. APPENDAGES:

- SIDE ELL REAR ELL FRONT TOWER ADDED STORIES SHED BAY WINDOW
 DORMERS PORCH CUPOLA

PHOTOGRAPH:

- ATTACHED ENGAGED ONE STORY MORE THAN ONE STORY
 FULL WIDTH WRAPAROUND SLEEPING PORCH SECONDARY PORCH
17. PLAN: HALL AND PARLOR 1/2 CAPE CENTRAL HALL SIDE HALL
 BACK HALL IRREGULAR OTHER _____
18. PRIMARY STRUCTURAL SYSTEM: TIMBER FRAME BRACED FRAME BRICK STONE BALLOON FRAME
 CONCRETE STEEL LOG PLANK WALL PLATFORM FRAME
 FRAME CONSTRUCTION - TYPE UNKNOWN OTHER _____
19. CHIMNEY PLACEMENT: INTERIOR INTERIOR FRONT/REAR CENTER INTERIOR END EXTERIOR
 OTHER _____
20. ROOF CONFIGURATION: GABLE SIDE GABLE FRONT HIP MANSARD FLAT
 GAMBREL PARAPET GABLE SHED CROSS GABLE
 COMPOUND OTHER _____
21. ROOF MATERIAL: WOOD METAL TILE SLATE ASPHALT ASBESTOS _____
22. EXTERIOR WALL MATERIALS: CLAPBOARD BRICK FLUSH SHEATHING WOOD SHINGLE STONE
 LOG PRESSED METAL CONCRETE STUCCO ASPHALT
 GRANITE ASBESTOS TERRA COTTA BOARD AND BATTEN ALUMINUM/VINYL
 OTHER _____
23. FOUNDATION MATERIAL: FIELDSTONE BRICK WOOD CONCRETE GRANITE ORNAMENTAL CONC. BLOCK
 OTHER _____
24. OUTBUILDINGS/FEATURES: CARRIAGE HOUSE FENCE OR WALL CEMETERY BARN (CONNECTED)
 BARN (DETACHED) FORMAL GARDEN LANDSCAPE/PLANT MAT. ARCHAEOLOGICAL SITE
 GARAGE OTHER _____

HISTORICAL DATA

25. DOCUMENTED DATE OF CONSTRUCTION: _____ 26. ESTIMATED DATE OF CONSTRUCTION: _____
27. DATE MAJOR ADDITIONS/ALTERATIONS: _____
28. ARCHITECT: _____ 29. CONTRACTOR: _____
30. ORIGINAL OWNER: _____
31. SUBSEQUENT SIGNIFICANT OWNER: _____ DATES: _____
32. CULTURAL/ETHNIC AFFILIATION: ENGLISH FRENCH ACADIAN NATIVE AMERICAN SCOTTISH FRENCH CANADIAN
 EAST EUROPEAN IRISH OTHER _____
33. HISTORIC CONTEXT(S): COMMERCE INDUSTRY TRANSPORTATION AGRICULTURE MILITARY
 RELIGION CIVIC AFFAIRS RECREATION HABITATION EDUCATION
 ART, LIT, SCIENCE SOCIAL _____
34. COMMENTS/SOURCES: _____

35. HISTORICAL DRAWINGS EXIST: YES NO LOCATION: _____

ENVIRONMENTAL DATA

36. SITE INTEGRITY: ORIGINAL MOVED DATE MOVED _____
37. SETTING: RURAL/UNDISTURBED RURAL/BUILT UP SMALL TOWN URBAN SUBURBAN
38. QUADRANGLE MAP USED: _____ QUADRANGLE #: _____
39. UTM NORTHING: _____ 40. UTM EASTING: _____
41. FACADE DIRECTION (CIRCLE ONE): N S E W NE NW SE SW

=====

MHPC USE ONLY

DATE ENTERED IN INVENTORY: _____ PHOTO FILE #: _____

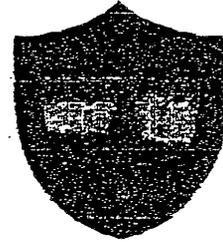
NR STATUS: L HD E NE ND REVIEWER _____

DATA SOURCE: HPF CLG R&C STAFF STATE SURVEY OTHER _____ LEVEL OF SURVEY: R I

ASSOCIATED INVENTORY NUMBERS: _____



Maine Department of Inland
Fisheries and Wildlife
358 Shaker Road
Gray, Maine 04039



Telephone: 207-657-2345 ext. 113
Fax: 207-657-2980
Email: brian.lewis@state.me.us

John Elias Baldacci, Governor

Roland Martin, Commissioner

November 30, 2006

Paul Ostrowski
PO Box 1237
Gray, Maine 04039

RE: Route 302 Parallel Service Road, Windham

Dear Paul Ostrowski,

I have reviewed your request for fishery resource information, and there are no known threatened/endangered fish species or habitat in the vicinity of the proposed project. However, Ditch Brook and an unnamed tributary to Tarkill Pond flow through parts of the proposed project area. While we have no data regarding the unnamed tributary, Ditch Brook supports wild populations of brook trout and brown trout as well as numerous other species. Our regional buffer policy is outlined below.

Stream systems are vulnerable to environmental impacts associated with increased development and encroachment. If present, this project should be sensitive to these resource issues by including provisions for riparian buffers and minimizing any other potential stream impacts. Our regional buffer policy requests 100 foot undisturbed buffers along both sides of any stream or stream-associated wetlands. Buffers should be measured from the upland wetland edge of stream-associated wetlands, and if the natural vegetation has been previously altered then restoration may be warranted. This buffer requirement improves erosion/sedimentation problems; reduces thermal impacts; maintains water quality; supplies leaf litter and woody debris for the system; and provides valuable wildlife habitat. Protection of these important riparian functions insures that the overall health of the stream habitat is maintained.

Stream crossings, if applicable, must include provisions for adequate fish passage, and any in-stream work needs to be done between the first of July and the first of October. Project design should minimize the number of stream crossings. If you have any additional questions or concerns then feel free to contact us.

Sincerely,

A handwritten signature in cursive script, appearing to read 'Brian Lewis'.

Brian Lewis
Fishery Specialist
MDIFW



STATE OF MAINE
DEPARTMENT OF CONSERVATION
157 HOSPITAL STREET
93 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0093

JOHN ELIAS BALDACC
GOVERNOR

PATRICK K. MCGOWAN
COMMISSIONER

December 6, 2006

Paul D. Ostrowski, P.E.
Design Engineer
Gorrill-Palmer Consulting Engineers, Inc.
P.O. Box 1237, 15 Shaker Road
Gray, Maine 04039

Re: Rare and exemplary botanical features, proposed Route 302 Parallel Service Road, Job No. 166, Windham.

Dear Mr. Ostrowski:

I have searched the Natural Areas Program's digital, manual and map files in response to your request of November 15, 2006 for information on the presence of rare or unique botanical features documented from the vicinity of the project site in the Town of Windham, Maine. Rare and unique botanical features include the habitat of rare, threatened or endangered plant species and unique or exemplary natural communities. Our review involves examining maps, manual and computerized records, other sources of information such as scientific articles or published references, and the personal knowledge of staff or cooperating experts.

Our official response covers only botanical features. For authoritative information and official response for zoological features you must make a similar request to Steve Timpano, Environmental Coordinator, Maine Department of Inland Fisheries and Wildlife, 284 State Street, Augusta, Maine 04333.

Please be advised that there is a good quality example of a Red Maple - Sensitive Fern Natural Community just to the north of the study area (see enclosed map and natural community fact sheet). In designing a service road in this area, we would strongly recommend not encroaching on this habitat and minimizing any new sources of storm water runoff that would drain into it. We request the opportunity to review plans for the road if the proposed alignment comes within 250 feet of the Red Maple - Sensitive Fern Natural Community.

The table below provides information on the unique natural community in terms of global rarity rank, state rarity rank and element occurrence rank (see attached explanation of ranks). The element occurrence rank is a system used to rank the overall quality (i.e. condition, landscape context and size) of a natural community or rare plant occurrence. If you would like more information on this natural community, or would like to schedule a field visit to this area, please contact MNAP ecologist Don Cameron at 287-8041.



Scientific Name	Common Name	Global Rarity Rank	State Rarity Rank	Element Occurrence Rank
Red maple – sensitive fern swamp	Red Maple Swamp	G3G5	S4	B-Good

If someone is hired to conduct a field survey of the project area, please refer to the enclosed supplemental information regarding rare and exemplary botanical features documented to occur in the vicinity of the project site. The list may include information on features known to occur historically in the area as well as recently field-verified information. While historic records have not been documented in several years, they may persist in the area if suitable habitat exists. The enclosed list identifies features with potential to occur in the area, and it should be considered if you choose to conduct field surveys.

This finding is available and appropriate for preparation and review of environmental assessments, but it is not a substitute for on-site surveys. Comprehensive field surveys do not exist for all areas in Maine, and in the absence of a specific field investigation, the Maine Natural Areas Program cannot provide a definitive statement on the presence or absence of unusual natural features at this site.

The Natural Areas Program is continuously working to achieve a more comprehensive database of exemplary natural features in Maine. We would appreciate the contribution of any information obtained should you decide to do field work. The Natural Areas Program welcomes coordination with individuals or organizations proposing environmental alteration, or conducting environmental assessments. If, however, data provided by the Natural Areas Program are to be published in any form, the Program should be informed at the outset and credited as the source.

The Natural Areas Program has instituted a fee structure of \$75.00 an hour to recover the actual cost of processing your request for information. You will receive an invoice for \$150.00 for our services.

Thank you for using the Natural Areas Program in the environmental review process. Please do not hesitate to contact me if you have further questions about the Natural Areas Program or about rare or unique botanical features on this site.

Sincerely,



Raquel D. Goodrich
Information Manager
93 State House Station
Augusta, ME 04333-0093
207-287-8046
raquel.goodrich@maine.gov

Enclosures

Rare and Exemplary Botanical Features in the Project Vicinity

11/22/2006

Documented within a Four-Mile Radius of the Proposed Service Road, Windham, Maine.

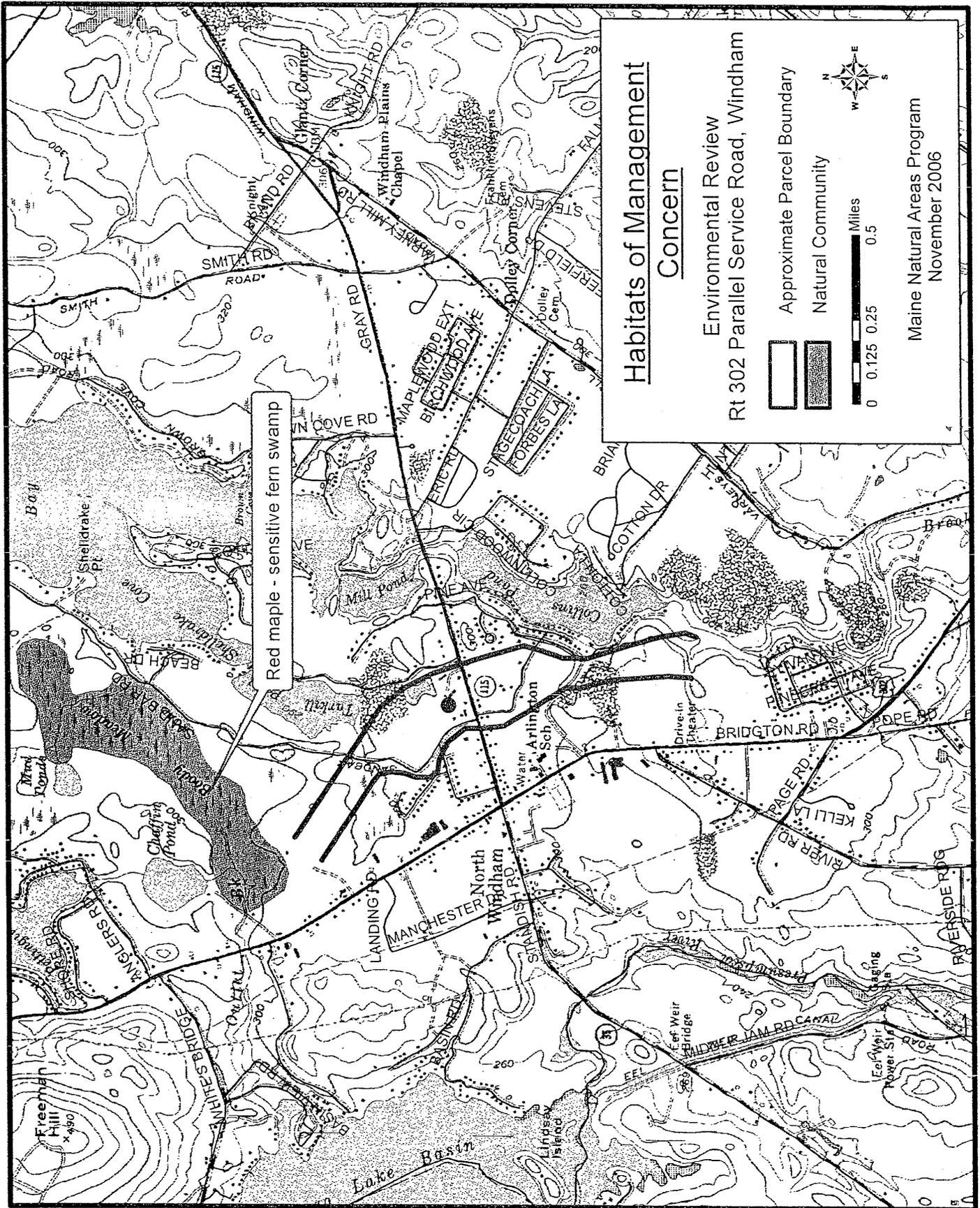
<u>Scientific Name</u>	<u>Common Name</u>	<u>Last Seen</u>	<u>Global Rarity Rank</u>	<u>State Rarity Rank</u>	<u>State Protection Status</u>	<u>Habitat Description</u>
Rhododendron maximum	Great Rhododendron	1992	G5	S1	T	Damp woods, swamps, and pond margins.
Lindera benzoin	Spicebush	1991-07	G5	S3	SC	Damp woods and brooksides.
Triphora trianthophora	Nodding Pogonia	2000-08-17	G3G4	S1	T	Northern Hardwood (beech-birch-maple) forests, usually dominated by beech, often in deep litter.
Quercus coccinea	Scarlet Oak	1916-08	G5	S1	E	Dry sandy soil.
Red maple - sensitive fern swamp	Red Maple Swamp	2004-06-21	G3G5	S4		Poorly-drained basins throughout Maine, usually on inorganic soils. Often associated with lakes or streams, and usually flooded in spring. Small streams or pools may persist
Pitch pine bog	Pitch Pine Bog	2004-06-21	G3G5	S2		Characteristic of southern Maine south along the coastal plain, these are partly or sparsely forested peatlands with pitch pine the typical tree. Typical bog conditions predominate

Rare and Exemplary Botanical Features in the Project Vicinity

11/22/2008

Documented within a Four-Mile Radius of the Proposed Service Road, Windham, Maine.

<u>Scientific Name</u>	<u>Last Seen</u>	<u>Global Rarity Rank</u>	<u>State Rarity Rank</u>	<u>State Protection Status</u>	<u>Habitat Description</u>
------------------------	------------------	---------------------------	--------------------------	--------------------------------	----------------------------



Red maple - sensitive fern swamp

Habitats of Management
Concern

Environmental Review
 Rt 302 Parallel Service Road, Windham

Approximate Parcel Boundary
 Natural Community

Miles
 0 0.125 0.25 0.5

Maine Natural Areas Program
 November 2006

Red maple dominates the somewhat open to nearly closed canopy (20-90% closure), sometimes with a relatively large component (up to 40% RD) of balsam fir, red spruce, or northern white cedar. Green ash and yellow birch are common, but rarely abundant, associates. The maples may be widely spaced with multiple trunks and arching crowns. The shrub layer is patchy: winterberry is common, various other shrubs may be locally abundant. The herb layer is well developed and dominated by herbs, with dwarf shrubs <20% of herb cover. Bluejoint and sensitive fern are characteristic herbs. The bryoid layer is usually <35% cover; Sphagnum mosses are typical but do not form extensive, deep carpets as they do in peatlands.



(19 samples)

Sites occupy mineral soils or well decomposed organic material over mineral soil. Flats or gentle slopes in small basins, or on floodplains of streams to small rivers. Soils are typically 30-60 cm deep, loamy to silty in texture, sometimes with well decomposed muck over the mineral fraction, and pH 4.8-5.4.

Characteristic Species

Canopy	
Red maple	(F,C)
Balsam fir	(C)
Gray birch	(C)
Northern white cedar	(C)
Red spruce	(C)

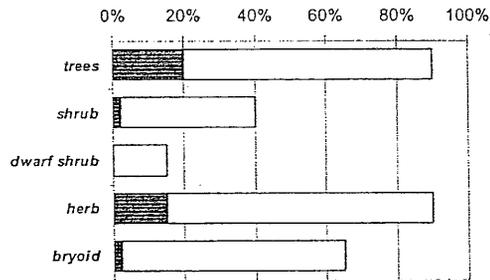
Sapling/shrub	
Winterberry	(F,C)
Arrowwood	(C)
Balsam fir	(C)
Gray birch	(C)
Red spruce	(C)
Speckled alder	(C)

Dwarf Shrub

Herb	
Flat-topped white aster	(F)
Lady fern	(F)
Bluejoint	(C)
Interrupted fern	(C)
Royal fern	(C)
Sensitive fern	(C)
Tuckerman's sedge	(C)
Tussock sedge	(C)

Bryoid	
Sphagnum mosses	(F,C)

Vegetation Structure (total cover by stratum)



Associated Rare Plants

- Eastern joe-pye weed
- Smooth winterberry
- Spicebush
- Swamp saxifrage
- Swamp white oak
- Sweet pepper-bush
- Wiegand's sedge

Diagnostics

These are mineral soil wetlands in which red maple dominates the canopy or is codominant with conifers other than black spruce or larch. The seasonally flooded soils usually remain saturated through the growing season.

Similar Types

Red Maple Wooded Fens are similar, but either occur in association with large peatlands or occupy small somewhat peaty basins; they do not occur on mineral soils. Some small Northern White Cedar Swamps and Spruce - Fir - Cinnamon Fern Forests, particularly along the coast, include a fair amount of red maple but have cedar or spruce/fir, respectively, as the most abundant canopy species. Silver Maple Floodplain Forests are dominated by silver maple and generally occur along larger rivers, but the two types can intergrade on some floodplains.

Distribution

Statewide, but most common in southern half of state. Extends southward and southwestward from Maine; eastward distribution unknown.

Landscape Pattern: Large Patch

State Rank S4

Where to see it (examples on conservation lands)

Mt Agamenticus	York Co.
Roberts Pond, Massabesic Experimental Forest	York Co.
Kennebunk Plains Preserve	York Co.
Waterboro Barrens Preserve	York Co.
Steep Falls Wildlife Management Area	Cumberland Co.
Great Heath Public Lands	Washington Co.
Mattagodus Wildlife Management Area	Penobscot Co.
Lake Onawa, Borestone Mountain Sanctuary	Piscataquis Co.



Conservation, Wildlife, and Management Considerations

Maintaining the hydrologic integrity of these stream drainages with upland buffers is key. These swamps typically have had few conflicting uses, although some have been recently harvested. ATV use has been observed at some sites.

Red maple swamps often provide habitat in which spotted turtles hibernate. If wet Sphagnum hummocks are present, four-toed salamanders may breed in this community. Examples that occur on floodplains of streams and small rivers may contain wood turtles, which overwinter in the stream channel and forage in the floodplain. The silver-haired bat often roosts in riparian habitats in trees with loose bark. The northern waterthrush is a common associate of this

Cross-references to Other Classifications

SAF Type(s)

108 Red maple ME < SAF

New Hampshire

Red maple/lake sedge streamside/seepage swamp	S3
Red maple/sensitive fern-tussock sedge basin/seepage swamp	S2S3
Seasonally flooded red maple swamp	S4S5
Red maple floodplain forest	S2S3

National Vegetation Classification

(Type, Global Rank)

CEGL006198	Picea rubens - Acer rubrum / Nemopanthus mucronatus Forest	G?
CEGL006220		

Literature References

Golet et al. 1993



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Maine Field Office

1168 Main Street

Old Town, ME 04468-2023

(207) 827-5938



DEC 11 2006

MEFO log #53411-2007-SL-0082

December 11, 2006

Paul Ostrowski
Gorrill-Palmer Consulting Engineers
P.O. Box 1237
15 Shaker Road
Gray, ME 04039

Dear Mr. Ostrowski:

Thank you for your letter requesting information or recommendations from the U.S. Fish and Wildlife Service. A list of federally-listed species in Maine is enclosed for your information. The following rare and endangered species are located within your project area:

Species	Location	State Status	Federal status
Black racer snake	adjacent to project area	endangered	none

E = endangered
T = threatened
SC = special concern
FSC = federal species of concern
D = delisted

Comments on listed species:

A northern black racer snake was observed near the project area. This species is listed as endangered by Maine Inland Fisheries and Wildlife. *(see attached map)*

I recommend that you contact the Maine Department of Inland Fisheries and Wildlife for additional information on state-threatened and endangered wildlife and other wildlife species of special concern. The Maine Endangered Species Act may protect some of the species in your project area.

Scott Lindsay
Maine Department of Inland Fisheries and Wildlife
RR 1 358 Shaker Rd.
Gray, ME 04039

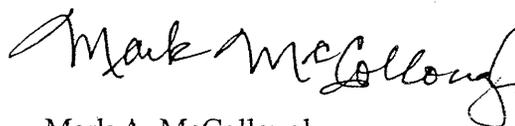
Phone: 207 657-2345

There are no known federal threatened or endangered plants in the project area, but there could be state-listed plants. You should contact the Maine Natural Areas Program for more information.

Maine Natural Areas Program
Department of Conservation
93 State House Station
Augusta, ME 04333
Phone: 207 287-8044

A list of federally-listed species in Maine is enclosed for your information. If you have any questions, please call me at (207) 827-5938.

Sincerely,

A handwritten signature in black ink that reads "Mark McCollough". The signature is written in a cursive style with a large, sweeping "M" and "C".

Mark A. McCollough,
Endangered Species Biologist

Enclosure

cc: Scott Lindsay, MDIFW

