

# North Route 302 Corridor Plan

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## Executive Summary

### Preface

Windham, with a population of approximately 17,000 people, has experienced significant growth over the past thirty years; and as a result, Route 302 as a primary commuter and summer recreational route through the Town, has also experienced significant increases in traffic volumes. Route 302 from River Road to White's Bridge Road (area south of this study area) has experienced a dramatic increase in commercial development and traffic volumes, resulting in the widening of this roadway from two lanes in most places to a current total of five lanes (two through lanes in each direction with a center turn lane).

Route 302 from White's Bridge Road north to Mineral Spring Road, the subject of this study, is currently experiencing similar pressures. The corridor includes a single travel lane in each direction, is largely commercial in nature with several side roads leading to residences, and carries significant commuter and seasonal traffic. It currently carries approximately 21,000 vehicles per day. The historic growth for this area is one-and-a-half to two percent per year; however, it is anticipated that immediate future growth will not be as aggressive due to less available developable property and the slow economic environment. Even with minimal growth, this corridor is quickly approaching its capacity as a two lane corridor.

As such, Gorrill-Palmer Consulting Engineers, Inc. was retained by PACTS and the Town of Windham to examine the need for roadway widening, parallel access roads, and the use of access management principles to maximize mobility and safety, while continuing to encourage the development of commercial properties.

The recommendations for this corridor and its related options should hold to a consistent design philosophy and a long-term phased implementation plan. This will allow the Town, PACTS and MaineDOT to provide planning in a consistent manner along the corridor as well as provide clear and predictable guidelines to Applicants wishing to do business in Windham.

### Recommendations

#### Description of Phasing

What follows is a description of the transportation/access management improvement recommendations.

- *Access Management Plan:* The most important portions of any access management plan are reducing and strategically locating the number of curb cuts, reducing curb cut widths, providing interconnections between adjacent sites, and use of side/parallel streets where feasible and appropriate. The Town of Windham can help to realize the improvements by requiring them as part of the site redevelopment process for businesses along the corridor. Potential access management recommendations are described within this report; however, it should be noted

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that their final location / implementation depends on specific development on the roadway and individual site specifics. However, the recommendations can be adopted by the Town as the overall guiding requirements to be met for this section of Route 302.

- *Restripe Route 302 as a Three-Lane Cross Section (Within three years):* The current 44 foot paved width of Route 302 in the study area would allow for restriping of the roadway to provide a center two-way left-turn lane, a travel lane in each direction, and shoulders that could be used by bicyclists. This cross section would allow left turning vehicles on Route 302 to use the left turn lane and not restrict the movement of the through traffic. This would also assist left turning vehicles exiting the side streets / driveways to use the center turn lane to make a two stage left turn.
- *Signalize Enterprise Drive (Within three years if warranted):* This would include full signalization of the intersection. The intersection will first need to meet warrants for signalization according to the Manual on Uniform Traffic Control Devices (MUTCD) and be approved by the MaineDOT.
- *Alignment of Angler's Road with White's Bridge Road (Within Five Years, preferably sooner):* This project includes realigning Angler's Road across from White's Bridge Road. The resulting four-leg intersection would have more efficient operations than the current offset (i.e. 'T'-style) intersections.
- *Widening of Route 302 (Ten to Twenty Years, preferably not needed):* The need for this improvement varies considerably based on the growth of the area and how well access management techniques are implemented throughout the corridor. The current two-lane section is already operating marginally during peak periods. With the implementation of the three lane cross section described previously, the corridor should operate better than it does today. Widening Route 302 to a five lane cross section would require additional right-of-way, have impacts on the quality and quantity of stormwater, and could negatively impact properties along the corridor. For those reasons, every effort should be made to avoid the five lane cross-section. However, should volumes and capacity exceed a three lane cross-section, the five lane cross section would be needed, which would include two through lanes in each direction and a center two-way left turn lane or a series of dedicated left turn lanes.
- *Extension of Manchester Drive to Enterprise Drive (Ten to Twenty Years):* To minimize impacts from additional development, and to remove a portion of local trips from the Route 302 corridor, it is recommended that Manchester Drive be extended northerly to White's Bridge Road and possibly continue further northerly to intersect Route 302 opposite Enterprise Drive.
- *Transportation Demand Management (TDM) (Immediately):* This includes techniques that distribute traffic more evenly throughout the day and concentrates less traffic during the peak hours or somehow reduces the volume of traffic on the corridor during the peak hours. These are things that could be implemented anytime and would include: staggered work hours, carpooling / vanpooling, bus service, providing bicycle facilities.
- *Construction of Sidewalk (Immediately to Long Term):* Construction of a sidewalk within this section of Route 302 needs to be considered carefully. It could be implemented immediately or as development occurs; however, the potential for widening Route 302 also needs to be

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considered such that sidewalks constructed in the next several years are not removed should Route 302 be widened in the future.

The Town recently updated their Ordinances. The Ordinances include numerous access management requirements such as; allowable number of curb cuts, sight distance requirements, curb cut spacing, corner clearances etc. These requirements are consistent with the techniques and recommendations identified as part of this study.

## Preliminary Opinions of Cost

Gorrill-Palmer Consulting Engineers, Inc. calculated preliminary opinions of probable construction cost for the primary widening improvements to Route 302. The total length of the study area is approximately 7,900 feet, which includes approximately 600 feet of signalized intersection improvements at White's Bridge / Anglers Road. Our opinions are described in more detail as follows:

1. Conversion of existing two lane cross-section to a three lane cross-section inclusive of a center turn lane - \$190 - \$200 per linear foot (Total corridor cost of approximately \$1,387,000 - \$1,460,000).
2. Conversion of three lane cross-section with center turn lane (item 1) to five lane cross-section - \$430 per linear foot (Total corridor cost of approximately \$3,139,000). Since it is well beyond the scope of this study; acquisition of right-of-way, costs associated with stormwater quality and quantity management are not included but would be expected to be significant.
3. Conversion of the center turn lane to raised median with loam and seed \$140 per linear foot (Total corridor cost of approximately \$1,022,000)
4. Construction of a sidewalk (Assumes it is constructed concurrently with the roadway widening and includes vertical bituminous curbing) - \$120 per linear foot (Total corridor cost of \$876,000)

It is anticipated that signalization of Enterprise Drive would be the financial responsibility of the development that triggers the warrant for the signalization. The extent of this mitigation could vary significantly depending on the development proposed and what the cross-section of Route 302 is at the time of signalization. It is also anticipated that MaineDOT will, at a minimum, assist with the alignment of Anglers Road with White's Bridge Road. A full capacity and queue analysis would need to be performed for this intersection for the Weekday AM and PM peak hours as well as a Saturday peak hour to determine exactly what improvements will be necessary; however, it is anticipated that the mitigation shown on the plans provided in this report are a good representation of what may be required.

## Potential Right-of-Way Costs

The three lane cross section described previously would not require any additional right-of-way than is available today. However, widening Route 302 to a five lane cross section would require additional right-of-way throughout the corridor, not only to accommodate the proposed pavement width but also utilities. Trees would also need to be removed to accommodate clear zone

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requirements. This additional right-of-way may also negatively effect properties along the corridor leaving them non-conforming.

## Potential Environmental / Stormwater Costs

There are at least two factors that would need to be addressed with the widening of Route 302 in this area. The first factor is that some of the widening would take place within sensitive watersheds and stormwater quality would need to be addressed to satisfy DEP. The second factor is that the widening of Route 302 could add four to five acres of impervious area, which would require stormwater quantity mitigation to satisfy DEP. The evaluation needed to determine the extent of the stormwater / environmental mitigation required is outside the scope of this study, but based on our past experience with roadway reconstruction this could cost an additional \$100,000 to \$150,000 per impervious acre, which does not include acquisition of right-of-way.

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## Chapter 1 Introduction

### Project Background

Windham is a fast-growing town in Cumberland County, and its commercial district is a regional center, attracting shoppers and workers from much of the Lakes Region area of the state of Maine. Route 302 plays a significant role in the transportation network for Windham, and serves significant development occurring in the area, most significantly in the vicinity of the Windham Mall. It is the primary route for communities ranging from Raymond to Bridgton, and is also a key roadway for recreationally-based traffic.

Significant residential development in Windham and its surrounding communities, combined with the addition of commercial development has resulted in ongoing traffic growth along this roadway. As Route 302 north of White's Bridge Road remains primarily a two-lane roadway, issues of access management, capacity, safety, are beginning to become significant issues along the corridor.

Route 302 is a principal arterial and the land uses along the roadway are primarily commercial in nature, as businesses desire to have access to high levels of traffic volume. However, some of the existing development was done prior to the implementation of current access management standards, and as a result, driveways in some places are spaced too closely, or adjacent sites are not interconnected. This results in traffic turning on and off the roadway at more locations than desired, and could result in a higher crash rate if future development continues this trend.

### Study Area

The study area primarily consists of Route 302 from White's Bridge Road to Mineral Spring Road. The intersections included in the study are as follows:

- Route 302 at White's Bridge Road
- Route 302 at Angler's Drive (Signalized with White's Bridge Road)
- Route 302 at Enterprise Drive
- Route 302 at Mineral Spring Road (conceptually only – no turning movement counts)

In addition, the guidance included with this report has clear recommendations for future driveways and intersections. As discussed above, a key focus on Route 302 is that of access management issues. Published information and recent traffic impact studies indicate that the current two to three-lane configuration and proliferation of driveways cannot be sustained indefinitely; as such, improvements along this corridor will be needed.

### Project Goals

It is important to develop a set of goals to serve as a benchmark by which to evaluate the effectiveness and impact of various alternatives and in particular a recommended set of improvements. The goals are as follows:

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- Utilize proven strategies that maximize corridor mobility.
- Recognize the affect of the business community along Route 302 in making the roadway important from an economic perspective.
- Maintain or improve safety along the corridor.
- Improve facilities for other modes of travel, e.g. pedestrian, bicycle, and transit (long-term).
- Implement access management strategies to minimize the number of curb cuts, provide direct connections between adjacent businesses, and help to clarify access points along the corridor.
- Create an incremental strategy that allows for a sequence of improvements, and as such, not requiring that all improvements be undertaken simultaneously.

As identified in the goals above, the balancing of competing needs is of great importance along this corridor. Although state and federal funding for this road necessitates the preservation of access for through traffic (including truck traffic) along Route 302, local and recreational users of this road should also feel comfortable passing through or patronizing local businesses.

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## Chapter 2 Existing Conditions

Route 302 provides access from the Portland area to the south up to Fryeburg and into the Conway region in New Hampshire. It is a principal arterial, with the main purpose of an arterial being movement of traffic between communities; so mobility is considered to be of paramount importance, along with safety. For the purposes of this report, the study area includes the signalized intersection of White's Bridge Road to the south up to and including Mineral Spring Road to the north, although improvements should continue further north if possible. The majority of the corridor is a single 12 foot wide travel lane in each direction with a 10 foot wide paved shoulder. Speeds along the study area vary from a short section of 30 mph in the southerly section transitioning to 40 mph in the middle of the study area and then to 50 mph at the northerly end of the study area continuing north.

Previously, most of the land development along Route 302 has occurred south of White's Bridge Road. Now additional development proposals and projects have been taking place within the study area, thus driving interest in examining this portion of the roadway and determining the measures necessary to accommodate long-term growth in this area.

### Data Collection

Our office compiled turning movement counts from recent studies completed in the area as well as a count completed at Enterprise Drive last summer for the weekday PM peak hour.

Based on the turning movement counts, the peak hour for the corridor occurs between the hours of 3:30 to 5:45 PM. This window of peak time is due to the fact that volumes are heavy and relatively stable throughout this period, so the peak "hour" is in actuality two to three hours, particularly during the summer months. The raw counts are summarized on Figure 1 in Appendix A.

### Historic Growth

Historical data was obtained from the Maine Department of Transportation (MaineDOT) from 1997 to 2007. Based on this information, it appears that the roadway volumes along Route 302 have been increasing by approximately one-and-a-half to two percent per year; however, it is anticipated that immediate future growth will not be as aggressive due to less available developable property and the slow economic environment. Even with minimal growth, this corridor is quickly approaching its capacity as a two lane corridor.

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## 2010 Design Volumes

The raw turning movement volumes are shown on Figure 1 of Appendix A for the weekday PM peak hour. The 2010 design hour volumes are shown on Figure 2 of Appendix A for the weekday PM peak hour. Typically, the 30<sup>th</sup> highest hour is used as a design hour. It is possible that other times, such as a Saturday afternoon in the middle of the summer could be more congested; however, evaluating the roadway network for peak congestion times can lead to over improvements that most of the time are not needed.

## Collision History

Our office obtained the collision history for the Route 302 corridor from the MaineDOT for 2006-2008, the latest three-year period available. A location is classified as a High Crash Location (HCL) if it meets both of the following criteria:

1. Eight or more crashes over a three-year period, and;
2. A Critical Rate Factor (CRF) of 1.00 or greater for the same three-year period. A CRF compares the actual crash rate of each intersection or road segment to the Statewide crash rate of similar locations. A CRF less than 1.00 indicates a lower than average crash rate.

Based on the crash data, no locations within the study corridor were considered High Crash Locations.

Pedestrians / Bicycles / Fatalities - In addition to identifying high crash locations, Gorrill-Palmer Consulting Engineers also reviewed the corridor to identify if within that three year period there were crashes involving pedestrians / bicycles or fatalities. Based on the MaineDOT data, there were no crashes within the corridor that involved pedestrians, bicycles, or fatalities.

The crash history is included in Appendix C of this report.

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## Chapter 3 Transportation Improvement Options/Recommendations

### Constraints and Needs of Options

For a corridor such as Route 302, finding a balance between providing access, mobility and safety is critical. The corridor is largely commercial in nature, but carrying significant commuter and seasonal components. This could be even greater depending on future development within the study area.

Restriping Route 302 within the existing pavement width to include a center turn lane and single through lane in each direction should improve the mobility, capacity and safety of the corridor above what it is today. Incorporating good access management and traffic demand practices will lengthen the time that the three lane section will remain adequate to accommodate future traffic. While widening of Route 302 from the three lane cross section to a five lane cross section will add capacity, it comes at significant cost involving additional right-of-way, impacts to adjacent properties, and impacts to stormwater quality and increased quantity.

### Description of Options

What follows is an in-depth discussion of the options. The concept drawings for many of the options are shown on the plans provided in Appendix B and shown on the following page.

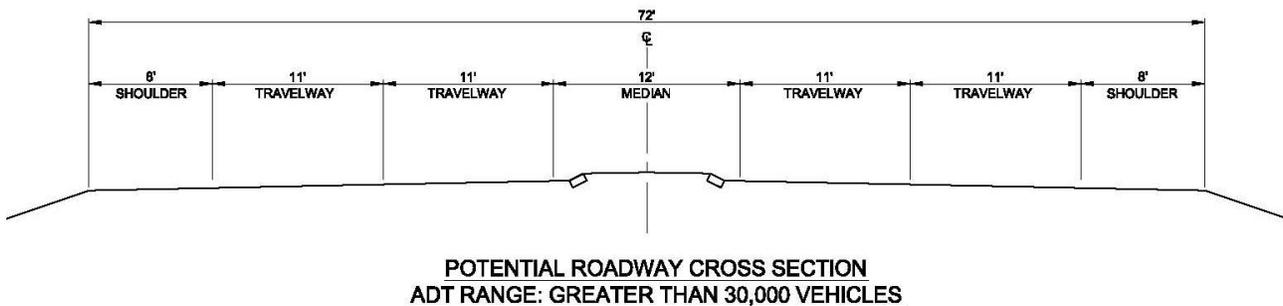
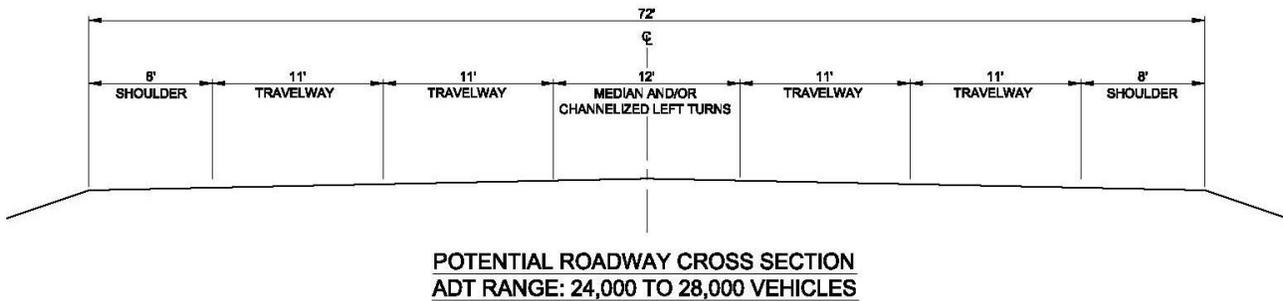
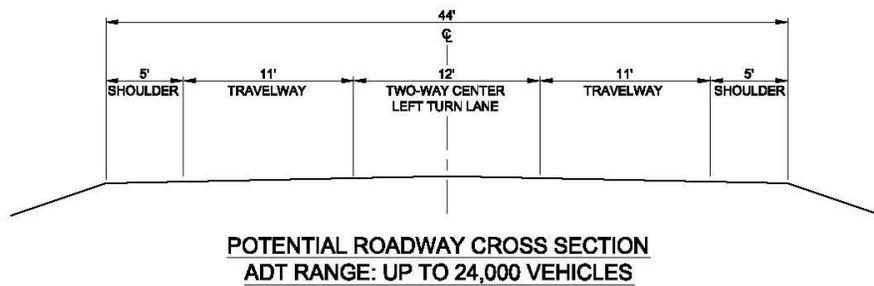
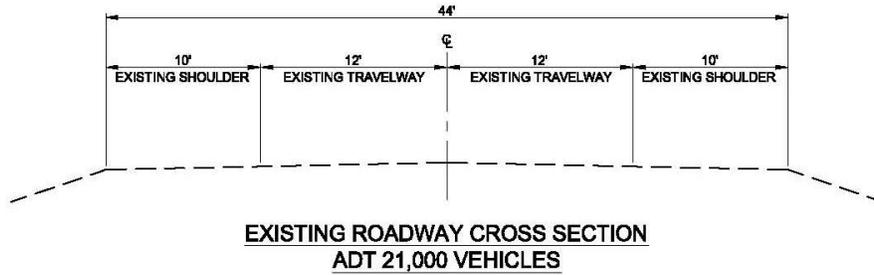
### Near-Term Improvements / Recommendations

Several options have been examined for the corridor, and are discussed as follows:

- *Access Management Plan (Immediately):* The most important portions of any access management plan are reducing and strategically locating the number of curb cuts, reducing curb cut widths, providing interconnections between adjacent sites, and use of side/parallel streets where feasible and appropriate. The potential for proliferation of full-access driveways is a major concern along Route 302. Given the need to maintain mobility along this corridor, it is important for the Town to work with local businesses and applicants for development to the Planning Board, for site plan review, and building permits to make access management part of any development plan. The most important portions of any access management plan are reducing the number of curb cuts, reducing curb cut widths, providing interconnections between adjacent sites, and use of side/parallel streets where feasible and appropriate.

The Town of Windham can help to realize the improvements by requiring them as part of the site redevelopment process for businesses along the corridor. Potential access management recommendations are described or included in Appendix E of this report, but it should be noted that their final location / implementation depends on specific development on the roadway and individual site specifics. However, the recommendations can be adopted by the Town as the overall guiding requirements to be met for this section of Route 302.

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- *Restripe Route 302 as a Three-Lane Cross Section (Within three years):* The current width of Route 302 in the study area (approximately 44 feet) would allow for restriping of the roadway to provide a center two-way left-turn lane, a single travel lane in each direction, and shoulders that could be used by bicyclists (five feet wide). This cross section would allow left turning vehicles on Route 302 to use the left turn lane and not restrict the movement of the through traffic. This would also assist left turning vehicles exiting the side streets / driveways to use the center turn lane to make a two stage left turn.

The Town has already had this proposed cross-section reviewed and approved by MaineDOT. Although the study area for this corridor study stopped at Mineral Spring Road, the cross-section should be extended further north if possible, at a minimum to the Assembly of God Church. This restriping to a three lane section may require some additional roadway work, such as increasing pavement depth, but would improve vehicular flow and overall safety with minimal cost (compared to roadway reconstruction / widening). Preliminary opinions of cost are provided in Chapter 4. Once the restriping has been done, we recommend that the Town request the MaineDOT to review and adjust the speed limits as appropriate. The MaineDOT is the only authority that has the jurisdiction to change the speed limits within this corridor.

- *Signalize Enterprise Drive (Within three years if warranted):* This would include full signalization of the intersection. The intersection will first need to meet warrants for signalization according to the Manual on Uniform Traffic Control Devices (MUTCD) and be approved by the MaineDOT. The following is a brief step by step approach for doing a signal warrant analysis:
  - Perform a minimum of 8 hours of traffic counts (typically 12 hours is done) on a weekday that typically captures the AM, noontime and PM peak hours at a minimum. This should include pedestrians and bicycles. These volumes need to be adjusted to “average” weekday volumes, typically through use of MaineDOT adjustment factors.
  - Do an intersection condition diagram that includes the lane uses on each approach to the intersection.
  - If development is proposed that would not have been included in the traffic count, that traffic needs to be added in to the traffic volumes.
  - Compare the adjusted volumes to the 8 signal warrants. Those are: Eight Hour vehicle volume, Four Hour vehicle volume, Peak Hour, Pedestrian Volume, School Crossing, Coordinated Signal System, Crash Experience, and Roadway Network. The intersection should not be signalized if it does not meet at least one of the above warrants; however, meeting one of the warrants does not necessarily mean that a signal should be installed. MaineDOT typically prefers at least the Four Hour vehicle volume warrant be met before signalization is considered.
  - Before a signal is installed, a capacity analysis should be done to identify if the existing number of lanes and lane uses are appropriate. It is not uncommon when signalizing an intersection to need to increase the number of approach lanes on the major street that previously had the right of way and was not required to stop.

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- *Alignment of Angler's Road with White's Bridge Road (Within Five Years, preferably sooner):* This project includes realigning Angler's Road across from White's Bridge Road. The resulting four-leg intersection would have more efficient operations than the current offset (i.e. 'T'-style) intersections. This project has been recommended for several years, and some work has begun to address the offset of the White's Bridge approach, but until the project is completed it remains the first priority for the corridor. The Town has recently acquired the necessary properties to move forward with this project.
- *Extension of Sidewalk (Immediately to Long Term):* Currently, there is no sidewalk from the intersection of White's Bridge Road northerly. The density of businesses and residences along that section of the corridor may not currently demand the need for a sidewalk, but as development occurs, a sidewalk will help to reduce vehicular traffic along the corridor and provide safe accommodations for pedestrians.

Construction of a sidewalk within this section of Route 302 needs to be considered carefully. It could be implemented immediately or as development occurs; however, the potential for widening Route 302 also needs to be considered such that sidewalks constructed in the next several years are not removed should Route 302 be widened in the future.

- *Extension of Manchester Drive to Enterprise Drive:* To minimize impacts from additional development, and to remove a portion of local trips from the Route 302 corridor, it is recommended that Manchester Drive be extended northerly to White's Bridge Road and possibly continue further northerly to intersect Route 302 opposite Enterprise Drive.

The Town recently updated their Ordinances. The Ordinances include numerous access management requirements such as; allowable number of curb cuts, sight distance requirements, curb cut spacing, corner clearances etc. These requirements are consistent with the techniques and recommendations identified as part of this study.

## Other Possible Long-Term Strategies

While these measures are anticipated to provide adequate roadway capacity to Route 302 for some time (ten to twenty years, even with additional development), the potential combination of left turn movements as well as high through volumes may contribute to an increase in crashes toward the long-term. Possible additional measures to address this are discussed as follows:

- *Widening of Route 302 (Ten to Twenty Years, preferably not needed):* The need for this improvement varies considerably based on the growth of the area and how well access management techniques are implemented throughout the corridor. The current two-lane section is already operating marginally during peak periods. With the implementation of the three lane cross section described previously, the corridor should operate better than it does today.

Widening Route 302 to a five lane cross section would require additional right-of-way, have impacts on the quality and quantity of stormwater, and could negatively impact properties along the corridor. For those reasons, every effort should be made to avoid the five lane cross-section. However, should volumes and capacity exceed a three lane cross-section, the five lane cross section may be needed, which would include two through lanes in each direction and a center two-way left turn lane or a series of dedicated left turn lanes.

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- *Center Medians on Route 302 from White's Bridge Road to Enterprise Drive (Twenty plus years):* If traffic volumes continue to increase, even with the measures recommended in this report put in place, it may be necessary to construct a center median where the recommended center left-turn lane would be. Based on published studies and previous projects completed by our office, as traffic volumes approach 28,000 or more vehicles per day, the ability to safely make left turns is severely restricted. As such, center medians may be needed along this section. Again, it should be noted that this step is not likely to require significant investigations for twenty years, but should be retained as a long-term option for the Town should long-term growth pose safety and operational concerns.

## Access Management

The long-term proliferation of full-access driveways is a major concern along Route 302. Most of Route 302 within this study area is within the urban compact. This means that unless the proposed development is forecast to generate more than 100 trip ends during a peak hour, MaineDOT does not have review authority and jurisdiction for review and approval of driveways is the responsibility of the Town. This puts considerable responsibility for good access management and planning on the Town. It is recommended that the Town work with home owners and local businesses to make access management part of any site redevelopment plan as well as proposed site plans, in keeping with the new ordinance requirements and guidelines enclosed with this report. A copy of applicable sections of the latest Town Ordinance is provided in Appendix E.

Access management typically consists of several aspects, which are listed as follows:

- *Sight Distances:* MaineDOT requires minimum sight distances for driveways along state-aid roadways; however, for projects within the Windham urban compact, the Town of Windham maintains sight distance requirements for all new driveways. (It should be noted that projects generating over 100 peak hour trip ends require a traffic movement permit from MaineDOT, even if within the urban compact area.) The Town has recently adopted sight distance requirements (See Appendix E) that are similar to those which are based on the AASHTO publication *A Policy on Geometric Design of Highways and Streets* and MaineDOT Entrance Rules.
- *Traffic Signals / Roundabouts / Major Intersection Controls:* An issue that can occur on many corridors with a mixture of side streets and high-volume commercial driveways is that of intersection spacing. Each major intersection with signalized or roundabout control should be assessed for potential queuing along Route 302 in order to minimize queues blocking driveways along the corridor. In addition, spacing between intersections is also an important consideration. In order to maintain movement of vehicles along Route 302 north of White's Bridge Road, MaineDOT requires traffic signal spacing ranging from 2,600 feet for 40 mph to 3,600 feet for 50 mph for locations outside the urban compact. If roundabouts are utilized, flow of traffic from location to location becomes less of a consideration and distances of 750 feet or more are adequate. At this point in time, the only location anticipated to require signalization in the near future in Enterprise Drive. However, any large development could trigger the need for signalization so this should remain a consideration as development occurs.

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- *Spacing between Driveways/Corner Clearance:* Just as major intersections with traffic control devices should be placed to minimize impacts upon driveways in their vicinity, distances from driveways best serve traffic flow and safety needs when sufficiently spaced away from major intersections as well as other driveways. As with sight distances, the Town has recently adopted spacing requirements (See Appendix E) similar to MaineDOT's Entrance Permit Regulations, which are based on the AASHTO publication *A Policy on Geometric Design of Highways and Streets*.
- *Spacing of Driveways along Three or Five-Lane Sections:* The arrangement of driveways is also potentially critical. For example, along some portions of Route 302 to the south of the study area, the proliferation of driveways on both sides of the street, causes for the potential of two vehicles headed toward each other within the two-way left turn lane. Appendix D shows some very basic examples of acceptable and unacceptable driveway configurations.
- *Number of Curb Cuts Per Lot:* Typically, the most-utilized aspect of access management is that of reducing the number of curb cuts or reducing potential turning movements at certain driveways. For example, if a small site has three full-access driveways, or worse, a single large curb cut with no clear delineation as to where vehicles should enter or exit, the potential for conflicts with other vehicles becomes significant. If the driveways are reduced to one or two, and appropriate signage is utilized, the ability for motorists to understand where they need to be will be made clear, and the potential for conflict significantly reduced. This can be a positive for owners since it can make the access safer for their customers / clients, by eliminating a driveway that could allow additional parking, or provide opportunity for additional landscaping.
- *Double Frontage Lots:* If a parcel has frontage along multiple streets (in particular, public ways or high-volume commercial driveways), it is considered to have double frontage. Many communities and to an increasing extent, MaineDOT, now require that full access be provided to the lower-volume driveway or street, where traffic may come to the main roadway via traffic control if it is available. If an additional driveway is to be permitted along the main roadway, it can be restricted to right turns only in order to minimize potential turning conflicts.
- *Driveway/Entrance Widths:* MaineDOT typically requires that a driveway be no more than 42 feet in width (not including radii). However, in the case of access to major traffic generators this width can be increased with inclusion of appropriate medians and traffic control devices. Ultimately, the driveway width should be based upon the needs of the site, as well as other factors such as pedestrian crossings and truck access. But in most cases, the width should not exceed the demonstrated need.
- *Consolidation of Roadways / Driveways:* Consistent with limiting the number of curb cuts along the corridor to reduce the number of conflict points, consolidation of driveways or even public accesses and roads has the same benefits. However, it can take several years to consolidate since it is typically done as part of a redevelopment of the property.

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- *Interconnection of Adjacent Properties:* This includes providing vehicular, pedestrian and bicycle connections between adjacent properties. This reduces the number of vehicles that need to turn onto Route 302 only to turn off at the next driveway. Providing this interconnection improves the capacity and safety of the corridor.

In summary, it is recommended that the Town of Windham evaluate each parcel along Route 302 through the approvals process when the site is developed, redeveloped, or required to get some form of permit from the Town, to ensure that each site takes into account access management measures and does so in context with adjacent parcels. By doing this, fewer turning conflicts will take place, safety will improve, and the need for major changes such as medians along Route 302 will be delayed or eliminated.

## Driveway Guidelines

Decisions concerning the number of entrances to allow for any one property and restriction of movements of these driveways are primarily dependant upon the planned use of the property and whether or not the property is a corner lot. The Town recently adopted new ordinances addressing driveway criteria. A copy of the ordinance requirements with specifics are provided in Appendix E, with some of the issues that are addressed identified as follows:

- Limits the number of curb cuts per lot
- Limits the allowable width of the curb cuts
- Identifies when permits are required
- Identifies maintenance responsibilities
- Requires entrances to “...provide safe access...”
- Identifies required sight distances (both cars and larger vehicles) and how to measure
- Indicates allowable slopes of entrances
- Identifies required capacity thresholds
- Addresses double frontage lots
- Addresses potential queuing problems
- Sets spacing requirements (between entrances)
- Sets corner clearance requirements (between entrances and public ways)
- Requires addressing appropriate “throat” lengths
- Requires separator strips

## Transportation Demand Management

With the forecast of continuing growth in traffic for Windham, and constraints to various transportation funding mechanisms the current norm, alternative measures to keep traffic volumes from increasing will have greater importance. One significant group of measures has been typically clustered under the umbrella of Transportation Demand Management (TDM). TDM measures include many techniques, and what follows is a brief discussion of many of the most common techniques:

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- *Staggered work hours:* Particularly for hourly employees, workers coming to and from a place of employment results in brief periods of time where roadways are often overwhelmed with traffic. Yet, it is unrealistic to redesign transportation infrastructure to accommodate brief periods of traffic surges. If employers can work with their employees to adjust work hours (perhaps from 7:30 to 4:30, or 9:00 to 6:00), peak periods can be extended, rather than intensifying the existing peak hour traffic volumes.
- *Carpooling/Vanpooling:* If drivers with similar hours commute to and from the same town, sharing rides can significantly cut down on peak hour traffic volumes. Ideally, if clusters of employers communicate with each other on worker needs, the potential for carpooling is increased. For larger employers with many workers from the same town, use of a vanpool with a driver may also be an option.
- *Bus Service:* Bus service is another transportation demand management technique. This technique could be especially helpful to connect the larger neighborhoods to the local businesses. An intra-town bus route that would allow residents and guests the opportunity to visit the downtown establishments without dealing with the traffic could be very beneficial and would help to reduce or slow the rate of growth in Route 302 traffic.
- *Secure Bicycle Facilities:* For some people with short commutes, one impediment to using a bicycle for a mode of transit is the lack of secured bicycle storage areas. Provision of such facilities can encourage workers interested in such travel modes particularly in the summer when traffic volumes are highest. Additional accommodations such as shower and changing room facilities are also beneficial in promoting walking and bicycling as viable modes of transportation.

Because employers may be skeptical at first, local agencies and municipalities can assist with incentives. For example, the Town of Windham, after determining that TDM measures are less costly than significant upgrades to local infrastructure upgrades, may elect to provide tax incentives, in the form of credits, to employers who volunteer the initiation of a TDM program. As time passes and more employers become involved, a consortium of employers can form groups to oversee TDM initiatives and coordinate them in the community.

While such measures were once relegated to large metropolitan areas, mandatory TDM requirements are already practiced in the City of Portland, and the Maine Department of Transportation has begun assessing fees for creation of various TDM programs in several regions of the state. Again, while there may be initial skepticism of such measures, in the long run they can ultimately save money, and help to preserve corridors such as Route 302 that are dealing with capacity constraints. In the end, the measures should be tailored to specific employers, as the impacts and ability to mitigate those impacts by a small employer would be different than a large one.

## Additional Potential Long-Term Options

It is recommended that access management, and potentially some TDM options be implemented and evaluated prior to any additional work on the following concepts. In addition, further evaluation should be undertaken in a comprehensive public manner, primarily focused on the Route 302 business community, before any final concepts or designs are proposed. Each business

# North Route 302 Corridor Plan

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should be consulted to determine how to mitigate any impacts that would result from potential changes.

## Extension of Manchester Drive

As development continues, primarily along the northwest side of Route 302 in the vicinity of the study area, even with proper access management techniques, additional traffic will utilize the corridor, increasing pressures on capacity and mobility. For some time now, the Town has been working with consultants and developers to construct a parallel roadway (Manchester Drive) along this side of Route 302 which currently begins at Route 35 west of Route 302 and continues northerly toward the Lowe's site.

Ideally, this roadway would be extended to White's Bridge Road as parcel development occurs along the planned corridor. Primary access points should be placed along this roadway instead of Route 302. Providing access from White's Bridge Road to Route 35 will likely remove local traffic from Route 302 and also improve safety, taking some pressure off driveways and access points to Route 302.

Further extension of Manchester Drive to Route 302 across from Enterprise Drive would also serve to preserve capacity along Route 302. It is recommended that the roadway have a two-lane cross-section, with auxiliary lanes as needed, and a minimum of a four-foot paved shoulder to allow for use by pedestrians or bicyclists wishing to access development parcels without resorting to the use of Route 302.

## Raised Center Medians from White's Bridge Road to Enterprise Drive

This report recommends the use of access management, transportation demand management, and other measures to maintain and improve operations along Route 302 from White's Bridge Road to Mineral Spring Road. The goal of these measures is to preserve a proposed three-lane cross section as long as possible, as the center two-way left-turn lane will maximize convenient access into existing and future businesses while limiting the amount of construction and environmental impacts as possible.

However, as volumes continue to increase, and if the various measures recommended are unable to result in continued safety along the corridor, widening of Route 302 to provide a five lane cross section should be considered. This determination would be related to a future safety analysis of the corridor to determine if crash levels have noticeably increased from the current levels. If crash rates continue to increase, it may trigger the need for center medians. However, this strategy should be considered only when all other options have been exhausted, and safety remains a concern. Certain openings in the median could be provided at select locations for protected left turn movements. Since center medians can restrict left turn movements along the corridor, the issues of inappropriate u-turns must be addressed.

The medians themselves, as they would be twelve to fourteen feet in width, would provide opportunities for Town-maintained or adopt-a-spot style plantings. The nature of the plantings could range from seeding of wildflowers to detailed shrubbery. The placement of the medians,

# North Route 302 Corridor Plan

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therefore, could result in a significant improvement on the visual aspect of the Route 302 corridor to act as a gateway treatment.

Again, it must be stressed that the goal of this Plan will be to minimize the impact to the corridor. But as the forecast volumes do indicate longer-term issues with the five-lane section, the Plan must accommodate potential changes to the section in order to preserve mobility and minimize safety concerns.

Route 302 is a State Highway on the National Highway System within the Town of Windham. As such; the Federal Highway Administration, MaineDOT and the Town all have a stake in what happens along the corridor. If it was identified that there was a safety issue, it would most likely be a collaborative effort between the three entities in identifying when and where the raised center medians would be constructed.

## Implementation of Options

Current forecasts for highway funding over the next several biannual cycles indicates that funding will not be available to implement any plan of significance along Route 302, simply due to budget constraints. As such, options will need to be phased, and other techniques/policies should be examined to delay or eliminate the need for implementation of the full array of options. Alternative funding sources that have worked in other communities that could be explored here include the following:

- Impact Fees - This includes a per vehicle fee for forecast vehicles through the corridor that originated from any new development within the Town. Another option would be to charge this per vehicle fee to any development within the corridor.
- TIF Districts - This would consist of the Town bonding improvements and using proceeds from additional tax revenues to pay off the bonds.
- Reimbursement - This would include new developments along the corridor expanding their required mitigation to include a slightly larger area and then being reimbursed as other development occurs along the corridor. This avoids spot improvements along the corridor.
- Other sources of funding - Since this is a State Highway on the National Highway System, Federal Highway Administration and MaineDOT have a vested interest in how it operates. Although funding is minimal at this time, these both may be sources for funding in the future.

# North Route 302 Corridor Plan

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## Chapter 4 Preliminary Opinion of Cost

### Opinions of Cost

As described previously, there are multiple roadway cross-sections proposed for this corridor depending on Annual Average Daily Traffic Volumes (AADT).

- Existing Cross-Section - Single 12 foot wide travel lane in each direction with 10 foot wide paved shoulders (Total pavement width 44 feet wide)
- Short Term Improvement - This would involve using the existing 44 foot wide pavement width but reallocating this width to a 12 foot wide center two-way left turn lane (ctwltl), single 11 foot wide travel lane in each direction and 5 foot wide paved shoulders (Total pavement width 44 feet wide). Since a portion of the existing shoulders would now become travel lanes, the existing shoulder pavement buildup needs to be reinforced (thicker) to support the new demand. This can be accomplished in one of two ways; either to overlay the entire width of the cross section (approximately 3.25 inches of pavement) or to “box” cut out a portion of the existing shoulder gravel and replace it with pavement.
- Long Term Improvement - Because traffic volumes on Route 302 are so significant, the Short Term Improvement described above will soon (within ten years) need to be widened to include not only the ctwltl, but two travel lanes and eight foot paved shoulder in each direction, for a total of a five lane cross-section (Total pavement width of 72 feet wide). This total 72 foot wide cross-section width is wider than the existing 66 foot wide right of way, therefore, additional right of way will be needed to accomplish this widening.
- Additional Long Term Improvement - As additional roadways and/or driveways are introduced along the corridor and traffic volumes continue to increase, it may be necessary for safety purposes to convert the ctwltl to a raised median and restrict left turn movements along the corridor to either signalized intersections or roundabouts. (Total pavement width of 72 feet wide)
- Sidewalk - Currently there are no sidewalks from the intersection of White’s Bridge Road north along the corridor. Should the Town want to promote pedestrian activity to the north to existing or future uses within the study area, a sidewalk is recommended. We recommend that the sidewalk be factored in as improvements occur along the corridor, but recommend that it be constructed concurrently with the five lane cross-section. This will reduce the cost of the sidewalk and avoid requiring reconstructing portions of the sidewalk during the widening of the existing cross-section.

A preliminary opinion of probable construction cost was determined for the above scenarios on a per foot basis. The preliminary opinions of cost do not include; improvements at the White’s Bridge Road / Anglers Road signalized intersection, acquiring additional right of way, removal of ledge, signalization of other intersections. Additional potential environmental / stormwater

# North Route 302 Corridor Plan

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mitigation is discussed separately, and has the potential to add significant costs to the widening scenarios. The preliminary opinions of cost are as follows with breakdowns provided in Appendix F. The total length of the study area is approximately 7,900 feet (Whites Bridge Road to Assembly of God Church), which includes approximately 600 feet of signalized intersection improvements at White's Bridge / Anglers Road.

- Conversion of existing two lane cross-section to a three lane cross-section inclusive of a center turn lane - \$190 - \$200 per linear foot (Total corridor cost of approximately \$1,387,000 - \$1,460,000).
- Conversion of three lane cross-section with center turn lane (item 1) to five lane cross-section - \$430 per linear foot (Total corridor cost of approximately \$3,139,000). Since it is well beyond the scope of this study; acquisition of right-of-way, costs associated with stormwater quality and quantity management is not included but would be expected to be significant.
- Conversion of the center turn lane to raised median with loam and seed \$140 per linear foot (Total corridor cost of approximately \$1,022,000)
- Construction of a sidewalk (Assumes it is constructed concurrently with the roadway widening and includes vertical bituminous curbing) - \$120 per linear foot (Total corridor cost of \$876,000)

It is anticipated that signalization of Enterprise Drive would be the financial responsibility of the development that triggers the warrant for the signalization. The extent of this mitigation could vary significantly depending on the development proposed and what the cross-section of Route 302 is at the time of signalization. It is also anticipated that MaineDOT will provide some funding for the realignment of Anglers Road with White's Bridge Road. A full capacity and queue analysis would need to be performed for this intersection for the Weekday AM and PM peak hours as well as a Saturday peak hour to determine exactly what improvements will be necessary; however, it is anticipated that the mitigation shown on Sheet 7 of the plans provided in Appendix B are a good representation.

## Potential Right-of-Way Costs

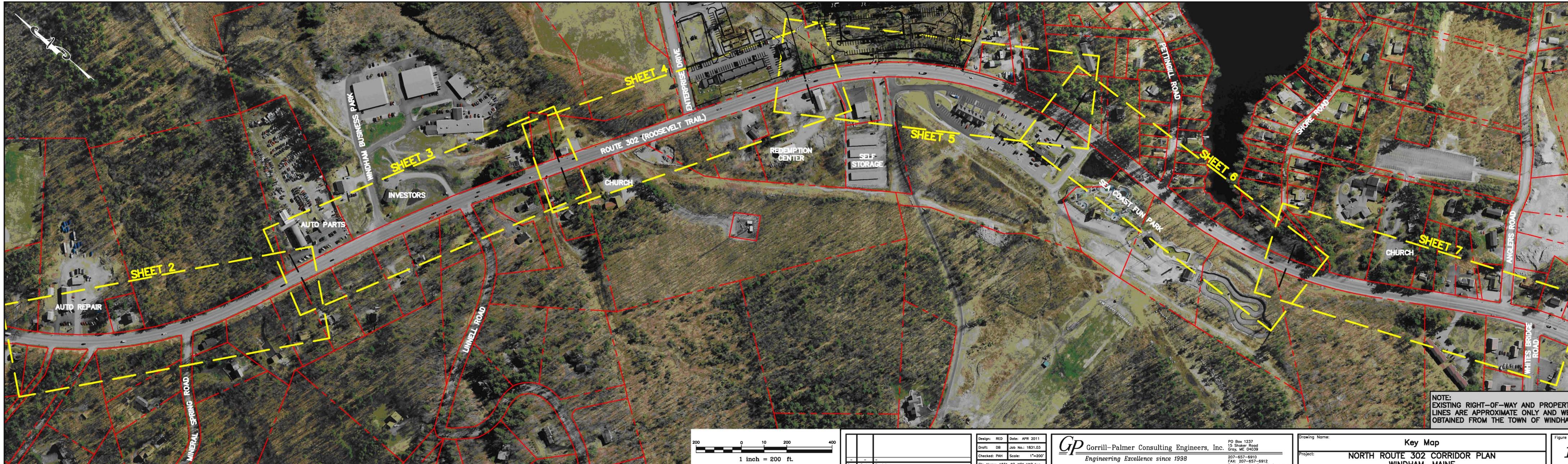
The three lane cross section described previously would not require any additional right-of-way than is available today. However, widening Route 302 to a five lane cross section would require additional right-of-way throughout the corridor, not only to accommodate the proposed pavement width but also utilities. Trees would also need to be removed to accommodate clear zone requirements. This additional right-of-way acquisition may negatively effect properties along the corridor leaving them non-conforming.

## Potential Environmental / Stormwater Costs

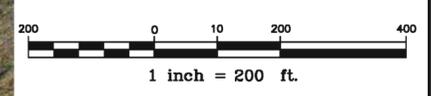
# North Route 302 Corridor Plan

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There are at least two factors that would need to be addressed with the widening of Route 302 in this area. The first factor is that some of the widening would take place within sensitive watersheds and stormwater quality would need to be addressed to satisfy DEP. The second factor is that the widening of Route 302 could add four to five acres of impervious area, which would require stormwater quantity mitigation to satisfy DEP. Because the overall pavement width does not change, these issues would not be a factor in the conversion of the roadway section from its existing conditions to the proposed cross section that includes a single travel lane in each direction with center turn lane; however, these would be relevant in adding a travel lane in each direction to provide for a five lane cross-section. It is impossible to identify at this level and scope of study the extent of the stormwater / environmental mitigation required, but based on our past experience with roadway reconstruction this could cost \$100,000 to \$150,000 per impervious acre, which does not include acquisition of right-of-way.



NOTE:  
EXISTING RIGHT-OF-WAY AND PROPERTY  
LINES ARE APPROXIMATE ONLY AND WERE  
OBTAINED FROM THE TOWN OF WINDHAM.



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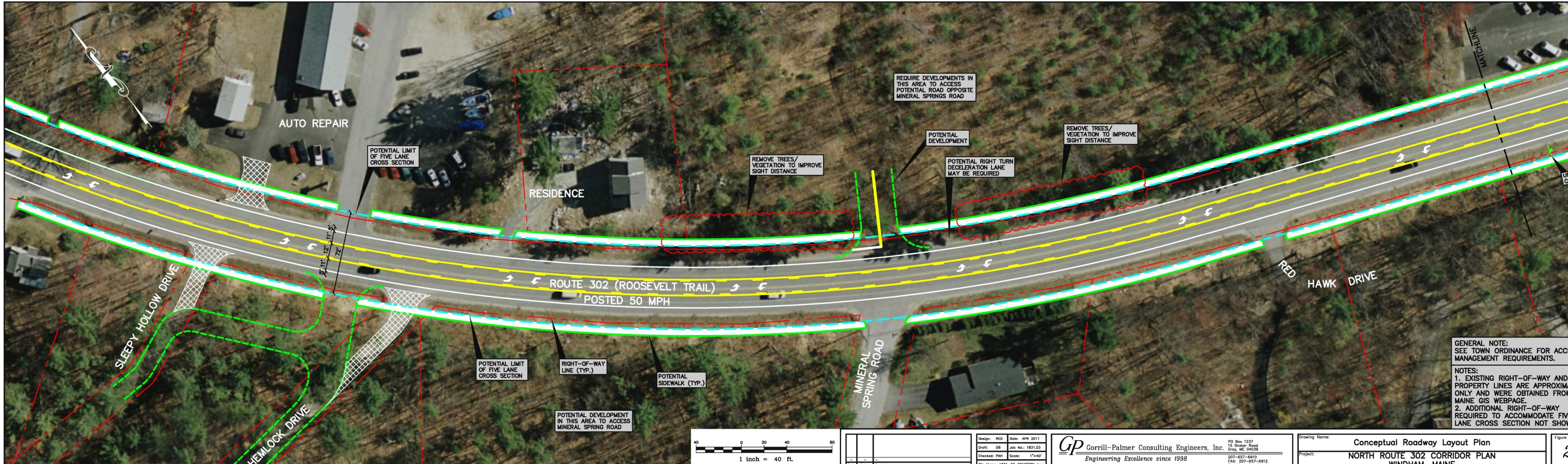
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Drawing Name:	Key Map
Project:	NORTH ROUTE 302 CORRIDOR PLAN WINDHAM, MAINE

Figure No.  
**1**



REQUIRE DEVELOPMENTS IN THIS AREA TO ACCESS POTENTIAL ROAD OPPOSITE MINERAL SPRINGS ROAD

POTENTIAL LIMIT OF FIVE LANE CROSS SECTION

REMOVE TREES/VEGETATION TO IMPROVE SIGHT DISTANCE

POTENTIAL DEVELOPMENT

REMOVE TREES/VEGETATION TO IMPROVE SIGHT DISTANCE

POTENTIAL RIGHT TURN DECELERATION LANE MAY BE REQUIRED

RESIDENCE

ROUTE 302 (ROOSEVELT TRAIL)  
POSTED 50 MPH

RED HAWK DRIVE

SLEEPY HOLLOW DRIVE

HEMLOCK DRIVE

MINERAL SPRING ROAD

POTENTIAL LIMIT OF FIVE LANE CROSS SECTION

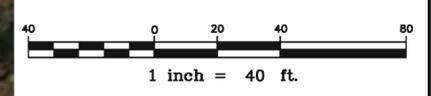
RIGHT-OF-WAY LINE (TYP.)

POTENTIAL SIDEWALK (TYP.)

POTENTIAL DEVELOPMENT IN THIS AREA TO ACCESS MINERAL SPRING ROAD

GENERAL NOTE:  
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- NOTES:
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  - ADDITIONAL RIGHT-OF-WAY REQUIRED TO ACCOMMODATE FIVE LANE CROSS SECTION NOT SHOWN.



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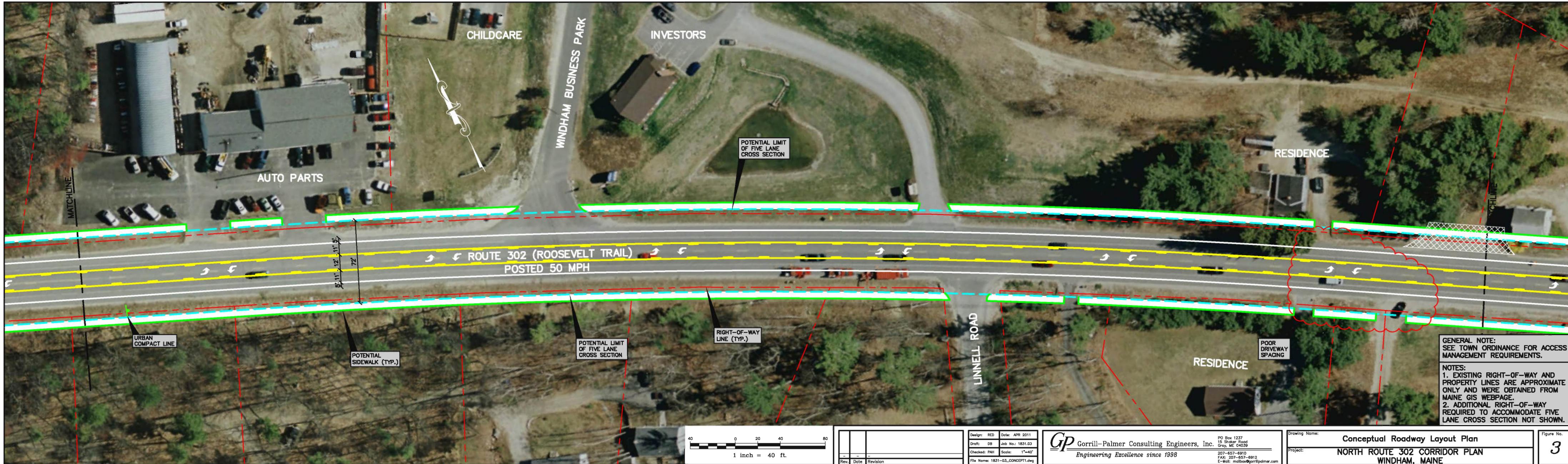
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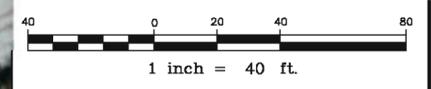
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Project: **NORTH ROUTE 302 CORRIDOR PLAN  
WINDHAM, MAINE**



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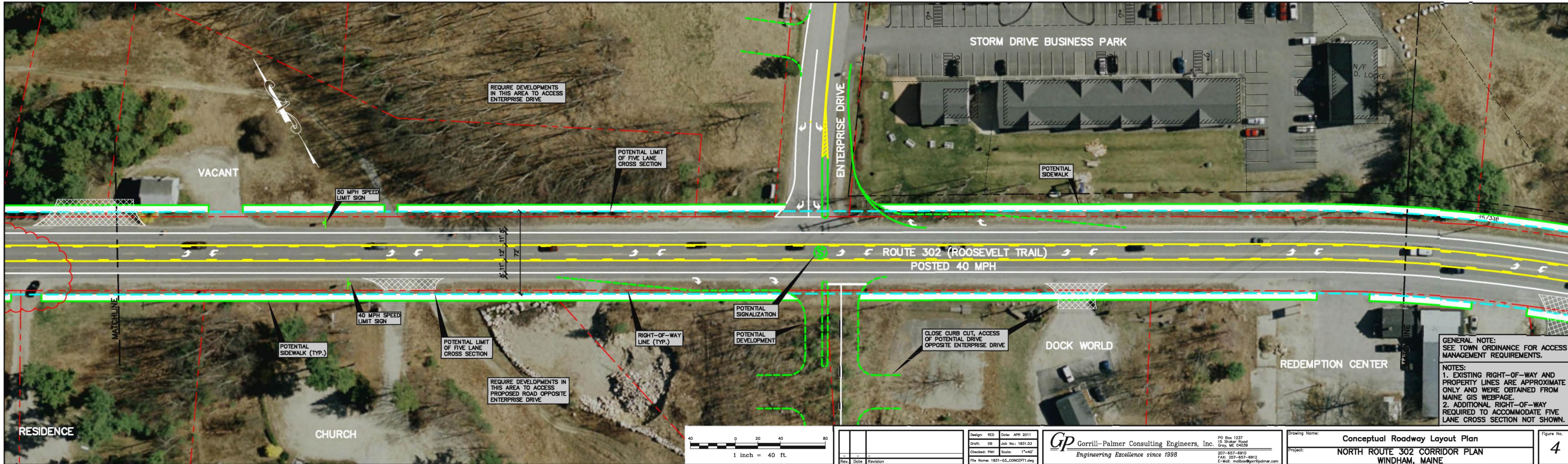
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REQUIRE DEVELOPMENTS  
IN THIS AREA TO ACCESS  
ENTERPRISE DRIVE

POTENTIAL LIMIT  
OF FIVE LANE  
CROSS SECTION

50 MPH SPEED  
LIMIT SIGN

POTENTIAL  
SIDEWALK

ROUTE 302 (ROOSEVELT TRAIL)  
POSTED 40 MPH

40 MPH SPEED  
LIMIT SIGN

POTENTIAL  
SIDEWALK (TYP.)

POTENTIAL LIMIT  
OF FIVE LANE  
CROSS SECTION

RIGHT-OF-WAY  
LINE (TYP.)

POTENTIAL  
SIGNALIZATION

POTENTIAL  
DEVELOPMENT

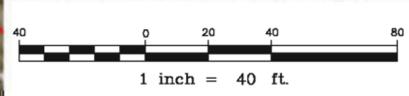
CLOSE CURB CUT, ACCESS  
OF POTENTIAL DRIVE  
OPPOSITE ENTERPRISE DRIVE

DOCK WORLD

REDEMPTION CENTER

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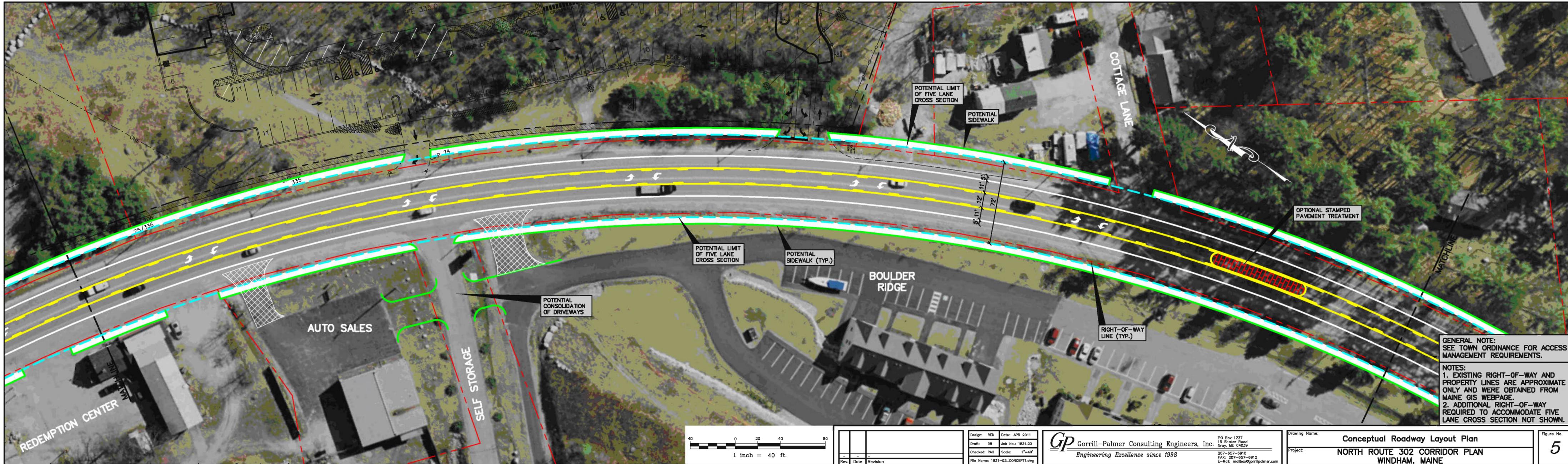
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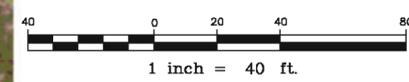
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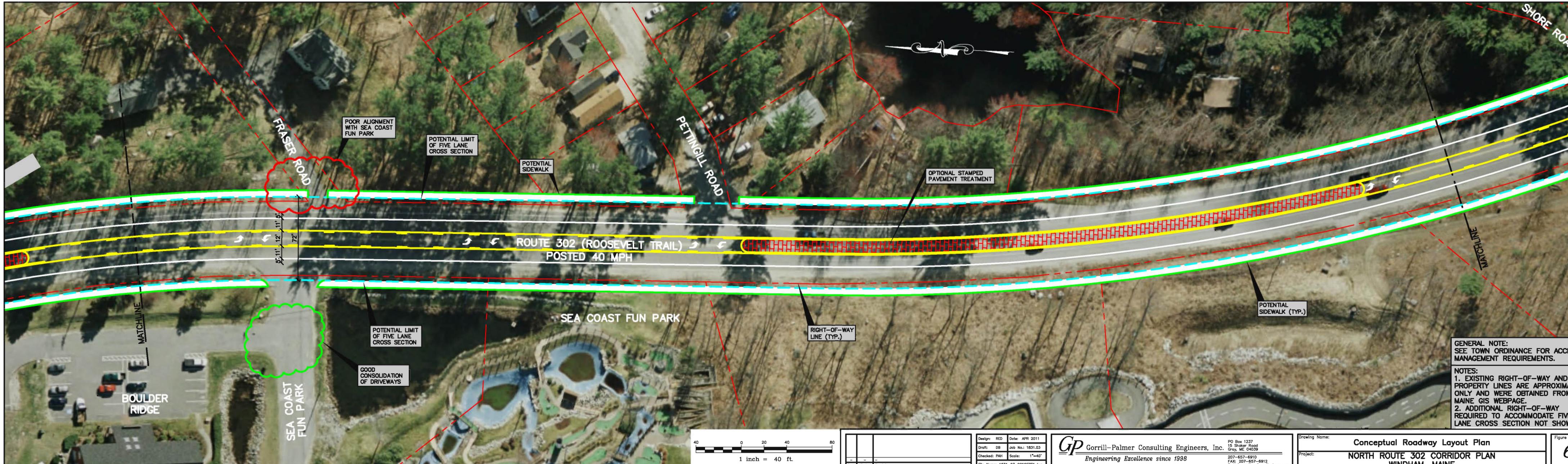
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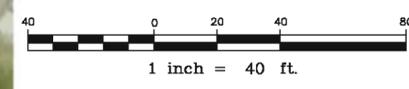
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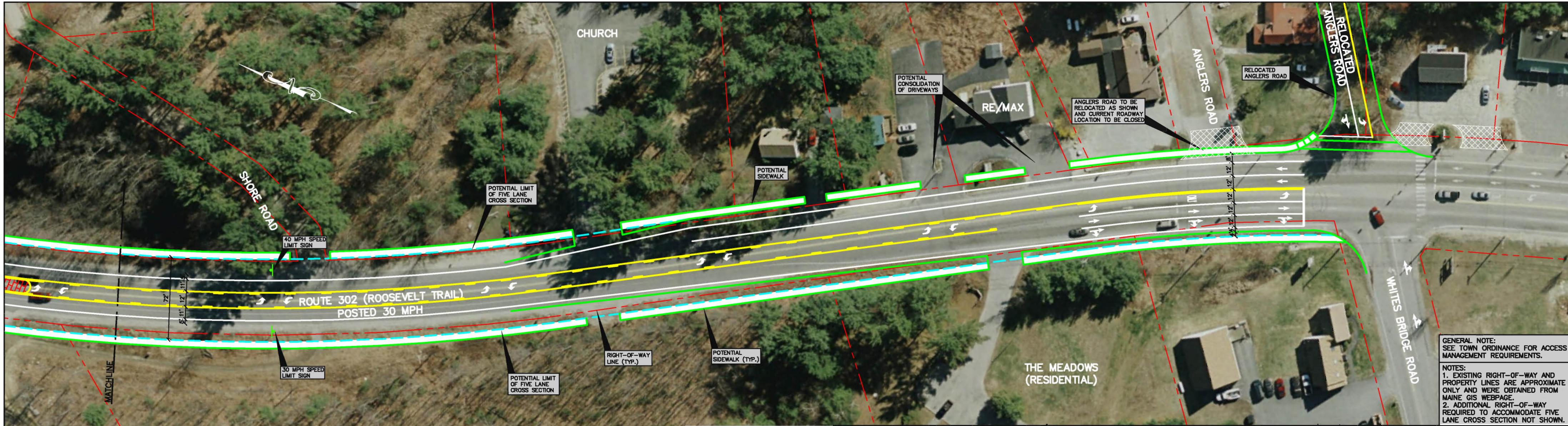
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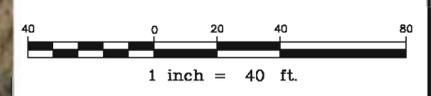
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