Scope of Work

The following Scope of Work has been prepared to combine efforts wherever appropriate (e.g. meetings, mapping) and also sets forth separate yet related activities where needed (such as the development of concepts). We believe this approach will result in a comprehensive scoping effort that is streamlined and efficient. The VHB Team proposes the following Scope of Work:

Task A: Project Kick-Off Meeting

The VHB team will work with the CCRPC Project Manager to schedule a kick-off meeting with the CCRPC and Town staff to initiate a dialogue and exchange information about the three projects. The roles and expectations for attendees as well as the specifics of the scoping study process will be discussed and protocols will be agreed upon consistent with CCRPC and Town goals. VHB will prepare an agenda for the meeting, and arrange to collect available information prior to the meeting.

Goals for the meeting will be as follows:

- Discuss stakeholders' roles and respective responsibilities, general goals of the project, project schedule, approval processes, questions and answers
- Review public engagement goals, communication protocols for team
- Discuss conclusions of previous studies
- Collect and/or request available information not collected prior to the meeting
- Review current action items with schedule for completion
- Document meeting notes to attendees

In advance of the meeting, the VHB Team will complete an initial assessment of existing information, in order to use the meeting to solicit additional potential sources of information, as well as to ensure that the Project Team has access to the most current data available.

Deliverables: VHB will prepare an agenda and minutes of the meeting and distribute them to participants and other appropriate parties.

Task B: Compile Base Map/Document Existing Conditions

There is a lot of existing information available about the project area, including recommendations from prior studies, aerial mapping, existing plans, traffic data, natural resources data, tax maps, etc. The VHB Team will meet with Town staff to discuss available information, compile this information, and conduct field reconnaissance to assemble a complete picture of available information. The VHB Team will:

1. Compile a **base map** using available mapping including VT digital orthophotos, digital parcel maps for the Town and other natural resource-based GIS data available from the CCRPC or the Vermont Center for Geographic Information (VCGI). Existing conditions to be noted include presence of existing bike and pedestrian facilities, roadway widths, drainage features, traffic signal information, topographic data, natural resources, ROW/parcel widths, roadway ownership, and other items as appropriate. VHB will obtain the digital GIS tax parcels from the Town, and include this information on the orthophotos base mapping. We assume that the Town will provide the property owner information to include on the base mapping. Additional items will include: natural resource constraints, utilities, historic and archaeological constraints, etc.
2. Collect available **traffic information** such as the Annual Average Daily Traffic counts, turning movement counts, bike and pedestrian counts and crash data. Since the turning movements were conducted at the Lakeshore Drive/Blakely Road intersection in 2014 we assume traffic data collection shall be limited to existing available data and no field counts will be required. We will also obtain a copy of the existing traffic signal plan for the intersection. VHB will also compile available and relevant existing reports and studies, adjacent intersection studies

and nearby traffic impact studies, as available. We will document crash history, highway rights-of-way limits, existing (2016) traffic conditions, and document the intersection performance including level-of-service, delays and volume/capacity ratio. This information will be prepared into a brief technical summary memorandum with graphics, as appropriate.

3. Identify **existing utilities** in the project area using available information. We will contact Colchester Public Works Department; Colchester Fire Districts #2 and #3; Fairpoint; GMP; Comcast; and Vermont Gas Systems requesting copies of their utility record plans and other pertinent utility information. Team member Aldrich+Elliott has also worked extensively on utility design and installation in the project area and will provide valuable insight. Using the information collected, the general location of existing utilities will be shown on the base mapping.
4. Collect **land use** data within the study area to include general land uses and projected growth. Existing bike and pedestrian generators and destinations will be identified and documented. The existing conditions plan will include planned developments identified by the Town and relevant information from available corridor and master plans.
5. Identify and document the **cultural and environmental resources** within the study area. These resources include, but are not limited to, the following:
    - Wetlands and floodplains
    - Archaeological and historic sites/districts/structures
    - Air and water quality
    - Noise sensitive land uses
    - Fish and wildlife habitats
    - Endangered/threatened species/habitats
    - Community character (local aesthetics)
    - Socioeconomic characteristics
    - Agricultural lands
    - Land and Water Conservation Funds lands (Section 6(f))
    - Public and recreational land (Section 4(f))
    - Utility impacts
    - ROW of impacts
    - Climatology data
    - Precipitation data
    - Topography
    - Hydrology
    - Soils data
    - Groundwater table
    - Stormwater treatment
6. Conduct **field investigations** to supplement the available information research and to observe traffic operations in conjunction with pedestrian, bicycle, and transit activity. This field work will focus on inventorying elements important

to the project and the development of the recommended alternatives, such as land use, traffic patterns, sidewalks, crosswalks, primary pedestrian and bicycle routes, signal phasing and operation, and the presence of utilities. During the field review, existing conditions mentioned above will be recorded in field notes, by taking photographs and by indicating them on the available high resolution aerial photos.

Field investigations relative to stormwater management will include inventory and visual inspection of existing infrastructure within the Town right-of-way, and beyond for systems that extend into other public streets within the study area. The field inspection will include: roadways, driveways, culverts, open channel and closed pipe drainage infrastructure, bicycle/pedestrian facilities, utility setbacks, and conflicts or obstacles within the right-of-way. Both natural and man-made outfall points will be included in this assessment. Rim or catch-basin elevations and pipe invert elevations will be acquired for all existing closed-pipe infrastructure using sub-decimal accurate Global Positioning System (GPS). In addition, the size and material of system components will be verified and tracked where this information is not already included in the Town's stormwater infrastructure inventory. Wherever possible, we will collect this infrastructure data in a manner that allows it to be easily incorporated into the Town's recently-acquired VUEWorks Asset Management System; this may include preparing data sheets or electronic forms for existing stormwater infrastructure within the study area to document conditions and identify deficiencies.

7. Obtain the most current version of the **stormwater infrastructure** inventory developed as part of Colchester's Integrated Water Resource Management plan (http://colchestervt.gov/291/Maps-Data). This will include existing GIS mapping of stormwater infrastructure, as-built information, the exact locations of existing outfall points, as well as available site plans and future development efforts. The VHB Team will use this information to inform field investigations and to pre-screen areas where existing conditions have the potential to impact project design. One example of such conditions is concern about the outfall of the 36" pipe that passes under West Lakeshore Drive and conveys stormwater to the Bay at the western edge of the Moorings Marina. While the chambers installed here trap some sediment, water levels in the chambers are often too high to allow adequate settling, and the chambers are difficult to pump and clean out.
8. Complete a desktop evaluation using readily available information on the **physical characteristics** of the study area, including topography, hydrology, and soils data (with particular attention to soil series that often lend themselves to infiltration-based stormwater designs), as well as elevation of seasonal high groundwater and local precipitation data.

   Information on potential natural resource constraints such as wetlands, floodplains, and wildlife habitat, will also be compiled. In addition, as part of this data compilation effort, the Project Team will identify large undeveloped areas,

if any, that may be suitable for stormwater treatment within the study area. This information will inform field investigations, as well as later efforts to develop planning and design criteria for the project.

> Information about planning-level soil suitability for infiltration-based stormwater management practices was recently evaluated by Stone as part of the Malletts Bay Initiative.

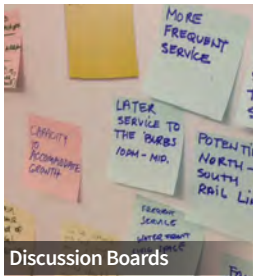
Information on potential natural resource constraints such as wetlands, floodplains, and wildlife habitat, will also be compiled. In addition, as part of this data compilation effort, the Project Team will identify large undeveloped areas, if any, that may be suitable for stormwater treatment within the study area. This information will inform field investigations, as well as later efforts to develop planning and design criteria for the project.

Deliverables: The VHB Team will prepare base mapping for the project and distribute to the Town and CCRPC. Field notes, photographic documentation of existing conditions, resource mapping, utility mapping, etc. will be compiled and distributed to the CCRPC and Town as appropriate.

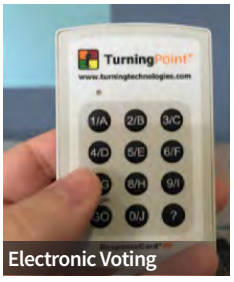
Task C: Local Concerns Meeting and Purpose and Need Statement

The VHB Team, with the CCRPC and Town's assistance, will organize, moderate, and document a Local Concerns Meeting that will cover all three components of the project. This will be a publically noticed meeting seeking input from adjacent land/business owners and local citizens, as well as representatives from the CCRPC and Town. At this meeting the project definition process will be explained in general terms. We will welcome comments and concerns from the attendees regarding the project. The purpose of the meeting is to develop a clear understanding of the


Dotmocracy Exercises



Discussion Boards



Electronic Voting


Visioning/Charrettes


Legos


Social Media Tools

VHB uses a variety of public outreach techniques to increase overall public engagement.

perceived transportation and stormwater concerns within the project area. The project goals and objectives will be discussed. The meeting can include a field visit to the project site if the CCRPC and Town feels this would be beneficial.

After the Local Concerns Meting, VHB will prepare a draft Purpose and Need Statement (possibly prepared in three parts to reflect the separate project components) for review and approval by the CCRPC and Town that will consider input from the CCRPC and Town as well as public input received at the Local Concerns Meeting. This statement will clearly define the project needs and succinctly explain the deficiencies within the project area that the alternatives are to address. This statement will help to determine which alternatives fulfill the projects goals and needs. Upon the CCRPC and Town's review, a final version will be prepared.

Deliverables: VHB will prepare and distribute meeting minutes and presentation materials. Submittal of draft and final Purpose and Need Statement to the CCRPC and Town for review and acceptance.

Task D: Identify Land Use Context

The VHB Team, with assistance from the CCRPC and Town, will identify existing and proposed land uses within the project area, which consists of a mix of recreational, residential and commercial uses. Additionally, we will examine the overall context of the intersection in relation to existing and planned pedestrian and bicycle facilities. We will observe existing patterns and anticipate predicted patterns based on planned initiatives, and assess how the proposed alternatives fit with these patterns.

Task E: Planning and Design Criteria

The VHB Team will develop planning and design criteria for the project. The criteria will draw from the Town of Colchester's Public Works Specifications and Standards. Applicable design standards and any performance information available from the Vermont Agency of Natural Resources will also be reviewed and considered in developing the design criteria, as well as targets for stormwater pollutant load reductions as framed in the Lake Champlain Phosphorus TMDL. The criteria will emphasize the use of green stormwater infrastructure practices wherever possible.

AASHTO, FHWA, and VTrans guidelines will be used for the evaluation of alternative transportation improvements including bike lanes, sidewalks, paths, crosswalks and signing. The Vermont Pedestrian and Bicycle Facility Planning and Design Manual; National Association of City Transportation Officials (NACTO) Urban Street Design Guide; Americans with Disabilities Act Guidelines and other relevant policies and standards will all be used to formulate the design criteria for the project. The planning and design criteria selected for the project will be summarized in a technical memo prepared in two parts; one for stormwater infrastructure and one for transportation considerations.

Task F: Stormwater Infrastructure Assessment

Using as-built information and data collected during the field investigation, the VHB Team will select and apply a suitable modeling tool to assess the capacity of the existing stormwater system in the study area and identify line segments with insufficient slope or capacity during the design storm event(s) selected in consultation with the Town. Any critical structural deficiencies or hydraulic restrictions will be documented in a technical memo.

Task G: Sub-basin Delineation, Watershed Description and Hydrologic Analysis

The VHB Team will delineate a drainage area or sub-basin for each stormwater system within the study area (as defined in the RFP). Delineation of these drainage areas may extend beyond the immediate project boundaries in order to capture the entirety of each area. Sub-basin boundaries will be field verified, and then used to complete a hydrologic analysis of the existing stormwater systems for various storm events. The results of the hydrologic analysis will be summarized in a technical memo, and will include a map showing the sub-watershed boundaries.

Deliverables: The VHB Team will prepare and distribute a technical memo describing the sub-watershed boundaries and their characteristics.

Task H: Develop Conceptual Alternatives

1. Stormwater Management

The Town has indicated interest in considering two possible suites of alternatives – one that would ensure stormwater discharges from Town-owned property within the study area meet all local and state water quality standards for stormwater discharges, and a second that would ensure all stormwater discharges from Town-owned property exceed local and state standards. The VHB Team will develop conceptual plans and narratives that address these suites of alternatives, and will likely include one or more of the following elements:

- Emphasizing low impact development techniques and infiltration-based Best Management Practices (BMPs) in areas where the soils and groundwater conditions are suitable;
- Adding curb to optimize collection of surface runoff from roadways, or to direct runoff to specific areas for treatment;
- Removing strategic sections of curb to encourage disconnection of runoff from the closed drainage system;
- Seeking opportunities to implement stormwater management measures concurrently with either the West Lakeshore Drive pedestrian/bicycle and East/West Lakeshore Drive and Blakely Road intersection improvements, or the addition of municipal sewer;

- Using the State boat launch parking area for stormwater retention and/or treatment; and,
- Pumping stormwater from Town roadways to publicly-owned upland areas with suitable soils for retention and treatment.

2. Pedestrian and Bicycle Facilities

Alternatives aimed to mitigate deficiencies identified as part of the study will be developed using information obtained during the site visit, appropriate guidelines, specifications, and design standards, including the NACTO Urban Street Design Guide; Americans with Disabilities Act Guidelines; the Vermont Pedestrian and Bicycle Facility Planning and Design Manual; the VTrans Guidelines for Pedestrian Crossing Treatments; and other applicable State and Federal guidelines. Although there is no design at this stage, familiarity with these guidelines ensures that the alternatives developed are practical and appropriate from a design standpoint. Alternatives will include sidewalks, bike lanes, shared use paths, shared lane markings, off-road facilities, and a combination of these measures. We will use input from the CCRPC and Town and the Local Concerns Meeting to assist in development of alternatives. We will discuss various types of facilities with the CCRPC and Town early on in the project to identify any alternatives that should be eliminated from consideration, or any others that should be added to the listing above..

The following will be considered during development of alternatives:

- Relevant previous studies, reports, or other information obtained from the CCRPC and Town
- Planned future facilities such as bike lanes and sidewalks
- Stormwater treatment
- Safety and mobility
- Right of way and private property impacts
- Location of existing features and potential constraints
- Need for new or improved pavement markings and signage

3. Capacity Improvements at the Lakeshore Drive/Blakely Road Signalized Intersection

Alternatives aimed at improving levels of service and better accommodate pedestrians and bicyclists will be investigated. Appropriate guidelines, specifications, and design standards, including the NACTO Urban Street Design Guide; the Highway Capacity Manual; the MUTCD;, and FHWA Roundabout Design Guide.

VHB will compile available and relevant existing reports and studies, adjacent intersection studies and nearby traffic impact studies, as available. We will also will document crash history, highway rights-of-way and any potential environmental

constraints. VHB will also evaluate existing (2016) traffic conditions and document the intersection performance including level-of-service, delays and volume/capacity ratio. This information will be prepared into a brief technical summary memorandum and maps, as appropriate.

VHB will develop future year (2036) design hour traffic volumes, using baseline growth and information about planned developments provided by the Town. Trip generation will be approximated using available Institute of Transportation Engineers (ITE) or documented trip generation rates.

Based on our initial investigations and understanding of the intersection, we anticipate the following concepts will be evaluated:

- Optimizing the signal timing to improve levels of service
- Providing advance, rather than exclusive, pedestrian phases
- Adding an additional through lane for eastbound West Lakeshore Drive and westbound Blakely Road at the intersection so that throughput can be increased
- Replacing the current intersection with a roundabout

The development of concepts will include the review of the previous alternatives developed under the 2015 Bayside Build-Out Analysis prepared by the CCRPC. Potential changes to traffic volumes resulting from the various build-out scenarios will be factored into the discussion of alternatives at the intersection. Conceptual alternatives will include immediately implementable options, in addition to possible medium term and long-term recommendations for the intersection.

The foregoing alternatives, and others as identified through the public involvement process, will be developed by the VHB Team and coordinated with the CCRPC and Town staff to determine if they are compatible with the CCRPC and Town's needs. Alternatives determined to be viable will be further developed to produce conceptual plans that include key design features, approximate construction costs, resource and ROW impacts, earthwork, and typical sections and details of the proposed improvements. The VHB Team will prepare an evaluation matrix that contains information concerning the recommended improvements; impacts assessed; the need to acquire Right-of-Way; cost estimates for further planning, design and construction cost of the project; and any permits required to aid in identifying a preferred alternative.

Deliverable: For each improvement, a conceptual design will be prepared that includes a technical assessment of the advantages and disadvantages of each project such as functionality, cost, public sentiment, constructability, maintenance concerns, and any required permits or easements. Conceptual

designs of alternatives will be submitted to the CCRPC and Town for review and comment.

Task I: Identify Right-of-Way Issues

VHB will obtain the ROW and parcel information within the project area based on the Town's tax parcel database and other field-identified information. The ROW and parcel information will be overlaid onto our base mapping. This information will identify public/private ownership and any existing easements or restrictions such as Act 250 permits on any adjacent properties. The conceptual alternatives will be overlaid in order to conceptually estimate levels of ROW impact resulting from each alternative.

Task J: Identify Utility Conflicts

VHB will identify and assess public and private utilities within the project area where they would constrain or be impacted by the proposed improvements. Overhead utilities are prevalent within the project area and will be inventoried during a VHB site visit. As part of this visit we will take note of how far away from the roadway the utility poles are located. We will request information on underground utilities from the CCRPC and Town's DPW and private utility providers such as Vermont Gas. Using this information we will estimate the extent of impacts and potential relocations anticipated under the various alternatives.

Task K: Identify Resource Constraints and Permitting Requirements

The VHB Team will review natural and cultural resource issues including wetlands, surface waters, floodplains, river corridors, lake shorelands, flora/fauna, endangered species, storm water, hazardous material sites, forest lands, historic, archaeological and architectural resources, 4(f) and 6(f) public lands, and agricultural lands. We will identify potential impacts on these resources and permitting requirements, including the potential for review under Act 250.

Historic resources will be reviewed by VHB to determine potential impacts to those resources. This will include a reconnaissance-level survey for historic resources. UVM Consulting Archeological Program will conduct an Archaeological Resources Assessment to determine if any of the proposed project area may be archaeologically sensitive.

Because a series of alternatives has not yet been selected, all environmental resource work will include the areas in which all proposed alternatives will take place. Recommendations for the effects on environmental resources, along with anticipated permit requirements for each alternative, will be assessed and included in the appropriate study.

VHB will contact state and federal resource agencies (e.g. Agency of Natural Resources, Department of Fish and Wildlife, Corps of Engineers) to ascertain the presence or absence of resources in the project area. If resources are found to be present, we will summarize the extent to which resources may or may not be impacted for each alternative.

The VHB Team will estimate the new, redeveloped and existing contributing surface areas resulting from each alternative, as well as an assessment of what will be required to obtain a stormwater discharge permit, if needed. An estimate of the area of disturbance resulting from the projects will be included to assess the extent of mitigation required under the National Pollutant Discharge Elimination System (erosion prevention and sediment control) permit.

VHB will incorporate stormwater infrastructure into the alternatives. Because stormwater treatment will play an important role in selecting the preferred alternatives, each alternative will incorporate treatment to the extent possible.

Deliverable: Resource mapping and copies of correspondence with the contacted resource agencies. Additionally, the VHB Team will prepare Historic and Archeological Resource memorandums summarizing our findings and recommended actions to be undertaken during the design phase.

Task L: Alternatives Presentation

The VHB Team, with the CCRPC and Town's assistance, will organize, moderate, and document an Alternatives Presentation Meeting. VHB will present the outcome of the alternatives investigations at the meeting to solicit public input. This will likely be conducted at a Selectboard meeting or could be an independent public meeting specifically scheduled to discuss the many project issues. This meeting will be publically warned, and the various alternatives, pros and cons, the evaluation matrix, and supporting documentation will be presented. The desired outcome is selection of a series of preferred alternatives by the CCRPC and Town based in part on public input.

Deliverables: Meeting notification, alternatives, meeting agenda and meeting notes.

Task M: Selection of Preferred Alternatives

Following the Alternatives Presentation Meeting the VHB Team will meet with the CCRPC and Town Project Manager and the Project Committee to discuss the alternatives and make recommendations regarding the preferred alternatives for the project. VHB will also meet with the Colchester Selectboard and present a summary of the scoping process, the alternatives developed, pros and cons of each alternative, and comments made by the Project Committee, the public and any other commenting party.

Deliverable: Deliverables: VHB will prepare and distribute a summary of the meetings and a list or table of the preferred alternatives.

Task N: Scoping Reports

1. Stormwater Management Report

Ultimately, the information developed through the investigations will be documented and compiled by the VHB Team in a Stormwater Management Report. The Report will include:

- A summary of existing natural resource constraints and potential resource impacts;
- A synopsis of the alternatives considered, including benefits and impacts;
- Opportunities to coordinate stormwater improvements with other infrastructure work in the study area; and
- A final recommendation for a suite of stormwater management measures.

2. Scoping Report(s) for Transportation and Intersection Projects

Following the selection of the preferred alternatives for the West Lakeshore Drive Pedestrian/Bike Improvements and East/West Lakeshore Drive and Blakely Road Signalized Intersection projects, VHB will compile all pertinent information gathered during the investigative stage, including all relevant meetings and engineering analyses, in a draft Scoping Report. Summaries of the resource impacts will be prepared to clearly state the information presented in the evaluation matrix for each component. VHB will also prepare a synopsis of the alternatives that includes benefits and impacts for each alternative, and present a final recommendation for each project component. Upon completion of the draft Scoping Report VHB, will deliver one copy to be reviewed by the CCRPC Project Manager. After receiving comments on the draft Scoping Report from the CCRPC Project Manager, a revised draft Scoping Report shall be distributed to the Project Committee. We expect the CCRPC Project Manager and Project Committee will provide any additional comments on the draft Scoping Report and the VHB Team will prepare a Final Report to address the comments.

Deliverable: Draft reports will be delivered to the Town and CCRPC for review and comment, and Final Scoping Reports will be prepared based on feedback received.

Task O: Regulatory Agency Coordination

If any potential environmental impacts are identified in the Stormwater Management Report or Scoping Report, the Project Team will coordinate with the regulatory agencies of jurisdiction. This coordination may include a discussion of minimization

and mitigation procedures, as well as procedures for obtaining any necessary permits. A summary of the discussions, requirements, and minimization/mitigation strategies will be incorporated into the Final Scoping Reports.

Task P: Project Management and Coordination

The VHB Project Manager will conduct regular internal coordination meetings to check on progress, discuss ideas and alternatives, and have the task managers exchange information and ideas. Additionally, the VHB Team will meet monthly with the CCRPC and Town to review progress, provide updates, and exchange information as appropriate.