Project Refinements

Middlebury NHG SGNL(73)

US Route 7 (Court Street) at Charles Avenue and Monroe Street

PREPARED FOR

VERMONT
AGENCY OF TRANSPORTATION

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OCTOBER 2023

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Introduction

Project NHG SGNL(73) considers improvements to the intersections of US Route 7 (US 7) at Charles Avenue and Monroe Street in Middlebury, Vermont. This location was proposed by Addison County Regional Planning Commission as one of the regional priority projects for consideration as a part of VTrans' VPSP2 process. Once ranked favorably against other locally proposed projects, this project was selected for project refinement. This report is a summary of the project refinement process for project NHG SGNL(73).

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Project Location

The NHG SGNL(73) project site is located at the intersections of US 7 at Charles Avenue and US 7 at Monroe Street in Middlebury, Vermont. The project is just outside the Designated Downtown District but is within the Middlebury Village Historic District (per the 1980 boundary extension). Additionally, Middlebury Union High School is accessed via Charles Avenue.

2.1 Municipality

The Town of Middlebury, in Addison County, is part of the Addison County Regional Planning Commission. The Addison County Regional Planning Commission serves 21 towns in the region including Middlebury. The Town of Middlebury is listed on the National Register of Historic Places.

2.2 Routes

The intersection is located between mile marker 4.3 and 4.5, or station numbers 229+65 and 237+62 along US 7. US 7 provides regional access to Middlebury from the north and south. It extends from the Canadian border in the north through Vermont and into Massachusetts in the south. The speed limit along US 7 varies, but in the vicinity of the Charles Avenue/Monroe Street intersections, the posted speed is 25 mph. The speed limit increases to 35 mph at Creek Road, which is approximately 700 feet south of the Monroe Street intersection.

US 7 has a functional class 3 Other Principal Arterial designation according to the Vermont Agency of Transportation. Functional class 3 highways have the capacity for medium to high speeds or medium to high volume traffic movements over medium and interregional, inter-city, and intra-city travel needs. US 7 is also referred to as Court Street in this area. For the purposes of this study, US 7 will be used except in cases when referring to findings from historic studies that used Court Street.

Charles Avenue has a functional class 5 Major Collector designation according to the Vermont Agency of Transportation. Functional class 5 roadways are designated as frontage or service roads where there is no intended purpose of providing for long distance or high-volume traffic movement.

Monroe Street is classified as a Local Roadway by Vermont Agency of Transportation.

2.3 Existing Configuration

The existing intersection layouts are shown in **Figure 1**. As shown, Charles Avenue intersects US 7 from the west approximately 160 feet north of where Monroe Street intersects from the east creating two closely spaced signalized intersections. The location of Middlebury Union High School with access via Charles Avenue creates an offset movement for students, faculty and staff from the east side of US 7.

US 7 consists of a single lane in each direction in this area with a 260-foot-long northbound left turn lane for turns onto Charles Avenue that extends past Monroe Street. Charles Avenue and Monroe Street each consist of a single lane in each direction. The intersection is operating with protected/permitted phasing to turn onto Charles Avenue.

Pedestrians are accommodated via sidewalks along both sides of US 7 and just the north side of both Charles Avenue and Monroe Street. Crosswalks connect pedestrians to these sidewalks with crossings designated for north/south pedestrian movements (across each side street) and east/west pedestrian movements (across US 7) only on the north leg of the Charles Avenue

intersection and only on the south leg of the Monroe Street intersection. There is no bicycle infrastructure at this intersection and both sidewalks and shoulders are too narrow to accommodate cyclists.

Figure 1: Project Site

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Planning and Construction Documents

The intersections of US 7 at Charles Avenue and US 7 at Monroe Street have been a priority for the region dating back to 1998. In 2016 a Scoping Study was completed for the location. The Scoping Study provided a preferred alternative to facilitate improved mobility and safety for vehicular, pedestrian, bicycle, and transit traffic. In addition, the 2018 Regional Plan for Addison County recognized these intersections as an area that requires improvement.

3.1 Intersection History

In addition to regional and town plans, this intersection has been studied over the years. Below are the historic documents that mention or focus on the intersections of US 7 at Monroe Street and US 7 at Charles Avenue.

Middlebury Town Plan, 2005

In 2005, the Town of Middlebury Town Plan recommended the need for the realignment of Charles Avenue to intersect opposite Monroe Street at US 7.

Addison County Transportation Plan, 2008

In 2008, the Addison County Regional Planning Commission recognized the intersections of US 7 at Charles Avenue and US 7 at Monroe Street as a mid-term project (less than 10 years) in the Addison County Transportation Plan. The project was described as an improvement to "realign intersection to eliminate offset of Charles and Monroe."

Court Street/Monroe Steet/Charles Avenue Intersections Study, 2016

In 2016, the Town of Middlebury conducted an Intersection Scoping Study that included three alternatives that were presented to the public. Alternative 1 was a Charles Avenue Roundabout, Alternative 2 was a Monroe Street Roundabout, and Alternative 3 was Monroe Street signal with a realigned Charles Avenue as the fourth leg. Ultimately the Scoping Study recommended realigning Charles Avenue to meet Monroe Street and installing a signal to replace the two signals that exist there now.

Middlebury Town Plan, 2017

In 2017 the Middlebury Town Plan prioritized the implementation of recommendations from the 2015 Charles Avenue/ Monroe Street Intersection Study (Town Plan, pg.157). Additionally, they called the intersection "unsafe" and "overdue" for improvements (Town Plan, pg. 143). The Town Plan outlined these improvements to "use land use planning to promote the livability of Middlebury, by supporting neighborhoods and investing in the safety and appearance of the built environment" (Town Plan, pg. 199).

Addison County Regional Plan, 2018

Addison County Regional Plan recommended that the intersections of US 7 at Charles Avenue and US 7 at Monroe Street be studied to explore improvements.

3.2 Preferred Alternative

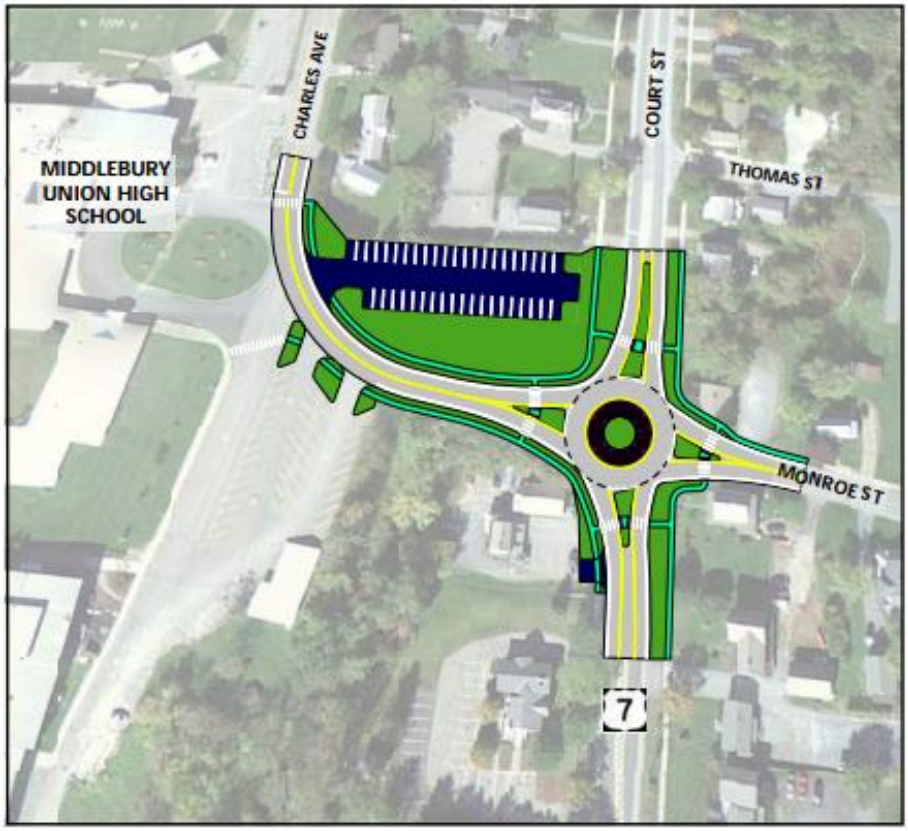
During the 2016 scoping study conducted by VHB, there were three alternatives presented to the public. Alternative 1 was Charles Avenue Roundabout, Alternative 2 was a Monroe Street Roundabout and Alternative 3 was Monroe Street signal with a realigned Charles Avenue as the fourth leg.

Figure 2: Alternative 1

Source: Court Street/Monroe Street/Charles Avenue Intersections Scoping Study, 2016

Alternative 1 would replace the existing traffic signal at the Charles Avenue intersection with US 7 with a single lane roundabout. A new southbound left turn lane would be added on US 7 at the Monroe Street intersection.

Figure 3: Alternative 2



Source: Court Street/Monroe Street/Charles Avenue Intersections Scoping Study, 2016

Alternative 2 contemplated replacing both US 7 traffic signals with a single lane roundabout. Charles Avenue would be realigned to intersect US 7 across from Monroe Street. School parking (or enhanced open space) would be created in the area of the existing Charles Avenue alignment, made available through the relocation of Charles Avenue to the south.

Figure 4: Alternative 3

Source: Court Street/Monroe Street/Charles Avenue Intersections Scoping Study, 2016

Alternative 3 contemplated removing the existing Charles Avenue traffic signal and realigning Charles Avenue to intersect with US 7 across from Monroe Street. A new traffic signal and reconfigured four-way intersection would include north and southbound left turn lanes as well as southbound and eastbound right turn lanes. School parking (or enhanced open space) would be created in the area of the existing Charles Avenue alignment, made available through the relocation of Charles Avenue to the south.

The intersection alternatives and alternatives evaluation assessment were presented to the Middlebury Selectboard on January 12, 2016. Following a discussion of the alternatives, the Selectboard approved the four-way signalized intersection design, Alternative #3, as the preferred alternative, with seven votes in favor and none opposed. The Town has since voted to acquire property and has procured engineering services for the preliminary design of this alternative.

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Community/Municipal Involvement

The intersections of US 7 at Charles Avenue and US 7 at Monroe Street are located directly in front of the Middlebury Union High School and are an important connection for the community. These locations went through a public process from 2015 to 2016 for the Court Street/Monroe Street/Charles Avenue Scoping Study. There were five public meetings where the project was discussed including a local concerns meeting, alternatives presentation, school board meeting, selectboard meeting and a town meeting. This scoping process yielded a preferred alternative. Progress towards this preferred alternative was made through procured engineering services to advance conceptual design plans and when the Middlebury voters in 2023 approved the purchase of a property to allow this improvement to move forward.

4.1 Summary of Public Engagement

This intersection has historically raised concerns for community members. There are issues with traffic during school arrival and dismissal and it lacks safe pedestrian crossings and bike infrastructure. There was strong public participation throughout the scoping process.

The first public meeting was held on June 3, 2015, at Middlebury Union High School. They discussed the issues that were occurring at the intersection, project goals, and next steps for recommended alternatives. The next meeting was held on October 13, 2015. The purpose of this meeting was to review the intersection alternatives and to solicit input from the public on the alternatives. The third meeting was on December 1, 2015, and VHB presented the alternatives to the school board. The fourth meeting was held on January 12, 2016, at the Middlebury Selectboard meeting. VHB presented the three alternatives, and the Selectboard approved the third alternative unanimously.

The final meeting was separate from the original scoping effort as the Town looked to advanced the project. At the 2023 annual Town Meeting held on March 6th, the voters authorized the Selectboard to apply up to $295,000 from the Cross Street Bridge Reserve Fund for the purchase of the former Maverick Gas Station at 82 Court Street for the purpose of reconfiguring the intersections of US 7 at Monroe Street and US 7 at Charles Avenue into a single intersection.

Public Engagement Timeline

- Local Concerns Meeting - June 3, 2015
- Alternatives Presentation Meeting - October 13, 2015
- School Board Meeting - December 1, 2015
- Selectboard Meeting - January 12, 2016
- Town Meeting - March 6, 2023

4.2 Community Benefits

The intersections of US 7 at Charles Avenue and US 7 at Monroe Street have been a priority for the community for many years. The 2012 Town Plan cited the Charles and Monroe intersections as having "needs and improvements". Community members noted that the left turns from US 7 onto Monroe Street and Charles Avenue are the biggest issue at this location. Additionally, the lack of sidewalks on the southside of Monroe Street is a concern for parents.

The traffic associated with the High School creates congestion at these closely spaced intersections and the left turn lane on US 7 queues through the intersection with Monroe Street. The current condition does not provide space for southbound left turns to wait to turn onto Monroe Street.

The recommended alternative, a single signalized intersection, would improve mobility and safety for all modes. It enhances connectivity between the school and the surrounding neighborhood. Updating this intersection would improve the safety and functionality for community members as called out in previous plans for this region.

5

Project Purpose and Need Statement

A project Purpose and Need Statement articulates the reasons for investigating improvements and should identify specific goals that any improvements will achieve. The development of a clear Purpose and Need Statement helps to guide the identification and screening of alternatives and the eventual selection of a preferred alternative. The following Purpose and Need Statement was developed during the 2016 Scoping Study.

5.1 Project Purpose

The Purpose of the Court Street/Monroe Street/Charles Avenue Intersections Scoping Study was to develop transportation system improvements that enhance safety for all users; accommodate school-related transportation demands, reduce traffic congestion, and facilitate mobility for all modes; and improve bicycle and pedestrian network connectivity.

5.2 Project Needs

The needs identified as a part of the Court Street/Monroe Street/Charles Avenue Intersections Scoping Study included the following:

Improve Safety for all Modes:

The offset nature of the two intersections, the lack of vehicle storage space for southbound left-turning vehicles, and the short pedestrian crossing phase led to existing safety concerns with the project study area.

Reduce Congestion:

The school-related travel demands, and the inefficiency of the intersection operations cause significant congestion during the morning, mid-afternoon, and evening peak hours, with average vehicle delays often exceeding 100 seconds (Levels of Service F) during these periods.

Enhance Bicycle & Pedestrian Connectivity:

Currently, there are no sidewalks along the south side of Charles Avenue between the Middlebury Union High School and Court Street, and there are no crosswalks or pedestrian signals across the southerly quadrant of the Court Street/Charles Avenue intersection and across the northerly quadrant of the Court Street/Monroe Street intersection.

Existing shoulder widths along both sides of Court Street are inadequate to safely accommodate beginner or intermediate bicyclists and catch basin grates located along Court Street are recessed into the pavement, creating hazards for bicyclists using the shoulders.

6

Project Scope

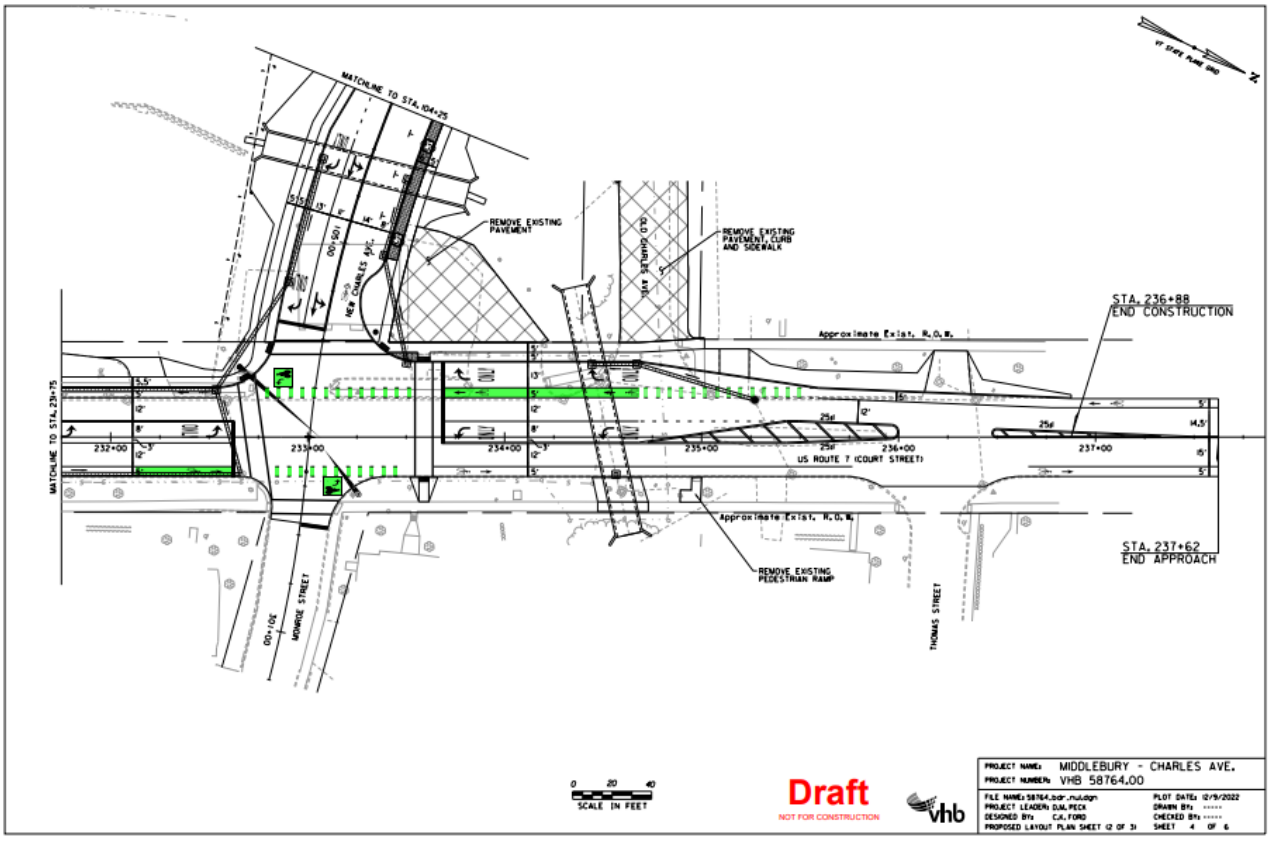
The 2016 Court Street/Monroe Street/Charles Avenue Intersections Scoping Study outlined the scope of the preferred alternative at this intersection which is now proposed as NHG SGNL (73). This project was chosen to improve safety for all modes, reduce congestion particularly around school arrival and dismissal, and enhance bicycle and pedestrian connections. This will be done by realigning Charles Avenue to form a single traffic signal controlled four-way intersection with US 7 at Monroe Street, improving sidewalk and crossing connections, acquiring the southwest parcel, and converting the former Charles Avenue alignment to high school parking.

The following project details, estimate and challenges are consistent with the project scope outlined in the 2016 Court Street/Monroe Street/Charles Avenue Intersections Scoping Study and have been updated to represent the current 2023 existing conditions and engineering efforts.

6.1 Project Details

The Town of Middlebury had conceptual plans prepared for the project in December 2022. These plans provide a design to realign Charles Avenue across from Monroe Street and were prepared for the Town to advance the project and prepare an estimate for the purchase of a key parcel for that process to begin. The project details of the NHG SGNL(73) are planned to advance the Town's current conceptual plans, consistent with the preferred alternative scoped at this location. The plan is illustrated in **Figure 5** and described in further detail below.

Figure 5: Conceptual Plans



As shown, the new intersection will include left turn lanes on US 7 as well as a right turn lane from US 7 southbound into New Charles Avenue. In addition, Charles Avenue will include a shared left/through lane as well as a right turn lane. Pedestrians will be accommodated by sidewalks on both sides of each leg of the intersection in addition to bicycle accommodation on US 7 via both bike lanes and bike turn boxes for left turn movements.

Roadway Surface Treatment

VTrans asset information indicates that the pavement condition on US 7 at this project location is good with the most recent paving being completed in 2021. Monroe Street has similarly good quality pavement. The Charles Avenue access to the school has medium to poor pavement

conditions and no improvements are proposed at this location prior to the intersection improvements as the existing access road will be removed.

Geometry Modifications

The project realigns Charles Avenue opposite Monroe Street at a single traffic signal controlled four-way intersection with US 7. The existing pavement, curb and sidewalk on Charles Avenue will be removed. A newly aligned Charles Avenue will provide access to the school.

Shoulder Treatment/Modifications

In lieu of shoulders, the project will include marked bicycle lanes on each side of US 7.

Intersection Identification/Treatment

The project will include traffic signal control of the realigned four-way intersection.

Bicyclist Considerations/Improvements

Bicycle asset improvements include dedicated bike lanes on both sides of US 7 through the intersection. Bike boxes will be provided to facilitate left turns into Charles Avenue and Monroe Street.

Pedestrian Considerations/Improvements

Pedestrian asset improvements include sidewalks and crosswalks in all directions at the new intersection.

Transit Access Considerations/Improvements

During the design and construction phase of this project, bus circulation should be accommodated. There is a Tri-Valley Transit stop at the Patricia A. Hannaford Career Center that operates regularly. In addition, bus access to the school must be considered in design and continue to be accommodated during construction.

Access Management Considerations/Modifications

The existing Charles Avenue alignment will be removed and a new Charles Avenue alignment will be located opposite Monroe Street at the site of the existing Maverick Gas Station. The existing Maverick Gas Station curb cuts and access will be removed as part of this process.

Asset(s) Condition/Improvements

There is an existing culvert carrying an unnamed tributary of the Otter Creek that passes underneath US 7 south of the existing alignment of Charles Avenue and north of Monroe Street. The culvert is in fair condition and, per the conceptual design plans for this project, this culvert will be replaced as a part of the project. Notably, this will require an adjustment to the stream crossing which will require a stream alteration permit.

Resiliency Considerations/Improvements

Relating to climate resiliency considerations, an unnamed tributary of Otter Creek passes through a culvert as indicated above, that culvert will be adjusted as a part of this project.

The Vermont Transportation Flood Resilience Planning Tool is a resource used to assess the vulnerability and criticality of transportation assets to flood hazards. It considers the impact of flood inundation, erosion, and deposition on roads, bridges, and culverts, as well as the importance of these assets in maintaining a resilient transportation network and providing access to essential facilities. At the Project location, the tool assesses Charles Avenue for a vulnerability score of 5/10, indicating a moderate susceptibility to flood-related impacts and a criticality score of 2/10, suggesting relatively low importance in supporting transportation functionality during and after flooding events. However, it is recognized as being locally important. The segment of US 7 directly at this project location scored similarly 4/10 for vulnerability and 2/10 for criticality.

Environmental Considerations/Improvements

The main environmental consideration includes addressing potential hazards resulting from the removal of the Maverick Gas Station located on US 7 opposite Monroe Street and in the future alignment of Charles Avenue.

Additional environmental considerations include the resiliency considerations outlined above including the presence of an unnamed tributary that passes across US 7 in a culvert between Charles Avenue and Monroe Street. This project site is located close to wetlands to the north and south, but the project footprint is not anticipated to impact them. Additionally, resource mapping indicates soil type of Vergennes Clay in the vicinity of this project.

6.2 Project Estimate

The 2023 construction estimate for the Charles Avenue realignment is $2,187,629.49. The engineering & permitting, right-of-way, and construction administration estimate for the Charles Avenue realignment is $569,000.00. The construction estimate for the Middlebury High School lot reconfiguration is $376,563.73. The engineering & permitting, right-of-way, and construction administration estimate for the lot reconfiguration is $96,000.00. The total project estimate is $3,329,193.22.

6.3 Project Challenges

This project will experience a tight construction schedule due to the need to maintain access to the school and perform the most impactful construction in the summer when school is not in session.

As outlined above, the relocation of the stream crossing is a potential challenge. Although utilities are not anticipated to be of concern, the presence of overhead utilities along US 7 will be considered.

Finally, the acquisition of the Maverick Gas Station and mitigation of potential hazardous materials is a significant challenge which is addressed in more detail in the following section. The Town of Middlebury has procured a consultant and is pursuing the necessary environmental, hydraulic, and soil investigation/ remediation due diligence. Additionally, Middlebury has

enrolled in Vermont's Waste Management and Prevention Program, BRELLA, which will grant state funded financial assistance for the brown field revitalization as well as enable environmental liability protection. More specific information is provided below.

Maverick Gas Station Acquisition and Hazardous Materials

The acquisition of the Maverick site was required for this project to proceed. The Parcel was acquired from Global Montello Group Corp by the Town of Middlebury on February 15, 2023. The acquisition of the Maverick gas station could unveil contaminated soil and hazardous materials from the fuel tanks. A Long-Term Groundwater Monitoring Report was conducted by KAS Engineering Science & Engineering in October 2020. Based on the results of the August 2020 groundwater monitoring event conducted at the Middlebury Maverick (former Citgo) property in Middlebury, Vermont, KAS presented the following conclusions:

- The depth to groundwater ranged from 8.74 feet btoc in MW00-2 to 10.20 feet btoc in MWE-1 and groundwater generally flows towards the west at a hydraulic gradient of 2.0%. This groundwater flow and gradient is generally consistent with historical measurements collected at the Site.
- MtBE was the only volatile organic compound (VOC) reported in excess of its Vermont Groundwater Enforcement Standard at monitoring wells MW00-1 and MW07-3. A concentration of MtBE was reported above laboratory method detection limits at MW07-2; however, at a level below its VGES. No VOCs were reported above laboratory method detection limits in the remaining wells sampled. Total reported VOC concentrations ranged from non-detect to 910 ug/L. The highest concentration of VOCs was reported in MW00-1, which is located downgradient to the source area; and, based on data collected to date, the extent of the dissolved petroleum VOC impact is believed to be generally limited to the area in the vicinity of monitoring wells MW00-1 and MW07-3. A portion of the plume may extend to the west and beyond MW00-1 and potentially toward the tributary of the Otter creek. However, during an investigation conducted in 2007, surface water/streambed samples were collected from within the tributary and no petroleum related VOCs were reported above laboratory detection limits. At this time, it appears the dissolved phase plume is adequately defined with the current monitoring well network; and,
- No sensitive receptors except for soil and groundwater beneath the Site have been identified to be impacted by the petroleum release.
- Based on the results of the August 2020 groundwater monitoring event conducted at the Middlebury Maverick (former Citgo) property in Middlebury, Vermont, KAS recommended the following:
    - Although the plume appears to be contained on Site and no new sensitive receptors have been identified, additional data is needed to establish a long-term declining trend at monitoring well MW00-1. Once a declining trend has been established at MW00-1 with the use of GroundWater Spatiotemporal Data Analysis Tool (GWSDAT), the Site should be considered eligible for a SMAC status; however, until that time, routine monitoring should continue; and,
    - Groundwater monitoring should be conducted in the fall of 2022, to monitor potential groundwater impacts related to seasonal groundwater fluctuations and confirm groundwater flow direction. Groundwater samples should be collected from MW00-1, MW07-2, MW07-3, and MWE-1 and analyzed for VOCs via EPA Method 8260C-D.

6.4 Recommendations & Next Steps

This refinement process reviewed the project development to date of Middlebury NHG SGNL(73) and its identified purpose to improve safety for all modes, reduce congestion particularly around school arrival and dismissal, and enhance bicycle and pedestrian connections. The preferred alternative realigns Charles Avenue to form a single signalized four-way intersection with US 7 at Monroe Street, improves sidewalk and crossing connections, acquires the southwest parcel, and converts the former Charles Avenue alignment to additional parking for the high school.

The Town has progressed the project by procuring a consultant to develop preliminary design and acquiring a parcel needed for the project while pursuing mitigation of environmental concerns.

The recommendation resulting from the refinement process is that the project should be programmed for design.

Appendices

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TOWN OF MIDDLEBURY
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October 25, 2023

Jesse A. Devlin
Highway Safety & Design Program Manager
Vermont Agency of Transportation
219 North Main Street
Barre, VT 05641

Re: MIDDLEBURY-NHG SGNL (73)

Dear Mr. Devlin,

The recently developed VPSP2 (VTrans Project Selection and Prioritization Process) was implemented by the Vemont Agency of Transportation (VTrans) in an effort to develop a performance-based data driven project selection and prioritization framework that maximizes the transportation value delivered to users of the facilities. This process includes a mechanism in which Regional Planning Commissions in coordination with their communities can propose potential projects that are desirable from a regional and local perspective. The Addison County Regional Planning Commission (ACRPC) worked with the Town of Middlebury to propose a future project at the intersection of Monroe Street and Charles Avenue with US Route 7 to improve the safety and mobility of the intersection.

This regionally proposed project was selected for advancement and programmed MIDDLEBURY-NHG SGNL (73). The initial phase of this project is a project refinement stage, which intends to obtain consistent information regarding the proposed project or need and reinforce project support and understanding with the Regional Planning Commissions and municipalities. The ACRPC and Town of Middlebury worked with Consulting Firm VHB throughout this process and thoroughly discussed project location, community/municipal involvement, previous planning or construction documents, project purpose and need or project vision, potential project scope or key focus areas, project estimate and project challenges. This included discussion of the alternatives analysis and preferred alternative for the intersection that was endorsed by the Selectboard as part of the 2016 Charles/ Monroe Intersection Study and the subsequent work completed by the Town to document environmental concerns at the site and develop a conceptual plan and cost estimate for the intersection.

The work performed within the project refinement stage resulted in beneficial discussion and this letter intends to acknowledge an understanding of the process and overall support for the project.

- The Town of Middlebury acknowledges that the project refinement phase is a critical step in advancing the project towards design and construction and may require further project definition.
- The Town of Middlebury acknowledges that the project will require a finance and maintenance agreement that may require Municipal funding for non-participating project elements and/or maintenance responsibilities.
- The Town of Middlebury supports the continued advancement of MIDDLEBURY-NHG SGNL (73)

Sincerely,

Kathleen Ramsay
Town Manager

Intersection Scoping Study

COURT STREET/MONROE STREET/CHARLES AVENUE INTERSECTIONS

Middlebury, Vermont

Prepared for **Town of Middlebury**
Middlebury, Vermont

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April 3, 2016

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Appendices

1.0 Project Background & Project Development Process

The Town of Middlebury engaged VHB and SE Group to explore alternatives and recommend improvements for the complex intersection of Court Street (US 7), Charles Avenue, and Monroe Street that facilitate improved mobility and safety for vehicular, pedestrian, bicycle, and transit travel modes. The existing Court Street signalized intersections at Charles Avenue and Monroe Street are offset and their configuration results in inefficient traffic operations, driver confusion, mode conflicts, and safety issues. Beyond these operational deficiencies, the intersection configuration discourages continuity with the surrounding land uses and efficient north-south and east-west circulation through Middlebury.

The following is a summary of the process and timeline followed for this project:

- Project Kick-Off Meeting (April 17, 2015)
  Project initiation meeting with representatives from the Town of Middlebury, Middlebury Union High School, and VHB.
- Develop Purpose & Need Statement (May 2015)
  The Purpose & Need Statement clearly identifies the goals to which the project should adhere and provides a useful screening tool during the alternatives assessment phase.
- Local Concerns Meeting (June 3, 2015)
  Public meeting to gather local input on issues related to the study intersections.
- Document Existing Conditions (June – August 2015)
  Comprehensive assessment of existing site and traffic conditions for use in developing and evaluating potential alternatives.
- Develop & Evaluate Conceptual Alternatives (August – September 2015)
  Three distinct Build alternatives and several sub-alternatives were developed for the project area. These alternatives were evaluated against metrics such as cost, right-of-way impacts, natural and cultural resource impacts, and adherence to the project Purpose and Need Statement.
- Alternatives Presentation Meeting (October 2015)
  Present alternative concepts to the public for their review and input
- Identify Preferred Alternative (January 2016)
  Middlebury Selectboard selects preferred alternative

This project was funded through the Vermont Municipal Planning Grant (MPG) program which encourages and supports planning and revitalization for local municipalities in Vermont. Awarded annually and administered by the Department of Housing and Community Development, the MPG program works to strengthen Vermont by funding local planning initiatives that support statewide planning goals.

2.0 Study Area

The project is located along Court Street (U.S. Route 7) just outside the Designated Downtown district, but within the Middlebury Village Historic District (per the 1980 boundary extension). The project study area includes both the Court Street/Charles Street intersection to the north and the Court Street/Monroe Street intersection to the south as well as the Middlebury Union High School parking lots and Charles Street to the west and adjacent parcels along Monroe Street to the east. The Court Street/Charles Avenue intersection serves as the main entrance to the Middlebury Union high School and, as such, accommodates pulses of school-related vehicular, pedestrian, and bicycle traffic during the morning and afternoon periods. The pair of intersections also serve as a southern gateway into Middlebury. In 2008, intersection improvements were completed along Court Street which included new traffic signal mast arms, stamped & colored crosswalks, and new traffic signal coordination hardware.

Figure 1: Project Study Area

3.0 Project Purpose & Need Statement

A project Purpose and Need Statement articulates the reasons for investigating improvements and should identify specific goals that any improvements will achieve. The development of a clear Purpose and Need Statement helps to guide the identification and screening of alternatives and the eventual selection of a preferred alternative. The following Purpose and Need Statement was developed during the course of this project.

Project Purpose

The Purpose of the Court Street/Charles Avenue/Monroe Street Intersection Scoping Study is to develop transportation system improvements that enhance safety for all users; accommodate school-related transportation demands, reduce traffic congestion and facilitate mobility for all modes; and improve bicycle and pedestrian network connectivity.

Project Needs

- **Improve Safety for all Modes:** The offset nature of the two intersections, the lack of vehicle storage space for southbound left-turning vehicles, and the short pedestrian crossing phase lead to existing safety concerns with the project study area.

- **Reduce Congestion:** The school-related travel demands and the inefficiency of the intersection operations cause significant congestion during the morning, mid-afternoon, and evening peak hours, with average vehicle delays often exceeding 100 seconds (Levels of Service F) during these periods.

- **Enhance Bicycle & Pedestrian Connectivity:**
  - Currently, there are no sidewalks along the south side of Charles Street between the Middlebury Union High School and Court Street, and there are no crosswalks or pedestrian signals across the southerly quadrant of the Court Street/Charles Street intersection and across the northerly quadrant of the Court Street/Monroe Street intersection.
  - Existing shoulder widths along both sides of Court Street are inadequate to safely accommodate beginner or intermediate bicyclists and catch basin grates located along Court Street are recessed into the pavement, creating hazards for bicyclists using the shoulders.

4.0 Summary of Public Input

4.1 Local Concerns Meeting

A public information meeting was held on June 3, 2015 at the Middlebury Union High School. Approximately 25 residents and town officials attended. The purpose of the meeting was to provide attendees with background on the project and to solicit thoughts, ideas, concerns and issues about the intersection.

Some of the major points raised by the attendees included the following:

- The most difficult turns to make due to traffic congestion) are a left turn from Court Street to Monroe Street and a left turn from Court Street to Charles Avenue.
- The busiest times of day are during school arrivals and dismissals.
- A standard aligned intersection as opposed to the current configuration of Monroe/Court/Charles would be preferable.
- The south side of Monroe Street does not have a sidewalk even though lots of children walk along that street.
- A dedicated right turn lane from Charles Street to Court Street would help the school traffic.
- There should be a pedestrian crossing signal along Court Street to cross Charles Avenue
- A pedestrian bridge over Court Street would have advantages and disadvantages
- Another project: extending Charles Avenue to Creek Road
- Roundabout would make turning left at Thomas Street (north of the project area) almost impossible

The meeting flyer, sign-in sheet, presentation, and full meeting notes can be found in Appendix A.

4.2 Alternatives Analysis Public Meeting

A public information meeting was held on October 13, 2015 at the Middlebury Union High School. Approximately 30 residents and town officials attended. The purpose of the meeting was to review the intersection alternatives and to solicit input from the attendees on the alternatives. Following a thorough review of the alternative intersection configurations and alternatives evaluation matrix, the majority of attendees identified Alternative 3 (Monroe Street Signal) as the preferred alternative. The meeting flyer, sign-in sheet, presentation, and full meeting notes can be found in Appendix A.

4.3 School Board Meeting

The intersection alternatives, along with the sub-alternatives developed for the Middlebury Union High School entrance were presented to the Addison Central Supervisory Union UD #3 School Board Meeting on December 1, 2015. The meeting agenda and presentation can be found in Appendix A.

4.4 Selectboard Meeting

The intersection alternatives and alternatives evaluation assessment was presented to the Middlebury Selectboard on January 12, 2016. Following a discussion of the alternatives, the Selectboard approved the four-way signalized intersection design, Alternative #3, as the preferred alternative, with seven votes in favor and none opposed. The meeting agenda, meeting minutes, and presentation can be found in Appendix A.

5.0 Existing Conditions Assessment

This section provides an overview of the existing roadway, sidewalk traffic, safety, natural resource and permitting-related conditions associated with the Charles Avenue and Monroe Street signalized intersections along Court Street.

5.1 Roadway

US Route 7 (Court Street) provides regional access to Middlebury from the north and south. It extends from the Canadian border in the north through Vermont and into Massachusetts in the south. The speed limit along US Route 7 varies, but in the vicinity of the Charles Avenue/Monroe Street intersections, the posted speed is 25 mph. The speed limit increases to 35 mph at Creek Road, which is approximately 700 feet south of the Monroe Street intersection.

Additionally, the intersection falls at the center of a school zone with the Middlebury Union High School and Patricia A. Hannaford Career Center located on Charles Avenue immediately west of Court Street. The Mary Hogan Elementary School is located approximately ¼ of a mile north of the study area on Mary Hogan Drive, while the Middlebury Union Middle School is located approximately ¾ of a mile south of the study area.

Charles Avenue and Monroe Street intersect Court Street approximately 160 feet apart to form an offset intersection configuration. Charles Avenue meets Court Street from the west forming a T-intersection. Monroe Street intersects Court Street from the east to form a four-way intersection with a gas station driveway serving as the forth leg on the west side. Most of the intersection approaches have a single approach lane with the exception of the northbound Court Street approaches. Both of the northbound Court Street approaches (i.e. at Charles Street and at Monroe Avenue) have an exclusive left turn lane. The left-turn lane turning into the gas station at Monroe Street has approximately 75 feet of storage space while the left turn lane into Charles Avenue is approximately 125 feet long (the distance between Charles Avenue and Monroe Street). There is no striped left-turn lane for the southbound left turn onto Monroe Avenue.

All of the traffic movements at these two signals are controlled by a single traffic controller, which communicates with upstream and downstream signal controllers via a wireless radio connection. The Master Controller and signals at Centre Plaza and at Middle Road are owned and maintained by VTrans. The remaining local controllers and signal equipment are owned and maintained by the Town of Middlebury.

5.2 Traffic

The Average Annual Daily Traffic (AADT) on the segment of US Route 7 in the vicinity of Charles Avenue/Monroe Street is 16,500 vehicles per day, which is the highest level of daily traffic in Middlebury.

Traffic volume networks were developed for this project based on traffic volume counts conducted in May 2015. Traffic volume networks were developed for the weekday morning (7:45 -8:45 AM), weekday school peak (2:30-3:30 PM), and weekday evening (4:15-5:15 PM) time periods. The raw traffic data was adjusted to Design Hour Volume (DHV) conditions following standard VTrans procedures and was grown to a design year of 2026 using recent traffic growth trends in the area. Traffic count data and traffic network supporting documentation can be found in Appendix B.

The volume of traffic through the study area indicates the importance of the intersection and the roadway to the overall street system, but does not necessarily indicate the quality of the traffic flow. To assess the quality of the traffic flow, capacity analyses were conducted to determine how well the intersection serves the traffic demands placed on it.

The traffic performance measures and the evaluation criteria used in the operational analyses are based on the methodology presented in the *Highway Capacity Manual (HCM)*.[1] Six levels of service (LOS) are defined in the HCM and are given letter designations ranging from LOS A to LOS F, with LOS A representing generally free-flow traffic and LOS F typically representing over-capacity conditions.

Results of the traffic operational analysis for the 2026 No Build conditions are summarized in Table 1 for the three peak hour conditions reviewed.

As shown in the table, the results of the No Build operational analyses show that during all three of the peak periods evaluated, the intersections of Court Street at Charles Street and Monroe Street operate at a LOS F. Details on the traffic operational analysis can be found in Appendix B.

[1] Highway Capacity Manual, published by the Transportation Research Board, Washington, D.C., 2000, 2010.

Table 1: 2026 No Build Signaled Intersection Capacity Analysis

Location	2026 Weekday Morning Peak Hour				2026 Weekday School (PM) Peak Hour			
	v/c	LOS	Delay	95thQ	v/c	LOS	Delay	95thQ
Court Street at Charles Ave (S)								
Charles Ave - EB LT/RT	0.42	C	30	175	0.41	C	29	200
Court St - NB LT	0.39	B	12	25	0.20	A	8	25
Court St - NB TH	0.85	A	7	125	0.93	B	12	100
Court St - SB TH/RT	1.46	F	249	1025	1.81	F	410	1325
Overall	**0.95**	**F**	**102**	**-**	**0.95**	**F**	**191**	**-**
Court Street at Monroe St (S)								
Gas Station - EB LT/TH/RT	0.00	C	31	25	0.04	D	42	25
Monroe St - WB LT/TH/RT	0.06	C	32	25	0.05	D	42	25
Court St - NB LT	-	-	-	-	-	-	-	-
Court St - NB TH/RT	1.37	F	199	1250	1.32	F	188	1125
Court St - SB LT/TH/RT	0.86	B	20	200	0.92	C	31	250
Overall	**1.00**	**F**	**114**	**-**	**0.95**	**F**	**101**	**-**

Location	2026 Weekday Evening Peak Hour			
	v/c	LOS	Delay	95thQ
Court Street at Charles Ave (S)				
Charles Ave - EB LT/RT	0.08	C	31	50
Court St - NB LT	0.12	B	16	25
Court St - NB TH	0.73	A	6	175
Court St - SB TH/RT	1.25	F	146	1325
Overall	**0.84**	**F**	**83**	**-**
Court Street at Monroe St (S)				
Gas Station - EB LT/TH/RT	0.01	C	33	25
Monroe St - WB LT/TH/RT	0.02	C	33	25
Court St - NB LT	0.06	B	15	25
Court St - NB TH/RT	1.03	E	64	1025
Court St - SB LT/TH/RT	0.90	B	16	300
Overall	**0.79**	**D**	**37**	**-**

v/c - The volume to capacity ratio.
LOS - The level of service.
Delay - The delay expressed in seconds.
95thQ - The 95th percentile queue expressed in feet. ## - Exceeds storage.

5.3 Safety

The most recent five year period of crash data available from VTRANS is from January 2010 through December 2014. During this period 24 crashes were identified as occurring at or near the intersection of Court Street/Charles Avenue/Monroe Street. Eleven crashes occurred north of the intersection, eight crashes were at the intersection and five crashes were south of the intersection. It should be noted that this is not a High Crash Location (HCL). The majority of the crashes were property damage only crashes occurring on a clear or cloudy weekday. The types of crashes identified were rear end crashes which account for 75% of all the crashes, a broadside crash, a sideswipe/angle crash and several crashes were not identified by type. The high percentage of rear end crashes (18 of 24 crashes) indicated that the signal operations are impacting the crashes at this location. See Table 2, below, for a summary of all the crashes.

Table 2: Crash Data Summary

	US 7 South of Charles Ave	Charles Ave Intersection	US 7 North of Charles Ave	TOTAL	PERCENT
YEAR					
2014	2	3	3	8	33%
2013				0	0%
2012	3	1		4	17%
2011		2	6	8	33%
2010		2	2	4	17%
Total	5	8	11	24	100%
TYPE					
Rear End	1	6	11	18	75%
Broadside	1			1	4%
Sideswipe/Angle Crash		1		1	4%
Other/Unknown	3	1		4	17%
Total	5	8	11	24	100%
SEVERITY					
Property Damage	4	8	8	20	83%
Personal Injury	1		3	4	17%
Total	5	8	11	24	100%
DAY OF WEEK					
Mon-Fri	5	6	10	21	88%
Sat-Sun		2	1	3	13%
Total	5	8	11	24	100%
WEATHER					
Clear/Cloudy	5	6	11	22	92%
Snow/Ice		2		2	8%
Total	5	8	11	24	100%
SEASON					
Winter (Dec-Feb)	1	3	1	5	21%
Spring (Mar-May)	1	2	5	8	33%
Summer (Jun-Aug)	1	1	4	6	25%
Fall (Sept-Nov)	2	2	1	5	21%
Total	5	8	11	24	100%

Source: Vermont Agency of Transportation.

5.4 Bicycle & Pedestrian Facilities

The Project Area includes sidewalks, crosswalks, and pedestrian signals (see Appendix C for map). However, the only bike facilities are narrow shoulders. Improving bicycle and pedestrian facilities is a stated goal of the 2012 Town Plan (under its transportation goals).

5.4.1 Sidewalks

Court Street (U.S. Route 7) has five foot wide sidewalks on both sides separated from the road by a varying width green strip. Charles Avenue has a sidewalk only on the north side of the street, level with the road surface and separated by a varying width gravel shoulder. Monroe Street has a sidewalk on the north side of the street, raised but adjacent to the roadway. Therefore, the sidewalk gaps are the south side of Charles Avenue and the south side of Monroe Street.

5.4.2 Crosswalks & Pedestrian Signals

The existing crosswalks are red imprinted resin material with white painted borders. Crosswalks are located at the following:

- Across Court Street at the south side of the Monroe Street/Court Street intersection
- Across Court Street at the north side of the Charles Ave/Court Street intersection
- Across Charles Avenue, parallel to Court Street
- Across the gas station property, parallel to Court Street
- Across Monroe Street, parallel to Court Street

All of these crosswalks have pedestrian crossing signals except across Monroe Street. Crosswalks are not located on the south side of the Charles Avenue/Court Street intersection or the north side of the Monroe Street/Court Street intersection. These missing links create the following situations:

- Pedestrians walking north on Court Street, wishing to turn left onto Charles Street, must use the pedestrian signal crossing to get across Charles Avenue and walk on the north side, rather than simply turn left onto Charles Avenue as they walk towards the high school, because there is no crosswalk on the south side of Charles Avenue.

- Instead, pedestrians on Charles Avenue wishing to turn right onto Court Street and left on Monroe Street must cross from the north side of Charles Avenue or on the north side of the Monroe/Court Street intersection.

- Pedestrians on Monroe Street must walk on the south side of the street even if they plan to head north. They cross at the crosswalk to the south or to the north.

While these are not impossible crossing situations, the missing links force illegal crossings or attempt to change the pedestrians' already established patterns.

5.4.3 Bicycle Lanes

There are no bicycle lanes in the study area, only 2-3 foot shoulders. Considering there is high demand for bicyclists in the downtown area, the existing conditions are inadequate for safe riding conditions.

5.5 Land Use & Zoning

The project area is located in two areas of note: The Office/Apartment (OFA) district and the Historic Court Street Area. They are described below, and shown in Appendix C.

Office/Apartment (OFA) district: The 2012 Middlebury Town Plan (page 68) states that, "The Office and Apartment District is established along major traffic arteries by allowing a mixture of residential homes and apartments, appropriate businesses and professional offices. OFA also acts as a transitional buffer zone between commercial areas and residential neighborhoods. Residential density is the same as provided for in the HDR District."

"Historic Court Street Area (Court Street to Creek Road)" as described on page 159-160 of the 2012 Town Plan states:

> *Court Street is a major local and regional (US 7) traffic artery, heavily used by cars, trucks, school busses, pedestrians and bicyclists. Congestion at peak times causes traffic backups, delays and hazards for turning traffic and vehicles attempting to enter from side streets and driveways.*
>
> *The Town and VTrans have provided state-of-the-art controllable signalization along Court Street, which can be programmed for demand actuation and synchronized flow, and safe pedestrian crossings. However, given that any community and regional growth inevitably adds increased traffic, and to reduce turning hazards on Court Street and US Route 7, every opportunity should be pursued to reduce trips and turning movements on and off Court Street by connecting parking lots and providing rear traffic circulation to parallel streets and alleys as part of development review proceedings.*
>
> *This Plan calls for a public planning forum regarding solutions to congestion on Court Street, in particular the Monroe/Court/Charles Street intersection.*
>
> *Changes or increases in commercial uses on Court Street must not be allowed to further add or cause need for widening, turning lanes or additional traffic signals, or exacerbate traffic congestion or unsafe conditions. The Zoning Regulations shall maintain the historic character of the district for applications involving changes to nonresidential uses and guard against detracting elements such as façade treatments and vehicle canopies and drive-throughs. Pedestrian and bicyclist safety shall be addressed both in the development review process and in the Town's own street maintenance and improvement programs.*

5.6 Environmental & Cultural Resources

VHB conducted a desktop review of the Agency of Natural Resources ("ANR") online, privileged databases, and the Division for Historic Preservation's Online Resource Center ("ORC"), to determine if any of the following resources were included in the project area.

5.6.1 Floodplains

The current Flood Insurance Rate Map ("FIRM") for the Town of Middlebury (Community Panel Number 500008 0003A, Effective Date January 3, 1985) issued by the Federal Emergency Management Agency ("FEMA"), shows an area of 100-year floodplain associated with Barnes Creek (tributary to Otter Creek), which flows through the Scoping Study Area. The Floodplain elevation is approximately 350 feet above sea level (NGVD 29). There are no state-mapped river corridors located within the Scoping Study Area.

5.6.2 Wetlands

ANR has one wetland mapped as part of the Vermont Significant Wetlands Inventory ("VSWI") program within the Scoping Study Area. This wetland, associated with Barnes Creek, originates northeast of the Scoping Study Area, north of Thomas Street. ANR also has mapped a potential wetland feature within the Scoping Study Area (part of the "Wetland Advisory Layer", not available to download). This potential wetland area, also associated with Barnes Creek, is located south of Thomas Street, within the Scoping Study Area. Both the VSWI-mapped wetland and the potential wetland area would need to be assessed in the field to determine the presence or absence of a wetland, and if present, the wetland boundaries would need to be delineated using the accepted methods. See Appendix C.

5.6.3 Streams

One stream mapped by the Vermont Hydrography Dataset ("VHD") is located running approximately northeast to southwest through the Scoping Study Area. As described above, this stream is a tributary to Otter Creek and is designated (at least locally) as Barnes Creek. This stream is currently conveyed under Court Street via culvert. See Appendix C.

5.6.4 Rare, Threatened or Endangered Species

ANR has no state-protected (threatened or endangered) or rare species mapped within or in the immediate vicinity of the Scoping Study Area. Middlebury is located within the known summer range of the Indiana bat (Myotis sodalis), which is federally listed as endangered, however there are no known occurrences (hibernacula or summer roosting) in the Scoping Study Area vicinity. See Appendix C.

5.6.5 Oil & Hazardous Materials

Based on the available information, VHB identified one site located within close proximity to the Project area which is anticipated to affect Project construction:

- Middlebury Citgo (active HWS #982471, active UST #1080): The facility currently known as the Maverick Gas Station is a State-listed HWS identified as the "Middlebury Citgo" site. Petroleum-impacted soil and groundwater were discovered at this site, which is located within the Project area, during underground piping replacement associated with an 8,000 gallon gasoline UST and two 6,000 gallon gasoline USTs which were installed in 1986. These USTs remain in-use and are located to the north of the on-site building. Five groundwater monitoring wells were installed and groundwater was determined to flow northwest towards a tributary to the Otter Creek. Laboratory results from on-site groundwater samples showed the presence of petroleum volatile organic compounds ("VOCs") above regulatory standards within the Project area. Soils were only field screened using a photoionization detector and have not been laboratory analyzed to identify the magnitude of impacts. **Therefore, petroleum-impacted soil, groundwater, and soil gas, and underground storage tanks and piping are likely to be encountered during project construction at the Maverick Gas Station located within the Project area.**

Based on our assessment, the following actions are recommended:

- VHB has identified the Maverick Gas Station as an area where surficial soil, groundwater, and soil gas contamination are likely to be encountered and where underground petroleum storage tanks and piping remain. VHB recommends that excavation should be avoided or minimized in this area.
- The VT DEC Waste Management Division should be notified prior to any engineering design. Regulatory approval from the VT DEC Waste Management Division would be required to complete either Alternative #2 or #3.
- If the Project will produce a net cut of soil then pre-characterization will be required for any soils to be removed from the site, to determine appropriate re-use or disposal methods. For soils that are impacted only with petroleum, it may be possible to treat the soils by stockpiling, encapsulating with plastic sheeting, and periodically monitoring at an approved off-site location, or to use the soils as alternate daily cover at a landfill, or to dispose of the soils at a certified landfill or at a thermal treatment facility.

See Appendix D for additional details.

5.6.6. Historic Resources

Historic resources are those listed in or eligible for listing the National Register of Historic Places as individual or contributing resources. Under Section 106 of the National Historic

Preservation Act of 1966, federal agencies are required to take into account the effects of their undertakings on historic properties, and then avoid, minimize, or mitigate any adverse effects.

The project area is located in the Middlebury Village Historic District (amendment) (see maps in Appendix E). The properties on all corners of the intersection except for the gas station are considered contributing resources to the historic district. The gas station is not considered a historic resource. Alternatives that avoid historic properties will require less study and permitting than those that are considered historic properties.

5.6.7 Archaeological Resources

The corridor has been previously disturbed for roadway construction, utilities, and other development. Any excavation in or near the stream will need to be reviewed; all alternatives involving the new roadway will required the same amount of archaeological investigation.

5.6.8 Section 4(f) Resources

Section 4(f) refers to the original section within the U.S. Department of Transportation Act of 1966 which established the requirement for consideration of park and recreational lands, wildlife and waterfowl refuges, and historic sites in transportation project development. The law, now codified in 49 U.S.C. §303 and 23 U.S.C. §138, is implemented by the Federal Highway Administration (FHWA) through the regulation 23 CFR 774. Section 4(f) applies to projects that receive funding from or require approval by an agency of the U.S. Department of Transportation.

Before approving a project that uses Section 4(f) property, FHWA must either (1) determine that the impacts are *de minimis*, or (2) undertake a Section 4(f) Evaluation. If the Section 4(f) Evaluation identifies a feasible and prudent alternative that completely avoids Section 4(f) properties, it must be selected. If there is no feasible and prudent alternative that avoids all Section 4(f) properties, FHWA has some discretion in selecting the alternative that causes the least overall harm. FHWA must also find that all possible planning to minimize harm to the Section 4(f) property has occurred.

Section 4(f) properties in this project include the contributing properties of the Middlebury Village Historic District.

5.6.9 Section 6(f) Resources

VHB consulted the Land and Water Conservation Funds Database as well as with the Town of Middlebury, and there are no Section 6(f) properties in the project area.

5.7 Utilities

A map of existing utilities can be found in Appendix F. Utility poles and wires run on the east side of US Route 7 and cross at the south side of the Charles/Court intersection, running along

the south side of Charles Avenue. Traffic mast arms are located at the NE & SW corners of the Charles/Court intersection and the NE/SW corners of the Monroe/Court intersection. There is a utility cabinet on a concrete pad in the green strip of the east side of Court Street, south of the intersection with Charles Avenue.

Catch-basins are located in the following areas:

- at the T-intersection of Court Street and Charles Street in the middle of the green strip between the sidewalk and roadway
- at the NW corner of Court Street/Charles Avenue – two catch basins just north of the crosswalk, in the paved shoulder
- at the SW corner of Court Street/Charles Avenue – two catch basins just south of the crosswalk in the paved shoulder
- on the east side of Court Street in the paved shoulder, just south of the SE corner of the Monroe Street/Court Street intersection
- across the street from the previous (listed above), on the west side of Court Street, in the shoulder, just south of the crosswalk.

5.8 Right-of-Way

U.S. Route 7 (Court Street) was laid out with a 5 rod (82.5 foot) right-of-way. The right-of-way width of Charles Avenue is 60 feet, and the Monroe Street right-of-way is 3 rods (49.5 feet) wide. See Appendix G for the project base map with parcel lines.

6.0 Alternatives Assessment

Project alternatives were developed based on data collection, public input, and the ability of options available to meet the Project Purpose and Need. The three Project Alternatives are discussed below. In addition to the road alignment alternatives, there are sub-alternatives for school parking lot and reconfiguration and landscaping. See Appendix H for graphic depictions of the alternatives.

6.1 Alternative 1: Charles Avenue Roundabout

The Charles Avenue roundabout would add a three-leg, single lane roundabout on Court Street (US Route 7) at Charles Ave. The three-leg approach lanes would be Court Street northbound, Court Street southbound, and Charles Avenue eastbound. The roundabout would require land acquisition from existing properties on all sides of the intersection. The road reconfiguration would be from approximately Thomas Street intersection to Monroe Street intersection. The roundabout would include splitter islands on the approach legs. A turning lane would be established for left turns onto Monroe Street from the north. Crosswalks would be installed across Charles Street and across Court Street, north of the roundabout.

As shown in Table 3 below, Court Street at Charles Avenue in Alternative 1 operates over capacity during the weekday morning peak period with a v/c ratio of 1.03. During the weekday evening peak period the intersection is also expected to be near or at capacity with a v/c of 0.99. The high volumes also lead to queues in the northbound direction that exceed the available storage before the Monroe Street intersection.

Table 3: Alternative 1 Roundabout Capacity Analyses

Location	2026 Weekday Morning Peak Hour				2026 Weekday School (PM) Peak Hour			
	v/c	LOS	Delay	95thQ	v/c	LOS	Delay	95thQ
Court Street at Charles Ave								
Charles Ave - EB LT/RT	0.36	B	13	50	0.53	C	19	75
Court St - NB LT/TH	1.03	F	56	1500	0.85	D	25	300
Court St - SB TH/RT	0.84	D	25	275	0.85	C	24	275
Overall	**1.03**	**E**	**41**	**-**	**0.85**	**C**	**24**	**-**

	2026 Weekday Evening Peak Hour			
	v/c	LOS	Delay	95thQ
Court Street at Charles Ave				
Charles Ave - EB LT/RT	0.17	B	12	25
Court St - NB LT/TH	0.77	C	18	250
Court St - SB TH/RT	0.99	E	45	1625
Overall	**0.99**	**D**	**33**	**-**

v/c - The volume to capacity ratio.

LOS - The level of service.

Delay - The delay expressed in seconds.

95thQ - The 95th percentile queue expressed in feet. XX - Exceeds storage.

Under Alternative 1, the Court Street intersection with Monroe Street would continue as a signalized intersection and remain part of the Court Street signal system. Exclusive pedestrian crossings would be maintained. The northbound and westbound geometries would remain the same while the southbound approach would change from a single lane approach to a left turn lane and a shared through-right turn lane.

As shown in the table below, the results of the signalized intersection of Monroe Street show good levels of service with LOS A under the three peak hour conditions. However, like the roundabout at Charles Avenue, queues between the two intersections exceed the available storage.

Table 4: Alternative 1 Signalized Intersection Capacity Analyses

Location	2026 Weekday Morning Peak Hour				2026 Weekday School (PM) Peak Hour			
	v/c	LOS	Delay	95thQ	v/c	LOS	Delay	95thQ
Court Street at Monroe St (S)								
Gas Station - EB LT/TH/RT	0.00	C	32	25	0.05	D	38	25
Monroe St - WB LT/TH/RT	0.07	C	32	50	0.05	D	38	25
Court St - NB LT	-	-	-	-	-	-	-	-
Court St - NB TH/RT	0.75	A	10	775	0.62	A	8	450
Court St - SB LT	0.06	A	4	25	0.10	A	4	25
Court St - SB TH/RT	0.60	A	7	450	0.68	A	9	550
Overall	**0.69**	**A**	**10**	**-**	**0.60**	**A**	**10**	**-**

	2026 Weekday Evening Peak Hour			
	v/c	LOS	Delay	95thQ
Court Street at Monroe St (S)				
Gas Station - EB LT/TH/RT	0.01	D	41	25
Monroe St - WB LT/TH/RT	0.02	D	41	25
Court St - NB LT	0.02	B	14	25
Court St - NB TH/RT	0.58	A	5	450
Court St - SB LT	0.09	A	5	50
Court St - SB TH/RT	0.77	B	12	950
Overall	**0.70**	**A**	**10**	**-**

v/c - The volume to capacity ratio.

LOS - The level of service.

Delay - The delay expressed in seconds.

95thQ - The 95th percentile queue expressed in feet. XX - Exceeds storage.

6.2 Alternative 2: Monroe Street Roundabout

The Monroe Street roundabout would construct a four leg, one-lane roundabout, aligning Charles Ave and Monroe Street. This alternative relocates the existing Charles Ave by acquiring the property at the southwest corner of the intersection. The high school parking lot can be located on the old siting of Charles Avenue. There are crosswalks across all legs of the roundabout.

Table 5: Alternative 2 Roundabout Capacity Analyses

Location	2026 Weekday Morning Peak Hour				2026 Weekday School (PM) Peak Hour			
	v/c	LOS	Delay	95thQ	v/c	LOS	Delay	95thQ
Court St at Charles Ave / Monroe St								
Charles Ave - EB LT/TH/RT	0.38	B	14	50	0.52	C	18	75
Monroe St - WB LT/TH/RT	0.26	B	14	25	0.17	B	10	25
Court St - NB LT/TH/RT	1.00	E	49	950	0.86	D	27	325
Court St - SB LT/TH/RT	0.88	D	31	325	0.87	D	27	325
Overall	**1.00**	**E**	**37**	**-**	**0.87**	**C**	**25**	**-**

	2026 Weekday Evening Peak Hour			
	v/c	LOS	Delay	95thQ
Court St at Charles Ave / Monroe St				
Charles Ave - EB LT/TH/RT	0.18	B	12	25
Monroe St - WB LT/TH/RT	0.07	A	9	25
Court St - NB LT/TH/RT	0.81	C	20	250
Court St - SB LT/TH/RT	1.01	F	51	1725
Overall	**1.01**	**E**	**36**	**-**

v/c - The volume to capacity ratio.

LOS - The level of service.

Delay - The delay expressed in seconds.

95thQ - The 95th percentile queue expressed in feet.

As shown in the table above, the Court Street/ Charles Avenue/ Monroe Street in Alternative 2 operates at or over capacity during both the weekday morning and weekday evening peak periods. Additionally during these peak periods the overall LOS for the roundabout is LOS E. Unlike Alternative 1, queuing does not have as large of an impact on the operations of the intersection since there are no longer two intersections in close proximity to each other.

6.3 Alternative 3: Monroe Street Signal

The Monroe Street signal option realigns Charles Avenue to line-up with Monroe Street at a four-way intersection with Court Street. Rather than a roundabout, traffic would be controlled by a traffic light. There would be designated left turn lanes from Court Street northbound to Charles Avenue and southbound to Monroe Street. This alternative includes sidewalks and crosswalks in all directions. It would require acquisition of property at the southwest corner. As with Alternative 2, the former Charles Avenue alignment would be converted to the high school parking lot.

Table 6: Alternative 3 Signalized Intersection Capacity Analyses

Location	2026 Weekday Morning Peak Hour				2026 Weekday School (PM) Peak Hour			
	v/c	LOS	Delay	95thQ	v/c	LOS	Delay	95thQ
Court St at Charles Ave / Monroe St								
Charles Ave - EB LT/TH	0.57	D	50	150	0.70	D	54	175
Charles Ave - EB RT	0.07	D	41	50	0.10	D	39	75
Monroe St - WB LT/TH/RT	0.36	D	43	125	0.19	D	38	75
Court St - NB LT	0.38	A	9	100	0.40	D	43	100
Court St - NB TH/RT	0.69	B	15	850	0.74	B	20	750
Court St - SB LT	0.29	D	54	50	0.44	D	48	75
Court St - SB TH	0.67	B	18	625	0.79	C	24	775
Court St - SB RT	0.03	A	9	25	0.03	B	11	25
Overall	**0.64**	**B**	**20**	**-**	**0.68**	**C**	**26**	**-**

	2026 Weekday Evening Peak Hour			
	v/c	LOS	Delay	95thQ
Court St at Charles Ave / Monroe St				
Charles Ave - EB LT/TH	0.16	D	43	50
Charles Ave - EB RT	0.03	D	42	25
Monroe St - WB LT/TH/RT	0.20	D	43	75
Court St - NB LT	0.31	D	46	75
Court St - NB TH/RT	0.68	B	14	825
Court St - SB LT	0.31	D	46	75
Court St - SB TH	0.83	B	20	1150
Court St - SB RT	0.02	A	6	25
Overall	**0.70**	**B**	**19**	**-**

v/c - The volume to capacity ratio.

LOS - The level of service.

Delay - The delay expressed in seconds.

95thQ - The 95th percentile queue expressed in feet.

As shown in the above table, the results of the signalized intersection of Court Street/Charles Avenue/Monroe Street show good levels of service with LOS C or better under the three peak hour conditions under Alternative 3.

6.4 Alternatives Evaluation Matrix

The matrix below provides an objective evaluation of the No Build and three Build alternatives evaluated for the Court/Charles/Monroe Intersection study area. Alternative 1, which replaces the signal at the Court Street/Charles Avenue intersection with a roundabout, is the lowest cost Build alternative. However, Alternative 1 only moderately improves traffic flow and bicycle and pedestrian accessibility and also has significant right-of-way and historic resource impacts.

Both Alternatives 2 and 3 realign Charles Avenue to intersect Court Street across from Monroe Street. Although the overall configuration and construction cost for both alternatives are similar, Alternative 3 has less right-of-way impact than Alternative 2, has better traffic performance, and has less historic district impacts than Alternative 2.

Table 7: Alternatives Evaluation Matrix

	No Build	Alt 1 *Charles Roundabout*	Alt 2 *Monroe Roundabout*	Alt 3 *Monroe Signal*
COST: *Design & Construction*	**$0**	**$350,000**	**$980,000**	**$870,000**
COST: *Right-of-Way*	**$0**	**Lowest** *(partial impacts to 1 property)*	**Highest** *(acquisition plus partial impacts to 1 property)*	**Middle** *(acquisition)*
CONGESTION: *Avg. Level of Service*	**LOS F**	**LOS D/E**	**LOS D**	**LOS A**
BIKE/PED: *Accessibility & Safety*	**No Change**	**Slight Increase** *(Two intersections)*	**Increase** *(Single intersection)*	**Increase** *(Single intersection)*
SAFETY: *Anticipated Effects*	**No Change**	**Slight Decrease** *(combine roundabout & signal)*	**Improvement** *(single intersection; roundabout)*	**Improvement** *(single intersection; signal)*
IMPACTS: *Historic Properties*	**None**	**Significant** *(Historic District)*	**Significant** *(Historic District)*	**Moderate**
IMPACTS: *Hazardous Materials*	**None**	**None**	**Yes** *(Fuel Tanks)*	**Yes** *(Fuel Tanks)*

7.0 Preferred Alternative

The intersection alternatives and alternatives evaluation assessment was presented to the Middlebury Selectboard on January 12, 2016. Following a discussion of the alternatives, the Selectboard approved the four-way signalized intersection design, **Alternative #3**, as the preferred alternative, with seven votes in favor and none opposed. The meeting agenda, meeting minutes, and presentation can be found in Appendix A.

Appendix A

Summary of Public Input

Town of Middlebury
Court Street/Charles Ave/Monroe Street Intersection
Initial Public Information Meeting
Wednesday, June 3, 2015
Middlebury Union High School Cafeteria
7:00 PM

Please mark your calendar for an initial public information meeting on the Court Street/Charles Ave/Monroe Street Intersection Scoping Project on Wednesday, June 3rd at 7:00 PM in the Middlebury Union High School Cafeteria.

Ted Dunakin (Middlebury Planning and Zoning) and David Saladino (VHB) will provide a brief overview of the project. A break-out session will follow the presentation to solicit thoughts, ideas, and issues on the intersection.

For additional information, please contact Ted Dunakin at TDunakin@TownOfMiddlebury.org or Dave Saladino at dsaladino@vhb.com.

Project Description:
The Town of Middlebury wishes to explore alternatives and recommend improvements that facilitate improved mobility and safety for vehicular, pedestrian, bicycle, and transit traffic for the complex intersection of Charles Avenue, Court Street, and Monroe Street. The existing Court Street signalized intersection configuration at Charles Avenue and Monroe Street is atypical and promotes inefficient traffic operations, driver confusion, mode conflicts, and safety issues. Beyond these operational deficiencies, the intersection configuration discourages continuity with the surrounding land uses and efficient north-south circulation through Middlebury. Our approach to this project is simple—use this study and plan as an opportunity to create a safe, accessible southern gateway into Middlebury that welcomes and accommodates all modes of transportation.

Middlebury Court Street/Charles Ave/Monroe Street Intersection Scoping Study

Town of Middlebury, Vermont

Presented by
David Saladino, PE, AICP
Kelly Barry, EIT

June 3, 2015

Introductions/Project Team

Ted Dunakin
Planning and Zoning
Town of Middlebury

Dan Werner
Operations/Public Works
Town of Middlebury

David Saladino, PE, AICP
Project Manager
VHB

Meredith Graham, PE
Senior Traffic Engineer
VHB

Kelly Barry, EIT
Project Engineer
VHB

Kaitlin O'Shea
Preservation Planner
VHB

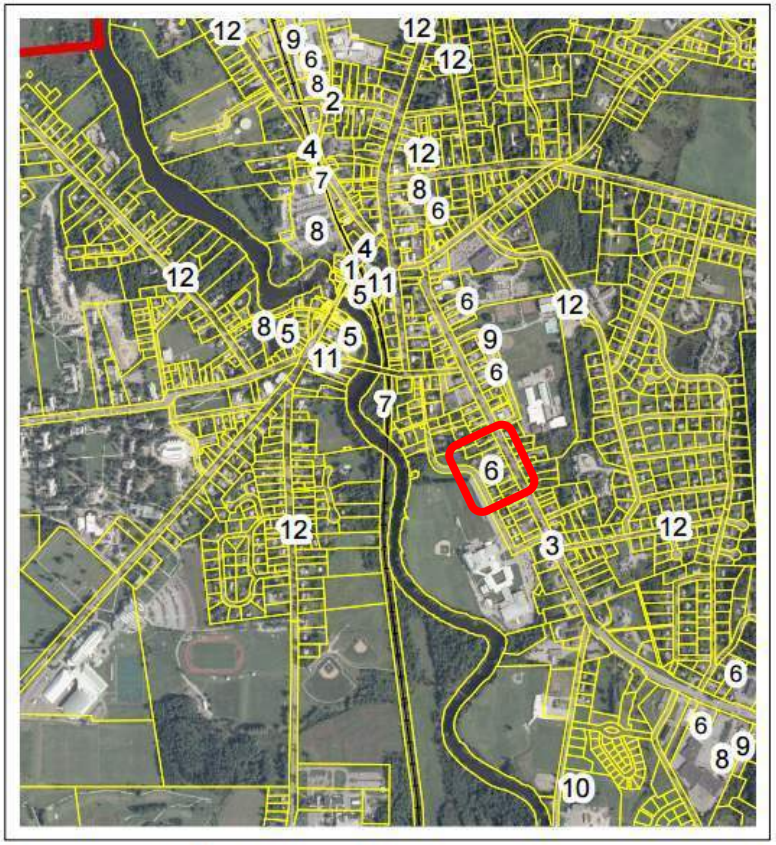
Project Goals

- Improve **mobility** & **safety** for **all modes**
- Enhance **connectivity** between surrounding land uses
- Balance the needs of **all stakeholders**
- Ensure that transportation infrastructure is **complementary** to community character.

How to Get There

- Listen > Investigate > Evaluate > Select
- Develop a **range of alternatives** from which a **Preferred Alternative** will be selected and progress towards final design and construction

Cited in 2012 Town Plan



Transportation Plan - Needs and Improvements

Map # Key

1. RR tunnel - MarbleWorks Access
2. Elm / Seymour intersection
3. Charles /Monroe intersection
4. RR passenger platform options
5. Downtown parking / management
6. Parking lot interconnections
7. Ped railroad crossing
8. Parking lot improvements
9. Park & Ride locations
10. ACTR Transit Facility
11. Bus stop & transit amenities
12. Traffic calming needed

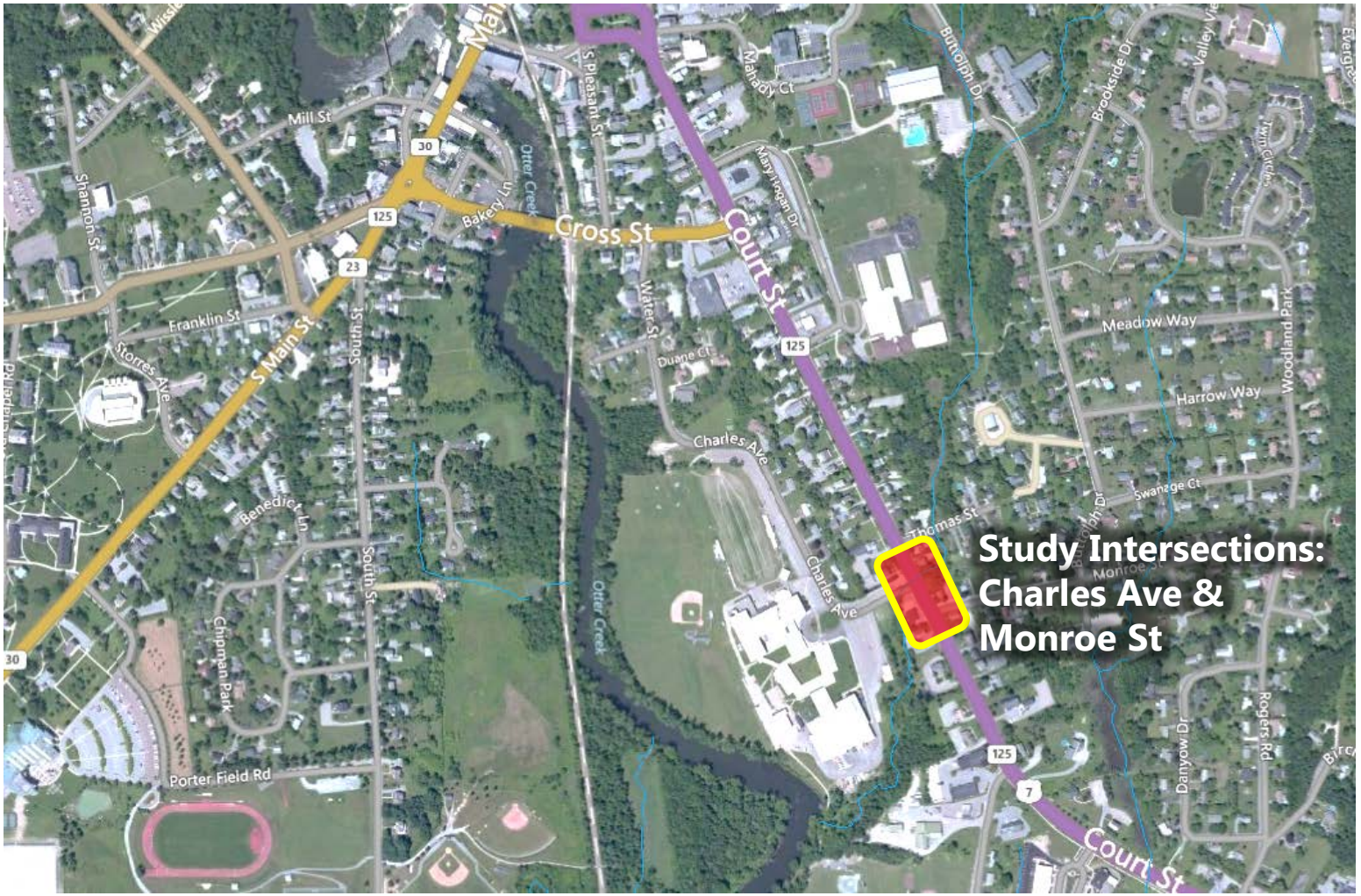
See also Town Map of Transportation Plan Needs and Improvements

0 0.05 0.1 0.2 0.3 0.4 Miles

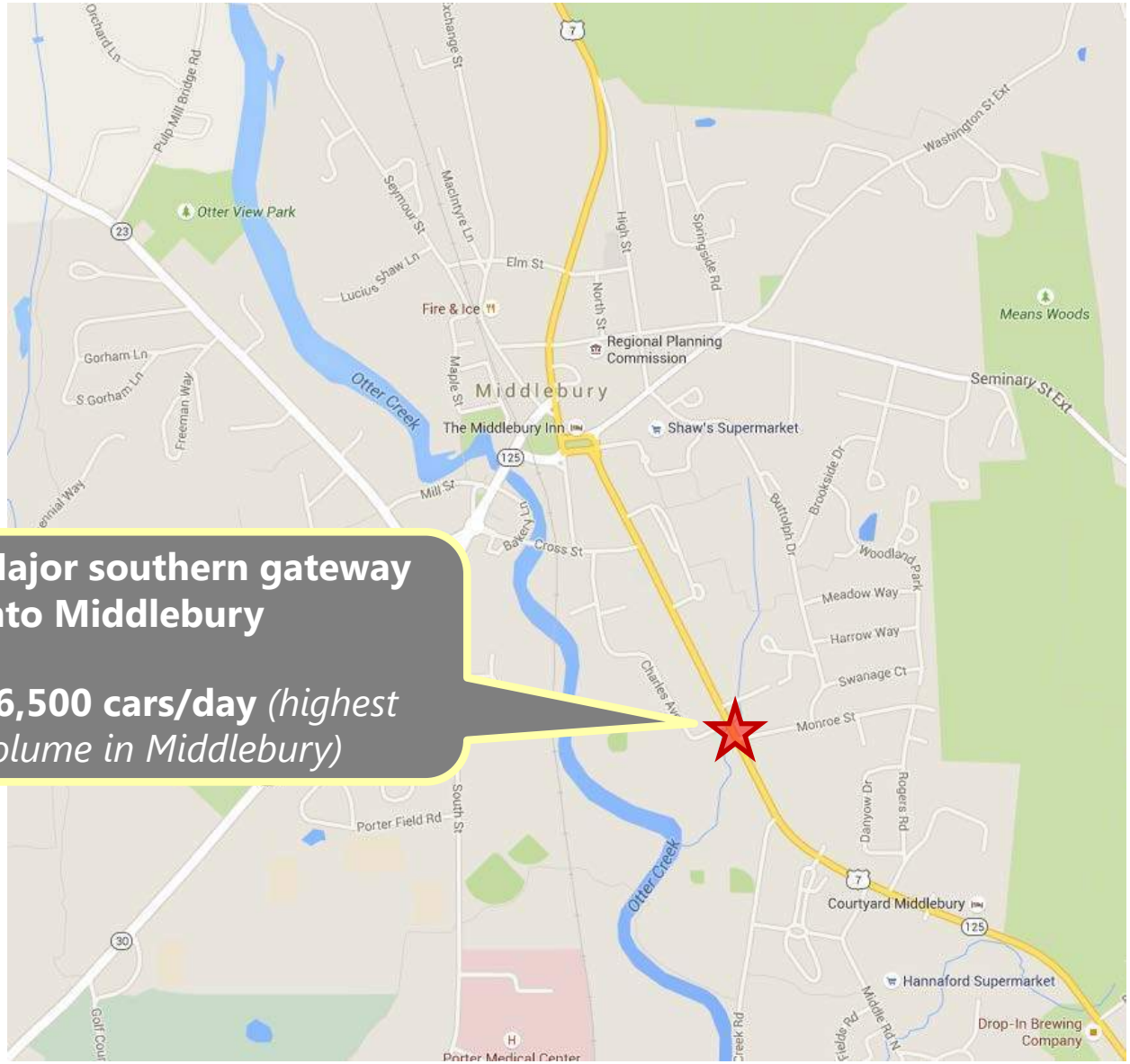
Middlebury 2012 Town Plan

N

Project Area

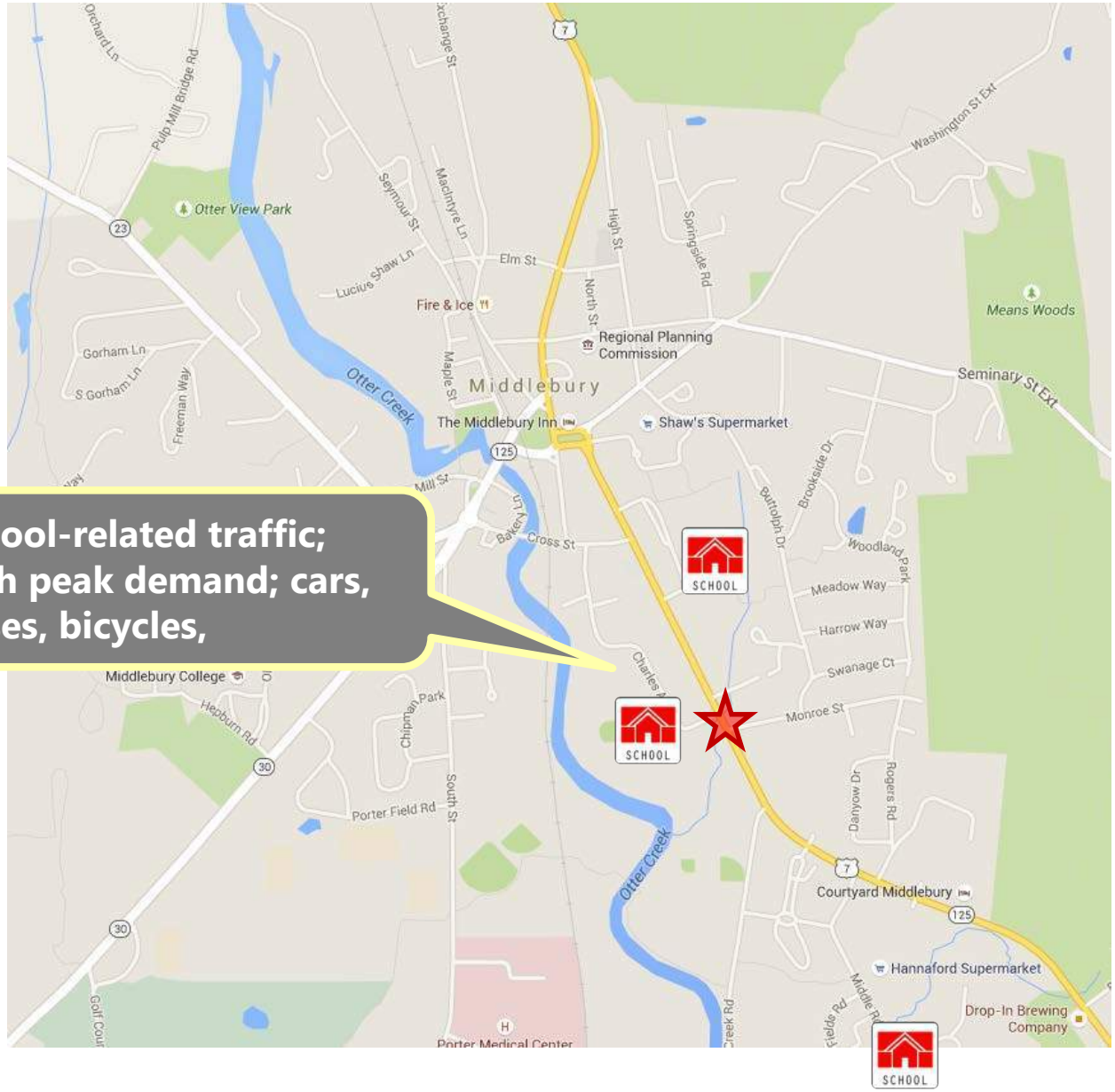


Existing Characteristics



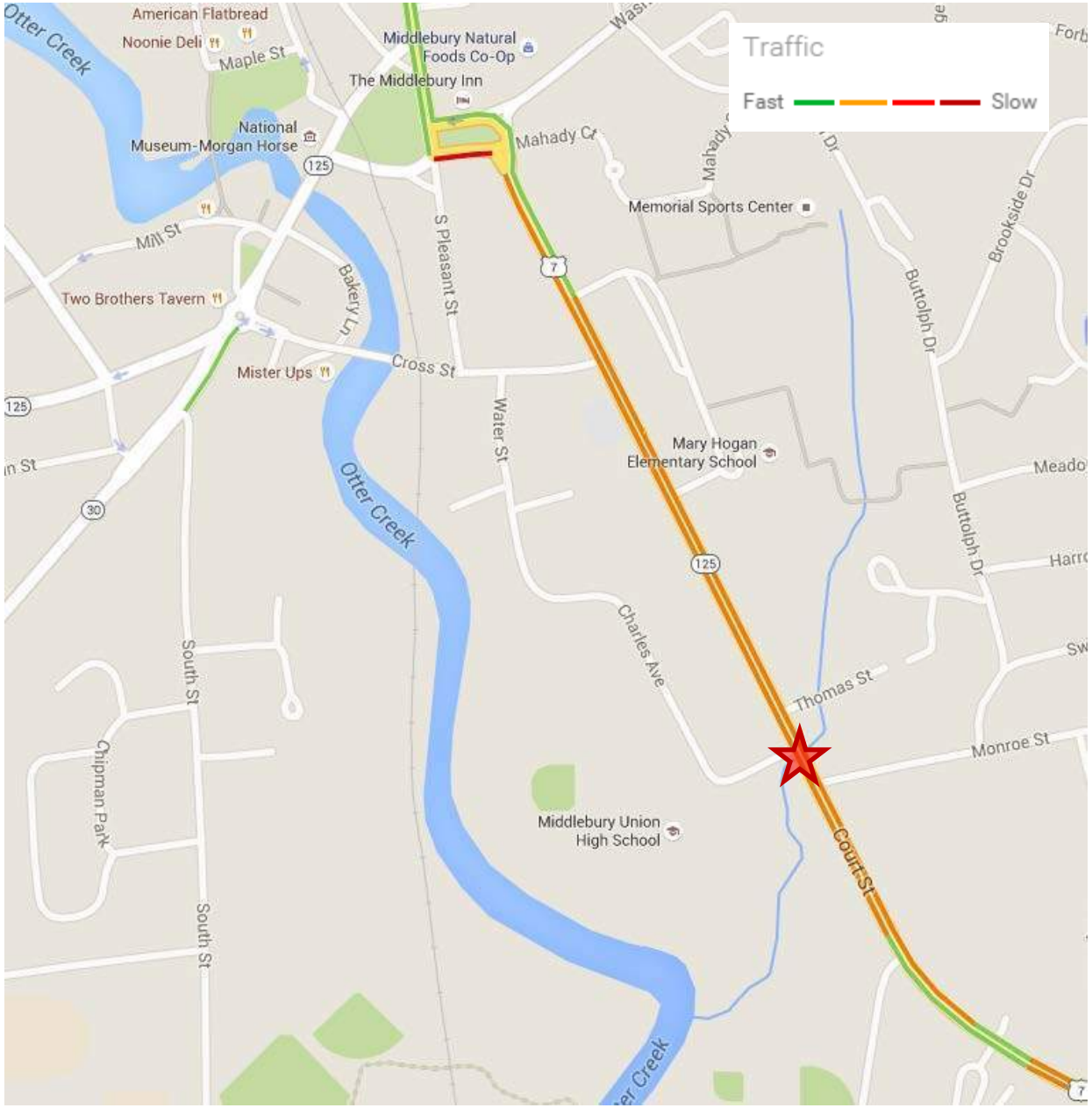
- **Major southern gateway into Middlebury**
- **16,500 cars/day** *(highest volume in Middlebury)*

Existing Characteristics

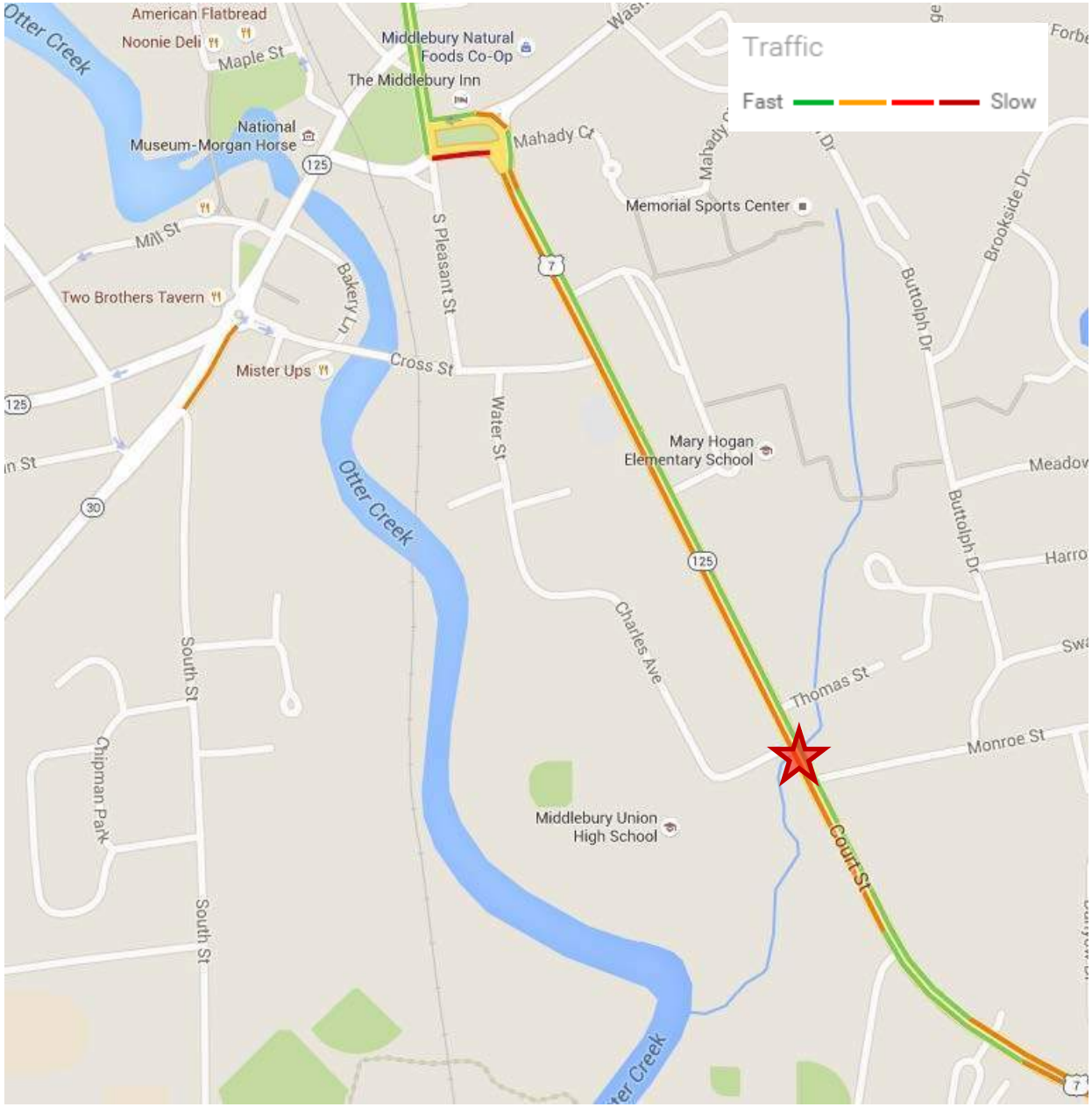


- **School-related traffic; high peak demand; cars, buses, bicycles,**

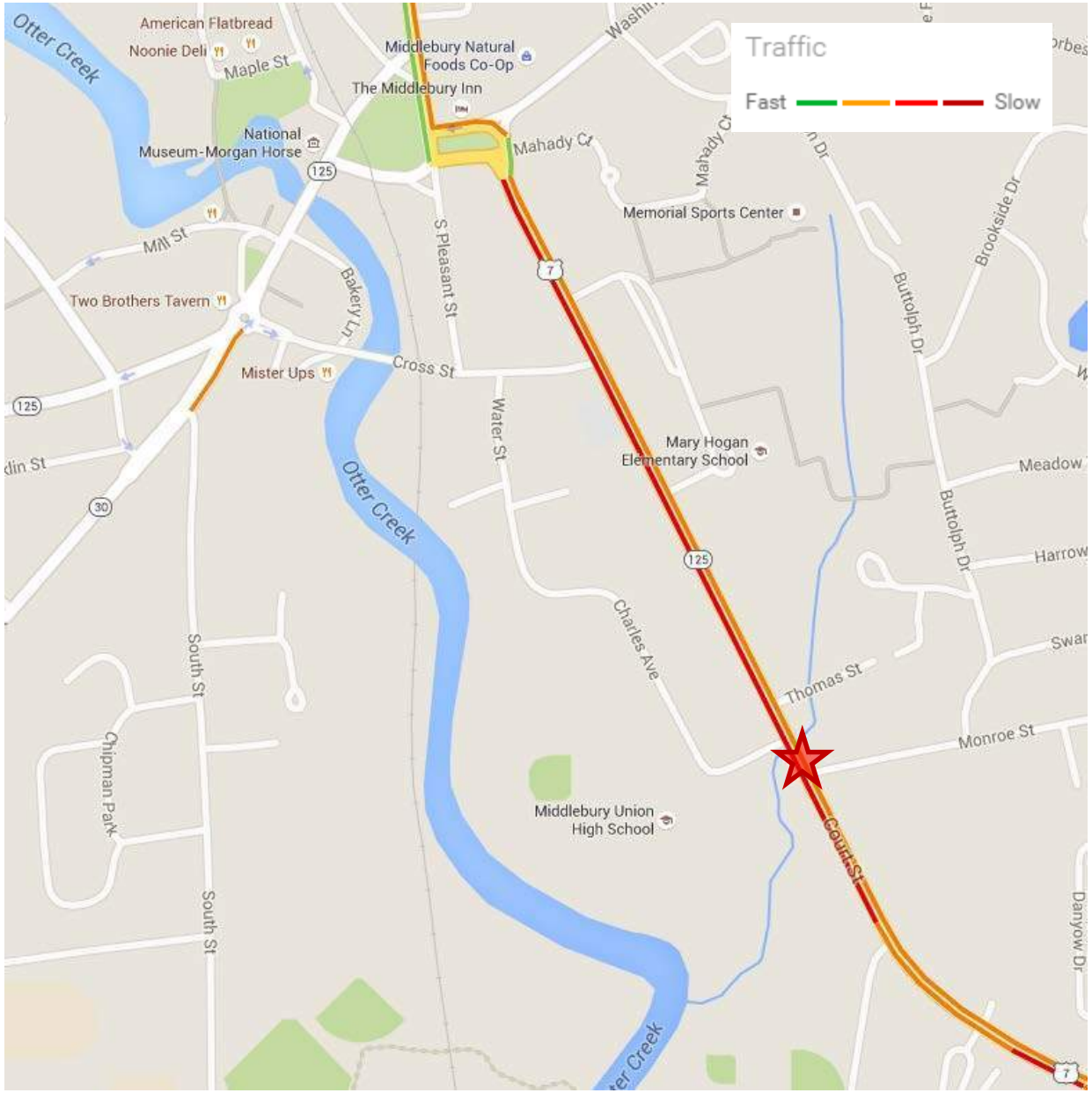
Traffic Congestion – 7:30 AM



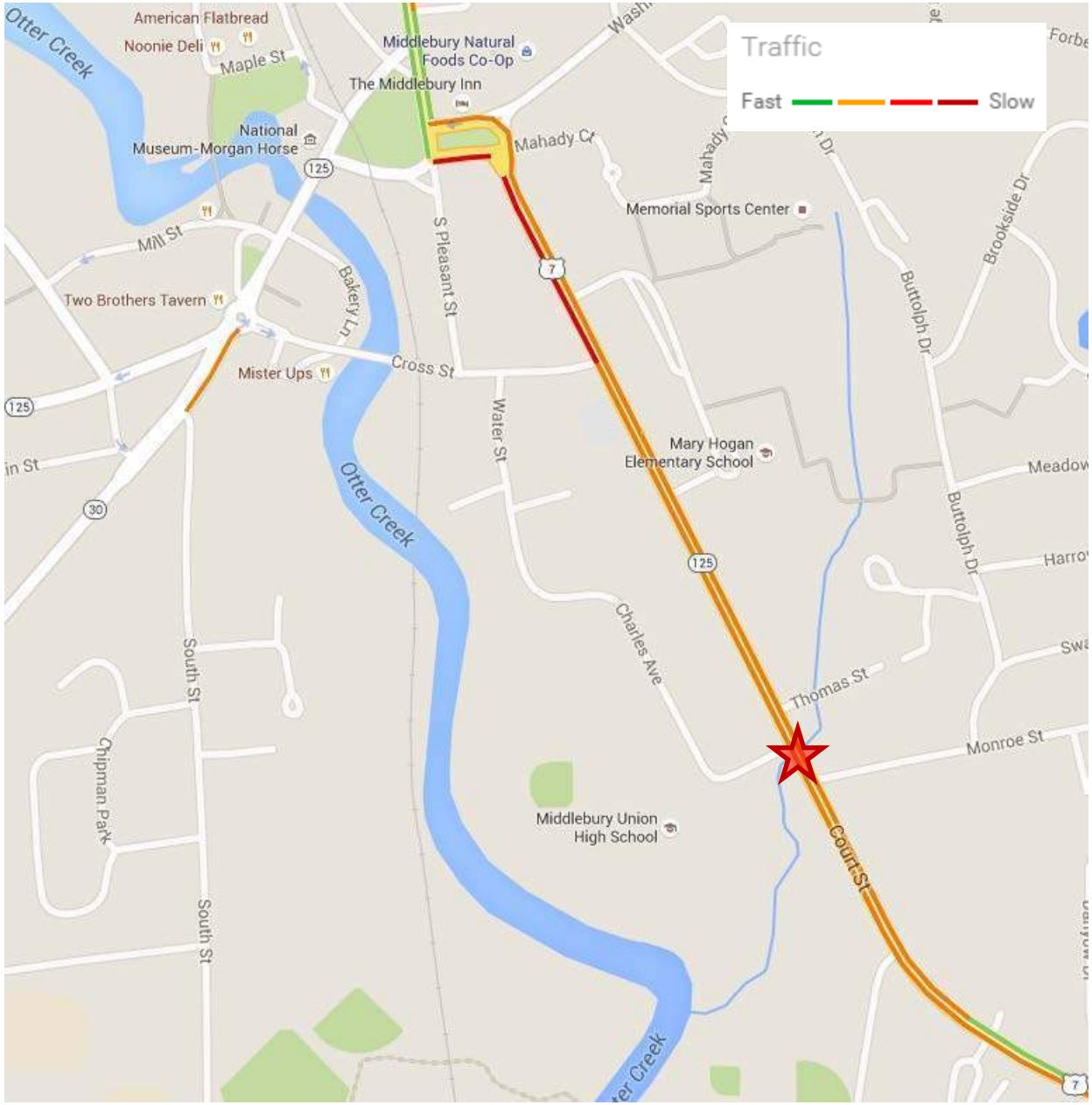
Traffic Congestion – 12:00 PM



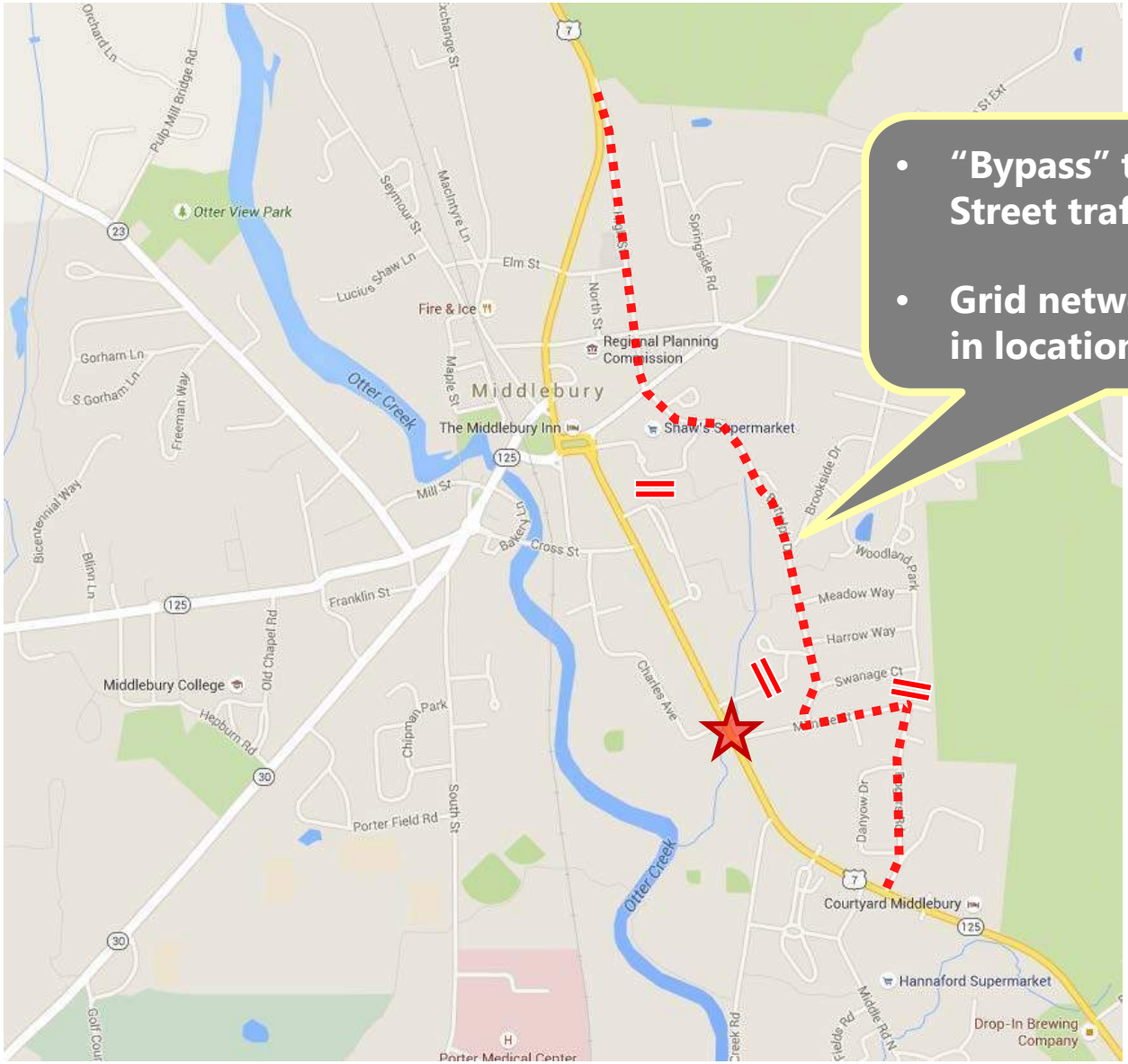
Traffic Congestion – 3:00 PM



Traffic Congestion – 5:00 PM



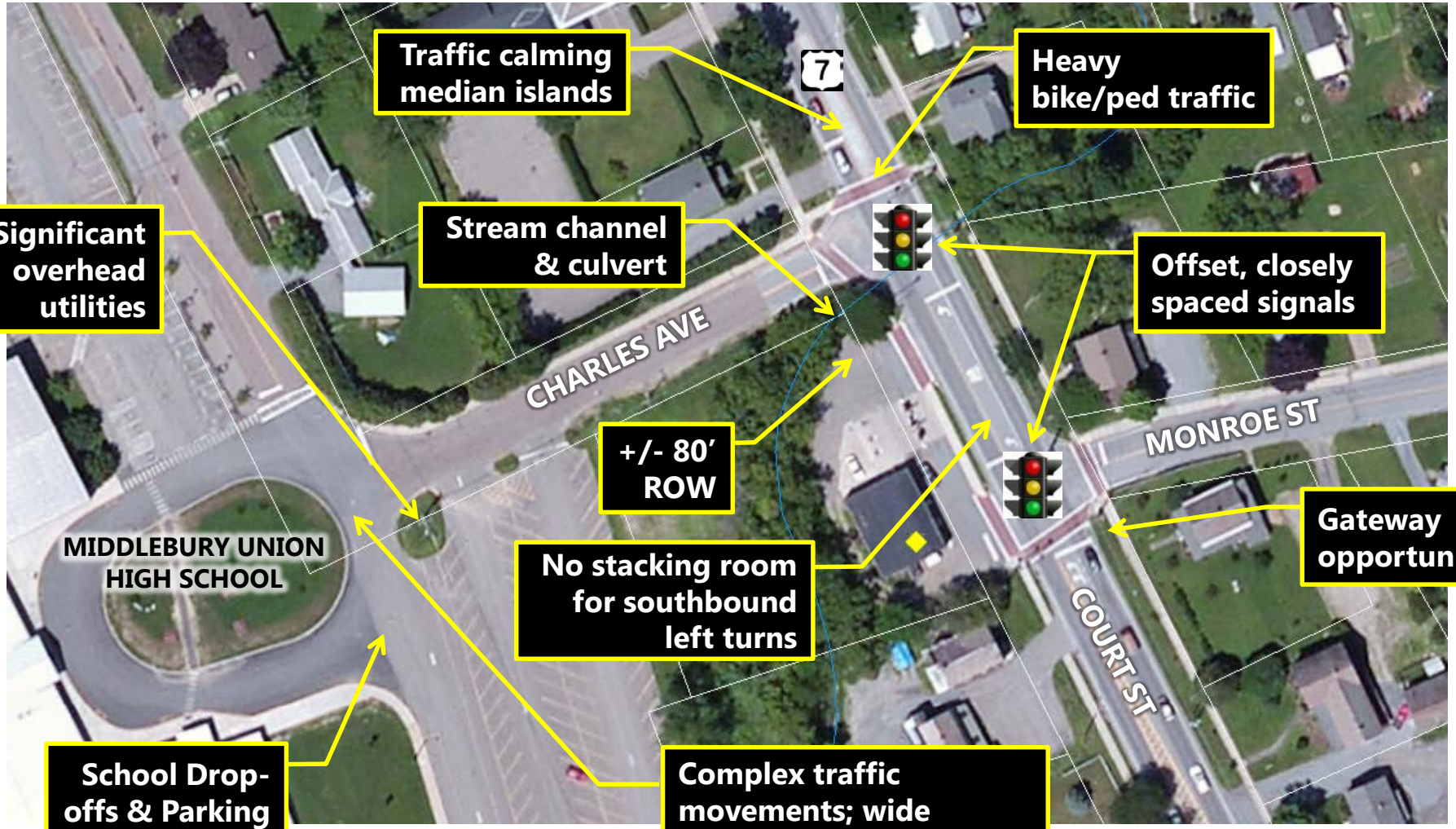
Bypass & Closed Connections

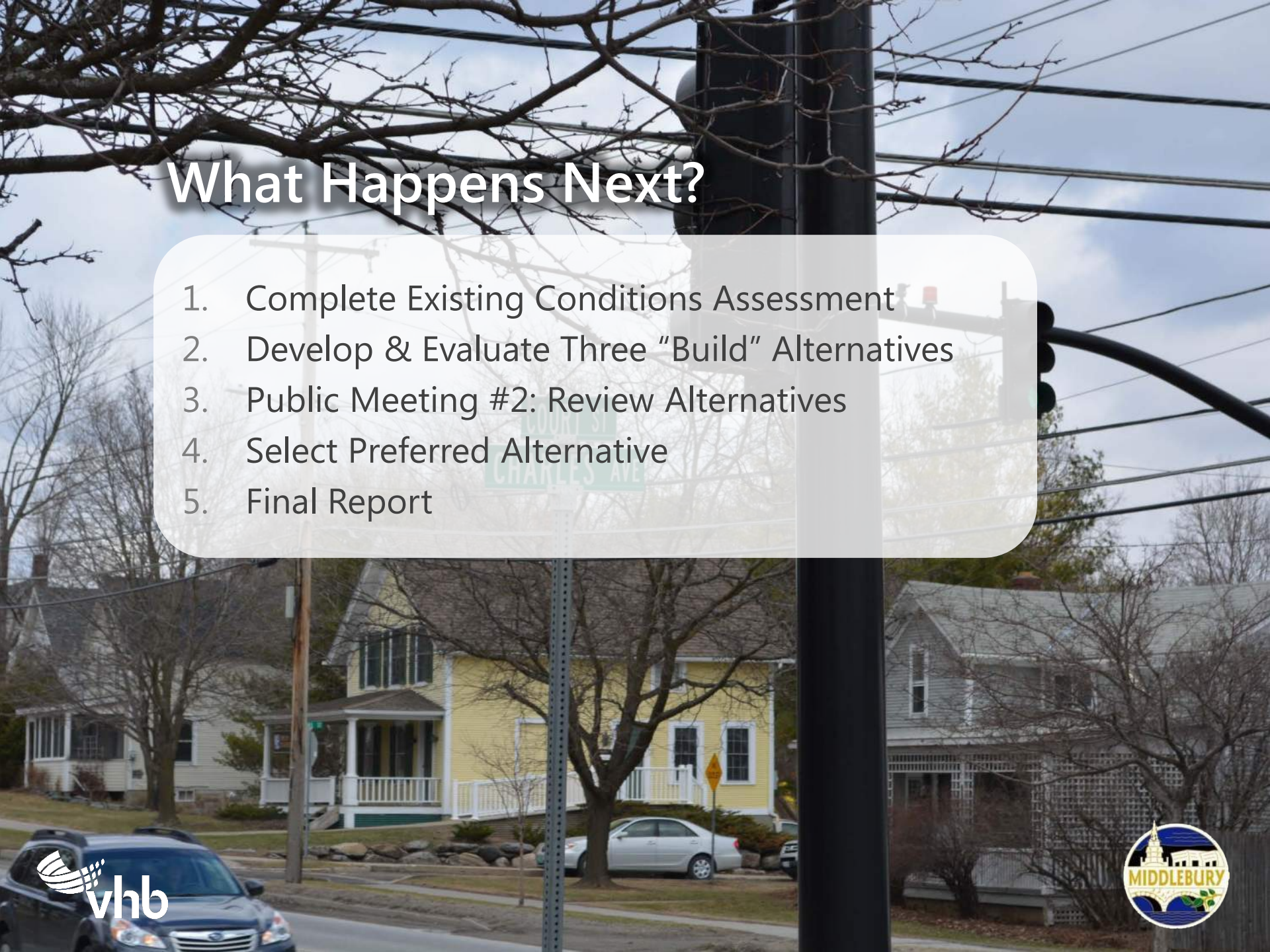


- "Bypass" to avoid Court Street traffic
- Grid network disrupted in locations

Intersection Area

Existing Conditions & Issues

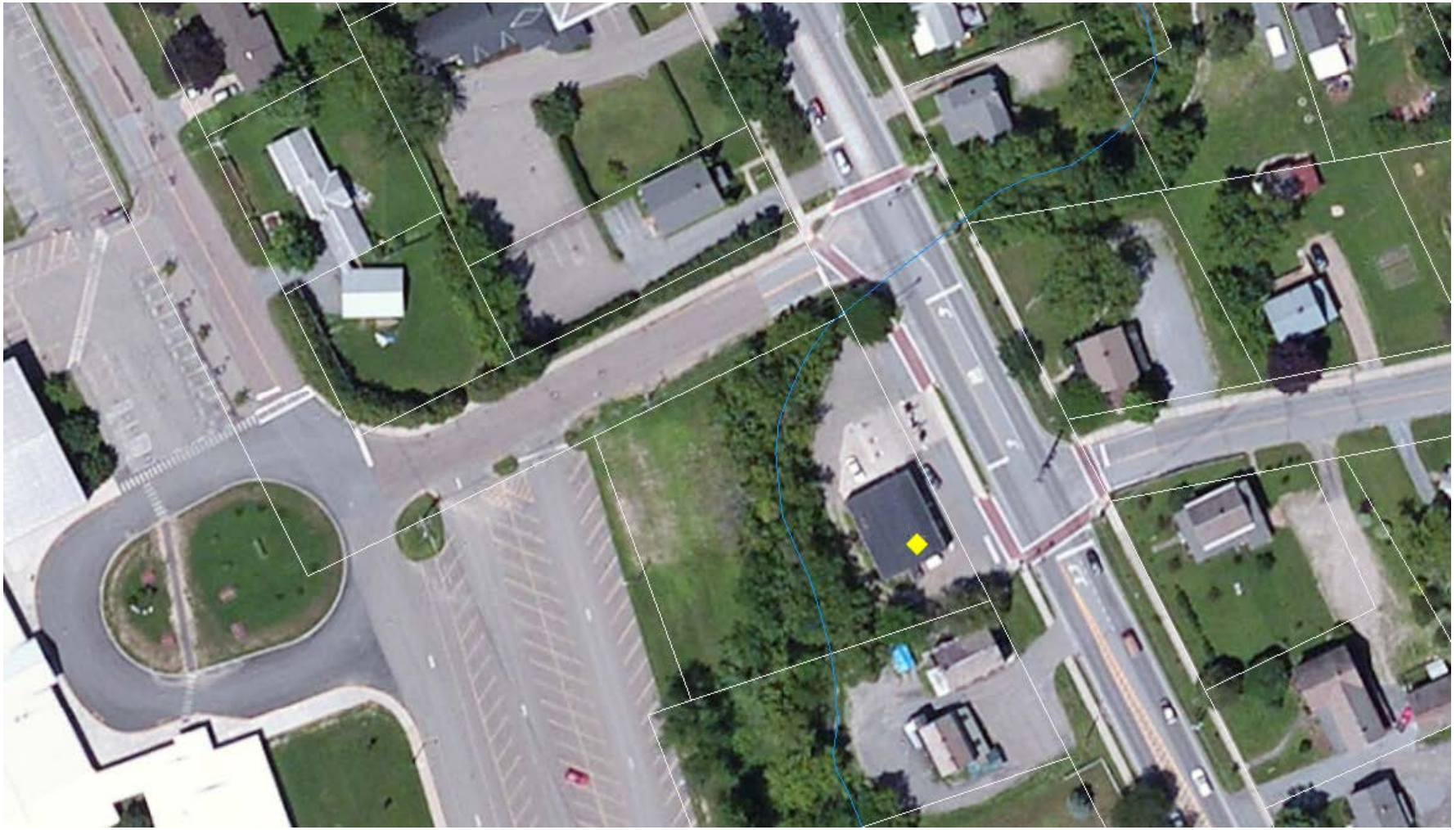




What Happens Next?

1. Complete Existing Conditions Assessment
2. Develop & Evaluate Three “Build” Alternatives
3. Public Meeting #2: Review Alternatives
4. Select Preferred Alternative
5. Final Report

Break-out Groups



Ted Dunakin | tdunakin@townofmiddlebury.org | 802.388.8100 x210

Dan Werner | dwerner@townofmiddlebury.org | 802.388.4045

David Saladino | dsaladino@vhb.com | 802.497.6121

Kelly Barry | kbarry@vhb.com | 802.497.6173

www.vhb.com

Offices located throughout the east coast

Meeting Notes

Place: Middlebury Union High School

Date: June 3, 2015 Notes Taken by: VHB

Project #: 57766.00 Re: Middlebury Court St/Monroe St/Charles Ave Intersection Scoping Study Public Meeting

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ATTENDEES: Ted Dunakin (Town of Middlebury), Dan Werner (Town of Middlebury), Dave Saladino (VHB), Kaitlin O'Shea (VHB), Kelly Barry (VHB), see attached sign-in sheet

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The proposed Court St/Monroe St/Charles Ave intersection improvement project (Project) will develop, review and select a preferred alternative to reconfigure the intersections of Charles Ave and Monroe St with Court St/Route 7 in Middlebury to provide better mobility, safety, and connectivity for all modes of transportation. The Project design is being funded by a Municipal Planning Grant and Town of Middlebury funds. The following notes are a record of the Local Concerns Meeting that took place on June 3, 2015 as part of the project development process. The purpose of the meeting was to solicit input from local residents, property owners and agencies to better target the proposed alternatives to meet the user's needs.

1. Introduction
    a. *Dave introduced the project, its location, and the project team.*
        i. *Ted Dunakin, Town of Middlebury, Planning and Zoning*
        ii. *Dan Werner, Town of Middlebury, Department of Public Works*
        iii. *Dave Saladino, Project Manager, VHB*
        iv. *Kaitlin O'Shea, Preservation Planner, VHB*
        v. *Kelly Barry, Project Engineer, VHB*
        vi. *Meredith Graham, Senior Traffic Engineer, VHB*
    b. *The purpose of this meeting is to solicit input from those in attendance.*
2. Preliminary Project Goals
    a. Improve Mobility and Safety
    b. Enhance Connectivity
    c. Balance Needs of Stakeholders
    d. Ensure Infrastructure is Complementary to Community Character
3. Scoping Phase

a. Listen, Investigate, Evaluate, Select

4. Reviewed Existing Conditions
    a. Vehicles per Day
    b. Types of Traffic
    c. Peak Hour Volumes
    d. Bypass Routes
5. Question and Comments
    a. *No traffic counts were taken in the middle of the day. How would that affect the design?*
        i. *This data was just received and is an initial look at peak hour trends. Full day traffic data will be used to supplement the recent peak hour turning movement counts - Dave*
    b. *Everyone crossing Monroe Street has to come down the cross walk on one side. The counters may have missed some pedestrian crossings.*
    c. *What will the new Town Recreation Center do to traffic volumes? It will be a municipal gym that hosts a variety of Middlebury Parks and Recreation programs.*
        i. *We haven't gotten to that level on analysis yet. We are still in the data collection phase of scoping - Dave*
    d. *People get backed up while trying to turn towards the Mary Hogan Elementary School in the morning. Cars can back up onto Court Street.*
    e. *There is a pedestrian path from Buttolph Drive to Mary Hogan Elementary School that some pedestrians use.*
    f. *The creek shown in the map is substantial and will need to be accounted for in the design.*
    g. *Bypass routes are used by a lot of people who don't like sitting in traffic on Court Street.*
    h. *Other towns have multiple in and out routes for schools, but not Mary Hogan. Seems like a poor design.*
    i. *Perhaps part of the solution is to encourage alternative modes of transportation. Is that part of the scope of this study?*
        i. *Yes, that can be part of the solution – Dave*
    j. *Safer routes to schools and more bike/ped friendly infrastructure is important.*
    k. *Perhaps we could include a ped bridge over Route 7?*

i. *Stairs sometimes deter use of ped bridges, and would also have to be ADA compliant, but still worth a consideration in the alternatives – Dave*

l. *There is no turning lane if you are heading south on Court Street turning left towards Monroe St.*

6. Break-Out Groups
    a. Summary of Table 1 Comments
        i. *Left turns onto Monroe and Charles are biggest issues. A roundabout would eliminate all left turns*
        ii. *A parallel bike path along the corridor so bike/ped can be safely out of the roadway and use the same crossings*
        iii. *Continuing Charles Ave to Creek Road would eliminate some southbound school traffic*
        iv. *A left turn lane should be provided at Monroe St if not pursuing a roundabout option*
    b. Summary of Table 2 Comments
        i. *Lack of sidewalks on south side of Monroe Street is a safety concern with so many children on that road – new sidewalk to tie into Court Street*
        ii. *Add traffic calming measures to Monroe St*
        iii. *Roundabout would making turning left from Thomas Street nearly impossible*
        iv. *Also discussed extending Charles Ave to Creek Road*
        v. *A standard crossing with aligned intersection would be improvement but may also impact property south of gas station due to slopes and retaining wall*
    c. Summary of Table 3 Comments
        i. *Agree with aligning roads to make one intersection – did not discuss roundabout*
        ii. *Consider moving Monroe St behind the residences and aligned with Charles Ave, instead of moving Charles Ave south*
        iii. *Dedicated right turn lane from Charles Ave to Court St*
        iv. *Consider a ped bridge over Court St*
        v. *Consider a crossing signal along Court St across Charles Ave*
7. Additional Comments Received via Email

a. *As I'm unable to make tonight's public meeting I wanted to forward my comments to you as a Middlebury resident (Woodland Park) who uses this intersection on a regular basis as well as one who attempts to travel through the town on Rt. 7. Besides the obvious problem that shouldn't have been allowed (having three district schools connect to Rt. 7 in such close proximity):*
    i. *The traffic light at Monroe when heading out to Court St. takes too long to turn for traffic to effectively get out. If making a left turn to head south it's generally more expedient to drive around the neighborhood and exit on Rogers Rd. to Court St.*
    ii. *Besides adjusting the timing on the Monroe/Court St. light, why not shift it to a flashing red during non-peak hours? This would make way more sense so I don't hold up north-south traffic because I wish to turn left onto Court St.*
    iii. *The Monroe St. sign (no turning sign during certain school hours on certain days) should be removed as it is pretty pointless as by the time one reads it they are in a confined area that would necessitate turning around.*

b. *Thank you for organizing the public information meeting regarding the intersection of Monroe Street and Route 7. This intersection is a problem. I wish I could attend the meeting but I won't be able to; however, I would like to share my ideas with you.*
    i. *My suggestion is that the town acquire the south portion of the lot that currently holds the gas station. Then re-route Charles Street through that portion so that Charles and Monroe directly face each other.*
    ii. *I don't know if there is enough land on the southern end of this lot to run a street without taking the building down (it looks close). One possibility might be to exchange land parcels with the current owner. A stretch of land directly across Monroe Street in exchange for the parcel of land where Charles Street now enters Route 7. Such an exchange of land parcels could be a win-win for the town and the land owner.*
    iii. *Again, thanks for asking for public input and hope you have a productive meeting.*

c. *My thought/concern is regarding the Charles Ave, Court St. and Monroe Street traffic issue. I am and will be the biggest advocate for a traffic circle in this location yet sadly, my house is 89 Court Street… smack dab in the middle of this potential project. Although I attended this meeting, I did not feel like this was the time to voice any concerns for the unfortunate location of my home. When and where would I do this?*

Name	Address	Email
Irene Barna	7 Forbes Circle, Mdby	ibarna@middlebury.edu
Lance Phelps	79 Court St.	lance@phelpseng.com
Harry T Baker	4 Maple St. E. Midd	gbakerotc@comcast.net
Susan Shashok	1 Church St.	seshashok@comcast.net
Fred Dunnington	Po Box 242 Middlebury VT	fsdunnington@gmail.com
Chris Robbins	8 Gorham Ln. Midd.	a.c.robbins23@gmail.com
Lorraine Morse	124 Water St. Midd.	l.gmorse@myfairpoint.net
Meg Baker	40 Monroe St. Midd.	megabaker@gmail.com
C. DAVID BELCHER	86 Court St.	cdavid.belcher@gmail.com
Bruce MacIntire	73 Charles Ave	bmacintire@addisoncentralsu.org
Barbara Greenewalt	254 Happy Valley Rd	greenb@myfairpoint.net
BILL HUNTINGTON	67 MONROE ST	HUNTINGTON.WILLIAM@GMAIL
Mike + Judy Olinick	311 Woodland PK	olinickc
Alice Eckles	P.O. Box 443	aleckles@gmail.com middlebury.edu
Laura Asemily	266 Washington St Ext	laseemily@yahoo.com
Karen LaFlamme	89 Court St	klaflamme@middlebury.edu
Adam Franco	2 Evergreen Ln	adamfranco@gmail.com
Lee + Bonnie Totten Adkins	17 Overbrook Dr.	leemadkins@comcast.net
Ross CONRAD	609 Burnham Dr.	
George + Margaret KLOACK	130 Overbrook Dr	mgkloack@comcast.net
Roger Desautels	3 schoolhouse Rd	gdesautels@yahoo

PUBLIC MEETING NOTICE

Court Street/Charles Ave/Monroe Street Intersection Alternatives Review Public Meeting

Tuesday, October 13th, 2015
Middlebury Union High School Auditorium
7:00 PM

Please mark your calendar for a public meeting to review and discuss preliminary engineering alternatives that have been developed for the Court Street/Charles Avenue and Court Street/Monroe Street intersections. This meeting is open to all and will be held on Tuesday, October 13th at 7:00 PM in the Middlebury Union High School Auditorium.

Dan Werner (Middlebury Public Works Director of Operations) and David Saladino (VHB) will provide a brief overview of the project and present the alternatives developed to enhance safety, accessibility, and overall operations at the intersection. For additional information, please contact Dan Werner at dwerner@townofmiddlebury.org or Dave Saladino at dsaladino@vhb.com.

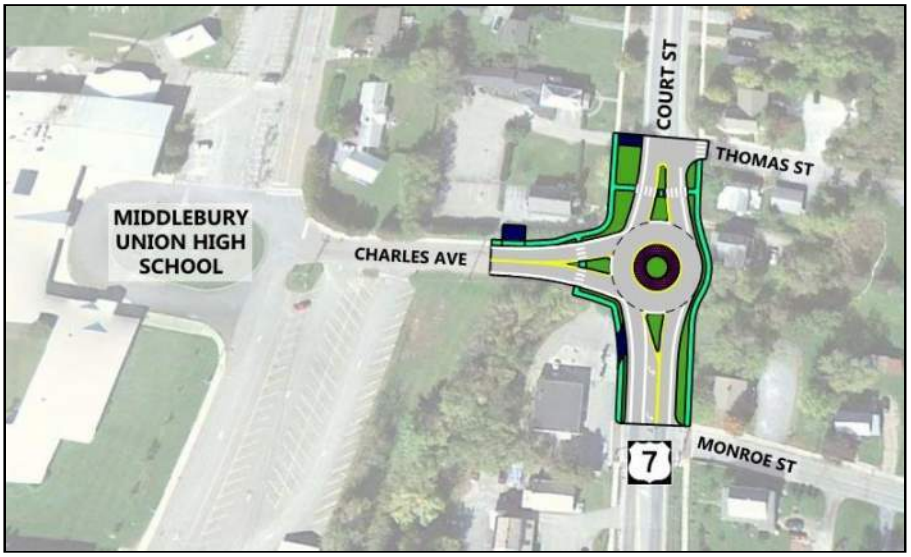
Project Description:
The Town of Middlebury is exploring alternatives that facilitate improved mobility and safety for vehicular, pedestrian, bicycle, and transit traffic through the complex intersections of Charles Avenue, Court Street, and Monroe Street. The two signalized intersections are aligned very closely together which promotes inefficient traffic flow, driver confusion, and safety issues. Beyond these operational deficiencies, the intersection configuration discourages continuity with the surrounding neighborhood and High School and serves as a barrier to efficient north-south circulation through Middlebury. The overall goal of this study is to define a package of improvements that enhances safety for all users; accommodates school-related transportation demands, reduces traffic congestion and facilitates mobility for all modes; and improves bicycle and pedestrian network connectivity.

See intersection alternatives on back

Court St/Charles Ave/Monroe Street Intersection Alternatives

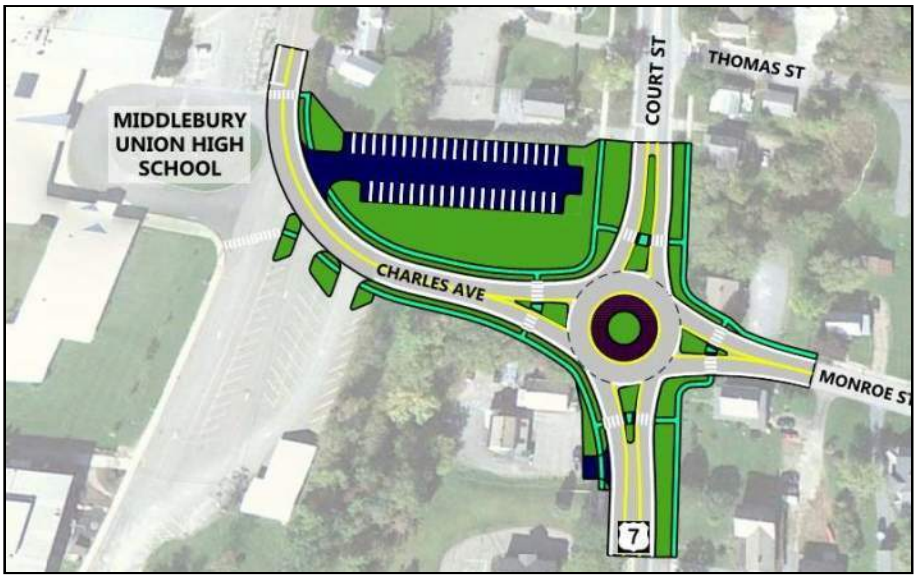
Alternative #1: Charles Ave Roundabout

Alternative 1 replaces the existing traffic signal at the Charles & Court Street intersection with a single lane round-about. A new southbound left turn lane is added on Court Street at the Monroe Street intersection.



Alternative #2: Monroe St Roundabout

Alternative #2 replaces both Court Street traffic signals with a single lane round-about. Charles Avenue is realigned to intersect Court Street across from Monroe Street. School parking (or enhanced open space) is created in the space created through the relocation of Charles Avenue.



Alternative #3: Monroe St Signal

Alternative #3 removes the existing Charles Avenue traffic signal and realigns Charles Avenue to intersect with Court Street across from Monroe Street. School parking (or enhanced open space) is created in the space created through the relocation of Charles Avenue.

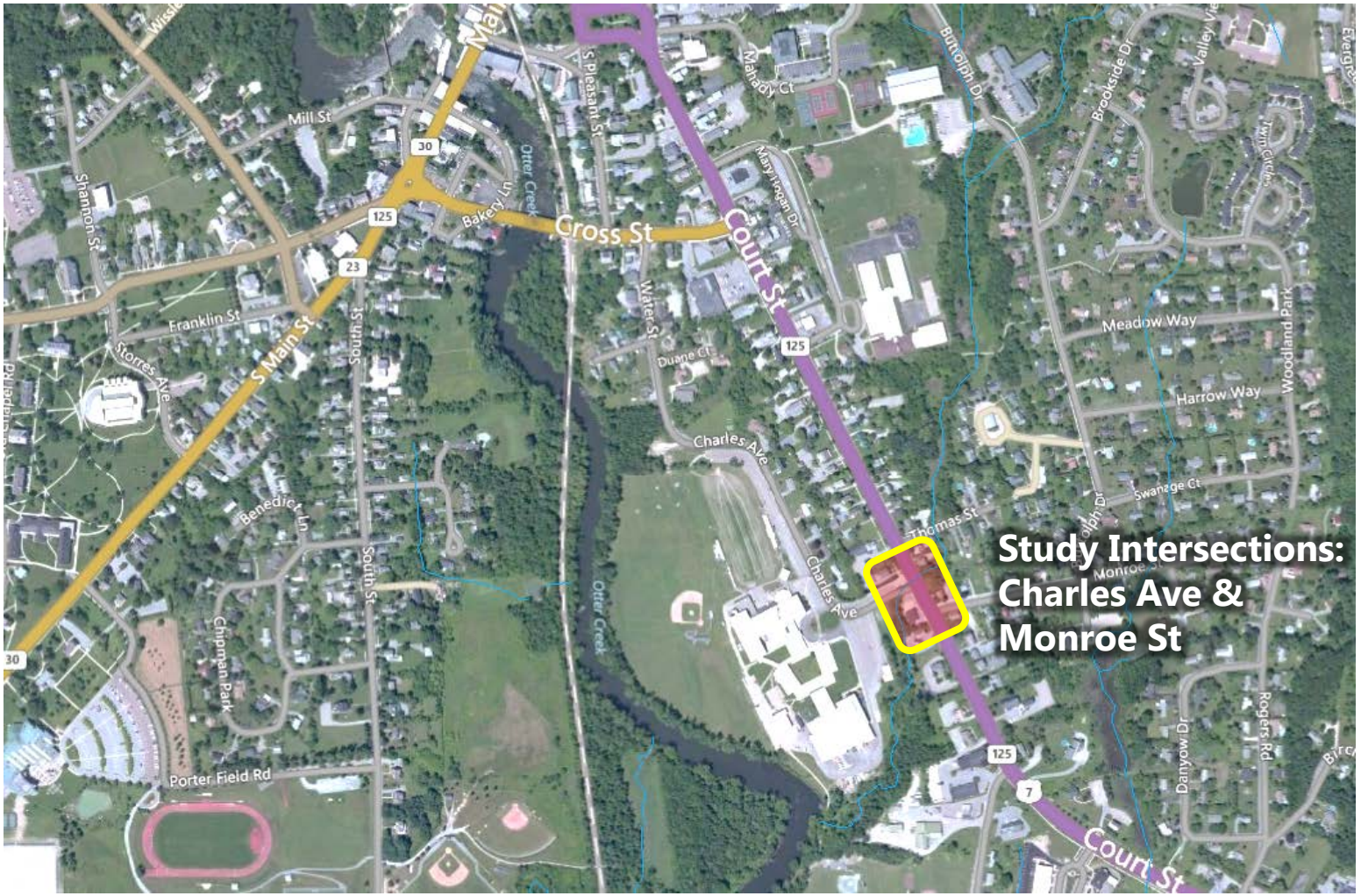
Middlebury Court Street/Charles Ave/Monroe Street Intersection Scoping Study

Town of Middlebury, Vermont

Presented by
David Saladino, PE, AICP

October 13, 2015

Project Area



Project Goals

- Improve **mobility** & **safety** for **all modes**
- Enhance **connectivity** between surrounding land uses *(e.g. school, neighborhoods, etc)*
- Balance the needs of **all stakeholders**
- Ensure that transportation infrastructure is **complementary** to community character.

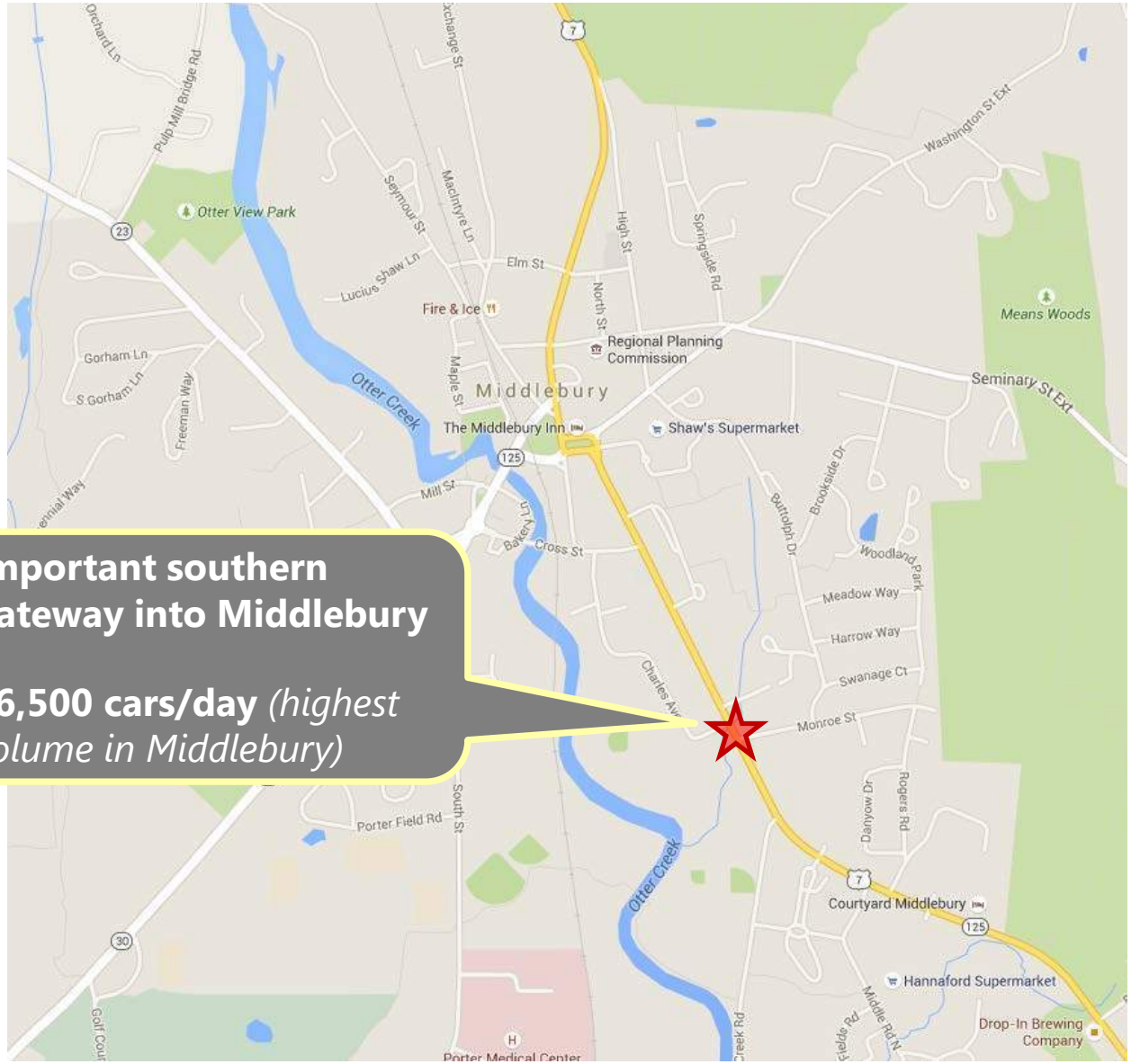
How to Get There

- **SCOPING PHASE**

  Listen > Investigate > Evaluate > Select

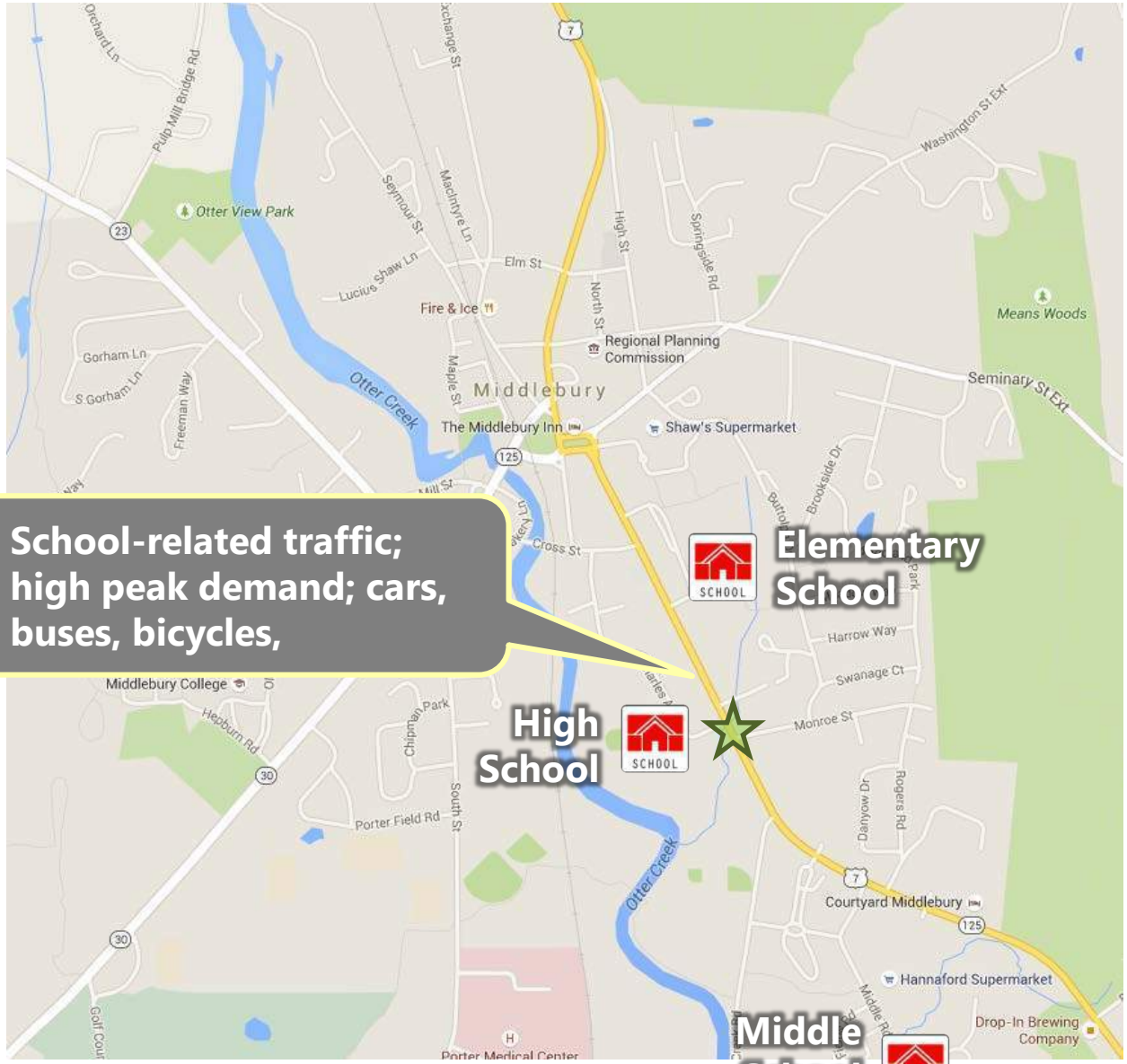
- Develop a **range of alternatives** from which a ***Preferred Alternative*** will be selected to progress towards final design and construction

Existing Characteristics



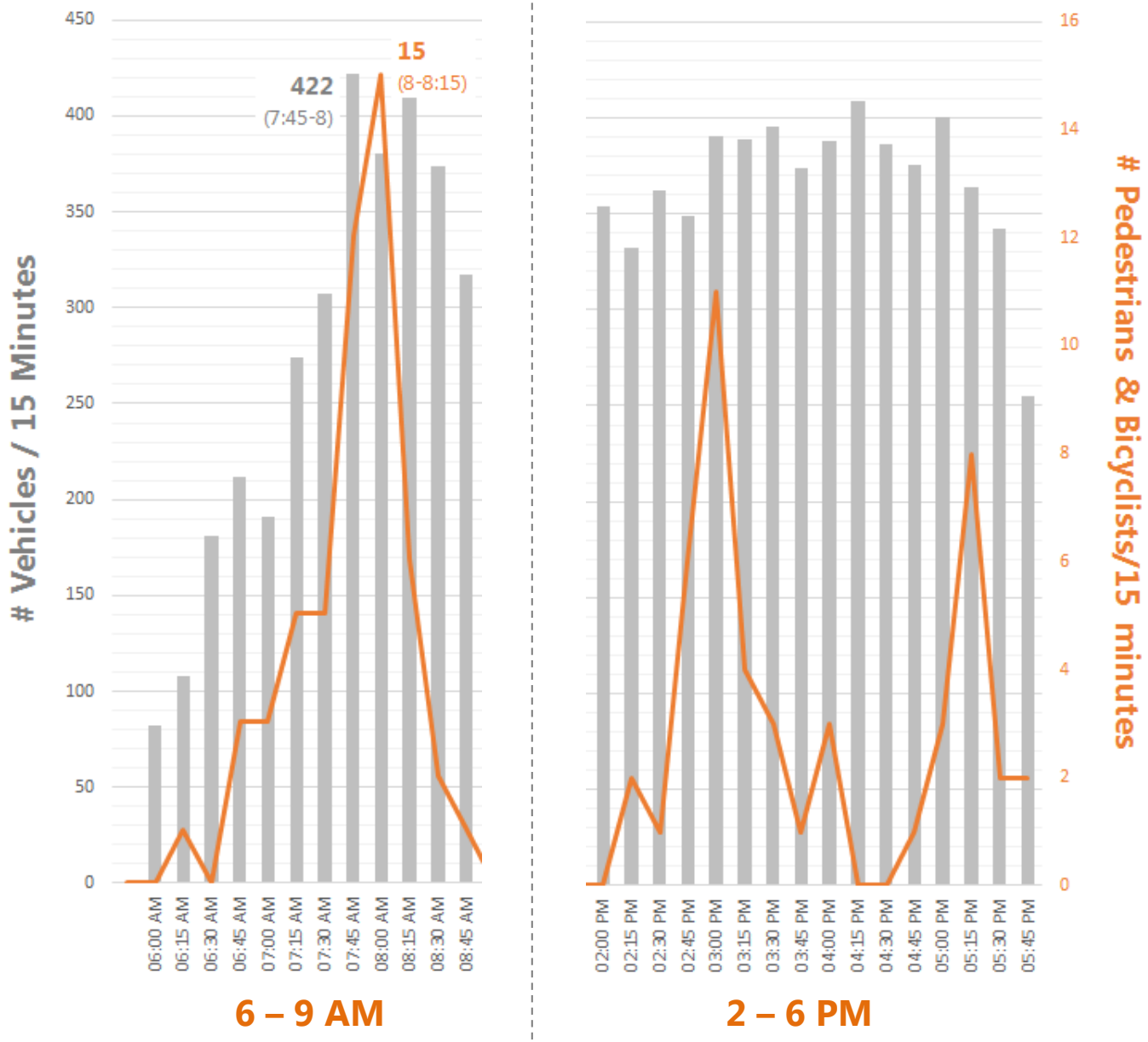
- **Important southern gateway into Middlebury**
- **16,500 cars/day** *(highest volume in Middlebury)*

Existing Characteristics

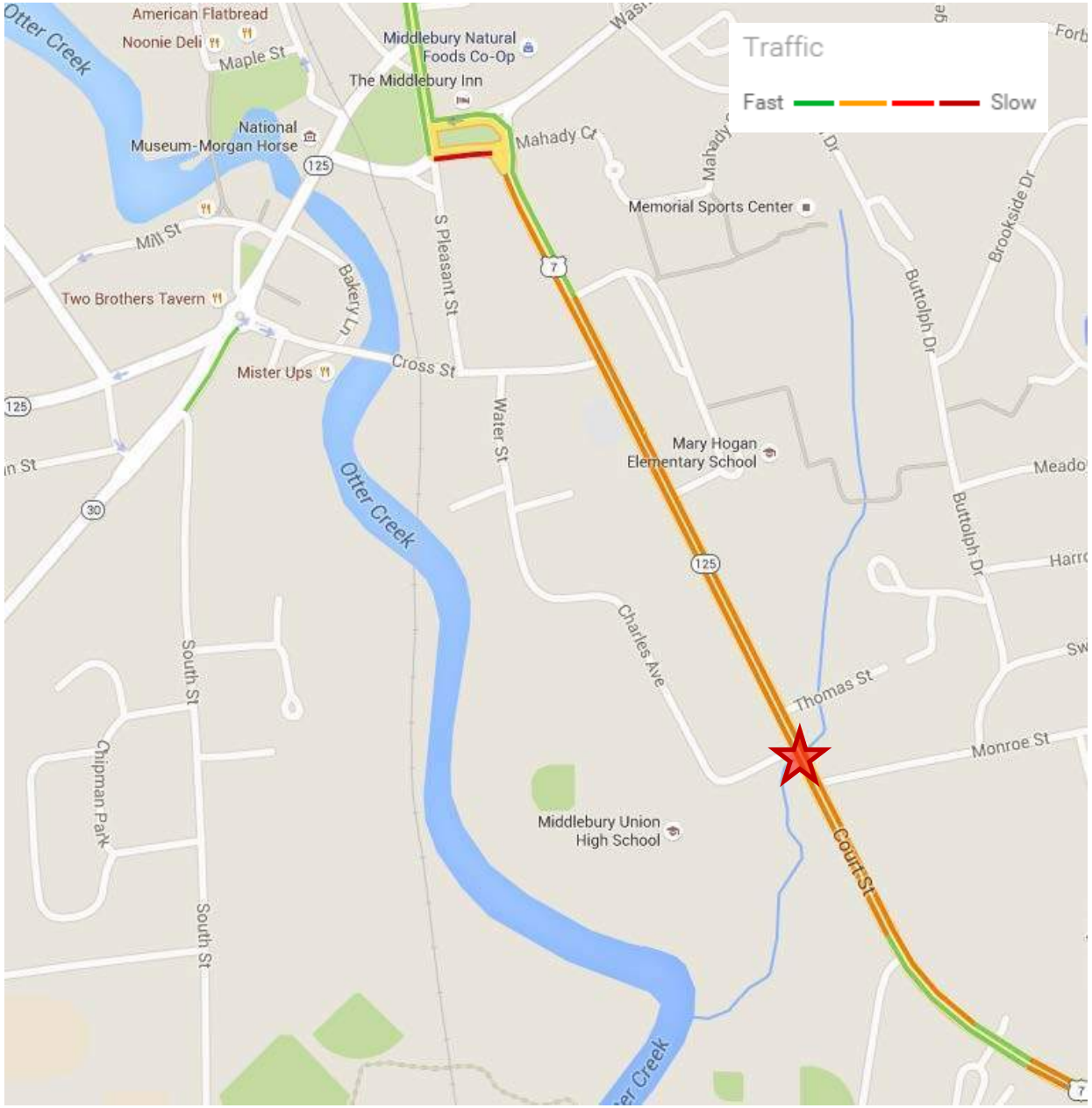


- School-related traffic; high peak demand; cars, buses, bicycles,

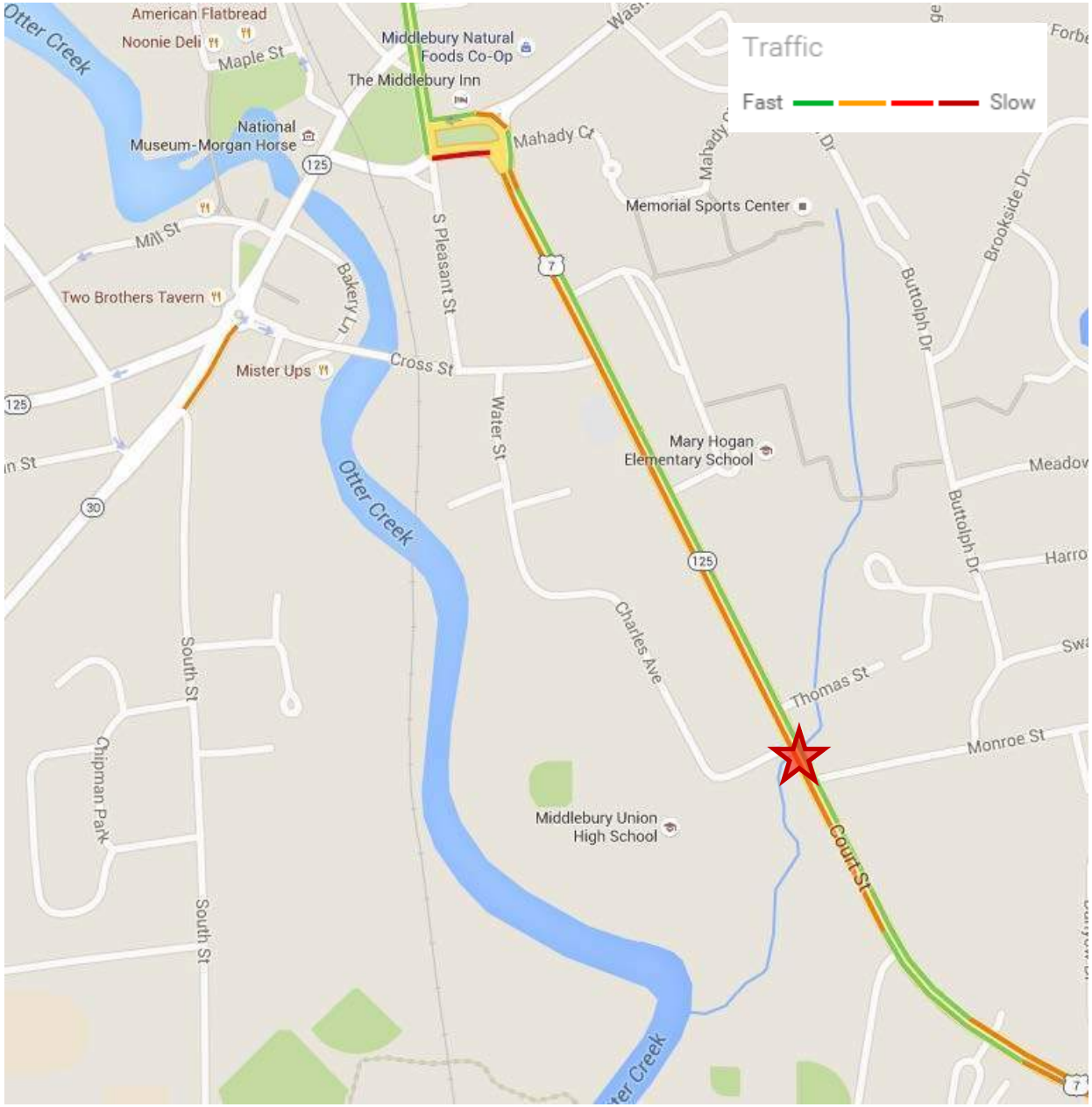
Highly Peaked Traffic Volumes



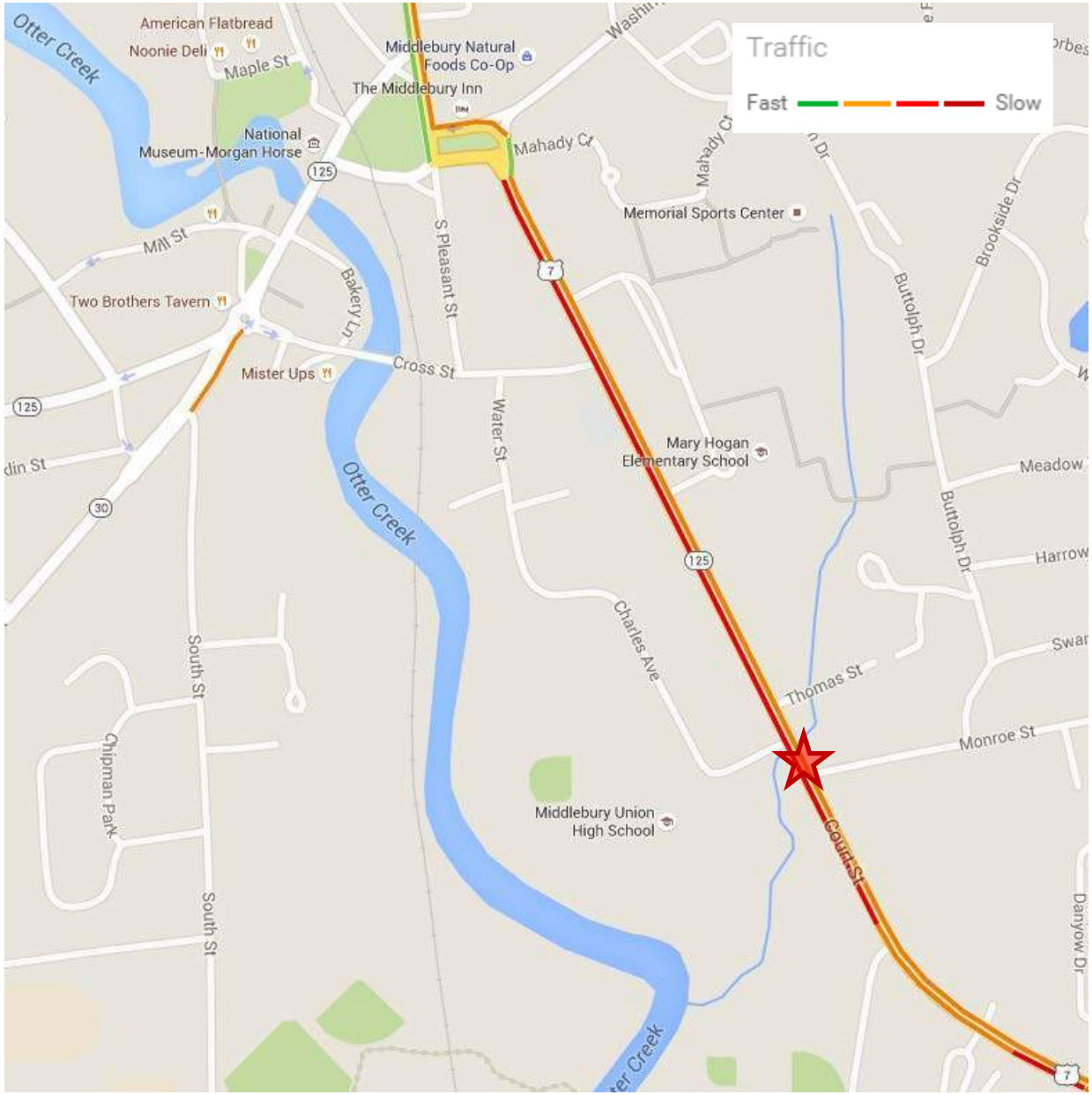
Average Traffic Speeds – 7:30 AM



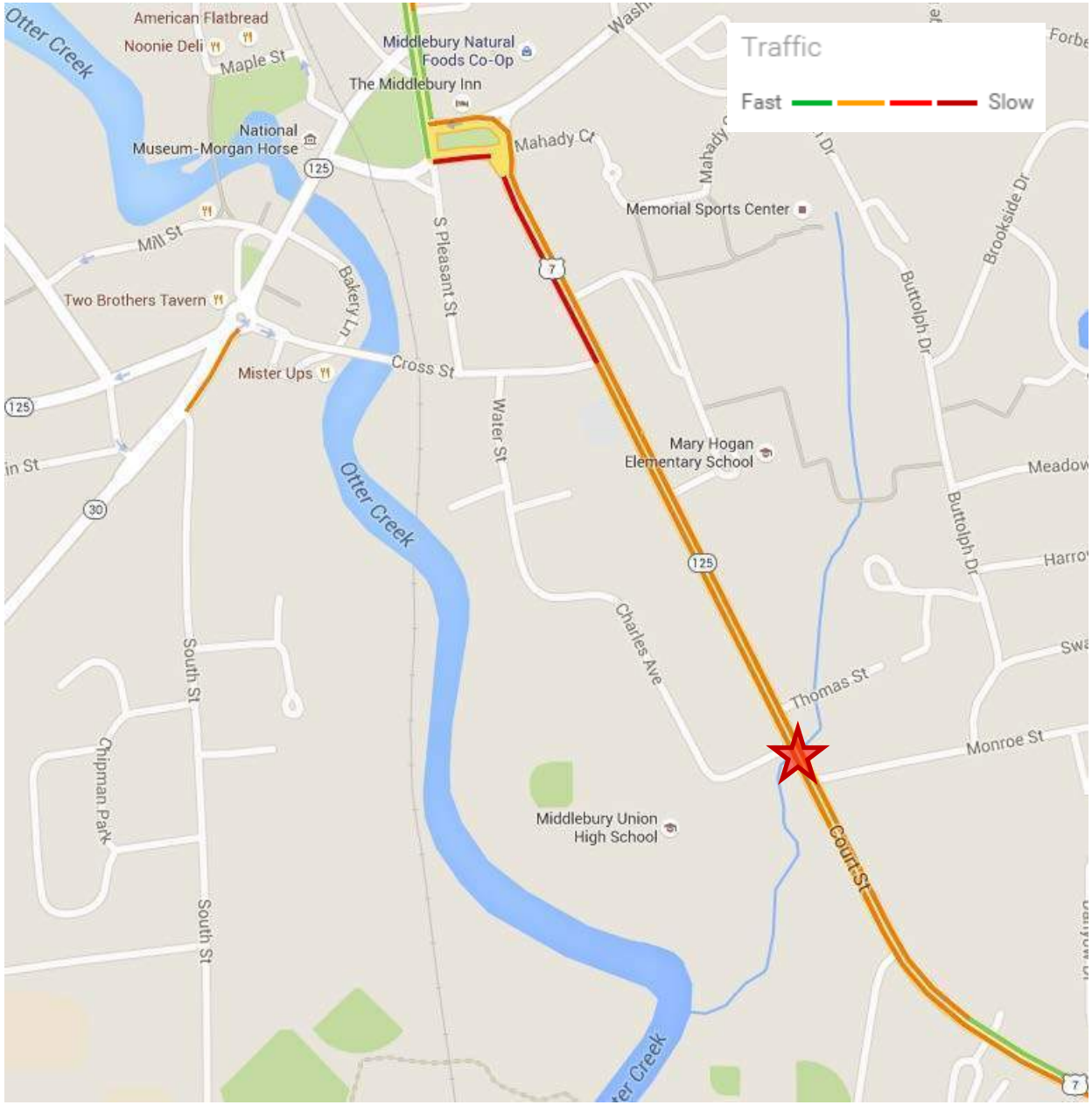
Average Traffic Speeds – 12:00 PM



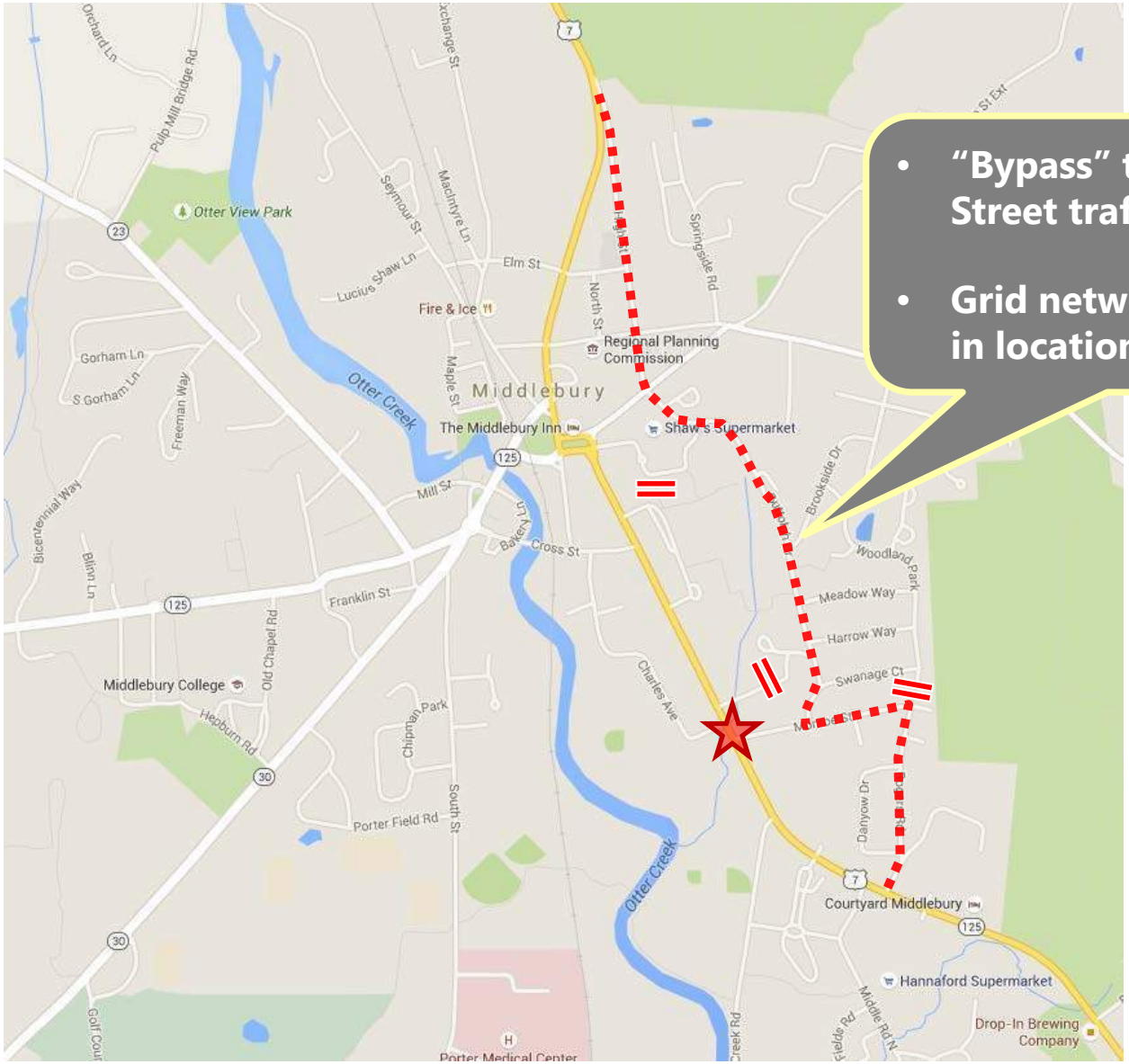
Average Traffic Speeds – 3:00 PM



Average Traffic Speeds – 5:00 PM



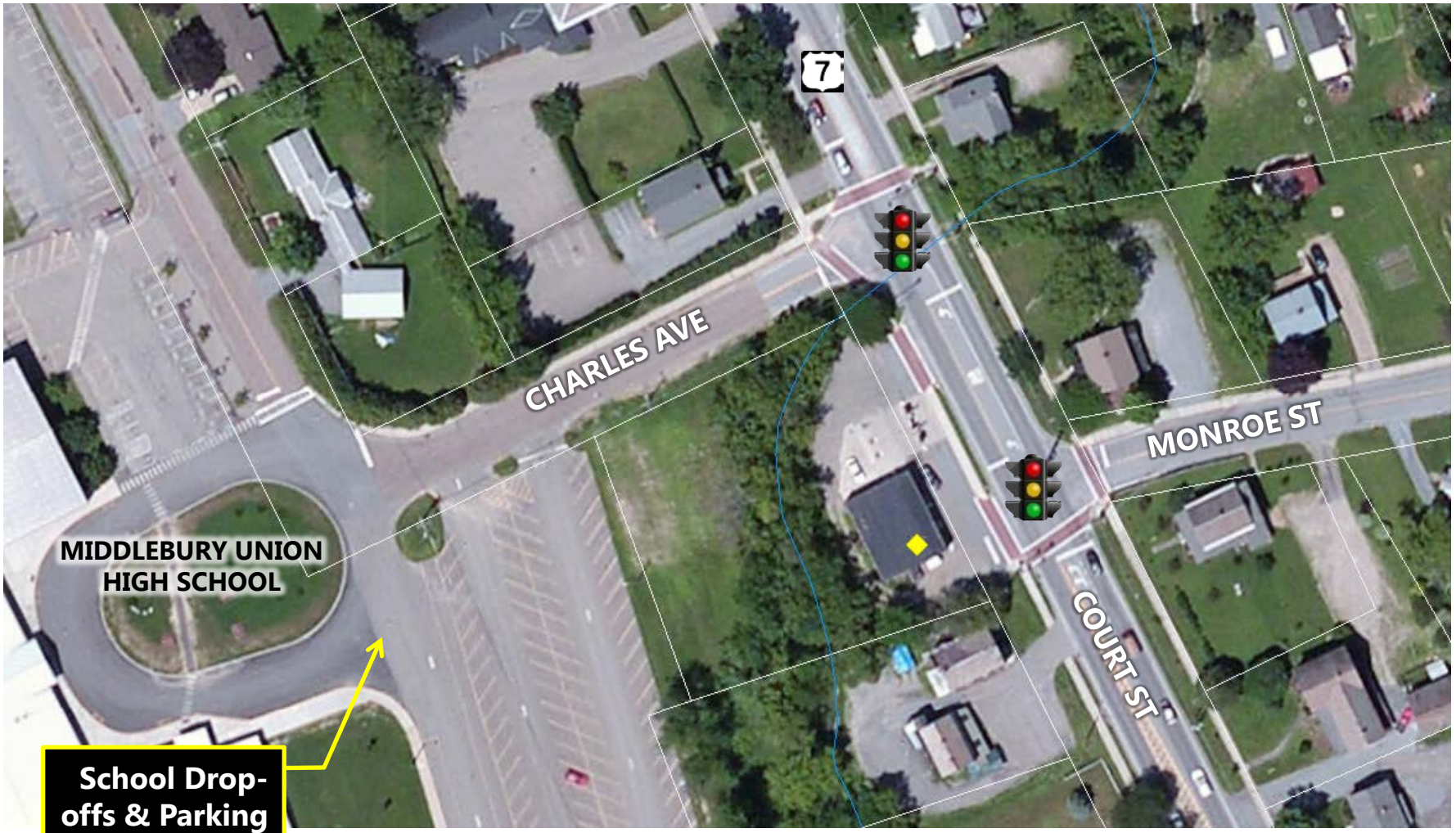
Bypass & Closed Connections



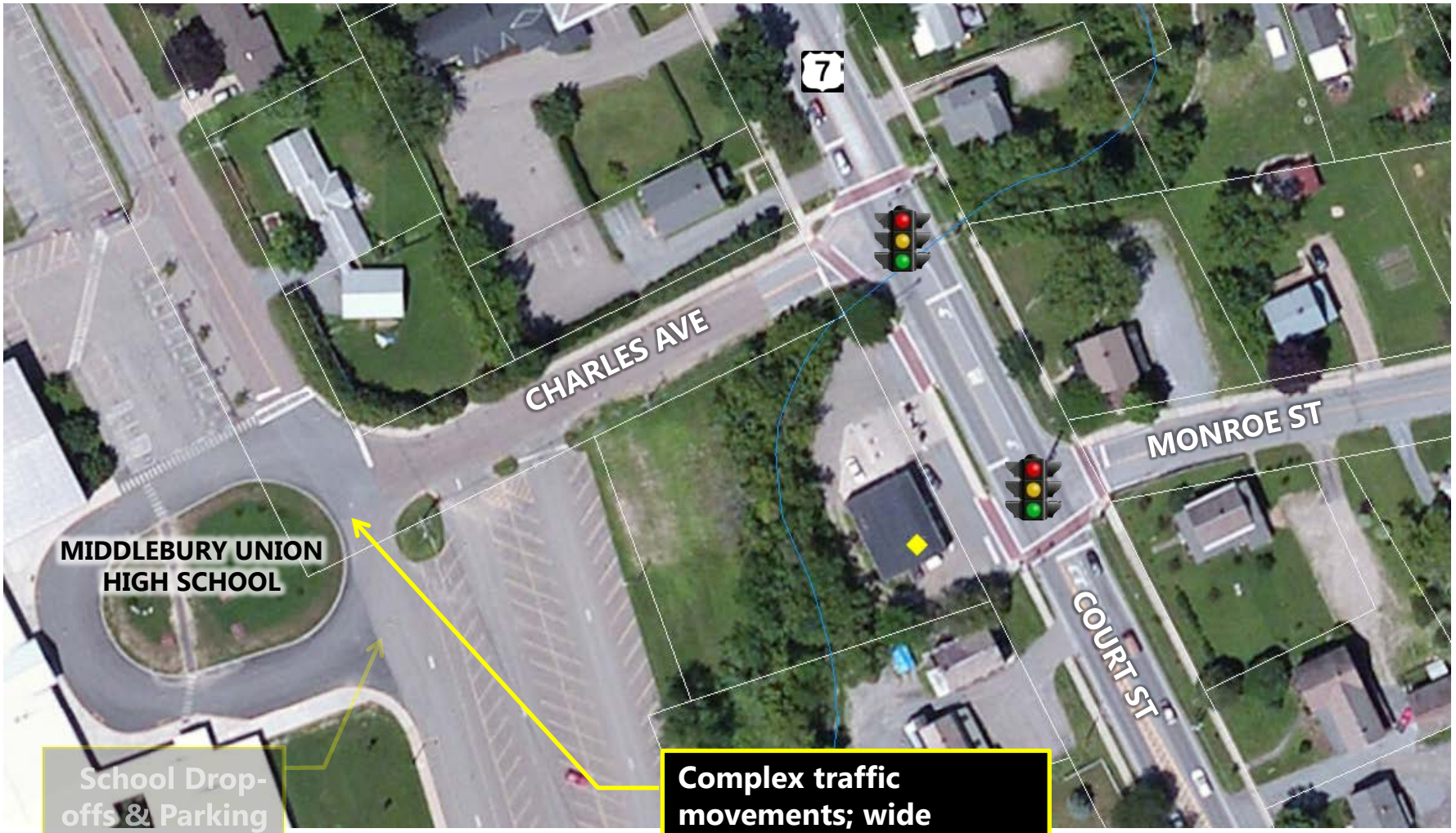
- "Bypass" to avoid Court Street traffic
- Grid network disrupted in locations

Intersection Area

Existing Conditions & Issues



Existing Conditions & Issues



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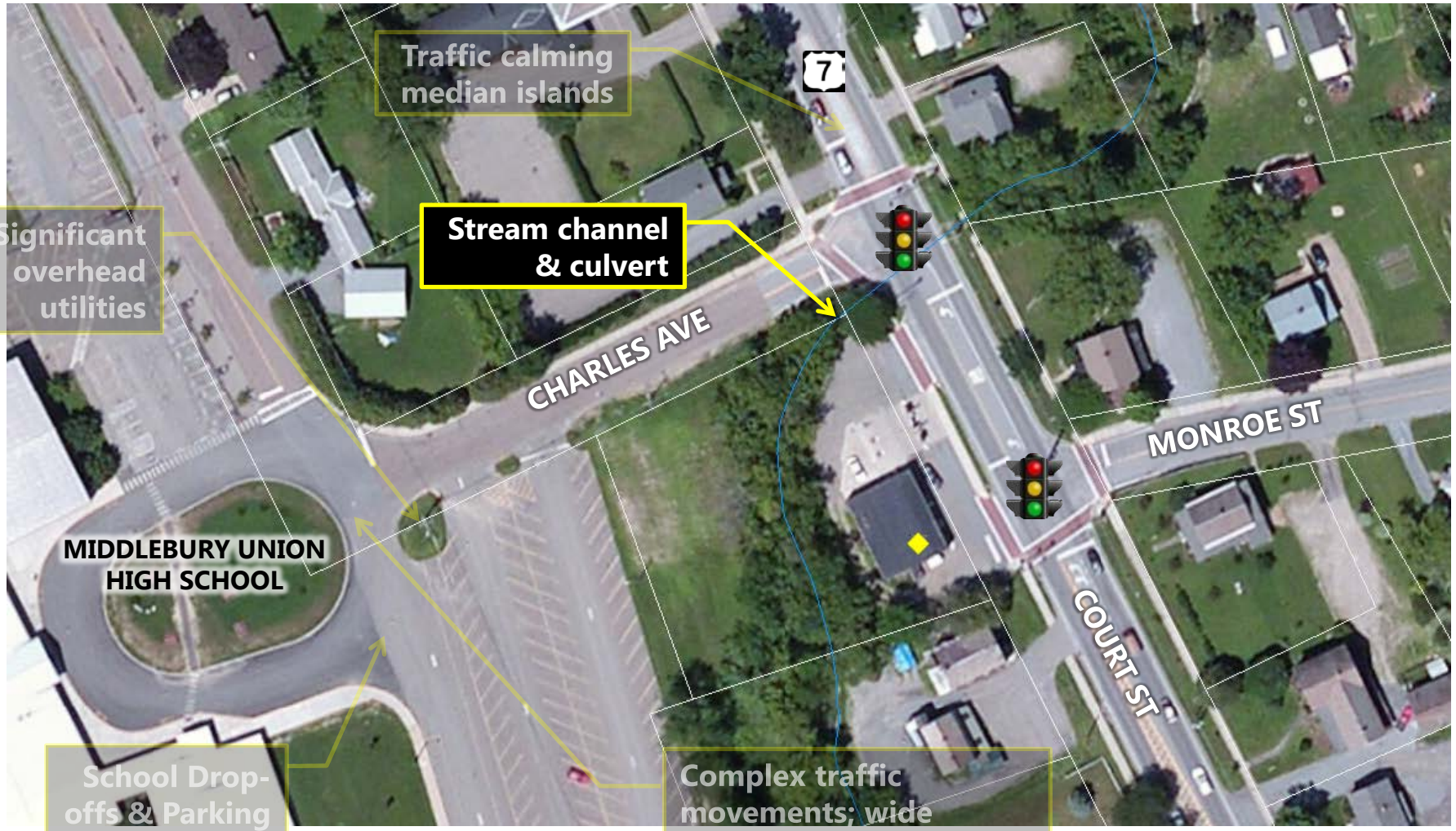

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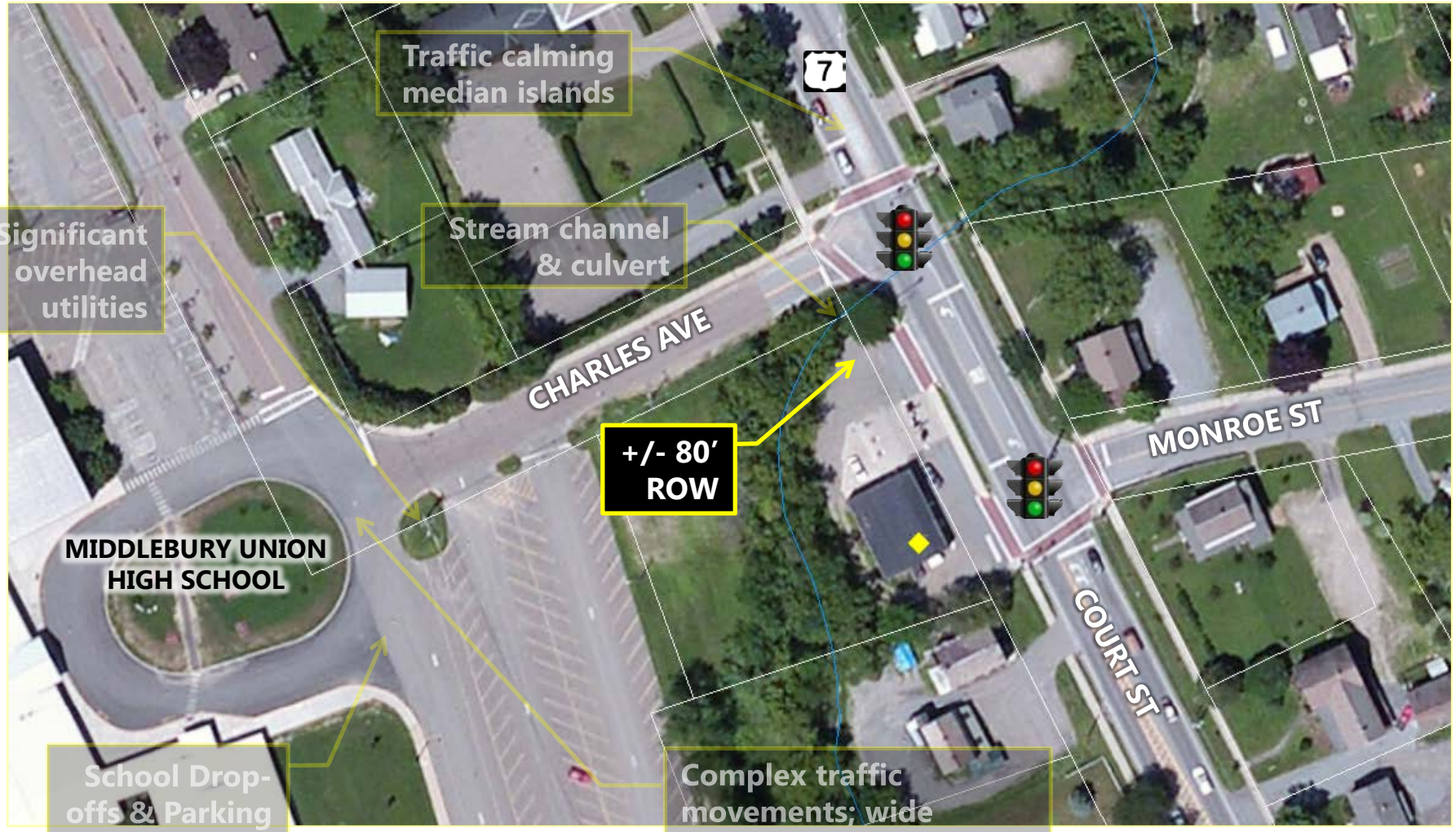
Existing Conditions & Issues



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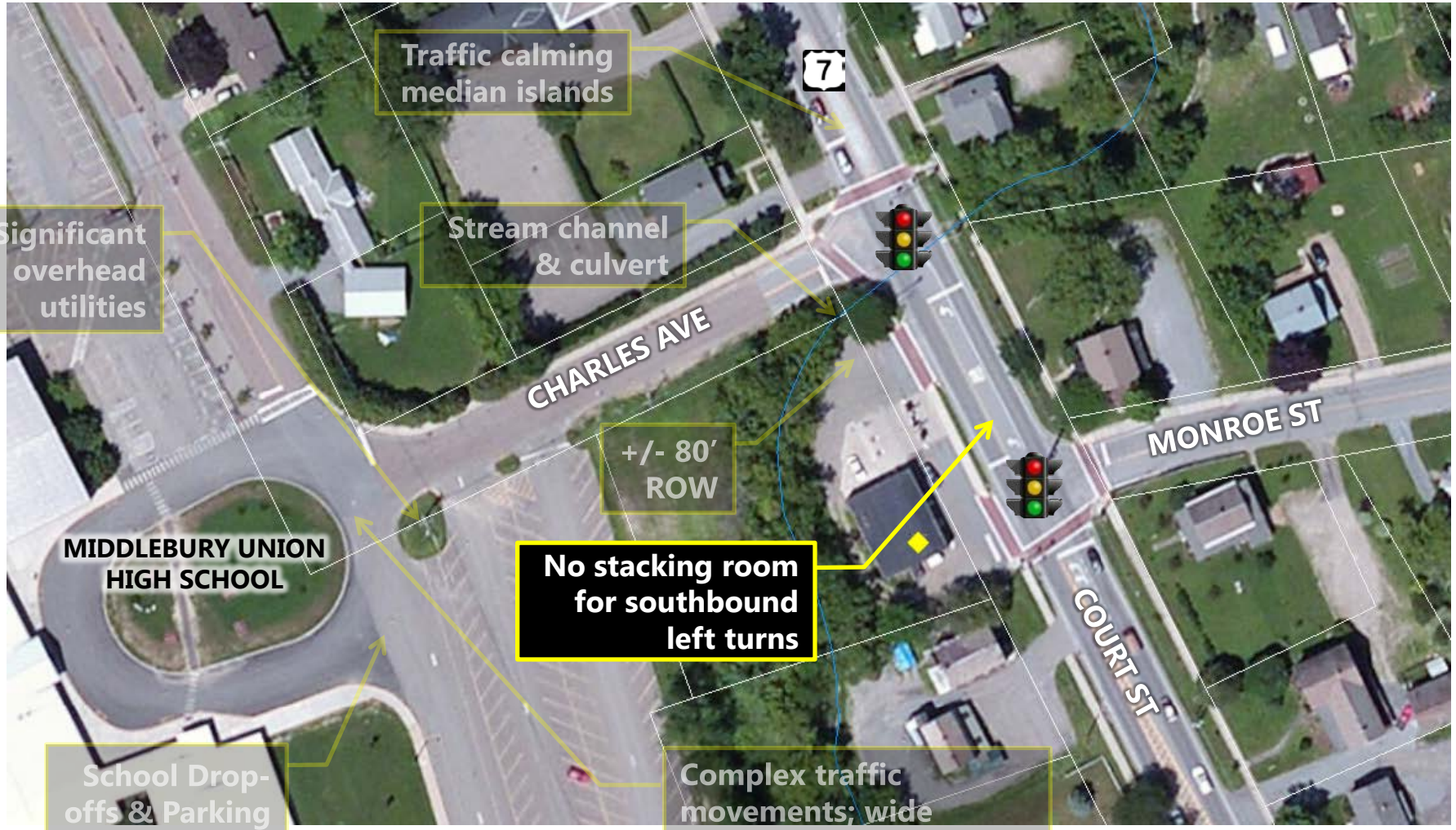

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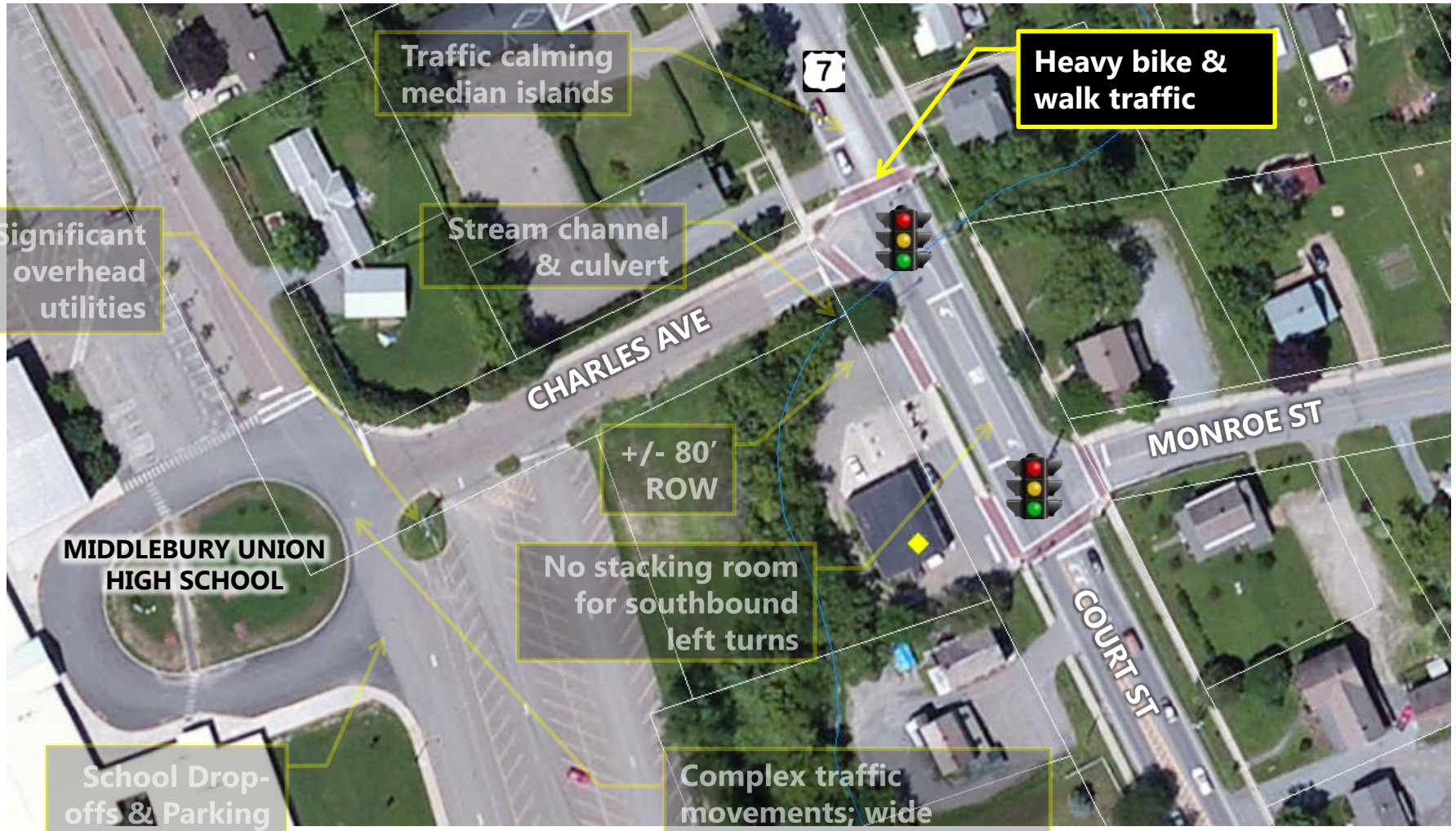

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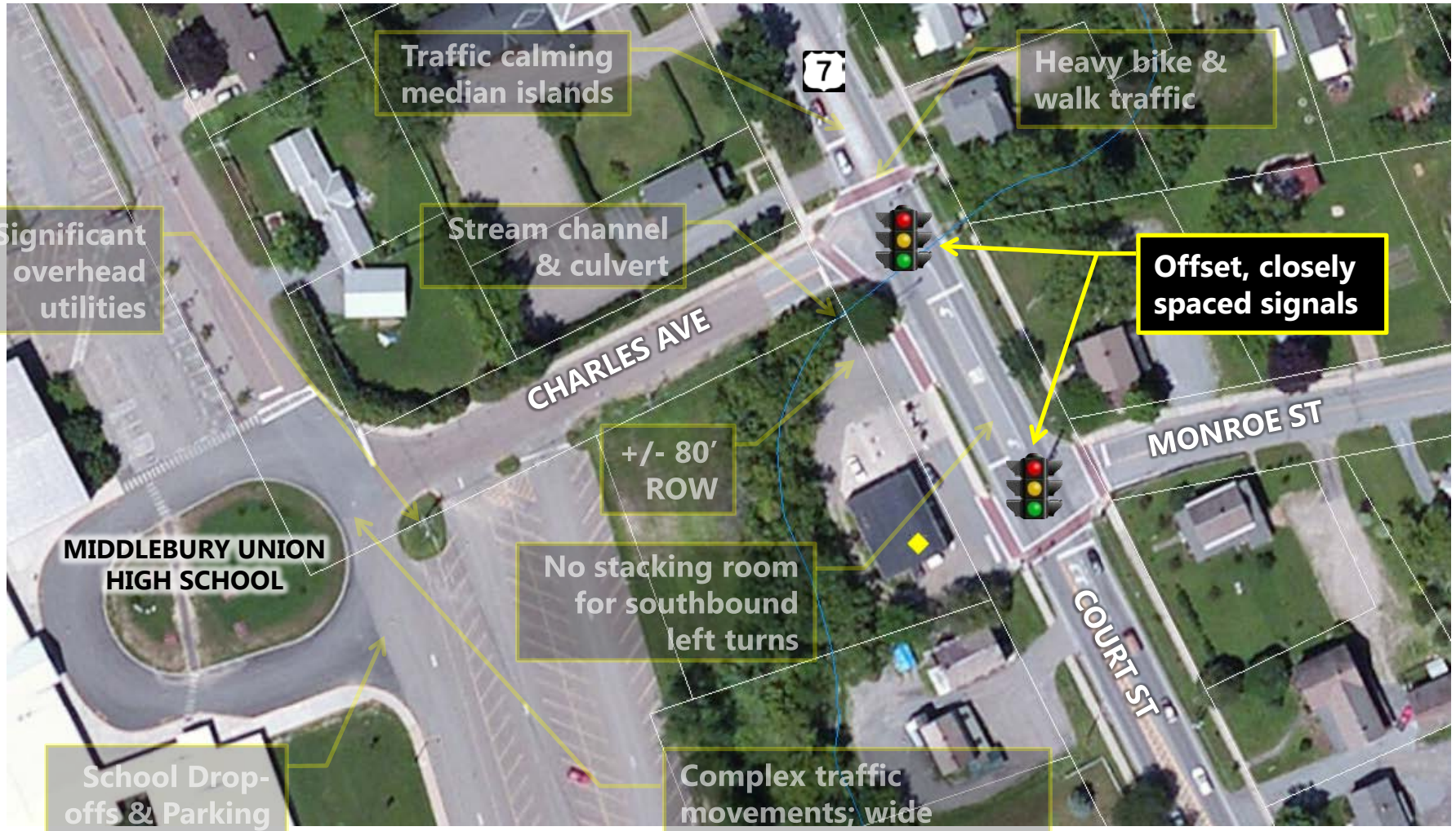
Existing Conditions & Issues



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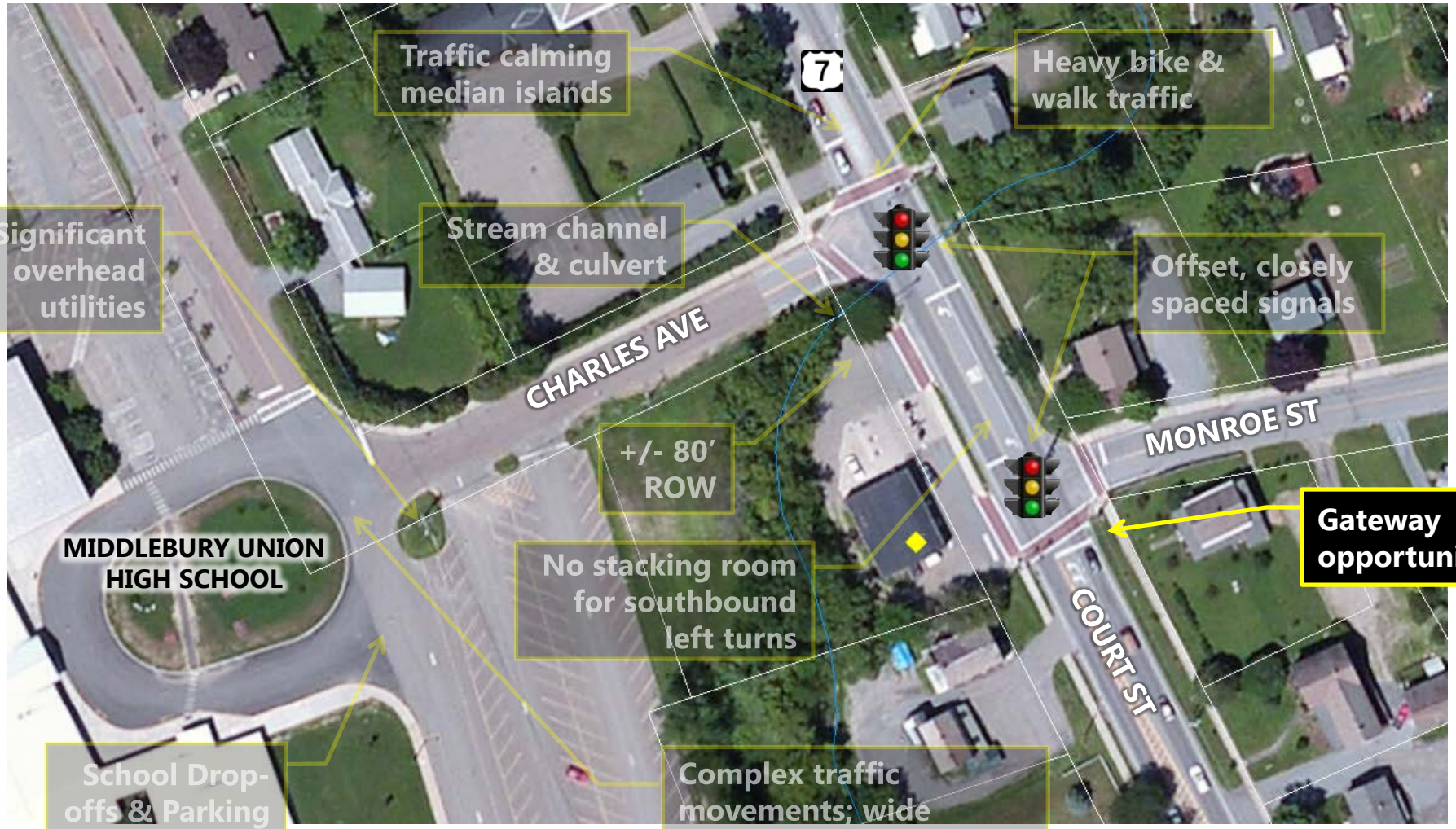
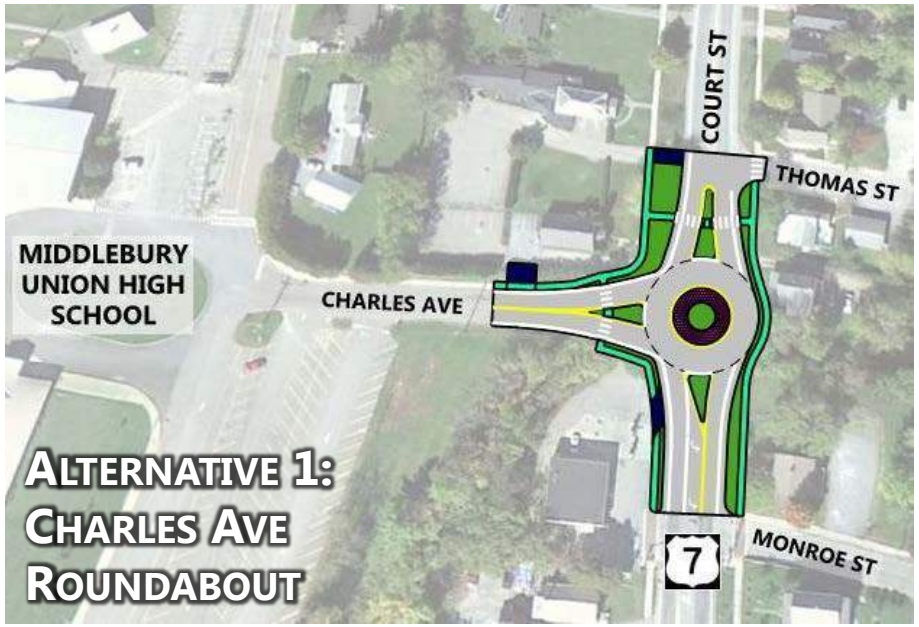
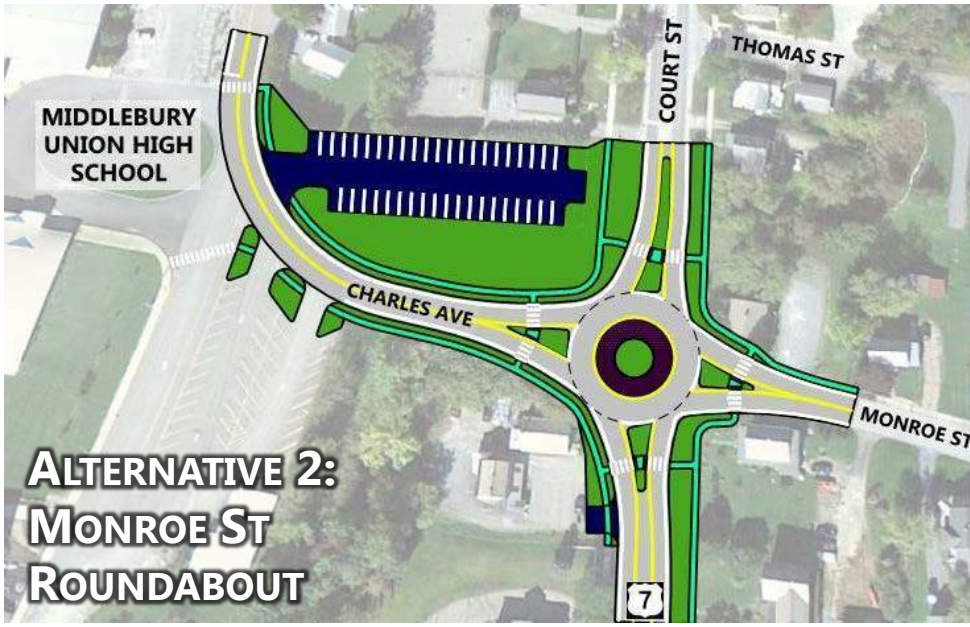


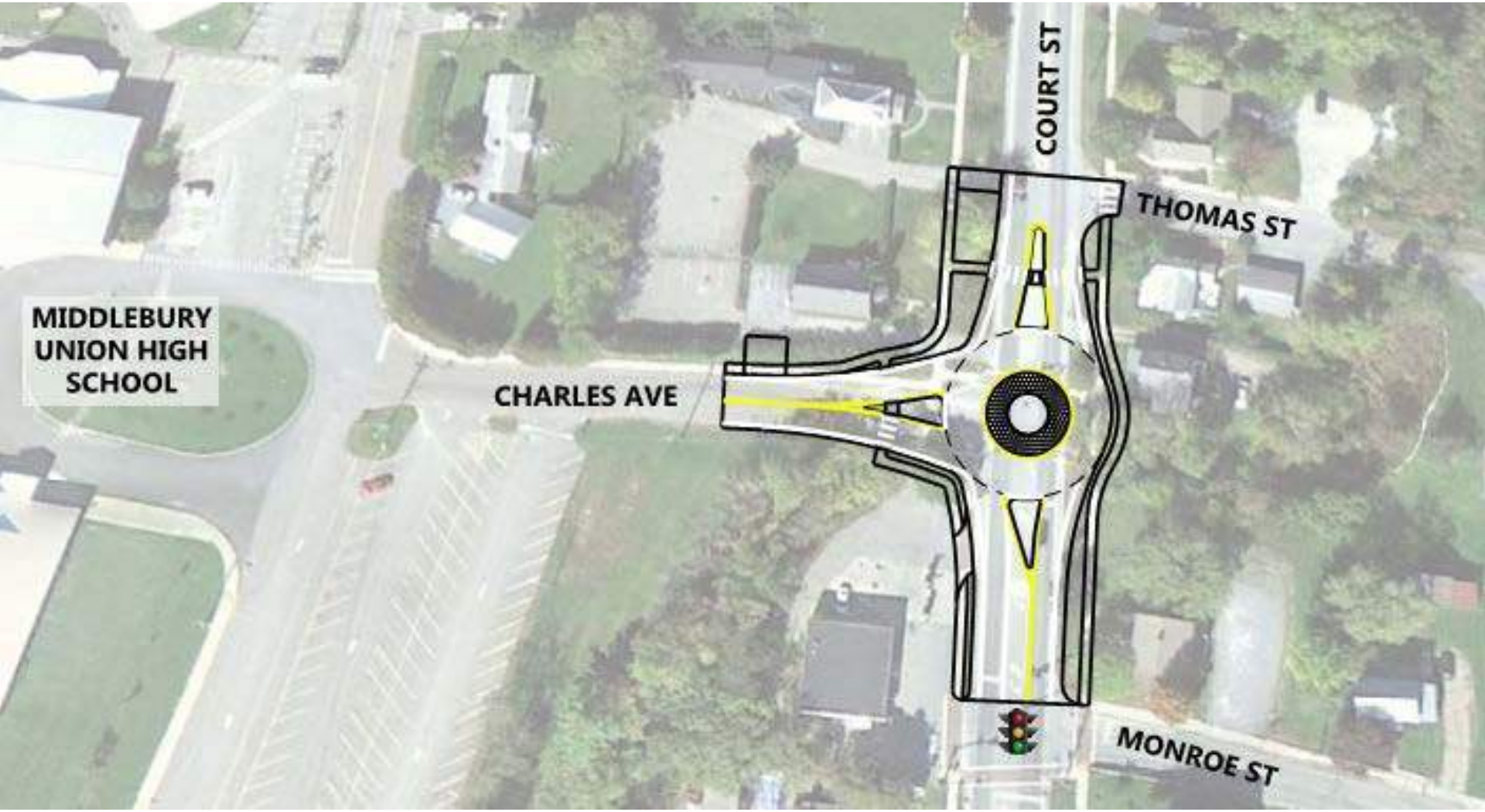
Alternatives

Alternatives

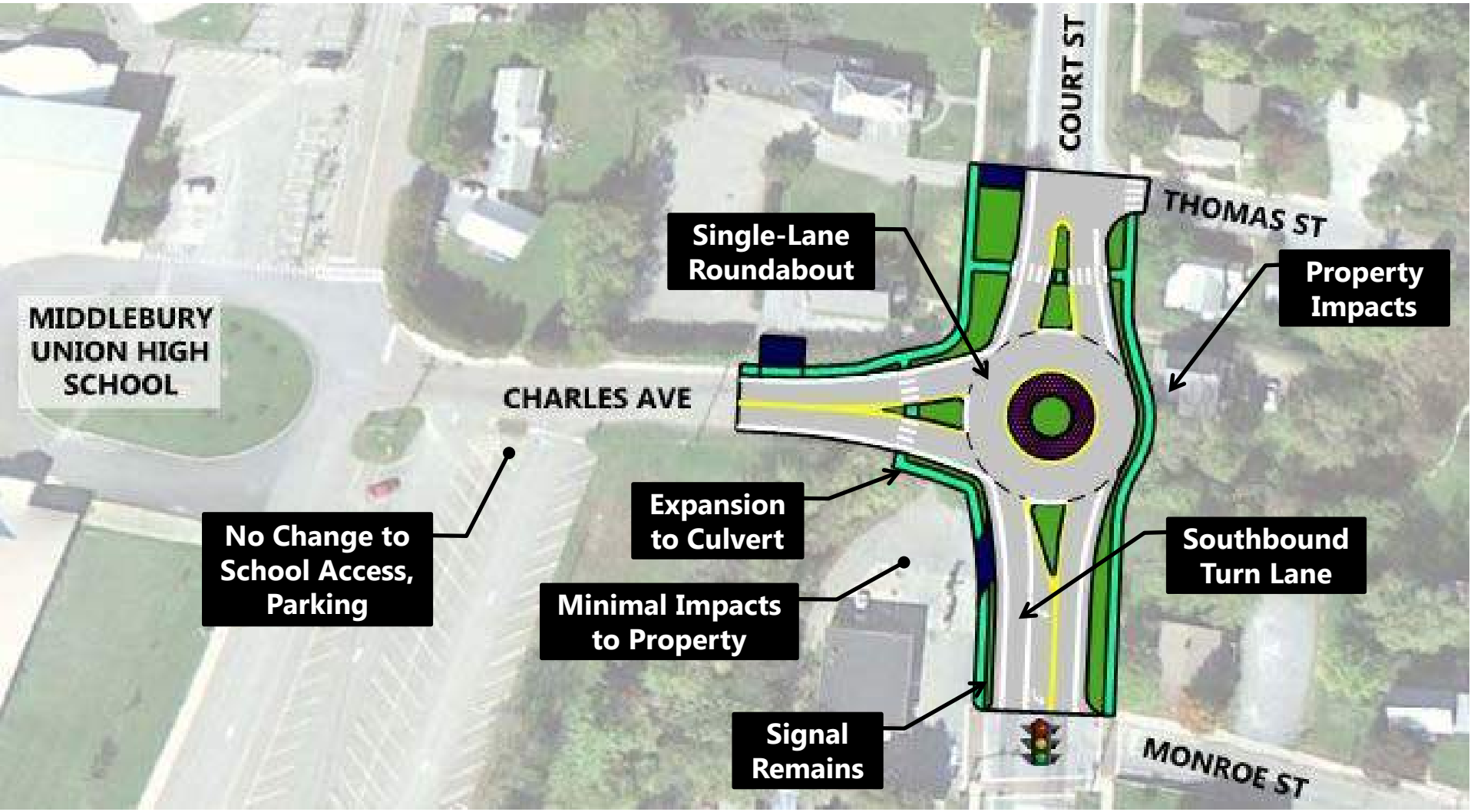




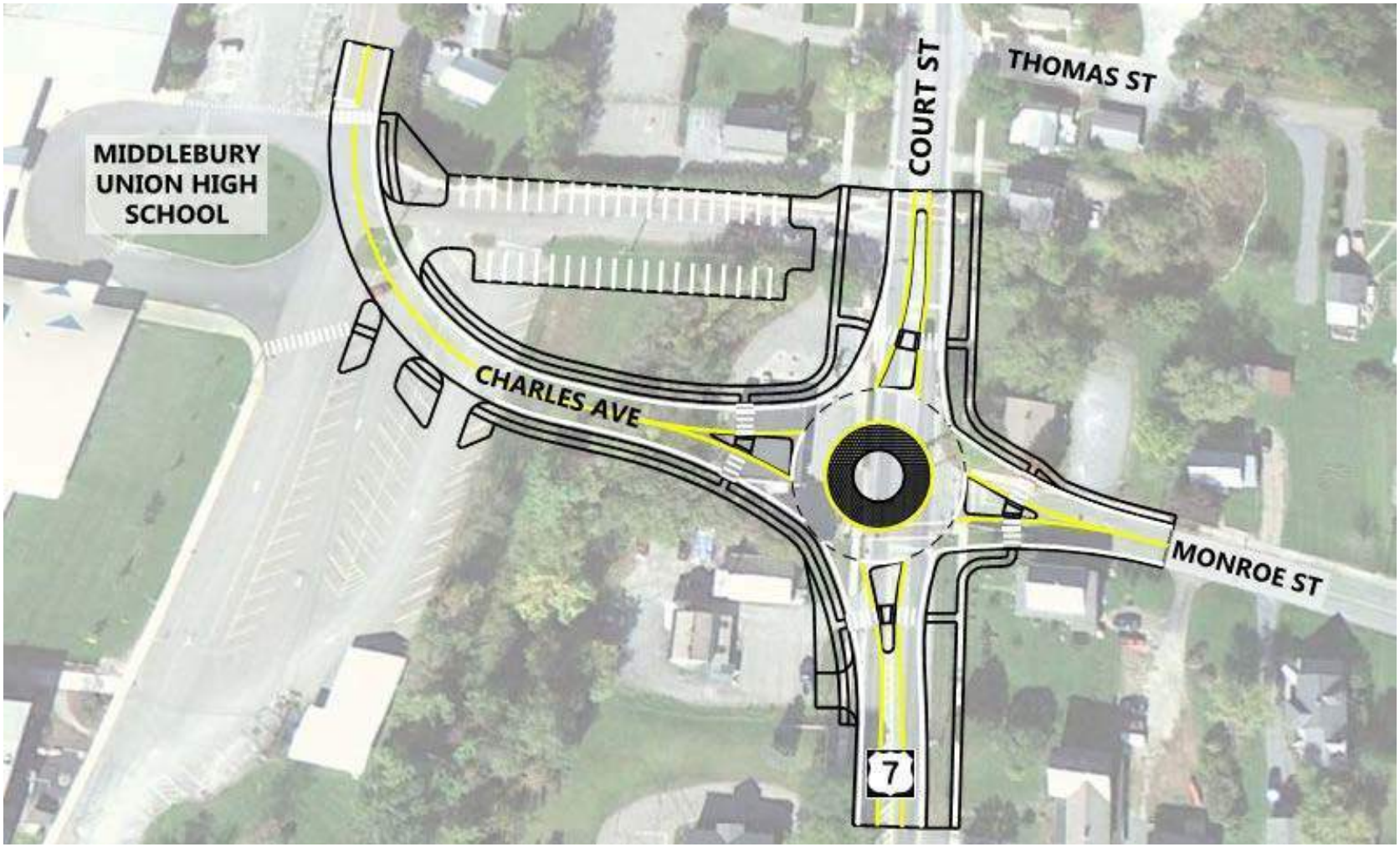
Alternative 1: Charles Avenue Roundabout



Alternative 1: Charles Avenue Roundabout



Alternative 2: Monroe Street Roundabout



Alternative 2: Monroe Street Roundabout

Alternative 3: Monroe Street Signal

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Alternative Comparisons

	No Build	Alt 1 *Charles Roundabout*	Alt 2 *Monroe Roundabout*	Alt 3 *Monroe Signal*
COST: *Design & Construction*	**$0**	**$350,000**	**$980,000**	**$870,000**
COST: *Right-of-Way*	**$0**	**Lowest** *(partial impacts to 1 property)*	**Highest** *(acquisition plus partial impacts to 1 property)*	**Middle** *(acquisition)*
CONGESTION: *Avg. Level of Service*	**LOS F**	**LOS D/E**	**LOS D**	**LOS A**
BIKE/PED: *Accessibility & Safety*	**No Change**	**Slight Increase** *(Two intersections)*	**Increase** *(Single intersection)*	**Increase** *(Single intersection)*
SAFETY: *Anticipated Effects*	**No Change**	**Slight Decrease** *(combine roundabout & signal)*	**Improvement** *(single intersection; roundabout)*	**Improvement** *(single intersection; signal)*
IMPACTS: *Historic Properties*	**None**	**Significant** *(Historic District)*	**Significant** *(Historic District)*	**Moderate**
IMPACTS: *Hazardous Materials*	**None**	**None**	**Yes** *(Fuel Tanks)*	**Yes** *(Fuel Tanks)*
	13	*9*	*7*	*13*

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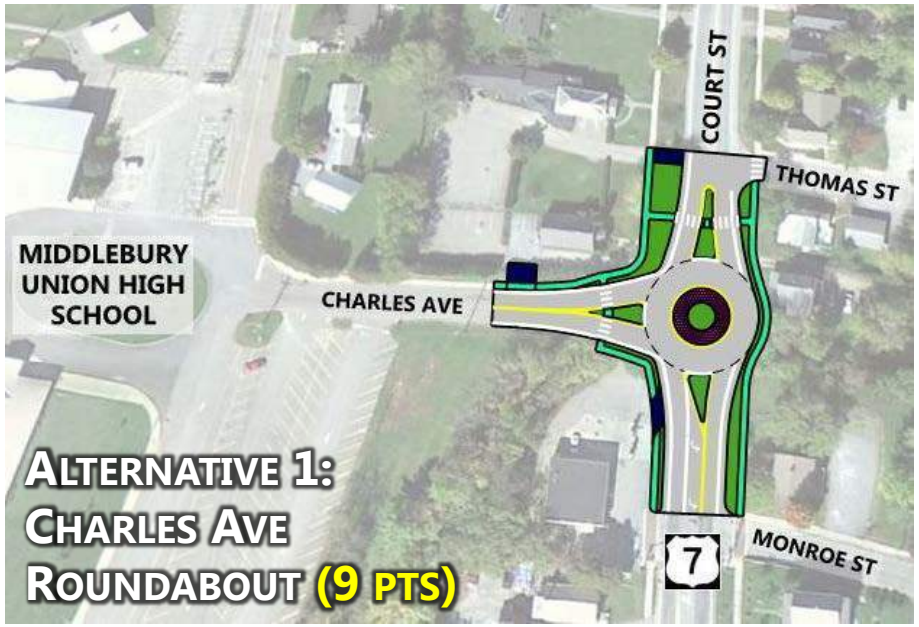
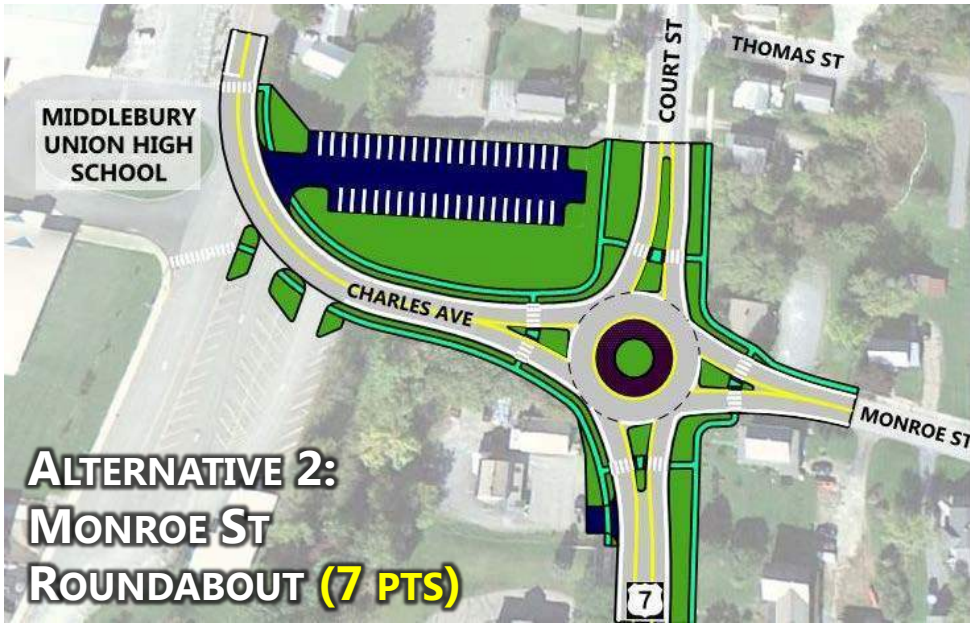
Alternatives - Discussion





What Happens Next?

1. Selectboard to identify Preferred Alternative (Nov – Dec)
2. Final Report (December)
3. Seek funding for final design, permitting & construction

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www.vhb.com

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Offices located throughout the east coast

Meeting Notes

Place:	Middlebury Union High School, Auditorium		
Date:	October 13, 2015	Notes Taken by:	VHB
Project #:	57766.00	Re:	Court Street/Charles Ave/Monroe Street Intersection Alternatives

ATTENDEES: David Saladino (VHB), Kaitlin O'Shea (VHB), Dan Werner (Middlebury), Kathleen Ramsay (Middlebury), Jennifer Murray (Middlebury), & see attached sign-in sheet

The proposed Court St/Monroe St/Charles Ave intersection improvement project (Project) will develop, review and select a preferred alternative to reconfigure the intersections of Charles Avenue and Monroe Street with Court St/Route 7 in Middlebury to provide better mobility, safety, and connectivity for all modes of transportation. The Project design is being funded by a Municipal Planning Grant and Town of Middlebury funds. The following notes are a record of the Alternatives Meeting that took place on October 13, 2015 as part of the project development process. The purpose of the meeting to solicit input from local residents, properties, and agencies regarding the developed alternatives design.

1. **Brief Introduction**
    a. Dan introduced Dave Saladino (VHB) & Kaitlin O'Shea (VHB) as part of the project team.
    b. The purpose of the meeting is to solicit input from those in attendance regarding the presented alternatives.
    c. Dave asked how many were in attendance at the last meeting
        i. About half were at the last meeting.
        ii. About ¼ of those in attendance own property or are associated with property at the intersection.

2. **Slide presentation by Dave Saladino**
    a. Study Area
    b. Project Goals
        i. Mobility & Safety
        ii. Connectivity
        iii. Balance Needs of Stakeholders
        iv. Ensure transportation infrastructure is complementary to existing and planned
        v. Background of project: troublesome intersection, congestion
    c. Project Development Process

40 IDX Drive, Building 100
Suite 200
South Burlington, VT 05403

i. We are in the scoping phase. With federal dollars involved, we are required to go through a scoping phase.

d. Existing Conditions
   i. This is the southern gateway into Middlebury
   ii. 16,500 cars per day
   iii. Peak travel 7:45-8:00, 8:00-8:15, and afternoon spikes at 2:45-3:00, and 5:45
   iv. Bypass & Closed Connections
      1. Use side streets to avoid the Court Street traffic, which can create problems for the neighborhood. However, Middlebury doesn't have a grid network, more winding through the streets.
   v. Intersection Area
      1. A lot of pavement around Charles Ave / Court Street – school parking lot and drop off area.
      2. There are complex traffic movements, especially as it is a public street through the high school campus
      3. Significant overhead utility lines off Charles Ave
      4. Relatively new streetscape improvements on Court Street
      5. Stream channels and culverts in the project area
      6. ROW is 80' +/-
      7. Issues:
         a. missing southbound left turn lane to Monroe Street, heavy bike and pedestrian traffic
         b. Problem: two lights, single control. VTrans is currently retiming them.
            i. (Comment from attendee: Slight improvement in timing. Now 5 cars can turn off Charles onto Court St instead of 3).
         c. Also, this is an opportunity to utilize this as a gateway

3. Alternatives Presentation (second part of slide presentation)

a. Charles Avenue Roundabout
   i. Single lane roundabout that replaces the existing Charles Ave signal, but leaves the Monroe St signal in place.
   ii. Includes property impacts at all quadrants.
   iii. No change to school access or parking.

b. Monroe Street Roundabout

Meeting Notes

i. Removes the existing Charles Avenue and realigns it, curving through the gas station property. Removes both traffic signals and replaces them with a single lane roundabout.
ii. Stream relocation.
iii. Gas station removed.
iv. Relocated parking and green space to former Charles Avenue location.
v. Significant property impacts on NE quadrant

c. Monroe Street Signal
   i. Remove and realign Charles Avenue to line up with Monroe Street for a four way signal intersection. Removes the Charles Ave/Court Street traffic signal.
   ii. Relocated parking and green space to former Charles Avenue location.
   iii. Traffic signal, not roundabout
   iv. 3 lanes: one N/S and one for turns
d. Alternative Comparison
   i. Chart showing costs/environmental impacts/Level of Service/Safety

4. Public Comment / Q&A

Comments in italics. VHB answers beneath.

a. Pedestrian Safety: The roundabout seems more dangerous than the light. Is there a study on the impact?
   i. There are two theories. Roundabouts make everyone slow down and there are fewer collisions. A signal makes everyone stop and therefore gives everyone a turn. People can cross easily at a roundabout, free-flowing, but on a signal, they might try to cross before their turn.

b. The crosswalk is too close the roundabout. Should it be offset to give drivers more time to react? At Two Brothers (restaurant in Middlebury), the crosswalk is too close.

c. But Two Brothers has a median.
   i. Typically crosswalks are set about one car length from the yield sign.

d. Traffic signals allow people to get out of their driveways on Court Street. With a roundabout it will be harder.
   i. There are signals to the north and south, and in theory, there are opportunities for traffic to move. It will be difficult with a roundabout and signals because traffic flows at a different rate.

Meeting Notes

e. *Owner of 76 Court Street, on the NW side of the intersection. During the busy time, with my patient traffic leavings, it will be hard for them to make a left northbound turn without a light. Likely, it would be a right exit only and they could go around the roundabout. Not a huge deal, just noting it.*

f. *Won't traffic back up into the roundabout?*
    i. Yes, that will happen on Alternative 1. Not the best option.

g. *This is not a normal roundabout because most of the people crossing are high school students who are distracted. It is dangerous for kids. And there are a lot of high school drivers. Creates problems with the roundabout.*

h. Dave Saladino asks if anyone is a fan of the roundabout Alternative 1. Answer: No, not really. Alt 2 or 3 is better.

i. *Can you speak to the parking lots in Alternatives 2 & 3 - how will they accommodate buses? Will you talk about sub-alternatives?*
    i. Yes. They will be sized properly, need to figure out the campus.

j. *I stand at the Mormon Church waiting for ACTR and notice that there is a lot of bypass coming from Quarry Road area, people looking to avoid Court Street and it takes them onto Monroe Street.*

k. *I live on Monroe Street and do not have a sidewalk in front of my house. My concern is that aligning the intersections will make travel through Monroe Street more attractive. This will create safety problems for my kids who have to cross the street without a crosswalk. The dog leg turn of Monroe Street makes it unfavorable right now. The intersection needs to accommodate cars, but the same busy time needs to accommodate people.*

l. *Is there a more detailed matrix?*
    i. Yes.

m. *Price tag of Alternative 3. Who is paying for it? And what about access to the high school?*

i. Cost generally funded through federal dollars. This intersection is not at the top of VTrans priority. Can work it through the Regional Planning Commission (RPC) to get it on the list. OR it can be self-funded by the town. Different sources of money have different requirements. Usually it is a cost of 10% or 20% for the town.
ii. Traffic calming studies of other areas can be applied to this intersection, too.

n. I take my daughter to middle school, and the intersection improvements (widening) are much better there.

o. We should consider adding more lanes, reducing green space on either side.

p. I live on Thomas Street and hear people gunning it to make the lights. I like the rotary because it removes the traffic lights.

q. What about the stream? Does it depend on the money pot?
i. Yes, regulations depends on the source.

r. This is in a very big watershed area?
i. Yes. There is an opportunity to upsize the culvert, and federal dollars will probably require it.

s. Approaching it from a safety concern, there are many rear end accidents north of the intersection, but not as much on the side streets.
i. Yes, that happens where there are signals. The safety angle will help, and is probably the best option. We can talk about ways to pitch it for funding.

5. What's Next

a. School Board to review alternatives
b. Selectboard visit, so they can endorse an alternative.
c. Wrap up the report.
d. Looking for funds to move forward.

6. Landscaping Sub-Alternatives

a. Dave goes over the alternatives, which are variations of landscaping and parking configurations with the school property.

b. Alternative 1 adds 4 spaces.
c. Alternative 2 is a net reduction of 20 spaces, but can be regained if the Charles Ave area is not all green space.
d. Alternative 3 adds a roundabout in front of the high school. Loss of 31 spaces.
e. All of these add probably several hundred thousand dollars to project cost.
f. Questions
    i. *Would love more green space, but is there still emergency vehicle access?*
        1. Yes.

    ii. *I agree, the green space is great. And keeping the school buses there, prevents vehicles from getting so close to the curb. Emergency vehicles go to the back of the school.*

    iii. *One thing first mentioned – access going by Hannaford School over to the athletic fields. Is that an independent project?*
        1. Yes. It distracts from this project, which is really this intersection. IT would be an expensive extension.

g. You can reach out to us with questions. Stay tuned to the select board agenda.

7. Additional Public Comment – Received via email from ACTR

Dear Dan and Dave,

Thank you for the opportunity to weigh in on proposed plans for improving safety and flow at the Court Street/Charles Ave/Monroe Street Intersection.

ACTR's Operations staff has reviewed the choices and we favor Alternative #3.

- *Best sight lines for pedestrian crossings*
- *Traffic light would enforce fairness and courtesy during peak travel times*
- *Appears to be the least disruptive to traffic flow during construction*

Additionally we hope you will consider adding a bus pull out or two. It would be especially helpful to have one on the south bound side. Our morning buses drop off curbside at the high school so we will have enough time to get MUMS students delivered on time. (MUMS adopted an earlier start time this year.)

We also hope construction will coordinate with MUHS's summer vacation.

Best,

Meeting Notes

Mary-Claire Crogan
Community Relations Manager, ACTR
Transportation for everyone since 1992.
297 Creek Road
Middlebury, VT 05753
(802)388-ACTR

CONTACT INFO
Dave Saladino – dsaladino@vhb.com – 802-497-6121
Kaitlin O'Shea – koshea@vhb.com – 802-497-6136

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SIGN-IN SHEET
ALTERNATIVES PRESENTATION

Middlebury / Court Street, Charles Avenue, Monroe Street Intersection Scoping Study

Name	Affiliation/Address	Phone Number	E-Mail Address
Michael Olinick	311 Woodland Park	3884290	MOLINICK@MIDDLEBURY.EDU
Wendy Hurdler	10 meadow way	388 2372	whirdler1@comcast.net
Megan Mandigo	60 Monroe St.	989-7349	mmandigo@gmail.com
Chris Robbins	8 Gorham Ln.	388-1852	a.c.robbins73@gmail.com
Howard Widelitz	58 Washington St	989-7132	Howard.Widelitz@comcast.com
Dan Werner	94 Main St	388-4045	dlwerner@town of middlebury.org
Ruth Hardy	Town 8 Maple Ct. East Mdd ID#4 School	989-7444	rhardy@acsu.org ~~ruth.e.hardy@gmail.com~~
Susan Shashok.	P.O. Box 36 E. Mdd Selectboard	388-5458	seshashok@comcast.net
Sean Farrell	P.O. Box 532 East Middlebury	989-7040	Sfarrell@acsu.org
Peter Miller	76 Court Street Middlebury	989-8240	millerp63@gmail.com
Tom Hughes	126 Charles Ave.	388-2967	tmhistorical@msn.com
Laura Asermily	266 Washington Street	388-9478	

SIGN-IN SHEET
ALTERNATIVES PRESENTATION

Middlebury / Court Street, Charles Avenue, Monroe Street Intersection Scoping Study

Meeting Date/Time: Tuesday October 13, 2015
Meeting Location: Middlebury Union High School, Middlebury, VT

Name	Affiliation/Address	Phone Number	E-Mail Address
Jennifer Murray	T/O Middlebury		
Kathleen Ramsay	Town of Middlebury		
IRENE BARNS	7 FORGES CIRCLE MBY		
Nathan Burt	T/O Middlebury	388-9546	
JP Rees	UD#3	377-5405	jrees@acsu.org
LYNN PHELPS	79 COURT ST. OFFICE BUILDING.		
Tom Hanley	1 Lucius Shaw LN Police Dept	388-3191	thanley@middleburypdice.org
William Lawson	MUHS	382-1199	wlawson@acsu.org
BILL HUNTINGTON	67 MONROE ST	388-4132	HUNTINGTON.WILLIAM@CMSU.COM
Jill & Chris Stackhouse	#2 81 Court St	388-9224	cstack4@gmail.com

SIGN-IN SHEET
ALTERNATIVES PRESENTATION

Middlebury / Court Street, Charles Avenue, Monroe Street Intersection Scoping Study

Name	Affiliation/Address	Phone Number	E-Mail Address
Bart Larrow	80 Court St.	388-7251	cblarrow@shoreham.net
Bruce L MacIntire	73 Charles Ave	382-1198	bmacintire@gcsu.org
Kate Tilton	5 Thomas St.	398 2098	katetilton17@gmail.com

UD#3 School Board

Middlebury Union High School
Learning Center
73 Charles Avenue
Middlebury, VT 05753

AGENDA

December 1, 2015
6:00 PM

1. Call to Order

2. Public Comment

3. Recommendation to Approve Minutes
    a. UD#3 School Board Meeting - November 3, 2015

4. Act on Bills

5. Monroe St. Traffic Proposal

6. Report of the Principals
    a. Action: Facilities Upgrades
        i. Lockers - MUHS
        ii. Security Upgrades - MUHS
        iii. Security Upgrades - MUMS

7. Report of the Superintendent
    a. Discussion: FY17 UD#3 Budget

8. Report of the Board
    a. Discussion: Early Retirement for Budget
    b. Discussion: Charter Committee Update

9. Other Business

10. Items for Future Meetings

11. Next Meeting Date: January 5, 2016 at 5:30 PM at Mary Hogan School

12. Adjournment

Public Comment Guidelines

Public comments are encouraged and welcome at each regular board meeting during the period designated for public comment at the beginning of the agenda. Citizens will be called to make their statement by the board chair. Public comments regarding personnel or legal matters will not be heard by the Board.

When there are many people who wish to speak, the chair can at their discretion, use a speakers' list. Members of the public will be given an opportunity to sign the speakers' list, indicating which agenda item will be addressed. The chair may choose to limit the time for each speaker.

Middlebury Court Street/Charles Ave/Monroe Street Intersection Scoping Study

Town of Middlebury, Vermont

Presented by
David Saladino, PE, AICP

December 1, 2015

Project Goals

- Improve **mobility** & **safety** for **all modes**
- Enhance **connectivity** between surrounding land uses *(e.g. school, neighborhoods, etc)*
- Balance the needs of **all stakeholders**
- Ensure that transportation infrastructure is **complementary** to community character.

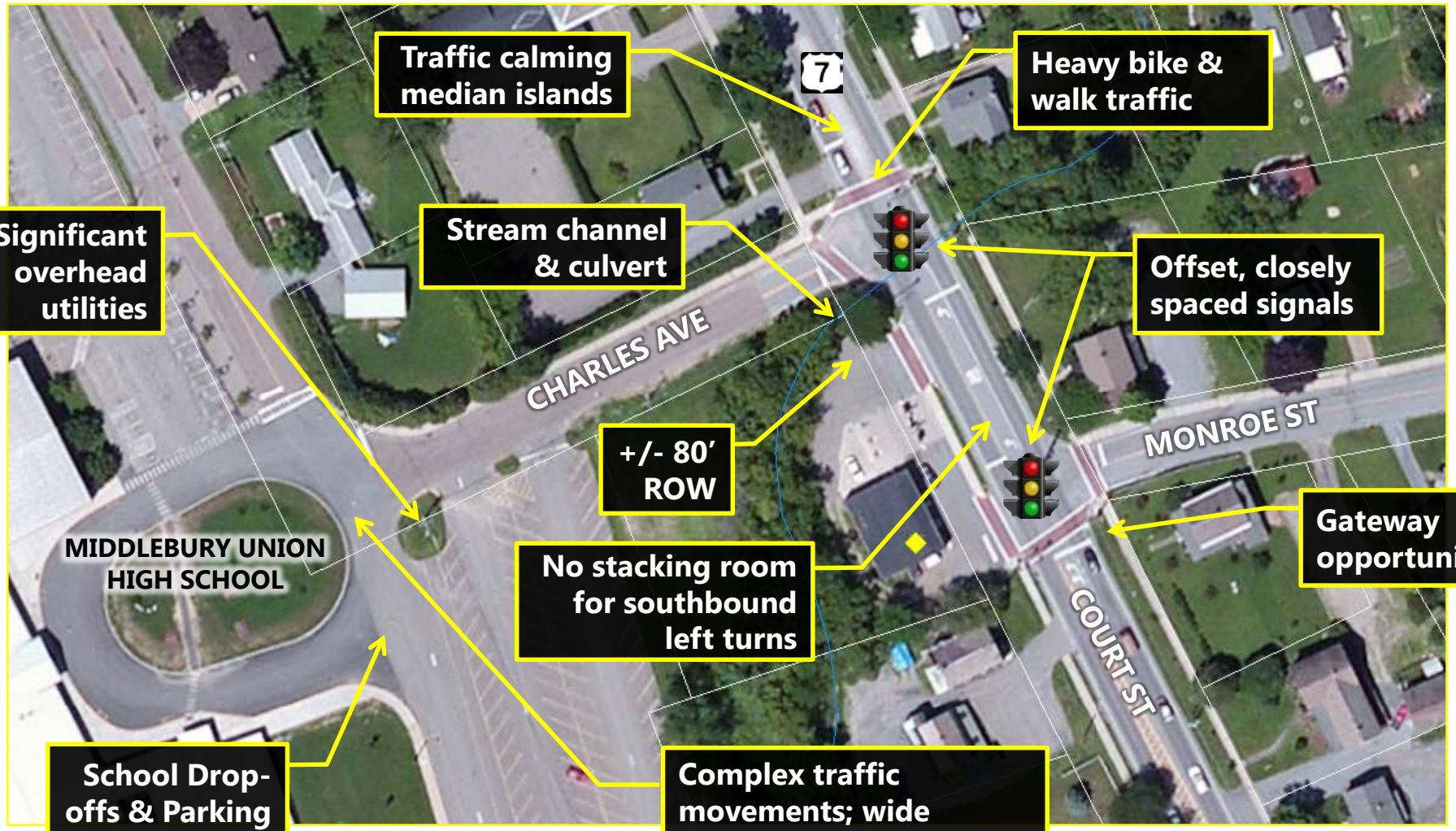
How to Get There

- **SCOPING PHASE**

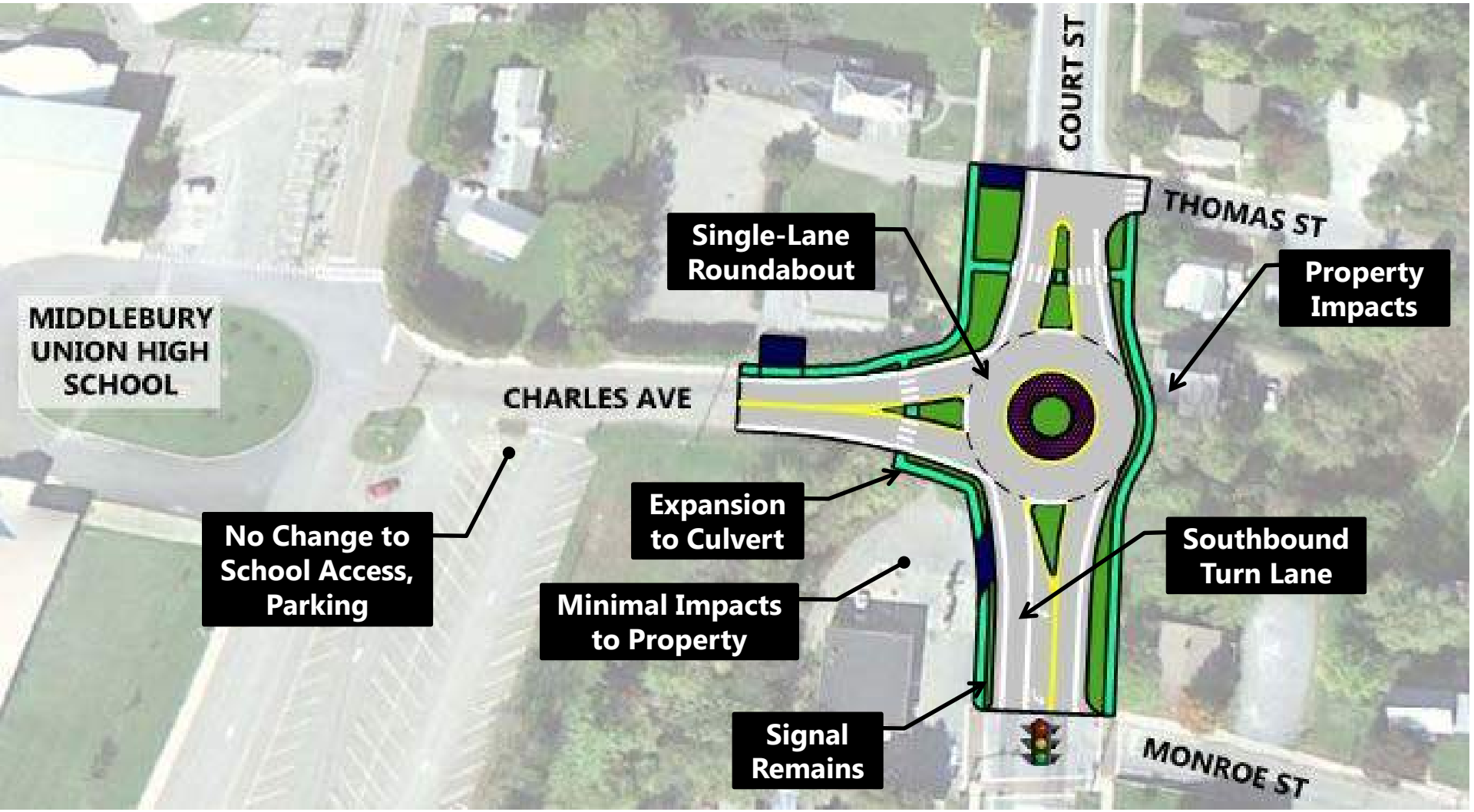
  Listen > Investigate > Evaluate > Select

- Develop a **range of alternatives** from which a ***Preferred Alternative*** will be selected to progress towards final design and construction

Existing Conditions & Issues



Alternative 1: Charles Avenue Roundabout



Alternative 2: Monroe Street Roundabout

Alternative 3: Monroe Street Signal

SE GROUP

0 30' 60' 120'

COURT STREET AND CHARLES AVE REALIGNMENT
MIDDLEBURY, VT

vhb

+4 Parking Spaces

SE GROUP

0 30' 60' 120'

COURT STREET AND CHARLES AVE REALIGNMENT
MIDDLEBURY, VT

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-20 Parking Spaces

SE GROUP

COURT STREET AND CHARLES AVE REALIGNMENT
MIDDLEBURY, VT

vhb

-31 Parking Spaces

Alternative Comparisons

	No Build	Alt 1 *Charles Roundabout*	Alt 2 *Monroe Roundabout*	Alt 3 *Monroe Signal*
COST: *Design & Construction*	**$0**	**$350,000**	**$980,000**	**$870,000**
COST: *Right-of-Way*	**$0**	**Lowest** *(partial impacts to 1 property)*	**Highest** *(acquisition plus partial impacts to 1 property)*	**Middle** *(acquisition)*
CONGESTION: *Avg. Level of Service*	**LOS F**	**LOS D/E**	**LOS D**	**LOS A**
BIKE/PED: *Accessibility & Safety*	**No Change**	**Slight Increase** *(Two intersections)*	**Increase** *(Single intersection)*	**Increase** *(Single intersection)*
SAFETY: *Anticipated Effects*	**No Change**	**Slight Decrease** *(combine roundabout & signal)*	**Improvement** *(single intersection; roundabout)*	**Improvement** *(single intersection; signal)*
IMPACTS: *Historic Properties*	**None**	**Significant** *(Historic District)*	**Significant** *(Historic District)*	**Moderate**
IMPACTS: *Hazardous Materials*	**None**	**None**	**Yes** *(Fuel Tanks)*	**Yes** *(Fuel Tanks)*
	13	*9*	*7*	*13*

vhb

MIDDLEBURY

What Happens Next?

1. Selectboard to identify Preferred Alternative (Nov – Dec)
2. Final Report (December)
3. Seek funding for final design, permitting & construction

Dan Werner | dwerner@townofmiddlebury.org | 802.388.4045

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www.vhb.com

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Offices located throughout the east coast

Town of Middlebury
Regular Selectboard Meeting
TUESDAY
January 12, 2016
7:00 P.M.
Large Conference Room
94 Main Street

AGENDA

7:00 1. Call to Order

2. *Approval of Minutes of December 15, 2015 & January 5, 2016

3. *Approval of Agenda

4. **Citizen Comments [Opportunity to raise or address issues that are not otherwise included on this agenda]

7:10 5. **Presentation of Alternatives Analysis for Court Street/Monroe Street/Charles Avenue Intersection, David Saladino, P.E., VHB

7:30 6. **Dog Park Organizers – Request for the Selectboard to Enter into a Lease Agreement with the College to Locate a Dog Park on College land off South Street, just east of Middlebury Regional EMS

7:45 7. **Main Street & Merchants Row Overpass Bridge Replacements Project Local Management Team Update

8:00 8. **FY17 Budget Proposal Review & Update

8:20 9. *Award Water Monitoring & Creek Road Sidewalk Engineering Contracts

8:25 10. *Consider Resolution Adopting the State of Vermont Section 457 Deferred Compensation Plan

11. *Adopt Hazard Mitigation Plan

8:30 12. *Approval of Check Warrants

13. *Town Manager's Report

14. Board Member Concerns

15. *Executive Session – If Needed

16. **Action on Matters Discussed in Executive Session

8:40 17. *Adjourn

* Decision Item ** Possible Decision

If you need special accommodations to attend this meeting, please contact the Town Manager's Office at 388-8100 x-202 as early as possible.

Additional information about most Agenda items is available on the Town's website, www.townofmiddlebury.org on the Selectboard page.

SELECTBOARD MEETING
Municipal Building – Large Conference Rom
Tuesday, January 12, 2016
Meeting Minutes

*D R A F T

**subject to Board approval*

Members Present: Dean George, Nick Artim, Susan Shashok, Gary Baker, Donna Donahue, Laura Asermily, and *Brian Carpenter (*participating by phone beginning at 7:35 p.m.).

Staff Present: Town Manager Kathleen Ramsay, Director of Operations Dan Werner, and Recreation Director Terri Arnold. Several members of the community attended the meeting, which was televised on MCTV by Dick Thodal, and reported by John Flowers of *The Addison Independent*.

1. Call to Order

Dean George called the meeting to order at 7:05 p.m.

2. Approval of Minutes for December 15, 2015

Susan Shashok moved to approve minutes for the Selectboard meeting held December 15, 2015 (copy attached); Laura Asermily seconded. Motion carried with 6 members in favor, none opposed, and 1 member absent. **MOTION PASSED**.

Approval of Minutes for January 5, 2016

Correction: Page 6, Line 304: substitute “Michigan” for “Alaska”

Susan Shashok moved to approve minutes for January 5, 2016 as amended; Nick Artim seconded. Motion carried with 6 members in favor, none opposed, and 1 member absent. **MOTION PASSED**.

3. Approval of Agenda

Gary Baker moved to approve the agenda as presented; Laura Asermily seconded. Motion carried with 6 members in favor, none opposed, and 1 member absent. **MOTION PASSED**.

4. Citizen Comments

None.

5. Presentation of Alternatives Analysis for Court Street/Monroe Street/Charles Avenue Intersection

Engineers David Saladino and Adam Portz of Vanasse, Hangen, Brustlin, Inc. (VHB) reviewed the results of the Court Street/Charles Avenue/Monroe Street intersection Scoping Study (copy attached) for design options to improve pedestrian and bicycle safety, reduce traffic congestion, and accommodate school transportation demands. Following public feedback solicited in October, the engineers presented the following three alternatives:

#1- Charles Avenue Roundabout, estimated at $350,000 (not including acquisition of adjacent property), would replace the existing traffic signal at the Charles Avenue/Court Street intersection with a single-lane roundabout, and a new southbound left turn on Court Street at the Monroe Street intersection.

#2 - Monroe Street Roundabout, estimated at $980,000 (excluding property acquisition), would replace both Court Street traffic signals with a single-lane roundabout, and realign Charles Avenue to intersect with Court Street across from Monroe, resulting with additional parking or green space at the high school.

#3 - Monroe Street Signal, estimated at $870,000 (excluding property acquisition), would remove the existing Charles Avenue traffic signal, and realign Charles Avenue to intersect with Court Street across from Monroe, also creating additional school parking or green space.

David Saladino indicated that those in attendance at the public hearing, as well as school board members, preferred the signalization option, #3. Regarding roundabout versus signalization in a village center location, he noted that a signalized intersection tends to be more efficient for traffic flow, as well as safer for pedestrians, allowing them to gather to cross before the light changes, as opposed to waiting for traffic gaps at a roundabout and crossing at random intervals.

David Portz also reviewed the sketches, or sub-alternatives, for creating an access road from the high school campus to the new Recreation Facility on Creek Road, a long-term objective not reflected in the current project estimates.

In terms of funding and a timeline, Mr. Saladino noted the project is not a priority for the Vermont Agency of Transportation (VTrans), which serves as a conduit for federal funds; however, he indicated that the property manager for Champlain Oil was amenable to property acquisition discussions for the project.

Laura Asermily moved to endorse the four-way signalized intersection design, Alternative #3, in the Court Street/Charles Avenue/Monroe Street Intersection Scoping Study as the preferred alternative, as determined through public input at the October 13, 2015 public information meeting; Nick Artim seconded. Motion carried with 7 members in favor, none opposed. **MOTION PASSED**.

6. Proposed Dog Park

Members of the Middlebury Off Leash Area Group (MOLAG) Jane Steele, and Kathy Nilsson, together with Middlebury College representative David Donahue, provided an update since their last presentation to the Board on November 24th, when concerns were raised regarding the proposed dog park to be located on college land off South Street, just east of Middlebury Regional EMS; specifically, the close proximity to the EMS helipad used for medical evacuation. Mr. Donahue noted that all concerns have been satisfied (correspondence attached), adding that the hospital has indicated there are approximately 12 flights per year, mostly at night, and parking will be available in the northeast back corner of the existing hospital lot, which is minimally used. Regarding the Act 250 permit process, he suggested an amendment, at considerably less cost, to meet the requirement.

Having received calls on the proposed dog park, Susan Shashok asked when the organizers plan to engage the community through public information meetings. Jane Steele advised that once the lease is signed, plans are being made for advertising, fundraising, and informational meetings. Gary Baker suggested holding a public hearing prior to signing the lease. Parks & Recreation Director Terri Arnold supported the dog park, with the caveat that the Rec Department should not take on its maintenance should the group fail to do so in the future. Nick Artim moved for tentative approval of the land lease (copy attached), pending the successful completion and State approval of the amended Act 250 permit; Donna Donahue seconded.

Motion carried with 7 members in favor, none opposed. **MOTION PASSED**.

7. Main Street & Merchants Row Overpass Bridge Replacements Local Project Management Team Update

Dean George reported on two meetings held last week by the Local Project Management Team (LPMT), at which members reviewed the response from VTrans to the committee's letter of November 10th (highlights attached). The LPMT is looking forward to the outcome of the February 17th meeting of the Vermont Rail Council, which is planning to weigh in on the issue of lowering the minimum clearance requirement, and associated costs, from 21 to 19 feet for the two downtown rail bridges. Dean also noted the Local Project Team discussed the relocation of the Addison County Transfer Resource (ACTR) transfer point, multi-modal station, and future of Greg's Meat Market building. The LPMT is scheduled to meet again on Thursday, January 14th.

Acknowledging of former Town Manager Bill Finger's letter of resignation as Local Project Manager (copy attached), in light of how the project has evolved since its inception, Board members expressed their appreciation for Bill's service, and continued willingness to advise the Selectboard in going forward.

8. FY17 Budget Proposal Review & Update

Town Manager Kathleen Ramsay advised that the Parks & Recreation Committee has voted to endorse a $10 program fee, already incorporated in the proposed budget ($27,750). The Personnel Committee is scheduled to meet on January 18th to review the proposed new position for a Safety & Operations Director budgeted at $100,000 (for wages and benefits). In regard to the Fund Balance, Town Treasurer Jackie Sullivan has indicated an audit will be available by January 22nd. To achieve the Board's target of no increase on the tax rate, an additional $61,420 must be trimmed from the proposed FY17 budget.

Regarding appropriation of funds to the various social service agencies, Susan Shashok suggested that the Board rely on the Policy for the Appropriation of Aid to Health & Human Services Programs for the Benefit of Middlebury Residents (copy attached), and allow voters to decide. Gary Baker noted the Charter House is warned as a separate article, and agreed all others will be proposed as level-funded. Susan requested that Article 3 reflect a change from "Selectmen" to "Selectboard," and asked for clarification regarding a proposed article on the penalty for late tax payments. Town Manager Kathleen Ramsay advised that a 1% penalty is being proposed for payments received within 10 days of the last installment only, followed by a 8% penalty thereafter with interest applied.

Dean George noted the budget must be finalized by January 26th, and encouraged Board members to forward any proposed amendments to the Town Manager prior to that date. Kathleen advised that the last day to file petitions signed by at least 5% of voters with the Town Clerk for articles to be included in the Town Meeting Warning is Thursday, January 14th by 5:00 p.m., and the deadline for nomination petitions for elected office is Monday, January 25th by 5:00 p.m.

9. Award Water Monitoring & Creek Road Sidewalk Engineering Contracts

Director of Operations Dan Werner advised three firms responded to the Town's Request for Proposals (RFPs) for engineering design services for chlorine and fluoride monitoring facilities at the two entry points to Middlebury's water distribution system: Well #2 (Palmer Springs) and Wells 3 and 4, a project necessary in order for the Town to be in compliance with new

requirements under the State's Safe Water Drinking Act. Dan recommended the Board award the project to low bidder Aldrich & Elliott for a total cost of $13,400, noting theirs most closely followed the requirements outlined in the RFP (copies of all three responses attached). Susan Shashok so moved; Laura Asermily seconded. Motion carried with 7 members in favor, none opposed. **MOTION PASSED**.

Dan also reported that the Town recently submitted an RFP for engineering services for the Creek Road Sidewalk and Road Reconstruction Project, and although eight firms had expressed interest, only Dubois & King, Inc. (D&K) submitted a bid by the December 22nd deadline (copy attached). The project will combine two funding sources; 1) a State $250,000 sidewalk grant; and 2) the remainder from the Town's Capital fund. Dan noted that the $75,202 bid from D & K for engineering services is 10% less than the $840,000 cost estimated by Phelps Engineering for both projects, and therefore recommended the Board award the bid to Dubois & King, Inc. for a not-to-exceed amount of $75,202. Nick Artim so moved; Susan Shashok seconded.

Brian Carpenter asked if paving at the new Recreation facility will be included, or if a change order will be considered. Dan advised the project will go out to bid on February 3rd, then back to the Selectboard in March, and in the meantime he will meet with Dubois & King to discuss an add alternative regarding the Recreation Facilities parking lot. Dean George suggested consulting with Breadloaf engineers to obtain the square footage. Motion carried with 7 members in favor, none opposed. **MOTION PASSED**.

10. Consider Resolution Adopting the State of Vermont Section 457 Deferred Compensation Plan

Town Manager Kathleen Ramsay presented a resolution to allow employees to participate in the Vermont Municipal Retirement System's Section 457 retirement savings plan through payroll reductions (copy attached). Kathleen advised the plan is administered by the Vermont Municipal Employees' Retirement System (VMERS) Board and offers much lower fees on investments. Gary Baker moved to authorize Board Chair Dean George to sign the Resolution adopting the State of Vermont Section 457 Deferred Compensation Plan; Brian Carpenter seconded. Motion carried with 7 members in favor, none opposed. **MOTION PASSED**.

11. Adopt Hazard Mitigation Plan

At its December 15th meeting, the Selectboard adopted the Town's Hazard Mitigation Plan, as approved by the Federal Emergency Management Agency (FEMA). Since that time, FEMA has clarified its process for approving the plan at the federal level, noting that the Selectboard must first approve a formal resolution adopting the Hazard Mitigation Plan (copy attached). Laura Asermily so moved; Nick Artim seconded. Motion carried with 7 members in favor, none opposed. **MOTION PASSED**.

12. Approval of Check Warrants

Having reviewed the check warrants from January 6, 2016 through January 12, 2016 (copy attached), Gary Baker moved to approve total expenditures in the amount of $173,931.37 consisting of $84,386.12 for accounts payable, and $89,545.25 for payroll; Laura Asermily seconded. Motion carried with 7 members, none opposed. **MOTION PASSED.**

13. Town Manager's Report

Town Manager Kathleen Ramsay reported that the Town has issued an RFP for the fabrication and installation of interpretive sign panels and parking signs for the downtown Middlebury Visitor Services Project. RFP responses are due by January 15th, and it is anticipated the project will be complete by early summer.

The Town's website now features a new link dedicated to the Means Woods Nature Preserve, including a Field Guide to the Natural History of the Means Woods, and information on the walking trails.

As a follow-up to discussion regarding the grant options in connection with the Exchange Street/Elm Street intersection, the decision was made to forego an application to the Strong Communities, Better Connections Grant Program at this time.

14. Board Member Concerns

Donna Donahue has received a number of positive comments on the new lights at the Memorial Sports Center, and added that the pre-skate event on New Years Event was well attended with some 140 participants.

Laura Asermily thanked employees of Public Works for keeping sidewalks clear of snow in a timely fashion, which helped with the success of the recent Bike to School event.

Gary Baker asked about the status of the Unpaved Roads budget. Town Manager Kathleen Ramsay advised she will provide a report at the Board's next meeting.

Nick Artim recently received a solicitation in the mail for water service line insurance, and cautioned other recipients that the insurance is neither endorsed nor required by the Town of Middlebury.

15. Executive Session
16. Action on Matters Discussed in Executive Session

None.

17. Adjourn

The Board adjourned at 8:55 p.m. The next meeting of the Middlebury Selectboard will be held on Tuesday, January 26, 2016 at 7:00 p.m.

Submitted by,
Peggy Connor, Board Clerk

Middlebury Court Street/Charles Ave/Monroe Street Intersection Scoping Study

Town of Middlebury, Vermont

Presented by
David Saladino, PE, AICP

January 12, 2016

Project Goals

- Improve **mobility** & **safety** for **all modes**
- Enhance **connectivity** between surrounding land uses *(e.g. school, neighborhoods, etc)*
- Balance the needs of **all stakeholders**
- Ensure that transportation infrastructure is **complementary** to community character.

vhb SE GROUP

How to Get There

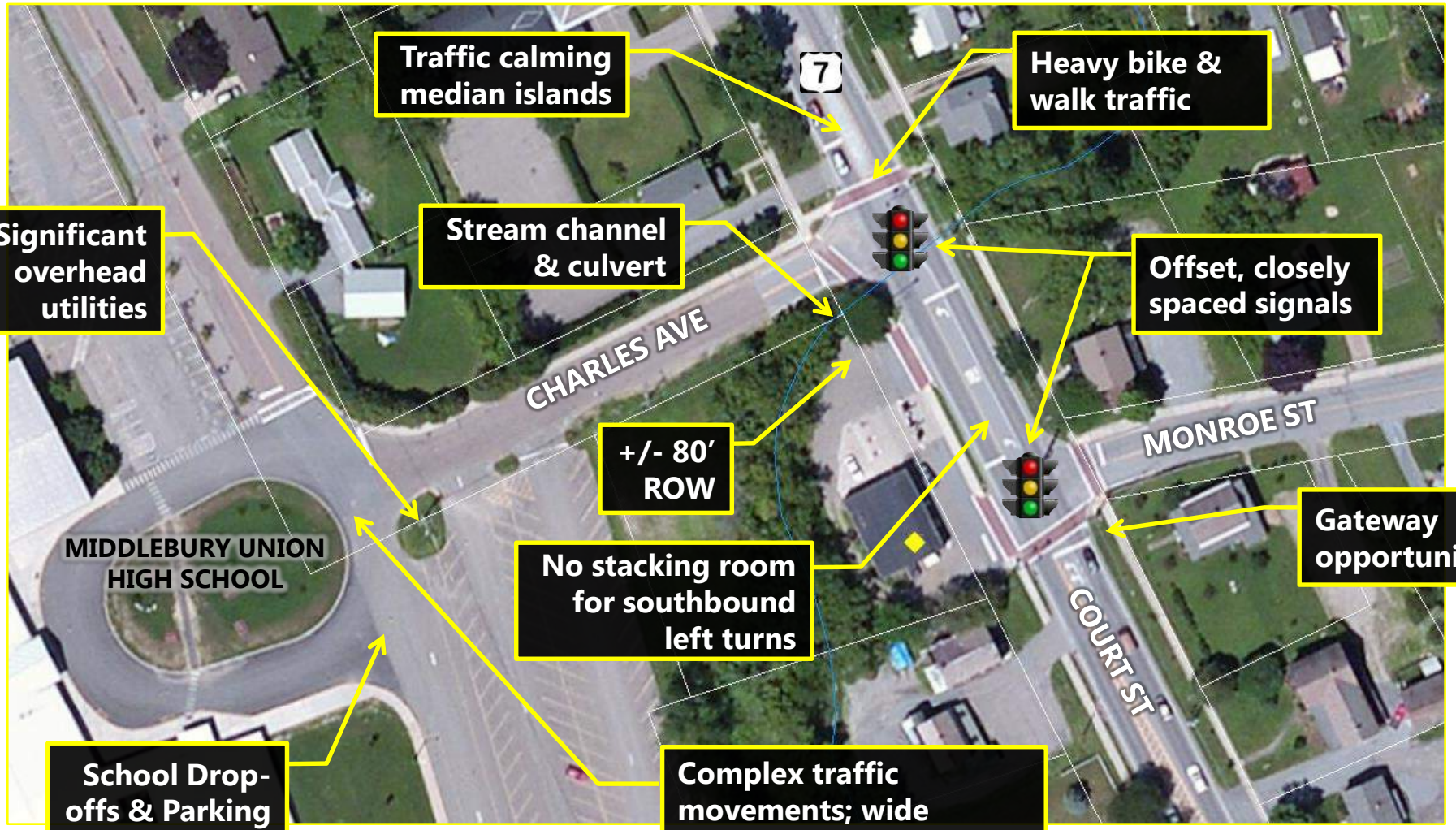
- **SCOPING PHASE**

  Listen > Investigate > Evaluate > Select

- Develop a **range of alternatives** from which a ***Preferred Alternative*** will be selected to progress towards final design and construction

vhb SE GROUP

Existing Conditions & Issues



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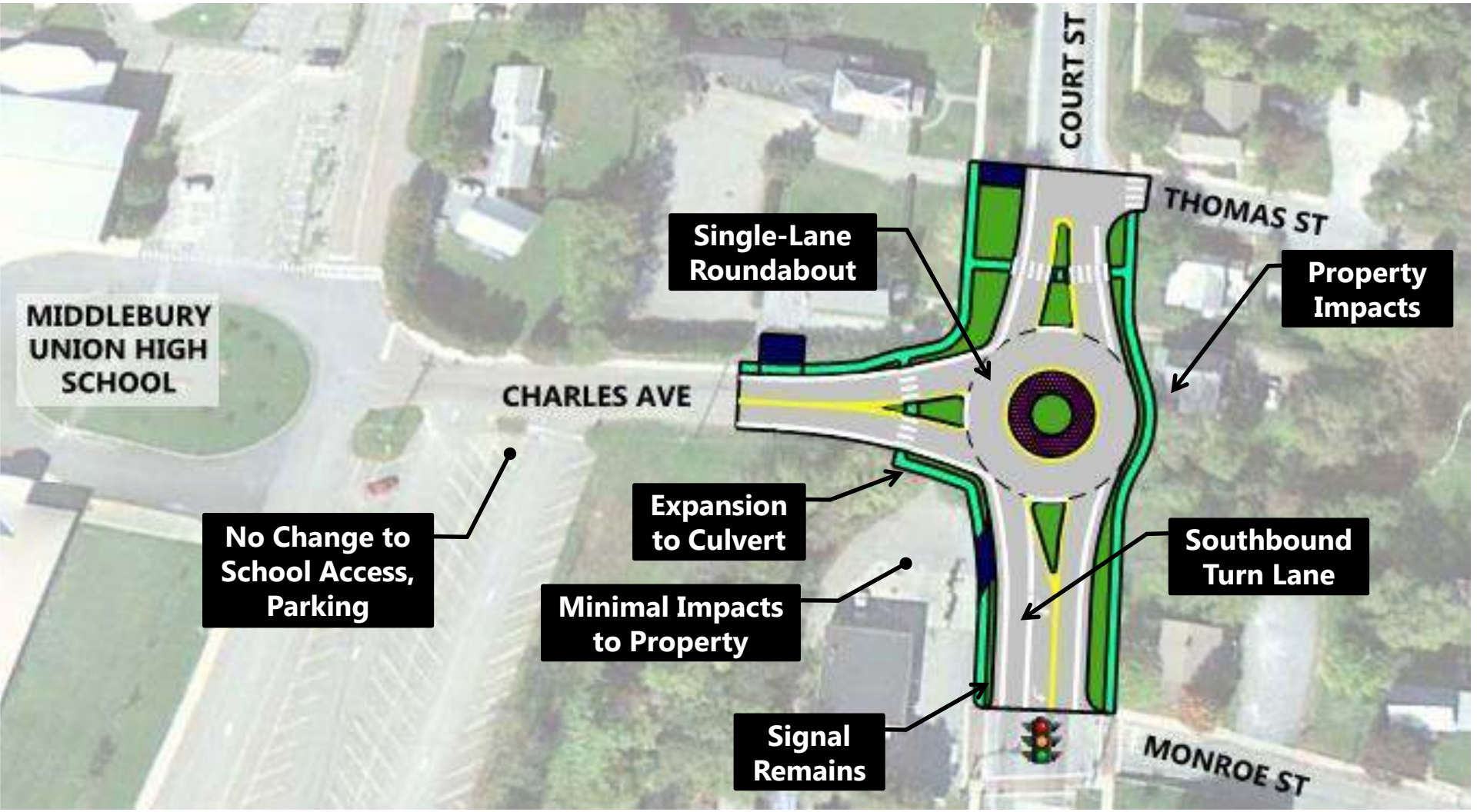
MIDDLEBURY

Alternative 1: Charles Avenue Roundabout



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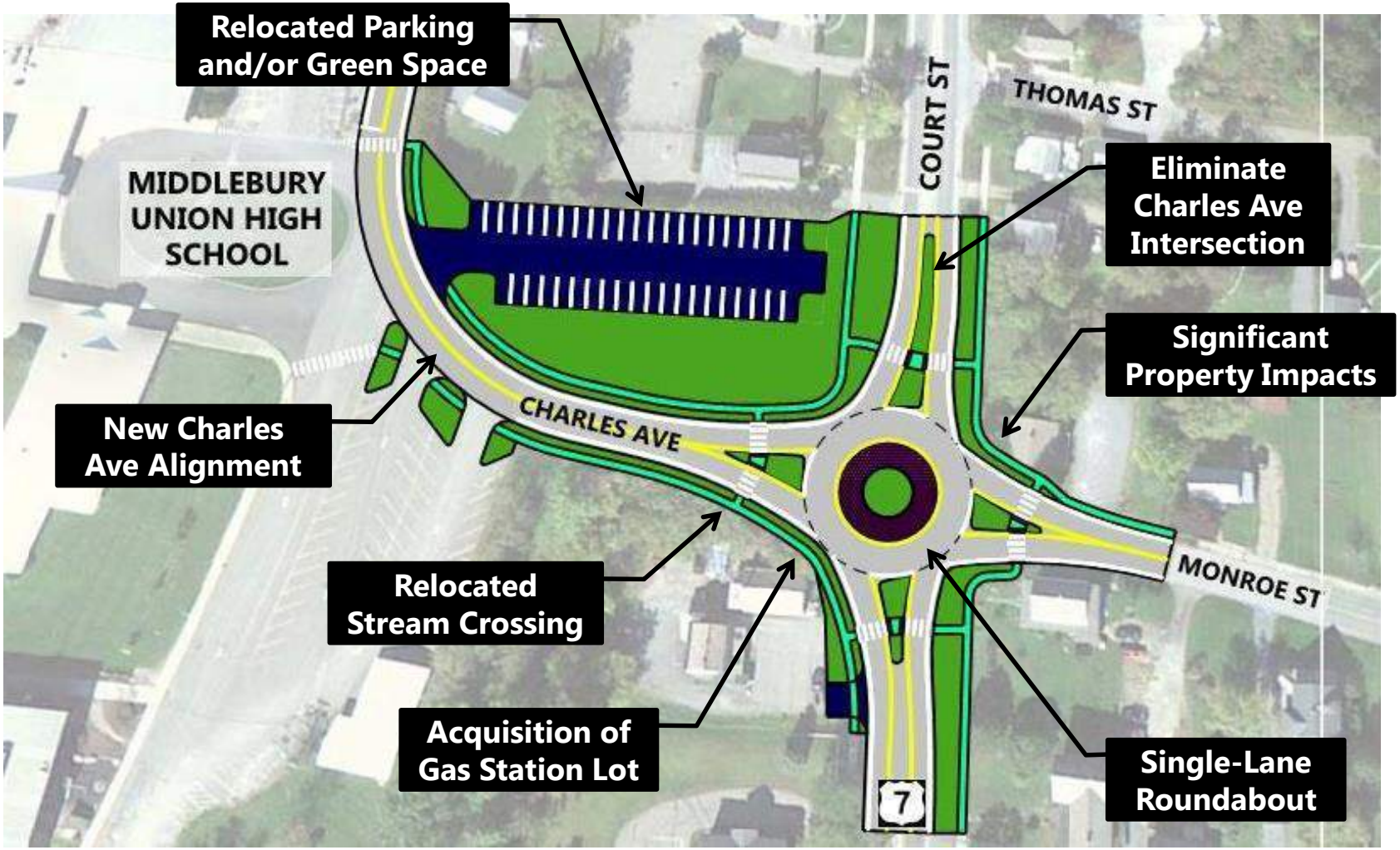
Alternative 2: Monroe Street Roundabout



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Alternative 3: Monroe Street Signal

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Alternative Comparisons

	No Build	Alt 1 *Charles Roundabout*	Alt 2 *Monroe Roundabout*	Alt 3 *Monroe Signal*
COST: *Design & Construction*	**$0**	**$350,000**	**$980,000**	**$870,000**
COST: *Right-of-Way*	**$0**	**Lowest** *(partial impacts to 1 property)*	**Highest** *(acquisition plus partial impacts to 1 property)*	**Middle** *(acquisition)*
CONGESTION: *Avg. Level of Service*	**LOS F**	**LOS D/E**	**LOS D**	**LOS A**
BIKE/PED: *Accessibility & Safety*	**No Change**	**Slight Increase** *(Two intersections)*	**Increase** *(Single intersection)*	**Increase** *(Single intersection)*
SAFETY: *Anticipated Effects*	**No Change**	**Slight Decrease** *(combine roundabout & signal)*	**Improvement** *(single intersection; roundabout)*	**Improvement** *(single intersection; signal)*
IMPACTS: *Historic Properties*	**None**	**Significant** *(Historic District)*	**Significant** *(Historic District)*	**Moderate**
IMPACTS: *Hazardous Materials*	**None**	**None**	**Yes** *(Fuel Tanks)*	**Yes** *(Fuel Tanks)*
	13	*9*	*7*	*13*

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What Happens Next?

1. Identify Preferred Alternative (Tonight)
2. Final Report (End of January)
3. Identify funding for final design, permitting & construction

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Dan Werner | dwerner@townofmiddlebury.org | 802.388.4045

David Saladino | dsaladino@vhb.com | 802.497.6121

www.vhb.com

vhb

Offices located throughout the east coast

Appendix B

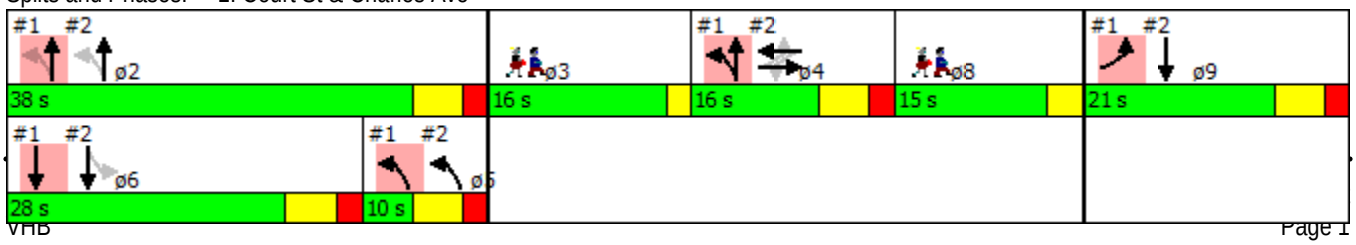
Traffic Analysis

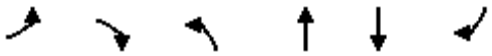
Lane Group	EBL	NBL	NBT	SBT	ø2	ø3	ø4	ø5	ø8
Lane Configurations									
Volume (vph)	70	165	770	630					
Lane Group Flow (vph)	254	179	837	741					
Turn Type	Prot	custom	NA	NA					
Protected Phases	9	4 5	2 4	6	2	3	4	5	8
Permitted Phases		2							
Detector Phase	9	4 5	2 4	6					
Switch Phase									
Minimum Initial (s)	7.0			10.0	16.0	1.0	8.0	4.0	1.0
Minimum Split (s)	16.0			16.0	22.0	16.0	16.0	10.0	15.0
Total Split (s)	21.0			28.0	38.0	16.0	16.0	10.0	15.0
Total Split (%)	19.8%			26.4%	36%	15%	15%	9%	14%
Yellow Time (s)	4.0			4.0	4.0	2.0	4.0	4.0	3.0
All-Red Time (s)	2.0			2.0	2.0	0.0	2.0	2.0	0.0
Lost Time Adjust (s)	-2.0			-2.0					
Total Lost Time (s)	4.0			4.0					
Lead/Lag				Lead		Lead	Lag	Lag	
Lead-Lag Optimize?						Yes			
Recall Mode	None			Max	Max	None	None	None	None
v/c Ratio	0.66	0.32	0.74	1.39					
Control Delay	34.6	7.4	7.5	211.2					
Queue Delay	2.6	0.5	19.9	1.8					
Total Delay	37.2	8.0	27.4	213.0					
Queue Length 50th (ft)	83	16	10	~454					
Queue Length 95th (ft)	143	m24	m98	#1005					
Internal Link Dist (ft)	246		97	1644					
Turn Bay Length (ft)									
Base Capacity (vph)	382	556	1133	535					
Starvation Cap Reductn	0	142	309	0					
Spillback Cap Reductn	54	0	0	101					
Storage Cap Reductn	0	0	0	0					
Reduced v/c Ratio	0.77	0.43	1.02	1.71					

Intersection Summary

Cycle Length: 106
Actuated Cycle Length: 81.2
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Court St & Charles Ave





Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	70	95	165	770	630	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-4%			0%	0%	
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frpb, ped/bikes	0.98		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.92		1.00	1.00	0.99	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1593		1735	1827	1771	
Flt Permitted	0.98		0.14	1.00	1.00	
Satd. Flow (perm)	1593		257	1827	1771	
Peak-hour factor, PHF	0.65	0.65	0.92	0.92	0.91	0.91
Adj. Flow (vph)	108	146	179	837	692	49
RTOR Reduction (vph)	44	0	0	0	2	0
Lane Group Flow (vph)	210	0	179	837	739	0
Confl. Peds. (#/hr)	10	4	16			16
Heavy Vehicles (%)	8%	8%	4%	4%	6%	6%
Turn Type	Prot		custom	NA	NA	
Protected Phases	9		4 5	2 4	6	
Permitted Phases			2			
Actuated Green, G (s)	15.3		42.8	42.8	22.4	
Effective Green, g (s)	17.3		46.8	46.8	24.4	
Actuated g/C Ratio	0.20		0.55	0.55	0.29	
Clearance Time (s)	6.0				6.0	
Vehicle Extension (s)	2.0				2.0	
Lane Grp Cap (vph)	324		461	1005	508	
v/s Ratio Prot	c0.13		0.08	c0.46	c0.42	
v/s Ratio Perm			0.13			
v/c Ratio	0.65		0.39	0.83	1.45	
Uniform Delay, d1	31.1		25.0	15.9	30.3	
Progression Factor	1.00		0.48	0.36	1.00	
Incremental Delay, d2	3.3		0.1	0.6	215.3	
Delay (s)	34.4		12.0	6.3	245.6	
Level of Service	C		B	A	F	
Approach Delay (s)	34.4			7.3	245.6	
Approach LOS	C			A	F	

Intersection Summary			
HCM 2000 Control Delay	98.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	65.1%	ICU Level of Service	C
Analysis Period (min)	15		

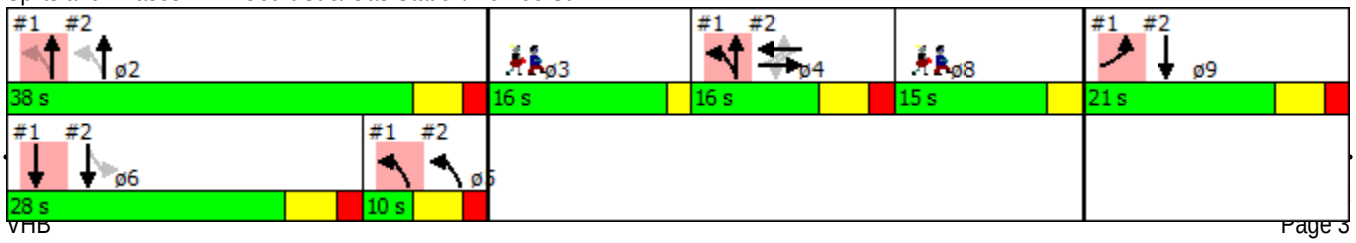
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT	ø3	ø5	ø8	ø9
Lane Configurations											
Volume (vph)	1	0	35	0	880	15	710				
Lane Group Flow (vph)	0	4	0	143	968	0	771				
Turn Type	Perm	NA	Perm	NA	NA	custom	NA				
Protected Phases		4		4	2		6 9	3	5	8	9
Permitted Phases	4		4			6					
Detector Phase	4	4	4	4	2	6	6 9				
Switch Phase											
Minimum Initial (s)	8.0	8.0	8.0	8.0	16.0	10.0		1.0	4.0	1.0	7.0
Minimum Split (s)	16.0	16.0	16.0	16.0	22.0	16.0		16.0	10.0	15.0	16.0
Total Split (s)	16.0	16.0	16.0	16.0	38.0	28.0		16.0	10.0	15.0	21.0
Total Split (%)	15.1%	15.1%	15.1%	15.1%	35.8%	26.4%		15%	9%	14%	20%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		2.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0		0.0	2.0	0.0	2.0
Lost Time Adjust (s)		-2.0		-2.0	-2.0						
Total Lost Time (s)		4.0		4.0	4.0						
Lead/Lag	Lag	Lag	Lag	Lag		Lead		Lead	Lag		
Lead-Lag Optimize?								Yes			
Recall Mode	None	None	None	None	Max	Max		None	None	None	None
v/c Ratio		0.01		0.35	1.29		0.79				
Control Delay		0.0		4.0	163.5		17.3				
Queue Delay		0.0		0.2	0.4		50.5				
Total Delay		0.0		4.2	163.8		67.8				
Queue Length 50th (ft)		0		0	~565		111				
Queue Length 95th (ft)		0		0	#1229		m167				
Internal Link Dist (ft)		21		602	677		97				
Turn Bay Length (ft)											
Base Capacity (vph)		411		406	752		977				
Starvation Cap Reductn		0		0	0		296				
Spillback Cap Reductn		0		34	42		0				
Storage Cap Reductn		0		0	0		0				
Reduced v/c Ratio		0.01		0.38	1.36		1.13				

Intersection Summary

Cycle Length: 106
Actuated Cycle Length: 81.2
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Court St & Gas Station/Monroe St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	0	1	35	0	55	0	880	10	15	710	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	11	12	12	12
Grade (%)		0%			-4%			0%			0%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.98			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			0.99			1.00			1.00	
Frt		0.93			0.92			1.00			1.00	
Flt Protected		0.98			0.98			1.00			1.00	
Satd. Flow (prot)		1699			1735			1762			1774	
Flt Permitted		0.91			0.87			1.00			0.97	
Satd. Flow (perm)		1577			1540			1762			1731	
Peak-hour factor, PHF	0.50	0.50	0.50	0.63	0.63	0.63	0.92	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	2	0	2	56	0	87	0	957	11	16	755	0
RTOR Reduction (vph)	0	3	0	0	122	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	1	0	0	21	0	0	967	0	0	771	0
Confl. Peds. (#/hr)			4	4					8	8		
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	7%	7%	7%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		custom	NA	
Protected Phases		4			4		5	2			6 9	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)		10.2			10.2			32.6			43.7	
Effective Green, g (s)		12.2			12.2			34.6			45.7	
Actuated g/C Ratio		0.14			0.14			0.41			0.54	
Clearance Time (s)		6.0			6.0			6.0				
Vehicle Extension (s)		4.0			4.0			2.0				
Lane Grp Cap (vph)		226			221			717			930	
v/s Ratio Prot								c0.55				
v/s Ratio Perm		0.00			c0.01						c0.45	
v/c Ratio		0.00			0.09			1.35			0.83	
Uniform Delay, d1		31.2			31.6			25.2			16.4	
Progression Factor		1.00			1.00			1.00			0.94	
Incremental Delay, d2		0.0			0.3			166.3			0.6	
Delay (s)		31.2			31.8			191.5			15.9	
Level of Service		C			C			F			B	
Approach Delay (s)		31.2			31.8			191.5			15.9	
Approach LOS		C			C			F			B	

Intersection Summary			
HCM 2000 Control Delay	107.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	62.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 1: Court St & Charles Ave

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (ft)	313	113	117	1750
Average Queue (ft)	139	50	61	1583
95th Queue (ft)	290	95	112	2093
Link Distance (ft)	292	126	126	1689
Upstream Blk Time (%)	9	0	0	78
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Court St & Gas Station/Monroe St

Movement	EB	WB	NB	B4	SB
Directions Served	LTR	LTR	TR	T	LTR
Maximum Queue (ft)	30	137	804	929	145
Average Queue (ft)	1	47	765	788	118
95th Queue (ft)	11	101	843	1227	160
Link Distance (ft)	67	642	693	870	126
Upstream Blk Time (%)			73	80	25
Queuing Penalty (veh)			0	0	185
Storage Bay Dist (ft)					
Storage Blk Time (%)			61		
Queuing Penalty (veh)			0		

Network Summary

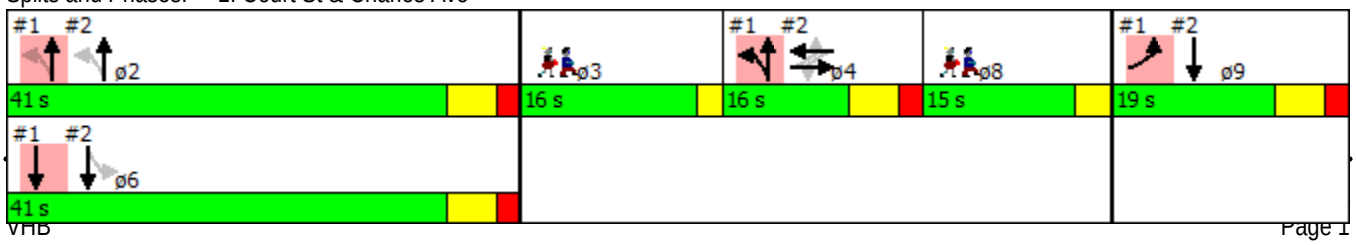
Network wide Queuing Penalty: 186

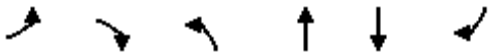
Lane Group	EBL	NBL	NBT	SBT	ø2	ø3	ø8
Lane Configurations							
Volume (vph)	15	35	720	940			
Lane Group Flow (vph)	91	38	774	1005			
Turn Type	Prot	custom	NA	NA			
Protected Phases	9	4	2 4	6	2	3	8
Permitted Phases		2					
Detector Phase	9	4	2 4	6			
Switch Phase							
Minimum Initial (s)	7.0	8.0		16.0	16.0	1.0	1.0
Minimum Split (s)	16.0	16.0		22.0	22.0	16.0	15.0
Total Split (s)	19.0	16.0		41.0	41.0	16.0	15.0
Total Split (%)	17.8%	15.0%		38.3%	38%	15%	14%
Yellow Time (s)	4.0	4.0		4.0	4.0	2.0	3.0
All-Red Time (s)	2.0	2.0		2.0	2.0	0.0	0.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0			
Total Lost Time (s)	4.0	4.0		4.0			
Lead/Lag		Lag				Lead	
Lead-Lag Optimize?						Yes	
Recall Mode	None	None		Max	Max	None	None
v/c Ratio	0.25	0.11	0.64	1.13			
Control Delay	15.0	4.7	6.4	96.5			
Queue Delay	0.2	0.1	1.9	1.0			
Total Delay	15.2	4.7	8.3	97.4			
Queue Length 50th (ft)	9	0	3	~551			
Queue Length 95th (ft)	32	m4	m169	#1233			
Internal Link Dist (ft)	246		97	1644			
Turn Bay Length (ft)							
Base Capacity (vph)	358	338	1216	891			
Starvation Cap Reductn	0	31	282	0			
Spillback Cap Reductn	51	0	0	138			
Storage Cap Reductn	0	0	0	0			
Reduced v/c Ratio	0.30	0.12	0.83	1.33			

Intersection Summary

Cycle Length: 107
Actuated Cycle Length: 85.2
Natural Cycle: 135
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Court St & Charles Ave





Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	15	45	35	720	940	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-4%			0%	0%	
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frpb, ped/bikes	1.00		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.90		1.00	1.00	1.00	
Flt Protected	0.99		0.95	1.00	1.00	
Satd. Flow (prot)	1687		1752	1845	1874	
Flt Permitted	0.99		0.10	1.00	1.00	
Satd. Flow (perm)	1687		182	1845	1874	
Peak-hour factor, PHF	0.66	0.66	0.93	0.93	0.96	0.96
Adj. Flow (vph)	23	68	38	774	979	26
RTOR Reduction (vph)	56	0	0	0	1	0
Lane Group Flow (vph)	35	0	38	774	1004	0
Confl. Peds. (#/hr)			2			2
Heavy Vehicles (%)	2%	2%	3%	3%	1%	1%
Turn Type	Prot		custom	NA	NA	
Protected Phases	9		4	2 4	6	
Permitted Phases			2			
Actuated Green, G (s)	13.2		48.7	48.7	38.5	
Effective Green, g (s)	15.2		52.7	52.7	40.5	
Actuated g/C Ratio	0.17		0.59	0.59	0.46	
Clearance Time (s)	6.0		6.0		6.0	
Vehicle Extension (s)	2.0		4.0		2.0	
Lane Grp Cap (vph)	288		322	1092	852	
v/s Ratio Prot	c0.02		0.02	c0.42	c0.54	
v/s Ratio Perm			0.05			
v/c Ratio	0.12		0.12	0.71	1.18	
Uniform Delay, d1	31.2		30.4	12.8	24.2	
Progression Factor	1.00		0.50	0.41	1.00	
Incremental Delay, d2	0.1		0.1	0.7	92.6	
Delay (s)	31.3		15.2	5.9	116.9	
Level of Service	C		B	A	F	
Approach Delay (s)	31.3			6.3	116.9	
Approach LOS	C			A	F	

Intersection Summary			
HCM 2000 Control Delay	65.7	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	89.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		

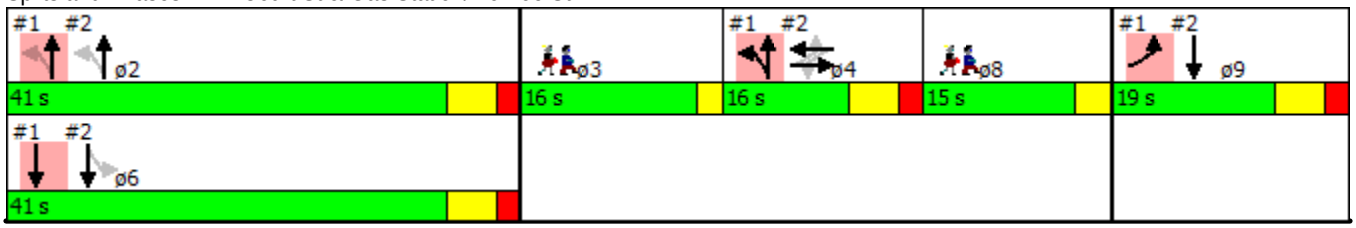
c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø3	ø8	ø9
Lane Configurations										
Volume (vph)	1	20	0	5	740	30	955			
Lane Group Flow (vph)	10	0	52	5	820	0	1017			
Turn Type	NA	Perm	NA	Perm	NA	custom	NA			
Protected Phases	4		4		2		6 9	3	8	9
Permitted Phases		4		2		6				
Detector Phase	4	4	4	2	2	6	6 9			
Switch Phase										
Minimum Initial (s)	8.0	8.0	8.0	16.0	16.0	16.0		1.0	1.0	7.0
Minimum Split (s)	16.0	16.0	16.0	22.0	22.0	22.0		16.0	15.0	16.0
Total Split (s)	16.0	16.0	16.0	41.0	41.0	41.0		16.0	15.0	19.0
Total Split (%)	15.0%	15.0%	15.0%	38.3%	38.3%	38.3%		15%	14%	18%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		2.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0		0.0	0.0	2.0
Lost Time Adjust (s)	-2.0		-2.0	-2.0	-2.0					
Total Lost Time (s)	4.0		4.0	4.0	4.0					
Lead/Lag	Lag	Lag	Lag					Lead		
Lead-Lag Optimize?								Yes		
Recall Mode	None	None	None	Max	Max	Max		None	None	None
v/c Ratio	0.04		0.15	0.06	0.97		0.80			
Control Delay	23.7		0.9	20.4	49.2		13.4			
Queue Delay	0.0		0.0	0.0	10.0		26.5			
Total Delay	23.7		1.0	20.4	59.2		39.8			
Queue Length 50th (ft)	1		0	1	349		116			
Queue Length 95th (ft)	11		0	12	#978		m269			
Internal Link Dist (ft)	21		602		677		97			
Turn Bay Length (ft)				75						
Base Capacity (vph)	250		340	87	846		1273			
Starvation Cap Reductn	0		0	0	0		297			
Spillback Cap Reductn	0		15	0	38		0			
Storage Cap Reductn	0		0	0	0		0			
Reduced v/c Ratio	0.04		0.16	0.06	1.01		1.04			

Intersection Summary

Cycle Length: 107
Actuated Cycle Length: 85.2
Natural Cycle: 135
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Court St & Gas Station/Monroe St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1	5	20	0	15	5	740	15	30	955	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	11	12	12	12
Grade (%)		0%			-4%			0%			0%	
Total Lost time (s)		4.0			4.0		4.0	4.0			4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00			1.00	
Frpb, ped/bikes		1.00			1.00		1.00	1.00			1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00			1.00	
Frt		0.89			0.94		1.00	1.00			1.00	
Flt Protected		1.00			0.97		0.95	1.00			1.00	
Satd. Flow (prot)		1695			1776		1752	1778			1878	
Flt Permitted		1.00			0.83		0.10	1.00			0.96	
Satd. Flow (perm)		1695			1519		182	1778			1812	
Peak-hour factor, PHF	0.63	0.63	0.63	0.67	0.67	0.67	0.92	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	0	2	8	30	0	22	5	804	16	31	985	1
RTOR Reduction (vph)	0	7	0	0	45	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	3	0	0	7	0	5	819	0	0	1017	0
Confl. Peds. (#/hr)							3					3
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	3%	3%	3%	1%	1%	1%
Turn Type		NA		Perm	NA		Perm	NA		custom	NA	
Protected Phases		4			4			2			6 9	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)		10.2			10.2		38.5	38.5			57.7	
Effective Green, g (s)		12.2			12.2		40.5	40.5			59.7	
Actuated g/C Ratio		0.14			0.14		0.46	0.46			0.67	
Clearance Time (s)		6.0			6.0		6.0	6.0				
Vehicle Extension (s)		4.0			4.0		2.0	2.0				
Lane Grp Cap (vph)		232			208		82	809			1215	
v/s Ratio Prot		0.00						c0.46				
v/s Ratio Perm					c0.00		0.03				c0.56	
v/c Ratio		0.01			0.03		0.06	1.01			0.84	
Uniform Delay, d1		33.2			33.3		13.6	24.2			11.0	
Progression Factor		1.00			1.00		1.00	1.00			1.02	
Incremental Delay, d2		0.0			0.1		1.4	34.9			0.5	
Delay (s)		33.2			33.4		15.0	59.1			11.7	
Level of Service		C			C		B	E			B	
Approach Delay (s)		33.2			33.4			58.9			11.7	
Approach LOS		C			C			E			B	

Intersection Summary			
HCM 2000 Control Delay	32.9	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	89.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	89.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 1: Court St & Charles Ave

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (ft)	108	79	100	1738
Average Queue (ft)	35	23	24	1556
95th Queue (ft)	79	59	80	2170
Link Distance (ft)	292	126	126	1689
Upstream Blk Time (%)			0	82
Queuing Penalty (veh)			0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Court St & Gas Station/Monroe St

Movement	EB	WB	NB	NB	B4	SB
Directions Served	LTR	LTR	L	TR	T	LTR
Maximum Queue (ft)	30	77	70	724	138	145
Average Queue (ft)	6	24	6	410	12	119
95th Queue (ft)	26	59	35	713	98	165
Link Distance (ft)	67	642		693	870	126
Upstream Blk Time (%)				4		16
Queuing Penalty (veh)				0		154
Storage Bay Dist (ft)			75			
Storage Blk Time (%)				45		
Queuing Penalty (veh)				2		

Network Summary

Network wide Queuing Penalty: 156

Lane Group	EBL	NBL	NBT	SBT	ø2	ø3	ø4	ø5	ø8
Lane Configurations									
Volume (vph)	90	60	690	730					
Lane Group Flow (vph)	377	61	704	875					
Turn Type	Prot	custom	NA	NA					
Protected Phases	9	4 5	2 4	6	2	3	4	5	8
Permitted Phases		2							
Detector Phase	9	4 5	2 4	6					
Switch Phase									
Minimum Initial (s)	8.0			16.0	16.0	1.0	4.0	4.0	1.0
Minimum Split (s)	16.0			22.0	22.0	16.0	14.0	10.0	15.0
Total Split (s)	34.0			28.0	38.0	16.0	14.0	10.0	15.0
Total Split (%)	29.1%			23.9%	32%	14%	12%	9%	13%
Yellow Time (s)	4.0			4.0	4.0	2.0	4.0	4.0	3.0
All-Red Time (s)	2.0			2.0	2.0	0.0	2.0	2.0	0.0
Lost Time Adjust (s)	-2.0			-2.0					
Total Lost Time (s)	4.0			4.0					
Lead/Lag				Lead		Lead	Lag	Lag	
Lead-Lag Optimize?						Yes			
Recall Mode	None			Max	Max	None	None	None	None
v/c Ratio	0.69	0.15	0.80	1.78					
Control Delay	35.6	4.2	12.0	385.7					
Queue Delay	1.2	0.1	29.4	4.0					
Total Delay	36.7	4.3	41.4	389.7					
Queue Length 50th (ft)	142	1	14	~720					
Queue Length 95th (ft)	178	m6	m90	#1308					
Internal Link Dist (ft)	246		97	1644					
Turn Bay Length (ft)									
Base Capacity (vph)	546	402	878	491					
Starvation Cap Reductn	0	43	204	0					
Spillback Cap Reductn	50	0	0	166					
Storage Cap Reductn	0	0	0	0					
Reduced v/c Ratio	0.76	0.17	1.04	2.69					

Intersection Summary

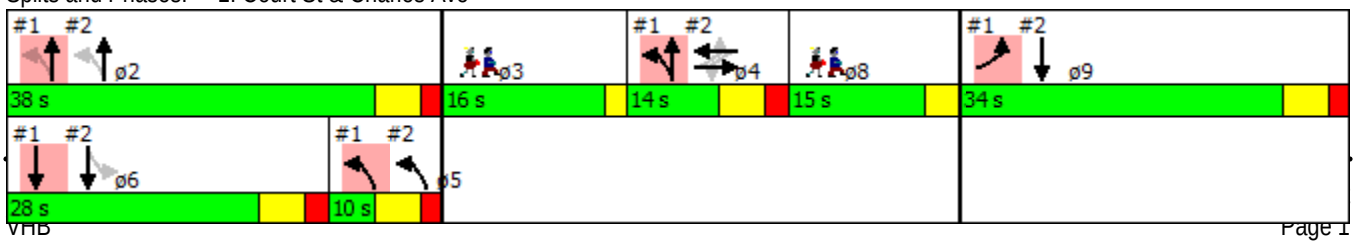
Cycle Length: 117
Actuated Cycle Length: 98.4
Natural Cycle: 145
Control Type: Actuated-Uncoordinated

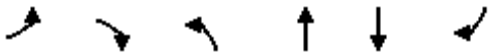
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Court St & Charles Ave





Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	90	125	60	690	730	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-4%			0%	0%	
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frpb, ped/bikes	0.99		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.92		1.00	1.00	0.99	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1628		1719	1810	1797	
Flt Permitted	0.98		0.13	1.00	1.00	
Satd. Flow (perm)	1628		235	1810	1797	
Peak-hour factor, PHF	0.57	0.57	0.98	0.98	0.88	0.88
Adj. Flow (vph)	158	219	61	704	830	45
RTOR Reduction (vph)	40	0	0	0	1	0
Lane Group Flow (vph)	337	0	61	704	874	0
Confl. Peds. (#/hr)	16	2				
Heavy Vehicles (%)	6%	6%	5%	5%	5%	5%
Turn Type	Prot		custom	NA	NA	
Protected Phases	9		4 5	2 4	6	
Permitted Phases			2			
Actuated Green, G (s)	28.6		42.2	42.2	24.8	
Effective Green, g (s)	30.6		46.2	46.2	26.8	
Actuated g/C Ratio	0.30		0.45	0.45	0.26	
Clearance Time (s)	6.0				6.0	
Vehicle Extension (s)	2.0				2.0	
Lane Grp Cap (vph)	486		328	815	469	
v/s Ratio Prot	c0.21		0.03	c0.39	c0.49	
v/s Ratio Perm			0.06			
v/c Ratio	0.69		0.19	0.86	1.86	
Uniform Delay, d1	31.8		34.9	25.3	37.9	
Progression Factor	1.00		0.23	0.36	1.00	
Incremental Delay, d2	3.4		0.0	1.0	396.3	
Delay (s)	35.3		7.9	10.1	434.1	
Level of Service	D		A	B	F	
Approach Delay (s)	35.3			9.9	434.1	
Approach LOS	D			A	F	

Intersection Summary			
HCM 2000 Control Delay	198.7	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	102.5	Sum of lost time (s)	21.0
Intersection Capacity Utilization	67.0%	ICU Level of Service	C
Analysis Period (min)	15		

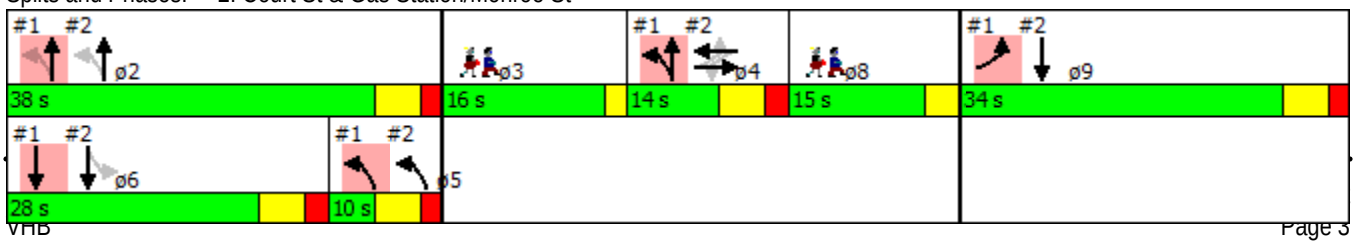
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT	ø3	ø5	ø8	ø9
Lane Configurations											
Volume (vph)	5	1	25	0	700	30	825				
Lane Group Flow (vph)	0	15	0	92	745	0	900				
Turn Type	Perm	NA	Perm	NA	NA	custom	NA				
Protected Phases		4		4	2		6 9	3	5	8	9
Permitted Phases	4		4			6					
Detector Phase	4	4	4	4	2	6	6 9				
Switch Phase											
Minimum Initial (s)	4.0	4.0	4.0	4.0	16.0	16.0		1.0	4.0	1.0	8.0
Minimum Split (s)	14.0	14.0	14.0	14.0	22.0	22.0		16.0	10.0	15.0	16.0
Total Split (s)	14.0	14.0	14.0	14.0	38.0	28.0		16.0	10.0	15.0	34.0
Total Split (%)	12.0%	12.0%	12.0%	12.0%	32.5%	23.9%		14%	9%	13%	29%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		2.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0		0.0	2.0	0.0	2.0
Lost Time Adjust (s)		-2.0		-2.0	-2.0						
Total Lost Time (s)		4.0		4.0	4.0						
Lead/Lag	Lag	Lag	Lag	Lag		Lead		Lead	Lag		
Lead-Lag Optimize?								Yes			
Recall Mode	None	None	None	None	Max	Max		None	None	None	None
v/c Ratio		0.09		0.28	1.21		0.83				
Control Delay		36.2		2.2	140.5		26.9				
Queue Delay		0.0		0.1	0.4		50.2				
Total Delay		36.2		2.3	140.9		77.1				
Queue Length 50th (ft)		4		0	~458		270				
Queue Length 95th (ft)		19		0	#1017		m183				
Internal Link Dist (ft)		21		602	677		97				
Turn Bay Length (ft)											
Base Capacity (vph)		161		326	615		1086				
Starvation Cap Reductn		0		0	0		408				
Spillback Cap Reductn		0		22	34		0				
Storage Cap Reductn		0		0	0		0				
Reduced v/c Ratio		0.09		0.30	1.28		1.33				

Intersection Summary

Cycle Length: 117
Actuated Cycle Length: 98.4
Natural Cycle: 145
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Court St & Gas Station/Monroe St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1	5	25	0	45	0	700	30	30	825	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	11	12	12	12
Grade (%)		0%			-4%			0%			0%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.98			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			0.99			1.00			1.00	
Frt		0.94			0.91			0.99			1.00	
Flt Protected		0.98			0.98			1.00			1.00	
Satd. Flow (prot)		1711			1730			1737			1806	
Flt Permitted		0.85			0.88			1.00			0.96	
Satd. Flow (perm)		1494			1541			1737			1736	
Peak-hour factor, PHF	0.67	0.67	0.67	0.76	0.76	0.76	0.98	0.98	0.98	0.95	0.95	0.95
Adj. Flow (vph)	7	1	7	33	0	59	0	714	31	32	868	0
RTOR Reduction (vph)	0	6	0	0	83	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	9	0	0	9	0	0	744	0	0	900	0
Confl. Peds. (#/hr)			3	3			7		3	3		7
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	5%	5%	5%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		custom	NA	
Protected Phases		4			4		5	2			6 9	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)		8.2			8.2			34.0			59.4	
Effective Green, g (s)		10.2			10.2			36.0			61.4	
Actuated g/C Ratio		0.10			0.10			0.35			0.60	
Clearance Time (s)		6.0			6.0			6.0				
Vehicle Extension (s)		4.0			4.0			2.0				
Lane Grp Cap (vph)		148			153			610			1039	
v/s Ratio Prot								c0.43				
v/s Ratio Perm		0.01			c0.01						c0.52	
v/c Ratio		0.06			0.06			1.22			0.87	
Uniform Delay, d1		41.8			41.8			33.2			17.1	
Progression Factor		1.00			1.00			1.00			1.38	
Incremental Delay, d2		0.2			0.2			113.0			0.7	
Delay (s)		42.0			42.0			146.2			24.4	
Level of Service		D			D			F			C	
Approach Delay (s)		42.0			42.0			146.2			24.4	
Approach LOS		D			D			F			C	

Intersection Summary			
HCM 2000 Control Delay	77.3	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	102.5	Sum of lost time (s)	21.0
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 1: Court St & Charles Ave

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (ft)	317	77	124	1745
Average Queue (ft)	155	27	68	1636
95th Queue (ft)	315	65	123	2056
Link Distance (ft)	292	126	126	1689
Upstream Blk Time (%)	9		0	89
Queuing Penalty (veh)	0		2	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Court St & Gas Station/Monroe St

Movement	EB	WB	NB	B4	SB
Directions Served	LTR	LTR	TR	T	LTR
Maximum Queue (ft)	39	94	806	929	152
Average Queue (ft)	8	37	742	715	128
95th Queue (ft)	31	76	931	1268	158
Link Distance (ft)	67	642	693	870	126
Upstream Blk Time (%)	0		69	72	37
Queuing Penalty (veh)	0		0	0	317
Storage Bay Dist (ft)					
Storage Blk Time (%)			65		
Queuing Penalty (veh)			0		

Network Summary

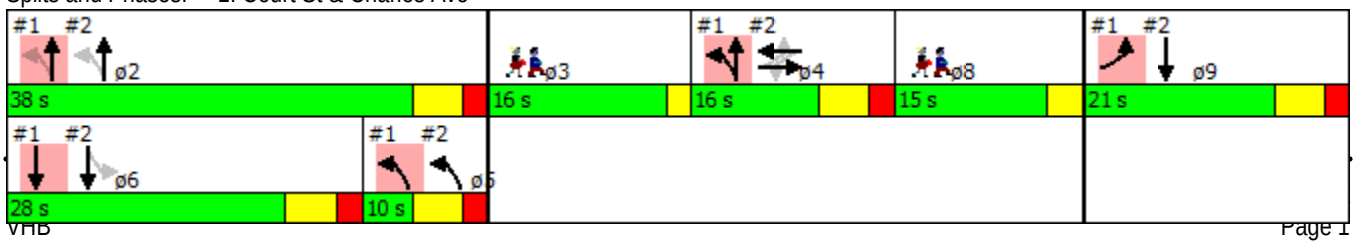
Network wide Queuing Penalty: 319

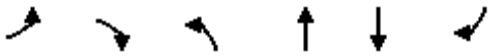
Lane Group	EBL	NBL	NBT	SBT	ø2	ø3	ø4	ø5	ø8
Lane Configurations									
Volume (vph)	75	180	850	695					
Lane Group Flow (vph)	277	196	924	819					
Turn Type	Prot	custom	NA	NA					
Protected Phases	9	4 5	2 4	6	2	3	4	5	8
Permitted Phases		2							
Detector Phase	9	4 5	2 4	6					
Switch Phase									
Minimum Initial (s)	8.0			10.0	16.0	1.0	4.0	4.0	1.0
Minimum Split (s)	16.0			16.0	22.0	16.0	16.0	10.0	15.0
Total Split (s)	21.0			28.0	38.0	16.0	16.0	10.0	15.0
Total Split (%)	19.8%			26.4%	36%	15%	15%	9%	14%
Yellow Time (s)	4.0			4.0	4.0	2.0	4.0	4.0	3.0
All-Red Time (s)	2.0			2.0	2.0	0.0	2.0	2.0	0.0
Lost Time Adjust (s)	-2.0			-2.0					
Total Lost Time (s)	4.0			4.0					
Lead/Lag				Lead		Lead	Lag	Lag	
Lead-Lag Optimize?						Yes			
Recall Mode	None			Max	Max	None	None	None	None
v/c Ratio	0.72	0.35	0.82	1.53					
Control Delay	37.6	8.2	9.0	273.5					
Queue Delay	4.5	0.6	49.2	2.6					
Total Delay	42.1	8.8	58.2	276.1					
Queue Length 50th (ft)	93	21	25	~534					
Queue Length 95th (ft)	156	m24	m104	#1123					
Internal Link Dist (ft)	246		97	1644					
Turn Bay Length (ft)									
Base Capacity (vph)	384	556	1133	535					
Starvation Cap Reductn	0	141	300	0					
Spillback Cap Reductn	56	0	0	138					
Storage Cap Reductn	0	0	0	0					
Reduced v/c Ratio	0.84	0.47	1.11	2.06					

Intersection Summary

Cycle Length: 106
Actuated Cycle Length: 81.2
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Court St & Charles Ave





Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	75	105	180	850	695	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-4%			0%	0%	
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frpb, ped/bikes	0.98		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.92		1.00	1.00	0.99	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1591		1735	1827	1771	
Flt Permitted	0.98		0.14	1.00	1.00	
Satd. Flow (perm)	1591		257	1827	1771	
Peak-hour factor, PHF	0.65	0.65	0.92	0.92	0.91	0.91
Adj. Flow (vph)	115	162	196	924	764	55
RTOR Reduction (vph)	45	0	0	0	2	0
Lane Group Flow (vph)	232	0	196	924	817	0
Confl. Peds. (#/hr)	10	4	16			16
Heavy Vehicles (%)	8%	8%	4%	4%	6%	6%
Turn Type	Prot		custom	NA	NA	
Protected Phases	9		4 5	2 4	6	
Permitted Phases			2			
Actuated Green, G (s)	15.3		42.8	42.8	22.4	
Effective Green, g (s)	17.3		46.8	46.8	24.4	
Actuated g/C Ratio	0.20		0.55	0.55	0.29	
Clearance Time (s)	6.0				6.0	
Vehicle Extension (s)	2.0				2.0	
Lane Grp Cap (vph)	323		461	1005	508	
v/s Ratio Prot	c0.15		0.09	c0.51	c0.46	
v/s Ratio Perm			0.14			
v/c Ratio	0.72		0.43	0.92	1.61	
Uniform Delay, d1	31.6		25.2	17.4	30.3	
Progression Factor	1.00		0.50	0.39	1.00	
Incremental Delay, d2	6.2		0.1	1.5	282.7	
Delay (s)	37.8		12.6	8.3	313.0	
Level of Service	D		B	A	F	
Approach Delay (s)	37.8			9.0	313.0	
Approach LOS	D			A	F	

Intersection Summary			
HCM 2000 Control Delay	124.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.11		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		

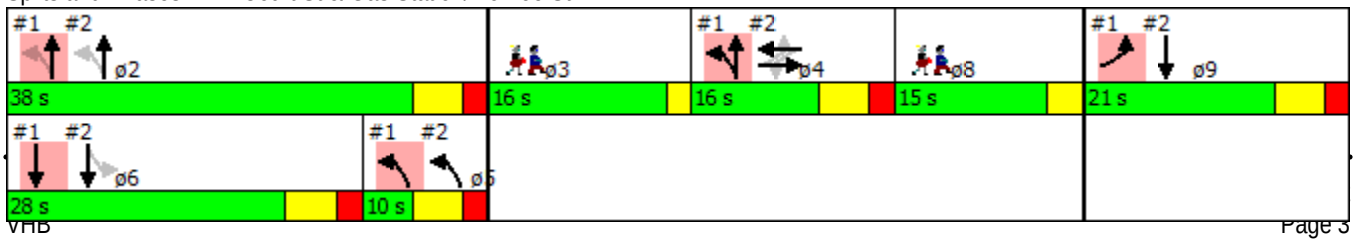
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT	ø3	ø5	ø8	ø9
Lane Configurations											
Volume (vph)	1	0	40	0	970	15	785				
Lane Group Flow (vph)	0	4	0	158	1065	0	851				
Turn Type	Perm	NA	Perm	NA	NA	custom	NA				
Protected Phases		4		4	2		6 9	3	5	8	9
Permitted Phases	4		4			6					
Detector Phase	4	4	4	4	2	6	6 9				
Switch Phase											
Minimum Initial (s)	4.0	4.0	4.0	4.0	16.0	10.0		1.0	4.0	1.0	8.0
Minimum Split (s)	16.0	16.0	16.0	16.0	22.0	16.0		16.0	10.0	15.0	16.0
Total Split (s)	16.0	16.0	16.0	16.0	38.0	28.0		16.0	10.0	15.0	21.0
Total Split (%)	15.1%	15.1%	15.1%	15.1%	35.8%	26.4%		15%	9%	14%	20%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		2.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0		0.0	2.0	0.0	2.0
Lost Time Adjust (s)		-2.0		-2.0	-2.0						
Total Lost Time (s)		4.0		4.0	4.0						
Lead/Lag	Lag	Lag	Lag	Lag		Lead		Lead	Lag		
Lead-Lag Optimize?								Yes			
Recall Mode	None	None	None	None	Max	Max		None	None	None	None
v/c Ratio		0.01		0.39	1.42		0.87				
Control Delay		0.0		5.4	218.7		20.5				
Queue Delay		0.0		0.2	0.4		48.9				
Total Delay		0.0		5.6	219.1		69.4				
Queue Length 50th (ft)		0		0	~664		165				
Queue Length 95th (ft)		0		0	#1375		m181				
Internal Link Dist (ft)		21		602	677		97				
Turn Bay Length (ft)											
Base Capacity (vph)		408		406	752		976				
Starvation Cap Reductn		0		0	0		293				
Spillback Cap Reductn		0		36	46		0				
Storage Cap Reductn		0		0	0		0				
Reduced v/c Ratio		0.01		0.43	1.51		1.25				

Intersection Summary

Cycle Length: 106
Actuated Cycle Length: 81.2
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Court St & Gas Station/Monroe St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	0	1	40	0	60	0	970	10	15	785	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	11	12	12	12
Grade (%)		0%			-4%			0%			0%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.98			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			0.99			1.00			1.00	
Frt		0.93			0.92			1.00			1.00	
Flt Protected		0.98			0.98			1.00			1.00	
Satd. Flow (prot)		1699			1736			1763			1774	
Flt Permitted		0.89			0.87			1.00			0.97	
Satd. Flow (perm)		1554			1537			1763			1730	
Peak-hour factor, PHF	0.50	0.50	0.50	0.63	0.63	0.63	0.92	0.92	0.92	0.94	0.94	0.94
Adj. Flow (vph)	2	0	2	63	0	95	0	1054	11	16	835	0
RTOR Reduction (vph)	0	3	0	0	135	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	1	0	0	23	0	0	1064	0	0	851	0
Confl. Peds. (#/hr)			4	4					8	8		
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	7%	7%	7%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		custom	NA	
Protected Phases		4			4		5	2			6 9	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)		10.2			10.2			32.6			43.7	
Effective Green, g (s)		12.2			12.2			34.6			45.7	
Actuated g/C Ratio		0.14			0.14			0.41			0.54	
Clearance Time (s)		6.0			6.0			6.0				
Vehicle Extension (s)		4.0			4.0			2.0				
Lane Grp Cap (vph)		223			220			717			930	
v/s Ratio Prot								c0.60				
v/s Ratio Perm		0.00			c0.01						c0.49	
v/c Ratio		0.00			0.10			1.48			0.92	
Uniform Delay, d1		31.2			31.6			25.2			17.9	
Progression Factor		1.00			1.00			1.00			1.05	
Incremental Delay, d2		0.0			0.3			225.5			1.5	
Delay (s)		31.2			31.9			250.7			20.3	
Level of Service		C			C			F			C	
Approach Delay (s)		31.2			31.9			250.7			20.3	
Approach LOS		C			C			F			C	

Intersection Summary			
HCM 2000 Control Delay	139.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	85.0	Sum of lost time (s)	21.0
Intersection Capacity Utilization	66.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 1: Court St & Charles Ave

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (ft)	290	122	117	1748
Average Queue (ft)	146	57	58	1606
95th Queue (ft)	302	101	106	2077
Link Distance (ft)	292	126	126	1689
Upstream Blk Time (%)	10	0	0	82
Queuing Penalty (veh)	0	0	0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Court St & Gas Station/Monroe St

Movement	EB	WB	NB	B4	SB
Directions Served	LTR	LTR	TR	T	LTR
Maximum Queue (ft)	30	162	806	929	149
Average Queue (ft)	2	57	771	838	114
95th Queue (ft)	15	123	831	1170	157
Link Distance (ft)	67	642	693	870	126
Upstream Blk Time (%)			75	87	21
Queuing Penalty (veh)			0	0	170
Storage Bay Dist (ft)					
Storage Blk Time (%)			62		
Queuing Penalty (veh)			0		

Network Summary

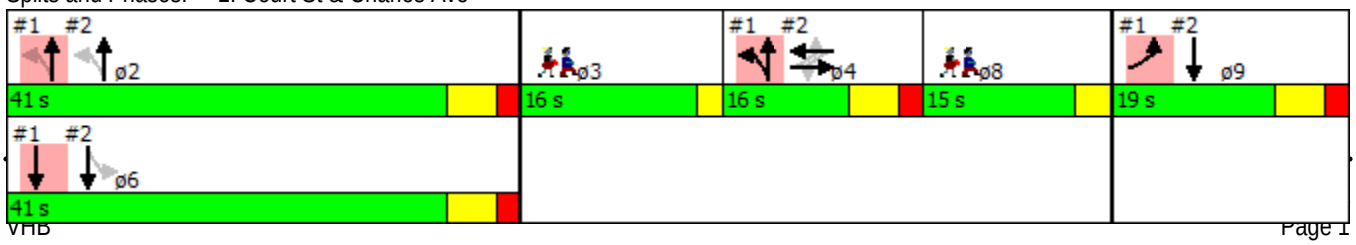
Network wide Queuing Penalty: 171

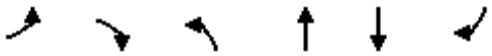
Lane Group	EBL	NBL	NBT	SBT	ø2	ø3	ø8
Lane Configurations							
Volume (vph)	15	40	795	1040			
Lane Group Flow (vph)	99	43	855	1109			
Turn Type	Prot	custom	NA	NA			
Protected Phases	9	4	2 4	6	2	3	8
Permitted Phases		2					
Detector Phase	9	4	2 4	6			
Switch Phase							
Minimum Initial (s)	8.0	4.0		10.0	16.0	1.0	1.0
Minimum Split (s)	16.0	16.0		16.0	22.0	16.0	15.0
Total Split (s)	19.0	16.0		41.0	41.0	16.0	15.0
Total Split (%)	17.8%	15.0%		38.3%	38%	15%	14%
Yellow Time (s)	4.0	4.0		4.0	4.0	2.0	3.0
All-Red Time (s)	2.0	2.0		2.0	2.0	0.0	0.0
Lost Time Adjust (s)	-2.0	-2.0		-2.0			
Total Lost Time (s)	4.0	4.0		4.0			
Lead/Lag		Lag				Lead	
Lead-Lag Optimize?						Yes	
Recall Mode	None	None		Max	Max	None	None
v/c Ratio	0.27	0.13	0.70	1.24			
Control Delay	14.4	5.4	6.9	143.3			
Queue Delay	0.3	0.1	4.4	1.6			
Total Delay	14.7	5.4	11.3	144.9			
Queue Length 50th (ft)	9	0	3	~658			
Queue Length 95th (ft)	32	m4	m170	#1390			
Internal Link Dist (ft)	246		97	1644			
Turn Bay Length (ft)							
Base Capacity (vph)	364	338	1216	892			
Starvation Cap Reductn	0	31	281	0			
Spillback Cap Reductn	57	0	0	209			
Storage Cap Reductn	0	0	0	0			
Reduced v/c Ratio	0.32	0.14	0.91	1.62			

Intersection Summary

Cycle Length: 107
Actuated Cycle Length: 85.2
Natural Cycle: 145
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Court St & Charles Ave





Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	15	50	40	795	1040	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-4%			0%	0%	
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frpb, ped/bikes	1.00		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.90		1.00	1.00	1.00	
Flt Protected	0.99		0.95	1.00	1.00	
Satd. Flow (prot)	1684		1752	1845	1874	
Flt Permitted	0.99		0.10	1.00	1.00	
Satd. Flow (perm)	1684		182	1845	1874	
Peak-hour factor, PHF	0.66	0.66	0.93	0.93	0.96	0.96
Adj. Flow (vph)	23	76	43	855	1083	26
RTOR Reduction (vph)	63	0	0	0	1	0
Lane Group Flow (vph)	36	0	43	855	1108	0
Confl. Peds. (#/hr)			2			2
Heavy Vehicles (%)	2%	2%	3%	3%	1%	1%
Turn Type	Prot		custom	NA	NA	
Protected Phases	9		4	2 4	6	
Permitted Phases			2			
Actuated Green, G (s)	13.2		48.7	48.7	38.5	
Effective Green, g (s)	15.2		52.7	52.7	40.5	
Actuated g/C Ratio	0.17		0.59	0.59	0.46	
Clearance Time (s)	6.0		6.0		6.0	
Vehicle Extension (s)	2.0		4.0		2.0	
Lane Grp Cap (vph)	287		322	1092	852	
v/s Ratio Prot	c0.02		0.02	c0.46	c0.59	
v/s Ratio Perm			0.06			
v/c Ratio	0.13		0.13	0.78	1.30	
Uniform Delay, d1	31.3		30.5	13.8	24.2	
Progression Factor	1.00		0.56	0.40	1.00	
Incremental Delay, d2	0.1		0.0	0.4	144.0	
Delay (s)	31.3		17.0	5.9	168.3	
Level of Service	C		B	A	F	
Approach Delay (s)	31.3			6.4	168.3	
Approach LOS	C			A	F	

Intersection Summary			
HCM 2000 Control Delay	92.8	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	89.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	69.6%	ICU Level of Service	C
Analysis Period (min)	15		

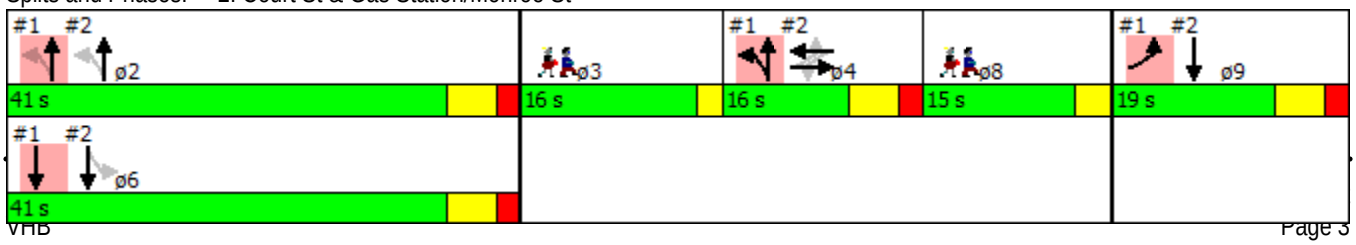
c Critical Lane Group

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø3	ø8	ø9
Lane Configurations										
Volume (vph)	1	20	0	5	820	35	1055			
Lane Group Flow (vph)	10	0	52	5	907	0	1125			
Turn Type	NA	Perm	NA	Perm	NA	custom	NA			
Protected Phases	4		4		2		6 9	3	8	9
Permitted Phases		4		2		6				
Detector Phase	4	4	4	2	2	6	6 9			
Switch Phase										
Minimum Initial (s)	4.0	4.0	4.0	16.0	16.0	10.0		1.0	1.0	8.0
Minimum Split (s)	16.0	16.0	16.0	22.0	22.0	16.0		16.0	15.0	16.0
Total Split (s)	16.0	16.0	16.0	41.0	41.0	41.0		16.0	15.0	19.0
Total Split (%)	15.0%	15.0%	15.0%	38.3%	38.3%	38.3%		15%	14%	18%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		2.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0		0.0	0.0	2.0
Lost Time Adjust (s)	-2.0		-2.0	-2.0	-2.0					
Total Lost Time (s)	4.0		4.0	4.0	4.0					
Lead/Lag	Lag	Lag	Lag					Lead		
Lead-Lag Optimize?								Yes		
Recall Mode	None	None	None	Max	Max	Max		None	None	None
v/c Ratio	0.04		0.15	0.06	1.07		0.89			
Control Delay	23.7		0.9	20.4	77.2		16.8			
Queue Delay	0.0		0.0	0.0	11.4		47.1			
Total Delay	23.7		1.0	20.4	88.5		63.9			
Queue Length 50th (ft)	1		0	1	~475		185			
Queue Length 95th (ft)	11		0	12	#1110		m281			
Internal Link Dist (ft)	21		602		677		97			
Turn Bay Length (ft)				75						
Base Capacity (vph)	250		340	87	846		1262			
Starvation Cap Reductn	0		0	0	0		277			
Spillback Cap Reductn	0		17	0	44		0			
Storage Cap Reductn	0		0	0	0		0			
Reduced v/c Ratio	0.04		0.16	0.06	1.13		1.14			

Intersection Summary

Cycle Length: 107
Actuated Cycle Length: 85.2
Natural Cycle: 145
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Court St & Gas Station/Monroe St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1	5	20	0	15	5	820	15	35	1055	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	11	12	12	12
Grade (%)		0%			-4%			0%			0%	
Total Lost time (s)		4.0			4.0		4.0	4.0			4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00			1.00	
Frpb, ped/bikes		1.00			1.00		1.00	1.00			1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00			1.00	
Frt		0.89			0.94		1.00	1.00			1.00	
Flt Protected		1.00			0.97		0.95	1.00			1.00	
Satd. Flow (prot)		1695			1776		1752	1778			1878	
Flt Permitted		1.00			0.83		0.10	1.00			0.95	
Satd. Flow (perm)		1695			1519		182	1778			1796	
Peak-hour factor, PHF	0.63	0.63	0.63	0.67	0.67	0.67	0.92	0.92	0.92	0.97	0.97	0.97
Adj. Flow (vph)	0	2	8	30	0	22	5	891	16	36	1088	1
RTOR Reduction (vph)	0	7	0	0	45	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	3	0	0	7	0	5	906	0	0	1125	0
Confl. Peds. (#/hr)							3					3
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	3%	3%	3%	1%	1%	1%
Turn Type		NA		Perm	NA		Perm	NA		custom	NA	
Protected Phases		4			4			2			6 9	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)		10.2			10.2		38.5	38.5			57.7	
Effective Green, g (s)		12.2			12.2		40.5	40.5			59.7	
Actuated g/C Ratio		0.14			0.14		0.46	0.46			0.67	
Clearance Time (s)		6.0			6.0		6.0	6.0				
Vehicle Extension (s)		4.0			4.0		2.0	2.0				
Lane Grp Cap (vph)		232			208		82	809			1204	
v/s Ratio Prot		0.00						c0.51				
v/s Ratio Perm					c0.00		0.03				c0.63	
v/c Ratio		0.01			0.03		0.06	1.12			0.93	
Uniform Delay, d1		33.2			33.3		13.6	24.2			12.9	
Progression Factor		1.00			1.00		1.00	1.00			1.19	
Incremental Delay, d2		0.0			0.1		1.4	70.2			1.6	
Delay (s)		33.2			33.4		15.0	94.4			17.0	
Level of Service		C			C		B	F			B	
Approach Delay (s)		33.2			33.4			94.0			17.0	
Approach LOS		C			C			F			B	

Intersection Summary			
HCM 2000 Control Delay	50.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	89.0	Sum of lost time (s)	17.0
Intersection Capacity Utilization	99.2%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 1: Court St & Charles Ave

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (ft)	100	80	108	1748
Average Queue (ft)	37	21	30	1634
95th Queue (ft)	79	58	87	2074
Link Distance (ft)	292	126	126	1689
Upstream Blk Time (%)			0	90
Queuing Penalty (veh)			0	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Court St & Gas Station/Monroe St

Movement	EB	WB	NB	NB	B4	SB
Directions Served	LTR	LTR	L	TR	T	LTR
Maximum Queue (ft)	30	77	60	803	579	148
Average Queue (ft)	6	25	5	606	261	121
95th Queue (ft)	25	59	30	938	831	161
Link Distance (ft)	67	642		693	870	126
Upstream Blk Time (%)				34	14	17
Queuing Penalty (veh)				0	0	186
Storage Bay Dist (ft)			75			
Storage Blk Time (%)				51		
Queuing Penalty (veh)				3		

Network Summary

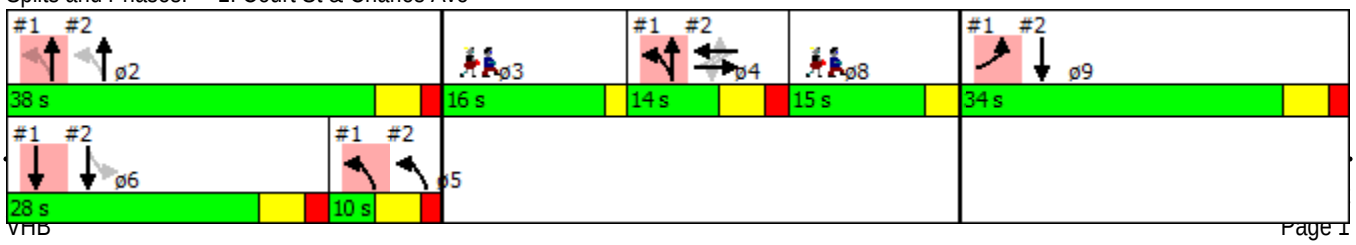
Network wide Queuing Penalty: 189

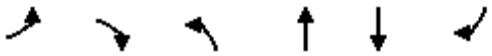
Lane Group	EBL	NBL	NBT	SBT	ø2	ø3	ø4	ø5	ø8
Lane Configurations									
Volume (vph)	100	65	760	805					
Lane Group Flow (vph)	421	66	776	966					
Turn Type	Prot	custom	NA	NA					
Protected Phases	9	4 5	2 4	6	2	3	4	5	8
Permitted Phases		2							
Detector Phase	9	4 5	2 4	6					
Switch Phase									
Minimum Initial (s)	8.0			10.0	16.0	1.0	4.0	4.0	2.0
Minimum Split (s)	16.0			16.0	22.0	16.0	14.0	10.0	15.0
Total Split (s)	34.0			28.0	38.0	16.0	14.0	10.0	15.0
Total Split (%)	29.1%			23.9%	32%	14%	12%	9%	13%
Yellow Time (s)	4.0			4.0	4.0	2.0	4.0	4.0	3.0
All-Red Time (s)	2.0			2.0	2.0	0.0	2.0	2.0	0.0
Lost Time Adjust (s)	-2.0			-2.0					
Total Lost Time (s)	4.0			4.0					
Lead/Lag				Lead		Lead	Lag	Lag	
Lead-Lag Optimize?						Yes			
Recall Mode	None			Max	Max	None	None	None	None
v/c Ratio	0.77	0.16	0.88	1.97					
Control Delay	39.9	4.5	14.1	466.4					
Queue Delay	2.7	0.1	48.2	5.1					
Total Delay	42.5	4.6	62.3	471.5					
Queue Length 50th (ft)	167	1	16	~826					
Queue Length 95th (ft)	204	m6	m95	#1455					
Internal Link Dist (ft)	246		97	1644					
Turn Bay Length (ft)									
Base Capacity (vph)	547	402	878	491					
Starvation Cap Reductn	0	43	200	0					
Spillback Cap Reductn	54	0	0	195					
Storage Cap Reductn	0	0	0	0					
Reduced v/c Ratio	0.85	0.18	1.14	3.26					

Intersection Summary

Cycle Length: 117
Actuated Cycle Length: 98.4
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 1: Court St & Charles Ave





Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	100	140	65	760	805	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Grade (%)	-4%			0%	0%	
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	1.00		1.00	1.00	1.00	
Frpb, ped/bikes	0.99		1.00	1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00	
Frt	0.92		1.00	1.00	0.99	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1627		1719	1810	1797	
Flt Permitted	0.98		0.13	1.00	1.00	
Satd. Flow (perm)	1627		235	1810	1797	
Peak-hour factor, PHF	0.57	0.57	0.98	0.98	0.88	0.88
Adj. Flow (vph)	175	246	66	776	915	51
RTOR Reduction (vph)	41	0	0	0	1	0
Lane Group Flow (vph)	380	0	66	776	965	0
Confl. Peds. (#/hr)	16	2				
Heavy Vehicles (%)	6%	6%	5%	5%	5%	5%
Turn Type	Prot		custom	NA	NA	
Protected Phases	9		4 5	2 4	6	
Permitted Phases			2			
Actuated Green, G (s)	28.6		42.2	42.2	24.8	
Effective Green, g (s)	30.6		46.2	46.2	26.8	
Actuated g/C Ratio	0.30		0.45	0.45	0.26	
Clearance Time (s)	6.0				6.0	
Vehicle Extension (s)	2.0				2.0	
Lane Grp Cap (vph)	485		328	815	469	
v/s Ratio Prot	c0.23		0.03	c0.43	c0.54	
v/s Ratio Perm			0.06			
v/c Ratio	0.78		0.20	0.95	2.06	
Uniform Delay, d1	32.9		35.0	27.1	37.9	
Progression Factor	1.00		0.24	0.34	1.00	
Incremental Delay, d2	7.5		0.0	3.2	482.8	
Delay (s)	40.4		8.3	12.5	520.7	
Level of Service	D		A	B	F	
Approach Delay (s)	40.4			12.1	520.7	
Approach LOS	D			B	F	

Intersection Summary			
HCM 2000 Control Delay	237.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.18		
Actuated Cycle Length (s)	102.5	Sum of lost time (s)	21.0
Intersection Capacity Utilization	73.0%	ICU Level of Service	C
Analysis Period (min)	15		

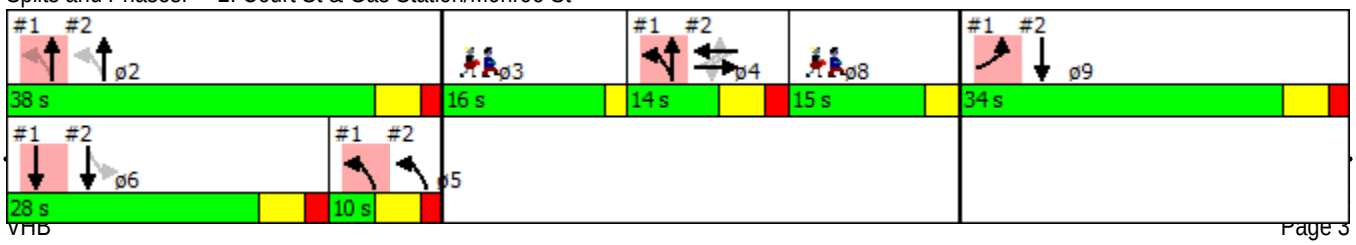
c Critical Lane Group

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT	ø3	ø5	ø8	ø9
Lane Configurations											
Volume (vph)	5	1	25	0	770	35	910				
Lane Group Flow (vph)	0	15	0	99	822	0	995				
Turn Type	Perm	NA	Perm	NA	NA	custom	NA				
Protected Phases		4		4	2		6 9	3	5	8	9
Permitted Phases	4		4			6					
Detector Phase	4	4	4	4	2	6	6 9				
Switch Phase											
Minimum Initial (s)	4.0	4.0	4.0	4.0	16.0	10.0		1.0	4.0	2.0	8.0
Minimum Split (s)	14.0	14.0	14.0	14.0	22.0	16.0		16.0	10.0	15.0	16.0
Total Split (s)	14.0	14.0	14.0	14.0	38.0	28.0		16.0	10.0	15.0	34.0
Total Split (%)	12.0%	12.0%	12.0%	12.0%	32.5%	23.9%		14%	9%	13%	29%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		2.0	4.0	3.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0		0.0	2.0	0.0	2.0
Lost Time Adjust (s)		-2.0		-2.0	-2.0						
Total Lost Time (s)		4.0		4.0	4.0						
Lead/Lag	Lag	Lag	Lag	Lag		Lead		Lead	Lag		
Lead-Lag Optimize?								Yes			
Recall Mode	None	None	None	None	Max	Max		None	None	None	None
v/c Ratio		0.10		0.30	1.34		0.92				
Control Delay		36.3		2.4	191.9		29.9				
Queue Delay		0.0		0.1	0.5		47.2				
Total Delay		36.3		2.5	192.4		77.2				
Queue Length 50th (ft)		4		0	~548		347				
Queue Length 95th (ft)		19		0	#1147		m207				
Internal Link Dist (ft)		21		602	677		97				
Turn Bay Length (ft)											
Base Capacity (vph)		157		327	614		1077				
Starvation Cap Reductn		0		0	0		398				
Spillback Cap Reductn		0		23	39		0				
Storage Cap Reductn		0		0	0		0				
Reduced v/c Ratio		0.10		0.33	1.43		1.47				

Intersection Summary

Cycle Length: 117
Actuated Cycle Length: 98.4
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 2: Court St & Gas Station/Monroe St



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1	5	25	0	50	0	770	35	35	910	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	11	12	12	12
Grade (%)		0%			-4%			0%			0%	
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frpb, ped/bikes		0.98			1.00			1.00			1.00	
Flpb, ped/bikes		1.00			1.00			1.00			1.00	
Frt		0.94			0.91			0.99			1.00	
Flt Protected		0.98			0.98			1.00			1.00	
Satd. Flow (prot)		1711			1726			1736			1806	
Flt Permitted		0.83			0.88			1.00			0.95	
Satd. Flow (perm)		1461			1550			1736			1720	
Peak-hour factor, PHF	0.67	0.67	0.67	0.76	0.76	0.76	0.98	0.98	0.98	0.95	0.95	0.95
Adj. Flow (vph)	7	1	7	33	0	66	0	786	36	37	958	0
RTOR Reduction (vph)	0	6	0	0	89	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	9	0	0	10	0	0	821	0	0	995	0
Confl. Peds. (#/hr)			3	3			7		3	3		7
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	5%	5%	5%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		custom	NA	
Protected Phases		4			4		5	2			6 9	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)		8.2			8.2			34.0			59.4	
Effective Green, g (s)		10.2			10.2			36.0			61.4	
Actuated g/C Ratio		0.10			0.10			0.35			0.60	
Clearance Time (s)		6.0			6.0			6.0				
Vehicle Extension (s)		4.0			4.0			2.0				
Lane Grp Cap (vph)		145			154			609			1030	
v/s Ratio Prot								c0.47				
v/s Ratio Perm		0.01			c0.01						c0.58	
v/c Ratio		0.06			0.06			1.35			0.97	
Uniform Delay, d1		41.8			41.8			33.2			19.6	
Progression Factor		1.00			1.00			1.00			1.43	
Incremental Delay, d2		0.2			0.2			167.2			3.4	
Delay (s)		42.0			42.1			200.4			31.4	
Level of Service		D			D			F			C	
Approach Delay (s)		42.0			42.1			200.4			31.4	
Approach LOS		D			D			F			C	

Intersection Summary			
HCM 2000 Control Delay	104.0	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	102.5	Sum of lost time (s)	21.0
Intersection Capacity Utilization	88.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 1: Court St & Charles Ave

Movement	EB	NB	NB	SB
Directions Served	LR	L	T	TR
Maximum Queue (ft)	336	82	129	1745
Average Queue (ft)	162	25	69	1646
95th Queue (ft)	324	61	120	2054
Link Distance (ft)	292	126	126	1689
Upstream Blk Time (%)	10		0	90
Queuing Penalty (veh)	0		2	0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Court St & Gas Station/Monroe St

Movement	EB	WB	NB	B4	SB
Directions Served	LTR	LTR	TR	T	LTR
Maximum Queue (ft)	38	108	806	929	152
Average Queue (ft)	9	41	771	806	125
95th Queue (ft)	33	85	843	1207	164
Link Distance (ft)	67	642	693	870	126
Upstream Blk Time (%)	0		77	82	34
Queuing Penalty (veh)	0		0	0	322
Storage Bay Dist (ft)					
Storage Blk Time (%)			65		
Queuing Penalty (veh)			0		

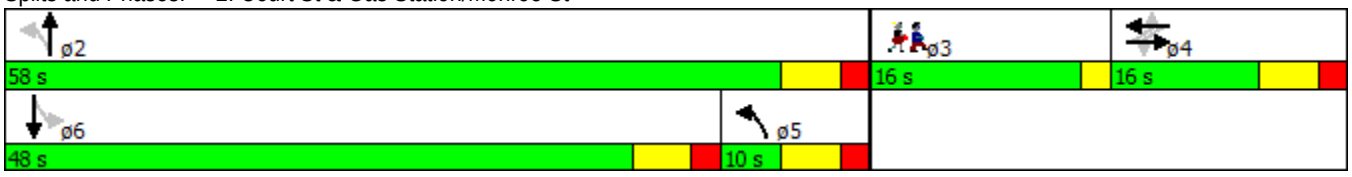
Network Summary

Network wide Queuing Penalty: 324

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT	ø3	ø5
Lane Configurations									
Volume (vph)	1	0	40	0	970	15	785		
Lane Group Flow (vph)	0	2	0	100	980	15	785		
Turn Type	Perm	NA	Perm	NA	NA	Perm	NA		
Protected Phases		4		4	2		6	3	5
Permitted Phases	4		4			6			
Detector Phase	4	4	4	4	2	6	6		
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	16.0	10.0	10.0	1.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	22.0	16.0	16.0	16.0	10.0
Total Split (s)	16.0	16.0	16.0	16.0	58.0	48.0	48.0	16.0	10.0
Total Split (%)	17.8%	17.8%	17.8%	17.8%	64.4%	53.3%	53.3%	18%	11%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0
Lost Time Adjust (s)		-2.0		-2.0	-2.0	0.0	-2.0		
Total Lost Time (s)		4.0		4.0	4.0	6.0	4.0		
Lead/Lag	Lag	Lag	Lag	Lag		Lead	Lead	Lead	Lag
Lead-Lag Optimize?								Yes	
Recall Mode	None	None	None	None	Max	Max	Max	None	None
v/c Ratio		0.01		0.33	0.71	0.06	0.57		
Control Delay		0.0		6.6	11.8	6.3	8.0		
Queue Delay		0.0		0.0	0.0	0.0	0.0		
Total Delay		0.0		6.6	11.8	6.3	8.0		
Queue Length 50th (ft)		0		0	162	1	103		
Queue Length 95th (ft)		0		26	#767	13	436		
Internal Link Dist (ft)		21		602	677		97		
Turn Bay Length (ft)									
Base Capacity (vph)		354		360	1375	264	1386		
Starvation Cap Reductn		0		0	0	0	0		
Spillback Cap Reductn		0		0	0	0	0		
Storage Cap Reductn		0		0	0	0	0		
Reduced v/c Ratio		0.01		0.28	0.71	0.06	0.57		

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 74.8
Natural Cycle: 90
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Court St & Gas Station/Monroe St



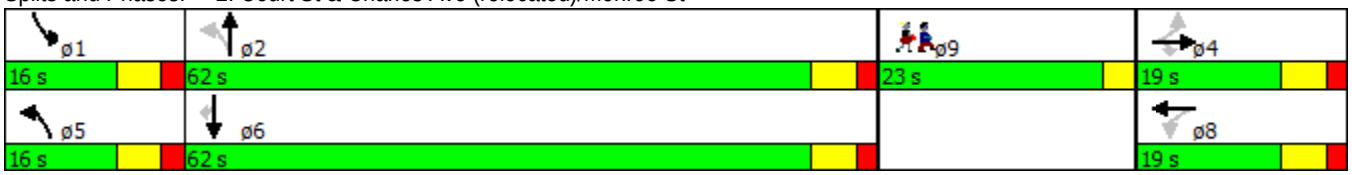
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	0	1	40	0	60	0	970	10	15	785	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	11	12	12	12
Grade (%)		0%			-4%			0%			0%	
Total Lost time (s)		4.0			4.0			4.0		6.0	4.0	
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	
Frpb, ped/bikes		0.98			1.00			1.00		1.00	1.00	
Flpb, ped/bikes		1.00			0.99			1.00		1.00	1.00	
Frt		0.93			0.92			1.00		1.00	1.00	
Flt Protected		0.98			0.98			1.00		0.95	1.00	
Satd. Flow (prot)		1694			1732			1763		1685	1776	
Flt Permitted		0.86			0.87			1.00		0.20	1.00	
Satd. Flow (perm)		1497			1535			1763		349	1776	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	1	0	1	40	0	60	0	970	10	15	785	0
RTOR Reduction (vph)	0	2	0	0	90	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	10	0	0	980	0	15	785	0
Confl. Peds. (#/hr)			4	4					8	8		
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	4%	4%	4%	7%	7%	7%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			4		5	2			6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)		5.7			5.7			55.5		55.5	55.5	
Effective Green, g (s)		7.7			7.7			57.5		55.5	57.5	
Actuated g/C Ratio		0.10			0.10			0.74		0.72	0.74	
Clearance Time (s)		6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)		4.0			4.0			2.0		2.0	2.0	
Lane Grp Cap (vph)		148			152			1308		249	1317	
v/s Ratio Prot								c0.56			0.44	
v/s Ratio Perm		0.00			c0.01					0.04		
v/c Ratio		0.00			0.07			0.75		0.06	0.60	
Uniform Delay, d1		31.4			31.6			5.8		3.3	4.6	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		0.0			0.2			4.0		0.5	2.0	
Delay (s)		31.4			31.9			9.8		3.7	6.6	
Level of Service		C			C			A		A	A	
Approach Delay (s)		31.4			31.9			9.8			6.6	
Approach LOS		C			C			A			A	

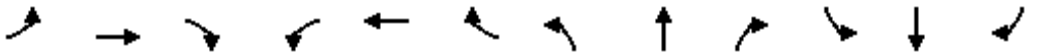
Intersection Summary			
HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	77.5	Sum of lost time (s)	14.0
Intersection Capacity Utilization	65.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR	ø9
Lane Configurations											
Volume (vph)	75	5	100	40	10	170	800	15	680	50	
Lane Group Flow (vph)	0	80	100	0	100	170	810	15	680	50	
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	Prot	NA	Perm	
Protected Phases		4			8	5	2	1	6		9
Permitted Phases	4		4	8		2				6	
Detector Phase	4	4	4	8	8	5	2	1	6	6	
Switch Phase											
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	5.0	10.0	5.0	10.0	10.0	1.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	23.0
Total Split (s)	19.0	19.0	19.0	19.0	19.0	16.0	62.0	16.0	62.0	62.0	23.0
Total Split (%)	15.8%	15.8%	15.8%	15.8%	15.8%	13.3%	51.7%	13.3%	51.7%	51.7%	19%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)		-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	
Total Lost Time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag						Lead	Lag	Lead	Lag	Lag	
Lead-Lag Optimize?								Yes			
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max	None
v/c Ratio		0.55	0.35		0.43	0.37	0.64	0.11	0.67	0.06	
Control Delay		57.6	11.0		34.6	7.5	14.5	47.4	20.6	0.1	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		57.6	11.0		34.6	7.5	14.5	47.4	20.6	0.1	
Queue Length 50th (ft)		46	0		36	22	177	9	257	0	
Queue Length 95th (ft)		#129	45		105	85	#843	33	617	0	
Internal Link Dist (ft)		458			602		677		97		
Turn Bay Length (ft)			75			150		105		75	
Base Capacity (vph)		158	304		251	474	1263	198	1010	903	
Starvation Cap Reductn		0	0		0	0	0	0	0	0	
Spillback Cap Reductn		0	0		0	0	0	0	0	0	
Storage Cap Reductn		0	0		0	0	0	0	0	0	
Reduced v/c Ratio		0.51	0.33		0.40	0.36	0.64	0.08	0.67	0.06	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 99.6
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Court St & Charles Ave (relocated)/Monroe St





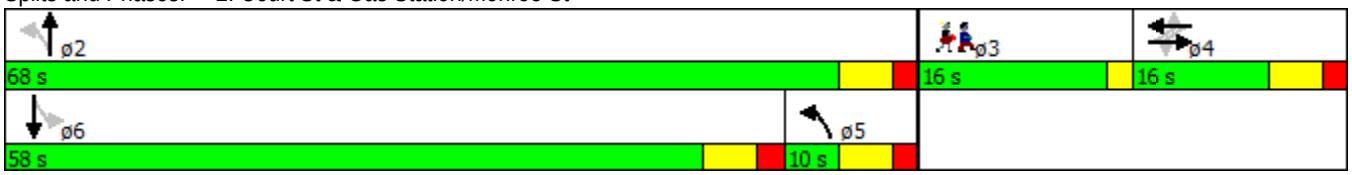
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	75	5	100	40	10	50	170	800	10	15	680	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		0%			-4%			0%			0%	
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes		1.00	0.96		1.00		1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		0.99		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.93		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1624	1395		1703		1678	1762		1631	1717	1459
Flt Permitted		0.61	1.00		0.84		0.25	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1042	1395		1461		439	1762		1631	1717	1459
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	75	5	100	40	10	50	170	800	10	15	680	50
RTOR Reduction (vph)	0	0	87	0	30	0	0	0	0	0	0	20
Lane Group Flow (vph)	0	80	13	0	70	0	170	810	0	15	680	30
Confl. Peds. (#/hr)			4	4					8	8		
Heavy Vehicles (%)	8%	8%	8%	0%	0%	0%	4%	4%	4%	7%	7%	7%
Turn Type	Perm	NA	Perm	Perm	NA		pm+pt	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8			2					6
Actuated Green, G (s)		11.9	11.9		11.9		76.8	69.4		1.4	61.7	61.7
Effective Green, g (s)		13.9	13.9		13.9		78.8	71.4		3.4	63.7	63.7
Actuated g/C Ratio		0.13	0.13		0.13		0.74	0.67		0.03	0.60	0.60
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)		4.0	4.0		3.0		3.0	2.0		3.0	2.0	2.0
Lane Grp Cap (vph)		135	181		189		451	1175		51	1022	868
v/s Ratio Prot							c0.04	c0.46		0.01	0.40	
v/s Ratio Perm		c0.08	0.01		0.05		0.24					0.02
v/c Ratio		0.59	0.07		0.37		0.38	0.69		0.29	0.67	0.03
Uniform Delay, d1		43.9	40.9		42.6		8.4	11.0		50.6	14.5	8.9
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		7.9	0.2		1.2		0.5	3.3		3.2	3.4	0.1
Delay (s)		51.8	41.1		43.8		8.9	14.3		53.8	17.9	9.0
Level of Service		D	D		D		A	B		D	B	A
Approach Delay (s)		45.9			43.8			13.3			18.1	
Approach LOS		D			D			B			B	

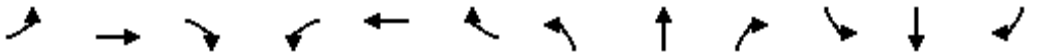
Intersection Summary			
HCM 2000 Control Delay	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	107.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBT	WBL	WBT	NBL	NBT	SBL	SBT	ø3
Lane Configurations								
Volume (vph)	1	20	0	5	820	35	1055	
Lane Group Flow (vph)	6	0	35	5	835	35	1056	
Turn Type	NA	Perm	NA	pm+pt	NA	Perm	NA	
Protected Phases	4		4	5	2		6	3
Permitted Phases		4		2		6		
Detector Phase	4	4	4	5	2	6	6	
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	16.0	10.0	10.0	1.0
Minimum Split (s)	16.0	16.0	16.0	10.0	22.0	16.0	16.0	16.0
Total Split (s)	16.0	16.0	16.0	10.0	68.0	58.0	58.0	16.0
Total Split (%)	16.0%	16.0%	16.0%	10.0%	68.0%	58.0%	58.0%	16%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)	-2.0		-2.0	-2.0	-2.0	0.0	-2.0	
Total Lost Time (s)	4.0		4.0	4.0	4.0	6.0	4.0	
Lead/Lag	Lag	Lag	Lag	Lag		Lead	Lead	Lead
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	Max	Max	Max	None
v/c Ratio	0.03		0.13	0.01	0.55	0.08	0.68	
Control Delay	25.5		1.1	4.4	6.6	6.9	11.6	
Queue Delay	0.0		0.0	0.0	0.0	0.0	0.0	
Total Delay	25.5		1.1	4.4	6.6	6.9	11.6	
Queue Length 50th (ft)	0		0	1	115	3	176	
Queue Length 95th (ft)	13		0	5	450	28	#940	
Internal Link Dist (ft)	21		602		677		97	
Turn Bay Length (ft)				75				
Base Capacity (vph)	243		315	349	1508	441	1557	
Starvation Cap Reductn	0		0	0	0	0	0	
Spillback Cap Reductn	0		0	0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	0	
Reduced v/c Ratio	0.02		0.11	0.01	0.55	0.08	0.68	

Intersection Summary
Cycle Length: 100
Actuated Cycle Length: 85
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Court St & Gas Station/Monroe St





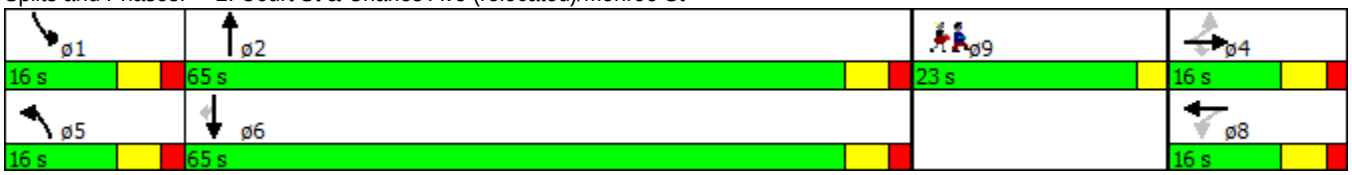
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1	5	20	0	15	5	820	15	35	1055	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	11	12	12	12
Grade (%)		0%			-4%			0%			0%	
Total Lost time (s)		4.0			4.0		4.0	4.0		6.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.89			0.94		1.00	1.00		1.00	1.00	
Flt Protected		1.00			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1686			1775		1752	1778		1787	1881	
Flt Permitted		1.00			0.82		0.16	1.00		0.29	1.00	
Satd. Flow (perm)		1686			1497		297	1778		542	1881	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	0	1	5	20	0	15	5	820	15	35	1055	1
RTOR Reduction (vph)	0	5	0	0	33	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1	0	0	2	0	5	835	0	35	1056	0
Confl. Peds. (#/hr)							3					3
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	3%	3%	3%	1%	1%	1%
Turn Type		NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			4		5	2			6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)		4.1			4.1		73.4	73.4		66.7	66.7	
Effective Green, g (s)		6.1			6.1		75.4	75.4		66.7	68.7	
Actuated g/C Ratio		0.06			0.06		0.80	0.80		0.71	0.73	
Clearance Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Vehicle Extension (s)		4.0			4.0		3.0	2.0		2.0	2.0	
Lane Grp Cap (vph)		109			97		280	1427		384	1376	
v/s Ratio Prot		0.00					0.00	c0.47			c0.56	
v/s Ratio Perm					c0.00		0.01			0.06		
v/c Ratio		0.01			0.02		0.02	0.58		0.09	0.77	
Uniform Delay, d1		41.1			41.1		13.6	3.4		4.2	7.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.1			0.1		0.0	1.8		0.5	4.2	
Delay (s)		41.1			41.2		13.6	5.2		4.7	11.9	
Level of Service		D			D		B	A		A	B	
Approach Delay (s)		41.1			41.2			5.2			11.6	
Approach LOS		D			D			A			B	

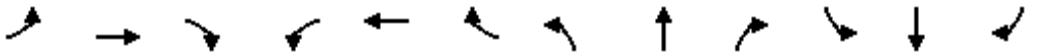
Intersection Summary			
HCM 2000 Control Delay	9.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	93.9	Sum of lost time (s)	14.0
Intersection Capacity Utilization	70.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR	ø9
Lane Configurations											
Volume (vph)	15	5	50	20	5	35	790	35	1005	25	
Lane Group Flow (vph)	0	20	50	0	35	35	805	35	1005	25	
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Prot	NA	Perm	
Protected Phases		4			8	5	2	1	6		9
Permitted Phases	4		4	8						6	
Detector Phase	4	4	4	8	8	5	2	1	6	6	
Switch Phase											
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	5.0	10.0	5.0	10.0	10.0	4.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	23.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0	16.0	65.0	16.0	65.0	65.0	23.0
Total Split (%)	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	54.2%	13.3%	54.2%	54.2%	19%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)		-2.0	-2.0		-2.0	-2.0	-2.0	-2.0	-2.0	-2.0	
Total Lost Time (s)		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	
Lead/Lag						Lead	Lag	Lead	Lag	Lag	
Lead-Lag Optimize?						Yes		Yes			
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max	None
v/c Ratio		0.12	0.18		0.20	0.20	0.63	0.20	0.77	0.02	
Control Delay		44.6	1.5		36.6	45.9	15.8	45.8	20.1	0.0	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		44.6	1.5		36.6	45.9	15.8	45.8	20.1	0.0	
Queue Length 50th (ft)		11	0		14	19	258	19	395	0	
Queue Length 95th (ft)		40	0		51	59	#811	59	#1128	0	
Internal Link Dist (ft)		449			602		677		97		
Turn Bay Length (ft)			75			150		105		75	
Base Capacity (vph)		192	296		201	223	1276	227	1304	1114	
Starvation Cap Reductn		0	0		0	0	0	0	0	0	
Spillback Cap Reductn		0	0		0	0	0	0	0	0	
Storage Cap Reductn		0	0		0	0	0	0	0	0	
Reduced v/c Ratio		0.10	0.17		0.17	0.16	0.63	0.15	0.77	0.02	

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 93.1
Natural Cycle: 130
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Court St & Charles Ave (relocated)/Monroe St





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	5	50	20	5	10	35	790	15	35	1005	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		0%			-4%			0%			0%	
Total Lost time (s)		4.0	4.0		4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	0.98
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1736	1531		1751		1694	1778		1728	1818	1511
Flt Permitted		0.81	1.00		0.81		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1459	1531		1463		1694	1778		1728	1818	1511
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	15	5	50	20	5	10	35	790	15	35	1005	25
RTOR Reduction (vph)	0	0	46	0	9	0	0	0	0	0	0	8
Lane Group Flow (vph)	0	20	4	0	26	0	35	805	0	35	1005	17
Confl. Peds. (#/hr)							3					3
Heavy Vehicles (%)	2%	2%	2%	0%	0%	0%	3%	3%	3%	1%	1%	1%
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								6
Actuated Green, G (s)		6.8	6.8		6.8		4.7	64.0		4.6	63.9	63.9
Effective Green, g (s)		8.8	8.8		8.8		6.7	66.0		6.6	65.9	65.9
Actuated g/C Ratio		0.09	0.09		0.09		0.07	0.66		0.07	0.66	0.66
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)		4.0	4.0		4.0		3.0	2.0		3.0	2.0	2.0
Lane Grp Cap (vph)		129	135		129		114	1179		114	1204	1000
v/s Ratio Prot							c0.02	0.45		0.02	c0.55	
v/s Ratio Perm		0.01	0.00		c0.02							0.01
v/c Ratio		0.16	0.03		0.20		0.31	0.68		0.31	0.83	0.02
Uniform Delay, d1		41.9	41.5		42.1		44.2	10.3		44.3	12.7	5.7
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.8	0.1		1.0		1.5	3.2		1.5	6.9	0.0
Delay (s)		42.7	41.6		43.1		45.7	13.5		45.8	19.6	5.8
Level of Service		D	D		D		D	B		D	B	A
Approach Delay (s)		41.9			43.1			14.9			20.1	
Approach LOS		D			D			B			C	

Intersection Summary			
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	99.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	76.2%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBT	SBL	SBT	ø3	ø5
Lane Configurations									
Volume (vph)	5	1	25	0	770	35	910		
Lane Group Flow (vph)	0	11	0	75	805	35	910		
Turn Type	Perm	NA	Perm	NA	NA	Perm	NA		
Protected Phases		4		4	2		6	3	5
Permitted Phases	4		4			6			
Detector Phase	4	4	4	4	2	6	6		
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	16.0	10.0	10.0	1.0	4.0
Minimum Split (s)	14.0	14.0	14.0	14.0	22.0	16.0	16.0	16.0	10.0
Total Split (s)	14.0	14.0	14.0	14.0	60.0	50.0	50.0	16.0	10.0
Total Split (%)	15.6%	15.6%	15.6%	15.6%	66.7%	55.6%	55.6%	18%	11%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	2.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	2.0
Lost Time Adjust (s)		-2.0		-2.0	-2.0	0.0	-2.0		
Total Lost Time (s)		4.0		4.0	4.0	6.0	4.0		
Lead/Lag	Lag	Lag	Lag	Lag		Lead	Lead	Lead	Lag
Lead-Lag Optimize?								Yes	
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	None	None
v/c Ratio		0.07		0.27	0.60	0.09	0.65		
Control Delay		29.6		3.6	9.9	7.1	11.1		
Queue Delay		0.0		0.0	0.0	0.0	0.0		
Total Delay		29.6		3.6	9.9	7.1	11.1		
Queue Length 50th (ft)		3		0	112	3	137		
Queue Length 95th (ft)		19		8	446	22	548		
Internal Link Dist (ft)		21		602	677		97		
Turn Bay Length (ft)									
Base Capacity (vph)		171		290	1347	382	1405		
Starvation Cap Reductn		0		0	0	0	0		
Spillback Cap Reductn		0		0	0	0	0		
Storage Cap Reductn		0		0	0	0	0		
Reduced v/c Ratio		0.06		0.26	0.60	0.09	0.65		

Intersection Summary
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Yellow
Natural Cycle: 90
Control Type: Actuated-Coordinated

Splits and Phases: 2: Court St & Gas Station/Monroe St

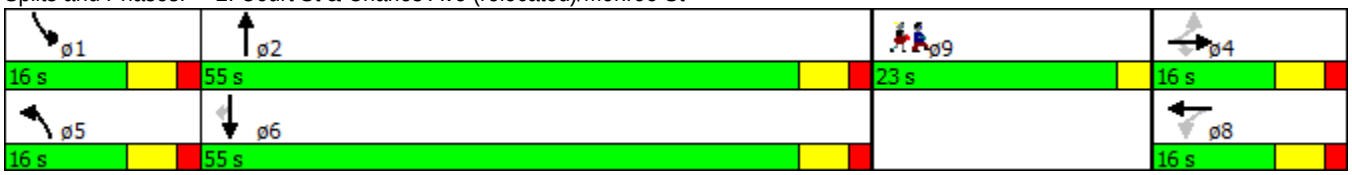
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	1	5	25	0	50	0	770	35	35	910	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	11	11	12	12	12
Grade (%)		0%			-4%			0%			0%	
Total Lost time (s)		4.0			4.0			4.0		6.0	4.0	
Lane Util. Factor		1.00			1.00			1.00		1.00	1.00	
Frpb, ped/bikes		0.98			1.00			1.00		1.00	1.00	
Flpb, ped/bikes		1.00			0.99			1.00		1.00	1.00	
Frt		0.94			0.91			0.99		1.00	1.00	
Flt Protected		0.98			0.98			1.00		0.95	1.00	
Satd. Flow (prot)		1714			1725			1736		1718	1810	
Flt Permitted		0.85			0.88			1.00		0.28	1.00	
Satd. Flow (perm)		1499			1551			1736		504	1810	
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	5	1	5	25	0	50	0	770	35	35	910	0
RTOR Reduction (vph)	0	5	0	0	69	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	6	0	0	6	0	0	804	0	35	910	0
Confl. Peds. (#/hr)			3	3			7		3	3		7
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	5%	5%	5%	5%	5%	5%
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		4			4		5	2			6	
Permitted Phases	4			4			2			6		
Actuated Green, G (s)		5.7			5.7			64.7		64.7	64.7	
Effective Green, g (s)		7.7			7.7			66.7		64.7	66.7	
Actuated g/C Ratio		0.09			0.09			0.74		0.72	0.74	
Clearance Time (s)		6.0			6.0			6.0		6.0	6.0	
Vehicle Extension (s)		4.0			4.0			2.0		2.0	2.0	
Lane Grp Cap (vph)		128			132			1286		362	1341	
v/s Ratio Prot								0.46			c0.50	
v/s Ratio Perm		c0.00			0.00					0.07		
v/c Ratio		0.05			0.05			0.62		0.10	0.68	
Uniform Delay, d1		37.8			37.8			5.6		3.8	6.1	
Progression Factor		1.00			1.00			1.00		1.00	1.00	
Incremental Delay, d2		0.2			0.2			2.3		0.5	2.8	
Delay (s)		38.0			38.0			7.9		4.4	8.8	
Level of Service		D			D			A		A	A	
Approach Delay (s)		38.0			38.0			7.9			8.7	
Approach LOS		D			D			A			A	

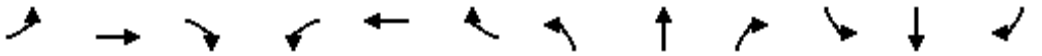
Intersection Summary			
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	59.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR	ø9
Lane Configurations											
Volume (vph)	100	5	140	25	5	60	710	35	770	45	
Lane Group Flow (vph)	0	105	140	0	75	60	745	35	770	45	
Turn Type	Perm	NA	Perm	Perm	NA	Prot	NA	Prot	NA	Perm	
Protected Phases		4			8	5	2	1	6		9
Permitted Phases	4		4	8						6	
Detector Phase	4	4	4	8	8	5	2	1	6	6	
Switch Phase											
Minimum Initial (s)	8.0	8.0	8.0	8.0	8.0	5.0	10.0	5.0	10.0	10.0	1.0
Minimum Split (s)	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	23.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0	16.0	55.0	16.0	55.0	55.0	23.0
Total Split (%)	14.5%	14.5%	14.5%	14.5%	14.5%	14.5%	50.0%	14.5%	50.0%	50.0%	21%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	3.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0
Lost Time Adjust (s)		-2.0	0.0		-2.0	-2.0	-2.0	0.0	-2.0	0.0	
Total Lost Time (s)		4.0	6.0		4.0	4.0	4.0	6.0	4.0	6.0	
Lead/Lag						Lead	Lag	Lead	Lag	Lag	
Lead-Lag Optimize?								Yes			
Recall Mode	None	None	None	None	None	None	Max	None	Max	Max	None
v/c Ratio		0.66	0.50		0.32	0.32	0.71	0.26	0.77	0.05	
Control Delay		64.1	14.9		25.4	47.2	22.8	49.3	26.7	0.1	
Queue Delay		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay		64.1	14.9		25.4	47.2	22.8	49.3	26.7	0.1	
Queue Length 50th (ft)		54	0		14	30	245	18	271	0	
Queue Length 95th (ft)		#171	60		65	83	#736	56	#770	0	
Internal Link Dist (ft)		452			602		677		97		
Turn Bay Length (ft)			75			150		105		75	
Base Capacity (vph)		159	282		237	222	1052	185	996	845	
Starvation Cap Reductn		0	0		0	0	0	0	0	0	
Spillback Cap Reductn		0	0		0	0	0	0	0	0	
Storage Cap Reductn		0	0		0	0	0	0	0	0	
Reduced v/c Ratio		0.66	0.50		0.32	0.27	0.71	0.19	0.77	0.05	

Intersection Summary
Cycle Length: 110
Actuated Cycle Length: 92.1
Natural Cycle: 100
Control Type: Actuated-Uncoordinated
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 2: Court St & Charles Ave (relocated)/Monroe St



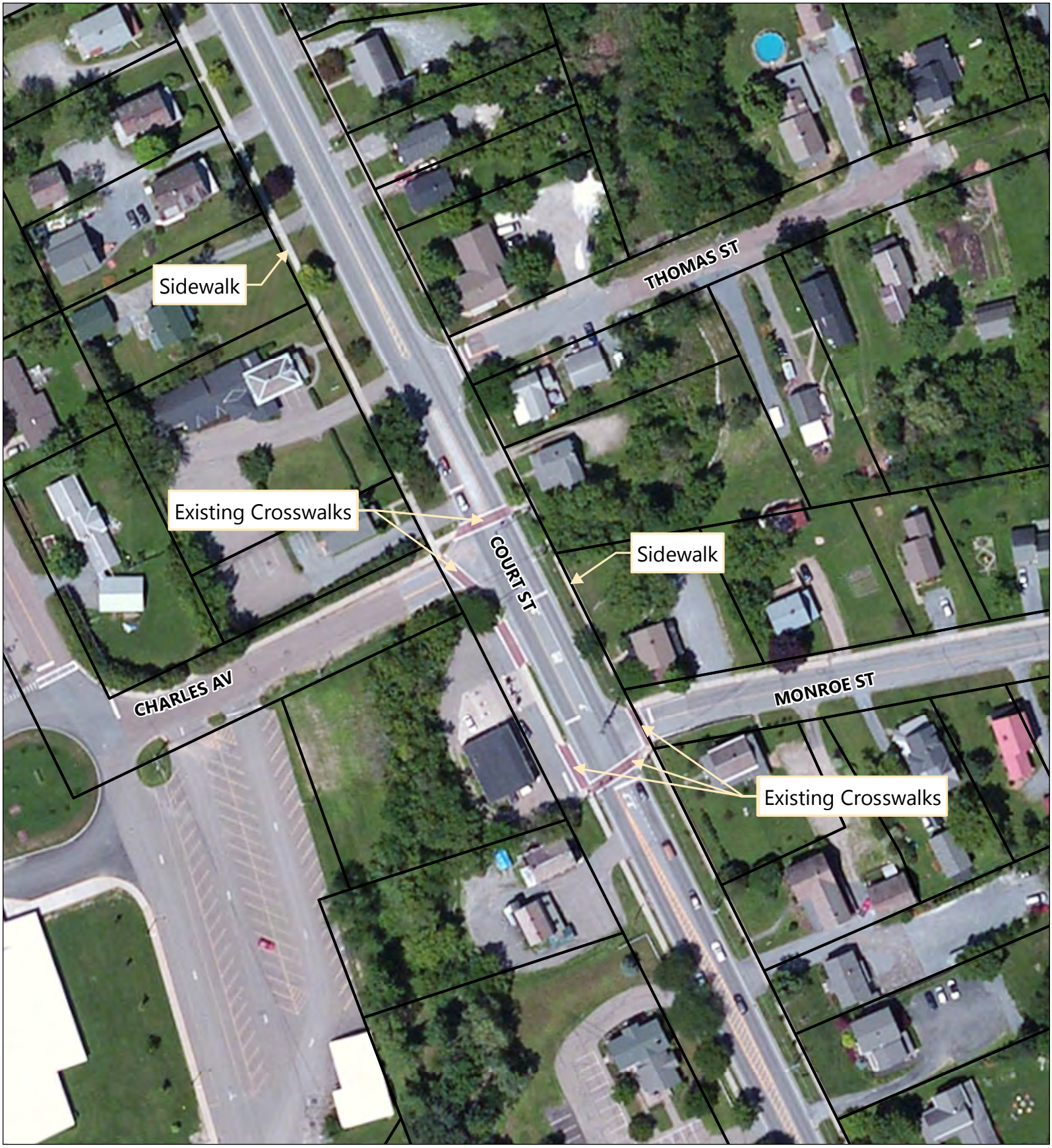


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	100	5	140	25	5	45	60	710	35	35	770	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	11	11	11	11	11	11	11
Grade (%)		0%			-4%			0%			0%	
Total Lost time (s)		4.0	6.0		4.0		4.0	4.0		6.0	4.0	6.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes		1.00	0.97		1.00		1.00	1.00		1.00	1.00	0.97
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.92		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.95	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1654	1423		1688		1662	1735		1662	1749	1448
Flt Permitted		0.69	1.00		0.86		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1188	1423		1482		1662	1735		1662	1749	1448
Peak-hour factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	100	5	140	25	5	45	60	710	35	35	770	45
RTOR Reduction (vph)	0	0	125	0	39	0	0	1	0	0	0	21
Lane Group Flow (vph)	0	105	15	0	36	0	60	744	0	35	770	24
Confl. Peds. (#/hr)			3	3			7		3	3		7
Heavy Vehicles (%)	6%	6%	6%	0%	0%	0%	5%	5%	5%	5%	5%	5%
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								6
Actuated Green, G (s)		10.3	10.3		10.3		6.8	53.8		4.7	51.7	51.7
Effective Green, g (s)		12.3	10.3		12.3		8.8	55.8		4.7	53.7	51.7
Actuated g/C Ratio		0.13	0.11		0.13		0.09	0.58		0.05	0.56	0.54
Clearance Time (s)		6.0	6.0		6.0		6.0	6.0		6.0	6.0	6.0
Vehicle Extension (s)		4.0	4.0		3.0		3.0	2.0		3.0	2.0	2.0
Lane Grp Cap (vph)		151	151		188		151	1003		80	973	775
v/s Ratio Prot							c0.04	0.43		0.02	c0.44	
v/s Ratio Perm		c0.09	0.01		0.02							0.02
v/c Ratio		0.70	0.10		0.19		0.40	0.74		0.44	0.79	0.03
Uniform Delay, d1		40.3	38.9		37.6		41.3	15.0		44.6	17.0	10.6
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		14.0	0.4		0.5		1.7	4.9		3.8	6.6	0.1
Delay (s)		54.3	39.3		38.1		43.1	20.0		48.4	23.5	10.6
Level of Service		D	D		D		D	B		D	C	B
Approach Delay (s)		45.7			38.1			21.7			23.9	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	96.5	Sum of lost time (s)	17.0
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Appendix C

Existing Conditions Figures



Town of Middlebury
Court Street Intersection Study
Bicycle and Pedestrian Infrastructure Map

DRAFT: July 30, 2015

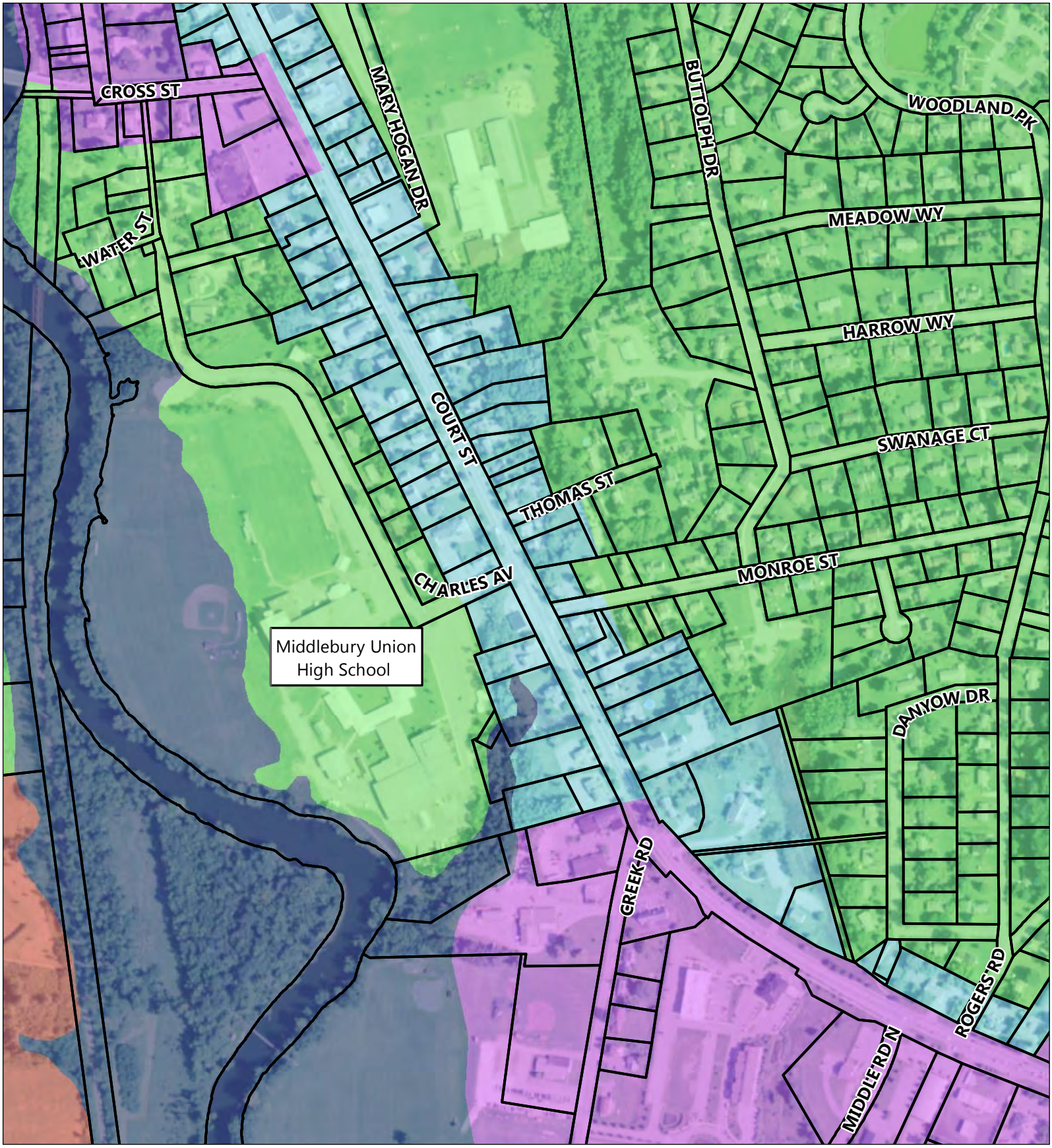
Legend

Parcel Boundary

0 50 100 Feet

Sources: Background - Bing imagery (2012); Parcel data downloaded from VCGI (2013); Roads data downloaded from VCGI (2014).

\\vtnfdata\projects\57766.00\GIS\Project\8.5x11_Bike_Ped.mxd Exported by: JTherrien



Legend

- Parcel Boundary
- Flood Hazard Overlay District
- High-Density Residential
- Institutional District
- Office/Appartment District
- Village Residential/Commerical District

Town of Middlebury
Court Street Intersection Study
Parcel and Zoning Map

DRAFT: July 30, 2015

0 200 400 Feet

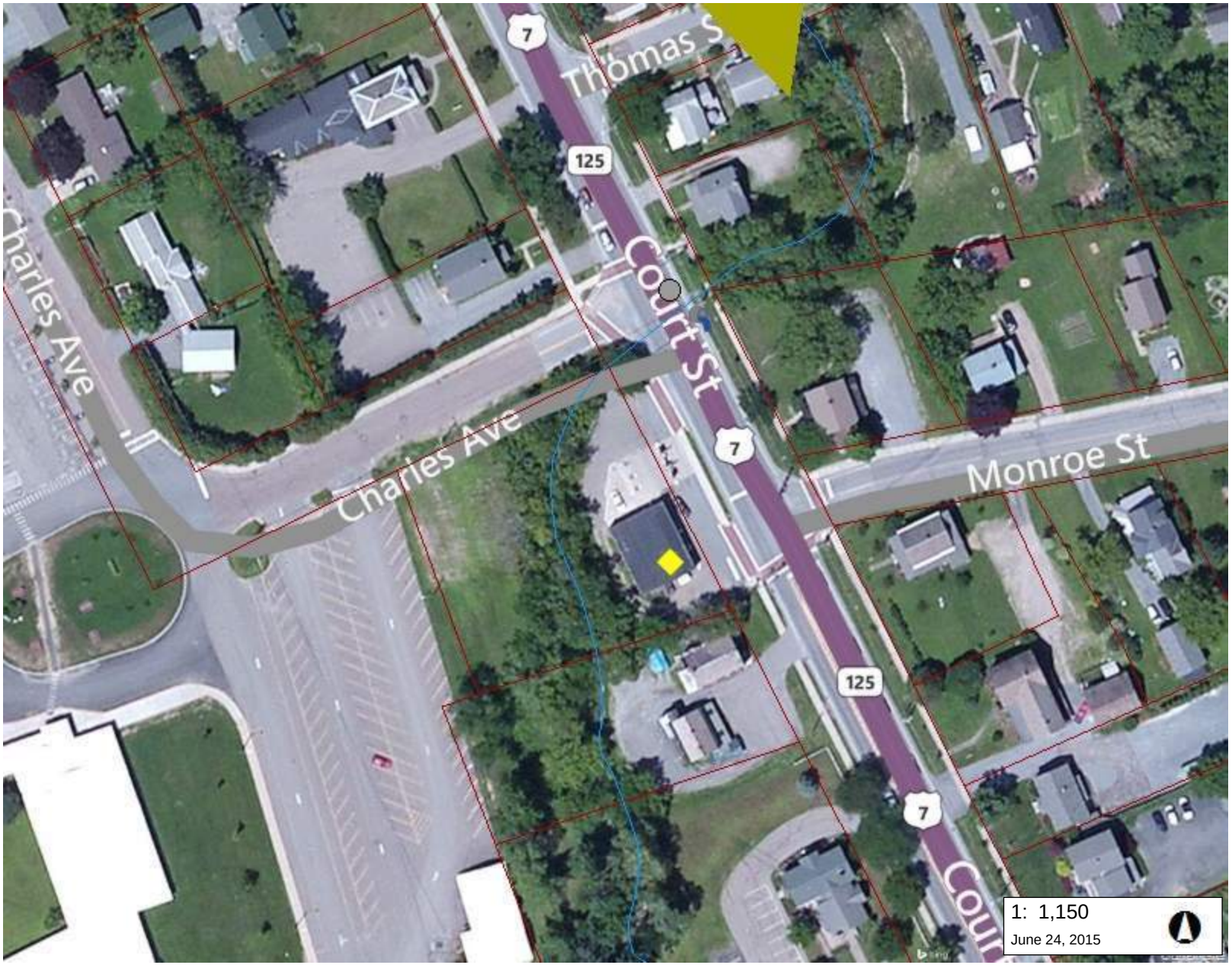
Sources: Background - Bing imagery (2012); Parcel data downloaded from VCGI (2013); Roads data downloaded from VCGI (2014); Zoning data provided by the Town of Middlebury (2015).

\\vtnfdata\projects\57766.00\GIS\Project\8.5x11_Parcel_Zoning.mxd Exported by: JTherrien

Natural Resources Atlas

Vermont Agency of Natural Resources

vermont.gov



LEGEND

- Class A Watersheds
  - Class A(2) Public Water Supplies
  - Class A(1) Ecological Waters
- Wetlands - VSWI
  - Class 1 Wetland
  - Class 2 Wetland
- Special Flood Hazard Areas (A Counties)
  - AE (1-percent annual chance floodp
  - A (1-percent annual chance floodpl
  - AO (1-percent annual chance zone feet)
  - 0.2-percent annual chance flood ha
- Hazardous Waste Site
- Hazardous Waste Generators
- Brownfields
- Underground Storage Tank (w
- Stream Crossings
  - Fully Passable
  - Reduced Passage
  - Impassable except for Adult Trout
  - Impassable
  - Bridge/Arch (Fully Passable)
- Rare Threatened Endangered
  - Threatened or Endangered
  - Rare
- Significant Natural Community
- VTRANS State and Town Long

NOTES

Map created using ANR's Natural Resources Atlas

58.0 0 29.00 58.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 96 Ft. 1cm = 12 Meters

THIS MAP IS NOT TO BE USED FOR NAVIGATION

Appendix D

Oil & Hazardous Materials Overview

Memorandum

To: Scoping Study for the Court Street/Charles Street/Monroe Street Intersection, Middlebury, VT

Date: August 21, 2015

Project #: 57766.00

From: Rachel Lomonaco

Re: Oil & Hazardous Materials Screening – Developed Review

EXISTING CONDITIONS

VHB reviewed the following Vermont Department of Environmental ("VT DEC") and Environmental Protection Agency ("EPA") Databases to identify sites of concern within 500 feet of the Project area:

- VT DEC designated hazardous waste sites ("HWSs")
- VT DEC and EPA Brownfield sites ("Brownfields")
- VT DEC registered underground storage tanks ("USTs")
- VT DEC and EPA registered hazardous waste generation facilities ("RCRA Generators")
- EPA Comprehensive Environmental Response, Compensation, and Liability Information System ("CERCLIS" or "Superfund")

Available information including VT DEC project summaries provided for the HWSs and available reports/maps were reviewed as a part of this assessment. The purpose of this review was to determine the approximate extent of existing contamination in the vicinity of the Project area. In addition to the sites identified on the above listed databases, undocumented contamination could be encountered anywhere throughout the Project area. Based on the available information, VHB identified five sites located within close proximity to the Project area which are further described below:

- Middlebury Citgo (active HWS #982471, active UST #1080)
  The facility currently known as the Maverick Gas Station is a State-listed hazardous waste site identified as the "Middlebury Citgo" site. Petroleum-impacted soil and groundwater were discovered at this site which is located within the Project area during underground piping replacement associated with an 8,000 gallon gasoline UST and two 6,000 gallon gasoline USTs which were installed in 1986. These USTs remain in-use and are located to the north of the on-site building. Five groundwater monitoring wells were installed and groundwater was determined to flow northwest towards a tributary to the Otter Creek. Laboratory results from on-site groundwater samples showed the presence of petroleum volatile organic compounds ("VOCs") above regulatory standards within the Project area. Soils were only field screened using a photoionization detector and have not been laboratory analyzed to identify the magnitude of impacts. ***Therefore, petroleum-impacted soil, groundwater, and soil gas, and underground storage tanks and piping are likely to be encountered during project construction at the Maverick Gas Station located within the Project area.***

- Middlebury Union High School (active HWS #962123, active UST #3883111)
  Petroleum-impacted soil and groundwater were discovered at the Middlebury Union High School located approximately 250 feet to the west of the Project area, during the removal of a 12,000 gallon fuel oil UST. A total of 120 cubic yards of impacted soil was excavated and treated on-site. This soil was thin-spread on-site in 1998 after sufficient treatment was completed. Groundwater was encountered at 12 feet below ground surface near this historic 12,000 gallon UST and did not appear to be impacted upon inspection. A 10,000 gallon fuel oil UST currently exists on the site. Groundwater flow in this area has been shown to be strongly to the west toward the Otter Creek and away from the Project area. ***A review of***

40 IDX Drive
Building 100, Suite 200
South Burlington, VT 05403
P 802.497.6100

available information indicates that soil, groundwater, and soil gas impacts associated with this site are unlikely to affect the Project area or Project construction.

- Vocational Center (active HWS #911043, closed UST #9990141)
  Petroleum-impacted soil was discovered at the adjoining Vocational Center located approximately 400 feet to the southwest of the Project area during the removal of a 1,000 gallon gasoline UST. Groundwater monitoring has indicated that groundwater is impacted with petroleum VOCs. Groundwater flow in this area has been shown to be strongly to the west toward the Otter Creek and away from the Project area. ***A review of available information indicates that soil, groundwater, and soil gas impacts associated with these sites are unlikely to affect the Project area or Project construction.***

- Pecks Rental Realty (HWS #951783, UST #1437, Brownfield site)
  Petroleum-impacted soil and groundwater were discovered at this site located approximately 925 feet to the south of the Project area during the removal of a 10,000 gallon fuel oil UST. The leak was discovered when a petroleum sheen was observed on the Otter Creek. It was determined that the released petroleum entered a building foundation drain and traveled to the Otter Creek via stormwater infrastructure (buried drain pipes and surface swales). Approximately 50 cubic yards of impacted soil was excavated from the swales and surrounding the buried drain piping. An additional 25 cubic yards of impacted soil was excavated from the tank grave. The impacted soil was treated on-site. These soils were approved for thin-spreading on-site by the VT DEC but it is unclear if thin-spreading has occurred. Reportedly, groundwater conditions are adequate for site closure upon the decommissioning of the on-site groundwater wells. ***A review of available information indicates that soil, groundwater, and soil gas impacts associated with this site are minimal and are unlikely to affect the Project area or Project construction.***

- Gaen Murphree Residence. (closed HWS #20043245)
  Petroleum-impacted soil, groundwater and surface water was discovered at this site located approximately 300 feet northeast of the Project area and was attributed to a fuel oil AST leak. Five groundwater monitoring wells were installed on-site. Although groundwater this site flows west towards the Project area, laboratory results did not indicated the presence of contaminants in site groundwater. This HWS was administratively closed on November 9, 2005. In order to achieve this "closed" designation, the VT DEC has determined that the HWS does not pose an unacceptable threat to human health or the environment but it does not indicate that all environmental issues have been addressed. ***A review of available information indicates that soil, groundwater, and soil gas impacts associated with this site are minimal and are unlikely to affect the Project area or Project construction.***

In addition, three EPA-listed RCRA generator facilities were identified within 500 feet of the Project area. RCRA designation indicates sites that have registered as generators of hazardous wastes, where the hazardous wastes are typically manifested off-site by certified haulers. RCRA status does not necessarily indicate that a facility has released contamination to the environment; however, improper handling practices at a RCRA facility could result in a release. Based on the available information and lack of documented environmental releases, these RCRA facilities are not considered likely to pose any additional risk of contamination to the Project area.

CONCLUSIONS

Based on the review of the environmental databases, VHB has identified the following which is likely to affect work within the Project area:

- **Petroleum-impacted soil, groundwater, and soil gas, and underground storage tanks and piping are likely to be encountered during project construction at the Maverick Gas Station located within the Project area.** Impacts to Project construction, Project cost and Project permitting are considered to be less significant for Alternative #1 and most significant for Alternatives #2 and #3, primarily because Alternative #1 requires no modification to the existing gasoline station while Alternatives #2 and #3 would require a full removal of the gasoline station building and underground infrastructure. Excavation, underground utility modification, and construction may be feasible within contaminated areas and designated hazardous sites, provided that appropriate techniques are implemented for protecting workers, the public, and the environment from the hazards and provided that regulatory approval can be obtained. Adequate planning and characterization of the contaminated sites prior to the final engineering design phase is essential for working effectively with such sites.

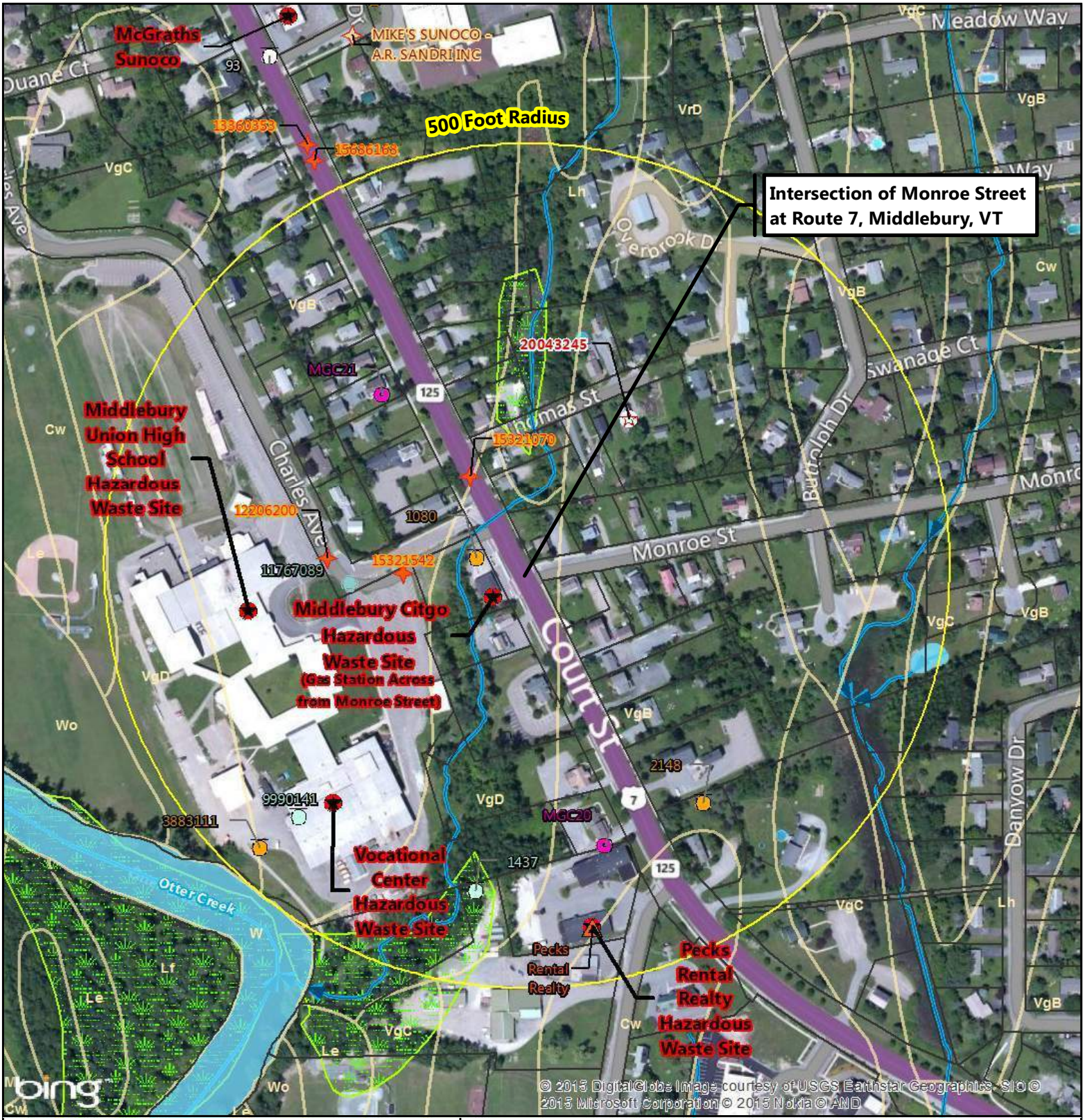
RECOMMENDATIONS

Based on these conclusions:

- VHB has identified the Maverick Gas Station as an area where surficial soil, groundwater, and soil gas contamination are likely to be encountered and where underground petroleum storage tanks and piping remain. VHB recommends that excavation should be avoided or minimized in this area.

- The VT DEC Waste Management Division should be notified prior to any engineering design. Regulatory approval from the VT DEC Waste Management Division would be required to complete either Alternative #2 or #3.

- If the Project will produce a net cut of soil then pre-characterization will be required for any soils to be removed from the site, to determine appropriate re-use or disposal methods. For soils that are impacted only with petroleum, it may be possible to treat the soils by stockpiling, encapsulating with plastic sheeting, and periodically monitoring at an approved off-site location, or to use the soils as alternate daily cover at a landfill, or to dispose of the soils at a certified landfill or at a thermal treatment facility.



Legend

- Surface Water
- Stream (VHD 08)
- VSWI Wetlands
- Parcel Boundaries
- 20' Elevation Contour
- NRCS Soil Boundary (VCGI)

EPA Database

- EPA Brownfield
- Air Pollution/Emissions
- TSD Facility
- CERCLIS
- Power (EGRID/EIA-860)
- ICIS/NPDES/PCS
- LUST-ARRA
- Fungicides/Insecticides
- SPCC Facility
- RCRA - EPA
- Pesticides
- TRIS
- TSCA

VT Database

- VT Brownfield
- UST - Active
- UST - Pulled
- UST - Unknown

Hazardous Waste Sites

- Active
- Closed
- RCRA - VT
- PSI (1980)
- Landfill Closed
- Landfill Active

Court Street/Charles Avenue/Monroe Street Intersection Hazardous Materials Screening

Monroe St at Route 7, Middlebury, VT

Sources: Background - BING Orthophoto (2014); Parcel data by Middlebury, VT (VCGI, 2011); Landfills, Brownfields, and Hazardous Waste Sites from VT DEC (2014); UST Site data provided by VT DEC (2010); Pollution Source Inventories (PSI) data provided by VT DEC (1980); Surface water data from VCGI (2012); VSWI wetlands by the VT ANR and from VCGI (2012); Streams from VT Hydrography Dataset; Roads by VTrans and from VCGI (2012); Contour layer from VCGI (2012). The following EPA facilities are from US EPA (2014): Pesticides & Fungicides (Section 7 Tracking System (SSTS)); Brownfields, Toxic Release Inventory(TRI), RCRA Large Quanity Generator (LQG); Air Pollution/Emissions, SPCC Facility, Leaking Underground Storage Tanks (LUST-ARRA); Toxic Storage and Disposal (TSD) Facility. Treatment Storage and Disposal (TSD) Facilities; Superfund Sites (CERLCIS); and National Pollution Discharge Elimination Site (NPDES), Electric Power Generating Facilities (EGRID/EIA-860).

Draft: March 11, 2015

300 150 0 300 Feet

Document Path: \\vhb\prop\Vermont\81568.15 Middlebury Court St\Submittal\Proposal\Graphics\OHM_MonroeSt_Middlebury.mxd

Appendix E

Middlebury Historic District Map

ADDENDUM TO THE MIDDLEBURY VILLAGE HISTORIC DISTRICT

N

MVHD BOUNDARY LINE

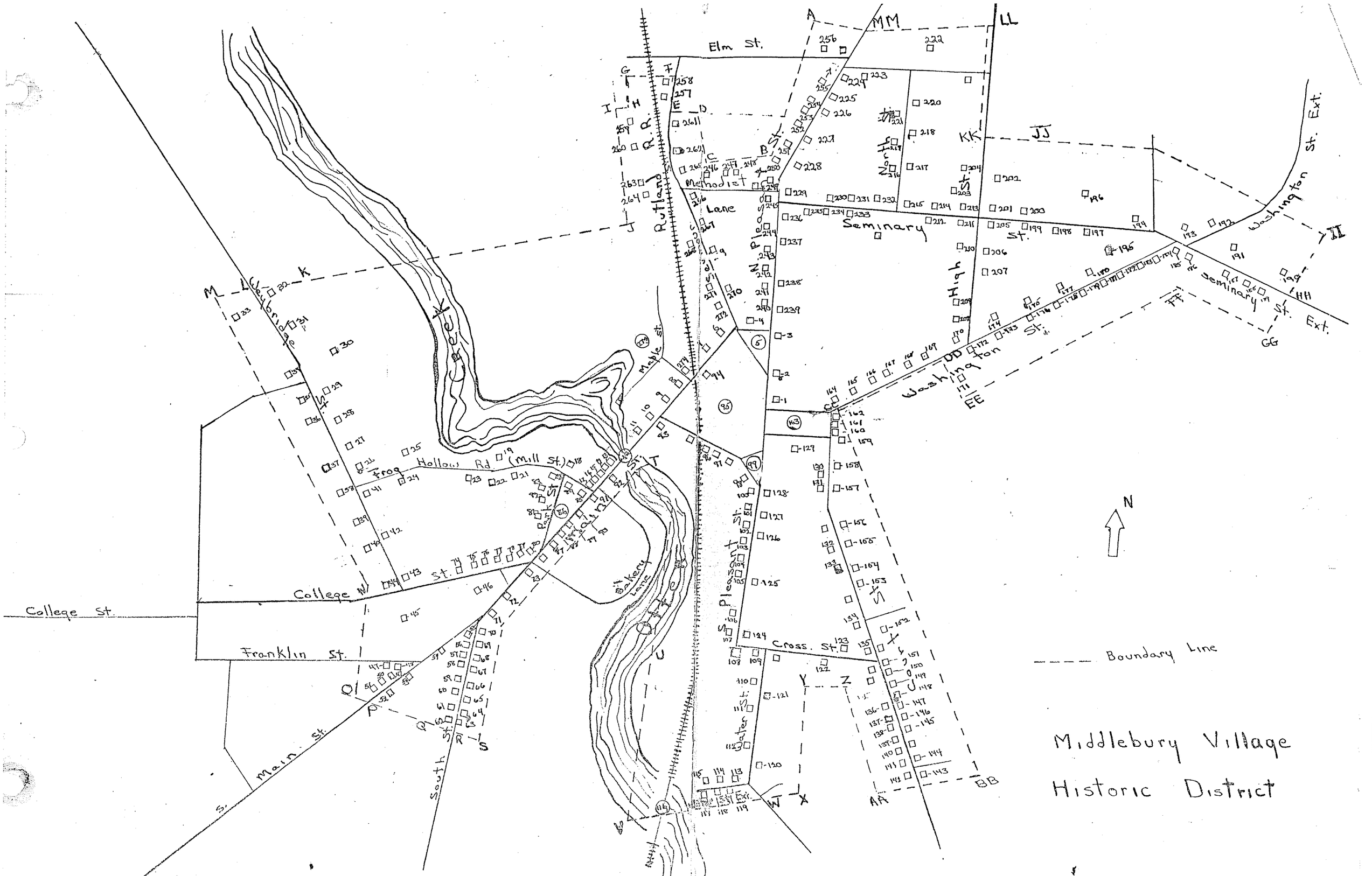
ADDENDUM BOUNDARY LINE

(A) MVHD BOUNDARY POINT

A' ADDENDUM BOUNDARY POINT

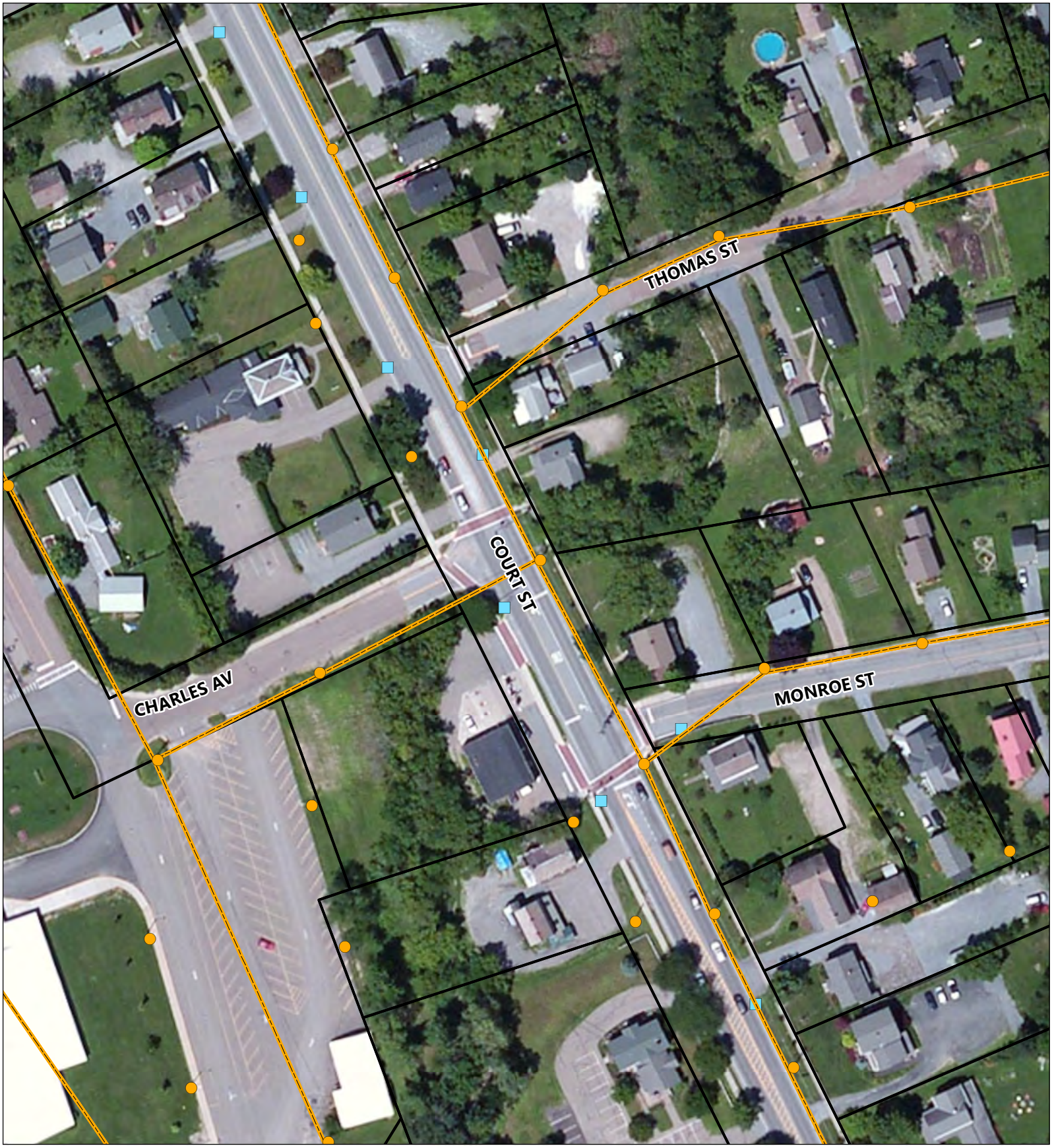
■ NON-CONTRIBUTING BUILDING

SHANNON ST.
WEYBRIDGE ST.
COLLEGE ST.
MAIN STREET
STORRS PARK
339
FRANKLIN ST.
STORRS AVE.
S. MAIN ST.
SOUTH STREET
RUTLAND RR
OTTER CREEK
PLEASANT STREET
CROSS ST.
COURT ST.
THOMAS ST.
CHARLES ST.
MONROE ST.
3 MILE BRIDGE R.D.


Elm St.
Methodist
Rutland R.R.
Lane
Seminary St.
High St.
Washington St. Ext.
Seminary St. Ext.
Washington St.
Maple St.
Frog Hollow Rd (Mill St.)
Park St.
Bakery Lane
College St.
Franklin St.
South St.
S. Main St.
Pleasant St.
Cross St.
Water St.
Weybridge St.
Creek
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z
AA
BB
CC
DD
EE
FF
GG
HH
JJ
KK
LL
MM
N
Boundary Line
Middlebury Village
Historic District

Appendix F

Utilities



Town of Middlebury
Court Street Intersection Study
Bicycle and Pedestrian
Overhead Utilities and
Stormwater Infrastructure Map

DRAFT: July 30, 2015

Legend

- Overhead Electric Pole (Approx)
- Overhead Electric Line (Approx)
- Stormwater Basins (Approx)
- Parcel Boundary

N

0 50 100 Feet

Sources: Background - Bing imagery (2012); Parcel data downloaded from VCGI (2013); Roads data downloaded from VCGI (2014).; Overhead electric, poles and stormwater infrastructure locations by VHB (2015).

\\vtnfdata\projects\57766.00\GIS\Project\8.5x11_Utilities.mxd Exported by: JTherrien

Appendix G

Project Base Map and Property Lines

CHARLES AV
OVERBROOK DR
THOMAS ST
BUTTOLPH DR
SWANAGE CT
COURT ST
CHARLES AVE
MONROE ST
Middlebury Union
High School
7

Legend

Parcel Boundary

Stream (VHD)

0 30 60 Feet

N

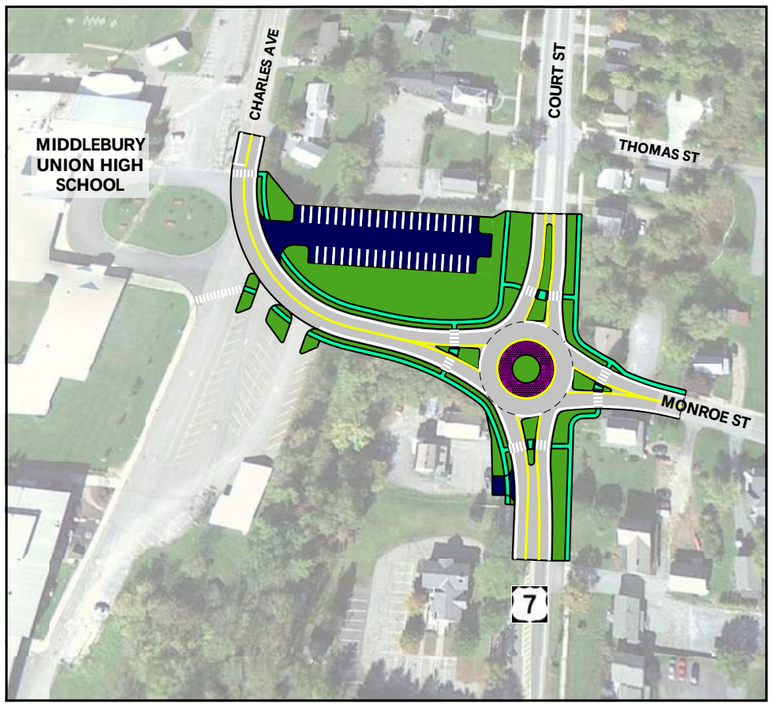
Appendix H

Alternatives

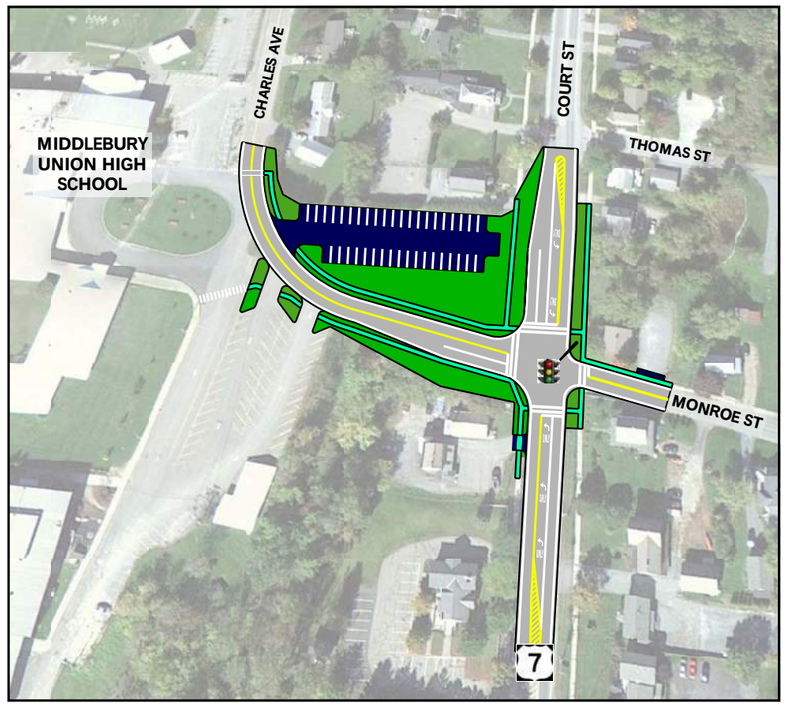
Court St/Charles Ave/Monroe Street Intersection Alternatives

Alternative 1: Charles Ave Roundabout

Alternative 2: Monroe St Roundabout



Alternative 3: Monroe St Signal



School Access, Circulation & Parking Sub-Alternatives

Sub-Alternative A

Sub-Alternative B

Sub-Alternative C

vhb SE GROUP

INDEX OF SHEETS

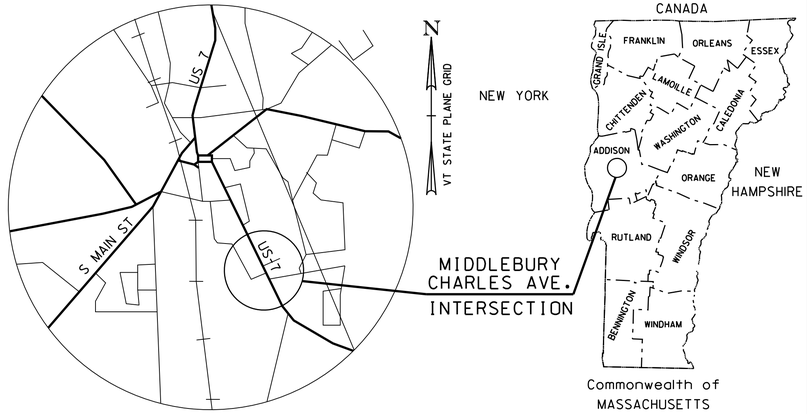
TOWN OF MIDDLEBURY

COUNTY OF ADDISON

PROPOSED IMPROVEMENTS

MIDDLEBURY

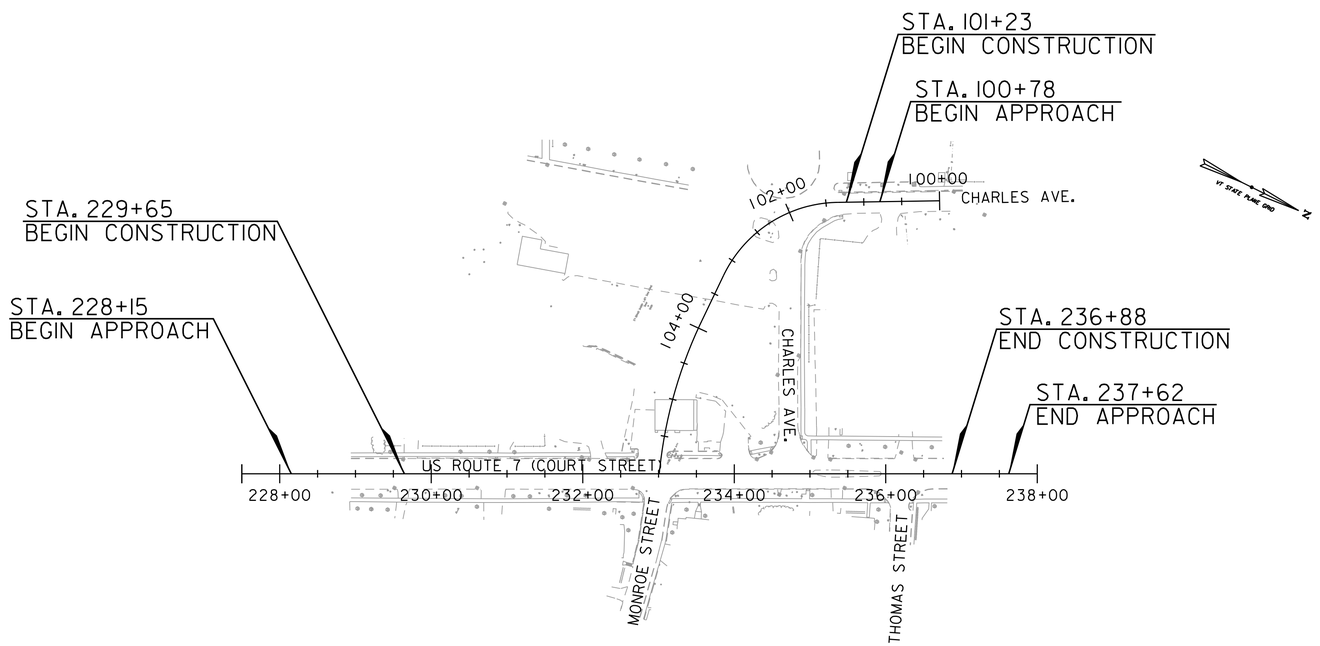
CHARLES AVE & MONROE ST INTERSECTION



PROJECT LENGTH: 1469 FEET = 0.278 MILES

PROJECT LOCATION: THE PROJECT IS LOCATED AT THE INTERSECTIONS OF MONROE STREET AND CHARLES AVENUE WITH US ROUTE 7 IN MIDDLEBURY, VERMONT.

PROJECT DESCRIPTION: WORK TO BE PERFORMED UNDER THIS PROJECT INCLUDES THE REALIGNMENT OF CHARLES AVENUE TO CREATE A NEW FOUR-WAY SIGNALIZED INTERSECTION WITH US ROUTE 7 AND MONROE STREET, WIDENING OF US ROUTE 7, A NEW ROADWAY CROSSING OF A PERENNIAL STREAM, A RECONSTRUCTION OF A SCHOOL PARKING LOT, PAVEMENT MARKINGS AND SIGNAGE, AND OTHER INCIDENTALS.



CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2018, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON APRIL 13, 2018 FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT REVISIONS AND SUCH REVISED SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE PLANS.

CONCEPTUAL PLANS
DECEMBER 2022

SURVEYED BY : VHB
SURVEYED DATE : JUNE 2022

DATUM
VERTICAL: NAVD 88
HORIZONTAL: VT STATE PLANE (NAD 83)

Draft
NOT FOR CONSTRUCTION

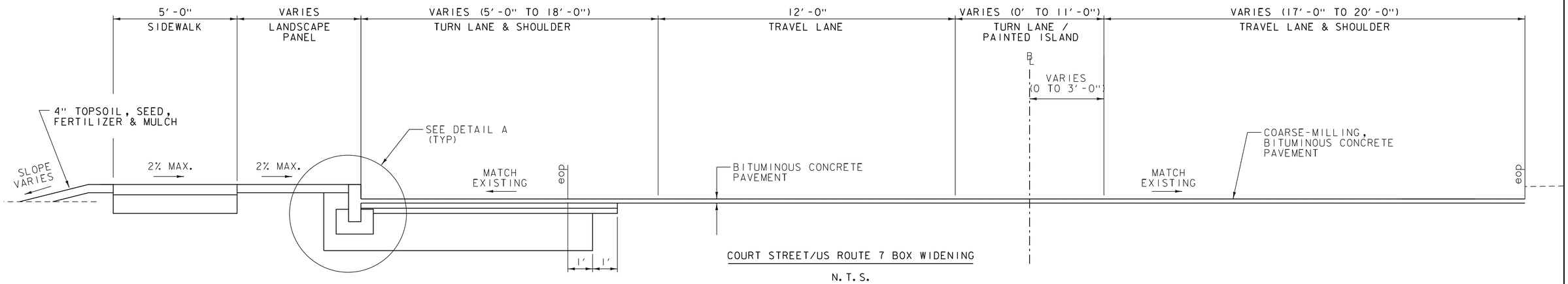
PROJECT MANAGER : D.M. PECK

MIDDLEBURY - INTERSECTION
PROJECT NUMBER : 58764.00

SHEET 1 OF 6 SHEETS

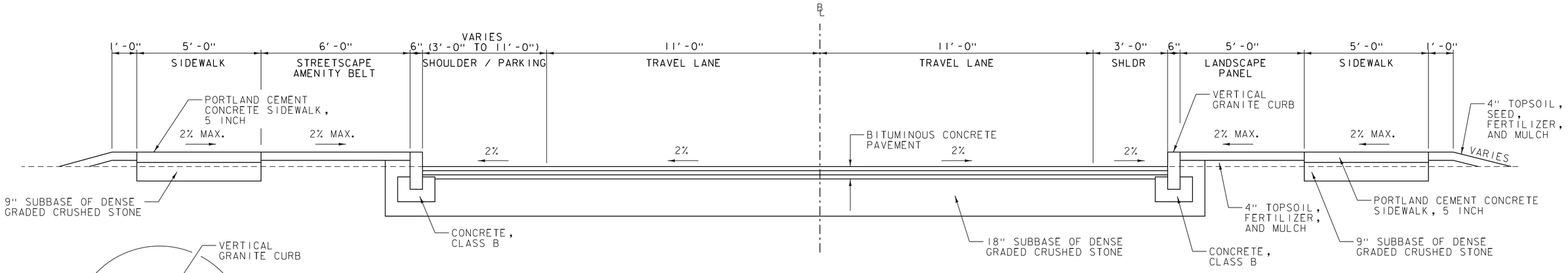
TYPICAL SECTIONS

MATERIAL TOLERANCES	
MATERIAL ITEM	THICKNESS TOLERANCE
PAVEMENT (FULL DEPTH)	± 1/4" (TOTAL THICKNESS)
SUBBASE	± 1"
CRUSHED STONE	± 1"



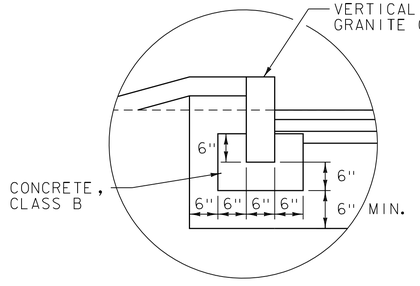
COURT STREET/US ROUTE 7 BOX WIDENING

N. T. S.



CHARLES AVENUE TYPICAL SECTION

N. T. S.



DETAIL A

N. T. S.

Draft

NOT FOR CONSTRUCTION

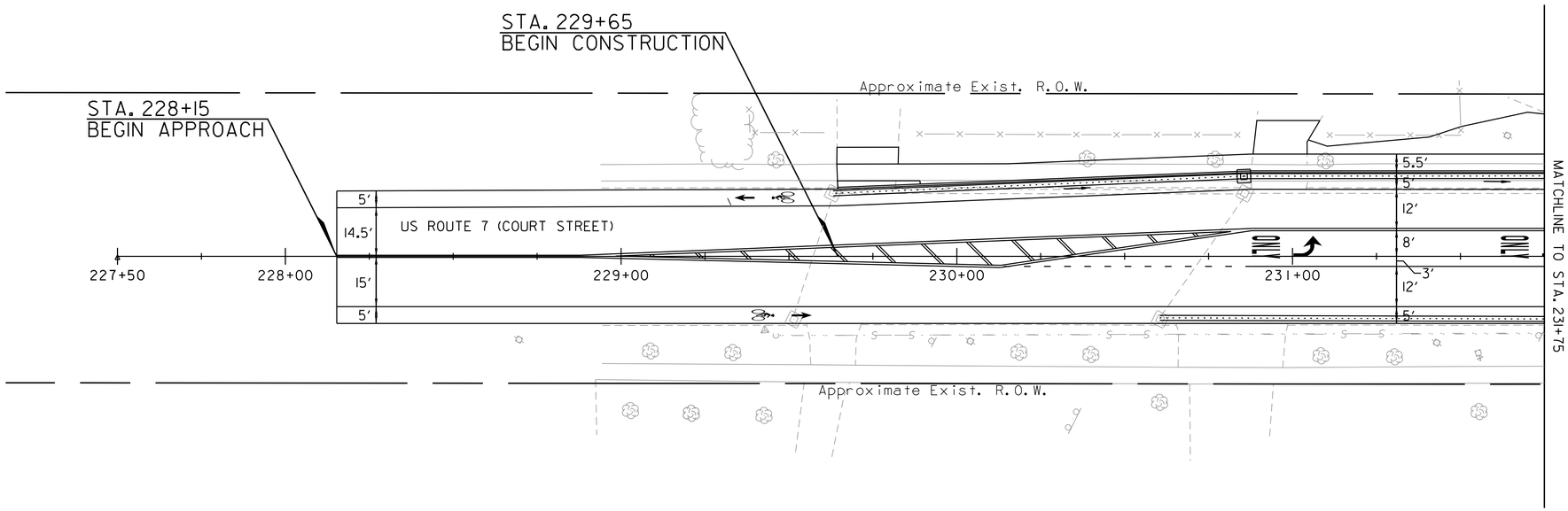
vhb

PROJECT NAME:	MIDDLEBURY - CHARLES AVE.
PROJECT NUMBER:	VHB 58764.00

FILE NAME: 58764_typ.dgn	PLOT DATE: 12/9/2022
PROJECT LEADER: D.M. PECK	DRAWN BY: C.K. FORD
DESIGNED BY: C.K. FORD	CHECKED BY: D.M. PECK
TYPICAL SECTIONS	SHEET 2 OF 6

VT STATE PLANE GRID

N



0 20 40

SCALE IN FEET

Draft

NOT FOR CONSTRUCTION

vhb

PROJECT NAME:	MIDDLEBURY - CHARLES AVE.
PROJECT NUMBER:	VHB 58764.00
FILE NAME: 58764_bdr_nul.dgn	PLOT DATE: 12/9/2022
PROJECT LEADER: D.M. PECK	DRAWN BY: -----
DESIGNED BY: C.K. FORD	CHECKED BY: -----
PROPOSED LAYOUT PLAN SHEET (1 OF 3)	SHEET 3 OF 6

VT STATE PLANE GRID

N

MATCHLINE TO STA. 104+25

ONLY

5′ 5′ 13′ 11′ 14′ 8′

105+00

NEW CHARLES AVE.

REMOVE EXISTING PAVEMENT

OLD CHARLES AVE.

REMOVE EXISTING PAVEMENT, CURB AND SIDEWALK

STA. 236+88
END CONSTRUCTION

Approximate Exist. R.O.W.

MATCHLINE TO STA. 231+75

5.5′ 5′ 12′ 8′ 3′ 12′ 5′

232+00

233+00

5′ 5′ 13′ 8′ 3′ 12′ 5′

234+00

235+00

25:1

236+00

US ROUTE 7 (COURT STREET)

5′ 12′ 14.5′ 15′ 5′

237+00

Approximate Exist. R.O.W.

STA. 237+62
END APPROACH

REMOVE EXISTING PEDESTRIAN RAMP

301+00

MONROE STREET

THOMAS STREET

0 20 40
SCALE IN FEET

Draft
NOT FOR CONSTRUCTION

vhb

PROJECT NAME:	MIDDLEBURY - CHARLES AVE.
PROJECT NUMBER:	VHB 58764.00
FILE NAME: 58764_bdr_nul.dgn	PLOT DATE: 12/9/2022
PROJECT LEADER: D.M. PECK	DRAWN BY: -----
DESIGNED BY: C.K. FORD	CHECKED BY: -----
PROPOSED LAYOUT PLAN SHEET (2 OF 3)	SHEET 4 OF 6

N

VT STATE PLANE GRID

MATCHLINE TO STA. 104+25

Approximate Exist. R.O.W.

Approximate Exist. R.O.W.

Approximate Exist. R.O.W.

Approximate Exist. R.O.W.

REMOVE EXISTING PAVEMENT, CURB AND SIDEWALK

OLD CHARLES AVE.

NEW CHARLES AVE.

CHARLES AVE.

100+00

101+00

102+00

103+00

104+00

STA. 100+78
BEGIN APPROACH

STA. 101+23
BEGIN CONSTRUCTION

15'
16'
8'
14'
11'
5'
15'
15'
5'
5'
12'
12'
12'
12'

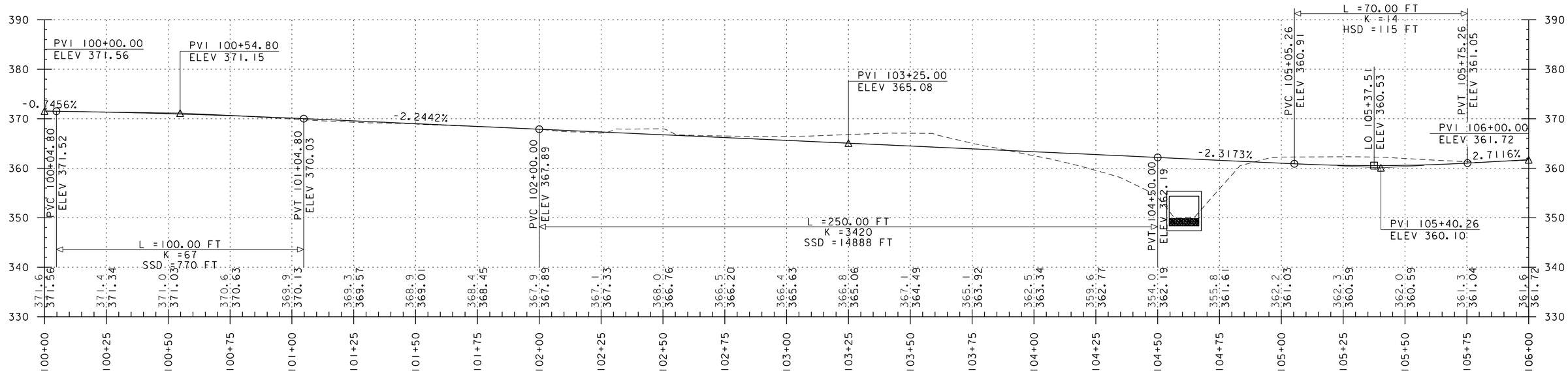
0 20 40
SCALE IN FEET

Draft
NOT FOR CONSTRUCTION

vhb

PROJECT NAME:	MIDDLEBURY - CHARLES AVENUE
PROJECT NUMBER:	VHB 58764.00

FILE NAME: 58764_bdr_nul.dgn	PLOT DATE: 12/9/2022
PROJECT LEADER: D.M. PECK	DRAWN BY: -----
DESIGNED BY: C.K. FORD	CHECKED BY: -----
PROPOSED LAYOUT PLAN SHEET (3 OF 3)	SHEET 5 OF 6



Draft

NOT FOR CONSTRUCTION

PROJECT NAME:	MIDDLEBURY - CHARLES AVE.
PROJECT NUMBER:	VHB 58764.00
FILE NAME: 58764pro.dgn	PLOT DATE: 12/9/2022
PROJECT LEADER: D.M. PECK	DRAWN BY: -----
DESIGNED BY: C.K. FORD	CHECKED BY: -----
PROFILE SHEET - NEW CHARLES AVE.	SHEET 6 OF 6

SELECTBOARD MEETING
Municipal Building – Large Conference Rom
Tuesday, January 12, 2016
Meeting Minutes

*D R A F T

**subject to Board approval*

Members Present: Dean George, Nick Artim, Susan Shashok, Gary Baker, Donna Donahue, Laura Asermily, and *Brian Carpenter (*participating by phone beginning at 7:35 p.m.).

Staff Present: Town Manager Kathleen Ramsay, Director of Operations Dan Werner, and Recreation Director Terri Arnold. Several members of the community attended the meeting, which was televised on MCTV by Dick Thodal, and reported by John Flowers of *The Addison Independent*.

1. Call to Order

Dean George called the meeting to order at 7:05 p.m.

2. Approval of Minutes for December 15, 2015

Susan Shashok moved to approve minutes for the Selectboard meeting held December 15, 2015 (copy attached); Laura Asermily seconded. Motion carried with 6 members in favor, none opposed, and 1 member absent. **MOTION PASSED**.

Approval of Minutes for January 5, 2016

Correction: Page 6, Line 304: substitute “Michigan” for “Alaska”

Susan Shashok moved to approve minutes for January 5, 2016 as amended; Nick Artim seconded. Motion carried with 6 members in favor, none opposed, and 1 member absent. **MOTION PASSED**.

3. Approval of Agenda

Gary Baker moved to approve the agenda as presented; Laura Asermily seconded. Motion carried with 6 members in favor, none opposed, and 1 member absent. **MOTION PASSED**.

4. Citizen Comments

None.

5. Presentation of Alternatives Analysis for Court Street/Monroe Street/Charles Avenue Intersection

Engineers David Saladino and Adam Portz of Vanasse, Hangen, Brustlin, Inc. (VHB) reviewed the results of the Court Street/Charles Avenue/Monroe Street intersection Scoping Study (copy attached) for design options to improve pedestrian and bicycle safety, reduce traffic congestion, and accommodate school transportation demands. Following public feedback solicited in October, the engineers presented the following three alternatives:

#1- Charles Avenue Roundabout, estimated at $350,000 (not including acquisition of adjacent property), would replace the existing traffic signal at the Charles Avenue/Court Street intersection with a single-lane roundabout, and a new southbound left turn on Court Street at the Monroe Street intersection.

#2 - Monroe Street Roundabout, estimated at $980,000 (excluding property acquisition), would replace both Court Street traffic signals with a single-lane roundabout, and realign Charles Avenue to intersect with Court Street across from Monroe, resulting with additional parking or green space at the high school.

#3 - Monroe Street Signal, estimated at $870,000 (excluding property acquisition), would remove the existing Charles Avenue traffic signal, and realign Charles Avenue to intersect with Court Street across from Monroe, also creating additional school parking or green space.

David Saladino indicated that those in attendance at the public hearing, as well as school board members, preferred the signalization option, #3. Regarding roundabout versus signalization in a village center location, he noted that a signalized intersection tends to be more efficient for traffic flow, as well as safer for pedestrians, allowing them to gather to cross before the light changes, as opposed to waiting for traffic gaps at a roundabout and crossing at random intervals.

David Portz also reviewed the sketches, or sub-alternatives, for creating an access road from the high school campus to the new Recreation Facility on Creek Road, a long-term objective not reflected in the current project estimates.

In terms of funding and a timeline, Mr. Saladino noted the project is not a priority for the Vermont Agency of Transportation (VTrans), which serves as a conduit for federal funds; however, he indicated that the property manager for Champlain Oil was amenable to property acquisition discussions for the project.

Laura Asermily moved to endorse the four-way signalized intersection design, Alternative #3, in the Court Street/Charles Avenue/Monroe Street Intersection Scoping Study as the preferred alternative, as determined through public input at the October 13, 2015 public information meeting; Nick Artim seconded. Motion carried with 7 members in favor, none opposed. **MOTION PASSED**.

6. Proposed Dog Park

Members of the Middlebury Off Leash Area Group (MOLAG) Jane Steele, and Kathy Nilsson, together with Middlebury College representative David Donahue, provided an update since their last presentation to the Board on November 24th, when concerns were raised regarding the proposed dog park to be located on college land off South Street, just east of Middlebury Regional EMS; specifically, the close proximity to the EMS helipad used for medical evacuation. Mr. Donahue noted that all concerns have been satisfied (correspondence attached), adding that the hospital has indicated there are approximately 12 flights per year, mostly at night, and parking will be available in the northeast back corner of the existing hospital lot, which is minimally used. Regarding the Act 250 permit process, he suggested an amendment, at considerably less cost, to meet the requirement.

Having received calls on the proposed dog park, Susan Shashok asked when the organizers plan to engage the community through public information meetings. Jane Steele advised that once the lease is signed, plans are being made for advertising, fundraising, and informational meetings. Gary Baker suggested holding a public hearing prior to signing the lease. Parks & Recreation Director Terri Arnold supported the dog park, with the caveat that the Rec Department should not take on its maintenance should the group fail to do so in the future. Nick Artim moved for tentative approval of the land lease (copy attached), pending the successful completion and State approval of the amended Act 250 permit; Donna Donahue seconded.

Motion carried with 7 members in favor, none opposed. **MOTION PASSED**.

7. Main Street & Merchants Row Overpass Bridge Replacements Local Project Management Team Update

Dean George reported on two meetings held last week by the Local Project Management Team (LPMT), at which members reviewed the response from VTrans to the committee's letter of November 10th (highlights attached). The LPMT is looking forward to the outcome of the February 17th meeting of the Vermont Rail Council, which is planning to weigh in on the issue of lowering the minimum clearance requirement, and associated costs, from 21 to 19 feet for the two downtown rail bridges. Dean also noted the Local Project Team discussed the relocation of the Addison County Transfer Resource (ACTR) transfer point, multi-modal station, and future of Greg's Meat Market building. The LPMT is scheduled to meet again on Thursday, January 14th.

Acknowledging of former Town Manager Bill Finger's letter of resignation as Local Project Manager (copy attached), in light of how the project has evolved since its inception, Board members expressed their appreciation for Bill's service, and continued willingness to advise the Selectboard in going forward.

8. FY17 Budget Proposal Review & Update

Town Manager Kathleen Ramsay advised that the Parks & Recreation Committee has voted to endorse a $10 program fee, already incorporated in the proposed budget ($27,750). The Personnel Committee is scheduled to meet on January 18th to review the proposed new position for a Safety & Operations Director budgeted at $100,000 (for wages and benefits). In regard to the Fund Balance, Town Treasurer Jackie Sullivan has indicated an audit will be available by January 22nd. To achieve the Board's target of no increase on the tax rate, an additional $61,420 must be trimmed from the proposed FY17 budget.

Regarding appropriation of funds to the various social service agencies, Susan Shashok suggested that the Board rely on the Policy for the Appropriation of Aid to Health & Human Services Programs for the Benefit of Middlebury Residents (copy attached), and allow voters to decide. Gary Baker noted the Charter House is warned as a separate article, and agreed all others will be proposed as level-funded. Susan requested that Article 3 reflect a change from "Selectmen" to "Selectboard," and asked for clarification regarding a proposed article on the penalty for late tax payments. Town Manager Kathleen Ramsay advised that a 1% penalty is being proposed for payments received within 10 days of the last installment only, followed by a 8% penalty thereafter with interest applied.

Dean George noted the budget must be finalized by January 26th, and encouraged Board members to forward any proposed amendments to the Town Manager prior to that date. Kathleen advised that the last day to file petitions signed by at least 5% of voters with the Town Clerk for articles to be included in the Town Meeting Warning is Thursday, January 14th by 5:00 p.m., and the deadline for nomination petitions for elected office is Monday, January 25th by 5:00 p.m.

9. Award Water Monitoring & Creek Road Sidewalk Engineering Contracts

Director of Operations Dan Werner advised three firms responded to the Town's Request for Proposals (RFPs) for engineering design services for chlorine and fluoride monitoring facilities at the two entry points to Middlebury's water distribution system: Well #2 (Palmer Springs) and Wells 3 and 4, a project necessary in order for the Town to be in compliance with new

requirements under the State's Safe Water Drinking Act. Dan recommended the Board award the project to low bidder Aldrich & Elliott for a total cost of $13,400, noting theirs most closely followed the requirements outlined in the RFP (copies of all three responses attached). Susan Shashok so moved; Laura Asermily seconded. Motion carried with 7 members in favor, none opposed. **MOTION PASSED**.

Dan also reported that the Town recently submitted an RFP for engineering services for the Creek Road Sidewalk and Road Reconstruction Project, and although eight firms had expressed interest, only Dubois & King, Inc. (D&K) submitted a bid by the December 22nd deadline (copy attached). The project will combine two funding sources; 1) a State $250,000 sidewalk grant; and 2) the remainder from the Town's Capital fund. Dan noted that the $75,202 bid from D & K for engineering services is 10% less than the $840,000 cost estimated by Phelps Engineering for both projects, and therefore recommended the Board award the bid to Dubois & King, Inc. for a not-to-exceed amount of $75,202. Nick Artim so moved; Susan Shashok seconded.

Brian Carpenter asked if paving at the new Recreation facility will be included, or if a change order will be considered. Dan advised the project will go out to bid on February 3rd, then back to the Selectboard in March, and in the meantime he will meet with Dubois & King to discuss an add alternative regarding the Recreation Facilities parking lot. Dean George suggested consulting with Breadloaf engineers to obtain the square footage. Motion carried with 7 members in favor, none opposed. **MOTION PASSED**.

10. Consider Resolution Adopting the State of Vermont Section 457 Deferred Compensation Plan

Town Manager Kathleen Ramsay presented a resolution to allow employees to participate in the Vermont Municipal Retirement System's Section 457 retirement savings plan through payroll reductions (copy attached). Kathleen advised the plan is administered by the Vermont Municipal Employees' Retirement System (VMERS) Board and offers much lower fees on investments. Gary Baker moved to authorize Board Chair Dean George to sign the Resolution adopting the State of Vermont Section 457 Deferred Compensation Plan; Brian Carpenter seconded. Motion carried with 7 members in favor, none opposed. **MOTION PASSED**.

11. Adopt Hazard Mitigation Plan

At its December 15th meeting, the Selectboard adopted the Town's Hazard Mitigation Plan, as approved by the Federal Emergency Management Agency (FEMA). Since that time, FEMA has clarified its process for approving the plan at the federal level, noting that the Selectboard must first approve a formal resolution adopting the Hazard Mitigation Plan (copy attached). Laura Asermily so moved; Nick Artim seconded. Motion carried with 7 members in favor, none opposed. **MOTION PASSED**.

12. Approval of Check Warrants

Having reviewed the check warrants from January 6, 2016 through January 12, 2016 (copy attached), Gary Baker moved to approve total expenditures in the amount of $173,931.37 consisting of $84,386.12 for accounts payable, and $89,545.25 for payroll; Laura Asermily seconded. Motion carried with 7 members, none opposed. **MOTION PASSED.**

13. Town Manager's Report

Town Manager Kathleen Ramsay reported that the Town has issued an RFP for the fabrication and installation of interpretive sign panels and parking signs for the downtown Middlebury Visitor Services Project. RFP responses are due by January 15th, and it is anticipated the project will be complete by early summer.

The Town's website now features a new link dedicated to the Means Woods Nature Preserve, including a Field Guide to the Natural History of the Means Woods, and information on the walking trails.

As a follow-up to discussion regarding the grant options in connection with the Exchange Street/Elm Street intersection, the decision was made to forego an application to the Strong Communities, Better Connections Grant Program at this time.

14. Board Member Concerns

Donna Donahue has received a number of positive comments on the new lights at the Memorial Sports Center, and added that the pre-skate event on New Years Event was well attended with some 140 participants.

Laura Asermily thanked employees of Public Works for keeping sidewalks clear of snow in a timely fashion, which helped with the success of the recent Bike to School event.

Gary Baker asked about the status of the Unpaved Roads budget. Town Manager Kathleen Ramsay advised she will provide a report at the Board's next meeting.

Nick Artim recently received a solicitation in the mail for water service line insurance, and cautioned other recipients that the insurance is neither endorsed nor required by the Town of Middlebury.

15. Executive Session
16. Action on Matters Discussed in Executive Session

None.

17. Adjourn

The Board adjourned at 8:55 p.m. The next meeting of the Middlebury Selectboard will be held on Tuesday, January 26, 2016 at 7:00 p.m.

Submitted by,
Peggy Connor, Board Clerk

TOWN of MIDDLEBURY, VERMONT

WARNING

Annual Town Meeting
March 6 and March 7, 2023

The legal voters of the Town of Middlebury, in the County of Addison, the State of Vermont are hereby warned and notified to meet at the Middlebury Union High School Auditorium at 73 Charles Avenue in Middlebury on Monday, March 6, 2023 at 7:00 P.M. to act on Articles 1 through 7, and to discuss Articles 8 through 10, and on Tuesday, March 7, 2023 from 7:00 A.M. through 7:00 P.M. at the Recreation Center, 154 Creek Road in Middlebury, to vote by Australian ballot on Articles 8 through 10 as provided by the Middlebury Town Charter.

With respect to Article 8, the legal voters of the Town of Middlebury are further notified that an informational meeting will be held on Monday, March 6, 2023 at 7:30 p.m. at the Middlebury Union High School Auditorium for the purpose of reviewing the proposal for issuing a bond for construction of a water tank for its public drinking water system. Information on the bond proposal will be presented under Article 7 of the Annual Town Meeting Warning.

Article 1 To act upon the reports of the Town Officers.

Article 2 Shall the voters of the Town of Middlebury vote to adopt the proposed budget for the Fiscal Year 2024 (July 1, 2023 – June 30, 2024) in the amount of $12,921,448 with a portion thereof in the amount of $8,553,380 to be raised by taxes and $809,308 to be allocated from annual local option tax receipts in excess of debt and maintenance requirements of the Cross Street Bridge to offset spending for Capital Improvements?

Article 3 Shall the voters of the Town of Middlebury vote, pursuant to 24 VSA § 2408(a), to authorize the Selectboard to apply up to $228,496 from the Cross Street Bridge Reserve Fund to offset increased capital improvement expenses of $92,860 and PD Adaptive Reuse Building debt service expense of $135,636?

Article 4 Shall the voters of the Town of Middlebury vote, pursuant to 24 VSA § 2408(a), to authorize the Selectboard to apply up to $295,000 from the Cross Street Bridge Reserve Fund for the purchase of the former Maverick Gas Station at 82 Court Street for the purpose of reconfiguring the intersection of Court Street, Monroe Street and Charles Avenue?

Article 5 Shall the voters of the Town of Middlebury vote, pursuant to 24 VSA § 2408(a), to authorize the Selectboard to apply up to One Million Dollars ($1,000,000) from the Cross Street Bridge Reserve Fund for the purpose of constructing of a water tank for its public drinking water system?

Article 6 Shall the voters of the Town of Middlebury vote to collect taxes on real property for fiscal year 2023/2024 in TWO equal installments due in the Treasurer's Office on the 15th day of November 2023 and the 15th day of March 2024?

Article 7 To transact other business proper to be done.

[For voting by Australian Ballot on Tuesday, March 7, 2023, polls open from 7:00 A.M. to 7:00 P.M.]

Article 8 Shall general obligation bonds or notes of the Town of Middlebury in an amount not to exceed Three Million Five Hundred Thousand Dollars ($3,500,000) subject to reduction from available alternate sources of funding, be issued for the purpose of financing the construction of a water tank for its public drinking water system, the estimated cost of such improvements being Three Million Five Hundred Thousand Dollars ($3,500,000).

Article 9 Shall the Town vote to adopt the following amendments to the Charter of the Town of Middlebury?

Language to be added is underlined, and deleted language has a strikethrough.

***Section 302, Elective officers, revise (a) by deleting "(7) Town Treasurer" from the list of officers elected by the Town at its annual Town Meeting:**

~~(7) Town Treasurer~~

*** Section 305, Treasurer, revise (a) as follows:**

(a) The Treasurer shall be appointed by the Selectboard. ~~elected annually at the annual meeting and shall serve for a three year term.~~

*** Section 306, Appointed Officers, revise (d), by adding "(7) a Town Treasurer" to the list of officers the appointed by the Selectboard:**

(7) a Town Treasurer

Article 10 To elect officers as required by the Middlebury Town Charter.

The legal voters of the Town of Middlebury are further notified that voter qualification, registration and absentee voting shall be as provided in Chapters 43 and 51 of Title 17, Vermont Statutes Annotated.

Dated at Middlebury, Vermont this _____ day of January 2023.

Brian R. Carpenter, Chair

Lindsey Fuentes-George, Vice Chair

Heather Seeley

Farhad Khan

Dan Brown

Andy Hooper

Isabel Gogarty

MIDDLEBURY SELECTBOARD

Town of Middlebury
ANNUAL TOWN MEETING
Middlebury Union High School Auditorium
Monday, March 6, 2023

Town Meeting Minutes

Citing the warning to the legal voters of Middlebury, Moderator Susan Shashok called the meeting to order at 7:00 p.m. Susan explained the basic meeting rules, and introduced the Selectboard: Chair, Brian Carpenter, Vice-Chair Lindsey Fuentes-George, Heather Seeley, Andy Hooper, Dan Brown, Farhad Khan and Isabelle Gogarty.

The Moderator introduced Town Manager Kathleen Ramsay and requested permission for the following non-resident members of the Town Administration to speak as needed throughout the meeting: Town Manager Ramsay, Library Director Dana Hart, Director of Public Works Planning Emmalee Cherington and Fire Chief David Shaw. There were no objections.

ARTICLE 1: To act upon the reports of the Town Officers.

Chair Brian Carpenter gave a brief review of 2022.

- New vitality downtown following the Covid shutdown and social distancing allowing people to once again enjoy the many events held downtown.
- The new Amtrak's Ethan Allen Express Train from Vermont to New York City from the new rail platform on Middle Seymour Street.
- The Zoning Bylaws were updated to permit greater residential housing densities and expanded mixed use areas, and our recent approval by the State as a Neighborhood Development Area Designation that provides incentives for development of workforce housing.
- New water lines were installed on Washington Street.
- Colonial Drive was reconstructed with new water, wastewater and stormwater utilities.
- Cady Road was repaved following the replacement of two large culverts.
- Participation in the Middlebury Airport Master Planning process.
- Updating the Noise Ordinance.

Looking ahead to 2023, Carpenter highlighted the following:

- South Street Project – water, sanitary sewer and stormwater improvements.
- Halladay Road Pump Station upgrade.
- Develop plans and budget for Ilsley Library expansion and renovations.
- Wastewater Treatment Facility improvements.
- Police Department storage facility upgrades.
- Continued work with non-profits on an increase in housing and childcare services.

Carpenter said after careful deliberation the Selectboard adopted an FY2024 budget that reflects inflationary pressures and the Town's commitment to a robust Capital Improvement Plan, and an efficient vehicle maintenance and replacement plan while preserving the current level of Town services. He said with the approval of the use of the Cross Street Bridge Funds in Article III, the estimated FY24 Town General Tax Rate would be $.8475, or $.0450 increase from FY23, or a 5.6% increase. He thanked his fellow Board members for their hard work throughout the year and their commitment to the community.

Selectboard member Farhad Khan read the dedication of the 2022 Town Report to retiring Director of Public Works Planning Dan Werner, and Isabel Gogarty read the recognitions to former Selectboard member Esther Charlestin, and retiring Town employees Bill Malloy, Jackie Sullivan and Chris English. Gogarty also presented the Annual Robert E. Collins Award to Kerri Sinks for her extraordinary commitment and dedication to the Parks and Recreation Department.

Heather Seeley moved to adopt Article 1; Farhad Khan seconded.
Motion Passed by unanimous voice vote: Article 1 Adopted

ARTICLE 2: Shall the voters of the Town of Middlebury vote to adopt the proposed budget for the Fiscal Year 2024 (July 1, 2023 – June 30, 2024) in the amount of $12,921,448 with a portion thereof in the amount of $8,553,380 to be raised by taxes and $809,308 to be allocated from annual local option tax receipts in excess of debt and maintenance requirements of the Cross Street Bridge to offset spending for Capital Improvements?

Jeremy Rathbun moved to adopt Article II, and Nick Artim seconded.

Ramsay said the FY24 budget presented for voter consideration incorporates input the Selectboard has received over the years to draw on reserves to minimize increases in the tax rate and to use Local Option Tax revenue in excess of what is needed for the Cross Street Bridge debt to fund infrastructure improvement projects, reduce amounts borrowed and for leveraging grant and other funding.

Ramsay said the major drivers in this year's budget were wages ($326,500), employee benefits ($179,100), equipment maintenance ($49,000) and equipment purchases ($21,400), equipment fuel ($23,000), Police Department adaptive reuse bond ($124,4160) and Capital Improvements ($92,870). She said the items that offset these increases are administrative charges in the Water Fund ($26,400) and Wastewater Fund ($17,600), General Fund interest ($115,000) and Cross Street Bridge Fund interest ($75,000).

Ramsay went over the breakdown of funding and the operational expenses and capital expenses by department and the Capital Budget, and an overview of the Local Option Tax receipts for the last 5 years, the Cross Street Bridge Fund debt, and the Local Option Tax funds available and proposed for Capital Improvement projects. She said the Selectboard has presented a budget requiring only a modest increase in the property tax rate this year, and asked residents to keep in mind that increases in wages, benefits, replacement of vehicles and equipment and unfunded mandates, as well as the uncertainty of inflation and the economy, and the future of state and federal funding and dwindling reserves, will put significant pressure on budgets in FY25 and beyond.

Discussion

James Malcolm asked about the Cross Street Bridge Funds timeline and Ramsay said they were bonded in 2010 for a 30-year term.

David Silberman asked about the roughly $200,000 this year for the Police Department Reuse Plan, when he thought we approved funds for this project a few years ago. Ramsay said in 2020 voters approved a bond for the Police Department Reuse Plan which was secured through the Municipal Bond Bank for a 7-year term. The proposed use of Cross Street Bridge Funds will pay the current debt service on that bond.

Diane Lawson asked about the $30,000 in the budget for Town Archives. Ramsay said when the Town Offices moved into the new offices in 2016, there was an extensive collection of old records that have been stored in various location around town, and this is a proposal to digitize these records.

Victoria DeWind asked if there would be a roundabout at the Court Street/Charles Avenue/Monroe Street intersection. Ramsay said we have hired VHB engineering to do a preliminary study and the results said the best option was to do an alignment with a 4-way intersection. She said they did analyze a roundabout, but it ranked lower than the 4-way intersection. Director of Public Works Planning Emmalee Cherington said one problem with a roundabout in that location was safety concerns given the number of bike and pedestrians that would be using the roundabout.

Meg Baker asked about sidewalks and traffic calming measures considering the high number of students that walk in that area. Ramsay said there are many years left in planning this and there will be lots of opportunities for public input before this is constructed.

Robin Barovick asked what the Police Chief's salary is. Ramsay responded it is one of our most underpaid civil servants for the amount of responsibility he has, and she thinks it's just over $100,000.

Laura Asermily questioned the $160,000 in the budget for salt, and asked if a more modest use of salt would be better. Director of Public Works Operations Bill Kernan said the increase in the line item for salt does not reflect an increase in use, just an increase in cost. Asermily said she would like to see a reduction in the use of it.

Lindsey Hescock asked how many school resource officers do we have, since the amount budgeted is $93,400. Ramsay said we have one officer, and that amount includes all the benefits as well as wages.

The Moderator called the question.

Motion Passed by unanimous voice vote: Article 2 adopted.

ARTICLE 3: Shall the voters of the Town of Middlebury vote, pursuant to 24 VSA § 2408(a), to authorize the Selectboard to apply up to $228,496 from the Cross Street Bridge Reserve Fund to offset increased capital improvement expenses of $92,860 and PD Adaptive Reuse Building debt service expense of $135,636?

Heather Seeley moved to adopt Article 3, and Farhad Khan seconded the motion.

Fuentes-George said in order to offset the FY24 budget increase and reduce the impact on the tax rate, the Selectboard propose applying $228,496 of the Cross Street Bridge Reserve Funds to cover the debt service as proposed to voters when the bond was approved in 2020 and to cover the increase in capital improvements in FY24. She said the debt service on the PD Adaptive Reuse Project of $135,636 was planned when the Town bonded for the project for seven years rather than twenty years, allowing the Town to save an estimated $179,000 in interest expenses vs. a twenty-year bond. She said this transfer will also offset an increased capital improvement spending of $92,860 for time sensitive items one-time expenses including schematic design costs and fund-raising consultant fees for the Ilsley Library expansion project. She said if approved,

the transfer will shave $.023 cents off the tax rate estimated for FY2024.

Discussion

Jeremy Rathbun asked if the fee for the schematic design included a contingency fund for things that might come up. Ramsay said the total budget amount for the schematic design and fund raising for the library is $163,000 and this amount is simply the increase in the Capital Budget this year.

Ross Conrad asked what the other projects were being covered by these funds. Ramsay said in addition to the library, there are the usual projects including sidewalk upgrades, paving and road maintenance.

Max Kraus asked for a reminder of what the Adaptive Reuse Project was. Fuentes-George said it was to reuse the former wastewater plant for storage and vehicles for the Middlebury Police Department.

The Moderator called the question.

Motion passed by unanimous voice vote: Article 3 adopted.

Article 4: Shall the voters of the Town of Middlebury vote, pursuant to 24 VSA § 2408(a), to authorize the Selectboard to apply up to $295,000 from the Cross Street Bridge Reserve Dund for the purchase of the former Maverick Gas Station at 82 Court Street for the purpose of reconfiguring the intersection of Court Street, Monroe Street and Charles Avenue?

James Malcolm moved to adopt Article 4. Gary Baker seconded the motion.

Brian Carpenter said we've all experienced a traffic jam on Court Street, and the traffic planners and engineers have all indicated that the main issue to be addressed first is the congestion at that very awkward intersection coming out of the high school at Charles Avenue by the Maverick Gas Station. He said as the first step in realigning this intersection, the Selectboard secured a purchase and sale agreement with the Maverick Gas Station. He said the Board proposes the use of $295,000 from the Cross Street Bridge Reserve funds to purchase that property that is needed for the realignment of this intersection to create a single, 4-way intersection to replace the current staggered configuration.

He said with the help of the Addison County Regional Planning Commission, the Town is applying for funding from the State's brownfields clean-up fund. He said using Cross Street Bridge Funds to purchase the property avoids the cost of issuing a bond and interest expense while the plan is finalized and funding for the realignment is secured. He said if the Town purchases the property, there are Capital Improvement funds set aside to maintain the property and make minor cosmetic improvements to improve the appearance of this property sitting at this major intersection. He said they would appreciate the support for this opportunity to address a critical infrastructure improvement to correct the traffic flow on Court Street.

Discussion

James Malcolm said in the late 1990's when major improvements were made at the high school, the Town wanted to align this intersection then and told the high school they needed to do it as part of their improvements. He said the high school could not do that since the owner of the gas station at the time didn't want to sell. He suggests we approve this to get this alignment done, since it's been 70 years since the high school was built and the development of the Buttolph Acres area and the traffic is significantly different.

Ellen Cronin asked if the sales price would be adjusted based on the findings of the environmental review. Carpenter said there is an agreed price in the purchase contract, but if there is something found we don't know about we may have to back out of it, however we know it's a brownfield, the tanks are already out of the ground, so while he can't promise nothing will be found, they have anticipated for this and is why the purchase prices is the assessed value. He said they've looked to purchase this property before, but prior inquiries to the company had strings attached to the purchase, but now they feel they have a fair contract and we are not assuming all the risk on this.

David Silberman said he thought this was a great project, and asked how "far down the road" is this project. Carpenter said if this is approved, we'll be working on the plans but between planning, permitting and funding he feels 5-years would be an aggressive plan. Silberman asked if we had any idea of what our maximum liability exposure would be for anything over the brownfield insurance protection. Ramsay said as she understands it so far, the polluting parties are the ones responsible forever and we would be applying to the program as an innocent purchaser to minimize any liability. Carpenter said they tried to assign the risk to the Town, but we were not willing to accept it.

Dawn Saunders asked what the plans were to improve the appearance of the property during the planning stages, such as leveling it. Ramsay said her original plan had been to demolish the building, but then remembered we have all the old town records traveling around town in storage and decided that would be a good location for them.

Tyler Ayers asked what studies and assessments had already been done and is there any sense of what the overall cost might be to do this alignment. Ramsay said when VHB did the conceptual look at this intersection it was 2015 and the estimate was $1.5 million, and we all know what's happened with prices since then.

Emmalee Cherington said since the initial study and the purchase of the gas station, the Vermont Agency of Transportation has now expressed interest in the project and they may help offset some of the costs.

Jeremy Rathbun confirmed that this vote is approving the purchase of the Maverick Gas Station after an environmental assessment is complete so we know what we're getting into, and Carpenter said that is correct.

Motion passed by unanimous voice vote: Article 4 adopted.

Brian Carpenter said James Malcolm asked about the Local Option Tax and it was pointed out that in 2010 we bonded for 30-years, which would take us to 2040. He said this has been talked about before, and the reality is that the Local Option Tax is here to stay. He said it has allowed us to do things and projects that have lagged for far too long and allows the greater community

to share the cost, and if you look throughout the State there are more towns that are beginning to utilize it as a way to fund infrastructure rather than just by property taxes. He said it's safe to assume that as we do our budgeting, while we want to be sure there are enough funds to take care of the needs of the Cross Street Bridge, beyond that we will utilize those funds for things that are critical to the town.

Article 5: Shall the voters of the Town of Middlebury vote, pursuant to 24 VSA § 2408(a), to authorize the Selectboard to apply up to One Million Dollars ($1,000,000) from the Cross Street Bridge Reserve Fund for the purpose of constructing of a water tank for its public drinking water system?

Alan Shashok moved to adopt Article 5. Gary Baker seconded the motion.

Selectboard member and Chair of the Infrastructure Committee Heather Seeley said that in 2017 the Town received the results of a hydraulic study of the Town's water system that identified and prioritized needed repairs and improvements. She said in 2022 we competed the first item on the priority list, the completion of the Court St/Washington Street waterline replacement, and the second priority on the list was the need for a 1.5 million gallon concrete tank on Chipman Hill.

She said Article 5 is asking voter approval to use $1 million in Cross Street Bridge Reserve Funds to offset the proposed $3.5 million cost of this project and is the same process used to help fund the Court Street/Water Street waterline project costing $3 million. Seeley said, however, through the hard work and initiative of Town staff, the Town of Middlebury was fortunate to receive $1.36 million in loan forgiveness (we don't need to pay it back) and $975,000 in no-interest finance with a 2% administration fee from the Drinking Water State Revolving Loan Fund (DWSRF) and $600,000 funding from the Northern Regional Commission Grant Program. As a result, we did not need to tap into the Cross Street Bridge Funds approved by voters in 2020 for this project, so she'd like to recognize the hard work of Town staff in this huge accomplishment (applause). She said we are using a similar financing strategy for this water tank project and are hoping for a similar outcome. She said the benefit to using the Cross Street Bridge Reserve Funds is to help offset the cost of bonding for this project, and it also broadens the payer base for funding infrastructure needed for residents, businesses, public services, schools, the hospital and firefighting and everyone benefits from this project, not just the water users, and it also reduces interest expense from borrowing.

Discussion

Charles Mraz asked what the need for this water tank is. Seeley said prior to the 2017 hydraulic study, the State Permit for our water system identified deficiencies in our fire flows and demand at peak times for water, and the 2017 study reiterated this problem. She said the system is required to permit a certain level of fire flows and at certain times there is a problem with the current water supply to meet the fire flows and the water demand. Mraz asked if the water source off RT 116 had adequate water supply and why couldn't we just increase the amount pumped to the reservoir. Emmalee Cherington said the Palmer Springs pump already pumps 20 hours per day to the reservoir, so it would be hard to increase the pumping from Palmer Springs, which is the main source.

Ross Conrad asked if this was a tank or tower. Seeley said it was an above ground, concrete storage tank. Conrad asked what it was lined with, since concrete has been known to have cracks. Seeley didn't believe the current tank is lined, and we'll know more when we get into the

construction. Conrad said concrete is porous and water is such a valuable resource, so we need to respect this.

Jeremy Rathbun, an engineer, said that the State requirement for storage is independent from supply, and requires several hours of fire flow that he believes it's 3,500 gallons per minute, so while we have a huge source, the State requires that much storage.

Amy Sheldon asked about the footprint of the tank on Chipman Hill and also the balance in the Cross Street Bridge Funds for bridge maintenance. Ramsay said after all these proposed Articles, there will be $1.5 million remaining in the Fund for bridge maintenance and that is more than enough for any maintenance coming up in the foreseeable future, and we have a 20-year maintenance plan. Seeley said there is a site plan of the Chipman Hill site on the handout prepared for the tank project, and the proposed tank will fit within the Town's existing property boundary. Emmalee Cherington said it is a prefab concrete tank that will be constructed on the location of the old reservoir on the western side of the property and will be 80' in diameter and 60' in elevation and won't been seen from the roadway.

Tyler Ayers asked about the two separate Articles for this project and was this $1 million added to the amount in Article 8, and what happens if one Article is approved, but one isn't. Ramsay responded that we need to bond for the entire cost of the project. Seeley said if Article 5 is approved, then the amount of the bond in Article 8 will be reduced by that amount. Seeley said if voters didn't approve the $1 million from the Cross Street Bridge Funds, but they approved Article 8, then we would bond for the entire amount of the project. If Article 5 is approved, but Article 8 isn't, then we wouldn't be able to do the project and we wouldn't draw funds from the Cross Street Bridge Reserve Funds.

Dawn Saunders said this is being done for the purpose of the "public drinking water" and she assumes that means the Middlebury's water system, and she's always wondered about the connection between the Middlebury and East Middlebury water systems. She said both water systems need adequate water for fires, but she wonders how the financing works and are there similar motions and funding mechanisms for when the East Middlebury Fire District water system needs help. Seeley said there are two separate systems, and the users of the East Middlebury Fire District #1 users pay for that system with their user rates, similar to the Middlebury Water System and these funds are separate from the general budget funds.

Joe McVeigh asked for a reminder on what Seeley had said earlier in the discussion of Article 5 that was important, and Seeley said she had called attention to the success the Town staff has had in acquiring funds for water system improvements that did not come from rate users or the Cross Street Bridge Reserve Funds. She said they are hoping to have the same success with this project so we won't have to use the money from the Cross Street Bridge Reserves.

Charles Mraz said he lives on Springside Road on the way to the Chipman Hill reservoir, and that road is already in rough shape, and he's concerned about all the heavy trucks that will be on that road for this project. Seeley said she agrees that we're a little behind in keeping the roads in good condition and we've been prioritizing road projects over the last few years. Springside Road is on the list for 2025, following completion of the water tank project.

The Moderator called the question.

Motion passed by unanimous voice vote: Article 5 is adopted.

Article 6: Shall the voters of the Town of Middlebury vote to collect taxes on real property for fiscal year 2023/2024 in TWO equal installments due in the Treasurer's Office on the 15th day of November 2023 and the 15th day of March 2024?

Nick Artim moved to adopt Article 6. Laura Asermily seconded the motion.

Selectboard member Andy Hooper said the local municipal tax and the State education tax are both issued in one tax bill at the local level. He said the State education tax is income sensitive and the calculation of the State tax relies on the database provided by the State and is updated throughout the year until early October. He said with Middlebury's first tax installment due on August 15th, we had to have the bills in the mail by July 15th, before all the information to calculate the State education tax had been received from the State, so bills were calculated using incomplete or outdated information that resulted in errors on the tax bills that causes stress for taxpayers and additional work for the Town's staff. He said pushing the first payment for property taxes until November 15th, allows us to receive all the calculations and updates from the State prior to calculating and mailing tax bills in mid-October allowing for accurate tax bills, so this year the Selectboard is proposing property taxes be paid in two installments; November 15th and March 15th. Hooper said for those wishing to pay in three installments, early, partial payment options are available by calling the finance office.

Victoria DeWind said the wording of the Article implied this was for one year only and wasn't on-going. Ramsay replied that voters are required to vote on this every year.

Diane Lawson asked if March 15th is the latest tax bills could be paid in the fiscal year. Hooper said the Finance Office had indicated the payments could be spread from November 15th, March 15th and May 15th. Lawson asked if they wanted to go with two payments, why not go with November 15th and May 15th. Ramsay said having the last payment on March 15th was considered the optimal time to be able to follow up with delinquent payments and get most of them cleaned up before the end of the fiscal year.

Robin Stattle said in 2020 tax payments went from 3 to 2 and wondered if that caused any adverse impacts. Ramsay said it hadn't, but we had been unable to articulate the reason for going from 3 to 2.

Tyler Ayers spoke in favor of the 3 payments saying it just made it easier to break the payments up, and the delinquent taxes are only about 2% of the income from taxes.

Dayton Wakefield said he was 100% behind this Article, because his tax bill last year had been totally messed up with both the Town and State and he didn't want to go through it again.

The Moderator called the question.

The motion was passed by voice vote: Article 6 is adopted.

Article 7: To transact other business proper to be done.

(For voting by Australian Ballot on Tuesday, March 7, 2023, polls open from 7:00 a.m. to 7:00 P.M.)

Article 8: Shall general obligation bonds or notes of the Town of Middlebury in an amount not to exceed Three Million Five Hundred Dollars ($3,500,000) subject to reduction from available alternate sources of funding, be issued for the purpose of financing the construction of a water tank for its public drinking water system, the estimated cost of such improvements being Three Million Five Hundred Thousand Dollars ($3,500,000).

Heather Seeley said the Selectboard is asking for your approval to bond for construction of a 1.5-million-gallon concrete storage tank on Chipman Hill adjacent to our current storage tank. She said the construction proposal includes tree planting to provide bank stabilization, screening and to provide natural habitats. She said our current tank is undersized and does not provide sufficient storage volumes for average daily demands and fire flows, and the additional tank will provide sufficient peak hourly demand, 3,500 gallons per minutes fire flow demand, stabilize water pressure and allow the Town to provide water service during repairs. She said the Town staff is working to identify grant funding and low-interest rate financing and/or loan forgiveness options that would eliminate the need to bond for the estimated $3.5 million cost of the project, and to qualify for these funding sources the Town must show proof of community support for the project and a successful bond vote confirms voter and community support.

Seeley said the engineering costs of $62,000 is funded through the Water Capital Improvement Fund. She said the funding options include the Capital Improvement Fund, a water rate increase (bond vote), Cross Street Bridge Fund Reserve approved in Article 5, and the State Revolving Fund Loan/Grant that requires a bond vote. She said a successful bond vote would help leverage State and federal funds and the goal is to reduce the costs to our residents.

Discussion

Alice Eckles asked if this additional storage is needed as a requirement for the State permit, and what happens if it isn't approved. Emmalee Cherington said the State could revoke our permit and the Town would not be able to distribute water.

Bruce Meacham asked if this proposed tank would replace the existing tank. Seeley said this would be an additional storage tank on Chipman Hill. Meacham asked how large the existing tank is and how much water does the town use in a day. Cherington said the existing tank is 1.50 million gallons and the average daily water use is 1.2 million gallons.

James Hand asked if Middlebury College was on the Town water system and if they were, what would their share be. Seeley said if the Town is able to secure funding to cover this then the water rates would not increase, but if we need to pay the Bond, then the water rates would be increased to pay for the Bond and all water users would share the cost. Hand asked about the money from the Cross Street Bridge Reserves, and Seeley said that money comes from the 1% Local Option Taxes that everyone contributes to through sales tax and rooms and meals tax.

Article 9: Shall the Town vote to adopt the following amendments to the Charter of the Town of Middlebury? Language to be added is underlined, and deleted language has a strikethrough:
***Section 302, Elective officers, revise (a) by deleting "(7) Town Treasurer" from the list of officers elected by the Town at its annual Town Meeting. ~~(7) Town Treasurer~~**
***Section 305, Treasurer, revise (a) as follows: (a) The Treasurer shall be appointed by the Selectboard. ~~Elected annually at the annual meeting and shall serve for a three year term:~~**
***Section 306, Appointed Officers, revise (d), by adding "(7) a Town Treasurer" to the list of officers the appointed by the Selectboard:**

Selectboard member Dan Brown said we've been fortunate that we've had very competent and honest individuals who have been elected as Town Treasurer, and the last one was Jackie Sullivan who has retired and currently by Beth Dow, who has stepped up to fill the position. He said we are proposing a change to the Town Charter to allow for this position to be an appointed position rather than an elected position. He said the Selectboard feels a fiduciary responsibility to ask voters for this change for the appointment of this position and feel it's essential for our financial operations and good governance. Brown said if this proposed change to our Town Charter is approved by the voters, then it needs to go for approval from the State Legislature.

Ellen Cronin asked what the job entailed, and Brown said the Treasurer's job is actually about 5 hours per week and as it's set up now the Treasurer is elected by the voters, but this proposed change would allow the position to be appointed and allow an opportunity for applicants to be interviewed and do background checks to determine we get the proper person.

Dave Silberman asked what the Town Treasurer does. Brown said they keep track of the checking account, and they sign checks and balance the checkbooks.

Dawn Saunders asked if Jackie Sullivan had been an employee as well as Town Treasurer. Brown said since there is only about 5 hours a week of work for the Treasurer, we've found it to be more efficient to combine those duties to an existing staff position in the Finance Office. Saunders is concerned that this infers an elected position isn't as trustworthy, and Brown said not necessarily, but the Selectboard doesn't have the option of who is elected.

George Klohck asked if Middlebury has researched how other Vermont towns handle this, and Brown said according to Vermont Digger there are 20 other towns in Vermont that are changing elected positions to appointed positions, and there were 20 last year as well.

Gary Baker said it's his understanding you cannot do a background check on an elected official, and we all know of other communities that have had hundreds of thousands of dollars stolen by financial officials. Brown said the Board feels this is the responsible thing to do for good governance.

Article 10: To elect officers as required by the Town Charter.

The Moderator said this was an opportunity for town residents running for office to introduce themselves and speak, as well as out-of-town residents who are running for the Addison Central School District (ACSD) Board.

The following candidates asked voters for their support:

Isabelle Gogarty – Middlebury Selectboard
Dan Brown – Middlebury Selectboard
Brain Carpenter – Middlebury Selectboard
Laura Harthan– ACSD School Board (Middlebury)
Ellen Whelan-Wuest – ACSD School Board (Cornwall)
Chris Kramer – ACSD School Board (Cornwall)

Steve Orzech, who is a current ACSD Board member and is not running for re-election, spoke about the challenge the Save Our Schools (SOS) organization is posing to the ACSD Board by having members elected to the Board and they are not being transparent about who these members are.

Ann Webster said she is running for re-election as Middlebury Town Clerk, but she is trying to retire and has an agreement with the Selectboard to continue on through this fiscal year, so encouraged anyone interested in being Town Clerk to please step forward so she can work with them in the time remaining to allow for a smooth transition.

Laura Asermily spoke on the Annual Town Meeting Poll and the items included on the poll, including an item on a public rest room facility.

Joe McVeigh, President of the Ilsley Library Board of Trustees and member of the Ilsley 100 Project Team, gave a presentation on the work done to-date by the Ilsley 100 Project Team on the much needed expansion and renovation of the existing library building. He described the comprehensive process that went into exploring options over the last year, before choosing an option that was endorsed by the Selectboard. He said the Team is now in the process of reviewing qualifications of design firms that have shown interest in the project, and in April they hope to choose 3 or 4 to submit schematic designs in a design competition before choosing the final firm that will involve a public process and community engagement. He said the current estimation of cost for this project is $14.8 million, and they are currently working on ways to fund this, including grants, fundraising, federal and state appropriations, and municipal financing in the form of a bond.

Ross Conrad, the Middlebury delegate on the Maple Broadband Board said this is a 20-member board made up of representative from Addison County towns to form one of ten tax exempt communications union districts in Vermont. He said their focus is high-speed fiber broadband service for everyone in the county and everyone in our town in areas who aren't served or are underserved. He spoke on their funding that comes from grants that come with limitations, and some funds are coming from ARPA funds from member towns. He said the Vermont Community Broadband Board has recently pledged to match any funds that Town's contribute, and they calculate they need another $15 million to have the entire Addison County covered with fiber broadband. He said they've built about 25-miles so far and have been able to do a small corner of Middlebury by Blake Roy Road, and they hope to do more of Middlebury in Phase 2, and the remainder of the town in Phase 3. He said they appreciate the Middlebury Selectboard and their consideration of contributing a small portion of Middlebury's ARPA funds.

Addison County Senator Ruth Hardy gave a quick presentation and update on the bills being worked on by the Health and Welfare Committee and the Government Operations Committee that she serves on.

Margaret Klohck moved to adjourn and Isabelle Gogarty seconded the motion.

Motion to adjourn passed by unanimous voice vote.

The 2023 Annual Town Meeting adjourned at 9:45 p.m.

Minutes submitted by,
Beth Dow

Susan E Shashok
Moderator, Susan Shashok

Town Clerk, Ann Webster