

# Hamburg Community Strategic Development Project

## 2019 DRI Application

Applications for the Downtown Revitalization Initiative (DRI) must be received by the appropriate Regional Economic Development Council (REDC) by **4:00 PM on May 31, 2019** at the email address provided at the end of this application.

### **BASIC INFORMATION**

**REDC Region:**

Western New York

**Municipality Name:**

Village of Hamburg, New York

**Downtown Name:**

Hamburg Community Strategic Development Project

**County Name:**

Erie

**Applicant Contact(s) Name and Title:**

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## **VISION FOR DOWNTOWN**

The Village of Hamburg, New York will serve as the sponsor for the Hamburg Community Strategic Development Project. Moreover, the Village of Hamburg and Town of Hamburg will serve as partners in the development and implementation of the proposed project. Please see the Project Map in Section Downtown Identification #1 (page 7) and Attachment 1 for a clear description and identification of the DRI Area.

It is the vision of the Hamburg Community stakeholders to utilize their recent revitalization successes, strategic location within region, and their existing capacity for retail, mixed-use, transportation, waterfront, and residential revitalization efforts to ultimately experience sustainable DRI growth. Specifically, the proposed Hamburg Community Strategic Development Project will target existing vacant or underutilized sites for retail, business, and mixed-use revitalization. As determined by the Town of Hamburg Retail Space Revitalization Committee in May 2019, existing vacant retail space within the Town of Hamburg is at approximately 30%. Moreover, a recent underutilized sites study, funded by an Empire State Development Corporation grant, identified portions of the Hamburg Community that are currently underutilized and serve as the focus of the proposed DRI revitalization efforts.

Ultimately, it is the primary objective of the Hamburg Community Strategic Development Project to transform the steadily developing Hamburg Community into a vibrant component of the Western New York Region where the next generation of New Yorkers will want to live, work, raise a family, and invest. The proposed project is based on revitalization efforts, multimodal transportation, waterfront development, community readiness, and potential for sustainable growth. The proposed Hamburg Community Strategic Development Project is comprised of five (5) revitalization components (RC):

- [1] RC-1: Lake Street/ Camp Road Corridor Development
- [2] RC-2: South Park Shopping District Development
- [3] RC-3: Multimodal Transportation & Connectivity
- [4] RC-4: Local Waterfront & Greenway Development
- [5] RC-5: West End Mixed-Use District Development

## **JUSTIFICATION**

Hamburg, New York is located directly south of the City of Buffalo and is considered the “Gateway to the Region” while traveling from the south and west. U.S. Interstate 90 travels directly through the Hamburg, New York in route to the cities of Buffalo, Rochester, Albany, and New York City. Additionally, U.S. Routes 219, 75, 62, & 20 and NYS Route 5 all travel directly through Hamburg, New York. The Village and Town of Hamburg also act as a transition from the City of Buffalo urban sprawl to the suburban/ rural communities of southern Erie County. It is estimated that the Village of Hamburg, Town of Hamburg, and southern Erie County have approximate populations of 10,000, 60,000, and 250,000, respectively. The Village and Town of Hamburg serve as an economic hub for the regional community and have a vibrant night life that revolves around its village and “main street” restaurants and retail shops. Additionally, the Village and Town of Hamburg are home to many large scale shopping centers, businesses, recreational facilities, venue attractions, and festivals that are constantly bringing individuals into the community from the Western New York region to include but not limited to: The McKinley Mall (currently in transition), numerous shopping plazas/ stores/ restaurants, the Lakeview Recreation Site, 18 Mile Creek Golf Course, the Erie County Fair, Hamburg Gaming, Buffalo Raceway, Burgerfest, and weekly farmers markets (seasonal). In 2018, the Erie County Fair attracted approximately 1,250,000 individuals from the regional community over the ten (10) day event.

The Village of Hamburg commissioned a market analysis to take a closer look at redevelopment areas and assess the strength of the market for retail, residential, and commercial use. The market analysis identified that a lack of diversity in housing types limited the ability to attract new residents and new housing types are needed to complement the recently revitalized Hamburg Business District (Buffalo and Main Streets). The market analysis identified opportunities for specialty retail development and noted that a lack of commercial office space for lease limited the office market in the Hamburg Community. Moreover, the market analysis was prepared to determine market realities. Some of the key findings included:

- Projected demand for 180,000 square feet of office space over the next 10 years within the study area
- Projected demand for 90,000 square feet of industrial space over the next 10 years within the study area
- Projected demand for 150,000 square feet of eating and drinking space over the next 10 years within the study area
- Projected demand for 50,000 square feet of specialty retail space over the next 10 years within the study area
- Projected demand for 255 new workforce apartments, 17 new market rate owner occupied townhouses/condos, and 116 new market rate traditional owner-occupied single family homes over the next 20 for the entire Hamburg Community

In 2016, the Village of Hamburg finalized an engineering plan for the development of a pedestrian bridge to provide connectivity between Centennial Overlook Park and the Anna Mae Bacon Bird Sanctuary. Please note that this engineering plan was prepared in alignment with a proposal from the Buffalo Niagara Waterkeeper to establish the 18 Mile Creek (Designated NYS Inland Waterway) Greenway.

In 2017, the Village of Hamburg initiated the Hamburg Multimodal Trails Master Plan as a collaborative venture with the Town of Hamburg to develop a comprehensive trails system focused on regional connectivity. The Hamburg Multimodal Trails Master Plan is comprised of ten (10) trail components that provide connectivity from the Hamburg Community to surrounding communities.

Additionally, in 2017, the Village of Hamburg finalized the Hamburg Underutilized Sites Strategy Study, which was supported by an Empire State Development Corporation grant. The overall goal of the project was to develop a revitalization initiative for a 261-acre area impacted by 46 underutilized and vacant properties. The Village of Hamburg also secured a Local Government Efficiency (LGe) grant to study the relocation of the Village of Hamburg DPW, Erie County, and NYS Highway operations to a more suitable location.

The Hamburg Underutilized Sites Strategy Study began with an extensive inventory and analysis of the existing conditions in an effort to determine constraints and opportunities throughout the study area. Some of the key inventory findings included:

- The study area is impacted by 46 underutilized and vacant properties, many of which are clustered west of the railroad within the Lake/ Camp Corridor and on either of the railroad within the West End
- Transportation access is exceptional, including I-90, State Highway 75, US Highway 62, rail, and a regional bus system
- Infrastructure access and capacity is excellent (with the exception of small areas without access to sanitary sewer) and can support large scale redevelopment
- A sizable portion of the study area is owned by public and quasi-public agencies, particularly within the West End, which could aid in redevelopment efforts
- Natural resources are nearly non-existent within the study area, eliminating one of many development hurdles

As previously stated, the proposed project is based on revitalization efforts, multimodal transportation, waterfront development, community readiness, and potential for sustainable growth. The proposed

Hamburg Community Strategic Development Project is comprised of five (5) revitalization components (RC):

- [1] RC-1: Lake Street/ Camp Road Corridor Development
- [2] RC-2: South Park Shopping District Development
- [3] RC-3: Multimodal Transportation & Connectivity
- [4] RC-4: Local Waterfront & Greenway Development
- [5] RC-5: West End Mixed-Use District Development

A brief description of each component is identified in the subsequent paragraphs.

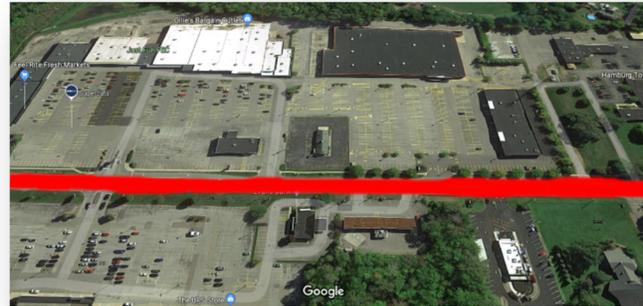
#### [1] RC-1: Lake Street/ Camp Road Corridor Development

The RC-1: Lake Street/ Camp Road Corridor Development refers to the revitalization efforts of vacant retail space, underutilized sites, and abandoned business structures located along Lake Street, Camp Road, and Elmview Avenue in both the Village and Town of Hamburg. This revitalization component was analyzed as part of the recent Hamburg Underutilized Sites Strategy Study and is located along the heavily traveled Route 75, which is the gateway through the Town into the Village.



#### [2] RC-2: South Park Shopping District Development

The RC-2: South Park Shopping District Development refers to the revitalization efforts of one of the premier shopping districts in the Town of Hamburg. The South Park Shopping District encompasses Town Hall Plaza and is in close proximity to the Erie County Fair Grounds, Hamburg Gaming, and Buffalo Raceway and serves as the primary gateway into the Town of Hamburg. Over the past two decades, the South Park Shopping District has steadily deteriorated and as identified by the Town of Hamburg Retail Space Revitalization Committee has twenty-five (25) rental units with thirteen (13) vacancies in addition to, two (2) boarded up sites previously utilized by Kmart and Friendly's Restaurant. The South Park Shopping District was once one of the premier centers in the Town of Hamburg and an area of pride among residents.



### [3] RC-3: Multimodal Transportation & Connectivity

RC-3: Multimodal Transportation & Connectivity refers to the development of a community wide comprehensive multimodal transportation system focused on connectivity. Moreover, the multimodal transportation components are focused on expanding the capacity for vehicular traffic flow through the development of roundabouts. Expanding the capacity for pedestrian/ biking travel through the implementation of a trails system and for the enhancement of transportation for seniors and individuals with disabilities through the expansion of the existing Town of Hamburg 5310 Transportation Program. Additionally, it is expected that the proposed project will include the development of a transit hub in one of the three (3) identified revitalization areas.



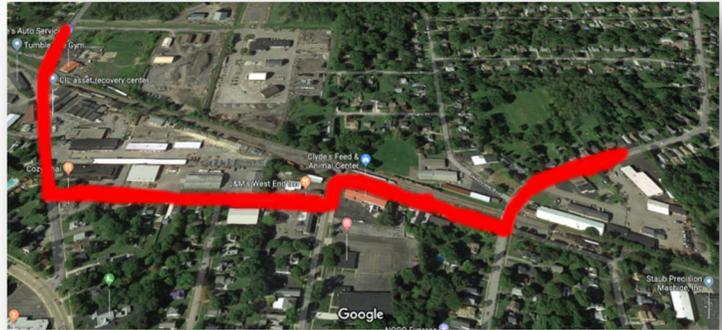
### [4] RC-4: Local Waterfront & Greenway Development

[4] RC-4: Local Waterfront & Greenway Development refers to the development of the Lake Erie Waterfront and the 18 Mile Creek Greenway. In 2015, the Village of Hamburg petitioned and was approved by DOS for the designation of the 18 Mile Creek as an inland waterway. In 2018, the Town of Hamburg received an LWRP award from DOS (CFA) for a marina feasibility study. In 2019, the Town of Hamburg will apply for a grant from DOS (CFA) for the redevelopment of the existing Town of Hamburg LWRP (Plan), which will expand the LWRA to include the Village of Hamburg and 18 Mile Creek Greenway Area. It is expected that the Hamburg Community Strategic Development Project will directly serve as a catalyst for the development of 18 Mile Creek Greenway. Please note that a significant portion of the greenway will travel through the existing Hamburg Business District (Buffalo and Main Streets in the Village of Hamburg). Please also note that the proposed project will include collaboration with and assistance from the Buffalo Niagara Riverkeeper. The proposed project is also expected to indirectly serve as a catalyst for the development of the Lake Erie waterfront and potential marina in the Town of Hamburg.



### [5] RC-5: West End Mixed-Use District Development

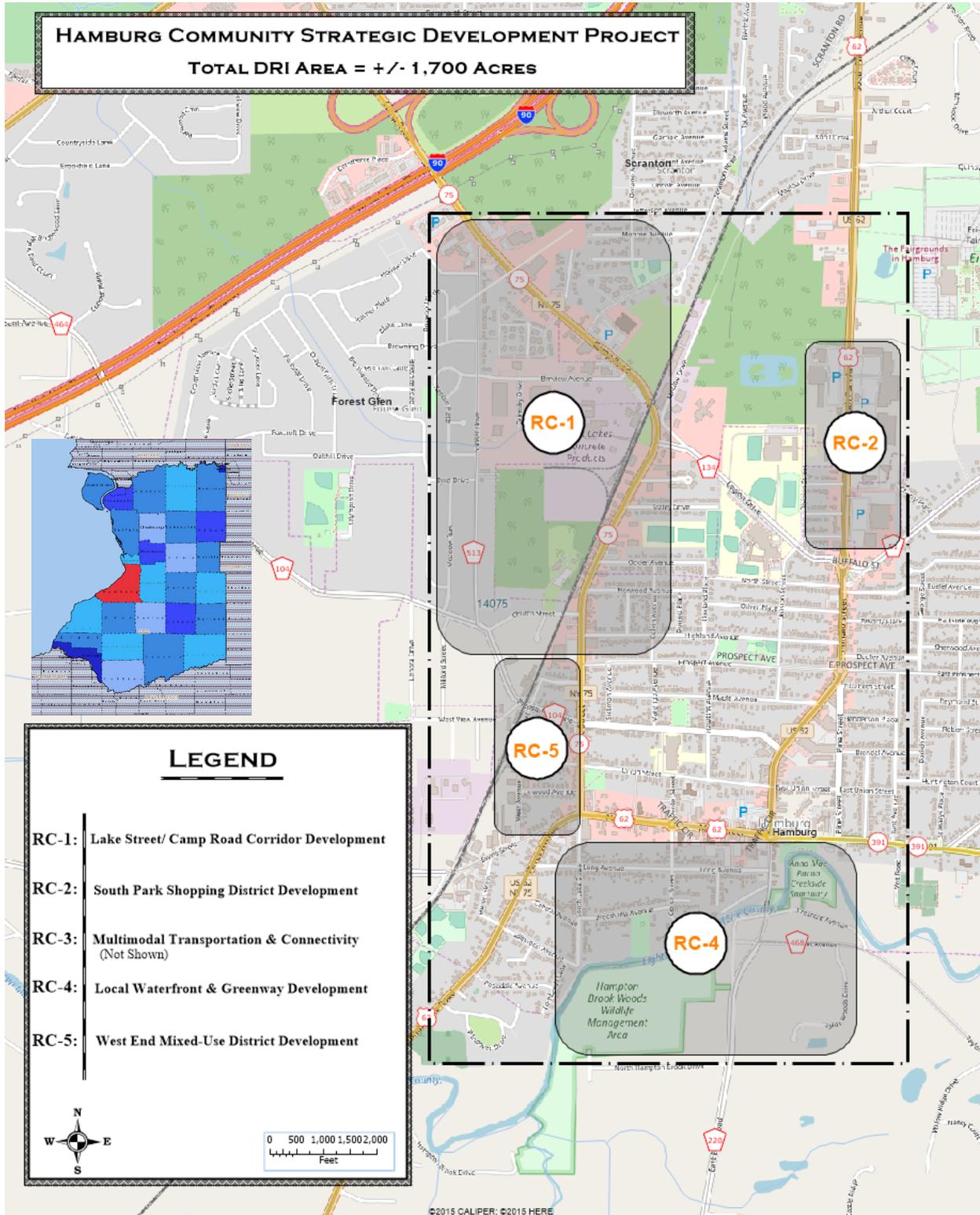
RC-5: West End Mixed-Use District Development refers to the revitalization efforts and repurposing of the Village of Hamburg DPW, Erie County, and NYS highway facilities for mixed-use residential/ business development. This revitalization component was analyzed as part of the recent Hamburg Underutilized Sites Strategy Study and is located in proximity to the heavily traveled Routes 75 & 62. Moreover, it is expected that the West End Mixed-Use District will attract younger professionals with a vibrant, walkable neighborhood in proximity to the Hamburg Business District, restaurants, shops, and night life.



Ultimately, the Hamburg Community Strategic Development Project will reinforce the identity of the Hamburg Community as a vital Western New York asset with unique charm and character. The infusion of the requested DRI funding will significantly enhance the capacity of the stakeholders to implement the proposed project and community revitalization. It is an objective of the Hamburg Community to maintain neighborhoods that are walkable, attractive, well maintained, and diverse, while including a comprehensive yet balanced mixture of residential, commercial, and retail spaces. It is expected that these components of the Hamburg Community will satisfy current residents, while attracting new residents and visitors from the local and regional community and beyond. Through the application of sound planning principles and strong partnerships the Hamburg Community, local property and business owners will invest in and redevelop vacant and underutilized sites to be converted for new uses, contributing to an appealing atmosphere of prosperity, sustainability, and safety.

**DOWNTOWN IDENTIFICATION**

**1) Boundaries of the proposed DRI area.**



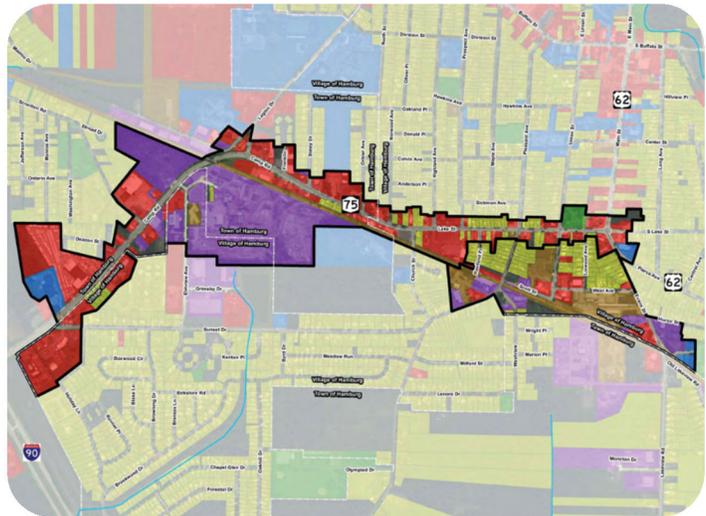
The total DRI Area for the proposed Hamburg Community Strategic Development Project is approximately 1,700 acres. Please see the project map above and in Attachment 1. Specifically, the DRI Area encompasses the five (5) proposed revitalization components. A complete description of each of the five (5) revitalization components is identified in the subsequent paragraphs.

### RC-1: Lake Street/ Camp Road Corridor Development

The RC-1: Lake Street/ Camp Road Corridor Development refers to the revitalization efforts of vacant retail space, underutilized sites, and abandoned business structures located along Lake Street, Camp Road, and Elmview Avenue in both the Village and Town of Hamburg.

The economic and market study revealed the need for approximately 50,000 square feet of revitalized retail space, 200,000 square feet of food and drinking establishments, and 180,000 square feet of Class A office space over the next ten (10) years. It also projected the demand for 255 additional market rate rental units by 2035. This area would be an ideal location for mixed use development. Retail uses would be attracted based on the high traffic counts, adjacent residential neighborhoods, and proposed upper floor apartments. While the plaza is active, there are excessive amounts of parking. Retail or mixed use infill development would improve the utilization of this site while creating a denser urban fabric. One of the sites for proposed office space is located on a former junk yard, north of Camp Road and surrounded by retail and proposed residential uses. The other is along Elmview Avenue, adjacent to the proposed large scale mixed use development. The economic and market study also revealed the need for owner occupied townhouse development and the need for 90,000 square feet of industrial and/ or warehouse/ distribution space over the next ten (10) years. The new townhouses/ warehouse space would create a buffer area between the existing residential neighborhoods to the north and the proposed infill retail development and offices.

The ultimate goal along Lake Street is to make it an extension of the highly successful Hamburg Business District (Buffalo and Main streets). In order to accomplish this goal, several things must happen. Lake Street needs to visually appear as if it is a natural extension of Buffalo and Main streets and it needs to become more pedestrian friendly. Installation of roundabouts, streetscape enhancement programs, and infill redevelopment to create a dense urban fabric will all enhance the pedestrian experience and create the visual connection. The addition of upper floor rental units will increase foot traffic along the corridor, enticing future retail development.



### RC-2: South Park Shopping District Development

The RC-2: South Park Shopping District Development refers to the revitalization efforts of one of the premier shopping districts in the Town of Hamburg. The South Park Shopping District encompasses Town Hall Plaza and is in close proximity to the Erie County Fair Grounds, Hamburg Gaming, and Buffalo Raceway and serves as the primary gateway into the Town of Hamburg. Over the past two decades, the South Park Shopping District has steadily deteriorated and as identified by the Town of Hamburg Retail Space Revitalization Committee has twenty-five (25) rental units with thirteen (13) vacancies in addition to, two (2) boarded up sites previously utilized by Kmart and Friendly's Restaurant. The South Park Shopping District was once one of the premier centers in the Town of Hamburg and an area of pride among residents.



The findings from the economic and market study are particularly applicable to the South Park Shopping District Development revitalization component. Specifically, the need for mixed-use development closer to the street is needed to maintain the appearance of the adjacent Hamburg Business District. The new mixed use development will combine all of these uses into a new compact, pedestrian oriented area, taking advantage of some of the largest underutilized properties within the DRI Area. A portion of the revitalization component will be to develop vacant buildings into a restaurant/ brewery and events center. Please note that the economic and market study revealed the need for 150,000 square feet of food and drinking establishments over the next ten (10) years. Successful micro-breweries have been popping up all over Western New York.

Moreover, the economic and market study revealed the need for new mixed use commercial and market rate apartments over the next ten (10) years. It also projected demand for 255 additional market rate rental units by 2035. This site would be an ideal location for a specialty retail space and mixed-use development. Walkability initiatives, property maintenance, and mixed use development were evaluated and considered as ways to improve connectivity and expand the tax base in the community.

### RC-3: Multimodal Transportation & Connectivity

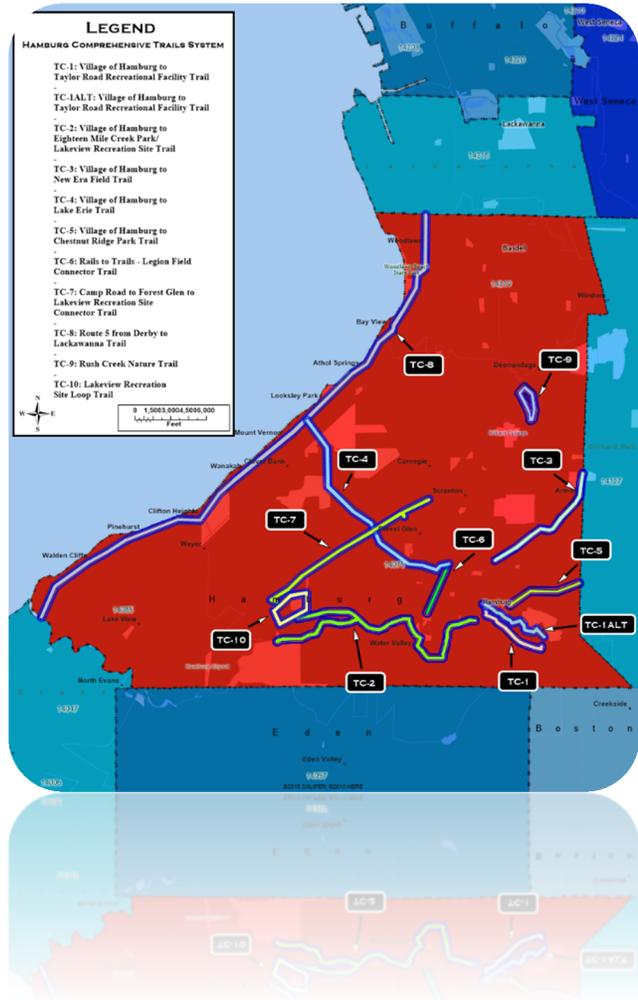
RC-3: Multimodal Transportation & Connectivity refers to the development of a community wide comprehensive multimodal transportation system focused on connectivity. Moreover, the multimodal transportation components are focused on expanding the capacity for vehicular traffic flow through the development of roundabouts. Expanding the capacity for pedestrian/ biking travel through the implementation of a trails system and for the enhancement of transportation for seniors and individuals with disabilities through the expansion of the existing Town of Hamburg 5310 Transportation Program.

The multimodal transportation initiatives are of significant importance as they are expected to provide connectivity. The comprehensive trails system identified in the Hamburg Multimodal Trails Master Plan, is a systemic, innovative approach to multimodal transportation which will ultimately transform pedestrian and biking connectivity throughout the local and regional community. Please note that a regional transit hub is expected to be included in one of the three (3) revitalization areas. This transit hub will have components in both the Village and Town of Hamburg and is expected to serve as the epicenter for multimodal transportation and will benefit pedestrians/ biking and seniors/ individuals with disabilities.

Additionally, two (2) roundabouts are planned for future development in the proposed DRI Area. Roundabout A is proposed at the intersection of Main Street and Lake Street. Currently, the intersection is a four-leg intersection controlled by a single span wire traffic signal. A roundabout was considered at this location in 2006 during the design of the Buffalo Street and Main Street project (PIN 5308.03), however it was not progressed due to funding constraints. The properties located adjacent to the intersection of Main Street and Lake Street consist of commercial businesses. Roundabout B is proposed at the intersection of Lake Street and Pleasant Avenue. Currently, the intersection is a four-leg intersection controlled by a single span wire traffic signal. The properties located adjacent to the intersection consist of commercial businesses on the northeast and southwest quadrants. The northwest quadrant is a satellite TV provider and the southeast quadrant is a residential dwelling.

A pedestrian bridge also is also planned for future development. As a transportation alternatives project designed to provide connectivity, the pedestrian bridge will provide access from Centennial Overlook Park across the 18 Mile Creek Greenway to the Anna Mae Bacon Bird Sanctuary. Moreover, this transportation alternatives project is based on the following four (4) objectives: [i] Establish northern access to the Anna Mae Bacon Bird Sanctuary, [ii] Minimize impacts to the environment and surrounding areas, [iii] Restoration of the Bird Sanctuary, and [iv] Provide connectivity to the trail system designed in the Hamburg Multimodal Trails Master Plan.

A commuter center is targeted for development through the reconstruction of two (2) adjacent parking lots in the Village of Hamburg in proximity to the Hamburg Business District (Buffalo and Main Streets) as a means to facilitate multimodal transportation throughout the Hamburg Community. Moreover, the commuter center will provide access for individuals to: fixed route bus service, NYSDOT 5310 van services for seniors and individuals with disabilities, rural paratransit, and ridesharing. Additionally, please note that at several points during the warm weather months these parking lots are utilized for



specialized community events to include but not limited to the annual community Burgerfest and weekly farmers markets. Specifically, the parking lot reconstruction will include: installation of new drainage, new more efficient lighting, improved parking for approximately 200 vehicles, reconfiguration of entrances and exits, public restrooms, and the installation of new pavement to replace ensure structural integrity.

#### RC-4: Local Waterfront & Greenway Development

RC-4: Local Waterfront & Greenway Development refers to the development of the Lake Erie Waterfront and the 18 Mile Creek Greenway. In 2015, the Village of Hamburg petitioned and was approved by DOS for the designation of the 18 Mile Creek as an inland waterway. In 2018, the Town of Hamburg received an LWRP award from DOS (CFA) for a marina feasibility study. In 2019, the Town of Hamburg will apply for a grant from DOS (CFA) for the redevelopment of the existing Town of Hamburg LWRP (Plan), which will expand the LWRA to include the Village of Hamburg and 18 Mile Creek Greenway. It is expected that the Hamburg Community Strategic Development Project will directly serve as a catalyst for the development of 18 Mile Creek Greenway. Please note that a significant portion of the greenway will travel through the existing Hamburg Business District (Buffalo and Main Streets). Please also note that the proposed project will include collaboration with and assistance from the Buffalo Niagara Riverkeeper. Please see the following scope derived from the Buffalo Niagara Riverkeeper 18 Mile Creek Greenway Development Proposal.



The Buffalo Niagara Riverkeeper will inventory natural and developed resources and conditions within the project boundary and develop a land and water use profile. This profile will identify existing land and water uses, including property ownership, existing zoning, and other relevant local development controls, relevant government and non-government entities, existing public access and connection points, existing recreational sites and resources, tourist oriented public services and facilities, tourist attractions, public safety and existing psychological barriers, transportation and transit routes, cultural and historic resources, scenic resources and view corridors, natural resources, potential environmental issues, opportunities for ecological enhancement, and demographics/ potential users. Moreover, the Buffalo Niagara Riverkeeper, will work closely with the Village and Town of Hamburg to identify potential next steps for implementation and/ or improvement of trail segments that will advance the development and implementation of the 18 Mile Creek Greenway.

### RC-5: West End Mixed-Use District Development

RC-5: West End Mixed-Use District Development refers to the revitalization efforts and repurposing of the Village of Hamburg DPW, Erie County, and NYS highway facilities for mixed-use residential/business development. This revitalization component was analyzed as part of the recent Hamburg Underutilized Sites Strategy Study and is located in proximity to the heavily traveled Routes 75 & 62. Moreover, it is expected that the West End Mixed-Use District will attract younger professionals with a vibrant, walkable neighborhood in proximity to the Hamburg Business District, restaurants, shops, and night life.

The economic and market study projected demand for 255 additional market rate rental units by 2035. Following the proposed consolidation and relocation of the Village of Hamburg Department of Public Works, this site would be an ideal location for live/ work units. Live/ work units provide residents living space as well as all types of commercial or industrial “maker” space. These units would provide a buffer between the residential uses to the north and industrial uses to the south. There are currently no official live/ work units in the Hamburg Community despite the fact many millennials are attracted to both the “maker space” concept of a small production facility or space for artistic or creative occupations such as art studios. The Village of Hamburg zoning allows home occupations in all three of its residential district designations.

The economic and market study also revealed the need for owner occupied townhouse development. The new townhouses would occupy currently vacant and underutilized industrial properties, creating a buffer between the existing residential neighborhoods to the east and the existing railroad to the west. A European-style covered market is envisioned to provide the area’s new neighbors with access to fresh foods and niche retail products. The market would be a hub for activity and reinforces the neighborhood’s cachet.

**2) Past investment, future investment potential.** Describe how this DRI area will be able to capitalize on prior private and public investment and catalyze future investments in the neighborhood and its surrounding areas. Describe recent planning efforts that support public and private investment in the proposed DRI area.

The Hamburg Community Strategic Development Project will build upon the high level of success achieved by the Village of Hamburg during the revitalization of the Hamburg Business District (Buffalo and Main Streets). Moreover, during the past decade the Village of Hamburg has received eleven (11) matching grants totaling approximately \$2,500,000 in addition to the NYSDOT roundabout



reconstruction project to revitalize the Hamburg Business District. Please note that through regular collaboration with stakeholders, local business owners, and the community, the Village of Hamburg was able to utilize the \$2,500,000 in public funds to attract greater than \$10,000,000 in private investment to revitalize the Hamburg Business District.

The methodology for the successful revitalization of the Hamburg Business District identified above will be utilized as the basis for the Hamburg Community Strategic Development Project. Please note that the five (5) revitalization components that comprise the proposed project will greatly enhance the local and regional community and will serve as a benchmark for collaborative partnerships throughout the state. Please note that new leadership in the Town of Hamburg has developed a strong relationship with the Village of Hamburg and is excited to work in cooperation on the proposed project. Additionally, please note that the Town of Hamburg has a significant capacity for future revitalization initiatives outside of the scope of the proposed project (i.e. McKinley Mall, Village of Blasdell, etc). It is expected that the Hamburg Community Strategic Development Project will serve as a catalyst for sustainable and continued revitalization throughout the Hamburg Community.

Recent public planning efforts in the Village and Town of Hamburg have been reenergized and include but are not limited to the following: Economic Development and Tourism Committee, Comprehensive Plan Update Committee, Shoreline Revitalization Committee, Retail Space Revitalization Committee, Hamburg Moves Committee, Community Development-HUD, Strategic Planning Committee, and the Hamburg Drug Free Communities Coalition.

Currently, the Village and Town of Hamburg is home to approximately 60,000 residents and 1,000 businesses, with a significant employment base. The Village of Hamburg has a diversified collection of employers, a growing retail/ entertainment sector, and varied housing choices for residents. Expectations are that the Village of Hamburg will continue to progress as a community and serve as a catalyst for revitalization and economic development in the Town, a process that will be a reflection of an evolving economic landscape in which it has successfully taken advantage of its attractive village setting, a strong local population, and strategic regional location.

Throughout the past decade and as previously stated, the Village of Hamburg has benefited from the implementation of a number of public and private projects that have contributed to the aesthetic and economic revitalization of the urban core. Most significant of these is the reconstruction of New York State Route 62 by the New York State Department of Transportation. Please note that this reconstruction project included four (4) roundabouts, which completely changed the character of the eastern portion of the community, with a total public investment in excess of \$20,000,000. Specifically, the project provided an infrastructure upgrade for central commercial arteries and improved roadway conditions, traffic flow, and installed and improved sidewalks, streetscaping, and period lighting.

The Route 62 project ushered in a new image and brand for the Village of Hamburg centered around the intersection of Buffalo and Main Streets (Hamburg Business District). A series of NYS Main Street grants, totaling \$800,000 over four (4) funding cycles, and an additional Rural Area Revitalization grant for \$200,000, provided funds which resulted in additional private investment in 40 buildings of in excess of \$10,000,000, including restoration and adaptive reuse of the historic Kronrenburg building on the roundabout at Buffalo and Main Streets. In 2012, the Hamburg Downtown Historic District was listed on the National Register of Historic Places, incorporating 62 contributing buildings along a two-block stretch of Main Street. This listing makes contributing properties potentially eligible for historic tax credits for building renovation projects.

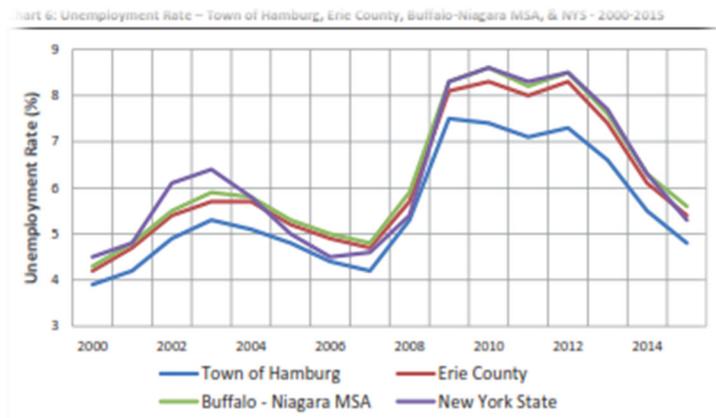
**3) Recent or impending job growth.** Describe how recent or impending job growth within or near the DRI area will attract professionals to an active life in the downtown, support redevelopment, and make growth sustainable in the long-term.

All five (5) revitalization components that comprise the proposed Hamburg Community Strategic Development Project are expected to serve as a catalyst for sustainable growth and economic development. Specifically, the revitalization of the vacant retail space, underutilized sites, and development of mixed-use spaces in addition to, multimodal transportation and waterfront/ greenway development are expected to transform the Hamburg Community and attract new businesses and professionals that will work, live, raise a family, and invest in the area. Moreover, the sustainability of the proposed project is based on expected community development and job growth. The following information was derived from the recent Hamburg Market Study.

### Industry and Employment

Since 2000, the trends in the unemployment rate in the Town of Hamburg (including the Village) have been consistent with those in the greater region, as well as of New York State. The Town, however, has consistently had a lower unemployment rate than Erie County, the Buffalo-Niagara Metropolitan Statistical Area, and New York State, quite significantly so in some years.

Please note that all four (4) geographic areas have seen a significant decrease in their unemployment rate since 2012. This drop is expected to continue, and can be attributed to a variety of factors, including the recovering economy, economic development efforts in the Village and region, and significant investments in the area such as the Buffalo Billion.



Since 2000, the number of businesses in Erie County has grown by 4.7 percent, outperforming the 4.3 percent growth in the greater Buffalo-Niagara Metropolitan Statistical Area, albeit by less than one percent. Growth was not realized in all industries however, as declines were seen in six of the 21 industry sectors in Erie County between 2000 and 2014. Most notable considering raw numbers are Construction, Manufacturing, Wholesale Trade, and Retail as these sectors made up more than 36 percent of the total establishments in 2000. This trend was reflected in both Erie County and the Buffalo-Niagara MSA. However, gains were seen in the number of Health Care, Professional, and Administrative establishments. While experiencing a slight decline between 2000 and 2010, the Food Services sector rebounded with more establishments in 2014.

The top industries for employment in 2000 in Erie County were Government, Manufacturing, and Health Care and Social Services. As of 2010, Retail has replaced Manufacturing in the top three as the Manufacturing industry experienced significant declines in employment. Accommodations and food services employment has steadily increased since 2000 rounding out the top five employment industries. Health Care and Social Assistance, Professional and Business Services, and Accommodation and Food

Services employment in Western New York are expected to grow significantly through 2022. Overall, employment is expected to grow by approximately 51,250 jobs from 2012 to 2022.

### Target Industries

In 2014, there were nine (9) industry sectors in the Buffalo-Niagara MSA which had a greater employment share relative to the United States. Of these nine industry sectors, three (3) had significantly greater employment share relative to the United States. These included management of companies and enterprises, educational services, and other services. Conversely, in 2014, there were nine industry sectors in the Buffalo-Niagara MSA which had a lesser employment share relative to the United States. Of these nine industry sectors, three had significantly lesser employment share relative to the United States. These included information, utilities, and professional and technical services. The greatest changes between 2005 and 2014 were experienced in the management of companies and enterprises and utilities.

An Economic Cluster Analysis provides a more detailed breakdown and analysis of the strengths or weaknesses of specific sub-sector industries within the larger industry categories. For example, the manufacturing industry overall is declining in the market area. However, electrical equipment manufacturing and chemical manufacturing continue to thrive. The Economic Cluster Analysis assesses why certain sub-sector industries like electrical equipment manufacturing and chemical manufacturing are performing better than others in the market and vice versa. This is an important exercise because it identifies current and emerging strengths within the market, as well as retention targets, that economic development agencies involved in Village redevelopment can strategically concentrate on for targeted economic development attraction and retention activities.

Some industries, such as construction of buildings, are usually related to or dependent on how well the national economy is doing. Other industries, such as specialty trade contractors, are growing because they have a regional competitive advantage in the Buffalo-Niagara MSA likely because their skills align well with the specific construction needs of Western New York industries. Dependent Industries/ Limited Prospects are industries that do not have a large employment share in the market relative to the share of that industry in the U.S. and they are losing their regional share of employment. Industries in this category are mostly “dependent” industries, meaning that their growth or decline is dependent on the overall performance of the area’s economy, while others are industries that would need (or already have) significant economic development incentives to succeed in the Buffalo-Niagara MSA.

Economic development agencies can strategically choose which industries to focus on. For instance, the Village of Hamburg’s strengths relative to the region are in industries that are “stable” as opposed to “prospering.” However, these are exactly the niches to which the Village should play to reinforce downtown development and create a vibrant mixed-use atmosphere. The Village should aim to attract workers of large new company headquarters as residents in the two study areas as opposed to attracting the companies themselves.

Another factor to consider in selecting targeted industries for attraction and retention are number of jobs, total wages generated for the Buffalo-Niagara MSA and the average wage of workers. Generally, economic development efforts should be focused on those industries that will create the greatest number of jobs and wealth in the economy. For example, a regional headquarters is a perfect example of strategic economic development targeting with more than 13,000 jobs currently, expected increases of more than 3,000 jobs and an average wage of more than \$85,000. Workers at these companies would be excellent residential prospects for the new mixed-use neighborhood developments that are in high demand. Niches with significant numbers of jobs such as food services and drinking places both have a very low average

wage but are important for the tourism sector and currently create vitality downtown which could be extended to exciting new mixed-use developments.

**4) Attractiveness of physical environment.** Identify the properties or characteristics that the DRI area possesses that contribute, or could contribute if enhanced, to the attractiveness and livability of the downtown for a diverse population of varying ages, income, gender identity, ability, mobility, and cultural background. Consider, for example, the presence of developable mixed-use spaces, varied housing types at different levels of affordability, walkability and bikeability, healthy and affordable food markets, and public parks and gathering spaces.

It is expected that the proposed Hamburg Community Strategic Development Project will provide several specific physical benefits to the community. Please see below for a description of each.

#### Physical Improvement of Vacant Spaces, Underutilized Sites, and Unused Structures

The revitalization areas targeted for retail, business, and mixed-use development are located in direct proximity to the Hamburg Business District and the center of the Town of Hamburg. Moreover, the proposed revitalization areas would significantly enhance the appearance, amenities, and character of the community. Currently, portions of the revitalization area include but are not limited to: underutilized big box retail areas, a former scrap yard, DPW facilities, and a vacant concrete production facility. Expected physical improvements include but are not limited to: retail, business, residential, mixed-use, a commuter train station, warehouse/ light industrial, live/ work units, townhouses, a covered market, restaurant/ brewery, and an events center.

#### Multimodal Transportation

The multimodal transportation initiatives are of significant importance as they are expected to provide connectivity in terms of physical walkability/ bikeability improvements, transportation for seniors and individuals with disabilities, pedestrian/ biking safety, and a more efficient traffic flow for vehicles. Additionally, the comprehensive trails system identified in the Hamburg Multimodal Trails Master Plan, is a systemic, innovative approach to multimodal transportation which will ultimately transform pedestrian and biking connectivity throughout the local and regional community. Please note that a transit hub is expected to be included in one of the three (3) revitalization areas. This transit hub is expected to serve as the epicenter for multimodal transportation and will benefit pedestrians/ biking and seniors/ individuals with disabilities. For example, seniors who receive paratransit from neighboring communities (i.e. Eden, Evans, Boston, etc) will be able to utilize the transit hub to either connect with fixed route transportation into the city or utilize it for a local destination and have connectivity into other parts of the Town/ Village (i.e. Hamburg Business District, Shopping, Senior Center, etc).

Additionally, two (2) roundabouts are planned for future development in the proposed DRI Area. Roundabout A is proposed at the intersection of Main Street and Lake Street. Currently, the intersection is a four-leg intersection controlled by a single span wire traffic signal. A roundabout was considered at this location in 2006 during the design of the Buffalo Street and Main Street project (PIN 5308.03), however it was not progressed due to funding constraints. The properties located adjacent to the intersection of Main Street and Lake Street consist of commercial businesses. Roundabout B is proposed at the intersection of Lake Street and Pleasant Avenue. Currently, the intersection is a four-leg intersection controlled by a single span wire traffic signal. The properties located adjacent to the intersection consist of commercial businesses on the northeast and southwest quadrants. The northwest quadrant is a satellite TV provider and the southeast quadrant is a residential dwelling.

A pedestrian bridge also is also planned for future development. As a transportation alternatives project designed to provide connectivity, the pedestrian bridge will provide access from Centennial Overlook Park across the 18 Mile Creek Greenway to the Anna Mae Bacon Bird Sanctuary. Moreover, this transportation alternatives project is based on the following four (4) objectives: [i] Establish northern access to the Anna Mae Bacon Bird Sanctuary, [ii] Minimize impacts to the environment and surrounding areas, [iii] Restoration of the Bird Sanctuary, and [iv] Provide connectivity to the trail system designed in the Hamburg Multimodal Trails Master Plan.

A commuter center is targeted for development through the reconstruction of two (2) adjacent parking lots in the Village of Hamburg in proximity to the Hamburg Business District (Buffalo and Main Streets) as a means to facilitate multimodal transportation throughout the Hamburg Community. Moreover, the commuter center will provide access for individuals to: fixed route bus service, NYSDOT 5310 van services for seniors and individuals with disabilities, rural paratransit, and ridesharing. Additionally, please note that at several points during the warm weather months these parking lots are utilized for specialized community events to include but not limited to the annual community Burgerfest and weekly farmers markets. Specifically, the parking lot reconstruction will include: installation of new drainage, new more efficient lighting, improved parking for approximately 200 vehicles, reconfiguration of entrances and exits, public restrooms, and the installation of new pavement to replace ensure structural integrity.

#### Local Waterfront & Greenway Development

The Village and Town of Hamburg have a vastly underdeveloped Lake Erie Waterfront and 18 Mile Creek Greenway. Currently, there is very limited development on the waterfront and no development on the greenway. The planning for the specific improvements to each will be significantly enhanced by the Hamburg Community Strategic Development Project, which is expected to serve as the catalyst for revitalization. The NYSDOS is currently involved in planning efforts for the Lake Erie Waterfront and the Buffalo Niagara Riverkeeper is currently involved in planning efforts for the 18 Mile Creek Greenway

In 2015, the Village of Hamburg petitioned and was approved by DOS for the designation of the 18 Mile Creek as an inland waterway. In 2018, the Town of Hamburg received an LWRP award from DOS (CFA) for a marina feasibility study. In 2019, the Town of Hamburg will apply for a grant from DOS (CFA) for the redevelopment of the existing Town of Hamburg LWRP (Plan), which will expand the LWRA to include the Village of Hamburg and 18 Mile Creek Greenway. It is expected that the Hamburg Community Strategic Development Project will directly serve as a catalyst for the development of 18 Mile Creek Greenway. Please note that a significant portion of the greenway will travel through the existing Hamburg Business District (Buffalo and Main Streets). Please also note that the proposed project will include collaboration with and assistance from the Buffalo Niagara Riverkeeper.

#### Existing Conditions

As part of the Hamburg Market Analysis, a visual survey of the Village of Hamburg and portions of the Town were conducted to assess the present physical conditions of various neighborhoods containing residents and businesses. This exercise was done on foot, exposing the consultant team to the proposed DRI Area. From this assessment, the distinct character of each neighborhood was derived, including its aesthetic qualities as well as the conditions of its building stock and public infrastructure.

*East Side Neighborhood (East of Buffalo Street)*

The East Side neighborhood is filled with a mix of one and two story homes, mostly single-family. Homes are generally newer than in the central Neighborhood. Houses are well maintained and landscaped. Few houses were less than well maintained and none of them were ready for demolition. The neighborhood is filled with a variety of house styles. A school and park space is found within the neighborhood.

*Central Neighborhood (Between Buffalo & Lake Streets)*

The Central Neighborhood has a higher concentration of older houses, nearly all well maintained. Most homes are two stories and there is a higher frequency of two- family houses. All properties are well landscaped and there seems to be a higher density of vegetation within this neighborhood (Including street trees). Houses present a wide variety of styles. Several parks serve the community.

*West Side Neighborhood (West of Lake Street)*

The West Side neighborhood is a mix of residential structures along with commercial, warehouse, and industrial uses. Most of the houses are in good condition, but there are areas and individual houses that are showing signs of disrepair. There are some infill houses that have replaced aging structures. There is a vacant parcel behind houses on Pleasant Avenue that could support a small residential development. The area is home to many former rail and freight buildings that are currently being used as warehouses. There are large storage yards which include the Hamburg DPW and Erie County/ NYS Highway facilities. Retail uses include the West End Inn, an animal feed store, and a train hobby store which are all in good condition. A few buildings on Pleasant Avenue are vacant with low value for reuse.

*South Park Avenue & Buffalo Street*

The Northern section of South Park Avenue and Buffalo Street contain Hamburg Town Hall, large retail plazas, and shopping centers with a Big Lots, Ollie's, Tops, Value, and Walgreens. Please note that a significant number of retail space along South Park Avenue is either abandoned or underutilized. Conversely, the retail space along Buffalo Street is in excellent condition, highly sought after, and vibrant. There is also J.P. Fitzgerald's, which is a large, popular bar and restaurant. Further south, there are smaller retail places including restaurants, nail and hair salons, yoga & dance studios, banks. There are also dentist and law offices mixed with some houses. There are no vacant buildings and facades are well maintained. Between Buffalo Street and Pine Street there is Hamburg Village Square Plaza, which was recently purchased by a local developer (ISKALO). The plaza has a large central parking area which the new owner rebuilt to improve drainage, pavement and vehicular and pedestrian circulation. The Plaza has a large central parking area. The Plaza Contains a Right-Aid, Federal Meats, Biehler Liquors, Sherwin Williams, Total Tan, Bangs, and a Chinese Restaurant. The other side contains Tuesday Morning, Pennysaver, and H&R Block. Roughly a third of the plaza is vacant space for lease, with, the new owner is refurbishing the entire plaza, creating new spaces and constructing new facades, and has already attracted a variety of new tenants. South of Village Square are more niche retail stores, pizzerias, a couple small bars, a theater and a bowling alley. There are no vacant spaces and the second floors look active. The streetscape is nicely done with trees and furniture.

*Main Street*

Main Street is another pleasant commercial block with a nice streetscape. Buildings are not vacant and are well maintained. One structure is in need of more significant repair. Along this section there are more banks and law offices, but there are still specialty retail spaces and small restaurants. There are florists, bars, diners, collectables, bread stores, and books. Further east on Main the street transforms into a mix of community services, offices and historic homes used either for small business or apartments.

*Lake Street/Camp Road*

There are no unifying elements on Lake Street. There are sidewalks, but no streetscape treatments. There

are a mix of houses. Some are well maintained historic structures, while others are vacant or underutilized. Businesses generally have larger parking areas. There are several gas stations and auto repair stations. There is an industrial building and a few isolated restaurants. Eventually Lake Street turns into Camp Road and becomes more auto-oriented commercial area with large parking lots. There is a Quality Inn located on Camp Road near the Thruway interchange. There are a couple of plazas that have minor retail sales and service establishments and professional offices. This area is a gateway location off of Interstate 90, however it does not sufficiently brand the village/ town or provide a positive impression with its development patterns.

*South Side Neighborhood (South of Main Street)*

South of Main Street is a mix of residential structures from the 1920's to the 1950's. The houses are well maintained and in good condition.

*North West Neighborhood (West of Sunset Drive)*

The neighborhood west of Sunset Drive is generally filled with relatively new residential developments. Some streets were built in the 1960's and 1970's. Other streets have been recently developed and Ryan Homes is currently ready to build a model single family home and construct others on the last 54 lots in the Country Meadows subdivision.

**5) Quality of Life policies.** Articulate the policies in place that increase the livability and quality of life of the downtown. Examples include the use of local land banks, modern zoning codes, comprehensive plans, complete streets plan, transit-oriented development, non-discrimination laws, age-friendly policies, and a downtown management structure. If policies that support livability and quality of life in downtown are not currently in place, describe near-term efforts by the municipality to create and implement such policies.

Over the past several years, the Village and Town of Hamburg have developed and implemented several initiatives to encourage and attract diversity, which includes but is not limited to the passage of the municipal Town of Hamburg Fair Housing Law (which includes the Village of Hamburg). This law will ensure fair housing to all individuals regardless of: race, disability, marital status, source of income, and sexual orientation. Moreover, the Town of Hamburg is very proud to be one of only a few government entities to have its own fair housing law. The Town of Hamburg, through its Department of Community Development, provides a wide variety of fair housing services in conjunction with its partner, Housing Opportunities Made Equal, Inc. (HOME, Inc.).

Additionally, the Village and Town of Hamburg promote balanced land use and development practices that preserve, enhance, and create healthy and attractive neighborhoods, walkable streets, economic development, and sustained property values. It is expected that appropriate development and land use management will enhance the character and quality of life of the Village and Town of Hamburg over time.

It is expected that the Village and Town of Hamburg will encourage public and private investments that strengthen the community's residential, business, and commercial environment while also protecting its natural resources and expanding recreational opportunities. Future land use decisions will consider the current physical configuration of the Village and Town of Hamburg. The impacts that proposed development, new construction or changes in property will be considered on residential, aesthetic, and pedestrian qualities as well as other aspects of neighborhood character. The Village and Town of

Hamburg will also utilize a future land use map to guide future decision making and to update zoning and land use regulations so that underutilized and underperforming areas achieve their highest and best use.

The mixed use development areas will encourage existing residences be retained and maintained. Only non-residential uses that can function well, given physical opportunities and limitations found within the designated areas, should be permitted. For example, properties along Lake Street tend to have smaller lot sizes, limited parking (off-street) and a range of architectural styles. Businesses that require a lot of parking and/or generate high volumes (e.g., drive-throughs) may not be well suited for the mixed use development areas.

Future zoning revisions designated in areas designed for mixed use development will clearly express intentions to retain and enhance residential dwellings on arterial roadways. Revisions will need to address and prohibit wrap around zoning to avoid commercial encroachment into adjacent residential streets. Commercial uses, even in mixed use areas, should be located only along major corridors, not on local neighborhood side streets. Modifying design standards for Lake Street and the other mixed-use areas will allow existing residential structures to remain intact and encourage commercial or office development that will not negatively impact nearby residents.

The West End Mixed Use District, which is generally bounded by the railroad, Church Street, Lake Street and Evans Street, will provide the Village and Town of Hamburg continued opportunities for appropriately scaled industrial development while allowing for creative redevelopment of sites and buildings. This could be the perfect location for arts and craft studios, live-work spaces and other niche development enterprises that require larger buildings and/or sites. These mixed-use industrial areas' future viability will require improvements to the public realm that will restore a sense of physical connectivity, improve walkability and enhance the pedestrian experience.



The design for new development in these areas should reflect the scale, massing and building materials typically found in turn of the century industrial districts. The Village and Town of Hamburg will consider developing design guidelines that guide landscaping and site design and identify design strategies that will celebrate the area's railroad heritage, enhance landscaping and site amenities, and guide building massing and façade design to ensure the existing physical context is retained over time.

The Gateway Commercial land use category is characterized by its location at two main entrances into the Village of Hamburg that border the Town of Hamburg. Land uses in these areas are, and will likely continue to be, more suburban in terms of scale, site configurations and development types. However, future development or redevelopment in these areas should better reflect character and promote complementary design standards.

Public realm enhancements, such as roadway reconstruction, enhancements to sidewalks, decorative street lighting, pedestrian amenities (e.g. benches), and landscaped gateway features should be pursued as a catalyst for private investment. The Village and Town of Hamburg will explore strategies to enhance private development, through the establishment of design standards and pursuit of grant funding.

Appropriate uses in these areas may include, but not be limited to: Small to mid-size general or market-specific retail, Banks and other professional offices, Gas stations and convenience stores, Grocery, pharmacy, and other personal products retail establishments, Multi-family residential development (e.g. townhomes and/or apartments, Gymnasiums, dance studios and similar facilities. Development within these areas will incorporate access management practices to minimize curb-cuts along major arterials and improve safety of motorists and pedestrians through the area.

**6) Public support.** Describe the public participation and engagement process conducted to develop the DRI application, and the support of local leaders and stakeholders for pursuing a vision of downtown revitalization. Characterize the commitment among local leaders and stakeholders to preparing and implementing a strategic investment plan.

The scope for the proposed Hamburg Community Strategic Development Project was derived from years of refined community planning initiatives. Moreover, throughout the past decade, the Village of Hamburg has been a champion for community revitalization and has been successful in securing and utilizing public funding opportunities to attract private investment, which is ultimately the core component of sustainable revitalization. Over the past two years, the Town of Hamburg has experienced a change in leadership that is willing to take a proactive instead of reactive approach to community planning and development. The strategic relationship between the Village and Town of Hamburg is particularly important as the Village has the experience, while the Town has the capacity as both municipalities work in cooperation to revitalize and develop an innovative, sustainable, and prosperous community.

The Village of Hamburg Economic Development Committee has begun the process of gathering community input for a second update to their Comprehensive Plan. A series of focus group meetings were held in Spring 2019. A Complete Streets Policy was formulated by the Village of Hamburg Recreational Trails & Tourism Task Force and was recently submitted to the Village Board for consideration. Existing building design standards for central business, commercial, and professional office districts will be modified and expanded to include residential and mixed use districts, in addition to, modifications and additions to the zoning code and land use regulations prepared by consultants. Downtown management strategies exist through the efforts of organizations such as Imagine Hamburg, Village Business Advisory Committee, and Hamburg Holidays.

An annual Village of Hamburg Economic Development and Business Update was held in January 2019 in the auditorium of the Union Pleasant Elementary School, to disseminate information to the general public and solicit comments and suggestions regarding the "state of the village". A public meeting was held and walks were conducted to inform residents and solicit input regarding the reconstruction of Sunset Drive, a main connector from the Forest Glen/ Country Meadows residential area to the Village and Town of Hamburg center via Pleasant Avenue to the south and to the City of Buffalo and employment centers to the north via Camp Road (Route 75 and I-90).

The Town of Hamburg has made significant progress in reestablishing and reengaging their public committees. The Comprehensive Plan Update Committee is currently planning to update the Town Comprehensive Plan which is greater than ten (10) years old. The Shoreline Revitalization Committee is working on the Town of Hamburg Marina Feasibility Study, Cloverbank Community Corridor (walkable

community project), and an update to the existing ten (10) year old LWRP (Plan). The Hamburg Moves Committee is a joint Village/ Town committee that is discussing the Hamburg Multimodal Trails Master Plan for the development of a comprehensive trails systems focused on connectivity. The Strategic Planning Committee is comprised of elected officials and department heads in an effort to formalize the project planning process. The Town of Hamburg Retail Space Revitalization Committee was recently established to work with private developers to fill the existing vacant retail space in the Town of Hamburg. Please note that all five (5) revitalization components that comprise the proposed Hamburg Community Strategic Development Project have been presented to and received input from one or more of the public committees identified above.

Additionally, a comprehensive public participation process was conducted which included multiple steering committee meetings, stakeholder interviews, public meetings, and walking tours. The vision statement and five (5) primary objectives were derived from this process. The five (5) derived primary objectives are:

1. To promote land use patterns that enhance the character of the community
2. To improve the quality and character of the community
3. To provide housing options for a wide range of individuals
4. To enhance and extend the revitalization of the community's core
5. To improve access by all modes of transportation for a safe and enjoyable environment

7) **Transformative opportunities.** Describe opportunities to build on the strengths described above by providing a list of transformative projects that could be ready for implementation with an infusion of DRI funds within the first one to two years (depending on the scope and complexity of the project).

As identified throughout this application, the Hamburg Community Strategic Development Project is comprised of five (5) revitalization components. Each of proposed revitalization components have been well researched and are prepped for implementation. Please see below for a comprehensive list of transformative projects with designated priority and expected implementation schedule.

Priority	Revitalization Component	Project	Implementation Schedule (Start)
1	[RC-4] Local Waterfront & Greenway Development	Greenway Development Plan (Buffalo Niagara Riverkeeper)	< 1 year
2	[RC-1] Lake Street/ Camp Road Corridor Development	Streetscaping/ Pedestrian Safety (Gaslamp & Walkability Infrastructure)	< 1 year
3	[RC-2] South Park Shopping District Development	Streetscaping/ Pedestrian Safety (Gaslamp & Walkability Infrastructure)	< 1 year
4	[RC-5] West End Mixed-Use District Development	Site Consolidation & Acquisition (DPW, County, NYS Highway Facilities)	1-2 years
5	[RC-3] Multimodal Transportation & Connectivity	Roundabout Land Acquisition (Lake/Main & Lake/ Pleasant)	1-2 years
6	[RC-3] Multimodal Transportation & Connectivity	Transit Hub & Commuter Center (Town Hall Plaza & Business District)	1-3 years
7	[RC-1] Lake Street/ Camp Road Corridor Development	Retail, Business, Mixed-Use Development (Tax Increment Financing)	2-3 years
8	[RC-2] South Park Shopping District Development	Retail, Business, Mixed-Use Development (Private Investment)	2-3 years
9	[RC-3] Multimodal Transportation & Connectivity	Multimodal Trail Development (Multimodal Trails Master Plan)	3-5 years
10	[RC-5] West End Mixed-Use District Development	Retail, Business, Mixed-Use Development (Tax Increment Financing)	3-5 years

**8) Administrative Capacity.** Describe the existing local administrative capacity to manage this planning and implementation initiative, including the ability to oversee contracts for awarded municipal projects using existing staff and resources.

The Village of Hamburg, New York will serve as the sponsor for the proposed Hamburg Community Strategic Development Project. The Village of Hamburg and Town of Hamburg will serve as partners in the development and implementation of the proposed project.

Expected Project Development and Implementation Staff

1. Mr. Thomas Moses, Mayor, Village of Hamburg
2. Mr. James Shaw, Supervisor, Town of Hamburg
3. Mr. Paul Becker, Special Projects Coordinator, Village of Hamburg
4. Mr. Mark Melewski, Consultant, EECG Consulting, LLC
5. Village Board Members
6. Town Board Members
7. Mr. Martin Denecke, Director, Town of Hamburg Youth, Recreation, & Senior Services
8. Mr. Christopher Hull, Director, Town of Hamburg Community Development
9. Mr. Sean Doyle, Director, Hamburg IDA
10. Public Committee Members
11. Hamburg School Board
12. Frontier School Board

Please note that the Village and Town of Hamburg have successfully secured, administered, and implemented numerous funding opportunities from federal, state, and local agencies to include but not limited to: FHA, NYSDOT, NYSDOS, NYSDEC, HUD, CDBG, and the Buffalo Bills Foundation.

**9) Other.** Provide any other information that informs the nomination of this downtown for a DRI award.

Attachments:

Attachment 1: Project Map – DRI Area

Attachment 2: Hamburg Multimodal Trails Master Plan

Attachment 3: 18 Mile Creek Greenway Development Proposal

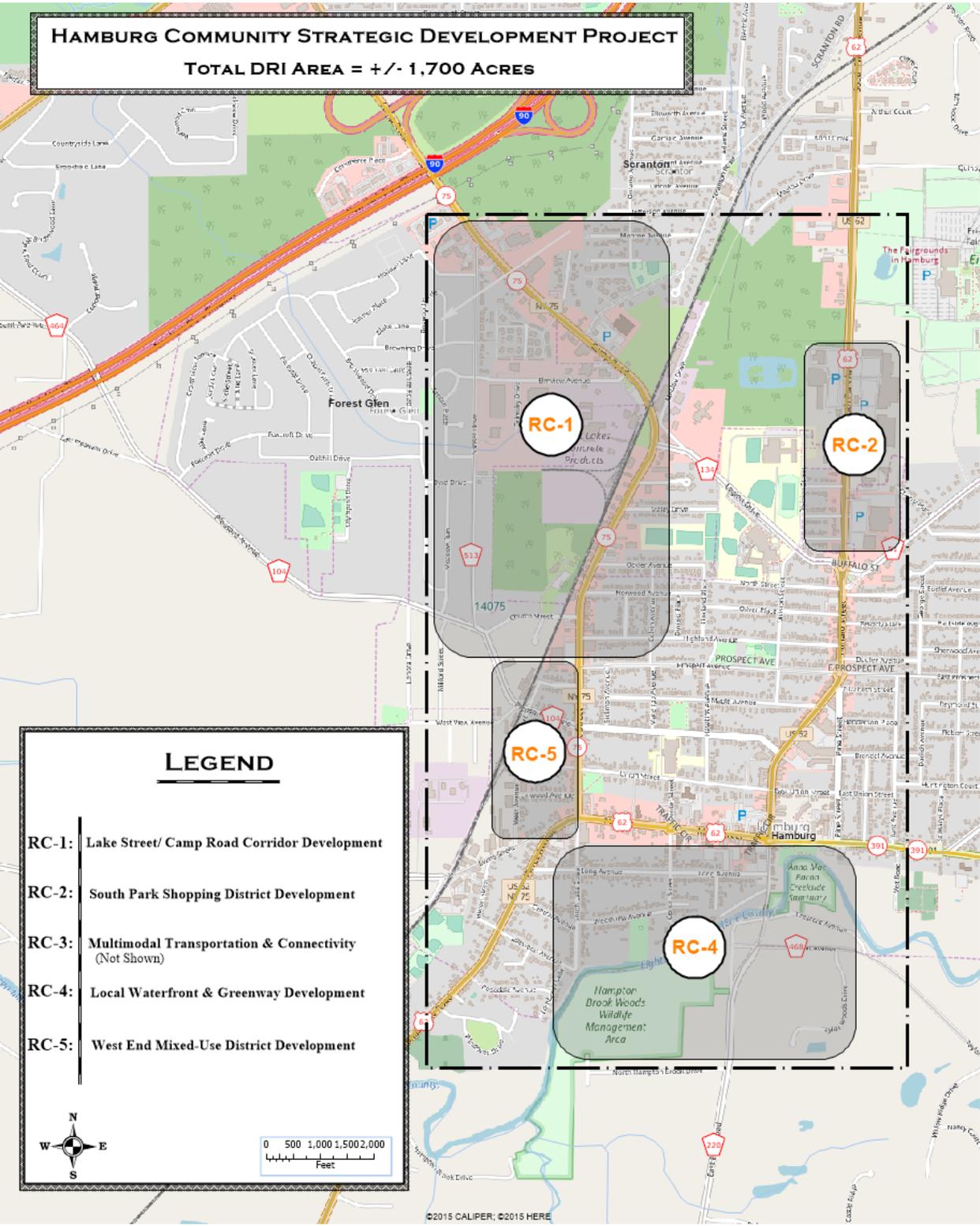
Attachment 4: Roundabout A & B Feasibility Study

## **SUBMISSION**

Applications from interested communities must be submitted electronically to the relevant Regional Economic Development Council at the email address in the table below. Proposals for areas within New York City must be sent to the relevant Office of the Borough President, which will select two applications for submission to the NYC Regional Economic Development Council.

- Capital Region [NYS-CapitalDist@esd.ny.gov](mailto:NYS-CapitalDist@esd.ny.gov)  
Counties: Albany, Columbia, Greene, Saratoga, Schenectady, Rensselaer, Warren, Washington
- Central New York [NYS-CentralNY@esd.ny.gov](mailto:NYS-CentralNY@esd.ny.gov)  
Counties: Cayuga, Cortland, Madison, Onondaga, Oswego
- Finger Lakes [NYS-FingerLakes@esd.ny.gov](mailto:NYS-FingerLakes@esd.ny.gov)  
Counties: Genesee, Livingston, Monroe, Ontario, Orleans, Seneca, Wayne, Wyoming, Yates
- Long Island [LIREDC@esd.ny.gov](mailto:LIREDC@esd.ny.gov)  
Counties: Nassau, Suffolk
- Mid-Hudson [NYS-MidHudson@esd.ny.gov](mailto:NYS-MidHudson@esd.ny.gov)  
Counties: Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster, Westchester
- Mohawk Valley [NYS-MohawkVal@esd.ny.gov](mailto:NYS-MohawkVal@esd.ny.gov)  
Counties: Fulton, Herkimer, Montgomery, Oneida, Otsego, Schoharie
- North Country [NYS-NorthCountry@esd.ny.gov](mailto:NYS-NorthCountry@esd.ny.gov)  
Counties: Clinton, Essex, Franklin, Hamilton, Jefferson, Lewis, St. Lawrence
- Southern Tier [NYS-SouthernTier@esd.ny.gov](mailto:NYS-SouthernTier@esd.ny.gov)  
Counties: Broome, Chemung, Chenango, Delaware, Schuyler, Steuben, Tioga, Tompkins
- Western New York [NYS-WNY-REDC@esd.ny.gov](mailto:NYS-WNY-REDC@esd.ny.gov)  
Counties: Allegany, Cattaraugus, Chautauqua, Erie, Niagara
- New York City - Submit to the appropriate office below.
  - Bronx: James Rausse at [JRausse@bronxbp.nyc.gov](mailto:JRausse@bronxbp.nyc.gov)
  - Brooklyn: Josh Levin at [JoshuaLevin@brooklynbp.nyc.gov](mailto:JoshuaLevin@brooklynbp.nyc.gov)
  - Manhattan: Elka Morety at [EMorety@manhattanbp.nyc.gov](mailto:EMorety@manhattanbp.nyc.gov)
  - Queens: Shurn Anderson at [SAnderson@queensbp.org](mailto:SAnderson@queensbp.org)
  - Staten Island: Lashay S. Young at [LYoung@statenilandusa.com](mailto:LYoung@statenilandusa.com)

# Attachment 1: Project Map – DRI Area





EECG Consulting, LLC

# Hamburg Multimodal Trails Master Plan

Prepared By:  
EECG Consulting, LLC

Submitted to:  
Village of Hamburg, NY  
Town of Hamburg, NY

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Draft

November 2017

Part 1: Section 1 – Section 7

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Appendix O – 2015 Regional Economic Development Council Request: Shoreline Trail

Appendix P – [TC-9]: Rush Creek Nature Trail Maps 1 & 2

Appendix Q – [TC-10]: Lakeview Recreation Site Loop Trail Maps 1 & 2

(Please See Part 2 of 2: Appendix R – Appendix V)

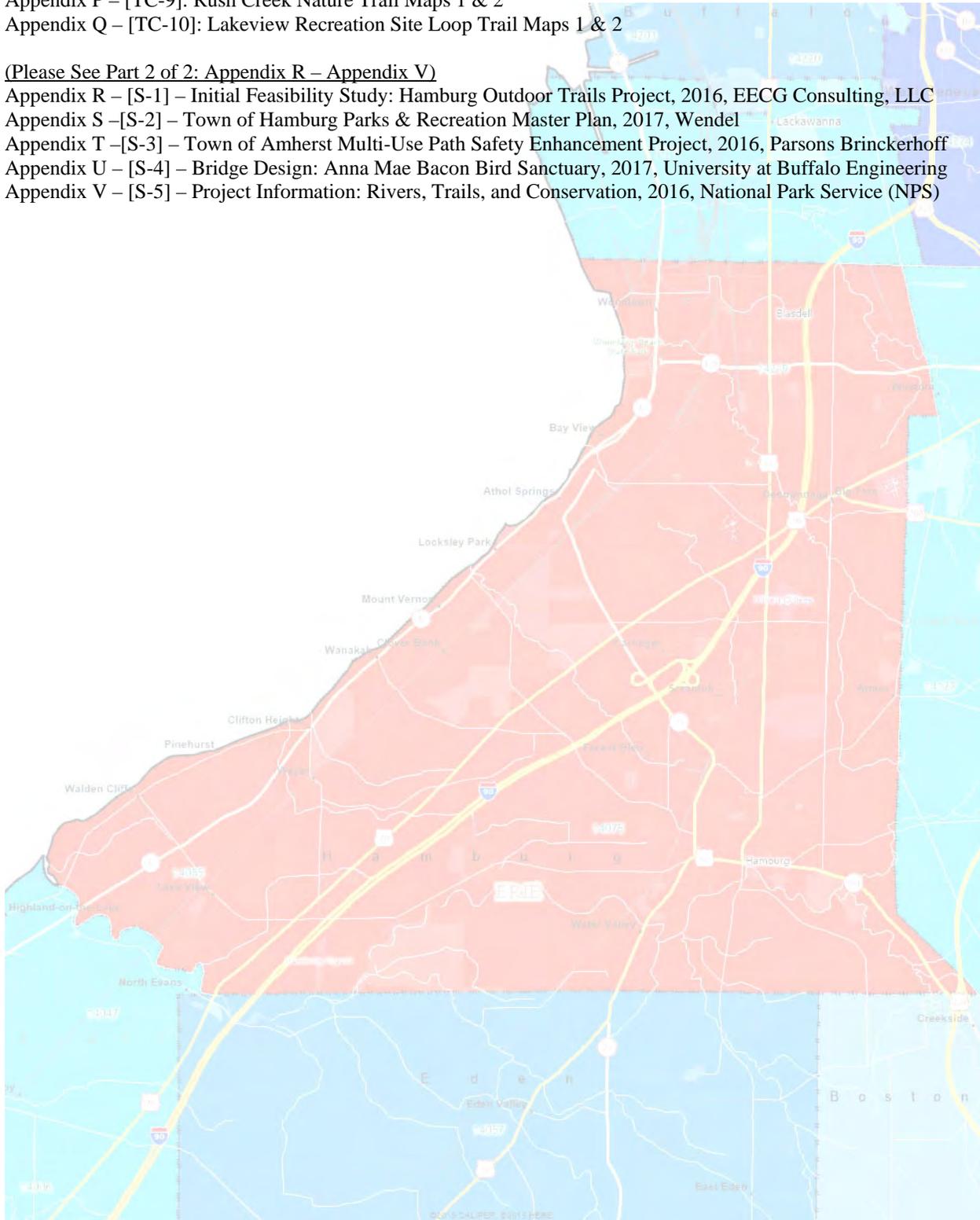
Appendix R – [S-1] – Initial Feasibility Study: Hamburg Outdoor Trails Project, 2016, EEGC Consulting, LLC

Appendix S – [S-2] – Town of Hamburg Parks & Recreation Master Plan, 2017, Wendel

Appendix T – [S-3] – Town of Amherst Multi-Use Path Safety Enhancement Project, 2016, Parsons Brinckerhoff

Appendix U – [S-4] – Bridge Design: Anna Mae Bacon Bird Sanctuary, 2017, University at Buffalo Engineering

Appendix V – [S-5] – Project Information: Rivers, Trails, and Conservation, 2016, National Park Service (NPS)



**Section 1 – Issue Statement**

It is the primary objective of the Hamburg Multimodal Trails Master Plan to provide Village of Hamburg, Town of Hamburg, and community stakeholders with a planning tool that will incorporate pre-existing and proposed independent community trail components into one comprehensive trails system. The Hamburg Multimodal Trails Master Plan is categorized into ten (10) sections. The sections and a brief description of each are identified in the table to the right of this page.

Specifically, the Hamburg Multimodal Trails Master Plan is built upon the Initial Feasibility Study for the Hamburg Outdoor Trails Project prepared by EECG Consulting, LLC in February 2016, which was based on a preliminary concept plan developed by the Village of Hamburg Recreational Trails and Tourism Task Force. Moreover, it is the intent of the Hamburg Multimodal Trails Master Plan to provide Village of Hamburg, Town of Hamburg, and community stakeholders with the information necessary for project planning, community support, regional development, collaboration, and future grant applications. Please note that the information contained in this master plan is for planning purposes only and does not in any way take the place of actual trail architectural design, drawings, and/or construction plans.

All of the qualitative and quantitative information contained in the Hamburg Multimodal Trails Master Plan has been obtained from primary sources to include but not limited to: GIS mapping, existing map covers, engineering planning tools, stakeholder interviews, and existing trail component information. This information will serve as the basis of the master plan and all derived results and findings.

<b>Section</b>	<b>Description</b>
<b>1 – Issue Statement</b>	Identifies the Hamburg Multimodal Trails Master Plan, primary objective(s), project components
<b>2 – Project Background</b>	Provides a brief description of the events, decision making, achievements, and planning leading up to the formulation of the Hamburg Multimodal Trails Master Plan
<b>3 – Town of Hamburg Parks &amp; Recreation Community Survey</b>	Identifies all relevant project information to include but not limited to: community support, feedback, and assessment
<b>4 - 2008 GBNRTC Bicycle and Pedestrian Master Plan</b>	Identifies all relevant project information to include but not limited to: regional objectives/ goals, MPO planning initiatives, and proposed/ existing regional trails
<b>5 - General Location: Town of Hamburg, NY</b>	Provides an overview of the Village of Hamburg, Town of Hamburg, and proposed trail component locations
<b>6 - Hamburg Comprehensive Trails System</b>	Formulates one comprehensive trails system based on the incorporation of all individual trail components; Identifies, describes, and provides GIS mapping for each individual trail component
<b>7 - Pro Forma Project Cost Estimates</b>	Provides itemized material cost estimates for the composition of each individual proposed trail component and the comprehensive trails system as a whole
<b>8 - Relevant Studies</b>	Independent studies and/ or information that provides significant relevance to the Hamburg Multimodal Trails Master Plan
<b>9 - Project Stakeholders</b>	Identifies the decision makers and stakeholders involved in the development and/ or implementation of any aspect of the Hamburg Comprehensive Trails System
<b>10 - Appendices</b>	Contains all project, component, and master plan supporting documents



## **Section 2 – Project Background**

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### **Project Background**

In May 2017, EECG Consulting, LLC was hired by the Village of Hamburg, Town of Hamburg Department of Youth, Recreation, & Senior Services, and Town of Hamburg Highway Department to develop and prepare the Hamburg Multimodal Trails Master Plan. The development and formulation of the Hamburg Multimodal Trails Master Plan is based on the significant grassroots efforts from community groups/ stakeholders and guidance from local, regional, and state decision makers. Please see below for a brief description of the planning processes and actions that lead from the initial concept plan to the Hamburg Multimodal Trails Master Plan.

**[2014]** The Village of Hamburg Recreational Trails and Tourism Task Force developed and formulated the concept plan for the Hamburg Outdoor Trails Project, which was devised as a subsequent component of the Village of Hamburg Healthy Neighborhood Corridor Project. Please note that the Village of Hamburg Healthy Neighborhood Corridor Project was awarded funding from NYSDOT as part of the Transportation Alternatives Program (TAP) in late 2014. Moreover, the concept plan for the Hamburg Outdoor Trails Project was comprised of two (2) off road recreational trails: Outdoor Adventure Trail and Recreation Connector Trail. Specifically, the Outdoor Adventure Trail connected the Village of Hamburg to the Eighteen Mile Creek Park while the Recreation Connector Trail connected the Village of Hamburg to the Lakeview Recreation Site. Additionally, the concept plan for the Hamburg Outdoor Trails Project was a component of the Eighteen Mile Creek Greenway Plan. Please see Appendix A for a complete description of the Hamburg Outdoor Trails Project.

**[2015]** Due to efforts from the Village of Hamburg, the Eighteen Mile Creek which runs through the Village of Hamburg, Town of Hamburg, and several adjacent municipalities was designated as an inland waterway by the New York State Senate. The concept plan for the Hamburg Outdoor Trails Project was shared with and received support from the local/ regional community and various stakeholder groups to include but not limited to: NYSDOT, GBNRTC, and the Buffalo-Niagara Riverkeeper. The Town of Hamburg Department of Youth, Recreation, & Senior Services began work on the Town of Hamburg Parks & Recreation Community Survey in an effort to obtain community feedback, which would serve as the basis for the Town of Hamburg Parks & Recreation Master Plan, an update to the existing 1994 master plan. The Town of Hamburg Parks & Recreation Community Survey was an extensive questionnaire available to all Village of Hamburg and Town of Hamburg residents from October 2015 to February 2016. Please note that the community survey results showed overwhelming support for community based trails similar to those identified in the concept plan for Hamburg Outdoor Trails Project.

**[2016]** EECG Consulting, LLC was hired by the Town of Hamburg Department of Youth, Recreation, & Senior Services to prepare the Initial Feasibility Study of the Hamburg Outdoor Trails Project. The feasibility study identified that the significant majority of the trails that comprise the Hamburg Outdoor Trails Project required connections through easements located on residential private property parcels. Based on the analysis of trails systems currently

implemented by other local municipalities and the challenges related to residential private property easements, the Village of Hamburg Recreational Trails and Tourism Task Force decided modify portions the existing trail components from off road to on road connections.

**[2017]** Based on the findings provided by the Town of Hamburg Parks & Recreation Community Survey and the Initial Feasibility Study of the Hamburg Outdoor Trails Project, the Village of Hamburg Recreational Trails and Tourism Task Force worked in a collaborative effort with the Village of Hamburg, Town of Hamburg Department of Youth, Recreation, & Senior Services, and Town of Hamburg Highway Department to develop and gain support for a new set of trail components, which will effectively comprise the Hamburg Comprehensive Trails System. Please note that Hamburg Comprehensive Trails System and the trails components that comprise it serve as the basis of the Hamburg Multimodal Trails Master Plan.



### Section 3 – Town of Hamburg Parks & Recreation Community Survey

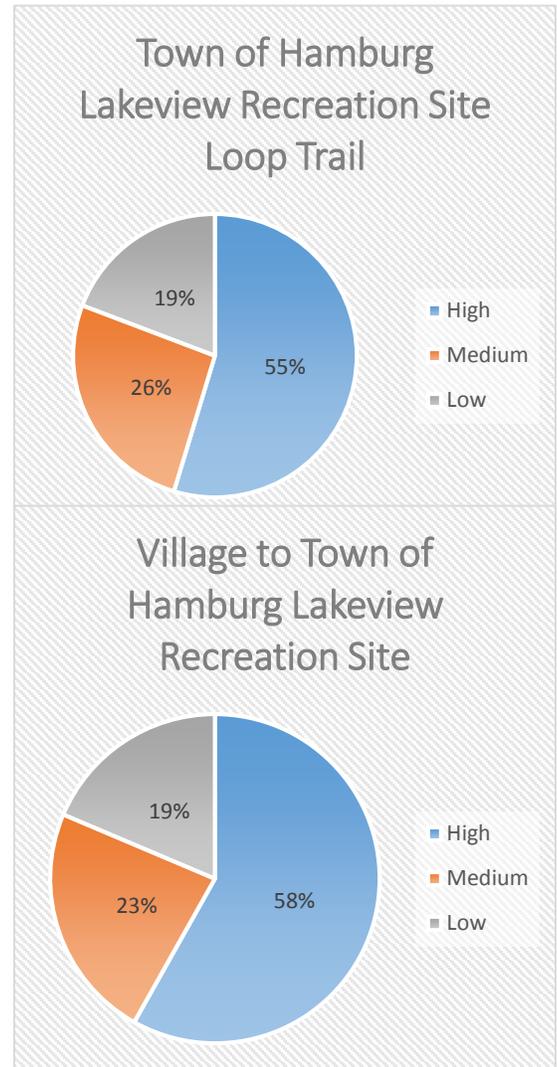
The Town of Hamburg Parks & Recreation Community Survey was available to all Village and Town of Hamburg residents from October 2015 to February 2016 and obtained community feedback regarding public facilities, programs, services, and potential upcoming community projects (facilities, attractions, and trails). Moreover, the Town of Hamburg Parks & Recreation Community Surveys was a collaborative effort between The Town of Hamburg Department of Youth, Recreation, and Senior Services, EECG Consulting, LLC, and Wendel and received over 900 responses. Please note that the Town of Hamburg Parks & Recreation Community Survey included quantitative questions regarding community support for the potential general locations of two (2) recreational trails and received approximately 500 responses. Approximately 81% of participants stated either a “High” or “Medium” level of support for each of the proposed trails. Please see Chart-I.

Additionally, qualitative information regarding the potential implementation of community trails was obtained through survey comments/ feedback with over 200 responses. Please see Chart-II for a sample of three (3) of the survey comments/ feedback received and Appendix B for a complete breakdown of the quantitative and qualitative community survey responses with respect to recreational trails.

Chart-II (Survey Question 27):  
*Are there other future recreational facilities and/ or trails that you would like to see in the Town of Hamburg?*

- ❖ *Love to have more hiking and paved bike paths!! Extend the Route 5 bike path to 18 mile creek.*
- ❖ *Find a way to petition the County to develop a bike lane along Route 5 and Old Lakeshore. So many cyclists/tourists in the summer who I am amazed are not run over...find a way to make them stay awhile and spend some money. A rest stop at the beach would be welcomed I am sure.*
- ❖ *More trails for walking and running..connecting the village to other nearby places. I'm new to the neighborhood and started venturing out last summer, and I can honestly say I'm stuck just running in a circle around the village back to my house, with my dog.*

Chart-I (Survey Question 26):  
*What is your level of support for new walking/ jogging/ bike path/ recreational trails at the following locations:*



## **Section 4 – 2008 GBNRTC Bicycle and Pedestrian Master Plan**

The Greater Buffalo Niagara Regional Transportation Council (GBNRTC) is the Metropolitan Planning Organization (MPO) for Erie and Niagara Counties and is responsible for developing long term coordinated human services and pedestrian/ bicyclist transportation plans. Moreover, the 2008 Bicycle and Pedestrian Master Plan is Buffalo-Niagara’s vision to make bicycling and walking an integral part of daily life in the region. The plan recommends projects, programs, and policies, for the next ten (10) years to encourage use of these practical, non-polluting, and affordable modes of transportation. Please see below for a list of the seven (7) primary objectives of the 2008 GBNRTC Bicycle and Pedestrian Master Plan. Please note that the description of the first primary objective is more depth as it is most directly related to the scope of the Hamburg Multimodal Trails Master Plan.



***2017 GBNRTC Online Bicycle Map***

1. Provide an Integrated Bicycle & Pedestrian Network
  - Adapt the character of roadways, with the exception of facilities that specifically prohibit bicycling, to allow safe and convenient travel by bicyclists
  - Complete an off-road trails network and establish new trails; improve access to trails
  - Incorporate innovative designs to expand and enhance the bikeway and pedestrian network
  - Eliminate barriers to pedestrian movement such as closing system gaps and/ or restoring sidewalks
  - Prioritize network implementation
  - Prioritize network maintenance
2. Provide Convenient and Secure Long-Term and Short-Term Bicycle Parking
3. Provide a Seamless and Convenient Interface with Transit
4. Educate Bicyclists, Motorists, and the General Public about Bicycling and Walking Safety
5. Market the Health Benefits of Bicycling and Walking
6. Improve Law Enforcement and Detailed Crash Analysis

### *2017 GBNRTC Online Bicycle Map*

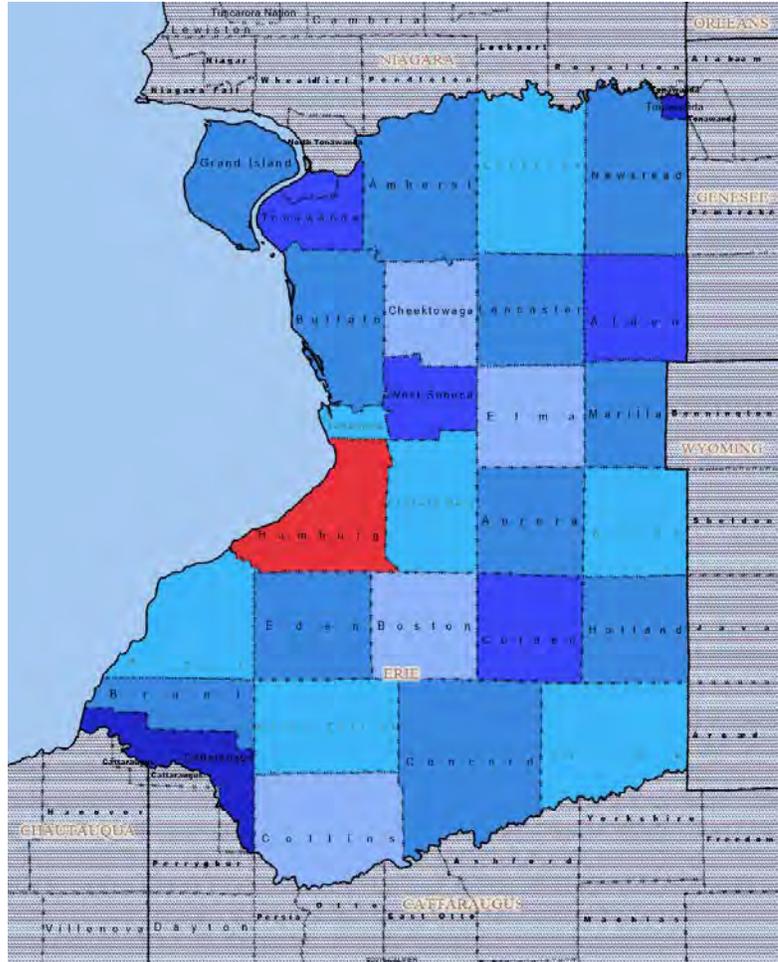
The 2017 GBNRTC Online Bicycle Map illustrates existing pedestrian/ bicyclist trails in Erie and Niagara Counties. Please see Appendix C for the full size version of the 2017 GBNRTC Online Bicycle Map. Additionally, please note the lack of existing trails in the Village of Hamburg, Town of Hamburg, and southtowns communities as a whole.



**Section 5 – General Location: Town of Hamburg, NY**

The Town of Hamburg, New York is located in Erie County and is currently one of the City’s largest suburbs. Moreover, the Town of Hamburg is comprised of 29 communities which includes the Village of Hamburg, is based on the shores of Lake Erie, and is home to many community groups/ organizations, festivals, and cultural events. According to the 2010 United States Census, approximately 56,936 people currently reside within the Town of Hamburg, of which, approximately 35,187 are between the ages of 18-64. Please see Appendix D for a full size version of General Location: Town of Hamburg, NY Maps 1 & 2.

The Town of Hamburg encompasses the Hamburg Central and Frontier Central Public School Districts with enrollments of approximately 4,066 and 5,086, respectively. The median household income in the Town of Hamburg is \$47,888 and approximately 7% of residents live below the poverty line.



**General Location: Town of Hamburg, NY;  
Map 1**

Erie County, New York is located on the western portion of the state and is the 8<sup>th</sup> most populous county in New York (2010). As identified by the 2010 United States Census approximately 919,040 individuals reside in Erie County, New York, of which, approximately 549,586 are between the ages of 18-64. Specifically, the Town of Hamburg is located directly south of the City of Buffalo and shares borders with the: Town of Evans, Town of Eden, Town of Boston, Town of Orchard Park, Town of West Seneca, and City of Lackawanna.



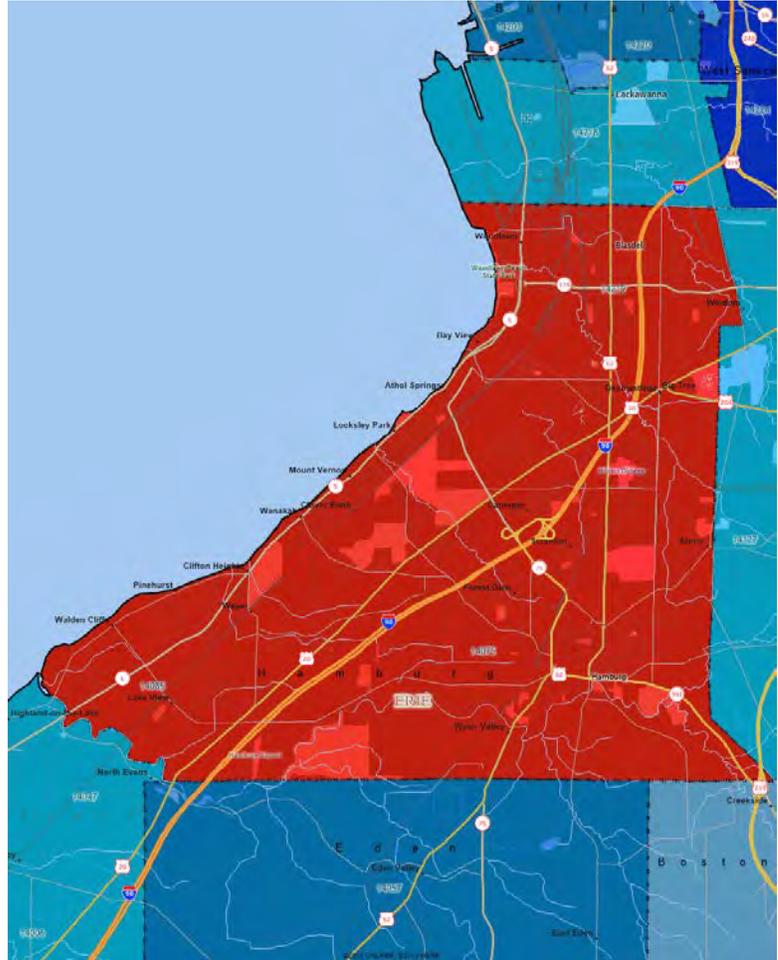
The Town of Hamburg is considered the gateway to the Western New York region from the south and west. U.S. Interstate 90 travels directly through the Town of Hamburg in route to the cities of Buffalo, Rochester, Albany, and New York City. Additionally, U.S. Routes 219, 62, & 20 and NYS Route 5 all travel directly through the Town of Hamburg.

The Town of Hamburg includes many parks, waterways, and attractions to include but not limited to: Woodlawn Beach State Park, Erie County Fairgrounds, Memorial Park, Centennial Park, Eighteen Mile Creek, Hamburg Beach, Lakeview Recreation Site, Eighteen Mile Creek Golf Course, and many Village of Hamburg shops and restaurants.

Approximately thirty-seven (37) public and private elementary, middle, and high schools exist within a ten (10) mile radius of the Town of Hamburg

Based on information provided by the Village of Hamburg, as of November 2017, there are no pedestrian and/ or bicyclist trails currently under

construction or scheduled for implementation in the Village or Town of Hamburg. The only existing trail to date is an off road snowmobile trail established and managed by the Hamburg Snowmobile Club. Moreover, the existing snowmobile trails travel from the Armor Community (Clark St and Abbott Rd area) to the utility easement near the U.S. Interstate 90 to the Lakeview Recreation Site area.



**General Location: Town of Hamburg, NY;  
Map 2**



## **Section 6 – Hamburg Comprehensive Trails System Overview**

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As identified in Section 1 – Issue Statement, it is the primary objective of the Hamburg Multimodal Trails Master Plan to provide a planning tool that will incorporate several proposed trail components into one comprehensive trails system. The Hamburg Comprehensive Trails System is focused on connections between communities, recreational locations, shopping centers, sporting venues/ fields, parkland, waterways, and existing trails/ trail systems located in municipalities adjacent to the Village and Town of Hamburg.

Moreover, the Hamburg Comprehensive Trails System maximizes the use of on road trails, Right-Of-Way (ROW), utility easements, and off road trails through public parkland/ property, while limiting travel through residential and/ or private property parcels. Specifically, the Hamburg Comprehensive Trails System is comprised of ten (10) trail components (TC). Please note that each trail component was recommended by either the Village of Hamburg, Town of Hamburg, and/ or community stakeholders. The Hamburg Comprehensive Trails System and the ten (10) trail components are identified below:

- [TC-0]: Hamburg Comprehensive Trails System
- [TC-1]: Village of Hamburg to Taylor Road Recreational Facility Trail
- [TC-1ALT]: Village of Hamburg to Taylor Road Recreational Facility Trail
- [TC-2]: Village of Hamburg to Eighteen Mile Creek Park/ Lakeview Recreation Site Trail
- [TC-3]: Village of Hamburg to New Era Field Trail
- [TC-4]: Village of Hamburg to Lake Erie Trail
- [TC-5]: Village of Hamburg to Chestnut Ridge Park Trail
- [TC-6]: Rails to Trails – Legion Field Connector Trail
- [TC-7]: Camp Road to Forest Glen to Lakeview Recreation Site Connector Trail
- [TC-8]: Route 5 from Derby to Lackawanna Trail
- [TC-9]: Rush Creek Nature Trail
- [TC-10]: Lakeview Recreation Site Loop Trail

Each trail component that comprises the Hamburg Comprehensive Trails System is illustrated in depth in the subsequent pages and is identified based on the following five (5) features:

- [F1] GIS Mapping – Detailed images with trail layout, roadways, natural/ physical barriers, and relevant crash data
- [F2] Description – Identification of directional travel through physical roadways and land
- [F3] Connectivity – Connection to currently existing or proposed local and/ or regional trails
- [F4] Feasibility/ Barriers – Barriers and/ or constraints that may need to be addressed during project implementation
- [F5] Relevant Crash Data – Indication of motor vehicle accidents(s) involving a pedestrian in proximity to a proposed trail component within the past five years

Moreover, the Hamburg Comprehensive Trails System is demand based, strategic, innovative, and will effectively provide local and regional connectivity, recreation, and assist with multimodal transportation. Multimodal transportation systems provide users with a variety of modal options, which is particularly relevant for those who are unable to drive, would prefer not to drive, or cannot afford the costs associated with automobile ownership. Multimodal transportation systems help to reduce the stress often caused on roadways by over-reliance on private vehicular access. Non-vehicular transportation is also increasingly promoted as a means for engaging in physical activity, in response to the rising rate of obesity and obesity-related diseases such as diabetes.



## Section 6 – [TC-0]: Hamburg Comprehensive Trails System

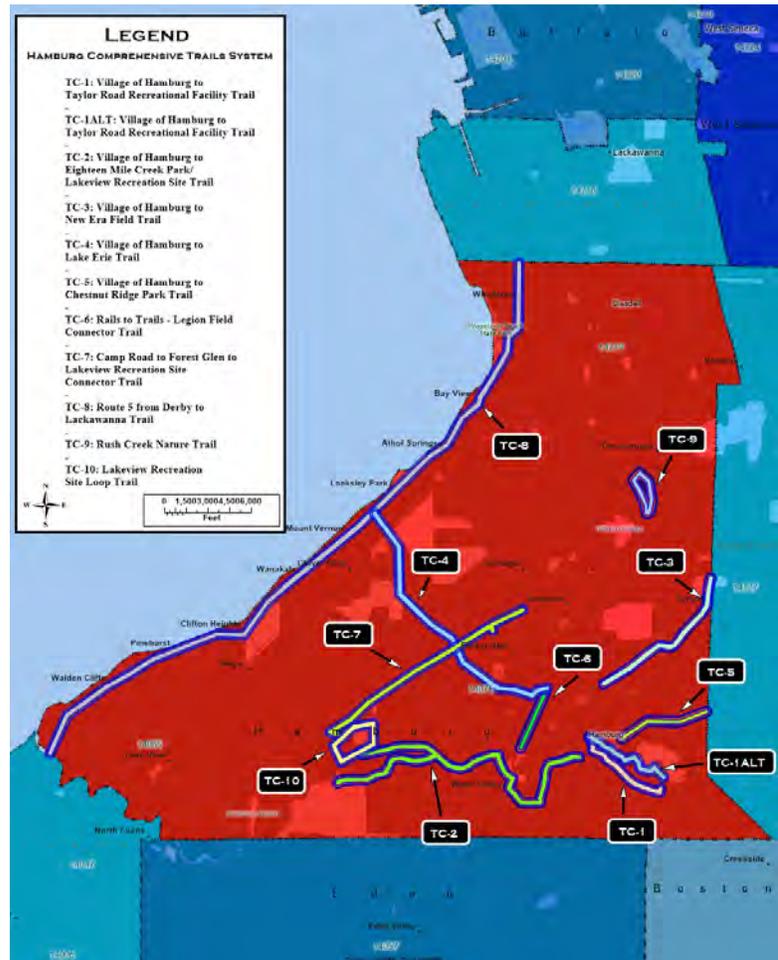
The project scope of the [T-0]: Hamburg Comprehensive Trails System including [F1] GIS Mapping, [F2] Description, [F3] Connectivity, [F4] Feasibility/ Barriers, and [F5] Relevant Crash Data is identified in the subsequent pages.

### [F1] GIS MAPPING

The Hamburg Comprehensive Trails System Map illustrates all trail component locations throughout the Village and Town of Hamburg. Please see Appendix E for a full size version of [TC-0]: Hamburg Comprehensive Trails System Map 1.

### [F2] DESCRIPTION

As identified in [F1] the Hamburg Comprehensive Trails System is comprised of ten (10) trail components (TC). Please note that the strategic locations of the trail components are utilized to maximize connectivity and public usage. The Hamburg Comprehensive Trails System is comprised of eight (8) connector trails and two (2) nature/ loop trails. Moreover, the significant majority of trail components utilize the public Right-Of-Way (ROW), existing New York State/ Erie County/ Town of Hamburg Parkland, abandoned railways, and utility easements that do not affect private property. Additionally, in some instances, partial walkability (sidewalks), crossing, and/ or trail infrastructure is existing and can be utilized for trail development.



*[TC-0]: Hamburg Comprehensive Trails System; Map 1*

### [F3] CONNECTIVITY

As previously stated in [F2], eight (8) of the ten (10) trail components are connector trails in the capacity that they provide connectivity from one location to other. The strategic locations of the connector trails were identified based on community support and to connect population centers with historically popular recreational locations and venues. As a means to enhance regional connectivity, three (3) of the trail components connect to either existing/ proposed trails or existing locations outside of the Town of Hamburg. Please note in these instances and with regards to the Hamburg



Multimodal Trails Master Plan, the proposed trail components will end at Town of Hamburg boundaries. Additionally, seven (7) of the trail components connect to each other in an effort to secure an interlocking system and provide continuous travel throughout several locations within the Town of Hamburg.

#### **[F4] FEASIBILITY/ BARRIERS**

As identified in [F2], the significant majority of trail components utilize the public Right-Of-Way (ROW), existing New York State/ Erie County/ Town of Hamburg Parkland, abandoned railways, and utility easements that do not affect private property. Please note that as identified, in the Initial Feasibility Study for the Hamburg Outdoor Trails Project (2016), it was determined that successful preexisting trails developed by other local/ regional municipalities minimized travel through residential and/ or private property parcels. Any natural and/ or physical barriers that are expected to affect project implementation are identified per trail component and are marked in each respective [F1] GIS Mapping.

#### **[F5] RELEVANT CRASH DATA**

As with any pedestrian/ bicyclist infrastructure crash data plays an integral role in identifying/ addressing any potential areas of concern. Specifically, crash data identifying accidents where a motor vehicle hit a pedestrian in the Village of Hamburg or Town of Hamburg from 2012 to 2017 was provided by Erie Crime Analysis Center (Buffalo Police Department) and is included in the Hamburg Multimodal Trails Master Plan. Any motor vehicle/ pedestrian accidents in the data set that occurred in proximity to a trail component will be marked in each respective [F1] GIS Mapping.

## **Section 6 – [TC-1]: Village of Hamburg to Taylor Road Recreational Facility Trail**

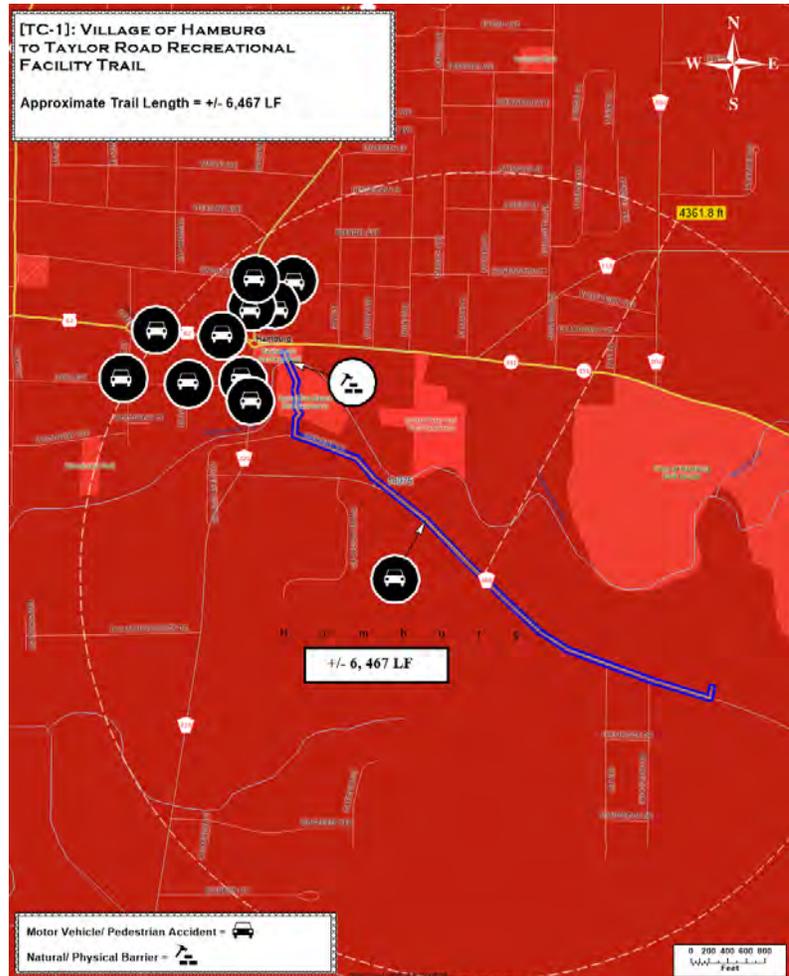
*The project scope for [TC-1]: Village of Hamburg to Taylor Road Recreational Facility Trail including [F1] GIS Mapping, [F2] Description, [F3] Connectivity, [F4] Feasibility/ Barriers, and [F5] Relevant Crash Data is identified in the subsequent pages.*

### **[F1] GIS MAPPING**

The [TC-1]: Village of Hamburg to Taylor Road Recreational Facility Trail Map illustrates the trail component location within the Village and Town of Hamburg. The approximate length of the Village of Hamburg to Taylor Road Recreational Facility Trail is +/- 6,467 LF (Linear Feet). Please see Appendix F for a full size version of [TC-1]: Village of Hamburg to Taylor Road Recreational Facility Trail Maps 1 & 2.

### **[F2] DESCRIPTION**

The [TC-1] Village of Hamburg to Taylor Road Recreational Facility Trail begins at Centennial Park in the Village of Hamburg and travels SE across the Eighteen Mile Creek through the Anna Mae Bacon Bird Sanctuary to connect to Crescent Ave. The trail will then connect to the existing sidewalk on the north side of Crescent Ave and travel E to Taylor Rd. From Taylor Rd the trail will continue east along the north side of Taylor Rd and end at the Taylor Road Recreational Facility. Please note that there are no existing sidewalks along this portion of Taylor Rd, therefore sidewalks or a pedestrian/ bike lane will need to be constructed along the Right-Of-Way (ROW) on the north side of Taylor RD.



***[TC-1]: Village of Hamburg to Taylor Road Recreational Facility Trail; Map 1***

### **[F3] CONNECTIVITY**

Connectivity for the [TC-1] Village of Hamburg to Taylor Road Recreational Facility Trail is based providing a connection between the center of the Village of Hamburg to Town of Hamburg parkland/ greenspace while targeting the

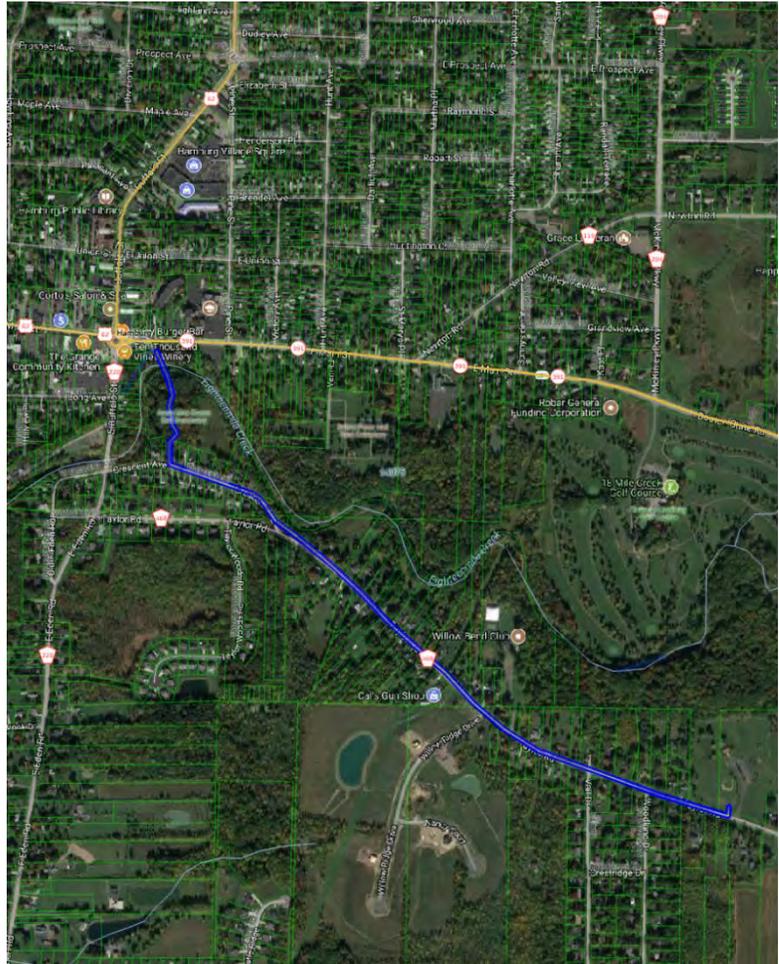


scenic Centennial Park, Anna Mae Bacon Bird Sanctuary, and Eighteen Mile Creek sites. The center of the Village of Hamburg is home to numerous restaurants, shops, and other attractions. Additionally, the Taylor Road Facility includes a playground, playing fields, fishing pond, cabin, barbeque areas, and many acres of greenspace.

**[F4] FEASIBILITY/  
BARRIERS**

The [TC-1]: Village of Hamburg to Taylor Road Recreational Facility Trail does not travel through any private residential parcels and maximizes usage of the ROW.

Please note there is one (1) natural and/ or physical barrier that is expected to affect project implementation. There is currently no existing bridge across the Eighteen Mile Creek to connect Centennial Park with the Anna Mae Bacon Bird Sanctuary. Please note that preliminary drawings for a bridge have been prepared by the University at Buffalo and are attached in Appendix U. Additionally, please note that there is no existing paved trail through the Anna Mae Bacon Bird Sanctuary, which will require design, excavation, and implementation.



***[TC-1]: Village of Hamburg to Taylor Road Recreational Facility Trail; Map 2***

**[F5] RELEVANT CRASH DATA**

From 2012-2017, there were eleven (11) motor vehicle accidents involving pedestrians in proximity to the proposed trail location.



## Section 6 – [TC-1ALT]: Village of Hamburg to Taylor Road Recreational Facility Trail

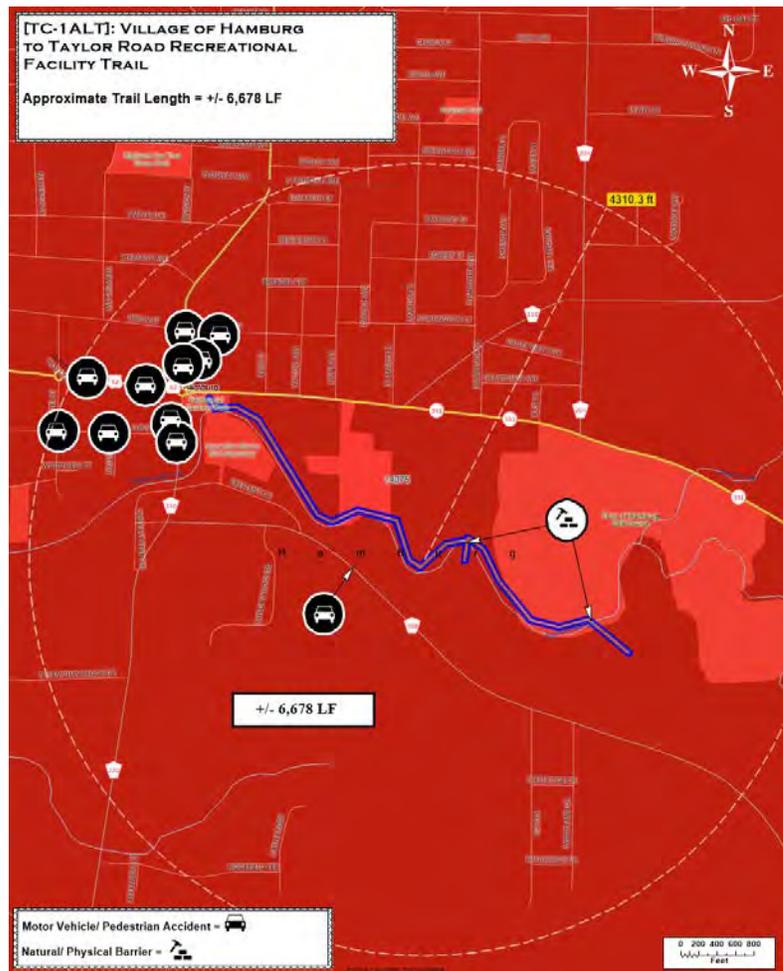
*The project scope for [TC-1ALT]: Village of Hamburg to Taylor Road Recreational Facility Trail including [F1] GIS Mapping, [F2] Description, [F3] Connectivity, [F4] Feasibility/ Barriers, and [F5] Relevant Crash Data is identified in the subsequent pages.*

### [F1] GIS MAPPING

The [TC-1ALT]: Village of Hamburg to Taylor Road Recreational Facility Trail Map illustrates the trail component location within the Village and Town of Hamburg. The approximate length of the Village of Hamburg to Taylor Road Recreational Facility Trail is +/- 6,678 LF. Please see Appendix G for a full size version of the [TC-1ALT]: Village of Hamburg to Taylor Road Recreational Facility Trail Maps 1 & 2.

### [F2] DESCRIPTION

The [TC-1ALT] Village of Hamburg to Taylor Road Recreational Facility Trail begins at Centennial Park in the Village of Hamburg and travels E along the north side of the Eighteen Mile Creek. Please note that the trail will cross the Eighteen Mile Creek at two (2) locations: Willow Bend Club and Taylor Road Recreational Facility. Both trails will cross the Eighteen Mile Creek directly to each respective venue location. Please note that as of November 2017, the Town of Hamburg is considering acquiring the Willow Bend Club in 2018 for public recreational use. Additionally, please note that the [TC-1ALT] Village of Hamburg to Taylor Road Recreational Facility Trail is a fully off road trail.



***[TC-1ALT]: Village of Hamburg to Taylor Road Recreational Facility Trail; Map 1***

### [F3] CONNECTIVITY

Connectivity for the [TC-1ALT] Village of Hamburg to Taylor Road Recreational Facility Trail is based on providing a connection between the center of the

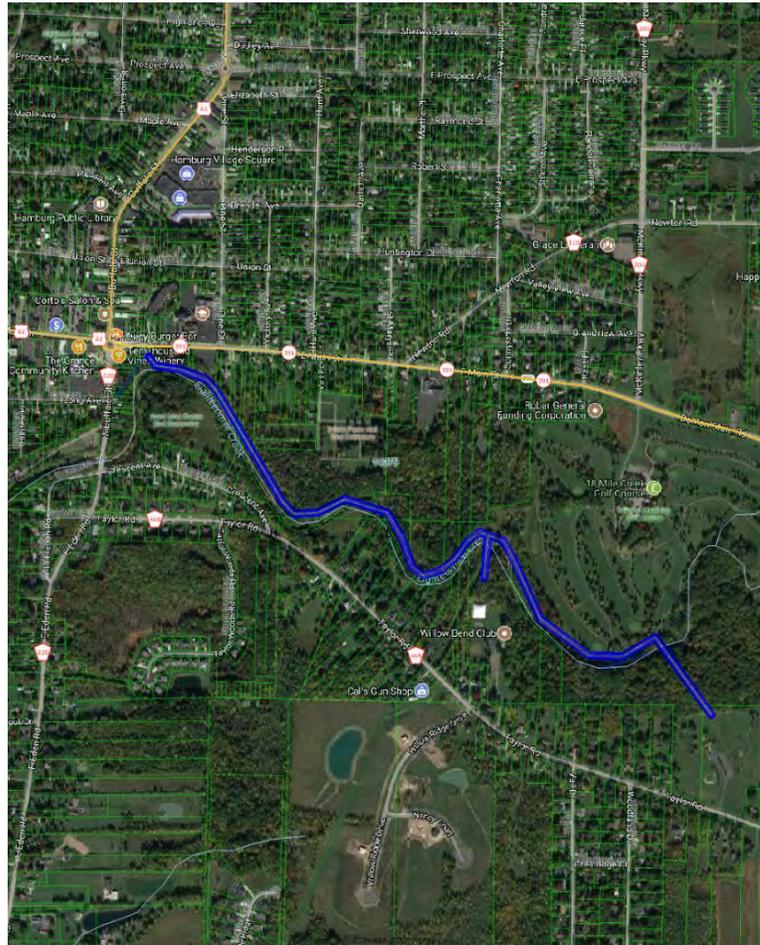


Village of Hamburg to Town of Hamburg parkland/ greenspace while targeting Centennial Park, Willow Bend Club, Taylor Road Recreational Facility, and the Eighteen Mile Creek Greenway. The center of the Village of Hamburg is home to numerous restaurants, shops, and other attractions. Additionally, the Willow Bend Club currently includes tennis courts, swimming pool, and dining facilities, while the Town of Hamburg Taylor Road Facility includes a playground, playing fields, fishing pond, cabin, barbeque areas, and many acres of greenspace.

**[F4] FEASIBILITY/ BARRIERS**

The [TC-1ALT]: Village of Hamburg to Taylor Road Recreational Facility Trail does travel through the rear portion of private property parcels. Permission from property owners is an expected requirement.

Please note there are two (2) natural and/ or physical barriers that are expected to affect project implementation. There are currently no existing bridges across the Eighteen Mile Creek to connect the north side of the Eighteen Mile Creek with the Willow Bend Club or Taylor Road Recreational Facility. Please note that the excavation of tree/ greenspace will be needed for trail implementation.



*[TC-1ALT]: Village of Hamburg to Taylor Road Recreational Facility Trail; Map 2*

**[F5] RELEVANT CRASH DATA**

From 2012-2017, there were eleven (11) motor vehicle accidents involving pedestrians in proximity to the proposed trail location.



## Section 6 – [TC-2]: Village of Hamburg to Eighteen Mile Creek Park to Lakeview Recreation Site Trail

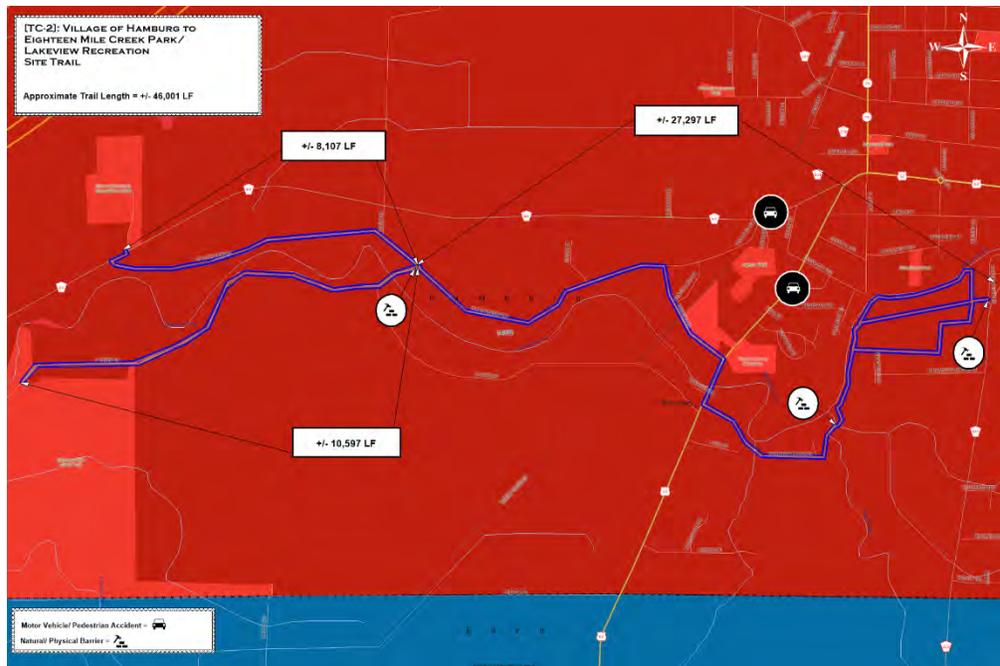
The project scope for [TC-2]: Village of Hamburg to Eighteen Mile Creek Park to Lakeview Recreation Site Trail including [F1] GIS Mapping, [F2] Description, [F3] Connectivity, [F4] Feasibility/ Barriers, and [F5] Relevant Crash Data is identified in the subsequent pages.

### [F 1] GIS MAPPING

The [TC-2]: Village of Hamburg to Eighteen Mile Creek Park to Lakeview Recreation Site Trail Map illustrates the trail component location within the Village and Town of Hamburg. The approximate length of the Village of Hamburg to Eighteen Mile Creek Park to Lakeview Recreation Site Trail is +/- 46,001 LF. Please see Appendix H for a full size version of [TC-2]: Village of Hamburg to Eighteen Mile Creek Park to Lakeview Recreation Site Trail Maps 1 & 2.

### [F2] DESCRIPTION

The [TC-2] Village of Hamburg to Eighteen Mile Creek Park to Lakeview Recreation Site Trail begins at the NYS parkland access point along the west side of Old East Eden Road and travels W/ SW along the south side of the Eighteen Mile Creek through the existing NYS parkland to connect with the existing dead end on Hampton Brook Dr. The trail continues along the ROW on the north side of Hampton Brook Dr to Gowanda State Rd (Route 62). At that point the trail will continue across Gowanda State Rd (Route 62) to connect with the existing sidewalk along the west side of Gowanda State Rd (Route 62). Traveling along the existing sidewalk the trail will continue north to Stevens Rd. The trail will then continue along the ROW on the south side of Stevens Rd to Old Lakeview Rd. From that point, the trail will continue along the ROW on the south side of Old Lakeview Rd to South Creek Rd. The trail will continue along the ROW on the north side of South Creek Road and end at the Eighteen Mile Creek Park. Please note that a second portion of the trail will continue along the ROW on the south side of Old Lakeview Rd to connect with Lakeview Rd. At that point, the trail will



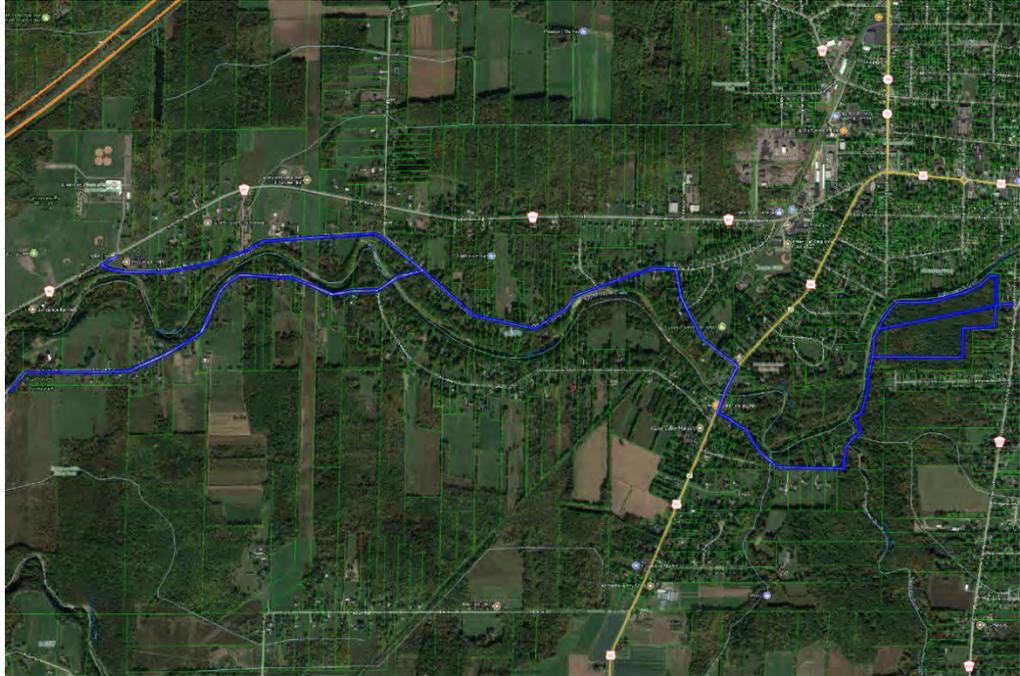
**[TC-2]: Village of Hamburg to Eighteen Mile Creek Park to Lakeview Recreation Site Trail; Map 1**



cross Lakeview Rd and connect with the Lakeview Recreation Site. Please note there are no existing sidewalks on Stevens Rd, Old Lakeview Rd, and South Creek Rd, therefore sidewalks or a pedestrian/ bike lane will need to be constructed.

**[F3] CONNECTIVITY**

Connectivity for the [TC-2]: Village of Hamburg to Eighteen Mile Creek Park to Lakeview Recreation Site Trail is multifaceted and effectively provides connections between the center of the Village of Hamburg, Eighteen Mile Creek Park,



Lakeview Recreation Site, and all adjacent communities. The [TC-2]: Village of Hamburg to Eighteen Mile Creek Park to Lakeview

***[TC-2]: Village of Hamburg to Eighteen Mile Creek Park to Lakeview Recreation Site Trail; Map 2***

Recreation Site Trail targets the scenic Eighteen Mile Creek Greenway, NYS parkland, Eighteen Mile Creek Park, and Lakeview Recreation Site. The Eighteen Mile Creek Park is home to several nature walks and fishing locations. The Lakeview Recreation Site is the premier recreational location within the Town of Hamburg and includes an ice arena, baseball/ softball diamonds, soccer fields, BMX track, lacrosse fields, dog park, playgrounds, and many acres of green space/ nature areas. Additionally, the [TC-2]: Village of Hamburg to Eighteen Mile Creek Park to Lakeview Recreation Site Trail will directly connect to the [TC-10]: Lakeview Recreation Site Loop Trail

**[F4] FEASIBILITY/ BARRIERS**

The [TC-2]: Village of Hamburg to Eighteen Mile Creek Park to Lakeview Recreation Site Trail may potentially travel through at least two (2) private residential parcels and maximizes usage of the ROW. [A] There is an existing residential driveway at the beginning of the trail on the west side of Old East Eden Rd/ access point to NYS Parkland. [B] The trail may pass through the rear portion of one or more residential parcels near the connection of the NYS Parkland to the dead end on Hampton Brook Rd.



Please note that there are three (3) expected natural and/ or physical barriers that will potentially affect project implementation. [C] The existing residential driveway at the beginning of the trail on the west side of Old East Eden Rd/ access point to NYS Parkland will need to be considered when creating a trail starting point. [D] A bridge or structure crossing the Eighteen Mile Creek in proximity to the connection of the NYS Parkland to the dead end on Hampton Brook Rd will be required. [E] The existing bridge on South Creek Rd that crosses the Eighteen Mile Creek near Old Lakeview Rd has narrow shoulders which may limit access to pedestrian/ bicyclist infrastructure.

**[F5] RELEVANT CRASH DATA**

From 2012-2017, there were two (2) motor vehicle accidents involving pedestrians in proximity to the proposed trail location.



## Section 6 – [TC-3]: Village of Hamburg to New Era Field Trail

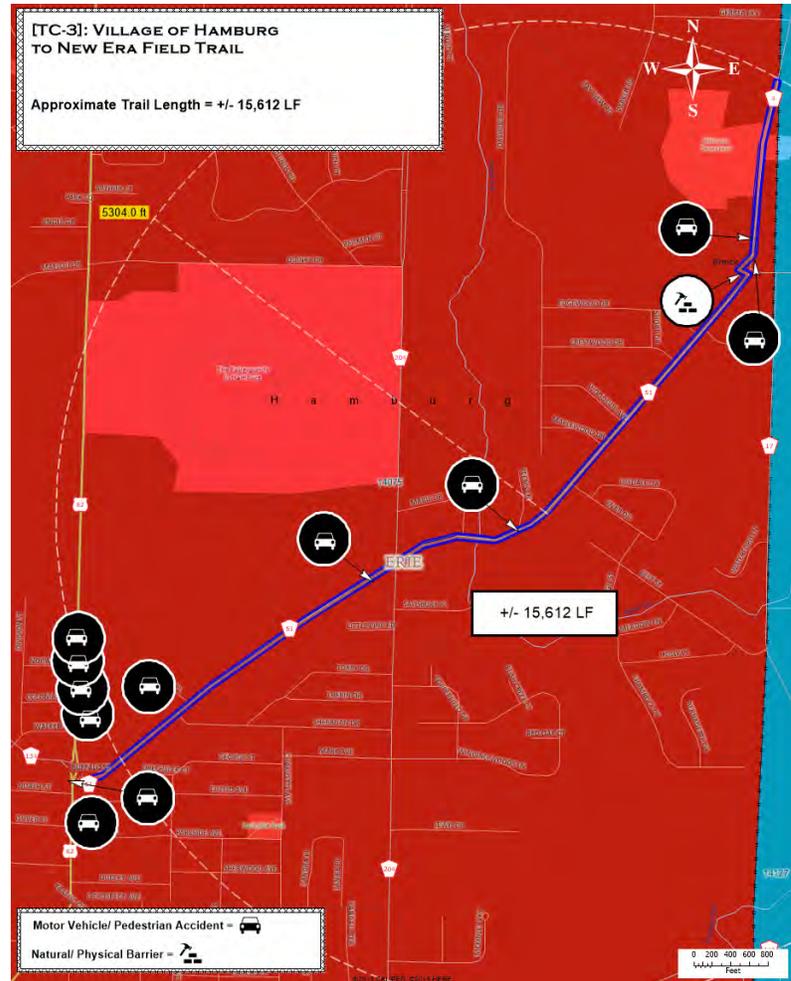
The project scope for [TC-3]: Village of Hamburg to New Era Field Trail including [F1] GIS Mapping, [F2] Description, [F3] Connectivity, [F4] Feasibility/ Barriers, and [F5] Relevant Crash Data is identified in the subsequent pages.

### [F1] GIS MAPPING

The [TC-3]: Village of Hamburg to New Era Field Trail Map illustrate the trail component location within the Village and Town of Hamburg. The approximate length of the Village of Hamburg to New Era Field Trail is +/- 15,612 LF. Please see Appendix I for a full size version of [TC-3]: Village of Hamburg to New Era Field Trail Maps 1 & 2.

### [F2] DESCRIPTION

The [TC-3] Village of Hamburg to New Era Field Trail begins at the Village of Hamburg community park at the southern end of Clark St near Buffalo St. The trail continues along the existing sidewalk on the east side of Clark St to McKinley Pkwy. The trail continues north along the ROW on the east side of Clark St to the intersection of Clark St, Bayview Rd, and Abbott Rd. Please note that there are no existing sidewalks on Clark St between McKinley Pkwy and Bayview Rd/ Abbott Rd/ Armor Duells Rd therefore sidewalks will need to be constructed. A pedestrian/ bicyclist crossing system at the intersection of Clark St, Bayview Rd, Abbott Rd, and Armor Duells Rd will need to be determined. Moreover, the proposed trail along the east side of Clark St will connect with the existing sidewalk portion on the west side of Abbott Rd to continue along the ROW on the west side of Abbott Rd to New Era Field. Please note that only a small portion of sidewalks exist on the west side of Abbott Rd, therefore sidewalks will need to be constructed. Additionally, please note that as per the Hamburg Multimodal Trails Master Plan, the [TC-3]: Village of Hamburg to New Era Field Trial will end at the Town of Hamburg/ Town of Orchard Park boundary. Additional collaboration will be needed with the Town of Orchard Park to complete the connection to New Era Field.

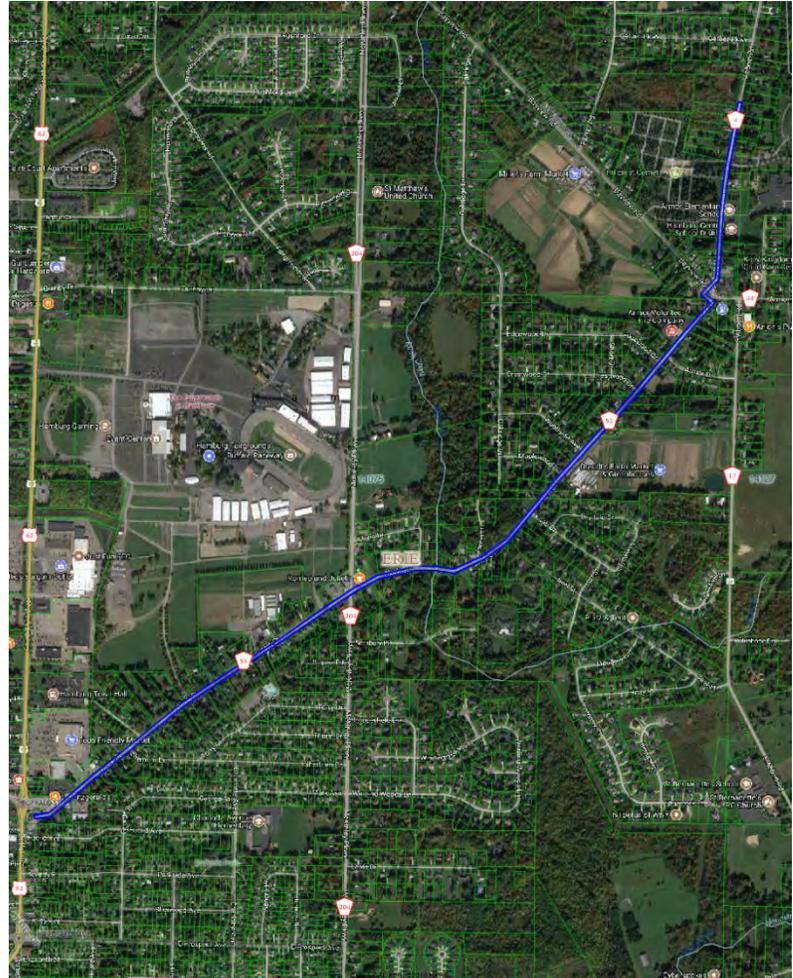


**[TC-3]: Village of Hamburg to New Era Field Trail; Map 1**



**[F3] CONNECTIVITY**

Connectivity for the [TC-3]: Village of Hamburg to New Era Field Trail is based on the connectivity from a vibrant portion of the Village of Hamburg/ Town of Hamburg directly to New Era Field. Additionally, please note that the [TC-3]: Village of Hamburg to New Era Field Trail incorporates two (2) other community connectivity functions. [I] Village of Hamburg to the Erie County Fairgrounds, which has entrances located on the east side of Clark St and the south side of McKinley Pkwy in proximity to the intersection of Clark St and McKinley Pkwy. [II] Village of Hamburg to the Town of Hamburg Armor Community. The Town of Hamburg Armor Community is located in proximity to the Clark St, Bayview Rd, Abbott Rd, and Armor Duells Rd intersection and currently has very limited pedestrian/ bicyclist connectivity to the Village of Hamburg.



*[TC-3]: Village of Hamburg to New Era Field Trail; Map 2*

**[F4] FEASIBILITY/ BARRIERS**

The [TC-3]: Village of Hamburg to New Era Field Trail does not travel through any private residential parcels and maximizes usage of the ROW. Please note that there is one (1) natural and/ or physical barrier that is expected to affect project implementation. The intersection of Clark St, Bayview Rd, Abbott Rd, and Armor Duells Rd is a potentially dangerous crossing site for pedestrians/ bicyclists due to both the amount of motor vehicle traffic and motor vehicle line of sight. An enhanced crossing system is recommended.

**[F5] RELEVANT CRASH DATA**

From 2012-2017, there were eleven (11) motor vehicle accidents involving pedestrians in proximity to the proposed trail location.



## Section 6 – [TC-4]: Village of Hamburg to Lake Erie Trail

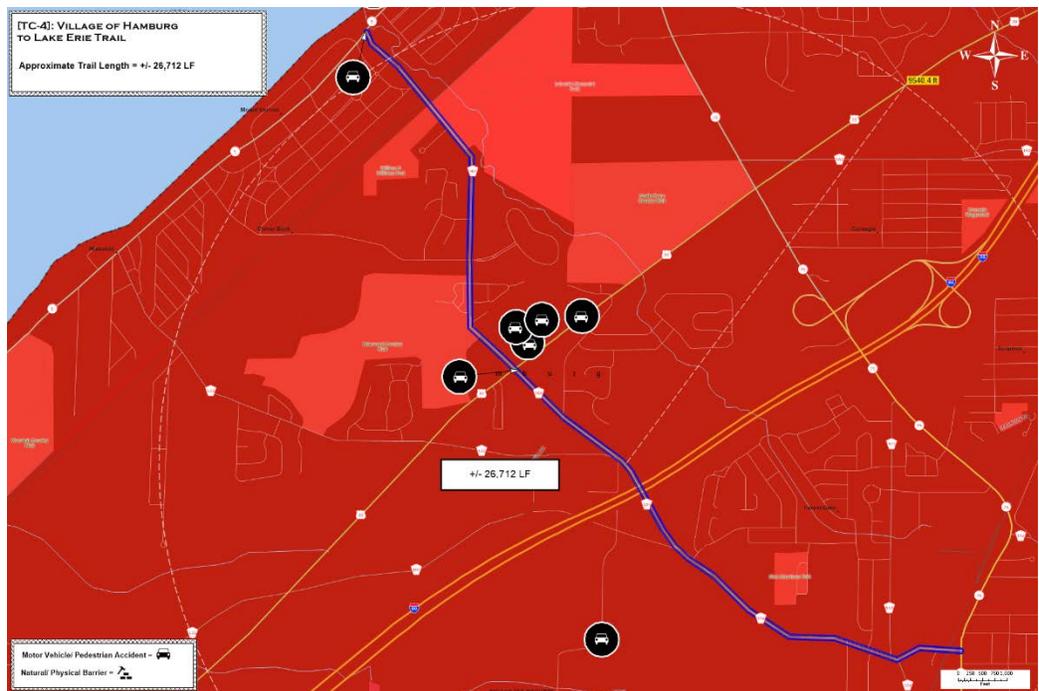
The project scope for [TC-4]: Village of Hamburg to Lake Erie Trail including [F1] GIS Mapping, [F2] Description, [F3] Connectivity, [F4] Feasibility/ Barriers, and [F5] Relevant Crash Data is identified in the subsequent pages.

### [F1] GIS MAPPING

The [TC-4]: Village of Hamburg to Lake Erie Trail Map illustrates the trail component location within the Village and Town of Hamburg. The approximate length of the Village of Hamburg to Lake Erie Trail is +/- 26,712 LF. Please see Appendix J for a full size version of [TC-4]: Village of Hamburg to Lake Erie Trail Maps 1 & 2.

### [F2] DESCRIPTION

The [TC-4] Village of Hamburg to Lake Erie Trail begins at the abandoned Erie Railroad along the south side of Church St and continues W along the existing sidewalk to the intersection of Church St and Pleasant Ave. At that point a system to cross



**[TC-4]: Village of Hamburg to Lake Erie Trail; Map 1**

to Pleasant Ave should be determined. The trail will then cross Pleasant Ave and connect to the existing sidewalk on the south side of Pleasant Ave and continue W on Pleasant Ave over the existing bridge to Rogers Rd. The trail will then continue along the ROW on the southwest side of Rogers Rd to connect to the existing sidewalk at the intersection of Rogers Rd and Southwestern BLVD. Please note that only a small portion of sidewalks exist along Pleasant Ave and Rogers Rd, therefore sidewalks and/ or pedestrian/ bicyclist lanes will need to be constructed. At that point the trail continues along Rogers Rd to the existing sidewalk at the intersection of Rogers Rd and Route 5.

### [F3] CONNECTIVITY

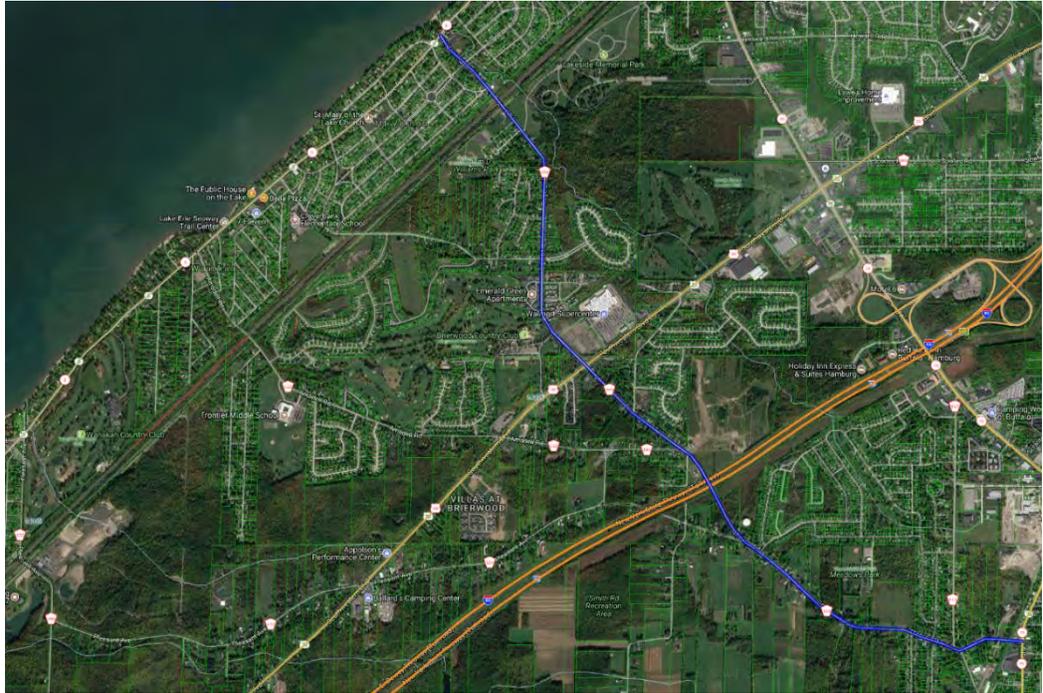
Connectivity for the [TC-4]: Village of Hamburg to Lake Erie Trail is based on the connectivity from the Village of Hamburg to the Lake Erie area, however the [TC-4]: Village of Hamburg to



Lake Erie Trail plays a significant role as the “spine” of the Hamburg Comprehensive Trails System. Please note that the [TC-4]: Village of Hamburg to Lake Erie Trail provides direct connections to the: [TC-6]: Rails to Trails – Legion Field Connector Trail, [TC-7]: Camp Road to Forest Glen to Lakeview Recreation Site Trail, and [TC-8]: Route 5 from Derby to Lackawanna Trail. Moreover, these direct connections also provide indirect connections to other trail components and several community location throughout the Village and Town of Hamburg. Please review Appendix E for a full size version of the [TC-0]: Hamburg Comprehensive Trails System Map 1.

**[F4] FEASIBILITY/ BARRIERS**

The [TC-4]: Village of Hamburg to Lake Erie Trail does not travel through any private residential parcels and maximizes usage of the ROW. Additionally, the [TC-4]: Village of Hamburg to Lake Erie Trail does not travel through any natural and/ or physical barriers.



*[TC-4]: Village of Hamburg to Lake Erie Trail; Map 2*

**[F5] RELEVANT CRASH DATA**

From 2012-2017, there were seven (7) motor vehicle accidents involving pedestrians in proximity to the proposed trail location.



## Section 6 – [TC-5]: Village of Hamburg to Chestnut Ridge Park Trail

The project scope for [TC-5]: Village of Hamburg to Chestnut Ridge Park Trail including [F1] GIS Mapping, [F2] Description, [F3] Connectivity, [F4] Feasibility/ Barriers, and [F5] Relevant Crash Data is identified in the subsequent pages.

### [F1] GIS MAPPING

The [TC-5]: Village of Hamburg to Chestnut Ridge Park Trail Map illustrates the trail component location within the Village and Town of Hamburg. The approximate length of the Village of Hamburg to Chestnut Ridge Park Trail is +/- 8,767 LF. Please see Appendix K for a full size version of [TC-5]: Village of Hamburg to Chestnut Ridge Park Trail Maps 1 & 2.

### [F2] DESCRIPTION

The [TC-5] Village of Hamburg to Chestnut Ridge Park Trail begins at the existing sidewalk at the intersection of East Main St and Newton Rd. The trail continues along the existing sidewalk on the south side of Newton Rd and continues to the intersection of Newton Rd and McKinley Pkwy. The trail then continues along the ROW on the south side of Newton Rd to Chestnut Ridge Park. Please note that only a small portion of sidewalks exist along Newton Rd, therefore sidewalks and/ or pedestrian/ bicyclist lanes will need to be constructed. Additionally, please note that as per the Hamburg Multimodal Trails Master Plan, the [TC-5]: Village of Hamburg to Chestnut Ridge Trail will end at the Town of Hamburg/ Town of Orchard Park boundary. Additional collaboration will be needed with the Town of Orchard Park to complete the connection to Chestnut Ridge Park.



**[TC-5]: Village of Hamburg to Chestnut Ridge Trail; Map 1**

### [F3] CONNECTIVITY

Connectivity for the [TC-5]: Village of Hamburg to Chestnut Ridge Park Trail is based on the connectivity from the Village of Hamburg directly to Chestnut Ridge Park.



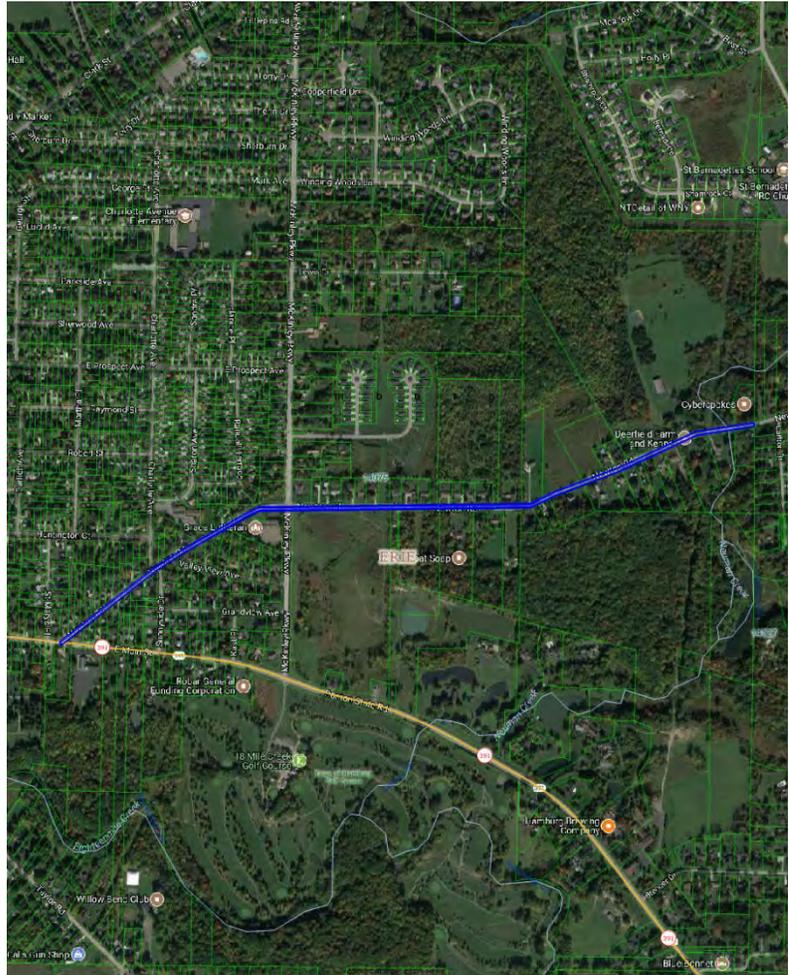
Chestnut Ridge Park is very popular attraction for Village and Town of Hamburg residents and includes a wide variety of amenities to include but not limited to: picnic shelters, tennis courts, nature trails, and Frisbee golf.

**[F4] FEASIBILITY/  
BARRIERS**

The [TC-5]: Village of Hamburg to Chestnut Ridge Park Trail does not travel through any private residential parcels and maximizes usage of the ROW. Additionally, the [TC-5]: Village of Hamburg to Chestnut Ridge Park Trail does not travel through any natural and/ or physical barriers.

**[F5] RELEVANT CRASH  
DATA**

From 2012-2017, there were two (2) motor vehicle accidents involving pedestrians in proximity to the proposed trail location.



***[TC-5]: Village of Hamburg to  
Chestnut Ridge Trail; Map 2***



## Section 6 – [TC-6]: Rails to Trails – Legion Field Connector Trail

The project scope for [TC-6]: Rails to Trails – Legion Field Connector Trail including [F1] GIS Mapping, [F2] Description, [F3] Connectivity, [F4] Feasibility/ Barriers, and [F5] Relevant Crash Data is identified in the subsequent pages.

### [F 1] GIS MAPPING

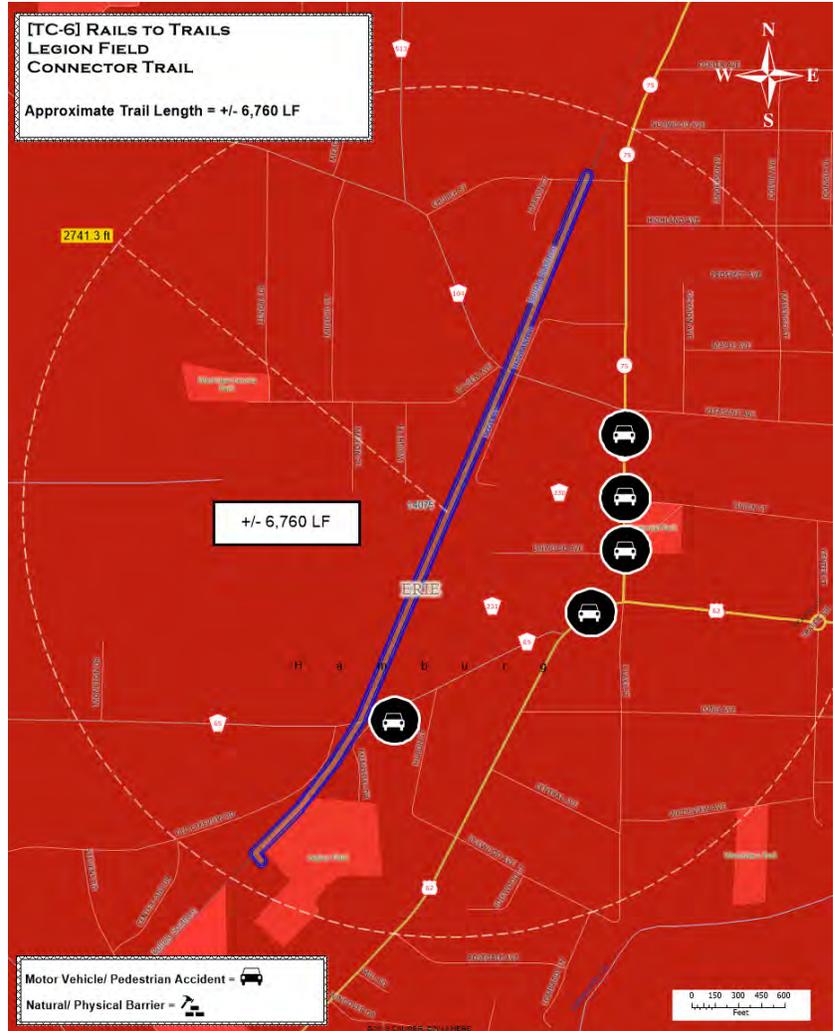
The [TC-6]: Rails to Trails – Legion Field Connector Trail Map illustrates the trail component location within the Village and Town of Hamburg. The approximate length of the Rails to Trails – Legion Field Connector Trail is +/- 6,760 LF. Please see Appendix L for a full size version of [TC-6]: Rails to Trails – Legion Field Connector Trail Maps 1 & 2.

### [F2] DESCRIPTION

The [TC-6]: Rails to Trails – Legion Field Connector Trail begins at the abandoned Erie Railroad along the south side of Church St and continues S along the abandoned railway corridor across Pleasant Ave and Evans St to connect with a determined location at Legion Field.

### [F3] CONNECTIVITY

Connectivity for the [TC-6]: Rails to Trails – Legion Field Connector Trail is based on the connectivity from one popular location in the Village of Hamburg to another (Legion Field). Legion Field is a large community baseball/ softball facility utilized by several little league organizations and high school teams during the season. Please note that the [TC-4]: Village of Hamburg to Lake Erie Trail directly connects to the [TC-6]: Rails to Trails – Legion Field Connector Trail. Please note that the [TC-6]: Rails to Trails – Legion Field Connector Trail is a fully off road trail that provides connections to several additional community locations throughout the Village of Hamburg.



**[TC-6]: Rails to Trails – Legion Field Connector Trail; Map 1**

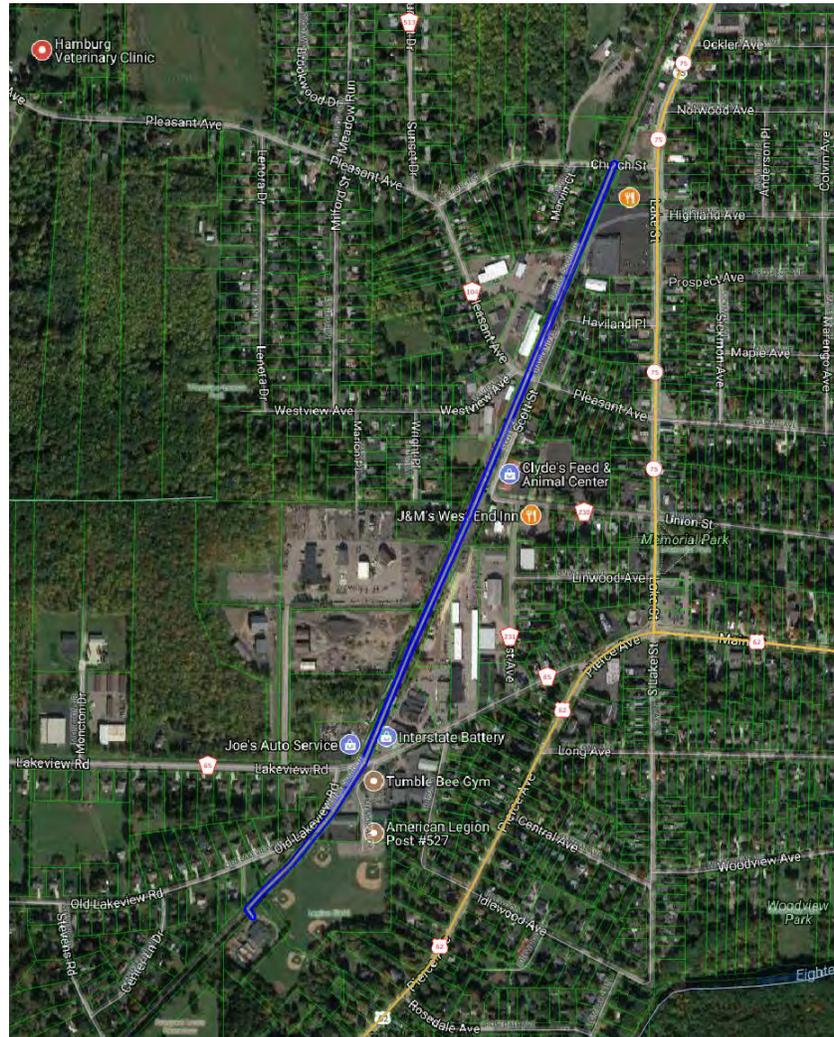


**[F4] FEASIBILITY/ BARRIERS**

The [TC-6]: Rails to Trails – Legion Field Connector Trail does not travel through any private property parcels and maximizes usage of a portion of the existing abandoned Erie Railroad corridor. Additionally, the [TC-6]: Rails to Trails – Legion Field Connector Trail does not travel through any natural and/ or physical barriers.

**[F5] RELEVANT CRASH DATA**

From 2012-2017, there were five (5) motor vehicle accidents involving pedestrians in proximity to the proposed trail location.



***[TC-6]: Rails to Trails – Legion Field Connector Trail; Map 2***



## Section 6 – [TC-7]: Camp Road to Forest Glen to Lakeview Recreation Site Connector Trail

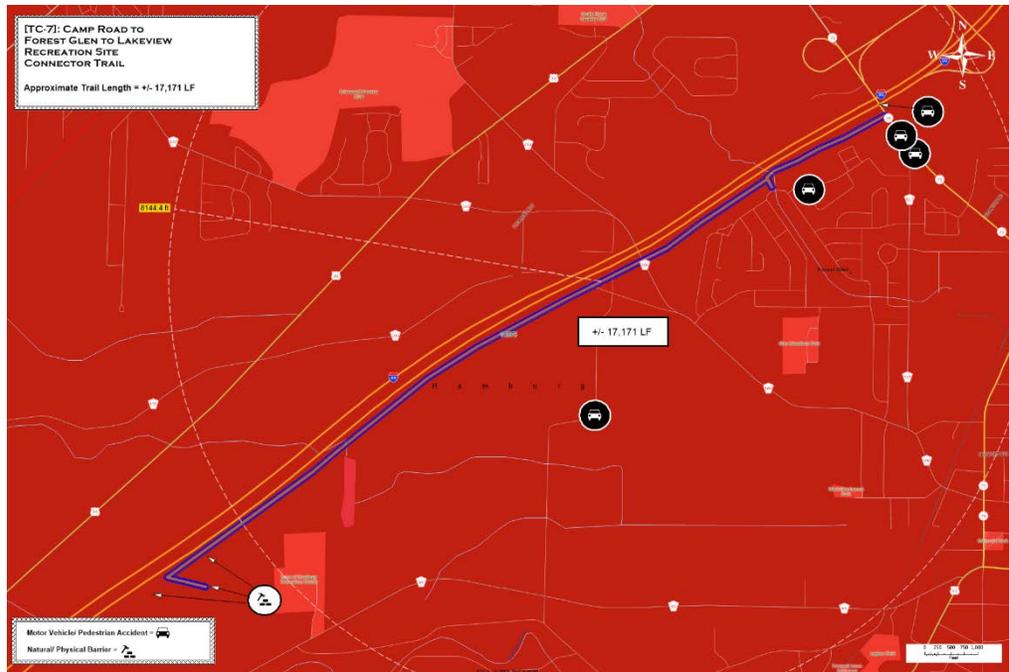
The project scope for [TC-7]: Camp Road to Forest Glen to Lakeview Recreation Site Connector Trail including [F1] GIS Mapping, [F2] Description, [F3] Connectivity, [F4] Feasibility/ Barriers, and [F5] Relevant Crash Data is identified in the subsequent pages.

### [F1] GIS MAPPING

The [TC-7]: Camp Road to Forest Glen to Lakeview Recreation Site Connector Trail Map illustrates the trail component location within the Village and Town of Hamburg. The approximate length of the Camp Road to Forest Glen to Lakeview Recreation Site Connector Trail is +/- 17,171 LF. Please see Appendix M for a full size version of [TC-7]: Camp Road to Forest Glen to Lakeview Recreation Site Trail Maps 1 & 2.

### [F2] DESCRIPTION

The [TC-7]: Camp Road to Forest Glen to Lakeview Recreation Site Connector Trail begins at the existing sidewalk along the west side of Camp Rd between the U.S. Interstate 90 and the Hampton Inn – Hamburg. Moreover, the trail will continue directly W/SW off road along the U.S. Interstate 90 through the existing utility easement to connect with the Forest Glen



**[TC-7]: Camp Road/ Forest Glen to Town of Hamburg Lakeview Recreation Site Connector Trail; Map 1**

development through the access point/ existing sidewalk on the north side of Brookwood Dr. The trail will then continue along the main trail W/SW through the utility easement along the U.S. Interstate 90 and end at the Lakeview Recreation Site. Please note that several snowmobile trails currently exist in proximity to the trail component location.

### [F3] CONNECTIVITY

Connectivity for the [TC-7]: Camp Road to Forest Glen to Lakeview Recreation Site Connector Trail is multifaceted and effectively provides connections between the center of the Village of Hamburg, Town of Hamburg, Forest Glen Development, Lakeview Recreation Site, and all



adjacent communities. Please note that the [TC-7]: Camp Road to Forest Glen to Lakeview Recreation Site Connector Trail connects directly to the [TC-4]: Village of Hamburg to Lake Erie Trail and [TC-10]: Lakeview Recreation Site Loop Trail. Additionally, the Lakeview Recreation Site is the premier recreational location within the Town of Hamburg and includes an ice arena, baseball/ softball diamonds, soccer fields, BMX track, lacrosse fields, dog park, playgrounds, and many acres of green space/ nature areas. Please note that the [TC-7]: Camp Road to Forest Glen to Lakeview Recreation Site Connector Trail is a fully off road trail.

**[F4] FEASIBILITY/ BARRIERS**

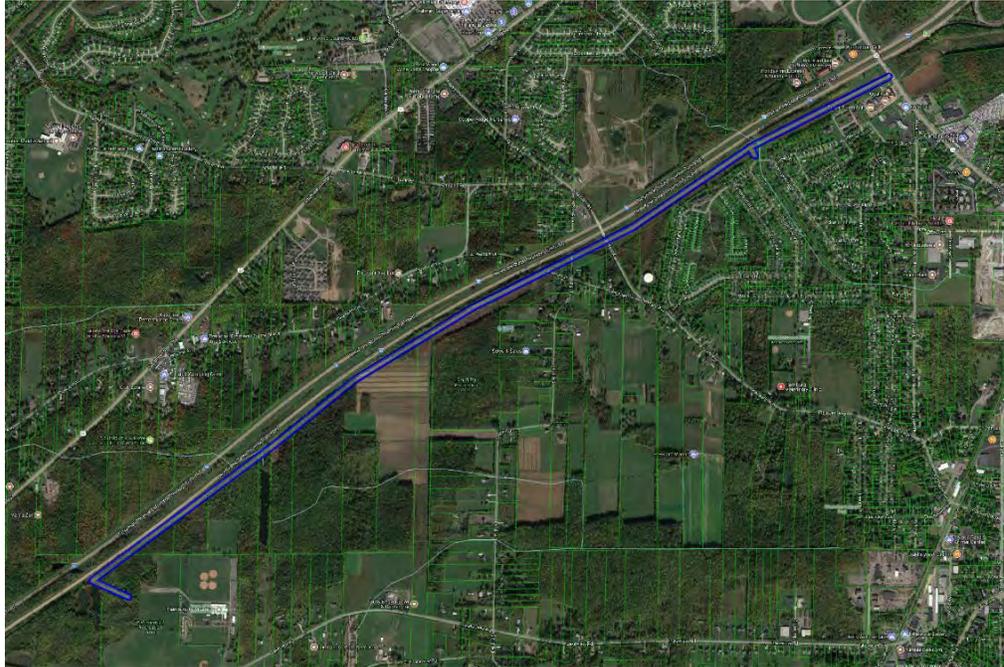
The [TC-7]: Camp Road to Forest Glen to Lakeview Recreation Site Connector Trail primary travels through an existing utility easement along the U.S.

Interstate 90. Approval from the utility company is required for implementation.

Please note that several NYS wetlands/ conservation areas exist along the northern portions of the Lakeview Recreation Site.

Any trail implementation in these areas will require approval from the NYS Department of Environmental Conservation (DEC).

Additionally, there are no existing natural and/ or physical barriers with the exception of the excavation of the tree/ greenspace needed for trail implementation.



***[TC-7]: Camp Road/ Forest Glen to Town of Hamburg Lakeview Recreation Site Connector Trail; Map 2***

**[F5] RELEVANT CRASH DATA**

From 2012-2017, there were five (5) motor vehicle accidents involving pedestrians in proximity to the proposed trail location.



## Section 6 – [TC-8]: Route 5 from Derby to Lackawanna Trail

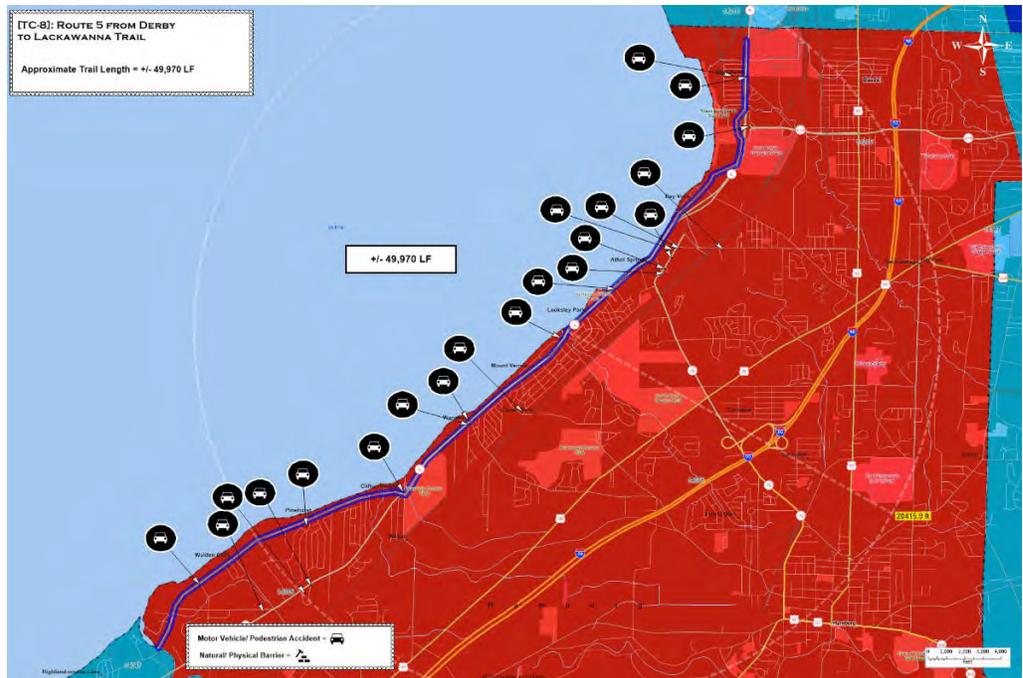
The project scope for [TC-8]: Route 5 from Derby to Lackawanna Trail including [F1] GIS Mapping, [F2] Description, [F3] Connectivity, [F4] Feasibility/ Barriers, and [F5] Relevant Crash Data is identified in the subsequent pages.

### [F1] GIS MAPPING

The [TC-8]: Route 5 from Derby to Lackawanna Trail Map illustrates the trail component location within the Town of Hamburg. Please note that Derby is a hamlet along the shores of Lake Erie within the northern portion of the Town of Evans. The approximate length of the Route 5 from Derby to Lackawanna Trail is +/- 49,970 LF. Please see Appendix N for a full size version of [TC-8]: Route 5 from Derby to Lackawanna Trail Maps 1 & 2.

### [F2] DESCRIPTION

The [TC-8]: Route 5 from Derby to Lackawanna Trail begins on the Eighteen Mile Creek Bridge at the existing sidewalk on the east side of Old Lake Shore Road and continues N along the ROW on the east side of Old Lake Shore Road to connect with



***[TC-8]: Route 5 from Derby to Lackawanna Trail; Map 1***

Route 5 (Lake Shore Road). At the intersection of Old Lake Shore Road and Route 5

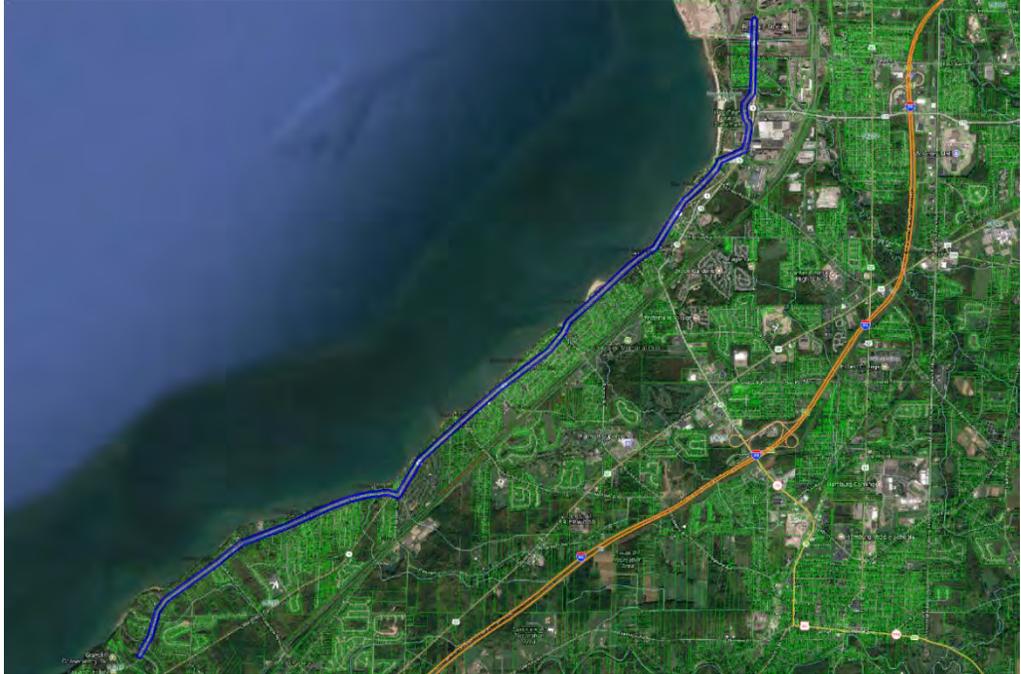
the trail will cross from the east side of Old Lake Shore Rd to the west side of Old Lake Shore Rd and continue N along the ROW along the west side of Route 5 until the intersection of Route 5 and Cloverbank Rd. At this point, the trail will cross to the east side of Route 5 and continue N along the ROW to the intersection of Route 5, Big Tree Rd, and South Lake Shore Rd. The trail will then continue along the ROW on the east side of South Lake Shore Rd and continue N to Hoover Rd and connect with the existing trail at the intersection of Hoover Rd and Route 5. At this point the trail will continue N along the existing trail/ pedestrian/ bicycle lane through Woodlawn Beach State Park to reconnect with Route 5 and continue N along the west side of Route 5 to the Town of Hamburg/ City of Lackawanna boundary. Please note that very few sidewalks exist along Old Lake Shore Road and Route 5, therefore sidewalks and/ or pedestrian/



bicycle lanes will need to be constructed. Additionally, please note that as per the Hamburg Multimodal Trails Master Plan, the [TC-8]: Route 5 from Derby to Lackawanna Trail will end at the Town of Hamburg/ Town of Evans & City of Lackawanna boundaries, respectively.

**[F3] CONNECTIVITY**

Connectivity for the [TC-8]: Route 5 from Derby to Lackawanna Trail is multifaceted and effectively provides connections for all adjacent communities and community attractions between the Town of Evans and the City of Lackawanna.



*[TC-8]: Route 5 from Derby to Lackawanna Trail; Map 2*

Please note that the [TC-8]: Route 5

from Derby to Lackawanna Trail connects directly to the

[TC-4]: Village of Hamburg to Lake Erie Trail. Additionally, please note that the [TC-8]: Route 5 from Derby to Lackawanna Trail plays a significant role in the regional pedestrian/ bicyclist lane and recreational trails plan as it effectively connects the existing/ planned trail from Lake Erie Beach/ Evangola State Park to southern portion of the Eighteen Mile Creek Bridge. Please see Appendix O for the 2015 Regional Economic Development Council Request: Shoreline Trail Beaches for a description of the planned and completed portions of the trail from Lake Erie Beach/ Evangola State Park to southern portion of the Eighteen Mile Creek Bridge. Moreover, [TC-8]: Route 5 from Derby to Lackawanna Trail will provide connectivity from Lake Erie Beach/ Evangola State Park through the City of Buffalo to northtowns communities.

**[F4] FEASIBILITY/ BARRIERS**

The [TC-8]: Route 5 from Derby to Lackawanna Trail minimizes travel through private residential parcels and maximizes usage of the ROW. However, there are several concerns regarding narrow road shoulders and safety concerns along Old Lakeshore Road and Route 5. Additionally, the [TC-8]: Route 5 from Derby to Lackawanna Trail does not travel through any natural and/ or physical barriers.

**[F5] RELEVANT CRASH DATA**

From 2012-2017, there were twenty (20) motor vehicle accidents involving pedestrians in proximity to the proposed trail location.



## Section 6 – [TC-9]: Rush Creek Park Nature Trail

The project scope for [TC-9]: Rush Creek Park Nature Trail including [F1] GIS Mapping, [F2] Description, [F3] Connectivity, [F4] Feasibility/ Barriers, and [F5] Relevant Crash Data is identified in the subsequent pages.

### [F1] GIS MAPPING

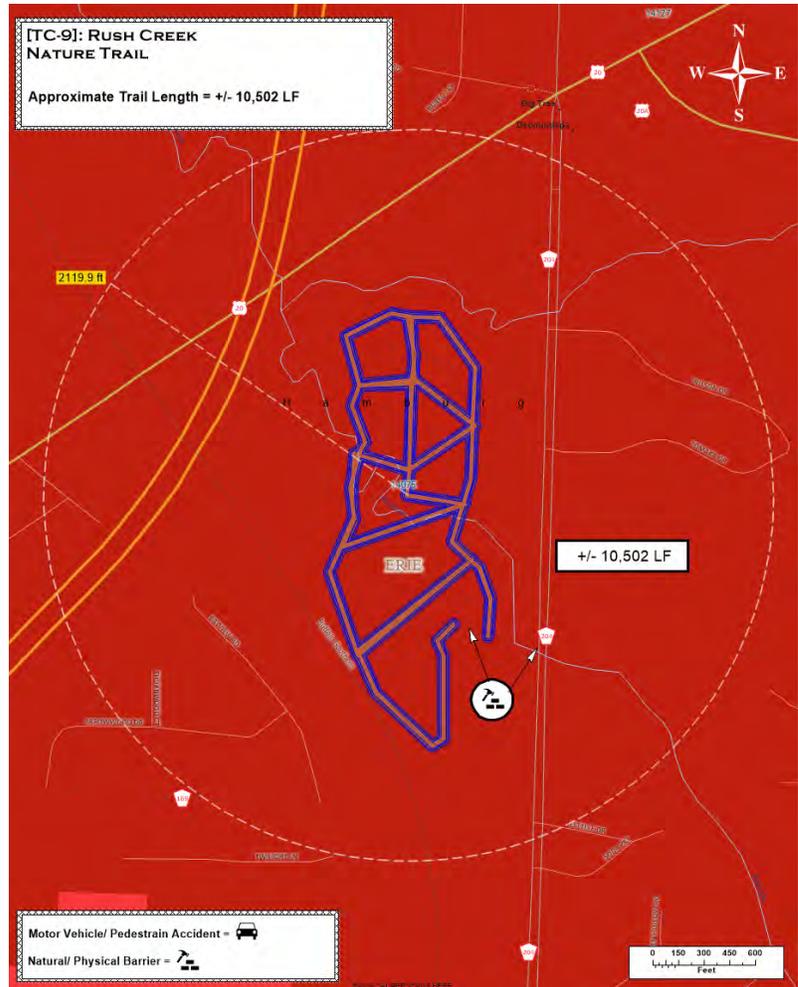
The [TC-9]: Rush Creek Park Nature Trail Map illustrates the trail component location within the Town of Hamburg. The approximate length of the Rush Creek Park Nature Trail is +/- 10,502 LF. Please see Appendix P for a full size version of [TC-9]: Rush Creek Park Nature Trail Maps 1 & 2.

### [F2] DESCRIPTION

The [TC-9]: Rush Creek Park Nature Trail navigates the existing snow mobile trails and green space throughout Rush Creek Park. The exact placement of the trail needs to be determined.

### [F3] CONNECTIVITY

Connectivity for the [TC-9]: Rush Creek Park Nature Trail is limited to the Rush Creek Park itself. Please note that this is a fully off road trail.



*[TC-9]: Rush Creek Park Nature Trail; Map 1*



**[F4] FEASIBILITY/ BARRIERS**

The [TC-9]: Rush Creek Park Nature Trail does not travel through any private residential parcels and maximizes usage of Town of Hamburg parkland. Please note that there is one (1) existing

natural and/ or physical barriers that may affect implementation.

The entrance way/ parking lot area to Rush Creek Park is deteriorated and needs renovation.

Additionally, please note that excavation of trees/ greenspace will be needed for trail implementation.

**[F5] RELEVANT CRASH DATA**

From 2012-2017, there were no motor vehicle accidents involving pedestrians in proximity to the proposed trail location.



***[TC-9]: Rush Creek Park Nature Trail; Map 2***



## Section 6 – [TC-10]: Lakeview Recreation Site Loop Trail

The project scope for [TC-10]: Lakeview Recreation Site Loop Trail including [F1] GIS Mapping, [F2] Description, [F3] Connectivity, [F4] Feasibility/ Barriers, and [F5] Relevant Crash Data is identified in the subsequent pages.

### [F1] GIS MAPPING

The [TC-10]: Lakeview Recreation Site Loop Trail Map illustrates the trail component location within the Town of Hamburg. The approximate length of the Town of Hamburg Lakeview Recreation Site Loop Trail is +/- 15,731 LF. Please see Appendix Q for a full size version of [TC-10]: Lakeview Recreation Site Loop Trail Maps 1 & 2.

### [F2] DESCRIPTION

The [TC-10]: Lakeview Recreation Site Loop Trail encompasses a significant portion of the Lakeview Recreation Site. Moreover, the [TC-10]: Lakeview Recreation Site Loop Trail provides recreation, connectivity, and access for members of the local and regional community.

### [F3] CONNECTIVITY

Despite identification as a loop trail, the [TC-10]: Lakeview Recreation Site Loop Trail plays a significant role in the cohesiveness of the Hamburg Comprehensive Trails System. Please note that the [TC-10]: Lakeview Recreation Site Loop Trail connects the [TC-7]: Camp Road to Forest Glen to Lakeview Recreation Site Connector Trail and the [TC-2]: Village of Hamburg to Eighteen Mile Creek Park to Lakeview Recreation Site Trail. Based on the trail components that comprise the Hamburg Comprehensive Trails System, the [TC-10]: Lakeview Recreation Site Loop Trail provides direct connectivity to many locations within the Village of Hamburg, Town of Hamburg, and the regional community. Please note this is a fully off road trail.



**[TC-10]: Town of Hamburg Lakeview Recreation Site Loop Trail; Map 1**



**[F4] FEASIBILITY/ BARRIERS**

The [TC-10]: Lakeview Recreation Site Loop Trail does not travel through any private residential parcels and maximizes usage of Town of Hamburg parkland. Additionally, the [TC-10]: Lakeview Recreation Site Loop Trail does not travel through any natural and/ or physical barriers. However, please note that several NYS wetlands/ conservation areas exist along the northern portions of the Lakeview Recreation Site. Any trail implementation in these areas will require approval from the NYS Department of Environmental Conservation (DEC).

**[F5] RELEVANT CRASH DATA**

From 2012-2017, there were no motor vehicle accidents involving pedestrians in proximity to the proposed trail location.



## Section 7 – Pro Forma Project Cost Estimates

The Pro Forma Project Cost Estimates for the Hamburg Comprehensive Trails System and the trail components that comprise it are identified below.

All pro forma cost estimates are based on itemized pricing for various elements that can be utilized for the construction of the Hamburg Comprehensive Trails System and the trail components that comprise it. Please note that the itemized pricing rather than total monetary values were utilized for the Hamburg Multimodal Trails Master Plan for two (2) factors: [i] existing infrastructure and [ii] construction options.

[i] Existing infrastructure refers primarily to the presence of existing sidewalks, crosswalks, crossing signals, and/ or other walkability structures along portions of the respective trail components. Determinations regarding utilizing or replacing existing infrastructure must be made by the project sponsor and/ stakeholders during the formal design, construction, and/ or implementation processes.

[ii] Construction options refers to the most effective and efficient means utilized to construct each respective trail component. For example, trail components may be comprised of any or a combination of the following based on optimization: sidewalks, pedestrian walkways, bicycle lanes, multiuse asphalt paths, crossing systems, and crosswalks. Determinations must be made by the project sponsor and/ stakeholders during the formal design, construction, and/ or implementation processes.

Item	Description	Unit	Unit Price
1.1	5ft-Wide Sidewalk	LF	\$55
1.2	4ft-Wide Sidewalk	LF	\$45
1.3	5ft-Wide Pedestrian/ Bike Lane	LF	\$22
1.4	8ft-Wide Multi-use Path	LF	\$48
1.5	6ft-Wide Multi-use Path	LF	\$36
1.6	In-Road Crossing System	1	\$30,000
1.7	ADA Accessible Ramp	1	\$1,900
1.8	LS Type Crosswalk	1	\$1,500
1.9	Re-striping Fog Lines	LF	\$1
2.0	Trail Markings & Signage	LF	\$1
2.1	Incidentals, Inflation, & Contingencies	% of Total Project Cost	15%
2.2	WZTC	% of Total Project Cost	10%

Please note that all pricing are estimates based on the local market and any additional costs to include but not limited to: design, bridges, culverts, drainage, signage, specialized excavations and required ROW takings are not included.



## **Eighteenmile CREEK GREENWAY TRAIL**

*Prepared for VILLAGE OF HAMBURG*

### **Menu of Potential Services for Greenway Trail Master Planning**

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#### **Task 01: Meetings - \$5,000 - \$16,000**

**1.1 Kick-Off Meeting\*:** Buffalo Niagara Riverkeeper (BNR) meeting with Village of Hamburg Personnel to review Scope of Work (SOW), Project Schedule and Milestones, and Goals and Objectives; coordinate other administrative logistics.

**1.2 Kick-Off Meeting:** BNR meeting with Village of Hamburg Personnel, Key Partners (as identified by Village of Hamburg), and Funding Agency, if, and as required by Funding Agency, to review Scope of Work (SOW), Project Schedule and Milestones, and Goals and Objectives; coordinate other administrative logistics with Funding Agency as required by Grant Award.

**1.3 Progress Meetings\*:** BNR will meet in-person, or coordinate conference calls, with Village of Hamburg Personnel, and key partners, as necessary, at the following frequency(ies):

- Every-other-week; or
- Monthly; and/or
- After submittal of each major milestone deliverable

Progress Meetings will include participation by BNR's Project Manager, Village of Hamburg Personnel, and other BNR and Town and Village Personnel, as required, depending upon tasks and milestones to be discussed and reviewed.

#### **Task 02: Establishment of Committees - \$4,000 - \$7,500**

In an effort to achieve the greatest potential for the Project's success, BNR recommends the establishment of a committee, or committees, to streamline communications and decision-making and to assist the project in various capacities. It is possible for the roles of the various committees, presented herein, below, to be combined and consolidated, depending upon the needs and desires of the Village of Hamburg.

**2.1 Steering Committee\*:** A Steering Committee is, arguably, the most essential committee required for the successful completion of the awarded Grant. The Steering Committee must include key personnel from the Village of Hamburg having the ability to make key decisions, or having the ability to communicate efficiently and directly with those having the authority to make key decisions. It is anticipated that Steering Committee participation would be required at Project initiation, at every major milestone, and at points of critical

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decision making. In the event that a Steering Committee is in-place prior to the Kick-Off Meetings presented as Tasks 1.1 and 1.2, herein, above, the Steering Committee will be invited to participate. In the event that a Steering Committee is not in-place prior to the Kick-Off Meetings presented as Tasks 1.1 and 1.2, herein, above, a separate Kick-Off Meeting (Task 1.1.1) including the TAC can be conducted.

**2.2 Stakeholder Committee:** The purpose of a Stakeholder Committee would be to gather representatives of any and all parties having a vested interest in the successful completion of the Project. A Stakeholder Committee can be instrumental in providing important input that can assist the Project Team and Steering Committee in their decision making. The Stakeholder Committee can provide an additional layer of public input and support, including people representative of their communities and their communities' needs. Stakeholder Committee input and participation is anticipated to be required for review of, and feedback on, major milestones.

**2.3 Technical Advisory Committee:** The purpose of a Technical Advisory Committee would be to provide a set of skills that provides further support to the Project Team and Steering Committee. A Technical Advisory Committee can be instrumental in helping guide a Steering Committee in their decision making process. The level of participation of the Technical Advisory Committee can be flexible and can range from being involved as frequently as the Steering Committee, or on an as-needed basis.

**Task 03: Goals and Objectives - \$3,000 - \$8,250**

**3.0 Goals and Objectives\*:** Working with Village of Hamburg Personnel, and any established Committees, BNR will revisit and revise, as necessary, Goals and Objectives proposed in the Grant Application. Whereas Goals and Objectives aren't required for the Grant Application, BNR will work closely with the Village of Hamburg Personnel, and their chosen Committees, to identify and define Goals and Objectives for the Project.

**Task 04: Project Boundary - \$3,800 - \$6,250**

**4.1 Establishment of Project Boundary\*:** Working with Village of Hamburg Personnel, and any established Committees, BNR will define the geographical extent of the Project Boundary and map the boundary on graphics or documents made readily-available to BNR (ACAD Survey, ESRI ArcGIS, digital aerial photographs, maps, etc.).

**Task 05: Collection and Review of Existing Plans and Projects - \$10,000 - \$16,300**

**5.1 Collection and Review of Existing Plans and Projects:** BNR will research, collect, and review existing plans and projects, within and in close proximity to the Project Boundary, that are applicable to the development of an Eighteenmile Creek Greenway Trail. BNR will provide a summary of their findings of the research conducted, and the impacts other plans and projects may have on the development of an Eighteenmile Creek Greenway Trail.

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**Task 06: Eighteenmile Creek Greenway Land and Water Use Profile - \$44,500 - \$66,250**

**6.1 Land and Water Use Profile\*:** BNR will inventory natural and developed resources and conditions within the Project Boundary and develop a land and water use profile. This profile will identify existing land and water uses, including property ownership; existing zoning and other relevant local development controls, relevant government and non-government entities, existing public access and connection points, existing recreational sites and resources, tourist-oriented public services and facilities, tourist attractions, public safety and existing psychological barriers, transportation and transit routes, cultural and historic resources, scenic resources and view corridors, natural resources, potential environmental issues, opportunities for ecological enhancement, and demographics/potential users.

**6.2 Opportunities and Constraints Analysis\*:** Upon completion of the Land and Water Use Profile (Task 5.1), BNR will synthesize their findings to develop an analysis of opportunities, constraints, and immediate needs for an Eighteenmile Creek Greenway Trail.

**Task 07: Eighteenmile Creek Greenway Schematic Master Plan - \$8,000 - \$21,000**

**7.1 Schematic Master Plan\*:** Upon completion of the Land and Water Use Profile and Opportunities and Constraints Analysis, BNR will synthesize the findings into a Schematic Master Plan, utilizing the Goals and Objectives to guide potential trail routes and alternatives; trail heads, access points and points of connectivity; gateways; supporting-use sites (parks, schools, public spaces, etc.) and destinations.

**Task 08: Identification of Potential Immediate Projects - \$15,000 - \$48,300**

**8.1 Identification of Potential Immediate Projects:** Upon the Village of Hamburg's acceptance and approval of the Schematic Master Plan, BNR will work closely with the Town and Village to identify potential next steps for implementation and/or improvement of trail segments that will advance the development and implementation of a greenway trail.

**Task 09: Eighteenmile Creek Greenway Implementation Plan - \$21,250 - \$43,000**

**1.1 Implementation Plan:** Upon the Village of Hamburg's acceptance and approval of the Schematic Master Plan, BNR will work closely with the Town and Village, and any established Committees, to develop and Implementation Plan and Strategy that will seek to identify and prioritize project phasing, estimated costs, potential funding sources, estimated timelines and schedules, and recommended means of management.

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**Task 10: Draft Eighteenmile Creek Greenway Master Plan - \$36,000 - \$50,000**

**10.1 Draft Master Plan\*:** Working closely with, and on behalf of, the Village of Hamburg and any established Committee(s), BNR will advance the Schematic Master Plan in synthesis with the identification of immediate projects (Task 08) and Greenway Implementation Plan (Task 09), to develop a Draft Master Plan further-detailing a proposed route, identifying critical action items and next steps that are necessary to occur to advance the implementation of a greenway trail, and identifying critical, remaining constraints and obstacles that will need to be addressed in order to implement a greenway trail.

**Task 11: Public Outreach - \$6,500 - \$41,000**

BNR recommends a high-level of public involvement to maximize the Project's potential for successful completion, continuation, and future implementation.

**11.1 Website/ Web Page Development and Maintenance:** While BNR does not, at this time, excel in website development, it is recommended that the Town and/or Village of Hamburg develop, or seek the development of, a dedicated Project website or web page that can serve as a portal for keeping the public and trail end-users informed of the Project, its Goals and Objectives, schedule, products and deliverables, opportunities for public participation and input, and other information. BNR can provide these services, and, at a minimum, can host a web site or web page on behalf of the Project, but more-efficient options likely exist, elsewhere.

**11.2 Public Meetings\*:** The number of Public Meetings can be further-determined based-on the established Committee(s) and their involvement and participation. It is recommended that no-fewer than three (3) Public Meetings be conducted. The recommended "minimum three" meetings would occur in conjunction with the Land and Water Use Profile/Opportunities and Constraints Analysis, the Schematic Master Plan, and the Draft Master Plan, allowing the public to provide input at each of these critical milestones. A fourth Public Meeting, while not critical to the collection of public input, for the unveiling of the Final Master Plan, would be an ideal opportunity to let the public know where their voice(s) had been heard, and could continue and build support and momentum towards implementation of the greenway trail. BNR has a strong record of public engagement and public outreach and can coordinate, advertise and lead public meetings, as well as be available in a supporting role to present and answer questions relating directly to their contracted tasks.

**11.3 Public Survey:** While included here with other Public Outreach, a Public Survey should occur early in the Master Planning process, simultaneous to Collection and Review of Existing Plans and Projects and development of the Land and Water Use Profile to solicit input on existing facilities, resources and amenities; public perception of greenway trails and a greenway trail within their community; and needs, desires and fears of trail users and the community as they pertain to a proposed greenway trail in their community.

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**Task 12: Final Eighteenmile Creek Greenway Master Plan - \$40,000 - \$75,000**

**12.1 Final Master Plan\*:** Working closely with, and on behalf of, the Village of Hamburg and any established Committee(s), BNR will advance the Draft Master Plan in synthesis with the findings and results of the Public Outreach efforts (public meetings and surveys) to develop a Final Master Plan that will detail a proposed route, identify critical action items and next steps that are necessary to occur to advance the implementation of a greenway trail, and identifying critical, remaining constraints and obstacles that will need to be addressed in order to implement a greenway trail. The Final Master Plan will be the guiding document that directs all future Eighteenmile Creek Greenway design and implementation efforts.

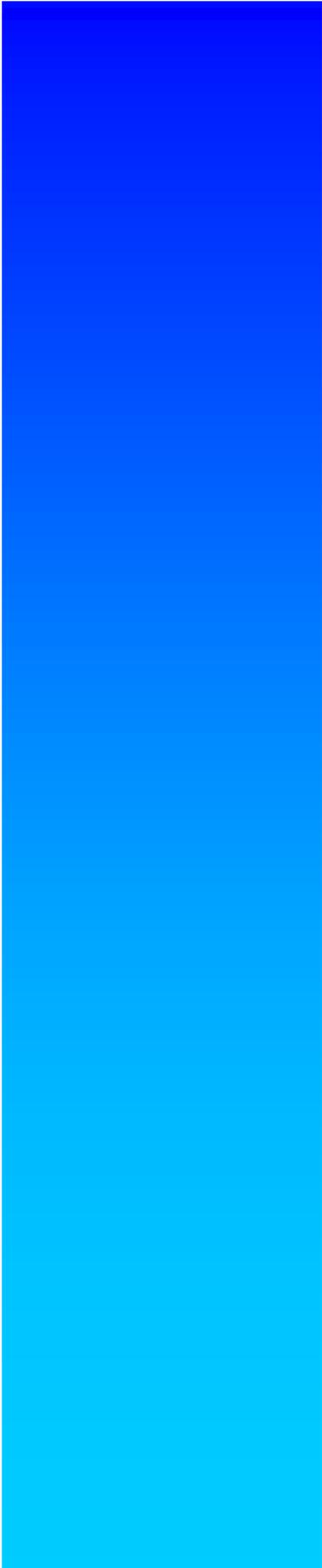
**Task 13: Design Standards - \$43,300 - \$80,000**

**13.1 Design Standards:** Working closely with, and on behalf of, the Village of Hamburg and any established Committee(s), BNR will develop a draft and final document (subject to Village of Hamburg approvals and acceptance, and input from the community as desired by the Village of Hamburg) defining a collection of standards for various design components for the Eighteenmile Creek Greenway Trail. To be incorporated into the design standards are parameters and guidelines for items including, but not limited to: Trail surface and base materials, earthwork, trail compaction, trail widths, setbacks, trail slope/grade, crossings, signage, mileage markers, furniture and other pedestrian amenities, lighting, gateways, trail heads and access points, trailhead parking, connectivity and intersections with other existing and/or proposed trail networks, security recommendations, landscaping, stormwater management and drainage, gates, fencing, bollards, utility coordination, and incorporation of public art.

**\* Indicates tasks BNR feels are paramount to successful completion of a Master Plan Effort and in which BNR must be involved.**

**Budget ranges provided herein are gross estimates intended for use by the Village of Hamburg to evaluate their need for BNR's participation in the Project. Upon the Village of Hamburg's selection of tasks for BNR to perform, BNR can develop and negotiate a detailed scope and fee with the Village of Hamburg.**

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# **Engineering Report Roundabout Feasibility Study**

**Main Street (US Route 62) /  
Lake Street (NY Route 75) &**

**Lake Street (NY Route 75) /  
Pleasant Avenue**

**Village of Hamburg  
Erie County  
New York**

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*CHA Project Number: 31894*

*Prepared for:*

*Village of Hamburg  
100 Main Street  
Hamburg, NY 14075*

*Prepared by:*



*January, 2017*



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### APPENDIX

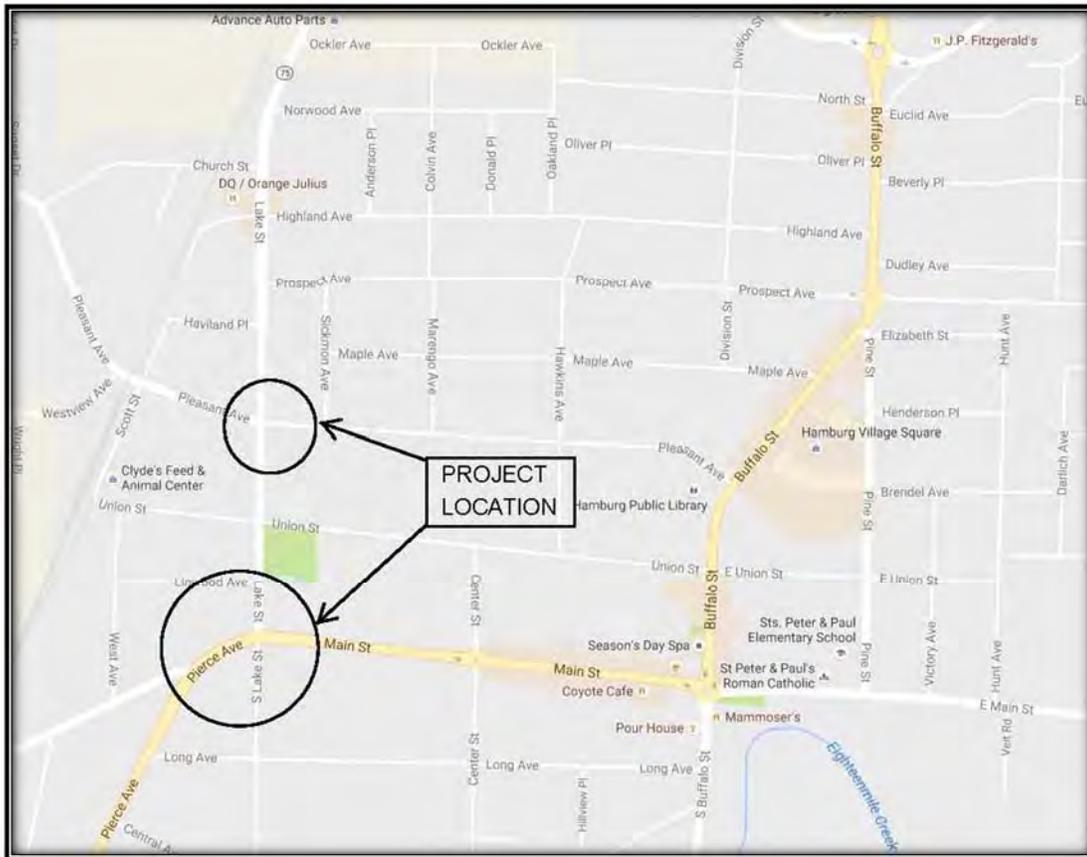
Appendix A	Preliminary Plans
Appendix B	Traffic Analysis



## Section 1.0 - Introduction

The purpose of this technical report is to provide the Village of Hamburg a summary of the preliminary investigation into the construction of a roundabout at the intersections of Main Street (US Route 62) and Lake Street (NY Route 75) and Lake Street (NY Route 75) and Pleasant Avenue. No ground survey information was utilized; the evaluation was performed using NYS 2014 orthogonal aerial imagery as a base map for the existing intersections.

### Site Map:





## **Section 2.0 - Existing Site Conditions:**

### **Lake Street/Main Street Intersection:**

The intersection of Main Street and Lake Street is a four-leg intersection controlled by a single span wire traffic signal. The Main Street/Lake Street legs enter at a 90 degree angle and the Pierce Avenue and S. Lake Street legs enter into the intersection at approximately a 60 degree angle. A roundabout was considered at this location in 2006 during the design of the Main Street and Buffalo Street project (PIN 5308.03), however it was not progressed because of funding constraints.

The properties located adjacent to the four quadrants of the Main Street / Lake Street intersection consist of commercial businesses. The sidewalks and curb ramps appear to be in good condition and meet current ADA standards. The intersection pavement also appears to be in good condition.

### **Lake Street / Pleasant Avenue intersection:**

The intersection of Lake Street and Pleasant Avenue is a four-leg intersection controlled by a single span wire traffic signal. The Lake Street and east approach of Pleasant Avenue enter at a 90 degree angle and the Lake Street and west leg of Pleasant Avenue enter the intersection at a 75 degree angle.

The properties located adjacent to the four quadrants of the Lake Street/Pleasant Avenue intersection consist of commercial businesses on the northeast and southwest quadrants. The northwest quadrant is a Time Warner sub-station and the southeast quadrant is a residential dwelling. The sidewalks and curb ramps appear to be in fair condition, some of the curb ramps do not meet the current ADA standards.

## **Section 3.0 - Proposed Roundabout Design Alternatives:**

Modern roundabouts would be constructed at the intersections of Main Street / Lake Street and Lake Street / Pleasant Avenue. The specific geometry of each roundabout is shown on the plans located in Appendix A. Parking would be eliminated in the immediate vicinity of the roundabouts to allow for the proper deflection of the approach roadways. The proposed alternatives would include new curb, sidewalks, curb ramps, storm drainage, signs, lighting, pavement markings and landscape enhancements.

### **Main Street / Lake Street Roundabout:**

At the Main Street / Lake Street roundabout, WB-67 vehicles would be able to proceed straight through the intersection on Main Street to Pierce Avenue (NY Route 75) and turn right onto Lake Street (NY Route 75). The S-BUS-36 School Bus design vehicle would be able to make all turns in all directions entering and exiting South Lake Street. Property acquisitions would be necessary on all four quadrants of the intersection.



### **Lake Street / Pleasant Avenue Roundabout:**

At the Lake Street / Pleasant Avenue roundabout, WB-20 design vehicles will be able to negotiate straight through the intersection along Lake Street. The S-BUS-36 design vehicle would be able to negotiate all the required movements on all four legs of the intersection. Property acquisitions would be necessary on all four quadrants of the intersection.

### **Section 4.0 - Conceptual Project Cost:**

Activities	Main St./Lake St./Pierce Ave. Alternative (Build)	Lake St. / Pleasant Ave. Alternative (Build)
ROW Cost	\$350,000	\$350,000
Preliminary Design	\$217,500	\$124,500
Final Design	\$217,500	\$124,500
Construction	\$1,450,000	\$830,000
Construction Inspection	\$174,000	\$99,600
Project Manager	\$43,500	\$24,900
<b>Project Cost</b>	<b>\$2,452,500</b>	<b>\$ 1,553,500</b>
<b>Total Project Cost</b>	<b>\$ 4,006,000</b>	

### **Section 5.0 – Alternative Analysis**

#### 5.1 Traffic Control/Level of Service:

Both intersections are currently controlled by a traffic signal. Existing peak hour traffic counts obtained from GBNRTC for the Weekday AM, Midday and PM peaks and are included in Appendix B. Both intersections were evaluated using the existing traffic volumes and traffic control.

The current standards for evaluating capacity and operating conditions are contained in the Highway Capacity Manual 2010 (HCM 2010), published by the Transportation Research Board (TRB). The procedures describe operating conditions in terms of Level of Service (LOS). In general, LOS “A” represents the best operating conditions and LOS “F” represents the worst. To determine existing traffic operating conditions at the study area intersections, a capacity analysis was performed using SYNCHRO software. The HCM 2010 methodology of using an intersection peak hour factor was used but since the 2010 methodology cannot analyze the signal phasing at the intersection of Main Street & Lake Street, the HCM 2000 reports were utilized for reporting the operational analysis of the signals.

The HCM output reports are included in Appendix B. The 2016 Existing Levels of Service (LOS) are presented below in Table 5.1.1. As shown, all intersection approaches currently operate at LOS C or better.



**Table 5.1.1  
2016 Existing  
Level of Service**

Roadway	Approach	AM	Mid	PM
<b>Main Street &amp; Lake Street</b>				
Main Street	EB	A (5.6)	A (5.0)	A (8.7)
Main Street	WB	B (12.9)	B (14.4)	C (20.9)
Lake Street	NB	B (18.2)	B (16.9)	B (18.2)
Lake Street	SB	B (15.7)	B (14.8)	B (16.7)
	<b>Overall</b>	<b>A (9.6)</b>	<b>B (10.9)</b>	<b>B (15.3)</b>
<b>Pleasant Avenue &amp; Lake Street</b>				
Pleasant Avenue	EB	C (20.9)	C (20.2)	C (20.2)
Pleasant Avenue	WB	B (19.9)	B (19.6)	B (19.9)
Lake Street	NB	A (7.0)	A (5.0)	A (4.7)
Lake Street	SB	A (3.6)	A (4.4)	A (6.3)
	<b>Overall</b>	<b>A (8.1)</b>	<b>A (7.5)</b>	<b>A (7.7)</b>

The 2016 Existing traffic volumes were grown to estimate the traffic volumes at the estimated time of completion (ETC) and ETC+20, which are years 2019 and 2039, respectively. A review of historic count data in the area showed historic trends in traffic volumes that ranged from a decrease of 0.5% per year to an increase of 0.5% year. To be conservative, the traffic volumes were increased by 0.5% per year to estimate the ETC and ETC+20 traffic volumes. The projected volumes are provided in Appendix B.

The No-Build operations were evaluated for ETC and ETC+20 using the estimated future volume and the existing geometry and traffic control. The LOS are summarized in Table 5.1.2 below. As shown, all intersection approaches are estimated to continue to operate at LOS C or better through ETC+20.

**Table 5.1.2  
No-Build Level of Service**

Roadway	Approach	AM		Mid		PM	
		ETC	ETC+20	ETC	ETC+20	ETC	ETC+20
<b>Main Street &amp; Lake Street</b>							
Main Street	EB	A (5.7)	A (9.6)	A (5.1)	A (5.6)	A (9.1)	B (14.5)
Main Street	WB	B (13.0)	B (14.2)	B (14.4)	B (15.3)	C (21.3)	C (25.0)
Lake Street	NB	B (18.3)	B (17.3)	B (16.9)	B (17.4)	B (18.2)	B (18.4)
Lake Street	SB	B (16.1)	B (13.0)	B (15.0)	B (15.8)	B (17.0)	B (18.7)
	<b>Overall</b>	<b>A (9.7)</b>	<b>B (11.6)</b>	<b>B (11.0)</b>	<b>B (11.8)</b>	<b>B (15.7)</b>	<b>B (19.1)</b>
<b>Pleasant Avenue &amp; Lake Street</b>							
Pleasant Avenue	EB	C (21.0)	C (20.7)	C (20.1)	B (20.0)	C (20.1)	C (20.1)
Pleasant Avenue	WB	B (19.9)	B (19.5)	B (19.5)	B (19.3)	B (19.7)	B (19.7)
Lake Street	NB	A (7.1)	A (8.6)	A (5.0)	A (5.5)	A (4.9)	A (4.9)
Lake Street	SB	A (3.6)	A (3.8)	A (4.4)	A (4.7)	A (6.5)	A (6.5)
	<b>Overall</b>	<b>A (8.2)</b>	<b>A (9.2)</b>	<b>A (7.6)</b>	<b>A (7.8)</b>	<b>A (7.9)</b>	<b>A (7.9)</b>



A two-lane roundabout was analyzed at the Main Street & Lake Street intersection, and a one-lane roundabout was analyzed at the Pleasant Avenue & Lake Street intersection for the ETC and ETC+20 design years. The roundabouts were analyzed using SIDRA Intersection software; the output reports are included in Appendix B. The ETC and ETC+20 LOS are presented in Table 5.1.3. As shown, all approaches are estimated to operate at LOS C or better for both intersections.

**Table 5.1.3  
Build Level of Service  
Roundabouts**

Roadway	Approach	AM		Mid		PM	
		ETC	ETC+20	ETC	ETC+20	ETC	ETC+20
<b>Main Street &amp; Lake Street</b>							
Main Street	EB	A (7.6)	A (7.8)	A (7.5)	A (7.7)	A (7.7)	A (8.0)
Main Street	WB	B (12.3)	B (14.3)	A (9.6)	B (10.7)	B (12.4)	B (14.4)
Lake Street	NB	B (10.2)	B (10.8)	A (9.4)	A (9.8)	B (10.2)	B (10.6)
Lake Street	SB	A (7.0)	A (7.2)	A (7.5)	A (7.7)	A (8.8)	A (10.0)
	<b>Overall</b>	<b>A (8.8)</b>	<b>A (9.5)</b>	<b>A (8.2)</b>	<b>A (8.7)</b>	<b>A (9.5)</b>	<b>B (10.6)</b>
<b>Pleasant Avenue &amp; Lake Street</b>							
Pleasant Avenue	EB	A (8.2)	A (8.6)	A (9.2)	A (9.8)	B (12.7)	B (16.1)
Pleasant Avenue	WB	B (13.1)	B (15.3)	B (10.9)	B (11.8)	B (10.2)	B (10.9)
Lake Street	NB	A (9.4)	C (23.4)	A (7.2)	A (8.3)	A (6.6)	A (6.9)
Lake Street	SB	A (5.7)	A (5.8)	A (6.6)	A (7.0)	A (6.6)	A (7.3)
	<b>Overall</b>	<b>A (8.6)</b>	<b>B (18.0)</b>	<b>A (7.5)</b>	<b>A (8.2)</b>	<b>A (7.4)</b>	<b>A (8.3)</b>

## 5.2 Work Zone Safety & Mobility:

Discussion on detours should describe, among other matters, the effects on providers of essential services (e.g., schools, fire departments, ambulance service), pedestrians, bicyclists, school children, etc. When on-site and off-site detours are discussed, the user benefits and user costs as well as construction costs should be part of the evaluation of detour alternatives. Safety of any detour routes and cost(s) to improve a detour route to minimum safety standards and ride-ability should be discussed. This section should also show coordination with local officials, businesses and residents as appropriate. If coordination has not been completed, it should be stated and proposed coordination list given. The report should contain documentation of these coordination efforts.

Two-way traffic will be maintained at all times via lane shifts onto the existing travel and parking lanes. No off site detours will be required. Routes for emergency vehicles will be maintained and open during construction. The details for the work zone traffic control will be prepared and evaluated during final design.

## 5.3 Drainage Systems:

The current drainage system for each intersection consist of a closed storm sewer system that outlets to various locations. New closed drainage infrastructure would be installed at the intersections to accommodate the proposed roundabout configurations. The proposed drainage system would consist of new catch basins, manholes and storm pipe necessary to meet the capacity of a 10 year design storm for the intersection. There appears to be sufficient capacity to



carry the additional surface area runoff from the proposed roundabouts based on a preliminary investigation into the existing storm sewer outlet pipes in the vicinity of the intersections. The details of the proposed storm drainage for the roundabouts will be evaluated during final design.

#### 5.4 Utilities:

There are a number of public and private utilities within the construction limits of the proposed roundabout. Underground sanitary sewer, storm sewer, waterlines, electric and telephone/fiber optic lines are known to be in the vicinity of the intersections. A detailed utility discovery during the design phase would be necessary to determine the extent of the impacts to public and private utilities. Based on a preliminary utility inventory investigation, the following utilities were identified at the intersections of Main Street / Lake Street and Lake Street and Pleasant Avenue.

##### **Main Street / Lake Street Existing Utilities:**

- A 12" DI water main is located on the north side of Main Street crossing Lake Street in a 24" steel casing pipe. There is a 6" water main located in the pavement of South Lake Street. There are 6" and 8" water mains that are located under the sidewalk on both sides of Pierce Avenue. There is an 8" water main under the west side sidewalk of Lake Street that heads north from the intersection. The water mains are maintained by Erie County Water Authority (ECWA).
- A 12" PVC Sanitary Sewer is located along the north curb line of Main Street and terminates at the intersection. An 8" Sanitary sewer is located between the curb and sidewalk along the west side of Pierce Ave and Lake Street. An 8" sanitary sewer is in the center of pavement of South Lake Street. The Sanitary sewers are maintained by Erie County Dept. of Environment Planning (ECDEP)
- There are 6" and 8" gas mains located along the south side of Pierce Avenue and Main Street between the curb and ROW line. A 6" gas main runs along the north side of Main Street terminating at the intersection. Gas lines are maintained by National Fuel & New York State Electric & Gas.
- Verizon has a 6 MTD (multi-tiled duct) concrete bank located along the south curb line of Main Street and Pierce Avenue. There is a 12' x 4' Verizon concrete vault in the southeast quadrant of the intersection of Main Street and Lake Street.
- There are various catch basins connected by 12" Storm sewers that outlets down S. Lake Street to Eighteen Mile Creek. NYSDOT maintains the storm sewers within the intersection.

##### **Lake Street / Pleasant Avenue Existing Utilities:**

- Verizon has a 6 MTD concrete bank running north / south along the east and west curb lines of Lake Street. Dual Verizon MTD banks are located along north curb line of the west leg of Pleasant Avenue.
- Time Warner Cable has a substation building on the northwest quadrant of the intersection.



- There are various catch basins connected by 12" storm pipes within the intersection. The storm sewers on Lake Street are maintained by the NYSDOT and ECDPW maintains the storm sewer on Pleasant Avenue.
- A 30" interceptor sanitary sewer runs east / west in the center of pavement of Pleasant Avenue. The 30" sewer is protected by a 54" steel casing pipe within the limits of the intersection of Lake Street. All four legs of the intersection have 8" sanitary sewer mains running up both sides of the curb line. The sanitary sewers are maintained by ECDEP.
- The east approach leg of Pleasant Avenue has a 6" Cast Iron water main running along the south curb line. An 8" ductile iron water main begins at the intersection of Lake Street and continues north along the west curb line of Lake Street. A 4" water main is located along the south curb line of Pleasant Avenue and continues west from the intersection. The water mains are maintained by Erie County Water Authority.

#### 5.5 Right of Way:

The estimated land acquisition area for the Main Street / Lake Street intersections is 0.44 Acres and the Lake Street / Pleasant Avenue intersection acquisition area is 0.23 Acres. The takings impact mostly active commercial properties. The exact right-of-way acquisitions necessary to construct the roundabouts would be determined during the final design phase of this project.

The entire Sunoco gas station structures on the western quadrant of the Main Street / Lake Street intersection would need to be acquired and approximately 3000 square feet of the funeral home parking lot at 21 Pierce Avenue would also be acquired for the project.

All four quadrants of the Lake Street / Pleasant Avenue intersection would require right-of-way acquisitions to construct the roundabout. The residential 2 story structure at 113 Lake Street on the southeast quadrant of the intersection is only a few feet from the existing highway right-of-way and would need to be removed to construct the roundabout. The remaining three quadrants of the intersection would require acquisitions of existing parking lots and lawn areas.

#### 5.6 Social, Economic and Environmental Considerations:

Depending on the funding sources, if the project progressed to the design phase it would need to go through various environmental regulatory processes. It appears that both proposed roundabouts would not have significant impact to the surrounding environment given that all adjacent quadrants of the intersections are established commercial or residential properties with the majority of the acquisitions being existing asphalt parking lot areas. There is the possibility of encountering contaminated soils on the adjacent gas station properties.

The proposed project impacts to the social and economic environment of the Village would need to be evaluated to determine the impacts the roundabouts would have to adjacent businesses and the surrounding community.



**APPENDIX – A**  
**PRELIMINARY PLANS**



**NOT FOR  
CONSTRUCTION**

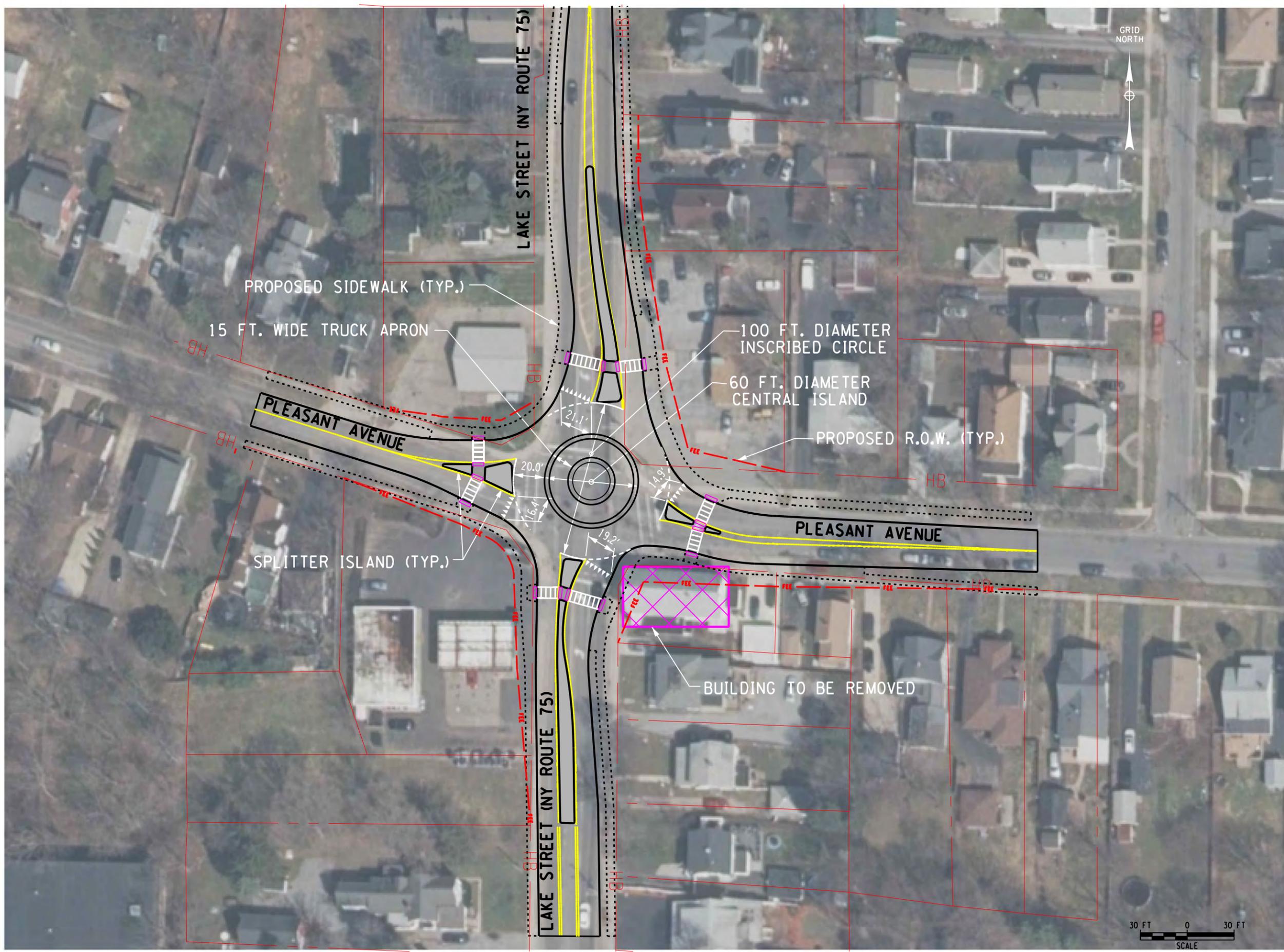
IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR TO ALTER AN ITEM IN ANY WAY. IF AN ITEM BEARING THE STAMP OF A LICENSED PROFESSIONAL IS ALTERED, THE ALTERING ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR SHALL STAMP THE DOCUMENT AND INCLUDE THE NOTATION "ALTERED BY" FOLLOWED BY THEIR SIGNATURE, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

No.	Submittal / Revision	Appd.	Date

LAKE STREET (NY RTE 75)  
PLEASANT AVENUE  
VILLAGE OF HAMBURG

ROUNDBABOUT  
PLAN

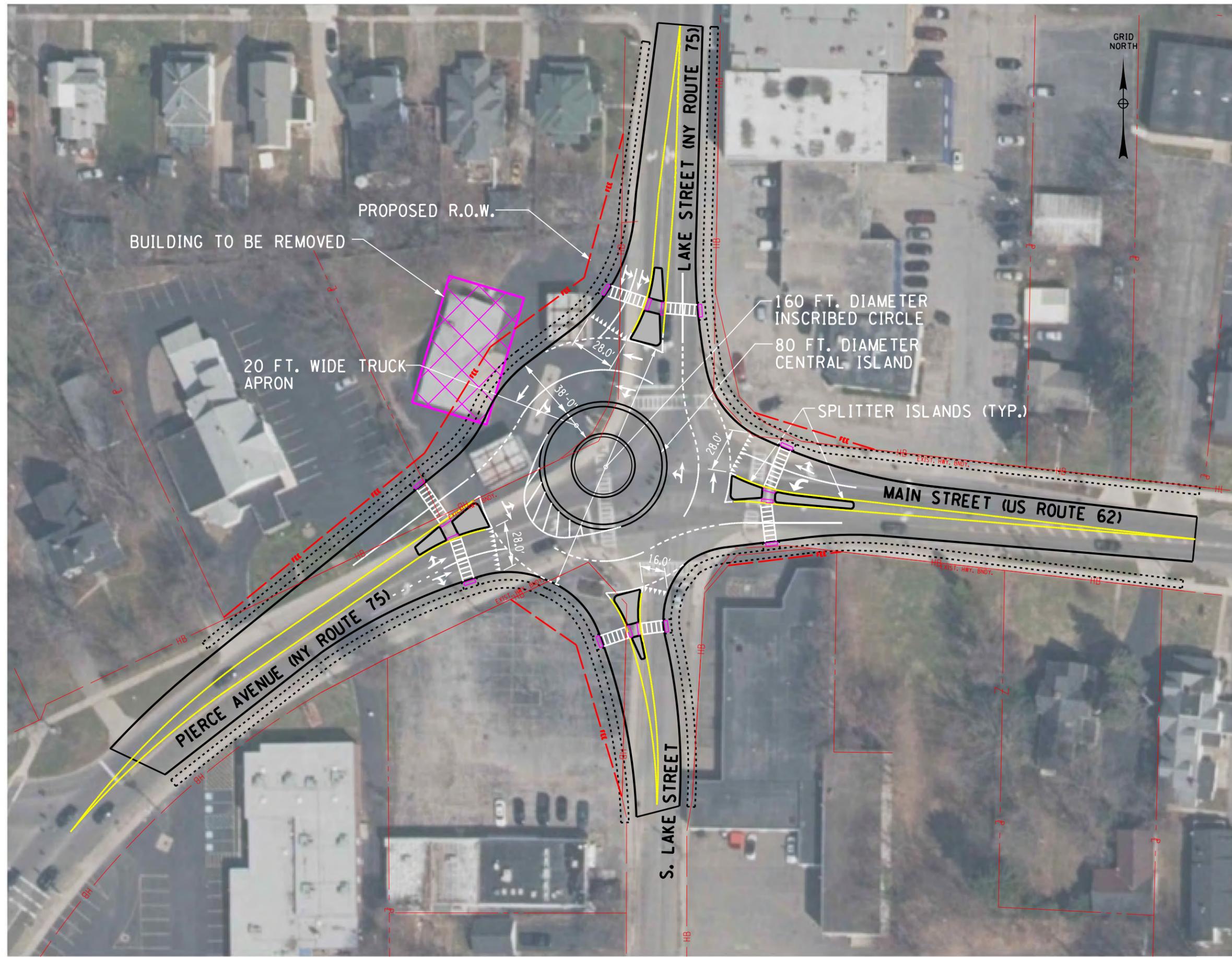
Designed By:	Project No.:	Drawing No.:
Drawn By:	Scale:	<b>FIG. - 2</b>
Checked By:	Plot Date: 10/25/2016	SHEET



FILE NAME = V:\P\0\sets\ANY\K\31894\CADD\MSTN\31894.cph.pln... L.P.L. Rd.dgn  
DATE/TIME = 10/25/2016  
USER = 1062



**NOT FOR  
CONSTRUCTION**



GRID  
NORTH

BUILDING TO BE REMOVED

PROPOSED R.O.W.

20 FT. WIDE TRUCK  
APRON

LAKE STREET (NY ROUTE 75)

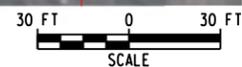
160 FT. DIAMETER  
INSCRIBED CIRCLE  
80 FT. DIAMETER  
CENTRAL ISLAND

SPLITTER ISLANDS (TYP.)

MAIN STREET (US ROUTE 62)

PIERCE AVENUE (NY ROUTE 75)

S. LAKE STREET



No.	Submittal / Revision	Appd.	Date

MAIN STREET (US RTE 62)  
LAKE STREET (NY RTE 75)  
VILLAGE OF HAMBURG

ROUNDABOUT  
PLAN

Designed By:	Project No.:	Drawing No.:
Drawn By:	Scale: 1"=60'	<b>FIG. - 1</b>
Checked By:	Plot Date: OCT. 2016	SHEET

FILE NAME = V:\P\projects\NY\K\31894\CADD\MSTN\31894\_cph.pln...L M L Rnd.dgn  
DATE/TIME = 10/25/2016  
USER = 1062



**APPENDIX – B**  
**TRAFFIC ANALYSIS**



Peak Hour Data for Intersection

Int ID: 256  
 Community: Hamburg  
 Road 1: Lake St  
 Road 2: Main St

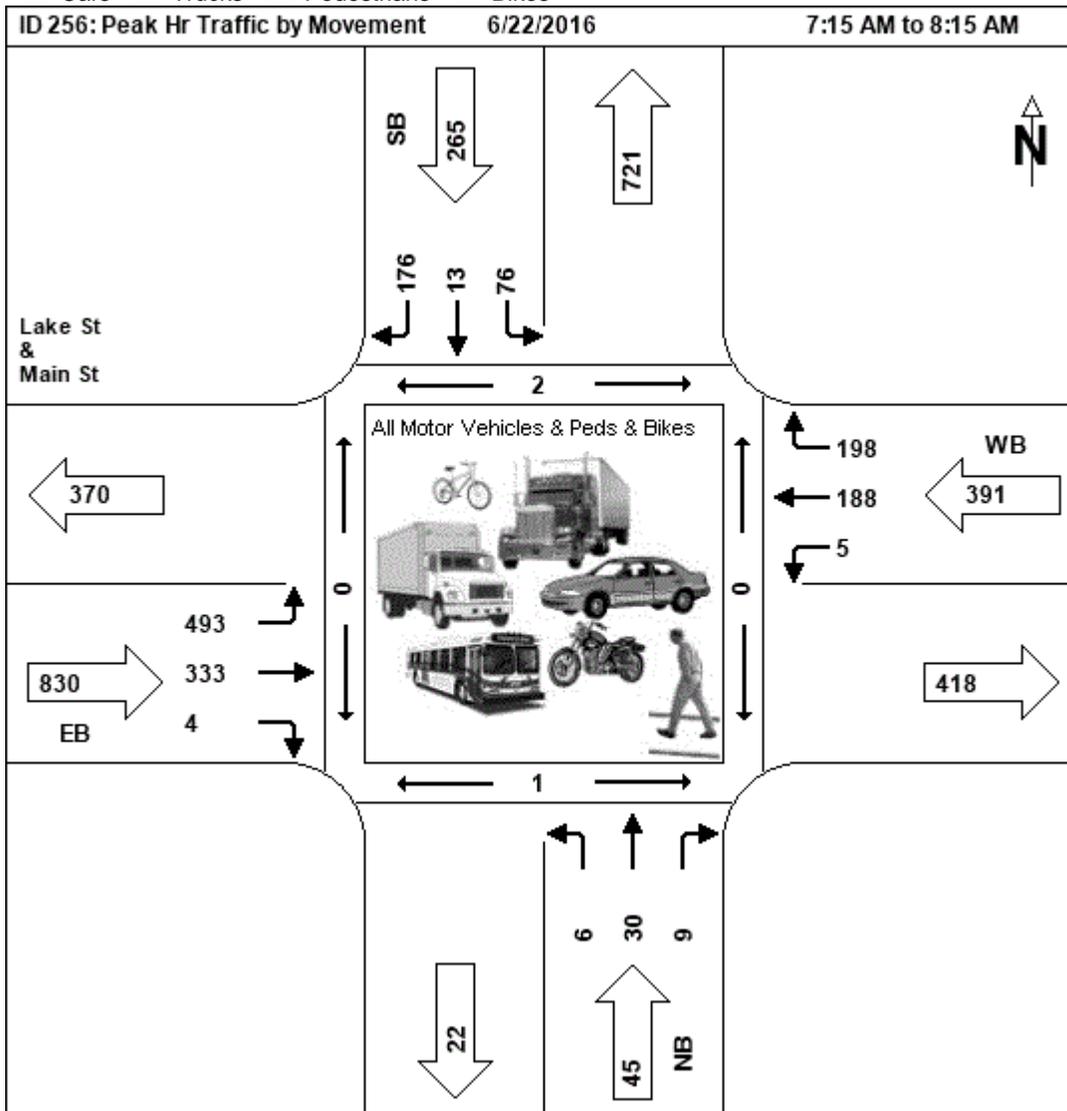
Corridor: NA  
 Road 3: Pierce Ave  
 Road 4: S Lake St

i?? ? A AA 1-1 of 1

AM Peak Hour  
 06/22/2016

Start Time	NB				App Total	EB				App Total	SB				App Total	WB				App Total	Int Total
	Left	Thru	Right	Ped		Left	Thru	Right	Ped		Left	Thru	Right	Ped		Left	Thru	Right	Ped		
7:15 AM	1	6	2	0	9	129	75	0	1	204	21	0	41	0	62	0	34	46	0	80	355
7:30 AM	1	13	4	0	18	132	86	1	0	219	17	3	46	0	66	3	53	48	2	104	407
7:45 AM	4	4	3	0	11	130	84	3	0	217	20	6	41	0	67	0	49	60	0	109	404
8:00 AM	0	7	0	0	7	102	88	0	0	190	18	4	48	0	70	2	52	44	0	98	365
Total	6	30	9	0	45	493	333	4	1	830	76	13	176	0	265	5	188	198	2	391	1531
PHF	0.38	0.58	0.56		0.63	0.93	0.95	0.33		0.95	0.90	0.54	0.92		0.95	0.42	0.89	0.83		0.90	
HV %	17	0	11			6	7	0			21	8	6			0	12	8			

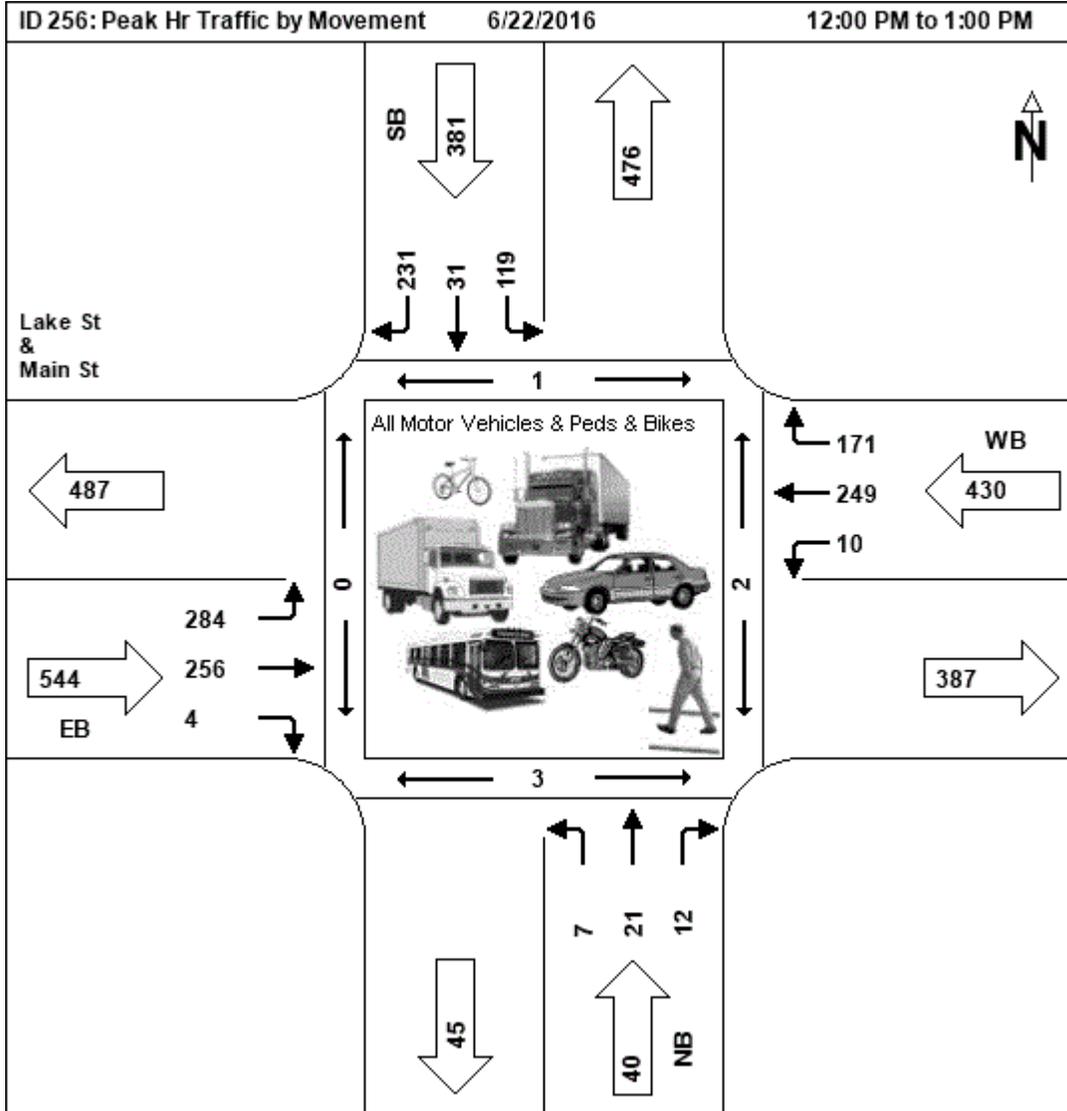
Cars  Trucks  Pedestrians  Bikes



**Midday Peak Hour  
06/22/2016**

Start Time	NB				App Total	EB				App Total	SB				App Total	WB				App Total	Int Total
	Left	Thru	Right	Ped		Left	Thru	Right	Ped		Left	Thru	Right	Ped		Left	Thru	Right	Ped		
12:00 PM	3	4	4	0	11	80	67	1	3	148	32	5	56	0	93	2	70	45	0	117	369
12:15 PM	2	3	5	0	10	69	64	2	0	135	35	5	59	0	99	2	52	45	0	99	343
12:30 PM	1	10	1	2	12	75	60	0	0	135	30	13	55	0	98	3	65	40	1	108	353
12:45 PM	1	4	2	0	7	60	65	1	0	126	22	8	61	0	91	3	62	41	0	106	330
Total	7	21	12	2	40	284	256	4	3	544	119	31	231	0	381	10	249	171	1	430	1395
PHF	0.58	0.53	0.60		0.83	0.89	0.96	0.50		0.92	0.85	0.60	0.95		0.96	0.83	0.89	0.95		0.92	
HV %	0	5	17			5	5	25		5	0	10		0	4	8					

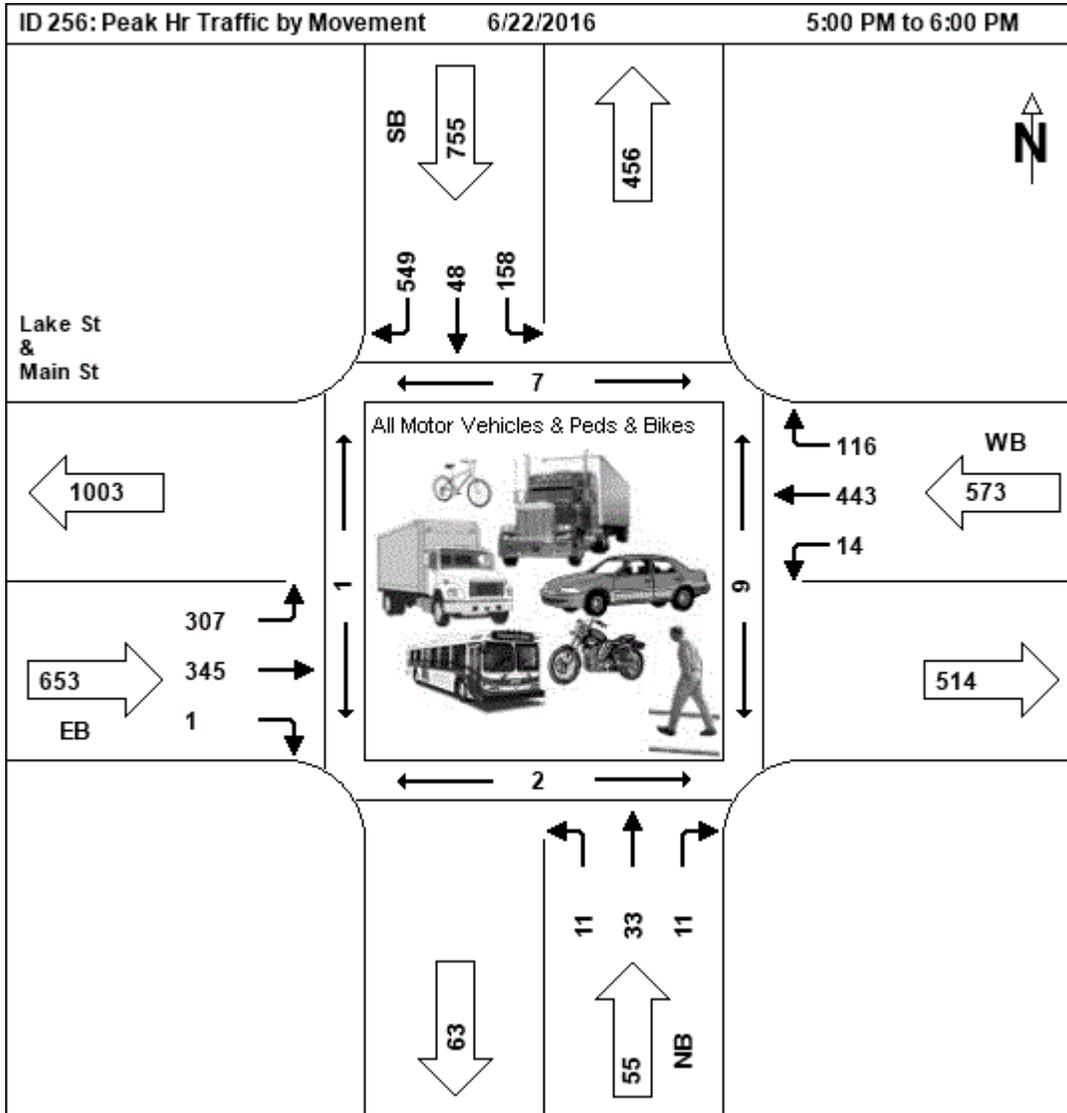
Cars  Trucks  Pedestrians  Bikes



**PM Peak Hour  
06/22/2016**

Start Time	NB				App Total	EB				App Total	SB				App Total	WB				App Total	Int Total
	Left	Thru	Right	Ped		Left	Thru	Right	Ped		Left	Thru	Right	Ped		Left	Thru	Right	Ped		
5:00 PM	2	9	1	3	12	72	84	0	1	156	38	14	137	0	189	2	107	31	1	140	497
5:15 PM	1	10	3	0	14	82	87	0	0	169	44	13	141	0	198	3	109	32	0	144	525
5:30 PM	4	5	2	3	11	72	86	1	1	159	44	15	145	0	204	6	107	33	4	146	520
5:45 PM	4	9	5	3	18	81	88	0	0	169	32	6	126	1	164	3	120	20	2	143	494
<b>Total</b>	11	33	11	9	55	307	345	1	2	653	158	48	549	1	755	14	443	116	7	573	2036
PHF	0.69	0.83	0.55		0.76	0.94	0.98	0.25		0.97	0.90	0.80	0.95		0.93	0.58	0.92	0.88		0.98	
HV %	0	6	9			3	4	0			3	0	2			0	2	1			

Cars  Trucks  Pedestrians  Bikes



Peak Hour Data for Intersection

Int ID: 1797  
 Community: Hamburg  
 Road 1: Lake St  
 Road 2: Pleasant Ave

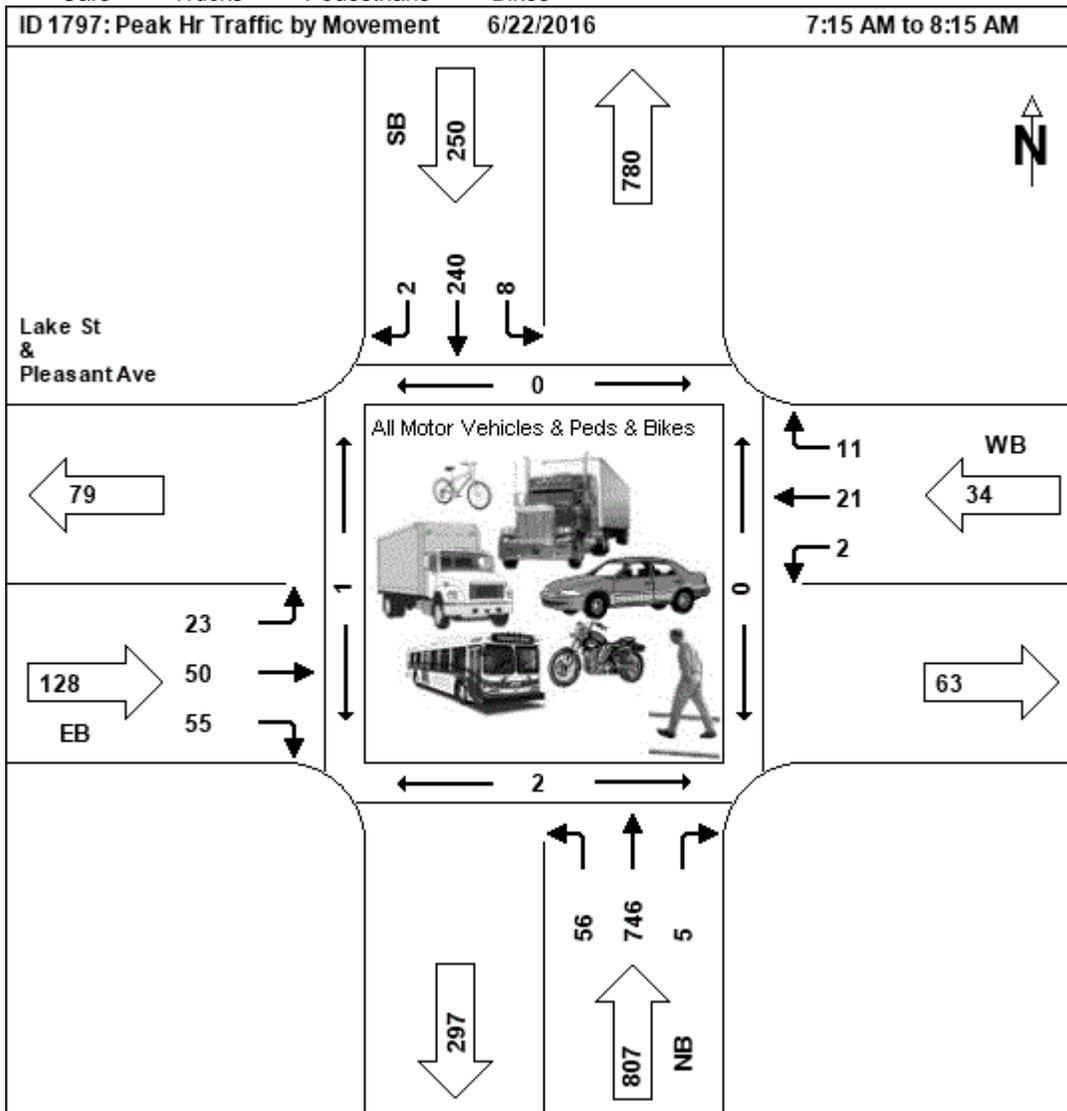
Corridor:  
 Road 3:  
 Road 4:

i?? ? A AA 1-1 of 1

AM Peak Hour  
 06/22/2016

Start Time	NB				App Total	EB				App Total	SB				App Total	WB				App Total	Int Total
	Left	Thru	Right	Ped		Left	Thru	Right	Ped		Left	Thru	Right	Ped		Left	Thru	Right	Ped		
7:15 AM	9	195	1	0	205	9	3	9	0	21	1	61	1	0	63	0	6	4	0	10	299
7:30 AM	11	197	2	0	210	5	11	14	0	30	3	51	1	0	55	1	4	2	0	7	302
7:45 AM	20	185	0	0	205	7	10	15	0	32	2	56	0	0	58	0	6	1	0	7	302
8:00 AM	16	168	2	0	186	2	25	16	2	43	2	71	0	1	73	1	5	4	0	10	312
Total	56	745	5	0	806	23	49	54	2	126	8	239	2	1	249	2	21	11	0	34	1215
PHF	0.70	0.95	0.63		0.96	0.64	0.49	0.84		0.73	0.67	0.84	0.50		0.85	0.50	0.88	0.69		0.85	
HV %	9	4	0			17	14	15			0	5	0			0	0	0			

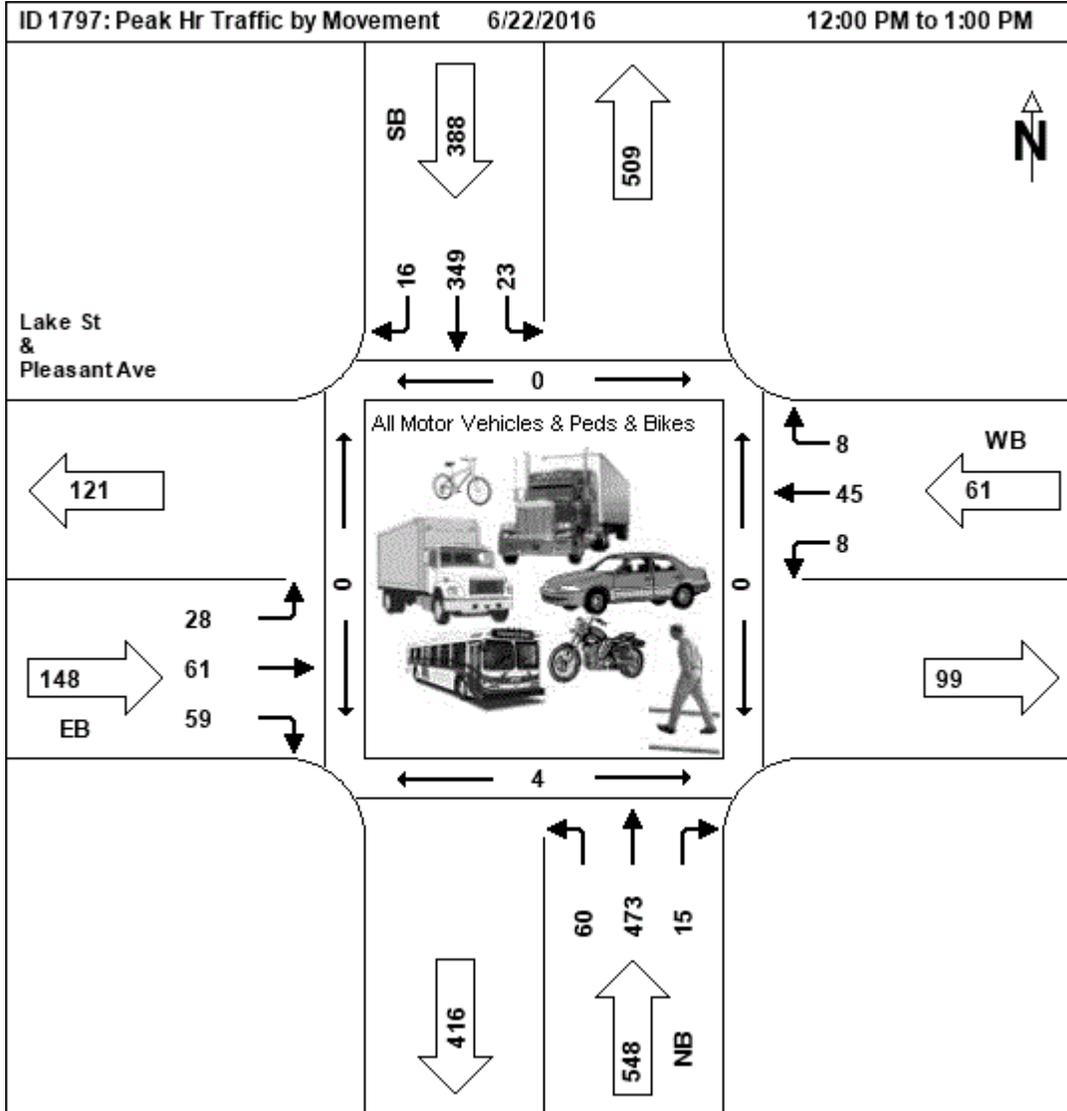
Cars  Trucks  Pedestrians  Bikes



**Midday Peak Hour  
06/22/2016**

Start Time	NB				EB				SB				WB				App Total	Int Total			
	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped	Left	Thru	Right	Ped					
12:00 PM	15	124	3	0	142	6	13	13	1	32	9	82	4	0	95	1	16	4	0	21	290
12:15 PM	14	116	2	0	132	5	17	20	2	42	4	76	3	0	83	3	5	1	0	9	266
12:30 PM	14	122	3	0	139	6	15	14	0	35	4	94	1	0	99	2	8	2	0	12	285
12:45 PM	17	111	7	0	135	11	16	12	1	39	6	97	8	0	111	2	16	1	0	19	304
Total	60	473	15	0	548	28	61	59	4	148	23	349	16	0	388	8	45	8	0	61	1145
PHF	0.88	0.95	0.54		0.96	0.64	0.90	0.74		0.88	0.64	0.90	0.50		0.87	0.67	0.70	0.50		0.73	
HV %	12	4	13			11	2	3			0	7	13			0	9	0			

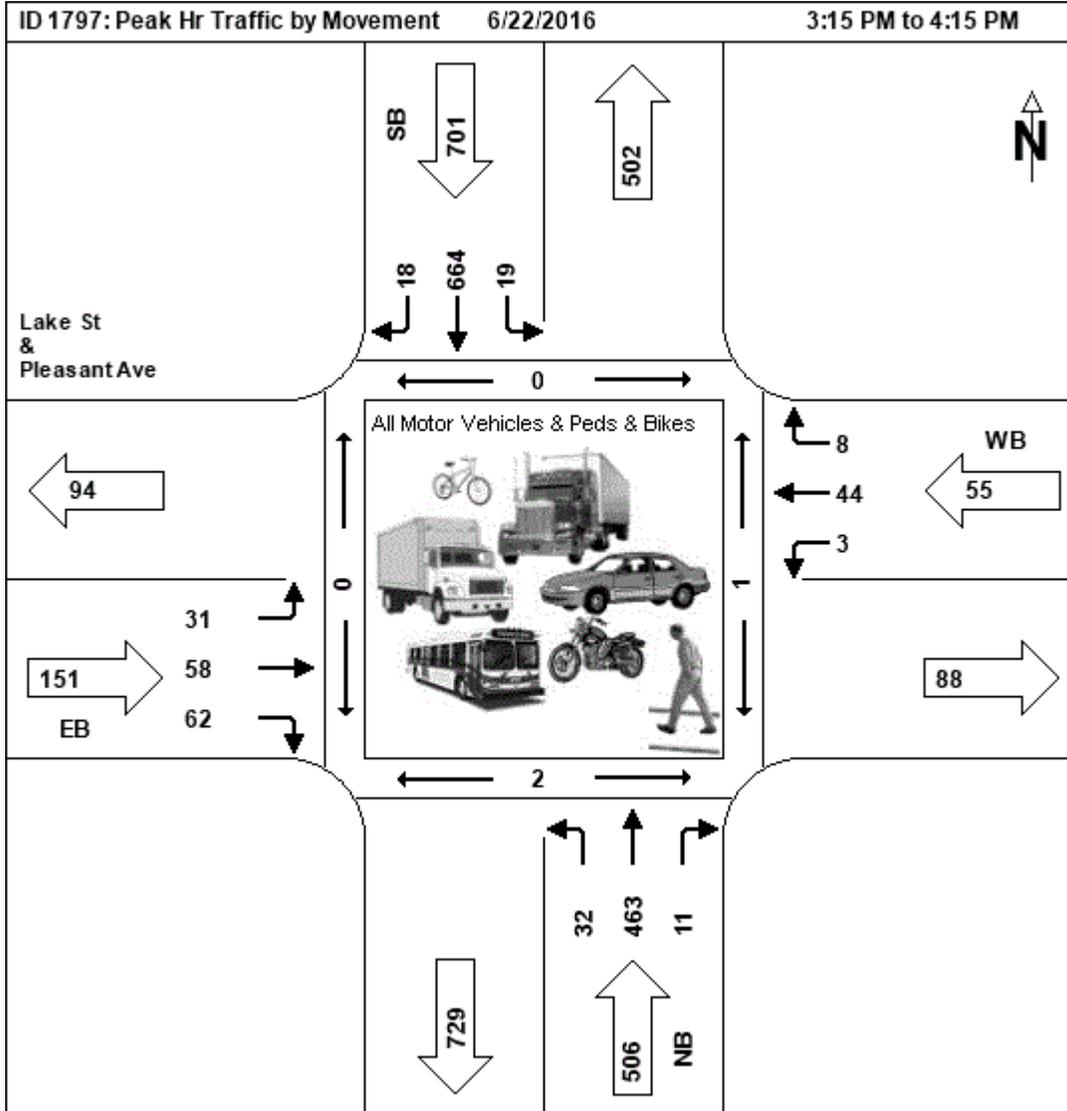
Cars  Trucks  Pedestrians  Bikes



**PM Peak Hour  
06/22/2016**

Start Time	NB				App Total	EB				App Total	SB				App Total	WB				App Total	Int Total
	Left	Thru	Right	Ped		Left	Thru	Right	Ped		Left	Thru	Right	Ped		Left	Thru	Right	Ped		
3:15 PM	8	129	4	0	141	11	16	11	0	38	4	153	5	0	162	1	17	4	0	22	363
3:30 PM	10	131	2	0	143	7	15	14	0	36	6	152	3	0	161	0	11	1	0	12	352
3:45 PM	11	102	3	0	116	8	19	22	2	49	3	170	6	0	179	1	10	0	0	11	355
4:00 PM	2	100	2	1	104	5	8	14	0	27	6	189	4	0	199	1	5	3	0	9	339
Total	31	462	11	1	504	31	58	61	2	150	19	664	18	0	701	3	43	8	0	54	1409
PHF	0.70	0.88	0.69		0.88	0.70	0.76	0.69		0.77	0.79	0.88	0.75		0.88	0.75	0.63	0.50		0.61	
HV %	10	4	9			0	0	8			0	2	0			0	9	25			

Cars  Trucks  Pedestrians  Bikes



Hamburg Roundabouts

Annual growth rate

0.005

Volume Calculations

3

23

Intersection	Approach	mm	2016 Existing			2019 (ETC)			2039 (ETC+20)				
			AM	Mid	PM	AM	Mid	PM	AM	Mid	PM		
Main St & Lake St	Lake St	NB	L	6	7	11	6	7	11	7	8	12	
			T	30	21	33	30	21	33	34	24	37	
			R	9	12	11	9	12	11	10	13	12	
	Main St	SB	L	L	76	119	158	77	121	160	85	133	177
				T	13	31	48	13	31	49	15	35	54
				R	176	231	549	179	234	557	197	259	616
		WB	L	L	493	284	307	500	288	312	553	319	344
				T	333	256	345	338	260	350	373	287	387
				R	4	4	1	4	4	1	4	4	1
	Main St	L	L	5	10	14	5	10	14	6	11	16	
			T	188	249	443	191	253	450	211	279	497	
			R	198	171	116	201	174	118	222	192	130	
Lake St & Pleasant Ave	Lake St	NB	L	56	60	32	57	61	32	63	67	36	
			T	746	473	463	757	480	470	837	530	519	
			R	5	15	11	5	15	11	6	17	12	
	Pleasant Ave	SB	L	L	8	23	19	8	23	19	9	26	21
				T	240	349	664	244	354	674	269	391	745
				R	2	16	18	2	16	18	2	18	20
		WB	L	L	23	28	31	23	28	31	26	31	35
				T	50	61	58	51	62	59	56	68	65
				R	55	59	62	56	60	63	62	66	70
	Pleasant Ave	L	L	2	8	3	2	8	3	2	9	3	
			T	21	45	44	21	46	45	24	50	49	
			R	11	8	8	11	8	8	12	9	9	

No seasonal adj

# HCM Signalized Intersection Capacity Analysis

## 3: S Lake St/Lake St (Rte 75) & Main St (Rte 62 & 75)/Main St (Rte 62)

10/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	493	333	4	5	188	198	6	30	9	76	13	176
Future Volume (vph)	493	333	4	5	188	198	6	30	9	76	13	176
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0		5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.96	1.00
Satd. Flow (prot)	1703	1774		1805	1696	1495		1757			1530	1524
Flt Permitted	0.46	1.00		0.55	1.00	1.00		0.94			0.72	1.00
Satd. Flow (perm)	817	1774		1040	1696	1495		1660			1155	1524
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	524	354	4	5	200	211	6	32	10	81	14	187
RTOR Reduction (vph)	0	0	0	0	0	151	0	9	0	0	0	115
Lane Group Flow (vph)	524	358	0	5	200	60	0	39	0	0	95	72
Heavy Vehicles (%)	6%	7%	0%	0%	12%	8%	17%	0%	11%	21%	8%	6%
Turn Type	pm+pt	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	29.6	29.6		12.9	12.9	12.9		5.7			5.7	17.4
Effective Green, g (s)	29.6	29.6		12.9	12.9	12.9		5.7			5.7	17.4
Actuated g/C Ratio	0.65	0.65		0.28	0.28	0.28		0.13			0.13	0.38
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0		5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	762	1159		296	482	425		208			145	753
v/s Ratio Prot	c0.18	0.20			0.12							0.02
v/s Ratio Perm	c0.27			0.00		0.04		0.02			c0.08	0.02
v/c Ratio	0.69	0.31		0.02	0.41	0.14		0.19			0.66	0.10
Uniform Delay, d1	4.4	3.4		11.6	13.1	12.1		17.7			18.9	8.9
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	2.6	0.2		0.0	0.6	0.2		0.4			10.2	0.1
Delay (s)	7.0	3.6		11.7	13.7	12.2		18.2			29.0	9.0
Level of Service	A	A		B	B	B		B			C	A
Approach Delay (s)		5.6			12.9			18.2			15.7	
Approach LOS		A			B			B			B	

### Intersection Summary

HCM 2000 Control Delay	9.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	45.3	Sum of lost time (s)	20.0
Intersection Capacity Utilization	61.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 8: Lake St (Rte 75)/Rte 75 & Pleasant Ave

10/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	50	55	2	21	11	56	746	5	8	240	2
Future Volume (vph)	23	50	55	2	21	11	56	746	5	8	240	2
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.95		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1543	1529		1805	1805		1656	1826		1805	1808	
Flt Permitted	0.74	1.00		0.69	1.00		0.60	1.00		0.29	1.00	
Satd. Flow (perm)	1195	1529		1305	1805		1054	1826		549	1808	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	24	52	57	2	22	11	58	769	5	8	247	2
RTOR Reduction (vph)	0	49	0	0	10	0	0	0	0	0	0	0
Lane Group Flow (vph)	24	60	0	2	23	0	58	774	0	8	249	0
Heavy Vehicles (%)	17%	14%	15%	0%	0%	0%	9%	4%	0%	0%	5%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.0	7.0		7.0	7.0		35.0	35.0		35.0	35.0	
Effective Green, g (s)	7.0	7.0		7.0	7.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.67	0.67		0.67	0.67	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	160	205		175	242		709	1229		369	1216	
v/s Ratio Prot		c0.04			0.01			c0.42			0.14	
v/s Ratio Perm	0.02			0.00			0.06			0.01		
v/c Ratio	0.15	0.29		0.01	0.10		0.08	0.63		0.02	0.20	
Uniform Delay, d1	19.9	20.3		19.5	19.7		2.9	4.8		2.8	3.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.8		0.0	0.2		0.2	2.5		0.1	0.4	
Delay (s)	20.3	21.1		19.5	19.9		3.2	7.3		2.9	3.6	
Level of Service	C	C		B	B		A	A		A	A	
Approach Delay (s)		20.9			19.9			7.0			3.6	
Approach LOS		C			B			A			A	

### Intersection Summary

HCM 2000 Control Delay	8.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	52.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 3: S Lake St/Lake St (Rte 75) & Main St (Rte 62 & 75)/Main St (Rte 62)

10/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	284	256	4	10	249	171	7	21	12	119	31	231
Future Volume (vph)	284	256	4	10	249	171	7	21	12	119	31	231
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0		5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.96	1.00
Satd. Flow (prot)	1719	1801		1805	1827	1495		1674			1758	1468
Flt Permitted	0.41	1.00		0.59	1.00	1.00		0.93			0.74	1.00
Satd. Flow (perm)	745	1801		1124	1827	1495		1572			1357	1468
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	299	269	4	11	262	180	7	22	13	125	33	243
RTOR Reduction (vph)	0	0	0	0	0	128	0	11	0	0	0	144
Lane Group Flow (vph)	299	273	0	11	262	52	0	31	0	0	158	99
Heavy Vehicles (%)	5%	5%	25%	0%	4%	8%	0%	5%	17%	5%	0%	10%
Turn Type	pm+pt	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	30.3	30.3		14.3	14.3	14.3		9.2			9.2	20.2
Effective Green, g (s)	30.3	30.3		14.3	14.3	14.3		9.2			9.2	20.2
Actuated g/C Ratio	0.61	0.61		0.29	0.29	0.29		0.19			0.19	0.41
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0		5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	672	1102		324	527	431		292			252	747
v/s Ratio Prot	c0.10	0.15			0.14							0.03
v/s Ratio Perm	c0.17			0.01		0.03		0.02			c0.12	0.04
v/c Ratio	0.44	0.25		0.03	0.50	0.12		0.11			0.63	0.13
Uniform Delay, d1	5.0	4.4		12.6	14.6	13.0		16.7			18.6	9.2
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	0.5	0.1		0.0	0.7	0.1		0.2			4.8	0.1
Delay (s)	5.5	4.5		12.7	15.4	13.1		16.9			23.4	9.2
Level of Service	A	A		B	B	B		B			C	A
Approach Delay (s)		5.0			14.4			16.9			14.8	
Approach LOS		A			B			B			B	

### Intersection Summary

HCM 2000 Control Delay	10.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	49.5	Sum of lost time (s)	20.0
Intersection Capacity Utilization	56.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 8: Lake St (Rte 75)/Rte 75 & Pleasant Ave

10/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	61	59	8	45	8	60	473	15	23	349	16
Future Volume (vph)	28	61	59	8	45	8	60	473	15	23	349	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.98		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1626	1717		1805	1724		1612	1814		1805	1760	
Flt Permitted	0.72	1.00		0.67	1.00		0.53	1.00		0.45	1.00	
Satd. Flow (perm)	1232	1717		1282	1724		903	1814		846	1760	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	30	65	63	9	48	9	64	503	16	24	371	17
RTOR Reduction (vph)	0	54	0	0	8	0	0	1	0	0	2	0
Lane Group Flow (vph)	30	74	0	9	49	0	64	518	0	24	386	0
Heavy Vehicles (%)	11%	2%	3%	0%	9%	0%	12%	4%	13%	0%	7%	13%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.0	7.0		7.0	7.0		33.4	33.4		33.4	33.4	
Effective Green, g (s)	7.0	7.0		7.0	7.0		33.4	33.4		33.4	33.4	
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.66	0.66		0.66	0.66	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	171	238		178	239		598	1202		560	1166	
v/s Ratio Prot		c0.04			0.03			c0.29			0.22	
v/s Ratio Perm	0.02			0.01			0.07			0.03		
v/c Ratio	0.18	0.31		0.05	0.21		0.11	0.43		0.04	0.33	
Uniform Delay, d1	19.2	19.5		18.8	19.2		3.1	4.0		3.0	3.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.7		0.1	0.4		0.4	1.1		0.1	0.8	
Delay (s)	19.6	20.3		18.9	19.7		3.4	5.1		3.1	4.4	
Level of Service	B	C		B	B		A	A		A	A	
Approach Delay (s)		20.2			19.6			5.0			4.4	
Approach LOS		C			B			A			A	

### Intersection Summary

HCM 2000 Control Delay	7.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.41		
Actuated Cycle Length (s)	50.4	Sum of lost time (s)	10.0
Intersection Capacity Utilization	54.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 3: S Lake St/Lake St (Rte 75) & Main St (Rte 62 & 75)/Main St (Rte 62)

10/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	307	347	1	14	443	116	11	33	11	158	48	549
Future Volume (vph)	307	347	1	14	443	116	11	33	11	158	48	549
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0		5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.96	1.00
Satd. Flow (prot)	1752	1826		1805	1863	1599		1738			1788	1583
Flt Permitted	0.22	1.00		0.55	1.00	1.00		0.93			0.74	1.00
Satd. Flow (perm)	412	1826		1039	1863	1599		1624			1372	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	316	358	1	14	457	120	11	34	11	163	49	566
RTOR Reduction (vph)	0	0	0	0	0	80	0	8	0	0	0	150
Lane Group Flow (vph)	316	359	0	14	457	40	0	48	0	0	212	416
Heavy Vehicles (%)	3%	4%	0%	0%	2%	1%	0%	6%	9%	3%	0%	2%
Turn Type	pm+pt	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	36.1	36.1		20.0	20.0	20.0		14.5			14.5	25.6
Effective Green, g (s)	36.1	36.1		20.0	20.0	20.0		14.5			14.5	25.6
Actuated g/C Ratio	0.60	0.60		0.33	0.33	0.33		0.24			0.24	0.42
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0		5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	490	1087		342	614	527		388			328	799
v/s Ratio Prot	c0.12	0.20			c0.25							0.10
v/s Ratio Perm	0.27			0.01		0.02		0.03			c0.15	0.17
v/c Ratio	0.64	0.33		0.04	0.74	0.08		0.12			0.65	0.52
Uniform Delay, d1	8.4	6.2		13.8	18.0	13.9		18.1			20.7	13.0
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	2.9	0.2		0.0	4.9	0.1		0.1			4.3	0.6
Delay (s)	11.3	6.3		13.8	22.9	14.0		18.2			25.1	13.6
Level of Service	B	A		B	C	B		B			C	B
Approach Delay (s)		8.7			20.9			18.2			16.7	
Approach LOS		A			C			B			B	

### Intersection Summary

HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	60.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	76.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 8: Lake St (Rte 75) & Pleasant Ave

10/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	51	62	3	44	8	32	463	11	19	664	18
Future Volume (vph)	31	51	62	3	44	8	32	463	11	19	664	18
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.98		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1671		1805	1667		1641	1819		1805	1856	
Flt Permitted	0.72	1.00		0.68	1.00		0.33	1.00		0.47	1.00	
Satd. Flow (perm)	1373	1671		1295	1667		569	1819		888	1856	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	32	53	64	3	45	8	33	477	11	20	685	19
RTOR Reduction (vph)	0	55	0	0	7	0	0	1	0	0	1	0
Lane Group Flow (vph)	32	62	0	3	46	0	33	487	0	20	703	0
Heavy Vehicles (%)	0%	0%	8%	0%	9%	25%	10%	4%	9%	0%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	6.8	6.8		6.8	6.8		33.8	33.8		33.8	33.8	
Effective Green, g (s)	6.8	6.8		6.8	6.8		33.8	33.8		33.8	33.8	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.67	0.67		0.67	0.67	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	184	224		174	224		380	1215		593	1239	
v/s Ratio Prot		c0.04			0.03			0.27			c0.38	
v/s Ratio Perm	0.02			0.00			0.06			0.02		
v/c Ratio	0.17	0.28		0.02	0.21		0.09	0.40		0.03	0.57	
Uniform Delay, d1	19.4	19.7		19.0	19.5		3.0	3.8		2.9	4.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.7		0.0	0.5		0.4	1.0		0.1	1.9	
Delay (s)	19.9	20.4		19.0	20.0		3.4	4.8		3.0	6.4	
Level of Service	B	C		B	B		A	A		A	A	
Approach Delay (s)		20.2			19.9			4.7			6.3	
Approach LOS		C			B			A			A	

### Intersection Summary

HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	50.6	Sum of lost time (s)	10.0
Intersection Capacity Utilization	52.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 3: S Lake St/Lake St (Rte 75) & Main St (Rte 62 & 75)/Main St (Rte 62)

10/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	500	338	4	5	191	201	6	30	9	77	13	179
Future Volume (vph)	500	338	4	5	191	201	6	30	9	77	13	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0		5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.96	1.00
Satd. Flow (prot)	1703	1774		1805	1696	1495		1757			1530	1524
Flt Permitted	0.46	1.00		0.54	1.00	1.00		0.94			0.72	1.00
Satd. Flow (perm)	816	1774		1034	1696	1495		1660			1154	1524
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	532	360	4	5	203	214	6	32	10	82	14	190
RTOR Reduction (vph)	0	0	0	0	0	153	0	9	0	0	0	117
Lane Group Flow (vph)	532	364	0	5	203	61	0	39	0	0	96	73
Heavy Vehicles (%)	6%	7%	0%	0%	12%	8%	17%	0%	11%	21%	8%	6%
Turn Type	pm+pt	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	29.8	29.8		13.0	13.0	13.0		5.7			5.7	17.5
Effective Green, g (s)	29.8	29.8		13.0	13.0	13.0		5.7			5.7	17.5
Actuated g/C Ratio	0.65	0.65		0.29	0.29	0.29		0.13			0.13	0.38
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0		5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	764	1161		295	484	427		207			144	753
v/s Ratio Prot	c0.18	0.20			0.12							0.03
v/s Ratio Perm	c0.28			0.00		0.04		0.02			c0.08	0.02
v/c Ratio	0.70	0.31		0.02	0.42	0.14		0.19			0.67	0.10
Uniform Delay, d1	4.5	3.4		11.7	13.2	12.1		17.8			19.0	8.9
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	2.8	0.2		0.0	0.6	0.2		0.4			11.1	0.1
Delay (s)	7.2	3.6		11.7	13.8	12.3		18.3			30.1	9.0
Level of Service	A	A		B	B	B		B			C	A
Approach Delay (s)		5.7			13.0			18.3			16.1	
Approach LOS		A			B			B			B	

### Intersection Summary

HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	45.5	Sum of lost time (s)	20.0
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 8: Lake St (Rte 75)/Rte 75 & Pleasant Ave

10/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	51	56	2	21	11	57	757	5	8	244	2
Future Volume (vph)	23	51	56	2	21	11	57	757	5	8	244	2
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.95		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1543	1529		1805	1805		1656	1826		1805	1808	
Flt Permitted	0.74	1.00		0.69	1.00		0.60	1.00		0.28	1.00	
Satd. Flow (perm)	1195	1529		1302	1805		1049	1826		537	1808	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	24	53	58	2	22	11	59	780	5	8	252	2
RTOR Reduction (vph)	0	50	0	0	10	0	0	0	0	0	0	0
Lane Group Flow (vph)	24	61	0	2	23	0	59	785	0	8	254	0
Heavy Vehicles (%)	17%	14%	15%	0%	0%	0%	9%	4%	0%	0%	5%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.0	7.0		7.0	7.0		35.0	35.0		35.0	35.0	
Effective Green, g (s)	7.0	7.0		7.0	7.0		35.0	35.0		35.0	35.0	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.67	0.67		0.67	0.67	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	160	205		175	242		706	1229		361	1216	
v/s Ratio Prot		c0.04			0.01			c0.43			0.14	
v/s Ratio Perm	0.02			0.00			0.06			0.01		
v/c Ratio	0.15	0.30		0.01	0.10		0.08	0.64		0.02	0.21	
Uniform Delay, d1	19.9	20.3		19.5	19.7		2.9	4.9		2.8	3.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.8		0.0	0.2		0.2	2.5		0.1	0.4	
Delay (s)	20.3	21.1		19.5	19.9		3.2	7.4		2.9	3.6	
Level of Service	C	C		B	B		A	A		A	A	
Approach Delay (s)		21.0			19.9			7.1			3.6	
Approach LOS		C			B			A			A	

### Intersection Summary

HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	52.0	Sum of lost time (s)	10.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 3: S Lake St/Lake St (Rte 75) & Main St (Rte 62 & 75)/Main St (Rte 62)

10/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	288	260	4	10	251	174	7	21	12	121	31	234
Future Volume (vph)	288	260	4	10	251	174	7	21	12	121	31	234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0		5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.96	1.00
Satd. Flow (prot)	1719	1801		1805	1827	1495		1674			1758	1468
Flt Permitted	0.41	1.00		0.59	1.00	1.00		0.93			0.74	1.00
Satd. Flow (perm)	742	1801		1119	1827	1495		1573			1356	1468
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	303	274	4	11	264	183	7	22	13	127	33	246
RTOR Reduction (vph)	0	0	0	0	0	130	0	11	0	0	0	146
Lane Group Flow (vph)	303	278	0	11	264	53	0	31	0	0	160	100
Heavy Vehicles (%)	5%	5%	25%	0%	4%	8%	0%	5%	17%	5%	0%	10%
Turn Type	pm+pt	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	30.4	30.4		14.4	14.4	14.4		9.3			9.3	20.3
Effective Green, g (s)	30.4	30.4		14.4	14.4	14.4		9.3			9.3	20.3
Actuated g/C Ratio	0.61	0.61		0.29	0.29	0.29		0.19			0.19	0.41
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0		5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	670	1101		324	529	433		294			253	747
v/s Ratio Prot	c0.10	0.15			0.14							0.03
v/s Ratio Perm	c0.18			0.01		0.04		0.02			c0.12	0.04
v/c Ratio	0.45	0.25		0.03	0.50	0.12		0.11			0.63	0.13
Uniform Delay, d1	5.1	4.4		12.7	14.7	13.0		16.8			18.6	9.2
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	0.5	0.1		0.0	0.7	0.1		0.2			5.1	0.1
Delay (s)	5.6	4.6		12.7	15.4	13.1		16.9			23.7	9.3
Level of Service	A	A		B	B	B		B			C	A
Approach Delay (s)		5.1			14.4			16.9			15.0	
Approach LOS		A			B			B			B	

### Intersection Summary

HCM 2000 Control Delay	11.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	49.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	56.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 8: Lake St (Rte 75)/Rte 75 & Pleasant Ave

10/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	62	60	8	46	8	61	480	15	23	354	16
Future Volume (vph)	28	62	60	8	46	8	61	480	15	23	354	16
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.98		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1626	1717		1805	1725		1612	1814		1805	1760	
Flt Permitted	0.72	1.00		0.67	1.00		0.53	1.00		0.44	1.00	
Satd. Flow (perm)	1231	1717		1280	1725		898	1814		835	1760	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	30	66	64	9	49	9	65	511	16	24	377	17
RTOR Reduction (vph)	0	55	0	0	8	0	0	1	0	0	2	0
Lane Group Flow (vph)	30	75	0	9	50	0	65	526	0	24	392	0
Heavy Vehicles (%)	11%	2%	3%	0%	9%	0%	12%	4%	13%	0%	7%	13%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.0	7.0		7.0	7.0		33.3	33.3		33.3	33.3	
Effective Green, g (s)	7.0	7.0		7.0	7.0		33.3	33.3		33.3	33.3	
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.66	0.66		0.66	0.66	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	171	238		178	240		594	1200		552	1165	
v/s Ratio Prot		c0.04			0.03			c0.29			0.22	
v/s Ratio Perm	0.02			0.01			0.07			0.03		
v/c Ratio	0.18	0.31		0.05	0.21		0.11	0.44		0.04	0.34	
Uniform Delay, d1	19.1	19.5		18.8	19.2		3.1	4.0		3.0	3.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.8		0.1	0.4		0.4	1.2		0.1	0.8	
Delay (s)	19.6	20.3		18.9	19.6		3.5	5.2		3.1	4.5	
Level of Service	B	C		B	B		A	A		A	A	
Approach Delay (s)		20.1			19.5			5.0			4.4	
Approach LOS		C			B			A			A	

### Intersection Summary

HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	50.3	Sum of lost time (s)	10.0
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 3: S Lake St/Lake St (Rte 75) & Main St (Rte 62 & 75)/Main St (Rte 62)

10/18/2016



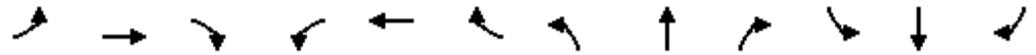
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	312	350	1	14	450	118	11	33	11	160	49	557
Future Volume (vph)	312	350	1	14	450	118	11	33	11	160	49	557
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0		5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.96	1.00
Satd. Flow (prot)	1752	1826		1805	1863	1599		1738			1789	1583
Flt Permitted	0.22	1.00		0.55	1.00	1.00		0.93			0.74	1.00
Satd. Flow (perm)	401	1826		1036	1863	1599		1624			1374	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	322	361	1	14	464	122	11	34	11	165	51	574
RTOR Reduction (vph)	0	0	0	0	0	82	0	8	0	0	0	148
Lane Group Flow (vph)	322	362	0	14	464	40	0	48	0	0	216	426
Heavy Vehicles (%)	3%	4%	0%	0%	2%	1%	0%	6%	9%	3%	0%	2%
Turn Type	pm+pt	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	36.3	36.3		20.2	20.2	20.2		14.7			14.7	25.8
Effective Green, g (s)	36.3	36.3		20.2	20.2	20.2		14.7			14.7	25.8
Actuated g/C Ratio	0.60	0.60		0.33	0.33	0.33		0.24			0.24	0.42
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0		5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	484	1086		343	616	529		391			331	799
v/s Ratio Prot	c0.12	0.20			c0.25							0.10
v/s Ratio Perm	0.27			0.01		0.03		0.03			c0.16	0.17
v/c Ratio	0.67	0.33		0.04	0.75	0.08		0.12			0.65	0.53
Uniform Delay, d1	8.7	6.2		13.8	18.2	14.0		18.1			20.9	13.1
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	3.4	0.2		0.0	5.2	0.1		0.1			4.6	0.7
Delay (s)	12.1	6.4		13.9	23.4	14.1		18.2			25.4	13.8
Level of Service	B	A		B	C	B		B			C	B
Approach Delay (s)		9.1			21.3			18.2			17.0	
Approach LOS		A			C			B			B	

### Intersection Summary

HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	61.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	77.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis  
 8: Lake St (Rte 75) & Pleasant Ave

10/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	31	59	63	3	45	8	32	470	11	19	674	18
Future Volume (vph)	31	59	63	3	45	8	32	470	11	19	674	18
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.98		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1683		1805	1668		1641	1819		1805	1856	
Flt Permitted	0.72	1.00		0.68	1.00		0.32	1.00		0.46	1.00	
Satd. Flow (perm)	1371	1683		1285	1668		555	1819		876	1856	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	32	61	65	3	46	8	33	485	11	20	695	19
RTOR Reduction (vph)	0	56	0	0	7	0	0	1	0	0	1	0
Lane Group Flow (vph)	32	70	0	3	47	0	33	495	0	20	713	0
Heavy Vehicles (%)	0%	0%	8%	0%	9%	25%	10%	4%	9%	0%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.0	7.0		7.0	7.0		33.5	33.5		33.5	33.5	
Effective Green, g (s)	7.0	7.0		7.0	7.0		33.5	33.5		33.5	33.5	
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.66	0.66		0.66	0.66	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	190	233		178	231		368	1206		581	1231	
v/s Ratio Prot		c0.04			0.03			0.27			c0.38	
v/s Ratio Perm	0.02			0.00			0.06			0.02		
v/c Ratio	0.17	0.30		0.02	0.20		0.09	0.41		0.03	0.58	
Uniform Delay, d1	19.2	19.5		18.8	19.3		3.0	3.9		2.9	4.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.7		0.0	0.4		0.5	1.0		0.1	2.0	
Delay (s)	19.6	20.3		18.8	19.7		3.5	5.0		3.0	6.6	
Level of Service	B	C		B	B		A	A		A	A	
Approach Delay (s)		20.1			19.7			4.9			6.5	
Approach LOS		C			B			A			A	

Intersection Summary			
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	50.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 3: S Lake St/Lake St (Rte 75) & Main St (Rte 62 & 75)/Main St (Rte 62)

10/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	553	373	4	6	211	222	7	34	10	85	15	197
Future Volume (vph)	553	373	4	6	211	222	7	34	10	85	15	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0		5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.96	1.00
Satd. Flow (prot)	1703	1774		1805	1696	1495		1758			1531	1524
Flt Permitted	0.45	1.00		0.53	1.00	1.00		0.95			0.72	1.00
Satd. Flow (perm)	806	1774		999	1696	1495		1677			1150	1524
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	588	397	4	6	224	236	7	36	11	90	16	210
RTOR Reduction (vph)	0	0	0	0	0	171	0	9	0	0	0	124
Lane Group Flow (vph)	588	401	0	6	224	65	0	45	0	0	106	86
Heavy Vehicles (%)	6%	7%	0%	0%	12%	8%	17%	0%	11%	21%	8%	6%
Turn Type	pm+pt	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	29.9	29.9		13.3	13.3	13.3		8.1			8.1	19.7
Effective Green, g (s)	29.9	29.9		13.3	13.3	13.3		8.1			8.1	19.7
Actuated g/C Ratio	0.62	0.62		0.28	0.28	0.28		0.17			0.17	0.41
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0		5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	718	1105		276	469	414		282			194	784
v/s Ratio Prot	c0.20	0.23			0.13							0.03
v/s Ratio Perm	c0.31			0.01		0.04		0.03			c0.09	0.03
v/c Ratio	0.82	0.36		0.02	0.48	0.16		0.16			0.55	0.11
Uniform Delay, d1	5.8	4.4		12.6	14.5	13.1		17.0			18.3	8.7
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	7.2	0.2		0.0	0.8	0.2		0.3			3.1	0.1
Delay (s)	13.0	4.6		12.7	15.2	13.3		17.3			21.4	8.8
Level of Service	B	A		B	B	B		B			C	A
Approach Delay (s)		9.6			14.2			17.3			13.0	
Approach LOS		A			B			B			B	

### Intersection Summary

HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.99		
Actuated Cycle Length (s)	48.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 8: Lake St (Rte 75)/Rte 75 & Pleasant Ave

10/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗		↖	↗		↖	↗		↖	↗	
Traffic Volume (vph)	26	56	62	2	24	12	63	837	6	9	269	2
Future Volume (vph)	26	56	62	2	24	12	63	837	6	9	269	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.95		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1543	1528		1805	1808		1656	1826		1805	1808	
Flt Permitted	0.73	1.00		0.68	1.00		0.59	1.00		0.23	1.00	
Satd. Flow (perm)	1190	1528		1289	1808		1025	1826		440	1808	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	27	58	64	2	25	12	65	863	6	9	277	2
RTOR Reduction (vph)	0	55	0	0	10	0	0	0	0	0	0	0
Lane Group Flow (vph)	27	67	0	2	27	0	65	869	0	9	279	0
Heavy Vehicles (%)	17%	14%	15%	0%	0%	0%	9%	4%	0%	0%	5%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.1	7.1		7.1	7.1		34.3	34.3		34.3	34.3	
Effective Green, g (s)	7.1	7.1		7.1	7.1		34.3	34.3		34.3	34.3	
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.67	0.67		0.67	0.67	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	164	211		178	249		683	1218		293	1206	
v/s Ratio Prot		c0.04			0.01			c0.48			0.15	
v/s Ratio Perm	0.02			0.00			0.06			0.02		
v/c Ratio	0.16	0.32		0.01	0.11		0.10	0.71		0.03	0.23	
Uniform Delay, d1	19.5	20.0		19.1	19.4		3.0	5.4		2.9	3.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.9		0.0	0.2		0.3	3.6		0.2	0.4	
Delay (s)	20.0	20.8		19.1	19.6		3.3	9.0		3.1	3.8	
Level of Service	C	C		B	B		A	A		A	A	
Approach Delay (s)		20.7			19.5			8.6			3.8	
Approach LOS		C			B			A			A	

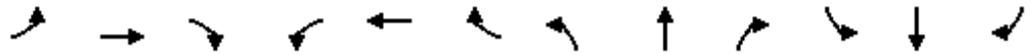
### Intersection Summary

HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	51.4	Sum of lost time (s)	10.0
Intersection Capacity Utilization	68.8%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 3: S Lake St/Lake St (Rte 75) & Main St (Rte 62 & 75)/Main St (Rte 62)

10/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	319	287	4	11	279	192	8	24	13	133	35	259
Future Volume (vph)	319	287	4	11	279	192	8	24	13	133	35	259
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0		5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.96			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.96	1.00
Satd. Flow (prot)	1719	1801		1805	1827	1495		1679			1758	1468
Flt Permitted	0.38	1.00		0.57	1.00	1.00		0.93			0.74	1.00
Satd. Flow (perm)	679	1801		1090	1827	1495		1575			1351	1468
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	336	302	4	12	294	202	8	25	14	140	37	273
RTOR Reduction (vph)	0	0	0	0	0	143	0	11	0	0	0	159
Lane Group Flow (vph)	336	306	0	12	294	59	0	36	0	0	177	114
Heavy Vehicles (%)	5%	5%	25%	0%	4%	8%	0%	5%	17%	5%	0%	10%
Turn Type	pm+pt	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	31.8	31.8		15.3	15.3	15.3		10.2			10.2	21.7
Effective Green, g (s)	31.8	31.8		15.3	15.3	15.3		10.2			10.2	21.7
Actuated g/C Ratio	0.61	0.61		0.29	0.29	0.29		0.20			0.20	0.42
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0		5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	645	1101		320	537	439		308			265	753
v/s Ratio Prot	c0.12	0.17			0.16							0.03
v/s Ratio Perm	c0.20			0.01		0.04		0.02			c0.13	0.04
v/c Ratio	0.52	0.28		0.04	0.55	0.14		0.12			0.67	0.15
Uniform Delay, d1	5.6	4.7		13.1	15.4	13.5		17.2			19.3	9.4
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		0.0	1.1	0.1		0.2			6.2	0.1
Delay (s)	6.4	4.9		13.1	16.6	13.6		17.4			25.6	9.5
Level of Service	A	A		B	B	B		B			C	A
Approach Delay (s)		5.6			15.3			17.4			15.8	
Approach LOS		A			B			B			B	

### Intersection Summary

HCM 2000 Control Delay	11.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	52.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 8: Lake St (Rte 75)/Rte 75 & Pleasant Ave

10/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	68	66	9	50	9	67	530	17	26	391	18
Future Volume (vph)	31	68	66	9	50	9	67	530	17	26	391	18
Ideal Flow (vphp)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.98		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1626	1717		1805	1724		1612	1814		1805	1760	
Flt Permitted	0.72	1.00		0.67	1.00		0.50	1.00		0.40	1.00	
Satd. Flow (perm)	1225	1717		1266	1724		853	1814		764	1760	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	33	72	70	10	53	10	71	564	18	28	416	19
RTOR Reduction (vph)	0	60	0	0	9	0	0	1	0	0	2	0
Lane Group Flow (vph)	33	82	0	10	54	0	71	581	0	28	433	0
Heavy Vehicles (%)	11%	2%	3%	0%	9%	0%	12%	4%	13%	0%	7%	13%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.1	7.1		7.1	7.1		32.8	32.8		32.8	32.8	
Effective Green, g (s)	7.1	7.1		7.1	7.1		32.8	32.8		32.8	32.8	
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.66	0.66		0.66	0.66	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	174	244		180	245		560	1192		502	1156	
v/s Ratio Prot		c0.05			0.03			c0.32			0.25	
v/s Ratio Perm	0.03			0.01			0.08			0.04		
v/c Ratio	0.19	0.34		0.06	0.22		0.13	0.49		0.06	0.37	
Uniform Delay, d1	18.9	19.3		18.5	19.0		3.2	4.3		3.0	3.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.8		0.1	0.5		0.5	1.4		0.2	0.9	
Delay (s)	19.4	20.1		18.6	19.4		3.7	5.7		3.3	4.8	
Level of Service	B	C		B	B		A	A		A	A	
Approach Delay (s)		20.0			19.3			5.5			4.7	
Approach LOS		B			B			A			A	

### Intersection Summary

HCM 2000 Control Delay	7.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	49.9	Sum of lost time (s)	10.0
Intersection Capacity Utilization	58.1%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 3: S Lake St/Lake St (Rte 75) & Main St (Rte 62 & 75)/Main St (Rte 62)

10/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	344	387	1	16	497	130	12	37	12	177	54	616
Future Volume (vph)	344	387	1	16	497	130	12	37	12	177	54	616
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0	5.0		5.0			5.0	5.0
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.97			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99			0.96	1.00
Satd. Flow (prot)	1752	1826		1805	1863	1599		1738			1789	1583
Flt Permitted	0.17	1.00		0.53	1.00	1.00		0.92			0.74	1.00
Satd. Flow (perm)	314	1826		1000	1863	1599		1622			1367	1583
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	355	399	1	16	512	134	12	38	12	182	56	635
RTOR Reduction (vph)	0	0	0	0	0	89	0	9	0	0	0	134
Lane Group Flow (vph)	355	400	0	16	512	45	0	53	0	0	238	501
Heavy Vehicles (%)	3%	4%	0%	0%	2%	1%	0%	6%	9%	3%	0%	2%
Turn Type	pm+pt	NA		Perm	NA	Perm	pm+pt	NA		pm+pt	NA	pm+ov
Protected Phases	7	4			8		5	2		1	6	7
Permitted Phases	4			8		8	2			6		6
Actuated Green, G (s)	37.2	37.2		21.1	21.1	21.1		16.0			16.0	27.1
Effective Green, g (s)	37.2	37.2		21.1	21.1	21.1		16.0			16.0	27.1
Actuated g/C Ratio	0.59	0.59		0.33	0.33	0.33		0.25			0.25	0.43
Clearance Time (s)	5.0	5.0		5.0	5.0	5.0		5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0		3.0			3.0	3.0
Lane Grp Cap (vph)	437	1074		333	621	533		410			346	804
v/s Ratio Prot	c0.14	0.22			0.27							c0.11
v/s Ratio Perm	c0.33			0.02	0.03	0.03		0.03			0.17	0.21
v/c Ratio	0.81	0.37		0.05	0.82	0.08		0.13			0.69	0.62
Uniform Delay, d1	11.9	6.8		14.3	19.3	14.4		18.2			21.3	14.1
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00			1.00	1.00
Incremental Delay, d2	11.0	0.2		0.1	8.7	0.1		0.1			5.6	1.5
Delay (s)	22.9	7.1		14.3	28.1	14.5		18.4			26.9	15.6
Level of Service	C	A		B	C	B		B			C	B
Approach Delay (s)		14.5			25.0			18.4			18.7	
Approach LOS		B			C			B			B	

### Intersection Summary

HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	63.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	83.5%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

# HCM Signalized Intersection Capacity Analysis

## 8: Lake St (Rte 75) & Pleasant Ave

10/18/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	59	63	3	45	8	32	470	11	19	674	18
Future Volume (vph)	31	59	63	3	45	8	32	470	11	19	674	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.92		1.00	0.98		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1683		1805	1668		1641	1819		1805	1856	
Flt Permitted	0.72	1.00		0.68	1.00		0.32	1.00		0.46	1.00	
Satd. Flow (perm)	1371	1683		1285	1668		555	1819		876	1856	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	32	61	65	3	46	8	33	485	11	20	695	19
RTOR Reduction (vph)	0	56	0	0	7	0	0	1	0	0	1	0
Lane Group Flow (vph)	32	70	0	3	47	0	33	495	0	20	713	0
Heavy Vehicles (%)	0%	0%	8%	0%	9%	25%	10%	4%	9%	0%	2%	0%
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.0	7.0		7.0	7.0		33.5	33.5		33.5	33.5	
Effective Green, g (s)	7.0	7.0		7.0	7.0		33.5	33.5		33.5	33.5	
Actuated g/C Ratio	0.14	0.14		0.14	0.14		0.66	0.66		0.66	0.66	
Clearance Time (s)	5.0	5.0		5.0	5.0		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	190	233		178	231		368	1206		581	1231	
v/s Ratio Prot		c0.04			0.03			0.27			c0.38	
v/s Ratio Perm	0.02			0.00			0.06			0.02		
v/c Ratio	0.17	0.30		0.02	0.20		0.09	0.41		0.03	0.58	
Uniform Delay, d1	19.2	19.5		18.8	19.3		3.0	3.9		2.9	4.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.7		0.0	0.4		0.5	1.0		0.1	2.0	
Delay (s)	19.6	20.3		18.8	19.7		3.5	5.0		3.0	6.6	
Level of Service	B	C		B	B		A	A		A	A	
Approach Delay (s)		20.1			19.7			4.9			6.5	
Approach LOS		C			B			A			A	

### Intersection Summary

HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	50.5	Sum of lost time (s)	10.0
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

# LANE SUMMARY

 Site: Main & Lake-ETC AM

Build (ETC)  
Roundabout

Lane Use and Performance													
	Demand Flows		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	Total veh/h	HV %						Veh	Dist ft				
South: S. Lake St													
Lane 1 <sup>d</sup>	48	4.5	482	0.099	100	10.2	LOS B	0.4	9.6	Full	1600	0.0	0.0
Approach	48	4.5		0.099		10.2	LOS B	0.4	9.6				
East: Main St													
Lane 1	5	0.0	431	0.012	100	14.4	LOS B	0.0	1.1	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	417	9.9	717	0.582	100	12.3	LOS B	4.1	109.9	Full	1600	0.0	0.0
Approach	422	9.8		0.582		12.3	LOS B	4.1	109.9				
North: Lake Street													
Lane 1	136	15.3	847	0.160	100	9.0	LOS A	0.8	21.2	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	150	6.0	938	0.160	100	5.3	LOS A	0.8	20.2	Full	1600	0.0	0.0
Approach	286	10.4		0.160		7.0	LOS A	0.8	21.2				
SouthWest: Main Street													
Lane 1 <sup>d</sup>	451	6.0	1134	0.398	100	9.4	LOS A	2.8	74.6	Full	1600	0.0	0.0
Lane 2	444	6.8	1116	0.398	100	5.8	LOS A	2.8	74.9	Full	1600	0.0	0.0
Approach	896	6.4		0.398		7.6	LOS A	2.8	74.9				
Intersection	1652	7.9		0.582		8.8	LOS A	4.1	109.9				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

# LANE SUMMARY

 Site: Main & Lake-ETC MD

Build (ETC)  
Roundabout

Lane Use and Performance													
	Demand Flows		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	Total veh/h	HV %						Veh	Dist ft				
South: S. Lake St													
Lane 1 <sup>d</sup>	42	7.7	548	0.077	100	9.4	LOS A	0.3	7.5	Full	1600	0.0	0.0
Approach	42	7.7		0.077		9.4	LOS A	0.3	7.5				
East: Main St													
Lane 1	11	0.0	527	0.020	100	12.7	LOS B	0.1	1.9	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	449	5.6	888	0.506	100	9.6	LOS A	3.2	84.4	Full	1600	0.0	0.0
Approach	460	5.5		0.506		9.6	LOS A	3.2	84.4				
North: Lake Street													
Lane 1 <sup>d</sup>	209	5.4	913	0.229	100	9.1	LOS A	1.1	29.3	Full	1600	0.0	0.0
Lane 2	198	10.0	866	0.229	100	5.8	LOS A	1.1	30.0	Full	1600	0.0	0.0
Approach	406	7.6		0.229		7.5	LOS A	1.1	30.0				
SouthWest: Main Street													
Lane 1	289	5.0	1071	0.270	100	9.7	LOS A	1.7	43.2	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	292	5.3	1081	0.270	100	5.4	LOS A	1.7	43.4	Full	1600	0.0	0.0
Approach	581	5.1		0.270		7.5	LOS A	1.7	43.4				
Intersection	1489	6.0		0.506		8.2	LOS A	3.2	84.4				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

# LANE SUMMARY

 Site: Main & Lake-ETC PM

Build (ETC)  
Roundabout

Lane Use and Performance													
	Demand Flows		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	Total veh/h	HV %						Veh	Dist ft				
South: S. Lake St													
Lane 1 <sup>d</sup>	57	5.4	510	0.111	100	10.2	LOS B	0.4	11.3	Full	1600	0.0	0.0
Approach	57	5.4		0.111		10.2	LOS B	0.4	11.3				
East: Main St													
Lane 1	14	0.0	505	0.029	100	13.1	LOS B	0.1	2.8	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	586	1.8	893	0.656	100	12.4	LOS B	6.1	155.2	Full	1600	0.0	0.0
Approach	600	1.7		0.656		12.4	LOS B	6.1	155.2				
North: Lake Street													
Lane 1	394	2.2	797	0.495	100	10.0	LOS B	3.3	84.6	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	395	2.0	799	0.495	100	7.6	LOS A	3.3	84.5	Full	1600	0.0	0.0
Approach	790	2.1		0.495		8.8	LOS A	3.3	84.6				
SouthWest: Main Street													
Lane 1	322	3.0	996	0.323	92 <sup>5</sup>	10.1	LOS B	2.1	54.8	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	362	4.0	1026	0.353	100	5.6	LOS A	2.4	62.4	Full	1600	0.0	0.0
Approach	684	3.5		0.353		7.7	LOS A	2.4	62.4				
Intersection	2130	2.5		0.656		9.5	LOS A	6.1	155.2				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>5</sup> Lane underutilisation determined by program

<sup>d</sup> Dominant lane on roundabout approach

Processed: Tuesday, October 18, 2016 11:03:20 AM

SIDRA INTERSECTION 6.0.22.4722

Project: V:\Projects\ANY\K4\31894\Data\Other\Traffic\Sidra\Roundabout Analysis.sip6

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**SIDRA  
INTERSECTION 6**

# LANE SUMMARY

 Site: Main & Lake-ETC+20 AM

Build (ETC+20)  
Roundabout

Lane Use and Performance													
	Demand Flows		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	Total veh/h	HV %						Veh	Dist ft				
South: S. Lake St													
Lane 1 <sup>d</sup>	54	4.5	445	0.122	100	10.8	LOS B	0.5	12.0	Full	1600	0.0	0.0
Approach	54	4.5		0.122		10.8	LOS B	0.5	12.0				
East: Main St													
Lane 1	6	0.0	408	0.016	100	14.9	LOS B	0.1	1.4	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	461	9.9	682	0.675	100	14.3	LOS B	5.5	148.3	Full	1600	0.0	0.0
Approach	467	9.8		0.675		14.3	LOS B	5.5	148.3				
North: Lake Street													
Lane 1	150	15.3	823	0.182	100	9.2	LOS A	0.9	24.7	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	166	6.0	914	0.182	100	5.4	LOS A	0.9	23.6	Full	1600	0.0	0.0
Approach	316	10.4		0.182		7.2	LOS A	0.9	24.7				
SouthWest: Main Street													
Lane 1	495	6.0	1110	0.446	100	9.6	LOS A	3.4	88.2	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	494	6.8	1109	0.446	100	6.0	LOS A	3.4	88.7	Full	1600	0.0	0.0
Approach	989	6.4		0.446		7.8	LOS A	3.4	88.7				
Intersection	1827	7.9		0.675		9.5	LOS A	5.5	148.3				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

# LANE SUMMARY

 Site: Main & Lake-ETC+20 MD

Build (ETC+20)  
Roundabout

Lane Use and Performance													
	Demand Flows		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	Total veh/h	HV %						Veh	Dist ft				
South: S. Lake St													
Lane 1 <sup>d</sup>	47	7.6	520	0.091	100	9.8	LOS A	0.3	9.0	Full	1600	0.0	0.0
Approach	47	7.6		0.091		9.8	LOS A	0.3	9.0				
East: Main St													
Lane 1	12	0.0	508	0.023	100	13.0	LOS B	0.1	2.2	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	496	5.6	862	0.575	100	10.6	LOS B	4.3	111.2	Full	1600	0.0	0.0
Approach	507	5.5		0.575		10.7	LOS B	4.3	111.2				
North: Lake Street													
Lane 1 <sup>d</sup>	231	5.4	887	0.260	100	9.2	LOS A	1.3	34.5	Full	1600	0.0	0.0
Lane 2	219	10.0	841	0.260	100	6.0	LOS A	1.3	35.3	Full	1600	0.0	0.0
Approach	449	7.6		0.260		7.7	LOS A	1.3	35.3				
SouthWest: Main Street													
Lane 1	319	5.0	1049	0.304	100	9.8	LOS A	1.9	50.4	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	323	5.3	1061	0.304	100	5.6	LOS A	1.9	50.6	Full	1600	0.0	0.0
Approach	642	5.1		0.304		7.7	LOS A	1.9	50.6				
Intersection	1646	6.0		0.575		8.7	LOS A	4.3	111.2				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

# LANE SUMMARY

 Site: Main & Lake-ETC+20 PM

Build (ETC+20)  
Roundabout

Lane Use and Performance													
	Demand Flows		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	Total veh/h	HV %						Veh	Dist ft				
South: S. Lake St													
Lane 1 <sup>d</sup>	62	5.4	478	0.130	100	10.6	LOS B	0.5	13.4	Full	1600	0.0	0.0
Approach	62	5.4		0.130		10.6	LOS B	0.5	13.4				
East: Main St													
Lane 1	16	0.0	485	0.034	100	13.4	LOS B	0.1	3.4	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	640	1.8	864	0.741	100	14.5	LOS B	8.4	213.6	Full	1600	0.0	0.0
Approach	656	1.7		0.741		14.4	LOS B	8.4	213.6				
North: Lake Street													
Lane 1	432	2.2	757	0.570	100	11.2	LOS B	4.4	111.4	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	433	2.0	759	0.570	100	8.8	LOS A	4.4	111.3	Full	1600	0.0	0.0
Approach	864	2.1		0.570		10.0	LOS A	4.4	111.4				
SouthWest: Main Street													
Lane 1	351	3.0	969	0.362	92 <sup>5</sup>	10.3	LOS B	2.5	64.0	Full	1600	0.0	0.0
Lane 2 <sup>d</sup>	396	4.0	1001	0.396	100	5.9	LOS A	2.8	73.2	Full	1600	0.0	0.0
Approach	747	3.5		0.396		8.0	LOS A	2.8	73.2				
Intersection	2330	2.5		0.741		10.6	LOS B	8.4	213.6				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>5</sup> Lane underutilisation determined by program

<sup>d</sup> Dominant lane on roundabout approach

# LANE SUMMARY

 Site: Pleasant & Lake ETC AM

Build (ETC)  
Roundabout

Lane Use and Performance													
	Demand Flows		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	Total veh/h	HV %						Veh	Dist ft				
South: Lake St													
Lane 1 <sup>d</sup>	844	4.3	960	0.879	100	9.4	LOS A	18.1	468.8	Full	1600	0.0	0.0
Approach	844	4.3		0.879		9.4	LOS A	18.1	468.8				
East: Pleasant Ave													
Lane 1 <sup>d</sup>	35	0.0	336	0.104	100	13.1	LOS B	0.6	16.2	Full	1600	0.0	0.0
Approach	35	0.0		0.104		13.1	LOS B	0.6	16.2				
North: Lake St													
Lane 1 <sup>d</sup>	262	4.8	958	0.273	100	5.7	LOS A	1.8	46.5	Full	1600	0.0	0.0
Approach	262	4.8		0.273		5.7	LOS A	1.8	46.5				
West: Pleasant Ave													
Lane 1 <sup>d</sup>	134	15.0	699	0.192	100	8.2	LOS A	1.0	28.2	Full	1600	0.0	0.0
Approach	134	15.0		0.192		8.2	LOS A	1.0	28.2				
Intersection	1275	5.4		0.879		8.6	LOS A	18.1	468.8				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

# LANE SUMMARY

 Site: Pleasant & Lake ETC MD

Build (ETC)  
Roundabout

Lane Use and Performance													
	Demand Flows		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	Total veh/h	HV %						Veh	Dist ft				
South: Lake St													
Lane 1 <sup>d</sup>	591	5.1	918	0.644	100	7.2	LOS A	6.4	166.1	Full	1600	0.0	0.0
Approach	591	5.1		0.644		7.2	LOS A	6.4	166.1				
East: Pleasant Ave													
Lane 1 <sup>d</sup>	66	6.7	505	0.131	100	10.9	LOS B	0.7	18.7	Full	1600	0.0	0.0
Approach	66	6.7		0.131		10.9	LOS B	0.7	18.7				
North: Lake St													
Lane 1 <sup>d</sup>	418	6.8	897	0.466	100	6.6	LOS A	3.4	90.4	Full	1600	0.0	0.0
Approach	418	6.8		0.466		6.6	LOS A	3.4	90.4				
West: Pleasant Ave													
Lane 1 <sup>d</sup>	160	4.1	666	0.240	100	9.2	LOS A	1.3	34.7	Full	1600	0.0	0.0
Approach	160	4.1		0.240		9.2	LOS A	1.3	34.7				
Intersection	1235	5.6		0.644		7.5	LOS A	6.4	166.1				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

# LANE SUMMARY

 Site: Pleasant & Lake ETC PM

Build (ETC)  
Roundabout

Lane Use and Performance													
	Demand Flows		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	Total veh/h	HV %						Veh	Dist ft				
South: Lake St													
Lane 1 <sup>d</sup>	529	4.5	933	0.567	100	6.6	LOS A	5.2	134.7	Full	1600	0.0	0.0
Approach	529	4.5		0.567		6.6	LOS A	5.2	134.7				
East: Pleasant Ave													
Lane 1 <sup>d</sup>	58	10.8	521	0.111	100	10.2	LOS B	0.6	15.6	Full	1600	0.0	0.0
Approach	58	10.8		0.111		10.2	LOS B	0.6	15.6				
North: Lake St													
Lane 1 <sup>d</sup>	733	1.9	995	0.737	100	6.6	LOS A	9.3	235.6	Full	1600	0.0	0.0
Approach	733	1.9		0.737		6.6	LOS A	9.3	235.6				
West: Pleasant Ave													
Lane 1 <sup>d</sup>	158	3.3	464	0.340	100	12.7	LOS B	2.1	53.4	Full	1600	0.0	0.0
Approach	158	3.3		0.340		12.7	LOS B	2.1	53.4				
Intersection	1477	3.3		0.737		7.4	LOS A	9.3	235.6				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

# LANE SUMMARY

 Site: Pleasant & Lake ETC+20 AM

Build (ETC+20)  
Roundabout

Lane Use and Performance													
	Demand Flows		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	Total veh/h	HV %						Veh	Dist ft				
South: Lake St													
Lane 1 <sup>d</sup>	934	4.3	947	0.986	100	23.4	LOS C	41.3	1068.1	Full	1600	0.0	0.0
Approach	934	4.3		0.986		23.4	LOS C	41.3	1068.1				
East: Pleasant Ave													
Lane 1 <sup>d</sup>	39	0.0	283	0.138	100	15.3	LOS B	0.9	21.9	Full	1600	0.0	0.0
Approach	39	0.0		0.138		15.3	LOS B	0.9	21.9				
North: Lake St													
Lane 1 <sup>d</sup>	289	4.8	946	0.305	100	5.8	LOS A	2.1	53.3	Full	1600	0.0	0.0
Approach	289	4.8		0.305		5.8	LOS A	2.1	53.3				
West: Pleasant Ave													
Lane 1 <sup>d</sup>	148	15.0	676	0.220	100	8.6	LOS A	1.2	33.0	Full	1600	0.0	0.0
Approach	148	15.0		0.220		8.6	LOS A	1.2	33.0				
Intersection	1410	5.4		0.986		18.0	LOS B	41.3	1068.1				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach

# LANE SUMMARY

 Site: Pleasant & Lake ETC+20 PM

Build (ETC+20)  
Roundabout

Lane Use and Performance													
	Demand Flows		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue		Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
	Total veh/h	HV %						Veh	Dist ft				
South: Lake St													
Lane 1 <sup>d</sup>	585	4.5	917	0.638	100	6.9	LOS A	6.5	167.9	Full	1600	0.0	0.0
Approach	585	4.5		0.638		6.9	LOS A	6.5	167.9				
East: Pleasant Ave													
Lane 1 <sup>d</sup>	63	10.9	476	0.132	100	10.9	LOS B	0.7	19.2	Full	1600	0.0	0.0
Approach	63	10.9		0.132		10.9	LOS B	0.7	19.2				
North: Lake St													
Lane 1 <sup>d</sup>	810	1.9	984	0.824	100	7.3	LOS A	12.7	323.1	Full	1600	0.0	0.0
Approach	810	1.9		0.824		7.3	LOS A	12.7	323.1				
West: Pleasant Ave													
Lane 1 <sup>d</sup>	175	3.3	391	0.448	100	16.1	LOS B	3.2	82.0	Full	1600	0.0	0.0
Approach	175	3.3		0.448		16.1	LOS B	3.2	82.0				
Intersection	1633	3.3		0.824		8.3	LOS A	12.7	323.1				

Level of Service (LOS) Method: Delay & v/c (HCM 2010).

Roundabout LOS Method: Same as Signalised Intersections.

Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.

LOS F will result if v/c > irrespective of lane delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 2010).

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

<sup>d</sup> Dominant lane on roundabout approach