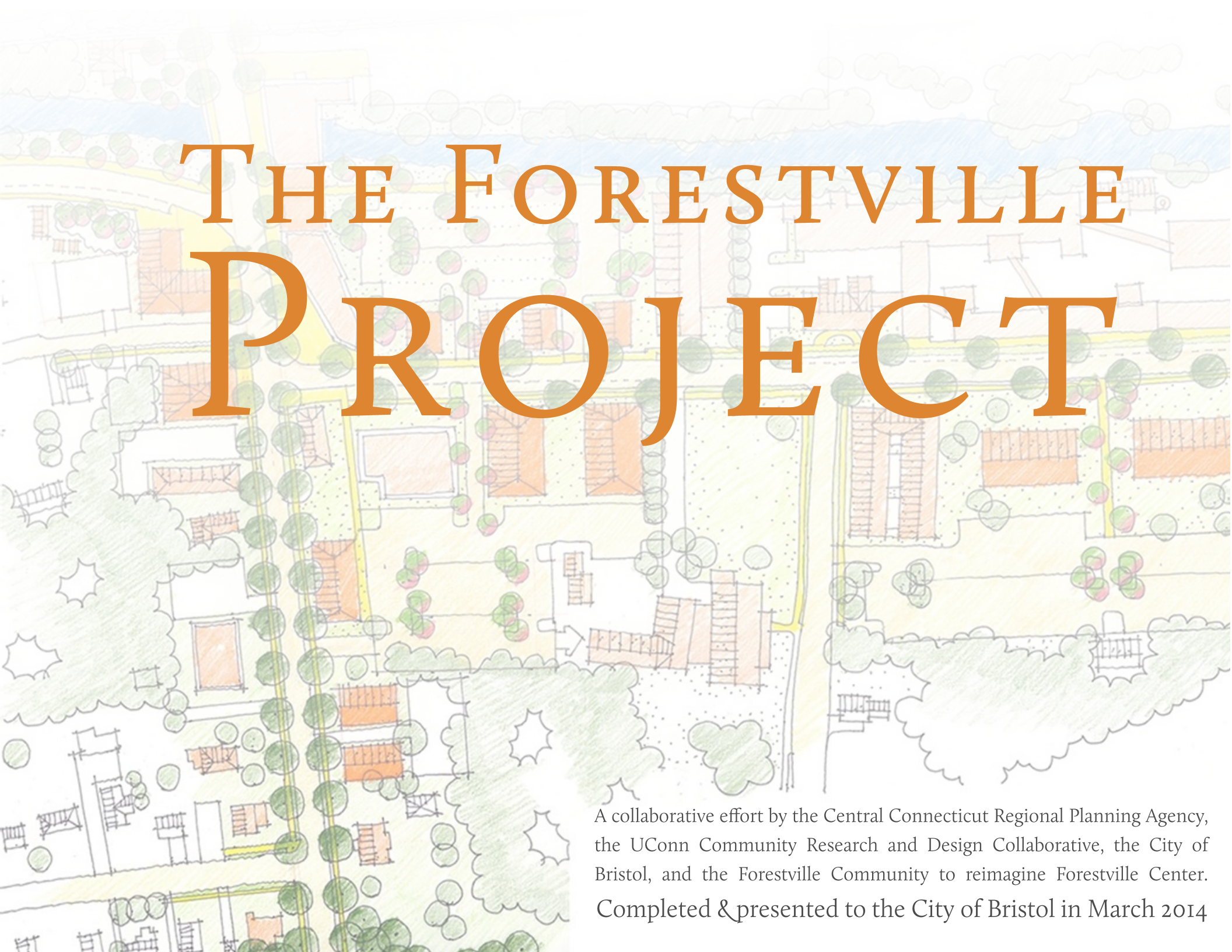
The Forestville Project



A collaborative effort by the Central Connecticut Regional Planning Agency, the UConn Community Research and Design Collaborative, the City of Bristol, and the Forestville Community to reimagine Forestville Center.

Completed & presented to the City of Bristol in March 2014

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Introduction

Project overview and purpose

History, scope, & project team

Vision, goals, and mission

Overview and purpose

Forestville is a New England village located on the eastern boundary of Bristol, a small city roughly 20 miles west of Hartford, Connecticut. A community with a rich history of manufacturing and civic pride, since its establishment in the mid nineteenth century Forestville residents would have grown accustomed to the sounds and sights associated with the production of springs, bells, brass hardware and most notably clocks. While those sounds may have changed, the residents of

The Sessions Manufacturing Company in the early 20th century.

Forestville center in the late 19th century.

this village and their connections to this place have remained steadfast. From the Pequabuck River cutting right through town to the tree lined streets dotted with the best of nineteenth century architecture, there are numerous amenities that Forestville can claim, including easy highway access, an active village association, a handful of small, locally owned businesses, and a pocket park surrounding the historic train station.

Despite these amenities, the landscape of Forestville has been dominated by the automobile for the last sixty years. With the

A current-day view of the intersection of East Main and Central Streets.

construction of State Route 72, East Main and Broad Streets became a busy steam of vehicles with very little regard to pedestrian access. The small traffic island at the intersection of Central and Broad Streets was designed to move traffic through that curved section of road as quickly as possible. However, with the construction of the Route 72 Expressway and the return of

The Sessions factory building along East Main Street.

East Main and Broad Streets to locally managed roads, transportation patterns have changed, removing much of the east-west traffic out of Forestville completely. With this change comes the opportunity to develop a walkable, thriving village center that highlights the character of this historic village while also planning for its future.

An historic home in Forestville.

History and scope

In the summer of 2011, the Central Connecticut Regional Planning Agency (CCRPA) was assessing potential transportation planning projects in the region. Aware of the changes Forestville was facing, CCRPA explored the possibility of a project further by contacting the Community Research and Design Collaborative (CRDC) at the University of Connecticut. The CRDC acts as an umbrella organization for the outreach work of landscape architecture faculty and leads the region in sustainable planning and design. The CRDC helps clients to plan and design affordable, equitable, and ecologically healthy environments. With both organizations bringing skills in land use and transportation planning, the project officially kicked off in the fall of 2011 and public participation began in January 2012.

In order to develop a plan that fits the context of Forestville and represents the vision of local residents, business owners, and others active in the community, public participation was critical. Through the establishment of a monthly working group and several community design meetings, both the challenges and opportunities that Forestville possessed began to emerge. There were several themes that continually emerged both in small and large public meetings. These ultimately shaped the project vision and goals.

CENTRAL CONNECTICUT
REGIONAL PLANNING AGENCY

College of Agriculture and Natural Resources
Community Research Design Collaborative
Department of Plant Science and Landscape Architecture

Vision, goals, and mission

During the project team's planning process and throughout the public participation process, the ideas and concerns expressed fell into two overarching categories: transportation and land use. Some of the major concerns that were consistently expressed include: a lack of parking, pedestrian safety, high vehicle speeds, complex intersections and vacant properties and lots. Some opportunities that were expressed by the community include: the local elementary schools, the new Route 72 expressway and easy highway access, the Forestville Village Association and their commitment to the community, historic architecture, and a strong village identify separate from the larger City of Bristol. Through several public discussions, a project mission statement was formed.

Project Goals

- To create a specific land use and transportation plan that will help guide future development.
- To build on the existing Bristol Route 72 Corridor Study and develop community-based designs that allow for continued growth within the existing village context while protecting natural resources.
- To address the traffic and circulation issues surrounding the intersection of Central Street and East Main Street (the former Route 72).
- To work with the Bristol Planning Commission to adopt this plan as an amendment to the POCD.

Mission statement

"To create a pedestrian friendly, mixed-use, and historically based Forestville Village Center that is accessible and safe for all users."

Project Vision

When asked to describe what they would like to see in Forestville, the following descriptions were shared:

- Small scale design
- On-street parking
- Street trees

- Wide sidewalks
- Outdoor dining, seating
- Benches and lighting
- Buildings close to one another
- Brick buildings
- River access
- Additional open space

Through the formation of the project mission statement and vision a framework was developed that could help guide the project.

Thorough research and analysis was then conducted to begin moving the project forward. CCRPA staff began by researching the history of Forestville and reviewing plans that relate to the area. Concurrently, CCRPA and its partners collected data on transportation patterns and land use in Forestville. This data was crucial to forming a complete understanding of how the village

Participants at a public meeting.

Participants marking up a map at a public meeting.

had changed as a result of the new Route 72. The project team worked closely with faculty from UConn's Center for Transportation and Livable systems and a team of senior design students from UConn's Transportation Engineering program. The faculty and students laid the groundwork for the transportation aspects of the final design.

Throughout this stage of the project, results of the project team's analysis were presented to the public for input on the final project design. Based on the analysis performed by CCRPA and UConn's Transportation Engineering program, a final master plan detailing infrastructure changes throughout Forestville was developed. This work was presented to a group of stakeholders at a public meeting, where designs were further refined.

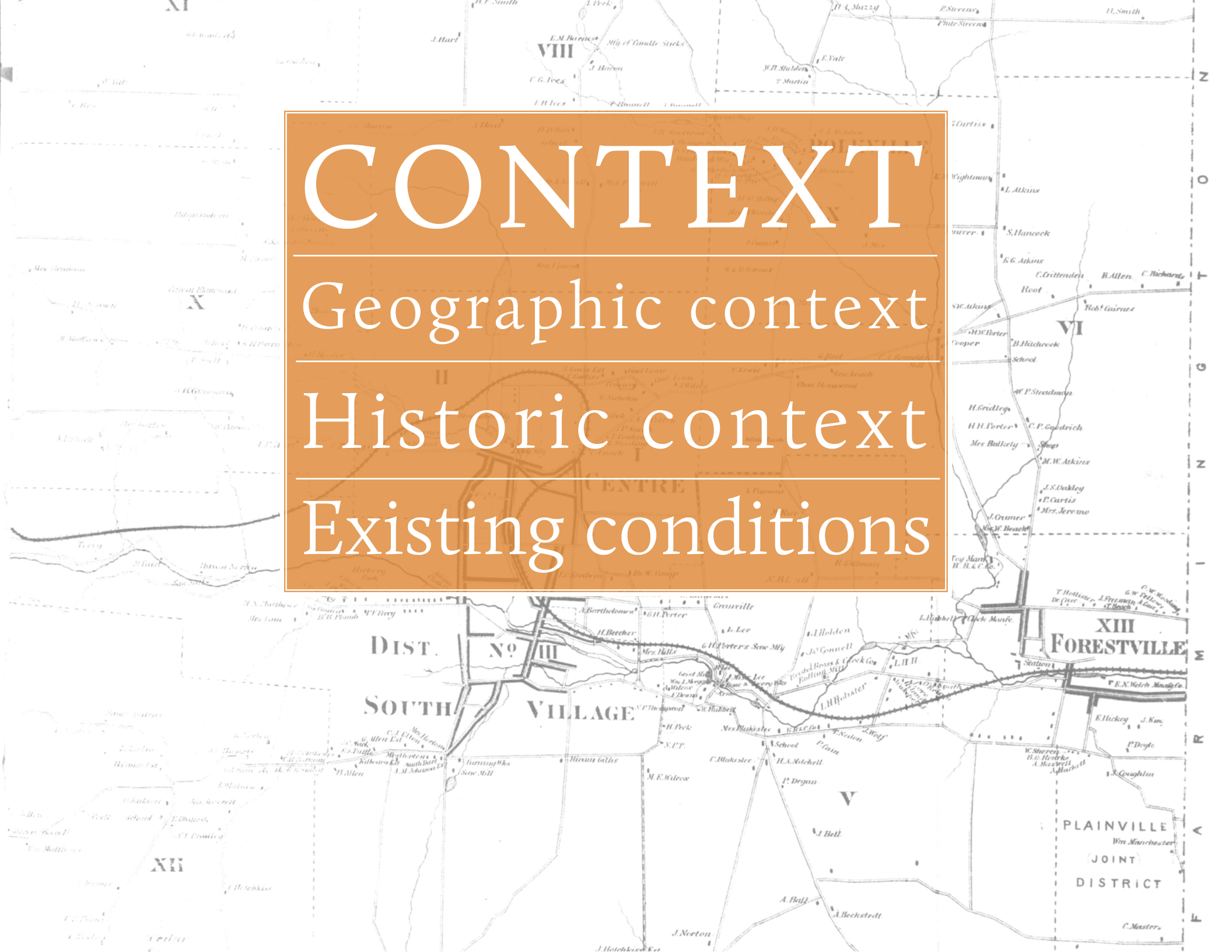
Finally, CCRPA assembled the plan into a single document that describes the project and details action steps. This plan will be presented to the City of Bristol for incorporation into the city's Plan of Conservation and Development.

CONTEXT

Geographic context

Historic context

Existing conditions

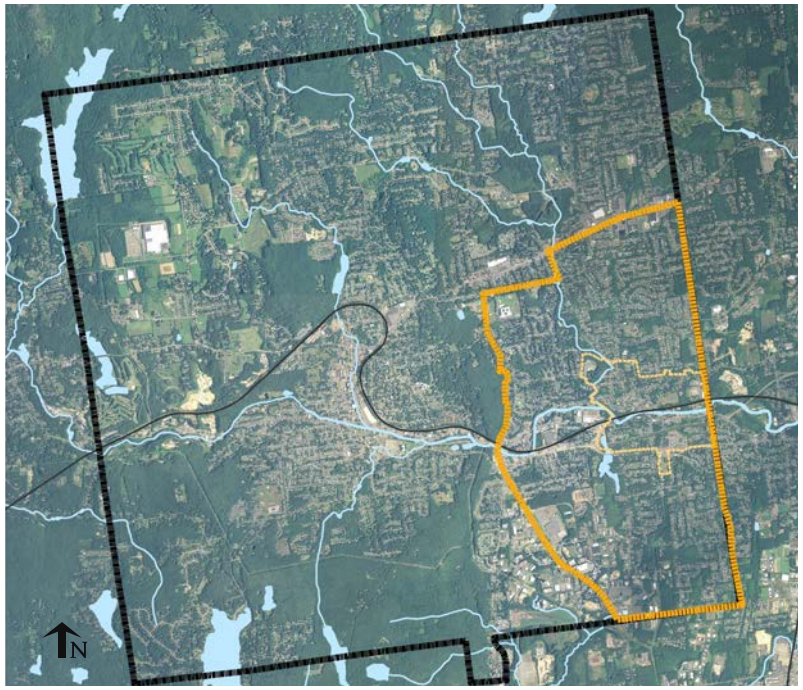


Geographic context

Forestville is located three miles southeast of the center Bristol, Connecticut, a city of approximately 60,000 people. Just twenty miles west of Hartford, Forestville is bounded by the distinctive Metacomet Ridge to the east and the Farmington Valley to the west. Forestville's location at the intersection of local and state roads has greatly influenced how the village has developed. With the recent transition of East Main Street from State Route 72 to a local road, both the physical landscape and village identity have begun to shift, making this a ripe time for revitalization and redevelopment.

While the historic boundaries of Forestville stretch across a large portion of Bristol, the boundaries for this project were honed in closer to the center of Forestville. The active study area is located at the intersection of Central, Broad and East Main Streets. The project boundary was formed based on areas within walking distance of the village center, the aesthetics of the historic architecture and neighborhoods, and areas of existing development.

Notable features in Forestville include: the Pequabuck River, which flows directly through the center of the village along Broad and East Main Streets; Quinlan Veterans Park; a historic train station and Clock Tower Park; the Manross Library; and many streets filled with beautiful 19th century homes.



The historic boundaries of Forestville (in orange) within Bristol.

The project boundaries.

The village center.

Historical context

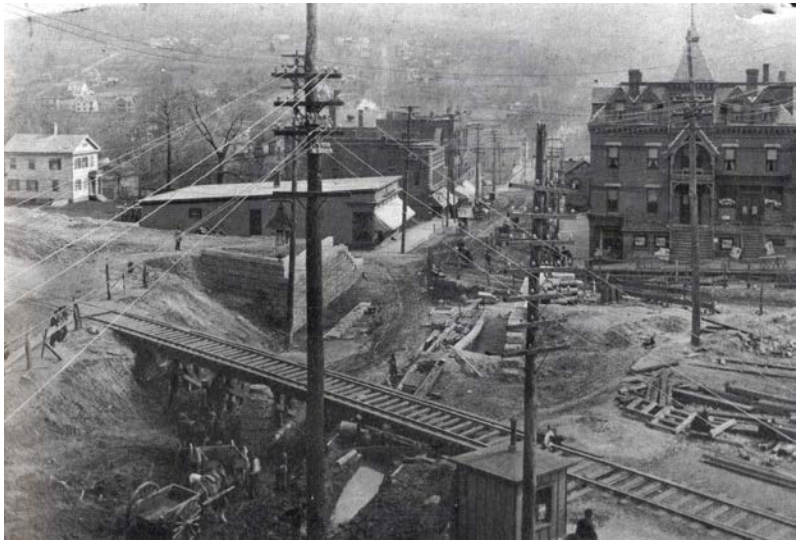
It was around the mid 1800's that Forestville saw it's a steady stream of development begin. It is rumored that its name came from the large swath of undeveloped forest that covered the area now known as Forestville. In 1833 three entrepreneurs established a clock manufacturing company, aptly named the Forestville Manufacturing Company, on East Main Street. This was the first in a series of steps towards Forestville being formed as a distinct village within Bristol. One of the most notable factors that led to the development of Forestville was the Pequabuck River and its role in allowing manufacturing companies to establish in this area of Bristol. Within the following fifty years, a number of other manufacturing companies were formed, including the Bristol Brass Burner Shop and the Fletcher Manufacturing Company.

Another key aspect to the growth of Forestville was the railroad moving into town and its associated train station. This, along with the growing manufacturing industry, led to the establishment of Forestville's own school house, post office, fire station, restaurants, shops, and boarding facilities for those stopping off from the train. Forestville continued to see growth and prosperity until the disastrous flood of 1955, a key factor in the village center declining over the next 50 years. When the

Forestville center, 1908.

flood occurred, it had severe impacts on the village center of Forestville. The bridge over the Pequabuck River was completely destroyed, mainly due to debris floating down the river. As a way of addressing the potential for future floods, the state set out to widen the river. Once the roads and bridge were rebuilt in Forestville center, the village struggled to return to the vibrancy it once claimed. Many businesses chose not to return and some suffered financial difficulties from flood damage. Remaining businesses also faced the challenge of a lack of on street parking, once a standby in providing easy access to these establishments. After the village center was reconstructed, all on street parking was removed. Due to a lack of a convenient on-street parking, drivers chose to continue through Forestville and do their business elsewhere where ample parking was available.

A bustling Forestville center, 1942.



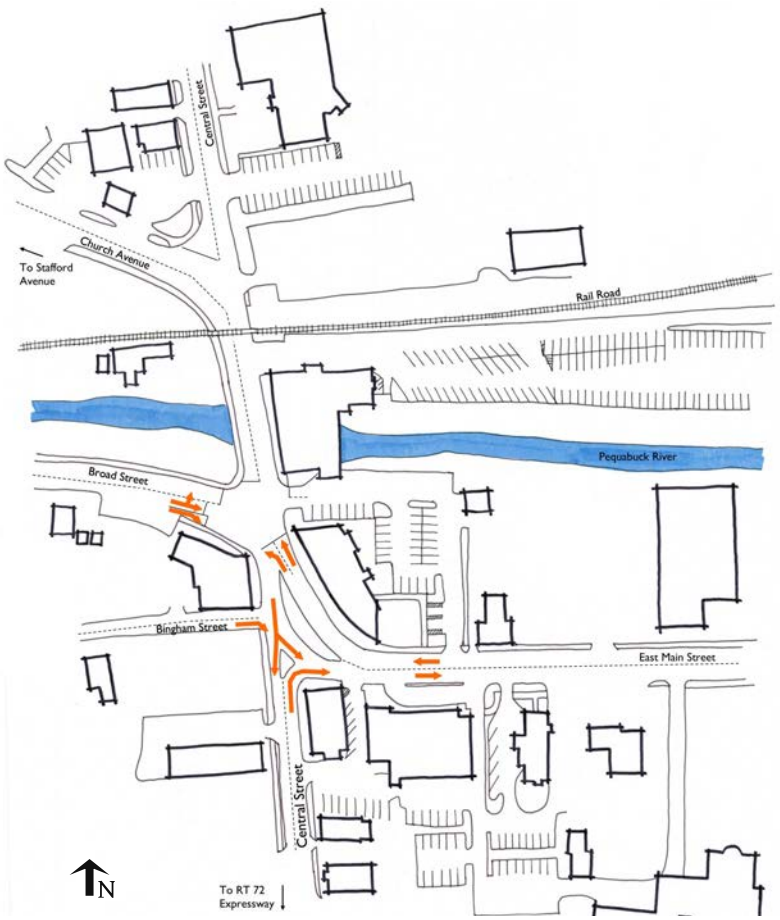
The railroad running through Forestville in 1900.

Existing conditions

Forestville's form has changed dramatically over the last fifty years. Transportation patterns have had major impacts, both on the movement of goods and people, and on the character of the village. These historic changes have resulted in the current form of the village. Before recommending further changes, a thorough understanding of existing conditions is necessary.

Traffic Circulation

The intersection of Broad, Central and East Main Streets in Forestville center is narrow and is characterized by a sharp curve and limited sight lines, which presents challenges to both pedestrians and drivers. Despite the new extension of Route 72 being open, there is still a fair amount of traffic that comes through this intersection. From the north, Stafford Avenue, one of the busiest north-south routes through Bristol, continues onto Church Avenue into Forestville. Currently, when a vehicle is heading north on Center Street and encounters the main intersection in Forestville, due to its design, they're forced to bear right onto East Main Street. This means that cars cannot easily travel from



Traffic circulation at Forestville's main intersection.

the new Route 72 extension to Stafford Avenue. There's not a large amount of on-street parking in the immediate area and it is not clear to drivers where to park.

Pedestrian Access

Currently, the sidewalks in this area are incredibly narrow and broken, and where they do exist, are not inviting to pedestrians at all. There's also no buffer between pedestrians and passing traffic. There are few crosswalks and the existing ones are faded.

Commercial Development

There is little commercial development and a number of vacant commercial properties. The existing buildings are one and two stories. Many need some façade improvements and some contribute to the sense of a street wall. A gas station, pizza place, Italian restaurant, travel agency, culinary supply store, computer repair shop, and post office comprise the majority of commercial development in the immediate area.

Surrounding Amenities

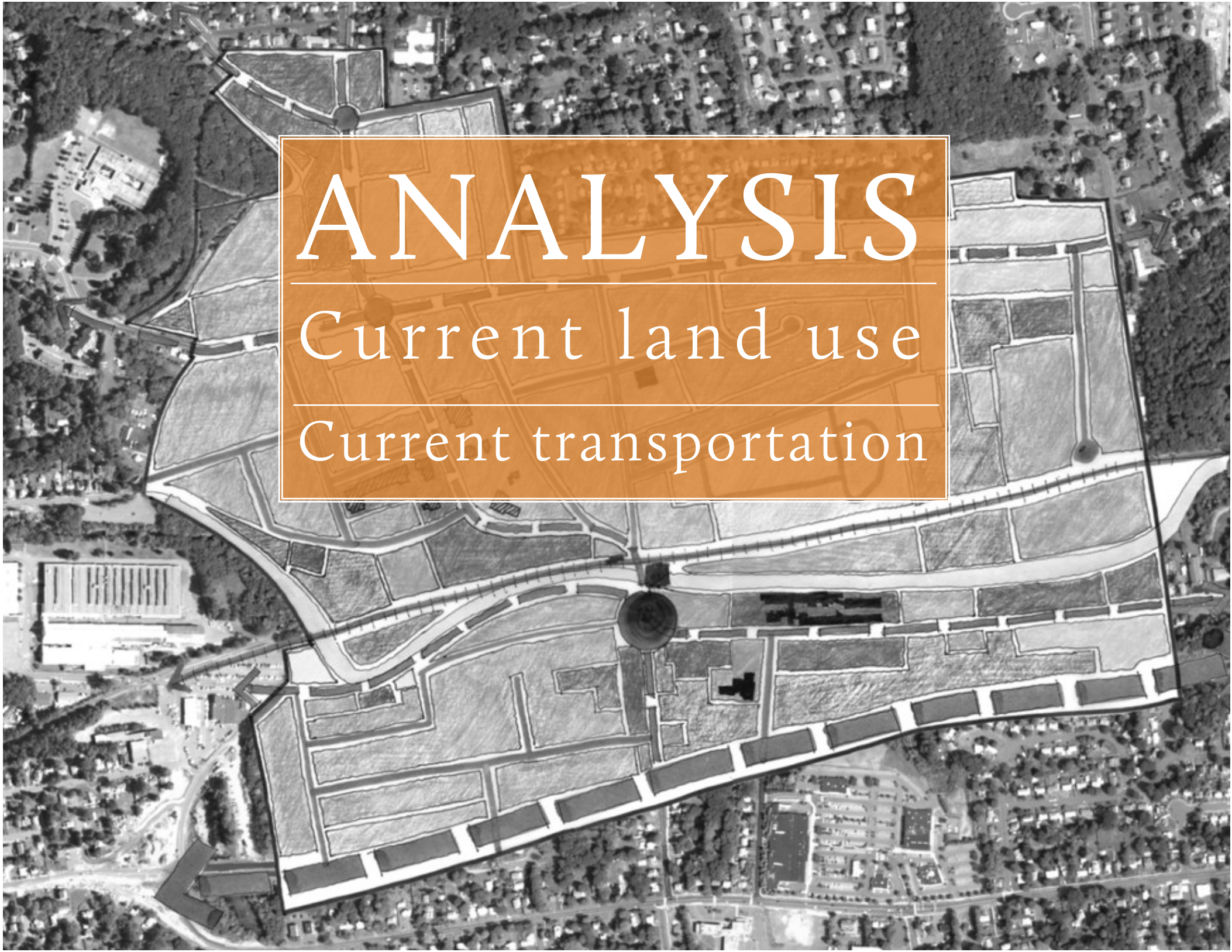
A branch of the Pequabuck River runs directly through the center of the village and is a great asset; however, due to its location adjacent to the intersection it's hardly noticeable. A small park, renovated railroad station, and clock tower lie to the northwest of the intersection. There is also the potential for trail connections

The traffic island and a restaurant in Forestville center.

to be made from this section of the railroad to the neighboring downtown of Plainville, the existing North West Drive bike trail, the future Farmington Canal Heritage Trail, and the expansive yet inaccessible wetlands in Plainville

Surrounding Neighborhoods

Immediately surrounding the village center, there are vibrant neighborhoods within easy walking distance of existing amenities. The housing stock is fairly well maintained and shows a variety of architectural styles.



ANALYSIS

Current land use

Current transportation

Current Land Use

Currently the center of Forestville is a mix of commercial and retail development interrupted by several vacant lots. Many of the buildings are older architectural styles with some newly constructed or rehabilitated buildings mixed in. The lack of cohesive and consistent development is partially due to the persistent flooding the village experiences at regular intervals which is, at times, quite severe. Several businesses have vacated commercial spaces after experiencing flooding damage, leading to the hodge-podge development.

There is little open space preserved in the village, namely a veteran's memorial park along the river, a small green surrounding the clock tower adjacent to the historic train station, and the Forestville Cemetery.

Surrounding the immediate village center, there are several pockets of residential development with a fine array of late nineteenth and early twentieth century architecture. Many of these homes are within a short walk of the village center, and can easily take advantage of any current and future amenities located there.

Residential—High Density

Residential—Medium Density

Residential—Low Density

Vegetation—Tall Trees

Vegetation—Open Field

Non-Residential—High Density

Non-Residential—Low Density

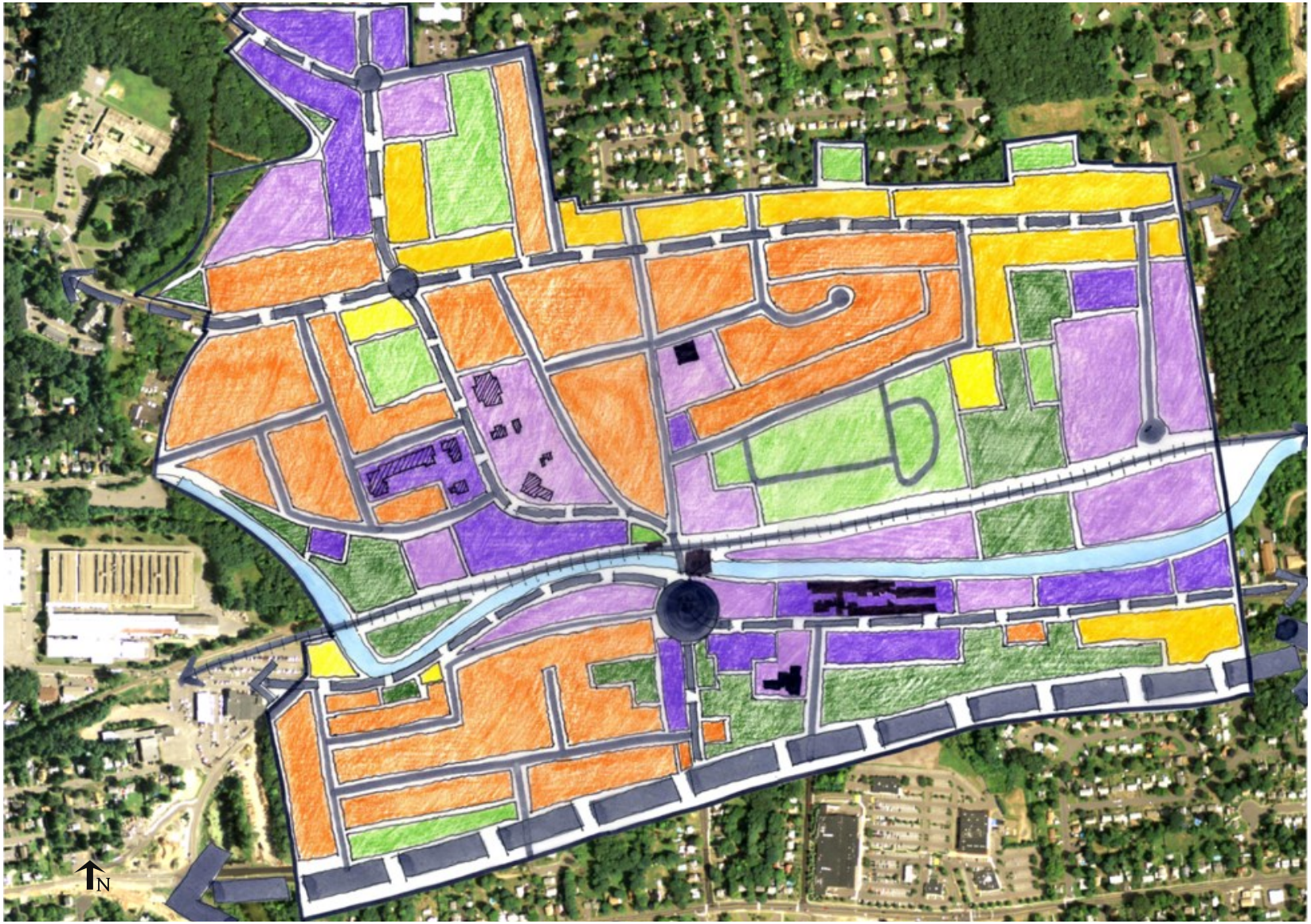
Major Road

Minor Road

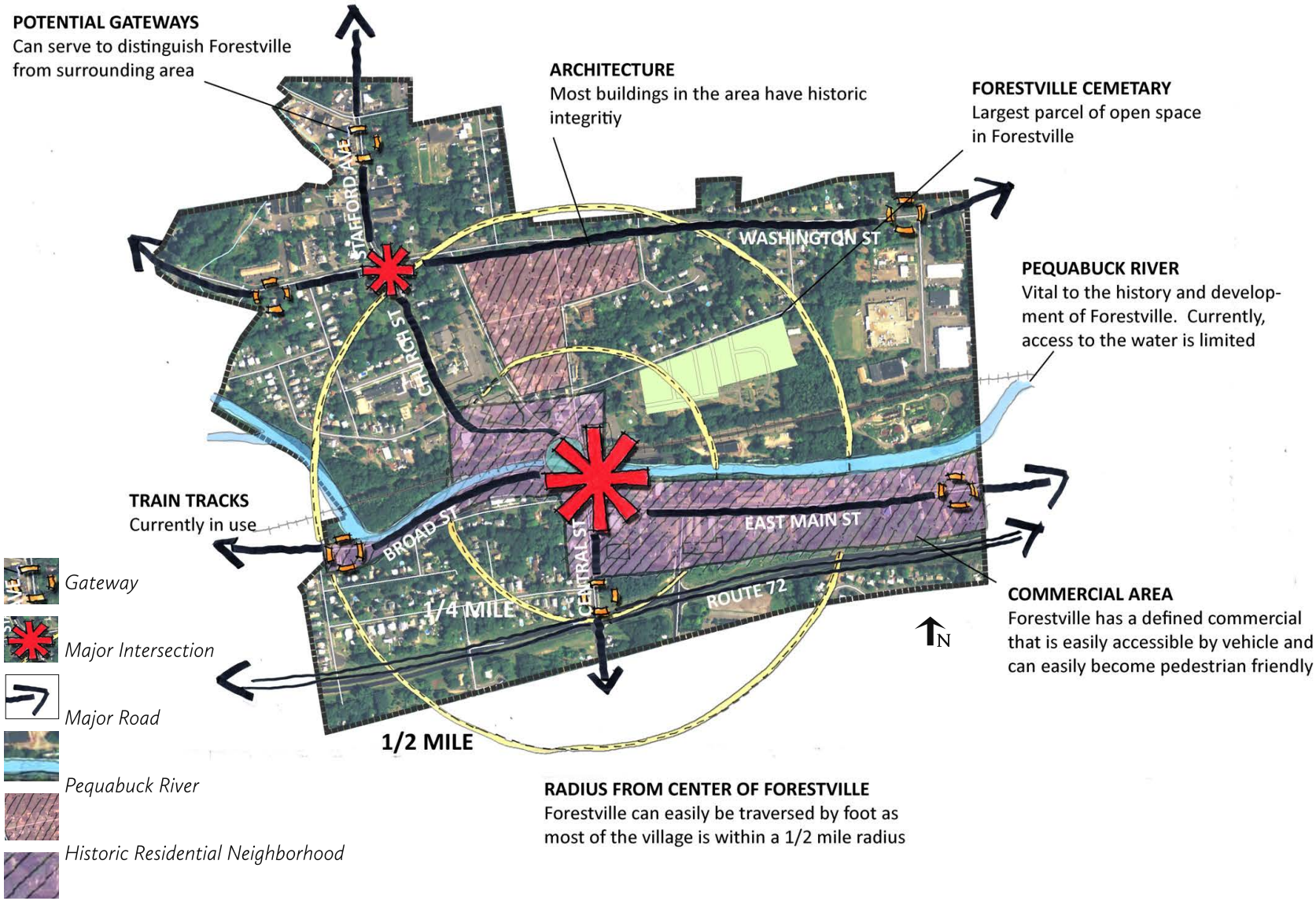
Rail Road

Major Intersection

Building



Current land use in Forestville center.



Site analysis of Forestville center.

Through a comprehensive site analysis, specific factors were identified that help shape the current footprint of Forestville. These factors present opportunities and resources that could be expanded upon to create a vibrant village center. Key points of entry to the village, areas of business and commerce, large blocks of open space and natural resources, and aesthetic characteristics have all be identified.

Open space

Observations

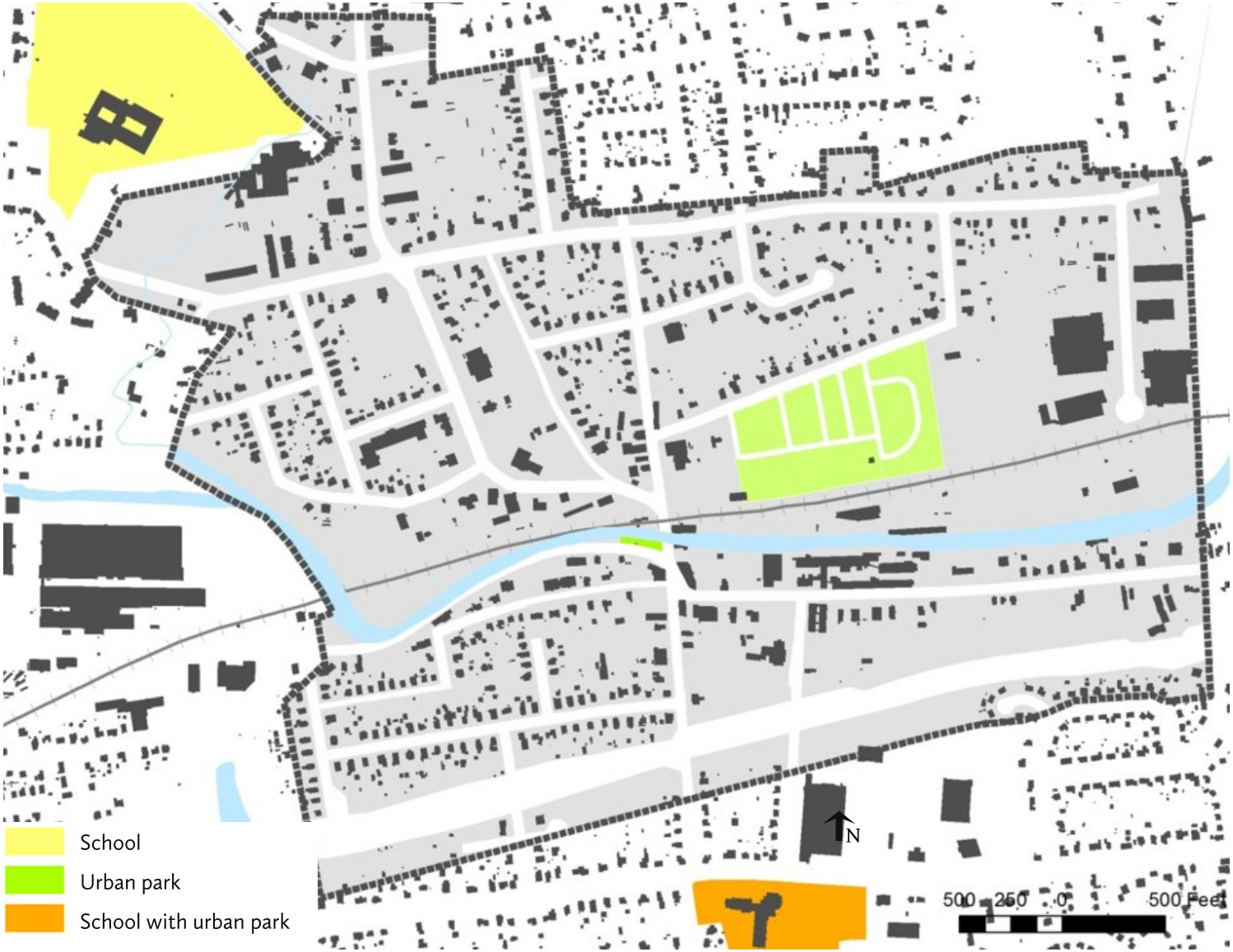
- Currently the only accessible open space in Forestville are the two pocket parks, Quinlan Memorial Park and the Clock Tower Park, and the Forestville Cemetery, a short walk north from the village center.
- The Pequabuck River runs through the heart of the village but goes unnoticed unless there is flooding. It is more often viewed as a hazard rather than a resource.
- The Hubbell and Greene-Hills elementary schools are located just outside the village center and offer recreation space.

Implications

- There is a desire to protect existing open space and find additional space to set aside.
- A river walk or alfresco dining along the waterway would allow residents and visitors to enjoy this valuable resource.

Clock tower park.

The banks of the Pequabuck River.



Open space in Forestville.

Development

Observations

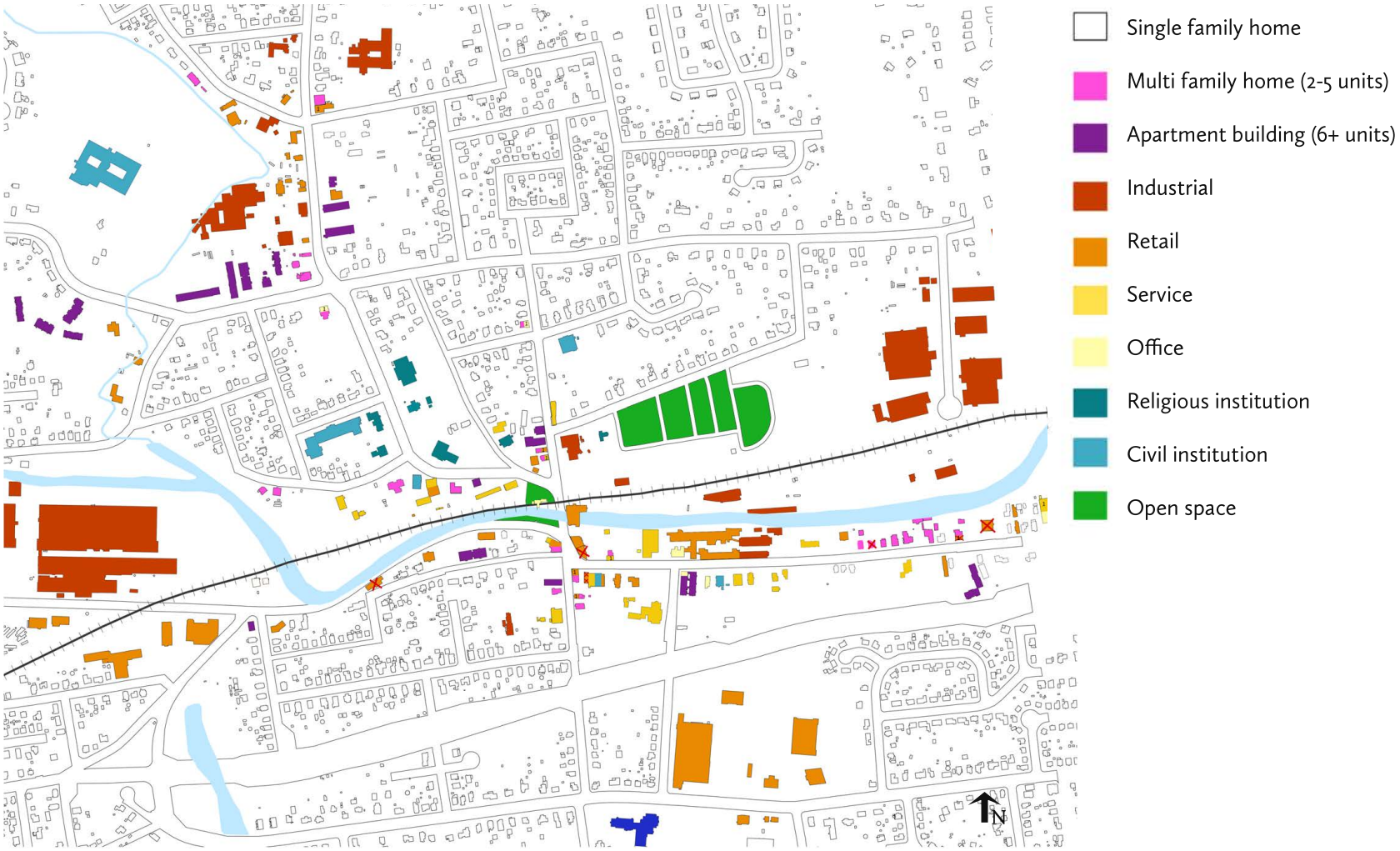
- There are several large industrial buildings surrounding the village center.
- There are significant gaps in the commercial development along East Main Street.
- The housing is predominantly single family.
- There are a number of architectural styles displayed throughout the village, particularly in residential areas.

Implications

- There may be potential for adaptive reuse of vacant buildings.
- There may be potential for infill development.
- Additional housing types may be necessary.
- New development should be done in such a way as to fit in with the existing aesthetics.

A vacant building in Forestville.

There are still undeveloped parcels.



Development in Forestville.

Development continued

Observations

- The center has a defined commercial area with multiple parking lots but a lack of signage makes it difficult for drivers to know how to utilize the parking lots.
- The small scale of the village makes it a walkable place.
- There are many vacant storefronts.
- There are a mix of small businesses in the village center but many are service oriented and don't facilitate the social interactions characteristic of vibrant town centers.

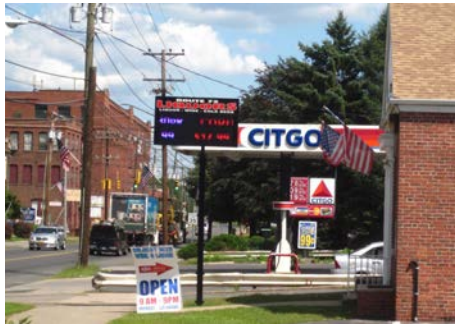
Implications

- The parking lots need better signage in order to direct drivers.
- On street parking would also offer ease of parking for those visiting businesses.
- The establishment of businesses that create space for social connections, such as coffee shops, pubs, restaurants and retail stores, would add to the vibrancy of the village and fill in vacant store fronts.

The central intersection of Forestville.

A stretch of East Main Street.

Current parking in Forestville. Despite numerous commercial parking lots in Forestville, each one is privately owned, making it confusing to visitors. It also forces business patrons to drive to each new location instead of parking and walking to several businesses at once



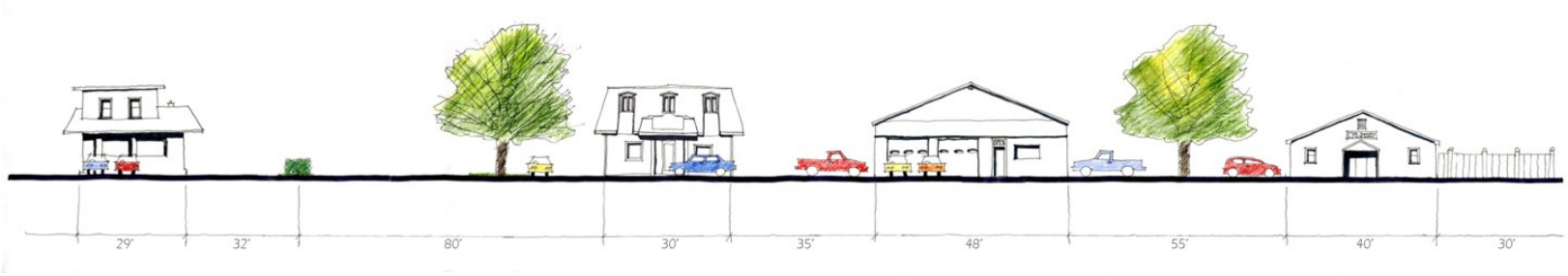
The pedestrian environment.

A business along Broad Street.

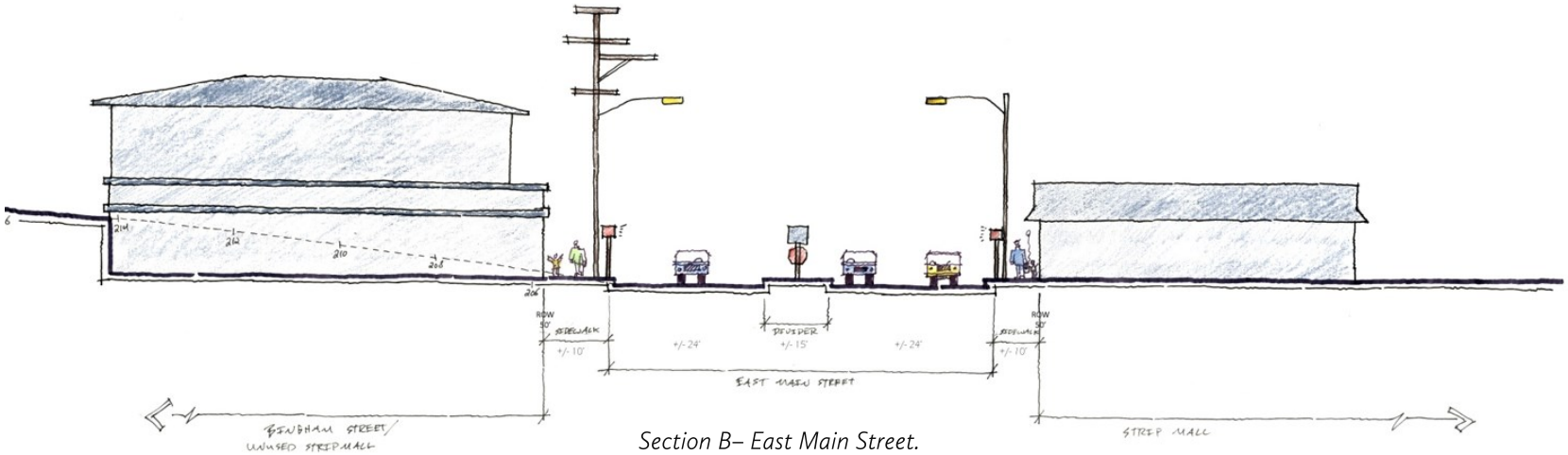
A commercial building on East Main St.

Development continued

Sections of East Main Street and Central Street: Despite the establishment of several newer businesses, there are still many stretches of roadway throughout Forestville that lack continuity in the style and spacing of the buildings.



Section A– East Main Street.



Section B– East Main Street.

Section C– Central Street.

Development continued

Besides the infill development, the most significant change to infrastructure has been the addition of the new route 72, as seen at right. Despite new development along East Main Street, there are still several stretches where vacant properties break up any continuity.

1934

1965

2011

Changes to Forestville's development over time.

Flooding & storm water

Historic flood damage

- The Pequabuck River attracted early manufacturers to the area in the mid 1800's and who used it for power supply and waste disposal.
- Spurred by the clock making industry and railroad access, growth and economic development continued in Forestville up until the flood of 1955.
- The flood wiped out Forestville's bridge and two buildings in its center, and left few village residents unaffected.
- Forestville was transformed by the flood: many businesses moved out and street parking was removed.

Recent flood damage

- Tropical storm Irene dumped up to 8 inches of rain over the course of one day in 2011.
- The Pequabuck River overflowed and turned Forestville's East Main Street into a fast-flowing spillway.
- Many Forestville businesses were severely damaged, causing some to close permanently, including a small machine shop, a computer repair center, and a computer retailer. Other businesses were closed temporarily to repair damage from the flood, like Nuchie's Restaurant, which sustained $77,000 worth of damage.

Looking south across the Pequabuck River along Central Street shortly after Hurricane Irene hit.

A view of the 1955 flood looking south down Central Street. Nuchie's Restaurant now occupies the site of Johnny's Restaurant.

Flooding & storm water cont.

Observation

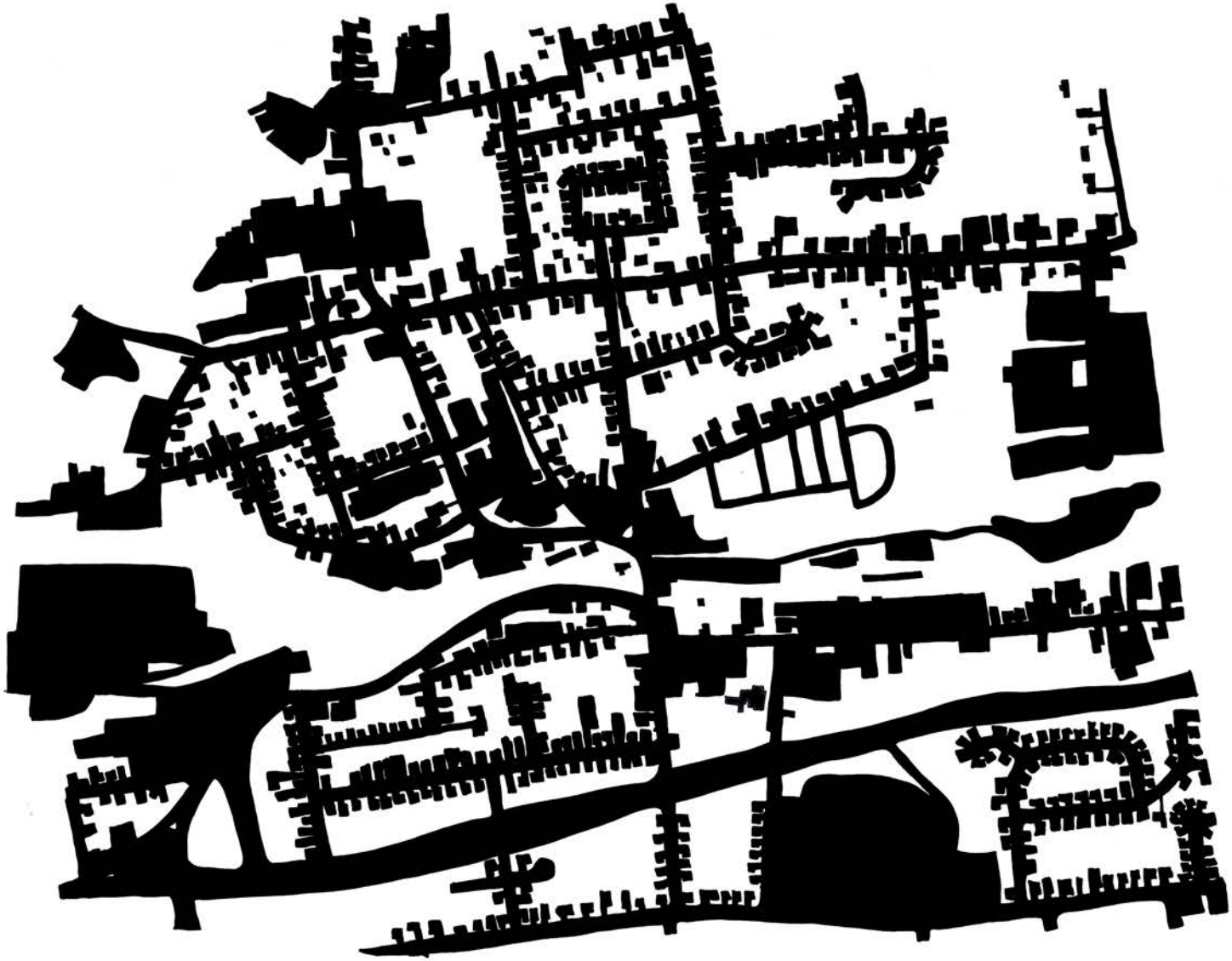
- Development along the river and within the watershed reduces its capacity to handle storm water.

Implications

- The greater extent of impervious surfaces, such as buildings and roads, has reduced infiltration of rain where it falls and increased the amount of storm water that flows quickly to rivers and streams.
- Infill of nearby water bodies has also reduced the amount of water that infiltrates the ground.
- Current development patterns have led to fragmented forests rather than large tracts of forest and open space, which can absorb more storm water.

Exposed stream banks along the Peqaubuck.

Development along the river restricts and concentrates it's flow.



A map of the impervious surfaces in Forestville as of 2010.

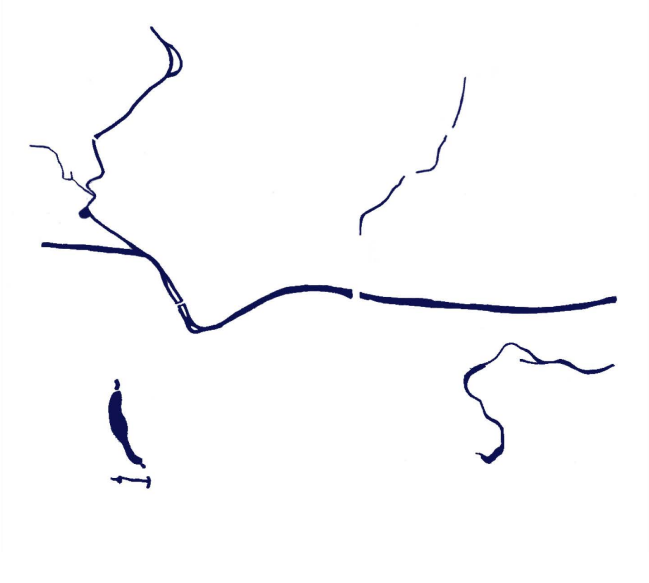
Hydrology

Observation:

- Physical changes to the river have altered the way flooding occurs along the Pequabuck River.

Implications:

- The straightened, or channelized, part of the river in downtown Bristol moves water downstream more quickly to Forestville.
- Fast flowing water has increased riverbank erosion and displaced vegetation along the river.
- The steep, reinforced riverbanks restrict ability of floodwaters to reach floodplains and relieve downstream flooding.
- The disconnection and infill of the Pequabuck River and other natural waterways has reduced the ability of rivers and streams to serve as a natural drainage system for the watershed.

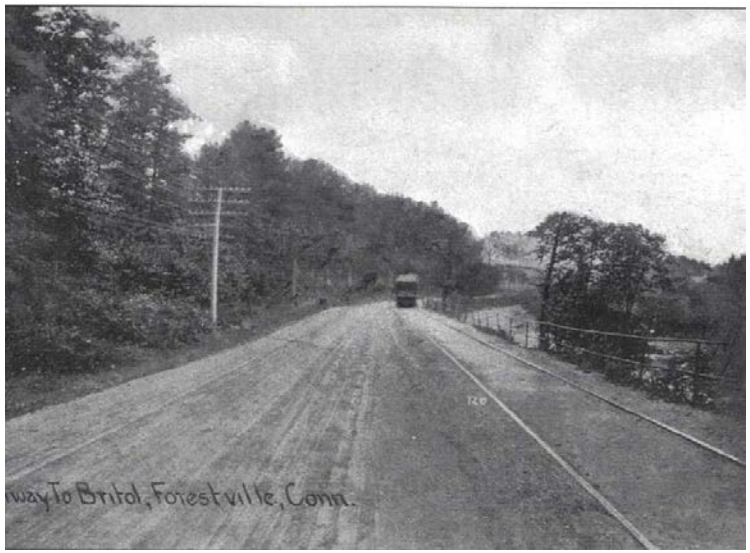


Changes to Forestville's water bodies over time. Many Forestville water bodies, including the Pequabuck River and Coppermine Brook, have been straightened, covered, or filled-in over time.

Aesthetics

Much of the architecture throughout Forestville speaks to its late nineteenth century beginnings. Many residential neighborhoods still have historic homes with large shade trees lining the streets. Several commercial and industrial buildings also bear architectural markings of an earlier era.

New development has not always stayed true to this aesthetic and many of the commercial areas sport a mixture of architectural styles. Going forward, future construction or rehabilitation should take the historic aesthetic into consideration to create a cohesive palette throughout the village.



Broad Street circa 1900 and today.

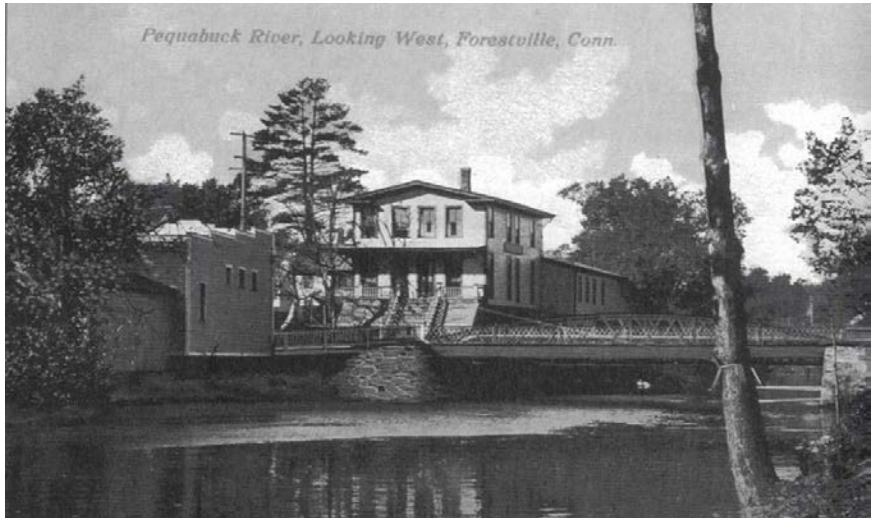
The Forestville train station circa 1970 and today.

The traffic island at center street circa 1900 and today.

A house on Washington Street, circa 1950 and today

The intersection of Central and Washington Streets circa1880 and today.

Looking down Central Street towards Forestville Center circa 1880 and today.



The Forest House, before being destroyed in the 1955 Pequabuck River flood. The Pequabuck River today.

Current Transportation

Improving the transportation infrastructure is a core component of this plan, and the center of Forestville itself revolves around the complex intersection of Central Street and the former Route 72 (currently Broad Street to the west and East Main Street to the east). Historic photographs show a tree once stood in the middle of this intersection, and a police officer use to direct daily traffic there in the 1980's. The existing traffic islands and signal were installed in 1986 by the Bristol Development Authority.

Presently, Forestville Center is designed with the purpose of managing the flow of vehicular traffic, as evident by the wide roadways and traffic islands. Even many land uses cater to vehicles, such as gas stations, car washes, and auto shops. With a dramatic shift in traffic patterns due to the construction of the new Route 72 expressway, there is an opportunity to redesign Forestville center as a pedestrian-oriented village instead of a conduit for vehicle travel.

As discussed in the 'Project Visions and Goals' section, through transportation land use recommendations, the overall goal of this plan is to facilitate a village center atmosphere by emphasizing pedestrian and cyclist amenities, better parking opportunities, and improved signage. Altogether, land use and transportation improvements reinforce one another to create an attractive, walkable, vibrant center. This project is an opportunity to redesign this intersection for a village center and all modes of transportation.

An aerial view of Forestville center.

Walkability: sidewalks

Observations

- Sidewalks are a standard width that can accommodate two pedestrians walking side by side.
- Sidewalks are generally available throughout Forestville, but they are not necessarily ideal or comfortable for walking.
- Most sidewalks do not provide a buffer (such as trees, benches, parked cars) between pedestrians and vehicles.

Implications

- Sidewalks could be wider where appropriate. Existing sidewalks cannot handle a busier village atmosphere with increased pedestrian traffic.
- Creating a buffer between pedestrians and vehicles (such as trees, lights, benches) improves walking experience and can help achieve ancillary goals. Introduction of on-street parking (parked cars acting as a buffer) can create additional parking opportunities.

Sidewalks along Central Street are exposed to busy traffic.

One of the few landscaped buffers between pedestrians and traffic.

Drivers can barely see the crosswalk on the curve of East Main St.

This crosswalk is very faded and located along a sharp curve.

Walkability: crosswalks

Observations

- Crosswalks are standard white bars painted on the road.
- Crosswalks, many of which are faded, are present at three locations, but they are not necessarily safe. They are located along the curve of East Main Street at Central Street, at the intersection of Broad Street and Central Street, and at the intersection of Lincoln Avenue and East Main Street.
- For example, the crosswalk on East Main Street just east of Central Street is dangerous because vehicles tend to drive quickly around the curve.

Implications

- Pedestrian crossings could be improved for safety and connectivity. There is no safe and convenient way to cross East Main Street.
- A more durable marking material, such as inlaid brick or pavers, would create a more visible, durable crosswalk.

Cyclists and trails

Observations

- No dedicated infrastructure exists for cyclists. Cyclists ride on the roadways with vehicles (or sidewalks if they feel safer).
- No connection exists from Forestville to nearby bike trails, such as the Farmington Canal Heritage Trail and East Coast Greenway.
- Many hikers currently use the railroad tracks as a trail which is generally not recommended, but hikers feel safe due to the low frequency and low speed of the trains. Some hikers travel between downtown Bristol to Forestville.

Implications

- There is a demand for trails as evident by pedestrian/hiking use along the railroad tracks.
- A dedicated multi-use trail and/or roadway accommodations for cyclists should be considered to improve cyclist safety and accessibility.

The Farmington Canal Heritage trail runs nearby to Forestville.

The roads in Forestville lack cycling amenities, such as East Main St. Sidewalks are too narrow to accommodate bike and pedestrian traffic concurrently.

Transit: buses and trains

Observations

- Rail is currently used for freight with low frequency.
- Historic passenger train service connected Forestville to major cities such as New York and Boston but service ceased in the late 1960's.
- The Connecticut Department of Transportation is currently studying the feasibility of restoring passenger service through Forestville.
- Bus transit service is currently provided by New Britain Transit, a division of the State's CT Transit system, and connects Forestville to Bristol, Plainville, and New Britain. Two bus routes serve Forestville from 6 am to 6 pm (the BL on weekends, and the PB on weekdays).
- A bus shelter is located at Quinlan Park, with other bus stops along the route. (The current system operates as a flag-down, meaning riders can board anywhere, but this system is changing to a designated stop system.)
- The Connecticut Department of Transportation is expanding service to Forestville when the new CTfastrak Bus Rapid Transit system begins operation in 2015. Some routes will go directly to Hartford.

Implications

- Transit options are currently limited but expanding in the near future with potential new rail and bus connections.
- A pedestrian-friendly village atmosphere can support transit-oriented development, and vice versa.
- With the expanding transit service the existing bus stop may need to be enlarged.
- A new bus stop for the CTfastrak bus may need to be added along Route 72.

Forestville's bus shelter.

ConnDOT is studying the feasibility of restoring passenger train service to Forestville.

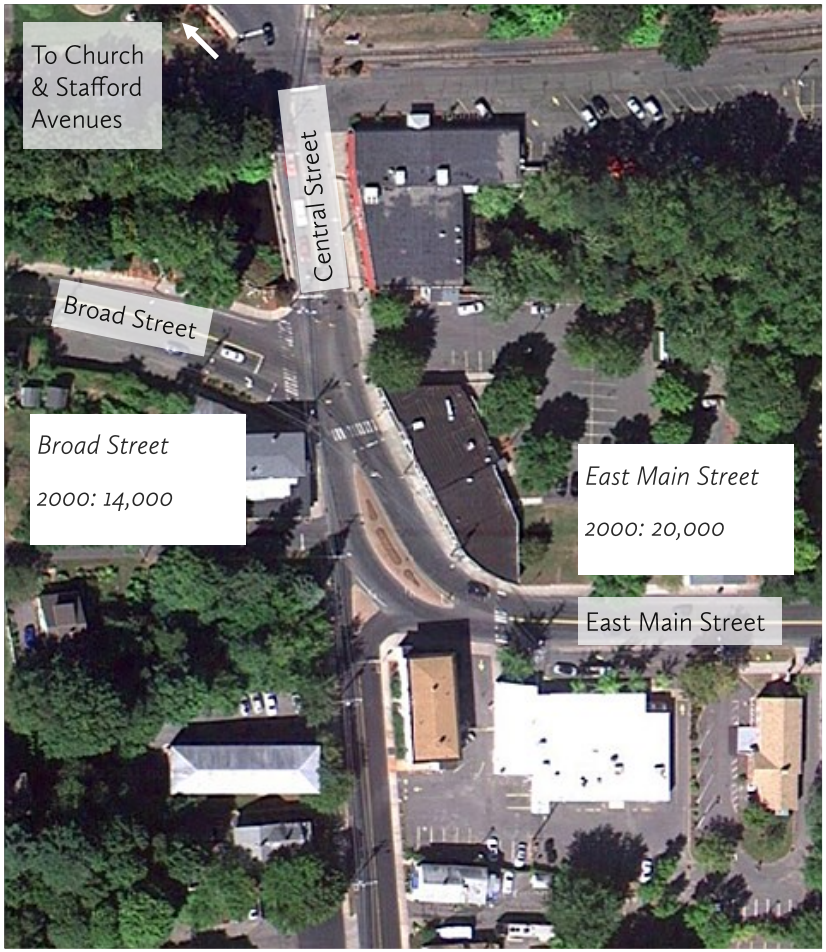
Automobiles: changes in volume & pattern

Observations

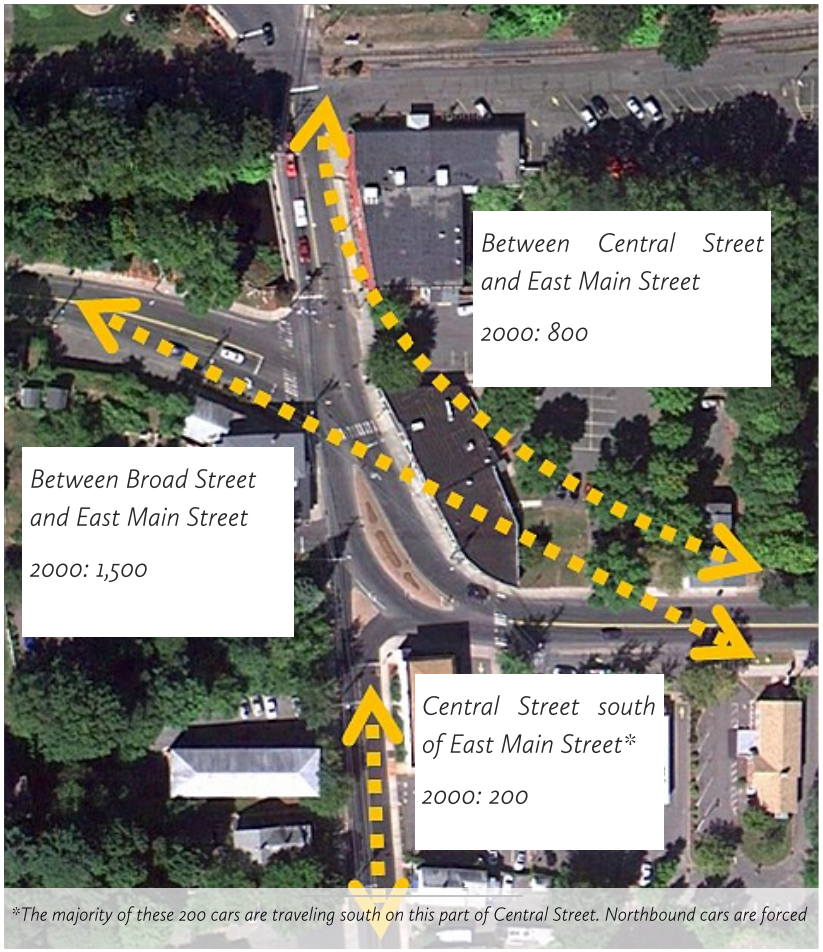
- Since 2010, traffic patterns have drastically changed due to the completion of the new State Route 72 just south of Forestville Center. (East Main Street and Broad Street, formerly part of State Route 72, have returned to being locally owned municipal roads.)
- In 2000, the average daily traffic (ADT) on East Main Street was nearly 20,000 cars per day.
- In 2012, the ADT through Forestville ranges from 6,000 to 11,000 depending on location.
- Prior to 2010, the majority of traffic going through Forestville traveled in the east-west direction, along Broad Street and East Main Street. The 2012 rates are lower because this east-west traffic has shifted to the new Route 72.
- The majority of traffic at the Central Street intersection is now north-south and northbound traffic follows Church Avenue to Stafford Avenue, connecting Route 72 with Route 6 which has 10,000 ADT.
- However, northbound vehicles on the southern portion of Central Street are restricted by the traffic islands at the intersection and are forced to bear right onto East Main Street. Therefore, the majority of the 200 cars traveling at peak times on the southern part of Central Street are southbound.
- While observing the peak traffic period, almost 1 car every 5 minutes performing an unsafe maneuver to get around the traffic islands.
- All other roads throughout Forestville are residential in nature and carry much lower ADT (see Appendix B for more traffic data).

Implications

- Lower traffic volumes create an opportunity to design a more pedestrian-oriented village atmosphere.
- Traffic patterns have shifted, but existing infrastructure does not accommodate the new traffic patterns.
- The traffic islands restrict north-south movement and forces additional vehicle traffic onto East Main Street. For example, motorists from south of Forestville seeking to travel north on Central Street must take Lincoln Avenue and turn left onto East Main Street.
- If the traffic islands were removed and cars could travel freely along the entire length of Central Street additional traffic would shift from East Main Street onto Central Street.



Average daily traffic (ADT), 2000, 2012.



Peak hour traffic, with vehicle travel directions, 2000, 2012.

Automobiles: physical conditions

Observations

- Roads throughout Forestville are generally one-lane in each direction.
- The busiest roads (East Main Street, Broad Street, and Church Avenue) are the widest and include a shoulder. These roads are at a minimum 32' or wider.
- Some roads include a dedicated left turn lane at intersections.
- Side streets, such as Lincoln Ave, are around 30' wide with a narrow shoulder.
- Residential streets are around 20' wide.
- The posted speed limit is 35 mph on East Main Street, 25 mph on Broad Street and near the traffic island, and 30 mph on Church Avenue.
- Actual speeds are higher, around 40-50 mph.

Implications

- While traffic volumes have decreased, East Main Street is still built to handle a higher volume of vehicles.
- Wide roadways with little traffic can encourage speeding.
- The large roads and high vehicle speeds can detract from the desired village-style atmosphere for Forestville.
- Many existing roads could accommodate two travel lanes and a parking lane. On-street parking could reduce vehicle speeds, provide additional parking opportunities and offer a buffer to pedestrians.

Many roads in Forestville are wide enough to accommodate extra lanes, parking, wider shoulders, or bike lanes.

Automobiles: on-street parking

Observations

- On-street parking throughout Forestville Center was largely removed during reconstruction after the flood of 1955.
- Some on-street parking is still permissible, such as on Broad Street by Quinlan Park, on Central Street on the bridge, and on Central Street north of the bridge.
- There is no on-street parking along East Main Street. Although not currently permissible, existing roadway widths (such as East Main Street) can accommodate on-street parking.

Implications

- On-street parking could help foster a village atmosphere by reducing vehicle speeds and act as a buffer between pedestrians and moving traffic.
- On-street parking could alleviate the demand for private parking.

On-street parking is still permitted on some streets.

Before the flood of 1955, on-street parking was permitted in Forestville center.

Automobiles: off-street parking and access

Observations

- Many residents and business owners note that lack of parking is a top concern for Forestville.
- In 1986, agreements between the Bristol Development Authority and private property owners resulted in the construction of two parking lots. These two lots were constructed by the City for general public use for fifteen years (from 1986 to 2001) and are located at the northeast corner of East Main and Central Streets (behind a commercial building) and behind the Post Office.
- These parking lots are now privately owned.
- Without on-street parking or public lots, the majority of parking lots in Forestville are private.
- Each property has its own access driveway.
- Parking signage is lacking which can lead to confusion for visitors.
- Although the agreement with the Bristol Development Authority has expired, some business owners continue to share their parking with other business owners. For example, a restaurant and hair salon continue to share their parking lot without conflict because they are open at different times of day.

Implications

- Lack of parking can negatively affect economic growth.
- Shared parking is an innovative strategy between business owners to maximize parking opportunities.
- Shared parking lots can also reduce the number of private driveways, which can reduce conflict points and improve safety, particularly for pedestrians.
- Lack of on-street parking or public lots limit the parking choices for visitors to Forestville.
- Improved signage could direct visitors to available parking.

Parking areas in Forestville.

FINAL PLAN

Project overview

Physical improvements

Casting a vision

Beyond this plan

Project overview

This master plan is the culmination of the data collection, analysis, public outreach, and traffic modeling performed for the Forestville Project. This plan directly responds to the four objectives drafted in the project's program statement, which are (see pages 10-13 for more information on the project's history and scope):

- The Forestville Project will result in a specific land use plan that will help guide future development.
- The plan will build on the existing Route 72 Corridor Study and will consist of community-based designs that allow for continued growth within the existing village context while protecting natural resources.
- A major focus of the project will be addressing traffic and circulation issues surrounding the intersection of Central Street and East Main Street (the former Route 72).
- Potential for the Bristol Planning Commission to adopt this plan as an amendment to the City's Plan of Conservation and Development.

This plan also seeks to fulfil the project's mission statement, drafted by the stakeholders in the Forestville community:

To create a pedestrian friendly, mixed-use and historically based Forestville Village Center that is accessible and safe for all users.

The Master Plan

To achieve the objectives of the project's objectives and mission, the master plan recommends a number of changes to Forestville's physical environment. Most significantly, the master plan proposes restoring Central Street to a two-way street which will function as the main spine (organizer) for the village. This is accomplished by removing the traffic islands and creating a perpendicular "T" intersection at Central Street and East Main Street. This simple change frees up space for a public plaza, increased parking, wider sidewalks, and other pedestrian amenities.

This plan proposes other changes through out Forestville that will result in the more efficient design of roadways, parking areas, and pedestrian areas. These changes will create a friendlier walking environment, reduce vehicle speeds, and free up land for additional, leasable building square footage.

Existing trees
Proposed grouping of street trees
Proposed street tree
Proposed flowering tree
Seasonal interest flowers/groundcovers
Lawn
Existing structure
Proposed structure
Pedestrian paving
Street/parking lot
Water

Physical improvements

While this master plan includes improvements to traffic and parking, the overarching theme is improving pedestrian safety and comfort. Enhancing the pedestrian environment is critical to creating a vibrant village atmosphere. The presence and interaction of people are the basis for a lively village center, not the vehicles that drive by – particularly when they are 10 to 15 mph over the posted speed limit.

The design recommendations in the master plan improve the village environment in a number of ways. Many of the recommendations include concrete changes that will primarily be initiated by public entities, such as the City of Bristol, while some will occur through private investment or public-private partnerships. These improvements occur in several categories, including:

- Road geometry
- On street parking
- Road and lane widths
- Wayfinding
- Pedestrian improvements
- Shared parking
- Trails

Appendix C: Table of Implementation

An overall view of all physical improvements and the ease of implementation is provided in *Appendix C.* Infrastructures changes to each street, how they will most likely be introduced, and when they could occur are outlined.

Improvements at major intersections

Description

The existing intersection in Forestville Center (where Broad Street and East Main Street meet Central Street) is designed for moving vehicles through Forestville as quickly as possible, particularly in the east-west direction. However, the dominant traffic pattern here is now in the north-south direction. Although crosswalks are present, the area can still feel intimidating for pedestrians.

Recommendations

- Refer to the figures on the following pages for details.
- Remove the traffic islands to restore travel in all directions and simplify turning movements. Install a stop sign on the west-bound lane of East Main Street where it meets Central Street. Remove the current stop sign on the north-bound lane of Central Street where it meets East Main Street.
- Eliminate the curves in the road by expanding the sidewalks and creating two perpendicular "T" Intersections. This change supports the change in traffic patterns and allows for efficient flow of north-south traffic while reclaiming pedestrian space. New crosswalks are also recommended.
- Update the existing traffic signal, which has three traffic phases and one pedestrian phase, to have two traffic phases and one pedestrian phase.
- *Appendix B* includes a technical analysis to demonstrate the feasibility of these concepts and guide future detailed engineering plans.

Beyond the Center

- Studies as appropriate for other major intersections, such as where Stafford Avenue meets Washington Street. (See *Outside Project Scope* section.)

How this supports the village atmosphere

- Restoring the north-south movement provides continuity on Central Street, allowing it to function as a spine/organizing feature for the village center.
- Pedestrian safety is improved by eliminating the curves in the road (which reduces vehicle speeds), decreasing the size of the intersection, and installing new crosswalks.

Implementation: Public

Existing Intersection

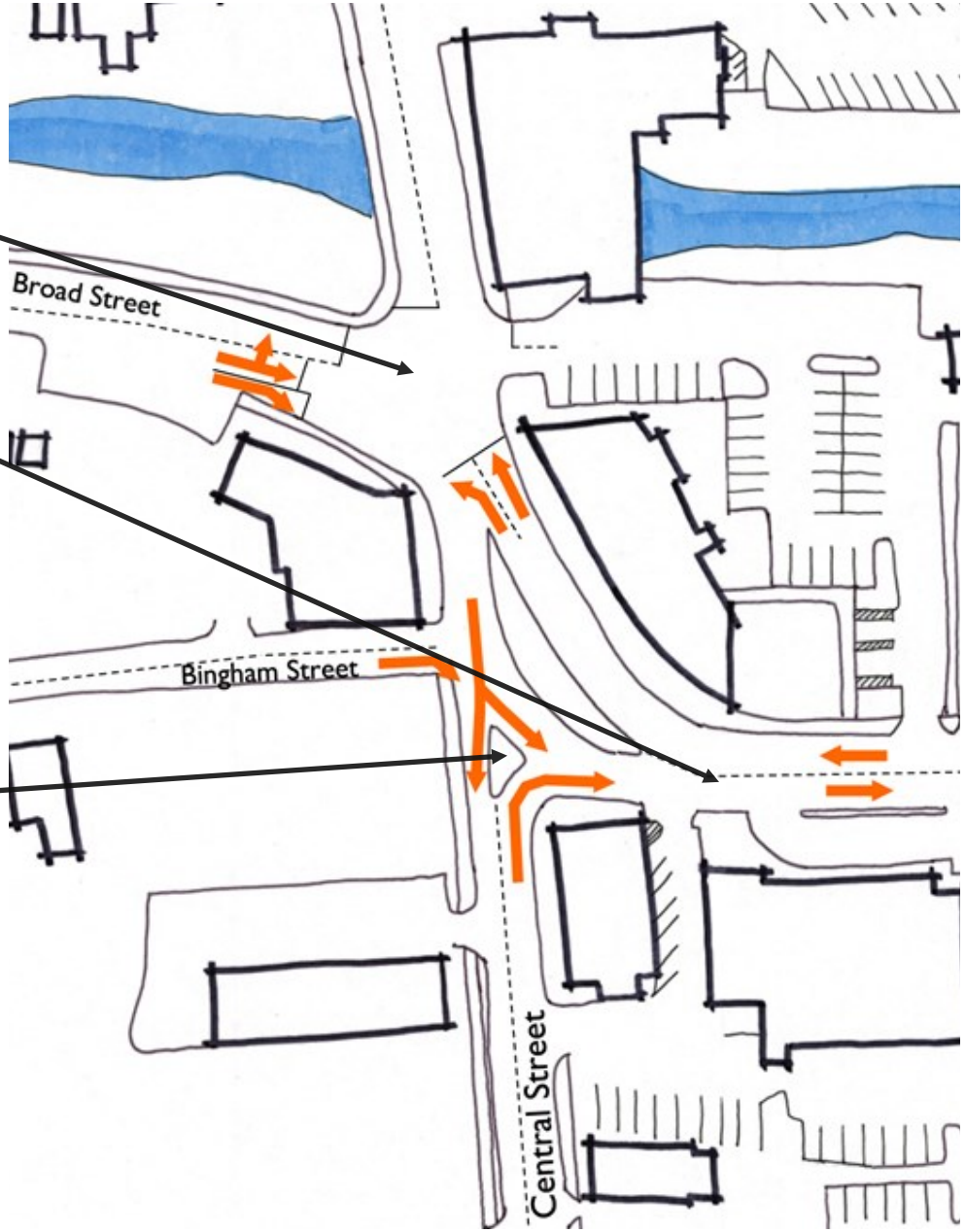
The intersection at Broad Street is unnecessarily wide, creating an uncomfortable pedestrian environment.

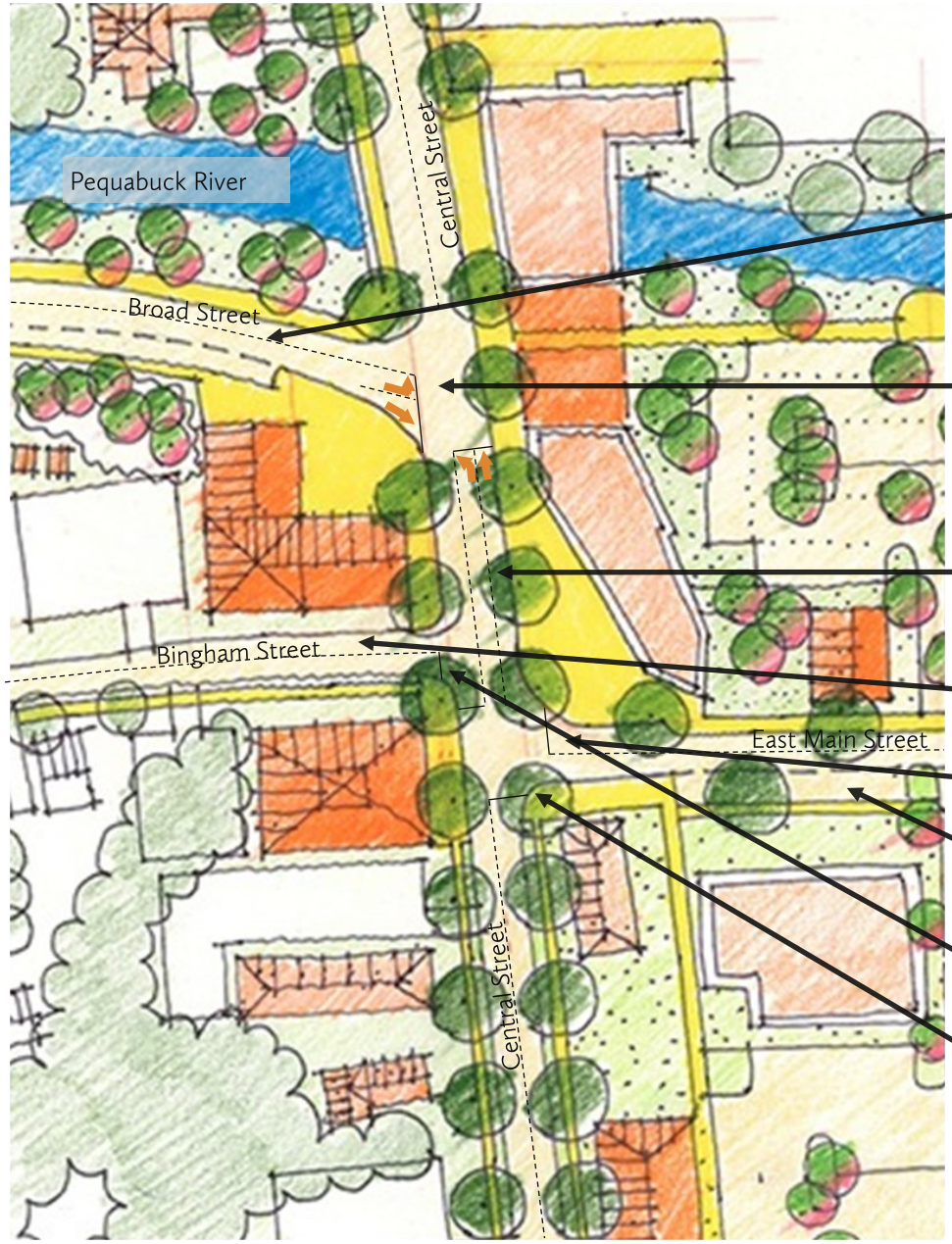
The current crosswalk at East Main Street is dangerous for pedestrians as vehicles accelerate around the turn.

Current traffic islands restrict vehicle movement.

Left turns are not possible from East Main Street onto Central Street.

Traveling north is not possible from the southern section of Central Street.





Redesigned Intersection

Broad St. narrowed and reduced to 2 lanes (1 EB, 1 WB) and on-street parking along the EB lane. Narrower lanes allow for a potential multi -use trail along the river.

Overall size of intersection and length of cross-walks reduced. Signal updated with 2 traffic phases and a pedestrian crossing phase.

1 SB lane, 2 NB lanes. Trucks turning north from East Main St. have room to turn, allowing for a narrower curb radius.

Bingham St. is left as is with right-turn in-and-out only.

Stop sign on East Main St.

East Main St. has 1 WB lane, 1 EB lane and on street parking along the EB lane.

New "To Rt.72" sign directs cars south down Central Street.

6' wide crosswalks added at both intersections.

Improvements at minor intersections

Description

Throughout Forestville, there are opportunities for improvements at smaller intersections to improve pedestrian safety. Two common design elements, bulb-outs and tight curb radiuses are described on the facing page.

Recommendations

- At Central Street and Church Street, expand existing bulb-out to further reduce the size of the intersection.
- At Lincoln Avenue and East Main Street, replace the traffic signal with a stop sign and add a bulb-out to reduce the size of the intersection and frame the proposed on-street parking.

Beyond the Center

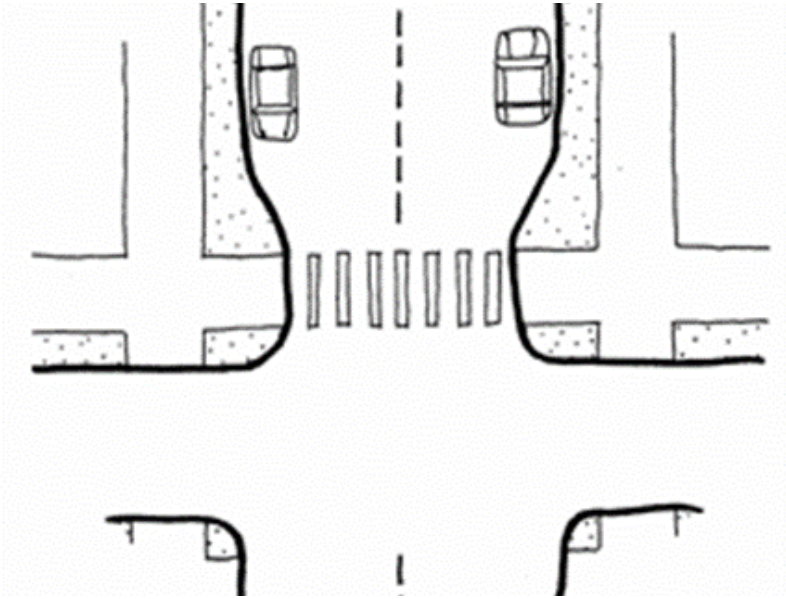
- Identify intersections where perpendicular intersections, sidewalk extensions, or bulb-outs could be installed to reduce vehicle speeds and improve pedestrian crossings.
- See "Outside Project Scope " section for further details.

How this supports the village atmosphere:

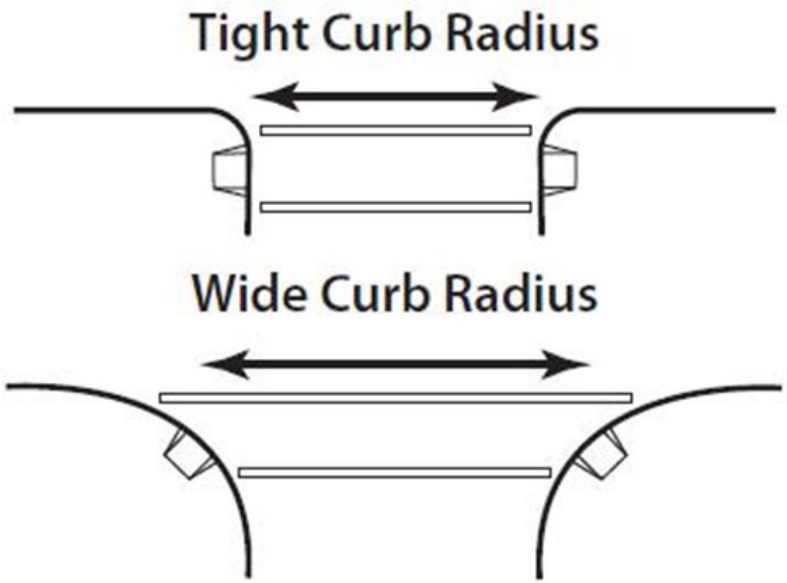
- Reduces vehicle speeds.
- Improves pedestrian crossings.

Implementation: Public

The intersection of Church Avenue and Central Street in 2010 before (above) and after (below) the bulb-out installed by ConnDOT as part of a railroad crossing safety project.



Bulb-outs increase safety by making pedestrians more visible and decreasing the crossing length. They also narrow the travel lanes and provide a visual cue to drivers to slow down.



A tighter curb radius shortens crosswalks and encourages vehicles to slow down, increasing pedestrian safety.

Road and lane widths

Description

The overall size of roads and width of travel lanes have an impact on vehicle speeds and pedestrian safety. Wider roads and lanes encourage higher vehicle speeds and require more time for a pedestrian to cross the street.

Many roads throughout Forestville are at least 30' wide with 15' travel lanes and a narrow shoulder. Such design standards may have been used in the past because these roads once handled larger traffic volumes or because on-street parking was permitted. However, with less traffic and no on street parking, the 15' travel lanes can feel wide open to motorists who feel safe driving at higher speeds – resulting in many cars above the speed limit.

Recommendations

- Narrowing the physical road width (e.g.; with sidewalk extensions or bulb-outs) is recommended for most intersections, in particular where Central Street meets East Main and Broad Street.
- Narrowing the lane width (e.g.; with on-street parking, shoulders, or bike lanes where appropriate) is recommended for Broad Street, Central Street, Church Avenue, East Main Street, and Lincoln Street.

Beyond the Center

- A variety of options such as on-street parking, bike lanes, and sidewalk extensions are possible and further discussed in the "Outside Project Scope" section.

How this support the village atmosphere:

- Reduces vehicle speeds.
- Improves pedestrian safety.
- Reduces street crossing distance for pedestrians.
- Potential for on-street parking.

Implementation: Public

Narrower lanes would provide a number of benefits.

On-street and shared parking

Description

Residents, visitors, and business owners identify insufficient parking as a top concern, particularly since on-street parking was removed when Forestville was reconstructed after the flood of 1955. This Master Plan proposes restoring on-street parking and shared parking.

On-street parking

Currently, on-street parking is readily utilized on Central Street north of Church Avenue. Additionally, parking is permitted on Broad Street (by Quinlan Park) and Central Street (on the bridge), but these spots are seldom used.

On-street parking is readily feasible and implementable given existing roadway widths. Many roads are at least 30' which can be re-striped to provide two 11' travel lanes and one 8' parking lane.

Recommendations

On-street parking is recommended for:

- East Main Street.
- Broad Street.
- Lincoln Avenue.

On street parking is not recommended for Church Avenue and the southern portion of Central Street, pending road widening, due to the desire to maintain these roads as a north-south corridor. (Though other enhancements are recommended in this report.)

Beyond the Center

- East Main Street could accommodate on-street parking on one side along its entire length, or on both sides with minor road widening.
- Broad Street, beyond Quinlan Park to the west, is not recommended for on-street parking due to the curve in the road.

How this supports the village atmosphere

- More parking, that is easily accessible and convenient.
- Reduces vehicle speeds.
- Buffer pedestrians from cars.

Implementation: Public

Many roads are wide enough to also accommodate on-street parking.

On-street and shared parking cont.

Shared Parking

Shared parking is not new to Forestville. In 1986, private property owners and the City of Bristol agreed to construct two parking lots for general public use with public funds. Although these agreements expired in 2001, property owners continued to work together with informal agreements to share parking. On-street parking, as previously discussed, can also be viewed as a form of shared parking.

Shared parking is effective because:

- Businesses are open at different times of day. For example, an office open during weekdays is typically closed when restaurants are open during the evening and weekends.
- With reduced parking space requirements, the reduced demand in land for parking means space can be allocated for trees (to provide shaded parking) or flood mitigation (to minimize flood impacts).

Recommendations

- Shared parking among property owners, particularly for the businesses located at the intersection of East Main Street and Central Street. Detailed maps are shown on pages X-X.

Beyond the Center

- Shared parking between property owners is recommended where feasible.

How this supports the village atmosphere

- More parking, that is easily accessible and convenient.
- Fewer driveways reduces the number of conflict points.
- Overall reduction in traffic by encouraging people to park and visit multiple businesses, rather than drive between places.

Implementation: Public and Private

With reduced parking space requirements, land is available to enhance parking lots , such as this parking lot with shade trees.

Typical parking lots are expanses of asphalt.

Trails and cyclist improvements

Description

During the public workshops, many Forestville residents sought improvements for cyclists—one idea that stood out is a trail system along the Pequabuck River. Many currently walk along the railroad tracks.

Recommendations

- A short pedestrian trail and river overlook.
- Sharrows are recommended for all streets to alert drivers.
- Although some roads are wide enough, bike lanes are not recommended until a city-wide bike study is completed to ensure integration with a wider network of lanes.

Beyond the Center

- A broader city-wide or region-wide bike network study to determine appropriate places for bike lanes and multi-use trail.
- Explore the idea of a potential multi-use trail along the Pequabuck River connecting downtown Bristol, Forestville, and downtown Plainville. The future Farmington Canal Heritage Trail, a popular trail, is expected through downtown Plainville.
- Signage is recommended to alert drivers that bikes have right of way in roads.

How this supports the village atmosphere

- Reduces vehicle speeds.
- Provides access to Pequabuck River.
- Improves cyclist safety.

Implementation: Public and Private

A multi-use trail is desired and one could potentially be designed to follow the Pequabuck River.

Sharrows indicate to drivers that cyclists may be present and that the road must be shared with them.

A bike lane provides a separate and dedicated space within the road for cyclists.

Creating a welcoming street for pedestrians

Description

A major goal of this plan is to create a comfortable environment for pedestrians. Numerous elements work together to create a cohesive atmosphere and aesthetic throughout the village.

Recommendations

- Street trees , to provide shade.
- Street furniture, such as benches, to provide places for social gathering.
- Lighting, to provide safety and activity throughout the day.
- Sidewalk extensions and bulb-outs, to reduce crossing distance and increase visibility.

Beyond the Center

- Continue above elements where applicable on Church Avenue and on the northern section of Central Street to the library.
- For East Main Street east of Lincoln Avenue introduce crosswalks and sidewalk extensions because there are few intersections that allow for crossing the street.
- For portions of Broad Street without parking, narrow the lane width with bike lanes or narrow the road width and implement a multi-use trail along the river.

How this supports the village atmosphere

- Increases pedestrian comfort and safety by acting as a buffer from cars.
- Helps create an identity and consistent aesthetic.
- Creates a comfortable environment for all users.

Implementation: Public

The existing sidewalk environment on Lincoln Street is bare but could accommodate many improvements.

Streetscapes with trees, lighting, and street furniture foster a village atmosphere setting that is attractive and comfortable for pedestrians.

Wayfinding

Description

Updated and improved wayfinding and signage will help people navigate Forestville Center. There are four types of signs: identification, directional, orientation, and regulatory.

Recommendations

- Identification signs for major off-street parking lots.
- Directional and orientation signs for visitors and pedestrians identifying open space, the library, and the Pequabuck River.
- Directional signs for motorists identifying the new Route 72. (Sign would indicate to motorists traveling south on Church Ave. that the fastest way to Route 72 is via Central St.)

Beyond the Center

- Identification signs (e.g., "Welcome to Forestville") are recommended on streets approaching the village center—such as Broad St., Church Ave., East Main St., and Central St.
- Regulatory Signs (e.g., "Yield to Pedestrians") are recommended in conjunction with the Identification Signs.

How this supports the village atmosphere

- Provides easily accessible and understandable information to get around Forestville.

Implementation: Public

Identification signs

- *Visual markers that display name and function of place or space*
- *Indicate entrances and exits to primary and secondary destinations*
- *Provide first impression*

Directional signs

- *Provide necessary cues to keep users on the move*
- *Graphically routes pedestrian or vehicular traffic between main entrances, key decision points and destinations*
- *Design should harmonize with*

Orientation signs

- *Offer overview of surroundings inform of map and directories*
- *Typically display location with a "you are here" indicator*
- *Usually free standing units that are readily visible*

Regulatory signs

- *Describe do's and don'ts of a place*
- *Communicate instructions immediately*
- *Should be unobtrusive and enhance the experience of a place*

Casting a vision

Once the infrastructure improvements have begun to be implemented in Forestville Center, the vision presented in the Master Plan can begin to be realized. The details in this section lay out the overall vision of a vibrant Forestville village.

Master Plan: Detailed Areas of Study

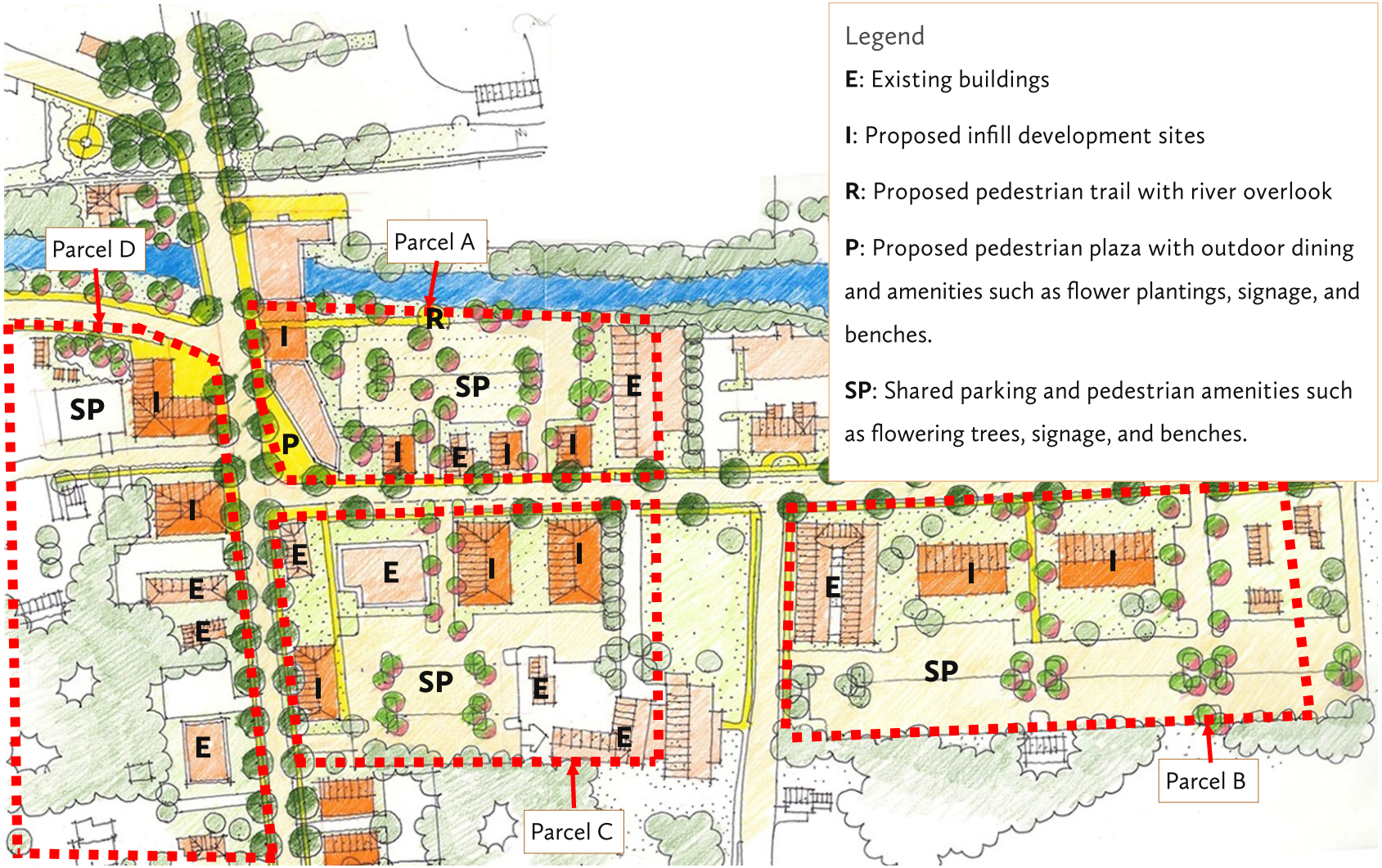
In order to understand the details of the master plan, the project area has been broken up into **four parcel areas** (see the map on the facing page):

- Parcel A: 2+ acres
- Parcel B: 3+ acres
- Parcel C: 3+acres
- Parcel D: 4+ acres

Within this area, the major roadways are East Main Street, Central Street, Broad Street and Church Ave.

In the north/south direction, the core project area runs the length of Central Street from the intersection with Church Avenue to the intersection with the new Route 72.

In the east/west direction it runs along East Main Street from the factory complex to a couple hundred feet west of Central Street.



Map showing the detailed areas of study

Study objectives

As mentioned in the program statement, improving traffic circulation is a major goal of this project. Many of the goals of this project can be achieved by designing complete streets.

> *The streets of our cities and towns are an important part of the livability of our communities. They ought to be for everyone, whether young or old, motorist or bicyclist, walker or wheelchair user, bus rider or shopkeeper. But too many of our streets are designed only for speeding cars, or worse, creeping traffic jams.*
>
> *Now, in communities across the country, a movement is growing to complete the streets. States, cities and towns are asking their planners and engineers to build road networks that are safer, more livable, and welcoming to everyone.*
>
> *Instituting a Complete Streets policy ensures that transportation planners and engineers consistently design and operate the entire roadway with all users in mind – including bicyclists, public transportation vehicles and riders, and pedestrians of all ages and abilities.*

-National Complete Streets Coalition

With the above statement in mind, here are our **five fundamental objectives** for this study (which correspond to areas on the map on the facing page):

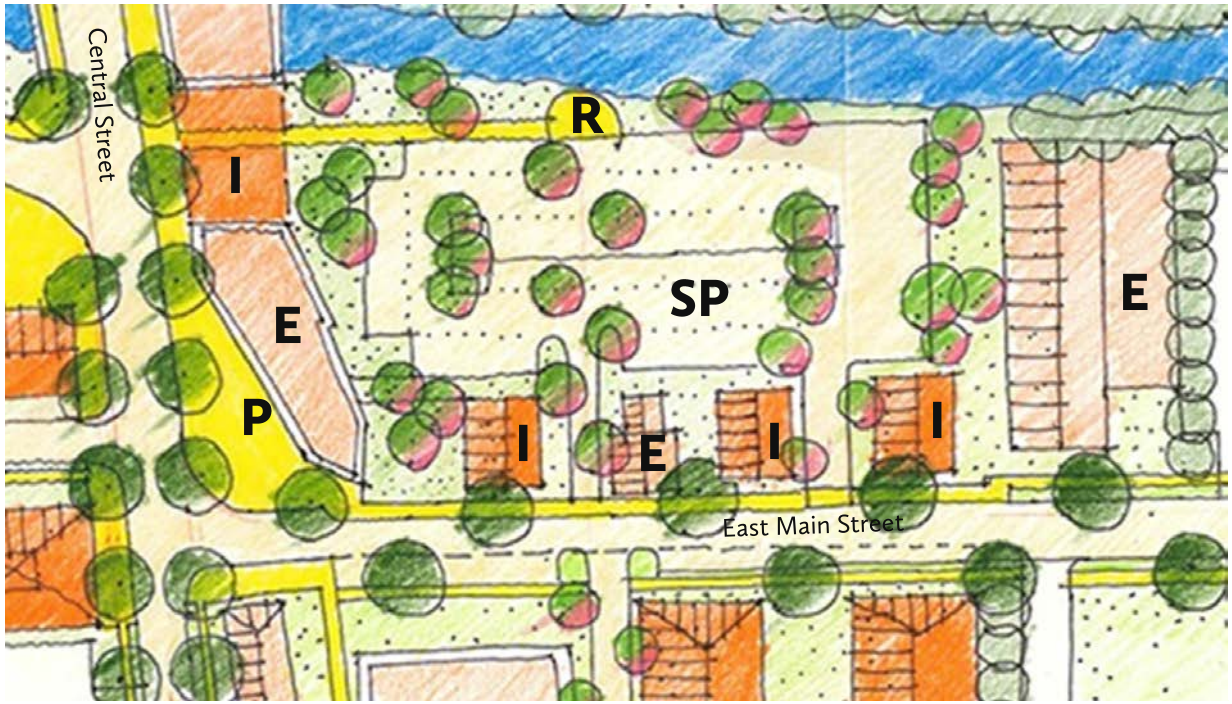
1. Slow down traffic cutting through the center (Broad/Central & East Main) by introducing perpendicular intersections.
2. Create a logical pattern for vehicular circulation (Central Street is a two way street).
3. Make Central Street a “Complete Street”.
4. Increase number of parking spaces.
5. Provide potential for additional leasable space.

Map showing how the objectives of this study relate to each project sub area.

Master plan—parcel A

Existing conditions

The primary challenge in this area are the traffic islands and the large curve, which limits visibility and creates a precarious environment for pedestrians crossing the street. There is no on street parking and the large parking lot on the north side of East Main Street is not designed to accommodate the maximum number of cars that the space could allow for. There are also several vacant parcels which break up the flow of development along the street.



E: Existing buildings

I: Proposed infill development sites

R: Proposed pedestrian trail with river overlook

P: Proposed pedestrian plaza with outdoor dining and amenities such as flower plantings, signage, and benches.

SP: Shared parking and pedestrian amenities such as flowering trees, signage, and benches.

Proposed plan

By creating a perpendicular intersection at Central Street and East Main Street, the sidewalk area is greatly increased creating a welcoming environment for pedestrians. The parking lot on the north side of East Main Street has been redesigned to accommodate more parking spaces and improve traffic flow. On street parking has been implemented on the south side of East Main Street.

Infill development has occurred, creating a consistent presence of buildings along the street. Uniform street trees have been planted along Central Street and East Main Street to slow vehicles and provide a buffer for pedestrians. A river walk trail has also been added allowing the Pequabuck to have more of presence in the village center.

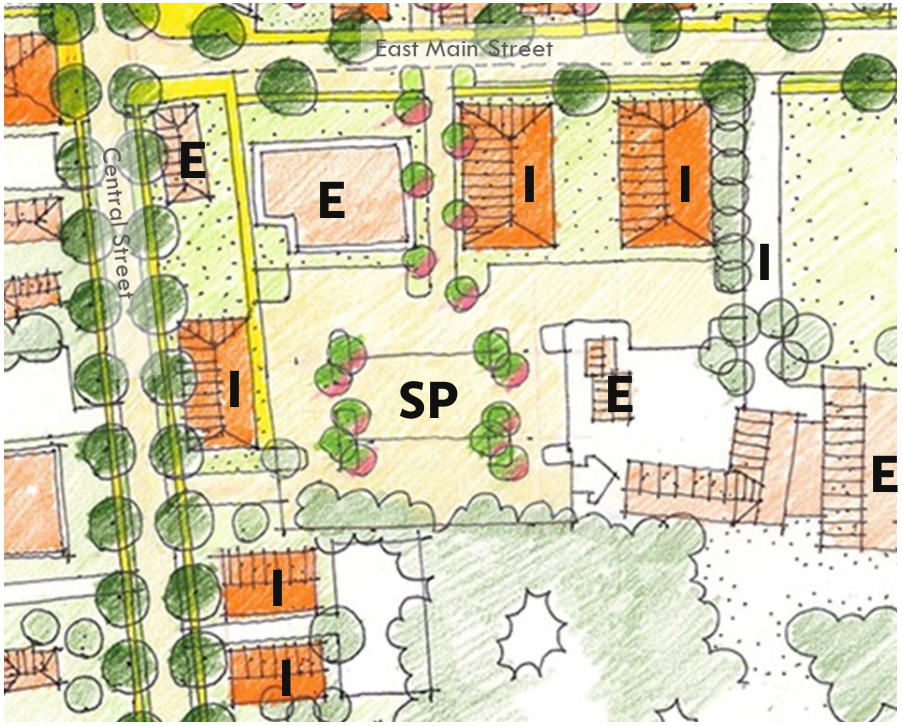
Master plan—parcel B

Existing conditions

This portion of the village is dominated by fast moving traffic on East Main Street and Central Street, poorly organized off street parking in lots to the south and several areas that could accommodate infill development.

Proposed plan

East Main Street can now accommodate on street parking on the south side, and uniform street trees and wider sidewalks have been added along both streets. The parking lots have been redesigned to allow for additional parking spaces, shade trees and other pedestrian amenities. The circulation for drivers, visitors seeking parking, and those on foot has been greatly improved creating a vibrant area that anchors this corner of the village center.



E: Existing buildings

I: Proposed infill development sites

R: Proposed pedestrian trail with river overlook

P: Proposed pedestrian plaza with outdoor dining and amenities such as flower plantings, signage, and benches.

SP: Shared parking and pedestrian amenities such as flowering trees, signage, and benches.

Master plan—parcel C

Existing conditions

This portion of Central Street is a key transition point for motorists coming off of Route 72 and attempting to travel north towards Stafford Avenue. Currently the traffic islands inhibit that and force north-bound drivers to bear east on East Main Street. A wide, open expanse of road allows drivers from Route 72 to continue traveling at high speeds as they enter the village. There are large gaps in the flow of development along the street and limited parking for those businesses at the corner of Central Street and Broad Street.

Proposed plan

The introduction of regularly-planted street trees cues drivers that they are entering a developed area and helps to reduce their speeds while also providing a buffer for the sidewalk. Through infill development, a regular rhythm of buildings now guide visitors down Central Street, along with uniform street trees. Drivers can find street parking along Broad Street and in small parking lots along side of businesses.

E: Existing buildings

I: Proposed infill development sites

R: Proposed pedestrian trail with river overlook

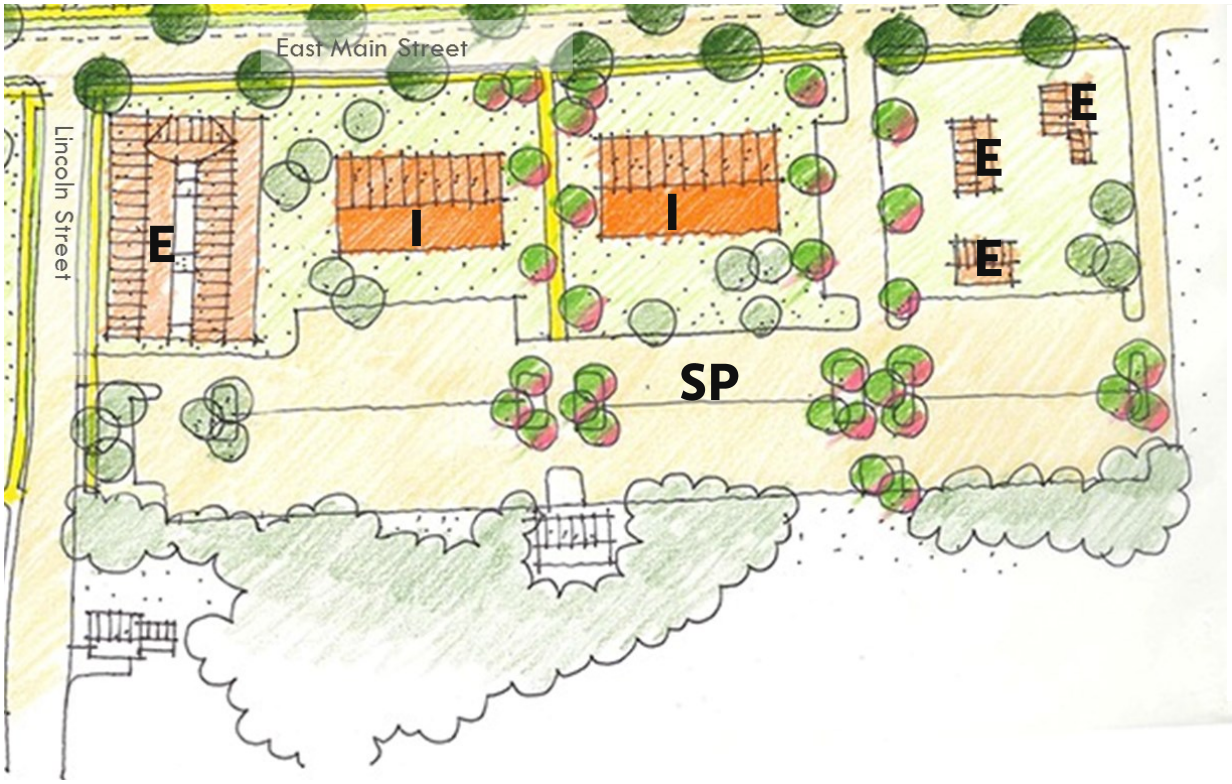
P: Proposed pedestrian plaza with outdoor dining and amenities such as flower plantings, signage, and benches.

SP: Shared parking and pedestrian amenities such as flowering trees, signage, and benches.

Master plan—parcel D

Existing conditions

This eastern section of East Main Street currently has disconnected parking lots behind businesses, several small buildings housing offices and residences, and a sparse landscape. Westbound traffic coming from the Route 72 expressway easily continues at a high speed with little to physically or visually slow them down.



E: Existing buildings

I: Proposed infill development sites

R: Proposed pedestrian trail with river overlook

P: Proposed pedestrian plaza with outdoor dining and amenities such as flower plantings, signage, and benches.

SP: Shared parking and pedestrian amenities such as flowering trees, signage, and benches.

Proposed plan

Several new, large buildings replace the smaller buildings, creating a more consistent flow of development along the street and reducing the number of curb cuts. Shared parking has been introduced behind these buildings and allows for visitors, both driving and walking, to easily move throughout the space. Alternating street trees and on street parking on the south side of East Main Street provide a buffer to pedestrians and slow down speeding drivers.

Master plan—road sections

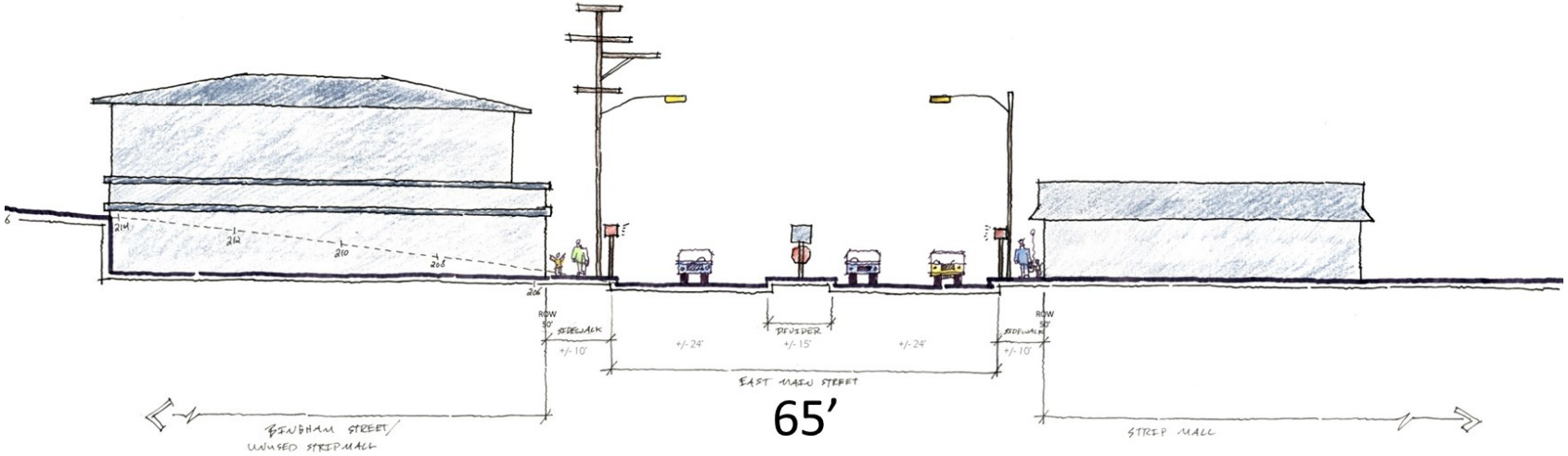
Section drawings along specific streets in Forestville help illustrate physical changes to the built environment. They allow the reader to visualize how the newly designed space would function and feel. On the following pages are before and after sections along three main routes in Forestville: Broad Street, East Main Street and Central Street.

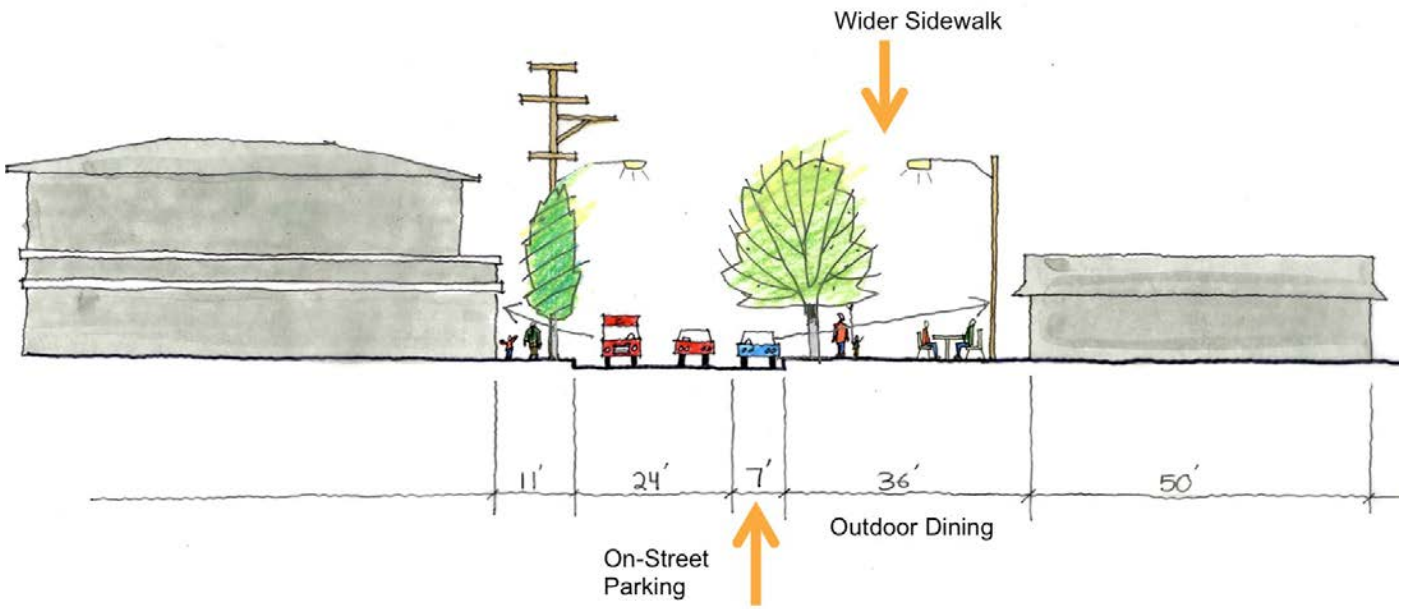
Church Ave
Central Street
Broad Street
Bingham Street
East Main Street
Central Street
Kenney Street
Route 72
A
A
B
B
C
C
North
Not to scale

Master plan—road sections @ Central Street (A-A)

The **existing cross section** shows a dimension of 65' for the road width. The sidewalks range in width from about 7' to around 10'. Few pedestrian amenities exist, such as tree planting, benches and wayfinding signage.

The **proposed cross section** shows a dimension of 31' for the road width. The 31' includes two travel lanes and on-street parking in some areas. The proposed sidewalks are a minimum of 11' along with plaza areas with a width in excess of 35'. The wider sidewalks and plazas allow for pedestrian amenities such as tree planting, benches and wayfinding signage.

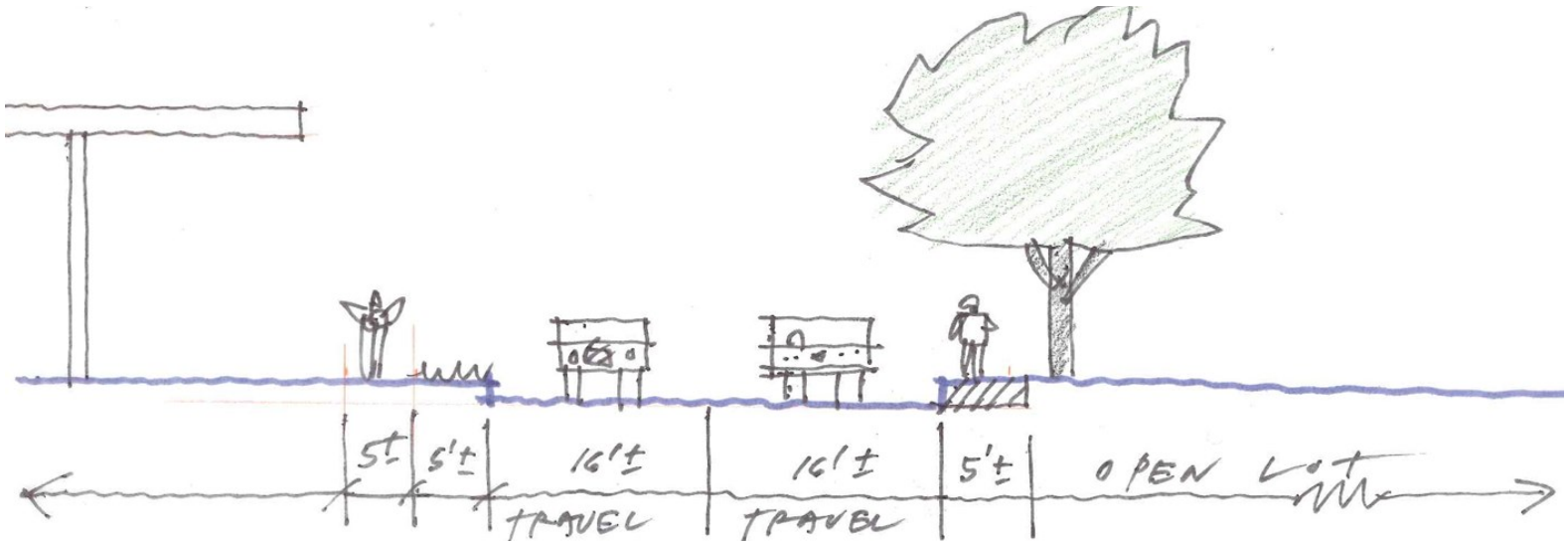

ROW 50'
SIDEWALK
+/-10'
+/-24'
DIVIDER
+/-15'
+/-24'
SIDEWALK
+/-10'
ROW 50'
EAST MAIN STREET
65'
BINGHAM STREET/
UNUSED STRIP MALL
STRIP MALL

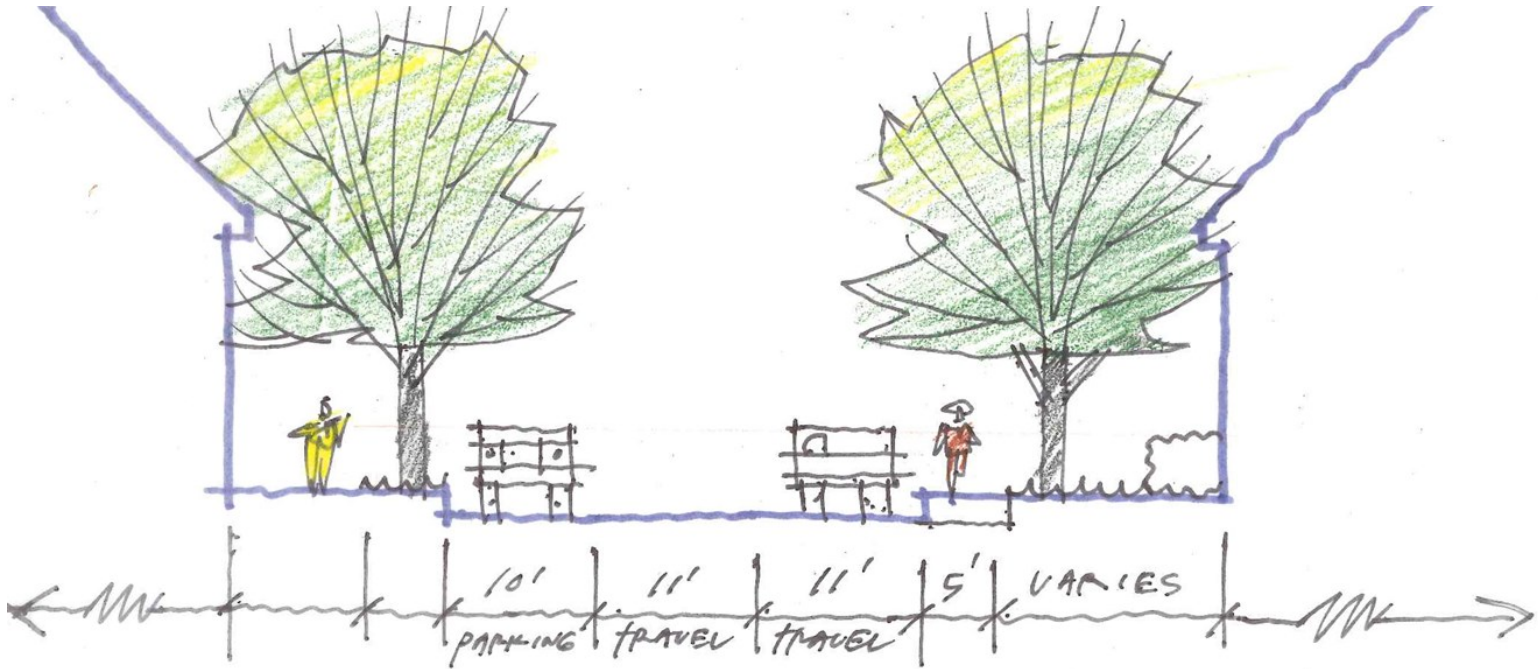

Wider Sidewalk
11'
24'
7'
36'
50'
Outdoor Dining
On-Street
Parking

Master plan—road sections @ East Main Street (B-B)

The **existing cross section** shows a dimension of 32'+ for the road width. The sidewalks range in width from about 5' to around 7'. There is no on-street parking and the travel lanes are about 16' in width. Few pedestrian amenities exist, such as tree planting, benches and wayfinding signage.

The **proposed cross section** shows a dimension of 32' for the road width. The 32' includes two travel lanes and on-street parking in some areas. The proposed sidewalks are a minimum of 5' and continuous. The continuous sidewalks allows for pedestrian amenities such as tree planting, benches and wayfinding signage.

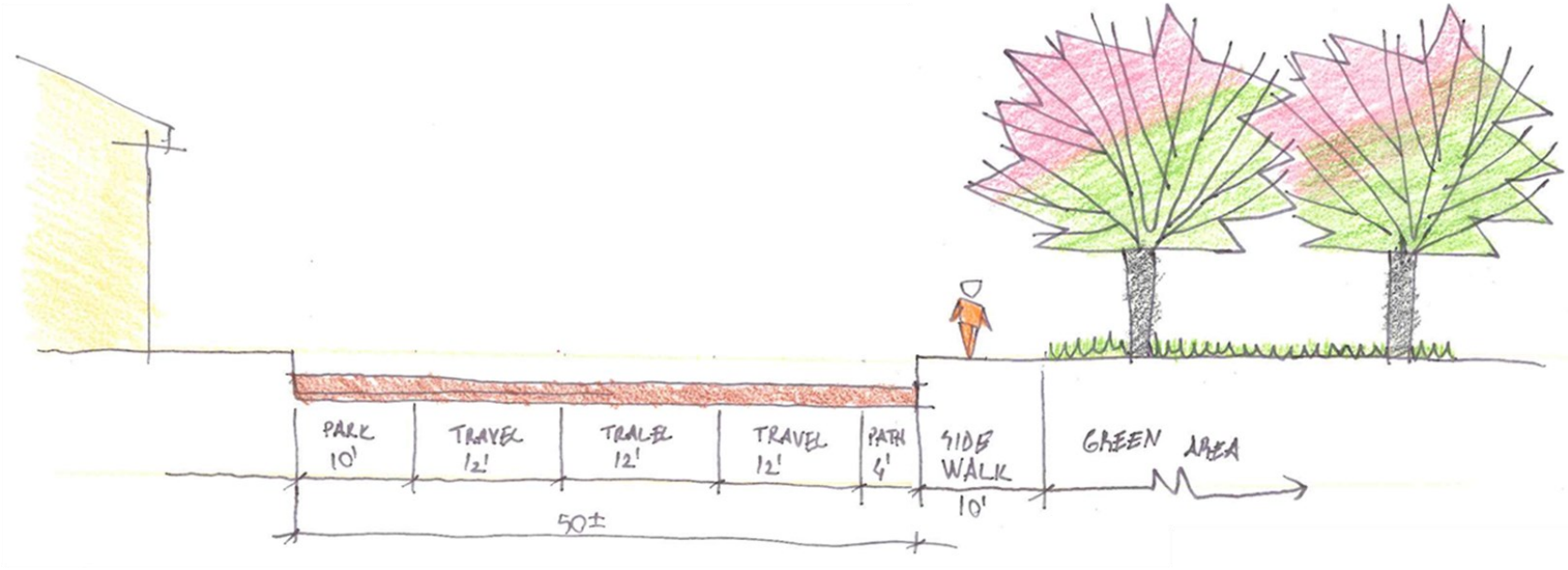

5'±
5'±
16'±
16'±
5'±
OPEN LOT
TRAVEL
TRAVEL

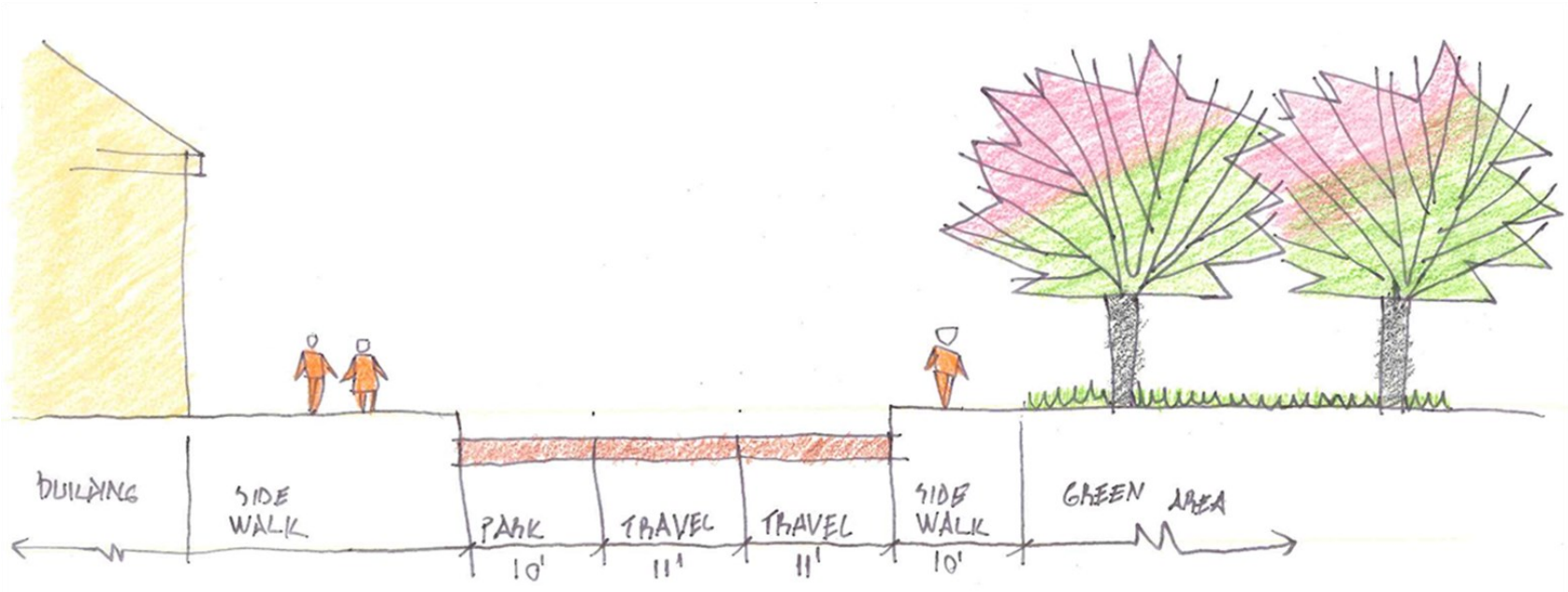

10'
11'
11'
5'
VARIES
PARKING
TRAVEL
TRAVEL

Master plan—road sections @ Broad Street (C-C)

The **existing cross section** shows a dimension of 50'+ for the road width. The sidewalks range in width from about 5' to around 7'. There is no on-street parking and the travel/ turning lanes are about 12' in width.

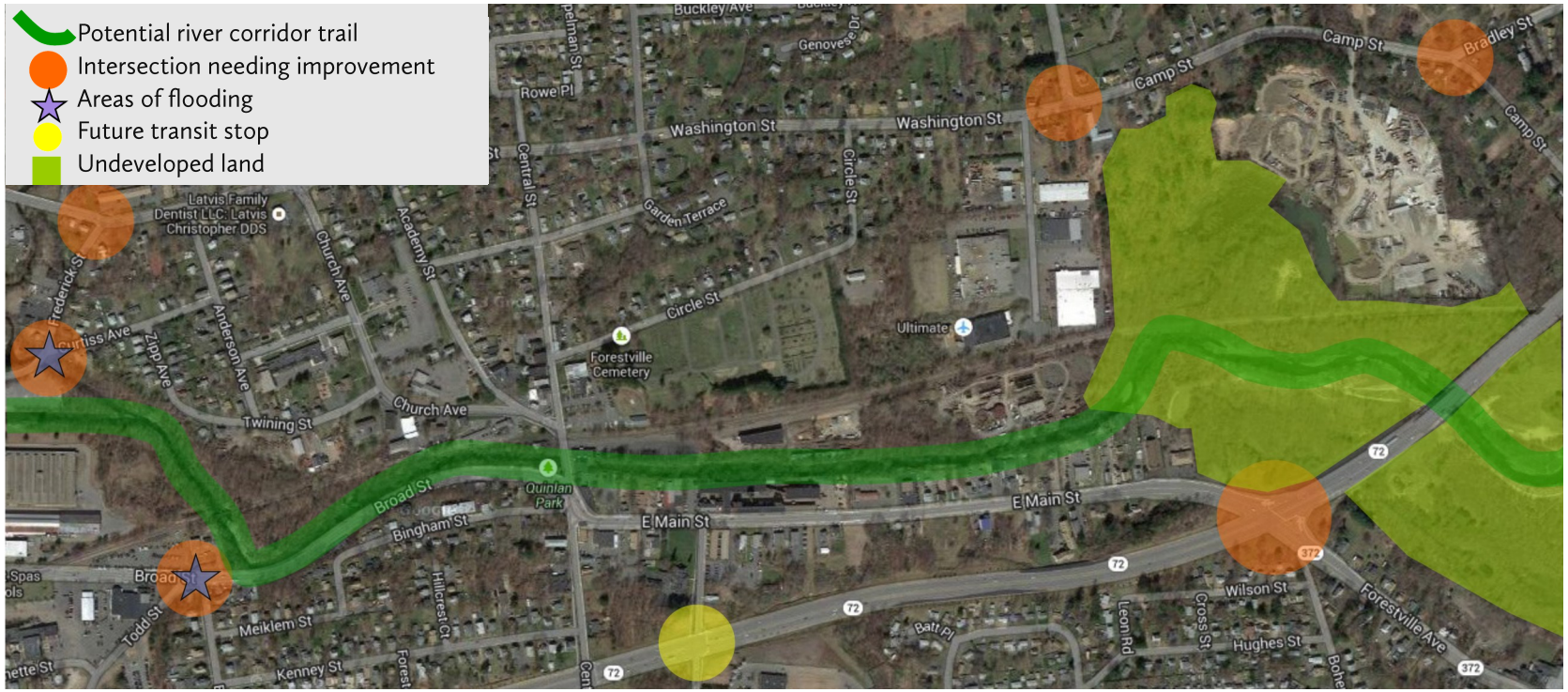
The **proposed cross section** shows a dimension of 32' for the road width. The 32' includes two travel lanes and on-street parking in some areas and a turning lane in other areas. The proposed sidewalks are a minimum of 10' and continuous. The continuous sidewalks allows for pedestrian amenities such as tree planting, benches and wayfinding signage.


PARK
10'
TRAVEL
12'
TRAVEL
12'
TRAVEL
12'
PATH
4'
SIDE
WALK
10'
GREEN AREA
50±


BUILDING
SIDE
WALK
PARK
10'
TRAVEL
11'
TRAVEL
11'
SIDE
WALK
10'
GREEN AREA

Outside the project scope

There are some areas for improvement and consideration throughout the larger Forestville area that are equally important but occur outside of the project scope. These areas include flooding mitigation, future bus service, intersection improvements, and trail development. In both of these categories, there are areas for improvement and opportunities to be realized as development progresses.



Flood mitigation

Changing the way that development occurs within the watershed is an important step towards mitigating damage from floods.

Development best practices

- Incorporate low impact development within floodplains and throughout the watershed to help infiltrate more stormwater into the ground and reduce the volume of water that reaches rivers when it rains.
- Limit the number of bridges and in-stream structures that are vulnerable to damage during floods.

Land use policies

- Preserving open space within floodplains upstream is one of the most effective ways to reduce flooding downstream.
- The extent of forest cover throughout the watershed should be increased, trees help to slow the flow of stormwater runoff into rivers and streams.
- New development within the floodplain should be avoided and the extent of impervious surfaces should be reduced where possible.

An example of a streetscape with low impact development features.

Forestville's one percent chance per year (red) and 0.2 percent chance per year (yellow) floodplains.

Vegetation fragmentation in Forestville. Light green areas represent cleared open space and dark green areas represent forest cover. Present day forest cover consists of mostly small disconnected fragments, reducing its capacity to slow stormwater runoff into the Pequabuck River.

Specific sites for flooding mitigation

There are two sites that present opportunities to address Forestville's vulnerability to flooding by reducing impervious surfaces upstream, increasing tree cover, and removing bridges and in-stream structures.

Copper Mine Brook

There are several things that can be done to mitigate flooding downstream of the junction of Copper Mine Brook and the Pequabuck River, an area that is itself prone to flooding. Several Frederick Street homes to the west of Copper Mine Brook are being bought by the city to be razed and the land kept as permanent open space due to repetitive flood damage (see photo on page X).

- Rather than replace the aging Frederick Street Bridge, it should be removed. The Washington Street Bridge, 800 feet upstream, provides a convenient alternative for vehicles crossing the river.
- The parking lot previously used by employees of the steel manufacturing building to the south should be removed and reforested to allow for more stormwater infiltration. The remaining obsolete road areas should also be reforested along with the grassy area next to the east bank of Copper Mine Brook.

Broad Street

The second site is located downstream where the Pequabuck River bends sharply at Broad Street.

- Relocate the Broad Street Pump Station driveway to the west to avoid the need for a bridge to cross the small tributary.
- Plant more trees on the property, especially along the tributary and river.
- Todd Street should curve to intersect Broad Street at a 90 degree angle. Replant the area previously covered by Todd Street with trees.

The Pequabuck River flood study

In response to the extensive damage caused by the flooding from Hurricane Irene in 2011, the towns of Bristol, Plymouth, and Plainville collectively applied for and received grant funding to conduct a flood mitigation study for their region. The study will analyze the watershed, remap the Pequabuck River's FEMA floodplain, and identify specific projects that will help mitigate the impact of future floods, with a focus on commercial areas such as Central Street and East Main Street. A consultant will be selected to conduct the study in January 2014.

A map showing the junction of the Copper Mine Brook with the Pequabuck River.

A map showing the river's bend at Broad Street.

Transportation changes

Bus Service – Existing and Expansions

Currently, Forestville is served by the PB route on weekdays (approximately once per hour from 6 am to 4 pm) and the BL route on the weekends (approximately once per hour from 9 am to 4 pm). These two routes connect Forestville with downtown Bristol, Plainville, and New Britain. There are a number of stops through Forestville, along East Main Street and Broad Street, but there is a bus shelter at Quinlan Park (at the intersection of Central Street and Broad Street).

Transit options will be expanded with CTfastrak, the bus rapid transit system for the Hartford Urbanized Area, which is scheduled to begin operations in 2015. The PB route will serve Forestville on weekdays and weekends, and operating hours will be expanded (approximately once per hour regularly, once every 30 minutes during peak hours, from 6 am to midnight). Also as part of CTfastrak, an express bus will stop between Bristol, New Britain, and Hartford. Depending on demand and public input, the express bus could also stop in Forestville.

Rail Study – Evaluating the Restoration of Passenger Service

While current rail use is limited to freight, the Connecticut Department of Transportation and its consultants are undertaking a feasibility study of restoring passenger service along the Central Connecticut corridor which travels through the following towns: Waterbury, Plymouth, Bristol, Plainville, New Britain, and Berlin. Latest news are available at http://centralctrailstudy.com/ .

Broader Bike Study, Pequabuck River Trail, and Open Space

While the Master Plan envisions a river-walk along the Pequabuck River, initiating such a proposal requires a separate project with a broader scope – since the potential trail could span across downtown Bristol, Forestville, and Plainville and become a multi-use trail. This trail could eventually connect to the wider network of trails in Central Connecticut – such as the Farmington Canal Heritage Trail, which is planned to be constructed through Plainville. There are also pockets of undeveloped land along the Pequabuck River (in Plainville) that could be considered for the trail.

Intersection of Broad Street and Todd Street

Broad Street, Broad Place, and Todd Street come together at an

awkward angle, which could pose a safety risk, and could be simplified. Also at this location, the bridge servicing the Broad Street Pump Station could be eliminated by moving the driveway. (Eliminating the bridge could improve river hydrology, as previously mentioned.)

Intersection of Frederick Street and Washington Street

This three-way intersection currently has stop-signs on two approaches – but there is no stop sign on Washington Street in the westbound direction. Due to the road geometry and angle which the roads come together, some sight lines are restricted leading to potentially dangerous conditions. This intersection could be simplified to improve safety.

Bridge on Frederick Street over Copper Mine Brook

This municipally owned bridge could potentially be removed, which could improve river hydrology and reduce taxpayer burden on bridge maintenance. The Frederick Street bridge may not be necessary due to the availability of nearby alternate routes such as the bridge on Washington Street over Copper Mine Brook (just north of the Frederick Street Bridge).

Intersection of East Main Street and Route 72

This intersection is the terminus of the expressway portion of Route 72 (from Interstate 84) and is one of the first impressions of Forestville. One concern is that, when the traffic signal is red, motorists from the expressway will take a right turn and travel through Forestville Center. Since these motorists have just come off the expressway, they are often traveling above the posted speed limit. Consider improvements that encourage vehicles to slow down before taking the right turn into Forestville, provide signage for Forestville, and improve the crossing for pedestrians.

Intersection of Camp Street and Washington Street

This three-way intersection on the Bristol-Plainville townline is currently stop-controlled on all three approaches. This area experiences heavy traffic, especially during peak hours, and could be considered for future improvements.

Intersection of Bradley Street and Camp Street

This three-way intersection in Plainville is currently stop-controlled on all three approaches. This area experiences heavy traffic, especially during peak hours, and could be considered for future improvements.

Appendix A: Implementation

Improvements

Elements	Responsible party	Next steps
Road width and road lane improvements (see table on next page for details)	City of Bristol	Locate funding Engineering Design Phase Public Hearing Obtain any permits or approvals
Central Street intersection improvements ■ Remove traffic islands ■ Sidewalk extensions to form two perpendicular "T" intersections (Broad Street at Central Street, and East Main Street at Central Street) ■ Update traffic signal with two traffic phases and one pedestrian phase ■ Remove stop sign on Central Street northbound on the approach to East Main Street ■ Install stop sign on East Main Street westbound on the approach to Central Street ■ Three traffic lanes (2 northbound, 1 southbound) on Central Street between East Main Street and Broad Street ■ Crosswalks on all intersection legs.	City of Bristol	Locate funding Engineering Design Phase Public Hearing Obtain any permits or approvals

Improvements continued

Elements	Responsible party	Next steps
Pedestrian Improvements, Bulb-Outs, and Streetscape — Improved sidewalks, street trees, lighting, street furniture	City of Bristol	Locate funding Engineering Design Phase Public Hearing Obtain any permits or approvals
Wayfinding and Signage	City of Bristol	After improvements take place
Cyclist and Trail Improvements ■ City-wide of region-wide bicycle network study ■ Potential for multi-use trail along Pequabuck River	Regional Planning Agency City of Bristol	Initiate Study
Shared Parking ■ For property owners south of East Main Street and east of Central Street ■ For property owners north of East Main Street and east of Central Street ■ For property owners south of East Main Street and east of Lincoln Ave	Private Property Owners City of Bristol	Discuss with City of Bristol possibility of constructing parking
Infill Development	Private Property Owners	Discuss

Existing road width and proposed lane use by street

Road	Existing Road Width	Proposed Number of Lanes and Lane Width	Proposed Use of remaining width
East Main Street—between Central Street and Lincoln Ave	37’	2 x 11’	8’ on-street parking on one side With slight widening, could accommodate on both sides
East Main Street—east of Lincoln Ave	32’	2 x 11’	8’ on-street parking on one side With widening, could accommodate on both sides
Church Avenue	Varies, 34’ - 40’	2 x 11’	Shoulder
Central Street—North of Church Ave	30’	2 x 11’	8’ on-street parking on one side (currently exists)
Central Street—Between Broad Street and East Main Street	Varies, 45’ - 80’	3 x 11’	Sidewalk extension
Central Street—South of East Main Street	31’ without turn lane 40’ with turn lane	2 x 11’ and 1 x 11’ turn lane	Shoulder
Broad Street—Near Central Street	Varies, 40’ - 70’	2 x 11’	8’ On-street parking lane on one side
Broad Street—West of Forestville Center	Varies, 30’ - 36’	2 x 11’	Potential multi-use trail along Pequabuck River
Lincoln Avenue	30’ without turn lane 35’ with turn lane	2 x 11’ and 1 x 10’ turn lane	8’ on-street parking on one side

Appendix B: Traffic simulation data

CCRPA collected traffic data for average daily traffic (ADT) and peak hour turning movements. These data are then inputted into HCS, TRANSYT-7F, TSIS-CORSIM software (developed by McTrans at the University of Florida) to test the feasibility of various intersection layouts in Forestville Center.

Elements that CCRPA tested in different layouts and configurations include:

- Traffic signals, all-way stops, or side-street stops.
- With and without turning lanes.

Traffic delay (in seconds per vehicle) are compared based on existing conditions and with the various elements noted above. The main elements of the final design include:

- Reconfiguring the existing traffic signal at Central Street and Broad Street.
- Realigning East Main Street so that it connects to Central Street at a perpendicular angle (eliminating the current traffic islands and wide curve) and installing a stop sign on East Main Street.
- Removing the stop sign on Central Street northbound on the approach to East Main Street.

The Center for Transportation and Livable Systems at the University of Connecticut and the Civil Engineering Senior Design team students also provided assistance with the traffic analysis and feasibility study. Input helped determine the final proposed configuration of the major intersection in Forestville Center.

The following figures and tables are included:

Figure 1: Average Daily Traffic (ADT) on Route 72 corridor, before and after construction. (Page 127.)

Table 1: Comparison of ADT on Route 72 corridor, before and after construction. (Page 128.)

Traffic on East Main Street and Pine Street (the portion that is not part of Route 72) have fallen by half since opening of the new Route 72.

Figure 2: ADT in Forestville Center, current traffic levels. (Page 129.)

Tables 2A—2J: Technical Data (Pages 130-149.)

Morning peak traffic is in the eastbound/southbound direction and afternoon peak traffic is in the westbound/northbound direction.

Overall, there is more traffic in the WB/NB direction, which is potential evidence to support the claim that: "Cars traveling WB on the Route 72 expressway from I-84, if a red light is present at the traffic signal, will take the right turn exit onto East Main Street."

Data collected by CCRPA with traffic counting equipment. Equipment is setup in a 'single tube' (records total vehicles, but not directional travel) and 'double tube' (records directional travel, but not total vehicles) configuration. The 'double tube' directional data is then applied to the 'single tube' total vehicle data.

Figure 3: Peak Hour Turning Movement Count in Forestville Center. (Page 150.)

Tables 3a—3c: Technical Data. (Pages 151-153.)

Peak hours are 7:00 AM to 8:00 AM and 4:30 PM to 5:30 PM.

Traffic patterns have shifted – the number of vehicles traveling EB/WB has dropped by half, but the number of vehicles traveling NB/SB has remained fairly constant.

Motorists traveling NB/SB (via Church Avenue) tend to travel EB/WB on East Main Street to connect with Route 72 (but they also have the option to connect with Route 72 via Central Street).

Approximately one car every five minutes performs an awkward maneuver at the traffic islands or to avoid the traffic islands (such as driving through the parking lot of a business).

Source: Data manually collected by CCRPA staff.

Figure 4a-4b: Simulation of Existing and Proposed. (Pages 154-155.)

Tables 4: Technical Data. (Page 156.)

Simulation suggests removing traffic islands will reduce delay for NB/SB traffic, but increase delay for WB traffic on East Main Street. This is not necessarily problematic because motorists are anticipated to shift from East Main Street to Central Street (because northbound travel is possible after removing the traffic islands.)

Simulation conducted by CCRPA with turning movement data.

2000 ADT

Source: ConnDOT, Route 72 Corridor Study by fitzgerald Haliday, Inc.

2012 ADT

Source: ConnDOT.

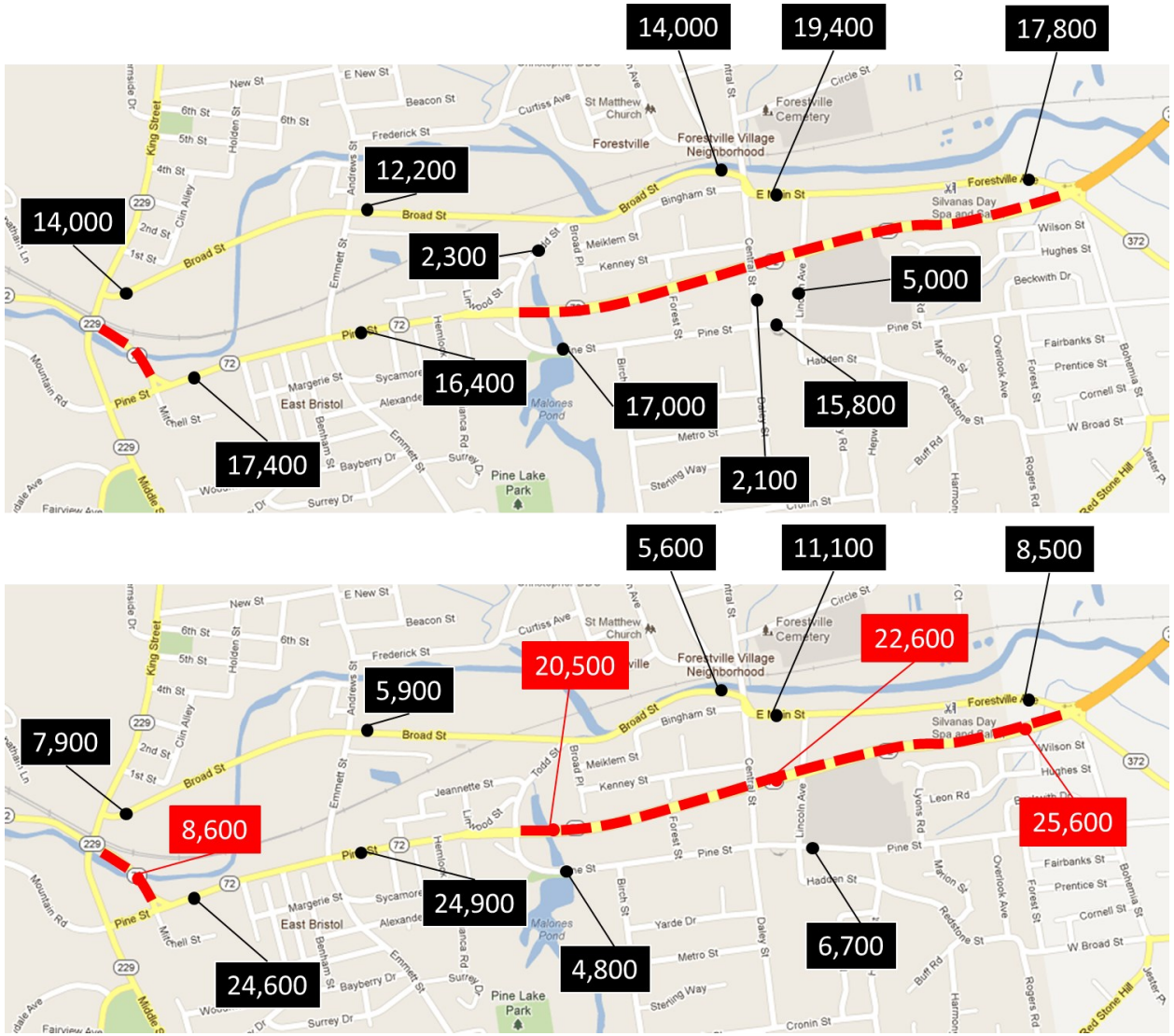


Figure 1. Average Daily Traffic (ADT) in the Route 72 corridor, before and after construction. The red dashed line is the new Route 72. Traffic on East Main Street and Broad Street have fallen by half.

Table 1: Comparison of ADT on Route 72 corridor, before and after construction

Location	2000	2012	Difference
Old Route 72			
Forestville Ave (Plainville)	17,800	8,500	-52%
East Main Street	19,400	11,100	-43%
Broad Street (at Central Street)	14,000	5,600	-60%
Broad Street (at Emmet Street)	12,200	5,900	-52%
Broad Street (at King Street)	14,000	7,900	-44%
New Route 72			
Route 72 (Plainville)	n/a	25,600	n/a
Route 72 (at Lincoln Ave)	n/a	22,600	n/a
Route 72 (at Todd Street)	n/a	20,500	n/a
Pine Street (at Emmett Street)	16,400	24,900	52%
Pine Street (near King Street)	17,400	24,600	41%
Pine Street segment not part of Route 72			
Pine Street (at Lincoln Ave)	15,800	6,700	-58%
Pine Street (at Todd Street)	17,000	4,800	-72%

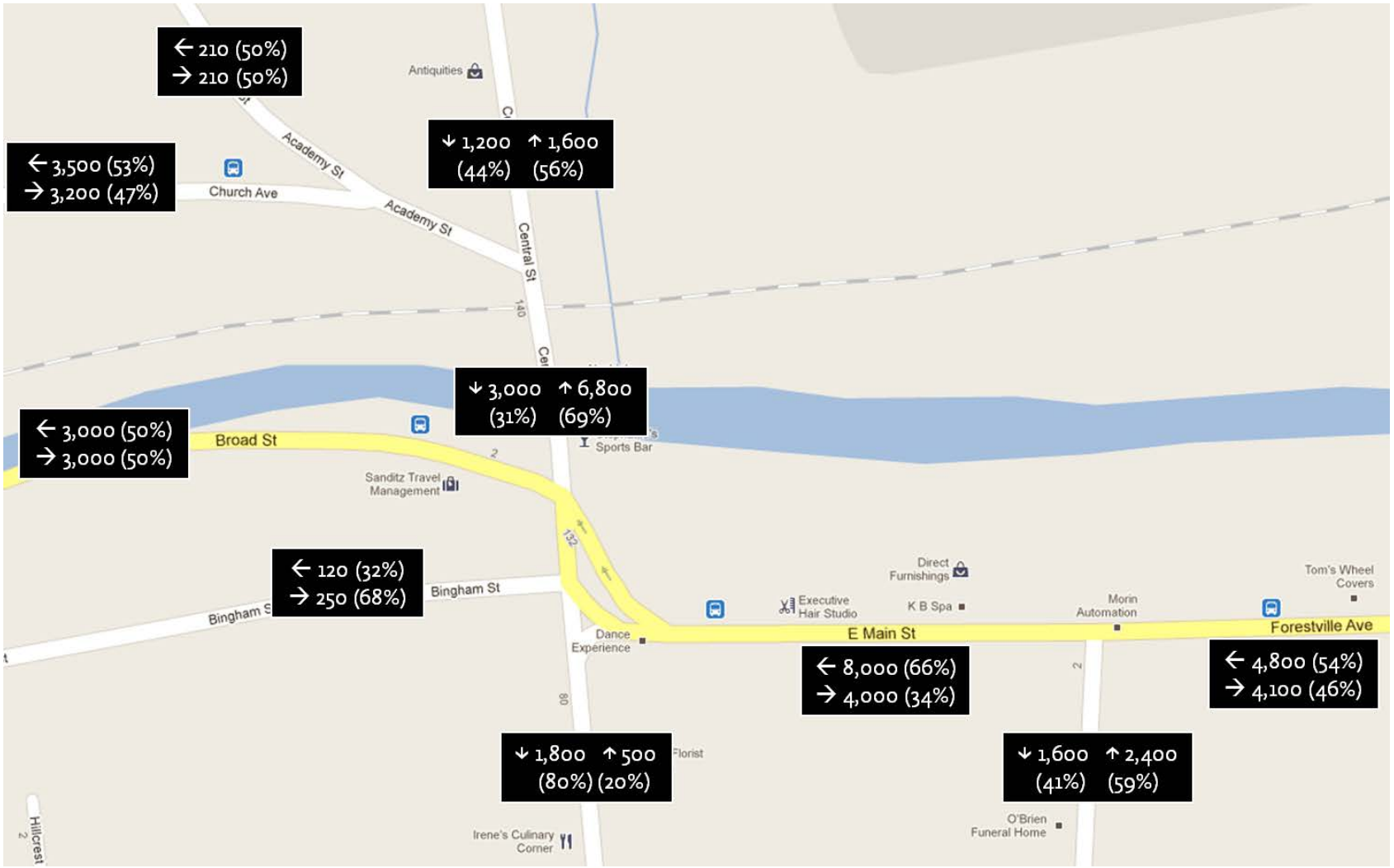


Figure 2: ADT in Forestville Center, current traffic levels.
Total volume and percentage by direction shown above. (Source: CCRPA)

Table 2a: Academy Street ADT

Time	Single Tube Total Traffic Data Collected							Average Traffic	
	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Weekday	Weekend
	1/6/2012	1/7/2012	1/8/2012	1/9/2012	1/10/2012	1/11/2012	1/12/2012		
12:00 - 12:59 AM	2	8	2	1	0	6	1	2	5
1:00 - 1:59 AM	3	2	2	0	0	4	4	2	2
2:00 - 2:59 AM	0	2	2	0	0	0	0	0	2
3:00 - 3:59 AM	0	0	0	2	0	0	2	1	0
4:00 - 4:59 AM	3	3	0	2	5	4	2	3	2
5:00 - 5:59 AM	11	6	4	4	7	10	12	9	5
6:00 - 6:59 AM	29	0	39	32	24	37	23	29	20
7:00 - 7:59 AM	28	15	42	26	34	42	22	30	29
8:00 - 8:59 AM	28	18	77	37	30	38	27	32	48
9:00 - 9:59 AM	21	36	100	19	34	47	22	29	68
10:00 - 10:59 AM	27	33	30	33	27	26	34	29	32
11:00 - 11:59 AM	29	62	171	32	29	31	43	33	117
12:00 - 12:59 PM	35	38	107	38	25	22	19	28	73
1:00 - 1:59 PM	31	41	31	46	31	49	35	38	36
2:00 - 2:59 PM	36	29	48	55	56	59	53	52	39
3:00 - 3:59 PM	54	76	30	46	36	51	40	45	53
4:00 - 4:59 PM	74	71	54	55	57	67	57	62	63
5:00 - 5:59 PM	43	45	35	77	64	39	54	55	40
6:00 - 6:59 PM	33	27	12	56	31	46	40	41	20
7:00 - 7:59 PM	23	20	21	45	27	20	28	29	21
8:00 - 8:59 PM	22	28	12	59	29	13	23	29	20
9:00 - 9:59 PM	17	10	16	5	24	18	10	15	13
10:00 - 10:59 PM	12	10	15	6	4	0	6	6	13
11:00 - 11:59 PM	10	8	10	3	0	4	4	4	9
							Total Daily Traffic	604	724

Table 2a: Academy Street ADT (continued)

	Directional (%) Traffic				Average Traffic by Direction			
	Weekday		Weekend		Weekday		Weekend	
Time	SB	NB	SB	NB	SB	NB	SB	NB
12:00 - 12:59 AM	57%	43%	20%	80%	1	1	1	4
1:00 - 1:59 AM	17%	83%	50%	50%	0	2	1	1
2:00 - 2:59 AM	0%	0%	0%	100%	0	0	0	2
3:00 - 3:59 AM	50%	50%	0%	0%	0	0	0	0
4:00 - 4:59 AM	78%	22%	50%	50%	2	1	1	1
5:00 - 5:59 AM	81%	19%	67%	33%	7	2	3	2
6:00 - 6:59 AM	62%	38%	5%	95%	18	11	1	19
7:00 - 7:59 AM	58%	42%	77%	23%	18	13	22	7
8:00 - 8:59 AM	63%	37%	38%	62%	20	12	18	29
9:00 - 9:59 AM	54%	46%	48%	53%	16	13	32	36
10:00 - 10:59 AM	50%	50%	42%	58%	15	15	13	18
11:00 - 11:59 AM	44%	56%	45%	55%	14	18	52	65
12:00 - 12:59 PM	49%	51%	64%	36%	14	14	46	26
1:00 - 1:59 PM	54%	46%	36%	64%	21	18	13	23
2:00 - 2:59 PM	43%	57%	27%	73%	22	30	10	28
3:00 - 3:59 PM	40%	60%	31%	69%	18	27	16	37
4:00 - 4:59 PM	43%	57%	55%	45%	26	36	34	28
5:00 - 5:59 PM	31%	69%	48%	52%	17	38	19	21
6:00 - 6:59 PM	47%	53%	54%	46%	19	22	11	9
7:00 - 7:59 PM	34%	66%	18%	82%	10	19	4	17
8:00 - 8:59 PM	47%	53%	54%	46%	14	15	11	9
9:00 - 9:59 PM	34%	66%	27%	73%	5	10	3	10
10:00 - 10:59 PM	40%	60%	31%	69%	2	3	4	9
11:00 - 11:59 PM	40%	60%	22%	78%	2	3	2	7
Total Daily Traffic by Direction					282	322	318	406

Table 2b: Church Avenue ADT

Time	Single Tube Total Traffic Data Collected							Average Traffic	
	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Weekday	Weekend
	1/6/2012	1/7/2012	1/8/2012	1/9/2012	1/10/2012	1/11/2012	1/12/2012		
12:00 - 12:59 AM	43	62	68	28	36	45	34	37	65
1:00 - 1:59 AM	32	41	49	22	17	19	27	23	45
2:00 - 2:59 AM	12	34	31	12	18	12	6	12	33
3:00 - 3:59 AM	10	16	24	7	12	12	17	12	20
4:00 - 4:59 AM	25	25	19	30	24	21	31	26	22
5:00 - 5:59 AM	86	39	28	83	86	99	89	89	34
6:00 - 6:59 AM	246	85	66	270	267	261	238	256	76
7:00 - 7:59 AM	446	147	129	464	468	442	404	445	138
8:00 - 8:59 AM	373	243	224	407	405	382	381	390	234
9:00 - 9:59 AM	347	310	305	307	309	291	308	312	308
10:00 - 10:59 AM	364	451	315	318	375	348	311	343	383
11:00 - 11:59 AM	361	463	443	329	367	364	332	351	453
12:00 - 12:59 PM	403	506	476	382	397	377	359	384	491
1:00 - 1:59 PM	436	484	342	376	416	371	334	387	413
2:00 - 2:59 PM	471	505	365	442	484	417	463	455	435
3:00 - 3:59 PM	545	486	350	527	561	551	529	543	418
4:00 - 4:59 PM	657	436	352	587	620	610	624	620	394
5:00 - 5:59 PM	654	484	326	645	636	601	631	633	405
6:00 - 6:59 PM	469	327	276	436	365	429	487	437	302
7:00 - 7:59 PM	319	283	211	258	251	302	331	292	247
8:00 - 8:59 PM	249	229	179	204	244	229	260	237	204
9:00 - 9:59 PM	229	209	103	130	186	181	175	180	156
10:00 - 10:59 PM	163	137	106	96	118	95	122	119	122
11:00 - 11:59 PM	124	105	63	71	65	65	69	79	84
							Total Daily Traffic	6662	5479

Table 2b: Church Avenue ADT (continued)

Directional (%) Traffic					Average Traffic by Direction			
	Weekday		Weekend		Weekday		Weekend	
Time	SB	NB	SB	NB	SB	NB	SB	NB
12:00 - 12:59 AM	32%	68%	39%	61%	12	25	26	39
1:00 - 1:59 AM	32%	68%	41%	59%	8	16	19	26
2:00 - 2:59 AM	34%	66%	32%	68%	4	8	10	22
3:00 - 3:59 AM	57%	43%	25%	75%	7	5	5	15
4:00 - 4:59 AM	71%	29%	53%	47%	19	8	12	10
5:00 - 5:59 AM	87%	13%	72%	28%	77	12	24	9
6:00 - 6:59 AM	78%	22%	64%	36%	200	56	48	28
7:00 - 7:59 AM	68%	32%	65%	35%	304	141	90	48
8:00 - 8:59 AM	64%	36%	57%	43%	248	142	132	101
9:00 - 9:59 AM	57%	43%	57%	43%	177	135	174	133
10:00 - 10:59 AM	55%	45%	55%	45%	190	154	211	172
11:00 - 11:59 AM	52%	48%	53%	47%	182	169	239	214
12:00 - 12:59 PM	51%	49%	52%	48%	194	189	256	235
1:00 - 1:59 PM	46%	54%	53%	47%	180	207	220	193
2:00 - 2:59 PM	43%	57%	47%	53%	196	260	206	229
3:00 - 3:59 PM	38%	62%	42%	58%	208	335	174	244
4:00 - 4:59 PM	32%	68%	49%	51%	200	420	194	200
5:00 - 5:59 PM	32%	68%	47%	53%	200	433	190	215
6:00 - 6:59 PM	39%	61%	54%	46%	171	266	164	138
7:00 - 7:59 PM	39%	61%	44%	56%	115	177	110	137
8:00 - 8:59 PM	40%	60%	46%	54%	94	143	94	110
9:00 - 9:59 PM	39%	61%	33%	67%	71	109	51	105
10:00 - 10:59 PM	42%	58%	34%	66%	50	69	41	80
11:00 - 11:59 PM	40%	60%	37%	63%	31	48	31	53
Total Daily Traffic by Direction					3133	3528	2721	2758

Table 2c: Broad Street ADT

Time	Single Tube Total Traffic Data Collected							Average Traffic	
	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Weekday	Weekend
	4/24/2012	4/25/2012	4/26/2012	4/27/2012	4/28/2012	4/29/2012	4/30/2012		
12:00 - 12:59 AM	29	40	22	37	48	65	24	30	57
1:00 - 1:59 AM	5	17	12	29	29	30	11	15	30
2:00 - 2:59 AM	10	5	9	14	32	30	7	9	31
3:00 - 3:59 AM	8	11	11	10	16	20	9	10	18
4:00 - 4:59 AM	23	24	19	26	27	18	24	23	23
5:00 - 5:59 AM	89	87	90	78	31	18	90	87	25
6:00 - 6:59 AM	258	271	247	224	77	55	215	243	66
7:00 - 7:59 AM	420	390	413	401	163	69	421	409	116
8:00 - 8:59 AM	338	373	363	385	260	123	356	363	192
9:00 - 9:59 AM	329	337	308	326	298	152	327	325	225
10:00 - 10:59 AM	317	361	297	336	379	224	306	323	302
11:00 - 11:59 AM	307	379	324	354	414	264	347	342	339
12:00 - 12:59 PM	413	340	376	428	404	266	389	389	335
1:00 - 1:59 PM	331	393	388	390	338	289	380	376	314
2:00 - 2:59 PM	412	393	466	472	360	294	416	432	327
3:00 - 3:59 PM	518	485	507	498	336	307	445	491	322
4:00 - 4:59 PM	524	499	503	537	306	229	534	519	268
5:00 - 5:59 PM	518	509	539	601	300	222	504	534	261
6:00 - 6:59 PM	353	339	347	349	285	221	364	350	253
7:00 - 7:59 PM	237	236	242	276	233	193	237	246	213
8:00 - 8:59 PM	224	214	181	191	212	150	194	201	181
9:00 - 9:59 PM	142	137	131	150	134	88	119	136	111
10:00 - 10:59 PM	86	61	95	122	154	64	61	85	109
11:00 - 11:59 PM	55	57	49	90	122	35	40	58	79
							Total Daily Traffic	5997	4192

Table 2c: Broad Street ADT (continued)

	Directional (%) Traffic				Average Traffic by Direction			
	Weekday		Weekend		Weekday		Weekend	
Time	SB	NB	SB	NB	SB	NB	SB	NB
12:00 - 12:59 AM	35%	65%	39%	61%	11	20	22	34
1:00 - 1:59 AM	42%	58%	46%	54%	6	9	14	16
2:00 - 2:59 AM	39%	61%	47%	53%	3	6	14	17
3:00 - 3:59 AM	39%	61%	52%	48%	4	6	9	9
4:00 - 4:59 AM	46%	54%	40%	60%	11	12	9	14
5:00 - 5:59 AM	69%	31%	62%	38%	60	27	15	9
6:00 - 6:59 AM	63%	37%	56%	44%	153	90	37	29
7:00 - 7:59 AM	66%	34%	54%	46%	270	139	62	54
8:00 - 8:59 AM	60%	40%	57%	43%	217	146	109	82
9:00 - 9:59 AM	52%	48%	58%	42%	171	155	130	95
10:00 - 10:59 AM	55%	45%	56%	44%	178	146	169	133
11:00 - 11:59 AM	52%	48%	56%	44%	179	164	189	150
12:00 - 12:59 PM	53%	47%	52%	48%	208	181	174	161
1:00 - 1:59 PM	50%	50%	51%	49%	188	189	160	154
2:00 - 2:59 PM	47%	53%	45%	55%	204	228	146	181
3:00 - 3:59 PM	47%	53%	47%	53%	229	261	150	171
4:00 - 4:59 PM	44%	56%	47%	53%	231	289	127	141
5:00 - 5:59 PM	44%	56%	50%	50%	237	297	131	130
6:00 - 6:59 PM	48%	52%	46%	54%	168	182	117	136
7:00 - 7:59 PM	43%	57%	44%	56%	105	140	95	118
8:00 - 8:59 PM	43%	57%	40%	60%	86	115	73	108
9:00 - 9:59 PM	37%	63%	38%	62%	50	86	42	69
10:00 - 10:59 PM	37%	63%	38%	62%	31	54	42	67
11:00 - 11:59 PM	38%	62%	35%	65%	22	36	27	51
Total Daily Traffic by Direction					3021	2976	2063	2129

Table 2d: Bingham Street ADT

Single Tube Total Traffic Data Collected								Average Traffic	
Time	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Weekday	Weekend
	4/24/2012	4/25/2012	4/26/2012	4/27/2012	4/28/2012	4/29/2012	4/30/2012		
12:00 - 12:59 AM	7	8	14	12	5	10	3	9	8
1:00 - 1:59 AM	2	4	3	4	8	10	6	4	9
2:00 - 2:59 AM	3	0	0	0	1	6	3	1	4
3:00 - 3:59 AM	3	4	2	2	10	6	3	3	8
4:00 - 4:59 AM	1	2	2	1	3	4	2	2	4
5:00 - 5:59 AM	11	17	9	13	3	4	8	12	4
6:00 - 6:59 AM	18	12	17	16	4	5	14	15	5
7:00 - 7:59 AM	10	19	10	11	7	6	20	14	7
8:00 - 8:59 AM	23	19	15	20	5	10	24	20	8
9:00 - 9:59 AM	6	9	8	21	12	5	7	10	9
10:00 - 10:59 AM	13	25	13	21	33	12	14	17	23
11:00 - 11:59 AM	15	25	32	21	20	17	13	21	19
12:00 - 12:59 PM	15	19	24	11	22	10	21	18	16
1:00 - 1:59 PM	22	21	12	15	23	15	16	17	19
2:00 - 2:59 PM	15	18	11	17	12	18	25	17	15
3:00 - 3:59 PM	27	23	25	23	37	16	23	24	27
4:00 - 4:59 PM	23	24	23	22	23	31	20	22	27
5:00 - 5:59 PM	15	23	20	35	16	29	26	24	23
6:00 - 6:59 PM	21	20	23	27	28	14	30	24	21
7:00 - 7:59 PM	17	20	26	17	14	22	29	22	18
8:00 - 8:59 PM	21	19	29	27	24	12	22	24	18
9:00 - 9:59 PM	30	15	24	12	16	12	12	19	14
10:00 - 10:59 PM	19	22	14	22	24	18	17	19	21
11:00 - 11:59 PM	11	14	11	17	14	6	10	13	10
							Total Daily Traffic	370	331

Table 2d: Bingham Street ADT (continued)

	Directional (%) Traffic				Average Traffic by Direction			
	Weekday		Weekend		Weekday		Weekend	
Time	SB	NB	SB	NB	SB	NB	SB	NB
12:00 - 12:59 AM	55%	45%	63%	38%	5	4	5	3
1:00 - 1:59 AM	91%	9%	30%	70%	3	0	3	6
2:00 - 2:59 AM	75%	25%	67%	33%	1	0	2	1
3:00 - 3:59 AM	100%	0%	64%	36%	3	0	5	3
4:00 - 4:59 AM	100%	0%	60%	40%	2	0	2	1
5:00 - 5:59 AM	85%	15%	100%	0%	10	2	4	0
6:00 - 6:59 AM	98%	2%	67%	33%	15	0	3	2
7:00 - 7:59 AM	74%	26%	100%	0%	10	4	7	0
8:00 - 8:59 AM	88%	12%	70%	30%	18	2	5	2
9:00 - 9:59 AM	81%	19%	93%	7%	8	2	8	1
10:00 - 10:59 AM	68%	32%	67%	33%	12	5	15	8
11:00 - 11:59 AM	77%	23%	77%	23%	16	5	14	4
12:00 - 12:59 PM	59%	41%	63%	37%	11	7	10	6
1:00 - 1:59 PM	66%	34%	56%	44%	11	6	11	8
2:00 - 2:59 PM	58%	42%	64%	36%	10	7	10	5
3:00 - 3:59 PM	62%	38%	53%	48%	15	9	14	13
4:00 - 4:59 PM	69%	31%	58%	42%	15	7	16	11
5:00 - 5:59 PM	69%	31%	60%	40%	16	7	14	9
6:00 - 6:59 PM	58%	42%	56%	44%	14	10	12	9
7:00 - 7:59 PM	67%	33%	71%	29%	15	7	13	5
8:00 - 8:59 PM	48%	52%	59%	41%	11	12	11	7
9:00 - 9:59 PM	51%	49%	44%	56%	9	9	6	8
10:00 - 10:59 PM	58%	42%	43%	57%	11	8	9	12
11:00 - 11:59 PM	55%	45%	55%	45%	7	6	5	5
Total Daily Traffic by Direction					249	121	202	129

Table 2e: Central Street north of Church Avenue ADT

Time	Single Tube Total Traffic Data Collected							Average Traffic	
	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Weekday	Weekend
	1/6/2012	1/7/2012	1/8/2012	1/9/2012	1/10/2012	1/11/2012	1/12/2012		
12:00 - 12:59 AM	7	14	20	7	10	15	10	10	17
1:00 - 1:59 AM	11	15	14	8	10	13	8	10	15
2:00 - 2:59 AM	7	9	12	9	7	4	6	7	11
3:00 - 3:59 AM	4	8	8	4	5	5	10	6	8
4:00 - 4:59 AM	17	11	5	15	24	17	22	19	8
5:00 - 5:59 AM	49	27	10	47	40	56	53	49	19
6:00 - 6:59 AM	85	34	13	74	83	85	80	81	24
7:00 - 7:59 AM	135	48	40	151	115	126	111	128	44
8:00 - 8:59 AM	121	92	69	151	177	151	125	145	81
9:00 - 9:59 AM	130	147	110	137	131	118	124	128	129
10:00 - 10:59 AM	155	189	121	138	160	154	138	149	155
11:00 - 11:59 AM	159	221	167	151	136	210	143	160	194
12:00 - 12:59 PM	226	213	192	165	192	182	182	189	203
1:00 - 1:59 PM	192	231	193	178	190	188	174	184	212
2:00 - 2:59 PM	181	208	176	199	215	203	182	196	192
3:00 - 3:59 PM	239	203	158	222	228	276	243	242	181
4:00 - 4:59 PM	249	196	167	247	246	225	300	253	182
5:00 - 5:59 PM	263	187	138	312	253	277	303	282	163
6:00 - 6:59 PM	208	135	111	211	179	209	246	211	123
7:00 - 7:59 PM	136	124	91	132	127	166	178	148	108
8:00 - 8:59 PM	114	108	82	97	93	131	137	114	95
9:00 - 9:59 PM	90	73	48	44	64	58	72	66	61
10:00 - 10:59 PM	63	45	43	42	33	34	31	41	44
11:00 - 11:59 PM	31	40	21	23	27	28	32	28	31
							Total Daily Traffic	2844	2294

Table 2e: Central Street north of Church Avenue ADT (continued)

	Directional (%) Traffic				Average Traffic by Direction			
	Weekday		Weekend		Weekday		Weekend	
Time	SB	NB	SB	NB	SB	NB	SB	NB
12:00 - 12:59 AM	47%	53%	44%	56%	5	5	7	10
1:00 - 1:59 AM	35%	65%	28%	72%	4	6	4	11
2:00 - 2:59 AM	24%	76%	33%	67%	2	5	4	7
3:00 - 3:59 AM	21%	79%	38%	63%	1	4	3	5
4:00 - 4:59 AM	41%	59%	50%	50%	8	11	4	4
5:00 - 5:59 AM	66%	34%	59%	41%	32	17	11	8
6:00 - 6:59 AM	54%	46%	59%	41%	44	37	14	10
7:00 - 7:59 AM	53%	47%	51%	49%	67	60	22	22
8:00 - 8:59 AM	50%	50%	40%	60%	72	73	32	49
9:00 - 9:59 AM	50%	50%	50%	50%	64	64	64	65
10:00 - 10:59 AM	46%	54%	48%	52%	68	81	74	81
11:00 - 11:59 AM	46%	54%	44%	56%	74	86	86	108
12:00 - 12:59 PM	47%	53%	40%	60%	89	100	82	121
1:00 - 1:59 PM	45%	55%	48%	52%	83	102	102	110
2:00 - 2:59 PM	44%	56%	43%	57%	86	110	83	109
3:00 - 3:59 PM	42%	58%	39%	61%	102	140	70	111
4:00 - 4:59 PM	34%	66%	44%	56%	87	167	80	102
5:00 - 5:59 PM	36%	64%	39%	61%	102	179	64	99
6:00 - 6:59 PM	40%	60%	47%	53%	85	126	58	65
7:00 - 7:59 PM	39%	61%	47%	53%	57	91	51	57
8:00 - 8:59 PM	45%	55%	49%	51%	51	63	47	48
9:00 - 9:59 PM	39%	61%	41%	59%	26	40	25	36
10:00 - 10:59 PM	47%	53%	38%	62%	19	22	17	27
11:00 - 11:59 PM	50%	50%	32%	68%	14	14	10	21
Total Daily Traffic by Direction					1241	1603	1010	1283

Table 2f: Central Street at the bridge ADT

Single Tube Total Traffic Data Collected								Average Traffic	
Time	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Weekday	Weekend
	1/6/2012	1/7/2012	1/8/2012	1/9/2012	1/10/2012	1/11/2012	1/12/2012		
12:00 - 12:59 AM	53	83	86	42	54	62	45	51	85
1:00 - 1:59 AM	49	54	65	30	27	33	38	35	60
2:00 - 2:59 AM	18	48	41	22	23	13	13	18	45
3:00 - 3:59 AM	15	26	32	12	16	18	28	18	29
4:00 - 4:59 AM	46	42	24	55	50	48	65	53	33
5:00 - 5:59 AM	127	68	35	140	145	153	177	148	52
6:00 - 6:59 AM	362	125	96	379	373	389	377	376	111
7:00 - 7:59 AM	600	193	174	629	626	592	554	600	184
8:00 - 8:59 AM	507	350	312	572	565	544	590	556	331
9:00 - 9:59 AM	471	457	461	462	458	452	480	465	459
10:00 - 10:59 AM	513	652	464	501	517	507	489	505	558
11:00 - 11:59 AM	557	686	625	502	522	624	516	544	656
12:00 - 12:59 PM	624	776	737	610	675	612	562	617	757
1:00 - 1:59 PM	643	706	541	557	616	595	529	588	624
2:00 - 2:59 PM	694	726	570	651	716	665	666	678	648
3:00 - 3:59 PM	815	709	500	737	808	777	775	782	605
4:00 - 4:59 PM	950	637	538	821	873	858	926	886	588
5:00 - 5:59 PM	892	657	472	920	883	873	952	904	565
6:00 - 6:59 PM	686	496	410	649	529	645	765	655	453
7:00 - 7:59 PM	472	418	310	419	382	463	515	450	364
8:00 - 8:59 PM	380	341	263	309	345	378	441	371	302
9:00 - 9:59 PM	314	337	150	181	243	237	252	245	244
10:00 - 10:59 PM	237	194	137	135	154	132	144	160	166
11:00 - 11:59 PM	162	147	100	92	93	96	90	107	124
							Total Daily Traffic	9812	8036

Table 2f: Central Street at the bridge ADT (continued)

Directional (%) Traffic					Average Traffic by Direction			
	Weekday		Weekend		Weekday		Weekend	
Time	SB	NB	SB	NB	SB	NB	SB	NB
12:00 - 12:59 AM	35%	65%	39%	61%	18	33	33	51
1:00 - 1:59 AM	30%	70%	31%	69%	10	25	19	41
2:00 - 2:59 AM	27%	73%	29%	71%	5	13	13	32
3:00 - 3:59 AM	41%	59%	29%	71%	7	11	8	21
4:00 - 4:59 AM	55%	45%	48%	52%	29	24	16	17
5:00 - 5:59 AM	77%	23%	65%	35%	114	34	33	18
6:00 - 6:59 AM	55%	45%	52%	48%	207	169	58	53
7:00 - 7:59 AM	34%	66%	56%	44%	202	398	103	81
8:00 - 8:59 AM	41%	59%	43%	57%	227	329	141	190
9:00 - 9:59 AM	40%	60%	39%	61%	188	277	181	278
10:00 - 10:59 AM	38%	62%	33%	67%	194	311	185	373
11:00 - 11:59 AM	35%	65%	26%	74%	190	354	170	486
12:00 - 12:59 PM	31%	69%	22%	78%	191	425	168	589
1:00 - 1:59 PM	32%	68%	31%	69%	186	402	194	429
2:00 - 2:59 PM	26%	74%	29%	71%	179	500	187	461
3:00 - 3:59 PM	19%	81%	27%	73%	151	631	162	443
4:00 - 4:59 PM	13%	87%	31%	69%	116	769	182	406
5:00 - 5:59 PM	13%	87%	29%	71%	122	782	164	401
6:00 - 6:59 PM	26%	74%	40%	60%	167	488	180	273
7:00 - 7:59 PM	32%	68%	35%	65%	144	307	127	237
8:00 - 8:59 PM	36%	64%	44%	56%	134	237	132	170
9:00 - 9:59 PM	35%	65%	38%	62%	85	161	92	151
10:00 - 10:59 PM	39%	61%	34%	66%	63	98	56	110
11:00 - 11:59 PM	40%	60%	31%	69%	43	64	39	85
Total Daily Traffic by Direction					2972	6840	2642	5394

Table 2g: Central Street south of East Main Street ADT

Single Tube Total Traffic Data Collected								Average Traffic	
Time	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Weekday	Weekend
	4/24/2012	4/25/2012	4/26/2012	4/27/2012	4/28/2012	4/29/2012	4/30/2012		
12:00 - 12:59 AM	5	16	5	10	20	28	9	9	24
1:00 - 1:59 AM	4	4	7	6	12	15	6	5	14
2:00 - 2:59 AM	5	5	9	4	6	14	4	5	10
3:00 - 3:59 AM	5	9	8	6	7	4	5	7	6
4:00 - 4:59 AM	23	17	19	13	13	10	17	18	12
5:00 - 5:59 AM	55	50	56	49	12	7	45	51	10
6:00 - 6:59 AM	91	97	94	99	46	23	101	96	35
7:00 - 7:59 AM	133	139	131	132	70	56	114	130	63
8:00 - 8:59 AM	150	153	143	157	109	74	155	152	92
9:00 - 9:59 AM	123	135	109	148	137	100	135	130	119
10:00 - 10:59 AM	120	133	105	132	181	137	109	120	159
11:00 - 11:59 AM	128	127	123	176	150	178	134	138	164
12:00 - 12:59 PM	122	130	144	172	169	175	144	142	172
1:00 - 1:59 PM	124	137	127	155	175	139	137	136	157
2:00 - 2:59 PM	157	158	190	190	141	154	159	171	148
3:00 - 3:59 PM	158	129	163	172	162	126	151	155	144
4:00 - 4:59 PM	159	161	186	211	160	150	161	176	155
5:00 - 5:59 PM	172	167	200	219	175	131	154	182	153
6:00 - 6:59 PM	151	153	160	202	149	89	144	162	119
7:00 - 7:59 PM	135	113	129	123	113	84	111	122	99
8:00 - 8:59 PM	77	112	101	115	86	79	61	93	83
9:00 - 9:59 PM	56	60	55	48	80	33	34	51	57
10:00 - 10:59 PM	31	31	31	47	51	25	27	33	38
11:00 - 11:59 PM	24	19	24	40	37	13	20	25	25
							Total Daily Traffic	2309	2053

Table 2g: Central Street south of East Main Street ADT (continued)

	Directional (%) Traffic				Average Traffic by Direction			
	Weekday		Weekend		Weekday		Weekend	
Time	SB	NB	SB	NB	SB	NB	SB	NB
12:00 - 12:59 AM	82%	18%	82%	18%	7	2	20	4
1:00 - 1:59 AM	63%	37%	81%	19%	3	2	11	3
2:00 - 2:59 AM	63%	37%	65%	35%	3	2	7	4
3:00 - 3:59 AM	66%	34%	75%	25%	4	2	4	1
4:00 - 4:59 AM	68%	32%	70%	30%	12	6	8	4
5:00 - 5:59 AM	86%	14%	89%	11%	44	7	9	1
6:00 - 6:59 AM	85%	15%	78%	22%	82	14	27	8
7:00 - 7:59 AM	82%	18%	81%	19%	106	24	51	12
8:00 - 8:59 AM	84%	16%	81%	19%	127	24	74	17
9:00 - 9:59 AM	80%	20%	85%	15%	104	26	100	18
10:00 - 10:59 AM	82%	18%	78%	22%	98	22	123	36
11:00 - 11:59 AM	79%	21%	84%	16%	109	29	137	27
12:00 - 12:59 PM	80%	20%	81%	19%	113	29	140	32
1:00 - 1:59 PM	83%	17%	83%	17%	113	23	130	27
2:00 - 2:59 PM	77%	23%	85%	15%	131	40	125	22
3:00 - 3:59 PM	80%	20%	84%	16%	123	31	121	23
4:00 - 4:59 PM	80%	20%	85%	15%	141	34	131	24
5:00 - 5:59 PM	81%	19%	80%	20%	147	35	123	30
6:00 - 6:59 PM	79%	21%	83%	17%	128	34	99	20
7:00 - 7:59 PM	72%	28%	79%	21%	88	34	78	21
8:00 - 8:59 PM	77%	23%	76%	24%	72	21	63	20
9:00 - 9:59 PM	83%	17%	72%	28%	42	8	40	16
10:00 - 10:59 PM	72%	28%	80%	20%	24	10	31	8
11:00 - 11:59 PM	81%	19%	81%	19%	21	5	20	5
Total Daily Traffic by Direction					1844	465	1672	380

Table 2h: East Main Street west of Lincoln Avenue ADT

Time	Single Tube Total Traffic Data Collected							Average Traffic	
	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday	Monday	Weekday	Weekend
	4/24/2012	4/25/2012	4/26/2012	4/27/2012	4/28/2012	4/29/2012	4/30/2012		
12:00 - 12:59 AM	49	85	60	84	112	141	43	64	127
1:00 - 1:59 AM	20	44	22	67	61	60	22	35	61
2:00 - 2:59 AM	22	14	20	20	56	54	20	19	55
3:00 - 3:59 AM	15	17	23	23	28	30	23	20	29
4:00 - 4:59 AM	42	40	43	39	34	25	37	40	30
5:00 - 5:59 AM	145	145	144	138	69	43	160	146	56
6:00 - 6:59 AM	488	494	460	460	161	123	447	470	142
7:00 - 7:59 AM	889	807	815	762	302	173	815	818	238
8:00 - 8:59 AM	706	726	676	753	481	260	654	703	371
9:00 - 9:59 AM	625	569	531	587	610	387	540	570	499
10:00 - 10:59 AM	606	567	532	642	740	482	563	582	611
11:00 - 11:59 AM	599	682	585	687	831	580	590	629	706
12:00 - 12:59 PM	737	700	719	798	793	619	673	725	706
1:00 - 1:59 PM	665	683	669	744	733	625	658	684	679
2:00 - 2:59 PM	831	808	843	908	699	671	792	836	685
3:00 - 3:59 PM	1011	974	1002	1039	751	633	931	991	692
4:00 - 4:59 PM	1072	1095	1086	1158	697	597	1083	1099	647
5:00 - 5:59 PM	1159	1070	1087	1203	696	519	1077	1119	608
6:00 - 6:59 PM	759	714	786	824	676	474	762	769	575
7:00 - 7:59 PM	552	536	555	655	548	444	508	561	496
8:00 - 8:59 PM	487	473	407	458	459	341	377	440	400
9:00 - 9:59 PM	301	303	288	346	309	229	236	295	269
10:00 - 10:59 PM	195	178	183	269	276	146	153	196	211
11:00 - 11:59 PM	109	118	130	194	242	111	97	130	177
							Total Daily Traffic	11942	9066

Table 2h: East Main Street west of Lincoln Avenue ADT (continued)

	Directional (%) Traffic				Average Traffic by Direction			
	Weekday		Weekend		Weekday		Weekend	
Time	SB	NB	SB	NB	SB	NB	SB	NB
12:00 - 12:59 AM	28%	72%	36%	64%	18	46	46	81
1:00 - 1:59 AM	27%	73%	18%	82%	10	25	11	50
2:00 - 2:59 AM	29%	71%	30%	70%	6	14	16	39
3:00 - 3:59 AM	42%	58%	47%	53%	9	12	14	15
4:00 - 4:59 AM	53%	47%	29%	71%	21	19	9	21
5:00 - 5:59 AM	72%	28%	60%	40%	105	41	34	22
6:00 - 6:59 AM	60%	40%	42%	58%	280	190	59	83
7:00 - 7:59 AM	51%	49%	51%	49%	416	401	121	116
8:00 - 8:59 AM	44%	56%	43%	57%	313	390	160	210
9:00 - 9:59 AM	43%	57%	44%	56%	246	324	220	279
10:00 - 10:59 AM	41%	59%	42%	58%	240	342	257	354
11:00 - 11:59 AM	40%	60%	39%	61%	250	378	278	427
12:00 - 12:59 PM	36%	64%	38%	62%	263	462	269	437
1:00 - 1:59 PM	36%	64%	37%	63%	249	435	250	429
2:00 - 2:59 PM	32%	68%	33%	67%	268	568	229	456
3:00 - 3:59 PM	26%	74%	29%	71%	260	731	203	489
4:00 - 4:59 PM	18%	82%	32%	68%	200	899	209	438
5:00 - 5:59 PM	18%	82%	37%	63%	196	923	225	383
6:00 - 6:59 PM	28%	72%	34%	66%	219	550	198	377
7:00 - 7:59 PM	30%	70%	34%	66%	169	392	168	328
8:00 - 8:59 PM	34%	66%	36%	64%	151	289	143	257
9:00 - 9:59 PM	31%	69%	35%	65%	92	203	94	175
10:00 - 10:59 PM	32%	68%	33%	67%	63	133	70	141
11:00 - 11:59 PM	33%	67%	31%	69%	43	87	56	121
Total Daily Traffic by Direction					4088	7854	3339	5726

Table 2i: East Main Street east of Lincoln Avenue ADT

Time	Single Tube Total Traffic Data Collected							Average Traffic	
	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Weekday	Weekend
	1/6/2012	1/7/2012	1/8/2012	1/9/2012	1/10/2012	1/11/2012	1/12/2012		
12:00 - 12:59 AM	64	92	107	39	71	67	58	60	100
1:00 - 1:59 AM	44	64	80	27	32	23	34	32	72
2:00 - 2:59 AM	21	55	49	11	18	21	15	17	52
3:00 - 3:59 AM	20	20	21	18	15	19	11	17	21
4:00 - 4:59 AM	40	29	24	29	34	32	35	34	27
5:00 - 5:59 AM	103	53	34	120	120	126	135	121	44
6:00 - 6:59 AM	338	105	51	387	411	390	400	385	78
7:00 - 7:59 AM	614	152	84	697	707	706	640	673	118
8:00 - 8:59 AM	504	277	133	525	561	579	578	549	205
9:00 - 9:59 AM	427	325	206	407	434	433	427	426	266
10:00 - 10:59 AM	452	415	267	388	421	447	416	425	341
11:00 - 11:59 AM	492	566	324	444	441	477	394	450	445
12:00 - 12:59 PM	545	608	373	431	501	535	500	502	491
1:00 - 1:59 PM	548	493	370	439	504	512	467	494	432
2:00 - 2:59 PM	624	560	376	581	609	578	518	582	468
3:00 - 3:59 PM	799	546	378	649	739	730	719	727	462
4:00 - 4:59 PM	970	463	388	781	935	857	902	889	426
5:00 - 5:59 PM	959	443	339	790	1112	769	885	903	391
6:00 - 6:59 PM	565	342	263	498	482	485	583	523	303
7:00 - 7:59 PM	375	277	236	312	301	313	341	328	257
8:00 - 8:59 PM	281	261	227	219	268	270	331	274	244
9:00 - 9:59 PM	289	243	139	178	237	229	224	231	191
10:00 - 10:59 PM	204	207	124	127	130	123	140	145	166
11:00 - 11:59 PM	149	158	82	78	99	88	118	106	120
							Total Daily Traffic	8893	5715

Table 2i: East Main Street east of Lincoln Avenue ADT (continued)

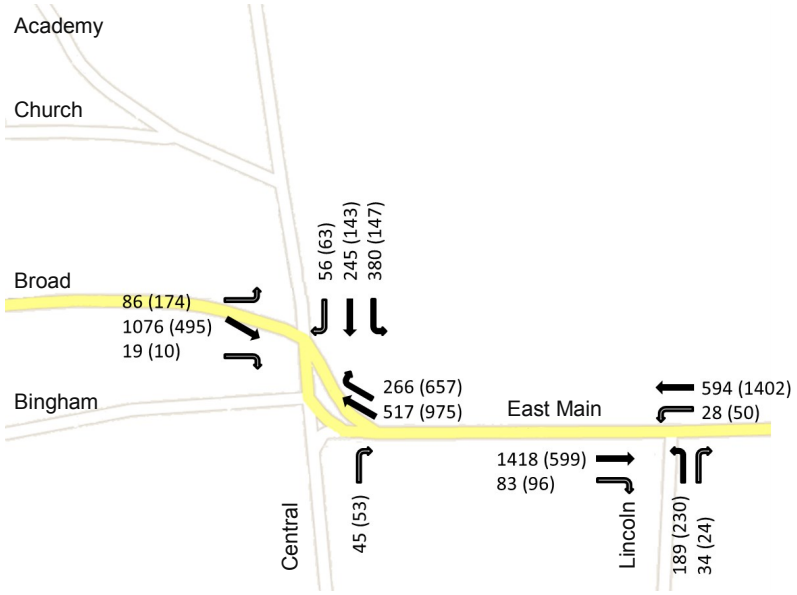
	Directional (%) Traffic				Average Traffic by Direction			
	Weekday		Weekend		Weekday		Weekend	
Time	SB	NB	SB	NB	SB	NB	SB	NB
12:00 - 12:59 AM	29%	71%	31%	69%	17	43	31	68
1:00 - 1:59 AM	36%	64%	37%	63%	11	21	26	46
2:00 - 2:59 AM	26%	74%	29%	71%	5	13	15	37
3:00 - 3:59 AM	49%	51%	27%	73%	8	9	6	15
4:00 - 4:59 AM	61%	39%	51%	49%	21	13	14	13
5:00 - 5:59 AM	76%	24%	65%	35%	92	29	28	15
6:00 - 6:59 AM	69%	31%	60%	40%	266	119	46	32
7:00 - 7:59 AM	67%	33%	56%	44%	448	225	66	52
8:00 - 8:59 AM	60%	40%	50%	50%	331	219	102	103
9:00 - 9:59 AM	49%	51%	53%	47%	211	215	140	125
10:00 - 10:59 AM	50%	50%	50%	50%	211	214	170	171
11:00 - 11:59 AM	47%	53%	49%	51%	213	236	220	225
12:00 - 12:59 PM	49%	51%	49%	51%	247	255	239	251
1:00 - 1:59 PM	45%	55%	46%	54%	224	270	197	234
2:00 - 2:59 PM	43%	57%	46%	54%	248	334	217	251
3:00 - 3:59 PM	38%	62%	42%	58%	278	449	193	269
4:00 - 4:59 PM	31%	69%	40%	60%	275	614	169	257
5:00 - 5:59 PM	31%	69%	42%	58%	280	623	165	226
6:00 - 6:59 PM	35%	65%	46%	54%	185	338	138	165
7:00 - 7:59 PM	37%	63%	37%	63%	120	208	94	162
8:00 - 8:59 PM	40%	60%	41%	59%	109	165	100	144
9:00 - 9:59 PM	36%	64%	39%	61%	84	147	75	116
10:00 - 10:59 PM	37%	63%	38%	62%	54	91	63	103
11:00 - 11:59 PM	33%	67%	39%	61%	35	71	47	73
Total Daily Traffic by Direction					3973	4920	2562	3152

Table 2j: Lincoln Avenue ADT

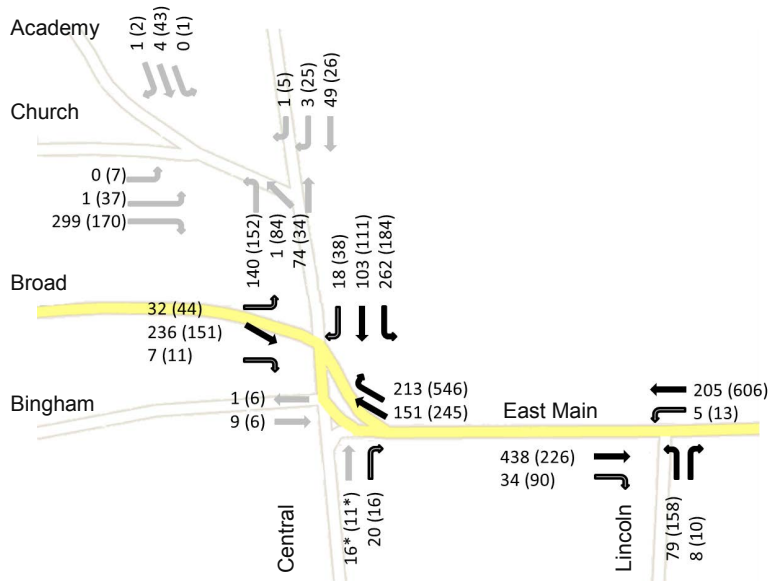
Time	Single Tube Total Traffic Data Collected							Average Traffic	
	Friday	Saturday	Sunday	Monday	Tuesday	Wednesday	Thursday	Weekday	Weekend
	1/6/2012	1/7/2012	1/8/2012	1/9/2012	1/10/2012	1/11/2012	1/12/2012		
12:00 - 12:59 AM	14	26	25	3	10	14	8	10	26
1:00 - 1:59 AM	12	12	15	8	4	8	9	8	14
2:00 - 2:59 AM	4	7	6	6	7	3	1	4	7
3:00 - 3:59 AM	14	5	9	11	11	11	8	11	7
4:00 - 4:59 AM	11	17	4	9	13	7	10	10	11
5:00 - 5:59 AM	23	21	11	26	28	21	21	24	16
6:00 - 6:59 AM	107	48	58	101	92	89	87	95	53
7:00 - 7:59 AM	185	89	81	203	172	161	138	172	85
8:00 - 8:59 AM	233	200	158	201	211	167	180	198	179
9:00 - 9:59 AM	219	280	223	234	215	174	185	205	252
10:00 - 10:59 AM	295	346	184	236	215	215	204	233	265
11:00 - 11:59 AM	276	320	279	225	240	246	232	244	300
12:00 - 12:59 PM	348	345	319	249	243	274	303	283	332
1:00 - 1:59 PM	325	300	218	228	270	233	256	262	259
2:00 - 2:59 PM	313	338	242	290	289	267	273	286	290
3:00 - 3:59 PM	379	317	224	324	303	328	344	336	271
4:00 - 4:59 PM	409	336	273	351	327	339	382	362	305
5:00 - 5:59 PM	428	359	235	361	363	367	431	390	297
6:00 - 6:59 PM	317	251	193	304	205	274	355	291	222
7:00 - 7:59 PM	235	194	133	175	154	190	227	196	164
8:00 - 8:59 PM	174	156	105	113	187	170	186	166	131
9:00 - 9:59 PM	148	87	64	65	62	82	66	85	76
10:00 - 10:59 PM	108	64	23	41	58	34	52	59	44
11:00 - 11:59 PM	65	44	22	41	25	41	28	40	33
							Total Daily Traffic	3970	3633

Table 2j: Lincoln Avenue ADT (continued)

Directional (%) Traffic					Average Traffic by Direction			
	Weekday		Weekend		Weekday		Weekend	
Time	SB	NB	SB	NB	SB	NB	SB	NB
12:00 - 12:59 AM	54%	46%	37%	63%	5	5	9	16
1:00 - 1:59 AM	24%	76%	29%	71%	2	6	4	10
2:00 - 2:59 AM	20%	80%	0%	100%	1	3	0	7
3:00 - 3:59 AM	46%	54%	25%	75%	5	6	2	5
4:00 - 4:59 AM	47%	53%	43%	57%	5	5	5	6
5:00 - 5:59 AM	58%	42%	67%	33%	14	10	11	5
6:00 - 6:59 AM	52%	48%	33%	67%	50	45	18	35
7:00 - 7:59 AM	42%	58%	51%	49%	72	100	43	42
8:00 - 8:59 AM	42%	58%	42%	58%	84	115	75	104
9:00 - 9:59 AM	44%	56%	44%	56%	90	116	111	140
10:00 - 10:59 AM	40%	60%	41%	59%	93	140	108	157
11:00 - 11:59 AM	40%	60%	46%	54%	97	147	139	160
12:00 - 12:59 PM	46%	54%	47%	53%	129	154	156	176
1:00 - 1:59 PM	37%	63%	41%	59%	97	165	106	153
2:00 - 2:59 PM	38%	62%	41%	59%	108	178	117	173
3:00 - 3:59 PM	40%	60%	34%	66%	134	202	91	180
4:00 - 4:59 PM	40%	60%	44%	56%	144	217	133	171
5:00 - 5:59 PM	43%	57%	47%	53%	168	222	140	157
6:00 - 6:59 PM	40%	60%	44%	56%	117	174	99	123
7:00 - 7:59 PM	34%	66%	40%	60%	66	130	66	98
8:00 - 8:59 PM	41%	59%	44%	56%	67	99	57	73
9:00 - 9:59 PM	37%	63%	43%	57%	31	53	33	43
10:00 - 10:59 PM	35%	65%	32%	68%	20	38	14	29
11:00 - 11:59 PM	45%	55%	32%	68%	18	22	11	22
Total Daily Traffic by Direction					1618	2353	1546	2087



2000 Peak hour turning movements. Source: ConnDOT



2012 Peak hour turning movements. Source: CCRPA

Figure 3: Peak hour turning movement counts.

Table 3a: Turning Movements during Peak Hour at intersection of Church Avenue, Academy Street, and Central Street

	From North (Academy Street)			From East (Central Street)			From South (Central Street at Bridge)			From West (Church Avenue)		
	Right (to Church Avenue)	Thru (to Central Street at Bridge)	Left (to Central Street)	Right (to Academy Street)	Thru (to Church Avenue)	Left (to Central Street at Bridge)	Right (to Central Street)	Thru (to Academy Street)	Left (to Church Avenue)	Right (to Central Street at Bridge)	Thru (to Central Street)	Left (to Academy Street)
Morning Peak*												
7:00 - 7:59 AM	1	4	0	1	3	49	74	1	140	299	1	0
Afternoon Peak*												
4:30 - 4:44 PM	*1*	*13*	*0*	*1*	*8*	*9*	*7*	*18*	*45*	*36*	*17*	*5*
4:45 - 4:59 PM	*0*	*10*	*0*	*2*	*4*	*6*	*8*	*23*	*44*	*48*	*7*	*1*
5:00 - 5:14 PM	*1*	*12*	*0*	*1*	*4*	*5*	*9*	*23*	*26*	*44*	*8*	*0*
5:15 - 5:29 PM	*0*	*8*	*1*	*1*	*9*	*6*	*10*	*20*	*37*	*42*	*5*	*1*
4:30 - 5:29 PM	2	43	1	5	25	26	34	84	152	170	37	7

*Morning peak counted in a one-hour-interval. Afternoon peak counted in 15-minute intervals, then summed together.

Table 3b: Turning Movements during Peak Hour at intersection of Central Street, Broad Street, and East Main Street

	From North (Central Street at Bridge)			From East (East Main Street)			From South (Central Street)			From West (Broad Street)		
	Right (to Broad Street	Thru (to Central Street)	Left (to East Main Street)	Right (to Central Street at bridge)	Thru (to Broad Street)	Left (to Central Street)*	Right (to East Main Street)	Thru (to Central Street at bridge)*	Left (to Broad Street)*	Right (to Central Street)	Thru (to East Main Street)	Left (to Central Street at bridge)
Morning Peak												
7:15 -8:14 AM	18	103	262	213	151	0	20	16	0	7	236	32
Afternoon Peak												
4:15 - 5:14 PM	38	111	184	546	245	1	16	11	0	11	151	44

*Although restricted by traffic islands, some motorists made this manuever.

In addition to the four main routes, Bingham Street and a private property driveway (at the traffic signal) are also at this intersection.

For the private property driveway at the traffic signal:
During the morning, 1 car entered (from north), 2 cars exited (to north).
During the afternoon, 7 cars entered (5 from north, 2 from west), 10 cars exited (to north).
This driveway is busier during the weekends and lunch/dinner time operations of a restaurant business.

For Bingham Street:
During the morning, 1 car entered (from north), 9 cars exited to east.
During the afternoon, 7 cars entered (6 from north, 1 from east by manuevering around traffic island), 6 cars exited to east.

Table 3c: Turning Movements during Peak Hour at intersection of East Main Street and Lincoln Avenue

	From East (East Main Street)		From South (Lincoln Ave)		From West (East Main Street)	
	Thru	Left	Right	Left	Right	Thru
Morning Peak						
7:00 - 7:14 AM	*43*	*2*	*1*	*21*	*6*	*99*
7:15 - 7:29 AM	*54*	*0*	*4*	*21*	*9*	*111*
7:30 - 7:44 AM	*50*	*1*	*3*	*23*	*8*	*136*
7:45 - 7:59 AM	*58*	*2*	*0*	*14*	*11*	*92*
7:00 - 7:59 AM	205	5	8	79	34	438
Afternoon Peak						
4:30 - 4:45 PM	*141*	*3*	*3*	*45*	*25*	*57*
4:45 - 5:00 PM	*143*	*4*	*5*	*39*	*18*	*48*
5:00 - 5:15 PM	*154*	*5*	*2*	*41*	*24*	*65*
5:15 - 5:30 PM	*168*	*1*	*0*	*33*	*23*	*56*
4:30 - 5:29 PM	606	13	10	158	90	226

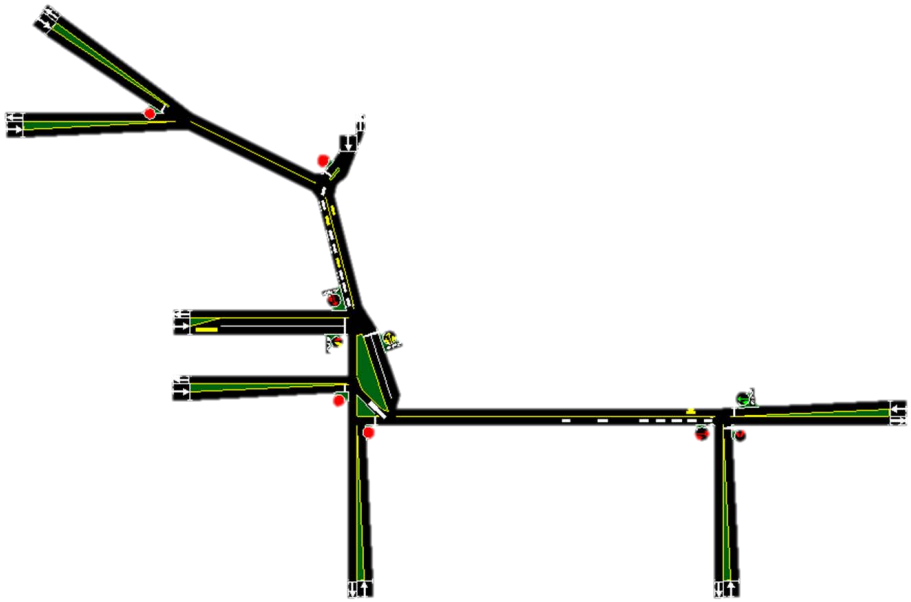


Figure 4a (Part I): Simulation of existing intersection. Screen shot of computer model using TRANSYT-7F software.

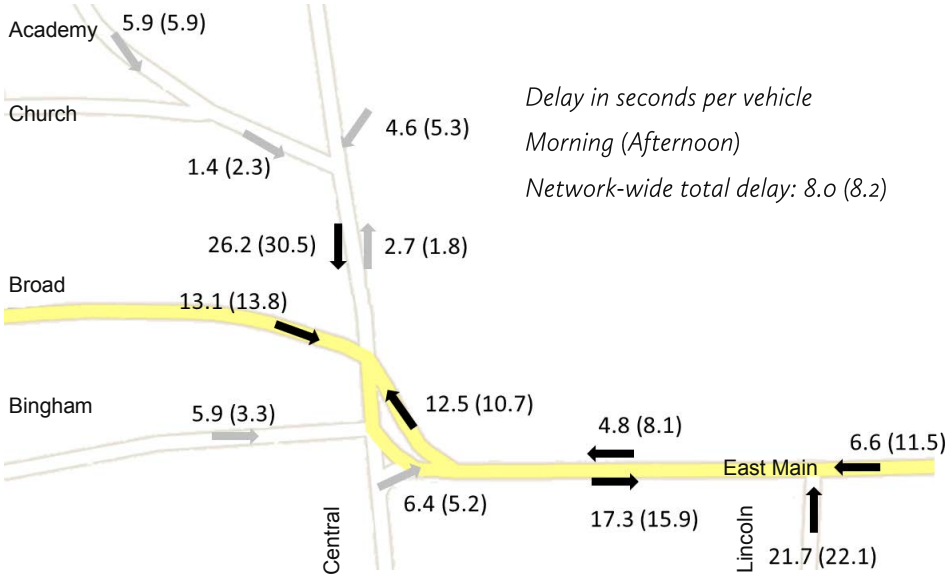


Figure 4a (Part II): Estimated delay based on existing conditions for each approach at each intersection based on simulation model.

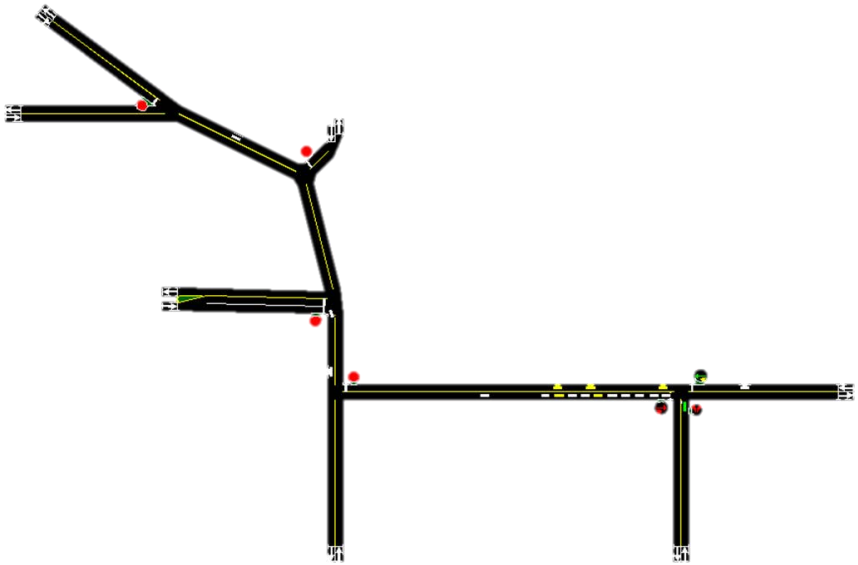
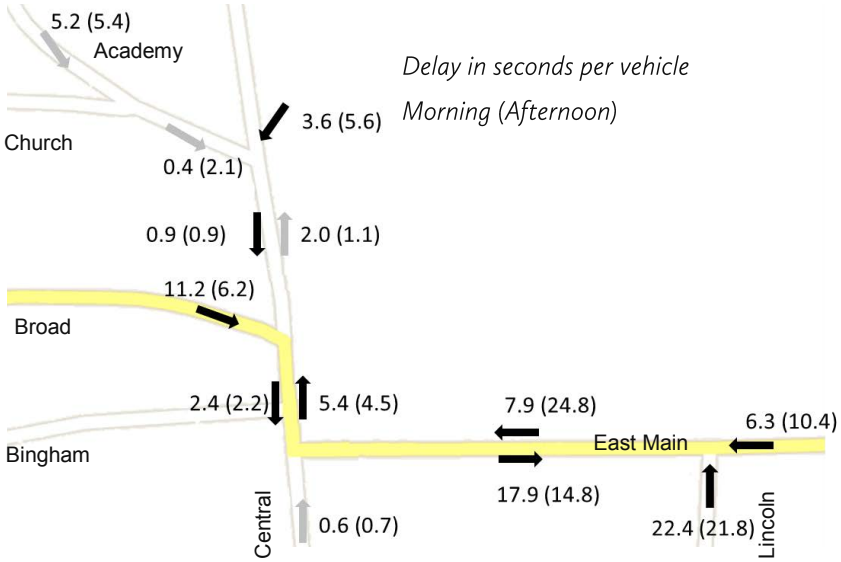


Figure 4b: Simulation of Proposed

(Left) Screen shot of computer model using TRANSYT-7F software. Bingham Street is omitted due to technical limitations of the software.

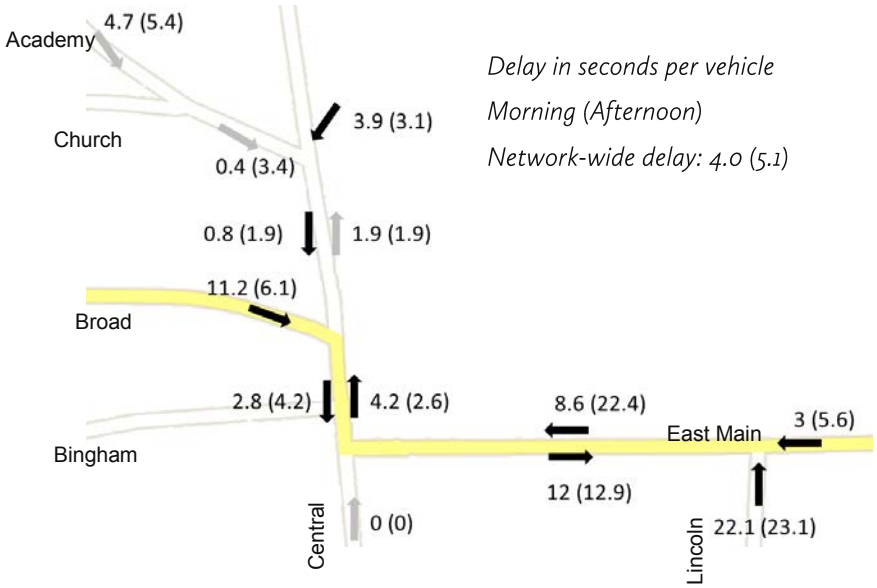
(Bottom Left) Estimated delay based on proposed changes and current traffic patterns.

(Bottom Right) Estimated delay based on proposed changes and a shift in traffic patterns. The assumption is that half the vehicle traffic from East Main Street and Lincoln Avenue will shift to Central Street because northbound travel will be possible after removing the traffic islands. If vehicle patterns shift, the network-wide delay will improve.



Delay in seconds per vehicle

Morning (Afternoon)



Delay in seconds per vehicle

Morning (Afternoon)

Network-wide delay: 4.0 (5.1)

Table 4: Delay Comparison of Simulation Models

Delay in secs/veh Morning (Afternoon)	Network-wide Delay	EB Delay (Broad St) at int. with Central	WB delay (E Main St at int. with Central)	NB delay (Central St at int. with Broad)	SB delay (Central St at int. with Broad)
Existing Conditions	8 (8.2)	13.1 (13.8)	12.5 (10.7)	n/a	26.2 (20.5)
Proposed Conditions (with current traffic patterns)	5.9 (8.1)	11.2 (6.2)	7.9 (24.8)	5.4 (4.5)	0.9 (0.9)
Proposed Conditions (with shift in traffic patterns)	4 (5.1)	11.2 (6.1)	8.6 (22.4)	4.2 (2.6)	0.8 (1.9)

*Additional simulations were conducted with varying layouts with stop signs, turning lanes, et al. Four-way stop intersections resulted in significant delay. Turning lanes did not have a considerable impact to delay.

Appendix C: Public participation

In order to create a village design that would accurately represent the vision of Forestville residents, business and property owners, and other interested people, providing ample opportunities for public participation was critical. From the beginning of the research and analysis stage, this project was put out before the public eye. It was first presented to Bristol city officials and commissions, then the Forestville Village Association, and finally the public at large. There was also a committed monthly working group that was formed early on to filter through the project team's initial ideas and offer feedback on design ideas.

The City of Bristol: City Officials, Planning Commission and Zoning Commission

In November 2011 the project team held a meeting with Bristol's Mayor, the city planner, and the Chair of the Zoning Commission, and also attended a regular meeting of the Planning Commission. The overall project goals were shared along with a plan for a more formal public participation process. It was at this meeting that the initial idea of adopting this plan as an amendment to the City's Plan of Conservation and Development (POCD) was discussed. A previous plan completed by the consultants Fitzgerald and Halliday, the Route 72 Land Use and Transportation Master Plan, was written for Bristol in 2005. This study was done to plan for the anticipated impacts of the now-relocated and expanded Route 72 Expressway. The full version of the plan can be found on the Bristol's municipal website. Within the plan, there are specific traffic management, roadway design and zoning recommendations for the village center of Forestville. It was encouraged that the Forestville Project build on the existing recommendations within the Corridor Study and provide a vision of what the village could become. By adopting the Forestville Plan as an amendment to the POCD it would allow any future development in Forestville to be filtered through the plan recommendations and help guide transportation and land use choices.

Working Group

Once the research and analysis phase was underway, the project team began to plan out how to engage a core group of public par-

ticipants on a regular basis. Through recommendations from City Officials and committees, Forestville businesses, and community organizations, individuals were identified who were then invited to participate in this working group. After a few meetings, a regular group of approximately ten participants was formed and began meeting monthly through the winter and spring months of 2012.

The main purposes of the working group were to represent and advocate for the different interests within the village, help the project team understand the "pulse" of Forestville, provide detailed information about the project area, and help identify existing challenges and potential opportunities. Through the monthly meetings, the working group acted as bridge between the public and project team and allowed for refinements to be made to the research, analysis and design phases of the project before being presented to the public.

Forestville Village Association

The Forestville Village Association (FVA) is a critical organization in the Forestville community. It defines itself and vision as:

> *A community minded neighborhood organization consisting of business leaders and residents interested in the Forestville section of Bristol, Connecticut. This association is designed to enhance the architectural and cultural character of Forestville, by promoting the quality of life and commerce of the community.*
>
> *The vision of the Forestville Village Association, Inc. is to encourage community business leaders and residents to become active participants in the village. Our goal is to promote village-based events and support efforts to maintain the natural and architectural beauty of the village.*

From the beginning, it was clear that including the FVA in the analysis and design of this project was critical to its success. The project team presented to this group on several occasions during the research and analysis phase and the design phase. Several of the FVA members were also part of the working group and were able to offer valuable, consistent input.

Community Design Meetings

Throughout the project several community design meetings were held for the public at large. The meetings informed Forestville residents and other interested parties of project progress and explored different design solutions for issues identified by the working group. Early on in the public participation process a meeting was held specifically targeting Forestville Village

A working group session.

Association members and property owners. The working group members felt it imperative that this audience be given a specific opportunity to hear about the project progress, view schematic designs and share any comments and questions they may have.

After these meetings, several community design meetings targeting the general public were held. Background information on the project and work completed was presented, followed by work sessions exploring areas for infill development, parking, and open space. Through these community design meetings, a concrete design direction and vision were identified. This information allowed the project team to then make informed decisions when drafting the final plan.