
Public Safety Building Access Study - Draft Report

Public Safety Building & City Industrial Park New Access Study

City of Watertown

Prepared for
Watertown Jefferson County Area
Transportation Council

317 Washington Street
Watertown, New York 13601



Final
November 2022

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City of Watertown, Jefferson County

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EXECUTIVE SUMMARY

The Public Safety Building and City Industrial Park New Access Study project is a feasibility analysis of transportation access locations for the City Center Industrial Park located in the City of Watertown, New York. This report has been prepared in accordance with the New York State Department of Transportation (NYSDOT) Project Development Manual, 6 NYCRR (New York Codes, Rules, and Regulations), Part 617 and 23 CFR (Code of Federal Regulations), and 771 for the Watertown Jefferson County Area Transportation Council (WJCTC).

The study limits are centralized around the City Center Industrial Park and the Public Safety Building Complex and two transportation corridors were identified as part of this project. The Arsenal Street corridor begins at Towne Center Drive, in the Town of Watertown, and extends approximately 2.3 miles eastward into the City to Massey Street South; the Massey Street South corridor begins at the CSX Yard access road and extends approximately 1.2 miles North to the intersection of Mullin Street West. The study identifies potential access locations to provide a more direct connection to areas within the City of Watertown that are south and east of the Industrial Park while also providing a designated truck access for Industrial Park commercial vehicles. Currently, the only access to the Industrial Park is limited to the Arsenal Street and Bellew Avenue South intersection which severely inhibits response times for City of Watertown emergency vehicles due to the presence of heavy truck traffic originating from the Industrial Park and various commercial businesses along Bellew Avenue South. This study is being performed in response to input from City of Watertown Public Safety, Jefferson County Sheriff's office, and Industrial Park stakeholders which desire to significantly improve access to the Industrial Park for both commercial and emergency response vehicles.

The feasibility assessment includes a comprehensive review of public participation results, existing site conditions, right-of-way ownership, existing land usage, potential future development, and a preliminary environmental analysis. To further determine impacts of each alternative, this assessment also reviewed existing transportation networks with consideration of traffic and crash data. An integral part of this study was through public and municipal coordination including meetings with Industrial Park stakeholders, City of Watertown Public Safety Personnel, Jefferson County Sheriff's Office Personnel and the NYSDOT. These meetings further strengthened the desire for additional access to the Industrial Park in anticipation that alternatives would be developed addressing concerns of all parties.

The existing conditions assessments presents key considerations for the alternative locations and other improvements that would be required to minimize impacts to adjacent environmental areas and the CSX railway. These considerations have been reflected in the selection of design alternatives presented in this report. Existing right-of-way mapping indicates Alternatives will require easements and/or acquisitions to construct proposed access routes. Industrial Park tenants expressed desire for future expansions and developments and while no plans for improvements are currently in planning stages, these concerns were also taken into consideration specifically focusing on improvements related to commercial truck access alternatives.

The preliminary environmental review determined that numerous alternatives would significantly impact federal and state defined wetlands and environmentally sensitive areas. Additionally, alternatives would require extensive clearing of existing forested areas creating additional impervious surfaces increasing stormwater runoff. It is important to note that construction timing may be impacted due to restrictions of summer tree removal resulting from the presence of endangered species habitat within the City of Watertown.

The transportation network was assessed to confirm roadway standards and classification of each corridor that is identified as part of this study. Arsenal Street is owned by the State of New York and maintained by NYSDOT, and classified as an Urban Principal Arterial that is part of the National Highway System and designated as an access roadway. Massey Street South is a City of Watertown owned and maintained roadway classified as an urban major collector; this corridor is not part of the National Highway system nor is it a designated access roadway. Interstate 81 is a New York State owned and Maintained roadway classified as a Principal Arterial Interstate that is part of the National Highway System and a designated access roadway. Ives Street is owned and Maintained by the City of Watertown and classified as an Urban Major Collector; this corridor is not part of the National Highway System nor is it a designated access roadway. The following corridors are designated as Urban Local Roads owned and maintained by the City of Watertown and are not part of the National Highway System nor are they designated as an access roadway: Mullin Street West, Pine Street, Coleman Ave, Sand Street, Waterman Drive, Rail Drive, Roundhouse Drive, and Bellew Avenue South. The Raymour & Flannigan Plaza owned and maintained by private stakeholders that primarily serves as a shopping plaza for commercial retail businesses and offices.

The traffic data analyses determined all 8 studied intersections currently experiences an acceptable Level of Service (LOS) rating and future improvements are not expected to significantly degrade quality to an extent where additional mitigation is required. However, the crash analyses determined all studied intersections and corridors experience crash rates greater than the statewide average for similar facilities. These findings indicate additional improvements may be required to reduce crash occurrences at each intersection.

Design alternatives were developed as part of this feasibility study, as presented on Figures 2 and 3 of Appendix A. A detailed evaluation of design alternatives was completed and determined a number of alternatives to be removed from further analysis based on geometric and goal shortcomings. Alternatives selected for a secondary review were categorized as Short Term and Long Term alternatives based on the anticipated improvements to the Industrial Complex each is expected to achieve. The overall feasibility study recommendation is to provide proposed design alternatives which benefit the accessibility of the Industrial Park and Public Safety Complex for future consideration and implementation

1.0 INTRODUCTION

This project involves a feasibility analysis of existing operations and identified plausible locations for redundant vehicular access to the City of Watertown and surrounding areas for the use by the City of Watertown Public Safety Building Complex (herein referred to as "PSB Complex") and City Center Industrial Park. Currently, these facilities are limited to one access location at the Arsenal Street and Bellew Avenue South intersection which significantly inhibits response times from emergency services, and may be affecting the ability to gain interest from new tenants to the Industrial Park. A redundant access point within the study limits would improve response times for emergency services and could also serve as the first stage of relief route for surrounding roadways. In addition, the proposed alternatives would provide added operational and safety benefits for future developments within the Industrial Park. The study examined the existing access route from Arsenal Street via Bellew Avenue South and Waterman Drive along with alternative access locations to identify the most suitable location for a redundant access point, corresponding roadway, and associated intersections. The alternative access routes have been analyzed in broad context and evaluated according to evaluation criteria established by the WJCTC. The preferred alternative could be utilized as the basis for future preliminary design by a separate effort led by the City of Watertown as a Locally Administered, Federal Aid project. This study has involved extensive stakeholder outreach and public engagement especially regarding the selection of proposed locations and identifying needs of all facilities involved.

1.1. Study Area

Located on the west side of the City of Watertown but east of the I-81 corridor, the Public Safety complex is the City and County's central hub for emergency services such as Emergency Medical Services, City of Watertown Police Department, and Jefferson County Sheriff's offices. Additionally, manufacturing, warehouse and office support facilities also utilize the adjacent land within the city Industrial Park, which in many cases require significant heavy vehicle truck traffic volumes in and out of the study area using Bellew Avenue South and exiting on to the surrounding roadway network at the intersection with Arsenal Street. Currently, the only access to the PSB Complex and Industrial Park is from Bellew Avenue South., which is classified as a local residential street and is not designed to facilitate the flow and volume of heavy vehicle traffic use.

The study for the alternatives analysis takes a broad look at lands surrounding the PSB Complex and Industrial Park, including the adjacent road network, as illustrated on Figure 1-1.

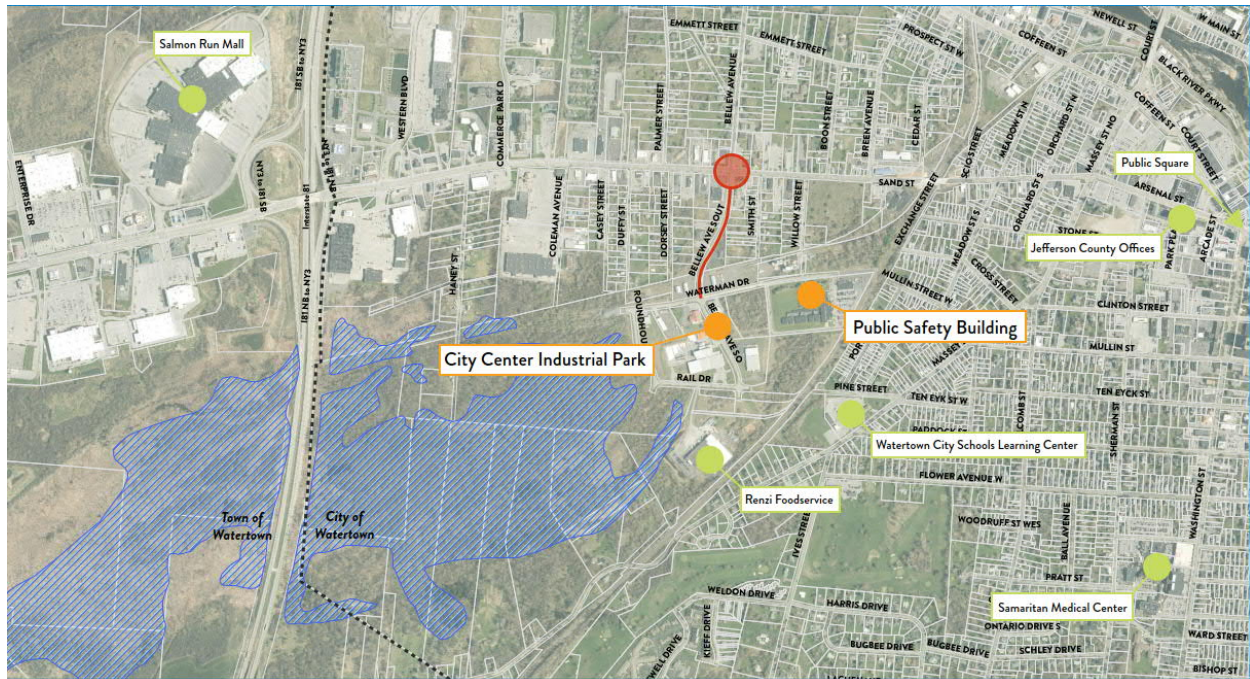


Figure 1-1: Project Location Map

1.2. Study Purpose and Need

Currently, the intersection of Arsenal Street and Bellew Avenue South is the only access for the PSB Complex personnel and Industrial Park tenants including commercial truck traffic. The WJCTC undertook this Public Safety Building Complex Access Point Study to identify the most suitable location and alignment for a redundant access to the PSB Complex and Industrial Park. The purpose of the study can be broken down into the following:

- Improve emergency services response times from the PSB Complex;
- Mitigate heavy truck vehicles away from the Arsenal Street corridor that are destined for the PSB Complex and Industrial Park by evaluating alternative access routes; and,
- To analyze existing access routes and recommend improvements to existing infrastructure including intersections, traffic signals, and road geometry

Furthermore, the following objectives of the Study that became critical:

Location/ Alignment

- The current intersection of Bellew Avenue South and Arsenal Street and associated infrastructure will continue to serve the park and PSB complex in its existing condition until upgrades are funded.
- Alternative alignments and locations will serve both the PSB Complex and the Industrial Park, and not exclude one or the other.
- Alternative alignments and locations will minimize the number of properties impacted.

Operations/ Safety

- The current intersection of Bellew Avenue South & Arsenal Street and associated infrastructure will accommodate existing user patterns and safety provisions.
- Alternative alignments and new intersections will provide safe and efficient movements in and out of the PSB Complex and Industrial Park.

Community

- Upgrades at the existing Bellew Avenue South and Arsenal Street intersection as well as alternative alignments and intersections aim to minimize negative impacts to residential areas and the surrounding community.

Environmental

- Alternative locations and alignments will minimize impacts to sensitive environmental resources.

Multi-Modal Opportunities

- The existing access point at Bellew Avenue South and Arsenal Street will maintain multi-modal capability and alternative alignments and locations should be multi-modal to accommodate trucks, buses, automobiles, bicyclists and pedestrians.

Tourism & Economic Development

- Alternative locations and access point should conform to the larger regional tourism and economic development vision and certainly not impede such goals for the City and County.

2.0 MUNICIPALITY & PUBLIC COORDINATION

Planning is an on-going process, building upon previous studies to adjust to new demands of people and their surrounding environment. Meetings with the WJCTC, City of Watertown Public Safety personnel, Jefferson County Sheriff’s office, and Industrial Park Stakeholders were conducted, each guided by current deficiencies all parties experience directly caused by existing geometry and limited site access. Barton & Loguidice retained the services of Highland Planning to perform one-on-one and small group interviews throughout the months of February and March, 2021. These interviews were directed toward sharing information regarding the project scope, desired outcomes, and to gather initial feedback for the Access Study.

Table 2-1: Sequence of Project Meetings		
Date	Organization/Firm	Description
February 25, 2021	Watertown Local Development Corporation	Existing Conditions, Needs Assessment, & Alternative Concepts
February 26, 2021	Jefferson County Economic Development (JCED)	Existing Conditions, Needs Assessment, & Alternative Concepts
March 2, 2021	Renzi’s Food Service	Existing Conditions, Needs Assessment, & Alternative Concepts
March 30, 2021	Gaetano Transportation	Existing Conditions, Needs Assessment, & Alternative Concepts
April 5, 2021	Erie Materials	Existing Conditions, Needs Assessment, & Alternative Concepts
August 17, 2021	Jefferson County Sheriff’s Office	Existing Conditions, Needs Assessment, & Alternative Concepts
November 9, 2021	City of Watertown Police Department	Existing Conditions, Needs Assessment, & Alternative Concepts

The information presented and summary of comments received during these meetings are included in Appendix C.

The study was performed with coordination and respect to the City of Watertown Comprehensive Plan and Origin-Destination study to fully understand the direction which the City intends to develop the Industrial Park. Additionally, this feasibility study was performed with respect to the City of Watertown Truck Route Study completed by Barton & Loguidice, with assistance from Highland Planning and WSP, and submitted February 2022 to the WJCTC.

2.1. City of Watertown Comprehensive Plan

The City’s 2019 Comprehensive Plan outlines a clear vision for the future of Watertown, and identifies opportunities for growing and enhancing its key assets and leveraging exciting new opportunities. Any future transportation investment surrounding the Industrial Complex and Public Safety Building will need to consider the goals and recommendations of the Comprehensive Plan, and determine the impacts, both positive and negative, to current and desired future land use and development.

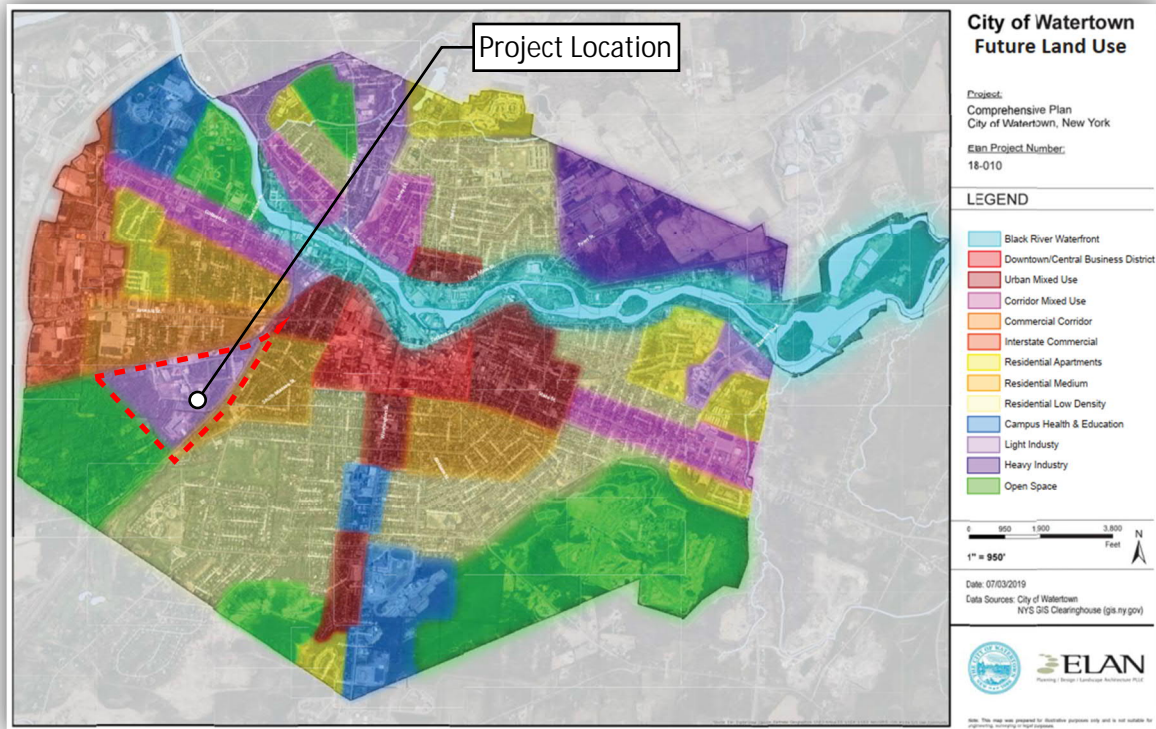


Figure 2-1: Suggested Future Land Use in the City of Watertown

One of the key takeaways from the Plan that has relevance to this Study is the City's interest in growing their Light Industrial economic sector in targeted locations. The Industrial Park is one of the most appropriate locations for such development, and thus was indicated as such on the Future Land Use map in the Plan. Any new and/or improved roadway access to the park and PSB Complex will support increased light industrial development by better facilitating the movement of truck traffic and emergency response vehicles in and out of the area. The City is currently in the process of rewriting its zoning designations and the Industrial Park area is intended to be rezoned as part of this effort. Future zoning will designate the first few blocks south of Arsenal Street as residential land use.

It is also important to compare the existing zoning and Future Land Use map designations for the areas in which the alternatives of this study are located. Alternatives were selected based on existing and future land usage to minimize impacts to residential areas. Commercial corridors detailed in the previous figure indicates that the City would support higher-intensity commercial development serving the region at large – suggesting that the corridor would remain a high-volume roadway with a significant amount of truck activity. This may result in increased congestion and delays given the intent to continue commercial development in this area, where feasible.

2.2. Origin-Destination Study

A cursory origin-destination assessment was undertaken to understand the travel characteristics of traffic entering and leaving the PSB Complex and Industrial Park. Travel patterns of vehicles using the Bellew Avenue South and Arsenal Street intersection were analyzed using a sample of data collected in the month of August 2021. The data was collected by AirSage, a company that specializes in geolocating data based on real time mobile, GPS, and other spatial inputs for population and location based analytics. All data was rendered anonymous and only used for purposes of generalizing trip patterns across the MPO region. The origins and destinations were calculated through a series of zones throughout the region in order to articulate general trends in where vehicles destined for the PSB Complex and Industrial Park are originating from. While this type of O&D study tends to be of a more regional scale, it does help in understanding if locating a new vehicular access point too far in any direction might have an effect on more regional travel patterns. The origin-destination assessment found the following top 4 travel patterns:

- Vehicles traveling between the City of Watertown and areas northwest of the Village of Brownville;
- Vehicles traveling between areas northwest of the City and areas southwest of the City;
- Vehicles traveling between areas southwest of the City and areas north of the region near Alexandria Bay;
- Vehicles traveling between areas southwest of the City and areas within the City of Watertown, primarily north of the Black River;

Following the assessment of travel patterns, it can be surmised that a new access location and route near or to the west of the existing Bellew Avenue South/Arsenal Street intersection would best serve the Industrial Park and PSB Complex, continuing to accommodate those vehicles traveling between points northwest and southwest of the City while continuing to provide access to areas within the City of Watertown. However, this O&D study does not account for the type of vehicle, particularly emergency response vehicles, and therefore does not merit the elimination of any of the east-bound alternatives from the current PSB Complex.

3.0 EXISTING FACILITIES

3.1. Land Usage

The Arsenal Street corridor from Towne Center Drive east to Bellew Avenue South is primarily composed of commercial facilities including retail stores, lodging, and medical office buildings; Arsenal Street west of Bellew Avenue South transitions to mixed land usage with commercial and residential properties lining the corridor. Bellew Avenue South is also primarily a commercially zoned corridor with retail, financial, and federal office driveway access along the roadway.

Massey Street South, Mullin Street West, Ives Street, and Coleman Ave are primarily residential corridors with little to no commercial facilities that contribute to additional traffic volumes that would otherwise not be present due to those facilities.

The Raymour & Flannigan plaza is a commercially zoned parcel which specifically acts as parking and access to commercial businesses and medical office buildings within the plazas footprint.

3.2. Environmental Assessment

A preliminary environmental assessment was completed to understand the impacts of potential impacts that proposed alternatives would inflict on surrounding areas.

Threatened & Endangered Species

Suitable roosting and foraging habitat for the endangered Indiana Bat and threatened Northern Long Eared Bat, including trees greater than 3 inches in DBH and trees near surface water resources, is present within the proposed alternatives projected limits of disturbance. Tree removals will occur during NYSDEC's tree cutting window for the protection of bats (November 1 – March 31) to avoid impacts to roosting bat species. Additionally, habitat for the Monarch Butterfly is identified within the project limits. While this species is currently identified as a "candidate" for sensitive species, special care is required to reduce impacts. As a result, potential projects will require coordination with the NYSDEC and Federal Fish and Wildlife to reduce impacts to endangered and threatened species.

Rare Wildlife Species

The Environmental Resource Mapper provided by the New York State Department of Environmental Conservation (NYSDEC) indicates that the project area is in the vicinity of rare plants listed as endangered, threatened or rare by the NYSDEC. However, it is expected that construction of additional access for the PSB Complex and Industrial Park will not impact rare plant species areas due to the location of proposed alternatives.

State and Federal Wetlands

Review of the NYSDEC Environmental Resource Mapper, Fish and Wildlife Service National Wetlands Inventory, and GIS data identified significant state wetland areas within the project limits that will experience significant disturbance with the construction of select design alternatives.

Floodplains

The Federal Emergency Mapping Assessment (FEMA) indicates the undisturbed area west of the Industrial Park and South of Towne Center plaza is classified as Zone A, designating this area as a special flood hazard area inundated by 100-year flood events. However, no base flood elevations are defined.

National & Historic Resources

Review of the National Register of Historic Places (NRHP) Cultural Resource Information System (CRIS) Mapping indicated there are no buildings or areas that are identified as historic within the study limits. However, the review of the NYS Parks CRIS mapping identified numerous archeological surveys within the study area that are within limits of disturbance of proposed alternatives.

Parks

While there are no NYS parks within the vicinity of the study area, a Cemetery is present along Arsenal Street and Willow Place. However, it is expected that construction of additional access for the PSB Complex and Industrial Park will not impact Cemetery areas due to the location of proposed alternatives.

Noise

Many residential dwellings exist within the project limits, specifically locations along Massey Street South. Since residential dwellings are the most susceptible to noise disruption beyond the construction phase, additional amenities may be required to adversely combat against additional noise caused by increased commercial truck traffic.

Visual Impacts

The construction of proposed alternatives is not anticipated to negatively affect visual appearances of surrounding areas.

3.3. Transportation Network

Development of the Watertown Public Safety Building study identified four alternative access points with the potential to improve response times of emergency vehicles to the downtown area. The corridors of Arsenal Street and Massey Street South were identified as integral connections to the downtown area and four intersections were selected to be studied based on alternative access points along these corridors. The Mullin Street West, Pine Street, and Ives Street corridors are anticipated to be the secondary corridors servicing the alternative access points for the downtown area.

Arsenal Street is owned by the State of New York and maintained by the New York State Department of Transportation (NYSDOT) that is functionally classified as an Urban Principal Arterial with an average daily traffic (ADT) flow of 22,102 vehicles per day (VPD) as of 2019. Within the study limits, Arsenal Street is composed of two 12' wide travel lanes in each direction with a 12' wide center two-way left turn lane. The speed limit within this corridor is 30mph in both the eastbound and westbound lanes. Additionally, Arsenal Street is a designated access highway and part of the National Highway System (NHS). The intersection of Arsenal Street and Bellew Avenue South is currently the primary access to the Industrial Complex and the City of Watertown Public Safety facility. This 4-legged, signalized intersection is composed of a dedicated left turn lane, through lane, and a combined thru/right turn lane in both the eastbound and westbound approaches; northbound and southbound approaches consist of a dedicated left turn lane and a combined thru/right turn lane.

Massey Street South is owned and maintained by the City of Watertown and is functionally classified as an Urban Major Collector. From Ives Street to the intersection of Arsenal Street, Massey Street South retains an ADT of 1,997vpd as of 2019; the ADT on Massey Street South from Old Rome Rd to the I-81 Bridge is 877vpd. Within the city limits, Massey Street South is a two lane roadway with an approximate pavement width of 30' and a posted speed limit of 30mph; on street parking is allowed along this corridor. Outside of the city limits, Massey Street South is a two lane roadway with an approximate pavement width of 22' with a posted speed limit of 55mph.

The following corridors in this report serve primarily as the main access for the proposed alternatives that intend to construct redundant access for the Public Safety Complex. It is important to note that some of these roadways are functionally classified as local/residential roads and therefore no traffic data is provided by the NYSDOT.

Mullin Street West is a City of Watertown owned and maintained roadway and classified as an Urban Local Road. It is not designated as an access highway nor is it part of the NHS. Mullin Street West is a two lane road with an approximate pavement width of 30 feet. The intersection of Massey Street South and Mullin Street West is a 5-legged intersection with an adjacent spur

catering to Dimmick Street. The intersection is controlled by a pre-timed traffic signal with one approach lane in each direction.

Pine Street is a City of Watertown owned and maintained roadway and classified as an Urban Local Road. It is not designated as an access highway nor is it part of the NHS. Pine Street is a two lane road with an approximate pavement width of 25 feet. Pine Street serves as secondary access to the Watertown City School District Learning Center parking lot. The intersection of Massey Street South and Pine Street is a two-way stop controlled intersection with stop signs located on Pine Street and West Ten Eyck Street; Massey Street South approaches are uncontrolled allowing for free flowing traffic movements.

Ives Street is a City of Watertown owned and maintained classified as an Urban Major Collector with an ADT of 2,131vpd. It is not designated as an access highway nor is it part of the NHS. Ives Street is a two lane roadway with an approximate pavement width of 28 feet. The intersection of Massey Street South and Ives Street is a 3-legged intersection controlled by a single stop sign on the Ives Street approach; Massey Street South approaches are uncontrolled allowing for free flowing traffic.

The Raymour & Flannigan plaza is owned and maintained by through private entities. Currently the plaza contains no traffic calming or traffic control devices that control access within the parking lot limits. A single yellow full barrier line extending the length of the plaza exists to partially define northbound and southbound travel lanes. Parking striping to designate spaces are present striping to designate parking spaces. The southern portion of the plaza is currently being utilized as an outdoor sales and storage area for Tractor Supply inventory. The intersection of Arsenal Street and Raymour & Flannigan/Cedar Square serves as the primary access to the shopping center. It is important to note that this intersection is a designated Citibus stop location. This 4-legged, signalized intersection is composed of a dedicated left turn lane, through lane, and a combined thru/right turn lane in both the eastbound and westbound approaches; northbound and southbound approaches consist of a dedicated left turn lane and a combined thru/right turn lane.

4.0 ALTERNATIVE ANALYSIS

4.1. Initial List of Potential Alternative Locations

The study area for the project was generally defined as the area between I-81 to the west, Arsenal Street to the north, and Massey Street South to the east and south. However, as the evaluation of alternatives progressed, the Towne Center entrance road west of I-81 in the Town of Watertown became a logical western boundary for the study area. The development and evaluation of alternatives followed a multi-step process that narrowed down the number of alternatives using qualitative and quantitative evaluation criteria along with input from project stakeholders and the public. Following several meetings with the MPO and local and regional stakeholders in 2021, the WJCTC, the City of Watertown Police Department and the Jefferson County Sherriff's office began outlining potential alternative routes into and out of the PSB Complex and Industrial Park to be further studied and eventually constructed. The following alternatives were taken into consideration for this project:

- Alternative 1 – Bellew Avenue South and Arsenal Street Intersection Improvements
- Alternative 2 – Access Road via Coleman Ave
- Alternative 3 – Access Road via Sand Street
- Alternative 4 – Black River Parkway Extension
- Alternative 5 – Access Road over CSX Railway via Mullin Street West
- Alternative 6A – Access Road over CSX Railway via Ives Street
- Alternative 6B – Access over CSX Railway via Pine street
- Alternative 7 – Access Road from Roundhouse drive to Massey Street South
- Alternative 8 – Designated Interstate 81 Off-Ramp
- Alternative 9 – Access Road from Towne Center Drive to Waterman Drive
- Alternative 10 – Raymour & Flannigan Entrance Drive

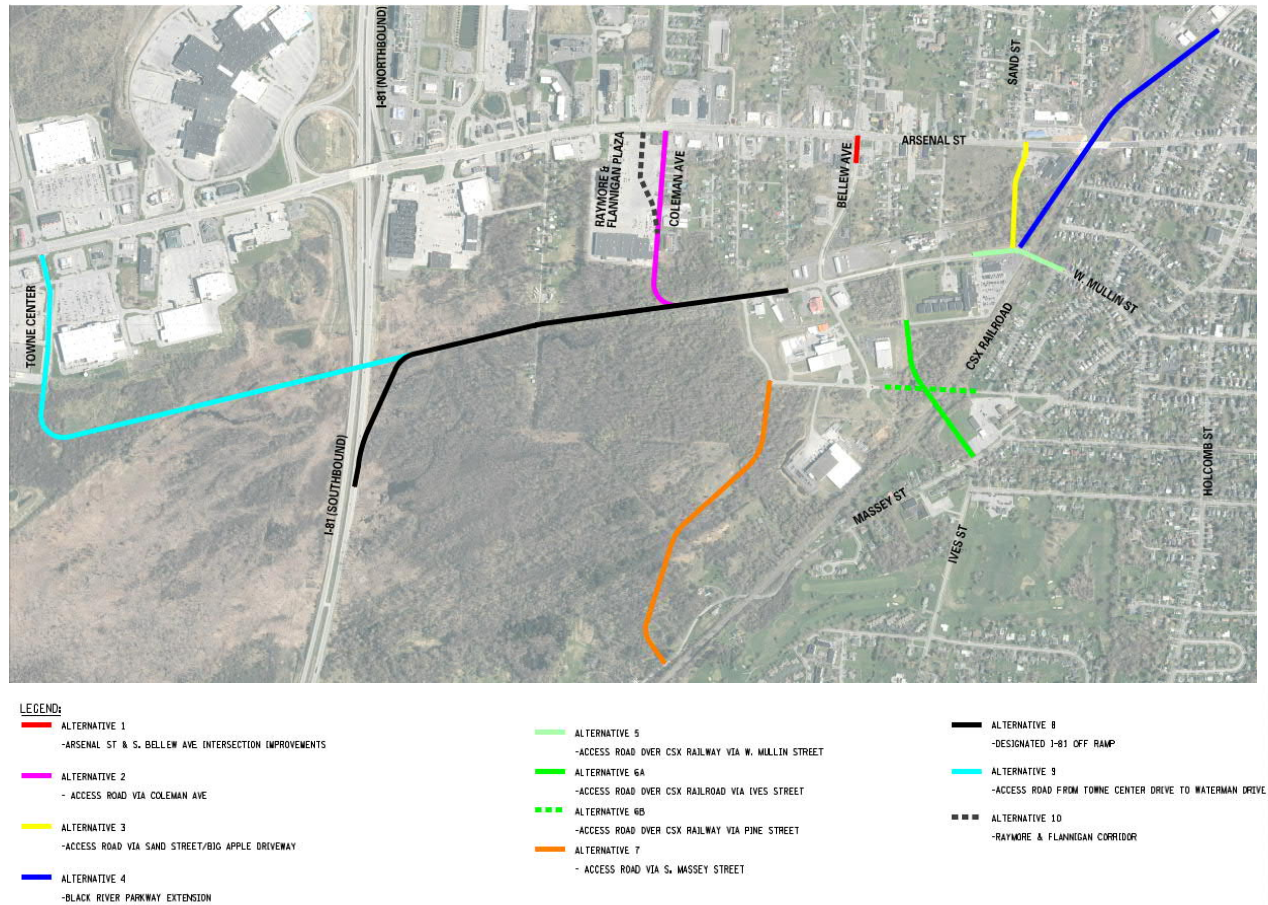


Figure 4-1: Initial Alternative Map

4.2. Design Criteria & Special Considerations

The initial screening process of the above mentioned ten alternatives include evaluating each against NYSDOT Highway Design Manual Criteria, Environmental and Transportation Conditions, and project goals. The Table below includes the Critical Design Elements for the potential new redundant access roadway alternatives to consider. It was determined that all alternatives could be designed to meet these criteria.

Table 4-1: Critical Design Elements for Alternative Access Routes					
PIN:		N/A	NHS (Y/N):		No
Route No. & Name:		PSB Access Road	Functional Classification:		Urban Collector
Project Type:		New Construction	Design Classification:		Collector
% Trucks:		N/A	Terrain:		Level
AADT:		N/A	Truck Access/Qualifying Highway		Access-Yes Qualifying-No
Element		Standard	Existing Condition	Proposed Condition	
1	Design Speed	30 mph HDM Section 2.7.3.3	N/A	30 mph	
2	Lane Width	Travel Lane: Greater of 10ft. or existing Turning Lane: Greater of 10 ft. or existing HDM Section 2.7.3.3 Exhibit 2-6	N/A	10 ft. min.	
3	Shoulder Width	4 ft. Paved Shoulder HDM Section 2.7.3.3 Exhibit 2-6	N/A	5 ft.	
4	Parking Lane Width	8 ft. min. HDM Section 2.7.3.3 Exhibit 2-6	N/A	N/A	
5	Horizontal Curve Radius	177 ft. Minimum (at $e_{max}=6\%$) HDM Section 2.7.3.3 Exhibit 2-6	N/A	177 ft. min.	
6	Superelevation	6.0% Maximum HDM Exhibit 2-1b	N/A	6.0% Max	
7	Stopping Sight Distance (Horizontal and Vertical)	No Minimum Vertical SSD required. Horizontal: 175 ft. Min. HDM Section 2.7.3.3 Exhibit 2-6	N/A	175 ft. min.	
8	Maximum Grade	9% max. HDM Section 2.7.3.3 Exhibit 2-6	N/A	9% max.	
9	Cross Slope	1.5% min. to 3% max. HDM Section 2.7.3.3	N/A	2.0% min.	
10	Vertical Clearance	14' Minimum, 14'-6" Desirable HDM Section 2.7.3.3 BM Section 2.3	N/A	14'-6"	
11	ADA Compliance – Pedestrian Infrastructure	Comply with HDM Chapter 18	N/A	N/A	

Initially, all alternatives were determined to conform to the overarching project purpose and objectives. An evaluation of environmental conditions and potential impacts were determined based upon locations of wetlands, steep slopes, historic, cultural, or archaeological features, and significant wildlife habitats. These environmental conditions are outlined further in Section 3.2.

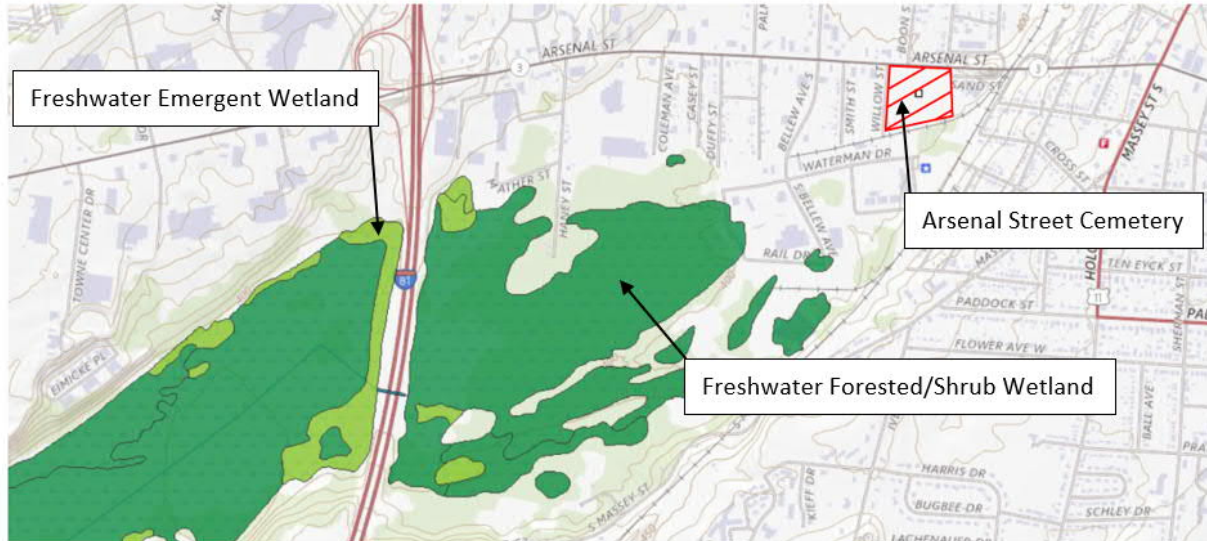


Figure 4-2 Environmental Conditions

4.3. Alternatives Removed from Further Study

The initial evaluation of alternative locations and alignments for a redundant access point into the PSB Complex and Industrial Park involved several alternatives that could potentially use existing infrastructure and intersections in close proximity, particularly Arsenal Street. The goal behind these alternatives, first and foremost, is to provide another point of ingress and egress into and out of the facilities, but also to utilize existing intersections and associated roadway infrastructure to minimize costs. Below is a summary of findings related to those alternatives that were eliminated from further consideration after early stakeholder input from PSB Complex tenants (Police and Sheriff's office) and Industrial Park tenants. Figure 4-3 illustrates the three alternatives that were removed from further study.

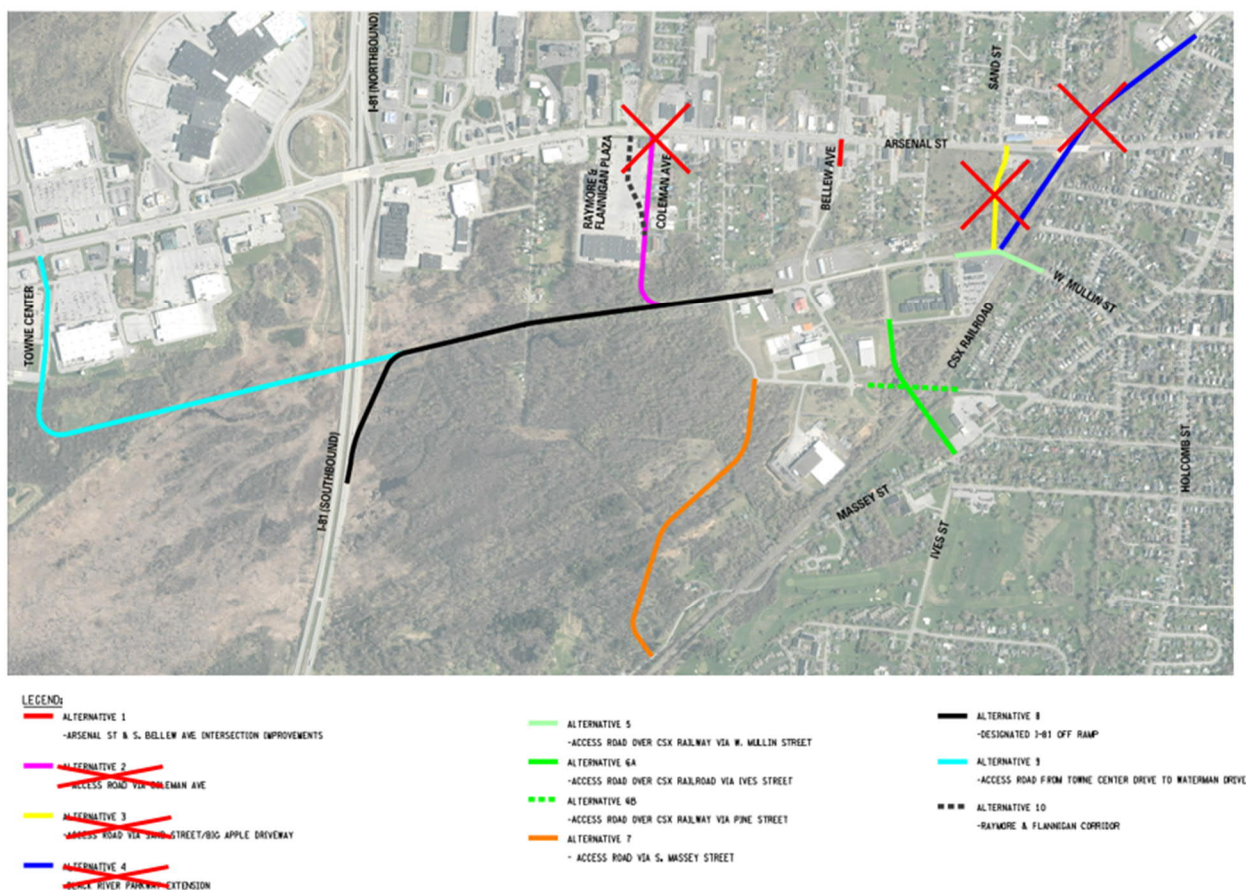


Figure 4-3: Alternatives Removed from Further Study

Alternative 2 – Coleman Ave

While a connection from Waterman Drive to the southern terminus of Coleman Ave can easily be accomplished, the impacts to private residential, office and commercial property as a result of rebuilding a connection to Arsenal Street that could adequately serve the Industrial Park (trucks) and PSB Complex would be substantial. Coleman Ave is a local paper street that provides direct access from Arsenal Street to residential and office uses on its eastern side, and secondary access to large commercial plazas on its western side. With a width of approximately 16' wide, the roadway is hardly suitable for its current roadway designation and use.

Deficiencies of this alternative include:

- Does not improve response times for Sheriff's office or Watertown PD for destinations north, east and south of the PSB Complex;
- Rebuilding the entirety of Coleman Ave to provide minimum widths and adequate turn movements at Arsenal;
- Utility relocations;
- Office and residential property takings/displacement;
- Does not alleviate truck traffic between I-81 and the industrial complex via Arsenal Street;

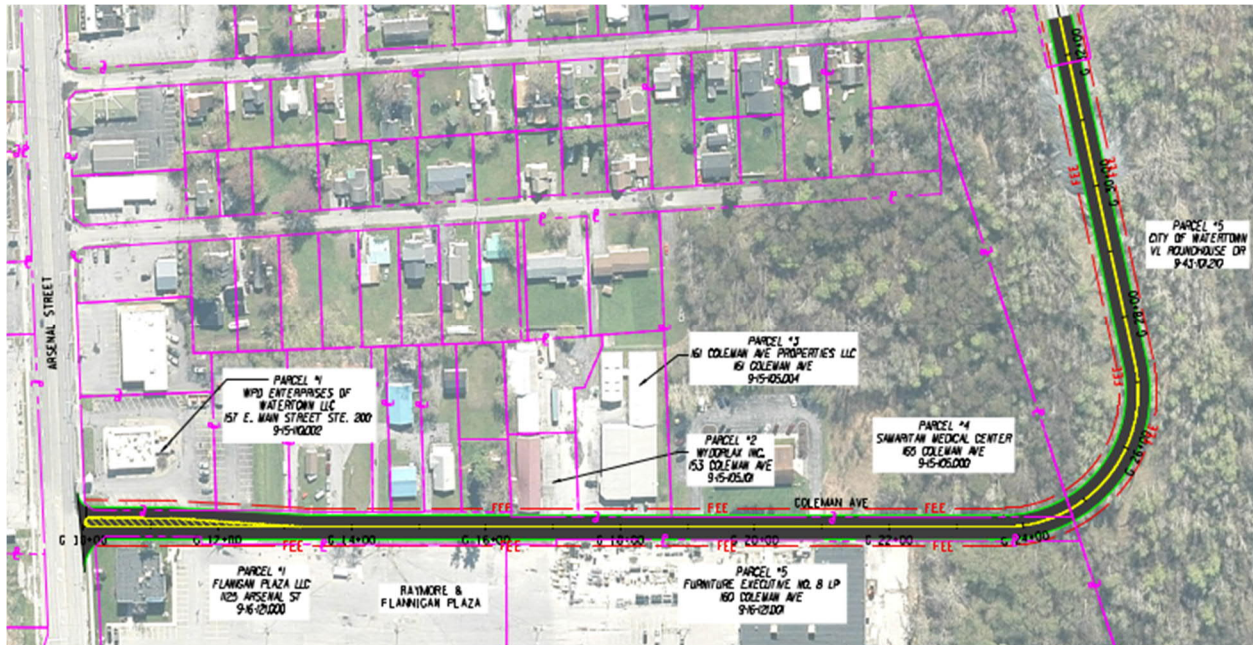


Figure 4-4: Alternative 2 – Coleman Ave

Alternative 3 – Sand Street Entrance Road

The Sand Street entrance drive to the Massey's Furniture Barn property was also evaluated as a redundant access point into and out of the PSB Complex and Industrial Park via Arsenal Street. Due to the location of the adjacent cemetery and to minimize impacts to a longstanding commercial property in Watertown, the alignment for any new roadway infrastructure would entail the demolition and displacement of a residential property between the furniture store and the cemetery, and the construction of a bridge to carry the new access road over the rail spur to the north of the PSB Complex. Due to the nature of impacts that would likely be required to the cemetery to carry truck traffic and emergency response times likely not being greatly improved with a redundant access so close to the existing location this alternative was considered not feasible and is no longer considered as part of the study. Also worth noting is that Willow Street to the west of Sand Street was also preliminarily evaluated for potential upgrades to the existing roadway infrastructure, but similarly, impacts to both private property and the cemetery, as well as not greatly improving response times removed Willow Street from further consideration.



Figure 4-5: Alternative 3 – Sand Street Entrance Road

Alternative 4 – Black River Parkway Extension

The Black River Parkway was also evaluated for a variety of reasons:

- To determine if reassigning the Parkway as a designated truck route to alleviate truck traffic in Public Square (this assessment was conducted as part of the ongoing Alternative Truck Route Study for the WJCTC); and,
- To understand if this route would be considered a viable redundant access alternative for the PSB Complex emergency responders

As part of this Planning Study, an analysis was performed at the request of the WJCTC to determine the feasibility of constructing an access road via Meadow Street North, south of the Black River Parkway and Coffeen Street intersection. This alternative would utilize the existing utility corridor and run parallel to the CSX railroad bed. However, this alternative contains a significant obstacles which make it not feasible, in addition to not likely greatly improving response times for areas in the south part of the City and County:

- Vertical and lateral clearances over CSX railway
- Vertical and lateral clearances under existing Arsenal Street bridge
- Vertical and lateral clearances of overhead utilities
- Proximity to Black River Parkway and Coffeen Street intersection

The proposed access road is a 34'-0" wide roadway composed of 12'-0" travel lanes and 5'-0" striped shoulders allowing for unhindered heavy truck traffic and supports quicker emergency response times to the north part of the City. The intersection of the access road and Meadow Street North would be constructed as an unsignalized, 3-way intersection with stop control only on the access road approach. The intersection at the PSB Complex will be stop controlled on the access road approach. Signage will be installed at the Meadow Street North intersection instructing motorists that unauthorized vehicular traffic will not be permitted along the access road; all unauthorized traffic would continue to use Bellew Avenue South as the primary entrance to the complex.

However, due to several design, constructability and ROW obstacles, this alternative was deemed not feasible and no long will be considered as part of the Study. Specifically, those include:

- Inadequate horizontal clearance from the active adjacent railbed without encumbering adjacent property;
- Bridge needed to connect Meadow Street North to the PSB Complex and Industrial Park would be approx. 600' long;
- Bridge abutment embankment would be highly impactful to adjacent property;
- Would only improve emergency response times to the northern part of the City;
- Not a direct route for trucks that primarily come from I-81 without having to use several local City streets;



Figure 4-6: Alternative 4 – Black River Parkway Extension

4.4. Alternatives Carried Forward for Evaluation

Following the initial evaluation of ten alternative access locations in which three alternatives were eliminated, WJCTC and the Highway Technical Committee (HTC) approved to advance the remaining six alternatives into a secondary evaluation process, and created an additional alternative which evolved from Alternatives 6A and 6B based on stakeholder and technical input, to develop a solution that combines elements of both base alternatives. A combined alternative 6A and 6B consists a connection to both Rail Drive and the internal restricted access ring road that services the PSB Complex, regardless of which exterior connection to local streets is selected – Pine Street or Massey Street South at Ives Street. Figure 4-4 portrays the remaining six alternatives, including the existing access location at Arsenal Street and Bellew Avenue South advanced into the secondary evaluation.

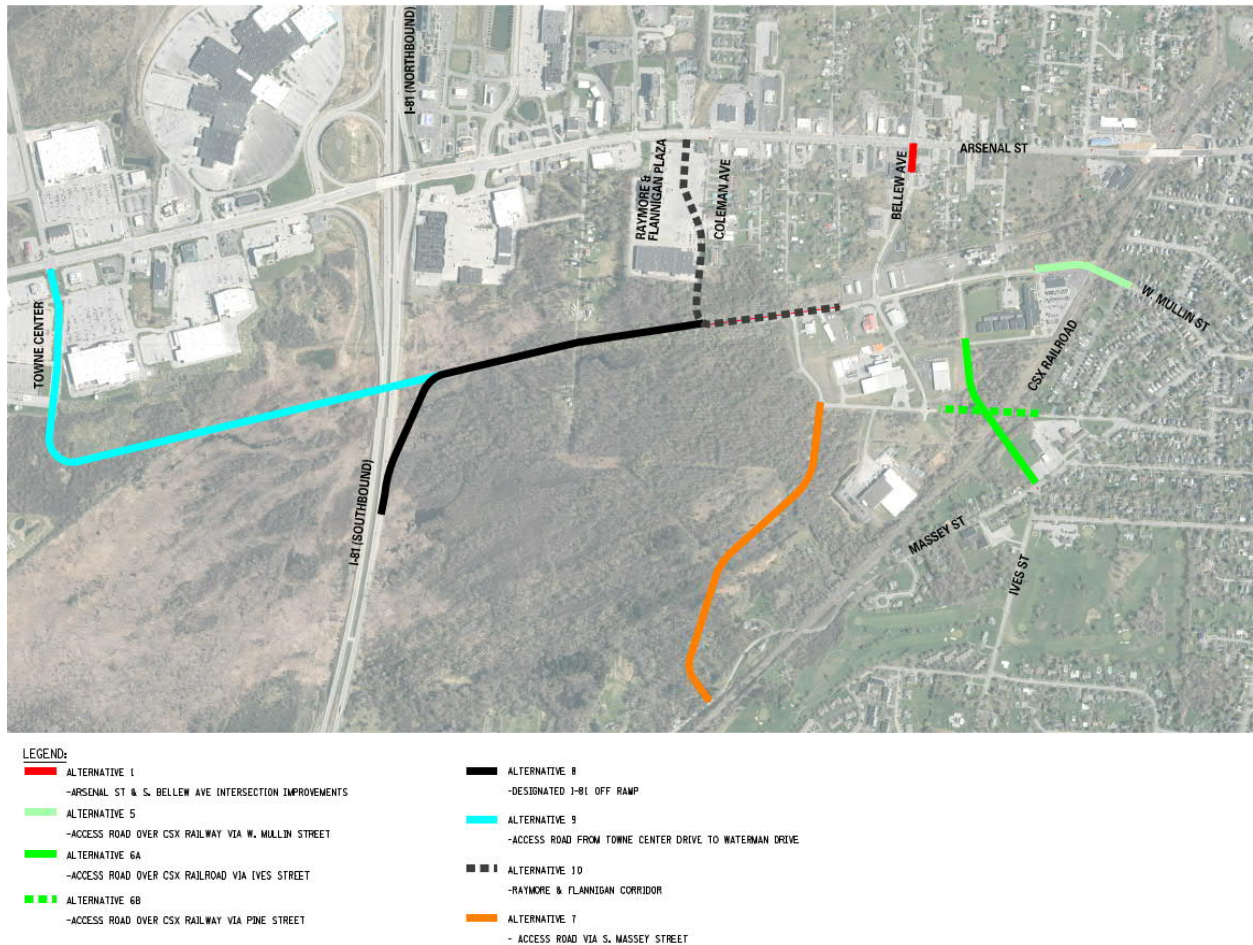


Figure 4-7: Alternative Carried Forward for Evaluation

Project information including plans and profiles for each of the alternatives included in the secondary list of potential redundant access alignments and locations are included in Attachment B.

WJCTC used input from the stakeholder meetings and discussions including tenants of both the Industrial Park and the PSB Complex along with community input to develop the project purpose and objectives outlined in Section 1.2 and further, to develop evaluation criteria used to assess the remaining six alternatives. The evaluation criteria used in the secondary screening of alternatives is outlined in Section 5 of this report.

It is important to note that the evaluation criteria described below were considered by stakeholder input. At the outset of the project in January/ February 2021, WJCTC and its planning team held a series of interviews with County Sheriff and City Police agency representatives, business tenants in the Industrial Park, and other stakeholders were asked to provide initial input on the project, in conjunction with the initial evaluation of alternatives.

4.5. Short Term Alternatives

Based on the goals of this study, it became apparent that Alternatives could be categorized as Short Term and Long Term alternatives based on the anticipated objective that would be achieved post construction. Short Term alternatives are considered to alleviate congestion at the intersection of Bellew Avenue South and Arsenal Street by constructing a redundant access for emergency response vehicle accessibility. Unauthorized vehicles (commercial trucks, cut-through traffic, etc.) would be prohibited from redundant alternative access roads connecting to Massey Street South and short-term alternatives would therefore not be anticipated to mitigate heavy, commercial vehicular traffic from the Industrial Park and would not account for future developments that may be incorporated within the Industrial Park complex.

4.5.1. *Alternative 1 – Bellew Avenue South and Arsenal Street Intersection Improvements*

Currently, the existing geometry of Bellew Avenue South is not properly designed for heavy commercial truck traffic and the adjacent properties are negatively impacted by erroneous or excessive turning movements. Alternative 1 proposes to reconstruct the Bellew Avenue South and Arsenal Street intersection geometry to allow for proper clearance of heavy vehicle turning movements. This proposed design intends to widen Bellew Avenue South within the intersection limits provide pavement markings to define travel lanes and buffer zones. By widening the roadway, adjacent concrete sidewalks and commercial asphalt driveways would require reconstruction. While this is a cost effective solution with immediate results, the improvements to the site in regards to project goals are minimal.

Deficiencies of this alternative include:

- Does not improve response times for Sherriff's office or Watertown PD for destinations north, east and south of the PSB Complex;
- Does not mitigate commercial or heavy truck traffic along Arsenal Street;
- Requires utility and traffic signal relocations
- Requires Right-of-Way encroachments

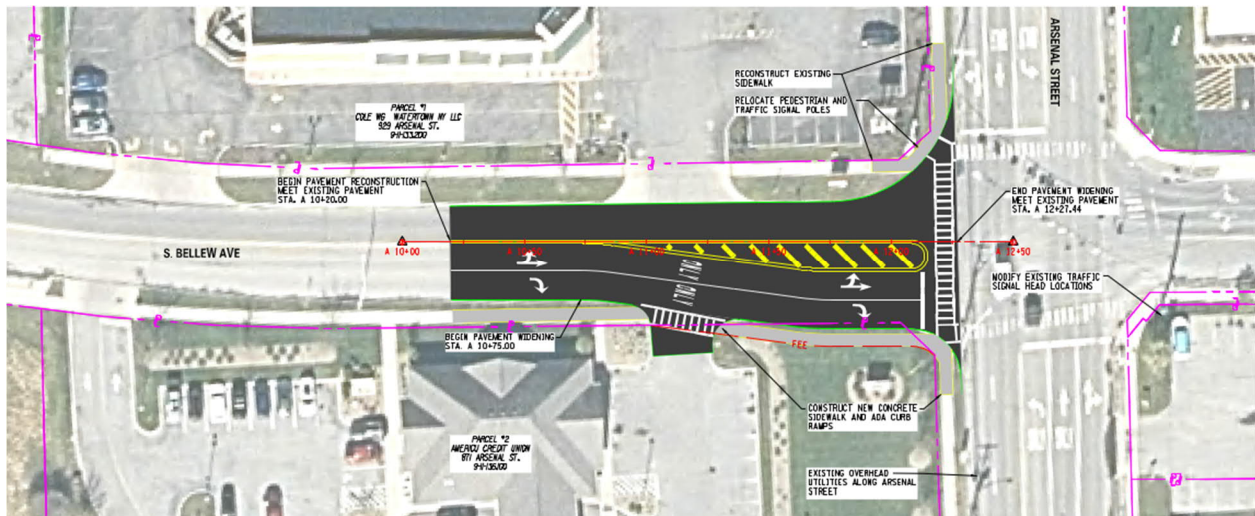


Figure 4-8: Alternative 1 – Bellew Avenue South & Arsenal Street Intersection Improvements

4.5.2. *Alternative 5 – Access Road over CSX Railway via Mullin Street West*

Alternative 5 proposes to construct an access bridge over CSX railway extending to Mullin Street West. The access road is anticipated to be composed of two, 12' travel lanes with 2' wide paved shoulders for a total pavement width of 28'. Since this alternative is primarily servicing the needs of the Public Safety Complex, signage would be installed to advise the general thru traffic of access controls related to the Public Safety Building complex.

Deficiencies of this alternative include:

- Does not mitigate commercial or heavy truck traffic along Arsenal Street;
- Requires utility relocations
- Requires Right-of-Way encroachments
- Significant impacts to residential areas to construct bridge
- Non-standard bridge approach

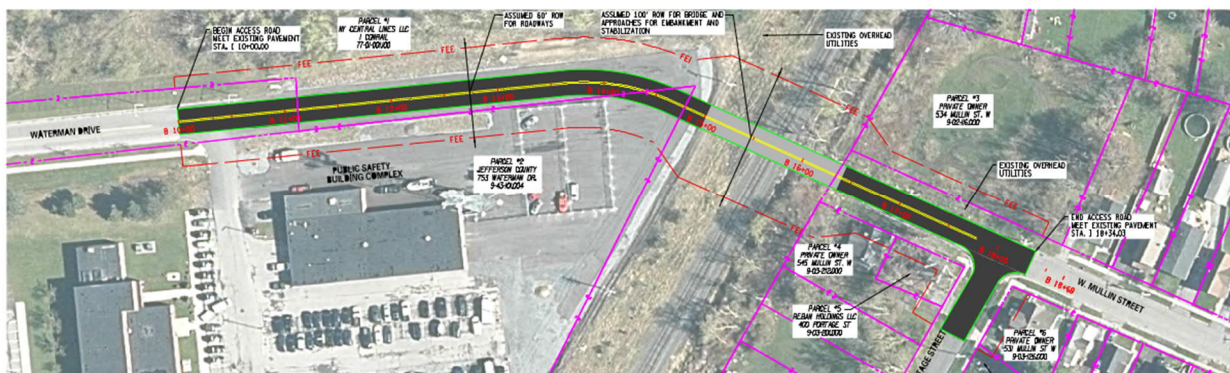


Figure 4-9: Alternative 5 – Access Road over CSX Railway via Mullin Street West

4.5.3. *Alternative 6A – Access Road over CSX Railway via Ives Street*

Alternative 6A proposes to construct an access bridge over CSX railway and connecting to Massey Street South at the Ives Street Intersection. The access road is intended to be composed of two, 12' travel lanes with 4' wide paved shoulders for a total pavement width of 32'. Guide rail will be installed along all lengths where vertical drop offs or adjacent to environmentally sensitive areas. This alternative would also construct a new, stopped controlled approach at the Massey Street South and Ives Street intersection allowing for more controlled access to the facility. To accommodate public and Industrial Park traffic, an additional spur connecting to Rail Drive could be constructed; doing so would allow the access road to be designated as authorized vehicles only from Rail Drive to the PSB complex utilized by public safety personnel and emergency vehicles only thereby removing any potential conflict with other public through-traffic that may use the internal roadway network as a means of access to the Industrial Park sites, or to connect with Arsenal Street. While this new access road will be signed to advise against unauthorized vehicles, it is anticipated that heavy commercial vehicles will be able to utilize this access for other commercial businesses within the Industrial Park grounds.

Deficiencies of this alternative include:

- Does not mitigate commercial or heavy truck traffic along Arsenal Street;
- Requires utility relocations
- Requires Right-of-Way encroachments
- Higher anticipated construction costs due to bridge length
- Non-standard bridge approach

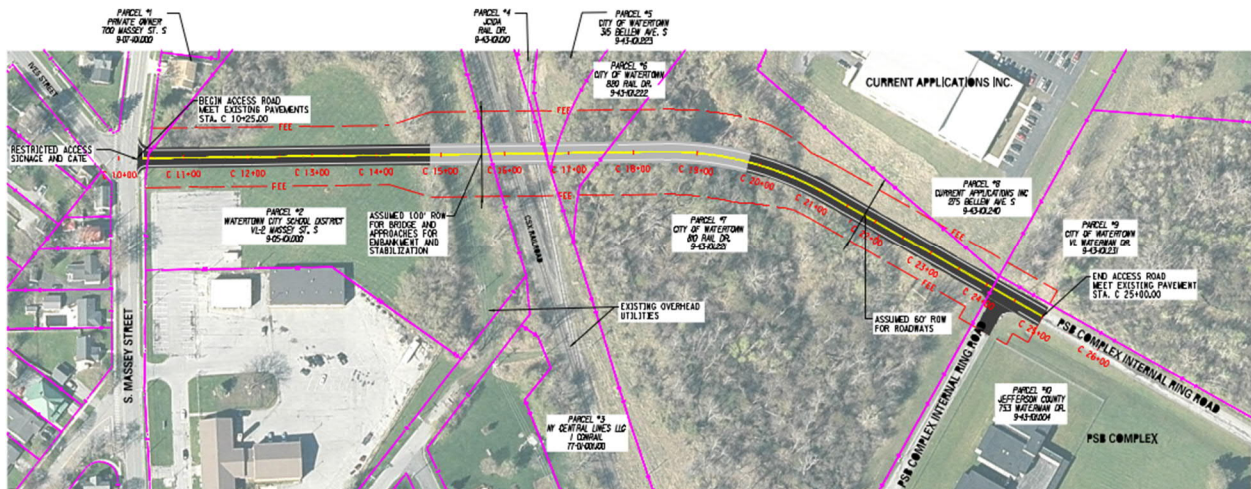


Figure 4-10: Alternative 6A – Access Road over CSX Railway via Ives Street

4.5.4. Alternative 6B – Access Road over CSX Railway via Pine Street

Alternative 6B proposes to construct an access bridge over CSX railway extending to Pine Street. The access road is intended to be a paved road with 12' travel lanes with 2' wide paved shoulders for a total pavement width of 28'. Guide rail will be installed along all lengths where vertical drop offs or adjacent to environmentally sensitive areas. To accommodate PSB Complex traffic, an additional spur extending from Rail Drive to the PSB Complex road could be constructed; doing so would allow the access road to be designated for public and Industrial Park traffic while the spur connecting to the PSB complex would be signed as authorized vehicles only to accommodate public safety personnel. This alternative is not intended to accommodate heavy commercial vehicle traffic destined for the Industrial Complex due to the proximity of residential areas. Deficiencies of this alternative include:

- Does not mitigate commercial or heavy truck traffic along Arsenal Street;
- Requires utility relocations
- Requires Right-of-Way encroachments
- Extensive earthwork required to meet clearance requirements
- Non-standard sight distances and bridge approach grades
- Requires Pine Street reconstruction to re-profile roadway

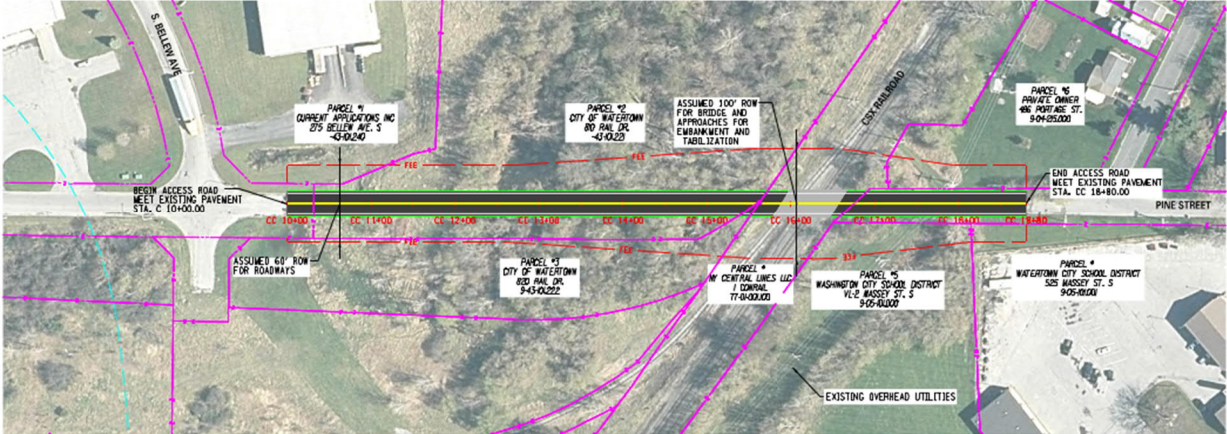


Figure 4-11: Alternative 6B – Access Road over CSX Railway via Pine Street

4.6. Long Term Alternatives

Long Term Alternatives primarily serve to provide additional access mitigating commercial vehicle and employee traffic to Industrial Park businesses. These alternatives were developed with future developments in mind to provide greater accessibility to I-81 and the greater Watertown area while reducing heavy vehicle volumes along Arsenal Street and residential areas. However, while Long Term Alternatives would provide an additional access point, they are not anticipated to significantly impact response times from emergency response vehicles.

4.6.1. *Alternative 7 – Access Road from Roundhouse Drive to Massey Street South*
Alternative 7 proposes to construct an access road along Massey Street South south of the City of Watertown limits. The primary objective for this alternative is to accommodate existing heavy vehicle commercial traffic intended for the Industrial Complex and serve as additional access for future developments. The proposed 0.55 mile long access road is designed with of two 12' travel lanes with 4' shoulders for a total pavement width of 32'. Guide rail installation would be required when adjacent to environmentally sensitive areas to provide added protection. Additionally, a break in access will be required to construct a stop controlled intersection with Massey Street South. However, through discussions with the City of Watertown Public Safety personnel and the Jefferson County Sheriff's office, this alternative will not directly benefit the City's response time for emergency vehicles. Conversely, the County Sheriff's office concluded this access road would be beneficial for County sheriff's personnel as it provides a more direct route to areas south of the City limits. Additionally, designation of truck routes from Adams Center to Massey Street South would assist with mitigating heavy vehicle commercial traffic originating south of the City of Watertown destined for the Industrial complex. Deficiencies of this alternative include:

- Does not mitigate all commercial or heavy truck traffic along Arsenal Street destined for the industrial complex;
- Requires designating new truck routes
- Extensive impacts to wetland and other environmentally sensitive areas
- Requires extensive Right-of-Way acquisitions from private property
- Requires construction of new intersection with Massey Street South

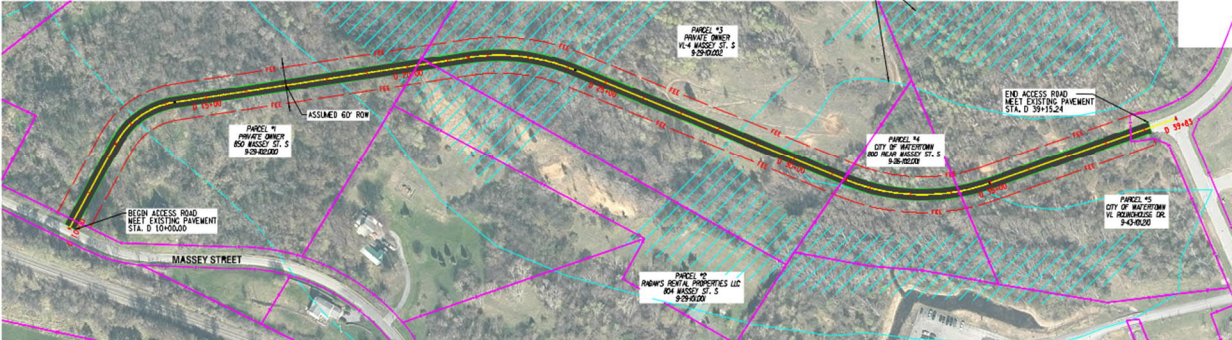


Figure 4-12: Alternative 7 – Access Road from Roundhouse Drive to S. Massey Street

4.6.2. *Alternative 8 – Designated Interstate 81 Off-Ramp*
Alternative 8 proposes to construct a new off ramp for I-81 northbound traffic that is destined for the industrial complex approximately 0.5 miles south of Exit 45. The access ramp is designed to be a one lane roadway with a 12' travel lane and 4' shoulders with guide rail installed along vertical drop-offs and environmentally sensitive areas. To minimize impacts, the access road is designed to utilize the existing well defined

maintenance corridor as the basis for the roadway alignment. This access road will intersect Harvey Street, therefore intersection signage will be required for access control. While this alternative will not accommodate traffic generated by the Public Safety Complex, it will aid with mitigating commercial heavy vehicle and employee traffic destined for the Industrial Complex that currently utilize I-81 Exit 45 (northbound). It is anticipated that this alternative will not mitigate heavy vehicle traffic existing the Industrial complex or those originating north of the City of Watertown. Deficiencies of this alternative include:

- Does not mitigate all commercial or heavy truck traffic along Arsenal Street destined for the industrial complex;
- Extensive impacts to wetland and other environmentally sensitive areas
- Requires Right-of-Way acquisitions
- Does not aid in improving response times for emergency personnel

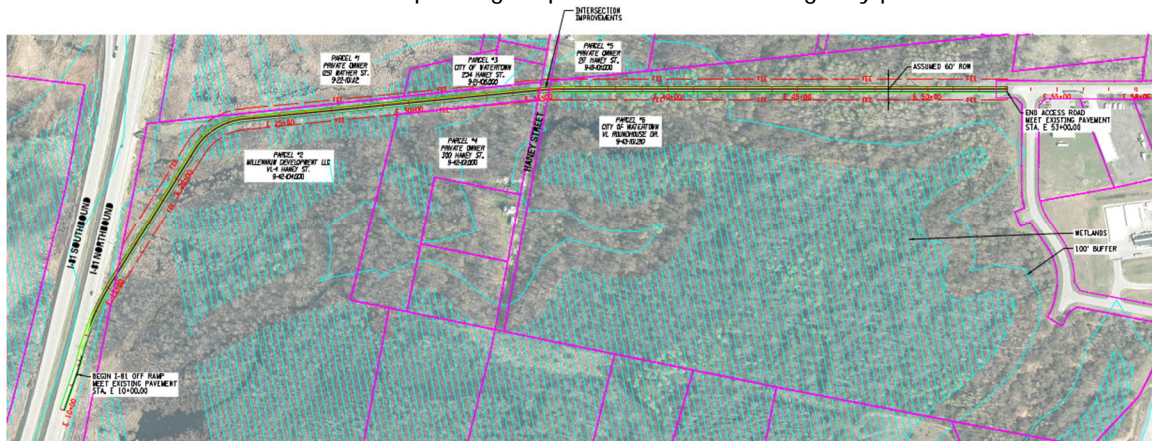


Figure 4-13: Alternative 8 – Designated Interstate 81 Off-Ramp

4.6.3. *Alternative 9 – Access Road from Towne Center Drive to Waterman Drive*
Alternative 9 proposes to construct an access road from the Towne Center shopping plaza to the Industrial Complex with a bridge crossing over I-81. The access road is designed to be approximately 1.33 miles in length composed of two 12' travel lanes with 4' wide shoulders for a total pavement width of 32'. Due to the proximity of wetlands and environmentally sensitive areas, guide rail installed for added protection. To minimize such impacts, the access road is designed to utilize the existing well defined maintenance corridor as the basis for the roadway alignment. This access road will intersect Harvey Street, therefore intersection signage will be required for access control. While this alternative will not accommodate traffic generated by the Public Safety Complex, it will aid with mitigating commercial heavy vehicle directing commercial heavy vehicle traffic destined for the Industrial complex to utilize the access road as the primary point of access. Deficiencies of this alternative include:

- Does not mitigate all commercial or heavy truck traffic along Arsenal Street destined for the industrial complex;
- Extensive impacts to wetland and other environmentally sensitive areas
- Requires extensive Right-of-Way acquisitions
- Does not aid in improving response times for emergency personnel

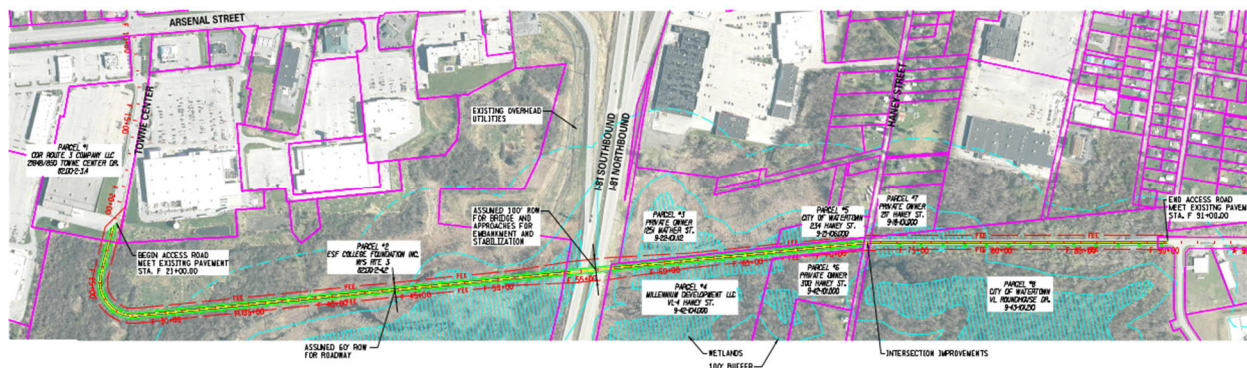


Figure 4-14: Alternative 9 – Access Road from Towne Center Drive to Waterman Drive

4.6.4. Alternative 10 – Raymour & Flannigan Corridor

The proposed access road is proposed to be composed of two 12'-0" travel lanes with 4'-0" wide paved shoulders for a total pavement width of 32'-0" to accommodate heavy vehicle movements. The access road would be defined by concrete curbing and landscape islands to provide a physical separation between the access road and existing parking lot restricting undisciplined movements. Within the proposed plaza limits, new striping is to be applied to properly define parking stalls and travel lanes, and signage will be installed at access intersections preventing erroneous movements and providing a safer corridor for motorists. South of the existing plaza limits, the proposed access road transitions to an uncurbed, 32' wide roadway linking with Waterman Drive. Access to Coleman Ave will be constructed as a curbed, two lane, two-way roadway with stop controlled access at the intersection of Coleman Ave and the intersection of the proposed access road. Additionally, Coleman Ave is proposed to be converted into a dead-end roadway further restricting unwarranted access on the proposed access road. The proposed design intends to reconstruct the Northbound approach of the Arsenal Street and Raymour & Flannigan/Cedar Square intersection to define a designated Northbound Left and Northbound Thru/Right turn lanes. The entry approach of the access road will be widened to account for wide turn movements required by heavy vehicle commercial truck traffic without conflicting with adjacent pedestrian infrastructure and landscape areas. It is assumed that no relocations of signal heads or revisions to phasing or signal timings will be required as part of this project.

However, this alternative would require substantial impacts to the existing operations and use of the commercial plaza. Deficiencies of this alternative include:

- Excessive Right-of-Way takings to construct access road through the existing plaza;
- Converting Coleman Ave to a one-way corridor limiting accessibility to residential and commercial properties;
- Does not alleviate heavy vehicle traffic between I-81 and Bellew Avenue South on Arsenal Street
- Does not directly improve response times from emergency response vehicles at the Public Safety Complex

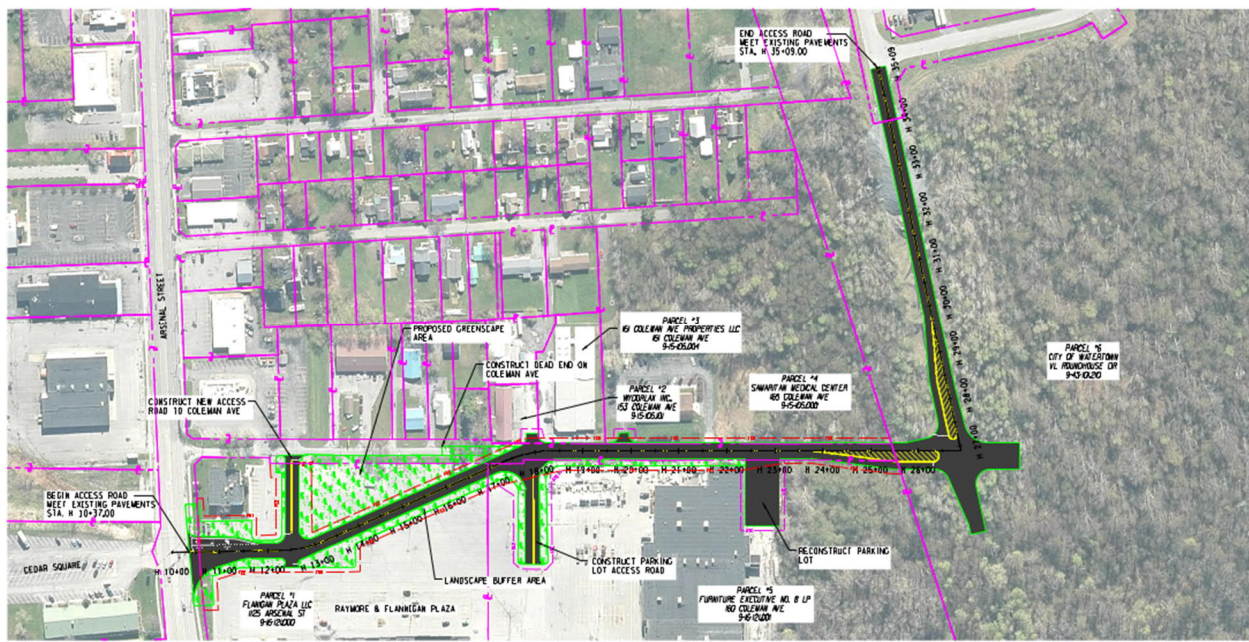


Figure 4-15: Alternative 10 – Raymour & Flannigan Corridor

5.0 SECONDARY SCREENING OF ALTERNATIVES

5.1 Secondary Screening Summary

The purpose of the secondary screening of alternatives is to summarize the obstacles, constraints or benefits of each in order to identify those that are more conforming to evaluation criteria and the goals of the study than others. This planning phase assessment will allow the WJCTC, NYSDOT, City and County, to determine the merits of each alternative for future detailed feasibility or preliminary design level analysis. As part of the evaluation of the remaining seven locations, roadway alignments and vertical profiles were prepared to determine potential impacts and constructability concerns, as well as environmental and ROW impacts.

Traffic and crash data was also assessed as part of the secondary screening of potential alternatives. It was determined during the scoping of the study to identify four (4) alternative access points and alignments with the potential to primarily improve response times of emergency vehicles in and out of the PSB Complex, and secondarily, to accommodate the movement of trucks in and out of the Industrial Park, and ideally reduce the amount of truck traffic needing to use Arsenal Street. The corridors of Arsenal Street and Massey Street South were identified as integral connections to the city outside of the Industrial Park and four additional critical intersections were selected to be evaluated based on the potential new access points and alignments being studied. The Mullin Street West, Pine Street, and Ives Street corridors were evaluated as secondary routes primarily servicing the PSB Complex while also allowing opportunity for an alternate truck access into and out of the Industrial Park.












Table 5-1: Secondary Evaluation Criteria for Remaining Alternatives	
Category	Criteria
<p>Access Location/ Alignment</p> 	New access location and alignment avoids or minimizes impact to private landowners
	Minimizes the number and nature of private land needed to acquire
	Minimizes number and nature of land owners impacted
	Existing access location can remain open while infrastructure upgrades at current location are being constructed
	Location and alignment minimizes non-standard geometric design features (i.e. avoid steep slopes, areas of limited site distance).
<p>Operations/ Safety</p> 	New access location does <u>not</u> result in new traffic issues at proposed new intersections
	Expanded internal circulation and access approach does not create safety concerns within the Industrial Park and PSB Complex
	New access location and alignment accommodates existing primary truck routes
	New access location and alignment does not greatly impact origin/ destination characteristics of existing access location
	New access location and alignment minimize the need for Non-Standard Design Features
	Reduces crash potential
	New access location and alignment improves existing geometrics
<p>Environmental</p> 	New access location and alignment avoid or minimize impact to significant natural features, including wetlands and other sensitive areas
	New access location and alignment avoid or minimize impact to significant historical or cultural resources
	New access location and alignment avoid steep slopes

Table 5-1: Secondary Evaluation Criteria for Remaining Alternatives	
Category	Criteria
Multi-Modal Opportunities 	Improves multi-modal accommodations
Tourism and Economic Development 	New access location and alignment continues to support and promote the growth potential of the Watertown Industrial District Alternative conforms to larger regional tourism and economic development vision
Cost and Performance 	Meets roadway owner (City, County, or NYSDOT) preference to optimize capital construction, operating, and maintenance costs Meets roadway owners Operational Needs Estimated total project cost is achievable

Stakeholders described positive and negative aspects of the existing Bellew Avenue South access point as well as concerns, ideas and opportunities for alternative alignments and locations. In particular, stakeholders expressed a desire to improve circulation, reduce traffic delays and emergency response times, and improve safety as well as avoid impacts to the nearby railbed and cemetery, and private property owners. Stakeholder feedback is summarized in Appendix D.

A qualitative evaluation method was used by WJCTC to evaluate all seven remaining alternatives, including the existing, against the above outlined evaluation criteria based on the following evaluation rankings:

	Alternative fully conforms to criteria
	Alternative mostly conforms to criteria
	Alternative partially conforms to criteria
	Alternative minimally conforms to criteria
	Alternative does not conform to criteria

A fully completed evaluation matrix is provided in Appendix B.

5.2. Transportation Analysis

5.2.1. Traffic Data & Analysis Methodology

Through coordination with the WJCTC and HTC, the existing Industrial Park and PSB Complex access location and four alternative access points were chosen for further analysis. Current turning movement count data was collected at each study intersection. NYSDOT performed turning movement counts during the peak morning (7:00AM-9:00AM) and evening (4:00PM-6:00PM) hours based on traditional peak travel periods. NYSDOT turning movement count data is provided in Appendix C. The following intersections were analyzed to determine existing traffic conditions around each alternative intersection:

- Arsenal Street and Bellew Avenue South
- Bellew Avenue South and Waterman Street
- Massey Street South and Mullin Street West
- Massey Street South and Pine Street
- Massey Street South and Ives Street

Additionally, NYSDOT provided traffic volume tube count data along Massey Street South between Greenview Drive and the CSX railroad access road.

In February 2022, Barton & Loguidice performed turn movement counts at the intersection of Arsenal Street and Raymour & Flannigan Plaza/Cedar Square during the peak morning (7:00AM-9:00AM) and peak evening (3:00PM-5:00PM). These intervals were determined based on traditional peak periods and previous count data submitted by the NYSDOT for other alternatives analyzed during development of the Watertown Public Safety Building Access Study report. An Existing Traffic Volume Diagram is provided in Appendix C.

A capacity analysis was performed using SYNCHRO 11, an industry accepted standard for the analysis of signalized and unsignalized intersections. The capacity analysis takes into consideration the following factors:

- Traffic volumes for each approach and turning movement
- Percentage of heavy vehicles
- Peak hour factor for each approach
- Type of control (i.e. stop sign, traffic light)
- Roadway geometry (i.e. number of lanes, lane and shoulder widths)
- Approach speed

Capacity analyses characterize operational conditions within a traffic stream and their perception by motorists and passengers. The descriptions of individual Levels of Service (LOS) characterize these operational conditions in terms of factors such as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. The LOS for an intersection is defined in terms of delay (seconds) of the average time a vehicle is stopped causing a delay within a 15-minute analysis period (peak hour factor adjustment). This delay is given a range from "A" to "F" where a LOS "A" is often perceived as what a vehicle experiences on a rural road with little to no interference due to other vehicles, and LOS "F" is considered to be stop and go traffic often experienced during rush hour in a major city. Generally speaking, a LOS of "D" or better is considered acceptable for current and design operating conditions. The following table illustrates the intersection ratings for signalized and unsignalized intersections based on the time of delay per vehicle:

Table 5-2: Level of Service (LOS) Criteria for Intersections			
LOS	Description	Delay in Seconds (Signalized)	Delay in Seconds (Unsignalized)
A	Little or no delay	<= 10.0	<= 10.0
B	Minor, Short delay	> 10 to 20	> 10 to 15
C	Average delay	> 20 to 35	> 15 to 25
D	Long, but acceptable delay	> 35 to 55	> 25 to 35
E	Long, Unacceptable delay	> 55 to 80	> 35 to 50
F	Long, Unacceptable delays	> 80	> 50

Synchro models were developed for the existing morning and afternoon peak hours for each study alternative. The NYSDOT Highway Design Manual requires new roadway construction projects to be analyzed 20 years beyond the estimated time of completion (ETC+20). Historical data was reviewed and determined that traffic volumes throughout the project corridors are experiencing a decrease in growth, but to be conservative an annual growth rate of 1.0% was applied to the existing traffic volumes.

To evaluate existing safety conditions for each proposed alternative access location, a crash analysis was performed in accordance with Chapter 5 of the NYSDOT Highway Design Manual. The New York State Department of Transportation provided crash data for the most recent three (3) year period (2018-2021). The data included verbal and police crash reports that occurred within 0.10 miles of each proposed alternative access location; any crashes that were not considered to be directly related to the intersection were removed from further analysis.

5.2.2. Trip Generation & Trip Distribution

While companies like Renzi Foodservice is currently in the midst of a planned expansion, discussions with the City and Industrial Park tenants indicate there are no anticipated future developments within the Industrial Park or in proximity to the PSB Complex that would impact significantly impact traffic volumes and require a trip generation analysis to be performed at this time.

Considering the potential new access locations and alignment alternatives, existing traffic flows and movements would be altered as portions of the PSB Complex and Industrial Park volumes will be transferred to the new access locations. For the purposes of this build analyses, an estimation of how traffic would be redistributed included the following assumptions:

- Trip distribution percentages at studied intersections were determined based on previous turning movement data collected by the NYSDOT and Barton & Loguidice.
- For Alternative 10, all heavy traffic volumes observed at the intersection of Bellew Avenue South and Waterman Drive during the studied peak hours were shifted to the Arsenal Street Raymour & Flannigan/Cedar Square intersection.
- For Alternatives 5, 6A, & 6B, approximately 40% westbound traffic entering the Industrial Park and PSB Complex via Arsenal Street will be redistributed to the new access location. Additionally, 40% of eastbound existing volumes will be redirected to new access locations as well.

Trip distribution and traffic volume figures are provided in Appendix C illustrating the breakdown in distribution percentages and adjusted volumes for existing and proposed conditions.

5.3. Summary of Findings for Transportation Analyses

5.3.1. Alternative 1 – Arsenal Street and Bellew Avenue South Intersection Improvements

Capacity Analysis

Discussions with stakeholders including the Sheriff’s office and City Police Dept. offered the following related to issues and opportunities:

- AmeriCU Credit Union and Walgreen’s driveways are too close to Arsenal Street, creating access conflicts and bottlenecks, which contribute to delayed response times leaving the PSB Complex.
- Improve access management along Bellew Avenue South approach to Arsenal Street as part of any upgrades to the roadway/intersection to improve traffic flow and response time out of the PSB Complex.

Table 5-3 Illustrates No-Build LOS results for ETC (2021) and ETC+20 (2041) capacity analyses.

Table 5-3 Alternative 1 – Arsenal Street & Bellew Avenue South Intersection Level of Service and Delay (sec)					
		Weekday AM Peak Hour		Weekday PM Peak Hour	
Intersection	Approach	ETC (2021) No Build Conditions	ETC+20 (2041) No Build Conditions	ETC (2021) No Build Conditions	ETC+20 (2041) No Build Conditions
Arsenal Street & Bellew Avenue South	NB Thru/Left	C (29.4)	C (31.8)	D (38.9)	D (43.8)
	NB Right	A (0.6)	A (0.7)	A (3.5)	A (5.3)
	SB Left	D (35.9)	D (39.8)	C (31.6)	D (36.8)
	SB Thru/Right	A (7.5)	A (7.4)	A (7.2)	A (6.8)
	EB Left	C (33.6)	D (36.3)	D (43.5)	D (54.4)
	EB Thru/Right	B (11.2)	B (13.3)	B (15.9)	B (19.2)
	WB Left	D (38.8)	D (41.3)	D (41.3)	D (45.0)
	EB Thru/Right	B (11.8)	B (14.4)	B (18.3)	C (26.1)
	Overall	B (15.8)	B (18.1)	C (20.3)	C (25.6)

Since this Alternative does not redistribute traffic, traffic volumes were not altered from the No Build condition. However, the signal operations were optimized to account for future traffic signal improvements that could be implemented to reduce delays at this intersection. Table 5-4 summarizes the proposed conditions for ETC and ETC+20 for future build conditions.

Table 5-4 Alternative 1 – Arsenal Street & Bellew Avenue South Proposed Conditions: Intersection Level of Service and Delays (sec)			
		Weekday AM Peak Hour	
Intersection	Approach	ETC+20 Build Conditions	ETC+20 Build Conditions
Arsenal Street & Bellew Avenue South	NB Thru/Left	C (30.3)	D (43.6)
	NB Right	A (0.5)	A (1.8)
	SB Left	D (37.7)	D (36.5)
	SB Thru/Right	A (7.3)	A (6.9)
	EB Left	D (34.7)	D (53.4)
	EB Thru/Right	B (12.0)	B (18.7)
	WB Left	D (38.5)	D (43.7)
	EB Thru/Right	B (13.3)	C (25.7)
	Overall	B (16.7)	C (25.2)

Crash Analysis

Within the three-year analysis period, 30 crashes occurred which were related to the Arsenal Street and Bellew Avenue South intersection. Of these, three crashes resulted in personal injury and one crash involved a pedestrian who was crossing Bellew Avenue South. 10 of the crashes recorded were categorized as right angle crashes. While typically right angle crashes are attributed to drivers’ inattention, disregarding traffic control devices, and failure to yield to the right of way, it is also possible that geometric factors (poor sight distance, intersection approach angles) can also increase the chances of right angle crashes. Further review of these right angle crashes determined that majority of right angle crashes involved a vehicle travelling north on Bellew Avenue South. Rear end crashes accounted for the second most common type with nine crashes occurring within the study period. While three (3) crashes were attributed to poor driving conditions (i.e. snow, ice, etc.), majority of crashes that occur at this intersection are directly related to driver inattention and error.

With the high occurrence of right angle crashes and the presence of a pedestrian involved crash, it is recommended that intersection improvements be made to increase vehicular, pedestrian, and bicyclist safety at this intersection. Improvements to the traffic signals and phasing, such as implementing a designated northbound and southbound left turn phase and increased all-red phases, would reduce the amount of conflicting movements. Additionally, relocating signal poles, commercial signage, and other obstructions along Arsenal Street would improve sight distances for motorists allowing for increased awareness and response time of errant vehicles.

The tables below summarize the types of crashes, contributing factors, and crash rates for this location. Please note, the Statewide average is based on urban four-legged intersections, signal controlled with left turn lanes.

Table 5-5 Alternative 1 - Arsenal Street & Bellew Avenue South Crash Summary		
Type of Crash	Number	Percentage
Right Angle	10	33.33%
Rear End	9	30.0%
Right Turn	3	10.0%
Left Turn	2	6.67%
Overtaking	2	6.67%
Pedestrian	1	3.33%
Object	1	3.33%
Head On	1	3.33%
Animal	1	3.33%

Table 5-6 Alternative 1 - Arsenal Street & Bellew Avenue South Intersection Crash Rate Comparison				
Intersection	Traffic Control	Number of Crashes	Crash Rate (ACC/MEV)	Statewide Average Rate*
Arsenal Street & Bellew Avenue South	4-way traffic signal	30	1.09	0.26

Summary of Recommendations

Based on the secondary screening analysis for Alternative 1, below is a summary of recommended improvements, benefits and constraints.

- Upgrade geometric design of existing intersection to better accommodate truck turning movements by widening the Bellew Avenue South northbound approach

- Reconsider the access locations on both sides of the Bellew Avenue South approach to alleviate queuing at the intersection and to improve response times for the PSB Complex
- Reconstruct existing sidewalks and curb ramps to meet ADA standards
- Relocate utility, light pole, and traffic signal poles pursuant to geometric design upgrades
- Improved truck turn movement ability would reduce adjacent property damage caused by heavy vehicle turns (curbs, lawn areas, poles and signs)
- Upgrades would have minimal to no ROW impacts (.02 ac)
- Cost effective upgrades to improve the functionality and safety of the current access point into the Industrial Park and PSB Complex

Conclusion

It is recommended that proposed infrastructure upgrades be considered, including a review of access management best practices along the Bellew Avenue South approach to Arsenal Street, to alleviate traffic delays from Bellew Avenue South to Arsenal Street, and to enhance safety provisions. These upgrades should be considered regardless of whether a redundant access point is pursued in the future. Additionally, it is important to note that an active CitiBus bus stop is present at this intersection and should be taken into consideration for future developments at this intersection. Although recommended upgrades would aid in better movement, flow and safety at the existing intersection, Alternative 1, without a redundant access point would not greatly improve response times in and out of the PSB Complex for emergency vehicles.

5.3.2. Alternative 2 – Access Road over CSX Railway via Mullin Street West

Capacity Analysis

Discussions with stakeholders including tenants of the Industrial Park, as well as the Sheriff's office and City Police Dept. offered the following related to issues and opportunities of this Alternative access location and alignment:

- Alternative would provide more efficient emergency response times to majority of the City by creating an optional route that does not require the use of Arsenal Street.
- City areas to the east, north and south could be accessed by emergency vehicles via the use of Massey Street South and Mullin Street, among others.
- Residential character of the adjacent neighborhood would be compromised by emergency vehicles, trucks, and the likely use of the new connection as a secondary by-pass road for city residents.
- Truck traffic destined for the Industrial Park from points north, east and south could use this access location instead of using Arsenal Street. However, the residential nature of Mullin Street and surround roadways would not be ideal for truck traffic and movements.

Table 5-7 Illustrates No-Build LOS results for ETC (2021) and ETC+20 (2041) capacity analyses.

Table 5-7 Alternative 5 – Access Road over CSX Railway via Mullin Street West Intersection Level of Service and Delay (sec)					
		Weekday AM Peak Hour		Weekday PM Peak Hour	
Intersection	Approach	ETC (2021) No Build Conditions	ETC+20 (2041) No Build Conditions	ETC (2021) No Build Conditions	ETC+20 (2041) No Build Conditions
Massey Street South & Mullin Street West	NB All Movements	B (15.3)	B (15.8)	B (15.0)	B (15.4)
	SB All Movements	B (14.3)	B (14.4)	B (13.3)	B (13.9)
	EB All Movements	A (1.6)	A (2.5)	A (5.7)	A (7.8)
	WB (Dimmick St) All Movements	C (21.3)	C (21.3)	C (21.3)	C (21.3)
	WB All Movements	B (14.0)	B (13.8)	B (15.5)	B (15.6)
	Overall	B (12.0)	B (12.4)	B (11.2)	B (12.3)

The construction of the proposed access road intends to connect Waterman Drive to Mullin Street West through the construction of a bridge over the CSX Railway. To serve as a basis of expected impacts, it is assumed that approximately 40% of Westbound entering and 40% of Eastbound Existing traffic destined for the Public Safety Complex will utilize the newly constructed approach. These volumes were redistributed through the ETC+20 No-Build Mullin Street West and Massey Street South intersection volumes based on NYSDOT provided turn movement counts. Table 5-8 Illustrates No-Build LOS results for ETC (2021) and ETC+20 (2041) capacity analyses.

Table 5-8 Alternative 5 – Access Road over CSX Railway via Mullin Street West Proposed Conditions: Intersection Level of Service and Delays (sec)			
		Weekday AM Peak Hour	Weekday PM Peak Hour
Intersection	Approach	ETC+20 Build Conditions	ETC+20 Build Conditions
Massey Street South & Mullin Street West	NB All Movements	B (16.4)	B (15.6)
	SB All Movements	B (12.5)	B (13.6)
	EB All Movements	A (3.2)	B (12.0)
	WB (Dimmick St) All Movements	C (21.3)	C (21.3)
	WB All Movements	B (14.0)	B (16.0)
	Overall	B (12.3)	B (13.6)

Crash Analysis

Within the 3 year study period, 3 crashes occurred that were related to the Massey Street South and Mullin Street West Intersection. Due to the minimal number of crashes, additional geometric or infrastructure improvements are not anticipated at this intersection to mitigate crash occurrences with the increased traffic generated by the proposed access road. The tables below summarize the types of crashes, contributing factors, and crash rates for this location.

Table 5-9 Alternative 5 – Access Road over CSX Railway via Mullin Street West Crash Summary Table		
Type of Crash	Number	Percentage
Right Angle	2	66.67%
Overtaking	1	33.33%

Table 5-10 Alternative 5 – Access Road over CSX Railway via Mullin Street West Intersection Crash Rate Comparison Table				
Intersection	Traffic Control	Number of Crashes	Crash Rate (ACC/MEV)	Statewide Average Rate*
Massey Street South & Mullin Street West	5-way traffic signal	3	0.96	0.24

Summary of Recommendations

Based on the secondary screening analysis for Alternative 5, below is a summary of recommended improvements, benefits and constraints.

- Construct a 28' wide paved asphalt roadway connecting Waterman Drive to Mullin Street West.
- Construct bridge spanning the CSX Railroad Right of Way to minimize impacts to the existing railroad
- No traffic signal improvements are required to accommodate additional traffic at the Massey Street South and Mullin Street West Intersection. However optimizing traffic signal timings and phasing would improve traffic operations.
- Waterman Drive will require extensive earthwork and construction efforts to achieve proper clearance over CSX Railway while adhering to accepted design standards
- Utility relocations of overhead transmission lines will be required to ensure proper vertical clearance
- Extensive ROW impacts will be required to construct Mullin Street West bridge approach within current design standards.

Conclusion

This alternative would provide a short term solution for the Industrial Complex by providing an access point to be utilized by emergency response vehicles and employees at the Public Safety Complex. However, significant geometric deficiencies, proximity to residential properties and Right-of-Way impacts hinder the construction of this Alternative. Additionally, the primary goal of this Alternative is aimed at improving response times from emergency vehicles and no heavy commercial vehicle traffic will be mitigated from the Arsenal Street corridor. Therefore, it is suggested that this Alternative is incorporated in in conjunction with Long Range alternative 10 to accommodate both Public Safety and Industrial Park traffic volumes.

5.3.3. Alternative 6A – Access Road over CSX Railway via Ives Street

Capacity Analysis

Discussions with stakeholders including tenants of the Industrial Park, as well as the Sheriff’s office and City Police Dept. offered the following related to issues and opportunities of this Alternative access location and alignment:

- Alternative would provide more efficient emergency response times to majority of the City by creating an optional route that does not require the use of Arsenal Street.
- City areas to the east and south could be accessed by emergency vehicles via the use of Massey Street South and Ives Street.
- Per previous discussions with City of Watertown Public Safety personnel, areas of the City to the north would not see a reduction in response time and will continue to utilize Arsenal Street.
- Residential character is not likely to be impacted since the proposed access road will be constructed through an empty commercial lot
- Truck traffic destined for the Industrial Park from points east and south could use this access location instead of using Arsenal Street

Table 5-11 Illustrates No-Build LOS results for ETC (2021) and ETC+20 (2041) capacity analyses.

Table 5-11 Alternative 6A – Access Road over CSX Railway via Ives Street Intersection Level of Service and Delay (sec)					
		Weekday AM Peak Hour		Weekday PM Peak Hour	
Intersection	Approach	ETC (2021) No Build Conditions	ETC+20 (2041) No Build Conditions	ETC (2021) No Build Conditions	ETC+20 (2041) No Build Conditions
Massey Street South & Ives Street	NB All Movements	N/A	N/A	N/A	N/A
	SB All Movements	A (4.1)	A (4.5)	A (5.2)	A (5.3)
	WB Thru/Left WB Right	A (9.6)	A (9.9)	B (10.6)	B (11.6)
	Overall	A (4.7)	A (5.0)	A (6.0)	A (6.3)

The construction of the proposed access road intends to connect Bellew Avenue South to Mullin Street West through the construction of an access road over CSX Railway and constructing an additional leg at the Mullin Street West and Ives Street intersection. To serve as a basis of expected impacts, it is assumed that approximately 40% of Westbound entering and 40% of Eastbound Existing traffic destined for the Public Safety Complex will utilize the newly constructed approach. These volumes were redistributed through the ETC+20 No-Build Ives Street and Massey Street South intersection volumes based on NYSDOT provided turn movement counts. No heavy vehicle traffic volumes

were redistributed as this alternative is not proposing to designate truck routes through residential areas. Table 5-12 Illustrates No-Build LOS results for ETC (2021) and ETC+20 (2041) capacity analyses.

Table 5-12 Alternative 6A – Access Road over CSX Railway via Ives Street Proposed Conditions: Intersection Level of Service and Delays (sec)			
		Weekday AM Peak Hour	Weekday PM Peak Hour
Intersection	Approach	ETC+20 Build Conditions	ETC+20 Build Conditions
Massey Street South & Ives Street	NB All Movements	A (0.3)	A (0.1)
	SB All Movements	A (4.1)	A (5.2)
	EB All Movements	B (11.7)	B (14.8)
	WB All Movements	B (10.2)	B (12.3)
	Overall	A (5.2)	A (7.0)

Crash Analysis

Within the 3 year period analyzed, 1 crash occurred at the Massey Street South and Ives Street intersection which was directly related to poor roadway conditions during a snow event. Due to the minimal number of crashes, additional geometric or infrastructure improvements are not anticipated at this intersection to mitigate crash occurrences with the increased traffic generated by the proposed access road.

Table 5-13 Alternative 6A – Massey Street South & Ives Street Crash Summary Table		
Type of Crash	Number	Percentage
Sideswipe	1	100.00%

Table 5-14 Alternative 6A – Massey Street South & Ives Street Intersection Crash Rate Comparison Table				
Intersection	Traffic Control	Number of Crashes	Crash Rate (ACC/MEV)	Statewide Average Rate*
Massey Street South & Ives Street	1-way stop controlled	1	0.31	0.19

Summary of Recommendations

Based on the secondary screening analysis for Alternative 6A, below is a summary of recommended improvements, benefits and constraints.

- Construct a 32' wide paved access road extending from Bellew Avenue South to Massey Street South creating an additional leg at the Ives Street intersection
- Construction of a bridge over CSX Railway to minimize impacts to existing railroad.
- Utility relocations will be required to ensure proper overhead clearance of existing transmission lines.
- Construct additional Spur connecting proposed access road to Rail Drive accommodating public and Industrial Park traffic.
- Extensive earthwork activities will be required to ensure proper clearance over CSX railway while adhering to current design standards
- Non-standard sight distances would be constructed due to the proposed profile of the access road

Conclusion

This alternative would provide a short term solution for the Industrial Complex by providing an access point to be utilized by emergency response vehicles, Industrial Park and Public Safety employees and minor commercial traffic volumes. However, extensive earthwork and geometric deficiencies hinder the construction of this Alternative. While the primary goal of this Alternative is aimed at improving response times from emergency response vehicles south and east of the Public Safety Complex, emergency vehicles travelling to areas north will continue to be limited to the existing Arsenal Street access. Additionally, this alternative was analyzed by assuming minimal to no commercial heavy truck traffic will be mitigated from Arsenal Street. Therefore, it is suggested that this Alternative is incorporated in conjunction with identified Long Range Alternative 10 to accommodate both Public Safety and Industrial Park needs.

5.3.4. Alternative 6B – Access Road over CSX Railway via Pine Street

Capacity Analysis

Alternative 6B was included after the initial Alternative list was established as it was concluded that Pine Street was a viable location for construction of an access road. The following are related to issues and opportunities of this Alternative access location and alignment:

- Alternative would provide more efficient emergency response times to majority of the City by creating an optional route to the east that does not require the use of Arsenal Street.
- Areas of the City to the east, north and south could be accessed by emergency vehicles via the use of Massey Street South and Pine Street intersection
- Residential character of the adjacent neighborhood will not be impacted as severe as other alternatives due to adjacent commercial property along Pine Street
- Truck traffic destined for the Industrial Park from points north, east and south could use this access location instead of using Arsenal Street. However, the residential nature of Mullin Street and surround roadways would not be ideal for truck traffic and movements.

Table 5-15 Illustrates No-Build LOS results for ETC (2021) and ETC+20 (2041) capacity analyses.

Table 5-15 Alternative 6B – Access Road over CSX Railway via Pine Street Intersection Level of Service and Delay (sec)					
		Weekday AM Peak Hour		Weekday PM Peak Hour	
Intersection	Approach	ETC (2021) No Build Conditions	ETC+20 (2041) No Build Conditions	ETC (2021) No Build Conditions	ETC+20 (2041) No Build Conditions
Massey Street South & Pine Street	NB All Movements	A (0.5)	A (0.4)	A (0.5)	A (0.5)
	SB All Movements	A (0.9)	A (0.9)	A (1.0)	A (1.0)
	EB All Movements	A (9.6)	A (9.9)	B (10.4)	B (11.0)
	WB All Movements	A (9.8)	B (10.1)	A (9.6)	B (10.0)
	Overall	A (2.0)	A (2.0)	A (1.7)	A (1.7)

The construction of the proposed access road intends to connect Bellew Avenue South/Rail Drive to Pine Street through the construction of a bridge over the CSX Railway. To serve as a basis of expected impacts, it is assumed that approximately 40% of Westbound entering and 40% of Eastbound Existing traffic destined for the Public Safety Complex will utilize the newly constructed approach. These volumes were redistributed through the ETC+20 No-Build Pine Street. Massey Street South intersection volumes based on NYSDOT provided turn movement counts. Table 5-16 Illustrates No-Build LOS results for ETC (2021) and ETC+20 (2041) capacity analyses.

Table 5-16 Alternative 6B – Access Road over CSX Railway via Mullin Street West Proposed Conditions: Intersection Level of Service and Delays (sec)			
		Weekday AM Peak Hour	Weekday PM Peak Hour
Intersection	Approach	ETC+20 Build Conditions	ETC+20 Build Conditions
Massey Street South & Pine Street	NB All Movements	A (2.3)	A (0.9)
	SB All Movements	A (0.8)	A (1.0)
	EB All Movements	B (10.7)	B (11.2)
	WB All Movements	B (11.0)	B (10.2)
	Overall	A (3.1)	A (3.7)

Crash Analysis

Within the 3 year period analyzed, 3 crashes occurred at the Massey Street South and Pine Street intersection with each crash classified as a Right Angle. Additionally, injuries incurred in each crash. Further analysis determined this specific intersection has a geometric skew for the side street approaches which hinder sight distances for Northbound and Southbound movements. Implementing safety measures at this intersection, such as improving is sight distance lines or reconstructing side street approaches to obtain perpendicular alignments to Massey Street South is recommended to reduce the severity of crashes and crash occurrences.

Table 5-17 Alternative 6B – Massey Street South & Pine Street Crash Summary		
Type of Crash	Number	Percentage
Right Angle	3	100.00%

Table 5-18 Alternative 6B – Massey Street South & Pine Street Intersection Crash Rate Comparison				
Intersection	Traffic Control	Number of Crashes	Crash Rate (ACC/MEV)	Statewide Average Rate*
Massey Street South & Mullin Street West	2-way stop controlled	3	1.07	0.19

*Statewide average based on urban 3-legged intersections with sign control on two approaches

Summary of Recommendations

Based on the secondary screening analysis for Alternative 6B, below is a summary of recommended improvements, benefits and constraints.

- Construct a 32’ wide paved access road connecting Pine Street to Rail Drive and Bellew Avenue South intersection and install guide railing along vertical drop offs and adjacent to environmentally sensitive areas.
- Construction of a bridge over CSX Railway to minimize impacts to existing railroad.
- No additional intersection control measures are required to account for additional traffic at the studied intersection.
- Utility relocations will be required to ensure proper overhead clearance of existing transmission lines
- Extensive earthwork activities will be required to ensure proper clearance over CSX railway while adhering to current design standards
- Non-standard sight distances would be constructed due to the proposed profile of the access road

Conclusion

This alternative would provide a short term solution for the Industrial Complex by providing an access point to be utilized by emergency response vehicles, Industrial Park and Public Safety employees and minor commercial traffic volumes. However, extensive earthwork and geometric deficiencies hinder the construction of this Alternative. Additionally, the primary goal of this Alternative is aimed at improving response times from emergency vehicles and while some commercial vehicle traffic is expected to utilize this access, it is anticipated that no heavy truck traffic will be mitigated from the

Arsenal Street corridor. Therefore, it is suggested that this Alternative is incorporated in conjunction with Long Range alternative 10 to accommodate both Public Safety and Industrial Park traffic needs.

5.3.5. Alternative 7 – Access Road from Roundhouse Drive to Massey Street South

Capacity Analysis

Discussions with stakeholders including tenants of the Industrial Park, as well as the Sheriff’s office and City Police Dept. offered the following related to issues and opportunities of this Alternative access location and alignment:

- Alternative would provide more efficient emergency response times to areas south of the City of Watertown, primarily servicing the Jefferson County Sheriff’s Department
- Emergency response times for City of Watertown Public Safety personnel will not be addressed
- Truck traffic destined for the Industrial Park from points east and south could use this access location instead of using Arsenal Street
- Designating a new truck route would assist mitigating heavy vehicle traffic on Arsenal Street

The construction of the proposed access road intends to connect Roundhouse Drive to Massey Street South. Since this alternative proposes to construct a new intersection, a capacity analysis of existing operations was not completed. To serve as a basis of expected impacts, it is assumed that approximately 40% of Westbound entering and 40% of Eastbound Existing traffic destined for the Public Safety Complex will utilize the newly constructed access road.

Table 5-19 illustrates the Build Capacity Analysis results.

Table 5-19 Alternative 7 – Access Road from Roundhouse Drive to Massey Street South Proposed Conditions: Intersection Level of Service and Delays (sec)			
		Weekday AM Peak Hour	Weekday PM Peak Hour
Intersection	Approach	ETC+20 Build Conditions	ETC+20 Build Conditions
Massey Street South & Proposed Access Road	NB All Movements	A (0.4)	A (0.1)
	SB All Movements	A (0.0)	A (0.0)
	EB All Movements	A (9.6)	A (9.8)
	Overall	A (0.5)	A (1.4)

Crash Analysis

The proposed Massey Street South access road would be located approximately 0.10 miles south of the CSX railroad bridge. Crash data for this alternative included all crash data along Massey Street South from CSX railroad maintenance road north to Greenview Drive. Within the 3 year period analyzed, only two 2 crashes occurred along the Massey Street South corridor; each crash involved a single vehicle. Since this is a more rural area of Watertown, crashes involving deer are common. Effective mitigation efforts to reduce conflicts with animals would be to provide adequate horizontal clearances within city ROW limits.

Table 5-20 Alternative 7 – Access Road from Roundhouse Drive to Massey Street South Crash Summary Table		
Type of Crash	Number	Percentage
Crash with Bridge	1	50.00%
Crash with Deer	1	50.00%

Table 5-21 Alternative 7 – Access Road from Roundhouse Drive to Massey Street South Intersection Crash Rate Comparison Table			
Intersection	Number of Crashes	Crash Rate (ACC/MVM)	Statewide Average Rate*
Massey Street South (from CSX Maintenance Road to Greenview Drive)	2	4.16	2.05

*Statewide average based on rural 2-lane, undivided roadway.

Summary of Recommendations

Based on the secondary screening analysis for Alternative 7, below is a summary of recommended improvements, benefits and constraints.

- Construct a 32' wide paved access road from Roundhouse drive to Massey Street South.
- Construct a new, 3-legged stop controlled intersection allowing for free-flowing traffic on Massey Street South.
- Construct additional spur from access road to PSB Complex designated as authorized vehicles only to accommodate public safety personnel.
- Requires extensive disturbance of wetland and other environmentally sensitive areas
- Requires extensive Right-of-Way acquisitions to construct access road through existing private properties

Conclusion

This alternative would provide a long term solution primarily benefitting the Jefferson County Sheriff's office and City Police and would provide an access point for future developments of the Industrial complex accommodating employees and minor commercial heavy vehicle volumes. However, this alternative will not improve emergency response times for City of Watertown and County Public Safety personnel. Therefore, it is suggested that this alternative is implemented in conjunction with short term alternative 6A and/or 6B to fully achieve the goals of this study.

5.3.6. Alternative 8 – Designated Interstate 81 Off-Ramp

Capacity Analysis

Discussions with stakeholders including tenants of the Industrial Park, as well as the Sheriff's office and City Police Dept. offered the following related to issues and opportunities of this Alternative access location and alignment:

- Alternative would provide more direct route for commercial truck traffic on I-81 Northbound that are destined for the Industrial Complex
- Emergency response times for City of Watertown Public Safety personnel or Jefferson County Sheriff's office will not be addressed

The construction of the proposed off ramp intends to divert I-81 Northbound heavy truck traffic destined for the Industrial complex from using Arsenal street by providing a direct access route to the site. This long term solution assists with mitigating existing eastbound commercial vehicle traffic on Arsenal Street and provides commercial access for future developments. However, this alternative does not provide mitigation for heavy truck volumes from existing the Industrial Park via Arsenal Street and Bellew Avenue South intersection. Since there are currently no plans for future development that would necessitate trip generation or trip distribution calculations, a capacity analysis of this alternative was not developed.

Crash Analysis

Alternative 8 intends to redirect I-81 Northbound traffic intended for the Industrial Complex through the construction of a new I-81 Northbound off ramp. The crash analysis focused on both I-81 Northbound and Southbound ramps that provide access to Arsenal Street. Within the 3 year period analyzed, 30 crashes along Route 3 which can be attributed to the I-81 Exit 45 ramps. 20 crashes occurred at the northbound ramp intersection; 10 occurred at the southbound slip ramp and intersection. Of these 30 crashes, 2 resulted in personal injury and one occurrence involved a pedestrian who was utilizing the crosswalk traversing the Northbound off ramp. Further analysis shows more

than 50% of crashes reported were designated as a rear end crash. Typically, rear end crashes are a result of driver inattention and poor driving conditions (i.e. snow, ice, etc.). Additionally, 15 crashes occurred during poor driving conditions.

Table 5-22 Alternative 8 – I-81 Off Ramps (Exit 45) Crash Summary Table		
Type of Crash	Number	Percentage
Rear End	16	53.34%
Left Turn	4	13.33%
Right Angle	4	13.33%
Right Turn	2	6.67%
Overtaking	2	6.67%
Object	1	3.33%
Pedestrian	1	3.33%

Table 5-23 Alternative 8 – I-81 Off Ramps (Exit 45) Intersection Crash Rate Comparison Table				
Intersection	Traffic Control	Number of Crashes	Crash Rate (ACC/MVM)	Statewide Average Rate*
Arsenal Street & I-81 Northbound Ramps	4-way traffic signal	20	0.67	0.26
Arsenal Street & I-81 Southbound Ramps	4-way traffic signal	10	0.33	0.26

*Statewide average based on urban 4-legged intersections, signal controlled with left turn lanes.

Summary of Recommendations

Based on the secondary screening analysis for Alternative 7, below is a summary of recommended improvements, benefits and constraints:

- Construct a 20’ wide off ramp for I-81 Northbound commercial traffic destined for the Industrial Complex
- Construct 4-legged, stop controlled intersection with Haney Street
- Alternative would provide access for existing and future Industrial Park developments to mitigate eastbound traffic on Arsenal Street

Conclusion

This alternative would provide a long term solution primarily benefitting I-81 northbound commercial heavy truck traffic destined for the Industrial complex providing an access point to accommodate existing and future developments. While the primary goal of this alternative is to mitigate Northbound commercial heavy vehicle traffic from Arsenal Street, the construction of the off ramp will not improve emergency response times for City of Watertown Public Safety personnel, Jefferson County Sheriff’s office,

mitigate I-81 southbound commercial heavy vehicle traffic, or mitigate existing commercial vehicle traffic from Arsenal Street. Therefore, it is suggested that this alternative is implemented in conjunction with one of the identified short term alternatives 6A and/or 6B, and Alternative 9.

5.3.7. Alternative 9 – Access Road from Towne Center Drive to Waterman Drive

Capacity Analysis

Discussions with stakeholders including tenants of the Industrial Park, as well as the Sheriff's office and City Police Dept. offered the following related to issues and opportunities of this Alternative access location and alignment:

- Alternative would provide a designated commercial vehicle route for I-81 southbound and Northbound traffic on I-81 that are destined for the Industrial Complex
- Constructing the access road and bridge over I-81 would eliminate conflicts on Arsenal Street
- Westbound entering and Eastbound existing commercial heavy vehicles would not be mitigated from Arsenal street
- Does not directly improve emergency response times for areas in the City of Watertown east and south of the Industrial Park
- Designate commercial truck route to aid in discouraging commercial vehicles from utilizing Arsenal Street to access the site

The construction of the Towne Center extension access road is intended to form a commercial corridor eliminating heavy vehicles destined for the industrial complex along Arsenal Street from the I-81 Northbound exit ramp to Bellew Avenue South. This alternative was developed as a long term solution in anticipation for future developments within the Industrial Park. However, since there are currently no plans for future development that would necessitate trip generation or trip distribution calculations, a capacity analysis of this alternative was not developed.

Crash Analysis

Alternative 9 proposes the construction of an access road over I-81 via Towne Center Drive. The crash analysis focused on crashes occurring around the Towne Center Drive and Arsenal Street intersection. Crashes occurring within shopping center parking lots were removed from this analysis. Within the 3 year period analyzed, 26 crashes occurred at the Arsenal Street and CR 202 intersection. Of these 26 crashes, 3 resulted in personal injury and no crashes involved pedestrians or bicyclists. Further analysis shows the majority of crashes reported were designated as a rear end crash. Typically, rear end crashes are a result of driver inattention and poor driving conditions (i.e. snow, ice, etc.). Additionally, 15 crashes occurred during poor driving conditions. However the

second most common crash at this intersection was Right Angle crashes. These types are often attributed to motorists disregarding traffic control devices, driver inattention and failure to yield to the right of way. Since the contributing factors of these crashes rarely involve the driver’s view being obstructed, it is concluded that sight distance limitations are not a contributing factor for crashes at this intersection. Additionally, since the crash reports provided attribute majority of crashes were caused by driver error (driver inattention, failure to yield to right of way, disregarding traffic control devices, etc.), no intersection improvements are required at this intersection to mitigate crash occurrences. However, traffic signal improvements are recommended to improve signal timing and re-phasing to account for additional traffic entering the intersection with the construction of the proposed access road.

Table 5-24 Alternative 9 – Towne Center Access Road to Waterman Drive Crash Summary Table		
Type of Crash	Number	Percentage
Rear End	12	46.15%
Right Angle	7	26.92%
Overtaking	3	11.54%
Right Turn	2	7.69%
Left Turn	1	3.85%
Sideswipe	1	3.85%

Table 5-25 Alternative 9 – Towne Center Access Road to Waterman Drive Intersection Crash Rate Comparison				
Intersection	Traffic Control	Number of Crashes	Crash Rate (ACC/MEV)	Statewide Average Rate*
Arsenal Street & Towne Center Drive/CR 202	4-way traffic signal	26	2.21	0.26

*Statewide average based on urban 4-legged intersections, signal controlled with left turn lanes.

Summary of Recommendations

Based on the secondary screening analysis for Alternative 7, below is a summary of recommended improvements, benefits and constraints.

- Construct a 32’ wide access road extending from Towne Center Drive to Waterman Drive with guide rail installation for added protection of adjacent environmentally sensitive areas
- Construction of a bridge spanning I-81 corridor
- Utilizes the existing maintenance road and berm to minimize environmental impacts
- Construct 4-legged, stop controlled intersection with Haney Street
- Requires extensive Right-of-Way acquisitions for construction

- Requires extensive encroachment of wetlands and other environmentally sensitive areas

Conclusion

This alternative would provide a long term solution primarily benefitting I-81 northbound and southbound commercial heavy truck traffic destined for the Industrial complex providing designated commercial heavy vehicle route to the site. While the primary goal of this alternative is to mitigate eastbound commercial heavy vehicle traffic from Arsenal Street, the construction of this roadway will not deter westbound traffic from utilizing the Arsenal Street and Bellew Avenue South access. Additionally, this alternative does not directly improve emergency response times for City of Watertown Public Safety personnel and the Jefferson County Sheriff's office for areas east and south of the complex. Therefore, it is suggested that this alternative is implemented in conjunction with one of the identified short term alternatives 6A and/or 6B.

5.3.8. Alternative 10 – Raymour & Flannigan Corridor

Capacity Analysis

Alternative 10 was included after the initial Alternative list was established as it was concluded that constructing a defined corridor through the Raymour & Flannigan plaza and connecting to Waterman Drive would be a short term solution for Industrial Park traffic. Discussions with stakeholders including tenants of the Industrial Park, as well as the Sheriff's office and City Police Dept. offered the following related to issues and opportunities of this Alternative access location and alignment:

- Alternative would alleviate congestion at the Arsenal Street & Bellew Avenue South intersection caused by Industrial Park traffic
- Does not directly improve City of Watertown Public Safety response time to areas east and south of the Complex.
- Establishes clearly defined travel lanes and parking limits to reduce uncontrolled movements within the existing parking lot
- Establishes a designated commercial truck route for existing and future developments to aid in discouraging commercial vehicles from utilizing Bellew Avenue South for access to the Industrial Park

Table 5-26 Illustrates No-Build LOS results for ETC (2021) and ETC+20 (2041) capacity analyses.

Table 5-26 Alternative 10 – Access Road via Raymour & Flannigan Plaza Intersection Level of Service and Delay (sec)					
		Weekday AM Peak Hour		Weekday PM Peak Hour	
Intersection	Approach	ETC (2021) No Build Conditions	ETC+20 (2041) No Build Conditions	ETC (2021) No Build Conditions	ETC+20 (2041) No Build Conditions
Arsenal Street & Raymour & Flannigan/Cedar Square	NB Left	A (9.9)	B (13.3)	C (23.9)	C (30.4)
	NB Thru/Right	A (7.8)	A (9.6)	A (8.7)	A (9.5)
	SB Left	B (10.5)	B (14.0)	C (22.5)	C (26.6)
	SB Thru/Right	A (0.0)	A (0.0)	A (0.1)	A (0.2)
	EB Left	A (9.8)	B (13.1)	C (28.0)	C (34.0)
	EB Thru/Right	A (3.7)	A (5.1)	B (12.4)	B (13.1)
	WB Left	B (10.3)	B (13.8)	C (25.5)	C (31.6)
	EB Thru/Right	A (3.8)	A (5.0)	A (8.0)	A (8.6)
	Overall	A (4.1)	A (5.5)	B (11.0)	B (12.1)

The construction of the proposed access road intends to build a clearly defined corridor through the existing Raymour & Flannigan Plaza while maintaining access to commercial properties. To serve as a basis of expected impacts, trips were distributed based on the following assumptions and data:

- All heavy vehicle traffic volumes observed at the intersection of Bellew Avenue South and Waterman Drive during the associated peak hours will be shifted to the Arsenal Street and Raymour & Flannigan/Cedar Square intersection.
- Trip distribution percentages at the study intersection were determined based on previous heavy vehicle turning movement data collected by the NYSDOT at the Intersection of Arsenal Street and Bellew Avenue South
- The access road south of the existing plaza limits will be limited to City Center Industrial Complex commercial truck traffic only. Therefore no passenger vehicle traffic volumes will be distributed as part of this analysis.

Table 5-27 Illustrates Build LOS results for ETC (2021) and ETC+20 (2041) capacity analyses.

Table 5-27 Alternative 10 – Access Road via Raymour & Flannigan Plaza Proposed Conditions: Intersection Level of Service and Delays (sec)			
		Weekday AM Peak Hour	Weekday PM Peak Hour
Intersection	Approach	ETC+20 Build Conditions	ETC+20 Build Conditions
Arsenal Street & Raymour & Flannigan/Cedar Square	NB Left	B (13.4)	C (31.1)
	NB Thru/Right	A (8.9)	A (9.4)
	SB Left	B (14.6)	C (26.8)
	SB Thru/Right	A (0.0)	A (0.2)
	EB Left	B (14.6)	C (34.8)
	EB Thru/Right	A (5.6)	C (13.4)
	WB Left	B (15.1)	C (32.3)
	WB Thru/Right	A (5.4)	A (8.7)
	Overall	A (6.0)	B (12.3)

Crash Analysis

Alternative #10 proposes the construction of an access road through the existing parking lot of the Raymour & Flannigan Plaza. The crash analysis focused on crashes occurring around the Raymour & Flannigan Plaza parking lot and Arsenal Street intersection. Crashes attributed to parking movement or Crashes with parking lot infrastructure (i.e. light poles, utility poles) were omitted from this analysis. Within the 3 year period analyzed, 3 crashes occurred at the Arsenal Street and Raymour & Flannigan Plaza intersection. Each of the recorded crashes resulted in personal injury and no crashes involved pedestrians or bicyclists. Further analysis shows 2 out of 3 crashes were caused by overtaking from vehicles exiting the Raymour & Flannigan Plaza. It is important to note that currently there are no existing pavement markings within the parking lot to designate travel lanes or turn lanes. Due to the nature of this alternative, Intersection improvements will be required to construct the access road. It is anticipated that by providing proper pavement markings and lane delineations crash rates will decrease at this intersection. Traffic signal improvements are recommended to improve signal timing and re-phasing to account for additional traffic entering the intersection with the construction of the proposed access road.

Table 5-28 Alternative 10 – Arsenal Street & Raymour & Flannigan Plaza Crash Summary Table		
Type of Crash	Number	Percentage
Overtaking	2	66.67%
Right Turn	1	33.33%

Table 5-29 Alternative 10 – Arsenal Street & Raymour & Flannigan Plaza Intersection Crash Rate Comparison				
Intersection	Traffic Control	Number of Crashes	Crash Rate (ACC/MEV)	Statewide Average Rate*
Arsenal Street & Tractor Supply Plaza	4-way traffic signal	3	0.13	0.26

*Statewide average based on urban 4-legged intersections, signal controlled with left turn lanes.

Summary of Recommendations

Based on the secondary screening analysis for Alternative 10, below is a summary of recommended improvements, benefits and constraints.

- Construct a 32' wide curbed corridor extending from Arsenal Street to Waterman Drive through the existing Raymour & Flannigan Plaza Drive.
- Requires extensive Right-of-Way acquisitions for construction
- Requires extensive encroachment of wetlands and other environmentally sensitive areas
- Requires Coleman Ave to be converted to a dead end roadway

Conclusion

This alternative would provide a long term solution primarily benefitting the existing tenants and future developments of the Industrial Park by providing access accommodating employees and commercial vehicle traffic. However, this alternative will not directly improve emergency response times for City of Watertown Public Safety personnel. Therefore, it is suggested that this alternative is implemented in conjunction with one of the identified short term alternatives to fully achieve the goals of this study.

6.0 PROJECT COSTS & RECOMMENDATIONS

6.1 Project Costs

The below figure outlines the estimated cost comparison between the 8 alternatives carried forward into final evaluation, as outlined previously – Alternative 1, 5, 6A, 6B, 7, 8, 9, & 10. The estimates were broken down into the following line items:

Clearing/Building Demo – The cost to clear and grub within the footprint of each alternative.

Roadway Construction – The cost includes all items to construct the roadway segment of each alternative excluding the bridge. This line item includes cut/fill, subbase, pavement courses, curbing, and guide railing.

Concrete Sidewalk – The cost includes the cost to construct the sidewalk on the roadway segment between at the intersection of Arsenal Street and Bellew Avenue South.

Intersection Improvements – The cost of traffic signal improvements including full replacement of traffic signals, pedestrian signals, conduit, pullboxes, and modifying existing controller cabinets.

Bridge Construction – The bridge costs were determined by calculating the anticipated shoulder break areas and utilizing the “NYSDOT Preliminary Cost Estimate Worksheet (New and Replacement Bridges)”, which captures all of the anticipated costs to construct the bridge portion of the project. The bridge cost includes features such as the sidewalk, approach slabs, and consist of either curbing or a barrier on both sides preventing runoff from coming into contact with fascia girders (all girders will presumably be weathering steel).

Signage – The cost includes installing new signs and sign posts, and removal of existing signs.

Work Zone Traffic Control – The cost to maintain traffic around and through the project site during construction.

Table 6-1 Short Term Preliminary Cost Estimate				
DESCRIPTION	ALTERNATIVE 1	ALTERNATIVE 5	ALTERNATIVE 6A	ALTERNATIVE 6B
Road Length (LF)	210	930	1525	880
Sidewalk Length (LF)	250	-	-	-
Bridge Length (LF)	-	125	475	95
Clearing/Grubbing	\$ 1,000.00	\$ 5,000.00	\$ 7,500.00	\$ 5,000.00
Excavation	\$ 1,350.00	\$ 2,400.00	\$ 4,800.00	\$ 3,900.00
Embankment	-	\$ 183,250.00	\$ 124,000.00	\$ 562,750.00
Asphalt Roadway Construction	\$ 69,495.00	\$ 179,120.00	\$ 390,480.00	\$ 225,990.00
Concrete Sidewalk Construction	\$ 14,380.00	-	-	-
Intersection Improvements	\$ 50,000.00	-	-	-
Bridge Construction	-	\$ 1,625,000.00	\$ 6,175,000.00	\$ 1,235,000.00
Signage	-	\$ 500.00	\$ 500.00	\$ 500.00
Construction Subtotal	\$ 136,225.00	\$ 1,995,270.00	\$ 6,702,280.00	\$ 2,033,140.00
Work Zone Traffic Control (8%)	\$ 10,898.00	\$ 159,621.60	\$ 536,182.40	\$ 162,651.20
Survey (2%)	\$ 2,724.50	\$ 39,905.40	\$ 134,045.60	\$ 40,662.80
Incidentals (10%)	\$ 13,622.50	\$ 199,527.00	\$ 670,228.00	\$ 203,314.00
Field Change Payment (5%)	\$ 6,811.25	\$ 99,763.50	\$ 335,114.00	\$ 101,657.00
Mobilization (4%)	\$ 5,449.00	\$ 79,810.80	\$ 268,091.20	\$ 81,325.60
Contingency (20%)	\$ 27,245.00	\$ 399,054.00	\$ 1,340,456.00	\$ 406,628.00
Total Project Costs	\$ 203,000.00	\$ 2,973,000.00	\$ 9,986,400.00	\$ 3,029,400.00

Table 6-2 Long Term Preliminary Cost Estimate				
DESCRIPTION	ALTERNATIVE 7	ALTERNATIVE 8	ALTERNATIVE 9	ALTERNATIVE 10
Road Length (LF)	2920	4300	7000	3310
Sidewalk Length (LF)	-	-	-	-
Bridge Length (LF)	-	-	235	-
Clearing/Grubbing	\$ 15,000.00	\$ 20,000.00	\$ 40,000.00	\$ 10,000.00
Excavation	\$ 128,400.00	\$ 139,800.00	\$ 219,600.00	\$ 345,000.00
Embankment	\$ 109,250.00	\$ 68,000.00	\$ 1,327,500.00	\$ 150,000.00
Asphalt Roadway Construction	\$ 647,160.00	\$ 717,630.00	\$ 3,354,010.00	\$ 1,805,000.00
Concrete Sidewalk Construction	-	-	-	-
Intersection Improvements	-	\$ 60,000.00	\$ 60,000.00	\$ 95,000.00
Bridge Construction	-	-	\$ 3,055,000.00	\$ -
Signage	\$ 1,000.00	\$ 1,000.00	\$ 1,000.00	\$ 5,000.00
Construction Subtotal	\$ 900,810.00	\$ 1,006,430.00	\$ 8,057,110.00	\$ 2,410,000.00
Work Zone Traffic Control (8%)	\$ 72,064.80	\$ 80,514.40	\$ 644,568.80	\$ 192,800.00
Survey (2%)	\$ 18,016.20	\$ 20,128.60	\$ 161,142.20	\$ 48,200.00
Incidentals (10%)	\$ 90,081.00	\$ 100,643.00	\$ 805,711.00	\$ 241,000.00
Field Change Payment (5%)	\$ 45,040.50	\$ 50,321.50	\$ 402,855.50	\$ 120,500.00
Mobilization (4%)	\$ 36,032.40	\$ 40,257.20	\$ 322,284.40	\$ 96,400.00
Contingency (20%)	\$ 180,162.00	\$ 201,286.00	\$ 1,611,422.00	\$ 482,000.00
Total Project Costs	\$ 1,342,300.00	\$ 1,499,600.00	\$ 12,005,100.00	\$ 3,590,900.00

6.2. Alternative Recommendations

The overall intent of this feasibility study is to identify short term and long term alternatives that could be further analyzed accommodating the needs of both the PSB Complex and Industrial Park. To address the needs of both the PSB Complex (primary goal) and Industrial Park (secondary goal), it is recommended that short term alternatives be considered in tandem with longer term alternatives. Together the analysis shows this coordinated approach would support existing tenants and help spur full buildout of the Industrial Park while also resulting in reduced response times, and safer and more efficient movement of emergency response vehicle trips within and around the City of Watertown and neighboring communities.

In the near term, and understanding the prudent nature of the City of Watertown and industrial park tenants needs to identify a redundant access to Arsenal Street for truck traffic volumes and movement, it is recommended that Alternative 10 be further studied to identify traffic and engineering design improvements that would be necessary to implement that project. Alternative 10, combined with improvements needed at the existing S. Bellew Ave. and Arsenal Street intersection would result in immediate safety and efficiency benefits for both the industrial park and the public safety complex. Further, it is recommended that Alternative 6A, Alternative 6B or a hybrid version of 6A&6B (constructing an additional spur to accommodate the needs of both the PSB Complex and industrial park) be progressed for additional consideration and more detailed engineering study. While alternatives 6A and 6B are not the most cost effective solutions, the recommendation for these alternatives is based on limiting environmental and right-of-way impacts, limited non-standard geometric deficiencies, anticipated impacts to residential properties, and the long-term goals of both the public safety complex and City Industrial park that could be achieved through the eventual construction of alternatives. Together, these shorter term alternatives would provide long-term benefits to the industrial park's ability to expand and grow while also facilitating the safety and operational needs of the public safety complex.

Long term, it is recommended that Alternative 9 be further studied as the WJCTC, City and Town explore a need and opportunity to construct an additional corridor parallel to Arsenal Street resulting in mitigating heavy vehicle traffic away from high density areas currently encumbered by high volumes along Arsenal Street and adjacent roadways. It is important to note that Alternative 9 would require significant environmental mitigation efforts to reduce impacts to sensitive areas.

Additionally, while Alternative 1 does not mitigate truck traffic away from Bellew Avenue South nor provide a redundant access to the Industrial Park, it is recommended that this alternative be progressed to address existing geometric deficiencies which hinder the intersection. This alternative is cost effective and benefits heavy vehicle traffic destined for the Industrial Park as well as adjacent commercial properties along Bellew Avenue South. Along with geometric improvements, optimizing traffic signal operations could reduce delays experienced at the

intersection improving motorist's accessibility. Further, with improvements to Alternative 1 as summarized in this report, in tandem with Alternative 10 through the Raymour and Flannigan Plaza, efficiencies in truck movements could be realized. If both projects were constructed over time, Alternative 10 via the use of Coleman Ave and through the existing plaza parking area is recommended to serve as the primary truck route in and out of the Industrial Park thus



Figure 6-1: Recommended Alternatives

removing those vehicle movements and resulting conflicts with other passenger and emergency response vehicles along Bellevue Avenue South.

APPENDIX A
Concept Plans

APPENDIX B
Secondary Screening

APPENDIX C
Transportation Analysis Data, Figures, & Synchro Output Reports

APPENDIX D
Public Coordination

The experience to
listen
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