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# Goodell Street Corridor Study

## Greater Buffalo Niagara Regional Transportation Council
## City of Buffalo
## Goodell Street, Pearl Street, and Tupper Street

Prepared for:
GBNRTC
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Buffalo, NY 14202

August 2023

# Greater Buffalo-Niagara Regional Transportation Council

## Buffalo, New York

# Goodell Street Corridor Study

## Prepared by:

## C&S Companies

## FINAL —August 2023



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# Executive Summary

The purpose of this study was to analyze existing and future operations along the Goodell Street corridor for proposed design alternatives. The corridor consists of Goodell Street, Pearl Street between Goodell Street and Tupper Street, and Tupper Street between Pearl Street and NY Route 33, and the terminus of NY Route 33 between Jefferson Avenue and Goodell Street. A recent safety evaluation presented high collision rates in the corridor at intersections and along street segments. This corridor is in need of safety enhancements, traffic calming, and multi-modal accommodations. This study investigated repurposing the existing road width to provide accommodations for multiple modes of transportation, with an emphasis on safety and equity, while maintaining an efficient traffic flow through the area.

The primary alternatives identified for this study were:

- Alternative 1
  Null Alternative, no changes to the existing facility, this alternative only takes into consideration future planned development and routine maintenance.
- Alternative 2
  Road diet from four lanes to three lanes on part or all of the Goodell Street corridor.
- Alternative 3
  Road diet from four lanes to two lanes on part or all of the Goodell Street corridor.
- Alternative 4
  Implement two-way operations on part or all of the Goodell Street corridor.

Complimenting these alternatives, there was an Alternative 5:

- Alternative 5
  Examine opportunities to reconfigure the terminus of NY Route 33 between the Jefferson Avenue interchange and the Goodell Street Exit.

Through existing inventory and public outreach, secondary alternatives were identified with a goal to improve safety, circulation, and support a reduction of travel lanes on Goodell Street. The secondary alternatives identified were:

- BFNC Drive Access
  Remove access to off-ramp for BFNC Drive from NYS Route 33. Traffic travelling westbound on NYS Route 33 will only be able to access Goodell Street from NYS Route 33, removing the merge point between BFNC Drive and Goodell Street just east of the Michigan Avenue intersection. BFNC would then be converted to two-way traffic from Mulberry Street to Jefferson Avenue.
- Pearl and Edward Street/Main Street/Goodell Street Intersection Realignment
  Reconfigure Pearl Street to better align with Edward Street, forcing traffic from Goodell Street to enter Pearl Street through a left turn movement.
- Pearl Street Two-Way Conversion
  Convert Pearl Street to two-way, and Edward Street to two-way from Pearl Street to Main Street.
- Tupper Street Two-Way Extension
  Convert Tupper Street to a two-way street from Ellicott Street to Oak Street, which currently operates as one-way eastbound.

- Ellicott Street Southbound Approach
  Reconfigure lanes to an exclusive left turn lane, and a shared through/right turn lane.

Using the existing calibrated GBNRTC Regional Travel Demand Model, the primary and secondary alternatives were programmed within the model to determine the impacts to traffic distributions in the study area. Future years of 2025 and 2045 were analyzed for the AM and PM peak hours. The resulting outputs of the alternatives illustrate a percent change on each road segment compared to Alternative 1, which has no geometric changes. Each alternative during each design year and peak, was studied using Synchro software to provide a capacity analysis on each intersection within the study network. It was found that the majority of alternatives are expected to operate with acceptable (LOS D or better) vehicle operations.

To further evaluate the alternatives, additional criteria which supported projects needs and goals, were used to compare how each alternative met further study objectives. Additional evaluation criteria each alternative was compared to were:

- Pedestrian Accommodations
- Bicyclist Accommodations
- Vehicle Travel Time
- Safety
- Environmental Considerations
- Public Outreach

Based on the capacity analysis and additional evaluation criteria, Alternative 3 is the alternative that ranks highest among all project objectives, which includes the implementation of the secondary alternatives. Alternative 3 proposes to remain three lanes westbound on Goodell Street from Michigan Avenue to Oak Street, and would reduce to two lanes westbound from Oak Street to Washington Street. The cross section for Alternative 3 on Goodell Street has opportunity for refinement during preliminary and final design. This study did not identify specific multi-modal accommodation types such as an on-street bicycle lane, a cycle track, or a shared use path, etc. The amount of space and location for these accommodations were identified, but preliminary design and additional public outreach during the capital improvement project process should narrow down which multi-modal accommodation is preferred.

Action items related to Alternative 5 were outlined to improve traffic distribution, slow vehicle speeds, and provide traffic calming. These action items were:

- Wayfinding Signage directing motorists to use Best Street to access BNMC
- Incremental speed reductions on NY Route 33 as it approaches Michigan Avenue
- Gateway at the Goodell Street Exit
- Additional study for NY Route 33 and parallel streets (Cherry Street, BNMC Drive) as it relates to the results of the NY Route 33, Kensington Expressway Project.

# 1.0 Introduction

## Background

Like many Upstate New York cities, Buffalo has been shifting from an auto centric approach to transportation planning that focuses on mobility. As recommended in Moving Forward 2050, new technologies, upgraded street features, and emerging transportation services will be incorporated along key corridors to create Smartly Enhanced Multi-modal Arterials (SEMAs) that offer a range of convenient transportation options. Using the existing foundation of our roadway network, streets can be reimagined to change their character and functionality. Through practices such as road diets, lane reductions, one- to two-way conversions, and multi-modal accommodations, a sustainable and equitable transportation network is created for all. Making these improvements and repurposing underused roadway space for pedestrians, bicycles, and transit, where feasible, will optimize travel along these corridors.

**Figure 1.1 – Photo of Pedestrians Crossing Goodell Street at Ellicott Street**

Multi-lane one-way roads tend to encourage higher speeds, especially with an efficient traffic signal system. But with the right implementation of countermeasures, traffic calming and improved safety will be achieved. Studies have shown that road diets and converting one-way streets to two-way operations create a better pedestrian friendly environment with improved accessibility, having a positive impact on the character of an area that promotes reinvestment with spin-of benefits for nearby communities and the regional economy.

The City of Buffalo has created initiatives such as the Transportation Demand Management (TDM) Plan, where the goal is to reduce single-occupancy vehicles and promote transportation alternatives such as walking and carpooling. The nearby Buffalo Niagara Medical Campus (BNMC) has created their own program, a Transportation Management Association (TMA) for the campus called Go BNMC. This displays the level of commitment the City of Buffalo and BNMC have to reduce environmental impacts through reducing traffic congestion and parking demand, and promoting the use of multi-modal transportation. For the City of

Buffalo, recent changes and studies have created momentum to reimagine the use and operations of some of its streets. Goodell Street has been identified as a high priority corridor in the CBD North Transportation Study. This study focused on the impacts of growth at BNMC on the surrounding neighborhoods, and the implementation of a transportation system to support a diverse population with improved mobility. An outcome of the CBD North Transportation Study was to perform a road diet on Goodell Street from four lanes to three lanes from Washington Street to Main Street, with the southernmost lane converted to a parking lane. This treatment has been implemented with success, and further exploration of follow up activities are being studied here that were action items in the CBD North Transportation Study. This study will analyze the impacts, benefits, and disadvantages to the conversion of Goodell Street and subsequently Tupper Street, Pearl Street, and NYS Route 33.

This study will be guided by a team consisting of GBNRTC, NYSDOT Region 5, the City of Buffalo, and BNMC. Traffic analyses will take advantage of regional and local models developed by GBNRTC to consider operations of the study area's roadway and intersection system as a whole network to inform the development of the study alternatives. The studied alternatives will include considerations for pedestrians, bicyclists, transit users, and motorists.

## Study Objectives

The purpose of this study was to analyze existing and future traffic operations along the Goodell Street corridor and surrounding study area to re-envision Goodell Street, Pearl Street between Goodell Street and Tupper Street, and Tupper Street between Pearl Street and NY Route 33. There is also a potential for reconfiguration of the terminus of NY Route 33 between the Jefferson Avenue interchange and Goodell Street. This reconfiguration would evolve from the Goodell Street study area and the alternatives analyzed.

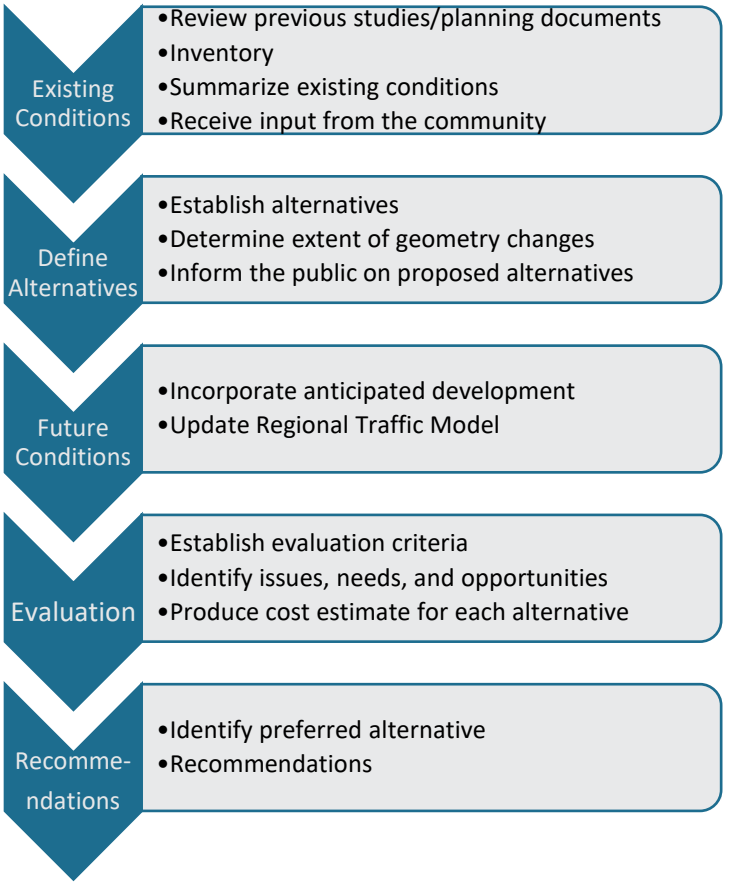
NYSDOT prepared in an Initial Project Proposal (IPP) in June 2021 which includes all of the streets in the study area. The IPP addressed safety and presented a crash rate that is 3 times higher than the statewide average. The IPP aligns with the primary objectives in this planning study.

The Goodell Street corridor is in need of safety enhancements which include traffic calming, pedestrian improvements, and on-street parking. This project will investigate repurposing the existing road width to fit all modes of transportation with an emphasis on safety and equity, while maintaining an efficient traffic flow through the area.

# Study Tasks

The Study was defined by a set of five tasks that ensured that the recommended alternatives are based on technical data collection and analyses, prioritized based on needs of the area, and supported by the local community. The following is a workflow of the process with associated tasks.

**Figure 1.2 – Study Tasks Summary**




# Public Engagement

The Goodell Street Corridor study converges long-standing residential neighborhoods, the medical community, and a business district. For this reason, outreach to those who live, work, and visit within or near the corridor is crucial to gain insight and consensus on the study area which is integral to the success of the study. There are also key stakeholders in the area that were engaged such as the Buffalo Niagara Medical Campus (BNMC), and the Niagara Frontier Transportation Authority (NFTA). Stakeholder and public engagement were done through in-person and virtual meetings, and online surveys on a project website. Two formal public meetings were held in person with a virtual component, these were:

- Project Planning Meeting: focused on the study background and issues.
- Alternative Review Meeting: The team provided sketches of the proposed alternatives to the public.

Public engagement efforts with additional details on event information and results are included in additional sections in this report, as well as Appendix A.

# 2.0 Existing and Future Conditions Inventory

## Existing Study Area

The City of Buffalo is the second-largest city in New York with a population around 278,000 according to the 2020 census. The study area is located within the Central Business District, and is in close proximity to the Fruit Belt and Allentown neighborhoods.

The study focuses on the Goodell Street corridor from the NYS Route 33 off-ramp to the intersection with Pearl Street and Edward Street, and continuing on Pearl Street to Tupper Street, easterly to NYS Route 33. Goodell Street is a westbound one-way arterial, and when coupled with East Tupper Street (the equivalent eastbound arterial), it serves as a major connector between NYS Route 33 and the heart of the City of Buffalo. Goodell Street takes motorists away from a restricted access highway and provides access to urban streets with shops, restaurants, and businesses. Goodell Street is also heavily used to travel to the BNMC medical campus, which is immediately north of Goodell Street.

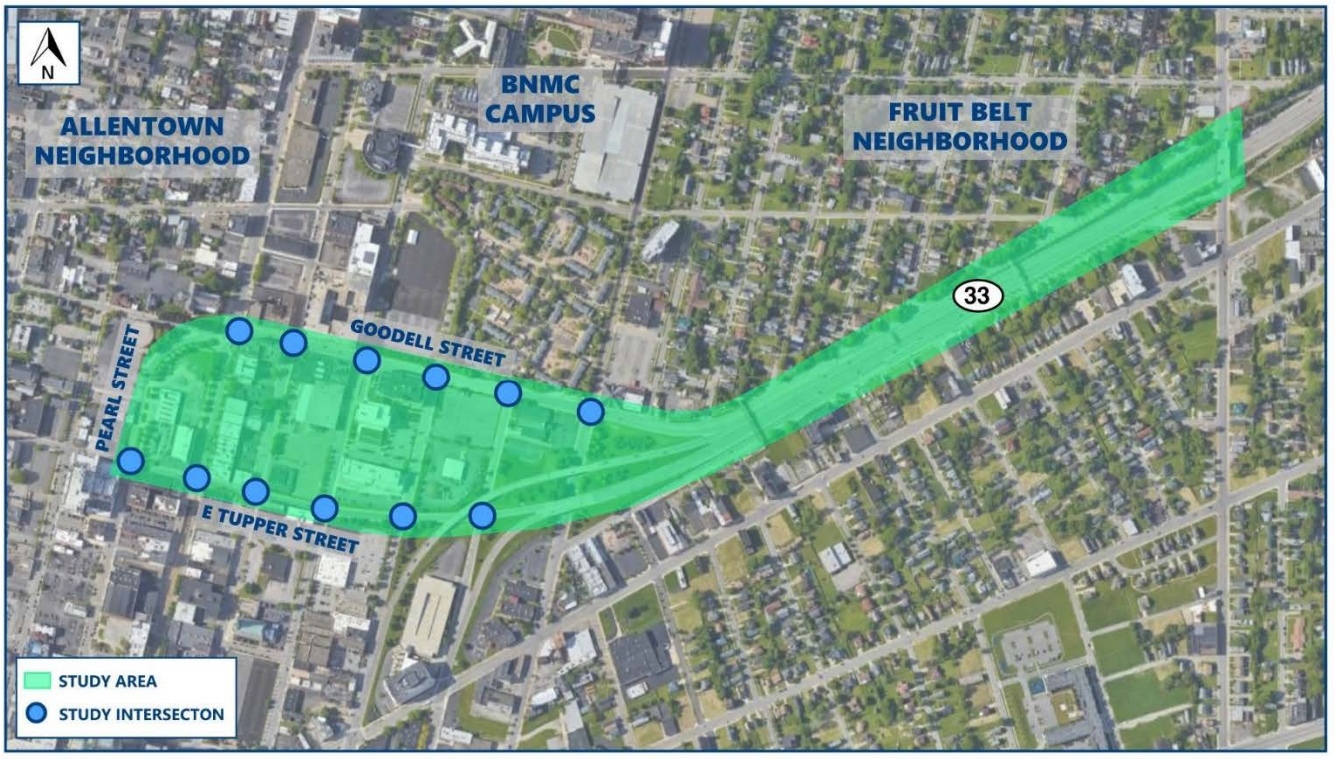



**Figure 2.1 – Study Area Map**

# Existing Conditions

## Existing Studies, Initiatives, and Programs

A number of transportation planning and traffic impact studies have been conducted in the study area in recent years. The most relevant studies and their outcomes are outlined below:

CBD North Study: This transportation planning study was conducted in 2017 to identify impacts to the local transportation system due to the existing and proposed development associated with the Buffalo Niagara Medical Campus (BNMC). In this study, a road diet is recommended for Goodell Street.

Buffalo Green Code: The Unified Development Ordinance (UDO), the City of Buffalo's first comprehensive rewrite of zoning laws since 1953, was implemented citywide in April 2017. The purpose of the UDO is to implement the community's vision of a more walkable and transit-friendly city.

GObike Buffalo: This organization is active in the Buffalo community providing advocacy, commuter and infrastructure planning, and education to promote active mobility within connected and sustainable communities. A part of GObike Buffalo are the GO Buffalo Niagara and GO BNMC programs, which work with commuters, employers, and property owners providing free resources, tools, and incentives to promote sustainable transportation options.

## Existing Inventory

An inventory was taken of the existing conditions within the study area, including pavement condition, on-street parking, sidewalk condition, on-street bicycle facilities, pedestrian amenities, transit locations, and utility locations. A detailed description of these conditions in Appendix B and are summarized below:

**Table 2.1 – Study Area Streets**

| Street Name | Functional Class | Jurisdiction |
|---|---|---|
| Goodell St | Principal Arterial | NYSDOT |
| E Tupper St | Principal Arterial | NYSDOT |
| NYS Route 33 | Principal Arterial Expwy | NYSDOT |
| Michigan Ave | Minor Arterial | City of Buffalo |
| Elm St | Principal Arterial | NYSDOT |
| Oak St | Principal Arterial | NYSDOT |
| Ellicott St | Major Collector | City of Buffalo |
| Washington St | Major Collector | City of Buffalo |
| Main St | Major Collector | City of Buffalo |
| Pearl St | Major Collector | City of Buffalo |

Goodell Street: The pavement condition on Goodell Street is fair. There is evidence of longitudinal cracking along the length of the corridor. There is continuous sidewalk along both sides of the corridor and the sidewalk is in good condition. Pedestrian signals and striped crosswalks are located at all signalized intersections. There are no existing bicycle facilities on Goodell Street. On-street parking is located on the south side of Goodell Street on one block between Washington Street and Main Street. There are no existing transit lines that run along Goodell Street.

E Tupper Street: There are signs of longitudinal and transverse cracking along the length of the E Tupper Street corridor, degrading the condition of the pavement. E Tupper Street has sidewalk in good condition on

both sides of the street with crosswalks on all intersection approaches. Pedestrian signals are located at each signalized intersection. Some of the curb ramps and detectable warning units are in poor shape. There are no existing bicycle facilities, on-street parking capacity, or transit lines that run through E Tupper Street.

## Existing Traffic Volumes and Operations

### Existing Turning Movement Data

The turning movement counts (TMCs) used for the baseline/existing conditions analysis are from April 2018. The April counts are most representative of peak traffic volumes since they were taken pre-Covid and during the academic school year. At the time of the counts, nearby schools were in session that would impact the study area including the Jacobs School of Medicine and Biomedical Sciences at the Buffalo Niagara Medical Campus. Nearby local secondary schools were also in session.

Counts were taken during the AM peak hours (7AM – 9AM) and PM peak hours (3PM – 6PM) on Wednesday April 11, 2018. The intersection of Pearl Street at Tupper Street was missing from this set of data collection, therefore counts taken on September 5, 2018 were used at this one location.

The turning movement data was compiled for each intersection to determine the network peak hour of the corridor. The existing AM network peak is from 7:30 to 8:30, and the existing PM network peak is from 4:30 to 5:30. Tables 1 and 2 show combined intersections volumes for the entire study area during each peak hour in increments of 15 minutes. Combined volumes for each individual intersection during peak hour can be found in Appendix C.

**Table 2.2 – AM Network Peak**

| | 7:00 – 8:00 | 7:15 – 8:15 | 7:30 – 8:30 | 7:45 – 8:45 | 8:00 – 9:00 |
|---|---|---|---|---|---|
| Total | 18187 | 20893 | 22200 | 21943 | 20951 |

**Table 2.3 – PM Network Peak**

| | 3:00 – 4:00 | 3:15 – 4:15 | 3:30 – 4:30 | 3:45 – 4:45 | 4:00 – 5:00 | 4:15 – 5:15 | 4:30 – 5:30 | 4:45 – 5:45 | 5:00 – 6:00 |
|---|---|---|---|---|---|---|---|---|---|
| Total | 17132 | 18059 | 18848 | 19861 | 20902 | 21015 | 21186 | 20337 | 19058 |

Individual intersection peak hours were also calculated to verify their alignment with the network peak hour. For the AM, most intersections on Tupper Street had a peak 15 minutes later than the network peak from 7:45 to 8:45. As shown in Table 1, the difference in volumes between these peaks is negligible, and the network peak from 7:45 to 8:45 will be used at these intersections. For the PM, most intersections peaked during the network peak, with the exception 3 intersections, in which times varied. The network peak was still used in the PM since the difference in volumes between peaks was negligible.

**Table 2.4 – Existing Intersection Peak Hours**

| Intersections | AM | PM |
|---|---|---|
| Goodell St & Michigan Ave | 7:30-8:30 | 4:30-5:30 |
| Goodell St & Elm St | 7:30-8:30 | 4:30-5:30 |
| Goodell St & N Oak St | 7:30-8:30 | 4:30-5:30 |
| Goodell St & Ellicott St | 7:30-8:30 | 4:45-5:45 |
| Goodell St & Washington St | 7:30-8:30 | 4:30-5:30 |
| Goodell St & Pearl St | 7:30-8:30 | 4:30-5:30 |
| Tupper St & Pearl St | 8:00-9:00 | 4:30-5:30 |
| Tupper St & Main St | 7:45-8:45 | 4:00-5:00 |
| Tupper St & Washington St | 7:45-8:45 | 4:00-5:00 |
| Tupper St & Ellicott St | 7:45-8:45 | 4:30-5:30 |
| Tupper St & N Oak St | 7:45-8:45 | 4:30-5:30 |
| Tupper St & Elm St | 7:15-8:15 | 4:30-5:30 |

### Baseline Scenario Capacity Analysis

The existing Goodell and Tupper Street corridors operate on a pretimed signal network. Traffic signal timings and operations were provided by NYSDOT for the corridor, which had the most up to date timings recently optimized in 2018.

**Table 2.5 – Signalized Intersection LOS Analysis**

| | Existing AM | | Existing PM | |
|---|---|---|---|---|
| Intersection | LOS | Delay | LOS | Delay |
| Goodell St & Michigan Ave | C | 29.3 | C | 24.5 |
| Goodell St & N Oak St | A | 4.3 | B | 14.2 |
| Goodell St & Ellicott St | A | 5.3 | A | 6.2 |
| Goodell St & Washington St | A | 3.4 | B | 10.4 |
| Goodell St & Pearl St | B | 19.5 | C | 20.8 |
| Tupper St & Pearl St | B | 14.3 | C | 23.2 |
| Tupper St & Main St | A | 8.6 | C | 22.8 |
| Tupper St & Washington St | A | 9.9 | C | 22.6 |
| Tupper St & Ellicott St | A | 7.2 | C | 22.3 |
| Tupper St & N Oak St | A | 6.6 | C | 20.8 |
| Tupper St & Elm St | A | 7.9 | C | 24.9 |

## Multi-Modal Accommodations

### Pedestrians

Pedestrian volumes at the study intersections were taken during the TMC from April 2018 and September 2018. These volumes were used to examine the existing pedestrian traffic along the study corridors. The intersections along the Goodell Street corridor that have the heaviest foot traffic during the peak hours are

Pearl Street/Main Street and Oak Street. The intersections along the Tupper Street corridor that has the heaviest foot traffic during the peak hours are Main Street, Washington Street, and Ellicott Street. Pedestrian accommodations vary throughout the corridor. All signalized intersections with the exception of Tupper Street and Elm Street have pedestrian signals for all marked crosswalks. The crosswalk types vary by intersection and not all intersections have ADA compliant pushbuttons. The intersection of Goodell Street and Pearl Street/Main Street have recently upgraded their pedestrian signal equipment, however, there is still pedestrian safety concerns due to the geometry of this intersection. See Table 2.6 for a summary of total pedestrian volumes.

**Table 2.6 – Pedestrian Volumes**

| Intersection | Pedestrian Volumes | | Total |
|---|---|---|---|
| | AM | PM | |
| Goodell Street | | | |
| Pearl Street/Main Street | 47 | 56 | 103 |
| Washington Street | 20 | 21 | 41 |
| Ellicott Street | 32 | 24 | 56 |
| Oak Street | 55 | 54 | 109 |
| Elm Street | 11 | 6 | 17 |
| Michigan Avenue | 13 | 16 | 29 |
| Tupper Street | | | |
| Pearl Street | 32 | 60 | 92 |
| Main Street | 82 | 123 | 205 |
| Washington Street | 58 | 87 | 145 |
| Ellicott Street | 66 | 43 | 109 |
| Oak Street | 3 | 11 | 14 |
| Elm Street | 1 | 2 | 3 |

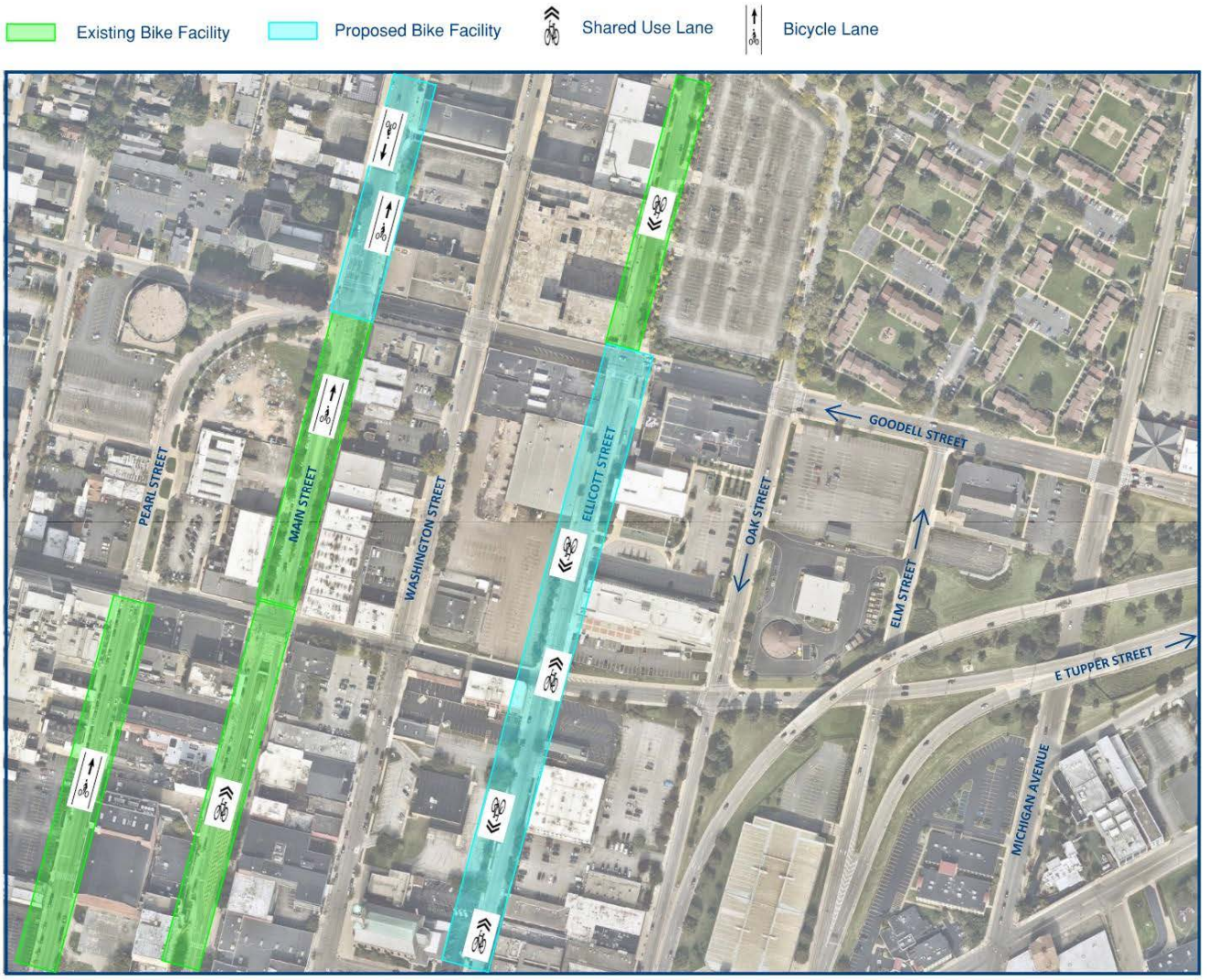
**Bicycles**

Bicycle facilities within the Goodell Street and Tupper Street study area are almost non-existent. Near the study area, street segments with designated bike lanes or marked as a shared lane are:

- Pearl Street south of the Tupper Street intersection
- Main Street between Goodell Street and Tupper Street and south of the Tupper Street intersection
- Ellicott Street north of the Goodell Street intersection

Under the current conditions, the Goodell Street corridor is not bicycle friendly. This four-lane one-way street with coordinated signals encourages high vehicular speeds. The existing lane widths are 12 feet with curb and no shoulders. There is currently no east-west connection between the bike lanes near the study area.

**Figure 2.2 – Existing and Proposed Bicycle Facilities**




## Public Transit

The City of Buffalo is connected by 50+ transit lines that travel throughout the city. Several transit bus routes and the Metro Rail (City of Buffalo's light rail) run through the Goodell Street corridor. As of February 2022, four bus routes travel through the Goodell Street study area. The bus routes are outlined below:

- 8 Main: Within the study area, there are two inbound bus stops for this route: Main Street/Edward Street and Pearl Street/Tupper Street, and there are two outbound bus stops for this route: Ellicott Street/Tupper Street and Ellicott Street/Goodell Street.
- 14 Abbott: Within the study area, there is one inbound and outbound bus stop for this route at Michigan Ave & Goodell Street
- 16 South Park: Within the study area, there is one inbound and outbound bus stop for this route at Michigan Ave & Goodell Street
- 111 South Michigan: There are no existing bus stops within the study corridor for this bus route.

The Metro Rail passes through the study area on Main Street, however there are no rail stops within the Goodell Street and Tupper Street corridor. See **Figure 2.3** for a map of transit lines running through the study area.

**Figure 2.3 – Transit Route Map**


## Safety Assessment

A safety screening of the Goodell Street and Tupper Street corridors was conducted in February 2022 by NYSDOT Region 5 Traffic Systems Operations Group. This eight-lane one-way couple was analyzed to determine any crash patterns that occur within the study area.

The study time period that was analyzed for the Goodell Street corridor was November 2018 to October 2020, since this was the most recent two-year period that the Accident Location Information System (ALIS) had available collision data. The Goodell Street corridor was analyzed as two zones, due to the significant difference in traffic volumes (AADT). The zones for Goodell Street are outlined in Table 2.7.

**Table 2.7 – Goodell Street Corridor Zones**

| Zone 1 | Zone 2 |
|---|---|
| Ellicott Street | Pearl Street/Main Street |
| Oak Street | Edward Street |
| Elm Street | Washington Street |
| Michigan Avenue | |
| Maple-Mulberry Access | |

Within the Goodell Street corridor, a total of 92 collisions were reported, with 58 collisions occurring within zone 1 and 34 collisions occurring within zone 2. The predominant crash type along this corridor was overtaking with a total of 62 collisions. The second most predominant crash type was left turns with a total of 12 collisions, most of which occurred within zone 1. The apparent contributing factors for these crashes are failure to yield ROW and improper passing/lane usage. The intersections along the Goodell Street corridor with the highest frequency of collisions are Michigan Avenue in zone 1 and Pearl Street/Main Street/Edward Street in zone 2. Five out of the seven intersections have crash rates that exceed the statewide average for similar facilities. See Table 2.8 for a summary of the crash data by intersection.

**Table 2.8 – Goodell Street Intersection Crash Analysis**

| Intersection | No. of Collisions | Crash Rate | Statewide Average Crash Rate |
|---|---|---|---|
| Zone 1 | | | |
| Ellicott Street | 6 | 0.39 | 0.56 |
| Oak Street | 13 | 1.10 | 0.56 |
| Elm Street | 12 | 0.76 | 0.13 |
| Michigan Avenue | 26 | 1.35 | 0.56 |
| Maple-Mulberry Access | 1 | n/a | n/a |
| Zone 2 | | | |
| Pearl Street/Main Street/ Edward Street | 23 | 2.63 | 0.56 |
| Washington Street | 10 | 1.76 | 0.56 |

The study time period that was analyzed for the Tupper Street corridor was January 2018 to December 2019, since this was the most recent two-year period that the ALIS had available collision data. The Tupper Street corridor was analyzed as two zones, due to the significant difference in traffic volumes (AADT). The zones for Tupper Street are outlined in Table 2.9.

**Table 2.9 – Tupper Street Corridor Zones**

| Zone 1 | Zone 2 |
|---|---|
| Pearl Street | Oak Street |
| Main Street | Elm Street |
| Washington Street | |
| Ellicott Street | |

Within the East Tupper Street corridor, a total of 103 crashes occurred. The predominant crash type were right angles, with a total of 50 collisions. The next most common crash types were overtaking and rear ends. The apparent contributing factors for these crash types were failure to yield ROW, driver inattention, and disregard for traffic control. The intersections along the Tupper Street corridor with the highest frequency of collisions are Washington Street in zone 1 and Elm Street in zone 2. All of the six intersections have crash rates

that exceed the statewide average for similar facilities. See Table 2.10 for a summary of the crash data by intersection. Refer to the safety screening report attached in Appendix D for additional crash information.

**Table 2.10 – Tupper Street Intersection Crash Analysis**

| Intersection | No. of Collisions | Crash Rate | Statewide Average Crash Rate |
|---|---|---|---|
| Zone 1 | | | |
| Pearl Street | 12 | 0.91 | 0.56 |
| Main Street | 4 | 0.35 | 0.56 |
| Washington Street | 22 | 2.00 | 0.56 |
| Ellicott Street | 7 | 1.83 | 0.56 |
| Zone 2 | | | |
| Oak Street | 18 | 0.99 | 0.56 |
| Washington Street | 26 | 0.89 | 0.56 |

Goodell Street Corridor: The entire length of the corridor saw a high frequency of overtaking collisions. Goodell Street is a four-lane one-way arterial with coordinated traffic signals. This encourages vehicles to drive at higher speeds and the current four-lane configuration leads to frequent lane changes. A road diet would have traffic calming effects that would likely reduce the potential for overtaking collisions.

Goodell Street at Michigan Avenue: Prior to entering this intersection, there is a short 200-foot merge point between vehicles exiting the NYS Route 33 ramp onto Goodell Street and vehicles coming from BNFC Drive. As expected, a high number of overtaking accidents were recorded at this intersection. Geometry improvements to the connection between Goodell Street and NYS Route 33 may alleviate this issue.

Goodell Street at Elm Street Intersection: This intersection is a stop-controlled intersection with Goodell Street operating freely and Elm Street operating under stop control. The heaviest movement for this intersection is left turns from Elm Street onto Goodell Street, and there is often a queuing on Elm Street during peak hours. Most likely due to the high left turn volumes and absence of a traffic signal, a high frequency of left turn collisions were recorded at this intersection.

Goodell Street at Pearl Street/Main Street: This intersection is a five-legged signalized intersection with complex intersection geometry. Goodell Street ends at this intersection with two lanes splitting off to the right as Edward Street and two lanes splitting off to the left as Pearl Street. Most likely due to the rapid lane shift and complex geometry, it is common for vehicles to get into overtaking collisions. Changes to the geometry of this intersection would likely reduce the number of collisions.

E Tupper Street at Washington Street: The predominant collision type at this intersection were right angle collisions. The existing traffic signals do not have backplates at this intersection. This reduces the visibility of the traffic light and may explain the frequent occurrence of right-angle collisions.

**E Tupper Street at Elm Street:** This intersection has limited sight distance for vehicles traveling eastbound on E Tupper Street. This likely contributes to the high number of right-angle collisions recorded at this intersection. There are currently supplemental signals, but additional measures could be taken to reduce collisions.

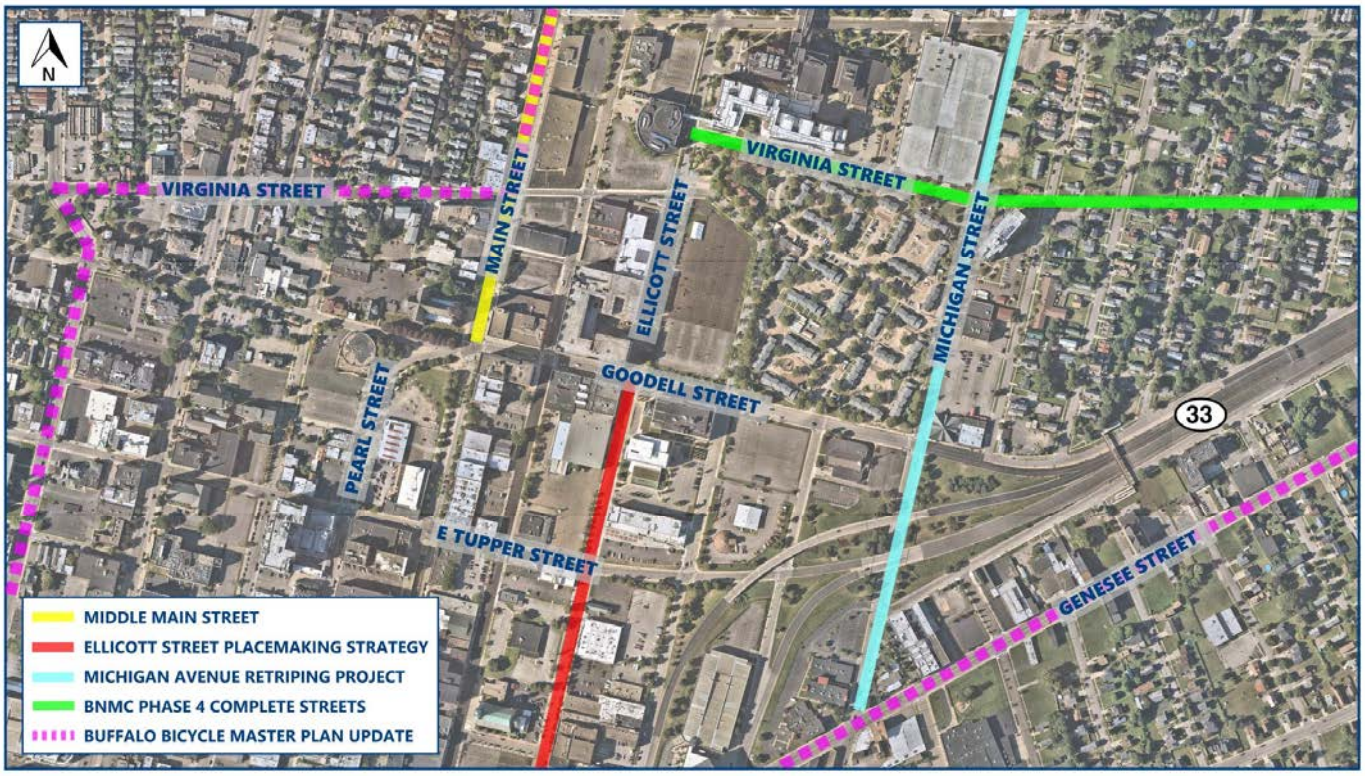
## Existing and Future Plans, Studies, and Development

As a steadily growing city, Buffalo has many developments and projects that are currently in various phases. Table 2.11 is a list of relevant projects and their status. Corresponding Figure 2.4 shows the location of these projects.

Table 2.11 – Existing and Future Capital Improvement Projects, Studies, & Plans

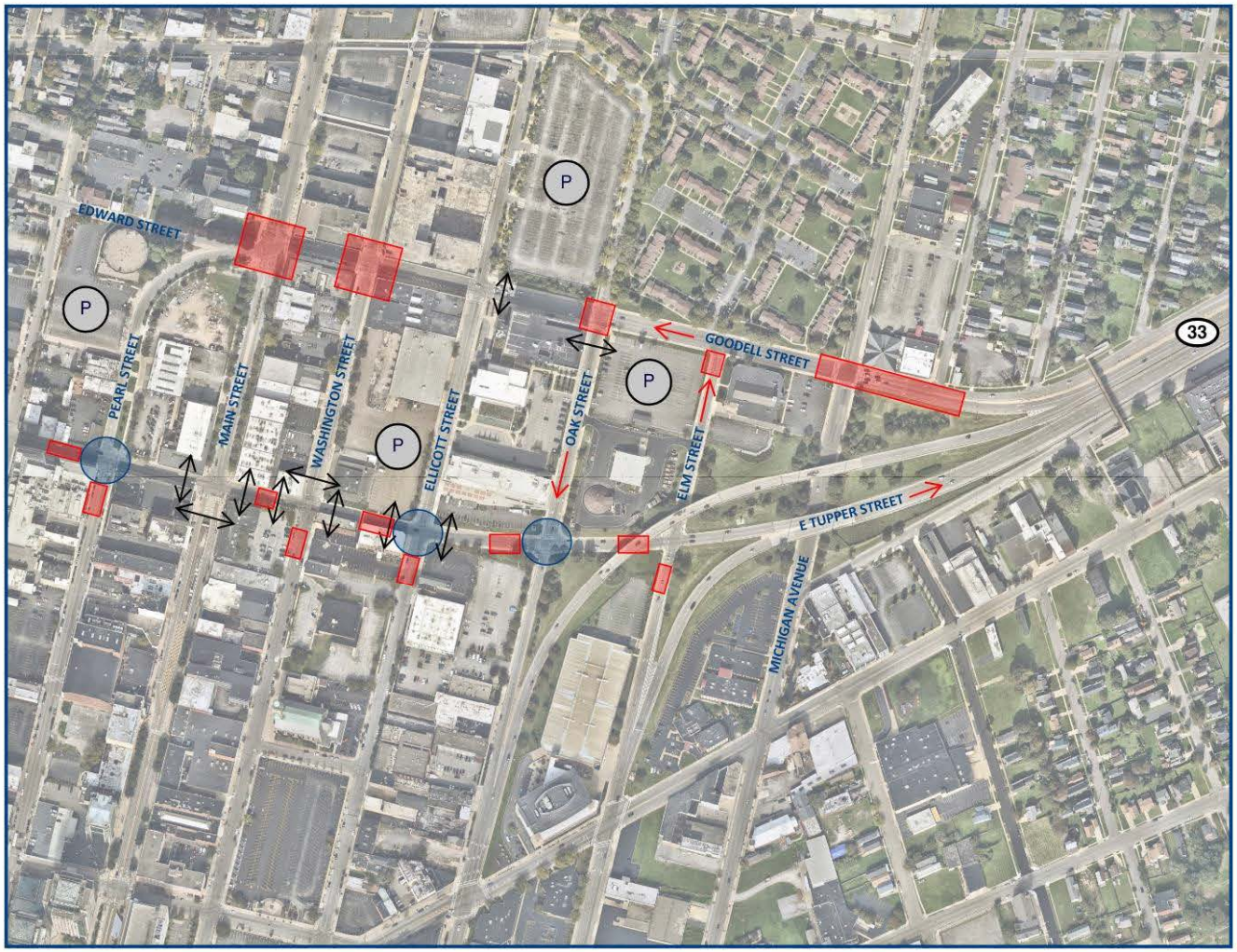
| Project/Study | Sponsor | Project Status | Description |
|---|---|---|---|
| Middle Main Street | City of Buffalo Department of Public Works | Design | This project is broken into 2 phases, with phase 1 being from Goodell Street to Ferry Street. The road will be going through a road diet, with a typical section of a single lane for northbound and southbound, and a two-way left turn lane. Bicycle infrastructure will be added through the means of a bicycle track. |
| Ellicott Street Placemaking Strategy | Buffalo Urban Development Corporation | Planning | This plan is incorporating a mix of transportation improvements to prepare for the future of mobility including mobility hubs, rideshare curb space, autonomous vehicles, and safe space for bicyclists and pedestrians. Between Goodell Street and Tupper, the plan is proposing streetscaping and proposed pedestrian improvements at intersections to establish a walkable link from the BNMC Campus and the downtown neighborhood. |
| Michigan Avenue Restriping Project | City of Buffalo Department of Public Works | Construction Complete | Lane reallocation through striping changes on Michigan Avenue from Genesee Street to North Street. Lane reallocation included adding left turn lanes at intersections, and a single lane of traffic in each direction from Goodell Street to North Street. |
| BNMC Phase 4 Complete Streets | City of Buffalo Department of Public Works | Construction Complete | This TIP project is along Virginia Street from Ellicott Street east to the NY 33 doing complete streets improvements around the medical campus. |
| Buffalo Bicycle Master Plan Update | City of Buffalo | Planning | This plan from 2016 identifies opportunities for new bikeways and conditions throughout the City of Buffalo, including planning efforts and initiatives. Part of Goodell Street within the study area is identified in as a potential road diet candidate based on traffic volumes. The Pearl Street/Goodell Street/Edward Street intersection is identified as an intersection in need of improvements for bicyclists. |

**Figure 2.4 – Existing and Future Plans, Studies, & Development Map**



# Preliminary Challenges and Opportunities

High Pedestrian Activity | Collision Zone | Traffic Congestion | One-Way Traffic | P Parking Lot

# 3.0 Public Engagement Round 1

A public outreach program was developed to engage the community and gather feedback on the Goodell Street Corridor, its existing conditions, transportation system needs, and priorities. The responses gathered through this process were used by the project team to provide recommendations for appropriate transportation infrastructure improvements on the Goodell Street Corridor and study area.

## Hybrid Meeting

A public outreach event was held on Thursday March 31st from 5:30PM to 7:30PM via Zoom and an in-person open house style meeting at the Buffalo Educational Opportunity Center at 555 Ellicott Street due to being directly adjacent to the study area. Both meetings started with a presentation that provided an overview of the project and its objectives. The meeting then opened up for general Q&A regarding the project and any concerns the public may have had.

The study area was segmented into 4 areas, NYS Route 33 (Kensington Expressway), Goodell Street, Pearl Street, and Tupper Street, with display boards made for each segment. The public was encouraged to provide their input on the existing conditions and needs for each study segment. This allowed the project team to understand where issues are located throughout the corridor.

**Figures 3.1 & 3.2 – Photos of Public Meeting**


## Online Survey

An online survey was launched on Tuesday March 15th, and closed on Friday April 15th. The survey was promoted during the first public meeting, flyers that were passed out in and surrounding the study area, emails to stakeholders, the GBNRTC website, and a paid ad on Instagram targeting users in the area. The survey had 111 respondents. The majority of respondents identified as commuters that travel the corridor a few times a week. Personal vehicle was the most frequent mode of transportation by 83% of respondents

with 46% of respondents using a bicycle/scooter, and 38% walking the corridor being the second and third most frequent responses. It should be noted that users could provide more than one answer.

**Table 3.1 – Survey Respondent Connection to Corridor**

| Connection to the Corridor | Number of Respondents |
|---|---|
| Resident of Neighboring Community | 30 |
| Employee or owner of business on or near the corridor | 30 |
| Commuter | 60 |
| Other | 8 |

The following are some key responses to the question "if you travel the corridor, what has your experience been like and what would you improve?"

- "We really need bicycle infrastructure - the space is there. Commuting across town is hard - this would help. I would recommend protected lane that can also connect to Pearl."
- "Traffic calming, at the very least"
- "The traffic lights are often off-sync which makes driving frustrating, it feels unsafe to bike as cars usually continue speeding through at 40+ mph while coming off the 33"
- "Road is too wide and too fast. Not enough trees!"
- "I only take it because I have to."
- "I have been traveling that corridor since 1986 and always found it to be a stressful situation, and I am not easily stressed in traffic. I've also felt empathy for the residents living along that area who have to deal with that level of traffic."

Respondents noted a protected bicycle space or dedicated bike lane would be needed to encourage them to bike on the corridor. Corridor needs ranked at the highest importance by respondents were:

Very Important
- Bicycle Lanes
- Handicap Accessibility
- Bump outs
- New Sidewalk

Important
- Amenities
- Improved Lighting
- Landscaping

Neutral/Not Important
- On-Street Parking

Respondents were given a map to make specific location comments on, the following are some answers:

- Tupper is a huge problem, cars race down it to get to the 33 as fast as possible, also go through red lights and block the intersection
- One of the few areas near downtown that I completely avoid while walking or biking. Drivers speed, lanes are wide, and there's no meaningful separation from the sidewalk. Drivers headed west on Goodell routinely cut across lanes to make the ambiguous turn onto Edward. Both Oak and Elm are unnecessarily wide for traffic and recklessly dangerous for anyone not in a vehicle.

- It is very dangerous for both cars and pedestrians. There is a point where if you're a pedestrian you just get stranded at the end of it. Cars turning right do not stop for pedestrians. Cars merging onto Pearl or Edward almost hit each other daily.
- Cars are always racing down this one-way. Edward is also dangerous, but it is Goodell and its off-ramp that appears to set the stage. We need to calm the traffic quicker from the ramp.
- The "Off & On Ramp" Areas need to be streamlined and more conducive to walking & bike traffic. They are simply unsafe as they're designed for motorists in 3-5 lane wide roadways. Additionally as these serve as on and off ramps people speed like crazy, making it even more dangerous. Reorienting the roads into more of a parkway feel and design would pay homage to the City's natural planning, beautify the streets, and also making it difficult to speed and safer for pedestrian and bike traffic.

Appendix A contains all of the detailed survey responses. Some additional comments regarding opinions on improvements or concerns included:

- To create better synergy between Allentown/Medical Campus/Fruit belt and Theater/ Entertainment Districts, Goodell and Tupper streets should be redesigned to reflect characteristics of an urban street instead of acting as an extension of Kensington expressway.
- This is an opportunity to calm traffic entering some of the fastest changing neighborhoods in Buffalo. We need to maximize the City and State's investments thus far in the 600 block, future Middle Main project, and the medical campus.
- The city needs to focus less on vehicles.
- Protected bike lanes! Bump-outs. Light timers that work and are CLEARLY working. If a pedestrian isn't sure the light timer is accurate, it's useless. Accessibility.
- I would support the return of the street to two-way traffic and narrower traffic lanes to slow traffic speeds, additionally street parking would slow traffic.
- Anything to improve high traffic speeds. But, it would because this area is so close to Main St and the restaurants/amenities nearby, it would be nice to have this corridor better connected to the surrounding areas.

# 4.0 Primary Alternatives

The primary alternatives identified for this project were the following:

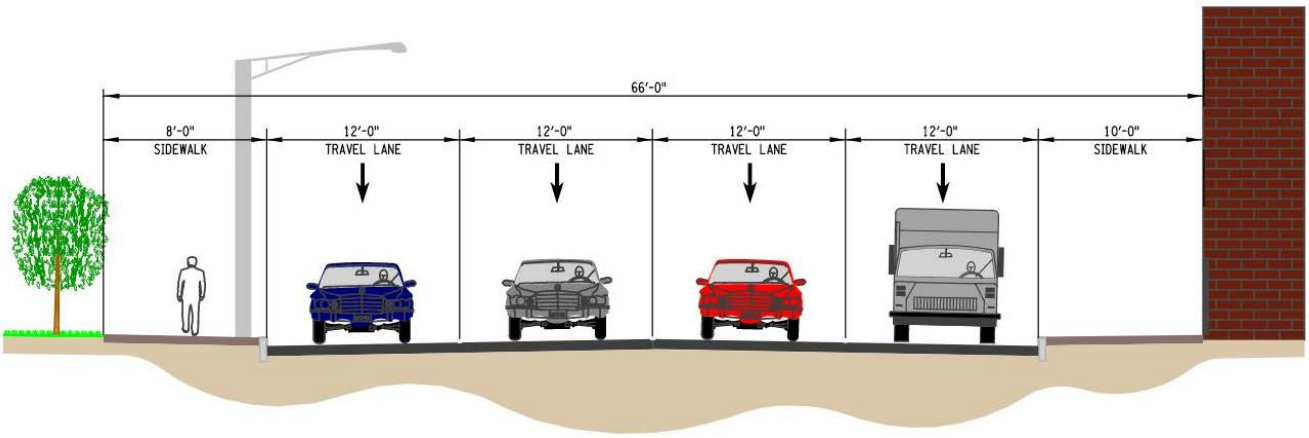
- Alternative 1 – Null Alternative
  There are no changes to the existing facility, this alternative only takes into consideration future planned development and routine maintenance.
- Alternative 2 – Road diet from four lanes to three lanes on part or all of the Goodell Street corridor
- Alternative 3 – Road diet from four lanes to two lanes on part or all of the Goodell Street corridor
- Alternative 4 – Implement two-way operations on part or all of the Goodell Street corridor

Each alternative was evaluated to determine the limits of implementation for a road diet or two-way conversion. Things considered for the extent of improvements included traffic volumes, circulation, and safety. Each alternative is explained in more detail under each subsection.

## Alternative 1

No further evaluation was completed on this alternative since it is considered null. The existing typical section of Alternative 1 is shown in Figure 4.1 below.

**Figure 4.1 – Alternative 1 Typical Section**



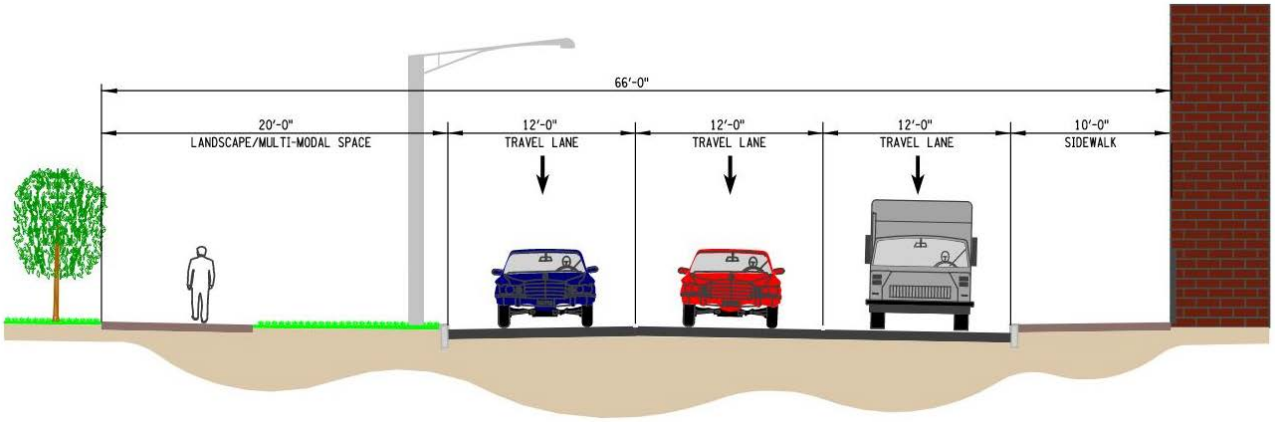

## Alternative 2

### Description

Alternative 2 is a road diet from four lanes to three lanes westbound on all or part of Goodell Street. Through the CBD North Study, it was recommended that Goodell Street be reduced to three lanes westbound from Ellicott Street to Main Street. This was implemented by creating a westbound exclusive left turn lane for the eastern approach at the intersection of Goodell Street at Washington Street.

This alternative consists of a lane reduction from four lanes to three lanes, from Michigan Avenue to the existing lane reduction at Washington Street. Three westbound through lanes are proposed with shared turn through/turn lanes at intersection approaches.

**Figure 4.2 – Alternative 2 Typical Section**

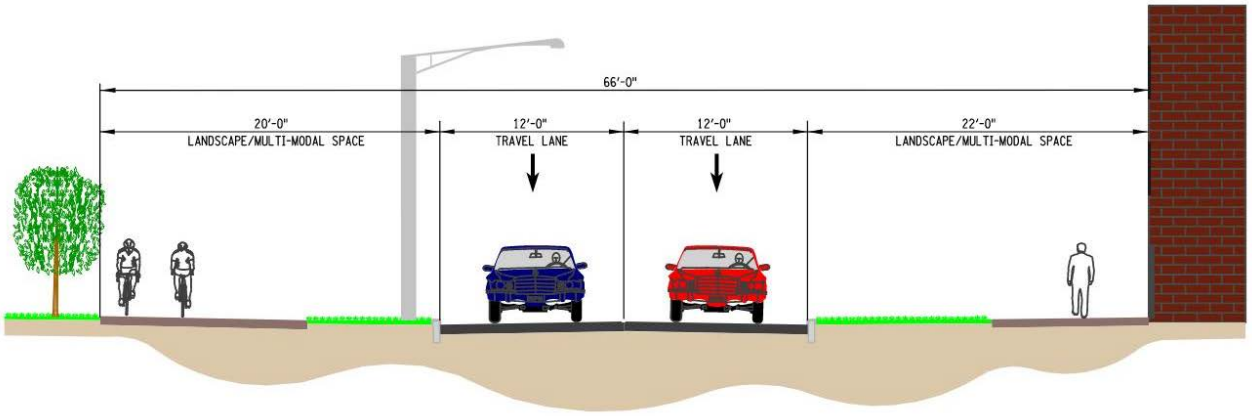



# Alternative 3

## Description

Alternative 3 is a road diet from four lanes to two lanes westbound on all or part of Goodell Street. To prevent traffic from queueing onto NYS Route 33 at the Michigan Avenue signal, it was decided to maintain three westbound lanes to Oak Street, where a large amount of traffic is anticipated to travel southbound. From Oak Street to Main Street, it is proposed to reduce travel lanes to two westbound lanes. Alternative 3 is shown in Figure 4.3 below.

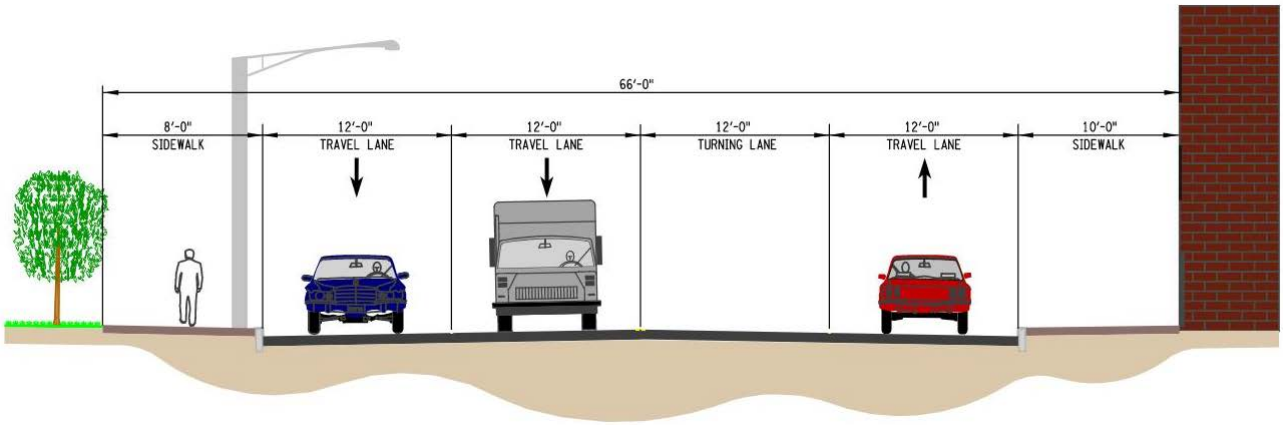
**Figure 4.3 – Alternative 3 Typical Section**



# Alternative 4

Alternative 4 is converting Goodell Street from one-way westbound operations, to two-way operations. Considered was converting Goodell Street to two-way operations from Main Street to Oak Street. Two-way operations ended at Oak Street to prevent leading traffic heading the wrong-way on NY Route 33. Alternative 4 is shown in Figure 4.4 below.

**Figure 4.4 – Alternative 4 Typical Section**



# 5.0 Secondary Alternatives

Through the existing conditions and inventory analyses, as well as the first public outreach event, additional alternatives were identified within the study area beyond the primary identified alternatives. These secondary or sub-alternatives, are proposed changes within the study area that will impact the operations and traffic distribution on the primary alternatives. Secondary alternatives were developed to meet the objectives of mitigating safety deficiencies, improving circulation, connectivity, and provide traffic calming. The following is a description of the secondary alternatives:

- BFNC Drive Access
  Remove access to off-ramp for BFNC Drive from NYS Route 33. Traffic travelling westbound on NYS Route 33 will only be able to access Goodell Street from NYS Route 33, removing the merge point between BFNC Drive and Goodell Street just east of the Michigan Avenue intersection. BFNC would then be converted to two-way traffic from Mulberry Street to Jefferson Avenue.
- Pearl and Edward Street/Main Street/Goodell Street Intersection Realignment
  Reconfigure Pearl Street to better align with Edward Street, forcing traffic from Goodell Street to enter Pearl Street through a left turn movement.
- Pearl Street Two-Way Conversion
  Convert Pearl Street to two-way, and Edward Street to two-way from Pearl Street to Main Street.
- Tupper Street Two-Way Extension
  Convert Tupper Street to a two-way street from Ellicott Street to Oak Street, which currently operates as one-way eastbound.
- Ellicott Street Southbound Approach
  Reconfigure lanes to an exclusive left turn lane, and a shared through/right turn lane.

These geometric changes will be applied to all of the primary alternatives in the analysis so that the primary alternatives can be analyzed and compared to one another and the project objectives consistently. The only alternative that will not have the secondary alternatives applied to is Alternative 1 – Null, since this alternative assumes the study area has no changes. Each secondary alternative is explained and justified more thoroughly in the following sections.

## BFNC Drive Access

### Background

Traffic on NYS Route 33 westbound splits at the BFNC Drive off-ramp, with the two roads closely parallel to one another, eventually reaching the same destination point east of the Michigan Avenue intersection. For vehicles travelling westbound on NYS Route 33 and BFNC Drive, approximately 45% use BFNC Drive to reach the Michigan Avenue intersection. Approximately 15% of the westbound traffic is making a right turn onto Michigan Avenue. There is minimal traffic using BFNC Drive from NYS Route 33 to access the adjacent Fruit Belt Neighborhood. When westbound traffic merges from BFNC Drive and NYS Route 33 at Michigan Avenue, it creates an additional conflict point. The collision rate for this intersection is above the statewide

average for comparable intersections. The majority of collisions (62%) were overtaking, through observations this could be contributed to vehicles being in the incorrect lane approaching the intersection and attempting to cross lanes to turn right onto Michigan Avenue and/or positioning themselves for a right turn at subsequent intersections downstream. This proposed geometric change would reduce the number of conflict points and weaving.

In addition to enhancing safety at the convergence of NYS Route 33 and BFNC Drive, another consideration for removing access from BFNC Drive is to provide a buffer for the Historic Fruit Belt Neighborhood from commuting and through traffic from NYS Route 33. When the NYS Route 33 was built, it disconnected the original Fruit Belt Neighborhood removing access to Cherry Street. This neighborhood is identified as a historically disadvantaged community through Justice40[1]. Parts of this neighborhood close to NYS Route 33 are identified on the Environmental Protection Agency's Environmental Justice Mapper for pollutants being within close proximity to heavy volumes of traffic. This would create additional space from that commuting traffic, with an opportunity for green space, reduced pavement, and a two-way conversion for improved circulation on BFNC

**Figure 5.1 – Proposed Typical Section for BFNC Drive**

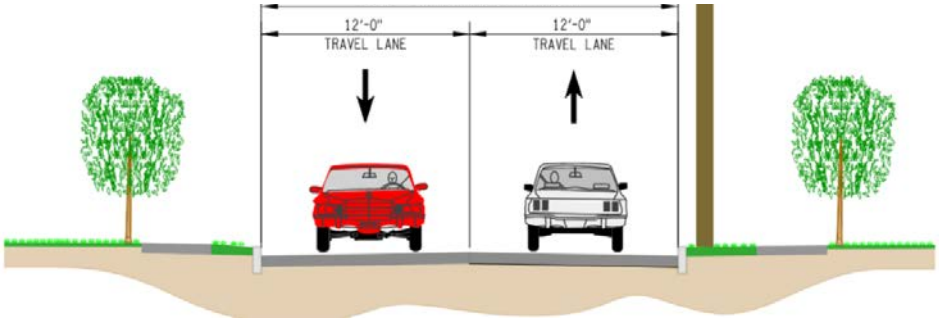



**Figure 5.2 – Proposed BFNC Drive Access**


[1] Justice40 is an initiative through the Federal Government to provide resources to disadvantaged communities which have had historical underinvestment. These communities are most vulnerable to climate change, pollution, and environmental hazards. The overarching goal is to prioritize projects that benefit these communities to improve their quality of life. In regards to transportation, that means providing an affordable, equitable, reliable, and safe transportation to these communities. Also ensuring there are no negative impacts through other transportation projects to these areas.

# PROPOSED GEOMETRY CHANGE - REMOVE ACCESS TO BFNC DRIVE FROM NYS ROUTE 33


## Description of Work

- Remove Access to BFNC Drive from NYS Route 33
- Convert BFNC Drive to two-way from Maple St. to Jefferson Ave.
- Install a barrier between BNFC Drive and NYS Route 33

## Project Goals Met

1) Mitigates safety deficiencies
2) Remove excess travel lanes
3) Separates Fruit Belt Neighborhood from commuter/high speed traffic

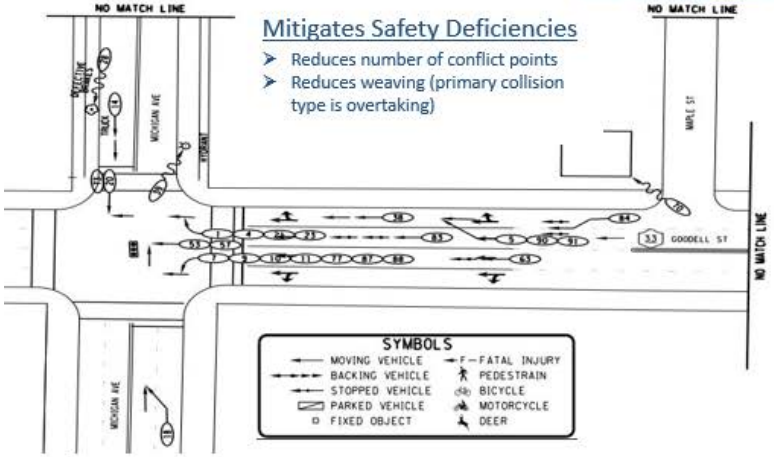
### Remove Excess Hardscape

- Look for opportunities to remove excess pavement/hardscape which would decrease the impervious area.

## Map of Impacted Area

### Mitigates Safety Deficiencies

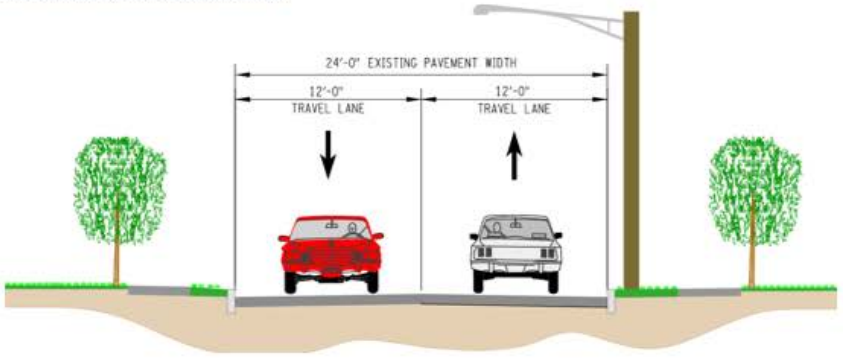
- Reduces number of conflict points
- Reduces weaving (primary collision type is overtaking)




**Collision Diagram between Maple Street and Michigan Avenue**

### Fruit Belt Neighborhood Separation

- Provides a buffer for the Fruit Belt Neighborhood from commuter traffic.
- BFNC Drive could be converted to two-way from Maple St. to Jefferson Ave. Converting the street to two-way with sharrows will improve circulation. One-way to two-way street conversions have a multitude of benefits for resident quality of life. (see proposed cross-section below)




**Example Pavement Section for BFNC Drive**

# Pearl Street and Edward Street/Main Street/Goodell Street Intersection Realignment:

## Background

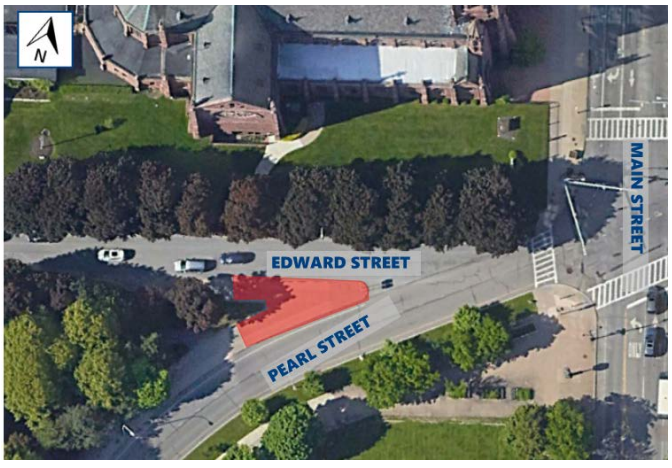
The safety analysis completed by NYSDOT shows that this intersection has an above statewide average crash rate 4.5 times higher compared to intersections of similar type. The Main Street and Goodell Street intersection has the highest collision rate in the Goodell Street Corridor within the study area. This intersection was identified in the CBD North Study as needing safety improvements. As per the recommendations in the CBD North Study, a parking lane was installed on the south side of Goodell Street from Washington Street to Main Street to reduce the number of lanes on Goodell Street and provide traffic calming. Since this parking lane was installed, collision rates have not improved. The primary collision style at the intersection is overtaking/sideswipes. Overhead signage exists at the Washington Street intersection in an attempt to situate vehicles in the proper lane.

**Figure 5.3 – Parking Lane and Overhead Signage at Washington Street Intersection**


**Figure 5.4 – Photo of Car In Between Lanes at Edward Street and Tupper Street**

This intersection is not only confusing for vehicles, but for pedestrians and bicyclists also. If pedestrians are on the sidewalk in between Pearl Street and Edward Street, there are no available crosswalks or pedestrian accommodations to continue to Main Street. Public feedback indicated that pedestrians are stranded at this location.

**Figure 5.5 – No Pedestrian Connections to Main Street In Between Pearl Street & Edward Street**

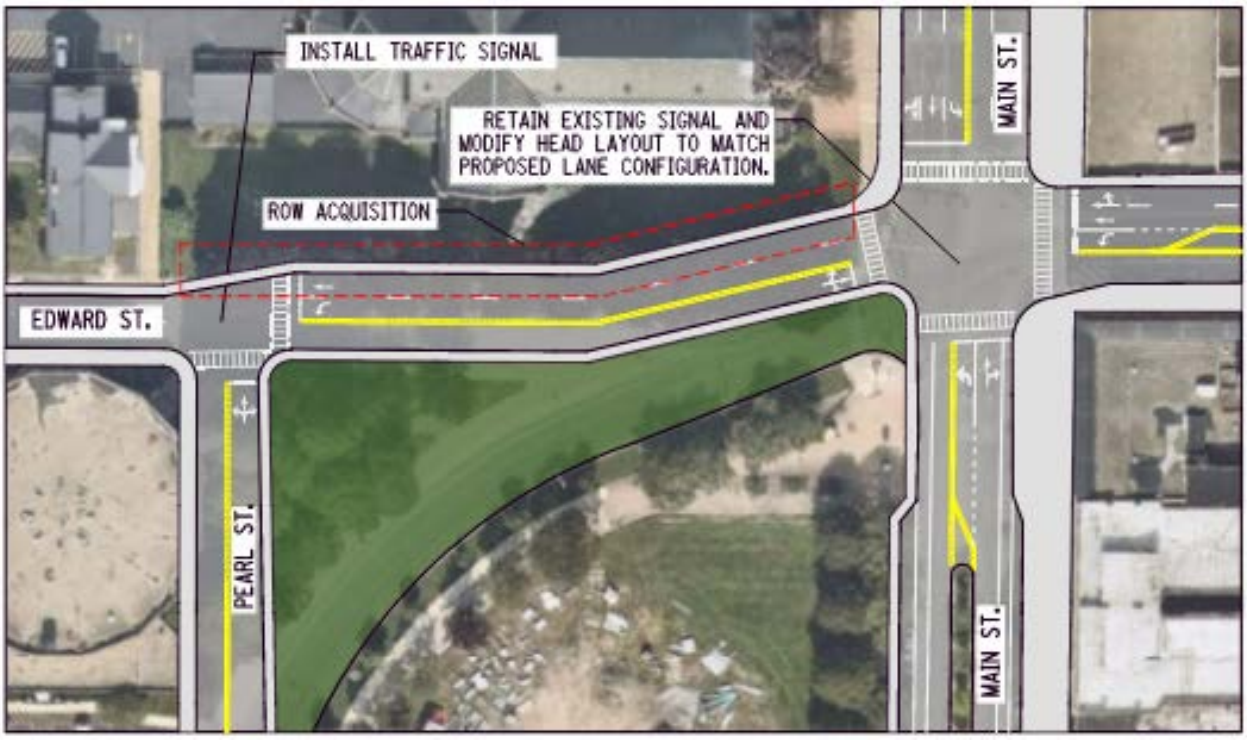


## Proposed Changes

To improve the safety of the intersection and provide contiguous pedestrian accommodations, a geometric change is recommended to improve the intersection alignment and channelization for the through movement, which is a major movement at the intersection for westbound traffic entering onto Edward Street and Pearl Street. Improving geometry with better channelization is expected to mitigate overtaking/sideswipe collisions at the intersection. A geometric change to more of a traditional intersection style will encourage better driver behavior with traffic calming. The current geometry set up for Pearl Street and Edward Street has the look and feel of an on-ramp.

Multiple intersection configurations were analyzed connecting Pearl Street with Edward Street, which concurrently impacts the geometry layout of Main Street. To provide better channelization of the westbound movement from Goodell Street to Edward Street, a right of way (R.O.W.) acquisition would be required on the northwest property at the intersection. Other options were explored that did not include a R.O.W. acquisition, but the result was an offset approach or less than optimal alignment with Goodell Street and Pearl Street. Figures on the following pages represent all options that were considered at this location.

**Figure 5.6 – Option 1 for Pearl Street and Edward Street Realignment**




Pearl Street re-aligned perpendicular to Edward Street. Convert Edward Street and Pearl Street to two-way travel from Main Street to Tupper Street. Westbound lane added on the north side of Edward Street. ROW acquisition required. Depicted in this sketch is Goodell Street Alternative 4.

**Figure 5.7 – Option 2 for Pearl Street and Edward Street Realignment**


Pearl Street re-aligned perpendicular to Edward Street. Convert Edward Street and Pearl Street to two-way travel from Main Street to Tupper Street. Eastbound lane added on the south side of Edward Street. ROW acquisition required. Depicted in this sketch is Goodell Street Alternative 3.

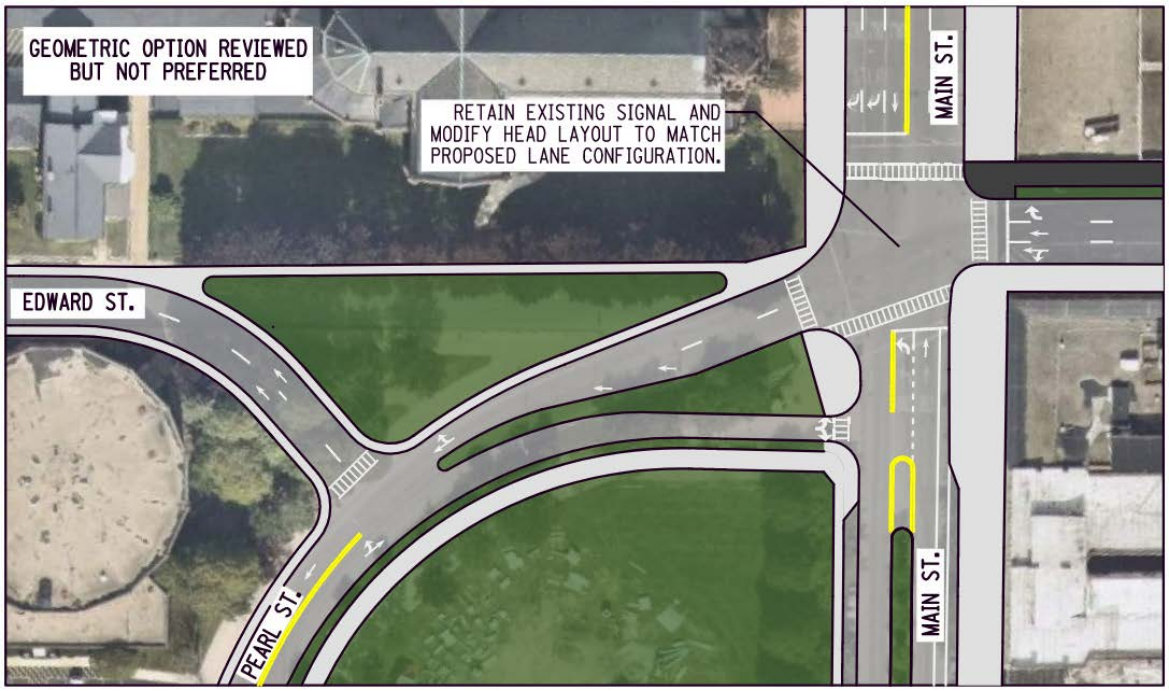
**Figure 5.8 – Option 3 for Pearl Street and Edward Street Realignment**


Pearl Street re-aligned perpendicular to Edward Street. Convert Edward Street and Pearl Street to two-way travel from Main Street to Tupper Street. Eastbound lane added on the south side of Edward Street. No ROW acquisition required. Depicted in this sketch is Goodell Street Alternative 3.

**Figure 5.9 – Option 4 for Pearl Street and Edward Street Realignment**


Edward Street re-aligned perpendicular to Pearl Street. Pearl Street and Edward Street remain one-way westbound. Depicted in this sketch is Goodell Street Alternative 3.

**Figure 5.10 – Option 5 for Pearl Street and Edward Street Realignment**




Edward Street re-aligned perpendicular to Pearl Street. Convert Pearl Street to two-way travel from Main Street to Tupper Street. Edward Street remains one-way westbound. Depicted in this sketch is Goodell Street Alternative 3.

**Figure 5.11 – Option 6 for Pearl Street and Edward Street Realignment**


Dual-single lane roundabouts. Convert Pearl Street to two-way travel from Main Street to Tupper Street. Depicted in this sketch is Goodell Street Alternative 3.

Options 4, 5, and 6 above were eliminated as preferred alternatives. They were eliminated for the following reasons:

- Option 4: Placing an intersection on a horizontal curve presents a safety challenge.
- Option 5: This option limits the potential of converting Pearl Street to two-way operations. This also creates an additional intersection in close proximity to the intersection of Main Street at Goodell Street.
- Option 6: Roundabouts are not preferred here due to the amount of space they occupy and the reduction of travel lanes for them to potentially fit. Roundabouts are also not preferred by pedestrians and bicyclists for their difficulty to navigate, especially when they have high traffic volumes.

# Pearl Street Two-Way Conversion

## Background

The proposed geometric changes at the Pearl Street and Edward Street intersection also provides an opportunity to convert Pearl Street to two-way operations. Pearl Street outside of the study area currently operates as a two-way street, with the exception of the block within the study area from Main Street to Edward Street. Providing two-way operations on Pearl Street gives consistency to drivers, improves circulation, and provides traffic calming.

**Figure 5.12 – Proposed Two-Way Geometry on Pearl Street**


The Pearl Street conversion to two-way was implemented in the regional model to analyze the proposed alternatives. Traffic originating from the south and designated west typically used parallel streets to Pearl Street, such as Washington Street and Ellicott Street, to travel to Goodell Street and continue westbound to Edward Street. The ability to travel northbound on Pearl Street reduces the traffic on Goodell Street by traffic using Pearl Street to travel to Edward Street and continue westbound.

Pedestrians will be accommodated by a sidewalk on both sides of Pearl Street. Bicycles will be accommodated by a two-way cycle track on the east side of Pearl Street. A cycle track is proposed on the east side to maintain intersection alignment of the approaches at the Tupper Street and Pearl Street intersection, and because there is ROW space on the east side of Pearl Street.

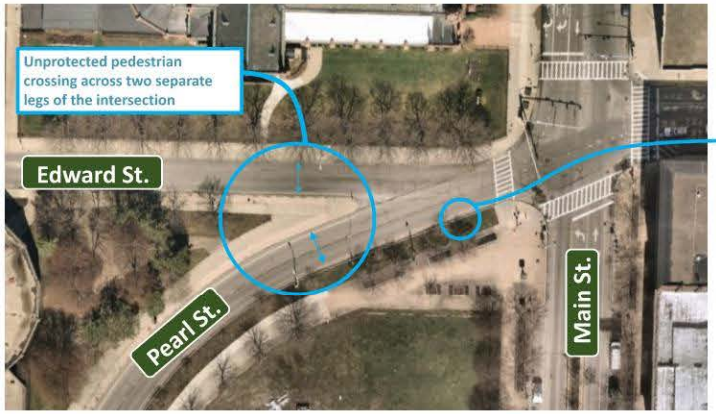
# PROPOSED GEOMETRY CHANGE – REALIGN PEARL STREET AND EDWARD STREET

## Description of Work

- Adjust the existing intersection configuration for the Goodell Street/Main Street/Pearl Street/Edward Street intersection.
- Convert Pearl Street to two-way from Edward Street to Tupper Street
- Provide pedestrian accommodations at the Pearl Street and Edward Street intersection.

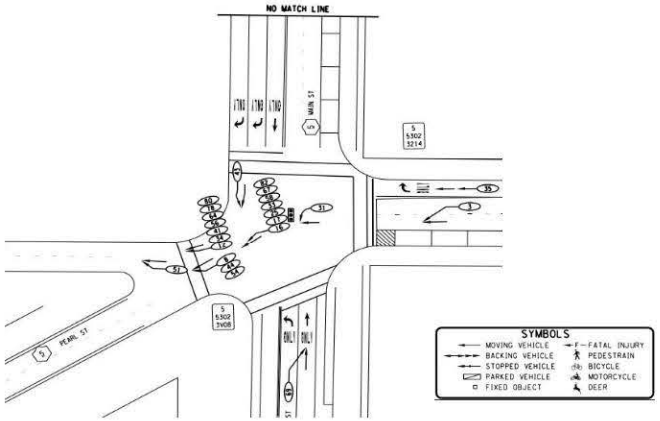
## Project Goals Met

1) Mitigates safety deficiencies
2) Improved Circulation
3) Enhanced Pedestrian Accommodations
4) Traffic Calming




### Enhanced Pedestrian Accommodations

- Provides pedestrians with a shorter crossing distance and eliminates the need for a pedestrian refuge island



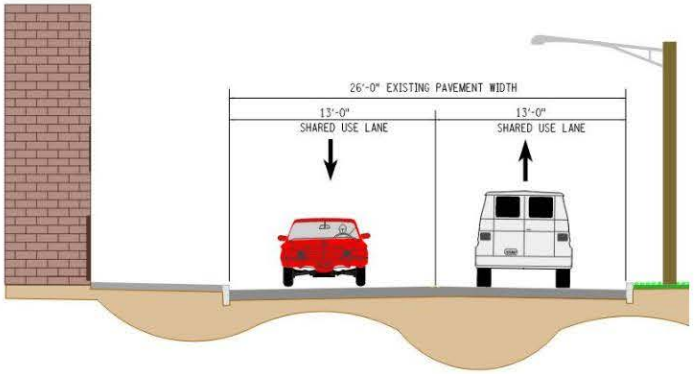

## Collision Diagram at Main Street Intersection

### Mitigates Safety Deficiencies

- Clear and defined intersection geometry
  - Main Street at Edward Street
  - Edward Street at Pearl Street
- Reduction in sideswipes at Edward Street and Pearl Street

### Traffic Calming

- Where Goodell Street meets Edward Street and Pearl Street was driven like a freeway prior to the new geometric setup (see photo in top right corner)
- One-way to two-way conversion benefits such as reduced collisions and traffic calming




## Proposed Pavement Section for Pearl Street

### Improved Circulation

- One-way to two-way conversion increases the efficiency of the downtown network (see proposed cross-section above)

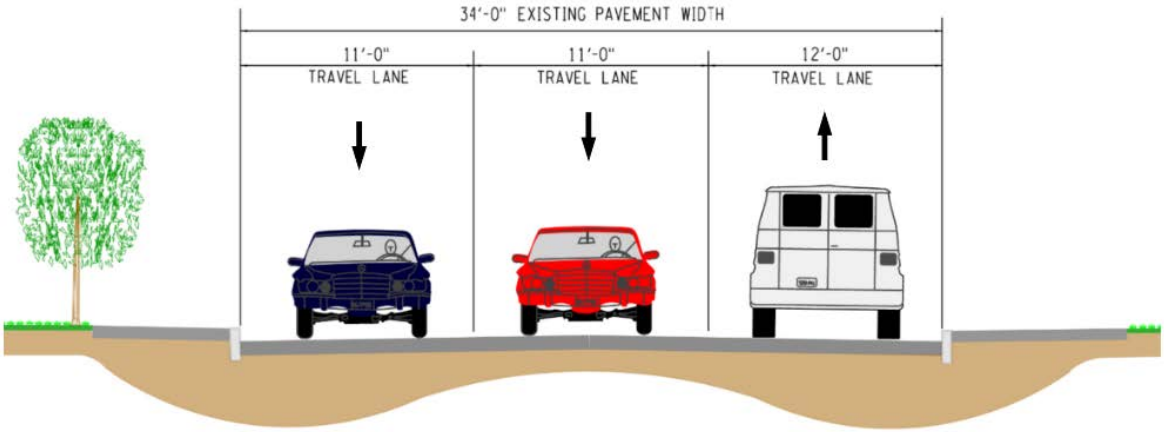
# Tupper Street Two-Way Conversion

## Background

Tupper Street has two-way operations until Ellicott Street and east of this intersection. East of Ellicott Street, Tupper Street eventually becomes NYS Route 33 eastbound. Oak Street is a major southbound connector from Goodell Street, with three lanes for capacity. The CBD North Study recommended that two-way operations on Tupper Street be studied for its feasibility. Converting Tupper Street to two-way operations for an additional block east of Ellicott Street will provide a westbound connection for Oak Street at Tupper Street. This connection will reduce the amount of traffic Goodell Street for vehicles designated south and west.

The NYSDOT safety analysis revealed that the intersection of Tupper Street and Oak Street has an above statewide average collision rate compared to similar intersections. The majority of collisions at this intersection are right angle, and half of the collisions at the intersection have resulted from injury. Multiple lane one-way roads encourage higher speeds, two-way traffic has been shown to provide traffic calming on a road. It is expected that converting Tupper Street to two-way operations for an additional block will encourage traffic calming, and therefore enhance pedestrian accommodations, as well as improve circulation in the study area by better distributing traffic. The existing pavement width would accommodate two eastbound travel lanes and a single eastbound travel lane.

**Figure 5.13 – Proposed Two-Way Operations on Tupper Street from Oak Street to Ellicott Street**




# Ellicott Street Southbound Approach

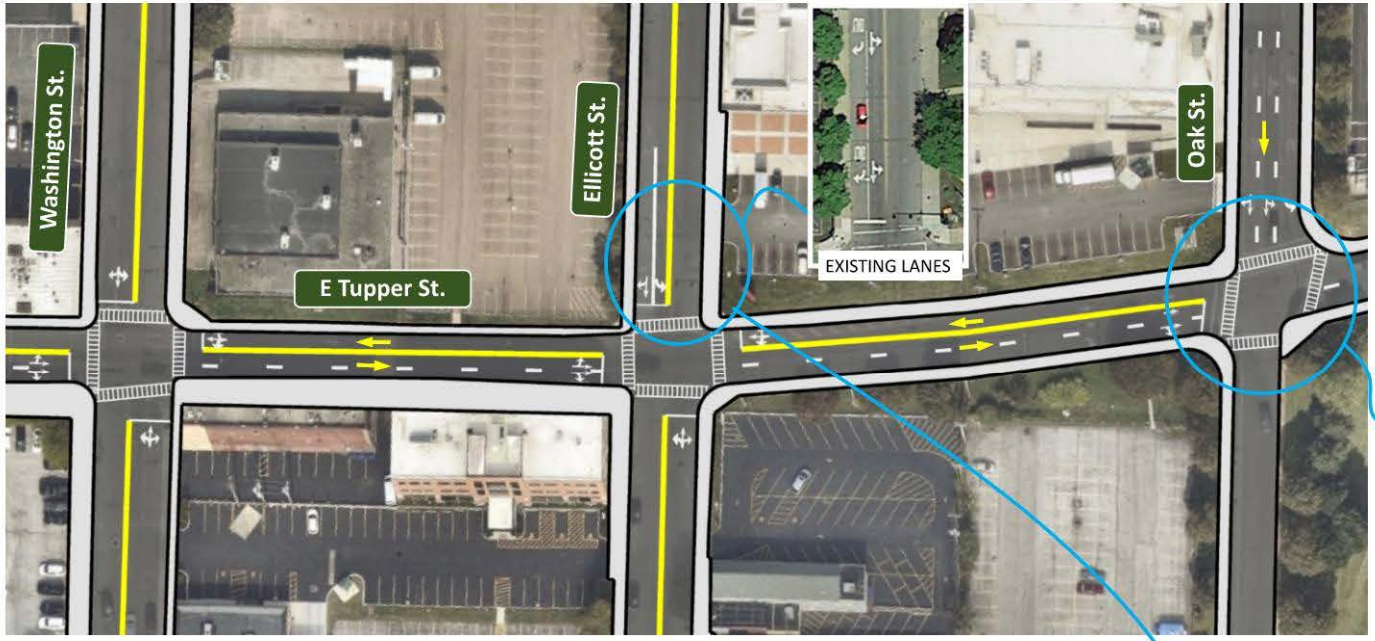
## Background

The southbound approach of the intersection of Ellicott Street and Tupper Street currently has an exclusive right turn lane and a shared through/left turn lane. The CBD North Study recommended to change the lane configuration on this approach to an exclusive left turn lane, and a shared through/right turn lane. Existing traffic counts show that in the AM and PM peak, the left turn volumes are much higher than the right turn volumes. In the PM peak, the left turn volumes exceed the right and through volumes combined.

This change would require some modifications on the receiving lanes on Ellicott Street southbound. The current through lane for the southbound approach is in alignment with the southbound receiving lane. If the through movement is shifted west to be shared with the right turn lane, this creates an offset in the southbound receiving lane. A few on-street parking spaces on the west side of Ellicott Street may need to be removed to accommodate the offset of the through movement, or dotted channelizing lines added to the intersection for the through movement.

**Figure 5.14 – Proposed Southbound Approach on Ellicott Street at Tupper Street**

# PROPOSED GEOMETRY CHANGE – EXTEND TWO-WAY TRAFFIC ON TUPPER STREET TO OAK STREET




**Map of Impacted Area**

## Description of Work

- Extend two-way operations on Tupper Street from Ellicott Street to Oak Street
- Adjust lane configuration for the southbound Ellicott Street approach to an exclusive left turn lane and shared through/right turn lane

## Project Goals Met

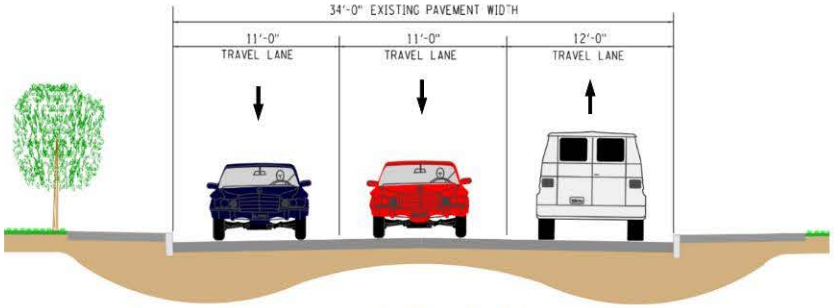
1) Improved Circulation
2) Traffic Calming
3) Enhanced Pedestrian Accommodations
4) Improved Lane Configurations

## Enhanced Pedestrian Accommodations

- Currently this section of E Tupper Street is the beginning of the one-way ramp to access NYS Route 33, which encourages high vehicle speeds. A one-way to two-way conversion will provide traffic calming and decrease speed, which will result in a safer crossing for pedestrians at the Oak Street intersection

## Improved Circulation

- A one-way to two-way conversion on E Tupper Street between Oak Street and Ellicott Street will allow westbound traffic to use E Tupper Street as an alternative route (see proposed cross-section below)
- Extending two-way operations on E Tupper Street diverts southbound traffic onto Oak Street and off of Goodell Street. This better circulates traffic around the local street network relieving Goodell Street of additional traffic volumes.



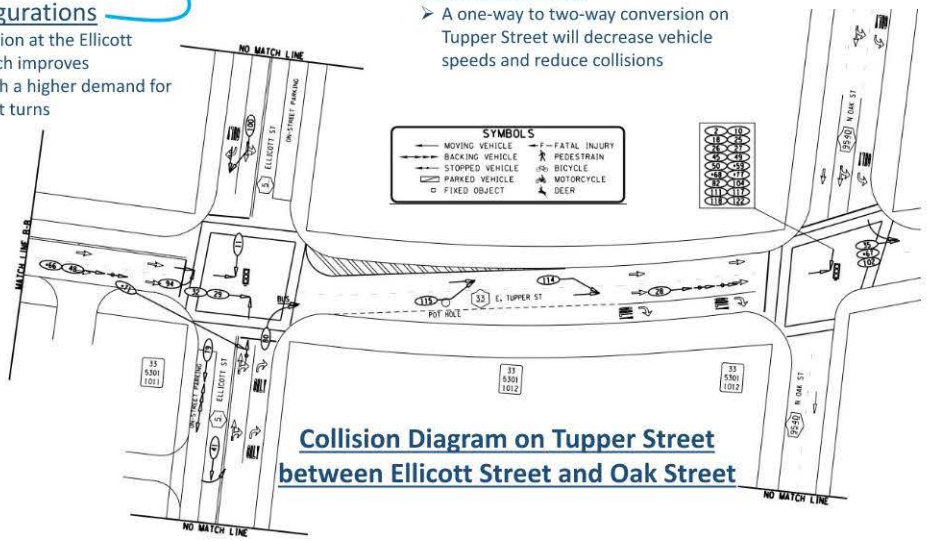

**Proposed Pavement Section for Tupper Street from Ellicott Street to Oak Street**

## Improved Lane Configurations

- Shifting the lane configuration at the Ellicott Street southbound approach improves intersection operations with a higher demand for left turns compared to right turns

## Traffic Calming

- A one-way to two-way conversion on Tupper Street will decrease vehicle speeds and reduce collisions




**Collision Diagram on Tupper Street between Ellicott Street and Oak Street**

# 6.0 Analysis of Proposed Alternatives

This section analyzes the primary alternatives and secondary alternatives collectively. As described in Section 4.0, the secondary alternatives were a result of data collection, the first round of public outreach, and a safety analysis completed by NYSDOT. These specific locations also have existing safety deficiencies that need to be mitigated through a change in roadway geometry. The secondary alternatives were applied to all primary alternatives during each peak hour and design year. The following are a list of primary alternatives:

- Alternative 1 – Null Alternative
  There are no reconfigurations or changes to the existing facility, this alternative only takes into consideration future planned development and routine maintenance.
- Alternative 2 – Road diet from four lanes to three lanes on part or all of the Goodell Street corridor
- Alternative 3 – Road diet from four lanes to two lanes on part of all of the Goodell Street corridor
- Alternative 4 – Implement two-way traffic on part of all of the Goodell Street corridor

The following geometric improvements were incorporated into Alternatives 2-4, and compared to Alternative 1 which has no changes to the facility.

- BFNC Drive: Remove access to off-ramp for BFNC Drive from NYS Route 33. Traffic travelling westbound on NYS Route 33 will only be able to access Goodell Street from NYS Route 33, removing the merge point between BFNC Drive and Goodell Street just east of the Michigan Avenue intersection. Convert BFNC Drive to two-way traffic from Maple Street to Jefferson Street.
- Pearl Street/Main Street/Goodell Street Intersection: Reconfigure Pearl Street to intersection with Edward Street at a 90 degree angle, forcing traffic from Goodell Street to enter Pearl Street with a left turn onto Pearl Street. Convert Pearl Street to two-way, and Edward Street to two-way from Pearl Street to Main Street.
- Tupper Street Two-Way Extension: Convert Tupper Street to a two-way street from Ellicott Street to Oak Street, which currently operates as one-way eastbound.
- Ellicott Street Southbound Approach: Reconfigure lanes to an exclusive left turn lane, and a shared through/right turn lane.

Alternative 1 will be the point of reference for comparison to the proposed alternatives. To determine distribution changes to each scenario, GBNRTC used the calibrated regional model during the AM and PM peaks for 2025 and 2045. After routing changes were made to the alternatives, each one was analyzed in Synchro using various measures of effectiveness including level of service (LOS), capacity, travel time, queueing, etc.

## Distribution Changes Between Alternatives

The proposed alternatives were modeled in the regional model for Alternatives 2-4, and the result was a percent change on each roadway segment compared to Alternative 1. The regional model is a 3-hour peak, therefore the percent change on each road segment had to be applied to hourly volumes to be analyzed by Synchro. The following process was used to apply distribution changes to each turning movement in the study area for each alternative:

1) For each separate alternative and peak, segments were identified that resulted in a minimum volume change of 25 vehicles, or was at least a 10% difference compared to Alternative 1. The rationale behind this is traffic is known to fluctuate by approximately 10% daily, any changes below 10% are considered negligible unless they resulted in 25 vehicles or greater. A volume of 25 vehicles was chosen since it may have measurable impacts to certain movements such as exclusive left turns.
2) Volume changes were redistributed through the network based on segment increases or decreases. The focus was on the major movements/changes within the network.

## Existing Conditions versus Alternative 1

Alternative 1 was converted to 2025 and 2045 design years. The existing condition is based on 2018 turning movement counts, which is in alignment with the regional model being calibrated to pre-pandemic traffic conditions. Using turning movement counts prior to the Covid-19 pandemic will reflect conservative traffic volumes. Alternative 1 is considered the null alternative for this project, the only changes between existing conditions and Alternative 1 is any future development that will happen in the adjacent area within and outside the limits of this project. This may include but is not limited to private and/or public development, roadway projects, BNMC (Buffalo Niagara Medical Campus) development, etc.

## Alternative 1

### Alternative 1 versus 2018 Existing Condition Distribution Changes

There were minimal volume and distribution changes from the 2018 existing turning movement counts to Alternative 1 design years 2025 and 2045. The majority of volume differences ranged from 25 to 50 vehicles per movement during the AM and PM peaks, with the largest difference being 155 vehicles. The difference in volume for each scenario has been provided in Appendix C.

### Operational Characteristics

The operational characteristics of the area describe conditions of the network including signal timings, phasings, and operation type, as well as levels of service, demand, queueing, and any other observations related to capacity and operations in the study area.

*Goodell Street*
The current traffic signal system on Goodell Street from Michigan Avenue to Pearl Street operates as pretimed with a 110 second cycle length. The traffic signals are programmed typically with two phases, with the exception of Michigan Avenue and Main Street. The Michigan Avenue intersection has 3 phases with a northbound lead on the side street approaches. The Main Street intersection has 3 phases with split phasing on the side street approaches.

*Tupper Street*

The current traffic signal system on Tupper Street from Pearl Street to Elm Street operates as pretimed with a 160 second cycle length. The traffic signals are programmed typically with two phases, with the exception of Washington Street which has 3 phases for a southbound lead on the side street approaches.

**Table 6.1 – Existing Signal Phases**

| | Phase Type | No. of Phases | Phase Type | No. of Phases |
|---|---|---|---|---|
| | Major Street | | Side Street | |
| Goodell Street Corridor | | | | |
| Michigan Avenue | Westbound Only | 1 | NB Lead | 2 |
| Oak Street | Westbound Only | 1 | Southbound Only | 1 |
| Ellicott Street | Westbound Only | 1 | Concurrent | 1 |
| Washington Street | Westbound Only | 1 | Concurrent | 1 |
| Main Street/Pearl Street | Westbound Only | 1 | Split | 2 |
| Tupper Street Corridor | | | | |
| Pearl Street | Concurrent | 1 | Concurrent | 1 |
| Main Street | Concurrent | 1 | Concurrent | 1 |
| Washington Street | Concurrent | 1 | SB Lead | 2 |
| Ellicott Street | Eastbound Only | 1 | Concurrent | 1 |
| Oak Street | Eastbound Only | 1 | Southbound Only | 1 |

Table 6.2 gives an overview of the existing levels of service (LOS) for each overall intersection in the study area. All intersections are operating at an overall intersection LOS C with the exception of the 2045 AM scenario at Michigan Avenue.

Along the Goodell Street corridor, Michigan Avenue has the heaviest side street volumes during the AM and PM peak hours. The next highest side street volumes are at the Main Street intersection. Along the Tupper Street corridor, the Pearl Street intersection has the heaviest side street volumes, with Elm Street having the next highest.

**Table 6.2 - Alternative 1 Overall Intersection Levels of Service**

| | Intersection LOS | | | |
|---|---|---|---|---|
| | 2025 | | 2045 | |
| | AM | PM | AM | PM |
| Goodell Street Corridor | | | | |
| Michigan Avenue | C (34.2) | C (23.6) | D (37.7) | C (23.6) |
| Oak Street | A (5.4) | B (16.0) | A (5.0) | B (15.9) |
| Ellicott Street | A (6.0) | A (7.8) | A (6.7) | A (7.3) |
| Washington Street | A (3.5) | B (10.7) | A (4.1) | B (10.2) |

**Table 6.2 Continued- Alternative 1 Overall Intersection Levels of Service**

| | Intersection LOS | | | |
|---|---|---|---|---|
| | 2025 | | 2045 | |
| | AM | PM | AM | PM |
| Main Street/Pearl Street | C (22.6) | C (20.6) | C (27.6) | C (20.7) |
| Tupper Street Corridor | | | | |
| Pearl Street | B (15.0) | C (22.9) | B (14.3) | C (23.1) |
| Main Street | B (12.9) | C (22.6) | B (12.3) | C (22.7) |
| Washington Street | B (10.4) | C (24.0) | B (10.9) | C (23.6) |
| Ellicott Street | A (8.2) | C (23.7) | A (8.6) | C (24.2) |
| Oak Street | A (6.8) | C (20.7) | A (7.1) | C (21.2) |
| Elm Street | B (12.3) | C (23.2) | B (12.8) | C (23.2) |

## Proposed Alternatives Analysis

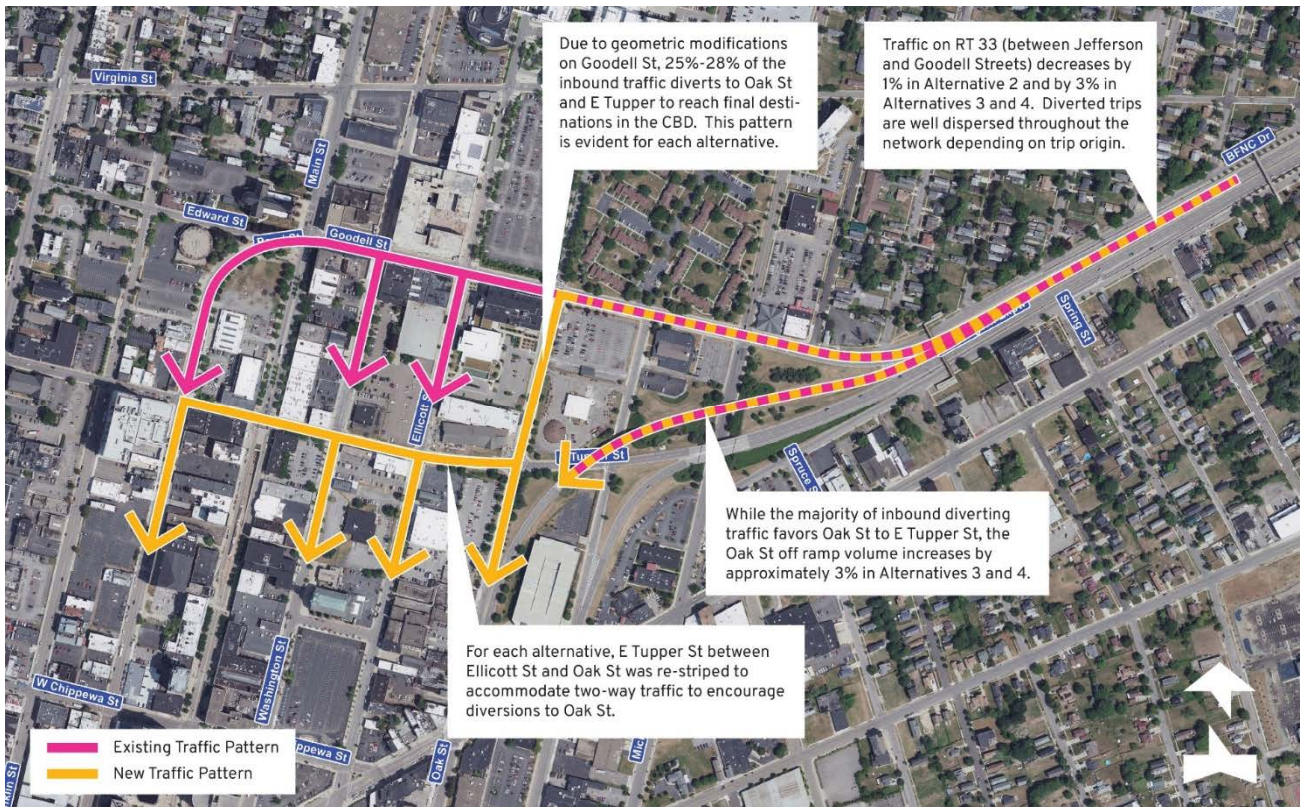
### Distribution Changes

The geometric improvements that are incorporated into Alternatives 2-4 created universal distribution changes that applied to all of the alternatives, peak hours, and design year scenarios. Figure 6.1 on the next page shows a graphic of the roadway segments which experience an increase or decrease of traffic volumes due to the secondary alternatives. The impact of these diversions (percentage change of volumes) varied between scenarios, but the following distribution changes were consistent for all of the alternatives:

- *Northbound on Elm Street:* There is a reduction of traffic volumes entering the study area network from Elm Street, which further reduces traffic volumes entering Goodell Street.
- *Southbound on Oak Street:* Westbound traffic on Goodell Street makes a left turn onto Oak Street and a right turn onto Tupper Street. Due to the two-way conversion of Tupper Street between Ellicott Street and Elm Street, westbound traffic is diverting from Goodell Street to Tupper Street. This also reduces the amount of traffic on parallel routes to Oak Street including Ellicott Street and Washington Street.
- *Westbound on Tupper Street:* Traffic volumes from Ellicott Street to Main Street greatly increase in the westbound direction. The conversion of Tupper Street to two-way from Oak Street to Ellicott Street diverts traffic off of Goodell Street and onto Tupper Street.
- *Eastbound on Tupper Street:* From Main Street to Oak Street, there is a reduction in eastbound traffic on Tupper Street. This is due to the reduction in southbound traffic on Pearl Street and traffic shifting from the northbound right turn movement at Pearl Street and Tupper Street, to a through movement on Pearl Street.
- *Northbound on Pearl Street:* Pearl Street experiences an increase in northbound traffic south of the Tupper Street intersection. The increase in northbound traffic on Pearl Street continues through the Tupper Street intersection to Edward Street, where the majority of traffic makes a left onto Edward Street. This distribution change reduces volumes on Franklin Street.

- *Southbound on Pearl Street:* The reduction of traffic on Goodell Street impacts the traffic volumes going through to Pearl Street. There is a large reduction (50% and more) of southbound traffic on Pearl Street for all alternatives.

**Figure 6.1 – Distribution Changes Due to Secondary Alternatives**




### Intersection Control Changes

The intersection of Elm Street at Goodell Street was changed to signalized control for all alternatives. This intersection has a high collision rate, and meets traffic signal warrant criteria outlined in the National Manual on Uniform Traffic Control (NMUTCD).

The proposed intersection of Pearl Street at Edward Street was analyzed under stop control for the Pearl Street approach. For the majority of alternatives and peak hours, this caused a failing LOS for Pearl Street with excessive queues. Therefore this intersection was analyzed under signalized control for all alternatives.

## Alternative 2

### Alternative 2 versus Alternative 1 Distribution Changes

The same methodology used to go from the baseline 2018 existing conditions to Alternative 1 was used to determine volume and distribution changes from Alternative 1 to Alternative 2. The largest change in distribution was the anticipated reduction of traffic entering Goodell Street from NYS Route 33. There was

also an increase of traffic volumes heading westbound on Tupper Street and a reduction of traffic volumes heading eastbound on Tupper Street.

**Operational Characteristics**

The traffic signal system was changed from pretimed control, to actuated coordinated control with updated cycle lengths and offsets. Signal timings and phasings were adjusted for distribution changes to account for additional approaches due to the two-way conversions of Pearl Street and Tupper Street from Ellicott Street to Oak Street.

As shown in Table 3, there are minimal changes to the overall intersection levels of service in the study area by reducing Goodell Street from four lanes westbound to three lanes westbound while incorporating the geometric changes.

The following are intersection operation and lane designation changes at intersections under Alternative 2 that were incorporated into the analysis and results in Table 6.3.

- *Main Street at Goodell Street:* The proposed traffic signal at Pearl Street and Edward Street slightly deteriorates the eastbound and westbound approach level of service at Main Street. This is due to the proximity of the signals to each other, and coordinating with the network on Goodell Street. Eastbound and westbound traffic must operate on split phasing due to intersection geometry, which reduces green time for the westbound approach.
- *Washington Street at Tupper Street:* The lane configuration at the Washington Street approaches should be mirrored since left turns and right turns are approximately the same volumes. With this change, left turns can have an exclusive phase. A right turn lane may not be advantageous since Goodell Street does not have exclusive left turns, and therefore there is no right turn overlap phase.

Table 6.3 - Alternative 1 versus Alternative 2 Overall Intersection Levels of Service

| | Intersection LOS | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2025 | | | | 2045 | | | |
| | AM | | PM | | AM | | PM | |
| | Alt 1 | Alt 2 | Alt 1 | Alt 2 | Alt 1 | Alt 2 | Alt 1 | Alt 2 |
| Goodell Street Corridor | | | | | | | | |
| Michigan Avenue | C (34.2) | C (28.9) | C (23.6) | C (24.4) | D (37.7) | **C (30.6)** | C (23.6) | C (25.7) |
| Elm Street | - | B (10.3) | - | B (11.9) | - | A (8.6) | - | A (8.1) |
| Oak Street | A (5.4) | A (4.0) | B (16.0) | B (19.6) | A (5.0) | A (4.7) | B (15.9) | B (14.8) |
| Ellicott Street | A (6.0) | **B (10.3)** | A (7.8) | **B (13.8)** | A (6.7) | A (9.5) | A (7.3) | **B (14.4)** |
| Washington Street | A (3.5) | A (5.4) | B (10.7) | B (12.1) | A (4.1) | A (7.3) | B (10.2) | B (11.4) |
| Main Street | C (22.6) | C (20.7) | C (20.6) | B (18.3) | C (27.6) | C (24.2) | C (20.7) | **D (35.8)** |
| Edward Street/Pearl | - | B (16.4) | - | B (19.0) | - | B (18.8) | - | B (13.3) |

Table 6.3 Continued - Alternative 1 versus Alternative 2 Overall Intersection Levels of Service

| | Intersection LOS | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 2025 | | | | 2045 | | | |
| | AM | | PM | | AM | | PM | |
| | Alt 1 | Alt 2 | Alt 1 | Alt 2 | Alt 1 | Alt 2 | Alt 1 | Alt 2 |
| Tupper Street Corridor | | | | | | | | |
| Pearl Street | B (15.0) | C (23.4) | C (22.9) | C (22.5) | B (14.3) | B (18.4) | C (23.1) | C (21.4) |
| Main Street | B (12.9) | B (19.6) | C (22.6) | B (18.6) | B (12.3) | B (19.2) | C (22.7) | B (19.1) |
| Washington Street | B (10.4) | B (11.9) | C (24.0) | B (18.9) | B (10.9) | B (12.6) | C (23.6) | C (20.7) |
| Ellicott Street | A (8.2) | B (11.7) | C (23.7) | C (25.3) | A (8.6) | B (15.9) | C (24.2) | B (25.2) |
| Oak Street | A (6.8) | B (12.7) | C (20.7) | C (21.9) | A (7.1) | A (9.1) | C (21.2) | B (19.9) |
| Elm Street | B (12.3) | C (21.5) | C (23.2) | B (13.0) | B (12.8) | C (22.6) | C (23.2) | B (11.5) |

## Alternative 3

### Alternative 3 versus Alternative 1 Distribution Changes

The distribution changes for Alternative 3 were similar to those of Alternative 2. The difference between the two alternatives is the amount of traffic volumes reduced on Goodell Street. Alternative 3 is proposing to reduce Goodell Street down to 2 lanes, which reduces capacity available to traffic. The regional model indicated that this reduction would further reduce the amount of traffic entering the network from NYS Route 33.

### Operational Characteristics

The traffic signal system was changed from pretimed control, to actuated coordinated control with updated cycle lengths and offsets. Signal timings and phasing were adjusted to account for additional approaches due to the two-way conversions of Pearl Street and Tupper Street from Ellicott Street to Oak Street.

The following are intersection operation and lane designation changes at intersections under Alternative 3 that were incorporated into the analysis and results in Table 6.4.

- *Goodell Street Corridor:* Max queueing occurs up to the upstream intersections from Ellicott Street and westbound. It is recommended that Goodell Street remain 3 lanes from Michigan Avenue to Oak Street to increase capacity and prevent queueing on the NYS Route 33 ramp.
- *Michigan Avenue at Goodell Street*: This intersection is high volume from the approaches competing for green time. There is significant queueing on northbound Michigan Avenue.
- *Main Street at Goodell Street*: Incorporating this intersection into the actuated coordinated network results in the majority of movements/approaches operating at a LOS E. This intersection is recommended to be removed from the coordinated system and have its own timing plan that is semi-actuated.

- *Main Street at Tupper Street*: The northbound approach is low volume compared to the rest of the study area, therefore the LOS is poor (LOS E).

**Table 6.4 - Alternative 1 versus Alternative 3 Overall Intersection Levels of Service**

| | 2025 | | | | 2045 | | | |
|---|---|---|---|---|---|---|---|---|
| | AM | | PM | | AM | | PM | |
| | Alt 1 | Alt 3 | Alt 1 | Alt 3 | Alt 1 | Alt 3 | Alt 1 | Alt 3 |
| Goodell Street Corridor | | | | | | | | |
| Michigan Avenue | C (34.2) | **C (32.7)** | C (23.6) | C (25.5) | D (37.7) | C (34.9) | C (23.6) | C (25.2) |
| Elm Street | - | B (19.6) | - | A (5.9) | - | B (12.5) | - | A (7.6) |
| Oak Street | A (5.4) | A (9.1) | B (16.0) | B (18.2) | A (5.0) | A (7.2) | B (15.9) | B (16.0) |
| Ellicott Street | A (6.0) | **B (11.4)** | A (7.8) | **B (14.0)** | A (6.7) | **B (10.7)** | A (7.3) | **C (27.6)** |
| Washington Street | A (3.5) | A (6.0) | B (10.7) | B (12.3) | A (4.1) | A (8.3) | B (10.2) | B (19.5) |
| Main Street | C (22.6) | C (20.4) | C (20.6) | B (18.0) | C (27.6) | **D (37.5)** | C (20.7) | C (26.4) |
| Edward Street/Pearl | - | B (16.3) | - | C (30.5) | - | A (9.0) | - | B (17.4) |
| Tupper Street Corridor | | | | | | | | |
| Pearl Street | B (15.0) | B (16.5) | C (22.9) | B (19.3) | B (14.3) | B (12.8) | C (23.1) | C (25.5) |
| Main Street | B (12.9) | B (14.6) | C (22.6) | B (16.2) | B (12.3) | B (15.0) | C (22.7) | B (12.4) |
| Washington Street | B (10.4) | B (12.2) | C (24.0) | B (19.7) | B (10.9) | B (11.8) | C (23.6) | B (13.7) |
| Ellicott Street | A (8.2) | **B (15.7)** | C (23.7) | C (26.2) | A (8.6) | **B (17.4)** | C (24.2) | C (31.1) |
| Oak Street | A (6.8) | A (7.5) | C (20.7) | C (21.6) | A (7.1) | A (6.6) | C (21.2) | B (16.0) |
| Elm Street | B (12.3) | B (18.6) | C (23.2) | B (11.3) | B (12.8) | B (18.5) | C (23.2) | B (10.9) |

## Alternative 4

### Alternative 4 versus Alternative 1 Distribution Changes

There were additional distribution changes identified in this alternative due to the two-way conversion of Goodell Street from Main Street to Oak Avenue. The following distribution changes that were unique to this scenario outside of those identified in the universal distribution changes include:

- *Volumes on Side Streets North of Goodell Street:* There was an increase in southbound volumes on Main Street, Washington Street, and Ellicott Street approaching Goodell Street, with a decrease in volumes on these streets between Goodell Street and Tupper Street. This is due to the two-way conversion, traffic heading southbound onto Goodell Street, and then using Oak Street to turn onto Tupper Street and continue eastbound onto NYS Route 33.
- *Volumes on Side Streets South of Tupper Street:* There was also an increase in northbound and southbound traffic volumes on Main Street, Washington Street, and Ellicott Street south of Tupper Street. This scenario had larger increases in volumes turning left from the side street onto westbound Tupper Street and using Pearl Street northbound, as well as traffic diverting off of Tupper Street onto these side streets.

**Operational Characteristics**

Alternative 4 was analyzed using two-phases at the majority of signalized intersections. The amount of left turns on Goodell Street is anticipated to be minimal (under 100 vehicles during the peak hour), and therefore no left turn lanes or phases were provided on Goodell Street and Tupper Street.

During the PM peak hour, traffic volumes diverted from eastbound Tupper Street to eastbound Goodell Street to Oak Street. This shift in traffic improved the overall LOS for intersections on Tupper Street.

The following are intersection operation and lane designation changes at intersections under Alternative 4 that were incorporated into the analysis and results in Table 5.

- *Michigan Avenue at Goodell Street:* Shorter cycle length that is not coordinated with the network. High volume approaches need to clear out more frequently to minimize the amount of queueing that occurs incurring additional delay to approaches.
- *Washington Street at Tupper Street:* Need to change right turn lane northbound to an exclusive left turn lane.
- *Ellicott Street at Tupper Street:* Max queueing occurs up to the upstream intersections.

Lane configuration changes recommended to accommodate the anticipated shift in traffic distribution include:

- *Washington Street SB Approach at Goodell Street:* Anticipated high demand southbound left turn movement, may need an exclusive left turn lane to accommodate
- *Ellicott Street SB Approach at Goodell Street*: Anticipated high demand southbound left turn movement, may need an exclusive left turn lane to accommodate.
- *Oak Street WB Approach at Goodell Street:* Anticipated high demand southbound left turn movement, may need an exclusive left turn lane to accommodate as well as a leading phase.
- *Pearl Street at Edward Street Intersection:* Northbound traffic has extensive queues and delays, a traffic signal to mitigate and provide adequate gaps for northbound left turns.

At peak times queuing eastbound at the Tupper Street and Oak Street back into the previous intersection (Ellicott Street).

**Table 6.5: Alternative 1 versus Alternative 4 Overall Intersection Levels of Service**

| | 2025 | | | | 2045 | | | |
|---|---|---|---|---|---|---|---|---|
| | AM | | PM | | AM | | PM | |
| | Alt 1 | Alt 4 | Alt 1 | Alt 4 | Alt 1 | Alt 4 | Alt 1 | Alt 4 |
| Goodell Street Corridor | | | | | | | | |
| Michigan Avenue | C (34.2) | C (34.8) | C (23.6) | C (25.8) | D (37.7) | D (37.0) | C (23.6) | C (25.8) |
| Elm Street | - | B (12.5) | - | A (9.1) | - | B (15.9) | - | A (7.8) |
| Oak Street | A (5.4) | A (8.1) | B (16.0) | B (18.3) | A (5.0) | A (8.4) | B (15.9) | B (16.5) |
| Ellicott Street | A (6.0) | B (17.7) | A (7.8) | B (19.7) | A (6.7) | C (23.0) | A (7.3) | B (16.0) |
| Washington Street | A (3.5) | A (6.3) | B (10.7) | B (15.4) | A (4.1) | A (7.7) | B (10.2) | B (12.8) |
| Main Street | C (22.6) | C (22.6) | C (20.6) | C (28.4) | C (27.6) | C (27.5) | C (20.7) | C (21.7) |
| Edward Street/Pearl | - | B (18.7) | - | B (12.8) | - | B (14.9) | - | B (11.8) |
| Tupper Street Corridor | | | | | | | | |
| Pearl Street | B (15.0) | B (18.6) | C (22.9) | B (17.9) | B (14.3) | C (20.3) | C (23.1) | C (20.3) |
| Main Street | B (12.9) | B (11.3) | C (22.6) | B (11.7) | B (12.3) | A (9.3) | C (22.7) | B (13.9) |
| Washington Street | B (10.4) | B (10.8) | C (24.0) | B (16.5) | B (10.9) | B (11.3) | C (23.6) | C (20.4) |
| Ellicott Street | A (8.2) | B (16.5) | C (23.7) | B (19.7) | A (8.6) | B (17.8) | C (24.2) | C (22.1) |
| Oak Street | A (6.8) | B (10.8) | C (20.7) | C (24.4) | A (7.1) | B (15.6) | C (21.2) | C (24.7) |
| Elm Street | B (12.3) | B (19.9) | C (23.2) | B (13.4) | B (12.8) | C (20.5) | C (23.2) | B (12.8) |

The regional model was used to determine the effects of improvement alternatives on nearby surrounding streets. Each alternative would impact volumes and distribution to adjacent streets, the conclusion for volume rerouting is that regardless of the chosen alternative, the surrounding streets did not have a significant impact outside of the study corridor. Traffic distribution changes were so small on the grid system surrounding the Goodell Street Corridor, that no adverse impacts to the surrounding streets were identified.

# 7.0 Environmental Screening

This section focuses on identifying potential environmental permits, approvals, and consequences for the alternatives. The project alternatives were screened for applicable federal and state environmental laws. This information is a precursor when a preferred alternative is identified and implemented into preliminary and final design and construction. The environmental screening criteria outlined here are typical considerations for all Locally Administered Federal Aid Projects (LAFAP).

## National Environmental Policy Act (NEPA)

This project will involve Federal aid funding. Therefore, this project must proceed in compliance with all Federal aid requirements. It is anticipated that this project would be progressed as a Class II action (Categorical Exclusion) because it is not currently known to individually or cumulatively have a significant environmental impact; therefore, it is expected to be excluded from the requirement to prepare an Environmental Impact Statement (EIS) or an Environmental Assessment (EA). The NEPA status of the project will need to be re-assessed during preliminary and final design through the Federal Environmental Approvals Worksheet (FEAW) process.

## State Environmental Quality Review Act (SEQRA)

This project has been evaluated in accordance with the State Environmental Quality Review (SEQR) regulations in 6 NYCRR Part 617 and, based on the current design, it has been determined that this project is a listed Type II action. A Type II Action is one that is of a class or type of action which has been determined by regulation to not have a significant effect on the environment. The project will be progressed as a Type II action under 6 NYCRR 617.5(c). The SEQR status of the project will be re-assessed during preliminary and final design.

Further, precedent for this determination is found in the NYS Department of Transportation (NYSDOT) regulations implementing SEQR, 17 NYCRR Part 15. The project actions known at this time are described in the list of Type II actions in 17 NYCRR Part 15.14(e)(37). Additionally. the project does not violate any of the criteria contained in subdivision (d) of Section 15.14.

## Additional Environmental Information

This project is located within Potential Environmental Justice Area (PEJA) Community census block groups 15000US360290025021 and 15000US360290025022. The design of this project will require consideration of the PEJA communities.

### Surface Water

There are no State or Federally classified surface water bodies within the study area. Since the design will likely disturb over 1 acre of land, the project will require coverage under the NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activities (GP-0-20-001) and a full Storm Water Pollution Prevention Plan (SWPPP) is expected to be required.

### Wetlands

State and Federal wetland mapping was reviewed for the study area and no wetlands were found in the vicinity of the project study area. Given the urban character of the project study area, no wetlands are anticipated within the project corridor.

### Water Source Quality

A review of the United States Environmental Protection Agency Designated Sole Source Aquifer Areas and Fact Sheets indicates that the project is not located in or adjacent to a Sole Source Aquifer. Aquifer mapping from the NYSDEC Division of Water was also reviewed and indicates the presence of a Principal Aquifer within the project limits. The project study area includes a portion of a Stratified-drift aquifer that was mapped at 1:250,000 scale. Groundwater quality impacts are not anticipated to occur as a result of this project; however, a groundwater assessment per NYSDOT's The Environmental Manual will need to be performed during preliminary design.

### Navigable Waters

There are no USACOE or NYSDEC navigable waters near the proposed project.

### Wild, Scenic, and Recreational Rivers

There are no Wild, Scenic, or Recreational Rivers near the proposed project.

### Coastal Policy Assessment

The project site is not located within the limits of the coastal area regulated pursuant to the New York State Coastal Management Program.

### Flood Plains

There are no flood plains near the proposed project.

### General Ecology and Wildlife

Endangered and Threatened Species - A US Fish and Wildlife Service (USFWS) website's Information, Planning and Conservation (IPaC) resource list was generated and reviewed for the project on February 3, 2023. The review indicated that there is one (1) federally listed, endangered or threatened species identified within the project area. The northern long-eared bat (NLEB) (Myotis septentrionalis) is listed as threatened.

The project is not within 0.5 miles of a known NLEB hibernacula or 150 feet of a known roost tree or other summer record. Potential habitat for this species includes trees greater than three (3) inches diameter breast high (DBH) that contain dead branches, hollows, or exfoliating bark; therefore, the removal of trees and snags 3" diameter at breast-height (dbh) and greater is considered to have a potential adverse effect on the NLE bat. An identification of potential habitat and tree removals will be made during preliminary design to assist with an IPaC effects determination as to whether this project may affect the northern long-eared bat. Any take that may occur as a result of a project is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o).

Bridges are also considered potential summer habitat for the NLEB; however, it is currently assumed that no bridges will be renovated or replaced under this contract. If bridge work is added to this contract under any alternative, the involved bridge(s) will need to be inspected for the presence of bats.

The IPaC resource list also indicated that the Monarch Butterfly (Danaus plexippus) is a candidate for listing. The IPaC will be reviewed at the time of the preliminary design to identify potential conflicts.

Certain birds are protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. Twenty birds were listed in the IPaC resource list that are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in this project location. During preliminary design, a determination should be made as to whether this projects activities may result in impacts to migratory birds, eagles, and their habitats and what appropriate regulations and conservation measures should be considered.

During preliminary design, an environmental assessment request letter will also need to be submitted to the NYSDEC Region 9 and a New York Natural Heritage Program (NYNHP) review form will also be completed and submitted to NYNHP.

Invasive Species - **A field inspection of the existing corridor will be performed during preliminary design, to determine if invasive species are present within the right-of-way. Given the urban character of the project study area it is anticipated that invasive species involvement would be minor.**

During construction, in general, impacts will be minimized by specifying native plants for landscaping and eliminating the use of invasive landscape plants. To prevent the unintentional introduction or spread of invasive species, all construction equipment should be cleaned of mud, seeds, vegetation and other debris before accessing the site and upon completion of the project.

### Cultural and Historical Resources

The project study area is in a well-established area of the City of Buffalo with numerous cultural and historical resources in the vicinity. This area has numerous (>50) National Register Eligible and listed structures along the corridor, potential archeological resources, and is within the NYS Heritage Areas for Buffalo and West Erie Canal

Corridor. A Cultural Resources study will need to be performed during design that would identify potential conflicts.

### Visual Resources

The project site is located along a highway exit that empties onto a busy one-way 4-lane urban street. Property use in the area includes both commercial and residential land uses. None of the alternatives propose a significant change to land uses in the area; however, a visual resources assessment will need to be performed during the design of this project.

## Parks and Recreational Facilities

There are no parks on or adjacent to the site of the proposed project, and none in the area that will be affected. However, this area is within the NYS Heritage Areas for Buffalo and West Erie Canal Corridor as well as the Erie Canalway National Heritage Corridor.

The proposed project will not impact park or recreational areas identified as the following:

- National Registry of Natural Landmarks
- Section 4(f) Properties
- Section 6(f) Land and Water Conservation Act Funded Properties
- Section 1010 Urban Park and Recreation Recovery Program Properties

### Farmland Assessment

The proposed project was reviewed pursuant to the Federal Farmland Preservation Act. According to the U.S. Department of Agriculture Soil Survey of Erie County, New York, no soil types within the study area are considered prime farmland, as defined by the USDA Natural Resources Conservation Service. Since the land to be impacted by this project is currently in use for means other than for agriculture (i.e., a highway corridor and ROW), the proposed project will not convert any prime or unique farmland or farmland of state or local importance to a nonagricultural use and no further Federal review is required.

Article 25-AA of the New York State Agricultural and Markets Law Section 305(4) protects State farmlands by requiring a Notice of Intent (NOI) and public review procedure for acquisition of more than one acre from any actively operated farm in an Agricultural District. A review of the Erie County Internet Mapping System indicated that the project is not located inside an Agricultural District. Therefore, the project will not acquire more than 1.0 acre of land within an agricultural district and further review under Section 305(4) will not be required.

### Air Quality, Noise, and Energy

Air Quality -The proposed project is located in Erie County. Erie County is currently an orphan non-attainment area for ozone per the EPA "South Court II" decision. Erie County is in attainment for all other criteria pollutants. This project is identified as exempt on the 2023 Transportation Improvement Program

(TIP); therefore, a conformity determination is not required for this Project. Additionally, a local air quality assessment is not required since the project is not expected to increase traffic volumes, significantly reduce source-receptor distances nor change other existing conditions to a degree that would significantly impact air quality. The project alternatives will need to be reviewed again in accordance with the NYSDOT's The Environmental Manual with respect to air quality during preliminary design.

Noise – The build alternatives may involve the movement of traffic patterns that may affect the noise levels of adjacent sensitive receptors. Short term construction noise is also expected to occur as part of this project. The proposed project will need to be assessed for noise impacts in accordance with the NYSDOT's The Environmental Manual during preliminary design.

Energy – Changes in traffic patterns may have an effect on energy consumption in this local area; therefore, the proposed project will need to be assessed for energy impacts in accordance with the NYSDOT's The Environmental Manual during preliminary design.

### Hazardous Waste and Contaminated Materials

The project study area includes numerous known spill sites and eleven NYSDEC remediation sites. A Phase 1 Environmental Site Assessment (ESA) in accordance with the NYSDOT's The Environmental Manual (TEM) will need to be performed during preliminary design to identify potential impacts to the proposed project.

### Asbestos Assessment

An Asbestos Assessment will need to be performed during preliminary design when the excavation areas and impacts to structures have been determined.

### Construction Impacts

Temporary effects due to construction activities will include the following: increased noise from construction equipment; dust from construction activities; and increased energy consumption from construction equipment. These effects are all expected to be minor due to their temporary nature and the mitigation measures applied during construction. Mitigation measures, if required, will be identified during Preliminary Design.

## Anticipated Permits, Approvals, and Coordination

The following environmental permits, approvals, and coordination apply to this project:

- NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activities (GP-0-20-001) and a full Storm Water Pollution Prevention Plan (SWPPP) is expected to be required.
- Cultural Resources study will need to be performed during preliminary design that would identify potential conflicts.

- US Fish and Wildlife Service (USFWS) review will need to be performed through the website's Information, Planning and Conservation (IPaC) during preliminary design.
- An environmental assessment request letter will need to be submitted to the NYSDEC Region 9 during preliminary design.
- New York Natural Heritage Program (NYNHP) review form will need to be completed and submitted during preliminary design.
- A groundwater assessment per NYSDOT's The Environmental Manual will need to be performed during preliminary design.

# 8.0 Public Engagement Round 2

The public outreach program continued with the goal to keep engaging the community and gather feedback on the proposed alternatives for the Goodell Street Corridor. The responses gathered through this process were used by the Project Team as an evaluation criteria when considering the preferred alternative and recommendations as a result of the study.

## Final Public Meeting

A second and final public outreach event was held on Tuesday, November 29th from 5:30PM to 7:00PM. An in-person open house meeting, with a virtual live stream, was held at the City Honors PS 195 at 186 E North Street. Similar to Public Meeting 1, this location was chosen for its close proximity to the study area and accessibility to the local community. The meeting had a presentation at 5:30 PM providing an updated overview of the project and its progress, followed by an open house at 6:00 PM. The Project Team shared renderings and concepts of proposed alternatives, providing the general public with renderings of what Goodell Street may look under each alternative.

### Online Survey

An online survey was launched during the final public meeting on Tuesday, November 29th, and closed on Thursday December 29th. The survey was promoted through post cards sent to adjacent neighborhoods, flyers that were passed out in and surrounding the area, emails to stakeholders, on the GBNRTC website, and a paid ad on Instagram targeting users in the area. The survey had a total of 89 respondents and similar to the previous survey, a majority of respondents identified as commuters and travel through the corridor a few times a week. Personal vehicle was once again the most frequent mode of transportation by 80% of respondents, while 34% of respondents use a bicycle/scooter and 41% walk through the corridor. It should be noted that users could provide more than one answer.

**Table 8.1 – Survey Respondent Connection to Corridor**

| Connection to the Corridor | Number of Respondents |
|---|---|
| Resident of Neighboring Community | 24 |
| Employee or owner of business on or near the corridor | 33 |
| Commuter | 47 |
| Other | 5 |

Question 4 on the survey provided an image of Alternative 1 and asked, "Does Alternative 1 address improvements that are important to you?" 88% of respondents said that Alternative 1 does not address important improvements. All other responses (yes, somewhat, and other) were under 6%.

Question 5 on the survey provided an image of Alternative 2 and asked, "Does Alternative 2 address improvements that are important to you?" 44% of respondents said that Alternative 2 does address important improvements while 29% said that it did not address important improvements. Other responses noted the need for more separation between cyclists and the road.

Question 6 on the survey provided an image of Alternative 3 and asked, "Does Alternative 3 address improvements that are important to you?" 59% of respondents said that Alternative 3 does address important improvements while 14% said that it did not address important improvements. 24% of respondents though this design somewhat addressed improvements. Alternative 3 had the highest amount of "Yes" responses in relation to addressing improvements.

Question 7 on the survey provided an image of Alternative 4 and asked, "Does Alternative 4 address improvements that are important to you?" 58% of respondents said that Alternative 4 does not address important improvements. 27% of respondents though this design somewhat addressed improvements and only 12% of respondents believed that this design addressed important improvements. Alternative 4 had the highest amount of "No" responses in relation to addressing improvements.

**Figure 8.1 – Image of Alternative 1**

**Figure 8.2 – Image of Alternative 2**

**Figure 8.3 – Image of Alternative 3**

**Figure 8.4 – Image of Alternative 4**

The table below summarizes all responses to the Alternative Designs shown in the survey, and whether respondents felt the alternative met project objectives.

**Table 8.2 – Public Feedback on Alternatives**

| | Alternative 1 | Alternative 2 | Alternative 3 | Alternative 4 |
|---|---|---|---|---|
| Yes | 6% | 21% | **59%** | 12% |
| Somewhat | 2% | **47%** | 24% | 27% |
| No | **88%** | 29% | 14% | 58% |
| Other | 2% | 3% | 1% | 2% |

The survey asked: "What are the most appealing aspects to you within the proposed alternatives" A few responses were similar, if not the same, to the same question posed in the first survey.

- "We really need bicycle infrastructure - the space is there. Commuting across town is hard - this would help. I would recommend protected lane that can also connect to Pearl."
- "Traffic calming, at the very least"
- "Road is too wide and too fast.

The last question on the survey asked respondents to provide any additional comments, suggestions, or concerns surrounding the Goodell St alternative designs. Notable responses included:

- "You need trees!"
- "You must address the transition from 33 to city streets. People drive too fast and its unsafe for pedestrians and cyclists to operate there."
- "The protected bike lane seems better as long as it's clearly marked as two-way bike traffic. Some other street infrastructure should be added to further slow traffic. Bollards would provide a nice added layer of protection."
- "The present layout is not pedestrian friendly and looks ugly."
- "Simple improvements to traffic light timing would make a huge difference. The current setup encourages speed for drivers who want to avoid being stopped at Main Street."
- "Priority for pedestrian safety is critical in this area."
- "Other than alternative 3, these designs do not seem to consider snow removal. Unless this is addressed during the design phase, this will continue to be a hazardous corridor for pedestrians in the winter."
- "I think there should be curb cuts mid-block with a crosswalk because the blocks are long on the corridor."
- "I don't think that two-way traffic on this street would benefit the campus"
- "Greenspace between the lanes and pedestrians is important. Addition of tress to line the roadway would add tree cover and shade hardscaped areas."
- "Alternative 4 offers a lot of advantages to improve traffic circulation. If only bike lanes could be accommodated in that design."

# 9.0 Evaluation of Alternatives

## Background

Additional criteria was developed for analyzing each of the alternatives to ensure a balanced evaluation of the needs of various modes along the corridor. Based on the capacity analyses, all proposed alternatives are expected to operate acceptably for motor vehicles without substantially increasing delay, or queueing traffic onto NYS Route 33. The objective of this study is to also investigate the impacts to pedestrians, bicyclists, safety, operational characteristics, public opinion through the public outreach process, and the environment.

The following evaluation criteria applied to each alternative serve the additional objective of providing equitable transportation opportunities. These in return will improve public health, protect the natural environment, and enhance quality of life for residents. Each alternative was evaluated for the following criteria categories:

- Pedestrian Accommodations
- Bicyclist Accommodations
- Vehicle Travel Time
- Safety
- Environmental Considerations
- Public Outreach

### Pedestrian Accommodations

Pedestrian facilities need to consider pedestrians of all ages, the needs of users with mobility, visual and hearing impairments, and their comfort level sharing facilities with other modes. There are multiple factors that contribute to the pedestrian experience along a roadway. Some of these features are necessities for pedestrians to be protected and feel safe, others are conveniences that improve upon conditions and make a better pedestrian experience, encouraging more people to walk. Elements that were reviewed for each alternative impacting pedestrians include:

*Sidewalks*: Sidewalks that improve pedestrian conditions include adequate width to accommodate pedestrian volumes, ADA compliance, and the availability of snow storage. A snow storage/buffer space provides a place for snow in the winter so as not to obstruct walking space, and also increases pedestrian comfort and safety by expanding the distance between pedestrians and moving vehicles.

*Intersection crossings:* Foreseeably, the majority of pedestrian and vehicle collisions occur while a pedestrian is crossing the road. Factors impacting pedestrian crossings, their safety, and comfort include the length of crossing, curb ramp availability, crosswalk striping, and pedestrian signals equipped with APS push buttons and countdown timers.

*Amenities:* Providing a welcoming pedestrian environment is one that includes benches, landscaping, shade, trash receptacles, and lighting. While all of these may not be necessary for pedestrians, they encourage walking. Overhead cobra head lights illuminate the street primarily and not the sidewalk. Sidewalks and pedestrian paths absent of pedestrian lighting create dimness giving pedestrians a feeling of compromised safety. Room for providing lighting, landscaping, and other features plays an important role in promoting walkability.

*Transit:* In preliminary discussions with Niagara Frontier Transportation Authority (NFTA) relating to transit stops along the corridor, they mentioned NFTA has avoided using the Goodell Street corridor as it is not viewed as pedestrian friendly. NFTA continuously reviews their routes and may consider transit stops along the corridor in the future if pedestrian conditions were improved.

The environmental justice mapper provided by NYSDEC shows that neighborhoods adjacent to the study area have a high number of people who walk and bike to their employment based on 2016-2020 census data. Providing proper pedestrian accommodations along this corridor

**Table 9.1 - Pedestrian Accommodations for Each Alternative**

| | Alternative 1 | Alternative 2 | Alternative 3 | Alternative 4 |
|---|---|---|---|---|
| *Sidewalks* | • Sidewalks present on both sides of street North side 8'-9' South side 8.5'-11'<br>• No snow storage or buffer | • Additional 12' available to be shared for multi-modal accommodations<br>• A snow storage/buffer/ or furniture zone could be provided | • Additional 24' available to be shared for multi-modal accommodations<br>• A snow storage/buffer/ or furniture zone could be provided<br>• Additional sidewalk or greenspace could be provided | • Use present sidewalk widths<br>• A snow storage or green space could be added, but would reduce existing sidewalk width |
| *Intersection Crossings* | • Marked crosswalks<br>• Pedestrian signals<br>• Crossing 4 lanes of traffic on a westbound progression network | • Marked crosswalks<br>• Pedestrian signals<br>• Crossing 3 lanes of traffic on a westbound progression network | • Marked crosswalks<br>• Pedestrian signals<br>• Crossing 2 lanes of traffic on a westbound progression network | • Marked crosswalks<br>• Pedestrian signals<br>• Crossing 4 lanes of traffic on a westbound progression network |

**Table 9.1 Continued - Pedestrian Accommodations for Each Alternative**

| | Alternative 1 | Alternative 2 | Alternative 3 | Alternative 4 |
|---|---|---|---|---|
| *Amenities* | • None | • Additional space available for a furniture zone, and landscaping | • Additional space available for a furniture zone, and landscaping | • Could repurpose 3' to 6' of sidewalk to have some pedestrian amenities, and maintain a minimum width of 5' |
| *Transit* | • No transit stops, NFTA feels the current environment on Goodell Street is not conducive to a transit stop | • A reduction in lanes would create some traffic calming so transit stops may be considered | • A reduction in lanes would create some traffic calming so transit stops may be considered | • A reduction in lanes would create some traffic calming so transit stops may be considered<br>• No additional pavement space for a bus pull off |

## Bicyclist Accommodations

Bicyclists cover a wide range of abilities from those who are experienced and comfortable in the travel lane jockeying for space with vehicles, to those who are recreational or apprehensive riders who prefer a dedicated space.

*Dedicated bicycle space:* Providing dedicated bicycle space for those who rely on riding to destinations would increase their safety and comfort. This can be provided in different forms such as a striped bicycle lane, a shared use path, a cycle track, or a bicycle lane placed behind the curb in a different space from motor vehicles. Within the project study limits, there are several north-south bike routes but currently no east-west connections.

**Table 9.2 - Bicycle Accommodations for Each Alternative**

| | Alternative 1 | Alternative 2 | Alternative 3 | Alternative 4 |
|---|---|---|---|---|
| *Dedicated Bicycle Space* | • None, bicycles share travel lanes with vehicles | • Potential for 5' bicycle lane or<br>• West connection to other city bicycle networks | • Potential for two-way bicycle traffic with a cycle track or shared use path<br>• West connection to other city bicycle networks | • None, bicycles share travel lanes with vehicles |

## Vehicle Travel Time

Travel time is a performance measure for vehicle operations which takes into consideration the variability of streets with interrupted flow. Travel time can change based on congestion, the number of signalized intersections, traffic signal green time, and cycle lengths. Travel time is a measurable indication for motorists understanding the mobility of a street network, which may influence their decision on travel routes. The regional model was used to determine traffic volume changes within the study area based on anticipated travel times due to geometric modifications made within the study area. Geometric modifications include travel lane reductions, and the conversion from one-way to two-way operations. These modifications combined with the origin-destination of users, resulted in a volume change on each road segment in the study area. SimTraffic was used to determine anticipated travel times through the Goodell Street corridor from Michigan Avenue to Main Street taking into consideration traffic signal operations.

**Table 9.3 - Vehicle Travel Times for Each Alternative**

| | Alternative 1 | Alternative 2 | Alternative 3 | Alternative 4 |
|---|---|---|---|---|
| *AM* | 1 min 50 sec | 2 min 12 sec | 2 min 13 sec | 2 min 28 sec |
| *PM* | 2 min 4 sec | 2 min 6 sec | 2 min 8 sec | 2 min 0 sec |

## Safety

Safety can be an actual identified problem through a collision analysis, or it can be perceived by the user. Compromised safety can come in many forms such as aggressive driver behavior like speeding, or an auto centric mentality, collisions, absence of pedestrian signals at crossings, etc. Some of the items that improve safety will be listed in other categories, safety on this category will focus on if the alternatives are proposing elements to encourage improved driver behavior and traffic calming.

*Weaving:* Based on the collision analysis performed by NYSDOT, a predominant collision style through this corridor is sideswipes. Sideswipes are typically due to weaving and changing lanes. Given motorists origins and destinations within the study area, many drivers are forced to cross multiple lanes of traffic to reach their destination. While the study cannot change origins and destinations, we can look for ways to limit the amount of weaving through geometric change.

*Traffic Calming Measures:* There are many traffic calming measures that can be applied to a street, however not all of these would be appropriate for the road function of the Goodell Street Corridor, or they could easily be applied to any of the alternatives. Applications that would be applicable to this project including a road diet, two-way conversion, and adding vertical elements such as trees or landscaping.

**Table 9.4 - Safety**

| | Alternative 1 | Alternative 2 | Alternative 3 | Alternative 4 |
|---|---|---|---|---|
| *Weaving* | • Does not improve weaving | • Improves the potential for weaving conflicts by reducing a westbound travel lane | • Improves the potential for weaving by reducing two westbound travel lanes | • Reduces weaving with only two westbound travel lanes<br>• Creates additional conflict points with oncoming traffic and left turns at intersections |
| *Traffic Calming* | • No traffic calming | • Reducing a westbound lane creates some traffic calming<br>• Some space is available for adding vertical elements such as landscaping/street trees | • Reducing two westbound lanes creates some traffic calming<br>• Space is available for adding vertical elements such as landscaping/street trees | • Two-way traffic creates a traffic calming affect encouraging motorists to be more cautious |

## Environmental Considerations

There are many categories that could be examined under an environmental evaluation. This covers pollutants, stormwater, socioeconomic issues/equity, sustainability, and more. Since the project is already in a built environment, and not adjacent to natural resources such as wetlands, forests, preservation areas, etc, there was no analysis on impacts to habitat or endangered species. The alternatives being reviewed are all within the existing footprint of the built environment, so no screening was done for SHPO/Cultural Resources. Consideration was also not given to possible contamination or pollutants that may be present when reconstruction begins. An environmental screening will be completed as a part of the final report, and it would apply to all project alternatives since they are all working within the built environment and have similar project limits. For the purpose of further evaluating alternatives for environmental impacts, the following were considered:

*Stormwater Management:* An effective method of stormwater management is reducing the amount of runoff from impervious surfaces. Stormwater management not only includes reducing impervious area, but landscaping, improving water quality and reducing quantity through green infrastructure techniques, and using low impact development.

*Environmental Justice:* The EPA has developed an environmental justice screening and mapping tool that covers a wide range of environmental justice indexes, including pollution and sources such as air toxic cancer risk, traffic proximity, wastewater discharge, and hazardous waste proximity. It also includes socioeconomic indicators, health disparities, and climate change vulnerability. Through this mapper, we are able to get census data on environmental justice indexes related to this project. This includes proximity to traffic, socioeconomic indicators, health disparities, and demographics for walking, bicycling, or driving to employment.

*Sustainability:* A sustainable transportation network is one which has low emissions, is energy efficient, and has affordable modes of transportation.

*Equity - Transportation Disadvantaged Community:* The USDOT is implementing a Justice 40 initiative for disadvantaged communities. As a part of identifying these communities, USDOT has created a mapping tool with designations for Justice 40 areas, making them eligible for specific grant programs. The mapping program was used to determine if there are any transportation disadvantaged communities within or adjacent to the Goodell Street Corridor. Multiple communities adjacent to the corridor were identified as historically disadvantaged communities, and have four or more indicators with transportation disadvantages. The map for this is available in Attachment A.

**Table 9.5 - Environmental Considerations for Each Alternative**

| | Alternative 1 | Alternative 2 | Alternative 3 | Alternative 4 |
|---|---|---|---|---|
| *Stormwater Management* | • Does not reduce impervious surfaces<br>• Does not provide space for trees or landscaping | • This alternative may have 7' of snow storage/buffer space that could be converted to grass/landscaping, unless it is chosen to be hardscaped | • This alternative may open up to 12' of snow storage/buffer space that could be converted to grass/landscaping, unless it is chosen to be completely hardscaped | • Most likely does not reduce impervious surface, only if some of the existing sidewalk is converted to grass (such a small area may be difficult to maintain) |
| *Environmental Justice* | • Does not improve conditions for the nearby environmental justice area | • Improves conditions by providing multi-modal accommodations (more opportunity for active transportation), and reduced traffic volumes, | • Further improves conditions by providing more multi-modal accommodations, improved pedestrian experience, and reduced traffic volumes | • Does not improve conditions for the nearby environmental justice area |

**Table 9.5 Continued - Environmental Considerations for Each Alternative**

| | Alternative 1 | Alternative 2 | Alternative 3 | Alternative 4 |
|---|---|---|---|---|
| *Sustainability* | • Does not improve conditions for a sustainable transportation network | • Provides a potential for dedicated bicycle space<br>• Provides space for improved pedestrian conditions (buffer, reduced crossing, landscaping, amenities) | • Provides dedicated bicycle space<br>• Provides space for improved pedestrian conditions (buffer, reduced crossing, landscaping, amenities) | • Does not improve conditions for a sustainable transportation network |
| *Equity* | • Does not improve conditions for an equitable transportation network | • Provides a potential for dedicated bicycle space<br>• Provides space for improved pedestrian conditions (buffer, reduced crossing, landscaping, amenities)<br>• May provide improvements for transit stops | • Provides dedicated bicycle space<br>• Provides space for improved pedestrian conditions (buffer, reduced crossing, landscaping, amenities)<br>• May provide improvements for transit stops | • Does not improve conditions for an equitable transportation network |

## Public Outreach

An online survey was launched on November 30th in conjunction with the second public meeting for this project. The online survey polled participants on basic information such as their connection to the corridor, how often they travel along Goodell Street, and their primary mode of transportation. The survey went through each of the proposed alternatives, and questioned whether they thought the proposed alternative addressed improvements that were important to them, with the ability to respond with yes, somewhat, no, or other.

**Table 9.6 – Public Outreach Feedback for Each Alternative**

| | Alternative 1 | Alternative 2 | Alternative 3 | Alternative 4 |
|---|---|---|---|---|
| *Public Outreach Results* | • Majority designated this does not address desired improvements | • Majority designated this somewhat addresses desired improvements | • Majority designated this does address desired improvements | • Majority designated this does not address desired improvements |

## Alternative Evaluation Matrix

Based on all of the criteria outlined in the previous section, each alternative was ranked 1 through 4, a 4 being the alternative that best meets the evaluation criteria, a 1 being the alternative that does not meet/least meets the evaluation criteria. The alternative which has the highest total best meets project objectives.

**Table 9.7 – Public Outreach Feedback for Each Alternative**

| Criteria | Pedestrians | Bicyclists | Vehicle Travel Time | Safety | Environmental | Public Outreach | Total |
|---|---|---|---|---|---|---|---|
| Alternative 1 | 1 | 1 | 4 | 1 | 1 | 1 | 9 |
| Alternative 2 | 3 | 3 | 3 | 3 | 3 | 3 | 18 |
| Alternative 3 | 4 | 4 | 2 | 4 | 4 | 4 | 22 |
| Alternative 4 | 2 | 2 | 1 | 2 | 2 | 2 | 11 |

# 10.0 Preferred Alternatives

This section includes a summary of preferred options throughout the corridor. It should be noted that circumstances such as available funding, new development, or other infrastructure projects may impact corridor improvements considered and implemented. A description of preferred alternatives and cost estimates for each is included at the end with the sections and drawings that graphically depict recommendations.

Costs for improvements along the corridor are based on 2023 dollars and include assumptions regarding specifics such as pavement section, necessary drainage work, sidewalk/snow storage area improvements, signal work, striping/signage, etc. Estimates include assumptions for work zone traffic control, survey, and mobilization. A 30% contingency was added to each estimate to account for this being planning level. Detailed cost estimates are provided in Appendix F.

## Primary Alternative

### Description

The preferred primary alternative was chosen based on the capacity analyses, NYSDOT's corridor safety evaluation, and the alternative evaluation criteria, which takes into consideration multiple modes, public feedback, and environmental considerations. The preferred alternative is Alternative 3 – a road diet from four lanes to two lanes on part of or all of the Goodell Street corridor. More specifically, Alternative 3 as the preferred alternative is recommended to maintain three westbound lanes on Goodell Street from NYS Route 33 until Oak Street. From Oak Street to Main Street, Goodell Street is recommended to reduce from three westbound travel lanes to two. Other recommendations with this alternative include:

- Improve the sidewalk/pedestrian realm along the corridor with space for landscaping, lighting, and other pedestrian amenities.
- Install bicycle accommodations in the form of a bicycle lane/cycle track/shared use path.
- Install a traffic signal at the Elm Street intersection.
- Install pedestrian signals, ADA compliant curb ramps, and crosswalks at each signalized intersection along Goodell Street.
- Install interconnected traffic signal network with video detection along Goodell Street.

### Costs

The overall cost of improvements along Goodell Street are estimated at approximately $3.1 million. Table 10.1 provides estimated costs for the major items associated with Alternative 3.

**Table 10.1 – Estimated Construction Cost of Preferred Goodell Street Improvements**

| Description | Total Cost |
|---|---|
| Rehabilitated Roadway Pavement | $852,000 |
| Reconstructed Roadway Drainage | $197,000 |
| New/Reconstructed Sidewalk and Snow Storage | $567,000 |
| Pedestrian Crossings | $47,000 |
| Traffic Signal Detection/Modify Signal Heads | $140,000.00 |
| New Traffic Signal at Elm Street | $132,000 |
| Pavement Markings | $64,000 |
| Planting Strips and Trees | $37,000 |
| Work Zone Traffic Control (8%) | $163,000 |
| Survey Operations (3%) | $66,000 |
| Mobilization (4%) | $91,000 |
| Subtotal | $2,356,000 |
| Contingency (30%) | $707,000 |
| Total Construction Cost (2023) | $3,063,000 |

# Secondary Alternatives

## Description

Additional geometric changes were reviewed in Section 5 to improve safety and mobility in the study area. These recommendations were a result of public outreach, the CBD North Study, and the NYSDOT safety analysis. The secondary alternatives support the primary recommended alternative by providing improved circulation and distribution of traffic volumes. The secondary alternatives are recommended in combination with Alternative 3, with a modification to the Pearl Street Two-Way Conversion alternative.

The change for the Pearl Street Two-Way Conversion is to maintain Edward Street as one-way westbound. After further evaluation, it is recommended that Edward Street remain one-way westbound in support of Alternative 3 based on the following:

- It provides driver consistency to maintain one-way operations.
- There are less signal phases and better operations at the Main Street/Pearl Street/Goodell Street intersection if Edward Street remains one-way.
- It is preferred by the City of Buffalo and NYSDOT to remain one-way if the preferred alternative for Goodell Street is to remain one-way.

### BFNC Drive Access

Remove access to off-ramp for BFNC Drive from NYS Route 33. Traffic travelling westbound on NYS Route 33 will only be able to access Goodell Street from NYS Route 33, removing the merge point between BFNC

Drive and Goodell Street just east of the Michigan Avenue intersection. BFNC would then be converted to two-way traffic from Mulberry Street to Jefferson Avenue.

### Pearl Street and Edward Street/Main Street/Goodell Street Intersection Realignment

Reconfigure Pearl Street to better align with Edward Street, forcing traffic from Goodell Street to enter Pearl Street through a left turn movement.

### Pearl Street Two-Way Conversion

Convert Pearl Street to two-way, and maintain one-way operations on Edward Street from Pearl Street to Main Street.

### Tupper Street Two-Way Extension

Convert Tupper Street to a two-way street from Ellicott Street to Oak Street, which currently operates as one-way eastbound.

### Ellicott Street Southbound Approach

Reconfigure lanes to an exclusive left turn lane, and a shared through/right turn lane.


**Figure 10.1 – Preferred Pearl Street Two-Way Conversion and Intersection Realignment**

## Costs

The overall cost of improvements along Goodell Street are estimated at approximately $1.8 million. Table 10.2 provides estimated costs for the major items associated with secondary alternatives for Alternative 3.

**Table 10.2 – Estimated Construction Cost for Secondary Alternative Improvements**

| Description | Total Cost |
|---|---|
| BFNC Drive Access | |
| Rehabilitated Roadway Pavement | $153,000 |
| Pavement Markings | $18,000 |
| Planting Strips and Trees | $8,000 |
| Work Zone Traffic Control (8%) | $15,000 |
| Survey Operations (3%) | $6,000 |
| Mobilization (4%) | $8,000 |
| Subtotal | $208,000 |
| Contingency (30%) | $62,000 |
| Total Construction Cost (2023) | $270,000 |
| Pearl Street and Edward Street/Main Street/Goodell Street Intersection Realignment | |
| Rehabilitated Roadway Pavement | $229,000 |
| Reconstructed Roadway Drainage | $173,000 |
| New/Reconstructed Sidewalk and Snow Storage | $187,000 |
| Pedestrian Crossing Items | $12,000 |
| Pearl Street and Edward Street/Main Street/Goodell Street Intersection Realignment | |
| New Signal Detection/Modify Signal Heads | $40,000 |
| Pavement Markings | $6,000 |
| Planting Strips and Trees | $16,000 |
| Work Zone Traffic Control (8%) | $53,000 |
| Survey Operations (3%) | $21,000 |
| Mobilization (4%) | $29,000 |
| Subtotal | $766,000 |
| Contingency (30%) | $230,000 |
| Total Construction Cost (2023) | $996,000 |
| Pearl Street Two-Way Conversion | |
| Rehabilitated Roadway Pavement | $83,000 |
| New/Reconstructed Sidewalk and Snow Storage | $115,000 |
| Pedestrian Crossing Items | $7,000 |
| Traffic Signal Installation/Modify Existing Signal | $180,000 |
| Pavement Markings | $7,000 |
| Planting Strips and Trees | $2,000 |

**Table 10.2 Continued – Estimated Construction Cost for Secondary Alternative Improvements**

| Description | Total Cost |
|---|---|
| Pearl Street Two-Way Conversion | |
| Work Zone Traffic Control ( 8%) | $19,000 |
| Survey Operations (3%) | $8,000 |
| Mobilization (4%) | $11,000 |
| Subtotal | $282,000 |
| Contingency (30%) | $84,000 |
| Total Construction Cost (2023) | $366,000 |
| Tupper Street Two-Way Extension | |
| Rehabilitated Roadway Pavement | $18,000 |
| Pedestrian Crossing Items | $15,000 |
| New Signal Detection/Modify Signal Heads | $28,000 |
| Pavement Markings | $3,000 |
| Work Zone Traffic Control (8%) | $5,000 |
| Survey Operations (3%) | $2,000 |
| Mobilization (4%) | $3,000 |
| Subtotal | $74,000 |
| Contingency (30%) | $22,000 |
| Total Construction Cost (2023) | $96,000 |
| Ellicott Street Southbound Approach | |
| Rehabilitated Roadway Pavement | $13,000 |
| Pedestrian Crossing Items | $15,000 |
| New Signal Detection/Modify Signal Heads | $28,000 |
| Pavement Markings | $4,000 |
| Work Zone Traffic Control (8%) | $5,000 |
| Survey Operations (3%) | $2,000 |
| Mobilization (4%) | $3,000 |
| Subtotal | $70,000 |
| Contingency (30%) | $21,000 |
| Total Construction Cost (2023) | $91,000 |

# 11.0 Action Items

## NYS Route 33

### Description

Included in this study was to examine NYS Route 33 from Jefferson Avenue to its connection with Goodell Street. Upstream from Jefferson Avenue, NYS Route 33 from Sidney Street to Best Street, is in preparations of an Environmental Document to improve connectivity to neighboring communities that the corridor severed when it was constructed. This ongoing study for NYS Route 33 upstream of this project was taken into consideration when proposing any improvements, action items, or recommendations for this segment within the study area.

Based on public outreach, feedback from stakeholders, the CBD North Study, and the objectives of this project, there are multiple objectives to support the Goodell Street alternatives and improve safety from Jefferson Street to Michigan Avenue. These include:

- Reduce the amount of traffic using Goodell Street to access BNMC. While vehicles use this route to go to the medical campus, they in turn use Tupper Street to leave and travel eastbound back to NYS Route 33.
- Reduce speeds and use traffic calming techniques for traffic entering Goodell Street prior to approaching the Michigan Avenue intersection.

To ensure consistency along NYS Route 33, and be in alignment with the results of the NYS Route 33, Kensington Expressway Project, the following are recommendations for improvements at NYS Route 33.

**BNMC Wayfinding Signage**

Best Street is an alternative connection from NYS Route 33 to BNMC. Wayfinding signage on NYS Route 33 instructing drivers to access BNMC from the Best Street exit could further reduce the amount of vehicles using the Goodell Street corridor. This recommendation came as a result of the CBD North Study. Best Street is currently operating with little delay, with all intersections, approaches, and movements having a level-of-service of C or better from Jefferson Avenue to Main Street. Therefore, there is additional capacity available on Best Street. The use of wayfinding signage to encourage traffic destined for the Buffalo Niagara Medical Campus to use Best Street cannot be modeled, however, based on the existing operations, it is assumed that an acceptable level-of-service can be maintained with an increase in vehicular traffic.

For Best Street to be a more desirable route to the BNMC, the CBD North Study made the following recommendations for improvements:

- Pavement reconstruction from Main Street to Jefferson Avenue
- Install street trees in various locations along the corridor

- Install wayfinding signage to/from Route 33 consistent with existing BNMC wayfinding signage

**Speed Reduction**

Just prior to the Goodell Street exit from NYS Route 33, there is a suggested exit speed of 30 MPH. There is advance warning signage of a reduced speed limit approximately 475 feet prior to the Michigan Avenue intersection. NYS Route 33 is classified as a principal arterial expressway, which ends at its terminus being the Oak Street flyover ramp, and Goodell Street exit. There is less than 500 feet for motorists to decrease speeds from 55 MPH to 30 MPH, which may seem abrupt for some drivers. The first posted speed limit sign of 30 MPH is located approximately 175 feet east of the Michigan Avenue intersection. Couple the abrupt speed limit change with an efficient signal system and a seen green light at Michigan Avenue, there may be little incentive for motorists to reduce speeds. Therefore, it is recommended to investigate the implementation of a phased speed reduction as motorists get closer to the Goodell Street exit. After the Jefferson Avenue exit, a speed limit change to 45 MPH would be prepare drivers for approaching city speed limits. It is known that speed limit changes along do not encourage drivers to slow down. Therefore, a speed reduction should be accompanied with other speed reduction measures such as striping reduced lane widths (from 12' to 11'), enforcement, speed radar signs, etc. Figure 11.1 on the next page shows an example of wayfinding and speed reduction signage.

Goodell Street currently has 12' lanes, and this study assumed alternatives would maintain 12' lanes. If reducing lane widths on NYS Route 33 prior to the Goodell Street exit is considered, this should be carried onto Goodell Street also for consistency.

**Figure 11.1 – Image of Wayfinding and Speed Reduction Signage on NYS Route 33**

### Gateway

Another effective treatment for encouraging lower speeds as motorists transition from high speed to low speed roadways is gateway treatments. The segment of transition at the Goodell Street exit has a wide open feel, with no vertical elements signaling drivers to slow speeds. This is a common issue in rural areas going from high speed country roads into hamlets and villages. A gateway treatment would signal drivers they are entering an urban area with low speeds. Vertical elements near the roadside have been shown to reduce vehicle speeds, making the area feel more enclosed. A sketch for a potential gateway treatment at the Goodell Street exit ramp is shown in Figure 10.2. The gateway treatment should take into consideration driver safety as a roadside obstacle. Things to take into consideration when implementing a gateway include:

- Try and keep vehicles in the roadway with proactive measures such as rumble strips and high friction surface treatments
- Maintain appropriate lateral offsets behind the curb.
- Objects should not obstruct the drivers' sight, intersection triangles should be maintained.
- Objects should not obstruct regulatory, warning, or advisory signage.

**Figure 11.2 – Image of Potential Gateway Treatment at Goodell Street Exit Ramp**

### Further Evaluations

NYS Route 33 is complex in its function with the surrounding streets. There are frontage roads in the study area, Cherry Street, and BNMC Drive, that run parallel to NYS Route 33 that serve the local streets and neighborhoods. There is also the current study of NYS Route 33 from Sidney Street to Best Street, stopping short of the study area for this project. Any further recommendations in this area should be in alignment with the NYS Route 33, Kensington Expressway Study, so as to create consistency with user expectations. It is recommended that once the study for NYS Route 33, Kensington Expressway is complete, this area be studied further for long-term improvements.