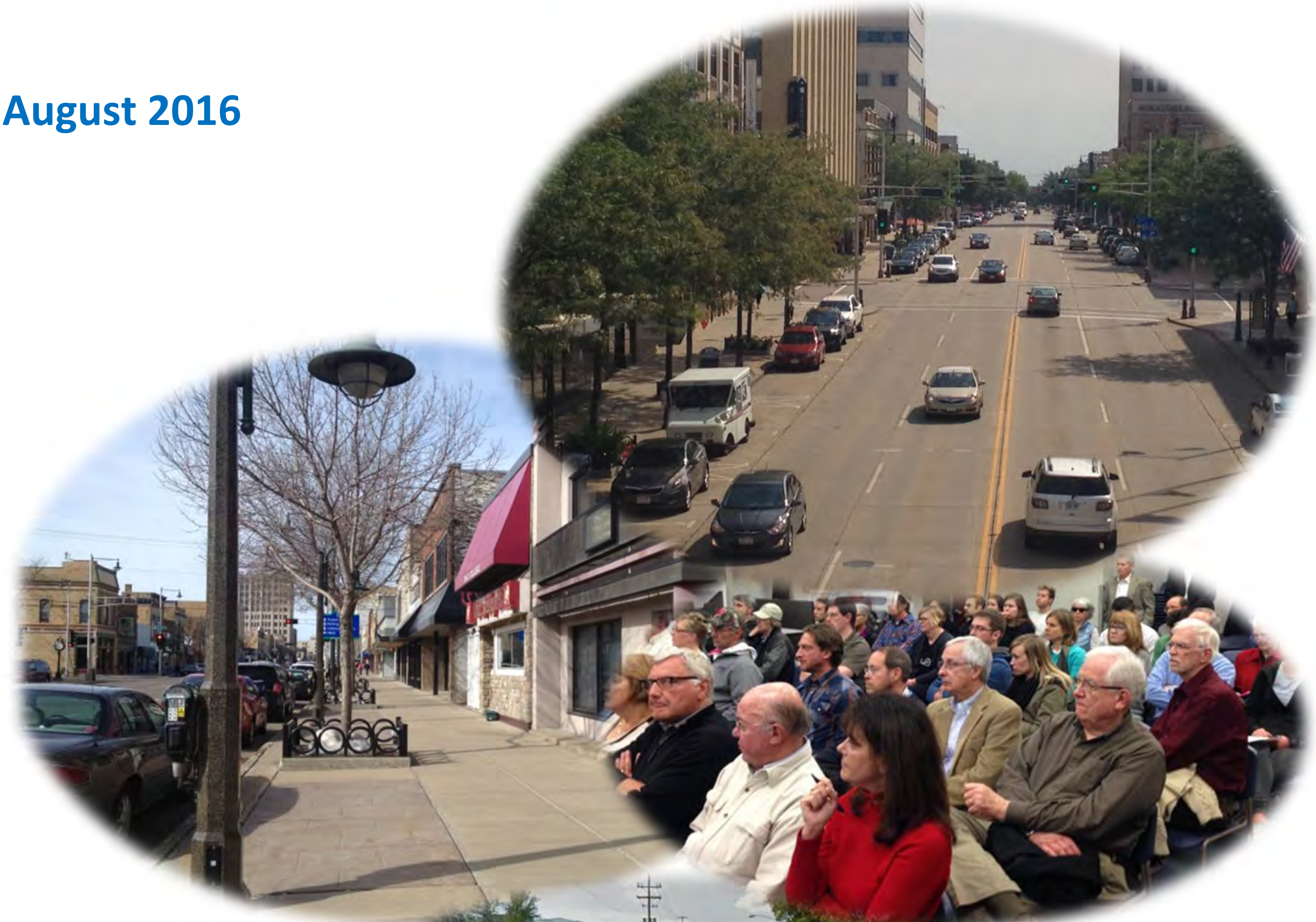
Downtown Appleton Mobility Plan

August 2016



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Contents

List of Tables

List of Figures

List of Exhibits

List of Appendices

Introduction

City centers across the nation are experiencing revival and renaissance. Demographic and market studies consistently show that in a 21st century economy, people want livable, walkable neighborhoods. A combination of transportation strategies is needed to accommodate these shifting attitudes.

Study Area

The study area is bound by the following streets:

- WIS 47 (Richmond Street / Memorial Drive) to the west
- Atlantic Street to the north
- Lawe Street to the east
- Fox River to the south

This area is approximately 0.92 miles wide and 0.7. miles high, resulting in an overall study area of approximately 0.64 square miles. For a larger map of the study area, see Exhibit 1.

Purpose of the Study

The purpose of the Downtown Appleton Mobility Study is to determine and evaluate strategies that would improve multi-modal mobility and traffic circulation in downtown Appleton. The study included an evaluation and analysis of existing and projected conditions, an evaluation of alternative transportation modes (bicycle, pedestrian) and recommendations for future projects.

The results of the study, documented in this Mobility Plan, are intended to set the stage for reconfiguring the transportation network in downtown Appleton. The proposed transportation network provides convenient access to valuable community resources such as employment centers, parks, the Fox River, cultural and entertainment attractions and civic uses. A well-designed multi-modal transportation network supports community health and well-being and promotes a strong economy.

Mobility is about more than just vehicular traffic. One-third of the population does not drive.

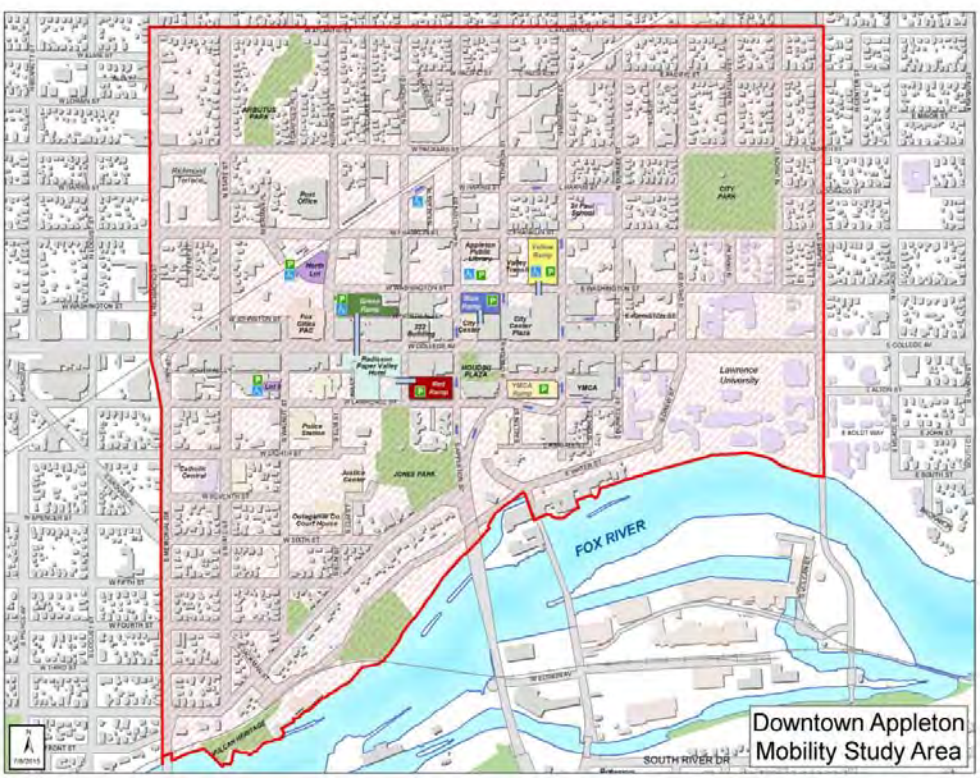


Figure 1: Study Area

Existing Conditions

Traffic flows well through downtown Appleton, even during peak hours. The study area is also already generally a pleasant place to bike and walk.

Vehicles

Traffic operations were analyzed for existing conditions (2015) and projected year 2036 no-build conditions. The 2036 no-build analysis looks at traffic operations in 2036 with no changes to the transportation system other than signal timing improvements.

Average Daily Traffic

Average Annual Daily Traffic (AADT) data was provided by the City of Appleton. The data included AADT counts from 2010 – 2015 along major routes within the study limits. Additional AADT data available from the Wisconsin Department of Transportation (WisDOT) for major routes (College Avenue, Richmond Street, etc.) in the study area was also referenced. See Exhibit 2 for a map of AADT in the study area.

Intersection Turning Movement Counts

The City of Appleton provided turning movement counts for six intersections in the study area. To supplement this data, turning movement traffic counts were conducted in November and December 2015. The counts were completed for the PM peak period from 3-6 PM. The PM peak hour was determined to be the controlling period for traffic operations by city staff. For a list of all intersections where traffic counts were conducted, see Appendix A.

Traffic Forecasting

The 2036 traffic forecasts were based on the AADT and intersection turning movement count data described previously. This information was provided to the East Central Wisconsin Regional Planning Commission (ECWRPC). ECWRPC used the regional travel demand model to predict future traffic growth. For additional information on the traffic forecasting process, see Appendix B.

Traffic Operations

Traffic operations for existing conditions and 2036 future conditions were analyzed using the Highway Capacity Manual (HCM) method in Synchro traffic modeling software for all stop-controlled intersections and Synchro methodology for all signalized intersections. The intersection Level of Service (LOS) of all analyzed intersections can be seen on Exhibit 3. If any specific movement at any of the intersections operates at LOS E or worse, it is noted on the exhibit. Traffic modeling results for the existing conditions analysis and 2036 no-build analysis can be found in Appendix C.

LOS is based on the average control delay per vehicle. Control delay is the increased time of travel for a vehicle approaching and passing through a controlled intersection, compared with a free-flow vehicle if it were not required to slow or stop at the intersection. This delay is made up of a number of factors that relate to control, geometrics, and traffic flow. LOS is an indicator of driver discomfort, frustration, fuel consumption, and increased travel time.

Traffic congestion is minimal in downtown Appleton. Vehicles typically experience less than 20 seconds of delay at the majority of intersections during the PM peak hour.

LOS is assigned a letter “grade” from A through F. LOS A indicates operations with very low control delay while LOS F describes operations with extremely high average control delay. The LOS criteria for stop controlled (unsignalized) intersections is shown in Table 1 and the LOS for signalized intersections is shown in Table 2.

Table 1: Unsignalized Intersection Level of Service Criteria

Level of Service	Average Control Delay (sec/veh)
A	0-10
B	> 10 - 15
C	> 15 - 25
D	> 25 - 35
E	> 35 - 50
F	> 50

Source: Highway Capacity Manual

Table 2: Signalized Intersection Level of Service Criteria

Level of Service	Average Control Delay (sec/veh)
A	0-10
B	> 10 - 20
C	> 20 - 35
D	> 35 - 55
E	> 55 - 80
F	> 80

Source: Highway Capacity Manual

Pedestrians

Every trip begins and ends with walking.

To reach your vehicle, bike, or transit stop, one must walk. Pedestrian comfort and safety is critical to achieving a balanced, multi-modal transportation system.

The majority of the streets within the study area include continuous sidewalks on both sides. See Exhibit 4 for a map showing gaps in the sidewalk system. Where sidewalks do exist, some are aging and are in need of maintenance and repair. For those in wheelchairs or pushing strollers, most intersections within the study area include curb ramps. However, many of the existing curb ramps do not meet the current requirements of the Americans with Disabilities Accessibility (ADA) Guidelines. For example, detectable warnings are not present at many intersections.

Portions of the study area have terraces between the sidewalk and the curb, often including mature street trees. These areas are the places where walking is the most pleasant. Pedestrians have physical separation from moving traffic and have the benefit of shade. In other parts of the study area, the sidewalk is immediately adjacent to the curb. This creates a less appealing walking environment, particularly on the streets with heavier traffic volumes, such as Richmond Street.

The most significant pedestrian safety problems are at intersections.

With a nearly continuous sidewalk network, Downtown Appleton's most significant pedestrian safety problems are at intersections. Pedestrian crossings are most difficult on busier streets such as Richmond Street, particularly in locations where there are no traffic signals. In locations with more than one lane in the same direction, such as the midblock crosswalk located on Appleton Street between Lawrence Street and College Avenue, pedestrians are exposed to the multiple-threat condition. This is when a car in one lane stops for a pedestrian, and the vehicle in the adjacent lane does not stop. This is a high-risk condition for pedestrians, particularly if vehicles stop close to the pedestrian, blocking the traffic in the adjacent lane from the pedestrian's view.

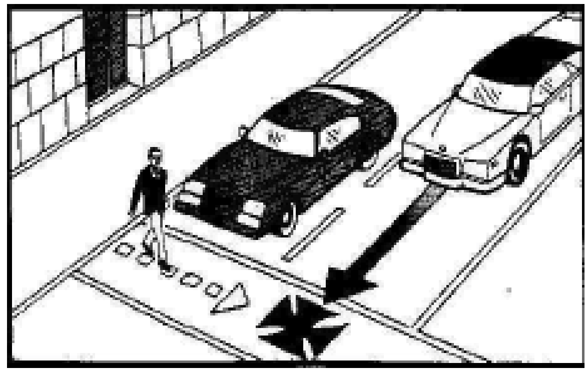


Figure 2: Multiple Threat Condition
A multiple-threat condition exists when a car in one lane stops for a pedestrian but a vehicle in the adjacent lane does not.

The study area has many unmarked crosswalks. Marked crosswalks are helpful in indicating preferred pedestrian crossing locations, to alert drivers to often-used pedestrian crossings, and to designate crosswalks on school walking routes. For the marked crosswalks that do exist, many are between six and ten feet in width. Wider crosswalks of ten to fifteen feet are more easily seen by drivers. Further, where marked crosswalks do exist, most consist of two parallel lines rather than high visibility crosswalks with transverse stripes, even in locations near schools where there is an increased need to draw driver's attention to the need to watch out for pedestrians.

The intersections of Lawrence and Morrison Streets and Lawrence and Oneida Streets have been observed to be problematic to pedestrians. Both are areas where there is high pedestrian demand and where the intersection geometry is complex.

There are also a number of existing plans and policies that address pedestrian and bicycle transportation in downtown Appleton. For a summary of these plans and their applicability to multi-modal mobility, see Appendix D.

Bicycles

Many streets in the study area are good for bicycling. However, they rarely have destinations people want to go to.

For the most part, downtown Appleton is a pleasant place to bike even though there are few designated bicycle facilities within the study area. See Exhibit 5 for a map of existing bicycle facilities in the study area. The street network is generally gridded, offering multiple route options. Major challenges in the study area include:

- College Avenue, where many destinations are located, is suitable only for enthused and confident bicyclists.

- Bicyclists are frequently observed riding on sidewalks in the study area, even when it is not allowed (College Avenue).
- Connections to the Fox River are lacking.
- There are few bicycle parking racks in the study area.

A Level of Traffic Stress analysis was performed to categorize study area streets based on how attractive they were to different categories of bicycle riders. A summary of this analysis can be found in Appendix E. The majority of the streets within the study area are comfortable for biking. While these streets do not contain many of the destinations people bike to, they do contain schools and homes. Efforts to make Appleton more bikeable will be made easier by the large number of streets already suited for most bicyclists.

Safety

Crash data for the five year period from 2010 through 2014 was reviewed to determine locations where vehicle, pedestrian or bicycle crashes occurred in downtown Appleton. Data was obtained from the Wisconsin Traffic Operations and Safety (TOPS) Laboratory.

Vehicles

Crash diagrams (see Appendix F) were prepared if an intersection had more than 20 crashes in the five year analysis period or if the intersection crash rate was greater than 1.0 crash per million entering vehicles. The following four intersections met these criteria:

- College Avenue and Appleton Street
- College Avenue and Drew Street
- Franklin Street and Superior Street
- Franklin Street and Morrison Street

Bicycles and Pedestrians

There were 70 pedestrian and bicycle crashes in downtown Appleton between 2010 and 2014. See Appendix F for more information. The following trends were noted:

- The intersection of College Avenue and Richmond Street has the highest number of crashes for both bicyclists and pedestrians.
- There were many pedestrian and bicycle crashes on College Avenue.
- Drew Street was the location of several bicycle and pedestrian crashes.
- The intersection of Richmond Street and Franklin Street was the location of several bicycle crashes.
- There was roughly the same number of bicycle and pedestrian crashes in the study area between 2010 and 2014.

Issues

The main issue in the study area is confusing northbound routing.

Identifying mobility issues in the study area was one of the first steps in the study. The issues identified and described below form the basis for the need for the study. The identification of issues was a joint effort between the study team, city staff, stakeholders and the public.

Northbound Routing

The existing northbound route through downtown Appleton requires misdirection for motorists and can be confusing. See Exhibit 6 for a map of the existing northbound route. In 1987, The City Center Plaza (originally the Avenue Mall) opened in downtown Appleton on the north side of College Avenue between Appleton Street and Morrison Street. Construction of the mall effectively severed a piece of the grid roadway network in downtown Appleton by removing a one-block portion of Oneida Street between College Avenue and Washington Street. Instead of a grid of two-way streets, northbound and southbound traffic through the middle of downtown Appleton was re-routed onto one-way streets.

Figure 3: Northbound Route
The route northbound traffic coming from the Oneida Street bridge takes to / through downtown Appleton is indirect and confusing.

Northbound traffic experienced the greatest traffic disruption. One of the main routes into downtown Appleton from the south is via the Oneida Skyline bridge over the Fox River. Currently, drivers proceed over the bridge and are then routed east along Lawrence Street before turning north along Morrison Street. North of College Avenue, the routing becomes more confusing. In the past, a splitter island at the Morrison Street and Harris Street intersection directed traffic west on Harris Street and then north on Oneida Street out of the downtown area. The splitter island was removed several years ago and traffic now follows whichever route it chooses, though Harris Street is still the marked route. This is confusing to drivers and leads traffic through residential neighborhoods north of downtown.

Southbound traffic follows Appleton Street through the downtown area. North of downtown, southbound traffic generally approaches from Oneida Street and is then redirected to Appleton Street just north of Pacific Street. Appleton Street transitions to a one-way street south of Washington Street.

Confusing Intersections

Several intersections in the downtown area were identified by city staff as confusing and/or unconventional.

Six of the seven intersections identified as confusing intersections are located on the city's one-way northbound route.

Field reviews of each intersection were completed and vehicular, bicycle and pedestrian issues were noted. The unconventional intersections include:

1. Oneida Street and Lawrence Street
2. Morrison Street and Lawrence Street
3. Morrison Street and Harris Street
4. Oneida Street and Harris Street
5. Oneida Street and North Street
6. Oneida Street and Pacific Street
7. State Street and Jackman Street

Details on each intersection can be found in Appendix G.

Figure 4: Oneida Street and Lawrence Street Intersection
The Oneida Street and Lawrence Street intersection is one of the most confusing in downtown Appleton.

Railroad Crossings

As part of an agreement with Canadian National Railroad, the City must close one public at-grade railroad crossing somewhere within the city limits. Through a separate study, the City has identified two potential at-grade crossings located in the downtown study area which are being considered for closure. The crossing locations, which are described in more detail in Appendix H, are located at Oneida Street and Morrison Street.

Figure 5: Oneida Street Railroad Crossing

Figure 6: Morrison Street Railroad Crossing

Truck Routing

Existing truck routes through the downtown area are shown on Exhibit 7. Contrary to driver expectancy, the signed truck routes do not take drivers down College Avenue, instead redirecting eastbound/westbound traffic to Lawrence Street and Washington Street. Northbound and southbound routing is also confusing with truck routes that abruptly end and no truck route entering or exiting the downtown area to the north.

Loading Zones

The location and availability of loading zones is a very important issue to business owners in the downtown area. The marked loading zones noted on Exhibit 7 were noted during a December 2015 field review.

Abundance of On-street Parking

A Downtown Parking Study was completed by Walker Parking Consultants in February 2015. The plan analyzed existing parking conditions and proposed recommendations for changing parking facilities and policy in the future. The Blue Ramp (City Center ramp) will be removed from service within 5 years. The Soldier Square Ramp, operated by the YMCA and not city owned, is nearing the end of its useful life.

Current weekday peak parking conditions at 11 AM are 65% occupancy. Weekday evening parking conditions at 7 PM are 33% occupancy. On-street occupancy was measured at 42%. The study projects future parking supply given a variety of scenarios.

In each scenario, even with a new expo center, new library and other organic growth, an oversupply of parking is projected.

This oversupply also assumes closure of the Blue Ramp and the Soldier Square/YMCA ramp.

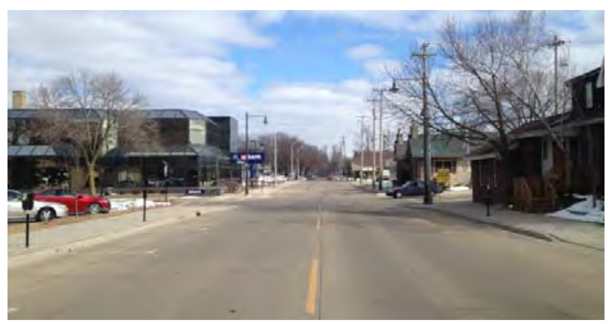


Figure 7: Washington Street Parking
Unoccupied on-street parking on Washington Street on a Saturday afternoon.

The parking oversupply is relevant to the mobility study for the following reasons:

- In order to provide bicycle facilities on some downtown streets, it may be necessary to reconfigure on-street parking in select locations. The oversupply of parking indicates that this is feasible from a parking utilization perspective.
- In order to encourage use of municipal and private parking ramps, it is necessary to have good pedestrian connections from those ramps to destinations throughout downtown. Parking in a ramp and walking a few blocks to a nearby destination should not be a significant inconvenience for users.

Unwarranted Traffic Signals

There are two traffic signals in the study area that do not meet traffic signal warrants.

There is not enough vehicular traffic or pedestrians passing through the intersection to justify the traffic signal from an engineering perspective.

The signals are located at the following intersections:

- Franklin Street and Superior Street
- Franklin Street and Oneida Street

See Appendix I for more information.

Figure 8: Franklin Street and Oneida Street Intersection
The existing traffic signal at the Franklin Street and Oneida Street intersection is not warranted.

Low Levels of Traffic Congestion

Most communities would consider low levels of traffic congestion to be a positive attribute. While this is true, very low levels of traffic congestion in a downtown area can also be an indicator of a lower level of economic activity. Existing traffic congestion in downtown Appleton, especially off College Avenue, is low and is predicted to remain that way through 2036 under the no-build scenario.

A well designed transportation system is needed to shape transportation demand and serve the economic future.

Access to the Fox River

One of the major challenges in downtown Appleton for vehicles, pedestrians and bicyclists is connecting to the Fox River. Close to the river, the streets stray from the grid pattern characteristic of most of the study area. In part due to topography challenges, relatively few streets connect to the river. Pedestrian desire lines have been trampled into the ground in some locations, indicating demand for more connections to the water. Vehicular access to the river is limited to Water Street which can only be accessed from two points in the downtown area – Drew Street and Jackman Street.

Figure 9: Pedestrian Trail to Water Street
A pedestrian trail trampled in the grass. The trail leads from the Water Street and Old Oneida Street intersection up the bluff.

Crosswalks

Downtown Appleton's most significant pedestrian safety problems are at intersections. The study area has many unmarked crosswalks. Marked crosswalks are helpful in indicating preferred pedestrian crossing locations, to alert drivers to often-used pedestrian crossings, and to designate crosswalks on school walking routes. Where marked crosswalks do exist, many are between six and ten feet in width; wider crosswalks of ten to fifteen feet are generally preferred as they are more easily seen by drivers. Further, where marked crosswalks do exist, most consist of two parallel lines rather than high visibility crosswalks with transverse stripes, even in locations near schools where there is an increased need to draw driver's attention to the need to watch out for pedestrians. While marked crosswalks are not necessary everywhere, crosswalk markings and the type of markings used should be carefully near schools, parks, and location where moderate numbers of pedestrians are expected.

Figure 10: Downtown Area Crosswalk
Crosswalks in the downtown area lack visibility.

Bicycle Access to Destinations

Although the majority of the streets in the study area are already comfortable for biking, there are rarely destinations on these streets that people want to get to. In the study area, a large majority of the destinations are on College Avenue. Biking is not allowed on College Avenue sidewalks. This fact, combined with the lack of designated bicycle facilities, amount of traffic on College Avenue, and frequent parking turnover make biking on this road undesirable for most cyclists.

Bicycle Parking

One of the most common obstacles for people using their bicycles is the lack of secure bicycle parking facilities when they arrive at their destination. Providing bicycle parking encourages people to use their bicycles and also benefits non-cyclists because bicycles are less likely to be locked to trees, benches, light posts and railings. This can cause damage to the street furniture and can result in bicycles blocking the sidewalk.

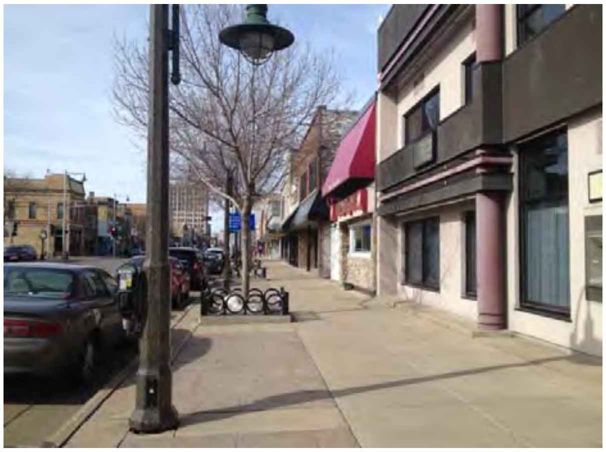


Figure 11: College Avenue Terrace
Bicycle parking is scarce in the study area, especially on College Avenue where there are many destinations.

Alternatives Considered

All alternatives seek to address the issues identified in the "Issues" section.

Traffic

Three alternatives were considered to improve traffic operations in downtown Appleton. These alternatives are described in more detail below. A fourth concept, which included a set of one-way pairs using Appleton Street and Oneida Street, was not studied because it necessitated removing a portion of the City Center Plaza and reconnecting Oneida Street. Studying the feasibility of this alternative from a structural standpoint was not supported by the Municipal Services Committee and therefore this concept was not studied.

Bicycle and pedestrian alternatives are described in detail following the description of traffic alternatives.

Alternative 1: Maintain Northbound Routing

Alternative 1 does not include any changes to northbound routing through downtown Appleton. Traffic entering the study area from the Oneida Street bridge would continue to follow one-way Lawrence Street to Morrison Street. There would be no major changes to the confusing intersections identified along the current northbound route.

This alternative would include the following changes:

- Removal of the traffic signals at the Franklin Street and Superior Street and Franklin Street and Oneida Street intersections. Both intersections would be replaced with two-way stop control on the Superior Street and Oneida Street.
- Updated signal timing at all intersections in the study area to reduce delay.
- Designating College Avenue as a truck route in the study area.

This alternative would provide minimal traffic benefits to downtown Appleton.

Alternative 2: Two-way Appleton Street

Alternative 2 would convert Appleton Street to two-way traffic throughout the study area and make it the main north/south route into and through downtown.

This alternative would include the following changes:

- Converting the following one-way streets to two-way traffic :
    - o Appleton Street between Prospect Avenue and Washington Street
    - o Lawrence Street between Appleton Street and Durkee Street

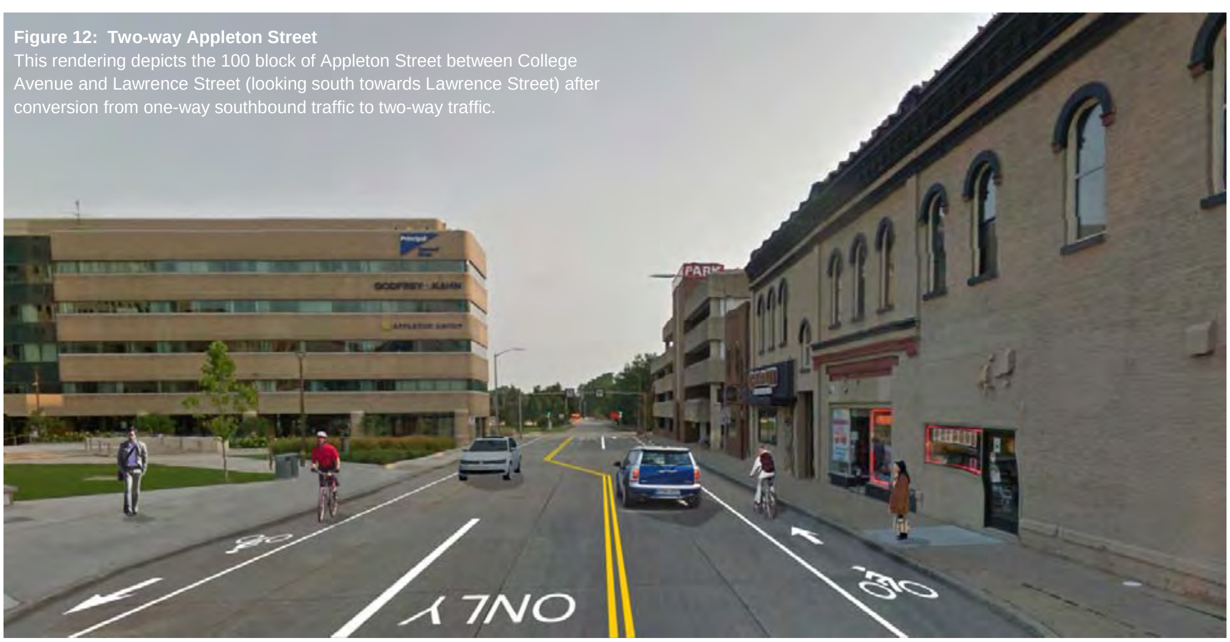


Figure 12: Two-way Appleton Street
This rendering depicts the 100 block of Appleton Street between College Avenue and Lawrence Street (looking south towards Lawrence Street) after conversion from one-way southbound traffic to two-way traffic.

  - Morrison Street between Lawrence Street and Harris Street
  - Harris Street between Oneida Street and Morrison Street
  - Durkee Street between Lawrence Street and College Avenue
- Reconstructing the northbound Oneida Street bridge over Jones Park to realign the roadway toward Appleton Street.
- Removing the curved portion of Oneida Street between Prospect Avenue Lawrence Street.
- Removing Allen Street and extending Oneida Street south of Lawrence Street. The land south of Lawrence Street in this area is referred to as the bluff site and has redevelopment potential.
- Designating Appleton Street as the main north/south route to/through downtown
- Removal of the traffic signals at the Franklin Street and Superior Street and Franklin Street and Oneida Street intersections. Both intersections would be replaced with two-way stop control on Superior Street and Oneida Street.
- Removal of the traffic signal at Lawrence Street and Oneida Street. The intersection would be converted to two-way stop control on Oneida Street.
- Removal of the traffic signal at Lawrence Street and Morrison Street. The intersection would be converted to four-way stop control. Four-way stop control is recommended to improve pedestrian safety as this intersection is adjacent to the YMCA.
- Updated signal timing at all intersections in the study area to reduce delay.
- Designating College Avenue as a truck route in the study area.
- Converting the Harris Street and Morrison Street intersection from four-way stop to two-way stop on Harris Street.
- Converting the Harris Street and Oneida Street intersection from three-way stop to two-way stop on Harris Street and reconstructing the southeast quadrant of the intersection to remove the diverter.

This alternative addresses confusing northbound routing and the intersections associated with it. However, it would also increase traffic congestion on Appleton Street and streets that intersect Appleton Street. On-street parking would also be removed on several streets to accommodate bicycle facilities. Consultant staff completed a PM peak hour traffic analysis and sensitivity analysis and City staff completed an AM peak hour traffic analysis and sensitivity analysis. For more details on the PM peak hour traffic analysis performed, see Appendix J.

Alternative 3: College Avenue Road Diet

A road diet typically involves converting an existing 4-lane, undivided roadway to a 3-lane segment consisting of two through lanes and a center, two-way left turn lane. This configuration, along with bicycle lanes and parking on both sides of the street, is proposed for Alternative 3. Road diets are known to reduce crashes (improve safety) and improve mobility and access for all road users. Road diets are also relatively low cost as they typically do not involve complete roadway reconstruction.

This alternative would not make any changes to northbound routing through downtown Appleton. Traffic entering the study area from the Oneida Street bridge would continue to follow one-way Lawrence Street to Morrison Street. There would be no major changes to the confusing intersections identified along the current northbound route.

The traffic analysis completed for the study showed that a road diet on College Avenue resulted in too much congestion on the roadway, even if Appleton Street was still one-way southbound. Significant queuing occurred at the signalized intersections along College Avenue resulting in very high LOS and near-gridlock conditions during the PM peak hour.

The College Avenue Road Diet alternative was dropped from further consideration due to unacceptable traffic operations on College Avenue.

See Appendix K for more information on the traffic analysis.

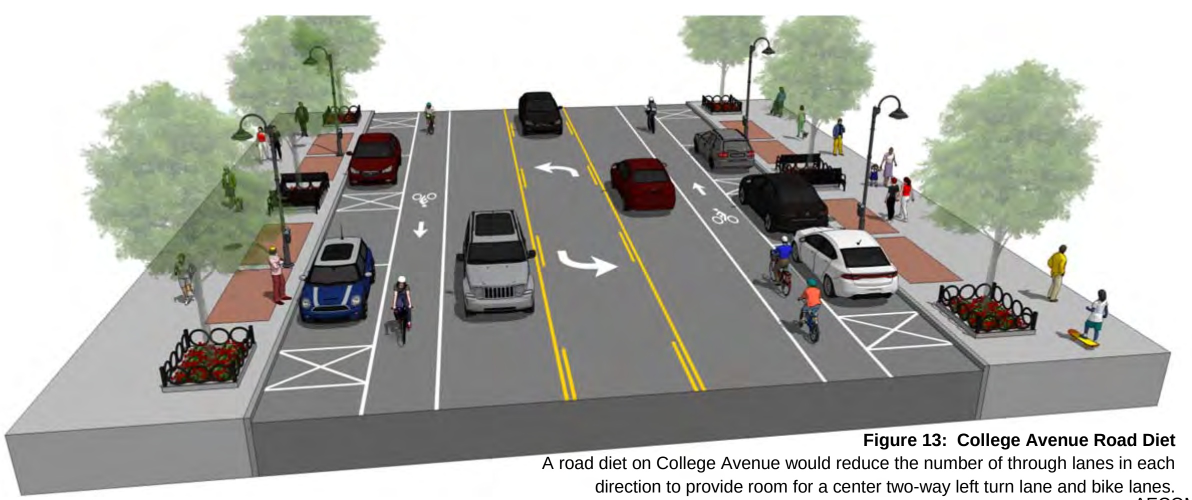


Figure 13: College Avenue Road Diet
A road diet on College Avenue would reduce the number of through lanes in each direction to provide room for a center two-way left turn lane and bike lanes.

Pedestrian Facilities

This section provides a brief overview of pedestrian facilities and treatments considered for downtown Appleton.

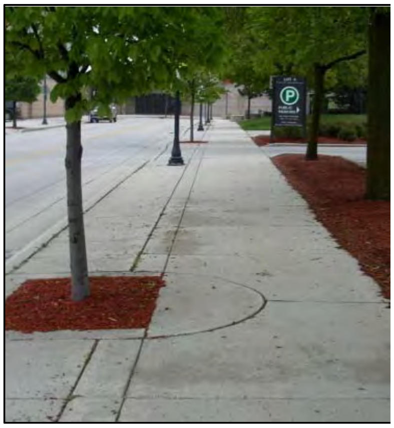


Figure 14: Sidewalk
A sidewalk is a dedicated space for pedestrians adjacent to a street. Most streets in Downtown Appleton have sidewalks. A 5-foot sidewalk is typical in residential neighborhoods; in commercial areas, sidewalks can be much wider than 5 feet to accommodate additional pedestrian traffic and street furniture.

Figure 15: Slow Street
Slow streets are designed for very low speed use by giving pedestrians and bicyclists priority while limiting motor vehicle speeds. Slow streets are known by a variety of names including play streets, low speed streets, and “woonerfs” after their Dutch name. The streets are generally at sidewalk level, without curbs. Motor vehicles are allowed to use the street to gain access to homes, businesses, or parking, but at very low speeds. Often the street is designed with chicanes or street furniture that forces vehicles to meander and move at a very slow pace. Many European countries have turned other lower volume residential streets into slower streets using a variety of treatments.

Figure 16: Raised Intersection
Raised intersections elevate an entire intersection to the level of the curb and sidewalk, essentially creating a large speed table. Like raised crosswalks, raised intersections crosswalks encourage motorists to yield to pedestrians because the raised intersection increases pedestrian visibility and forces motorists to slow down before going over the speed table. The crosswalks on each approach to a raised intersection are also elevated to enable pedestrians to cross the road at the same level as the sidewalk, eliminating the need for curb ramps. Raised intersections may use standard paving materials such as concrete or asphalt, or may use materials such as brick or other pavers to further differentiate the space.

Figure 17: Crosswalk: Marked
Marked crosswalks emphasize and designate the part of an intersection where drivers can expect pedestrians to cross. They also define the pedestrian crossing area where they otherwise would not exist such as a mid-block crossing. Motorists must always yield the right of way to pedestrians in any crosswalk except at a signalized intersection where pedestrians follow the appropriate signal. Crosswalks may be marked with two parallel lines (“standard”) or with wide bars that run in the direction of traffic (“continental,” shown here). Continental crosswalks are more visible to motorists than standard crosswalks.

Figure 18: Crosswalk: Unmarked
In Wisconsin, unmarked crosswalks are the continuation from a sidewalk on one side of the street to the other side of the street. Motorist must always yield the right of way to pedestrians in any unmarked or marked crosswalk except at a signalized intersection where pedestrians follow the appropriate signal.

Figure 19: Pedestrian Hybrid Beacon (“HAWK”)
A pedestrian hybrid beacon is an overhead warning device, used at locations that are unusually hazardous or where pedestrians or bicyclists should be expected to cross throughout the day or where pedestrian crossing activity would not be readily apparent. The beacon is dark until activated by a pedestrian or bicyclist. When activated, the beacon displays a yellow signal followed by a red signal to drivers and a “walk” signal to pedestrians. Criteria for installation are available in the MUTCD.

Figure 20: Rectangular Rapid Flashing Beacons (RRFBs)
Rectangular Rapid Flashing Beacons (RRFBs) are attached to pedestrian crossing warning signs (mounted street-side as shown), or are overhead, and are pedestrian activated or automated by sensors. The beacon remains dark until activated by a pedestrian; when activated, the beacon flashes yellow strobe lights to indicate to drivers that a pedestrian is present and they should yield to the pedestrian.

Figure 21: Median Refuge Island
A median refuge island is a protected area in the center of a street that allows pedestrians to cross one direction of traffic at a time. This makes finding gaps in traffic easier on busy two-way streets.

Figure 22: Pedestrian Bump-out / Curb Extension
Curb extensions reduce the effective street crossing distance for pedestrians by narrowing the streets. They also have a minor impact on reducing traffic speeds by narrowing the street. Curb extensions can also provide space for bicycle racks, benches, or other amenities.

Figure 23: Raised Crosswalk
Raised crosswalks are elevated from the street level, typically to the level of the curb and sidewalk. Raised crosswalks are essentially speed tables with a flat top that is wide enough for a crosswalk. Raised crosswalks encourage motorists to yield to pedestrians because the raised crosswalk increases pedestrian visibility and forces motorists to slow down before going over the speed table. Raised crosswalks may eliminate the need for pedestrian ramps at intersections. Street drainage must be carefully considered when retrofitting raised crosswalks.

Figure 24: Wayfinding Signs
Wayfinding signs and maps can help pedestrians navigate areas with lots of major activity centers. Wayfinding signs can be placed at key intersections and decision points.

Figure 25: Pedestrian Lighting
Standard street lights often do not provide adequate lighting of pedestrian areas including sidewalks. In areas with significant pedestrian use, anticipated pedestrian use, or concerns about safety, pedestrian-scale lighting should be installed. Pedestrian-scale lighting focuses light on pedestrian areas including sidewalks and shared use paths, often using light fixtures that are lower to the ground than traditional street lights. Pedestrian-scale lighting often uses decorative poles that can enhance the aesthetics of a street, or provide a historic appearance in historic areas.

Photo source: NACTO

Figure 26: Street Furniture and Amenities
Street furniture such as benches or other seating platforms should be considered in areas of high pedestrian activity, or where such activity is desirable. Providing spaces for pedestrians to gather and socialize can add significantly to the appeal and vitality of a streetscape. In addition to benches, items including water fountains, trash and recycling receptacles and public art should be considered.

The study area includes numerous land uses: residential streets, commercial and retail areas, and Lawrence University. Pedestrian access is critical in all of these areas to allow people access to businesses and homes, to transit, and to provide transportation and recreation options. In general, downtown Appleton has a complete pedestrian network. However, there are gaps in the pedestrian system, and areas in which pedestrian accommodations could be enhanced.

Bicycle Facilities

This section provides a brief overview of bicycle facilities and treatments considered for downtown Appleton.

Figure 27: Bike Lane – Standard
Standard bike lanes are signed and marked with pavement markings to designate space for bicyclists outside of the travel lanes to minimize conflicts on busier streets. Bike lanes typically operate in the same direction as motor vehicle traffic. Bike lanes are best suited for two-way arterial and collector streets where there is enough width to accommodate a bike lane in both directions. On one-way streets, they may be located on either the right or the left side of the roadway.
Preferred Width: 5 feet plus gutter pan; 6 feet with integral curb and gutter; 6+ feet next to parking
Minimum Width: 4 feet plus gutter pan; 5 feet with integral curb and gutter; 5+ feet next to parking

Figure 28: Bike Lane – Buffered
Buffered bike lanes are standard bike lanes that include a painted buffer on one or both sides of the bike lane. This buffer provides increased separation between a bike lane and a motor vehicle travel lane or a parking lane. A typical bike lane and buffer combination is a 5 foot bike lane and a 2-3 foot buffer. A buffer next to travel lane ensures that motorists give bicyclists the minimum 3-feet clearance when passing. A buffer next to parked cars helps to keep bicyclists from riding in an area where car doors may open into their paths.

Figure 29: Bike Lane – Separated
Separated bike lanes, sometimes called "cycle tracks" or "protected bike lanes," separate the bike lane from travel lanes with a vertical element such as curbs, bollards, pavement elevation, parked cars, or planters. While separated bike lanes increase bicyclists' sense of comfort, they still have conflict points at intersections and driveways, where turning traffic crosses them. Separated bike lanes may be placed at street level, sidewalk level, or an intermediate level, and may include vertical or rolled curbs.
Preferred Width: 6.5 feet plus gutter pan (one way); 10+ feet plus gutter pan (two-way)
Minimum Width: 5 feet plus gutter pan (one-way); 8 feet plus gutter pan (two-way)

Figure 30: Bike Lane – Climbing
A climbing lane provides a bicycle lane or buffered bicycle lane in the uphill direction on a hill, and shared lane markings in the downhill direction. This is often done where there is not room to fit a bicycle lane on each side of the street; providing a bicycle lane uphill allows slow moving bicyclists to move out of the travel lane. Bicyclists traveling downhill are often moving much closer to the speed of motor vehicles, and shared lane markings help position bicyclists in the most appropriate location to ride while also providing a visual cue to motorists that bicyclists have a right to use the street.

Figure 31: Bike Lane – Contraflow
Counter-flow bike lanes are signed and marked lanes that accommodate bicycle travel on one-way streets in the opposite direction of motor vehicle traffic. Counter-flow bike lanes may be conventional bike lanes, buffered bike lanes, or fully separated bike lanes.

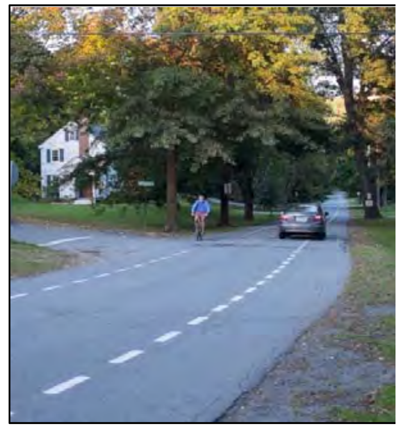


Figure 32: Bike Lane – Advisory
Many lower-traffic roads are too narrow to provide exclusive space for two standard-width bicycle lanes and two standard-width travel lanes. For lower volume, lower speed roads, advisory bike lanes (ABLs) have been developed as an alternative to a shared lane marking treatment to separate bicyclists from automobile traffic. These roads are marked to provide two separate standard width bicycle lanes on either side of a single shared (un-laned) motor vehicle travel space essentially creating a three-lane cross section. Roadway centerlines are not present. Parking lanes may be provided outside the advisory bike lanes.

Figure 33: Bicycle Boulevard (Neighborhood Greenway)
A bicycle boulevard is a street with low motorized traffic volumes and speeds designated to provide priority to bicyclists and neighborhood motor vehicle traffic. Bicycle boulevards may simply have signs and shared lane markings, or may include traffic calming elements including speed humps, traffic circles, chicanes, or traffic diverters. Bicycle boulevards benefit neighborhoods by reducing cut-through traffic and speeding without limiting access by residents. Recommendations for bicycle boulevards in this plan do not include guidance for specific treatments.

Figure 34: Shared Lane Marking (Sharrow)
Shared lane markings, sometimes called sharrows, are used on streets where bicyclists and motor vehicles share the same travel lane. The sharrow helps position bicyclists in the most appropriate location to ride. It also provides a visual cue to motorists that bicyclists have a right to use the street.

Shared lane markings are suitable for low-volume local and collector streets where there is insufficient right-of-way for bike lanes or where traffic volumes and speeds are low enough that a bike lane is not warranted. Shared lane markings should not be considered a replacement for bicycle lanes. The "Bicycles May Use Full Lane" sign (MUTCD R4-11) is commonly used in conjunction with shared lane markings and is recommended for the City of Appleton.

Figure 35: Shared-Use Path
A shared use path is an off-street bicycle and pedestrian facility that is physically separated from motor vehicle traffic. Typically shared use paths are located in an independent right-of-way such as in a park, stream valley greenway, along a utility corridor, or an abandoned railroad corridor. Shared-use paths are used by other non-motorized users including pedestrians, skaters, wheelchair users, joggers, and sometimes equestrians.

Consideration should be given to providing a smooth path surface for users. When concrete is used, joints should be saw cut. Asphalt is also an acceptable surface material.

Intersection Treatments and Bicycle Signage

Figure 36: Colored Pavement
Green colored pavement may be used to increase the visibility of bicycle facilities. Colored pavement may be used to highlight an entire bicycle corridor, but is most useful to highlight bicycle facilities in conflict areas – through intersections, across driveways, or crossing highway ramps.

Figure 37: Bike Box
A bike box is a designated area at the front of a traffic lane at a signalized intersection. Bike boxes provide bicyclists with a location to wait for a green signal that puts them in a location visible to motor vehicle traffic also stopped at the intersection. Bike boxes can facilitate left turns for bicyclists and can reduce the likelihood of "right-hook" crashes with turning vehicles. Bike boxes can also benefit pedestrians as they reduce vehicle encroachment in crosswalks. Installation of bike boxes also requires installation of "No Turn on Red" signs.

Figure 38: Bike Signal
Bicycle signals are traffic signals that govern bicycle movements at an intersection. Bicycle signals may be used when bicycles, pedestrians, and motor vehicles have different movement cycles.

Figure 39: Wayfinding Signs
Wayfinding signs indicate the direction and distance to specific destinations for bicyclists. Wayfinding signs can be used to enhance bicycle facilities including bike lanes, bike boulevards, and shared use paths. Signs can help bicyclists navigate the bicycle network and can be placed at key intersections to guide users to specific destinations. They can include the distance to those locations and approximate travel time as well.

For bicycle facility design guidance, refer to:

- AASHTO Guide for the Development of Bicycle Facilities, 4th Edition (https://bookstore.transportation.org/)
- Manual on Uniform Traffic Control Devices (http://mutcd.fhwa.dot.gov/)
- NACTO Urban Bikeway Design Guide (http://nacto.org/publication/urban-bikeway-design-guide/)
- Wisconsin Bicycle Facility Design Guide (http://wisconsindot.gov/Documents/projects/multimodal/bike/facility.pdf)

Stakeholder / Public Involvement

The study team sought input from the community through a stakeholders group, public meetings, social media and meetings with key stakeholders.

Throughout the planning process, community involvement played a critical role in shaping the overall project approach and vision of the Mobility Plan. Interested persons were provided the opportunity to participate in a variety of involvement activities including a stakeholders group, public meetings, reading and commenting on social media, and attending city government meetings. This section provides a summary of each activity.

Stakeholder Group

A stakeholders group, consisting of representatives from various organizations / entities in the study area, was formed in January 2016. This group met three times during the study to provide input and ideas to the study team. A list of groups / individuals who participated in the stakeholders meetings can be seen in Table 3.

A list of meeting dates and the purpose of each meeting is noted below. A copy of the minutes, which include the comments submitted by each stakeholder, can be found in Appendix L.

- **February 3, 2016 – Meeting 1**
    - The purpose of the meeting was to educate the stakeholders on the purpose and need for the study and the issues identified by the study team. Feedback was sought on existing mobility issues and ideas for improvements.
- **March 21, 2016 – Meeting 2**
    - The purpose of the meeting was to gather feedback on traffic, bicycle and pedestrian improvement ideas.
- **July 6, 2016 – Meeting 3**
    - The purpose of the meeting was to review the draft recommended improvements prior to the July 12, 2016 Municipal Services Committee meeting.

Table 3: Stakeholders Meeting Attendees

Organization	Representative
History Museum	Nicholas Hoffman
Valley Transit	Dan Sandmeier
Appleton Mayor's Office	Chad Doran
Lawrence University	Jake Woodford
YMCA	Danielle Englebert
Appleton Community and Economic Development	Monica Stage
Appleton Police Department	Todd Freeman, Larry Potter
Appleton Library	Colleen Rortvedt, Jessica Brittnacher
Appleton Downtown, Inc.	Jennifer Stephany, John Peterson
Appleton Mayor's Office	Tim Hanna
Appleton Area School District	Joe Sargent
Alderperson – District 4	Joe Martin
Alderperson – District 2	Vered Meltzer
Alderperson – District 11	Patti Coenen
Appleton Health Department	Kurt Eggebrecht
League of Women Voters	Jeanne Roberts, Penny Robinson
East Central Wisconsin Regional Planning Commission	Melissa Kraemer Badtke
Alderperson – District 1	William Siebers

All entities listed attended at least one meeting.

Public Involvement Meeting

A public involvement meeting was held on Thursday, April 7, 2016. The purpose of the meeting was to educate the public on the purpose of the study, the issues identified by the project team, and gather their thoughts on traffic, bicycle and pedestrian improvement alternative ideas. The meeting included a formal presentation, a question / answer session, and time for attendees to speak individually with members of the project team.

Sixty people in addition to the study team signed in at the public meeting.

Three news media outlets, FOX, CBS and ABC, featured stories about the public meeting and the study on their newscasts. For more information, see the meeting minutes in Appendix M.

Figure 40: April 7, 2016 Public Meeting

Twenty people submitted comment forms at the meeting. A few representative comments are shown below.

- ✓ Like the idea of 2-way Appleton Street, but concerned about loss of on-street parking.
- ✓ Too much emphasis on bicycle accommodations.
- ✓ Like staircase from bluff site to Water St.
- ✓ 2-way Appleton solves northbound routing problem.

Social Media

The public involvement meeting was advertised using social media via the Appleton City Hall Facebook page. Prior to the meeting, four separate posts about the study were posted to the page. Each post contained a link to an article about the study. For a copy of each article, see Appendix N.

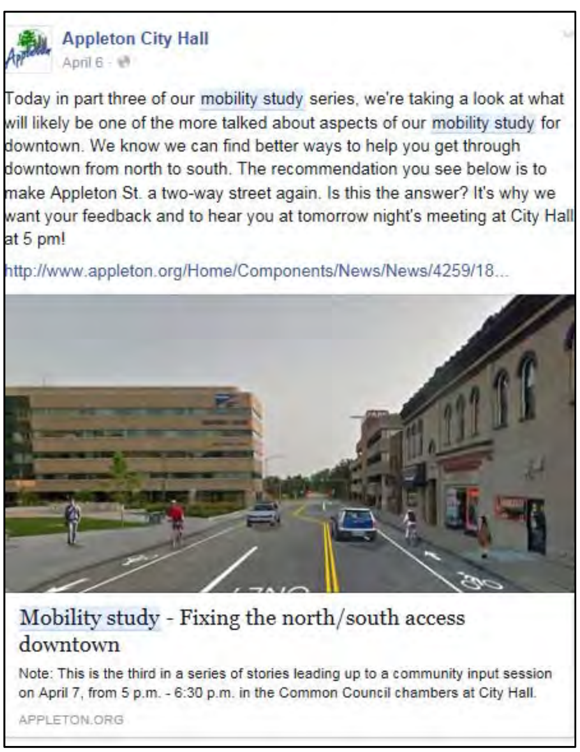


Figure 41: Facebook post discussing the study

The outreach via Facebook was very successful. Four days of posts reached approximately 20,400 people and resulted in 2, 246 clicks to the website stories from Facebook. The posts received 589 likes/shares.

In addition to Facebook, city staff live-tweeted updates from the public involvement meeting via Twitter.

Municipal Services Committee Meetings

The mobility study was discussed at the Municipal Services Committee meeting on July 12, 2016. The meeting included a lengthy presentation about the study and a map showing draft improvement recommendations in the core downtown area.

This meeting was open to the public. Approximately 25 people attended the meeting and 18 people provided verbal comments following the presentation.

Most attendees were supportive of the draft recommendations.

Key concerns included:

- Need for loading zone in the 100 block (near Houdini Plaza) of Appleton Street.
- Concern over the recommendation for bike lanes on Lawe Street and conflicts with vehicles and truck traffic.
- Need for education for bicyclists and drivers.

On August 9, 2016 the study team returned to meet with the Municipal Services Committee to address questions and comments from the July meeting. For more information on the Municipal Services Committee meetings, see the meeting minutes in Appendix O.

On August 17, 2016 the Common Council voted 15-0 to approve the Downtown Appleton Mobility Study recommendations.

Other Meetings

Members of the study team also held separate meetings with representatives from the following organizations:

- YMCA – Tuesday, June 28, 2016
- Appleton Downtown, Inc. – Tuesday, June 28, 2016

Recommended Improvements

The recommendations improve northbound routing by eliminating one-way streets in the downtown area. A significant number of bicycle and pedestrian improvements help to improve mobility for multiple transportation modes.

Recommended improvements in the core downtown area bound by Superior Street to the west, Washington Street to the north, Drew Street to the east and Water Street to the south are shown on the Recommended Improvements Map in Exhibit 8. The map should be printed full size (36" x 48") for maximum readability.

Traffic Recommendations

Alternative 2: Two-way Appleton Street is recommended.

This alternative is recommended because it:

- Creates a direct northbound route to/through downtown Appleton by converting Appleton Street from one-way to two-way traffic. Appleton Street is already two-way north of Washington Street.
- Improves several confusing intersections by eliminating one-way streets.
- Provides an opportunity for additional economic development on the bluff site by creating a larger redevelopment parcel west of Trinity Church through the removal of Oneida Street south of Lawrence Street.
- Removes unwarranted traffic signals on Franklin Street to reduce delay.
- Creates direct truck routes through the study area.
- Best utilizes the existing right of way to improve mobility for all modes of transportation by including numerous bicycle facilities.

The specific changes recommended as part of this alternative are described in detail on the next several pages.

Convert One-way Streets to Two-way Streets

The following streets are proposed to be converted from one-way streets to two-way streets:

- Appleton Street between Prospect Avenue and Washington Street
  - The typical section north of Lawrence Street should include one through lane in each direction, left turn lanes at intersections and bike lanes. Lane widths vary depending on the available right of way.
  - South of Lawrence Street, two through lanes approach the intersection from the Oneida Street bridge. One lane should be designated as a right turn only lane at Lawrence Street and the other as a through lane to Appleton Street.
  - Restrict left turns at the following locations to maintain traffic flow or improve safety:
    - Left turns out of the private parking ramp in the northeast quadrant of the Appleton Street and Lawrence Street intersection. This ramp currently only has access to southbound Appleton Street. This modification would switch access to northbound Appleton Street.
    - Northbound left turns into the Red Ramp from Appleton Street.
    - Northbound left turns into the alley north of College Avenue from Appleton Street.
    - Left turns from the City Center Alley.
    - Left turns from the alley north of College Avenue.
  - When the Blue Ramp is removed, remove access to Appleton Street at this location and create a loading/parking zone.
- Lawrence Street between Appleton Street and Durkee Street
  - This section of Lawrence Street would need to be reconstructed to achieve the desired configuration. Additional right of way is proposed to be acquired from the south side of the street to provide one through lane in each direction, bike lanes, parking and a median.

- Morrison Street between Lawrence Street and Harris Street
    - o The typical section should include one through lane in each direction, bike lanes and parking on one side of the street. A loading zone is provided near the YMCA.
- Harris Street between Oneida Street and Morrison Street
    - o The typical section should include one through lane in each direction and parking on one side of the street. See Exhibit 9 for more details.
- Durkee Street between Lawrence Street and College Avenue
    - o The typical section should include one through lane in each direction, bike lanes and parking on one side of the street. To achieve this configuration within the existing right of way, the existing terrace on the east side of the street would be removed.

See Exhibit 8 for a detailed map of improvements and the recommended typical section for each street. With regard to the prioritization of traffic improvements, reconstruction of the Oneida Street bridge and conversion of Appleton Street from one-way to two-way traffic south of Washington Street should be the first priority. This project is the impetus for the other one-way to two-way conversions and the entire downtown mobility plan.

Reconstruct the Oneida Street Bridge

The northbound Oneida Street bridge over Jones Park would need to be reconstructed and realigned to provide a direct connection to Appleton Street. The bridge was constructed in 1980 and rehabilitated in 2009. In 2014, the bridge had a sufficiency rating of 85.5, meaning it is still in good condition. It should be noted that construction of a new bridge would likely impact Jones Park, a Section 4(f) resource.

After the bridge is reconstructed, the portion of Oneida Street between Prospect Avenue and Lawrence Street should be removed. Removing this portion of Oneida Street creates a large parcel of land for potential future development.

Remove Traffic Signals

Four traffic signals would be removed to decrease delay and improve mobility.

Remove traffic signals at the following intersections:

- Franklin Street and Superior Street. Install two-way stop control on Superior Street. Consider pedestrian refuge islands on Franklin Street as described in Appendix P.
- Franklin Street and Oneida Street. Install two-way stop control on Oneida Street. Consider pedestrian refuge islands on Franklin Street as described in Appendix P.
- Lawrence Street and Oneida Street. Install two-way stop control on Oneida Street. If a south leg of Oneida Street is not constructed in conjunction with potential redevelopment on the bluff site, stop control would be one-way on Oneida Street.
- Lawrence Street and Morrison Street. Install four-way stop control and create a raised intersection. This configuration would promote a safe environment for pedestrians adjacent to the entrance to the YMCA.

Reconstruct Lawrence Street

As noted previously, Lawrence Street would be reconstructed to accommodate 2-way traffic. Lawrence Street should also be realigned between Oneida Street and Morrison Street to remove the existing curve. Any significant redevelopment of the bluff site should remove Allen Street and extend Oneida Street south of Lawrence Street.

Additional right of way is proposed to be acquired to provide one through lane in each direction, bike lanes, parking and a median. Raised intersections are

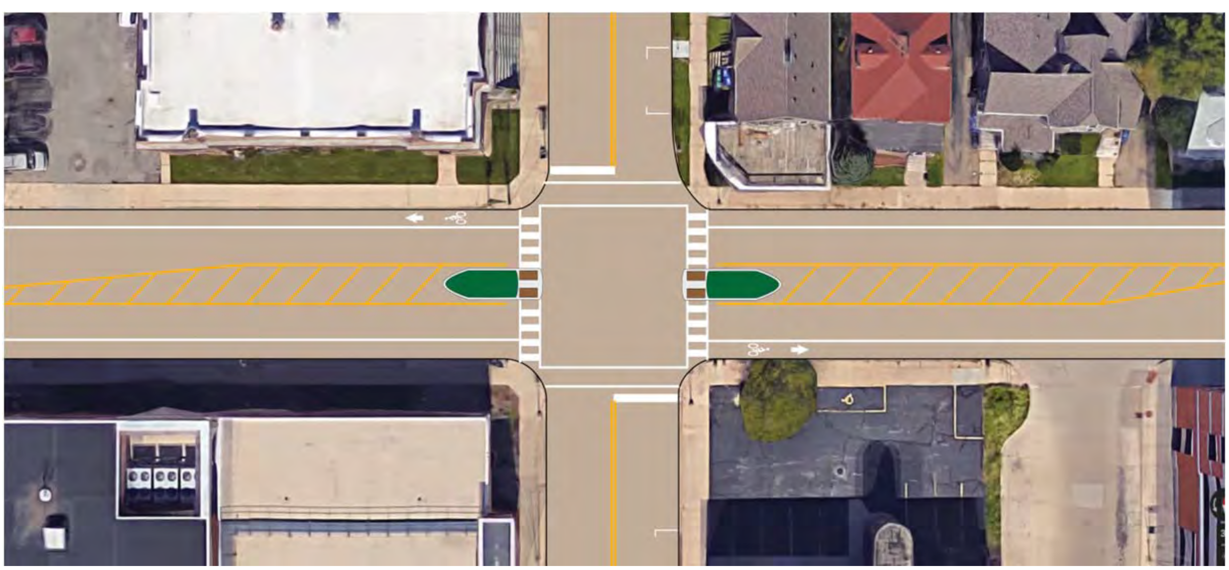


Figure 42: Franklin Street and Oneida Street Intersection
Conceptual image showing pedestrian refuge islands on Franklin Street.

recommended at the Morrison Street and Durkee Street intersections to promote pedestrian safety in the area surrounding the YMCA.

Modify Truck Routes

Truck routes through the downtown study area should be designated as follows:

- College Avenue between Richmond Street and Lawe Street
- Franklin Street between Richmond Street and Appleton Street
- Appleton Street between Lawrence Street and Franklin Street
- Oneida Street between the Fox River and Lawrence Street

Designate College Avenue a truck route.

This designation removes truck routes from the following locations:

- Lawrence Street between Memorial Drive and Morrison Street
- Morrison Street between Lawrence Street and Washington Street
- Washington Street between Division Street and Morrison Street.
- Division Street between Washington Street and Franklin Street

See Exhibit 7 for a map of existing truck routes and Exhibit 10 for a map of proposed truck routes. It should be noted that due to roadway right of way limitations, truck turns to/from College Avenue to Appleton Street would be very difficult and should only be attempted during off peak hours. Large vehicles would need the entire intersection area to complete turning movements.

Figure 43: Proposed Truck Routes
Proposed truck routes on College Avenue, Appleton Street and Franklin Street.

Maintain Oneida Street Railroad Crossing

The Oneida Street railroad crossing is important for mobility in the study area and should not be removed.

- Oneida Street provides access to a large senior/low income apartment building immediately north of the railroad tracks. A Salvation Army building is located south of the railroad tracks on North Street. If the railroad crossing was removed, it would require residents living in the apartment building who visit the Salvation Army to take a longer route, which may be difficult for seniors or those with limited mobility.
- Valley Transit uses Oneida Street for Route 5. This route includes a stop across the street from the senior/low income apartment building.
- The dead-end streets created by closing the railroad crossing would make access to the multiple commercial businesses in this area difficult.
- Oneida Street between Washington Avenue and Pacific Street is an alternate, parallel route to Appleton Street. Maintaining this link would improve mobility and reduce congestion on Appleton Street.

Reconstruct the Appleton Street / Oneida Street / Pacific Street Intersection

Designating Appleton Street as the main northbound route to/through downtown Appleton would increase traffic on Appleton Street. The existing intersection of Appleton Street / Oneida Street / Pacific Street was identified as a confusing intersection. Oneida Street access to Pacific Street is one way northbound and controlled with a yield sign, however vehicles typically do not yield as they should. An increase in traffic on Appleton Street would decrease the number of gaps for vehicles entering from Oneida Street which could become a safety issued. If a safety or operations issue develops, this intersection should be reconstructed to address this issue. City staff have created concept sketches for potential improvements to this intersection (see Exhibit 11).

Pedestrian Recommendations

Every street is intended to provide for comfortable and safe pedestrian travel. This section contains recommendations related to pedestrian facilities in downtown Appleton, although most of the policy-related recommendations are applicable citywide and not just in the study area.

Sidewalks

- Add sidewalks along any streets without sidewalks when they are next reconstructed; if reconstruction is more than ten years away, consider installing sidewalks as a standalone project. Dead-end streets may only require installation of a sidewalk on one side of the street, although sidewalks on both sides are recommended if buildings front on both sides of the street. Streets without sidewalks are displayed on Exhibit 4. The following streets should be a priority for sidewalk installation:
    - North Street between Oneida Street and Morrison Street
    - Fourth Street between State Street and Walnut Street
    - Prospect Avenue between State Street and Sixth Street

Lighting

- Ensure that adequate pedestrian lighting exists throughout the study area. Pedestrians do not feel comfortable walking in poorly lit areas, and often will choose to avoid these areas. Pedestrian lighting should be present in all commercial areas of the study area, and along other corridors where pedestrians are expected or desired.

- Pedestrian lighting improves the visibility of pedestrians walking along and across the street and enhances security. Pedestrian scaled street lighting is directed toward the sidewalk, positioned lower than roadway lighting (luminaires are mounted 12 to 14 feet above the sidewalk), and is more closely spaced than roadway lighting. Pedestrian lighting can be used alone or in combination with roadway-scale lighting in high activity areas to encourage nighttime use. Pedestrian lighting can be located on the same pole as roadway lighting to reduce the number of poles within the landscape/furniture zone.
- Pedestrian lighting should be prioritized in commercial areas, on transit routes, in areas of moderate pedestrian use, and in areas where personal security is an issue. Pedestrian ways not adjacent to streets may require lighting as determined by City staff.
- Intersection street lighting should be placed downstream of the curb ramps, perpendicular to the curb. Following FHWA guidance, luminaires should be located at least 10 feet from the crosswalk and positioned to light the side of the pedestrian facing the approaching vehicle. Where feasible, lighting should be placed on the approach side of a mid-block pedestrian crossing (near side) to enhance visibility of pedestrians.

Crosswalks and Curb Ramps

- Crosswalks should be wider and marked with higher visibility markings than has traditionally been used in the study area. The following guidance should be used:
    - Crosswalks in the study area should be a minimum of eight feet wide.
    - High visibility continental or ladder markings should be used at stop controlled or uncontrolled crossings of collector and arterial streets (such as Appleton Street and College Avenue). Continental or ladder markings should be used at all intersections near schools, the library, the transit center, the YMCA, Lawrence University, parking ramps and other areas with significant pedestrian volumes. The Federal Highway Administration document *Designing Sidewalks and Trails for Access* recommends continental markings for all crosswalks due to the increased visibility of the markings.
    - Where transverse lines are used to mark crosswalks, each line should be a minimum of 12 inches wide.

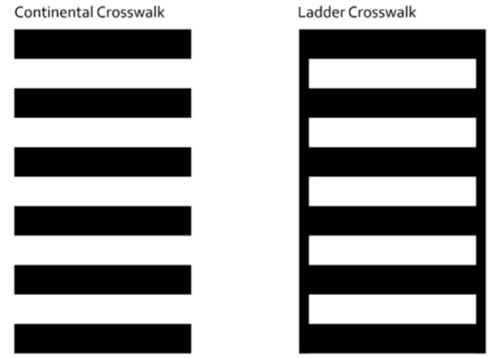


Figure 44: Typical Crosswalk Marking Styles

- Continue to ensure that ADA-compliant curb ramps are provided at all crosswalks (marked and unmarked). In general, this can be accomplished when the adjacent roadway is being resurfaced or reconstructed, although curb ramp retrofits may be warranted at select locations.

Pathways and Access to the River

- Provide a grand staircase or walkway from the corner of Olde Oneida Street and Water Street up the bluff to Kimball Street (currently the Fox Banquets property). Such a staircase could serve as a significant attraction downtown with lookouts or terraces cut into the hillside. This staircase should be integrated with any redevelopment of the Trinity Lutheran Church / Fox Banquets properties and should be clearly and easily accessible from Soldiers Square and College Avenue. The staircase should including a bike runnel—a small ramp at the edge of the stairway that allows bicyclists to wheel their bicycles up and down the stairs. The final design should meet Americans with Disabilities Act (ADA) requirements by including a path; the path location should be proximate to the staircase itself. It may be desirable from a grade perspective to provide the path from the west end of Kimball Street to Rocky Bleier Run; this path would provide an accessible route as well as bicycle access to the riverfront.

Figure 45: Existing Conditions – Location of Proposed Staircase

Figure 46: Conceptual Rendering of Staircase (Actual design to be determined – ADA accessibility should be considered)

- Provide a wide shared use path from Lawrence Street through Jones Park to Rocky Bleier Run. This path should be ADA compliant, and should integrate with any redevelopment of the park.
- Consider providing a ramp in the existing City easement/property from Prospect Avenue to Water Street approximately where Elm Street intersects with Prospect Avenue. The ramp should comply with ADA requirements and should include lighting and regular landings for resting points. It may be feasible for the ramp to bridge over Water Street to provide a direct connection to the park on the south side of the street.

Bicycle Recommendations

The City adopted the City of Appleton On-Street Bike Lane Plan in September 2010. This document presents many recommendations for the study area, as well as the rest of the city. This document builds upon those recommendations, but this document is not intended to fully supplant the 2010 Plan. The 2010 Plan should be consulted for connections outside of the study area, as well as specific bicycle parking recommendations. Also of note is that the recommendations contained in this plan are based on existing and projected conditions at the time this plan was prepared. Significant changes to traffic volumes or land use could impact the recommendations.

The proposed bicycle facilities create a comprehensive bicycle network for downtown Appleton. It is recognized that some projects may require years or even decades of planning, community discussion, and financial preparation before they can be realized. Many of these projects are also driven by opportunities; when a street is resurfaced or reconstructed, a much greater opportunity exists for incorporating a bikeway at a modest cost, but the bikeway improvement must be delayed for the roadway work. However, some projects represent very minor changes to existing infrastructure and can be implemented quickly and at little cost. It is also important to recognize that some network links are more critical than others. To this end, recommendations have been categorized into short, medium, and long term projects. See Appendix Q for a list of improvements included in each category and a map showing the location of each recommended improvement. An ultimate buildout map can also be seen in Exhibit 12.

- Short Term Improvements (0-3 years)
    - The timeframe for short term projects is roughly 0–3 years. These recommendations are typically expected to be less intrusive and less expensive such as adding shared lane markings to a street, or adding bicycle lanes with minimal impacts on parking. A few short term projects present some challenges and may be more expensive, but have been included because of the importance of the connection they create in the network.
- Medium Term Improvements (4-10 years)
    - The medium term includes projects that would be expected to be completed within 4–10 years. These projects tend to be more challenging than short term projects and likely require further study and more significant funding.
- Long Term Improvements (10+ years)
    - Projects in the long term category constitute useful connections in the bicycle network but are not likely candidates for implementation for ten years or more. The majority of these projects require significant reconstruction of a street or bridge in order to be achieved.

Figure 47: Bike Lanes

Regardless of the time horizon, these recommendations are meant to inform future decision making by the City. Any discussions of specific transportation investments ought to include consideration of cycling facilities, whether they appear as a recommendation in this plan or not. Such decisions should be informed by the contents of this plan but not restricted by it.

Table 4 displays the total centerline mileage of each type of recommended facility (i.e. bike lanes on both sides of a two-way street are only counted as one mile in Table 4). This table does not reflect facilities recommended in previous plans including the shared use paths near the riverfront.

Table 4: Centerline Miles of Recommended Bicycle Facilities by Facility Type

Facility Type	Miles
Bicycle Boulevard	1.42
Buffered Bike Lane	0.42
Bike Lane	5.26
Climbing Lane	0.32
Shared Lane Marking	2.20
Slow Street	0.07
Signed Route	0.43
Shared Use Path	0.62
Grand Total	**10.74**

Ultimate Buildout

The full bicycle facility recommendations are displayed on the Exhibit 11. This map reflects the ultimate buildout of facilities, and displays facilities that are recommended in previous plans. The facilities shown on this map should not be considered a limiting factor to adding bicycle facilities. Every time a street is resurfaced or reconstructed within the study area, the City should consider if it is appropriate and feasible to add a bicycle facility or treatment; this is particularly true further in the future as the conditions considered for this study change.

Figure 48: Packard Street – Existing Conditions

Figure 49: Packard Street – Proposed Buffered Bike Lane

Bicycle Detection at Traffic Signals

Some traffic signals in the study area are not capable of detecting bicycles. It is recommended that city staff continue to upgrade signal detection systems to include detection for bicyclists and look for opportunities to install push buttons if automated means are not feasible. For more information, refer to page 99 of the Second Edition of the National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide.

Minimum Width Facilities

Design guidance for streets and bicycle facilities generally includes minimum recommended widths for driving, bicycle, and parking lanes. While it is acceptable to use minimum width facilities, using a minimum width facility adjacent to another minimum width facility can be problematic. For example, a 10 foot wide driving lane may be desirable to provide space for other uses such as bicycling or parking, and to calm traffic speeds. However, providing a 10 foot travel lane adjacent to a minimum width bike lane (four feet, not including gutter pan), can result in very uncomfortable situations for bicyclists, particularly if on-street parking is also provided. Whenever possible, bicycle lanes wider than the minimum should be provided; in particular, the combined minimum width of a bicycle lane plus an on-street parking lane should be 14.5 feet. This helps prevent "dooring" crashes in which parked motorists open their car door into a bicyclist in a bike lane.

Bicycle Parking

One of the most common obstacles for people using their bicycles is the lack of secure bicycle parking facilities when they arrive at their destination. Providing bicycle parking encourages people to use their bicycles for transportation, but it also benefits non-cyclists:

- Bicycle parking is good for business. Economic development studies have found that people on bikes are more likely to make repeat trips to their local businesses, and to spend more money per month than those who drive.[1]

- Bicycle parking is much more space-efficient than automobile parking. Every customer arriving on a bike leaves a car parking space free for someone else.

- Providing bicycle parking gives a more orderly appearance to the streetscape. When bike racks are not present, people will lock their bikes to trees, benches, light posts, and railings. This causes damage to the street furniture and can result in bicycles blocking the sidewalk. Well-designed bicycle parking keeps bikes upright and out of the pedestrian right-of-way.

For additional bicycle parking recommendations, including information on acceptable bicycle racks for short and long term storage and policy recommendations, see Appendix R.

Figure 50: Saris brand Circle Dock Bike Rack

[1] Darren Flusche, "Bicycling Means Business: The Economic Benefits of Bicycle Infrastructure," (Advocacy Advance, 2012)

Other Considerations

Transit

Given the proposed changes to the transportation network in downtown Appleton, there would be impacts to existing Valley Transit routes. Many of the changes would be beneficial to transit riders as cities with grid systems and an abundance of 2-way streets offer the most options for routes and riders.

Figure 51: Valley Transit bus with bike racks

There are no transit stops shown on the proposed improvements map in Exhibit 8. This study did not include coordination with Valley Transit to determine where stops are needed and the type of accommodation desired. City staff should work with Valley Transit to determine the best way to incorporate transit routes and stops in to the proposed transportation network.

A method for improving transit operations is Transit Signal Priority (TSP). TSP works by allowing individual buses to communicate with the traffic signal controller at an intersection it's approaching. If intersection conditions allow, the traffic signal phasing can be altered to prioritize the bus movement by extending the bus phase or shortening conflicting phases to bring up the bus phase sooner.

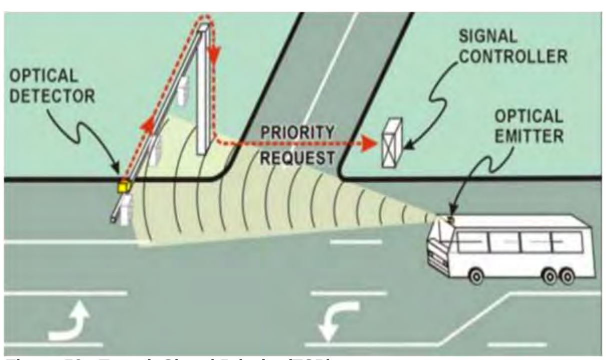


Figure 52: Transit Signal Priority (TSP)
Photo source: Streetsblog.org

The positive aspects of implementing TSP include reduction in bus travel times and improvement of on-time reliability. The negative aspect of TSP is the benefit is marginal for corridors with low traffic signal density and minimal recurring congestion. The College Avenue corridor has high signal density. While some recurring congestion is present, it's not to a degree where TSP would have a sizeable benefit. If the City wishes to pursue TSP, additional study to explore costs and benefits is recommended.

Loading Zones

The presence and availability of loading zones is very important to downtown business owners. Of particular concern during the study was the removal of parking and loading zones from the 100 (near Houdini Plaza) and 200 (near the Blue Ramp) blocks of Appleton Street. New loading zones are proposed on Oneida Street and in the 100 and 200 blocks of Appleton Street. Additional parking areas are proposed on Lawrence Street where none currently exist to help mitigate this concern. The Appleton Street loading zone in the 200 block (near existing Blue Ramp) and portions of the Oneida Street loading zone would not be available until after the Blue Ramp and YMCA ramp were removed. Following the July Municipal Services Committee meeting, a loading zone on the west edge of Houdini Plaza in the 100 block of Appleton Street was added to the proposed improvement plan. It should be noted that Houdini Plaza may be considered a Section 4(f) resource.

Development / Land Use Changes in the Study Area

Many portions of the study area are poised for redevelopment. Anticipated changes include a new expo center on Lawrence Street, a new library (location unknown), potential redevelopment of the bluff site and other organic growth. These changes were considered as part of the study and a traffic modeling sensitivity analysis was done to reflect potential build conditions with 20 percent more traffic. The proposed improvements, which create a 2-way grid system for the majority of the downtown area, would also help alleviate congestion due to the availability of alternate routes.

If significant redevelopment is proposed for a specific site downtown, a traffic impact analysis (TIA) should be completed once details about the development are known. Given the limited right of way available in the downtown area, it is likely any development would need to use the existing or planned roadway system.

Cost Estimates

These planning-level costs should only be used as very rough figures for long-range budgeting for projects – actual budgets should be developed based on specific project scopes, engineering plans, and competitive bids.

Roadway Cost Estimates

A planning level roadway cost estimate was developed for the reconstruction of Appleton Street between Prospect Avenue and Washington Street, including a new Appleton Street/Oneida Street bridge and removal of the existing northbound Oneida Street bridge. This area was selected because it is most likely the first major section to be constructed and the impetus for construction on surrounding streets.

The estimated cost for this improvement ranges from $4.0 - $4.3 million. For more details, see Appendix S.

Bicycle Facility Cost Estimates

Developing accurate cost estimates for bikeways included in a plan is challenging for a number of reasons. Estimating costs for any project is a challenge, until the actual project is scoped and designed. Estimating bikeway costs that are part of a roadway project is especially vexing since it often is impossible to estimate what portion of the total cost of a larger roadway project should be attributed to bicycling when the bikeway is incidental to the overall project. Often that requires comparing the cost of the same project without a bikeway with the additional cost to add the bikeway. In most cases, that marginal cost for the bikeway is small since the fixed costs are already associated with the larger project and adding more to a project takes advantage of the economies of scale of the larger roadway project.

This plan provides planning-level cost estimates as a range for the recommended bikeway types to provide an order of magnitude for the potential costs involved. These planning-level costs should only be used as very rough figures for long-range budgeting for projects – actual budgets should be developed based on specific project scopes, engineering plans, and competitive bids. The cost assumptions are based on regional and national-level data for bikeway construction projects. Table 5 provides a range of facility costs for the recommended bikeways for this plan while Table 6 provides the recommended system mileage and a computation of the costs based on the per mile costs and the mileage.

Table 5: Planning Level Cost Estimates for Bicycle Facilities (per mile)

Facility Type (Action)	Low Estimate per Mile	High Estimate per Mile
Signed Route (Add Signs)	$3,000	$5,000
Shared Lane Marking (Add Markings and Signs)	$10,000	$15,000
Bike Lane – Paint (Add Striping and Signs)	$10,000	$20,000
Bike Lane – Thermoplastic (Add Striping and Signs)	$20,000	$40,000
Bike Lane (Widen Road and Add Signs)	$200,000	$350,000
Climbing Lane – Paint (Add Striping and Signs)	$10,000	$20,000
Buffered Bike Lane	$30,000	$40,000
Bicycle Boulevard (Add traffic calming, Markings and Signs)	$5,000	$100,000
Shared Use Path (Construct New)	$300,000	$500,000

Table 6: Total Planning Level Estimated Costs by Facility Type

Facility Type	Miles	Low Estimate	High Estimate
Signed Route	0.43	$2,000	$3,000
Shared Lane Marking	2.20	$15,000	$22,000
Bike Lane	5.26	$43,000	$64,000
Climbing Lane	0.32	$4,000	$7,000
Buffered Bike Lane	0.42	$13,000	$17,000
Bicycle Boulevard	1.42	$8,000	$142,000
Slow Street*	0.07	$100,000	$200,000
Shared Use Path	0.62	$61,000	$101,000
Total	**10.74**	**$388,000**	**$791,000**

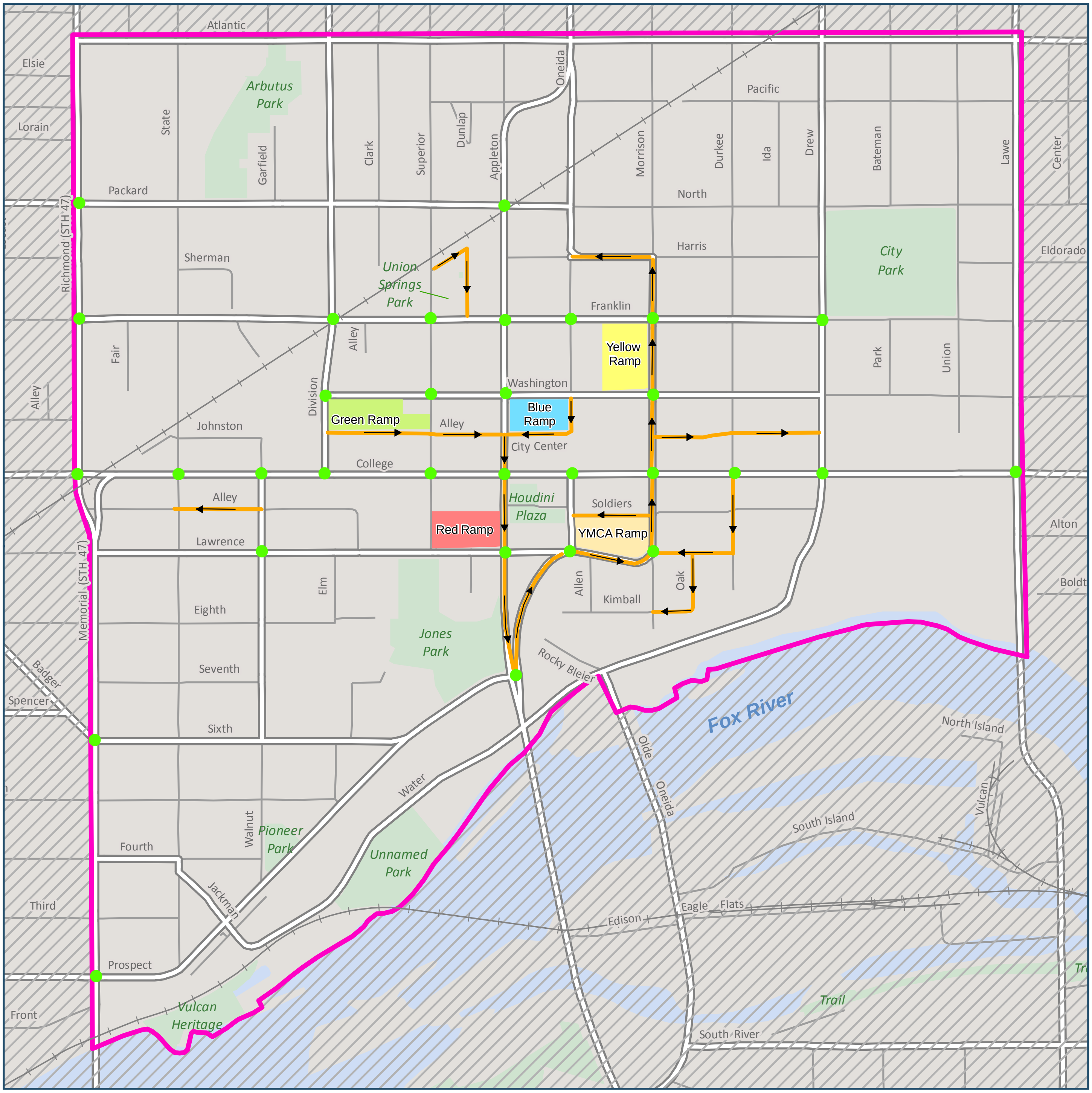
Notes: The cost for building a Slow Street is approximately the same as a standard street reconstruction. A single cost for providing bike lanes is provided regardless of if street widening would be required or not.

List of Exhibits

Exhibit 1

Study Area

Downtown Appleton Mobility Study



Study Area

March 2016

Legend

- Signalized Intersection
- One-way Street
- Study Limits

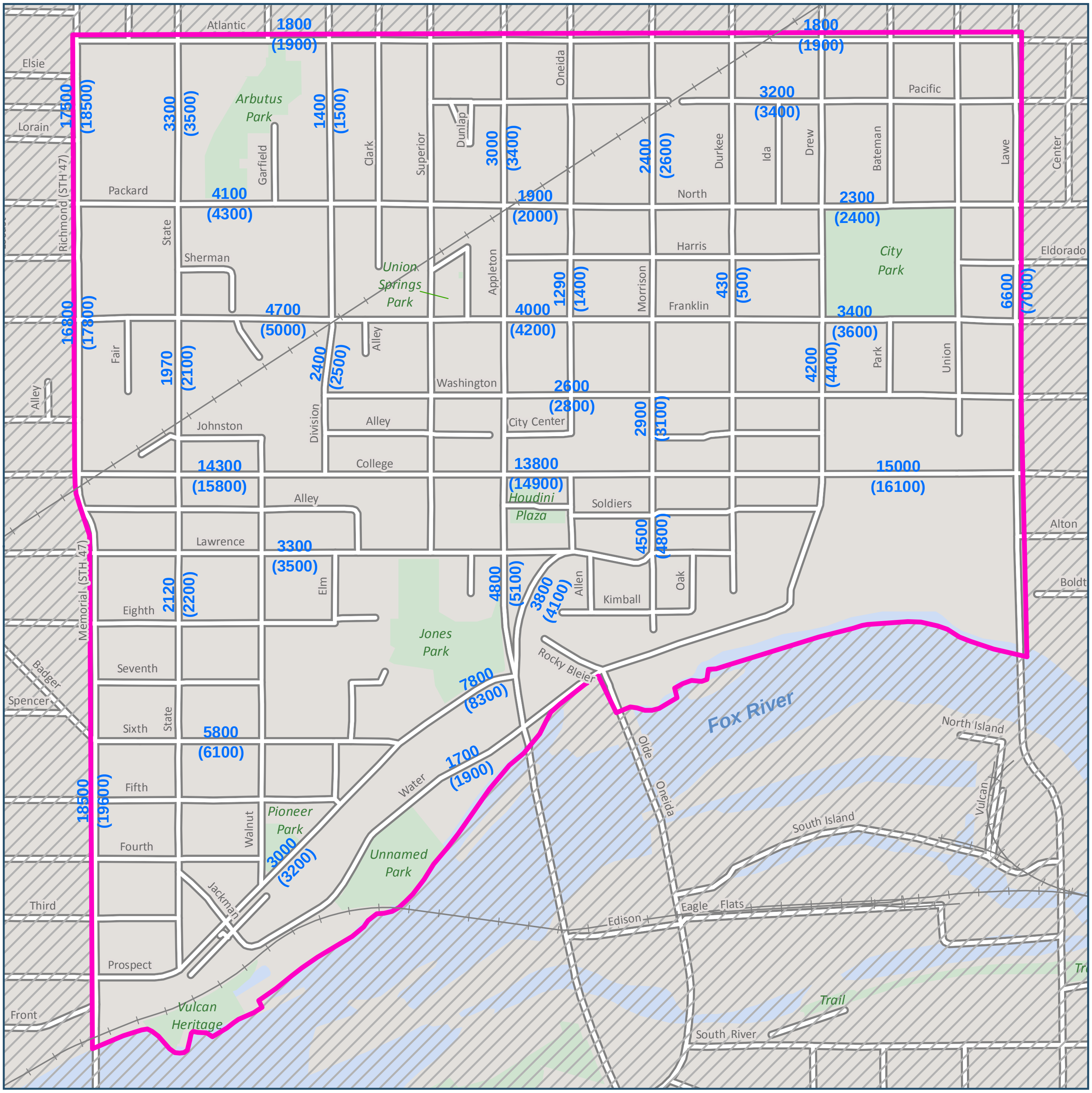
0 500 1,000 Feet

N

Exhibit 2

Average Annual Daily Traffic (AADT)

Downtown Appleton Mobility Study



Average Annual Daily Traffic (AADT)

Jan. 2016

Legend

Study Limits

XXXX 2015 Average Annual Daily Traffic (AADT)

(XXXX) 2036 Average Annual Daily Traffic (AADT)

0 500 1,000 Feet

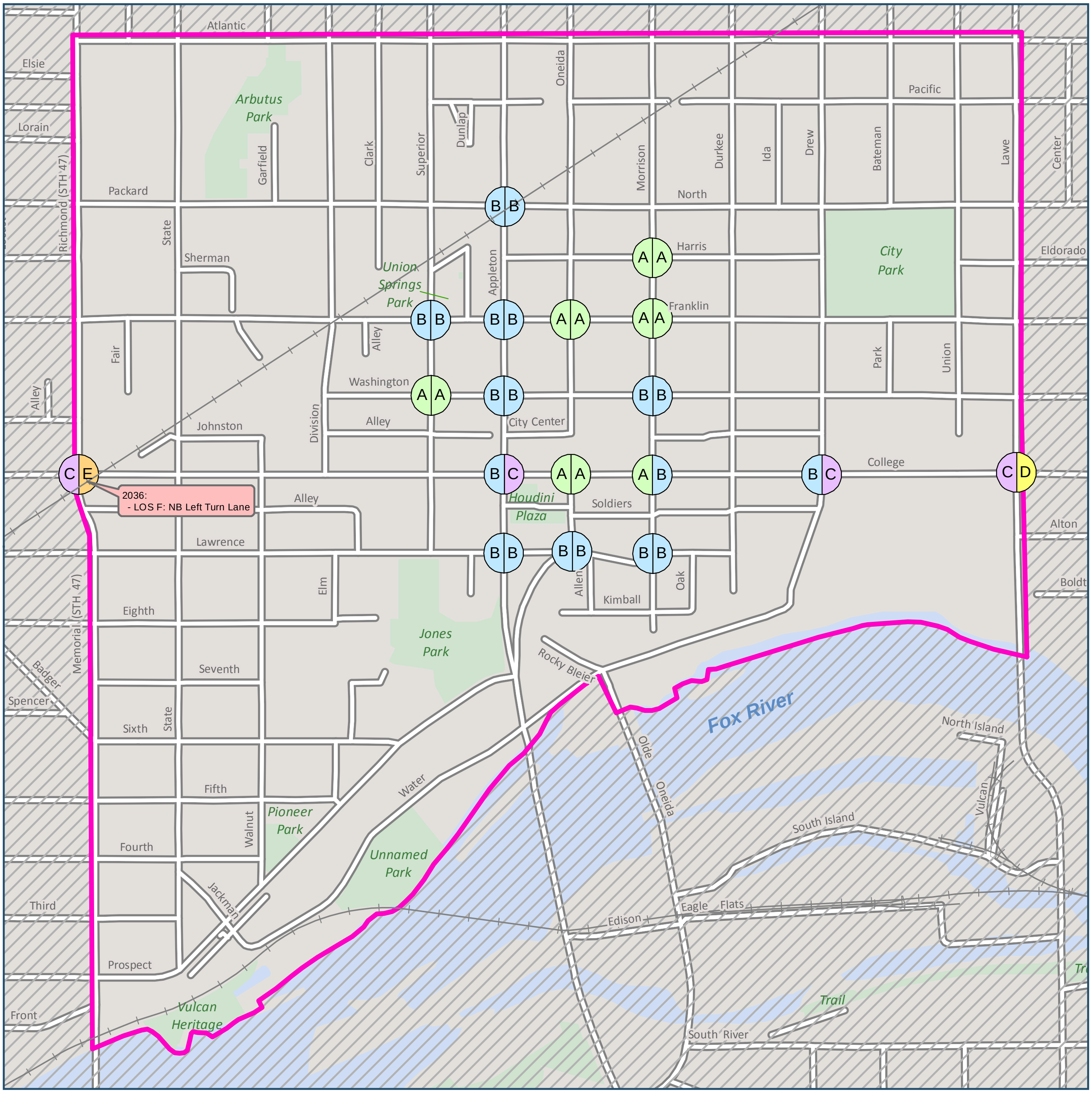
N

Exhibit 3

Level of Service – Existing Conditions and 2036

No-Build

Downtown Appleton Mobility Study



PM Peak Hour Traffic Operations - Existing & 2036 - No-Build

July 2016

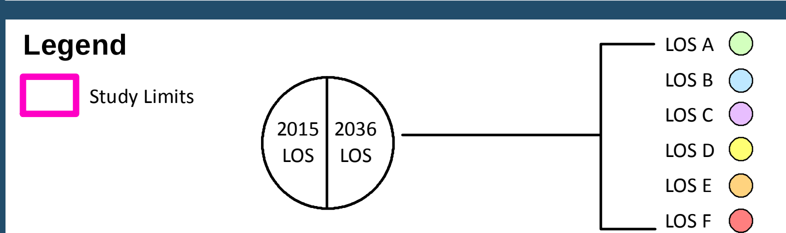
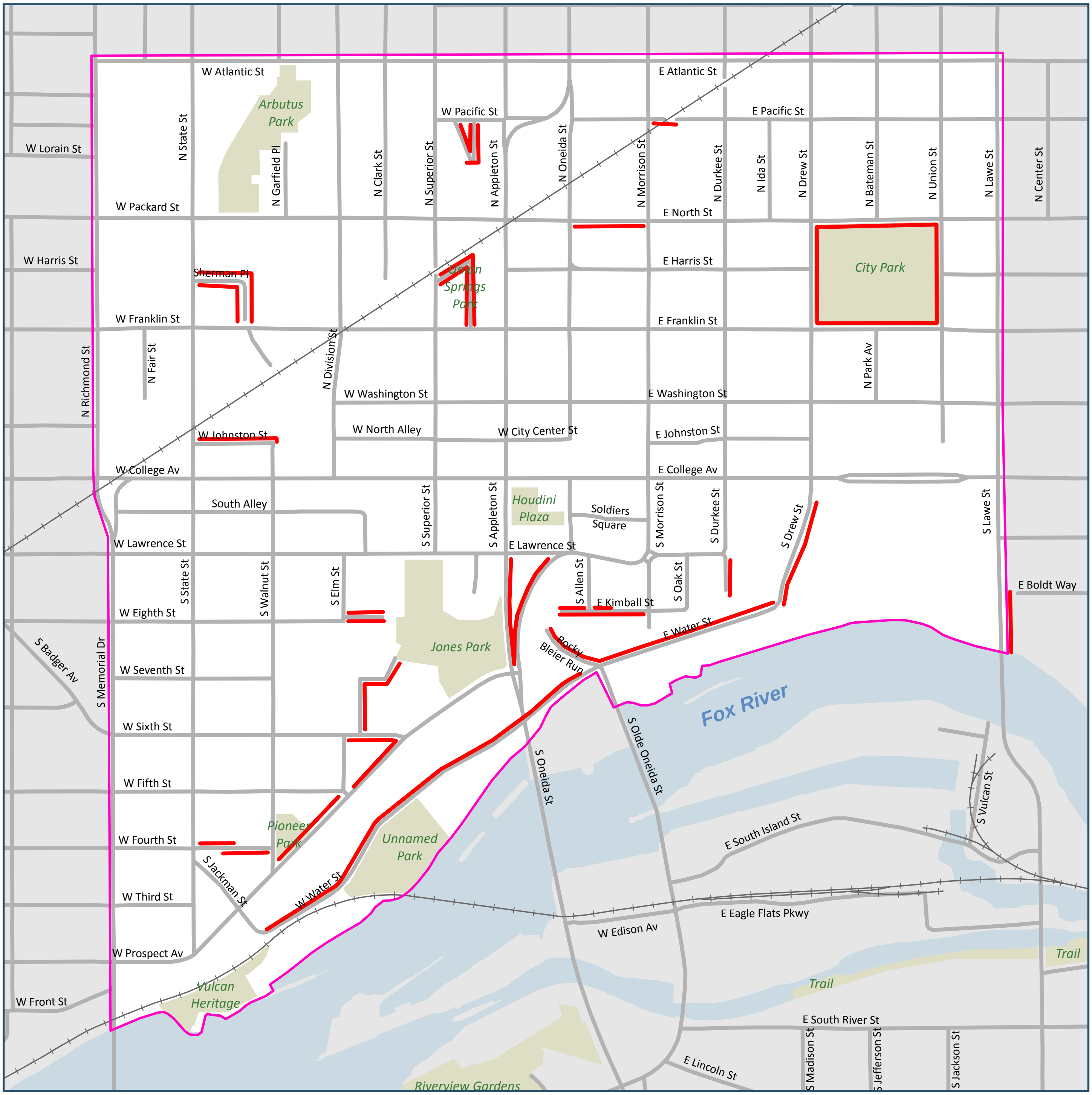


Exhibit 4

Sidewalk Gaps

Downtown Appleton Mobility Study



Sidewalk Gaps

July 2016

Legend

- Study Area
- Park
- Water

Pedestrian Facilities

- Area without sidewalk

N

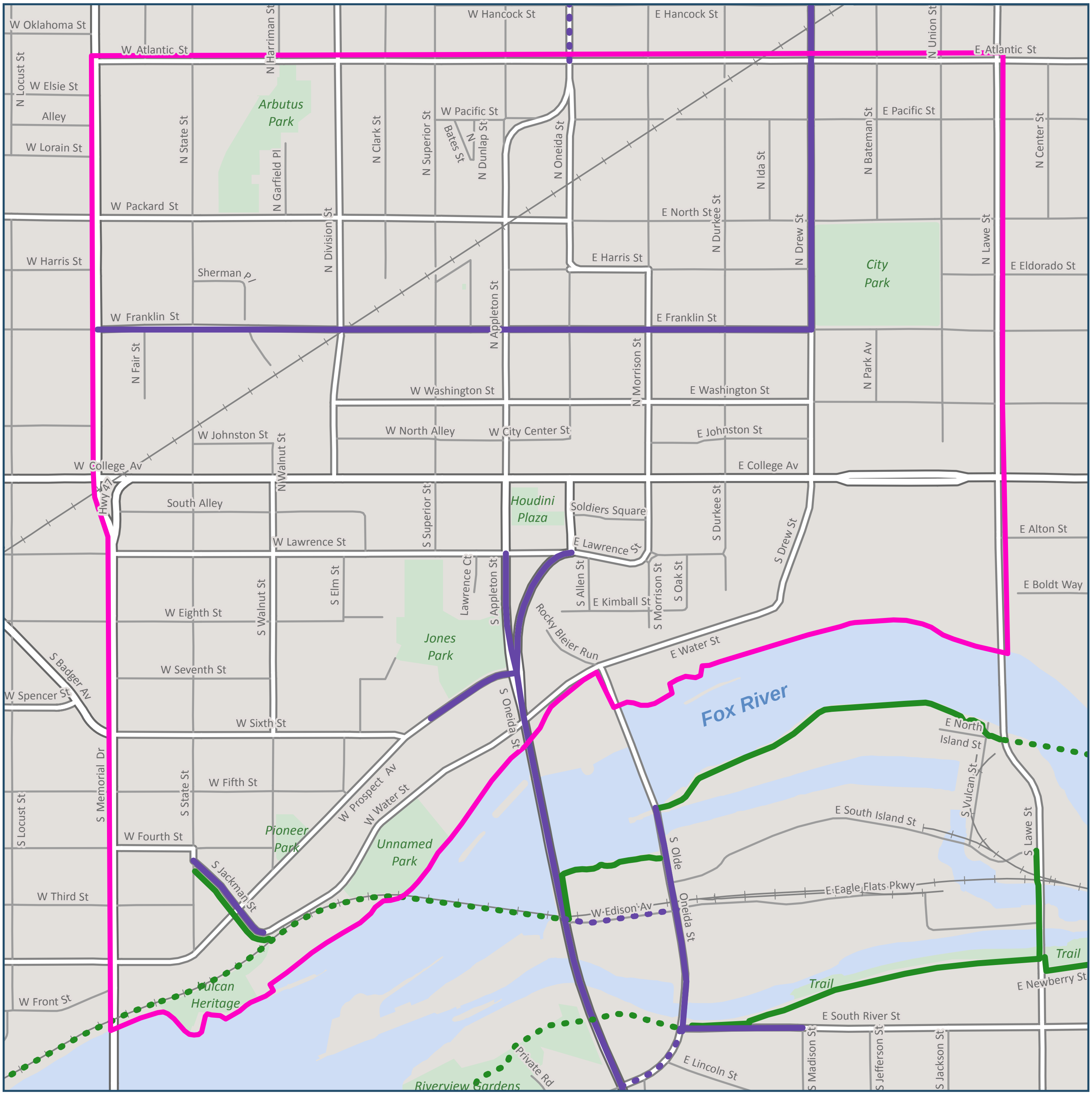
Feet

0 250 500

Exhibit 5

Existing Bicycle Facilities

Downtown Appleton Mobility Study



Existing and Proposed Bicycle Facilities

Jan. 2016

Legend

- Study Area
- Bike Lane, Existing
- Bike Lane, Proposed (2010 Bike Plan)
- Trail, Existing
- Trail, Proposed (Previous Plans)

0 500 1,000 Feet

N

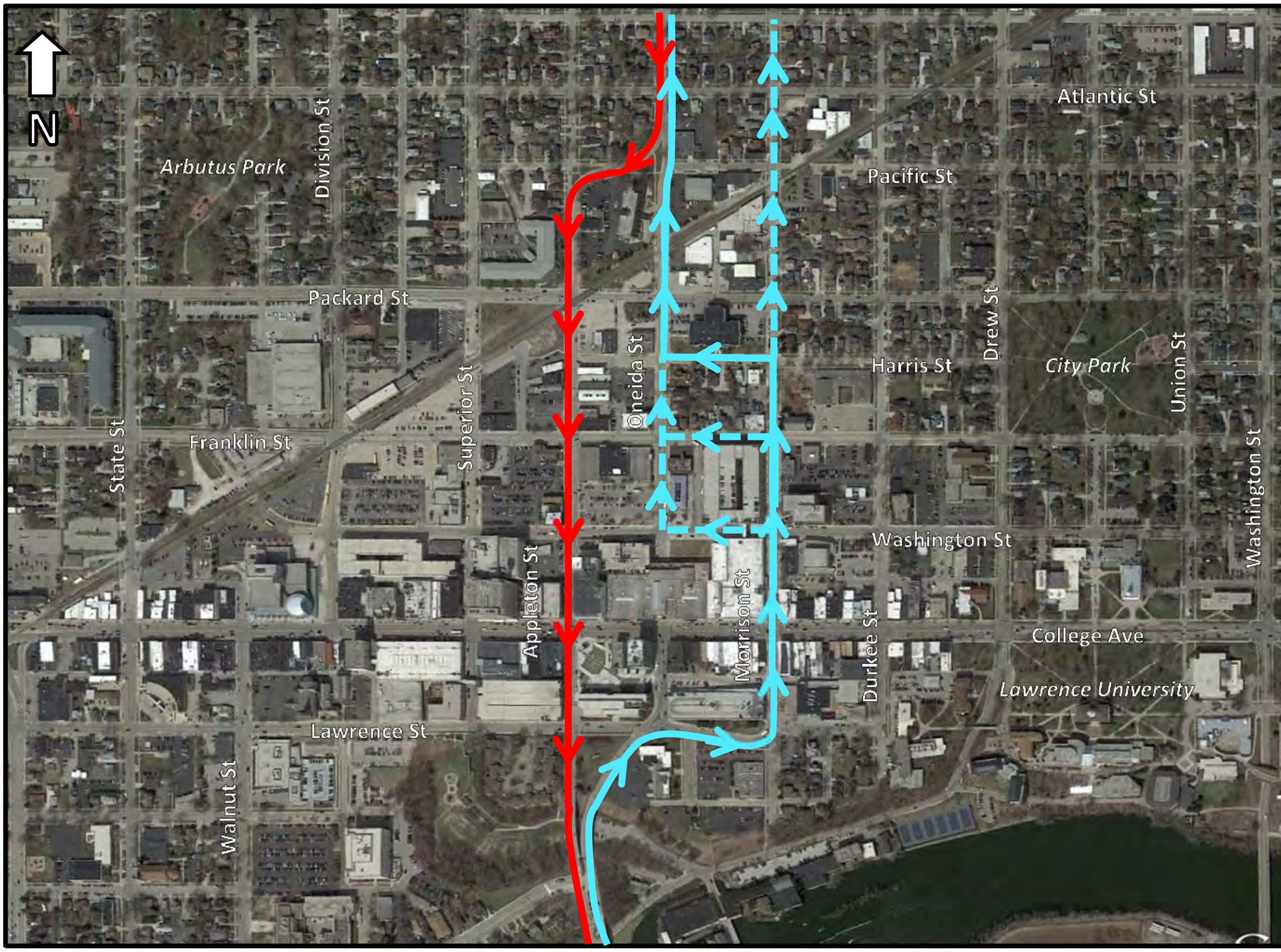
Exhibit 6

Northbound Route

Downtown Appleton Mobility Study

Northbound & Southbound Routes

Jan. 2016



Issues with existing Northbound and Southbound Routes

- Both routes utilize one-way streets, causing roadway and intersection confusion.
- Northbound route involves **6** unconventional intersections at the following locations:

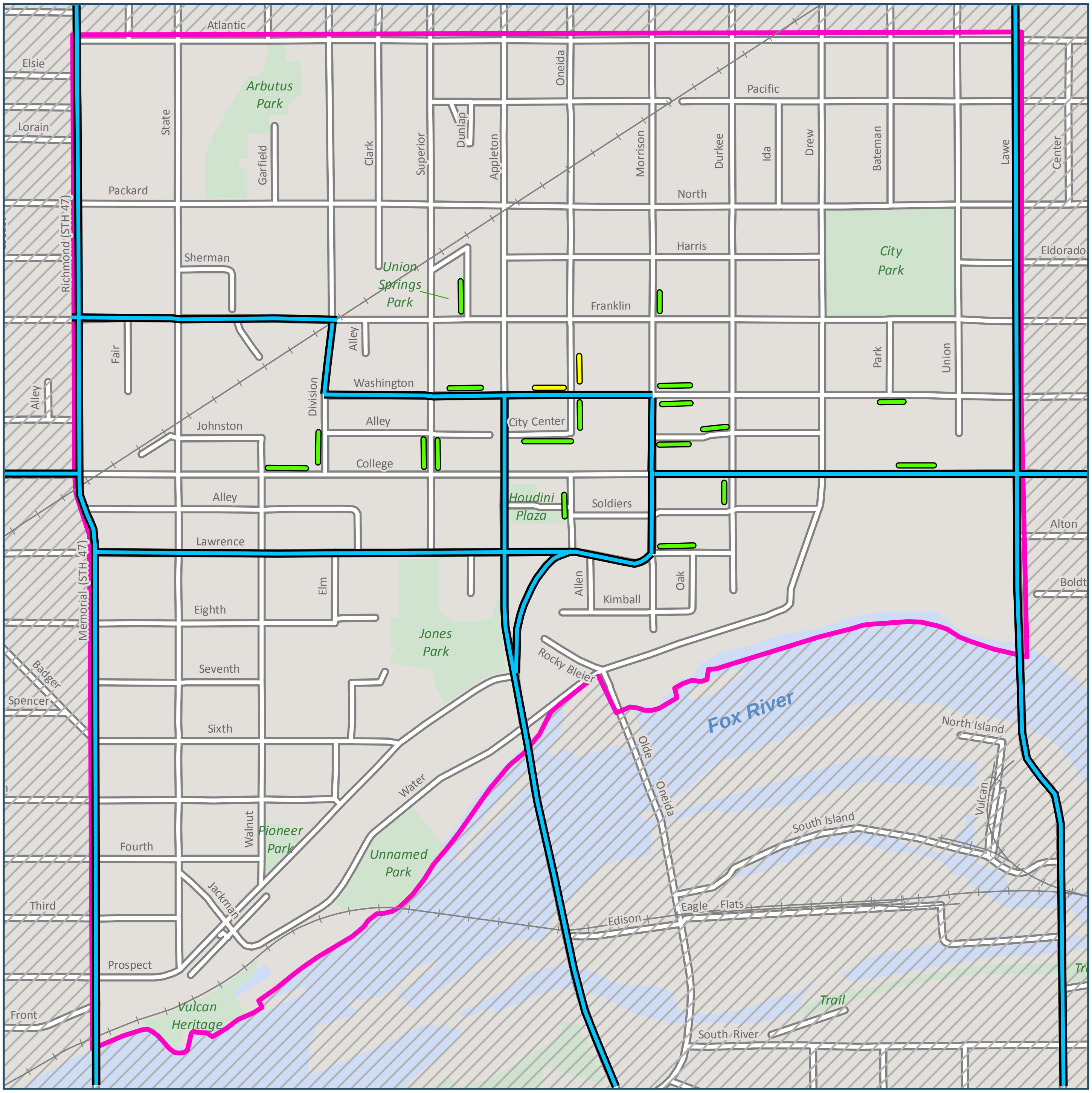
Oneida Street & Lawrence Street	Oneida Street & Harris Street
Morrison Street & Lawrence Street	Oneida Street & North Street
Morrison Street & Harris Street	Oneida Street & Pacific Street

- Northbound route does not have proper signing, allowing multiple northbound routes to be used, including some through residential neighborhoods.
- Causes misdirection for bicyclists when short, direct routes are key to encouraging trips.
- Southbound route drops a lane at the entrance to the City Center Plaza parking ramp.
- Northbound route causes traffic to pass in front of YMCA – a safety concern due to the number of adult and children pedestrians present.

Exhibit 7

Existing Truck Routes

Downtown Appleton Mobility Study



Truck Routing

Jan. 2016

Legend

- Study Limits
- Loading Zone
- Existing Truck Route
- Bus Loading Zones

0 500 1,000 Feet

N

Exhibit 8

Recommended Improvements

Recommended Improvements
Ultimate Build Out
July 2016
SCALE, FT
0 100 200
Downtown Appleton Mobility Study
AECOM Project No. 60445894
Appleton
Washington St.
College Ave.
Lawrence St.
Kimball St.
Water St.
Prospect Ave.
Rocky Bleier Run
Olde Oneida St.
Superior St.
Appleton St.
Oneida St.
Morrison St.
Durkee St.
Drew St.
Allen St.
Valley Transit
Library
Yellow Ramp
Blue Ramp
Green Ramp
Red Ramp
YMCA Ramp
YMCA
City Center Plaza
Houdini Plaza
Radisson Paper Valley Hotel
Jones Park
Fox River
Remove access when Blue Ramp is demolished
Loading zone and Parking
No left turn from North Alley
No left turn from City Center Alley
No left turn into north alley
Convert to 2-way traffic when Blue Ramp is removed
Bike and pedestrian connection to be determined
Expand existing roadway
15 Minute loading zone
No left turn into red ramp
Loading zone
No left turn out of private parking ramp
Loading zone and Parking
Signed bike route
Raised intersection
Reconstruct bridge to accommodate widened Drew St. Bridge should be minimum of 16' wide.
Climbing lane for bicycles traveling uphill. Requires expansion.
New south leg of Oneida St.
Remove roadway
Remove roadway and realign with Oneida St.
Shared use path (ADA accessible): route to be determined
Reconstruct bridge
Grand staircase (consider ADA accessibility)
Potential entrance to new development on bluff
Back-in angle parking
Realign Rocky Bleier Run to improve intersection sight distance.
Reconstruct bridge to accommodate bike lanes

Exhibit 9

Harris Street Recommendations

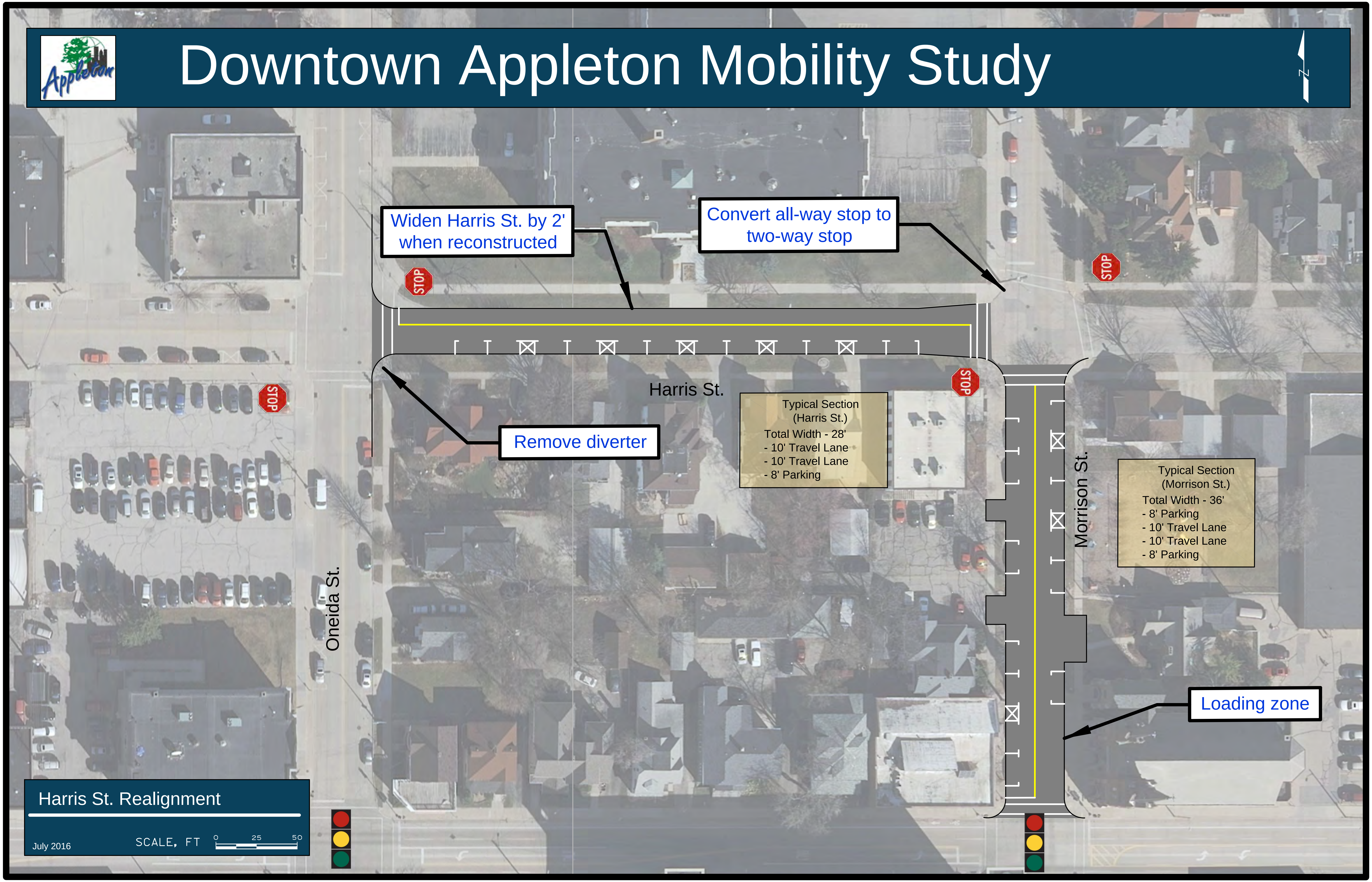
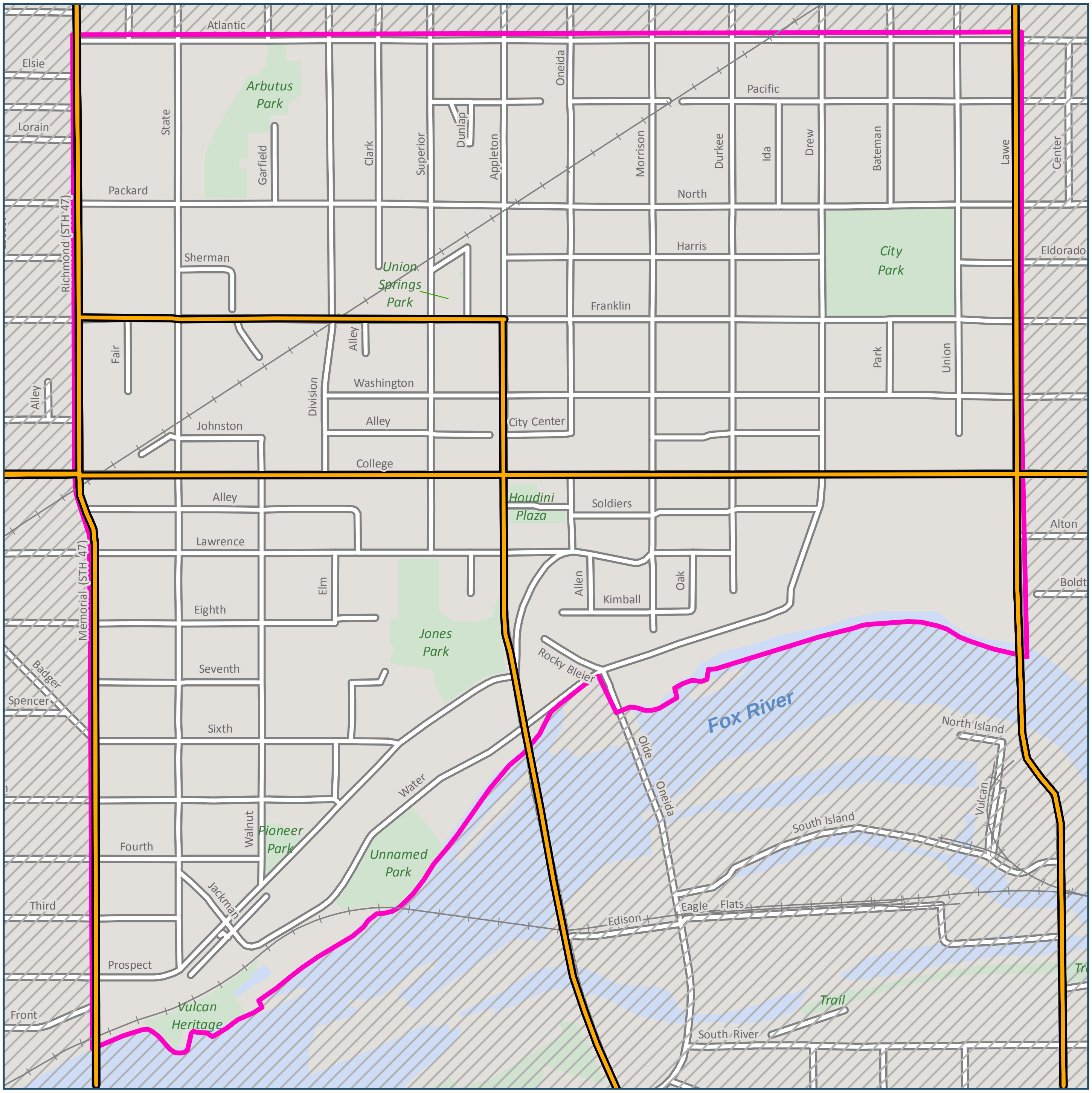

Downtown Appleton Mobility Study
Appleton
Widen Harris St. by 2' when reconstructed
Convert all-way stop to two-way stop
STOP
Remove diverter
Harris St.
Typical Section (Harris St.)
Total Width - 28'
- 10' Travel Lane
- 10' Travel Lane
- 8' Parking
Morrison St.
Typical Section (Morrison St.)
Total Width - 36'
- 8' Parking
- 10' Travel Lane
- 10' Travel Lane
- 8' Parking
Oneida St.
Loading zone
Harris St. Realignment
July 2016
SCALE, FT
0
25
50

Exhibit 10

Proposed Truck Routes

Downtown Appleton Mobility Study



Proposed Truck Routing

July 2016

Legend

- Study Limits
- Proposed Truck Routes

0 500 1,000 Feet

N

Exhibit 11

Potential Appleton Street / Oneida Street / Pacific Street Configuration

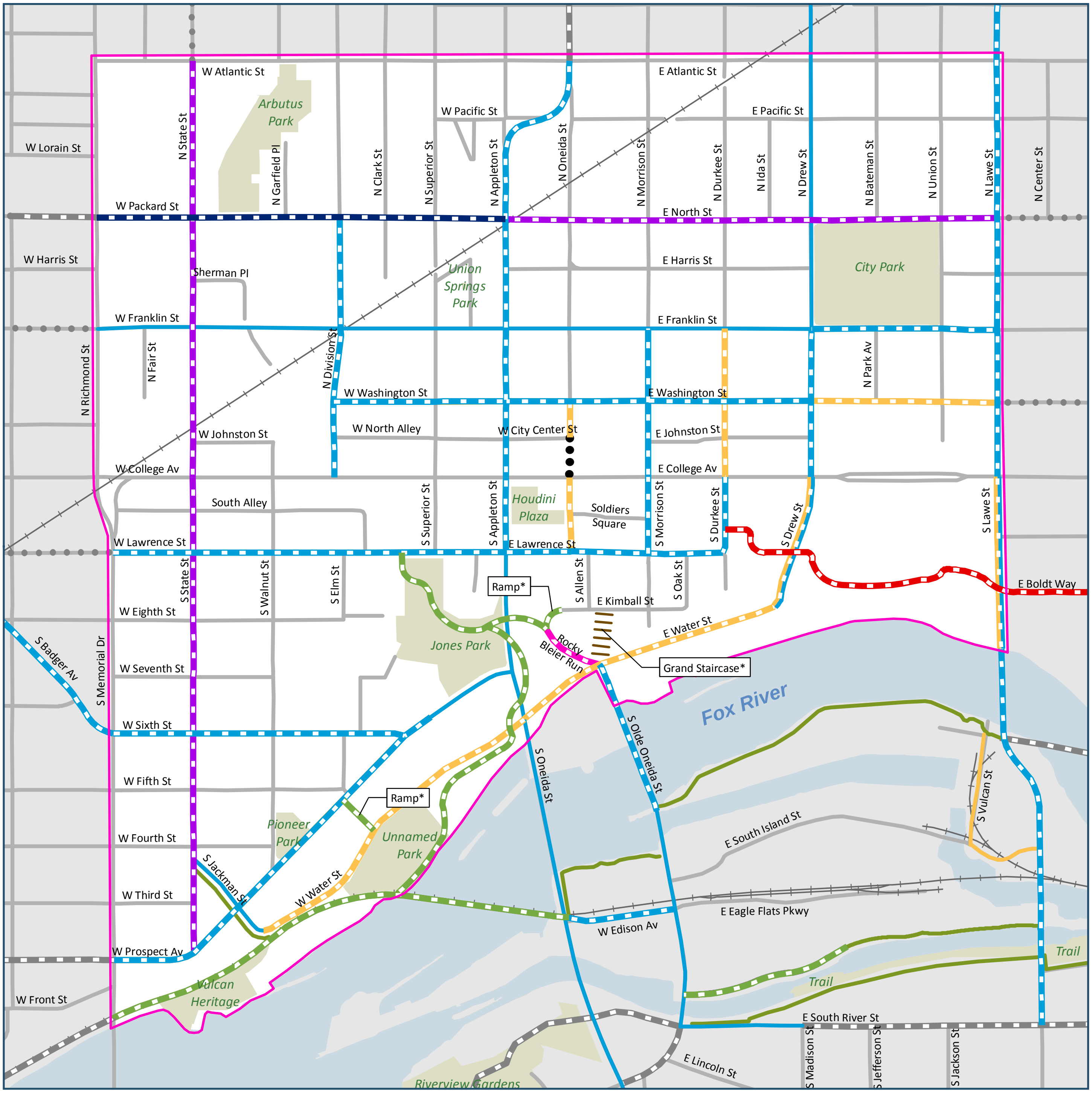
This concept, showing the potential reconfiguration of the Appleton Street / Oneida Street / Pacific Street intersection was created by City staff.

Exhibit 11

Exhibit 12

Ultimate Buildout Bicycle Network

Downtown Appleton Mobility Study



Proposed Bicycle Facilities - Ultimate Build Out

August 2016

Legend	Existing Bicycle Facilities	Proposed Bicycle Facilities		
Study Area	Bike Lane	Buffered Bike Lane	Slow Street	Bike Lane (2010 Plan)
Park	Shared Lane Marking	Bike Lane	Bicycle Boulevard	Signed Route (2010 Plan)
Water	Shared Use Path	Climbing Lane	Signed Route	
		Shared Lane Marking	Shared Use Path	
* ADA Accessible Faciliites to be Studied		To Be Determined		

N

Feet

0 250 500

List of Appendices

Appendix A

Intersections where Traffic Counts were conducted

The City of Appleton provided turning movement counts for the following intersections:

- Appleton Street & Washington Street (2010)
- Franklin Street & Oneida Street (2011)
- Franklin Street & Superior Street (2011)
- Morrison Street & Washington Street (2010)
- Superior Street & Washington Street (2010)
- College Avenue & Lawe Street (2006)

Turning movement traffic counts were conducted in November and December 2015 to supplement traffic data provided by the city. The counts were completed for the PM peak period from 3-6 PM. The following intersections were counted:

- Appleton Street & Franklin Street
- Appleton Street & Packard Street
- College Avenue & Appleton Street
- College Avenue & Drew Street
- College Avenue & Morrison Street
- College Avenue & Oneida Street
- Morrison Street & Harris Street
- Morrison Street & Franklin Street
- Lawrence Street & Appleton Street
- Lawrence Street & Morrison Street
- Lawrence Street & Oneida Street

Appendix B

Traffic Forecasting

AECOM
1350 Deming Way
Suite 100
Middleton, WI 53562
www.aecom.com

608 836 9800 tel
608 836 9767 fax

Memorandum

To	Amy Canfield, P.E. - AECOM	Page	1
CC			
Subject	Forecast Development – Downtown Appleton		
From	Jeff Sandberg, P.E. – AECOM Derek Salomonsen, EIT – AECOM		
Date	July 21, 2016		

Traffic Forecasts were developed in order to evaluate system operations of the existing road network and the proposed network improvements. The traffic volumes on which these forecasts were based were a mix of WisDOT AADT, City-provided AADT, new turning movement traffic counts, and City-provided turning movement traffic counts.

The Existing AADT and turning movement data was sent to East Central Wisconsin Regional Planning Commission (ECWRPC). ECWRPC used the regional travel demand model to predict future traffic growth. EXWRPC provided 2045 Average Weekday Traffic (AWDT) and 3-hour PM travel flows for existing and 2045 conditions. All ECWRPC information is in *Appendix A* of this memo. The AWDT and 3-hour travel flows were used to determine annual growth rates for AADT and each turning movement at each intersection. The minimum annual growth rate applied to existing turning movements and AADT was 0.27% and 0.25%, respectively. Growth rates lower than the minimum value were increased to the minimum value. The annual growth rates were applied to the existing turning movement volumes and AADT to generate the forecasted 2036 volumes under no-build conditions. All forecasted 2036 no-build volumes are in *Appendix B* of this memo.

For alternative 2, existing traffic volumes had to be adjusted for Appleton St. and Morrison St. under two-way traffic. A visual of how traffic was distributed can be seen in *Appendix C* of this memo. Below is a list of assumptions used while redistributing traffic throughout Downtown Appleton:

- For the purposes of this exercise, only traffic bounded (E-W) by Appleton St. and Morrison St. and (N-S) by Lawrence St. and Packard St. were affected by the conversion of one-way traffic to two-way traffic on Appleton St. and Morrison St.
- The NB Oneida St. Bridge over Rocky Bleier Run will be removed.
- All vehicles added at the following intersections were subtracted from another intersection, a list of assumptions is in *Appendix D* of this memo:
    - Appleton St. & Lawrence St.
    - Lawrence St. & Oneida St.
    - Lawrence St. & Morrison St.
    - College Ave & Appleton St.
    - College Ave. & Oneida St.
    - College Ave. & Morrison St.
- Everything North of College Ave on northbound Morrison St. was proportioned to existing counts.
- Side road volumes north of College Ave. were not changed. Any new movement added due to the conversion of Appleton St. and Morrison St. was given a volume of 20 vehicles.
- All vehicles added along southbound Morrison St. were not reduced from any other location.

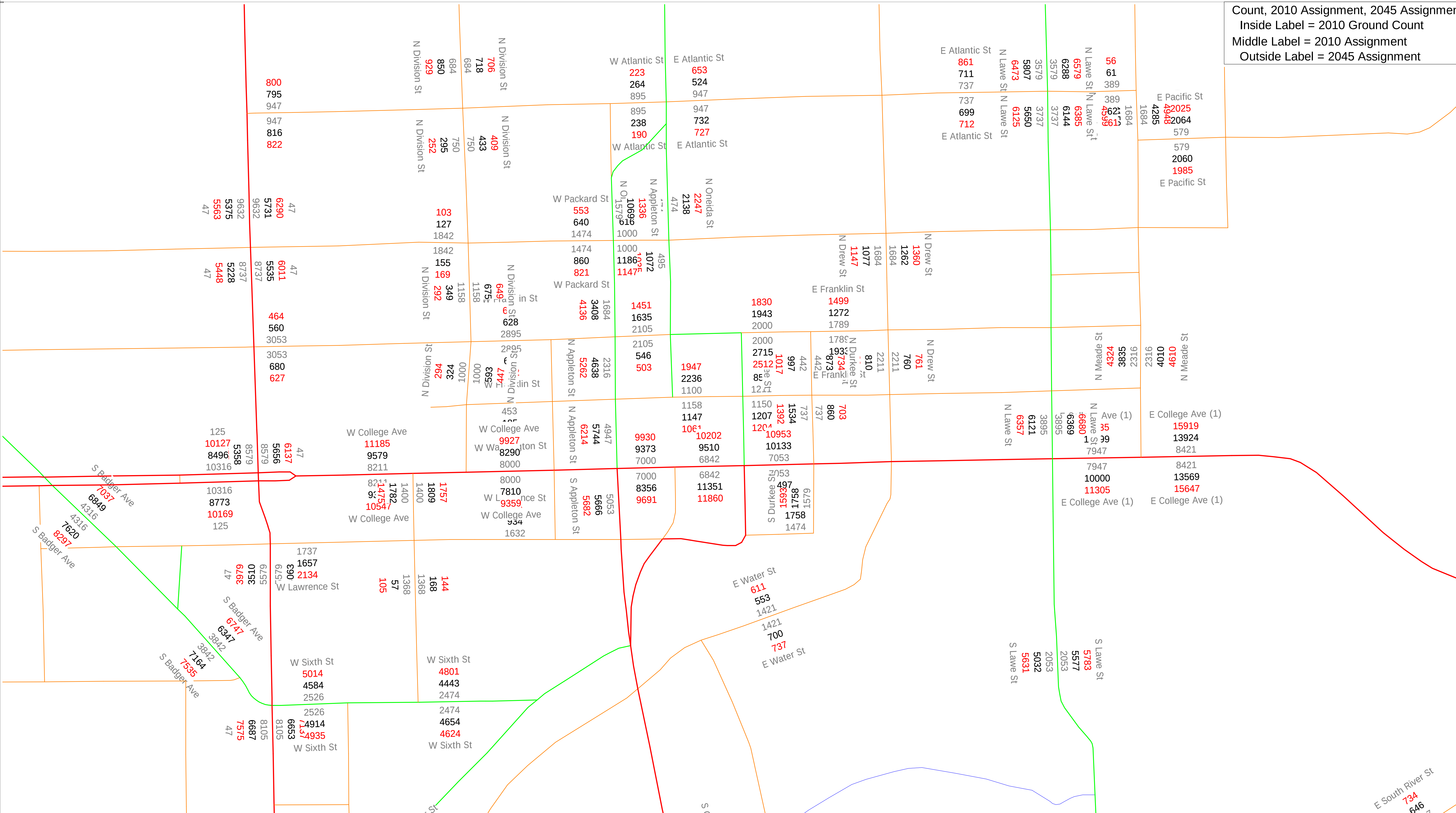
Average annual growth rates were calculated for intersections with new turning movements introduced within Alternative 2, similar to the no-build. These average annual growth rates were used to forecast 2036 volumes for new turning movements with two-way Appleton St. and Morrison St. The same annual growth rates used for no-build conditions were used for all other locations analyzed. The forecasted 2036 volumes for Alternative 2 can be seen in *Appendix E* of this memo.

Appendix A

ECWRPC Forecast

Northeast Region Travel Demand Model
2010 Count, 2010 Assignment, 2045 Assignment
Average Week Day Traffic (AWDT) by Direction

Count, 2010 Assignment, 2045 Assignment
Inside Label = 2010 Ground Count
Middle Label = 2010 Assignment
Outside Label = 2045 Assignment



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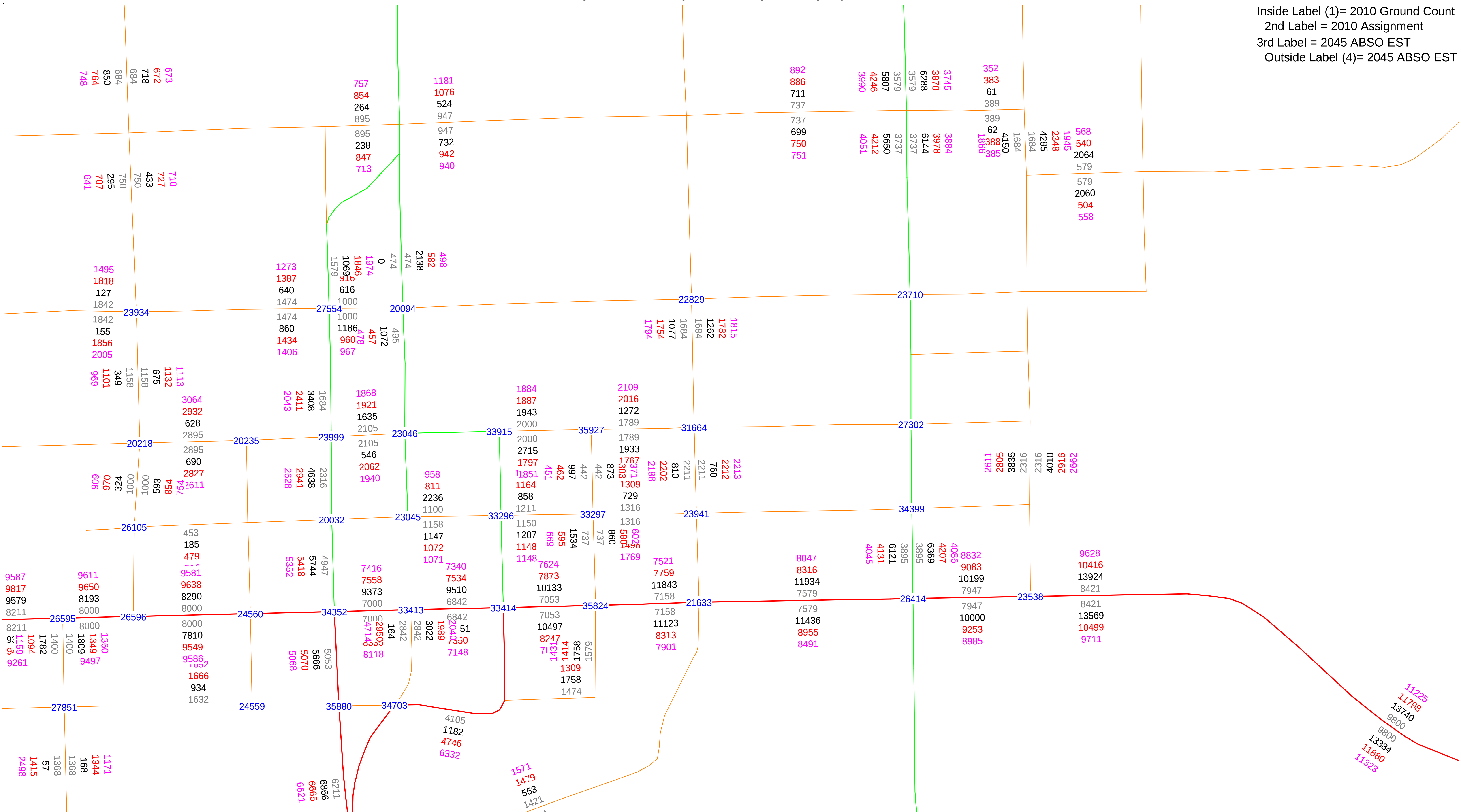
ECWRPC 2016

cube

Northeast Region Travel Demand Model
2010 Count, 2010 Assignment, 2045 ABSO EST & 2045 RATIO Estimates
Average Week Day Traffic (AWDT) by Direction



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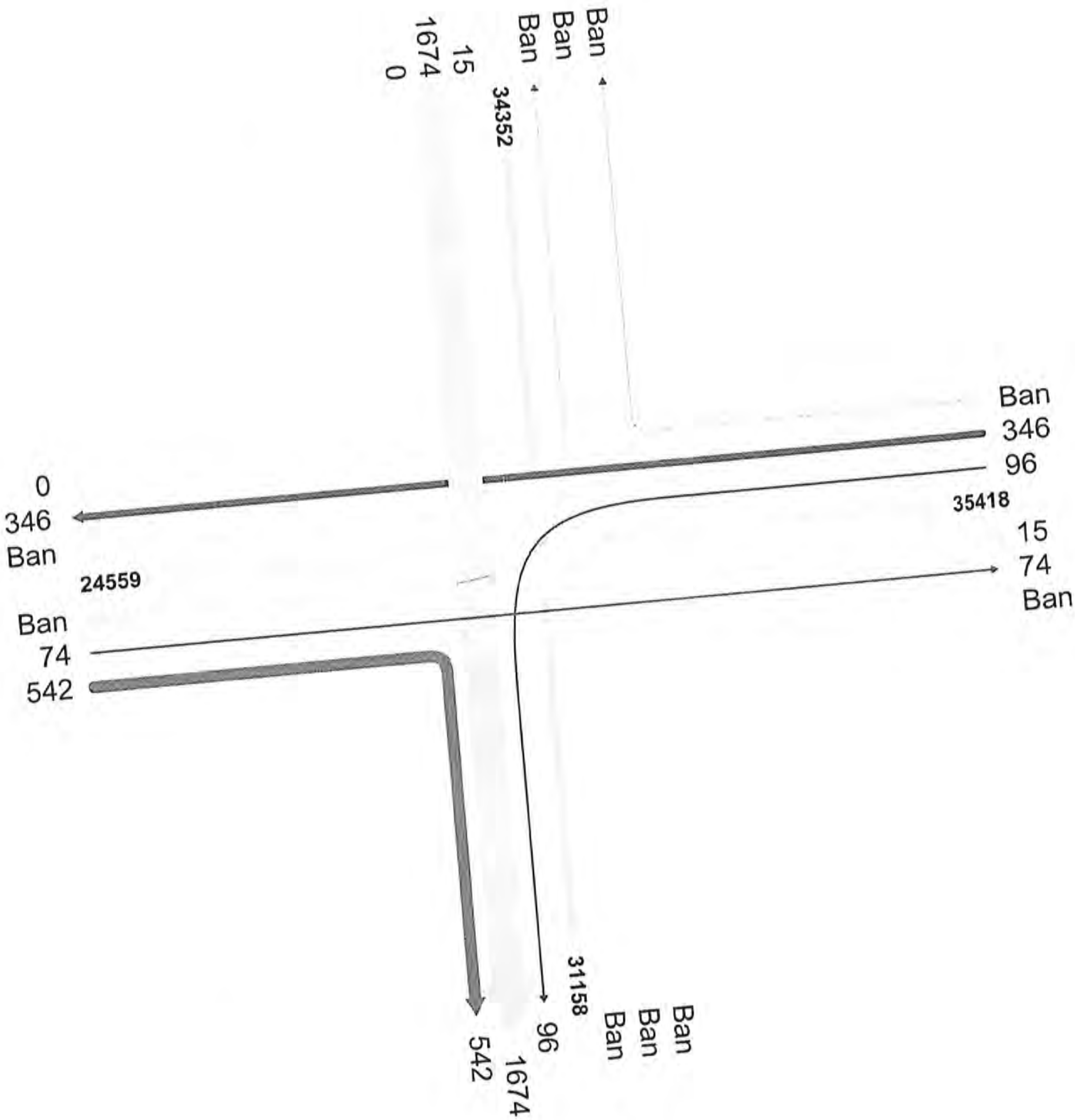
ECWRPC 2016

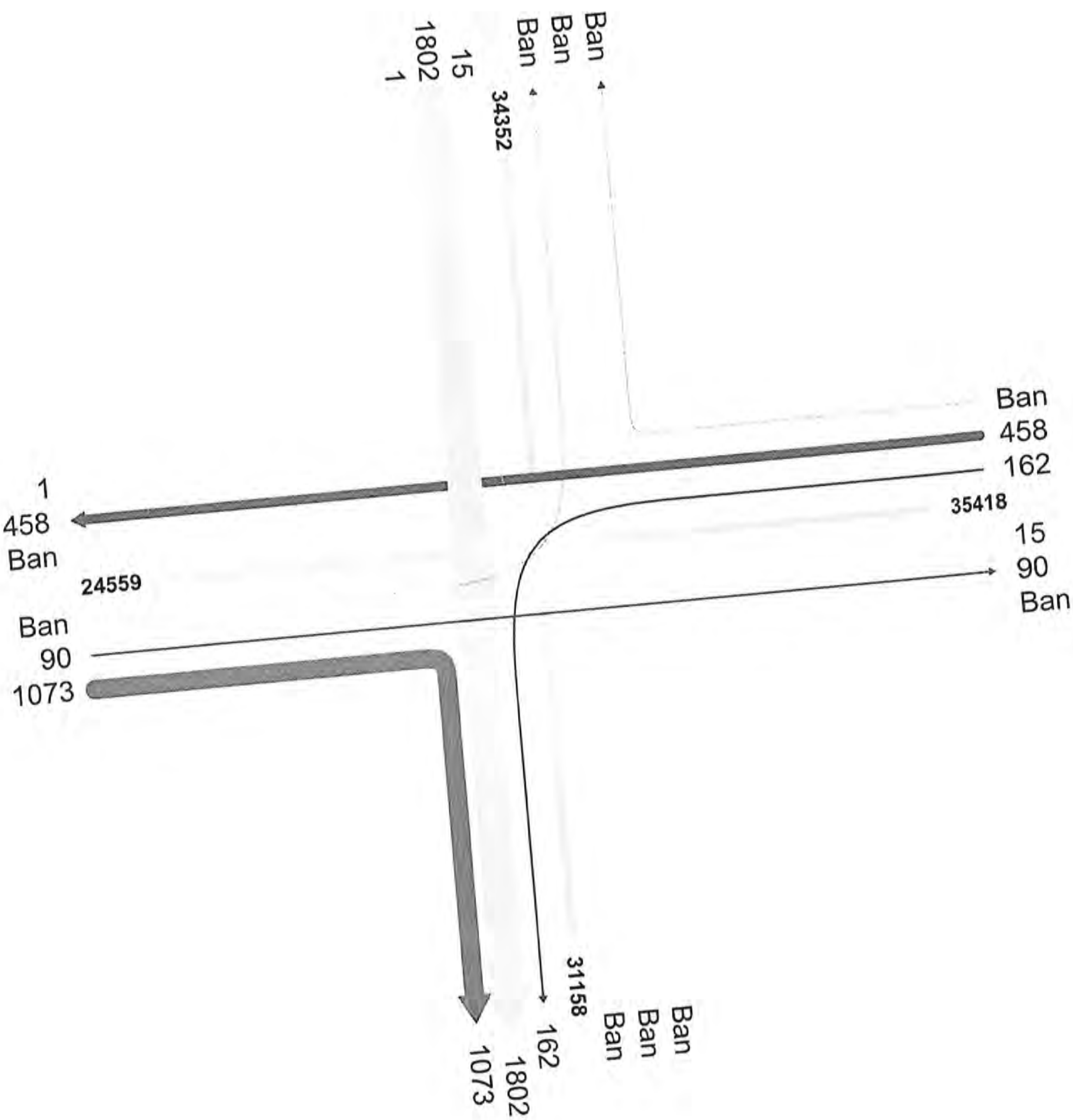
Intersection Data View
Node Number : 35880
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

Lawrence & Appleton
2010



Intersection Data View
Node Number : 35880
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

Lawrence & Appleton
2045



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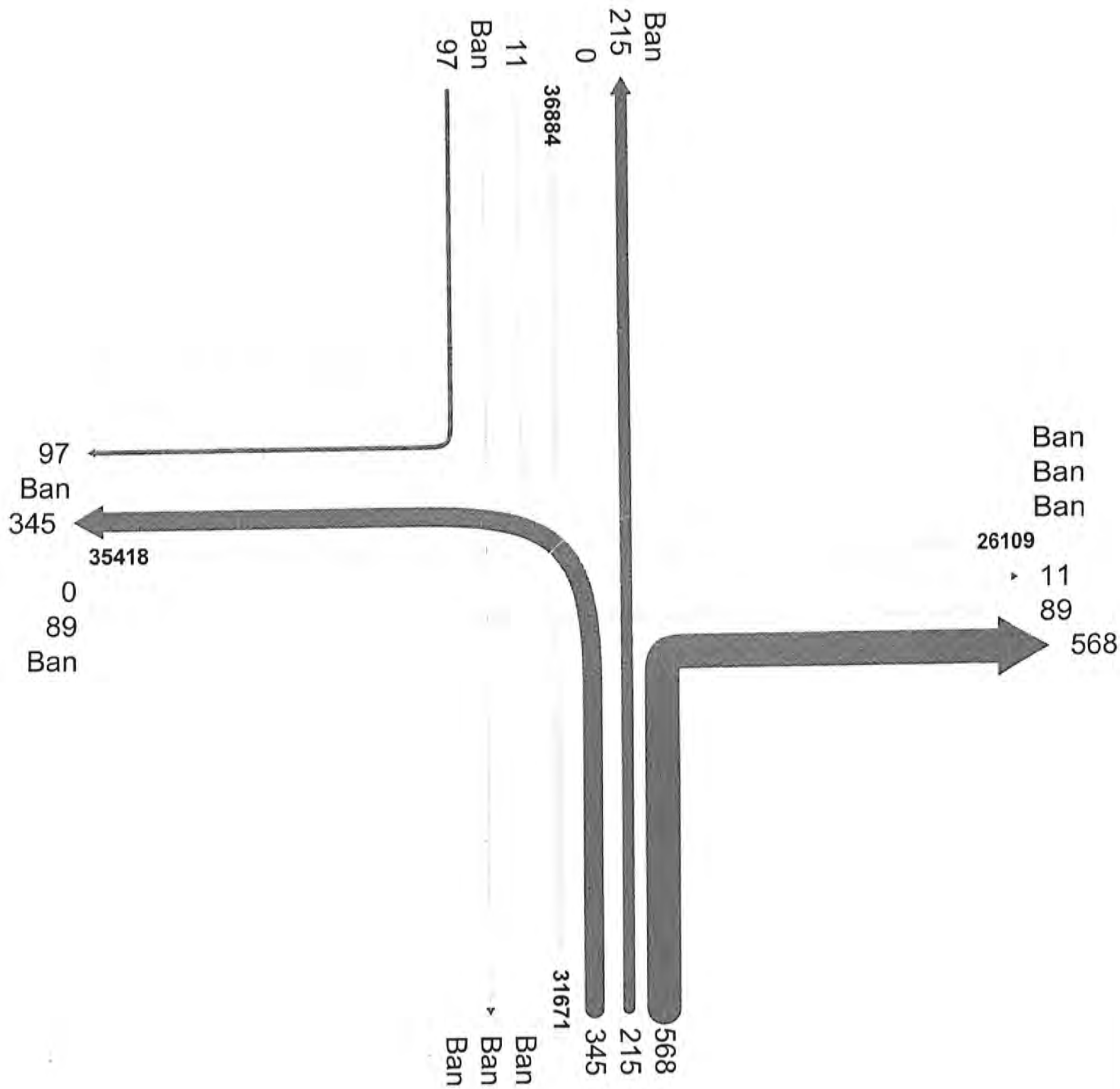
Intersection Data: P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECWRI

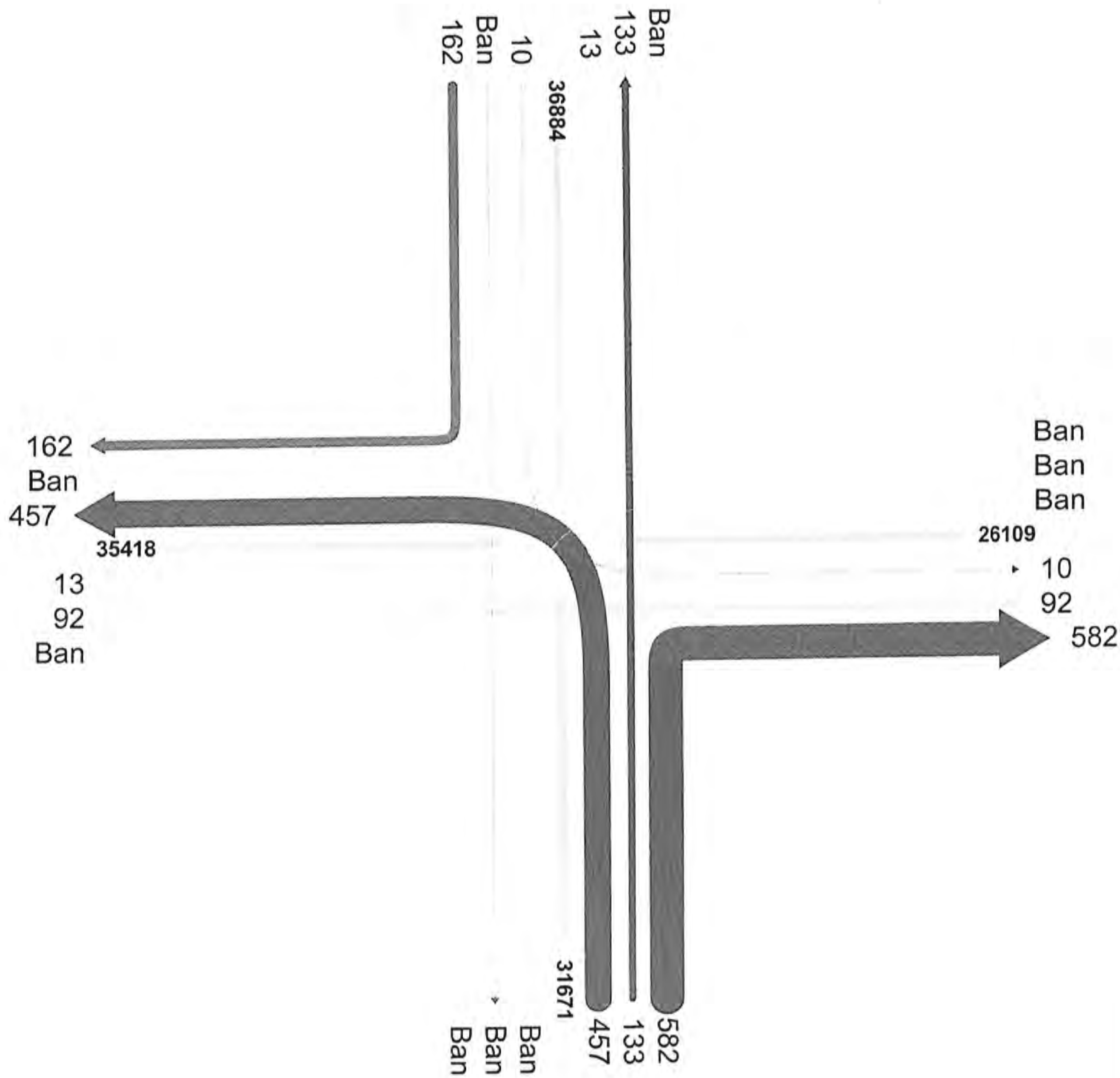
Intersection Data View
Node Number : 34703
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

Lawrence & Oneida
2010



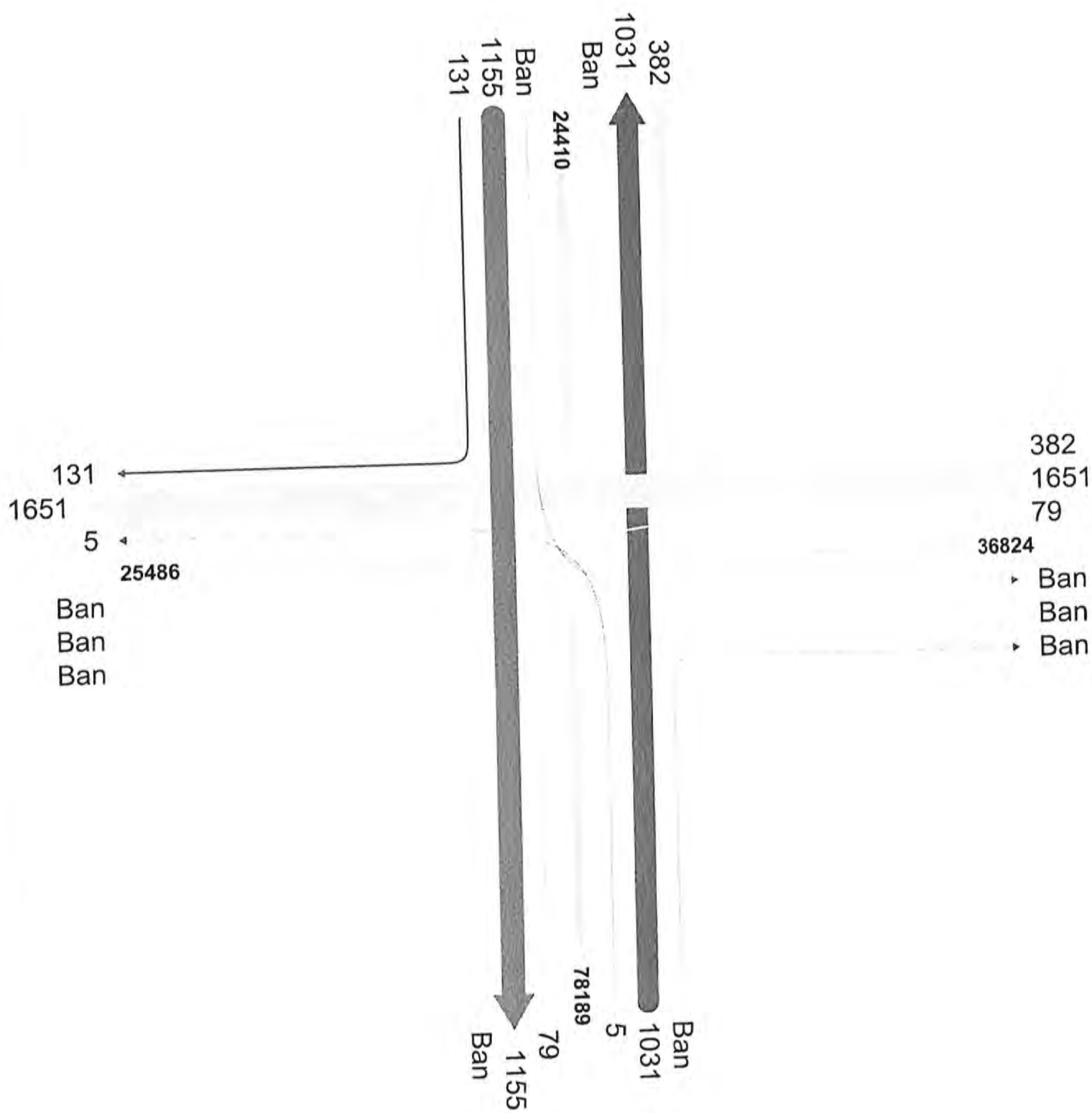
Intersection Data View
Node Number : 34703
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

Lawrence & Oneida
2045



Intersection Data View
Node Number : 24411
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

College & Richmond - WB Leg
2010



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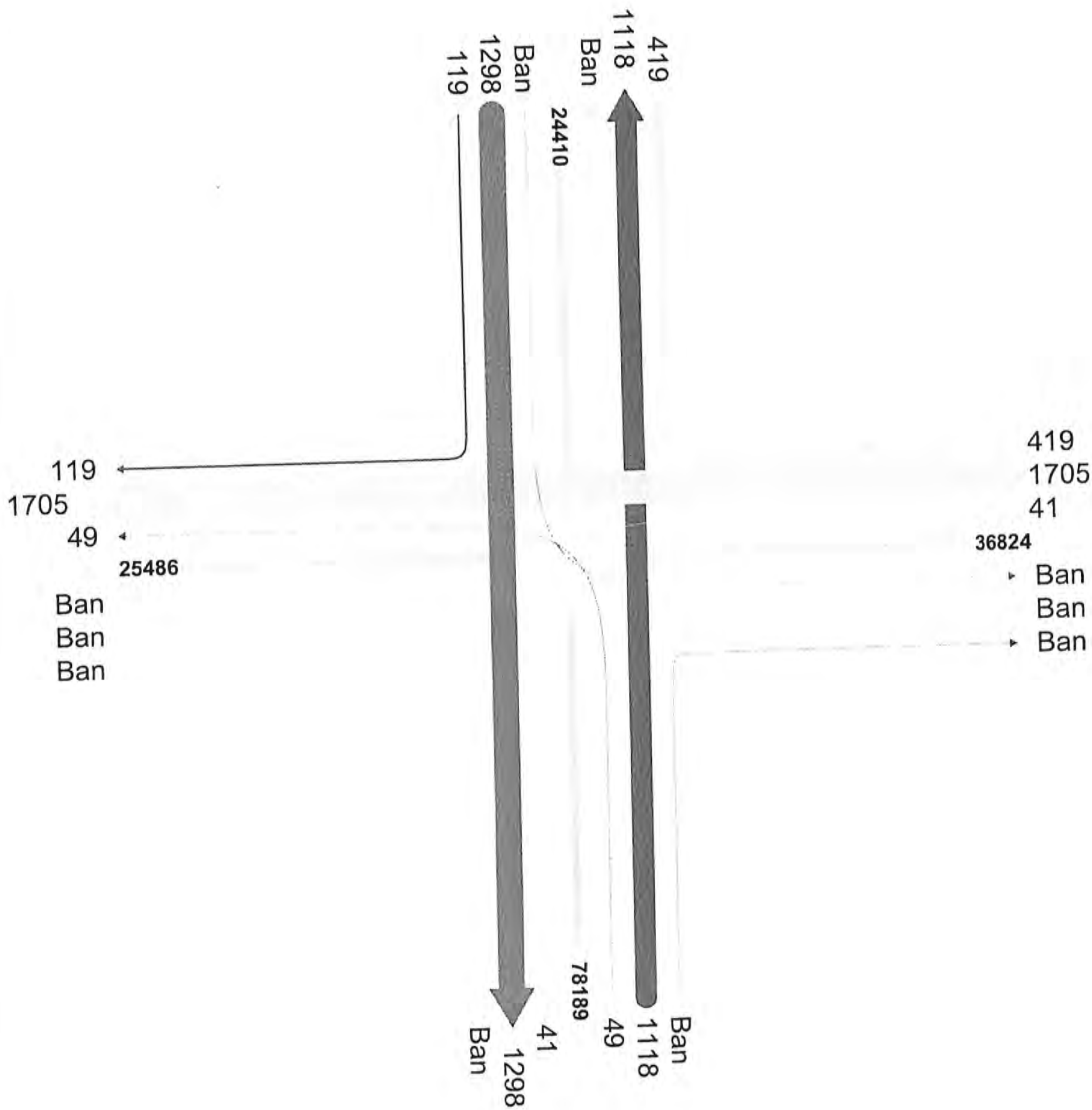
Intersection Data View
Node Number : 24411
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

College & Richmond- WB Leg
2045



Intersection Data View
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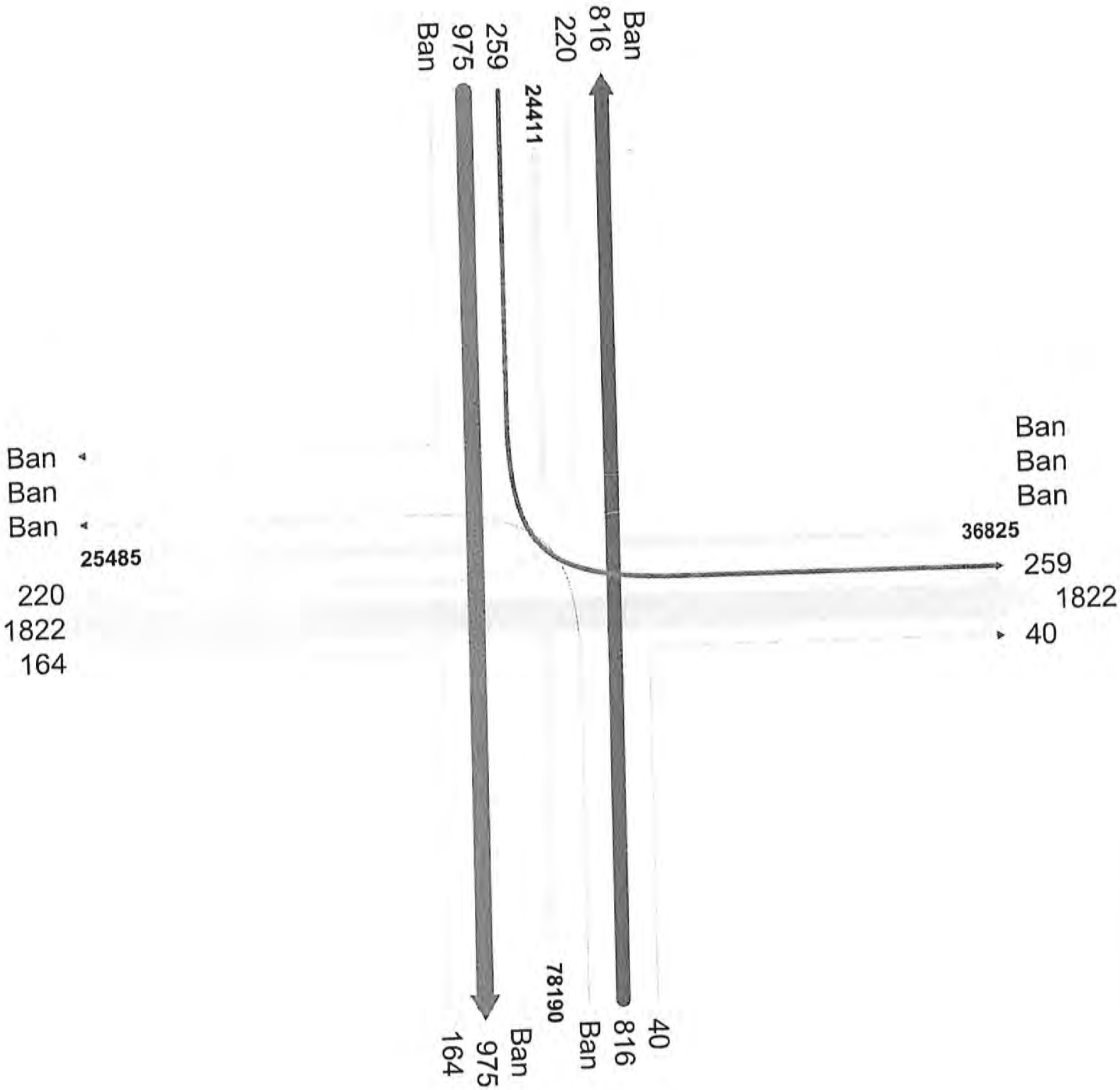
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

College & Richmond - EB Leg
2010



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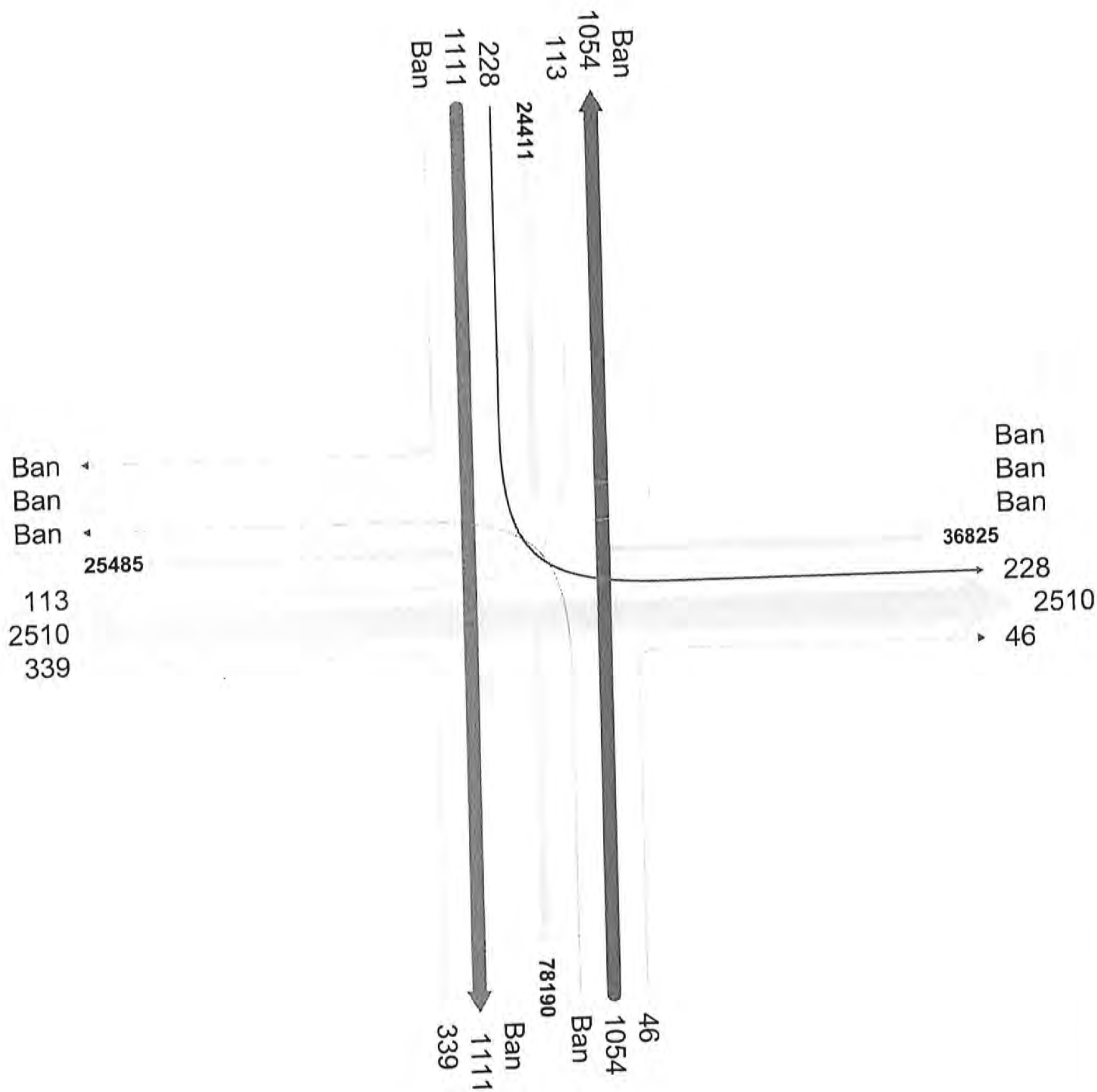
Intersection Data View
Node Number : 78189
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

College & Richmond - EB Leg
2045



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Intersection Data View
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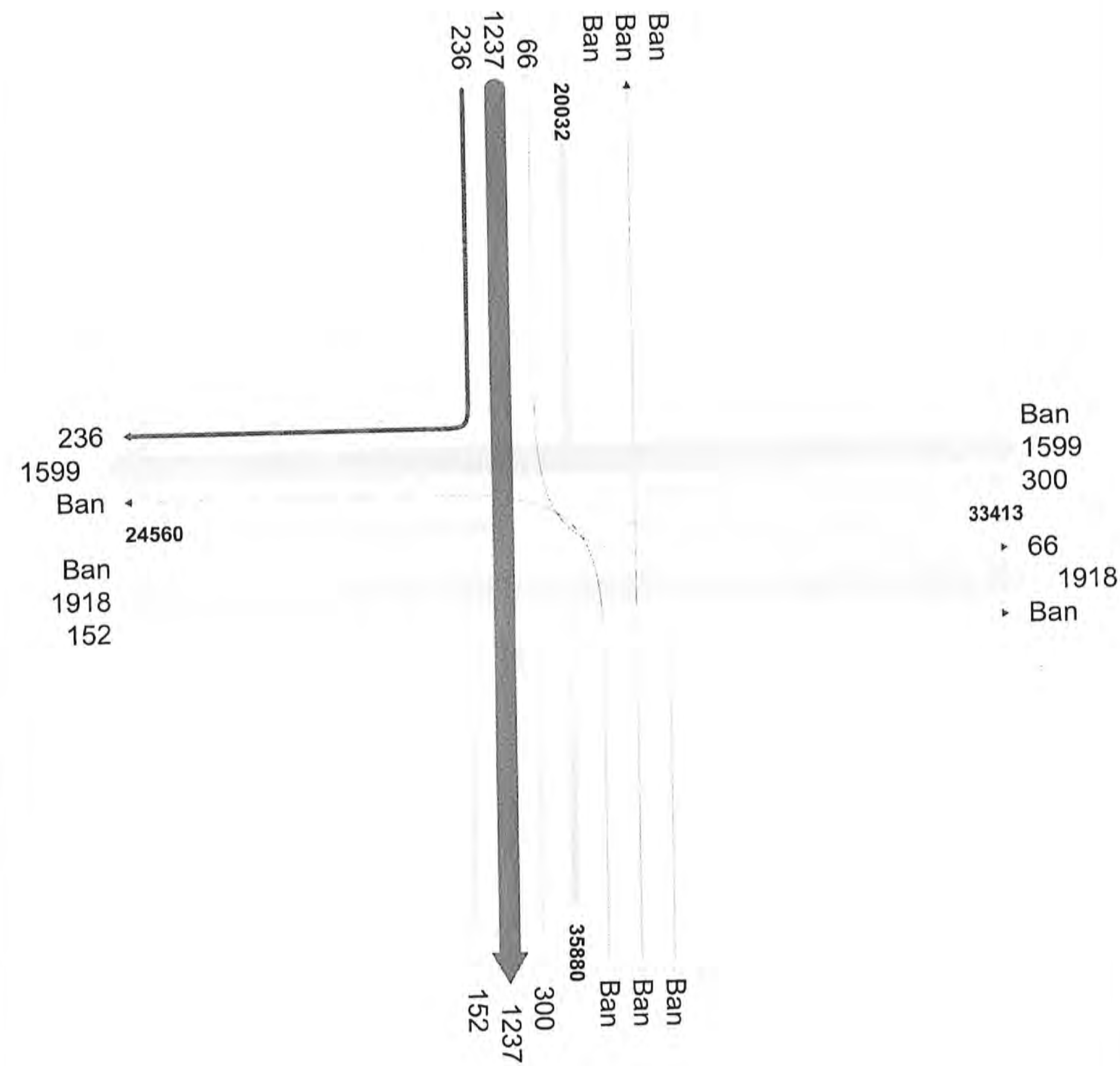
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

College & Appleton
2010



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Intersection Data View
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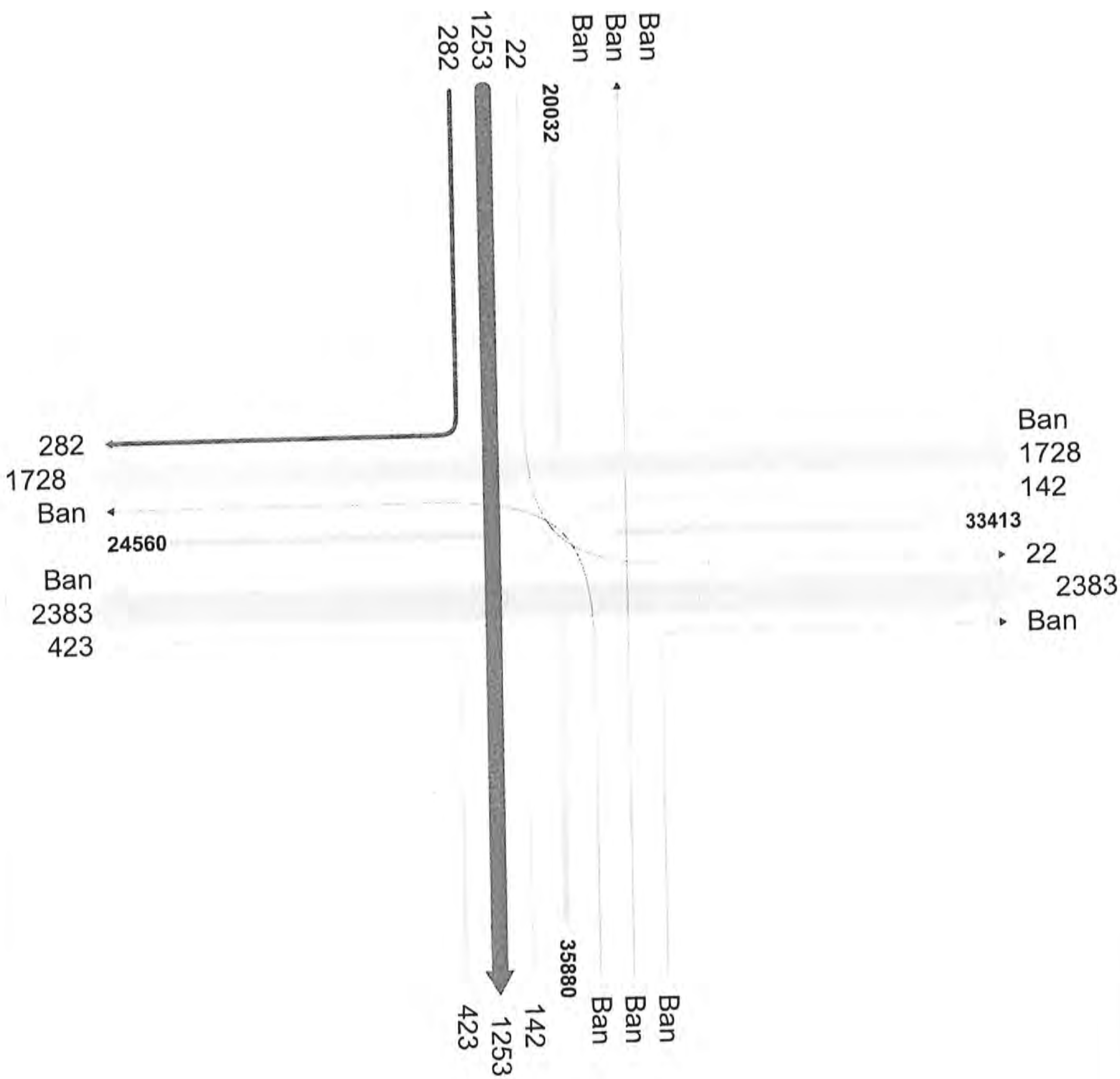
Attribute : (Volume 1 + Volume 2 + Volume 3)

College & Appleton
2045



Intersection Data View
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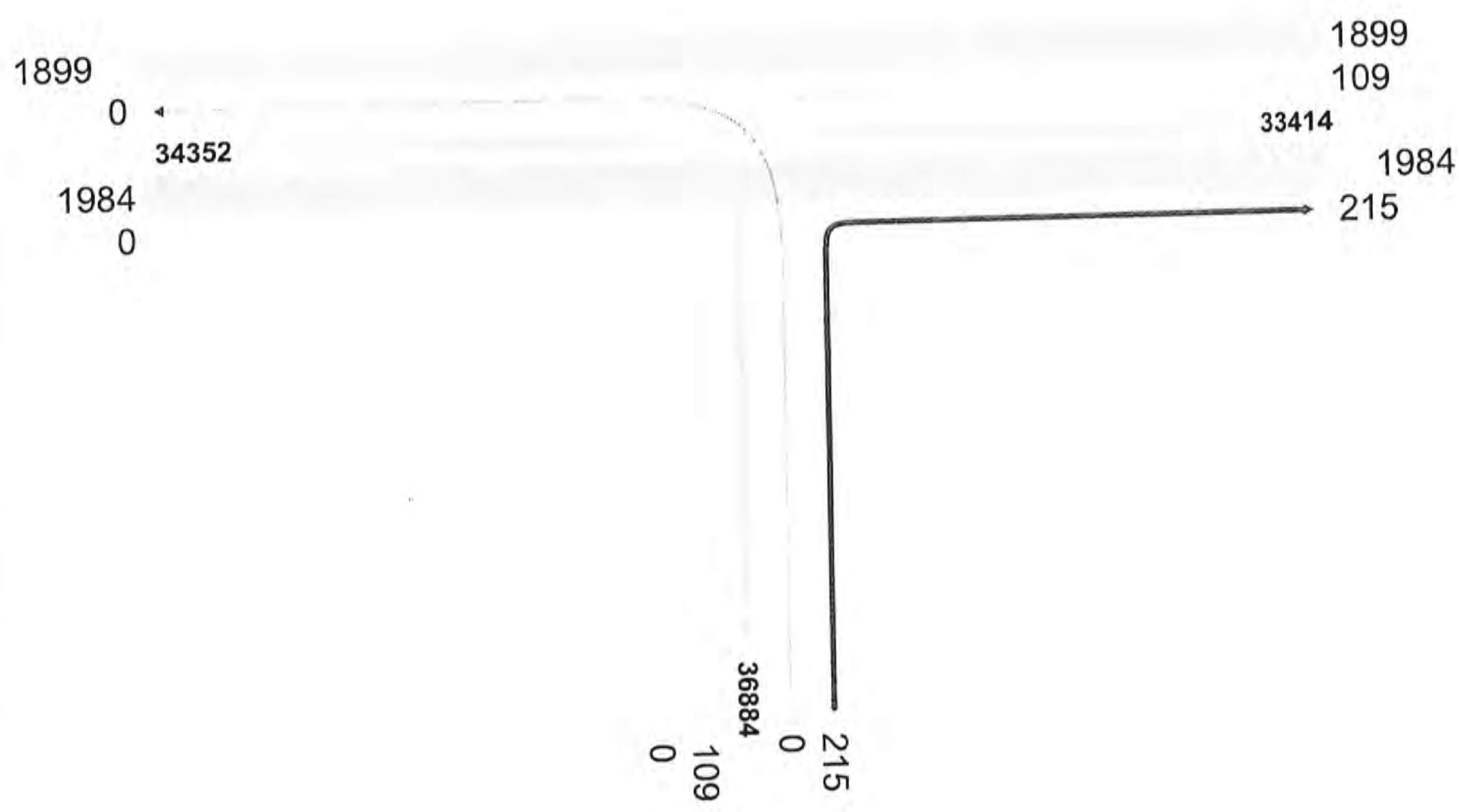
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

College & Oneida

2010



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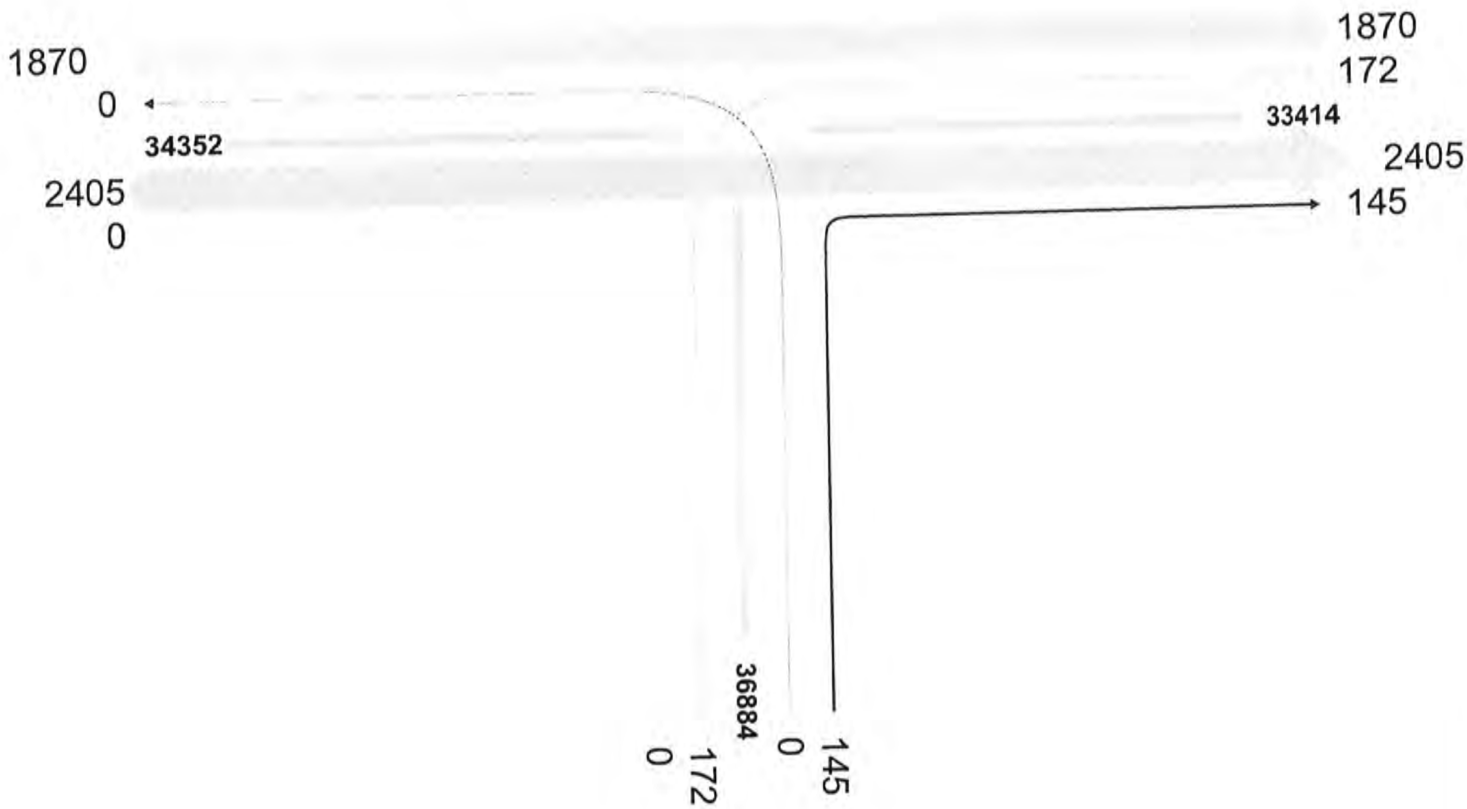
Intersection Data: P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECWRF

Intersection Data View
Node Number : 33413
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

College & Oneida
2045

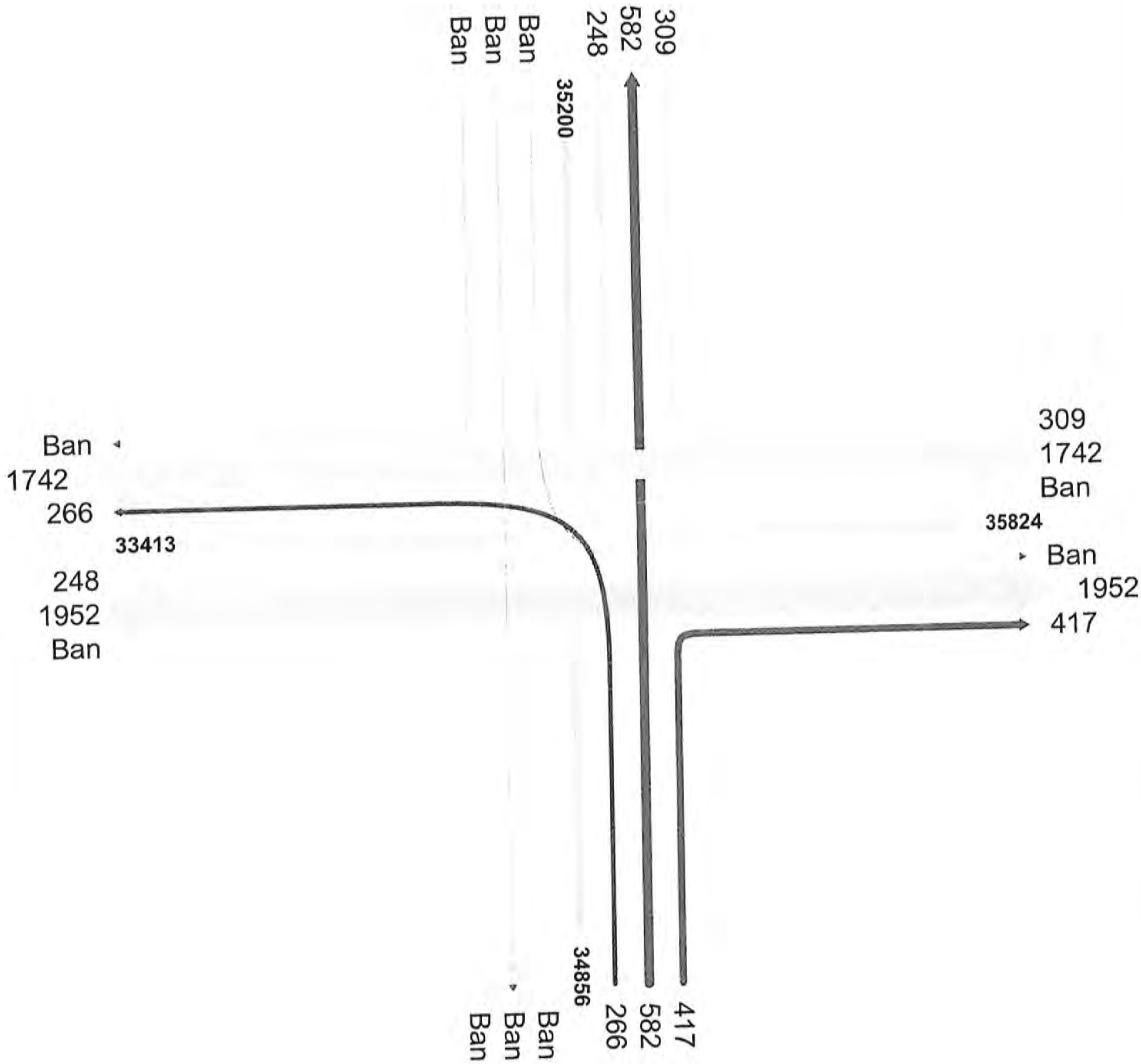


1/3/2016 7:50 AM P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECWR
Intersection Data: P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECWRF

Intersection Data View
Node Number : 33414
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

College & Morrison

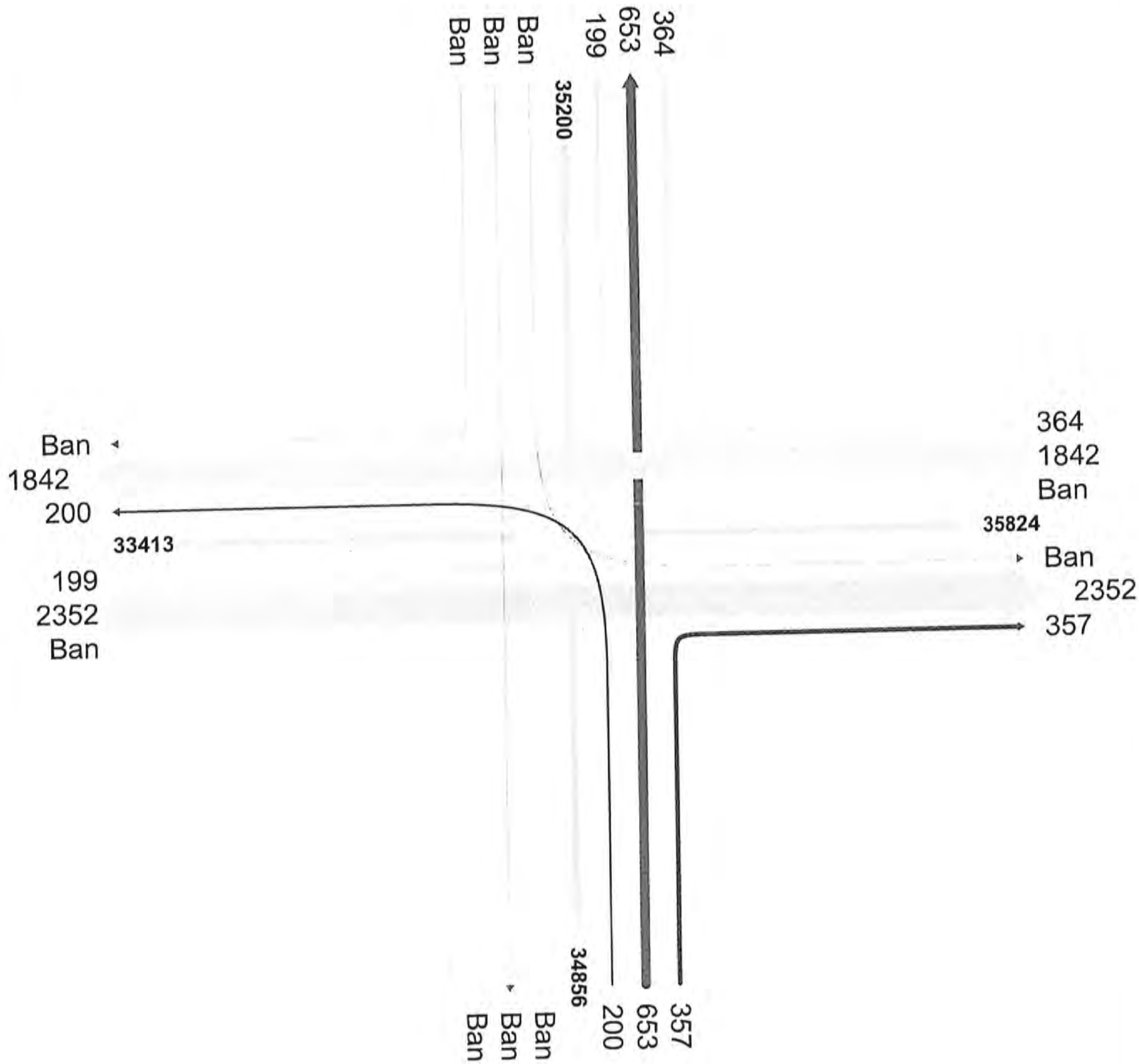
2010



12/31/2015 9:11 AM P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECW
Intersection Data: P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECWRF

Intersection Data View
Node Number : 33414
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

College & Morrison
2045

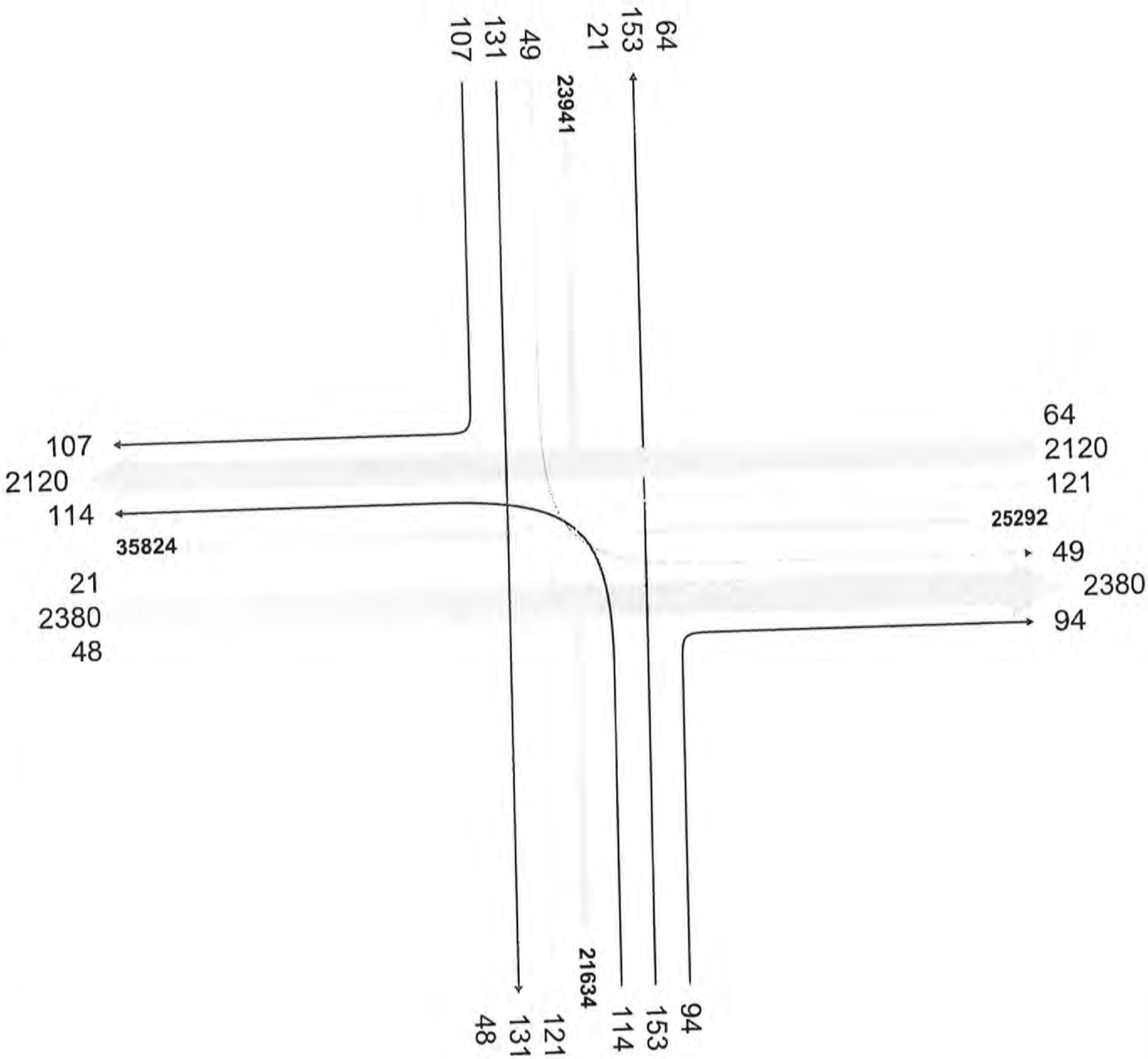


1/2/2016 10:36 AM P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECWI
Intersection Data: P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECWRF

Intersection Data View
Node Number : 21633
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

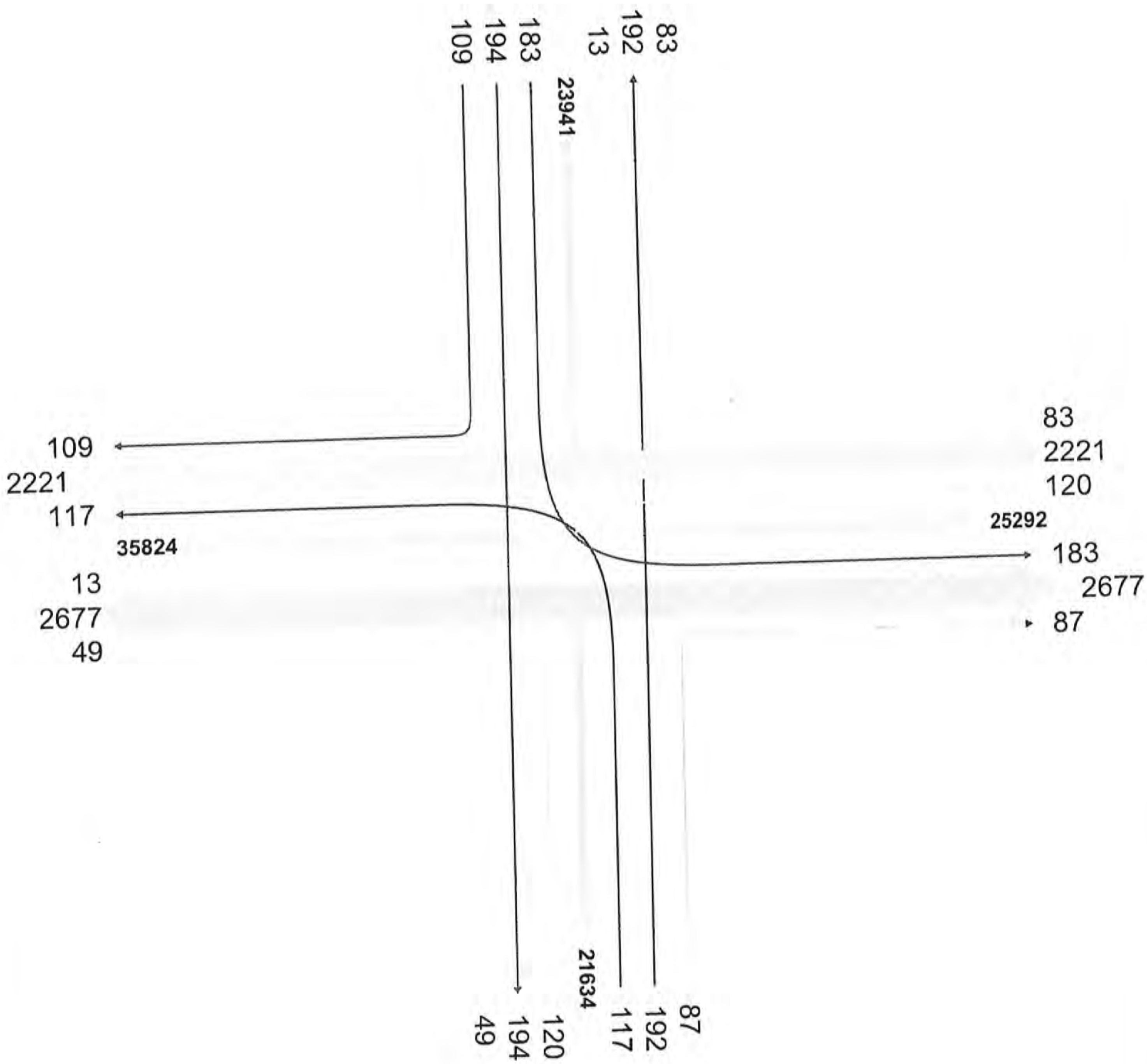
College & Drew

2010



Intersection Data View
Node Number : 21633
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

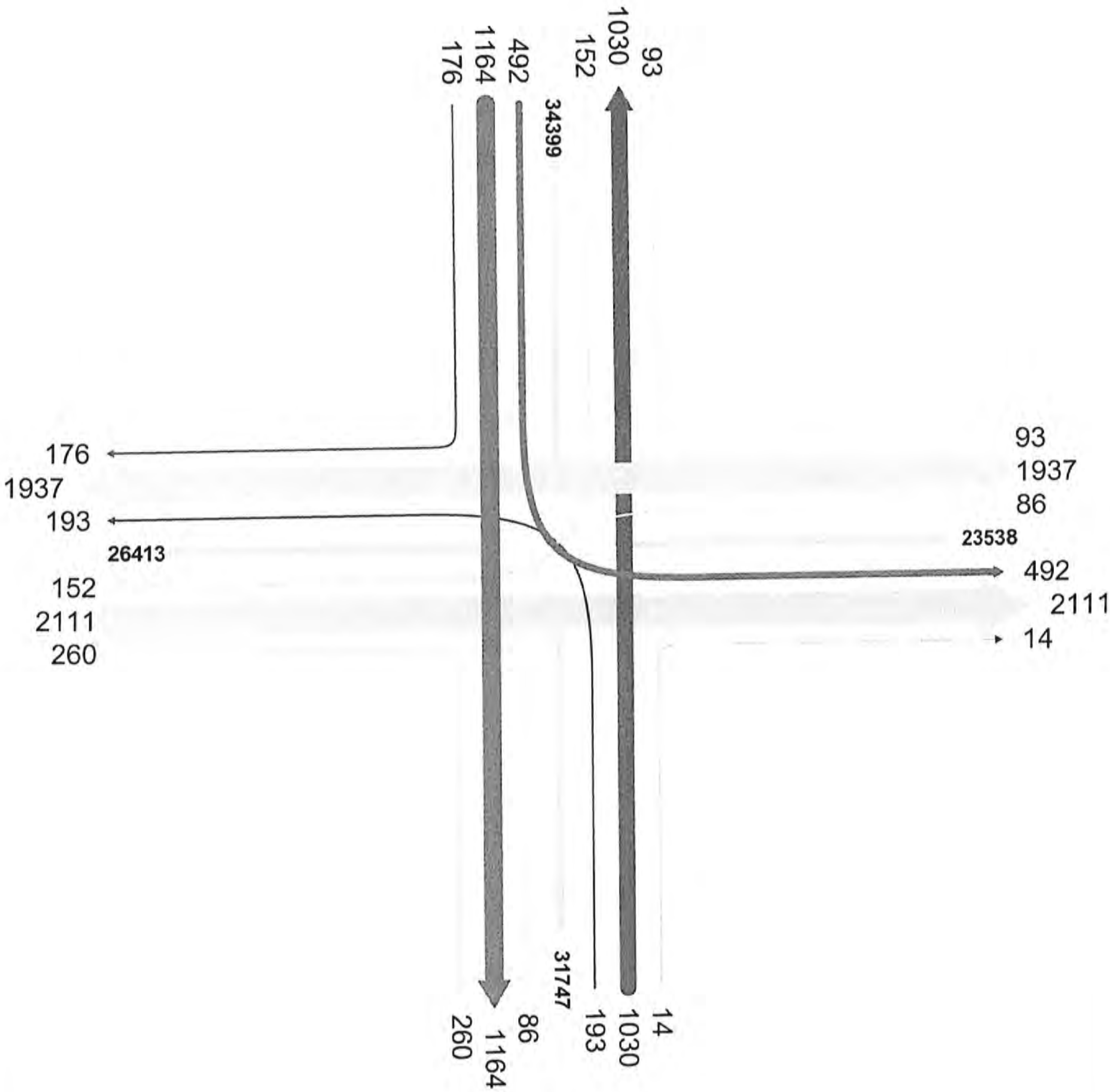
College & Drew
2045



1/2/2016 10:37 AM P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECWI
Intersection Data: P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECWRI

Intersection Data View
Node Number : 26414
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

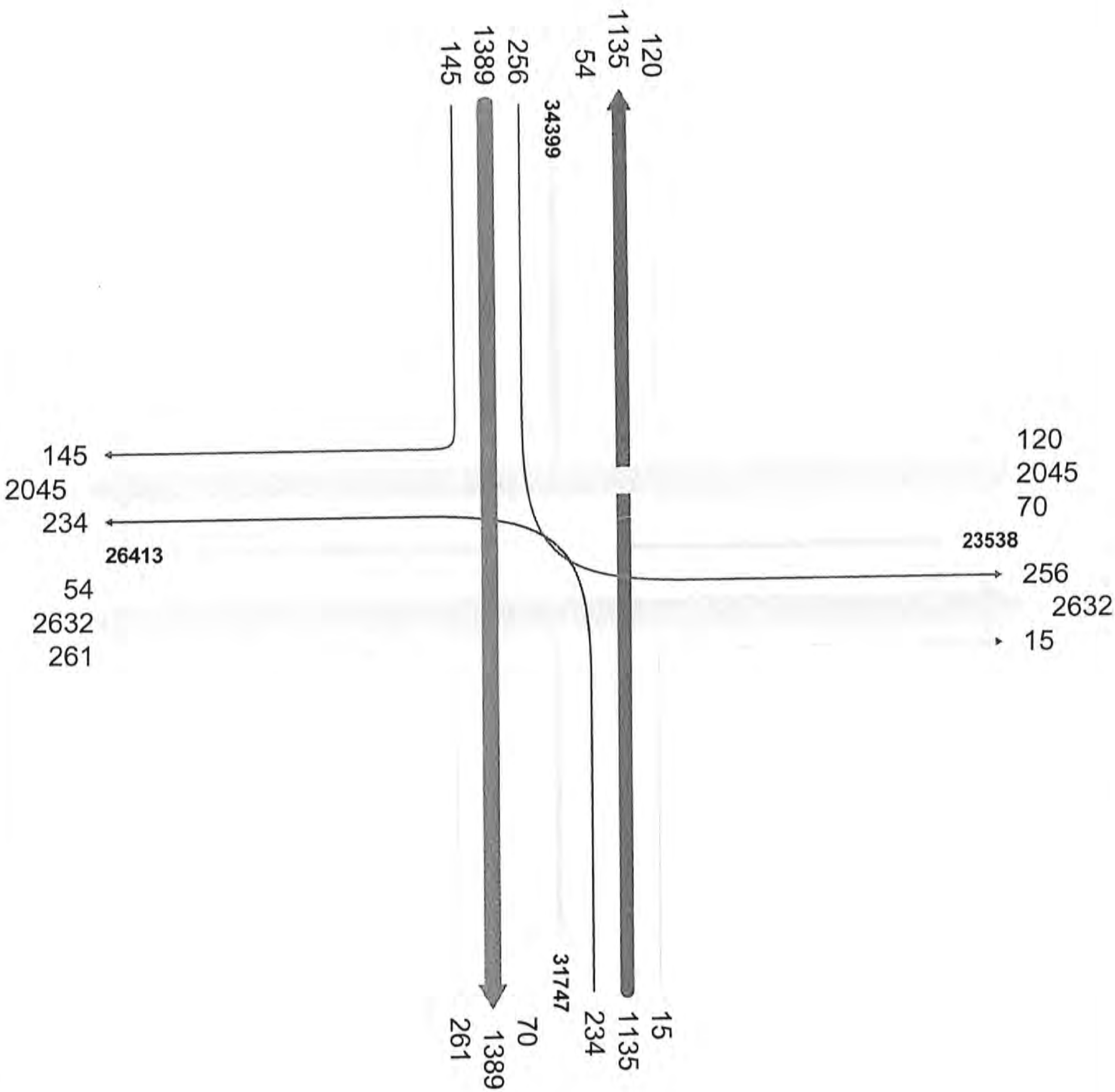
College & Lawe
2010



12/31/2015 9:01 AM P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECW
Intersection Data: P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECWRF

Intersection Data View
Node Number : 26414
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

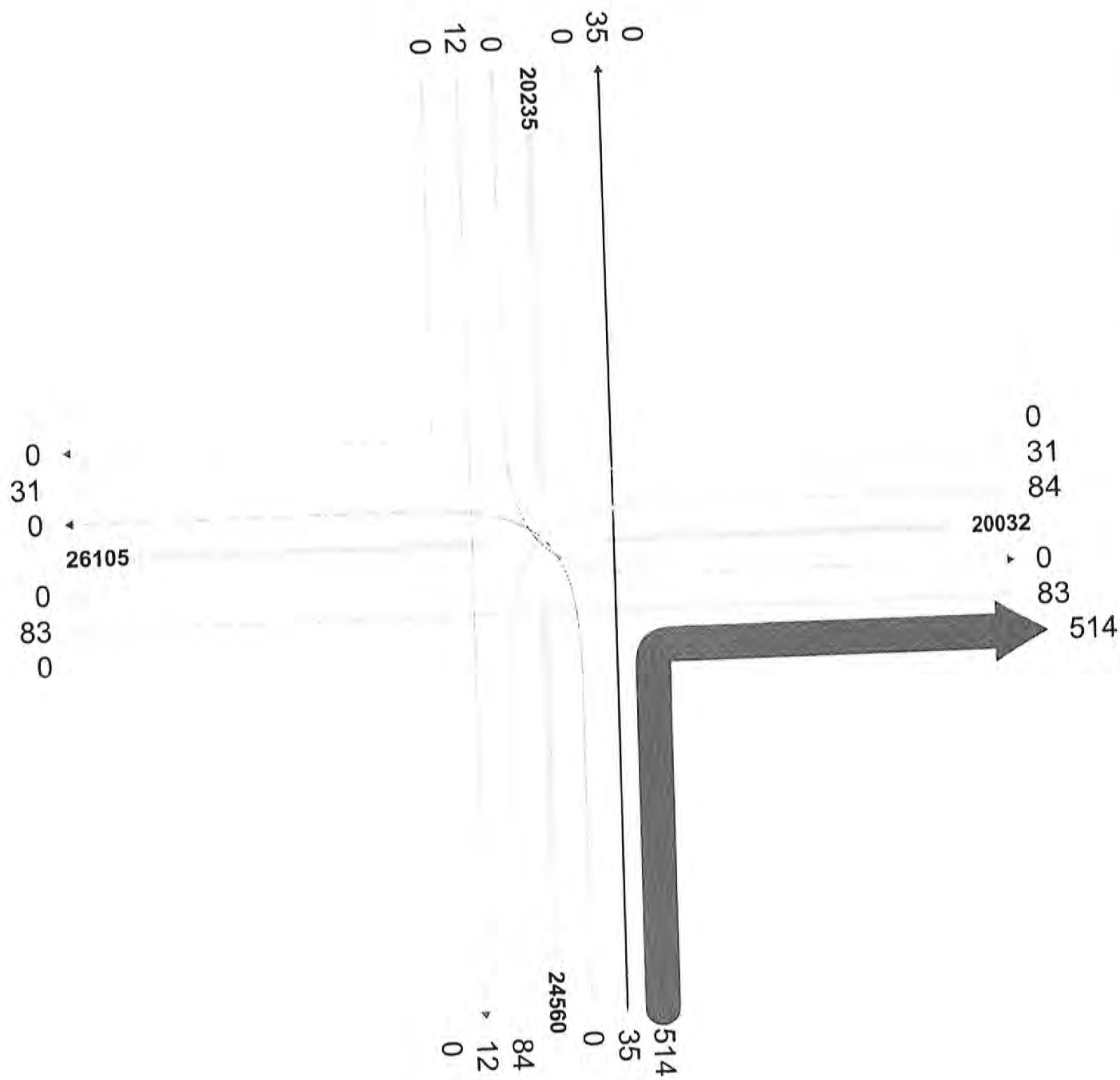
College & Lawe
2045



1/2/2016 10:38 AM P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECWI
Intersection Data: P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECWRF

Intersection Data View
Node Number : 20031
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

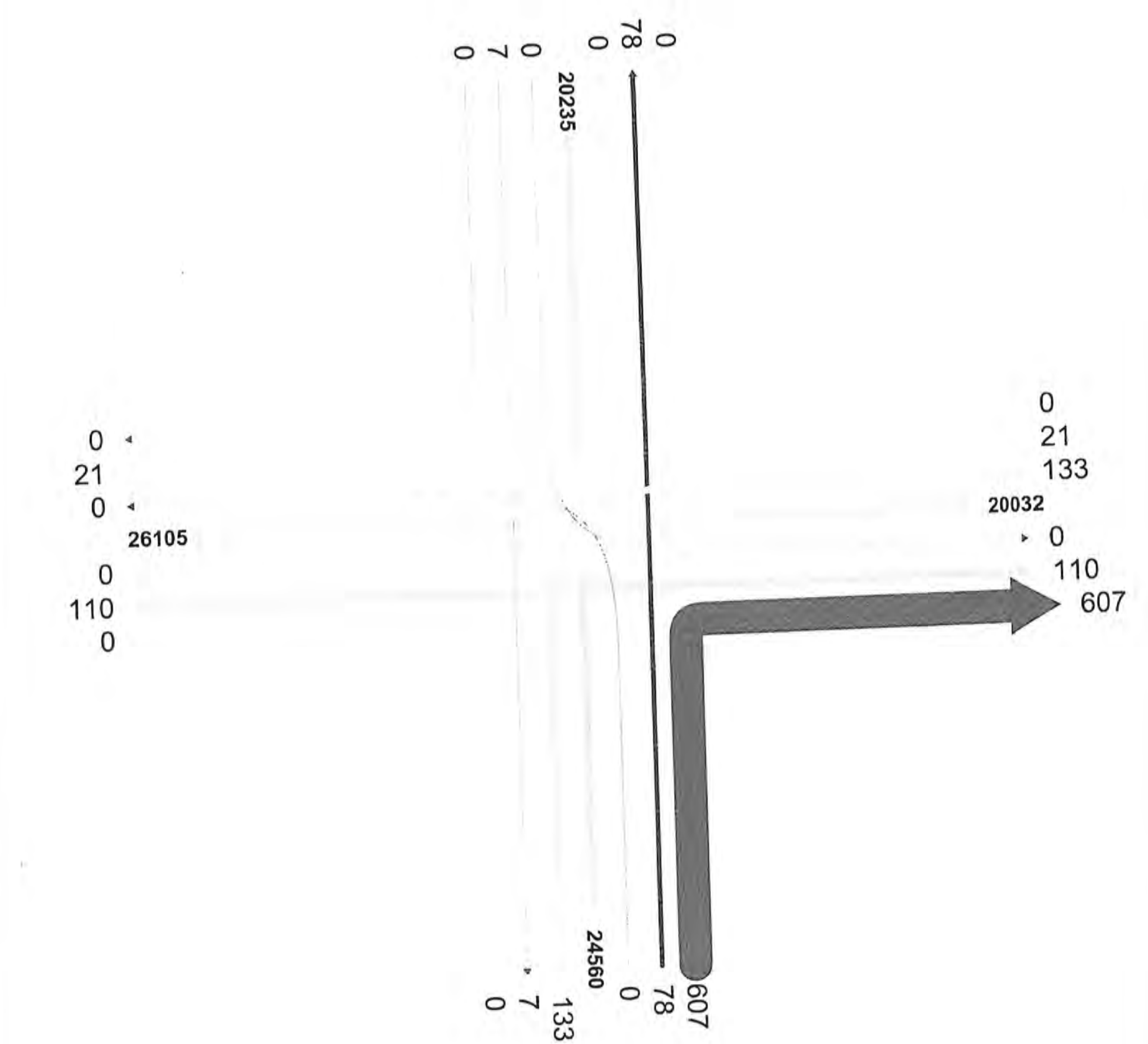
Washington & Superior
2010



12/31/2015 8:33 AM P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECV
Intersection Data: P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECWRF

Intersection Data View
Node Number : 20031
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

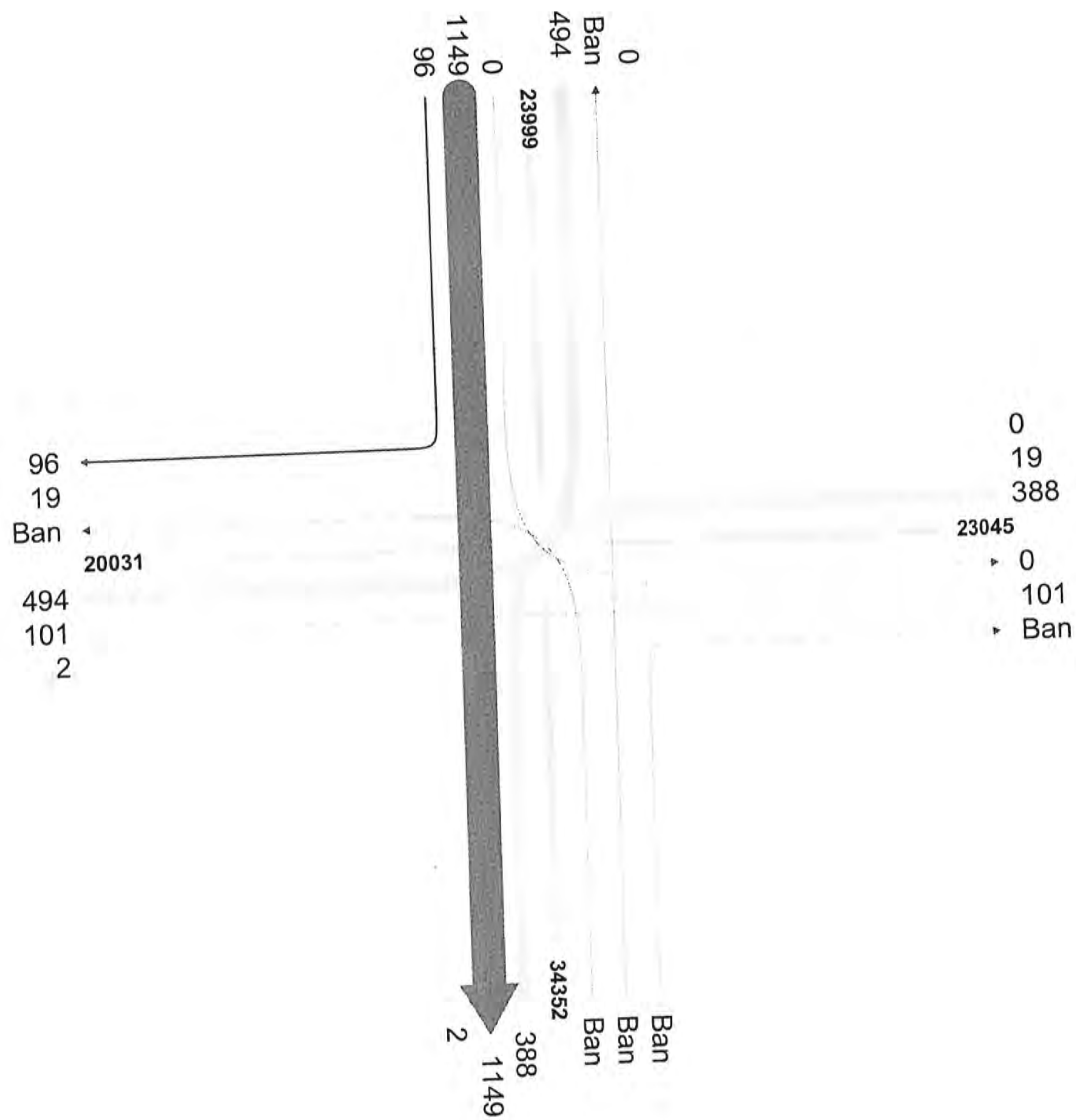
Washington & Superior
2045



1/2/2016 10:28 AM P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECWI
Intersection Data: P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECWRF

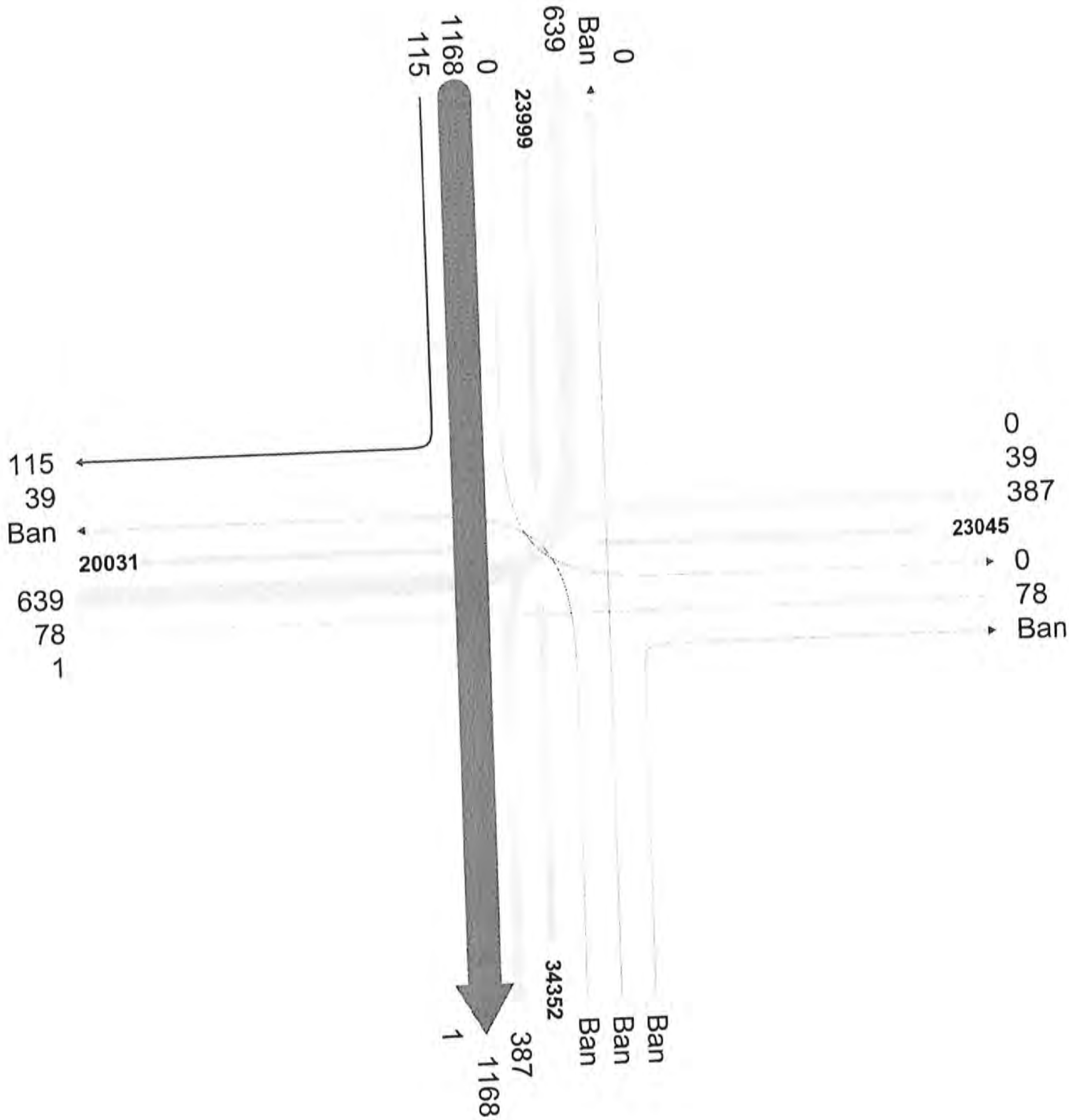
Intersection Data View
Node Number : 20032
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

Washington & Appleton
2010



Intersection Data View
Node Number : 20032
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

Washington & Appleton
2045

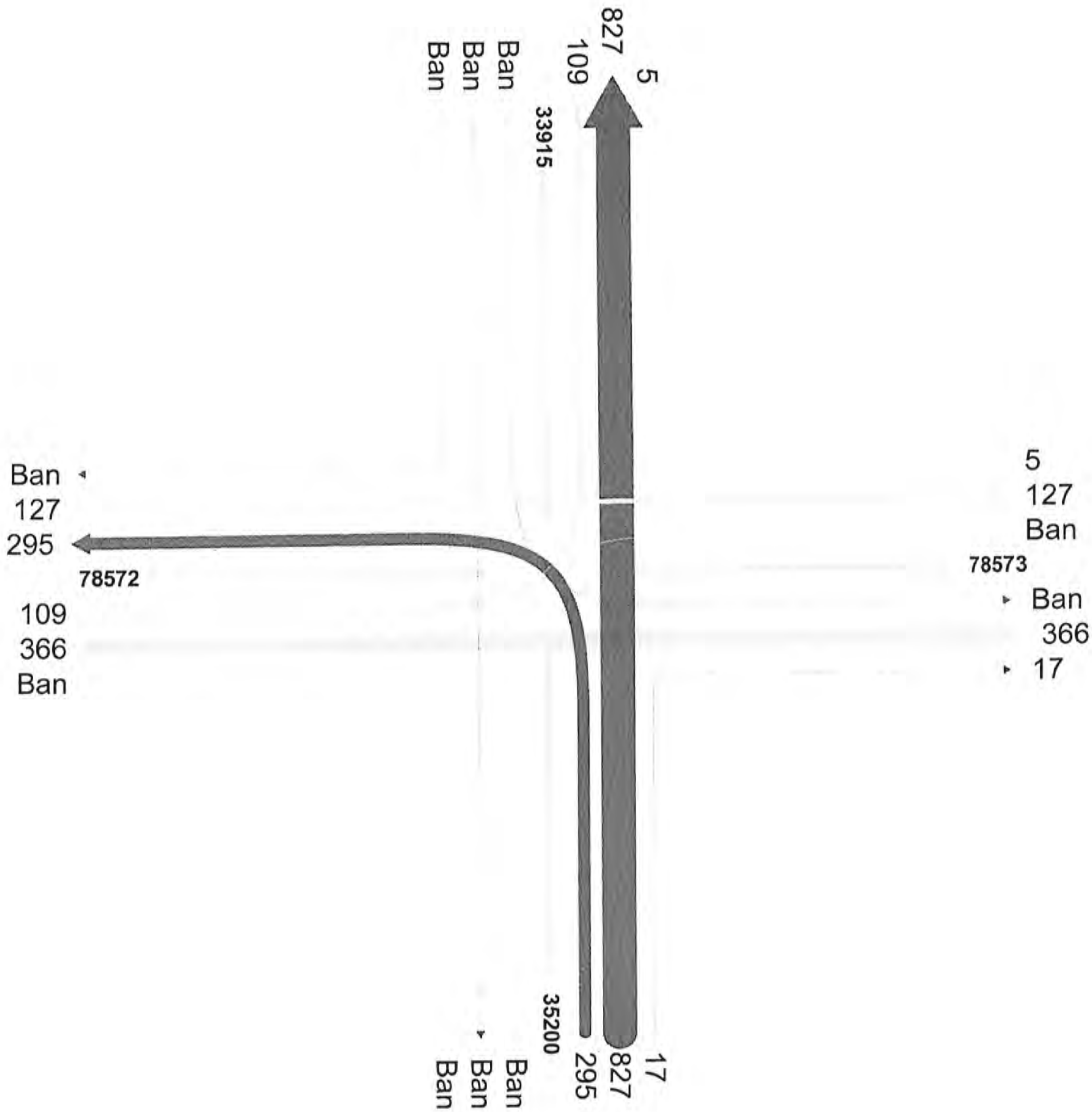


1/2/2016 10:29 AM P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECWI
Intersection Data: P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECWRI

Intersection Data View
Node Number : 33296
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

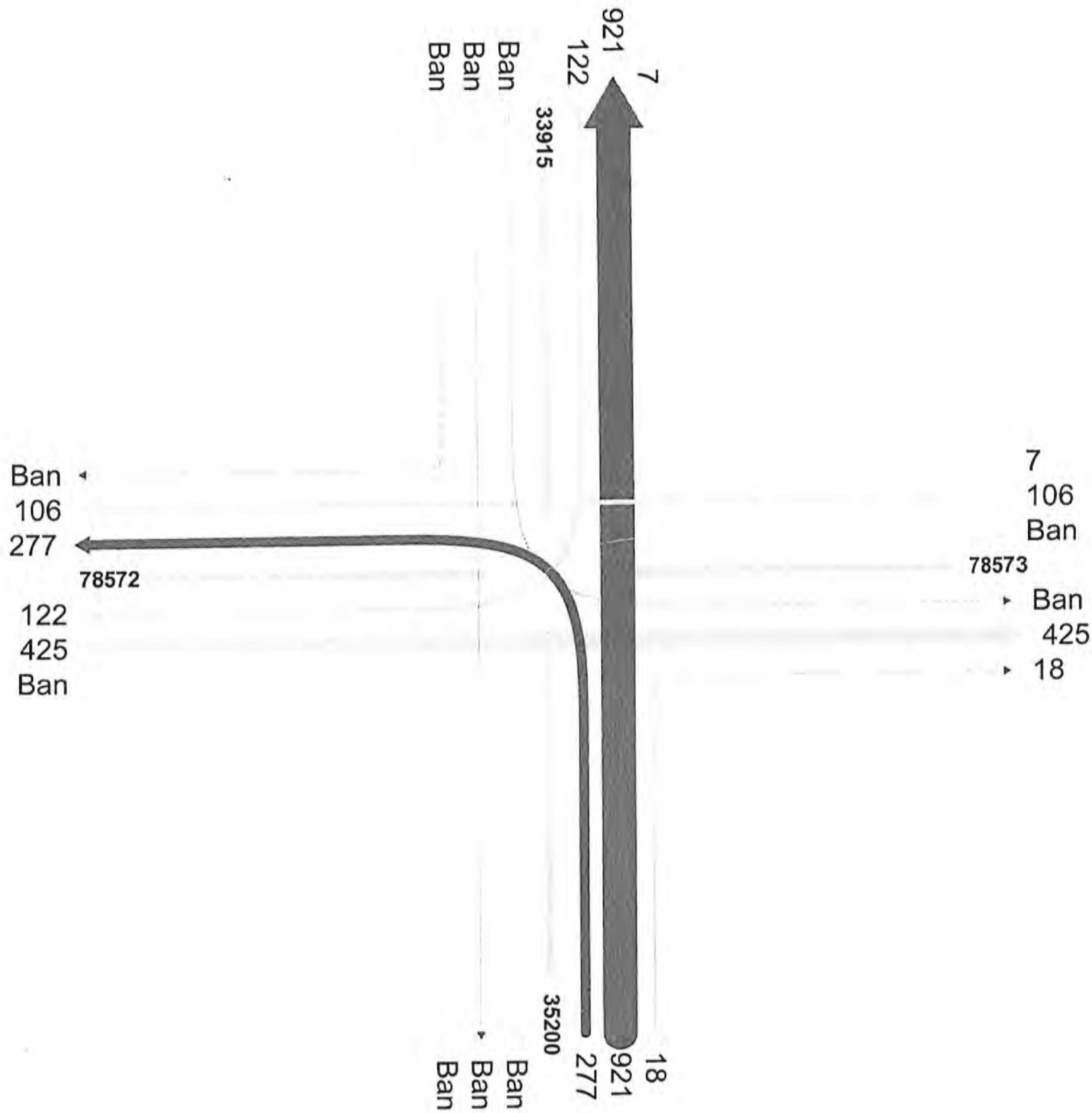
Washington & Morrison

2010



Intersection Data View
Node Number : 33296
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

Washington & Morrison
2045

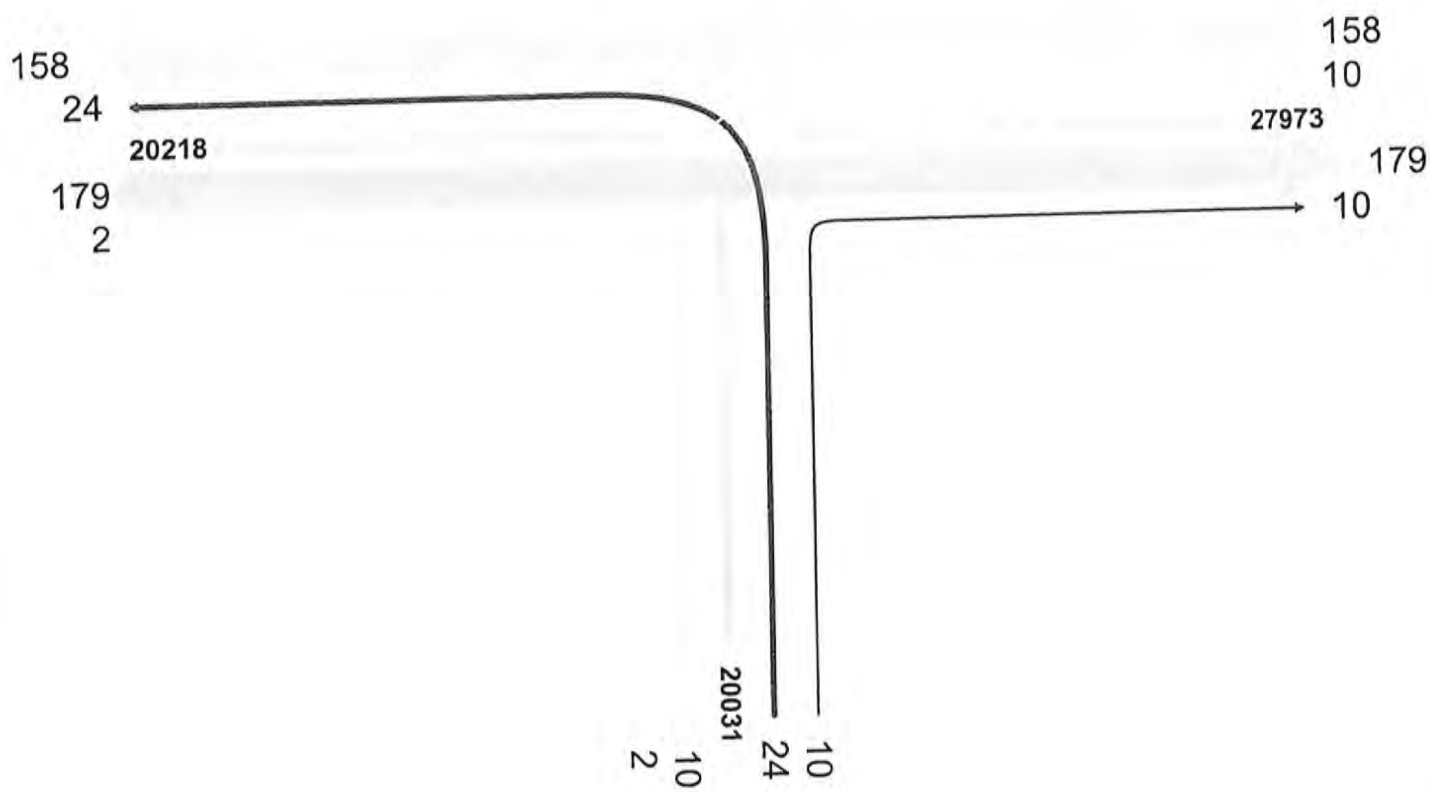


1/2/2016 10:30 AM P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECWI
Intersection Data: P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECWRF

Intersection Data View
Node Number : 20235
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

Franklin & Superior

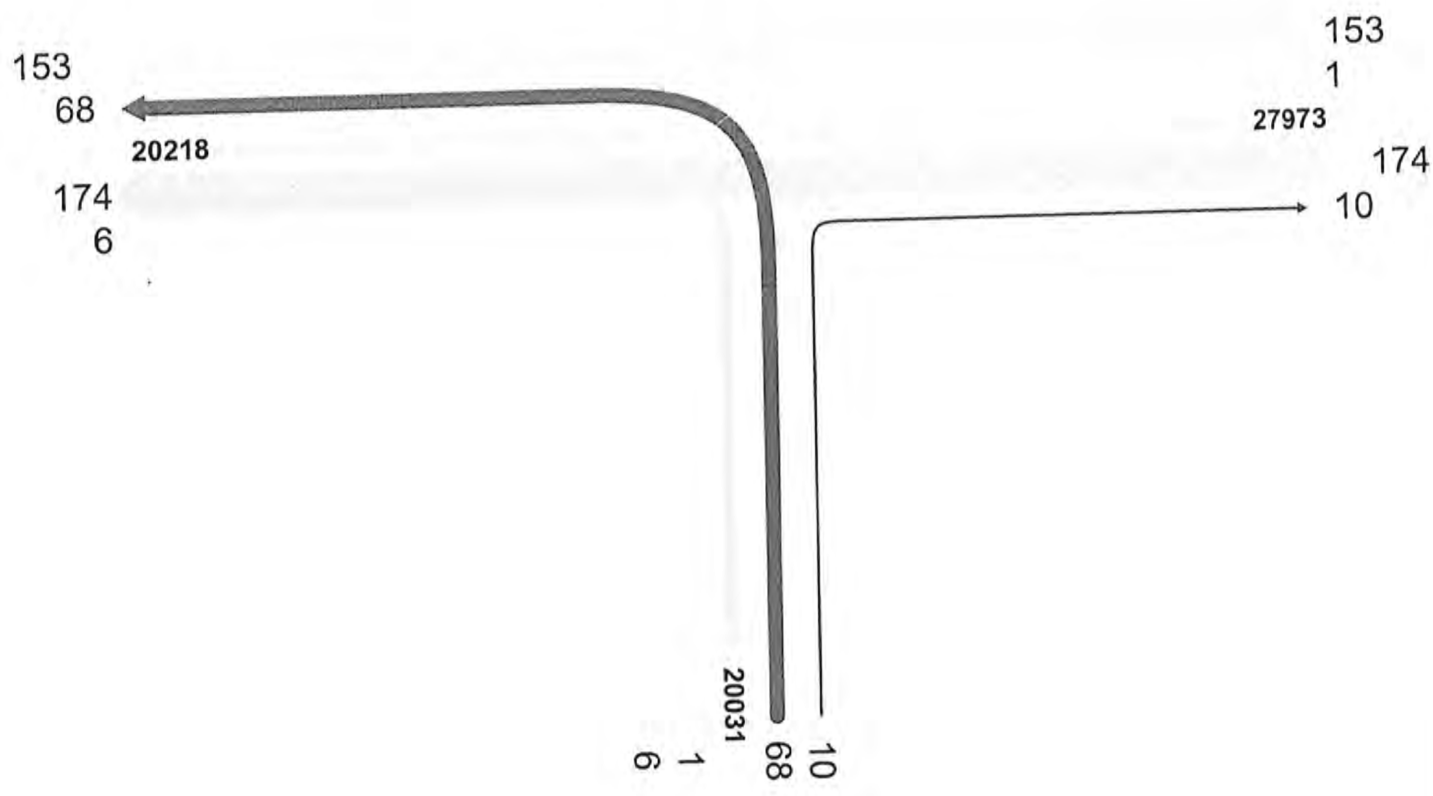
2010



12/31/2015 8:42 AM P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECW
Intersection Data: P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECWRF

Intersection Data View
Node Number : 20235
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

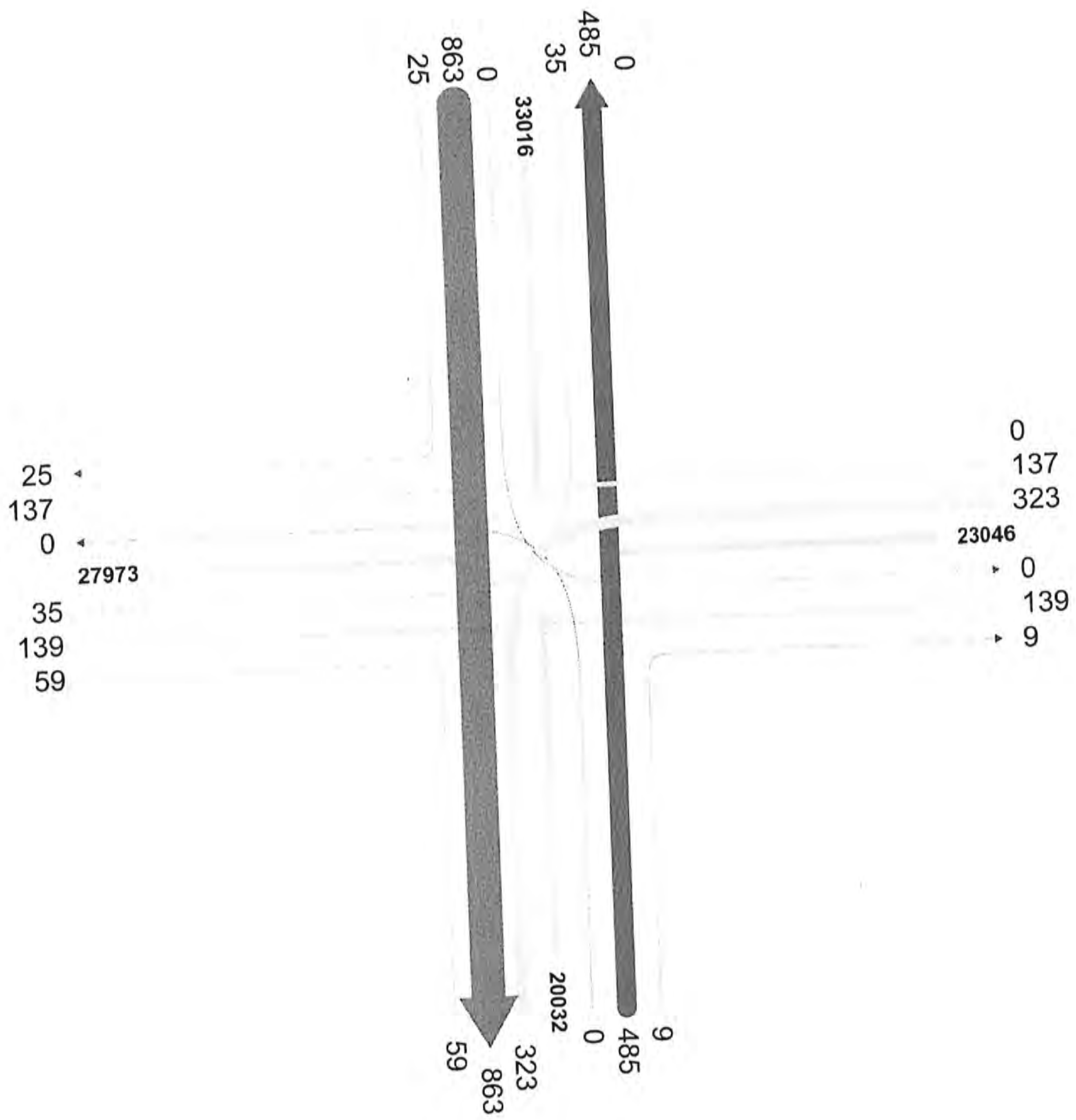
Franklin & Superior
2045



1/2/2016 10:24 AM P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECWI
Intersection Data: P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECWRF

Intersection Data View
Node Number : 23999
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

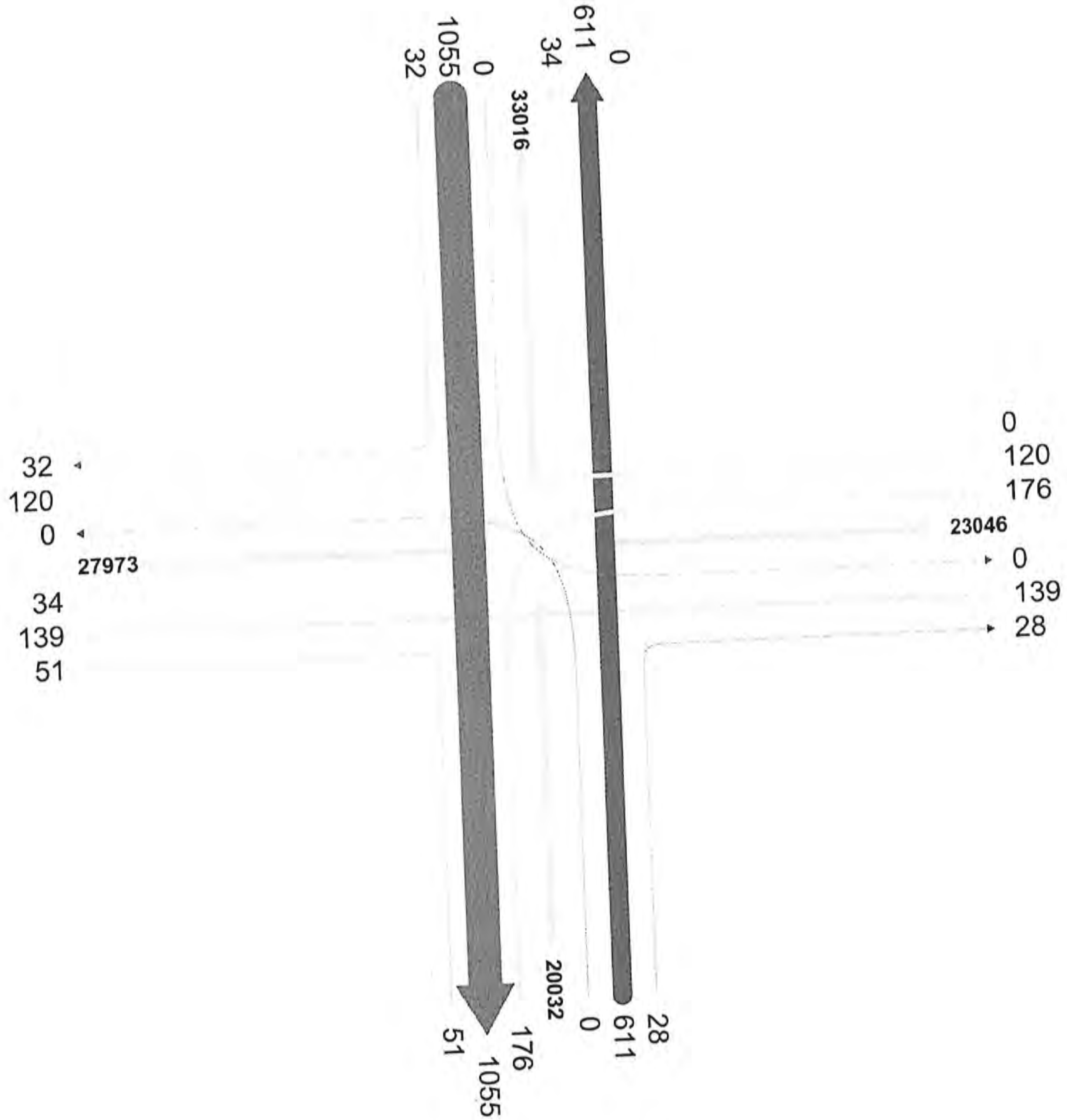
Franklin & Appleton
2010



12/31/2015 8:53 AM P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECW
Intersection Data: P:\WisDOT NE Model 12-17-15\NE_Region_ECWRPC_WisDOT (2)\NE_Region_ECWRF

Intersection Data View
Node Number : 23999
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

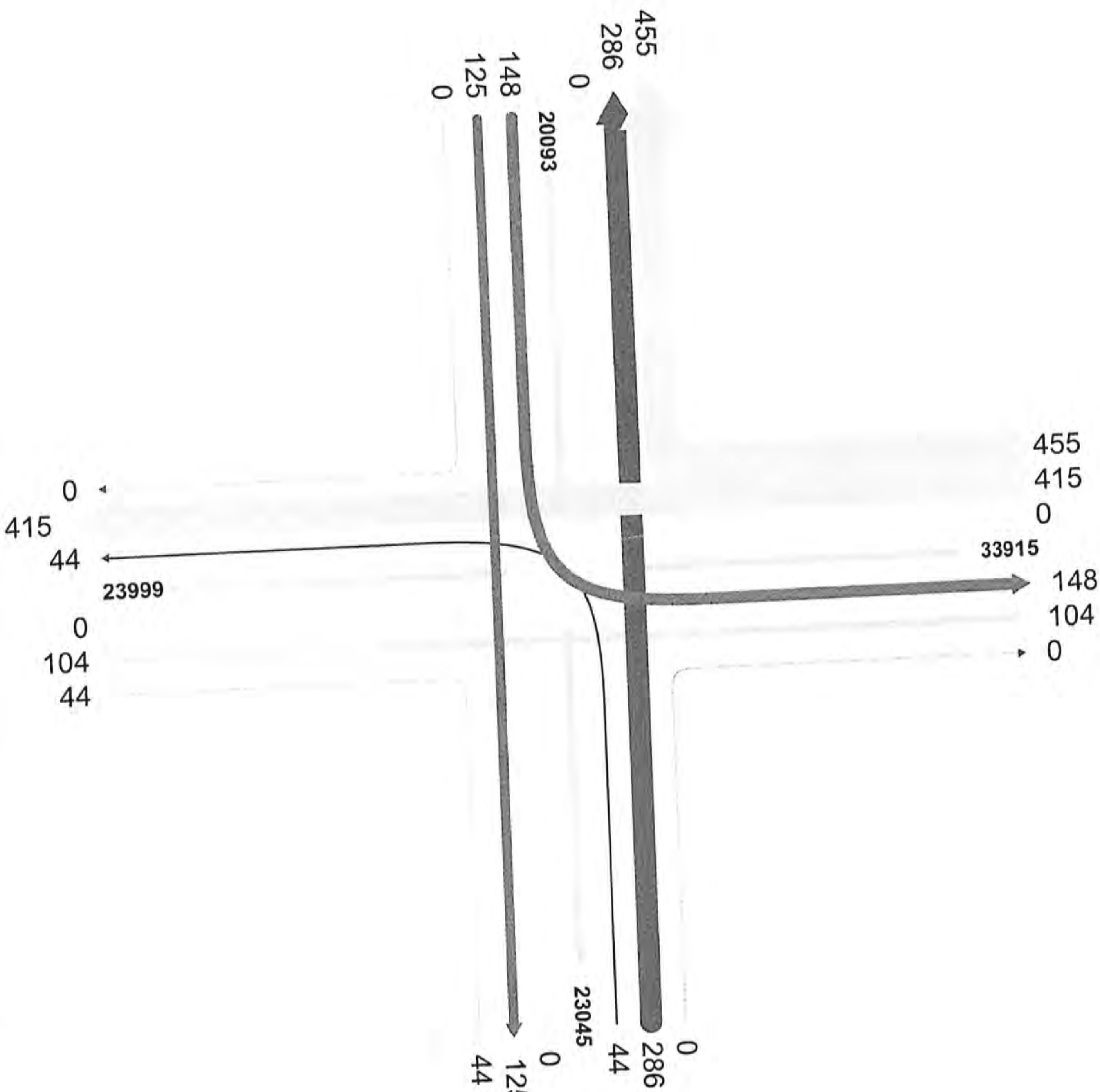
Franklin & Appleton
2045



Intersection Data View
Node Number : 23046
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

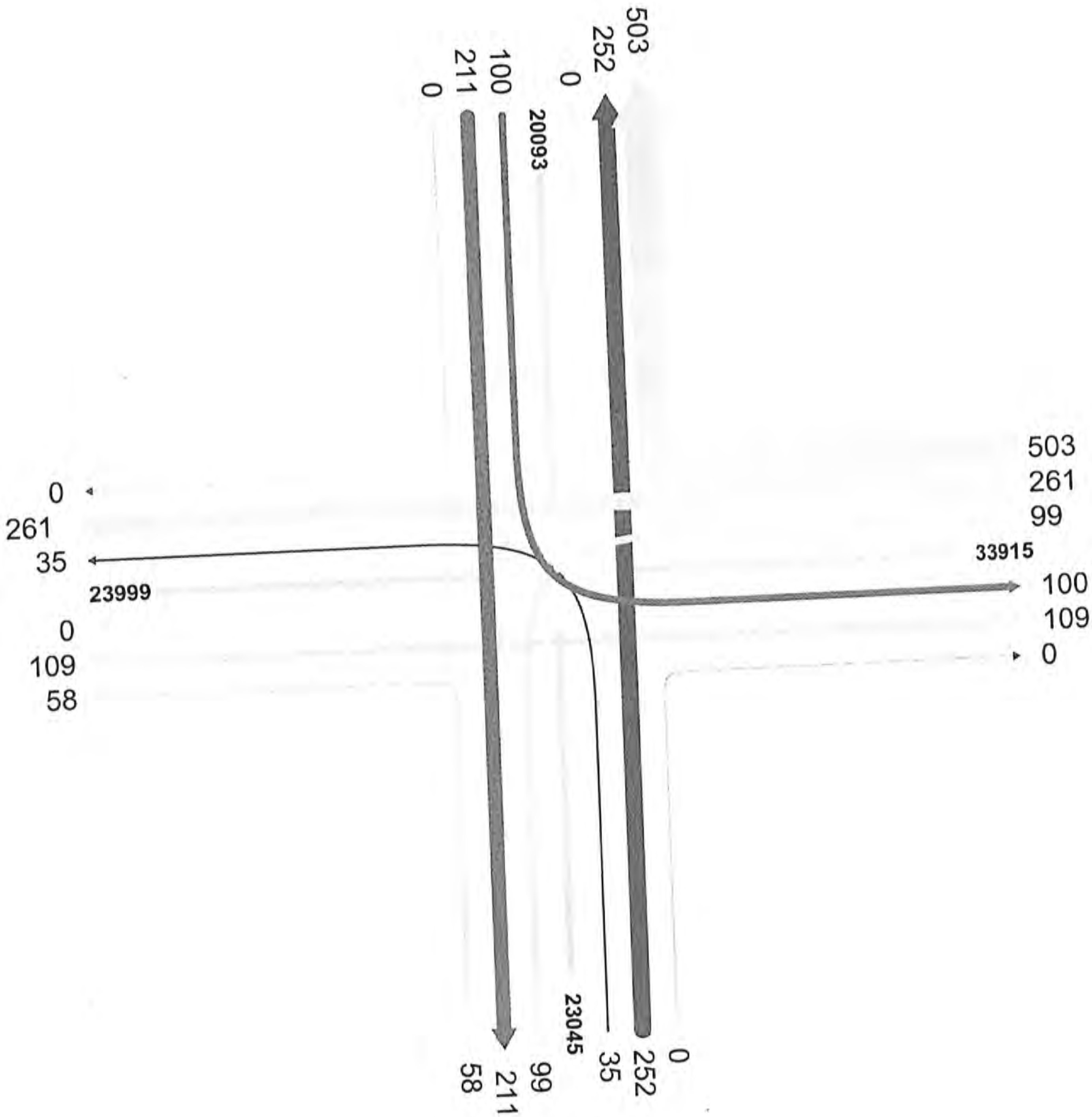
Franklin & Oneida

2010



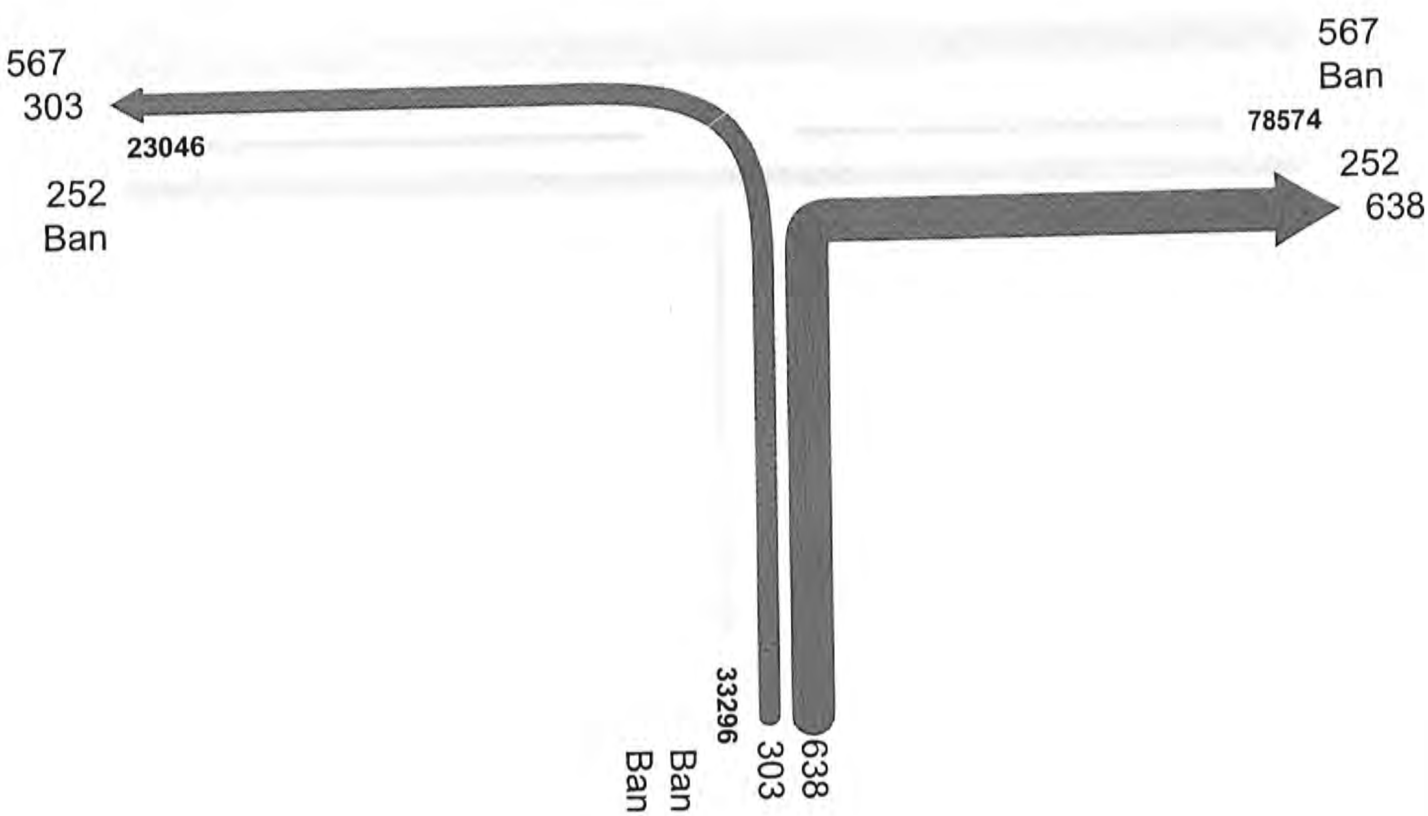
Intersection Data View
Node Number : 23046
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

Franklin & ONeida
2045



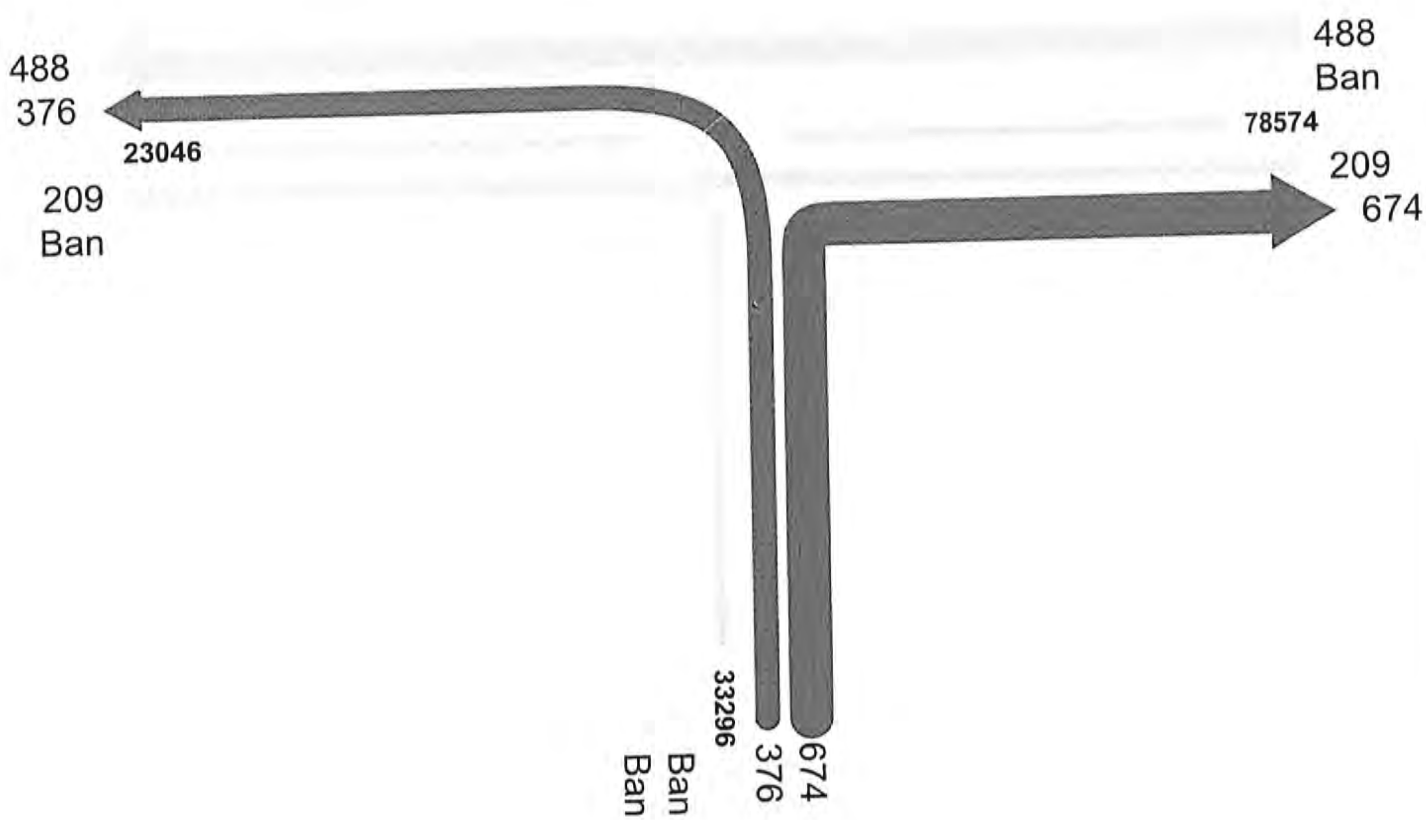
Intersection Data View
Node Number : 33915
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

Franklin & Morrison
2010



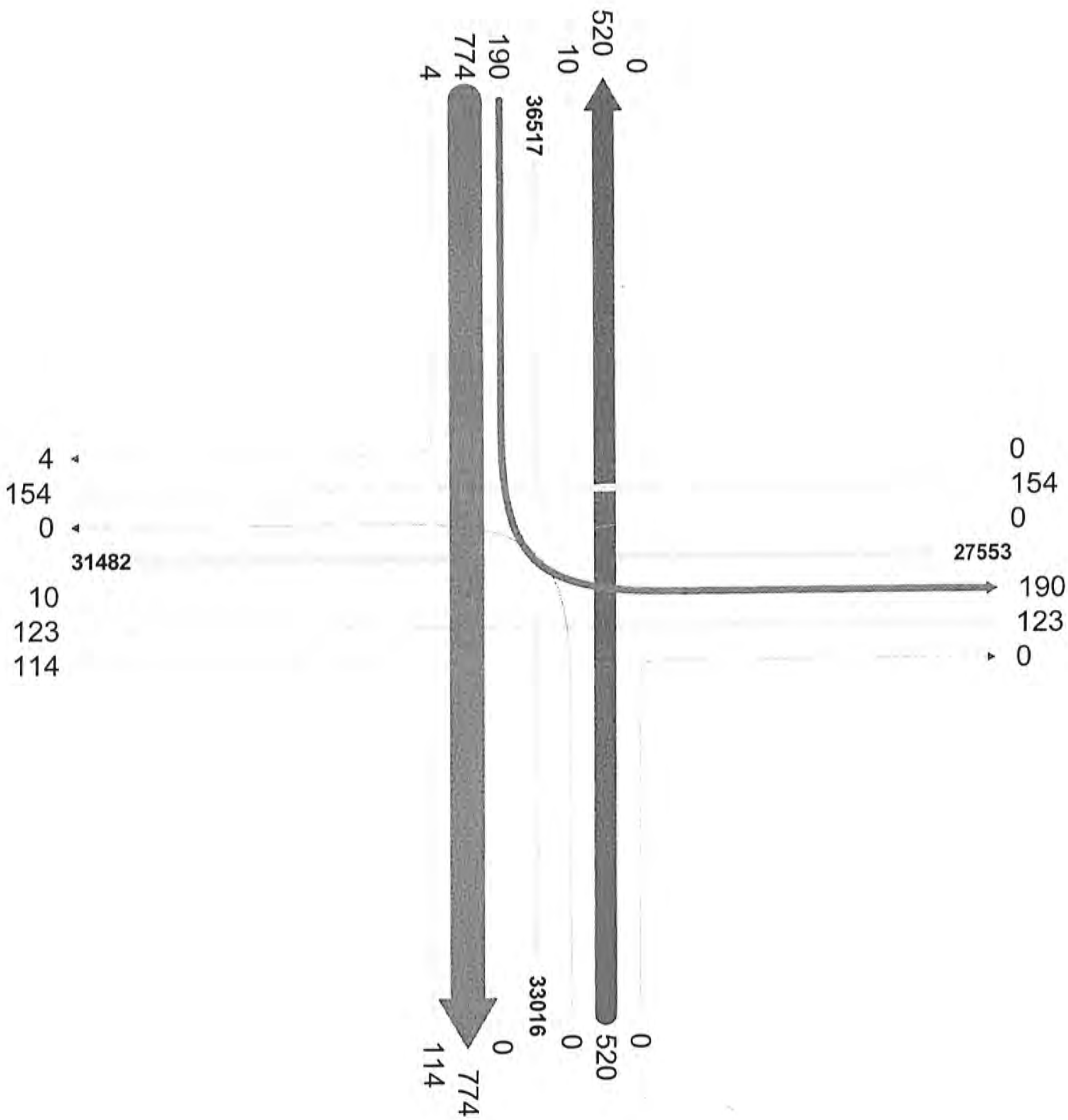
Intersection Data View
Node Number : 33915
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

Franklin & Morrison
2045



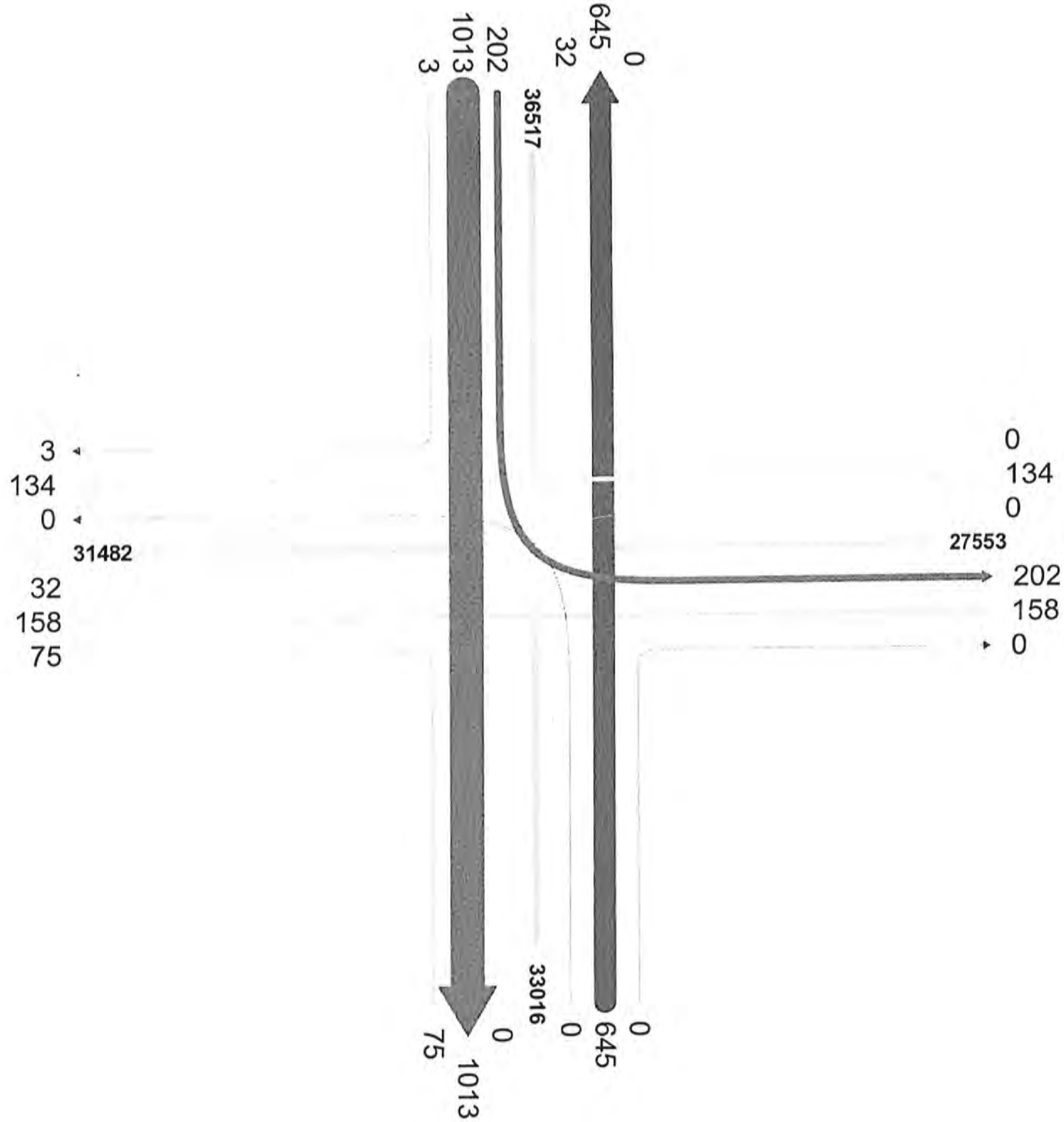
Intersection Data View
Node Number : 27554
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

Packard & Appleton
2010



Intersection Data View
Node Number : 27554
Intersection Type : Turn Flows Only;
Attribute : (Volume 1 + Volume 2 + Volume 3)

Packard & Appleton
2045



Appendix B

No-Build – Forecasted 2036

Traffic Volumes

AADT Forecast - 2036

Roadway	Between	....and	ECWRPC 2010 - AWDT	ECWRPC - 2045 AWDT	ECWRPC Percentage Increase	ECWRPC Annual Growth Rate	Applied Growth Rate	AADT - 2013	AADT - 2036
Appleton	Packard	Pacific	3158	3820	20.96%	0.55%	0.55%	3000	3400
Appleton	Prospect	Lawrence	6211	6643	6.96%	0.19%	0.25%	4800	5100
Atlantic	State	Division	1474	1640	11.23%	0.30%	0.30%	1800	1900
Atlantic	Drew	Drew	1790	1585.5	-11.42%	-0.35%	0.25%	1800	1900
College	State	Walnut	16422	19036	15.92%	0.42%	0.42%	14300	15800
College	Appleton	Oneida	14000	15714	12.24%	0.33%	0.33%	13800	14900
College	Drew	Lowe	15158	16904.5	11.52%	0.31%	0.31%	15000	16100
Division	Washington	Franklin	2000	1744	-12.83%	-0.39%	0.25%	2400	2500
Division	Packard	Atlantic	1500	1392.5	-7.17%	-0.21%	0.25%	1400	1500
Drew	Washington	Franklin	4422	4408	-0.33%	-0.01%	0.25%	4200	4400
Durkee	Franklin	Harris	884	793.5	-10.24%	-0.31%	0.25%	430	500
Franklin	State	Division	5790	5717	-1.26%	-0.04%	0.25%	4700	5000
Franklin	Appleton	Oneida	4210	3895.5	-7.47%	-0.22%	0.25%	4000	4200
Franklin	Drew	Park	3578	3830.5	7.06%	0.20%	0.25%	3400	3600
Lawrence	Walnut	Elm	3264	3358	2.88%	0.08%	0.25%	3300	3500
Lowe	Eldorado	Franklin	7474	8062.5	7.87%	0.22%	0.25%	6600	7000
Morrison	North	Pacific					0.40%	2400	2600
Morrison	Lawrence	College					0.30%	4500	4800
Morrison	College	Washington					0.30%	2900	3100
Oneida	Prospect	Lawrence	4316	4776.5	10.67%	0.29%	0.29%	3800	4100
Oneida	Franklin	Harris	990	935	-5.56%	-0.16%	0.25%	1290	1400
Pacific	Durkee	Drew					0.25%	3200	3400
Packard	State	Garfield	3684	3749	1.75%	0.05%	0.25%	4100	4300
Packard	Appleton	Oneida	2000	1853	-7.35%	-0.22%	0.25%	1900	2000
Packard	Drew	Bateman					0.25%	2300	2400
Prospect	Walnut	Fifth					0.25%	3000	3200
Prospect	Sixth	Oneida	7368	7476	1.47%	0.04%	0.25%	7800	8300
Richmond	Fifth	Fifth	16210	17730	9.37%	0.26%	0.26%	18500	19600
Richmond	Atlantic	Packard	19264	20274	5.24%	0.15%	0.25%	17500	18500
Richmond	Franklin	Franklin	17474	18380	5.18%	0.14%	0.25%	16800	17800
Sixth	State	Walnut	5052	5401.5	6.92%	0.19%	0.25%	5800	6100
State	Eighth	Lawrence					0.25%	2120	2200
State	Johnston	Franklin					0.25%	1970	2100
State	Packard	Atlantic					0.25%	3300	3500
Superior	Franklin	Packard					0.25%	970	1000
Washington	Oneida	Oneida	2258	1956	-13.37%	-0.41%	0.25%	2600	2800
Water	-	-	1790	2110	17.85%	0.47%	0.47%	1700	1900

l growth rate was applied to AADT counts.

No ECWRPC data available, annual growth rates from nearby/similar roadways was applied, or used minimum of 0.25%.

Traffic Volumes & Projections - No-Build
Appleton St. & Lawrence St.

	Lawrence EB				Lawrence WB				Appleton NB				Appleton SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	0	130	138	268	49	65	0	114	0	0	0	0	24	427	56	507
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	0	146	208	354	67	77	0	144	0	0	0	0	25	452	59	537
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	0	74	542		96	346	0		0	0	0		15	1674	0	
PM (3hr) - 2045	0	90	1073		162	458	0		0	0	0		15	1802	0	
ECWRPC Percent Increase		21.6%	98.0%		68.8%	32.4%							0.0%	7.6%		
PM - Applied Growth Rate		21.62%	97.97%		68.75%	32.37%							10.00%	10.00%		
Annual Growth Rate		0.56%	1.97%		1.51%	0.80%							0.27%	0.27%	0.27%	

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Input Data
AECOM Adjustments

Speed Limits
Lawrence = 25 MPH
Appleton = 25 MPH

Traffic Volumes & Projections - No-Build
Appleton St. & College Ave.

	College EB				College WB				Appleton NB				Appleton SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	0	661	77	738	54	536	0	590	0	0	0	0	63	351	165	579
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	0	753	142	895	57	568	0	625	0	0	0	0	67	372	184	622
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	0	1918	152		300	1599	0		0	0	0		66	1237	236	
PM (3hr) - 2045	0	2383	423		142	1728	0		0	0	0		22	1253	282	
ECWRPC Percent Increase		24.2%	178.3%		-52.7%	8.1%							-66.7%	1.3%	19.5%	
PM - Applied Growth Rate		24.24%	178.29%		10.00%	10.00%							10.00%	10.00%	19.49%	
Annual Growth Rate		0.62%	2.97%		0.27%	0.27%							0.27%	0.27%	0.51%	

Input Data
AECOM Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits
College = 25 MPH
Appleton = 25 MPH

Traffic Volumes & Projections - No-Build
Appleton St. & Washington St.

	Washington EB				Washington WB				Appleton NB				Appleton SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	17	33	59	109	209	55	39	303	1	50	18	69	16	335	4	355
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	20	35	62	117	221	85	41	347	1	53	19	73	17	355	4	376
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	494	101	2		388	19	0		1	1	1		1	1149	96	
PM (3hr) - 2045	639	78	1		387	39	0		1	1	1		1	1168	115	
ECWRPC Percent Increase	29.4%	-22.8%	-50.0%		-0.3%	105.3%			0.0%	0.0%	0.0%		0.0%	1.7%	19.8%	
PM - Applied Growth Rate	29.35%	10.00%	10.00%		10.00%	105.26%			10.00%	10.00%	10.00%		10.00%	10.00%	19.79%	
Annual Growth Rate	0.74%	0.27%	0.27%		0.27%	2.08%	0.27%		0.27%	0.27%	0.27%		0.27%	0.27%	0.52%	

Input Data
AECOM Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits
Washington = 25 MPH
Appleton = 25 MPH

Traffic Volumes & Projections - No-Build
Appleton St. & Franklin St.

	Franklin EB				Franklin WB				Appleton NB				Appleton SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	33	149	59		25	200	3	228	56	94	8	158	10	242	16	268
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	35	158	62	255	26	212	3	241	59	108	16	183	11	273	19	302
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	35	139	59		323	137	0		0	485	9		0	863	25	
PM (3hr) - 2045	34	139	51		176	120	0		0	611	28		0	1055	32	
ECWRPC Percent Increase	-2.9%	0.0%	-13.6%		-45.5%	-12.4%				26.0%	211.1%			22.2%	28.0%	
PM - Applied Growth Rate	10.00%	10.00%	10.00%		10.00%	10.00%				25.98%	211.11%			22.25%	28.00%	
Annual Growth Rate	0.27%	0.27%	0.27%		0.27%	0.27%	0.27%		0.27%	0.66%	3.30%		0.27%	0.58%	0.71%	

Input Data
AECOM Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits
Franklin = 25 MPH
Appleton = 25 MPH

Traffic Volumes & Projections - No-Build
Appleton St. & Packard St.

	Packard EB				Packard WB				Appleton NB				Appleton SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	30	88	34		3	98	0	101	40	119	5	164	8	211	32	251
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	60	102	36	199	3	104	0	107	42	135	5	183	8	248	34	290
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	10	123	114		0	154	0		0	520	0		190	774	4	
PM (3hr) - 2045	32	158	75		0	134	0		0	645	0		202	1013	3	
ECWRPC Percent Increase	220.0%	28.5%	-34.2%			-13.0%				24.0%			6.3%	30.9%	-25.0%	
PM - Applied Growth Rate	220.00%	28.46%	10.00%			10.00%				24.04%			10.00%	30.88%	10.00%	
Annual Growth Rate	3.38%	0.72%	0.27%		0.27%	0.27%	0.27%		0.27%	0.62%	0.27%		0.27%	0.77%	0.27%	

Input Data
AECOM Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits

Packard = 25 MPH   Appleton = 25 MPH

Traffic Volumes & Projections - No-Build
Morrison St. & Lawrence St.

	Washington EB				Washington WB				Appleton NB				Appleton SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	0	293	0	293	9	0	104	113	0	31	0	31	0	0	0	0
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	0	310	0	310	14	0	112	125	0	33	0	33	0	0	0	0
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	0	694	0		1	0	507		0	0	0		0	0	0	
PM (3hr) - 2045	0	704	0		2	0	570		0	0	0		0	0	0	
ECWRPC Percent Increase		1.4%			100.0%		12.4%									
PM - Applied Growth Rate		10.00%			100.00%		12.43%									
Annual Growth Rate		0.27%			2.00%		0.34%			0.27%						

Input Data
AECOM Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits

Washington	= 25 MPH	Appleton	= 25 MPH

Traffic Volumes & Projections - No-Build
Morrison St. & College Ave.

	College EB				College WB				Morrison NB				Morrison SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	63	712	0	775	0	507	41	548	57	139	139	335	0	0	0	0
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	67	796	0	863	0	537	45	582	60	149	147	356	0	0	0	0
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	248	1952	0		0	1742	309		266	582	417		0	0	0	
PM (3hr) - 2045	199	2352	0		0	1842	364		200	653	357		0	0	0	
ECWRPC Percent Increase	-19.8%	20.5%				5.7%	17.8%		-24.8%	12.2%	-14.4%					
PM - Applied Growth Rate	10.00%	20.49%				10.00%	17.80%		10.00%	12.20%	10.00%					
Annual Growth Rate	0.27%	0.53%				0.27%	0.47%		0.27%	0.33%	0.27%					

Input Data
AECOM Adjustment

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits

College = 25 MPH   Morrison = 25 MPH

Traffic Volumes & Projections - No-Build
Morrison St. & Washington St.

	Washington EB				Washington WB				Morrison NB				Morrison SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	7	163	0	170	0	75	11	86	91	65	24	180	0	0	0	0
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	7	178	0	186	0	79	13	93	96	69	25	191	0	0	0	0
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	109	366	0		0	127	5		295	827	17		0	0	0	
PM (3hr) - 2045	122	425	0		0	106	7		277	921	18		0	0	0	
ECWRPC Percent Increase	11.9%	16.1%				-16.5%	40.0%		-6.1%	11.4%	5.9%					
PM - Applied Growth Rate	11.93%	16.12%				10.00%	40.00%		10.00%	11.37%	10.00%					
Annual Growth Rate	0.32%	0.43%				0.27%	0.97%		0.27%	0.31%	0.27%					

Input Data
AECOM Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits

Washington = 25 MPH Morrison = 25 MPH

Traffic Volumes & Projections - No-Build
Morrison St. & Franklin St.

	Franklin EB				Franklin WB				Morrison NB				Morrison SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	9	200	0		0	133	11	144	27	69	28	124	0	0	0	0
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	10	212	0	221	0	141	12	152	31	74	30	134	0	0	0	0
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	0	252	0		0	567	0		303	0	638		0	0	0	
PM (3hr) - 2045	0	209				488	0		376	0	674					
ECWRPC Percent Increase		-17.1%				-13.9%			24.1%		5.6%					
PM - Applied Growth Rate		10.00%				10.00%			24.09%		10.00%					
Annual Growth Rate	0.27%	0.27%				0.27%	0.27%		0.62%	0.31%	0.27%					

Input Data
AECOM Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits

Franklin = 25 MPH
Morrison = 25 MPH

AECOM

July 2016

Traffic Volumes & Projections - No-Build
Morrison St. & Harris St.

	Harris EB				Harris WB				Morrison NB				Morrison SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	0	0	0		0	2	4	6	49	47	3	99	11	0	13	24
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	0	0	0	0	0	2	4	6	53	51	3	107	12	0	14	25
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	0	0	0		0	0	0		0	0	0		0	0	0	
PM (3hr) - 2045	0	0	0		0	0	0		0	0	0		0	0	0	
ECWRPC Percent Increase																
PM - Applied Growth Rate																
Annual Growth Rate						0.27%	0.27%		0.35%	0.35%	0.35%		0.27%	0.27%	0.27%	

*NO ECWRPC FORECAST FOR THIS INTERSETION

Input Data
AECMO Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits
Harris = 25 MPH
Morrison = 25 MPH

Traffic Volumes & Projections - No-Build
Lawrence St. & Oneida St.

	Lawrence EB				Lawrence WB				Oneida NB				Oneida SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	48	107	0	155	0	0	0	0	30	84	139	253	22	0	80	102
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	85	113	0	198	0	0	0	0	36	89	147	272	23	0	109	132
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	5	89	0		0	0	0		345	215	568		11	0	97	
PM (3hr) - 2045	13	92	0		0	0	0		457	133	582		10	0	162	
ECWRPC Percent Increase	160.0%	3.4%							32.5%	-38.1%	2.5%		-9.1%		67.0%	
PM - Applied Growth Rate	160.00%	10.00%							32.46%	10.00%	10.00%		10.00%		67.01%	
Annual Growth Rate	2.77%	0.27%							0.81%	0.27%	0.27%		0.27%		1.48%	

Input Data
AECOM Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum 0.27% annual growth rate

Observations:

Speed Limits
Lawrence = 25 MPH
Oneida = 25 MPH

Traffic Volumes & Projections - No-Build
College Ave. & Richmond St.

	College EB				College WB				Richmond NB				Richmond SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	206	616	51	873	116	541	141	798	97	704	110	911	173	568	114	855
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	218	747	79	1044	123	573	149	845	382	745	124	1251	183	609	121	913
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	220	1822	164		79	1651	382		5	1031	40		259	1155	131	
PM (3hr) - 2045	113	2510	339		41	1705	419		49	1118	49		228	1298	119	
ECWRPC Percent Increase	-48.6%	37.8%	106.7%		-48.1%	3.3%	9.7%		880.0%	8.4%	22.5%		-12.0%	12.4%	-9.2%	
PM - Applied Growth Rate	10.00%	37.76%	106.71%		10.00%	10.00%	10.00%		880.00%	10.00%	22.50%		10.00%	12.38%	10.00%	
Annual Growth Rate	0.27%	0.92%	2.10%		0.27%	0.27%	0.27%		6.74%	0.27%	0.58%		0.27%	0.33%	0.27%	

Input Data
= City of Appleton Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits

College = 25 MPH   Richmond = 25 MPH

Traffic Volumes & Projections - No-Build
College Ave. & Oneida St.

	College				College				Oneida							
	EB				WB				NB				SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	0	706	37	743	41	535	0	576	86	0	86	172	0	0	0	0
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	0	792	44	837	54	566	0	620	91	0	91	182	0	0	0	0
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	0	1984	37		109	1899	0		215	0	215		0	0	0	
PM (3hr) - 2045	0	2405	50		172	1870	0		145	0	145		0	0	0	
ECWRPC Percent Increase		21.2%	35.1%		57.8%	-1.5%			-32.6%		-32.6%					
PM - Applied Growth Rate		21.22%	35.14%		57.80%	10.00%			10.00%		10.00%					
Annual Growth Rate		0.55%	0.86%		1.31%	0.27%			0.27%		0.27%					

Input Data
AECOM Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits

College = 25 MPH

Oneida = 25 MPH

Traffic Volumes & Projections - No-Build
College Ave. & Drew St.

	College EB				College WB				Drew NB				Drew SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	49	690	24	763	47	544	91	682	24	75	47	146	172	55	59	286
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	52	740	25	818	50	576	106	732	25	86	50	161	379	70	62	511
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	21	2380	48		121	2120	64		114	153	94		49	131	107	
PM (3hr) - 2045	13	2677	49		120	2221	83		117	192	87		183	194	109	
ECWRPC Percent Increase	-38.1%	12.5%	2.1%		-0.8%	4.8%	29.7%		2.6%	25.5%	-7.4%		273.5%	48.1%	1.9%	
PM - Applied Growth Rate	10.00%	12.48%	10.00%		10.00%	10.00%	29.69%		10.00%	25.49%	10.00%		273.47%	48.09%	10.00%	
Annual Growth Rate	0.27%	0.34%	0.27%		0.27%	0.27%	0.75%		0.27%	0.65%	0.27%		3.84%	1.13%	0.27%	

Input Data
AECOM Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rates

Observations:

Speed Limits

College = 25 MPH Drew = 25 MPH

Traffic Volumes & Projections - No-Build
College Ave. & Lawe St.

	College EB				College WB				Lawe NB				Lawe SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	85	689	40	814	9	480	100	589	36	191	40	267	198	196	70	464
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	90	786	42	919	10	508	117	634	40	202	42	285	210	218	74	502
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	152	2111	260		86	1937	93		193	1030	14		492	1164	176	
PM (3hr) - 2045	54	2632	261		70	2045	120		234	1135	15		256	1389	145	
ECWRPC Percent Increase	-64.5%	24.7%	0.4%		-18.6%	5.6%	29.0%		21.2%	10.2%	7.1%		-48.0%	19.3%	-17.6%	
PM - Applied Growth Rate	10.00%	24.68%	10.00%		10.00%	10.00%	29.03%		21.24%	10.19%	10.00%		10.00%	19.33%	10.00%	
Annual Growth Rate	0.27%	0.63%	0.27%		0.27%	0.27%	0.73%		0.55%	0.28%	0.27%		0.27%	0.51%	0.27%	

Input Data
AECOM Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits

College = 25 MPH Lawe = 25 MPH

Traffic Volumes & Projections - No-Build
Franklin St. & Superior St.

	Franklin EB				Franklin WB				Superior NB				Superior SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	9	252	20		0	277	6	283	26	47	18	91	6	22	4	32
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	14	267	39	319	0	293	6	300	49	50	19	117	6	23	4	34
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	1	179	2		0	158	0		24	0	10		0	0	0	
PM (3hr) - 2045	2	174	6		0	153	0		68	0	10		0	0	0	
ECWRPC Percent Increase	100.0%	-2.8%	200.0%			-3.2%			183.3%		0.0%					
PM - Applied Growth Rate	100.00%	10.00%	200.00%			10.00%			183.33%		10.00%					
Annual Growth Rate	2.00%	0.27%	3.19%		0.27%	0.27%	0.27%		3.02%	0.27%	0.27%		0.27%	0.27%	0.27%	

Input Data
AECOM Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum 0.27% annual growth rate

Observations:

Speed Limits
Franklin = 25 MPH
Superior = 25 MPH

Traffic Volumes & Projections - No-Build
Franklin St. & Oneida St.

	Franklin EB				Franklin WB				Oneida NB				Oneida SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	5	183	5		30	236	16	282	6	18	13	37	6	15	14	35
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	5	194	6	205	61	250	17	328	6	19	14	39	9	21	15	45
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	0	104	44		30	415	455		44	286	0		48	125	0	
PM (3hr) - 2045	0	109	58		99	261	503		35	252	0		100	211	0	
ECWRPC Percent Increase		4.8%	31.8%		230.0%	-37.1%	10.5%		-20.5%	-11.9%			108.3%	68.8%		
PM - Applied Growth Rate		10.00%	31.82%		230.00%	10.00%	10.55%		10.00%	10.00%			108.33%	68.80%		
Annual Growth Rate	0.27%	0.27%	0.79%		3.47%	0.27%	0.29%		0.27%	0.27%	0.27%		2.12%	1.51%	0.27%	

Input Data
AECOM Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits

Franklin = 25 MPH Oneida = 25 MPH

Traffic Volumes & Projections - No-Build
Washington St. & Superior St.

	Washington EB				Washington WB				Superior NB				Superior SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	52	4	28	84	16	62	17	95	9	69	59	137	8	52	3	63
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	55	5	30	89	21	66	18	105	10	112	65	186	8	55	3	67
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	0	83	0		84	31	0		0	35	514		0	12	0	
PM (3hr) - 2045	0	110	0		133	21	0		0	78	607		0	7	0	
ECWRPC Percent Increase		32.5%			58.3%	-32.3%				122.9%	18.1%			-41.7%		
PM - Applied Growth Rate		32.53%			58.33%	10.00%				122.86%	18.09%			10.00%		
Annual Growth Rate	0.27%	0.81%	0.27%		1.32%	0.27%	0.27%		0.27%	2.32%	0.48%		0.27%	0.27%	0.27%	

Input Data
AECOM Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits
Washington = 25 MPH Superior = 25 MPH

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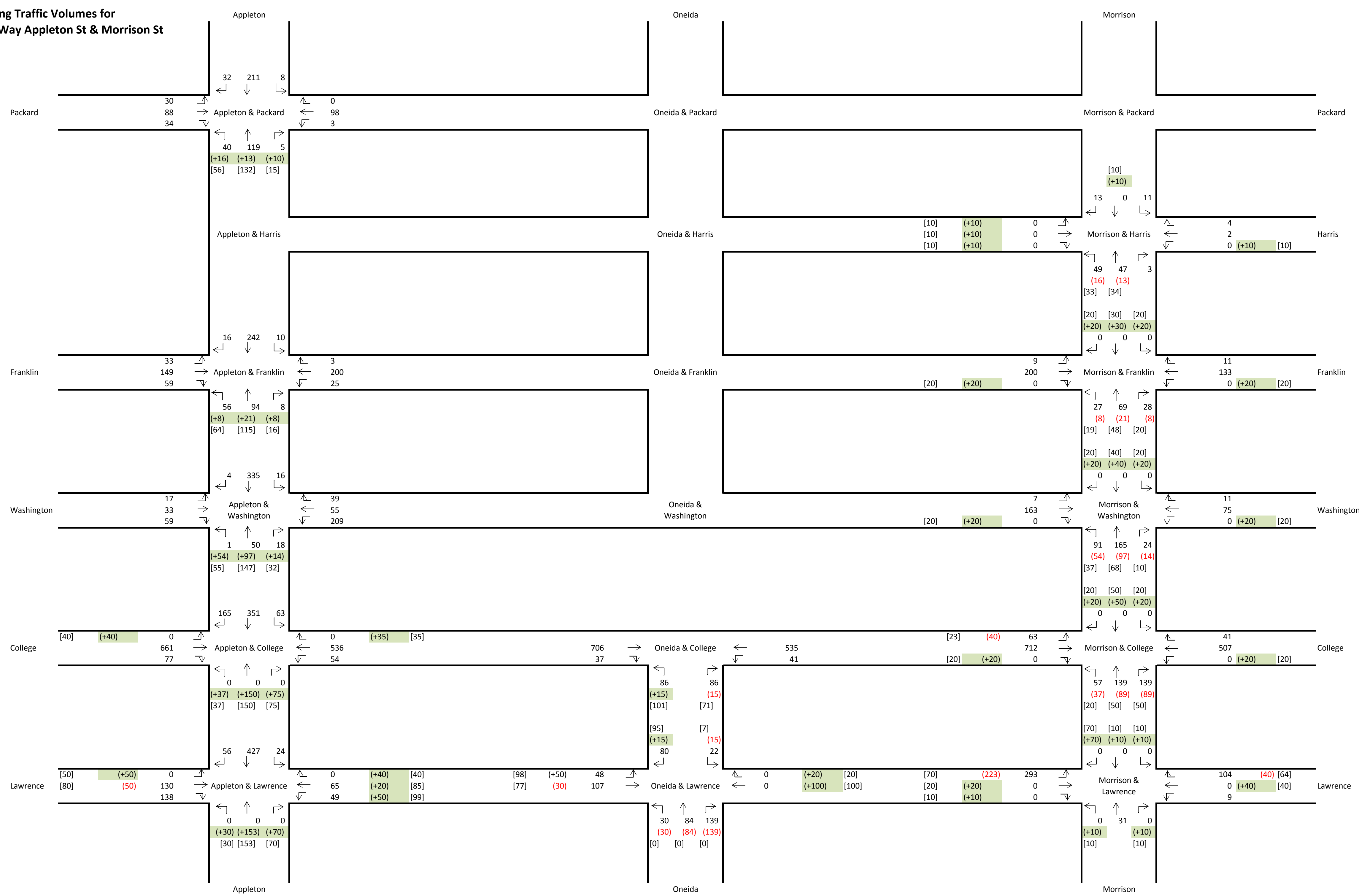
July 2016

Appendix C

Alternative 2 – Traffic Distribution

Existing Traffic Volumes for
Two-Way Appleton St & Morrison St



LEGEND

XXX	Existing Count
(XXX)	Adjusted Volume (Negative)
(+XXX)	Adjusted Volume (Positive)
[XXX]	New Volume

AECOM Project No. 60492083 July 2016 1350 Deming Way Suite 100 Middleton WI 53562 (608) 836-9800	Alternative 2 Two-Way Appleton St. Appleton, WI
	Traffic Volume Adjustements

Appendix D

List of Assumptions

Assumptions for Traffic Volume Adjustments
One-Way to Two-Way

- Oneida & Lawrence
  - Removed all NB vehicles, assuming leg of intersection would be removed.
  - EB left-turn lane added 50 vehicles from Oneida NB through now going to Appleton, taking a right, and then a left at Oneida.
  - EB through lane reduced 50 vehicles from Lawrence & Appleton EB Through, but added 20 vehicles to the EB through from NB right turn at Appleton & Lawrence.
  - WB Right Turn Lane, added 20 vehicles, did not remove elsewhere.
  - WB Thru Lane, Added 100 vehicles, due to traffic mainly trying to get to Appleton & Lawrence to either go NB or SB, some through traffic along Lawrence. (40 from WB thru @ Morrison & Lawrence, and 60 from SB Left turn @ Morrison & Lawrence, which came from turning movement off college or through movements continuing along Morrison SB).
  - SB right turn, added 15 vehicles, from people leaving YMCA ramp wanting to be destined for North downtown Appleton.
- Appleton & Lawrence
  - NB right-turn, added 20 vehicles from NB right turn at Oneida & Lawrence (left vehicles that would still use Morrison as a northbound route or have destination along Morrison/east Lawrence). Added 50 vehicles from NB through lane at Oneida & Lawrence.
  - NB through lane, added 119 which is 90% of the NB right turn movement at Oneida & Lawrence, and added 34 vehicles which is remainder of NB through movement at Oneida & Lawrence that would be destined WB College.
  - NB Left turn, added all NB left turning vehicles from Oneida & Lawrence.
  - EB Through, reduced by 50 vehicles which would normally be destined NB along old Morrison one-way, now turn left at Lawrence & Appleton.
  - WB Right turn, added 15 vehicles, from people leaving YMCA ramp on Oneida & additional users wanting to be destined northbound, and 35 from area over by YMCA that would normally be destined NB that may now use Appleton St.
  - WB Thru, added 20 vehicles, traffic from SB Morrison destined for WB Lawrence.
  - WB Left Turn, added from College & Morrison WB Left turn added volume. And added 30 from SB Morrison traffic destined for SB Bridge.
- Morrison & Lawrence
  - Removed WB right turning vehicles (40) that would be destined Northbound downtown Appleton, that will now utilized Appleton Two-way.
- College & Morrison
  - WB Left Turn Lane, Added 20 vehicles, did not remove elsewhere
  - EB Right Turn Lane, Added 20 vehicles, did not remove elsewhere.
  - SB thru Lane, added 50 vehicles, did not reduce from anywhere else.
- College & Appleton
  - NB Right Turn & Left Turn, Proportioned equally to Morrison & College, remaining vehicles continue northbound on Appleton.
  - WB Right turn, added 20 vehicles from College & Morrison WB Right Turn, and 15 from NB Left turn from Oneida & College destined for northbound downtown Appleton.
  - EB Left Turn, added 40 vehicles from Morrison & College EB Left Turn

Appendix E

Alternative 2 – Forecasted 2036 Volumes

Traffic Volumes & Projections - Alternative 2: Two-Way Appleton St.
Appleton St. & Lawrence St.

	Lawrence EB				Lawrence WB				Appleton NB				Appleton SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	50	80	138	268	99	85	40	224	30	153	70	253	24	427	56	507
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	59	90	208	357	136	101	47	283	36	181	83	300	25	452	59	537
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	0	74	542		96	346	0		0	0	0		15	1674	0	
PM (3hr) - 2045	0	90	1073		162	458	0		0	0	0		15	1802	0	
ECWRPC Percent Increase		21.6%	98.0%		68.8%	32.4%							0.0%	7.6%		
PM - Applied Growth Rate		21.62%	97.97%		68.75%	32.37%							10.00%	10.00%		
Annual Growth Rate	0.81%	0.56%	1.97%		1.51%	0.80%	0.81%		0.81%	0.81%	0.81%		0.27%	0.27%	0.27%	

Intersection Average % annaul increase 0.81%

Input Data
AECMO Adjustment

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits

Lawrence = 25 MPH   Appleton = 25 MPH

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Traffic Volumes & Projections - Alternative 2: Two-Way Appleton St.
Appleton St. & College St.

	College EB				College WB				Appleton NB				Appleton SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	40	661	77	778	54	536	35	625	37	150	75	262	63	351	165	579
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	47	753	142	942	57	568	41	666	43	175	88	306	67	372	184	622
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
`																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	0	1918	152		300	1599	0		0	0	0		66	1237	236	
PM (3hr) - 2045	0	2383	423		142	1728	0		0	0	0		22	1253	282	
ECWRPC Percent Increase		24.2%	178.3%		-52.7%	8.1%							-66.7%	1.3%	19.5%	
PM - Applied Growth Rate		24.24%	178.29%		10.00%	10.00%							10.00%	10.00%	19.49%	
Annual Growth Rate	0.74%	0.62%	2.97%		0.27%	0.27%	0.74%		0.74%	0.74%	0.74%		0.27%	0.27%	0.51%	

Intersection Average % annual increase 0.74%

Input Data
AECOM Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits

College = 25 MPH
Appleton = 25 MPH

Traffic Volumes & Projections - Alternative 2: Two-Way Appleton St.
Appleton St. & Washington St.

	Washington EB				Washington WB				Appleton NB				Appleton SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	17	33	59	109	209	55	39	303	55	147	32	234	16	335	4	355
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	20	35	68	123	221	85	45	351	64	170	37	270	18	355	4	378
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	494	101	0		388	19	0		0	0	0		0	1149	96	
PM (3hr) - 2045	639	78	0		387	39	0		0	0	0		0	1168	115	
ECWRPC Percent Increase	29.4%	-22.8%			-0.3%	105.3%								1.7%	19.8%	
PM - Applied Growth Rate	29.35%	10.00%			10.00%	105.26%								10.00%	19.79%	
Annual Growth Rate	0.74%	0.27%	0.69%		0.27%	2.08%	0.69%		0.69%	0.69%	0.69%		0.69%	0.27%	0.52%	

Intersection average % annual increase 0.69%

Input Data
AECOM Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits

Washington = 25 MPH Appleton = 25 MPH

Traffic Volumes & Projections - Alternative 2: Two-Way Appleton St.
Appleton St. & Franklin St.

	Franklin EB				Franklin WB				Appleton NB				Appleton SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	33	149	59		25	200	3	228	64	115	16	195	10	242	16	268
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	35	158	62	255	26	212	3	241	68	132	32	231	11	273	19	302
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	35	139	59		323	137	0		0	485	9		0	863	25	
PM (3hr) - 2045	34	139	51		176	120	0		0	611	28		0	1055	32	
ECWRPC Percent Increase	-2.9%	0.0%	-13.6%		-45.5%	-12.4%				26.0%	211.1%			22.2%	28.0%	
PM - Applied Growth Rate	10.00%	10.00%	10.00%		10.00%	10.00%				25.98%	211.11%			22.25%	28.00%	
Annual Growth Rate	0.27%	0.27%	0.27%		0.27%	0.27%	0.27%		0.27%	0.66%	3.30%		0.27%	0.58%	0.71%	

Input Data
AECOM Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits
Franklin = 25 MPH
Appleton = 25 MPH

Traffic Volumes & Projections - Alternative 2: Two-Way Appleton St.
Appleton St. & Packard St.

	Packard EB				Packard WB				Appleton NB				Appleton SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	30	88	34		3	98	0	101	56	132	15	203	8	211	32	251
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	60	102	36	199	3	104	0	107	59	150	16	225	8	248	34	290
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	10	123	114		0	154	0		0	520	0		190	774	4	
PM (3hr) - 2045	32	158	75		0	134	0		0	645	0		202	1013	3	
ECWRPC Percent Increase	220.0%	28.5%	-34.2%			-13.0%				24.0%			6.3%	30.9%	-25.0%	
PM - Applied Growth Rate	220.00%	28.46%	10.00%			10.00%				24.04%			10.00%	30.88%	10.00%	
Annual Growth Rate	3.38%	0.72%	0.27%		0.27%	0.27%	0.27%		0.27%	0.62%	0.27%		0.27%	0.77%	0.27%	

Inputa Data
AECOM Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits
Packard = 25 MPH
Appleton = 25 MPH

Traffic Volumes & Projections - Alternative 2: Two-Way Appleton St.
Morrison St. & Lawrence St.

	Lawrence EB				Lawrence WB				Morrison NB				Morrison SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	70	20	10	100	9	40	64	113	10	31	10	51	10	10	70	90
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	74	21	11	106	14	42	69	125	11	33	11	54	11	11	74	95
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	694	0	0		1	0	507		0	0	0		0	0	0	
PM (3hr) - 2045	704	0	0		2	0	570		0	0	0		0	0	0	
ECWRPC Percent Increase	1.4%				100.0%		12.4%									
PM - Applied Growth Rate	10.00%				100.00%		12.43%									
Annual Growth Rate	0.27%	0.27%	0.27%		2.00%	0.27%	0.34%		0.27%	0.27%	0.27%		0.27%	0.27%	0.27%	

Input Data
= City of Appleton Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits

Lawrence = 25 MPH
Morrison = 25 MPH

Traffic Volumes & Projections - Alternative 2: Two-Way Appleton St.
Morrison St. & College Ave.

	College EB				College WB				Morrison NB				Morrison SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	23	712	20	755	20	507	41	568	57	139	139	335	20	50	20	90
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	24	796	22	842	22	537	45	604	60	149	147	356	22	54	22	97
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	248	1952	0		0	1742	309		266	582	417		0	0	0	
PM (3hr) - 2045	199	2352	0		0	1842	364		200	653	357		0	0	0	
ECWRPC Percent Increase	-19.8%	20.5%				5.7%	17.8%		-24.8%	12.2%	-14.4%					
PM - Applied Growth Rate	10.00%	20.49%				10.00%	17.80%		10.00%	12.20%	10.00%					
Annual Growth Rate	0.27%	0.53%	0.35%		0.35%	0.27%	0.47%		0.27%	0.33%	0.27%		0.35%	0.35%	0.35%	

Intersection Average % annual increase 0.35%

Input Data
= AECOM Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits
College = 25 MPH
Morrison = 25 MPH

Traffic Volumes & Projections - Alternative 2: Two-Way Appleton St.
Morrison St. & Washington St.

	Washington EB				Washington WB				Morrison NB				Morrison SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	7	163	20	190	20	75	11	106	91	65	24	180	20	40	20	80
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	7	178	22	208	22	79	13	115	96	69	25	191	22	44	22	87
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	109	366	0		0	127	5		295	827	17		0	0	0	
PM (3hr) - 2045	122	425	0		0	106	7		277	921	18		0	0	0	
ECWRPC Percent Increase	11.9%	16.1%				-16.5%	40.0%		-6.1%	11.4%	5.9%					
PM - Applied Growth Rate	11.93%	16.12%				10.00%	40.00%		10.00%	11.37%	10.00%					
Annual Growth Rate	0.32%	0.43%	0.41%		0.41%	0.27%	0.97%		0.27%	0.31%	0.27%		0.41%	0.41%	0.41%	

Intersection Average % annaul increase 0.41%

Input Data
AECOM Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits
Washington = 25 MPH
Morrison = 25 MPH

Traffic Volumes & Projections - Alternative 2: Two-Way Appleton St.
Morrison St. & Franklin St.

	Franklin EB				Franklin WB				Morrison NB				Morrison SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	9	200	20		20	133	11	164	27	69	28	124	19	48	20	87
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	10	212	21	243	21	141	12	174	31	74	30	134	20	51	21	93
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	0	252	0		0	567	0		303	0	638		0	0	0	
PM (3hr) - 2045	0	209				488	0		376	0	674					
ECWRPC Percent Increase		-17.1%				-13.9%			24.1%		5.6%					
PM - Applied Growth Rate		10.00%				10.00%			24.09%		10.00%					
Annual Growth Rate	0.27%	0.27%	0.33%		0.33%	0.27%	0.27%		0.62%	0.31%	0.27%		0.33%	0.33%	0.33%	

Intersection Average % Annual increase 0.33%

Input Data
AECOM Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits
Franklin = 25 MPH
Morrison = 25 MPH

Traffic Volumes & Projections - Alternative 2: Two-Way Appleton St.
Morrison St. & Harris St.

	Harris EB				Harris WB				Morrison NB				Morrison SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	10	10	10		10	2	4	16	33	34	3	70	11	10	13	34
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	11	11	11	32	11	2	4	17	36	37	3	75	12	11	14	36
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year																
PM (3hr) - 2045																
ECWRPC Percent Increase																
PM - Applied Growth Rate																
Annual Growth Rate	0.30%	0.30%	0.30%		0.30%	0.27%	0.27%		0.35%	0.35%	0.35%		0.27%	0.27%	0.27%	

*NO ECWRPC FORECAST FOR THIS INTERSETION

Intersection average % annual increase 0.30%

Input Data
AECOM Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits

Harris	= 25 MPH	Morrison	= 25 MPH

Traffic Volumes & Projections - Alternative 2: Two-Way Appleton St.
Lawrence St. & Oneida St.

	Lawrence EB				Lawrence WB				Oneida NB				Oneida SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	98	77	0	175	0	100	20	120	0	0	0	0	7	0	95	102
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	174	82	0	255	0	120	24	144	0	0	0	0	7	0	129	137
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	5	89	0		0	0	0		345	215	568		11	0	97	
PM (3hr) - 2045	13	92	0		0	0	0		457	133	582		10	0	162	
ECWRPC Percent Increase	160.0%	3.4%							32.5%	-38.1%	2.5%		-9.1%		67.0%	
PM - Applied Growth Rate	160.00%	10.00%							32.46%	10.00%	10.00%		10.00%		67.01%	
Annual Growth Rate	2.77%	0.27%				0.88%	0.88%		0.81%	0.27%	0.27%		0.27%		1.48%	

intersection average % annual increase 0.88%

Input Data
AECOM Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits
Lawrence = 25 MPH
Oneida = 25 MPH

Traffic Volumes & Projections - Alternative 2: Two-Way Appleton St.
College Ave. & Oneida St.

	College EB				College WB				Oneida NB				SB			
Projected	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**	**LT**	**THRU**	**RT**	**APPR**
Current AM Peak				0				0				0				0
Current PM Peak	0	706	37	743	41	535	0	576	101	0	71	172	0	0	0	0
2036 AM Peak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2036 PM Peak	0	792	44	837	54	566	0	620	107	0	75	182	0	0	0	0
Current 2010 ECWRPC AWDT																
ECRPC 2045 AWDT																
Calculated Annual Growth Rate																
AM (3hr) - Base Year																
AM (3hr) - 2045																
ECWRPC Percent Increase																
AM - Applied Growth Rate																
PM (3hr) - Base Year	0	1984	37		109	1899	0		215	0	215		0	0	0	
PM (3hr) - 2045	0	2405	50		172	1870	0		145	0	145		0	0	0	
ECWRPC Percent Increase		21.2%	35.1%		57.8%	-1.5%			-32.6%		-32.6%					
PM - Applied Growth Rate		21.22%	35.14%		57.80%	10.00%			10.00%		10.00%					
Annual Growth Rate		0.55%	0.86%		1.31%	0.27%			0.27%		0.27%					

Input Data
= AECOM Adjustments

Rational:
Percent increase by movement
2036 Volumes Extrapolated from ECWRPC Projections
Minimum of 0.27% annual growth rate

Observations:

Speed Limits
College = 25 MPH
Oneida = 25 MPH

Appendix C

Traffic Analysis Results – Existing Conditions and 2036 No-Build

Existing Conditions - PM Peak

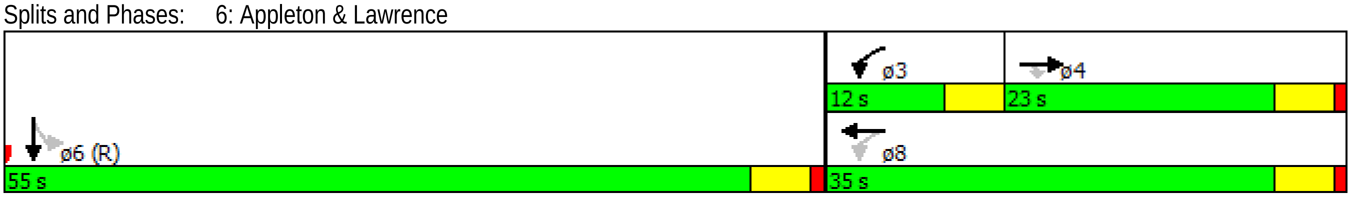
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	130	138	49	65	0	0	0	0	24	427	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	100		0	0		0	50		0
Storage Lanes	0		1	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Frt			0.850								0.983	
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	1863	1583	1770	1863	0	0	0	0	1770	3479	0
Flt Permitted				0.375						0.950		
Satd. Flow (perm)	0	1863	1583	699	1863	0	0	0	0	1770	3479	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			164								27	
Link Speed (mph)		25			25			30			25	
Link Distance (ft)		1279			319			486			394	
Travel Time (s)		34.9			8.7			11.0			10.7	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	0	160	170	60	80	0	0	0	0	30	527	69
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	160	170	60	80	0	0	0	0	30	596	0
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases			4	8						6		
Detector Phase		4	4	3	8					6	6	
Switch Phase												
Minimum Initial (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Minimum Split (s)		23.0	23.0	9.0	23.0					23.0	23.0	
Total Split (s)		23.0	23.0	12.0	35.0					55.0	55.0	
Total Split (%)		25.6%	25.6%	13.3%	38.9%					61.1%	61.1%	
Maximum Green (s)		18.0	18.0	8.0	30.0					50.0	50.0	
Yellow Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
All-Red Time (s)		1.0	1.0	0.0	1.0					1.0	1.0	
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0	-2.0	
Total Lost Time (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Recall Mode		None	None	None	None					C-Min	C-Min	
Walk Time (s)		7.0	7.0		7.0					7.0	7.0	
Flash Dont Walk (s)		11.0	11.0		11.0					11.0	11.0	
Pedestrian Calls (#/hr)		6	6		16					15	15	
Act Effct Green (s)		15.1	15.1	24.5	24.5					59.5	59.5	
Actuated g/C Ratio		0.17	0.17	0.27	0.27					0.66	0.66	
v/c Ratio		0.51	0.42	0.21	0.16					0.03	0.26	
Control Delay		39.1	9.1	22.9	22.5					5.3	5.0	
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	
Total Delay		39.1	9.1	22.9	22.5					5.3	5.0	
LOS		D	A	C	C					A	A	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		23.6			22.7						5.0	
Approach LOS		C			C						A	
Queue Length 50th (ft)		84	3	25	34					4	43	
Queue Length 95th (ft)		120	39	42	53					m10	56	
Internal Link Dist (ft)		1199			239			406			314	
Turn Bay Length (ft)			50	100						50		
Base Capacity (vph)		416	481	300	670					1177	2323	
Starvation Cap Reductn		0	0	0	0					0	0	
Spillback Cap Reductn		0	0	0	0					0	0	
Storage Cap Reductn		0	0	0	0					0	0	
Reduced v/c Ratio		0.38	0.35	0.20	0.12					0.03	0.26	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 80 (89%), Referenced to phase 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.51
Intersection Signal Delay: 12.9 Intersection LOS: B
Intersection Capacity Utilization 35.5% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Appleton & Lawrence

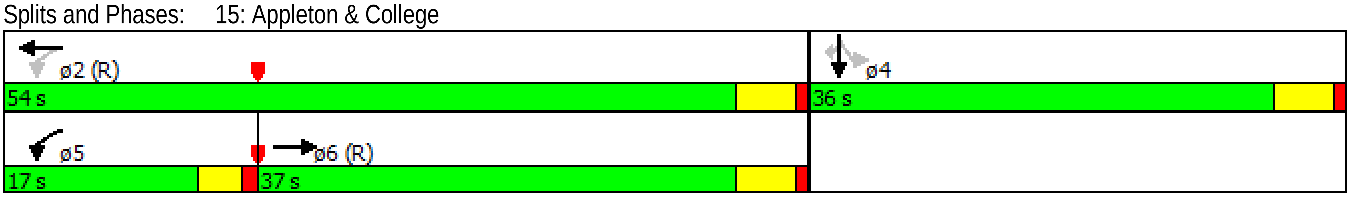


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	661	77	54	536	0	0	0	0	63	351	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frt		0.984										0.850
Flt Protected					0.995						0.992	
Satd. Flow (prot)	0	3483	0	0	3522	0	0	0	0	0	3511	1583
Flt Permitted					0.804						0.992	
Satd. Flow (perm)	0	3483	0	0	2846	0	0	0	0	0	3511	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		16										174
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		412			323			394			213	
Travel Time (s)		10.0			7.9			10.7			5.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	696	81	57	564	0	0	0	0	66	369	174
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	777	0	0	621	0	0	0	0	0	435	174
Turn Type		NA		pm+pt	NA					Perm	NA	Perm
Protected Phases		6		5	2						4	
Permitted Phases				2						4		4
Detector Phase		6		5	2					4	4	4
Switch Phase												
Minimum Initial (s)		8.0		5.0	8.0					8.0	8.0	8.0
Minimum Split (s)		23.0		9.0	23.0					23.0	23.0	23.0
Total Split (s)		37.0		17.0	54.0					36.0	36.0	36.0
Total Split (%)		41.1%		18.9%	60.0%					40.0%	40.0%	40.0%
Maximum Green (s)		32.0		13.0	49.0					31.0	31.0	31.0
Yellow Time (s)		4.0		3.0	4.0					4.0	4.0	4.0
All-Red Time (s)		1.0		1.0	1.0					1.0	1.0	1.0
Lost Time Adjust (s)		-1.0			-1.0						-2.0	-2.0
Total Lost Time (s)		4.0			4.0						3.0	3.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	3.0
Recall Mode		C-Max		Max	C-Max					Max	Max	Max
Walk Time (s)		7.0			7.0					7.0	7.0	7.0
Flash Dont Walk (s)		11.0			11.0					11.0	11.0	11.0
Pedestrian Calls (#/hr)		0			9					9	9	9
Act Effct Green (s)		33.0			50.0						33.0	33.0
Actuated g/C Ratio		0.37			0.56						0.37	0.37
v/c Ratio		0.60			0.37						0.34	0.25
Control Delay		13.6			8.9						21.5	4.2
Queue Delay		0.2			0.3						0.0	0.0
Total Delay		13.8			9.1						21.5	4.2
LOS		B			A						C	A
Approach Delay		13.8			9.1						16.6	
Approach LOS		B			A						B	
Queue Length 50th (ft)		75			78						92	0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		95			84						131	40
Internal Link Dist (ft)		332			243			314			133	
Turn Bay Length (ft)												
Base Capacity (vph)		1287			1678						1287	690
Starvation Cap Reductn		87			454						0	0
Spillback Cap Reductn		0			0						0	0
Storage Cap Reductn		0			0						0	0
Reduced v/c Ratio		0.65			0.51						0.34	0.25

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 38 (42%), Referenced to phase 2:WBTL and 6:EBT, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 13.2	Intersection LOS: B
Intersection Capacity Utilization 58.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 15: Appleton & College



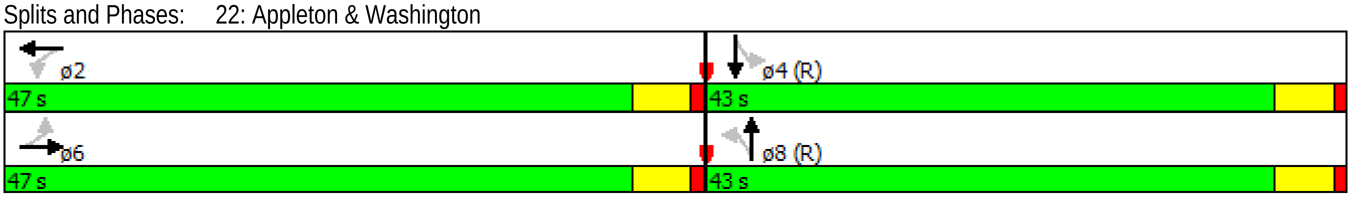
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	33	59	209	55	39	1	50	18	16	335	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	100		0	0		0	125		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.927			0.983			0.965			0.998	
Flt Protected		0.992			0.967			0.999		0.950		
Satd. Flow (prot)	0	1713	0	0	1771	0	0	1796	0	1770	1859	0
Flt Permitted		0.930			0.721			0.997		0.729		
Satd. Flow (perm)	0	1606	0	0	1320	0	0	1792	0	1358	1859	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		69			11			21			1	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		398			340			206			389	
Travel Time (s)		10.9			9.3			5.6			10.6	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	20	38	69	243	64	45	1	58	21	19	390	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	127	0	0	352	0	0	80	0	19	395	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	6	6		2	2		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	35.0	35.0		35.0	35.0		43.0	43.0		43.0	43.0	
Total Split (s)	47.0	47.0		47.0	47.0		43.0	43.0		43.0	43.0	
Total Split (%)	52.2%	52.2%		52.2%	52.2%		47.8%	47.8%		47.8%	47.8%	
Maximum Green (s)	42.0	42.0		42.0	42.0		38.0	38.0		38.0	38.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0		-2.0	-2.0	
Total Lost Time (s)		3.0			3.0			3.0		3.0	3.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		44.0			44.0			40.0		40.0	40.0	
Actuated g/C Ratio		0.49			0.49			0.44		0.44	0.44	
v/c Ratio		0.15			0.54			0.10		0.03	0.48	
Control Delay		6.8			19.3			11.6		11.2	15.7	
Queue Delay		0.0			0.0			0.0		0.0	0.6	
Total Delay		6.8			19.3			11.6		11.2	16.2	
LOS		A			B			B		B	B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		6.8			19.3			11.6			16.0	
Approach LOS		A			B			B			B	
Queue Length 50th (ft)		17			129			19		4	93	
Queue Length 95th (ft)		43			197			42		13	125	
Internal Link Dist (ft)		318			260			126			309	
Turn Bay Length (ft)										125		
Base Capacity (vph)		820			650			808		603	826	
Starvation Cap Reductn		0			0			0		0	159	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.15			0.54			0.10		0.03	0.59	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 64 (71%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.54
Intersection Signal Delay: 15.6 Intersection LOS: B
Intersection Capacity Utilization 48.0% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 22: Appleton & Washington

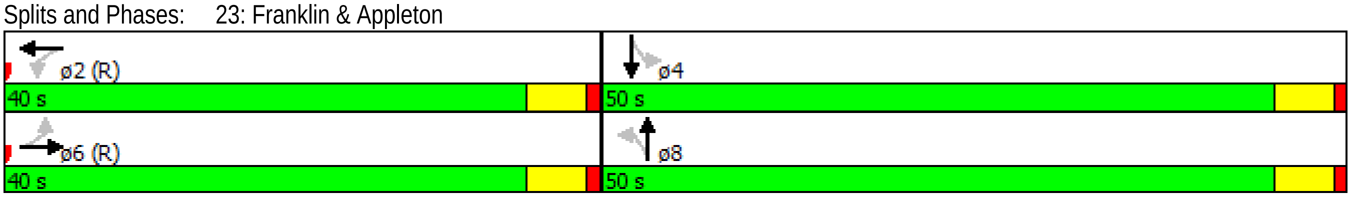


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	33	149	59	25	200	3	56	94	8	10	242	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	100		0	100		0	50		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.958			0.998			0.988			0.991	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1767	0	1703	1789	0	1770	1840	0	1752	1828	0
Flt Permitted	0.548			0.544			0.529			0.686		
Satd. Flow (perm)	1011	1767	0	975	1789	0	985	1840	0	1265	1828	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			1			7			5	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		391			338			389			313	
Travel Time (s)		9.5			8.2			10.6			8.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	2%	2%	2%	3%	3%	3%
Adj. Flow (vph)	35	160	63	27	215	3	60	101	9	11	260	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	35	223	0	27	218	0	60	110	0	11	277	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0		23.0	23.0	
Total Split (s)	40.0	40.0		40.0	40.0		50.0	50.0		50.0	50.0	
Total Split (%)	44.4%	44.4%		44.4%	44.4%		55.6%	55.6%		55.6%	55.6%	
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0		45.0	45.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-1.0	-2.0		-2.0	-2.0		-2.0	-1.0		-2.0	-2.0	
Total Lost Time (s)	4.0	3.0		3.0	3.0		3.0	4.0		3.0	3.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	36.0	37.0		37.0	37.0		47.0	46.0		47.0	47.0	
Actuated g/C Ratio	0.40	0.41		0.41	0.41		0.52	0.51		0.52	0.52	
v/c Ratio	0.09	0.30		0.07	0.30		0.12	0.12		0.02	0.29	
Control Delay	10.6	8.7		8.5	9.0		11.9	11.2		10.6	12.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.6	8.7		8.5	9.0		11.9	11.2		10.6	12.9	
LOS	B	A		A	A		B	B		B	B	
Approach Delay		9.0			9.0			11.5			12.8	
Approach LOS		A			A			B			B	
Queue Length 50th (ft)	5	13		4	26		18	31		3	82	
Queue Length 95th (ft)	14	42		9	42		m38	58		11	132	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		311			258			309			233	
Turn Bay Length (ft)	150			100			100			50		
Base Capacity (vph)	404	742		400	736		514	943		660	957	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.09	0.30		0.07	0.30		0.12	0.12		0.02	0.29	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 17 (19%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.30	
Intersection Signal Delay: 10.6	Intersection LOS: B
Intersection Capacity Utilization 45.1%	ICU Level of Service A
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 23: Franklin & Appleton



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	88	34	3	98	0	40	119	5	8	211	32
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	0		0	0		0	100		0	200		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850					0.994			0.980	
Flt Protected		0.987			0.999		0.950			0.950		
Satd. Flow (prot)	0	1693	1458	0	1714	1716	1630	1705	0	1630	1681	0
Flt Permitted		0.916			0.995		0.559			0.667		
Satd. Flow (perm)	0	1572	1458	0	1707	1716	959	1705	0	1144	1681	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			39					5			16	
Link Speed (mph)		28			28			28			28	
Link Distance (ft)		2206			281			292			617	
Travel Time (s)		53.7			6.8			7.1			15.0	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	34	100	39	3	111	0	45	135	6	9	240	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	134	39	0	114	0	45	141	0	9	276	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Minimum Split (s)	23.0	23.0	23.0	23.0	23.0	23.0	20.0	20.0		23.0	23.0	
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	60.0	60.0		60.0	60.0	
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	66.7%	66.7%		66.7%	66.7%	
Maximum Green (s)	25.0	25.0	25.0	25.0	25.0	25.0	56.0	56.0		55.0	55.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5		4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	0.5	0.5		1.0	1.0	
Lost Time Adjust (s)		-2.0	-2.0		-2.0	-1.0	-1.0	-1.0		-2.0	-2.0	
Total Lost Time (s)		3.0	3.0		3.0	4.0	3.0	3.0		3.0	3.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	5.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	
Act Effct Green (s)		27.0	27.0		27.0		57.0	57.0		57.0	57.0	
Actuated g/C Ratio		0.30	0.30		0.30		0.63	0.63		0.63	0.63	
v/c Ratio		0.28	0.08		0.22		0.07	0.13		0.01	0.26	
Control Delay		26.2	8.3		25.1		6.8	6.7		6.2	7.5	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		26.2	8.3		25.1		6.8	6.7		6.2	7.5	
LOS		C	A		C		A	A		A	A	
Approach Delay		22.1			25.1			6.7			7.5	
Approach LOS		C			C			A			A	
Queue Length 50th (ft)		58	0		48		9	28		2	58	
Queue Length 95th (ft)		103	22		89		21	50		7	92	
Internal Link Dist (ft)		2126			201			212			537	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)							100			200		
Base Capacity (vph)		471	464		512		607	1081		724	1070	
Starvation Cap Reductn		0	0		0		0	0		0	0	
Spillback Cap Reductn		0	0		0		0	0		0	0	
Storage Cap Reductn		0	0		0		0	0		0	0	
Reduced v/c Ratio		0.28	0.08		0.22		0.07	0.13		0.01	0.26	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 56 (62%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 50
Control Type: Pretimed
Maximum v/c Ratio: 0.28
Intersection Signal Delay: 13.3 Intersection LOS: B
Intersection Capacity Utilization 41.0% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 27: Packard & Appleton

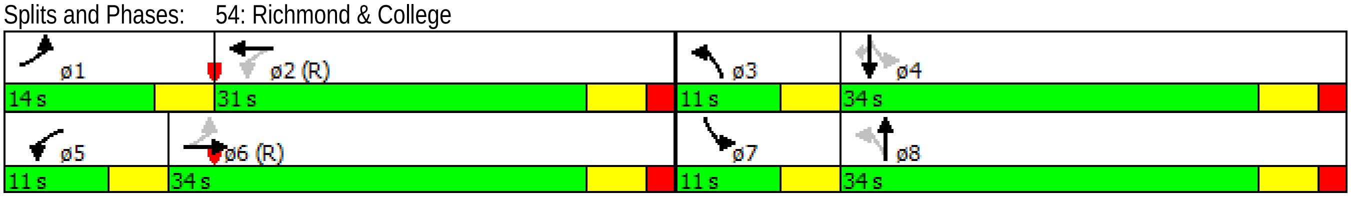
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	206	616	51	116	541	141	97	704	110	173	568	114
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	200		0	125		0	150		0	100		275
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.989			0.969			0.980				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3500	0	1630	3429	0	1630	3195	0	1630	3260	1458
Flt Permitted	0.189			0.299			0.337			0.161		
Satd. Flow (perm)	324	3500	0	513	3429	0	578	3195	0	276	3260	1458
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10			37			21				133
Link Speed (mph)		28			28			34			34	
Link Distance (ft)		2324			513			416			817	
Travel Time (s)		56.6			12.5			8.3			16.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	206	616	51	116	541	141	97	704	110	173	568	114
Shared Lane Traffic (%)												
Lane Group Flow (vph)	206	667	0	116	682	0	97	814	0	173	568	114
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8			4		4
Detector Phase	1	6		5	2		3	8		7	4	4
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	9.0	24.0		9.0	24.0		9.0	24.0		9.0	24.0	24.0
Total Split (s)	14.0	34.0		11.0	31.0		11.0	34.0		11.0	34.0	34.0
Total Split (%)	15.6%	37.8%		12.2%	34.4%		12.2%	37.8%		12.2%	37.8%	37.8%
Maximum Green (s)	10.0	28.0		7.0	25.0		7.0	28.0		7.0	28.0	28.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	0.0	2.0		0.0	2.0		0.0	2.0		0.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-2.0		-1.0	-2.0		-1.0	-3.0		-1.0	-3.0	-3.0
Total Lost Time (s)	3.0	4.0		3.0	4.0		3.0	3.0		3.0	3.0	3.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	Max
Walk Time (s)	0.0	7.0		0.0	7.0		0.0	7.0		0.0	7.0	7.0
Flash Dont Walk (s)	0.0	11.0		0.0	11.0		0.0	11.0		0.0	11.0	11.0
Pedestrian Calls (#/hr)	0	10		0	10		0	10		0	10	10
Act Effct Green (s)	42.0	32.2		36.2	27.4		38.7	31.0		39.6	33.2	33.2
Actuated g/C Ratio	0.47	0.36		0.40	0.30		0.43	0.34		0.44	0.37	0.37
v/c Ratio	0.68	0.53		0.38	0.64		0.29	0.73		0.72	0.47	0.18
Control Delay	27.1	25.2		14.9	24.6		16.1	29.8		33.7	24.1	3.6
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	27.1	25.2		14.9	24.6		16.1	29.8		33.7	24.1	3.6
LOS	C	C		B	C		B	C		C	C	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		25.6			23.2			28.3			23.3	
Approach LOS		C			C			C			C	
Queue Length 50th (ft)	69	160		41	142		30	205		56	133	0
Queue Length 95th (ft)	#127	215		78	179		59	275		#132	183	27
Internal Link Dist (ft)		2244			433			336			737	
Turn Bay Length (ft)	200			125			150			100		275
Base Capacity (vph)	310	1258		306	1070		343	1114		241	1202	621
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.66	0.53		0.38	0.64		0.28	0.73		0.72	0.47	0.18

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 25.2 Intersection LOS: C
Intersection Capacity Utilization 80.5% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 54: Richmond & College



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	706	37	41	535	86	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		100	0
Storage Lanes		0	0		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt	0.993					0.850
Flt Protected				0.996	0.950	
Satd. Flow (prot)	3514	0	0	3525	1770	1583
Flt Permitted				0.855	0.950	
Satd. Flow (perm)	3514	0	0	3026	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	13					91
Link Speed (mph)	28			28	25	
Link Distance (ft)	323			412	396	
Travel Time (s)	7.9			10.0	10.8	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	751	39	44	569	91	91
Shared Lane Traffic (%)						
Lane Group Flow (vph)	790	0	0	613	91	91
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	6			2	8	
Permitted Phases			2			8
Minimum Split (s)	23.0		23.0	23.0	23.0	23.0
Total Split (s)	66.0		66.0	66.0	24.0	24.0
Total Split (%)	73.3%		73.3%	73.3%	26.7%	26.7%
Maximum Green (s)	61.0		61.0	61.0	19.0	19.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	1.0		1.0	1.0	1.0	1.0
Lost Time Adjust (s)	-1.0			-1.0	-1.0	-1.0
Total Lost Time (s)	4.0			4.0	4.0	4.0
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	62.0			62.0	20.0	20.0
Actuated g/C Ratio	0.69			0.69	0.22	0.22
v/c Ratio	0.33			0.29	0.23	0.22
Control Delay	2.1			11.1	30.6	8.0
Queue Delay	0.1			0.0	0.0	0.0
Total Delay	2.2			11.1	30.6	8.0
LOS	A			B	C	A
Approach Delay	2.2			11.1	19.3	
Approach LOS	A			B	B	
Queue Length 50th (ft)	21			122	43	0
Queue Length 95th (ft)	27			174	84	37
Internal Link Dist (ft)	243			332	316	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Bay Length (ft)					100	
Base Capacity (vph)	2424			2084	393	422
Starvation Cap Reductn	542			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.42			0.29	0.23	0.22

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 21 (23%), Referenced to phase 2:WBTL and 6:EBT, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.33	
Intersection Signal Delay: 7.6	Intersection LOS: A
Intersection Capacity Utilization 51.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 18: Oneida & College

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	63	712	0	0	507	41	57	139	139	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00
Frt					0.989			0.938				
Flt Protected		0.996						0.992				
Satd. Flow (prot)	0	3525	0	0	3500	0	0	3293	0	0	0	0
Flt Permitted		0.867						0.992				
Satd. Flow (perm)	0	3068	0	0	3500	0	0	3293	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					11			143				
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		412			438			317			412	
Travel Time (s)		10.0			10.7			8.6			11.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	65	734	0	0	523	42	59	143	143	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	799	0	0	565	0	0	345	0	0	0	0
Turn Type	pm+pt	NA			NA		Perm	NA				
Protected Phases	1	6			2			8				
Permitted Phases	6						8					
Minimum Split (s)	9.0	23.0			23.0		23.0	23.0				
Total Split (s)	15.0	57.0			42.0		33.0	33.0				
Total Split (%)	16.7%	63.3%			46.7%		36.7%	36.7%				
Maximum Green (s)	10.0	52.0			37.0		28.0	28.0				
Yellow Time (s)	4.0	4.0			4.0		4.0	4.0				
All-Red Time (s)	1.0	1.0			1.0		1.0	1.0				
Lost Time Adjust (s)		-1.0			-1.0			-2.0				
Total Lost Time (s)		4.0			4.0			3.0				
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Walk Time (s)		7.0			7.0		7.0	7.0				
Flash Dont Walk (s)		11.0			11.0		11.0	11.0				
Pedestrian Calls (#/hr)		0			0		0	0				
Act Effct Green (s)		53.0			38.0			30.0				
Actuated g/C Ratio		0.59			0.42			0.33				
v/c Ratio		0.43			0.38			0.29				
Control Delay		3.6			14.3			13.4				
Queue Delay		0.4			0.0			0.0				
Total Delay		4.0			14.3			13.4				
LOS		A			B			B				
Approach Delay		4.0			14.3			13.4				
Approach LOS		A			B			B				
Queue Length 50th (ft)		35			69			42				
Queue Length 95th (ft)		39			125			75				
Internal Link Dist (ft)		332			358			237			332	
Turn Bay Length (ft)												
Base Capacity (vph)		1862			1484			1193				
Starvation Cap Reductn		526			0			0				

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.60			0.38			0.29				

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 53 (59%), Referenced to phase 1:EBL and 6:EBTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.43	
Intersection Signal Delay: 9.3	Intersection LOS: A
Intersection Capacity Utilization 56.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 19: Morrison & College

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	49	690	24	47	544	91	24	75	47	172	55	59
Ideal Flow (vphpl)	1750	1750	1900	1750	1750	1750	1900	1750	1750	1750	1750	1750
Storage Length (ft)	50		0	50		0	50		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.978			0.942			0.923	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3244	0	1630	3188	0	1770	1616	0	1630	1584	0
Flt Permitted	0.271			0.226			0.677			0.570		
Satd. Flow (perm)	465	3244	0	388	3188	0	1261	1616	0	978	1584	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			25			35			60	
Link Speed (mph)		28			28			28			28	
Link Distance (ft)		453			1029			566			812	
Travel Time (s)		11.0			25.1			15.4			19.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	53	750	26	51	591	99	26	82	51	187	60	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	776	0	51	690	0	26	133	0	187	124	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8			4		
Detector Phase	1	6		5	2		3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	9.0	23.0		9.0	23.0		9.0	23.0		9.0	23.0	
Total Split (s)	11.0	39.0		11.0	39.0		11.0	29.0		11.0	29.0	
Total Split (%)	12.2%	43.3%		12.2%	43.3%		12.2%	32.2%		12.2%	32.2%	
Maximum Green (s)	6.0	34.0		6.0	34.0		6.0	24.0		6.0	24.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-1.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	3.0	3.0		3.0	3.0		4.0	3.0		3.0	3.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		13			7			5			5	
Act Effct Green (s)	45.2	40.4		45.2	40.4		31.8	26.0		35.8	32.6	
Actuated g/C Ratio	0.50	0.45		0.50	0.45		0.35	0.29		0.40	0.36	
v/c Ratio	0.16	0.53		0.17	0.48		0.05	0.27		0.42	0.20	
Control Delay	3.9	5.7		21.7	32.5		17.0	19.8		21.4	13.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	3.9	5.7		21.7	32.5		17.0	19.8		21.4	13.4	
LOS	A	A		C	C		B	B		C	B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		5.6			31.7			19.3			18.2	
Approach LOS		A			C			B			B	
Queue Length 50th (ft)	2	48		24	205		9	42		69	22	
Queue Length 95th (ft)	7	72		m48	265		25	89		118	70	
Internal Link Dist (ft)		373			949			486			732	
Turn Bay Length (ft)	50			50			50			125		
Base Capacity (vph)	336	1458		305	1444		487	491		447	612	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.16	0.53		0.17	0.48		0.05	0.27		0.42	0.20	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 71 (79%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.53

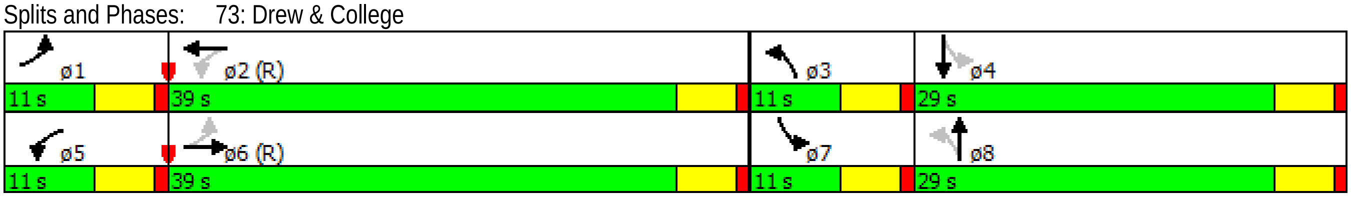
Intersection Signal Delay: 18.1 Intersection LOS: B

Intersection Capacity Utilization 55.9% ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 73: Drew & College



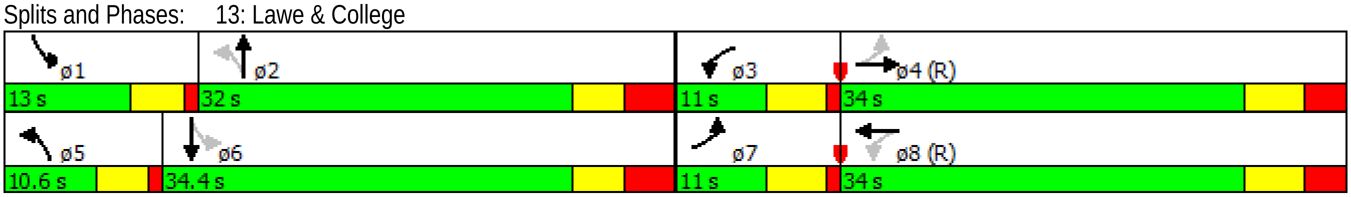
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	689	40	9	480	100	36	191	40	198	196	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	100		0	75		0	300		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992			0.974			0.974			0.961	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3511	0	1770	3447	0	1770	1814	0	1770	1790	0
Flt Permitted	0.251			0.243			0.579			0.438		
Satd. Flow (perm)	468	3511	0	453	3447	0	1079	1814	0	816	1790	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			28			12			21	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1029			572			499			479	
Travel Time (s)		23.4			13.0			11.3			10.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	749	43	10	522	109	39	208	43	215	213	76
Shared Lane Traffic (%)												
Lane Group Flow (vph)	92	792	0	10	631	0	39	251	0	215	289	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	15.0		6.0	10.0		6.0	10.0		6.0	10.0	
Minimum Split (s)	11.0	26.0		11.0	26.0		10.5	32.0		10.5	32.0	
Total Split (s)	11.0	34.0		11.0	34.0		10.6	32.0		13.0	34.4	
Total Split (%)	12.2%	37.8%		12.2%	37.8%		11.8%	35.6%		14.4%	38.2%	
Maximum Green (s)	6.0	27.0		6.0	27.0		6.1	25.0		8.5	27.4	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.5		1.0	3.5	
Lost Time Adjust (s)	0.0	-1.0		0.0	-1.0		0.0	-1.0		0.0	-1.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0		4.5	6.0		4.5	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Ped		None	Ped	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		12.0			12.0			18.0			18.0	
Pedestrian Calls (#/hr)		10			10			10			10	
Act Effct Green (s)	39.0	36.8		36.0	30.2		33.6	26.0		39.2	32.6	
Actuated g/C Ratio	0.43	0.41		0.40	0.34		0.37	0.29		0.44	0.36	
v/c Ratio	0.32	0.55		0.04	0.54		0.09	0.47		0.48	0.44	
Control Delay	12.3	13.9		30.7	43.7		14.8	28.5		19.9	24.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	12.3	13.9		30.7	43.7		14.8	28.5		19.9	24.0	
LOS	B	B		C	D		B	C		B	C	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		13.7			43.5			26.7			22.2	
Approach LOS		B			D			C			C	
Queue Length 50th (ft)	18	84		5	195		12	111		74	122	
Queue Length 95th (ft)	34	112		m13	254		30	183		123	200	
Internal Link Dist (ft)		949			492			419			399	
Turn Bay Length (ft)	200			100			75			300		
Base Capacity (vph)	289	1441		268	1176		449	532		445	661	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.32	0.55		0.04	0.54		0.09	0.47		0.48	0.44	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.55
Intersection Signal Delay: 25.4 Intersection LOS: C
Intersection Capacity Utilization 66.7% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Lawe & College

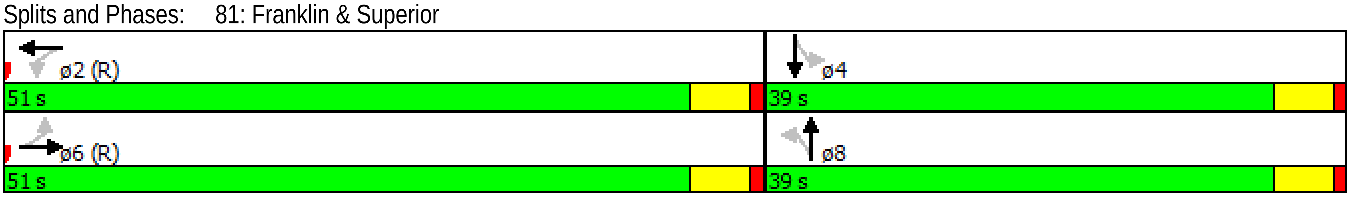


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	252	20	0	277	6	26	47	18	6	22	4
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	150		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989			0.997			0.974			0.982	
Flt Protected	0.950							0.986			0.991	
Satd. Flow (prot)	1630	1697	0	1716	1711	0	0	1648	0	0	1670	0
Flt Permitted	0.484							0.930			0.966	
Satd. Flow (perm)	830	1697	0	1716	1711	0	0	1554	0	0	1628	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			2			16			5	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		490			391			388			458	
Travel Time (s)		12.8			10.5			10.6			12.5	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	11	296	24	0	326	7	31	55	21	7	26	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	320	0	0	333	0	0	107	0	0	38	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0		23.0	23.0	
Total Split (s)	51.0	51.0		51.0	51.0		39.0	39.0		39.0	39.0	
Total Split (%)	56.7%	56.7%		56.7%	56.7%		43.3%	43.3%		43.3%	43.3%	
Maximum Green (s)	46.0	46.0		46.0	46.0		34.0	34.0		34.0	34.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0			-2.0			-2.0	
Total Lost Time (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	48.0	48.0			48.0			36.0			36.0	
Actuated g/C Ratio	0.53	0.53			0.53			0.40			0.40	
v/c Ratio	0.02	0.35			0.36			0.17			0.06	
Control Delay	10.2	13.2			9.2			15.6			15.3	
Queue Delay	0.0	0.0			0.2			0.0			0.0	
Total Delay	10.2	13.2			9.5			15.6			15.3	
LOS	B	B			A			B			B	
Approach Delay		13.1			9.5			15.6			15.3	
Approach LOS		B			A			B			B	
Queue Length 50th (ft)	3	96			60			32			11	
Queue Length 95th (ft)	10	142			82			62			29	
Internal Link Dist (ft)		410			311			308			378	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	150											
Base Capacity (vph)	442	908			913			631			654	
Starvation Cap Reductn	0	0			162			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.02	0.35			0.44			0.17			0.06	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 12 (13%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.36	
Intersection Signal Delay: 12.0	Intersection LOS: B
Intersection Capacity Utilization 31.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 81: Franklin & Superior



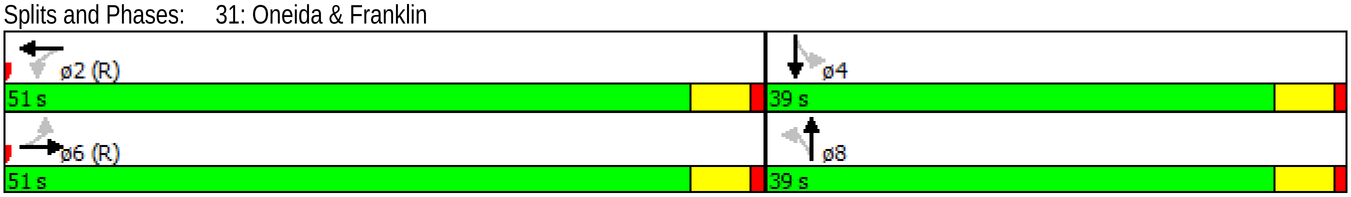
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	183	5	30	236	16	6	18	13	6	15	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	125		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.990			0.952			0.946	
Flt Protected	0.950			0.950				0.992			0.991	
Satd. Flow (prot)	1770	1855	0	1770	1844	0	0	1759	0	0	1746	0
Flt Permitted	0.527			0.591				0.975			0.973	
Satd. Flow (perm)	982	1855	0	1101	1844	0	0	1729	0	0	1715	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			6			15			16	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		338			417			394			310	
Travel Time (s)		8.2			10.2			10.7			8.5	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	6	206	6	34	265	18	7	20	15	7	17	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	6	212	0	34	283	0	0	42	0	0	40	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0		23.0	23.0	
Total Split (s)	51.0	51.0		51.0	51.0		39.0	39.0		39.0	39.0	
Total Split (%)	56.7%	56.7%		56.7%	56.7%		43.3%	43.3%		43.3%	43.3%	
Maximum Green (s)	46.0	46.0		46.0	46.0		34.0	34.0		34.0	34.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0			-2.0			-2.0	
Total Lost Time (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	48.0	48.0		48.0	48.0			36.0			36.0	
Actuated g/C Ratio	0.53	0.53		0.53	0.53			0.40			0.40	
v/c Ratio	0.01	0.21		0.06	0.29			0.06			0.06	
Control Delay	5.8	6.1		9.1	10.2			12.4			11.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	5.8	6.1		9.1	10.2			12.4			11.8	
LOS	A	A		A	B			B			B	
Approach Delay		6.1			10.1			12.4			11.8	
Approach LOS		A			B			B			B	
Queue Length 50th (ft)	1	28		7	59			9			8	
Queue Length 95th (ft)	m3	40		17	88			29			27	
Internal Link Dist (ft)		258			337			314			230	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	100			125								
Base Capacity (vph)	523	990		587	986			700			695	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.01	0.21		0.06	0.29			0.06			0.06	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 11 (12%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.29	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 30.1%	ICU Level of Service A
Analysis Period (min) 15	

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

Splits and Phases: 31: Oneida & Franklin

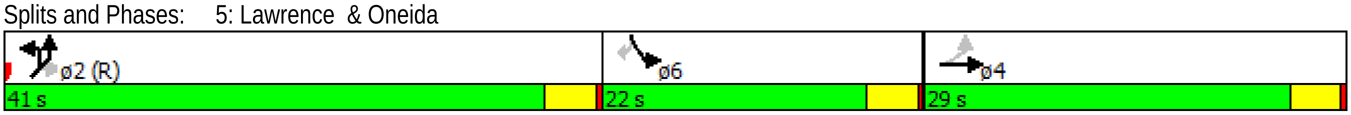


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	SBR2	NEL2	NEL	NER
Lane Configurations												
Volume (vph)	48	107	0	0	0	0	22	0	80	30	84	139
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	0		0	100	0			0	0
Storage Lanes	1		0	0		0	1	1			1	1
Taper Length (ft)	25			25			25				25	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt									0.850			0.850
Flt Protected		0.985					0.950				0.950	
Satd. Flow (prot)	0	3486	0	0	0	0	1770	0	1583	0	1752	1568
Flt Permitted		0.985					0.950				0.950	
Satd. Flow (perm)	0	3486	0	0	0	0	1770	0	1583	0	1752	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)									81			140
Link Speed (mph)		25			25		30				35	
Link Distance (ft)		319			445		396				605	
Travel Time (s)		8.7			12.1		9.0				11.8	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Adj. Flow (vph)	48	108	0	0	0	0	22	0	81	30	85	140
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	156	0	0	0	0	22	0	81	0	115	140
Turn Type	Perm	NA					Prot		Perm	Prot	Prot	Perm
Protected Phases		4					6			2	2	
Permitted Phases	4								6			2
Detector Phase	4	4					6		6	2	2	2
Switch Phase												
Minimum Initial (s)	4.0	4.0					4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0					22.0		22.0	22.0	22.0	22.0
Total Split (s)	29.0	29.0					22.0		22.0	41.0	41.0	41.0
Total Split (%)	31.5%	31.5%					23.9%		23.9%	44.6%	44.6%	44.6%
Maximum Green (s)	25.0	25.0					18.0		18.0	37.0	37.0	37.0
Yellow Time (s)	3.5	3.5					3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5					0.5		0.5	0.5	0.5	0.5
Lost Time Adjust (s)		0.0					0.0		0.0		0.0	0.0
Total Lost Time (s)		4.0					4.0		4.0		4.0	4.0
Lead/Lag							Lag		Lag	Lead	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0					3.0		3.0	3.0	3.0	3.0
Recall Mode	None	None					None		None	C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0					7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0					11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	4	4					3		3	6	6	6
Act Effct Green (s)		10.7					8.6		8.6		62.6	62.6
Actuated g/C Ratio		0.12					0.09		0.09		0.68	0.68
v/c Ratio		0.39					0.13		0.37		0.10	0.13
Control Delay		39.4					37.3		13.1		8.0	2.3
Queue Delay		0.0					0.0		0.0		0.0	0.0
Total Delay		39.4					37.3		13.1		8.0	2.3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	SBR2	NEL2	NEL	NER
LOS		D					D		B		A	A
Approach Delay		39.4					18.3				4.9	
Approach LOS		D					B				A	
Queue Length 50th (ft)		45					12		0		19	0
Queue Length 95th (ft)		68					31		38		67	30
Internal Link Dist (ft)		239			365		316				525	
Turn Bay Length (ft)							100					
Base Capacity (vph)		947					346		374		1192	1111
Starvation Cap Reductn		0					0		0		0	0
Spillback Cap Reductn		0					0		0		0	0
Storage Cap Reductn		0					0		0		0	0
Reduced v/c Ratio		0.16					0.06		0.22		0.10	0.13

Intersection Summary	
Area Type: Other	
Cycle Length: 92	
Actuated Cycle Length: 92	
Offset: 89 (97%), Referenced to phase 2:NEL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.39	
Intersection Signal Delay: 18.0	Intersection LOS: B
Intersection Capacity Utilization 24.0%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: Lawrence & Oneida

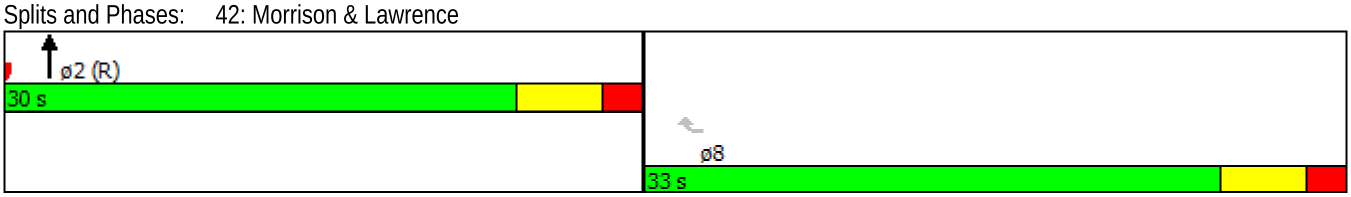


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	0	293	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	3539	0	0	0
Flt Permitted						
Satd. Flow (perm)	0	1863	3539	0	0	0
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (mph)	30		25			25
Link Distance (ft)	193		79			317
Travel Time (s)	4.4		2.2			8.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	318	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	318	0	0	0
Turn Type		Perm	NA			
Protected Phases			2			
Permitted Phases		8				
Detector Phase		8	2			
Switch Phase						
Minimum Initial (s)		4.0	4.0			
Minimum Split (s)		33.0	24.0			
Total Split (s)		33.0	30.0			
Total Split (%)		52.4%	47.6%			
Maximum Green (s)		27.0	24.0			
Yellow Time (s)		4.0	4.0			
All-Red Time (s)		2.0	2.0			
Lost Time Adjust (s)		0.0	0.0			
Total Lost Time (s)		6.0	6.0			
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0			
Recall Mode		None	C-Min			
Walk Time (s)		7.0	7.0			
Flash Dont Walk (s)		20.0	11.0			
Pedestrian Calls (#/hr)		60	0			
Act Effct Green (s)			39.6			
Actuated g/C Ratio			0.63			
v/c Ratio			0.14			
Control Delay			10.4			
Queue Delay			0.0			
Total Delay			10.4			
LOS			B			
Approach Delay			10.4			
Approach LOS			B			
Queue Length 50th (ft)			42			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Queue Length 95th (ft)			67			
Internal Link Dist (ft)	113		1			237
Turn Bay Length (ft)						
Base Capacity (vph)			2224			
Starvation Cap Reductn			0			
Spillback Cap Reductn			0			
Storage Cap Reductn			0			
Reduced v/c Ratio			0.14			

Intersection Summary	
Area Type: Other	
Cycle Length: 63	
Actuated Cycle Length: 63	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.14	
Intersection Signal Delay: 10.4	Intersection LOS: B
Intersection Capacity Utilization 13.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 42: Morrison & Lawrence

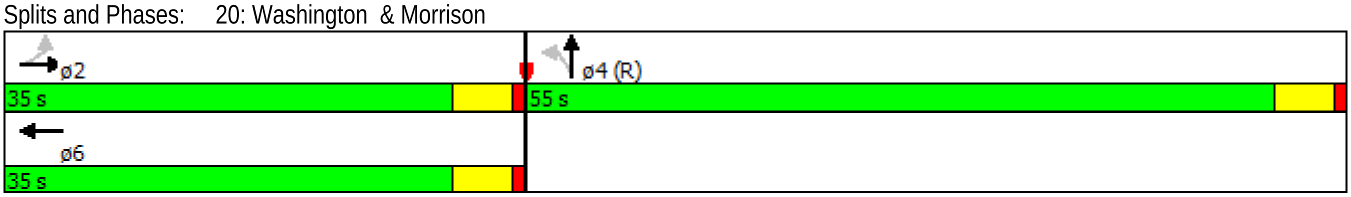


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	163	0	0	75	11	91	165	24	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt					0.983			0.987				
Flt Protected		0.998						0.984				
Satd. Flow (prot)	0	1859	0	0	1831	0	0	3437	0	0	0	0
Flt Permitted		0.991						0.984				
Satd. Flow (perm)	0	1846	0	0	1831	0	0	3437	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					9			19				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		407			738			412			393	
Travel Time (s)		11.1			20.1			11.2			10.7	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	8	183	0	0	84	12	102	185	27	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	191	0	0	96	0	0	314	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		2			6			4				
Permitted Phases	2						4					
Minimum Split (s)	23.0	23.0			23.0		23.0	23.0				
Total Split (s)	35.0	35.0			35.0		55.0	55.0				
Total Split (%)	38.9%	38.9%			38.9%		61.1%	61.1%				
Maximum Green (s)	30.0	30.0			30.0		50.0	50.0				
Yellow Time (s)	4.0	4.0			4.0		4.0	4.0				
All-Red Time (s)	1.0	1.0			1.0		1.0	1.0				
Lost Time Adjust (s)		-2.0			-2.0			-2.0				
Total Lost Time (s)		3.0			3.0			3.0				
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0			7.0		7.0	7.0				
Flash Dont Walk (s)	11.0	11.0			11.0		11.0	11.0				
Pedestrian Calls (#/hr)	0	0			0		0	0				
Act Effct Green (s)		32.0			32.0			52.0				
Actuated g/C Ratio		0.36			0.36			0.58				
v/c Ratio		0.29			0.15			0.16				
Control Delay		22.4			18.6			8.2				
Queue Delay		0.0			0.0			0.0				
Total Delay		22.4			18.6			8.2				
LOS		C			B			A				
Approach Delay		22.4			18.6			8.2				
Approach LOS		C			B			A				
Queue Length 50th (ft)		77			33			44				
Queue Length 95th (ft)		128			66			67				
Internal Link Dist (ft)		327			658			332			313	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)												
Base Capacity (vph)		656			656			1993				
Starvation Cap Reductn		0			0			0				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.29			0.15			0.16				

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 44 (49%), Referenced to phase 4:NBTL, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.29	
Intersection Signal Delay: 14.4	Intersection LOS: B
Intersection Capacity Utilization 28.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 20: Washington & Morrison

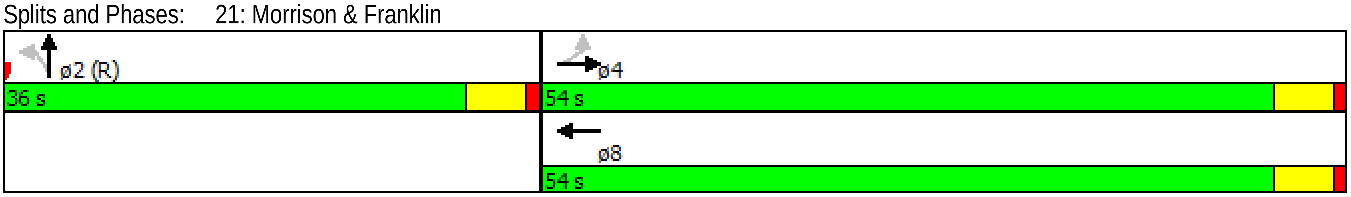


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	200	0	0	133	11	27	69	28	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	300		0	0		0
Storage Lanes	1		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt					0.990			0.957				
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1770	1863	0	0	1844	0	1770	3387	0	0	0	0
Flt Permitted	0.650						0.950					
Satd. Flow (perm)	1211	1863	0	0	1844	0	1770	3387	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					8			30				
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		417			894			393			308	
Travel Time (s)		10.2			21.8			10.7			8.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	10	215	0	0	143	12	29	74	30	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	215	0	0	155	0	29	104	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Minimum Split (s)	23.0	23.0			23.0		23.0	23.0				
Total Split (s)	54.0	54.0			54.0		36.0	36.0				
Total Split (%)	60.0%	60.0%			60.0%		40.0%	40.0%				
Maximum Green (s)	49.0	49.0			49.0		31.0	31.0				
Yellow Time (s)	4.0	4.0			4.0		4.0	4.0				
All-Red Time (s)	1.0	1.0			1.0		1.0	1.0				
Lost Time Adjust (s)	-1.0	-2.0			-2.0		-2.0	-1.0				
Total Lost Time (s)	4.0	3.0			3.0		3.0	4.0				
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0			7.0		7.0	7.0				
Flash Dont Walk (s)	11.0	11.0			11.0		11.0	11.0				
Pedestrian Calls (#/hr)	0	0			0		0	0				
Act Effct Green (s)	50.0	51.0			51.0		33.0	32.0				
Actuated g/C Ratio	0.56	0.57			0.57		0.37	0.36				
v/c Ratio	0.01	0.20			0.15		0.04	0.09				
Control Delay	5.9	5.7			9.2		12.9	8.7				
Queue Delay	0.0	0.0			0.0		0.0	0.0				
Total Delay	5.9	5.7			9.2		12.9	8.7				
LOS	A	A			A		B	A				
Approach Delay		5.7			9.2			9.6				
Approach LOS		A			A			A				
Queue Length 50th (ft)	1	24			37		5	2				
Queue Length 95th (ft)	5	39			66		13	12				
Internal Link Dist (ft)		337			814			313			228	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	150						300					
Base Capacity (vph)	672	1055			1048		649	1223				
Starvation Cap Reductn	0	0			0		0	0				
Spillback Cap Reductn	0	0			0		0	0				
Storage Cap Reductn	0	0			0		0	0				
Reduced v/c Ratio	0.01	0.20			0.15		0.04	0.09				

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 59 (66%), Referenced to phase 2:NBTL, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.20	
Intersection Signal Delay: 7.8	Intersection LOS: A
Intersection Capacity Utilization 20.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 21: Morrison & Franklin



Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	0	0	0	0	0	2	4	0	49	47	3
Peak Hour Factor	0.92	0.83	0.83	0.83	0.92	0.83	0.83	0.83	0.92	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	0	2	5	0	59	57	4
Number of Lanes	0	0	0	0	0	0	1	0	0	1	1	0

Approach	WB	NB
Opposing Approach		SB
Opposing Lanes	0	1
Conflicting Approach Left	NB	
Conflicting Lanes Left	2	0
Conflicting Approach Right	SB	WB
Conflicting Lanes Right	1	1
HCM Control Delay	6.9	7.9
HCM LOS	A	A

Lane	NBLn1	NBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	0%	46%
Vol Thru, %	0%	94%	33%	0%
Vol Right, %	0%	6%	67%	54%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	49	50	6	24
LT Vol	0	47	2	0
Through Vol	0	3	4	13
RT Vol	49	0	0	11
Lane Flow Rate	59	60	7	29
Geometry Grp	7	7	2	5
Degree of Util (X)	0.083	0.076	0.008	0.031
Departure Headway (Hd)	5.06	4.518	3.884	3.897
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	711	796	927	914
Service Time	2.767	2.225	1.884	1.942
HCM Lane V/C Ratio	0.083	0.075	0.008	0.032
HCM Control Delay	8.2	7.6	6.9	7.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.2	0	0.1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	11	0	13
Peak Hour Factor	0.92	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	13	0	16
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	
Conflicting Lanes Right	0
HCM Control Delay	7.1
HCM LOS	A

Lane

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	52	4	28	0	16	62	17	0	9	69	56
Peak Hour Factor	1.00	0.90	0.90	0.90	1.00	0.90	0.90	0.90	1.00	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	58	4	31	0	18	69	19	0	10	77	62
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.1	8.2	8.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	7%	62%	17%	13%
Vol Thru, %	51%	5%	65%	83%
Vol Right, %	42%	33%	18%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	134	84	95	63
LT Vol	69	4	62	52
Through Vol	56	28	17	3
RT Vol	9	52	16	8
Lane Flow Rate	149	93	106	70
Geometry Grp	1	1	1	1
Degree of Util (X)	0.175	0.116	0.131	0.088
Departure Headway (Hd)	4.233	4.466	4.455	4.548
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	849	804	805	788
Service Time	2.253	2.488	2.477	2.572
HCM Lane V/C Ratio	0.176	0.116	0.132	0.089
HCM Control Delay	8.2	8.1	8.2	8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.4	0.4	0.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	8	52	3
Peak Hour Factor	1.00	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	9	58	3
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8
HCM LOS	A

Lane

Future Year (2036) - PM Peak

No-Build

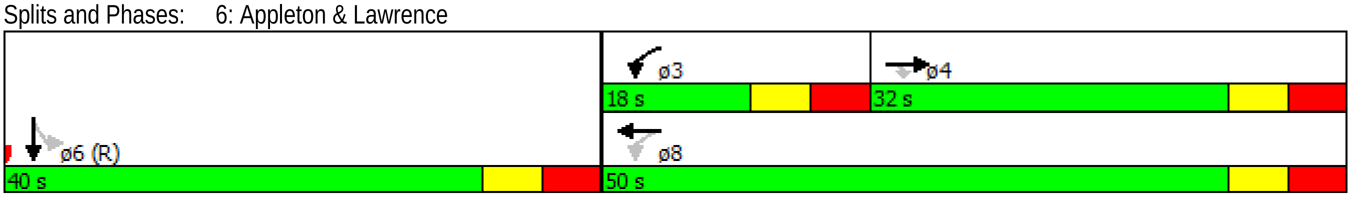
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↱	↰	↑					↰	↑↱	
Volume (vph)	0	146	208	67	77	0	0	0	0	25	452	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		50	100		0	0		0	50		0
Storage Lanes	0		1	1		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95
Ped Bike Factor			0.95	0.98						0.90	0.99	
Frt			0.850								0.983	
Flt Protected				0.950						0.950		
Satd. Flow (prot)	0	1863	1583	1770	1863	0	0	0	0	1770	3459	0
Flt Permitted				0.384						0.950		
Satd. Flow (perm)	0	1863	1508	700	1863	0	0	0	0	1593	3459	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			241								18	
Link Speed (mph)		25			25			30			25	
Link Distance (ft)		1279			319			486			394	
Travel Time (s)		34.9			8.7			11.0			10.7	
Confl. Peds. (#/hr)			24	24						40		12
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	0	180	257	83	95	0	0	0	0	31	558	73
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	180	257	83	95	0	0	0	0	31	631	0
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	
Protected Phases		4		3	8						6	
Permitted Phases			4	8						6		
Detector Phase		4	4	3	8					6	6	
Switch Phase												
Minimum Initial (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Minimum Split (s)		26.0	26.0	12.0	26.0					26.0	26.0	
Total Split (s)		32.0	32.0	18.0	50.0					40.0	40.0	
Total Split (%)		35.6%	35.6%	20.0%	55.6%					44.4%	44.4%	
Maximum Green (s)		24.0	24.0	10.0	42.0					32.0	32.0	
Yellow Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
All-Red Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	
Lost Time Adjust (s)		-2.0	-2.0	-1.0	-2.0					-2.0	-2.0	
Total Lost Time (s)		6.0	6.0	7.0	6.0					6.0	6.0	
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	
Recall Mode		None	None	None	None					C-Min	C-Min	
Walk Time (s)		7.0	7.0		7.0					7.0	7.0	
Flash Dont Walk (s)		11.0	11.0		11.0					11.0	11.0	
Pedestrian Calls (#/hr)		12	12		25					20	20	
Act Effct Green (s)		16.7	16.7	28.7	29.7					48.3	48.3	
Actuated g/C Ratio		0.19	0.19	0.32	0.33					0.54	0.54	
v/c Ratio		0.52	0.54	0.25	0.15					0.04	0.34	
Control Delay		37.7	9.6	20.3	18.6					11.4	11.6	
Queue Delay		0.0	0.0	0.0	0.0					0.0	0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		37.7	9.6	20.3	18.6					11.4	11.6	
LOS		D	A	C	B					B	B	
Approach Delay		21.2			19.4						11.6	
Approach LOS		C			B						B	
Queue Length 50th (ft)		93	8	32	36					6	67	
Queue Length 95th (ft)		128	47	48	52					m25	208	
Internal Link Dist (ft)		1199			239			406			314	
Turn Bay Length (ft)			50	100						50		
Base Capacity (vph)		538	607	355	910					855	1865	
Starvation Cap Reductn		0	0	0	0					0	0	
Spillback Cap Reductn		0	0	0	0					0	0	
Storage Cap Reductn		0	0	0	0					0	0	
Reduced v/c Ratio		0.33	0.42	0.23	0.10					0.04	0.34	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 6:SBTL, Start of Green
Natural Cycle: 65
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.54
Intersection Signal Delay: 16.0 Intersection LOS: B
Intersection Capacity Utilization 49.2% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Appleton & Lawrence



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	753	142	57	568	0	0	0	0	67	372	184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor		0.99									0.99	0.93
Frt		0.976										0.850
Flt Protected					0.995						0.992	
Satd. Flow (prot)	0	3424	0	0	3522	0	0	0	0	0	3511	1583
Flt Permitted					0.662						0.992	
Satd. Flow (perm)	0	3424	0	0	2343	0	0	0	0	0	3473	1474
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26										194
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		412			323			394			213	
Travel Time (s)		10.0			7.9			10.7			5.8	
Confl. Peds. (#/hr)			29	29						47		39
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	793	149	60	598	0	0	0	0	71	392	194
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	942	0	0	658	0	0	0	0	0	463	194
Turn Type		NA		pm+pt	NA					Perm	NA	Perm
Protected Phases		6		5	2						4	
Permitted Phases				2						4		4
Detector Phase		6		5	2					4	4	4
Switch Phase												
Minimum Initial (s)		8.0		4.0	8.0					8.0	8.0	8.0
Minimum Split (s)		29.0		11.0	26.0					26.0	26.0	26.0
Total Split (s)		37.0		17.0	54.0					36.0	36.0	36.0
Total Split (%)		41.1%		18.9%	60.0%					40.0%	40.0%	40.0%
Maximum Green (s)		29.0		10.0	46.0					28.0	28.0	28.0
Yellow Time (s)		4.0		3.0	4.0					4.0	4.0	4.0
All-Red Time (s)		4.0		4.0	4.0					4.0	4.0	4.0
Lost Time Adjust (s)		-1.0			-1.0						-2.0	-2.0
Total Lost Time (s)		7.0			7.0						6.0	6.0
Lead/Lag		Lag		Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0		3.0	3.0					3.0	3.0	3.0
Recall Mode		C-Max		Max	C-Max					Max	Max	Max
Walk Time (s)		7.0			7.0					7.0	7.0	7.0
Flash Dont Walk (s)		11.0			11.0					11.0	11.0	11.0
Pedestrian Calls (#/hr)		15			25					20	20	20
Act Effct Green (s)		30.0			47.0						30.0	30.0
Actuated g/C Ratio		0.33			0.52						0.33	0.33
v/c Ratio		0.81			0.49						0.40	0.31
Control Delay		41.6			6.7						24.4	4.9
Queue Delay		0.2			0.1						0.0	0.0
Total Delay		41.8			6.9						24.4	4.9
LOS		D			A						C	A
Approach Delay		41.8			6.9						18.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach LOS		D			A						B	
Queue Length 50th (ft)		214			43						105	0
Queue Length 95th (ft)		284			52						148	45
Internal Link Dist (ft)		332			243			314			133	
Turn Bay Length (ft)												
Base Capacity (vph)		1158			1354						1157	620
Starvation Cap Reductn		19			121						0	0
Spillback Cap Reductn		0			0						0	0
Storage Cap Reductn		0			0						0	0
Reduced v/c Ratio		0.83			0.53						0.40	0.31

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 22 (24%), Referenced to phase 2:WBTL and 6:EBT, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 24.9	Intersection LOS: C
Intersection Capacity Utilization 74.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 15: Appleton & College

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	35	62	221	85	42	1	53	19	17	355	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	100		0	0		0	125		0
Storage Lanes	0		0	0		0	0		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.929			0.984			0.965			0.998	
Flt Protected		0.992			0.969			0.999		0.950		
Satd. Flow (prot)	0	1717	0	0	1776	0	0	1796	0	1770	1859	0
Flt Permitted		0.902			0.743			0.996		0.702		
Satd. Flow (perm)	0	1561	0	0	1362	0	0	1790	0	1308	1859	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		72			10			22			1	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		398			340			206			389	
Travel Time (s)		10.9			9.3			5.6			10.6	
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	23	41	72	257	99	49	1	62	22	20	413	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	136	0	0	405	0	0	85	0	20	418	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	6	6		2	2		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	35.0	35.0		35.0	35.0		26.0	26.0		26.0	26.0	
Total Split (s)	47.0	47.0		47.0	47.0		43.0	43.0		43.0	43.0	
Total Split (%)	52.2%	52.2%		52.2%	52.2%		47.8%	47.8%		47.8%	47.8%	
Maximum Green (s)	39.0	39.0		39.0	39.0		35.0	35.0		35.0	35.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0		-2.0	-2.0	
Total Lost Time (s)		6.0			6.0			6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		41.0			41.0			37.0		37.0	37.0	
Actuated g/C Ratio		0.46			0.46			0.41		0.41	0.41	
v/c Ratio		0.18			0.65			0.11		0.04	0.55	
Control Delay		8.0			24.4			13.0		11.5	16.8	
Queue Delay		0.0			0.0			0.0		0.0	0.5	
Total Delay		8.0			24.4			13.0		11.5	17.4	
LOS		A			C			B		B	B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		8.0			24.4			13.0			17.1	
Approach LOS		A			C			B			B	
Queue Length 50th (ft)		20			167			21		4	95	
Queue Length 95th (ft)		49			252			47		m12	128	
Internal Link Dist (ft)		318			260			126			309	
Turn Bay Length (ft)										125		
Base Capacity (vph)		750			625			748		537	764	
Starvation Cap Reductn		0			0			0		0	102	
Spillback Cap Reductn		0			0			0		0	0	
Storage Cap Reductn		0			0			0		0	0	
Reduced v/c Ratio		0.18			0.65			0.11		0.04	0.63	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 64 (71%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.65

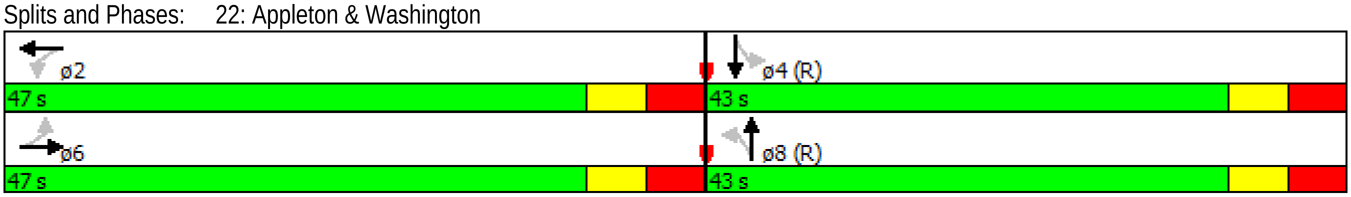
Intersection Signal Delay: 18.4 Intersection LOS: B

Intersection Capacity Utilization 54.9% ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 22: Appleton & Washington



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	158	62	26	212	3	59	108	16	11	273	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	100		0	100		0	50		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.97	0.97		0.93	1.00		0.96	0.99		0.95	0.99	
Frt		0.958			0.998			0.981			0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1707	0	1703	1787	0	1770	1809	0	1752	1816	0
Flt Permitted	0.573			0.566			0.522			0.672		
Satd. Flow (perm)	1021	1707	0	945	1787	0	931	1809	0	1178	1816	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		25			1			11			5	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		391			338			389			313	
Travel Time (s)		9.5			8.2			10.6			8.5	
Confl. Peds. (#/hr)	20		41	41		20	29		24	24		29
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	2%	2%	2%	3%	3%	3%
Adj. Flow (vph)	38	170	67	28	228	3	63	116	17	12	294	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	38	237	0	28	231	0	63	133	0	12	314	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Minimum Split (s)	26.0	26.0		26.0	26.0		26.0	26.0		26.0	26.0	
Total Split (s)	40.0	40.0		40.0	40.0		50.0	50.0		50.0	50.0	
Total Split (%)	44.4%	44.4%		44.4%	44.4%		55.6%	55.6%		55.6%	55.6%	
Maximum Green (s)	32.0	32.0		32.0	32.0		42.0	42.0		42.0	42.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)	-1.0	-2.0		-2.0	-2.0		-2.0	-1.0		-2.0	-2.0	
Total Lost Time (s)	7.0	6.0		6.0	6.0		6.0	7.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	20	20		15	15		15	15		15	15	
Act Effct Green (s)	33.0	34.0		34.0	34.0		44.0	43.0		44.0	44.0	
Actuated g/C Ratio	0.37	0.38		0.38	0.38		0.49	0.48		0.49	0.49	
v/c Ratio	0.10	0.36		0.08	0.34		0.14	0.15		0.02	0.35	
Control Delay	12.5	11.1		10.2	11.2		13.0	12.0		12.1	15.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	12.5	11.1		10.2	11.2		13.0	12.0		12.1	15.4	
LOS	B	B		B	B		B	B		B	B	
Approach Delay		11.3			11.1			12.3			15.3	
Approach LOS		B			B			B			B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	7	32		4	32		20	39		3	104	
Queue Length 95th (ft)	16	52		11	50		m38	m66		12	163	
Internal Link Dist (ft)		311			258			309			233	
Turn Bay Length (ft)	150			100			100			50		
Base Capacity (vph)	374	660		357	675		455	870		575	890	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	32	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.10	0.36		0.08	0.34		0.14	0.15		0.02	0.37	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 17 (19%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 55

Control Type: Pretimed

Maximum v/c Ratio: 0.36

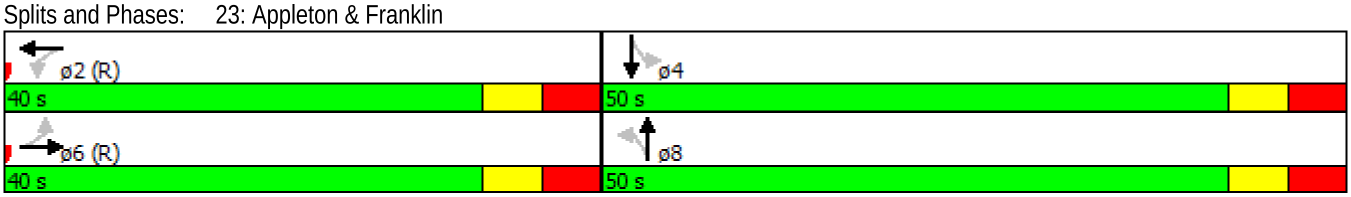
Intersection Signal Delay: 12.7 Intersection LOS: B

Intersection Capacity Utilization 58.3% ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 23: Appleton & Franklin



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	60	102	36	3	104	0	42	135	5	8	248	34
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	0		0	0		0	100		0	200		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99	0.97		1.00		0.99	1.00		0.97	1.00	
Frt			0.850					0.994			0.982	
Flt Protected		0.982			0.999		0.950			0.950		
Satd. Flow (prot)	0	1685	1458	0	1714	1716	1630	1701	0	1630	1679	0
Flt Permitted		0.832			0.992		0.547			0.656		
Satd. Flow (perm)	0	1419	1411	0	1702	1716	928	1701	0	1087	1679	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			61					4			14	
Link Speed (mph)		28			28			28			28	
Link Distance (ft)		2206			281			292			577	
Travel Time (s)		53.7			6.8			7.1			14.1	
Confl. Peds. (#/hr)	8		5	5		8	12		15	15		12
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	68	116	41	3	118	0	48	153	6	9	282	39
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	184	41	0	121	0	48	159	0	9	321	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Minimum Split (s)	26.0	26.0	26.0	26.0	26.0	26.0	23.5	23.5		26.0	26.0	
Total Split (s)	30.0	30.0	30.0	30.0	30.0	30.0	60.0	60.0		60.0	60.0	
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	33.3%	66.7%	66.7%		66.7%	66.7%	
Maximum Green (s)	22.0	22.0	22.0	22.0	22.0	22.0	52.5	52.5		52.0	52.0	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5		4.0	4.0	
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lost Time Adjust (s)		-2.0	-2.0		-2.0	-1.0	-1.0	-1.0		-2.0	-2.0	
Total Lost Time (s)		6.0	6.0		6.0	7.0	6.5	6.5		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0	7.0	7.0	7.0	7.0	5.0	5.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	5	5	5	8	8	8	15	15		12	12	
Act Effct Green (s)		24.0	24.0		24.0		53.5	53.5		54.0	54.0	
Actuated g/C Ratio		0.27	0.27		0.27		0.59	0.59		0.60	0.60	
v/c Ratio		0.49	0.10		0.27		0.09	0.16		0.01	0.32	
Control Delay		33.0	4.2		28.0		8.4	8.4		7.4	9.5	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		33.0	4.2		28.0		8.4	8.4		7.4	9.5	
LOS		C	A		C		A	A		A	A	
Approach Delay		27.8			28.0			8.4			9.4	
Approach LOS		C			C			A			A	
Queue Length 50th (ft)		88	0		54		11	36		2	78	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		149	15		98		25	63		8	122	
Internal Link Dist (ft)		2126			201			212			497	
Turn Bay Length (ft)							100			200		
Base Capacity (vph)		378	421		453		551	1012		652	1013	
Starvation Cap Reductn		0	0		0		0	0		0	0	
Spillback Cap Reductn		0	0		0		0	0		0	0	
Storage Cap Reductn		0	0		0		0	0		0	0	
Reduced v/c Ratio		0.49	0.10		0.27		0.09	0.16		0.01	0.32	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 56 (62%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 55
Control Type: Pretimed
Maximum v/c Ratio: 0.49
Intersection Signal Delay: 16.4 Intersection LOS: B
Intersection Capacity Utilization 61.6% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 27: Packard & Appleton

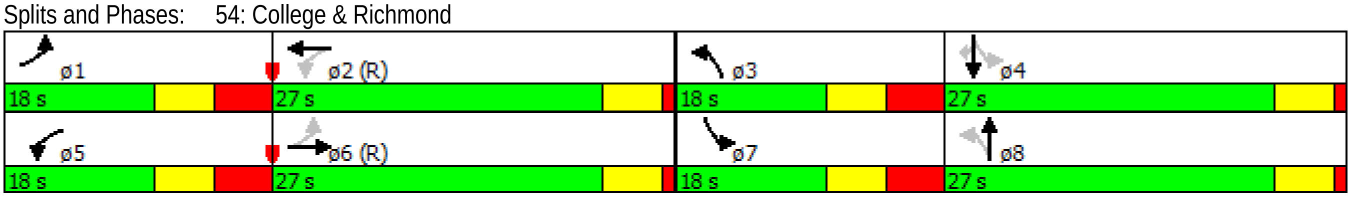
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	218	747	79	123	573	149	382	745	124	183	609	121
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	200		0	125		0	150		0	100		275
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Ped Bike Factor	0.98	0.99			0.98		0.99	0.99				0.97
Frt		0.986			0.969			0.979				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3464	0	1630	3366	0	1630	3175	0	1630	3260	1458
Flt Permitted	0.164			0.174			0.197			0.174		
Satd. Flow (perm)	277	3464	0	299	3366	0	336	3175	0	299	3260	1409
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			35			21				218
Link Speed (mph)		28			28			34			34	
Link Distance (ft)		2324			513			416			817	
Travel Time (s)		56.6			12.5			8.3			16.4	
Confl. Peds. (#/hr)	53		44	44		53	15		16	16		15
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	218	747	79	123	573	149	382	745	124	183	609	121
Shared Lane Traffic (%)												
Lane Group Flow (vph)	218	826	0	123	722	0	382	869	0	183	609	121
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8			4		4
Detector Phase	1	6		5	2		3	8		7	4	4
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	12.0	27.0		12.0	27.0		12.0	27.0		12.0	27.0	27.0
Total Split (s)	18.0	27.0		18.0	27.0		18.0	27.0		18.0	27.0	27.0
Total Split (%)	20.0%	30.0%		20.0%	30.0%		20.0%	30.0%		20.0%	30.0%	30.0%
Maximum Green (s)	10.0	22.0		10.0	22.0		10.0	22.0		10.0	22.0	22.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	4.0	1.0		4.0	1.0		4.0	1.0		4.0	1.0	1.0
Lost Time Adjust (s)	-1.0	-2.0		-1.0	-2.0		-1.0	-3.0		-1.0	-3.0	-3.0
Total Lost Time (s)	7.0	3.0		7.0	3.0		7.0	2.0		7.0	2.0	2.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	Max
Walk Time (s)	0.0	7.0		0.0	7.0		0.0	7.0		0.0	7.0	7.0
Flash Dont Walk (s)	0.0	11.0		0.0	11.0		0.0	11.0		0.0	11.0	11.0
Pedestrian Calls (#/hr)	0	12		0	25		0	16		0	15	15
Act Effct Green (s)	32.4	25.4		29.6	24.0		31.4	25.4		30.6	25.0	25.0
Actuated g/C Ratio	0.36	0.28		0.33	0.27		0.35	0.28		0.34	0.28	0.28
v/c Ratio	0.83	0.84		0.51	0.78		1.39	0.95		0.71	0.67	0.22
Control Delay	48.4	39.5		38.0	33.9		220.4	52.8		35.9	33.2	0.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	48.4	39.5		38.0	33.9		220.4	52.8		35.9	33.2	0.9
LOS	D	D		D	C		F	D		D	C	A
Approach Delay		41.4			34.5			104.0			29.5	
Approach LOS		D			C			F			C	
Queue Length 50th (ft)	81	231		55	123		~249	251		66	161	0
Queue Length 95th (ft)	#208	#342		110	176		#426	#380		#148	221	0
Internal Link Dist (ft)		2244			433			336			737	
Turn Bay Length (ft)	200			125			150			100		275
Base Capacity (vph)	265	986		265	924		275	912		265	905	548
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.82	0.84		0.46	0.78		1.39	0.95		0.69	0.67	0.22

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.39
Intersection Signal Delay: 56.6 Intersection LOS: E
Intersection Capacity Utilization 94.1% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 54: College & Richmond

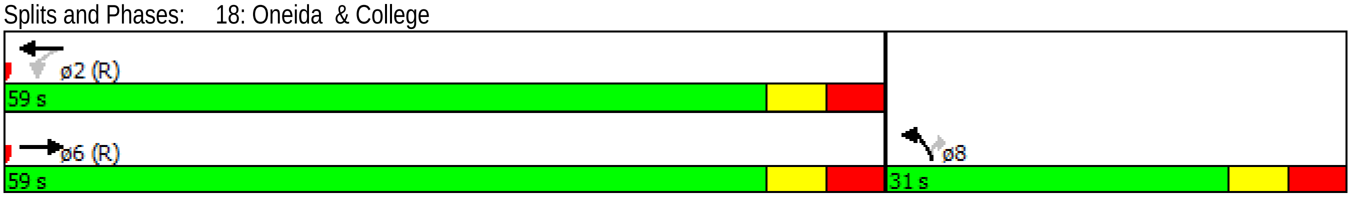


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	792	44	54	566	91	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		100	0
Storage Lanes		0	0		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Ped Bike Factor	0.99			1.00	0.91	0.92
Frt	0.992					0.850
Flt Protected				0.996	0.950	
Satd. Flow (prot)	3487	0	0	3525	1770	1583
Flt Permitted				0.792	0.950	
Satd. Flow (perm)	3487	0	0	2797	1613	1455
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	11					97
Link Speed (mph)	28			28	25	
Link Distance (ft)	323			412	396	
Travel Time (s)	7.9			10.0	10.8	
Confl. Peds. (#/hr)		44	44		59	47
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	843	47	57	602	97	97
Shared Lane Traffic (%)						
Lane Group Flow (vph)	890	0	0	659	97	97
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	6			2	8	
Permitted Phases			2			8
Minimum Split (s)	26.0		26.0	26.0	26.0	26.0
Total Split (s)	59.0		59.0	59.0	31.0	31.0
Total Split (%)	65.6%		65.6%	65.6%	34.4%	34.4%
Maximum Green (s)	51.0		51.0	51.0	23.0	23.0
Yellow Time (s)	4.0		4.0	4.0	4.0	4.0
All-Red Time (s)	4.0		4.0	4.0	4.0	4.0
Lost Time Adjust (s)	-1.0			-1.0	-1.0	-1.0
Total Lost Time (s)	7.0			7.0	7.0	7.0
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	20		0	0	25	25
Act Effct Green (s)	52.0			52.0	24.0	24.0
Actuated g/C Ratio	0.58			0.58	0.27	0.27
v/c Ratio	0.44			0.41	0.21	0.21
Control Delay	12.2			3.8	27.1	7.0
Queue Delay	0.4			0.0	0.0	0.0
Total Delay	12.6			3.8	27.1	7.0
LOS	B			A	C	A
Approach Delay	12.6			3.8	17.0	
Approach LOS	B			A	B	
Queue Length 50th (ft)	100			22	43	0

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Queue Length 95th (ft)	115			29	83	36
Internal Link Dist (ft)	243			332	316	
Turn Bay Length (ft)					100	
Base Capacity (vph)	2019			1616	472	459
Starvation Cap Reductn	571			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.61			0.41	0.21	0.21

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBT, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.44	
Intersection Signal Delay: 9.7	Intersection LOS: A
Intersection Capacity Utilization 73.2%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 18: Oneida & College



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	67	796	0	0	537	45	60	149	147	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	1.00	1.00	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00
Ped Bike Factor		1.00			0.99			0.97				
Frt					0.988			0.938				
Flt Protected		0.996						0.992				
Satd. Flow (prot)	0	3525	0	0	3475	0	0	3225	0	0	0	0
Flt Permitted		0.822						0.992				
Satd. Flow (perm)	0	2905	0	0	3475	0	0	3205	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					12			152				
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		412			438			317			412	
Travel Time (s)		10.0			10.7			8.6			11.2	
Confl. Peds. (#/hr)	46		51	51		46	24		26	26		24
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	69	821	0	0	554	46	62	154	152	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	890	0	0	600	0	0	368	0	0	0	0
Turn Type	pm+pt	NA			NA		Perm	NA				
Protected Phases	1	6			2			8				
Permitted Phases	6						8					
Minimum Split (s)	12.0	26.0			26.0		26.0	26.0				
Total Split (s)	18.0	63.0			45.0		27.0	27.0				
Total Split (%)	20.0%	70.0%			50.0%		30.0%	30.0%				
Maximum Green (s)	10.0	55.0			37.0		19.0	19.0				
Yellow Time (s)	4.0	4.0			4.0		4.0	4.0				
All-Red Time (s)	4.0	4.0			4.0		4.0	4.0				
Lost Time Adjust (s)		-1.0			-1.0			-2.0				
Total Lost Time (s)		7.0			7.0			6.0				
Lead/Lag	Lead				Lag							
Lead-Lag Optimize?												
Walk Time (s)		7.0			7.0		7.0	7.0				
Flash Dont Walk (s)		11.0			11.0		11.0	11.0				
Pedestrian Calls (#/hr)		25			25		20	20				
Act Effct Green (s)		56.0			38.0			21.0				
Actuated g/C Ratio		0.62			0.42			0.23				
v/c Ratio		0.47			0.41			0.43				
Control Delay		18.0			14.8			18.6				
Queue Delay		0.1			0.0			0.0				
Total Delay		18.1			14.8			18.6				
LOS		B			B			B				
Approach Delay		18.1			14.8			18.6				
Approach LOS		B			B			B				
Queue Length 50th (ft)		181			50			53				
Queue Length 95th (ft)		235			123			94				
Internal Link Dist (ft)		332			358			237			332	
Turn Bay Length (ft)												

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Base Capacity (vph)		1883			1474			864				
Starvation Cap Reductn		140			0			0				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.51			0.41			0.43				

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 70 (78%), Referenced to phase 1:EBL and 6:EBTL, Start of Green	
Natural Cycle: 65	
Control Type: Pretimed	
Maximum v/c Ratio: 0.47	
Intersection Signal Delay: 17.1	Intersection LOS: B
Intersection Capacity Utilization 72.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 19: Morrison & College

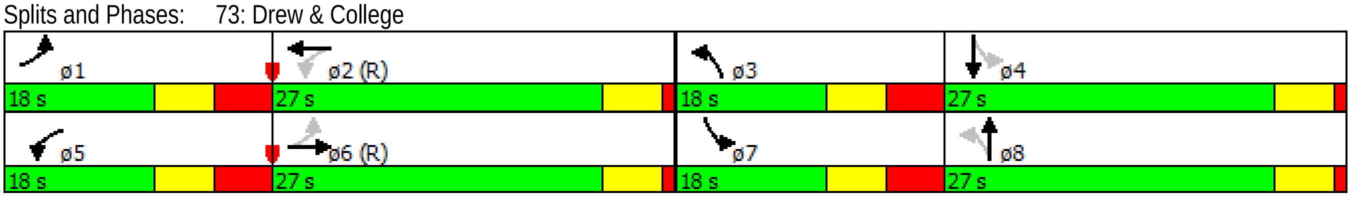
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	740	25	50	576	106	25	86	50	379	70	62
Ideal Flow (vphpl)	1750	1750	1900	1750	1750	1750	1900	1750	1750	1750	1750	1750
Storage Length (ft)	50		0	50		0	50		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.98	1.00			0.98		0.97	0.98		0.97	0.97	
Frt		0.995			0.977			0.945			0.930	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3229	0	1630	3133	0	1770	1587	0	1630	1555	0
Flt Permitted	0.174			0.175			0.666			0.502		
Satd. Flow (perm)	293	3229	0	300	3133	0	1200	1587	0	831	1555	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			23			32			48	
Link Speed (mph)		28			28			28			28	
Link Distance (ft)		453			1029			566			812	
Travel Time (s)		11.0			25.1			15.4			19.8	
Confl. Peds. (#/hr)	35		49	49		35	29		31	31		29
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	57	804	27	54	626	115	27	93	54	412	76	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	831	0	54	741	0	27	147	0	412	143	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8			4		
Detector Phase	1	6		5	2		3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	12.0	26.0		12.0	26.0		12.0	26.0		12.0	26.0	
Total Split (s)	18.0	27.0		18.0	27.0		18.0	27.0		18.0	27.0	
Total Split (%)	20.0%	30.0%		20.0%	30.0%		20.0%	30.0%		20.0%	30.0%	
Maximum Green (s)	10.0	22.0		10.0	22.0		10.0	22.0		10.0	22.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	4.0	1.0		4.0	1.0		4.0	1.0		4.0	1.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-1.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	6.0	3.0		6.0	3.0		7.0	3.0		6.0	3.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		25			15			31			15	
Act Effct Green (s)	34.3	29.4		34.1	29.3		27.4	24.0		37.7	35.9	
Actuated g/C Ratio	0.38	0.33		0.38	0.33		0.30	0.27		0.42	0.40	
v/c Ratio	0.23	0.79		0.22	0.72		0.07	0.33		0.91	0.22	
Control Delay	14.1	21.5		31.8	49.6		16.4	23.0		48.5	15.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	14.1	21.5		31.8	49.6		16.4	23.0		48.5	15.1	
LOS	B	C		C	D		B	C		D	B	
Approach Delay		21.0			48.4			22.0			39.9	
Approach LOS		C			D			C			D	
Queue Length 50th (ft)	7	54		27	232		9	52		172	30	
Queue Length 95th (ft)	32	#352		m47	#311		24	104		#277	88	
Internal Link Dist (ft)		373			949			486			732	
Turn Bay Length (ft)	50			50			50			125		
Base Capacity (vph)	295	1058		297	1036		483	446		454	649	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.19	0.79		0.18	0.72		0.06	0.33		0.91	0.22	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.91
Intersection Signal Delay: 34.4 Intersection LOS: C
Intersection Capacity Utilization 79.3% ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 73: Drew & College

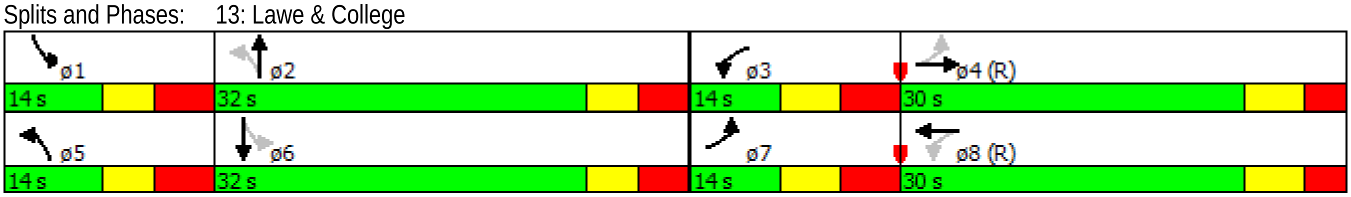


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	786	42	10	508	117	40	202	42	210	218	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	100		0	75		0	300		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992			0.972			0.974			0.962	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3511	0	1770	3440	0	1770	1814	0	1770	1792	0
Flt Permitted	0.165			0.189			0.489			0.456		
Satd. Flow (perm)	307	3511	0	352	3440	0	911	1814	0	849	1792	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			30			12			19	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1029			572			499			479	
Travel Time (s)		23.4			13.0			11.3			10.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	854	46	11	552	127	43	220	46	228	237	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	98	900	0	11	679	0	43	266	0	228	317	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	15.0		6.0	10.0		6.0	10.0		6.0	10.0	
Minimum Split (s)	14.0	26.0		14.0	26.0		13.5	32.0		13.5	32.0	
Total Split (s)	14.0	30.0		14.0	30.0		14.0	32.0		14.0	32.0	
Total Split (%)	15.6%	33.3%		15.6%	33.3%		15.6%	35.6%		15.6%	35.6%	
Maximum Green (s)	6.0	23.0		6.0	23.0		6.5	25.0		6.5	25.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.5	3.5		3.5	3.5	
All-Red Time (s)	4.0	3.0		4.0	3.0		4.0	3.5		4.0	3.5	
Lost Time Adjust (s)	0.0	-1.0		0.0	-1.0		0.0	-1.0		0.0	-1.0	
Total Lost Time (s)	8.0	6.0		8.0	6.0		7.5	6.0		7.5	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Ped		None	Ped	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		12.0			12.0			18.0			18.0	
Pedestrian Calls (#/hr)		10			10			10			10	
Act Effct Green (s)	34.4	35.2		29.6	26.8		30.8	26.0		34.0	31.6	
Actuated g/C Ratio	0.38	0.39		0.33	0.30		0.34	0.29		0.38	0.35	
v/c Ratio	0.46	0.65		0.05	0.65		0.12	0.50		0.59	0.49	
Control Delay	37.8	38.8		27.9	46.2		16.3	29.2		26.5	26.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	37.8	38.8		27.9	46.2		16.3	29.2		26.5	26.6	
LOS	D	D		C	D		B	C		C	C	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		38.7			45.9			27.4			26.6	
Approach LOS		D			D			C			C	
Queue Length 50th (ft)	54	266		6	209		14	120		83	145	
Queue Length 95th (ft)	m1	m#375		m15	269		34	195		137	232	
Internal Link Dist (ft)		949			492			419			399	
Turn Bay Length (ft)	200			100			75			300		
Base Capacity (vph)	215	1376		210	1045		375	532		386	641	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.46	0.65		0.05	0.65		0.11	0.50		0.59	0.49	

Intersection Summary
Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.65
Intersection Signal Delay: 36.7 Intersection LOS: D
Intersection Capacity Utilization 75.8% ICU Level of Service D
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Lawe & College



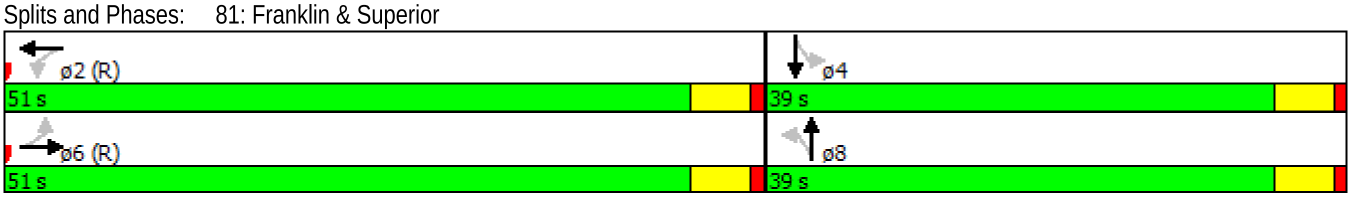
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	14	267	39	0	293	6	49	50	19	6	23	4
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	150		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.981			0.997			0.979			0.983	
Flt Protected	0.950							0.980			0.991	
Satd. Flow (prot)	1630	1683	0	1716	1711	0	0	1646	0	0	1671	0
Flt Permitted	0.468							0.883			0.964	
Satd. Flow (perm)	803	1683	0	1716	1711	0	0	1483	0	0	1626	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			2			13			5	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		490			391			388			445	
Travel Time (s)		12.8			10.5			10.6			12.1	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	16	314	46	0	345	7	58	59	22	7	27	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	360	0	0	352	0	0	139	0	0	39	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0		23.0	23.0	
Total Split (s)	51.0	51.0		51.0	51.0		39.0	39.0		39.0	39.0	
Total Split (%)	56.7%	56.7%		56.7%	56.7%		43.3%	43.3%		43.3%	43.3%	
Maximum Green (s)	46.0	46.0		46.0	46.0		34.0	34.0		34.0	34.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0			-2.0			-2.0	
Total Lost Time (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	48.0	48.0			48.0			36.0			36.0	
Actuated g/C Ratio	0.53	0.53			0.53			0.40			0.40	
v/c Ratio	0.04	0.40			0.39			0.23			0.06	
Control Delay	10.4	13.6			8.7			17.4			15.4	
Queue Delay	0.0	0.0			0.2			0.0			0.0	
Total Delay	10.4	13.6			8.9			17.4			15.4	
LOS	B	B			A			B			B	
Approach Delay		13.5			8.9			17.4			15.4	
Approach LOS		B			A			B			B	
Queue Length 50th (ft)	4	110			61			46			12	
Queue Length 95th (ft)	13	159			82			82			29	
Internal Link Dist (ft)		410			311			308			365	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	150											
Base Capacity (vph)	428	903			913			601			653	
Starvation Cap Reductn	0	0			122			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.04	0.40			0.45			0.23			0.06	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 12 (13%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 50
Control Type: Pretimed
Maximum v/c Ratio: 0.40
Intersection Signal Delay: 12.4 Intersection LOS: B
Intersection Capacity Utilization 38.2% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 81: Franklin & Superior



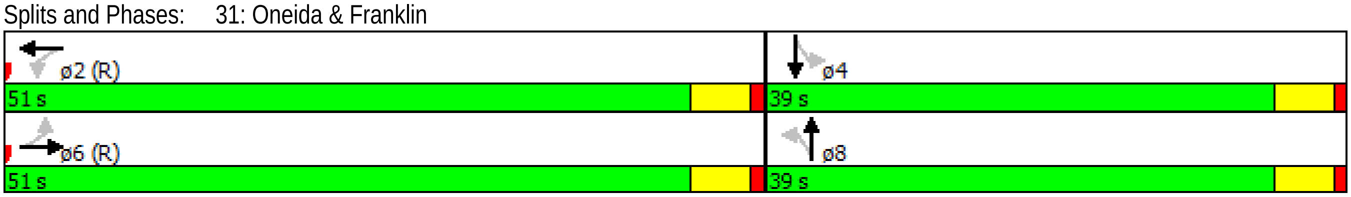
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	194	6	61	250	17	6	19	14	9	21	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	125		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.990			0.951			0.955	
Flt Protected	0.950			0.950				0.992			0.990	
Satd. Flow (prot)	1770	1853	0	1770	1844	0	0	1757	0	0	1761	0
Flt Permitted	0.512			0.579				0.975			0.966	
Satd. Flow (perm)	954	1853	0	1079	1844	0	0	1727	0	0	1718	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			6			16			17	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		338			417			394			310	
Travel Time (s)		8.2			10.2			10.7			8.5	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	6	218	7	69	281	19	7	21	16	10	24	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	6	225	0	69	300	0	0	44	0	0	51	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0		23.0	23.0	
Total Split (s)	51.0	51.0		51.0	51.0		39.0	39.0		39.0	39.0	
Total Split (%)	56.7%	56.7%		56.7%	56.7%		43.3%	43.3%		43.3%	43.3%	
Maximum Green (s)	46.0	46.0		46.0	46.0		34.0	34.0		34.0	34.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0			-2.0			-2.0	
Total Lost Time (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	48.0	48.0		48.0	48.0			36.0			36.0	
Actuated g/C Ratio	0.53	0.53		0.53	0.53			0.40			0.40	
v/c Ratio	0.01	0.23		0.12	0.30			0.06			0.07	
Control Delay	5.2	5.7		9.7	10.6			12.3			12.7	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	5.2	5.7		9.7	10.6			12.3			12.7	
LOS	A	A		A	B			B			B	
Approach Delay		5.7			10.5			12.3			12.7	
Approach LOS		A			B			B			B	
Queue Length 50th (ft)	1	28		14	66			9			12	
Queue Length 95th (ft)	m2	41		30	97			30			33	
Internal Link Dist (ft)		258			337			314			230	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	100			125								
Base Capacity (vph)	508	989		575	986			700			697	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.01	0.23		0.12	0.30			0.06			0.07	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 11 (12%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.30	
Intersection Signal Delay: 9.1	Intersection LOS: A
Intersection Capacity Utilization 31.2%	ICU Level of Service A
Analysis Period (min) 15	

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

Splits and Phases: 31: Oneida & Franklin

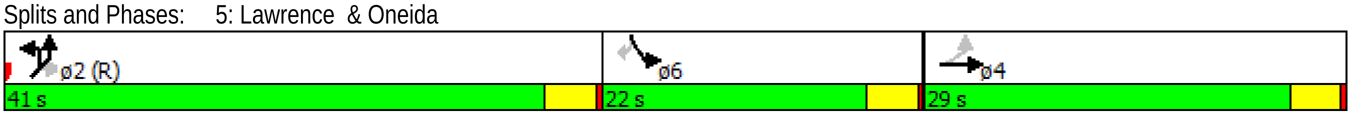


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	SBR2	NEL2	NEL	NER
Lane Configurations												
Volume (vph)	85	113	0	0	0	0	23	0	109	36	89	147
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	0		0	100	0			0	0
Storage Lanes	1		0	0		0	1	1			1	1
Taper Length (ft)	25			25			25				25	
Lane Util. Factor	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt									0.850			0.850
Flt Protected		0.979					0.950				0.950	
Satd. Flow (prot)	0	3465	0	0	0	0	1770	0	1583	0	1752	1568
Flt Permitted		0.979					0.950				0.950	
Satd. Flow (perm)	0	3465	0	0	0	0	1770	0	1583	0	1752	1568
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)									110			148
Link Speed (mph)		25			25		30				35	
Link Distance (ft)		319			445		396				605	
Travel Time (s)		8.7			12.1		9.0				11.8	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%	3%
Adj. Flow (vph)	86	114	0	0	0	0	23	0	110	36	90	148
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	200	0	0	0	0	23	0	110	0	126	148
Turn Type	Perm	NA					Prot		Perm	Prot	Prot	Perm
Protected Phases		4					6			2	2	
Permitted Phases	4								6			2
Detector Phase	4	4					6		6	2	2	2
Switch Phase												
Minimum Initial (s)	4.0	4.0					4.0		4.0	4.0	4.0	4.0
Minimum Split (s)	22.0	22.0					22.0		22.0	22.0	22.0	22.0
Total Split (s)	29.0	29.0					22.0		22.0	41.0	41.0	41.0
Total Split (%)	31.5%	31.5%					23.9%		23.9%	44.6%	44.6%	44.6%
Maximum Green (s)	25.0	25.0					18.0		18.0	37.0	37.0	37.0
Yellow Time (s)	3.5	3.5					3.5		3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5					0.5		0.5	0.5	0.5	0.5
Lost Time Adjust (s)		0.0					0.0		0.0		0.0	0.0
Total Lost Time (s)		4.0					4.0		4.0		4.0	4.0
Lead/Lag							Lag		Lag	Lead	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0					3.0		3.0	3.0	3.0	3.0
Recall Mode	None	None					None		None	C-Max	C-Max	C-Max
Walk Time (s)	7.0	7.0					7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0	11.0					11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	4	4					3		3	6	6	6
Act Effct Green (s)		11.5					8.7		8.7		61.7	61.7
Actuated g/C Ratio		0.12					0.09		0.09		0.67	0.67
v/c Ratio		0.46					0.14		0.44		0.11	0.13
Control Delay		40.1					37.3		12.9		8.3	2.3
Queue Delay		0.0					0.0		0.0		0.0	0.0
Total Delay		40.1					37.3		12.9		8.3	2.3

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBR	SBR2	NEL2	NEL	NER
LOS		D					D		B		A	A
Approach Delay		40.1					17.1				5.1	
Approach LOS		D					B				A	
Queue Length 50th (ft)		58					13		0		22	0
Queue Length 95th (ft)		84					32		43		73	31
Internal Link Dist (ft)		239			365		316				525	
Turn Bay Length (ft)							100					
Base Capacity (vph)		941					346		398		1175	1100
Starvation Cap Reductn		0					0		0		0	0
Spillback Cap Reductn		0					0		0		0	0
Storage Cap Reductn		0					0		0		0	0
Reduced v/c Ratio		0.21					0.07		0.28		0.11	0.13

Intersection Summary	
Area Type: Other	
Cycle Length: 92	
Actuated Cycle Length: 92	
Offset: 89 (97%), Referenced to phase 2:NEL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.46	
Intersection Signal Delay: 19.2	Intersection LOS: B
Intersection Capacity Utilization 25.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 5: Lawrence & Oneida

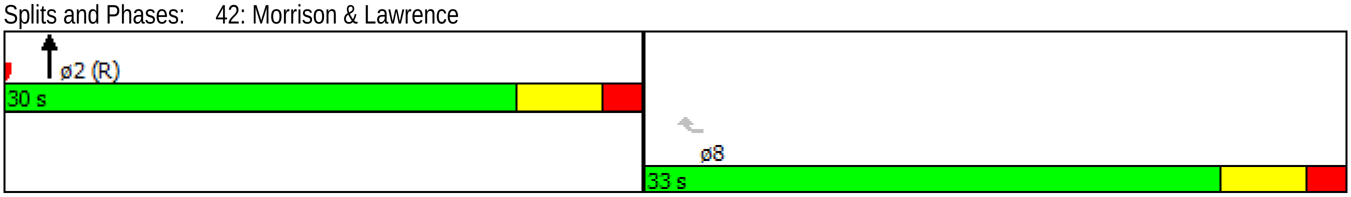


Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	0	0	310	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	1.00
Frt						
Flt Protected						
Satd. Flow (prot)	0	1863	3539	0	0	0
Flt Permitted						
Satd. Flow (perm)	0	1863	3539	0	0	0
Right Turn on Red		Yes		Yes		
Satd. Flow (RTOR)						
Link Speed (mph)	30		25			25
Link Distance (ft)	193		79			317
Travel Time (s)	4.4		2.2			8.6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	337	0	0	0
Shared Lane Traffic (%)						
Lane Group Flow (vph)	0	0	337	0	0	0
Turn Type		Perm	NA			
Protected Phases			2			
Permitted Phases		8				
Detector Phase		8	2			
Switch Phase						
Minimum Initial (s)		4.0	4.0			
Minimum Split (s)		33.0	24.0			
Total Split (s)		33.0	30.0			
Total Split (%)		52.4%	47.6%			
Maximum Green (s)		27.0	24.0			
Yellow Time (s)		4.0	4.0			
All-Red Time (s)		2.0	2.0			
Lost Time Adjust (s)		0.0	0.0			
Total Lost Time (s)		6.0	6.0			
Lead/Lag						
Lead-Lag Optimize?						
Vehicle Extension (s)		3.0	3.0			
Recall Mode		None	C-Min			
Walk Time (s)		7.0	7.0			
Flash Dont Walk (s)		20.0	11.0			
Pedestrian Calls (#/hr)		60	0			
Act Effct Green (s)			39.6			
Actuated g/C Ratio			0.63			
v/c Ratio			0.15			
Control Delay			10.4			
Queue Delay			0.0			
Total Delay			10.4			
LOS			B			
Approach Delay			10.4			
Approach LOS			B			
Queue Length 50th (ft)			45			

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Queue Length 95th (ft)			71			
Internal Link Dist (ft)	113		1			237
Turn Bay Length (ft)						
Base Capacity (vph)			2224			
Starvation Cap Reductn			0			
Spillback Cap Reductn			0			
Storage Cap Reductn			0			
Reduced v/c Ratio			0.15			

Intersection Summary	
Area Type:	Other
Cycle Length: 63	
Actuated Cycle Length: 63	
Offset: 0 (0%), Referenced to phase 2:NBT and 6:, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.15	
Intersection Signal Delay: 10.4	Intersection LOS: B
Intersection Capacity Utilization 13.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 42: Morrison & Lawrence

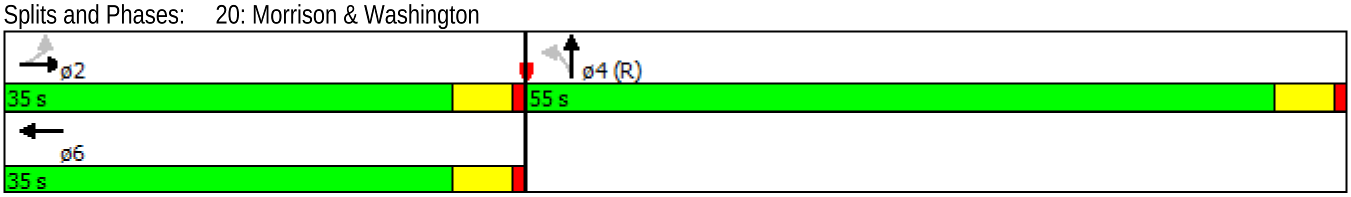


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	178	0	0	79	13	96	69	25	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	0.95	1.00	1.00	1.00
Frt					0.981			0.980				
Flt Protected		0.998						0.975				
Satd. Flow (prot)	0	1859	0	0	1827	0	0	3382	0	0	0	0
Flt Permitted		0.992						0.975				
Satd. Flow (perm)	0	1848	0	0	1827	0	0	3382	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					10			28				
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		407			414			412			393	
Travel Time (s)		11.1			11.3			11.2			10.7	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	8	200	0	0	89	15	108	78	28	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	208	0	0	104	0	0	214	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		2			6			4				
Permitted Phases	2						4					
Minimum Split (s)	23.0	23.0			23.0		23.0	23.0				
Total Split (s)	35.0	35.0			35.0		55.0	55.0				
Total Split (%)	38.9%	38.9%			38.9%		61.1%	61.1%				
Maximum Green (s)	30.0	30.0			30.0		50.0	50.0				
Yellow Time (s)	4.0	4.0			4.0		4.0	4.0				
All-Red Time (s)	1.0	1.0			1.0		1.0	1.0				
Lost Time Adjust (s)		-2.0			-2.0			-2.0				
Total Lost Time (s)		3.0			3.0			3.0				
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0			7.0		7.0	7.0				
Flash Dont Walk (s)	11.0	11.0			11.0		11.0	11.0				
Pedestrian Calls (#/hr)	0	0			0		0	0				
Act Effct Green (s)		32.0			32.0			52.0				
Actuated g/C Ratio		0.36			0.36			0.58				
v/c Ratio		0.32			0.16			0.11				
Control Delay		22.8			18.7			6.5				
Queue Delay		0.0			0.0			0.0				
Total Delay		22.8			18.7			6.5				
LOS		C			B			A				
Approach Delay		22.8			18.7			6.5				
Approach LOS		C			B			A				
Queue Length 50th (ft)		85			36			17				
Queue Length 95th (ft)		139			71			31				
Internal Link Dist (ft)		327			334			332			313	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)												
Base Capacity (vph)		657			656			1965				
Starvation Cap Reductn		0			0			0				
Spillback Cap Reductn		0			0			0				
Storage Cap Reductn		0			0			0				
Reduced v/c Ratio		0.32			0.16			0.11				

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 44 (49%), Referenced to phase 4:NBTL, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.32	
Intersection Signal Delay: 15.3	Intersection LOS: B
Intersection Capacity Utilization 27.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 20: Morrison & Washington

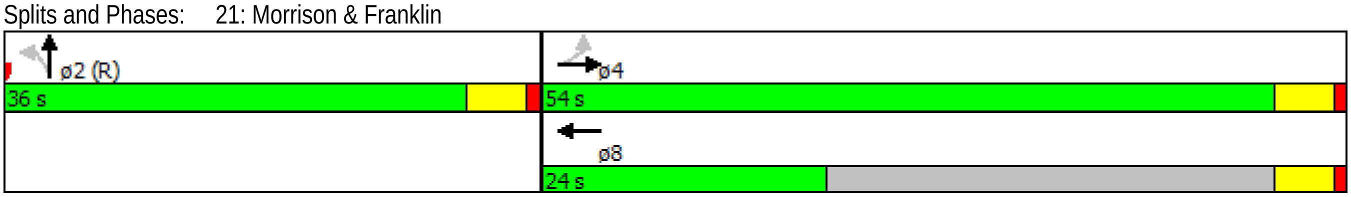


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	212	0	0	141	12	31	74	30	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	300		0	0		0
Storage Lanes	1		0	0		0	1		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	1.00	1.00
Frt					0.989			0.957				
Flt Protected	0.950						0.950					
Satd. Flow (prot)	1770	1863	0	0	1842	0	1770	3387	0	0	0	0
Flt Permitted	0.640						0.950					
Satd. Flow (perm)	1192	1863	0	0	1842	0	1770	3387	0	0	0	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)					8			32				
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		417			894			393			308	
Travel Time (s)		10.2			21.8			10.7			8.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	11	228	0	0	152	13	33	80	32	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	228	0	0	165	0	33	112	0	0	0	0
Turn Type	Perm	NA			NA		Perm	NA				
Protected Phases		4			8			2				
Permitted Phases	4						2					
Minimum Split (s)	23.0	23.0			23.0		23.0	23.0				
Total Split (s)	54.0	54.0			24.0		36.0	36.0				
Total Split (%)	60.0%	60.0%			26.7%		40.0%	40.0%				
Maximum Green (s)	49.0	49.0			19.0		31.0	31.0				
Yellow Time (s)	4.0	4.0			4.0		4.0	4.0				
All-Red Time (s)	1.0	1.0			1.0		1.0	1.0				
Lost Time Adjust (s)	-1.0	-2.0			-2.0		-2.0	-1.0				
Total Lost Time (s)	4.0	3.0			3.0		3.0	4.0				
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0			7.0		7.0	7.0				
Flash Dont Walk (s)	11.0	11.0			11.0		11.0	11.0				
Pedestrian Calls (#/hr)	0	0			0		0	0				
Act Effct Green (s)	50.0	51.0			51.0		33.0	32.0				
Actuated g/C Ratio	0.56	0.57			0.57		0.37	0.36				
v/c Ratio	0.02	0.22			0.16		0.05	0.09				
Control Delay	6.5	6.1			9.3		17.0	12.3				
Queue Delay	0.0	0.0			0.0		0.0	0.0				
Total Delay	6.5	6.1			9.3		17.0	12.3				
LOS	A	A			A		B	B				
Approach Delay		6.1			9.3			13.3				
Approach LOS		A			A			B				
Queue Length 50th (ft)	1	26			39		9	11				
Queue Length 95th (ft)	6	48			70		24	23				
Internal Link Dist (ft)		337			814			313			228	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	150						300					
Base Capacity (vph)	662	1055			1047		649	1224				
Starvation Cap Reductn	0	0			0		0	0				
Spillback Cap Reductn	0	0			0		0	0				
Storage Cap Reductn	0	0			0		0	0				
Reduced v/c Ratio	0.02	0.22			0.16		0.05	0.09				

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 59 (66%), Referenced to phase 2:NBTL, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.22	
Intersection Signal Delay: 9.0	Intersection LOS: A
Intersection Capacity Utilization 21.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 21: Morrison & Franklin



Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	0	0	0	0	0	4	8	0	53	51	5
Peak Hour Factor	0.92	0.83	0.83	0.83	0.92	0.83	0.83	0.83	0.92	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	0	5	10	0	64	61	6
Number of Lanes	0	0	0	0	0	0	1	0	0	1	1	0

Approach	WB	NB
Opposing Approach		SB
Opposing Lanes	0	1
Conflicting Approach Left	NB	
Conflicting Lanes Left	2	0
Conflicting Approach Right	SB	WB
Conflicting Lanes Right	1	1
HCM Control Delay	7	7.9
HCM LOS	A	A

Lane	NBLn1	NBLn2	WBLn1	SBLn1
Vol Left, %	100%	0%	0%	50%
Vol Thru, %	0%	91%	33%	0%
Vol Right, %	0%	9%	67%	50%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	53	56	12	30
LT Vol	0	51	4	0
Through Vol	0	5	8	15
RT Vol	53	0	0	15
Lane Flow Rate	64	67	14	36
Geometry Grp	7	7	2	5
Degree of Util (X)	0.09	0.085	0.016	0.04
Departure Headway (Hd)	5.078	4.515	3.929	3.953
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	709	797	916	900
Service Time	2.788	2.225	1.929	2.004
HCM Lane V/C Ratio	0.09	0.084	0.015	0.04
HCM Control Delay	8.3	7.6	7	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.3	0	0.1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	15	0	15
Peak Hour Factor	0.92	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	18	0	18
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	
Conflicting Lanes Right	0
HCM Control Delay	7.2
HCM LOS	A

Lane

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	55	5	30	0	21	66	18	0	10	112	65
Peak Hour Factor	1.00	0.90	0.90	0.90	1.00	0.90	0.90	0.90	1.00	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	61	6	33	0	23	73	20	0	11	124	72
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.4	8.5	8.8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	61%	20%	12%
Vol Thru, %	60%	6%	63%	83%
Vol Right, %	35%	33%	17%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	187	90	105	66
LT Vol	112	5	66	55
Through Vol	65	30	18	3
RT Vol	10	55	21	8
Lane Flow Rate	208	100	117	73
Geometry Grp	1	1	1	1
Degree of Util (X)	0.25	0.129	0.15	0.095
Departure Headway (Hd)	4.334	4.635	4.629	4.675
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	829	773	775	766
Service Time	2.361	2.667	2.66	2.708
HCM Lane V/C Ratio	0.251	0.129	0.151	0.095
HCM Control Delay	8.8	8.4	8.5	8.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1	0.4	0.5	0.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	8	55	3
Peak Hour Factor	1.00	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	9	61	3
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.2
HCM LOS	A

Lane

Appendix D

Existing Plans and Policies

16 North Carroll Street, Suite 200
Madison, WI 53703
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www.tooledesign.com

The following text was originally included in the memo identified below. The information relevant to bicycle parking has been copied from that memo and displayed here.

MEMORANDUM

Date: January 25, 2016
To: Amy Canfield
From: Kevin Luecke, Jennifer Hefferan, and Spencer Gardner
Project: Appleton Downtown Mobility Study
Re: Existing Bicycle and Pedestrian Conditions - Revised

Plans, Policies, and Programs

A number of existing plans and policies address pedestrian and bicycle transportation in downtown Appleton.

- Downtown Parking Study (February 2015)
  - The study determined that overall an oversupply of parking is projected downtown, even with the removal of the Blue Ramp, YMCA ramp, the addition of a new expo center, a new library and other organic growth. The area between Appleton Street and Durkee Street is projected to experience parking shortages, especially if a new library is built near the river. If a library is built in this location, a new 500-space parking facility was recommended.
  - The parking oversupply is relevant to bicycling and walking because:
    - In order to provide bicycle facilities on some downtown streets, it may be necessary to reconfigure parking in select locations. The oversupply of parking indicates that this is feasible from a parking perspective.
    - In order to encourage use of municipal and private parking ramps, it is necessary to have good connections from those ramps to destinations throughout downtown.
- Downtown Plan (part of 2007 Comprehensive Plan)
  - Supports a path system planned for the Fox River Corridor and also supports a rail-with-trail along the northern part of downtown.
  - Calls for improving pedestrian and bicycle connections to and through the downtown and for connecting Jones Park with Morrison Street.
  - Calls for a pedestrian and bicycle audit of the downtown area and the need to identify locations for bicycle storage.
- Fox River Corridor Plan (part of 2007 Comprehensive Plan)
  - Proposes to improve connections to the Fox River, including at the stairway at the end of Morrison Street and through Jones Park.
- Richmond Street Corridor Plan (part of 2007 Comprehensive Plan)
  - Recommends the City continue to reassess the need for pedestrian crossing improvements.
  - Recommends the city designate parallel streets for bicycle access since Richmond is only suitable for experienced bicyclists.
- City of Appleton On-Street Bike Lane Plan (2010)
  - Recommends bike lanes be installed on designated bicycle routes with 3,000 AADT or greater and on segments linking primary destinations such as parks, schools, etc. where traffic counts do not meet the AADT threshold.

Appendix E

Level of Traffic Stress Analysis

16 North Carroll Street, Suite 200
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The following text was originally included in the memo identified below. The information relevant to the Level of Traffic Stress analysis has been copied from that memo and displayed here.

MEMORANDUM

Date:	January 25, 2016
To:	Amy Canfield
From:	Kevin Luecke, Jennifer Hefferan, and Spencer Gardner
Project:	Appleton Downtown Mobility Study
Re:	Existing Bicycle and Pedestrian Conditions - Revised

Level of Traffic Stress

The evaluation of bicycling conditions includes an assessment of the quality of accommodations for people riding bicycles on streets in the study area. Anecdotal experience[1] supplemented with survey-based research[2] indicates that all people fall into one of the four categories shown in Table 1, based on their comfort, confidence, and willingness to interact with motor vehicle traffic while riding a bicycle.

Table 1: General Population Broken Down by Interest in Bicycling[1,2]

Category Description*	Traffic Stress Tolerance	Characteristics** The red bars indicate the percent of this group that strongly or somewhat agrees that they are concerned about being hit by a motor vehicle when bicycling.	Percent of Population**
No Way, No How	Less Tolerance	Not interested in riding a bicycle for transportation. 87%	31%
Interested but Concerned		Little tolerance for traffic stress with major concerns for safety. Strongly prefer separation from traffic on arterials by way of protected bike lanes and paths. 84%	56%
Enthused and Confident		Some tolerance for traffic stress. Confident riders who will share lanes with cars, especially on rural roads, but prefer separated bike lanes, paths, or paved shoulders on roads with higher traffic levels. 52%	9%
Strong and Fearless	More Tolerance	High tolerance for traffic stress. Experienced riders who are comfortable sharing lanes on higher speed and volume arterials. These riders are less interested in protected bike lanes and paths than the general population. 39%	4%

**These category names were developed by Roger Geller of the City of Portland Office of Transportation. They have become the standard names, but some people feel they cast a negative tone on certain types of bicyclists.*
***Percent of people concerned about being hit by a motor vehicle and percent of total population are from Dill, J. and N. McNeil. (2013, January).*

[1] *Geller, R. "Four Types of Cyclists." Portland Office of Transportation. (https://www.portlandoregon.gov/transportation/article/264746)*
[2] *Dill, J. and N. McNeil. (2013, January) "Four Types of Cyclists? Examining a Typology to Better Understand Bicycling Behavior and Potential." Paper presented at the Annual Meeting of the Transportation Research Board.*

The scores produced for each roadway by the Level of Traffic Stress (LTS) model loosely correlate with the categories outlined in Table . Generally speaking, LTS 4 is only suitable for “Strong and Fearless” bicyclists, LTS 3 is suitable for “Enthused and Confident” bicyclists, LTS 2 is suitable for almost everyone other than children, and LTS 1 is suitable for virtually the entire population. The LTS definitions are shown in Table 2.

Table 2: Level of Traffic Stress (LTS) Definitions

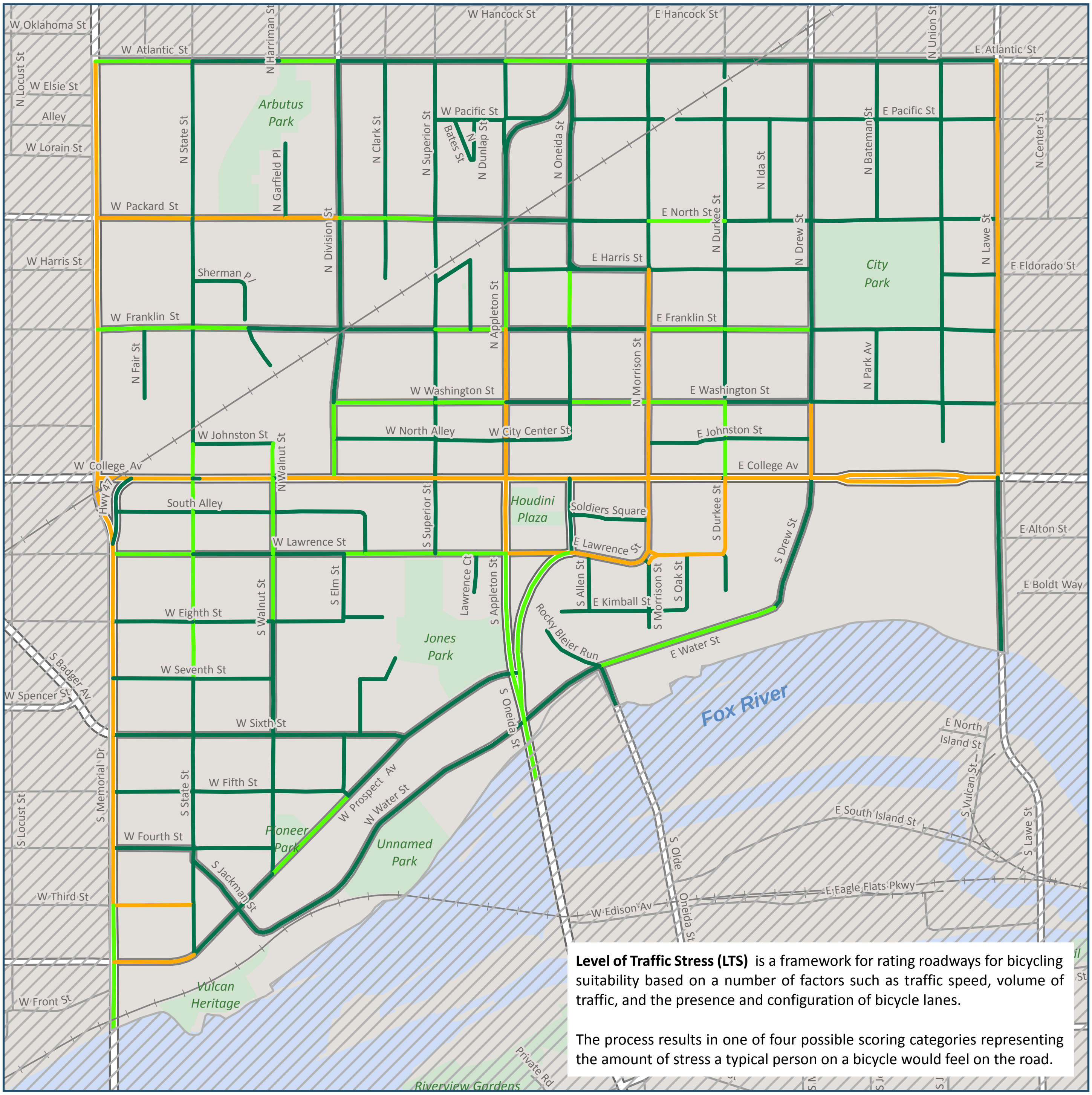
LTS 1	Presenting little traffic stress and demanding little attention from cyclists, and attractive enough for a relaxing bike ride. Suitable for almost all cyclists, including children trained to safely cross intersections. On links, cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a slow traffic stream with no more than one lane per direction, or are on a shared road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. Where cyclists ride alongside a parking lane, they have ample operating space outside the zone into which car doors are opened. Intersections are easy to approach and cross.
LTS 2	Presenting little traffic stress and therefore suitable to most adult cyclists but demanding more attention than might be expected from children. On links, cyclists are either physically separated from traffic, or are in an exclusive bicycling zone next to a well-confined traffic stream with adequate clearance from a parking lane, or are on a shared road where they interact with only occasional motor vehicles (as opposed to a stream of traffic) with a low speed differential. Where a bike lane lies between a through lane and a rightturn lane, it is configured to give cyclists unambiguous priority where cars cross the bike lane and to keep car speed in the right-turn lane comparable to bicycling speeds. Crossings are not difficult for most adults.
LTS 3	More traffic stress than LTS 2, yet markedly less than the stress of integrating with multilane traffic, and therefore welcome to many people currently riding bikes in American cities. Offering cyclists either an exclusive riding zone (lane) next to moderate-speed traffic or shared lanes on streets that are not multilane and have moderately low speed. Crossings may be longer or across higher-speed roads than allowed by LTS 2, but are still considered acceptably safe to most adult pedestrians.
LTS 4	A level of stress beyond LTS3.

Source: Mekuria, Furth, and Nixon. “Low-Stress Bicycling and Network Connectivity.” Report 11-19. May 2012. Mineta Transportation Institute. San Jose State University, San Jose, California.

The Level of Traffic Stress methodology was applied to the Downtown Appleton study area as shown on Exhibit 1. None of the streets in the study area scored a LTS of 4, which is the least comfortable level for bicyclists. A number of streets scored LTS 3 which is suitable for “Enthused and Confident” bicyclists, but too stressful for the majority of bicyclists. Notably, College Avenue is LTS 3 and this is the street within the study area with the highest concentration of destinations to which people may choose to bike. Other LTS 3 streets include Richmond Street/Memorial Drive, Lawe Street, Appleton Street, Packard Street, East Lawrence Street from Appleton to Durkee Streets, and Morrison Street from Harris Street to Lawrence Street.

The majority of the streets within the study area are either LTS 1 or 2, which are the most comfortable levels for bicyclists. While these streets do not contain many of the destinations people bike to, they do contain schools and homes. Efforts to make Appleton more bikeable will be made easier by the large number of streets already suitable for most bicyclists.

Downtown Appleton Mobility Study



Level of Traffic Stress (LTS) is a framework for rating roadways for bicycling suitability based on a number of factors such as traffic speed, volume of traffic, and the presence and configuration of bicycle lanes.

The process results in one of four possible scoring categories representing the amount of stress a typical person on a bicycle would feel on the road.

Level of Traffic Stress Analysis

Dec. 2015

Legend

- Study Area
- LTS 1 (Appropriate for all ages and abilities)
- LTS 2 (Suitable for most adults)
- LTS 3 (Tolerable for experienced cyclists)
- LTS 4 (Highly stressful for virtually all cyclists)

0 500 1,000 Feet

N

Appendix F

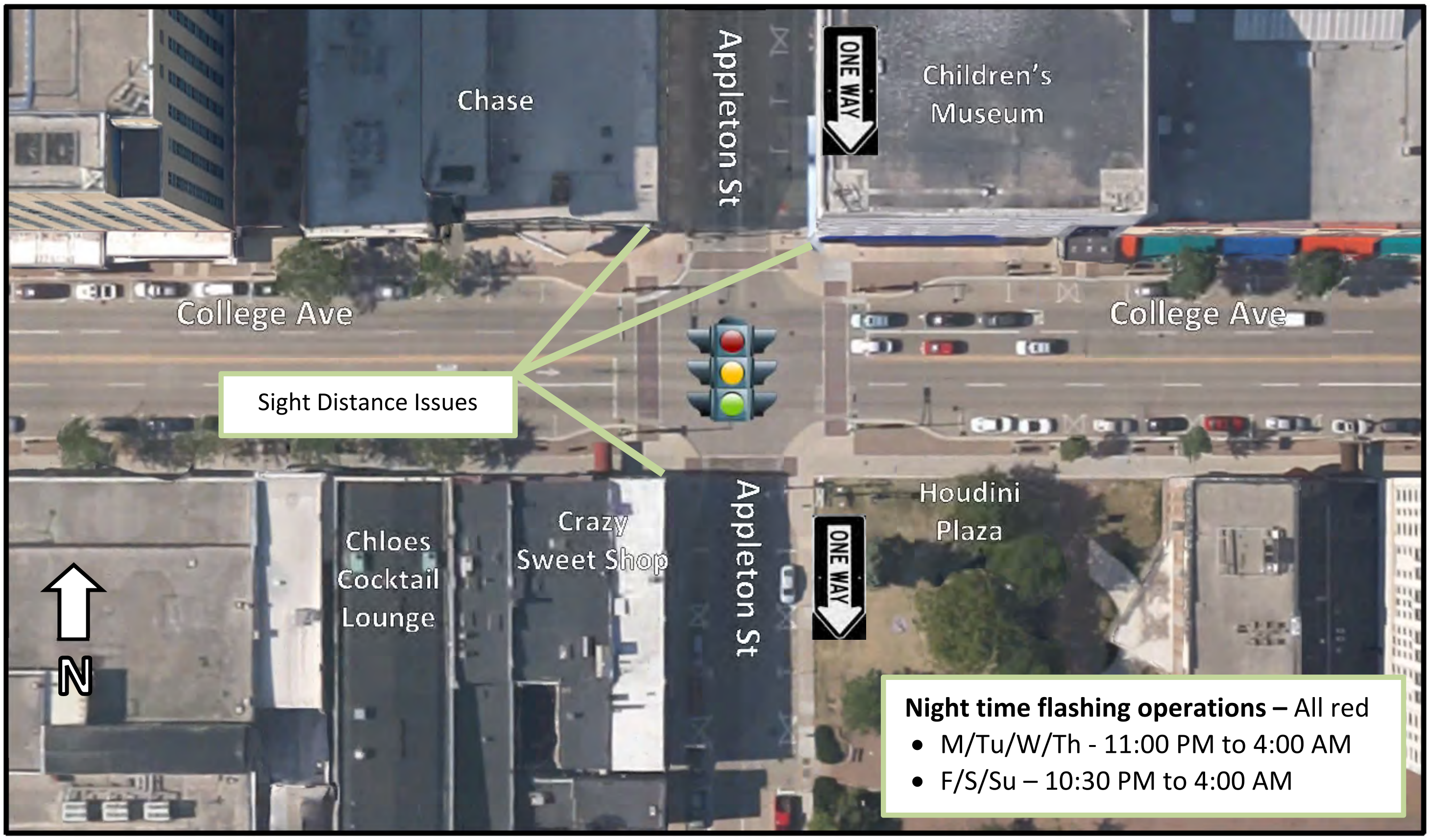
Safety Analysis

Downtown Appleton Mobility Study

Intersection Safety – Vehicle Crashes

College Avenue & Appleton Street

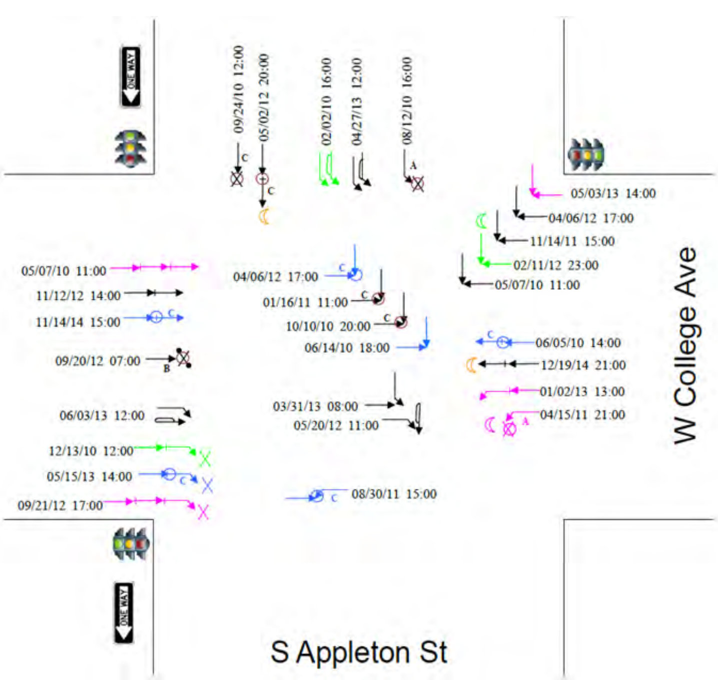
Jan. 2016



Night time flashing operations – All red

- M/Tu/W/Th - 11:00 PM to 4:00 AM
- F/S/Su – 10:30 PM to 4:00 AM

Crash Diagram 2010 - 2014



* A crash rate greater than 1 typically indicates safety problems. Crash rates less than 1 are not as concerning, but there may still be safety concerns based on crash trends.

Intersection Crash Results:

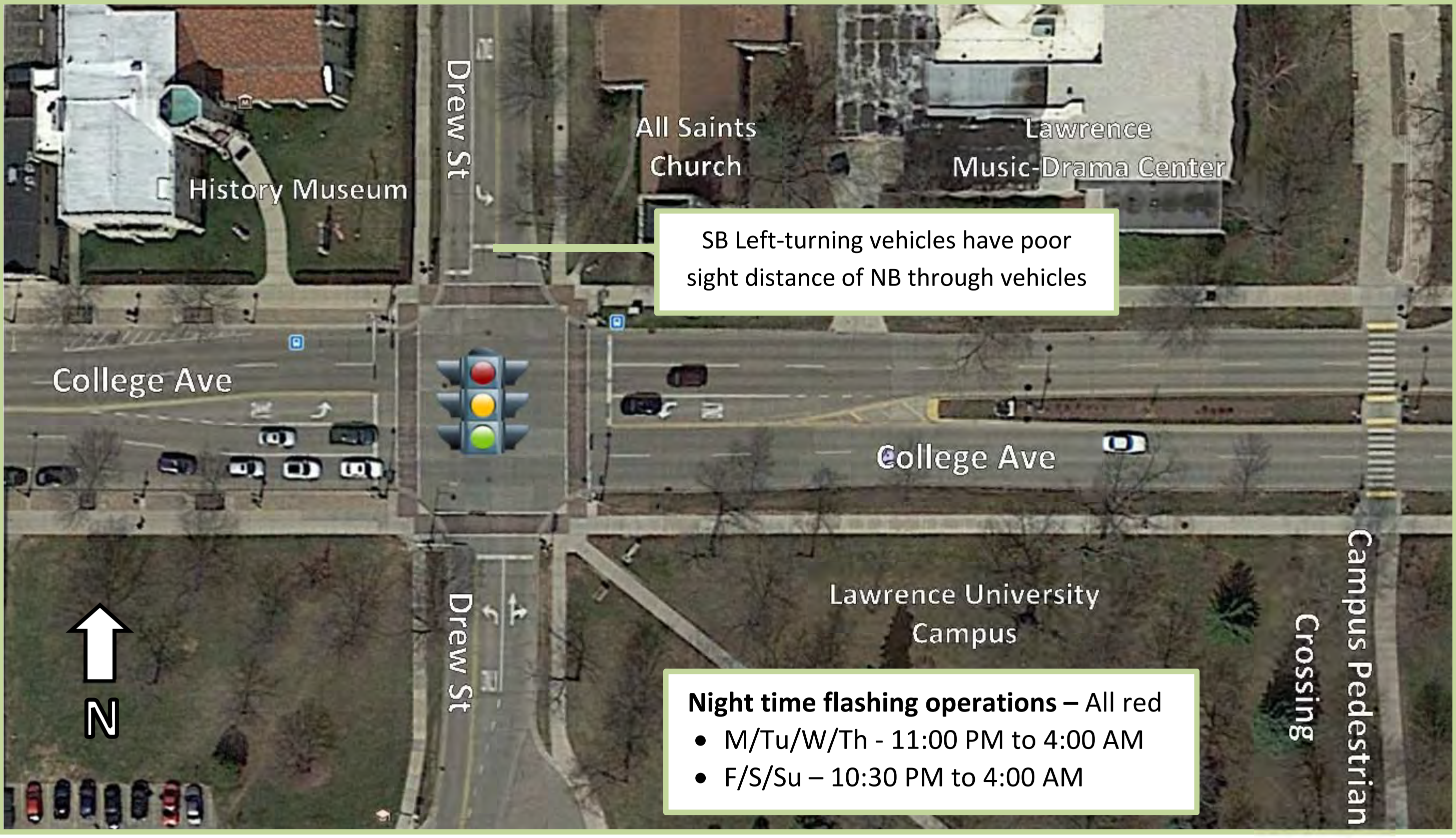
- Total of **29** crashes occurred from 2010 – 2014.
- Crash rate = **0.9*** crashes per million entering vehicles
- Crash trends from 2010 – 2014:
  - **10** angle crashes
    - **4** included EB traffic running red light
    - **3** included WB traffic running red light
    - **1** included SB traffic running red light
    - **2** could not be determined
  - **9** rear end crashes on College Avenue
  - **4** pedestrian or bicycle related crashes
- **12** injury crashes
  - **2** resulted in incapacitating injuries (A Severity)
  - **1** resulted in non-incapacitating injuries (B)
  - **9** resulted in possible injuries (C)
- **1** crash during night time flashing operations

Downtown Appleton Mobility Study

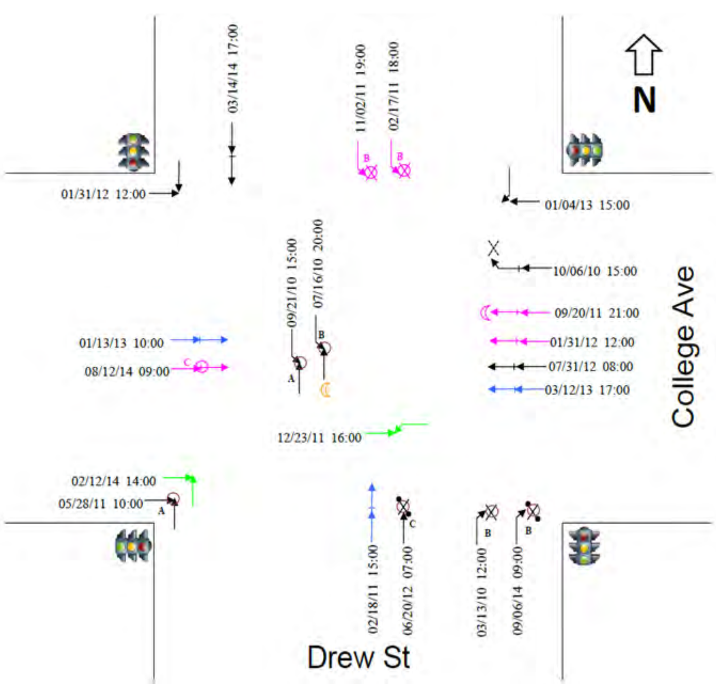
Intersection Safety – Vehicle Crashes

College Avenue & Drew Street

Jan. 2016



Crash Diagram 2010 - 2014



* A crash rate greater than 1 typically indicates safety problems. Crash rates less than 1 are not as concerning, but there may still be safety concerns based on crash trends.

Intersection Crash Results:

- Total of **21** crashes occurred from 2010 – 2014.
- Crash rate = **0.6*** crashes per million entering vehicles
- Crash trends from 2010 – 2014:
  - **3** angle crashes
    - **All** included EB traffic running red light
  - **7** rear end crashes on College Avenue
  - **5** pedestrian or bicycle related crashes
- **8** crashes involving pedestrians occurred at the Campus Pedestrian Crossing east of the Drew Street intersection. This crossing has a pedestrian-activated signal.
- **9** injury crashes
  - **2** resulted in incapacitating injuries (A severity)
  - **5** resulted in non-incapacitating injuries (B)
  - **2** resulted in possible injuries (C)

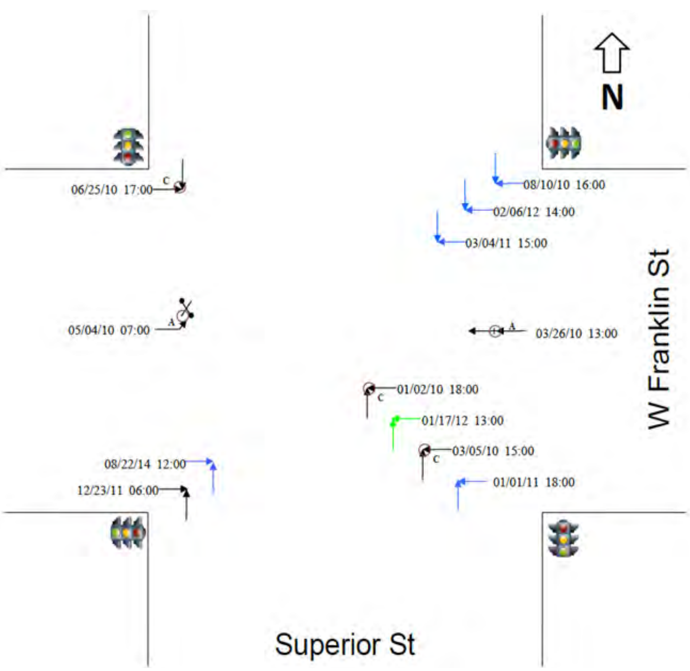
Downtown Appleton Mobility Study

Intersection Safety – Vehicle Crashes

Franklin Street & Superior Street

Jan. 2016

Crash Diagram 2010 - 2014



* A crash rate greater than 1 typically indicates safety problems. Crash rates less than 1 are not as concerning, but there may still be safety concerns based on crash trends.

Intersection Crash Results:

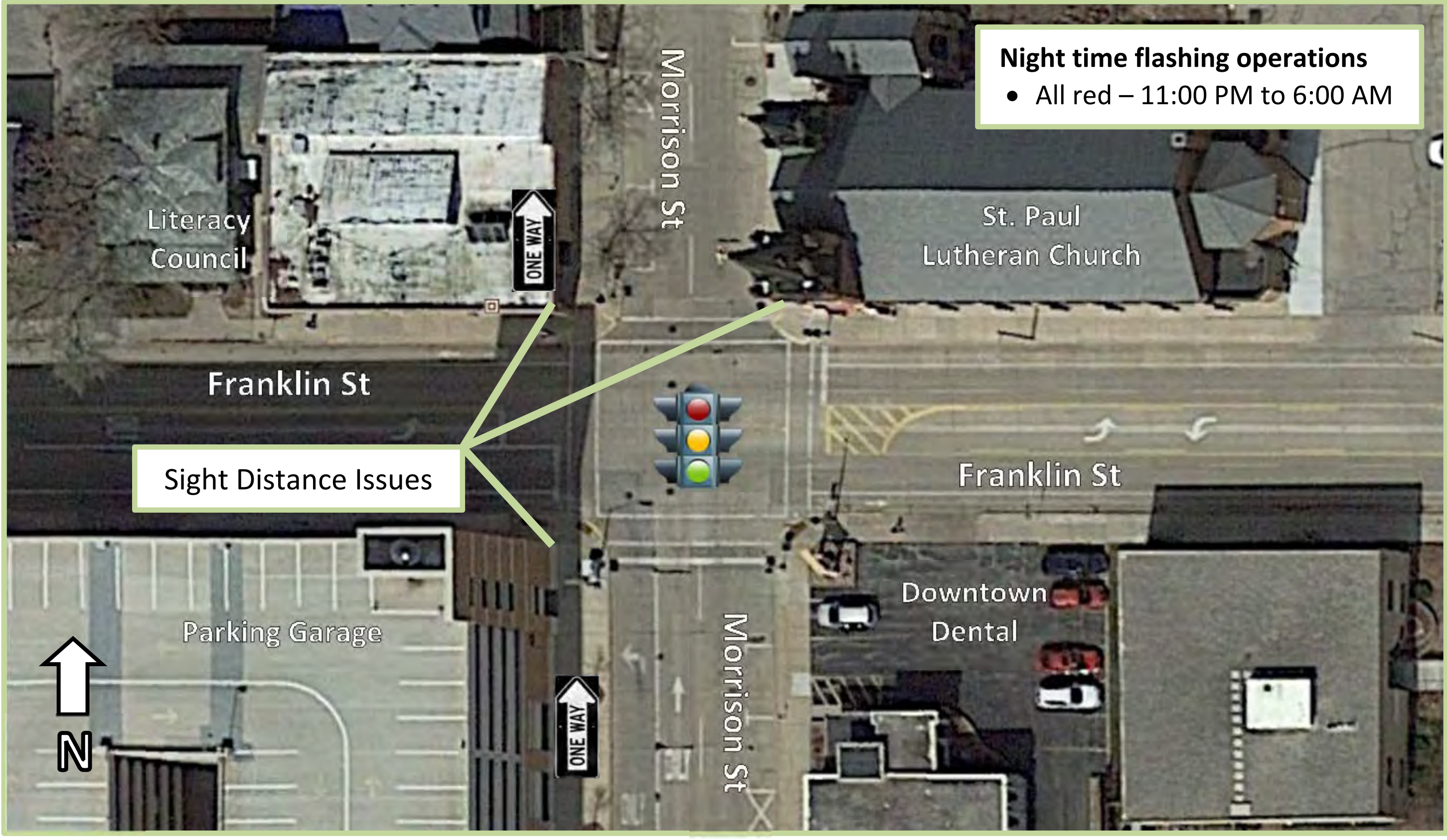
- Total of **12** crashes occurred from 2010 – 2014.
- Crash rate = **1.3*** crashes per million entering vehicles
- Crash trends from 2010 – 2014:
  - **10** angle crashes
    - **5** included WB traffic running red light
    - **1** included EB traffic running red light
    - **1** included SB traffic running red light
    - **1** included NB traffic running red light
    - **2** could not be determined
- **5** injury crashes
  - **2** resulted in incapacitating injuries (A Severity)
  - **3** resulted in possible injuries (C)
- **1** crash during night time flashing operations

Downtown Appleton Mobility Study

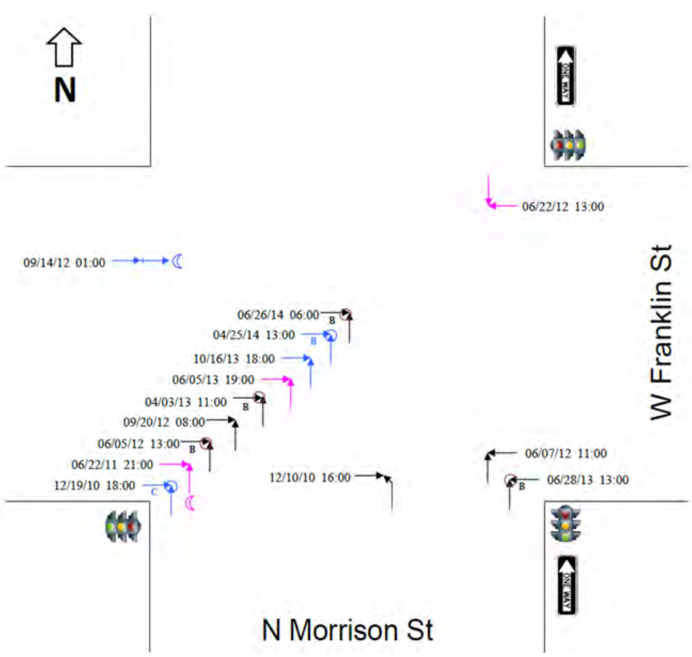
Intersection Safety – Vehicle Crashes

Franklin Street & Morrison Street

Jan. 2016



Crash Diagram 2010 - 2014

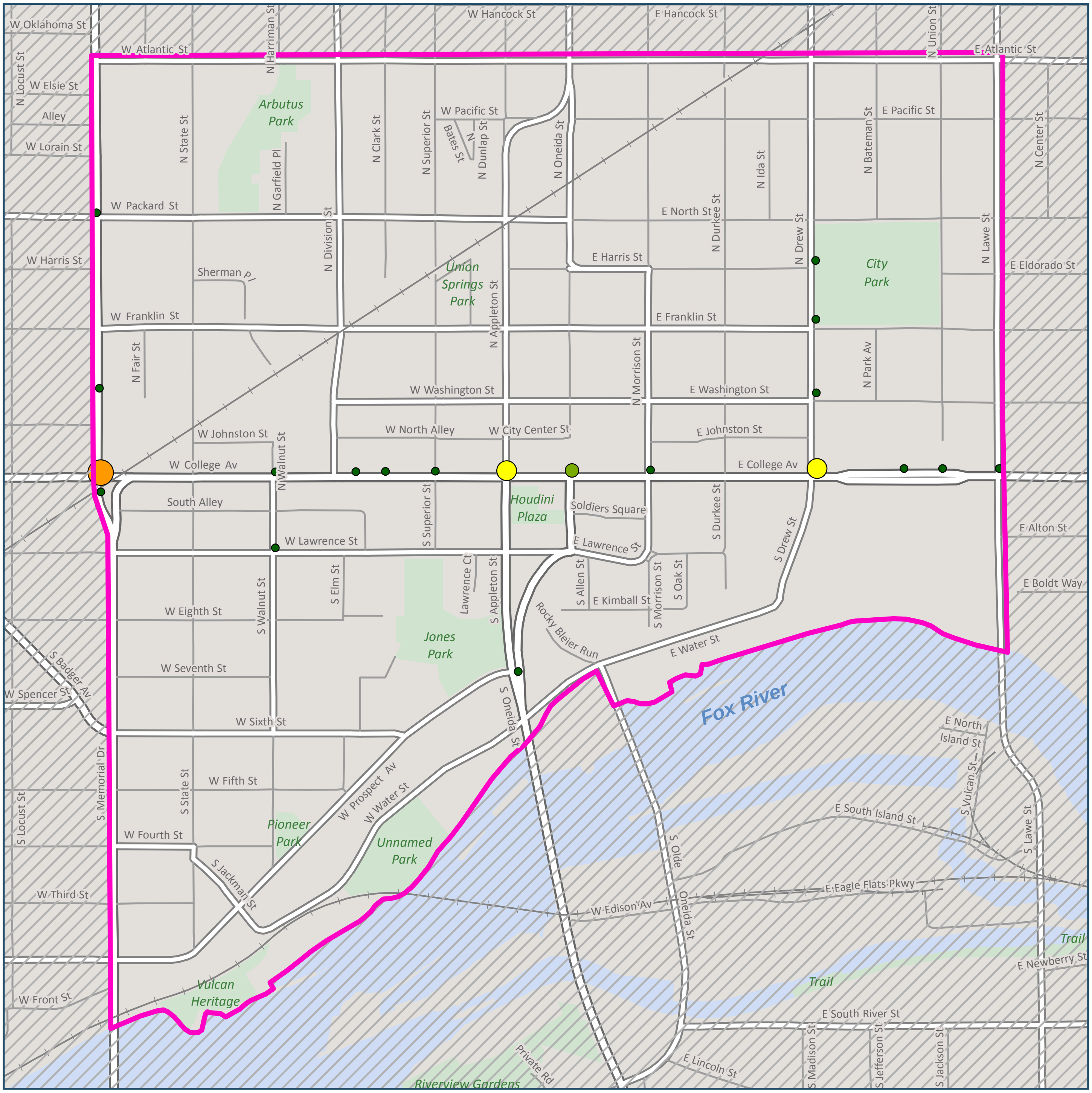


Intersection Crash Results:

- Total of **14** crashes occurred from 2010 – 2014.
- Crash rate = **1.1*** crashes per million entering vehicles
- Crash trends from 2010 – 2014:
    - **13** angle crashes
        - **7** included NB traffic running red light
        - **3** included EB traffic running red light
        - **1** included WB traffic running red light
        - **2** could not be determined
- **6** injury crashes
    - **5** resulted in non-incapacitating injuries (A Severity)
    - **1** resulted in possible injury (C)
- **1** crash during night time flashing operations

* A crash rate greater than 1 typically indicates safety problems. Crash rates less than 1 are not as concerning, but there may still be safety concerns based on crash trends.

Downtown Appleton Mobility Study



Pedestrian Crash Data 2010-2014

Dec. 2015

Legend

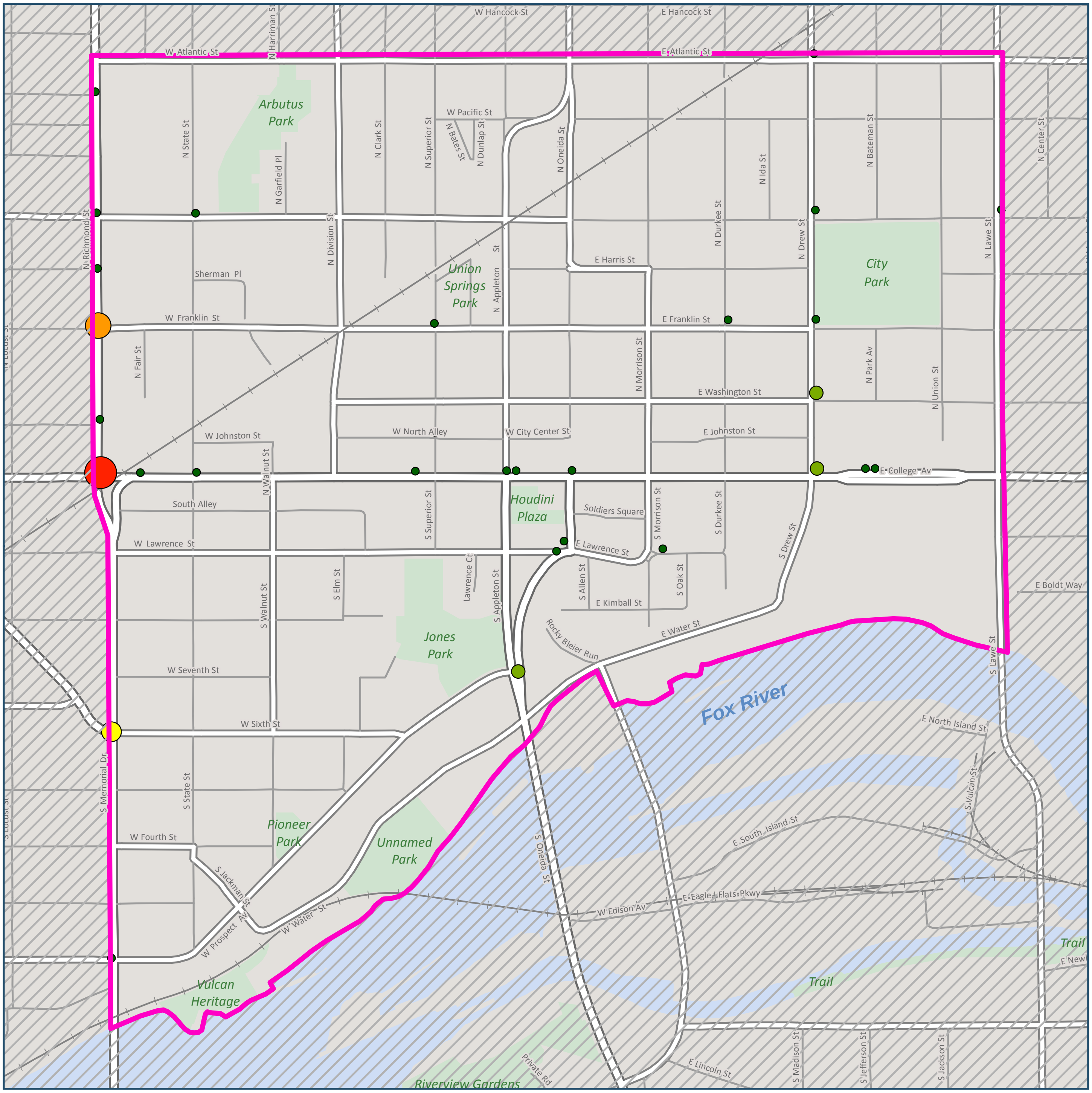
Pedestrian Crashes: 1, 2, 3, 4, 5

Study Area

0 500 1,000 Feet

N

Downtown Appleton Mobility Study



Bicycle Crash Data 2010-2014

Dec. 2015

Legend

Bicycle Crashes: 1, 2, 3, 4, 5

Study Area

0 500 1,000 Feet

N

Appendix G

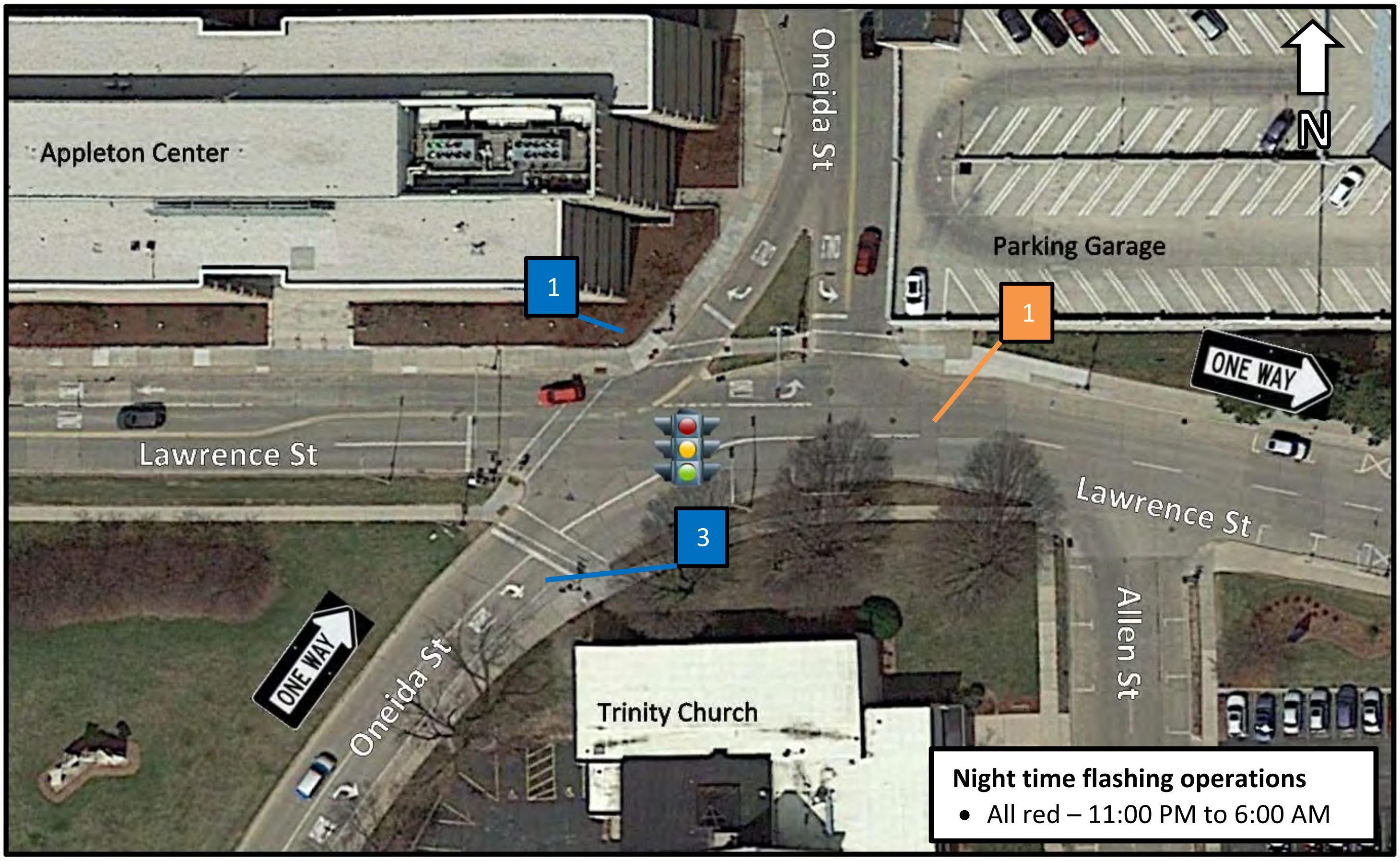
Confusing Intersections

Downtown Appleton Mobility Study

Unconventional / Confusing Intersections

Oneida Street & Lawrence Street

Jan. 2016



Existing intersection issues:

For vehicles:

1. Northbound signal location encourages wrong way turn to Oneida Street.

2. Additional guide signs needed for northbound approach.

3. Right turn on red is allowed for NB vehicles in far right lane. Left lane blocks vision of right turners looking west for oncoming traffic.

4. More pavement markings needed.

For bicycles:

1. No bicycle facilities.

2. Level of Traffic Stress 3
    - Non suitable for majority of bicyclists.

For pedestrians:

1. Missing crosswalk on east leg of intersection where many pedestrians cross.

2. Curb ramps may not meet current ADA* Guidelines

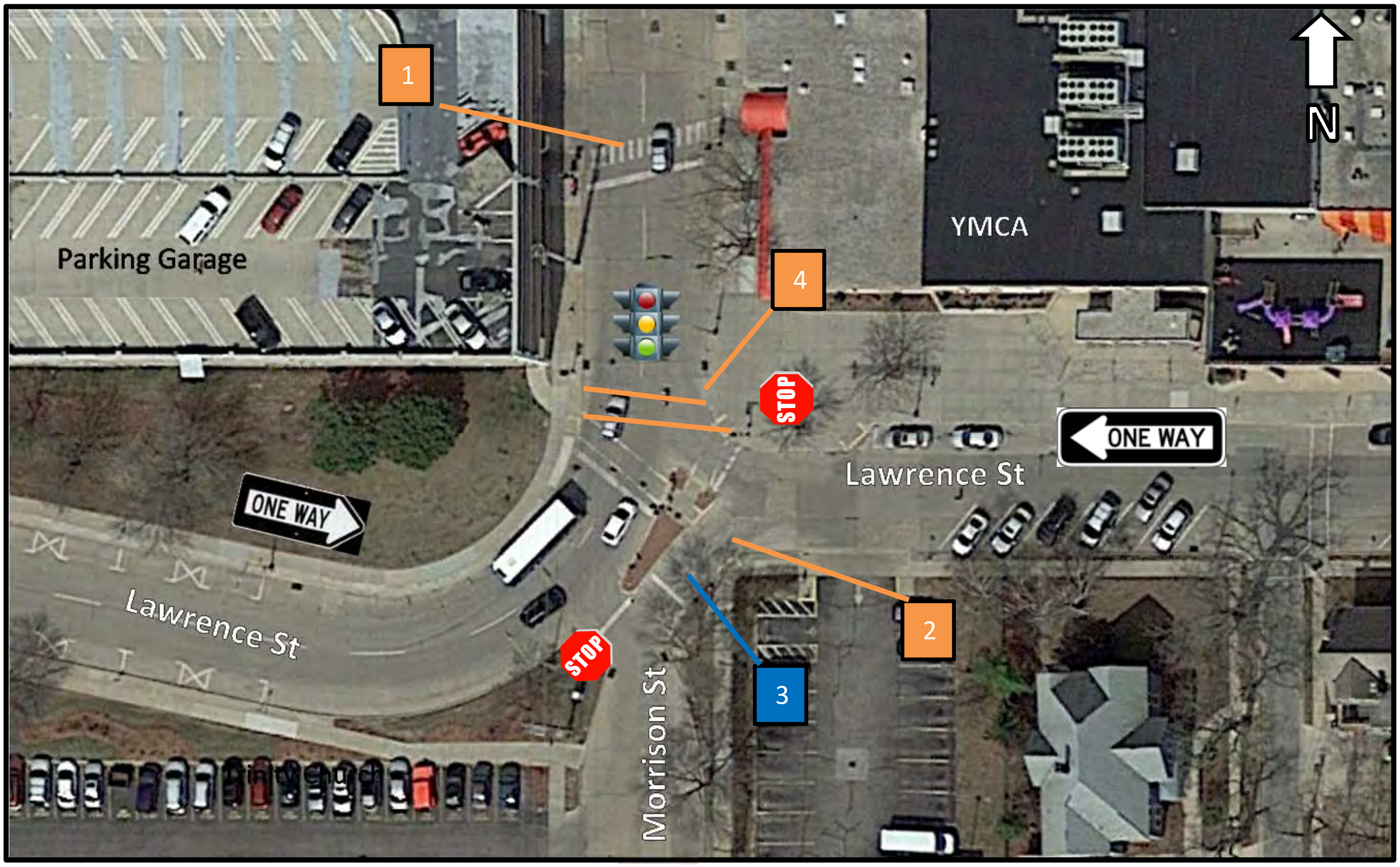
*ADA: Americans with Disabilities Act

Downtown Appleton Mobility Study

Unconventional / Confusing Intersections

Morrison Street & Lawrence Street

Jan. 2016



Existing intersection issues:

For vehicles:

1. Poor signal visibility on Lawrence Street due to curve in roadway.
2. Multiple traffic control devices:
   - EB Lawrence – Signal
   - NB Morrison – Stop
   - WB Lawrence – Stop
3. SE quadrant of intersection causes driver confusion.
4. Difficult to access YMCA because of 1-way street.

For bicycles:

1. No bicycle facilities.
2. Level of Traffic Stress 3
   - Non suitable for majority of bicyclists.

For pedestrians:

1. Most pedestrians cross at crosswalk north of intersection.
2. Missing crosswalk on SE leg of intersection.
3. Curb ramps may not meet current ADA* Guidelines.
4. Crosswalk requires misdirection, pedestrians more likely to use shortest route.

*ADA: Americans with Disabilities Act

Downtown Appleton Mobility Study

Unconventional / Confusing Intersections

Morrison Street & Harris Street

Jan. 2016

Existing intersection issues:

For vehicles:

1. No signing for northbound Morrison Street traffic to direct traffic westbound on Harris Street to Oneida Street on desired northbound route.

2. One-way streets start and end at intersection.

3. Street parking too close to intersection.

For bicycles:

1. No bicycle facilities.

2. Level of Traffic Stress 3 on south leg of intersection
   - Not suitable for majority of bicyclists.

For pedestrians:

1. Trip hazard from poor pavement conditions.

2. Curb ramps may not meet current ADA* Guidelines.

3. May warrant wider/higher visibility crosswalks due to being near Appleton Central High School.

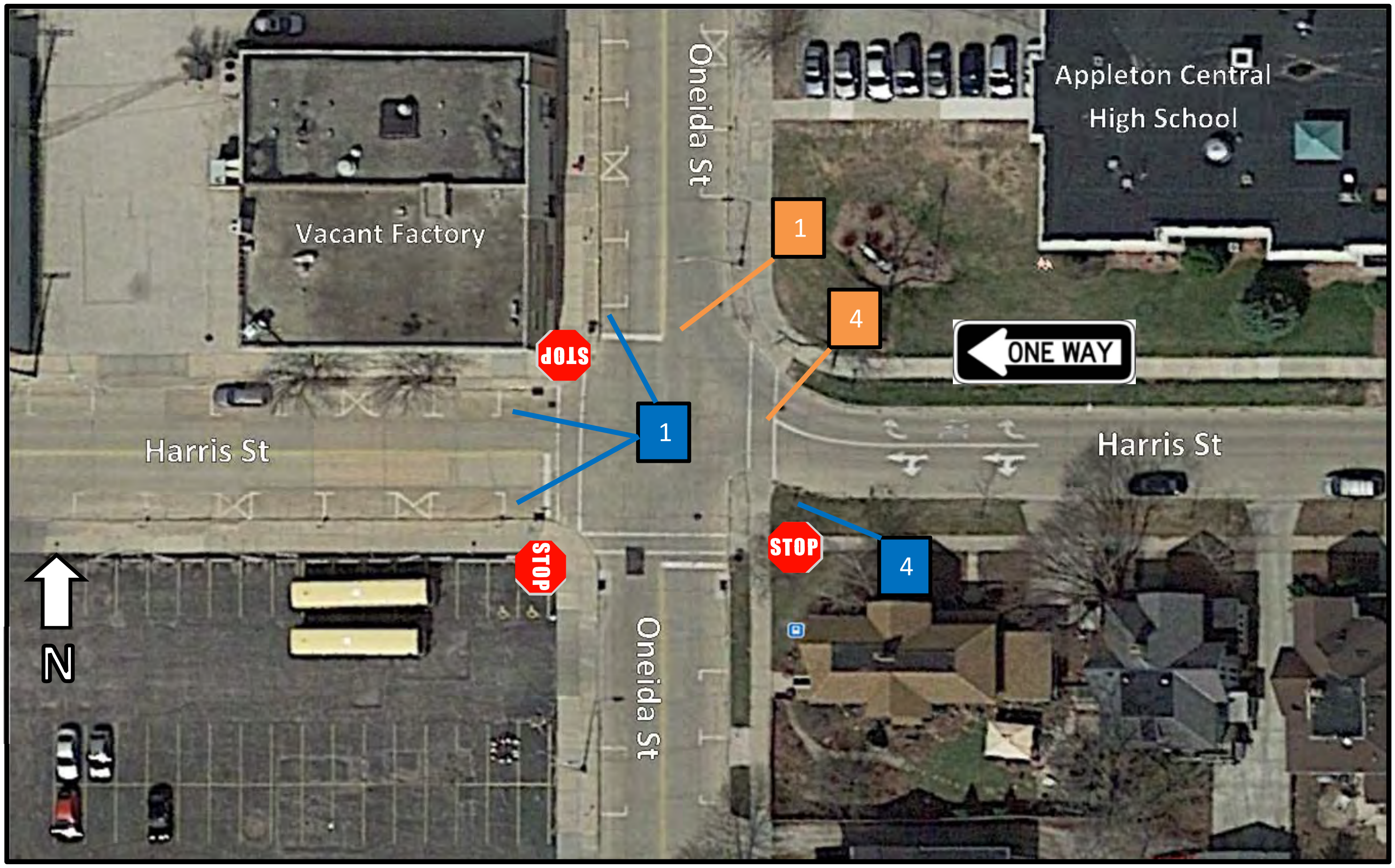
*ADA: Americans with Disabilities Act

Downtown Appleton Mobility Study

Unconventional / Confusing Intersections

Oneida Street & Harris Street

Jan. 2016



Existing intersection issues:

For vehicles:

1. Street parking too close to intersection on north and west legs.
2. One-way street ends on east leg of intersection.
3. 3-way stop control with no traffic control for westbound approach to intersection.
4. Geometry of east leg is confusing for WB left-turn movement.

For bicycles:

1. No bicycle facilities.
2. Level of Traffic Stress 2 for south leg of intersection
   - Suitable for majority of adult bicyclists.

For pedestrians:

1. No crosswalk markings on north leg of intersection.
2. Curb ramps may not meet current ADA* Guidelines.
3. May warrant wider/higher visibility crosswalks due to being near Appleton Central High School.
4. Potential safety issue on east leg crosswalk due to no traffic control.

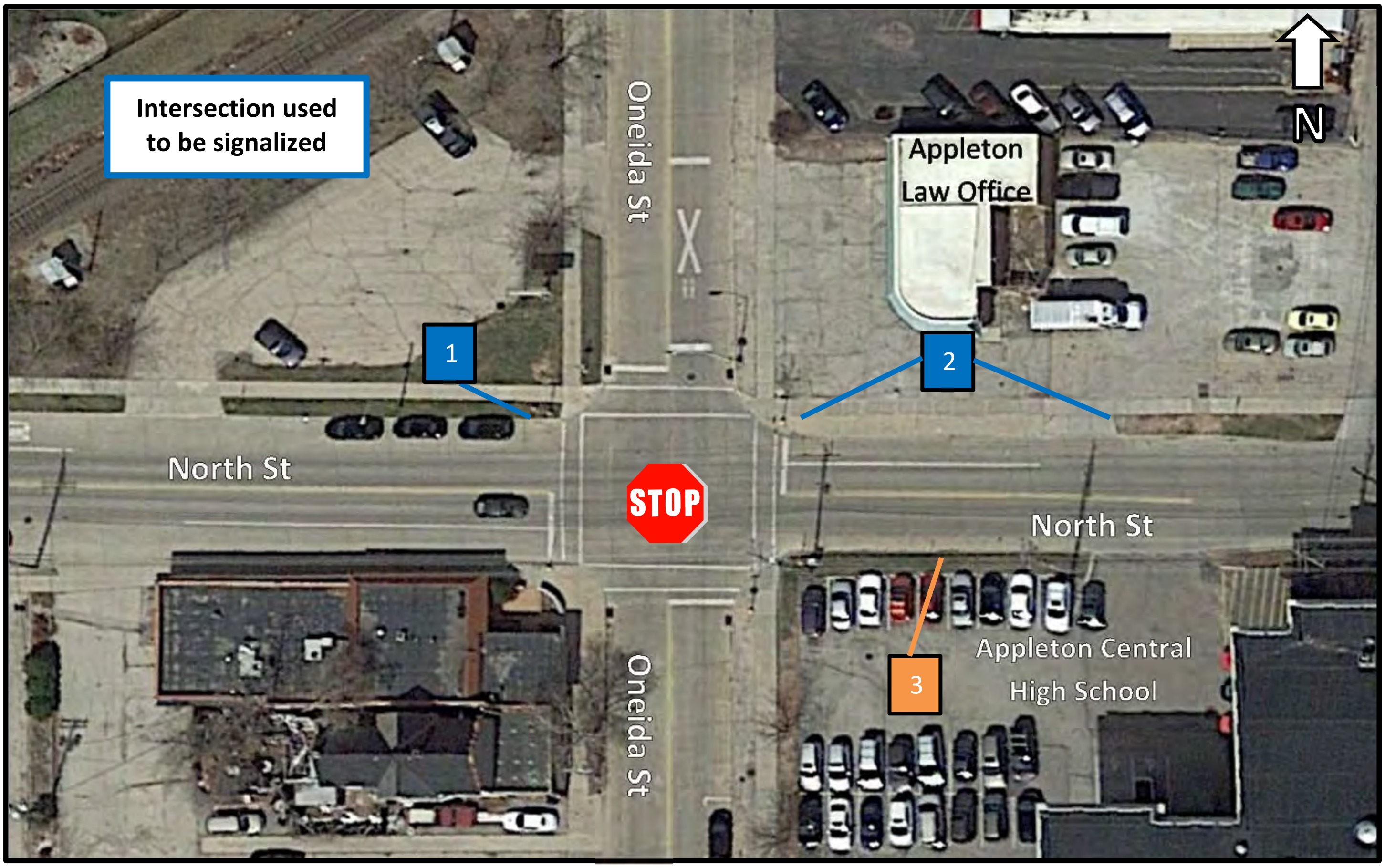
*ADA: Americans with Disabilities Act

Downtown Appleton Mobility Study

Unconventional / Confusing Intersections

Oneida Street & North Street

Jan. 2016



Existing intersection issues:

For vehicles:

1. Street parking too close on west leg of intersection.
2. Long driveway with back out parking along east leg of North Street.

For bicycles:

1. No bicycle facilities .

For pedestrians:

1. Curb ramps may not meet current ADA* Guidelines.
2. May warrant wider/higher visibility crosswalks near Appleton Central High School.
3. No sidewalk provided along south side of North Street east of Oneida Street.

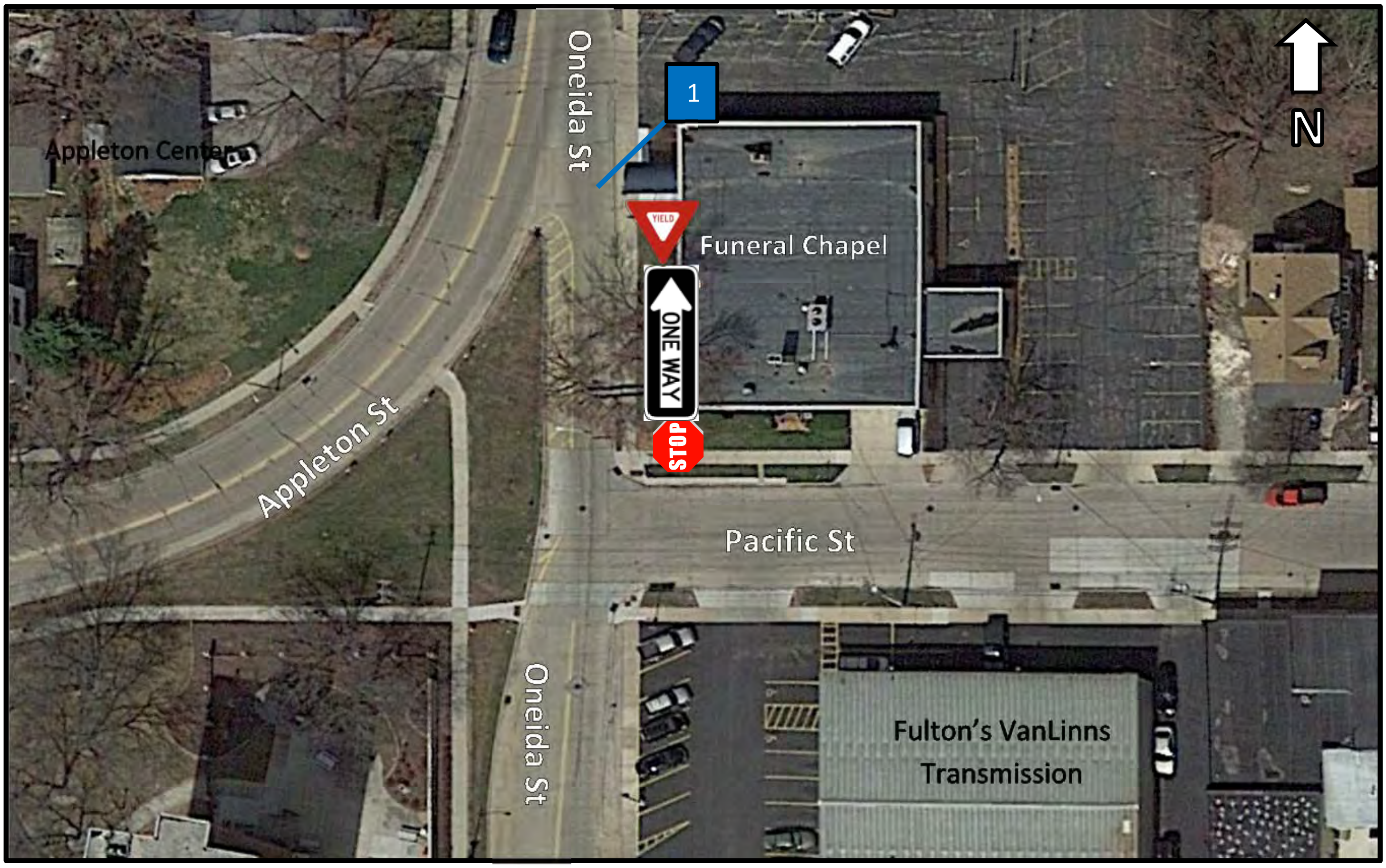
*ADA: Americans with Disabilities Act

Downtown Appleton Mobility Study

Unconventional / Confusing Intersections

Oneida Street & Pacific Street

Jan. 2016



Existing intersection issues:

For vehicles:

1. Northbound Oneida Street traffic has yield control onto Appleton Street at a poor angle, and some traffic proceeds without yielding, creating an unsafe merge.
2. Discontinuation of southbound Oneida Street through the Pacific Street intersection.
3. Discontinuation of Pacific Street through intersection.

For bicycles:

1. No bicycle facilities.

For pedestrians:

1. No crosswalk markings.
2. Curb ramps may not meet current ADA* Guidelines.

*ADA: Americans with Disabilities Act

Downtown Appleton Mobility Study

Unconventional / Confusing Intersections

State Street & Jackman Street

Jan. 2016

Existing intersection issues:

For vehicles:

1. Jackman Street has a steep grade which can lead to potential safety issues in winter weather due to slippery conditions.
2. Jackman Street is yield controlled, which can be confusing for drivers on all legs of the intersection.

For bicycles:

1. No bicycle facilities on State Street.
2. Level of Traffic Stress 2 on Jackman Street
   - Suitable for majority of adult bicyclists.

For pedestrians:

1. No crosswalk markings for east and north legs of intersection.
2. Curb ramps may not meet current ADA* Guidelines.

*ADA: Americans with Disabilities Act

Appendix H

Railroad Crossings

Downtown Appleton Mobility Study

Potential Railroad Crossing Closures

Oneida Street

Jan. 2016

Potential impacts of railroad crossing closure:

For vehicles:

1. Increases travel times in the area.
2. Reduces access to local businesses.
3. Removes the primary northbound route through Downtown Appleton.

For bicycles:

1. No potential impacts for bicycles.

For pedestrians:

1. Lengthen walk for students at Columbus Elementary School.
2. Pedestrians likely to still cross tracks at this location even if official crossing is removed.

Downtown Appleton Mobility Study

Potential Railroad Crossing Closures

Morrison Street

Jan. 2016

Potential impacts of railroad crossing closure:

For vehicles:

1. Increases travel times in the area.
2. Reduces access to local businesses.
3. Removes a secondary northbound route through Downtown Appleton.
4. Close to Pacific Street and Durkee Street closures .

For bicycles:

1. No potential impacts for Bicycles.

For pedestrians:

1. Requires significant misdirection due to Durkee Street and Pacific Street railroad crossings being closed.
2. Pedestrians likely to still cross tracks at this location even if official crossing is removed.

Appendix I

Unwarranted Traffic Signals

Downtown Appleton Mobility Study

Potentially Unwarranted Traffic Signals

Franklin Street & Superior Street

Jan. 2016

Intersection Information

Franklin Street
AADT = 4,000 vehicles
Peak Hour Entering Volume= 564 vehicles

Superior Street
AADT = 970 vehicles
Peak Hour Entering Volume= 123 vehicles

Signal Warrants Met?
None

Multi-Way Stop Warrants Met?
None

Existing Intersection LOS

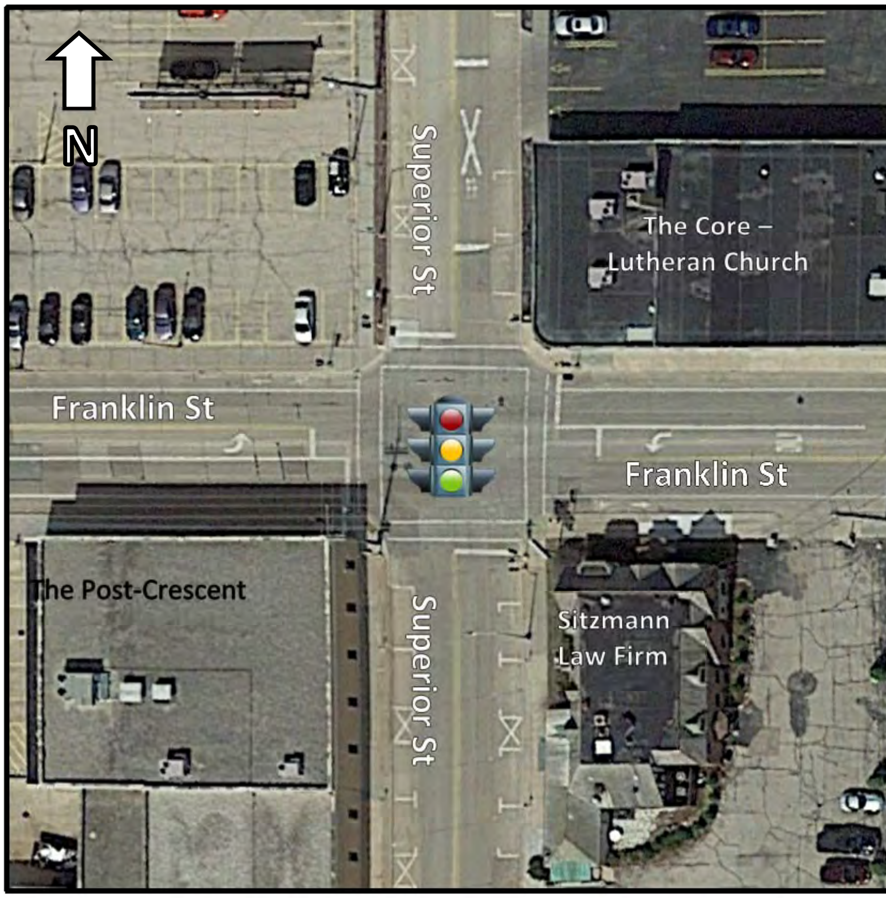
- With existing signal = LOS A
- 2-way stop control with stop control on Superior Street = LOS A
- 4-way stop control = LOS B

Future (2036) Intersection LOS

- With existing signal = LOS A
- 2-way stop control with stop control on Superior Street = LOS A
- 4-way stop control = LOS B

Signal's Night Time Flashing Operations

- 11:00 PM – 6:00 AM
- Franklin Street – Yellow Flash
- Superior Street – Red Flash



Downtown Appleton Mobility Study Area

Potential reasons NOT to remove signal:

(To be investigated during alternatives development process)

1. Sight distance issues
   a. It is difficult for northbound traffic on Superior Street to see around the Post Crescent building when looking west. The building abuts the sidewalk.
   b. It is difficult for southbound traffic on Superior Street to see around The Core Lutheran Church when looking east.

2. The traffic signal provides signalized pedestrian crossings. However, very few pedestrians who park in the parking lot in the intersection's northwest quadrant actually walk to the intersection to cross.

3. The 5-year crash rate at this intersection is 1.3 crashes per million entering vehicles. See safety Exhibit 13 for more information.

Downtown Appleton Mobility Study

Potentially Unwarranted Traffic Signals

Franklin Street & Oneida Street

Jan. 2016

Intersection Information

Franklin Street

AADT = 4,000 vehicles

Peak Hour Entering Volume= 475 vehicles

Oneida Street

AADT = 1,290 vehicles

Peak Hour Entering Volume= 72 vehicles

Signal Warrants Met?

None

Multi-Way Stop Warrants Met?

None

Existing LOS

- With existing signal = LOS A
- 2-way stop control with stop control on Superior Street = LOS A
- 4-way stop control = LOS A

Future (2036) LOS

- With existing signal = LOS A
- 2-way stop control with stop control on Superior Street = LOS A
- 4-way stop control = LOS B

Signal's Night Time Flashing Operations

- 11:00 PM – 6:00 AM
- Franklin Street – Yellow Flash
- Oneida Street – Red Flash

Downtown Appleton Mobility Study Area

Potential reasons NOT to remove signal:

(To be investigated during alternatives development process)

1. The traffic signal provides signalized pedestrian crossings.
2. A higher than usual pedestrian volume due to:
   - Public library in southwest intersection quadrant
   - Transit center south of intersection
   - Parking garage east of intersection
   - City Center Plaza south of intersection
   - St. Paul School & Daycare east of intersection
3. Sight distance issues for the southbound Oneida Street approach. This may cause safety issues with 2-way stop control on Oneida Street.

Appendix J

2-way Appleton Street Traffic (Alt. 2) Analysis

AECOM
1350 Deming Way
Suite 100
Middleton, WI 53562
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Memorandum

To	Eric Lom, P.E. - City of Appleton	Page	1
CC	Mike Hardy, P.E. - City of Appleton		
Subject	Operational Analysis – Two-Way Appleton St.		

From	Amy Canfield, P.E. - AECOM
Date	May 12, 2016

As part of the Downtown Appleton Mobility Study, AECOM completed an analysis of an alternative to convert Appleton St. to two-way traffic. This alternative will allow for better north-south connectivity through downtown Appleton. The analysis area was along Appleton St. from Lawrence St. to Washington St. (0.2 miles).

METHODOLOGY

Intersection operations were analyzed for the PM peak hour (4:30-5:30 PM) in the existing year (2105) and the future year 2036. Synchro traffic modeling software and SimTraffic were used for the analysis. The following three intersections were analyzed:

- Appleton St. & Lawrence St.
- Appleton St. & College Ave.
- Appleton St. & Washington St.

East Central Wisconsin Regional Planning Commission (ECWRPC) used the regional travel demand model to predict future traffic growth. Existing traffic throughout downtown Appleton was redistributed to allow two-way traffic on Appleton St., Lawrence St. and Morrison St. New traffic volumes were projected for future year 2036 by applying the ECWRPC growth rates.

OPERATIONAL ANALYSIS

All approaches to the intersection of Appleton St. & Lawrence St. will have one through/right-turn lane and one dedicated left-turn lane. All left-turn movements at the intersection will operate as permissive only.

The northbound/southbound approaches to the intersection of Appleton St. & College Ave. will each have one through/right-turn lane and one dedicated left-turn lane. The eastbound/westbound approaches to the intersection will each have one through/right-turn lane and one through/left-turn lane. The westbound left-turn movement will operate as protected/permissive and all other left-turn movements will operate as permissive only.

The northbound/southbound approaches to the intersection of Appleton St. & Washington St. will each have one through/right-turn lane and one dedicated left-turn lane. The eastbound/westbound approaches to the intersection will each have one through/left-turn/right-turn lane. All left-turn movements will operate as permissive only.

See Attachment 1 for intersection lane assignments.

All intersections operate at acceptable Level of Service (LOS) in existing year and future year 2036. Existing year and future year 2036 models included leading pedestrian intervals at all intersections. The LOS and control delay for each intersection can be seen in Table 1. See Attachment 2 for Synchro operational outputs for each intersection.

Table 1: Two-Way Appleton St. – Intersection Operational Analysis

Intersection	Existing (sec)	Future Year 2036 (sec)
Appleton St. & Lawrence St.	B (12)	B (14)
Appleton St. & College Ave.	C (21)	C (31)
Appleton St. & Washington St.	B (17)	B (19)

Existing Conditions

All intersections operate at acceptable LOS with existing traffic volumes. The Appleton St. & College Ave. intersection has two movements that operate at LOS D: northbound left-turn and southbound through movements. All other movements operate at LOS C or better. Coordination along College Ave. resulted in good progression and LOS. Table 2 shows all intersection turning movements LOS and delay for the existing year.

Table 2: Intersection Operations – Existing Year – LOS & Delay

Intersection	Eastbound (sec)			Westbound (sec)			Northbound (sec)			Southbound (sec)		
	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT
Appleton St. & Lawrence St.	B (19)	B (12)		C (22)	B (15)		B (14)	B (12)		A (6)	A (10)	
Appleton St. & College Ave.	C (21)			B (14)			C (22)	B (16)		B (15)	C (33)	
Appleton St. & Washington St.	B (10)			C (29)			B (14)	B (13)		A (10)	B (12)	

Converting Appleton St. to two-way traffic will increase queues, specifically along Appleton St. The 95th percentile queues from Synchro are shown in Table 3. Queues highlighted in red spillback into adjacent intersections.

Table 3: Intersection Operations – Existing Year - Queues

Intersection	Eastbound (ft)			Westbound (ft)			Northbound (ft)			Southbound (ft)		
	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT
Appleton St. & Lawrence St.	50	125		100	100		50	125		25	125	
Appleton St. & College Ave.	225			150			50	125		50	450	
Appleton St. & Washington St.	75			250			50	100		25	125	

Below is a list of potential queue impacts at the Appleton St. & Lawrence St. intersection:

- Westbound left-turn lane queues have the potential to exceed the storage provided. The adjacent intersection is too close to provide additional storage.
- All through movements have the potential to block dedicated left-turn lanes.
- *Lawrence Ct. access:* Eastbound through movement has the potential to block access to Lawrence Ct. Lawrence Ct. is a low volume access point.
- *Red Ramp access:* Southbound through movement has the potential to block access to the Red Ramp. Left turn restrictions for northbound traffic should be considered so as to not cause northbound traffic on Appleton St. to come to a standstill. This would not change existing conditions as northbound traffic cannot currently enter this ramp because Appleton St. is one-way southbound at this location.
- *Mid-block pedestrian crossing near Red Ramp:* The bump-outs and pedestrian crossing located near the Red Ramp in the 100 block of Appleton Street would need to be removed to accommodate the proposed typical section.
- *Access to parking ramp at Skyline Technologies building (northeast quadrant of Appleton St & Lawrence St. intersection):* The access point for this parking ramp is immediately north of Lawrence St. It will be very difficult for vehicles to turn left (south) onto Appleton St. from this parking ramp during peak hours. Consider making this location right-out (northbound) only. This ramp currently allows only left (southbound) turns because Appleton St. is one-way southbound at this location.

Below is a list of potential queue impacts at the Appleton St. & College Ave. intersection:

- Southbound through movement has the potential to spillback into the Appleton St. & Washington St. intersection.
- Northbound/southbound through movements have the potential to block dedicated left-turn lanes.
- Northbound through movement has the potential to block access to the Red Ramp.
- *City Center alley:* Southbound through movement has the potential to extend to the City Center alley. This would make it difficult for drivers to turn left from the City Center alley during peak hour. Turn restrictions during peak times may be considered.

- *Access to North Alley:* During peak hours, access for northbound traffic on Appleton St. to the North Alley will be difficult due to extended southbound queues.

Below is a list of potential queue impacts at the Appleton St. & Washington St. intersection:

- Northbound/southbound through movements have the potential to block the dedicated left-turn lanes.
- Southbound/eastbound through movements have the potential to block access to the Appleton Public Library driveway, the private parking lot behind IL Angolo and Chase bank access.
- *Access to the Blue Ramp*: Access to the Blue Ramp may be blocked by queues during peak hours. It may also be difficult to turn left (southbound) from the Blue Ramp during peak hours). If the Blue Ramp is removed and a new parking structure is constructed in its place, consideration should be given to moving all ramp access points to Washington St. or Oneida St. to reduce the number of access points and potential for delay on Appleton St.

A sensitivity analysis was completed to determine the number of hours in a typical day that have the potential for queue spillback. Using WisDOT hourly traffic count data and ECWRPC growth rates, it was found that 3 hours of typical daily operation will have the potential for queue spillback in the existing year.

Other potential impacts to consider:

- *Mid-block pedestrian crossing near Red Ramp:* The bump-outs and pedestrian crossing located near the Red Ramp in the 100 block of Appleton St. would need to be removed to accommodate the proposed typical section.
- *Houdini Plaza loading zone:* All parking/loading zones on Appleton St. would be removed in the vicinity of Houdini Plaza. Loading/unloading for Houdini Plaza events (concerts, farmer’s market, etc.) would need to occur on Oneida St. or College Ave.
- *Building for Kids loading zone:* All parking/loading zones on Appleton St. would be removed in the vicinity of the Building for Kids. Loading/unloading for buses and other patrons would need to occur on College Avenue or Washington St.
- *Short-term parking for businesses:* Some businesses indicated a need for short-term parking close to their business if Appleton St. parking is removed. Consider providing short-term parking (30 minutes or less) immediately upon entering the Red Ramp, close to Appleton St.

Future Year 2036 Conditions

All intersections operate at acceptable LOS during future year 2036 conditions. The Appleton St. & College Ave. intersection has two movements operating at LOS D: northbound left-turn and southbound through movements. The westbound left-turn movement at the Appleton St. & Lawrence St. intersection operates at LOS D. All other movements are LOS C or above. Coordination along College Ave. resulted in good progression and LOS. Table 4 shows all intersection turning movements LOS and delay for future year 2036.

Table 4: Intersection Operations – Future Year 2036 – LOS & Delay

Intersection	Eastbound (sec)			Westbound (sec)			Northbound (sec)			Southbound (sec)		
	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT
Appleton St. & Lawrence St.	B (20)	B (13)		C (28)	B (17)		B (14)	B (14)		A (6)	B (11)	
Appleton St. & College Ave.	D (46)			B (13)			C (29)		B (17)	B (17)		D (45)
Appleton St. & Washington St.	B (10)			C (33)			B (14)	B (13)		A (9)	B (12)	

Queues worsened slightly in future year 2036. The 95th percentile queues from Synchro are shown in Table 5 below. Queues highlighted in red spillback into adjacent intersections.

Table 5: Intersection Operations – Future Year 2036 - Queues

Intersection	Eastbound (ft)			Westbound (ft)			Northbound (ft)			Southbound (ft)		
	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT	LT	Thru	RT
Appleton St. & Lawrence St.	75	150		125	100		50	150		25	150	
Appleton St. & College Ave.	450			150			50		125	50		525
Appleton St. & Washington St.	75			300			50	125		25	125	

The same potential impacts are applicable for the future year 2036 queues; however, there is a higher probability of queue spillback into adjacent intersections. Two additional potential impacts of queues in the future year 2036 are:

- The Appleton St. & College Ave. intersection eastbound through movement has the potential to spillback into the College Ave. & Superior St. intersection.
- The Appleton St. & Washington St. intersection Westbound through movement has the potential to spillback into the Washington St. & Oneida St intersection.

The sensitivity analysis found that 6 hours of typical daily operation will have the potential for queue spillback in the future year 2036.

CONCLUSION

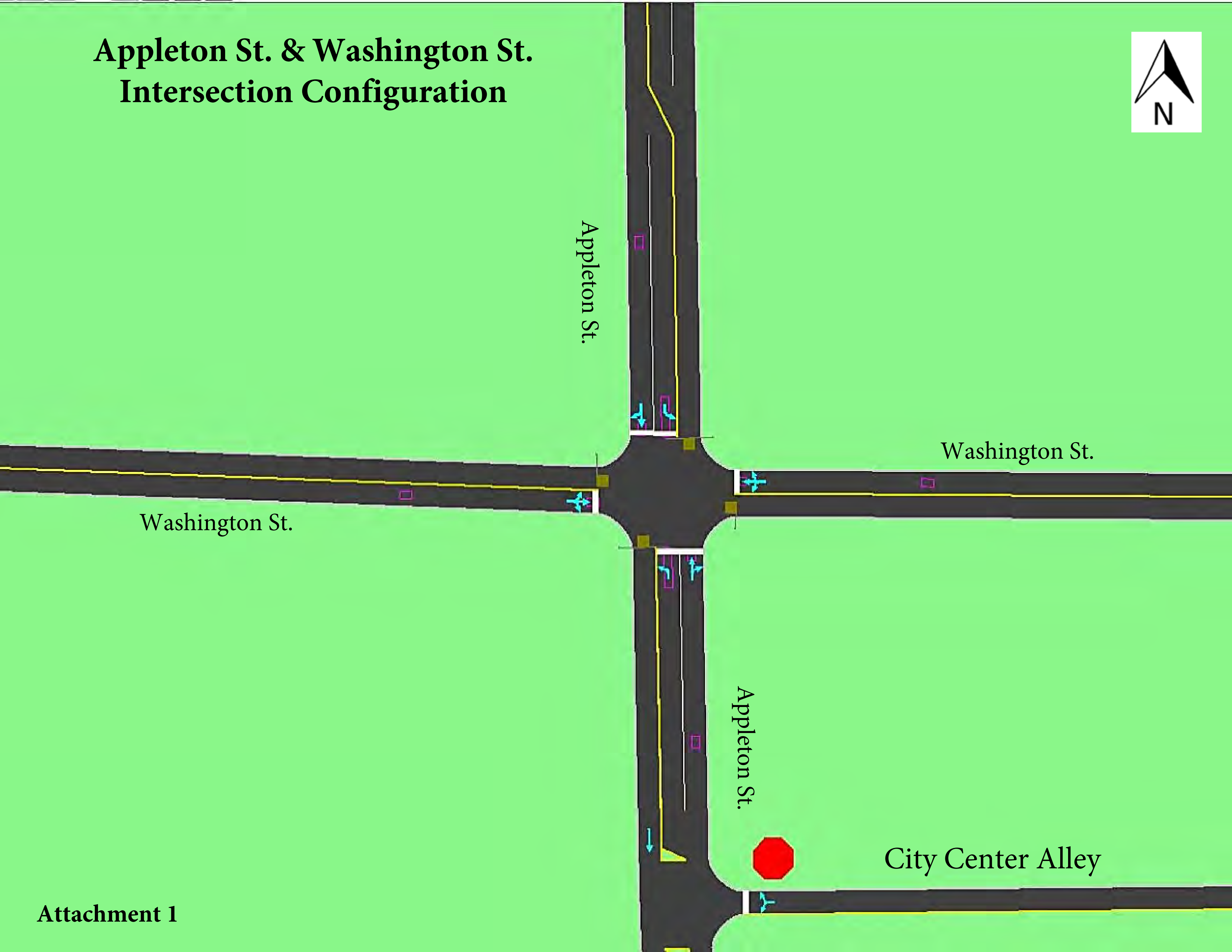
Converting Appleton St. to two-way traffic is feasible. Delay and queuing on Appleton St. will increase when compared to existing conditions, but not beyond acceptable measures. All intersection LOS and individual turning movement LOS are acceptable for existing and future year 2036 conditions.

Appleton St. & Lawrence St.
Intersection Configuration

Attachment 1

Attachment 1

Appleton St. & Washington St. Intersection Configuration



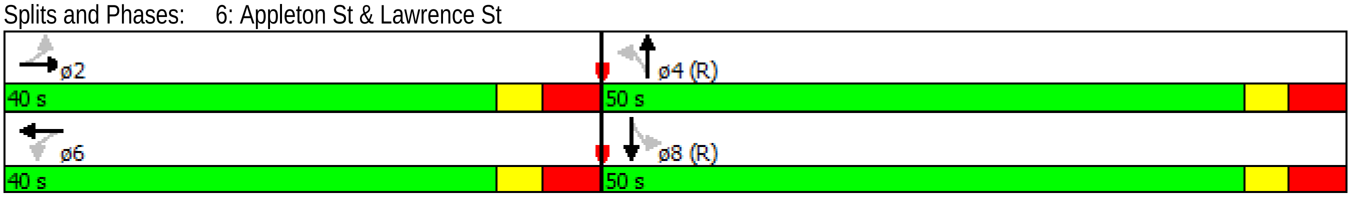
Attachment 1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	80	138	99	85	40	30	153	70	24	427	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	125		0	150		0	150		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.905			0.952			0.953			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1686	0	1770	1773	0	1770	1775	0	1770	1831	0
Flt Permitted	0.671			0.566			0.331			0.593		
Satd. Flow (perm)	1250	1686	0	1054	1773	0	617	1775	0	1105	1831	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		111			30			36			10	
Link Speed (mph)		25			25			30			25	
Link Distance (ft)		1279			319			661			394	
Travel Time (s)		34.9			8.7			15.0			10.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	87	150	108	92	43	33	166	76	26	464	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	54	237	0	108	135	0	33	242	0	26	525	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	23.0	23.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	40.0	40.0		40.0	40.0		50.0	50.0		50.0	50.0	
Total Split (%)	44.4%	44.4%		44.4%	44.4%		55.6%	55.6%		55.6%	55.6%	
Maximum Green (s)	33.0	33.0		33.0	33.0		43.0	43.0		43.0	43.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	5.0	5.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		15	15		6	6		16	16	
Act Effct Green (s)	34.0	34.0		34.0	34.0		44.0	44.0		44.0	44.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.49	0.49		0.49	0.49	
v/c Ratio	0.11	0.34		0.27	0.20		0.11	0.27		0.05	0.58	
Control Delay	19.2	11.8		21.8	15.4		13.7	12.4		5.6	8.4	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	1.1	
Total Delay	19.2	11.8		21.8	15.4		13.7	12.4		5.6	9.6	
LOS	B	B		C	B		B	B		A	A	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		13.2			18.2			12.6			9.4	
Approach LOS		B			B			B			A	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 62 (69%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 12.4	Intersection LOS: B
Intersection Capacity Utilization 59.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 6: Appleton St & Lawrence St

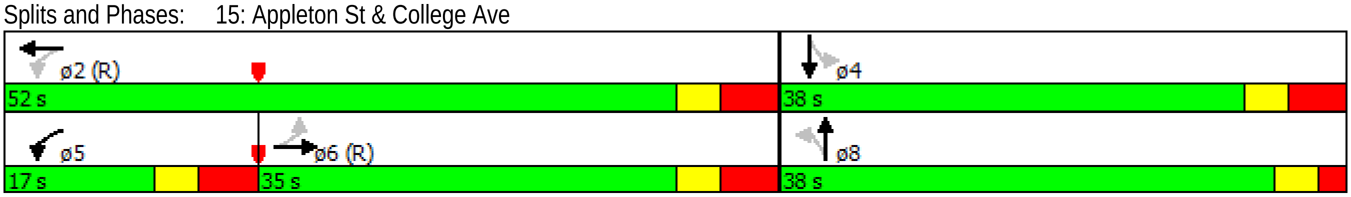


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	661	77	54	536	35	37	150	75	63	351	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	150		0	150		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			1.00			0.97		0.95	0.98	
Frt		0.985			0.992			0.950			0.952	
Flt Protected		0.997			0.996		0.950			0.950		
Satd. Flow (prot)	0	3444	0	0	3481	0	1770	1717	0	1770	1734	0
Flt Permitted		0.876			0.717		0.203			0.525		
Satd. Flow (perm)	0	3022	0	0	2506	0	378	1717	0	930	1734	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			10			32			29	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		412			323			394			213	
Travel Time (s)		10.0			7.9			10.7			5.8	
Confl. Peds. (#/hr)	25		29	29		25	39		47	47		39
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	42	696	81	57	564	37	39	158	79	66	369	174
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	819	0	0	658	0	39	237	0	66	543	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		6		5	2			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	6	6		5	2		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	26.0	26.0		11.5	25.0		24.0	24.0		26.0	26.0	
Total Split (s)	35.0	35.0		17.0	52.0		38.0	38.0		38.0	38.0	
Total Split (%)	38.9%	38.9%		18.9%	57.8%		42.2%	42.2%		42.2%	42.2%	
Maximum Green (s)	28.0	28.0		10.0	45.0		33.0	33.0		31.0	31.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	4.0		4.0	4.0		2.0	2.0		4.0	4.0	
Lost Time Adjust (s)		-1.0			-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)		6.0			6.0		4.0	4.0		6.0	6.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?				Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		Max	C-Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0		5.0	5.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	15	15			25		20	20		20	20	
Act Effct Green (s)		29.0			46.0		34.0	34.0		32.0	32.0	
Actuated g/C Ratio		0.32			0.51		0.38	0.38		0.36	0.36	
v/c Ratio		0.83			0.47		0.27	0.35		0.20	0.86	
Control Delay		21.4			13.5		22.2	15.7		15.4	31.0	
Queue Delay		0.0			0.3		0.0	0.0		0.0	2.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		21.4			13.8		22.2	15.7		15.4	33.1	
LOS		C			B		C	B		B	C	
Approach Delay		21.4			13.8			16.7			31.2	
Approach LOS		C			B			B			C	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 26 (29%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 21.2	Intersection LOS: C
Intersection Capacity Utilization 91.0%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 15: Appleton St & College Ave

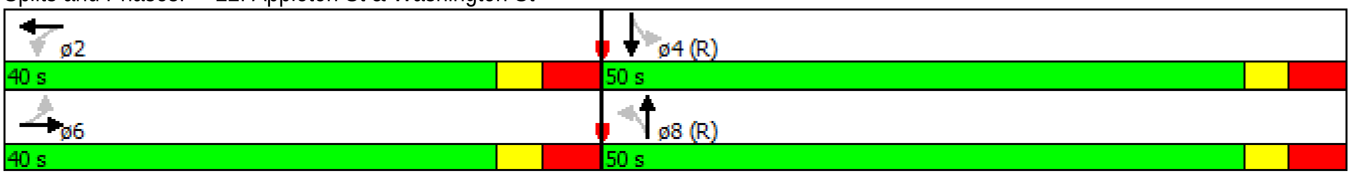


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	33	59	209	55	39	55	147	32	16	335	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	100		0	150		0	150		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.927			0.983			0.973			0.998	
Flt Protected		0.992			0.967		0.950			0.950		
Satd. Flow (prot)	0	1713	0	0	1771	0	1770	1812	0	1770	1859	0
Flt Permitted		0.925			0.744		0.470			0.635		
Satd. Flow (perm)	0	1597	0	0	1362	0	875	1812	0	1183	1859	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		64			9			17			1	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		398			340			206			389	
Travel Time (s)		10.9			9.3			5.6			10.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	18	36	64	227	60	42	60	160	35	17	364	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	118	0	0	329	0	60	195	0	17	368	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Minimum Split (s)	35.0	35.0		35.0	35.0		43.0	43.0		43.0	43.0	
Total Split (s)	40.0	40.0		40.0	40.0		50.0	50.0		50.0	50.0	
Total Split (%)	44.4%	44.4%		44.4%	44.4%		55.6%	55.6%		55.6%	55.6%	
Maximum Green (s)	33.0	33.0		33.0	33.0		43.0	43.0		43.0	43.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)		-1.0			-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		34.0			34.0		44.0	44.0		44.0	44.0	
Actuated g/C Ratio		0.38			0.38		0.49	0.49		0.49	0.49	
v/c Ratio		0.18			0.63		0.14	0.22		0.03	0.40	
Control Delay		10.3			28.8		13.8	12.7		9.6	11.7	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.4	
Total Delay		10.3			28.8		13.8	12.7		9.6	12.1	
LOS		B			C		B	B		A	B	
Approach Delay		10.3			28.8			13.0			12.0	
Approach LOS		B			C			B			B	

Intersection Summary	
Area Type:	Other

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 60 (67%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green
Natural Cycle: 80
Control Type: Pretimed
Maximum v/c Ratio: 0.63
Intersection Signal Delay: 17.2 Intersection LOS: B
Intersection Capacity Utilization 59.7% ICU Level of Service B
Analysis Period (min) 15

Splits and Phases: 22: Appleton St & Washington St

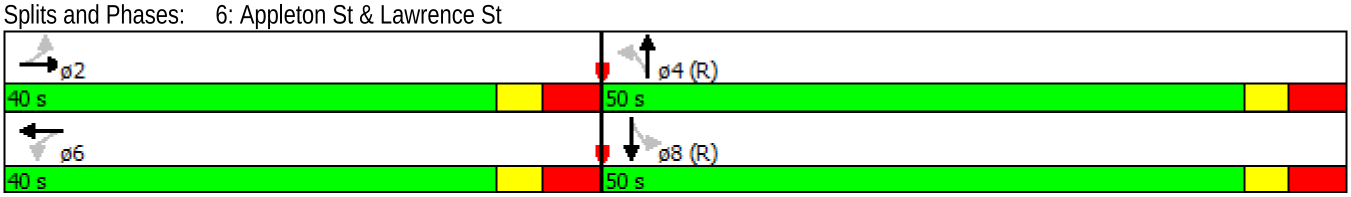


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	59	90	208	136	101	47	36	181	83	25	452	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	125		0	150		0	150		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.96			0.97	0.98		0.99	0.96		0.94	0.99	
Frt		0.895			0.952			0.953			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1667	0	1770	1735	0	1770	1710	0	1770	1821	0
Flt Permitted	0.655			0.460			0.306			0.548		
Satd. Flow (perm)	1171	1667	0	827	1735	0	565	1710	0	957	1821	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		148			30			36			10	
Link Speed (mph)		25			25			30			25	
Link Distance (ft)		1279			319			661			394	
Travel Time (s)		34.9			8.7			15.0			10.7	
Confl. Peds. (#/hr)	20			24		20	12		40	40		12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	98	226	148	110	51	39	197	90	27	491	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	324	0	148	161	0	39	287	0	27	555	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	23.0	23.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	40.0	40.0		40.0	40.0		50.0	50.0		50.0	50.0	
Total Split (%)	44.4%	44.4%		44.4%	44.4%		55.6%	55.6%		55.6%	55.6%	
Maximum Green (s)	33.0	33.0		33.0	33.0		43.0	43.0		43.0	43.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	5.0	5.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		15	15		6	6		16	16	
Act Effct Green (s)	34.0	34.0		34.0	34.0		44.0	44.0		44.0	44.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.49	0.49		0.49	0.49	
v/c Ratio	0.14	0.45		0.47	0.24		0.14	0.34		0.06	0.62	
Control Delay	19.6	13.2		27.5	16.6		14.4	13.5		6.1	9.1	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	2.2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	19.6	13.2		27.5	16.6		14.4	13.5		6.1	11.3	
LOS	B	B		C	B		B	B		A	B	
Approach Delay		14.3			21.8			13.6			11.0	
Approach LOS		B			C			B			B	
Queue Length 50th (ft)	24	68		63	49		12	82		5	123	
Queue Length 95th (ft)	52	141		123	94		31	138		m6	m132	
Internal Link Dist (ft)		1199			239			581			314	
Turn Bay Length (ft)	150			125			150			150		
Base Capacity (vph)	442	721		312	674		276	854		467	895	
Starvation Cap Reductn	0	0		0	0		0	0		0	206	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.14	0.45		0.47	0.24		0.14	0.34		0.06	0.81	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 87 (97%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 55	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.62	
Intersection Signal Delay: 14.4	Intersection LOS: B
Intersection Capacity Utilization 70.0%	ICU Level of Service C
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 6: Appleton St & Lawrence St



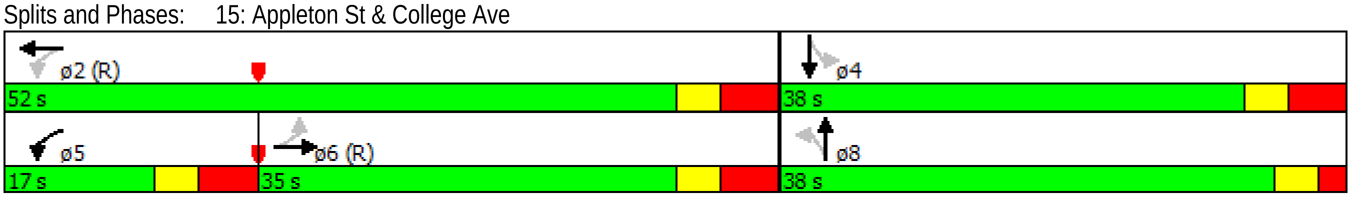
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	47	753	142	57	568	41	43	175	88	67	372	184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	150		0	150		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			1.00			0.97		0.96	0.98	
Frt		0.977			0.991			0.950			0.950	
Flt Protected		0.998			0.996		0.950			0.950		
Satd. Flow (prot)	0	3404	0	0	3476	0	1770	1716	0	1770	1729	0
Flt Permitted		0.868			0.646		0.157			0.475		
Satd. Flow (perm)	0	2957	0	0	2254	0	292	1716	0	846	1729	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			11			32			31	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		412			323			394			213	
Travel Time (s)		10.0			7.9			10.7			5.8	
Confl. Peds. (#/hr)	25		29	29		25	39		47	47		39
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	49	793	149	60	598	43	45	184	93	71	392	194
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	991	0	0	701	0	45	277	0	71	586	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		6		5	2			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	6	6		5	2		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	26.0	26.0		11.5	26.0		24.0	24.0		26.0	26.0	
Total Split (s)	35.0	35.0		17.0	52.0		38.0	38.0		38.0	38.0	
Total Split (%)	38.9%	38.9%		18.9%	57.8%		42.2%	42.2%		42.2%	42.2%	
Maximum Green (s)	28.0	28.0		10.0	45.0		33.0	33.0		31.0	31.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	4.0		4.0	4.0		2.0	2.0		4.0	4.0	
Lost Time Adjust (s)		-1.0			-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)		6.0			6.0		4.0	4.0		6.0	6.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?				Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		Max	C-Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0		5.0	5.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	15	15			25		20	20		20	20	
Act Effct Green (s)		29.0			46.0		34.0	34.0		32.0	32.0	
Actuated g/C Ratio		0.32			0.51		0.38	0.38		0.36	0.36	
v/c Ratio		1.02			0.54		0.41	0.41		0.24	0.92	
Control Delay		46.2			6.3		29.3	16.5		16.5	41.0	
Queue Delay		0.0			0.0		0.0	0.0		0.0	4.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		46.2			6.3		29.3	16.5		16.5	45.3	
LOS		D			A		C	B		B	D	
Approach Delay		46.2			6.3			18.3			42.2	
Approach LOS		D			A			B			D	
Queue Length 50th (ft)		~315			36		15	79		22	332	
Queue Length 95th (ft)		#433			47		36	125		m42	#524	
Internal Link Dist (ft)		332			243			314			133	
Turn Bay Length (ft)							150			150		
Base Capacity (vph)		969			1306		110	668		300	634	
Starvation Cap Reductn		0			28		0	0		0	24	
Spillback Cap Reductn		0			0		0	0		0	3	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		1.02			0.55		0.41	0.41		0.24	0.96	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 50 (56%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.02
Intersection Signal Delay: 31.4 Intersection LOS: C
Intersection Capacity Utilization 99.5% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: Appleton St & College Ave



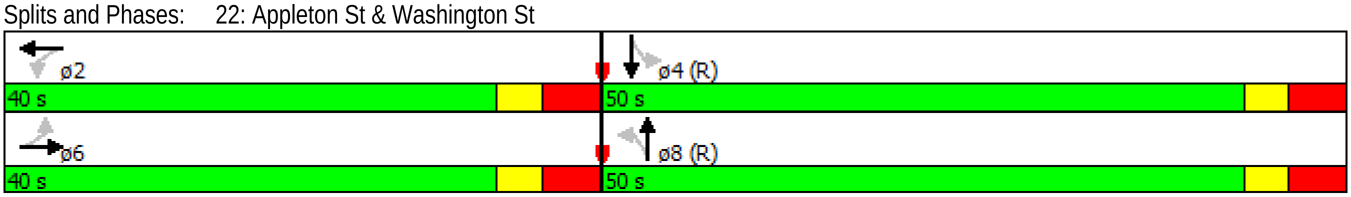
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	35	68	221	85	45	64	170	37	18	355	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	100		0	150		0	150		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.925			0.983			0.973			0.998	
Flt Protected		0.992			0.969		0.950			0.950		
Satd. Flow (prot)	0	1709	0	0	1774	0	1770	1812	0	1770	1859	0
Flt Permitted		0.907			0.750		0.450			0.610		
Satd. Flow (perm)	0	1563	0	0	1373	0	838	1812	0	1136	1859	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		74			9			17			1	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		398			340			206			389	
Travel Time (s)		10.9			9.3			5.6			10.6	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	38	74	240	92	49	70	185	40	20	386	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	134	0	0	381	0	70	225	0	20	390	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Minimum Split (s)	35.0	35.0		35.0	35.0		43.0	43.0		43.0	43.0	
Total Split (s)	40.0	40.0		40.0	40.0		50.0	50.0		50.0	50.0	
Total Split (%)	44.4%	44.4%		44.4%	44.4%		55.6%	55.6%		55.6%	55.6%	
Maximum Green (s)	33.0	33.0		33.0	33.0		43.0	43.0		43.0	43.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)		-1.0			-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	2	2		2	2		2	2		2	2	
Act Effct Green (s)		34.0			34.0		44.0	44.0		44.0	44.0	
Actuated g/C Ratio		0.38			0.38		0.49	0.49		0.49	0.49	
v/c Ratio		0.21			0.73		0.17	0.25		0.04	0.43	
Control Delay		10.1			33.1		14.3	13.3		9.0	11.3	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.4	
Total Delay		10.2			33.1		14.3	13.3		9.0	11.7	
LOS		B			C		B	B		A	B	
Approach Delay		10.2			33.1			13.5			11.6	
Approach LOS		B			C			B			B	
Queue Length 50th (ft)		22			178		21	65		4	75	
Queue Length 95th (ft)		60			#293		47	111		m11	103	
Internal Link Dist (ft)		318			260			126			309	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)							150			150		
Base Capacity (vph)		636			524		409	894		555	909	
Starvation Cap Reductn		0			0		0	0		0	168	
Spillback Cap Reductn		6			0		0	0		0	179	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.21			0.73		0.17	0.25		0.04	0.53	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 80 (89%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green
Natural Cycle: 80
Control Type: Pretimed
Maximum v/c Ratio: 0.73
Intersection Signal Delay: 18.6 Intersection LOS: B
Intersection Capacity Utilization 63.6% ICU Level of Service B
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 22: Appleton St & Washington St



Existing - PM Peak

Alternative 2: Two-Way Appleton St.

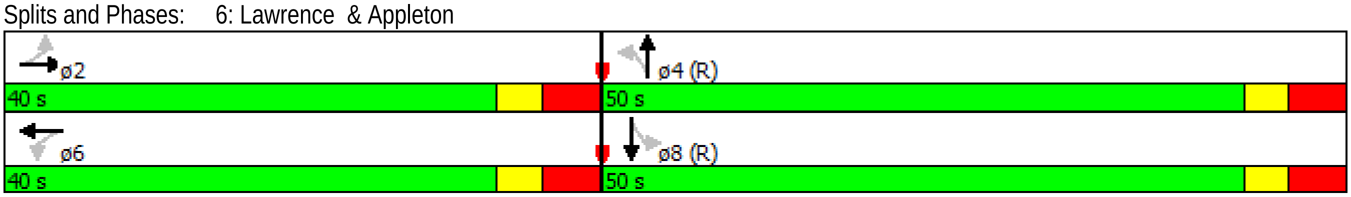
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	50	80	138	99	85	40	30	153	70	24	427	56
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	150		0	150		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.90	0.95		0.96	0.96		0.97	0.98		0.98	0.99	
Frt		0.905			0.952			0.953			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1594	0	1770	1698	0	1770	1748	0	1770	1806	0
Flt Permitted	0.671			0.566			0.331			0.593		
Satd. Flow (perm)	1131	1594	0	1007	1698	0	598	1748	0	1082	1806	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		111			30			36			10	
Link Speed (mph)		25			25			30			25	
Link Distance (ft)		1279			319			661			394	
Travel Time (s)		34.9			8.7			15.0			10.7	
Confl. Peds. (#/hr)	46		24	24		46	40		12	12		40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	87	150	108	92	43	33	166	76	26	464	61
Shared Lane Traffic (%)												
Lane Group Flow (vph)	54	237	0	108	135	0	33	242	0	26	525	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	23.0	23.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	40.0	40.0		40.0	40.0		50.0	50.0		50.0	50.0	
Total Split (%)	44.4%	44.4%		44.4%	44.4%		55.6%	55.6%		55.6%	55.6%	
Maximum Green (s)	33.0	33.0		33.0	33.0		43.0	43.0		43.0	43.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	5.0	5.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		15	15		6	6		16	16	
Act Effct Green (s)	34.0	34.0		34.0	34.0		44.0	44.0		44.0	44.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.49	0.49		0.49	0.49	
v/c Ratio	0.13	0.35		0.28	0.20		0.11	0.28		0.05	0.59	
Control Delay	19.4	12.0		22.1	15.5		13.8	12.5		5.7	8.6	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	1.1	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	19.4	12.0		22.1	15.5		13.8	12.5		5.7	9.7	
LOS	B	B		C	B		B	B		A	A	
Approach Delay		13.4			18.5			12.6			9.5	
Approach LOS		B			B			B			A	
Queue Length 50th (ft)	20	48		42	39		10	65		4	97	
Queue Length 95th (ft)	45	104		84	79		27	113		m5	m118	
Internal Link Dist (ft)		1199			239			581			314	
Turn Bay Length (ft)	150			150			150			150		
Base Capacity (vph)	427	671		380	660		292	872		528	888	
Starvation Cap Reductn	0	0		0	0		0	0		0	169	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.13	0.35		0.28	0.20		0.11	0.28		0.05	0.73	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 62 (69%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green
Natural Cycle: 50
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.59
Intersection Signal Delay: 12.6 Intersection LOS: B
Intersection Capacity Utilization 60.9% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Lawrence & Appleton



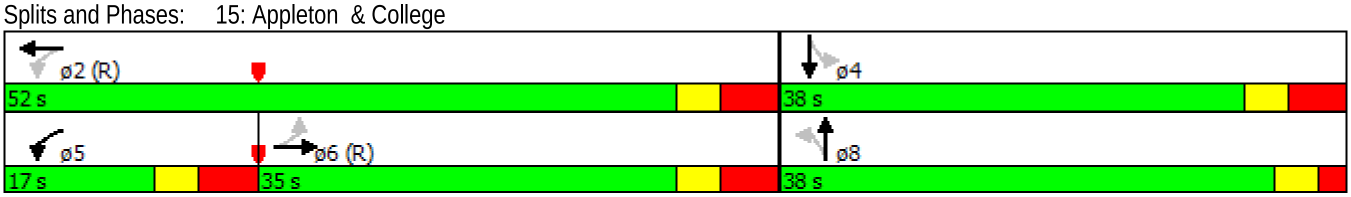
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	40	661	77	54	536	35	37	150	75	63	351	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	100		0	150		0	150		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.99			0.99			0.97		0.95	0.98	
Frt		0.985			0.992			0.950			0.952	
Flt Protected		0.997			0.996		0.950			0.950		
Satd. Flow (prot)	0	3444	0	0	3466	0	1770	1717	0	1770	1734	0
Flt Permitted		0.876			0.717		0.203			0.525		
Satd. Flow (perm)	0	3018	0	0	2495	0	378	1717	0	930	1734	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		14			10			32			29	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		412			323			394			213	
Travel Time (s)		10.0			7.9			10.7			5.8	
Confl. Peds. (#/hr)	55		29	29		55	39		47	47		39
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	42	696	81	57	564	37	39	158	79	66	369	174
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	819	0	0	658	0	39	237	0	66	543	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		6		5	2			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	6	6		5	2		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	26.0	26.0		11.5	25.0		24.0	24.0		26.0	26.0	
Total Split (s)	35.0	35.0		17.0	52.0		38.0	38.0		38.0	38.0	
Total Split (%)	38.9%	38.9%		18.9%	57.8%		42.2%	42.2%		42.2%	42.2%	
Maximum Green (s)	28.0	28.0		10.0	45.0		33.0	33.0		31.0	31.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	4.0		4.0	4.0		2.0	2.0		4.0	4.0	
Lost Time Adjust (s)		-1.0			-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)		6.0			6.0		4.0	4.0		6.0	6.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?				Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		Max	C-Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0		5.0	5.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	15	15			25		20	20		20	20	
Act Effct Green (s)		29.0			46.0		34.0	34.0		32.0	32.0	
Actuated g/C Ratio		0.32			0.51		0.38	0.38		0.36	0.36	
v/c Ratio		0.83			0.47		0.27	0.35		0.20	0.86	
Control Delay		21.5			13.5		22.1	15.7		15.2	30.9	
Queue Delay		0.0			0.3		0.0	0.0		0.0	2.0	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		21.5			13.9		22.1	15.7		15.2	32.9	
LOS		C			B		C	B		B	C	
Approach Delay		21.5			13.9			16.6			31.0	
Approach LOS		C			B			B			C	
Queue Length 50th (ft)		104			83		13	66		21	171	
Queue Length 95th (ft)		#205			141		33	108		m40	#449	
Internal Link Dist (ft)		332			243			314			133	
Turn Bay Length (ft)							150			150		
Base Capacity (vph)		981			1398		142	668		330	635	
Starvation Cap Reductn		0			280		0	0		0	29	
Spillback Cap Reductn		0			0		0	0		0	0	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.83			0.59		0.27	0.35		0.20	0.90	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 26 (29%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 21.2 Intersection LOS: C
Intersection Capacity Utilization 91.1% ICU Level of Service F
Analysis Period (min) 15
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: Appleton & College

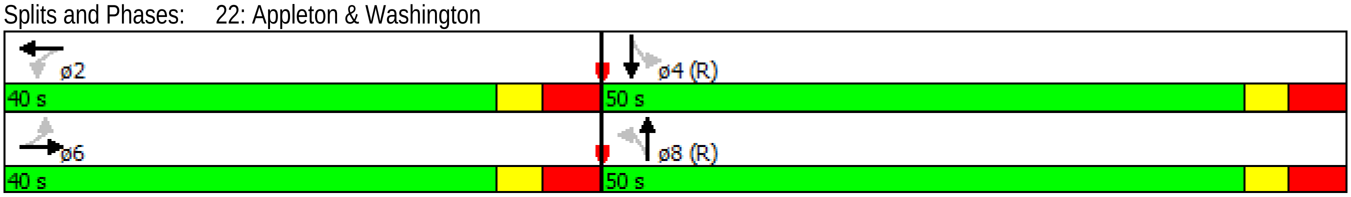


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	33	59	209	55	39	55	147	32	16	335	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	100		0	150		0	150		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.96			0.96		0.95	0.98		0.93	1.00	
Frt		0.927			0.983			0.973			0.998	
Flt Protected		0.992			0.967		0.950			0.950		
Satd. Flow (prot)	0	1647	0	0	1755	0	1770	1777	0	1770	1857	0
Flt Permitted		0.925			0.744		0.470			0.635		
Satd. Flow (perm)	0	1530	0	0	1310	0	831	1777	0	1102	1857	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		64			9			17			1	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		398			340			206			389	
Travel Time (s)		10.9			9.3			5.6			10.6	
Confl. Peds. (#/hr)	20		21	21		20	40		36	36		40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	18	36	64	227	60	42	60	160	35	17	364	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	118	0	0	329	0	60	195	0	17	368	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Minimum Split (s)	35.0	35.0		35.0	35.0		43.0	43.0		43.0	43.0	
Total Split (s)	40.0	40.0		40.0	40.0		50.0	50.0		50.0	50.0	
Total Split (%)	44.4%	44.4%		44.4%	44.4%		55.6%	55.6%		55.6%	55.6%	
Maximum Green (s)	33.0	33.0		33.0	33.0		43.0	43.0		43.0	43.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)		-1.0			-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		34.0			34.0		44.0	44.0		44.0	44.0	
Actuated g/C Ratio		0.38			0.38		0.49	0.49		0.49	0.49	
v/c Ratio		0.19			0.66		0.15	0.22		0.03	0.41	
Control Delay		10.3			30.1		14.0	12.8		9.6	11.7	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.4	
Total Delay		10.3			30.1		14.0	12.8		9.6	12.1	
LOS		B			C		B	B		A	B	
Approach Delay		10.3			30.1			13.1			12.0	
Approach LOS		B			C			B			B	
Queue Length 50th (ft)		19			148		18	55		4	79	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		55			246		42	96		11	114	
Internal Link Dist (ft)		318			260			126			309	
Turn Bay Length (ft)							150			150		
Base Capacity (vph)		617			500		406	877		538	908	
Starvation Cap Reductn		0			0		0	0		0	202	
Spillback Cap Reductn		1			0		0	0		0	55	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.19			0.66		0.15	0.22		0.03	0.52	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 60 (67%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green	
Natural Cycle: 80	
Control Type: Pretimed	
Maximum v/c Ratio: 0.66	
Intersection Signal Delay: 17.6	Intersection LOS: B
Intersection Capacity Utilization 60.0%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 22: Appleton & Washington



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	33	149	59	25	200	3	64	115	16	10	242	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	100		0	150		0	150		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.958			0.998			0.982			0.991	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1767	0	1703	1789	0	1770	1829	0	1752	1828	0
Flt Permitted	0.548			0.544			0.529			0.667		
Satd. Flow (perm)	1011	1767	0	975	1789	0	985	1829	0	1230	1828	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		27			1			11			5	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		391			338			389			313	
Travel Time (s)		9.5			8.2			10.6			8.5	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	2%	2%	2%	3%	3%	3%
Adj. Flow (vph)	35	160	63	27	215	3	69	124	17	11	260	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	35	223	0	27	218	0	69	141	0	11	277	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0		23.0	23.0	
Total Split (s)	40.0	40.0		40.0	40.0		50.0	50.0		50.0	50.0	
Total Split (%)	44.4%	44.4%		44.4%	44.4%		55.6%	55.6%		55.6%	55.6%	
Maximum Green (s)	35.0	35.0		35.0	35.0		45.0	45.0		45.0	45.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-1.0	-2.0		-2.0	-2.0		-2.0	-1.0		-2.0	-2.0	
Total Lost Time (s)	4.0	3.0		3.0	3.0		3.0	4.0		3.0	3.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	36.0	37.0		37.0	37.0		47.0	46.0		47.0	47.0	
Actuated g/C Ratio	0.40	0.41		0.41	0.41		0.52	0.51		0.52	0.52	
v/c Ratio	0.09	0.30		0.07	0.30		0.13	0.15		0.02	0.29	
Control Delay	10.6	8.7		8.3	8.9		8.3	7.6		10.6	12.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.6	8.7		8.3	8.9		8.3	7.6		10.6	12.9	
LOS	B	A		A	A		A	A		B	B	
Approach Delay		9.0			8.9			7.9			12.8	
Approach LOS		A			A			A			B	
Queue Length 50th (ft)	5	13		4	26		14	26		3	82	
Queue Length 95th (ft)	14	42		9	41		m25	m42		11	132	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Internal Link Dist (ft)		311			258			309			233	
Turn Bay Length (ft)	150			100			150			150		
Base Capacity (vph)	404	742		400	736		514	940		642	957	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.09	0.30		0.07	0.30		0.13	0.15		0.02	0.29	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 57 (63%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green

Natural Cycle: 50

Control Type: Pretimed

Maximum v/c Ratio: 0.30

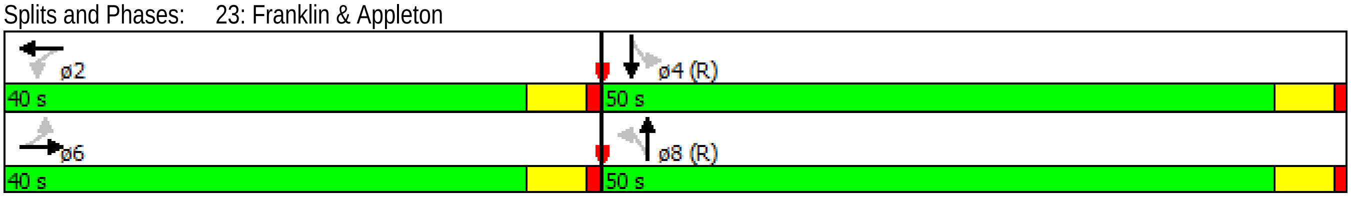
Intersection Signal Delay: 9.8 Intersection LOS: A

Intersection Capacity Utilization 45.4% ICU Level of Service A

Analysis Period (min) 15

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

Splits and Phases: 23: Franklin & Appleton

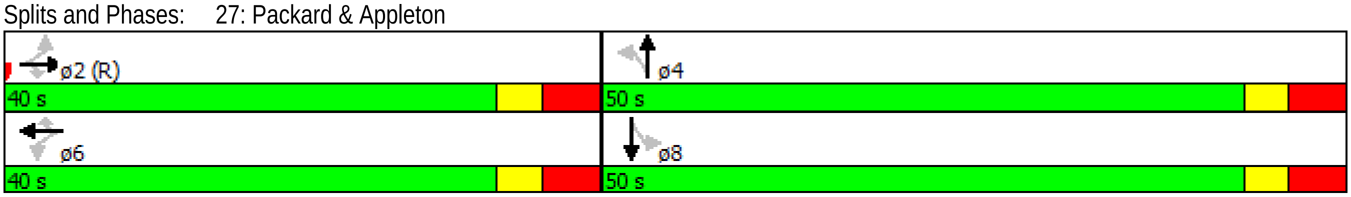


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	88	34	3	98	0	56	132	15	8	211	32
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	0		0	0		0	100		0	200		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850					0.985			0.980	
Flt Protected		0.987			0.999		0.950			0.950		
Satd. Flow (prot)	0	1693	1458	0	1714	1716	1630	1690	0	1630	1681	0
Flt Permitted		0.913			0.995		0.548			0.651		
Satd. Flow (perm)	0	1566	1458	0	1707	1716	940	1690	0	1117	1681	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			48					9			12	
Link Speed (mph)		28			28			28			28	
Link Distance (ft)		2206			281			292			577	
Travel Time (s)		53.7			6.8			7.1			14.1	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	34	100	39	3	111	0	64	150	17	9	240	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	134	39	0	114	0	64	167	0	9	276	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2		2	6		6	4			8		
Minimum Split (s)	23.0	23.0	23.0	25.0	25.0	25.0	25.0	25.0		25.0	25.0	
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	50.0	50.0		50.0	50.0	
Total Split (%)	44.4%	44.4%	44.4%	44.4%	44.4%	44.4%	55.6%	55.6%		55.6%	55.6%	
Maximum Green (s)	33.0	33.0	33.0	33.0	33.0	33.0	43.0	43.0		43.0	43.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lost Time Adjust (s)		-2.0	-2.0		-2.0	-1.0	-1.0	-1.0		-2.0	-2.0	
Total Lost Time (s)		5.0	5.0		5.0	6.0	6.0	6.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	5.0	5.0	5.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0	0	0	0	0	0	0		0	0	
Act Effct Green (s)		35.0	35.0		35.0		44.0	44.0		45.0	45.0	
Actuated g/C Ratio		0.39	0.39		0.39		0.49	0.49		0.50	0.50	
v/c Ratio		0.22	0.07		0.17		0.14	0.20		0.02	0.33	
Control Delay		19.6	4.7		18.9		13.7	13.1		11.5	14.1	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		19.6	4.7		18.9		13.7	13.1		11.5	14.1	
LOS		B	A		B		B	B		B	B	
Approach Delay		16.3			18.9			13.3			14.1	
Approach LOS		B			B			B			B	
Queue Length 50th (ft)		50	0		42		19	48		2	85	
Queue Length 95th (ft)		89	15		76		42	84		10	135	
Internal Link Dist (ft)		2126			201			212			497	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)							100			200		
Base Capacity (vph)		609	596		663		459	830		558	846	
Starvation Cap Reductn		0	0		0		0	0		0	0	
Spillback Cap Reductn		0	0		0		0	0		0	0	
Storage Cap Reductn		0	0		0		0	0		0	0	
Reduced v/c Ratio		0.22	0.07		0.17		0.14	0.20		0.02	0.33	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 56 (62%), Referenced to phase 2:EBTL, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.33	
Intersection Signal Delay: 15.0	Intersection LOS: B
Intersection Capacity Utilization 44.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 27: Packard & Appleton



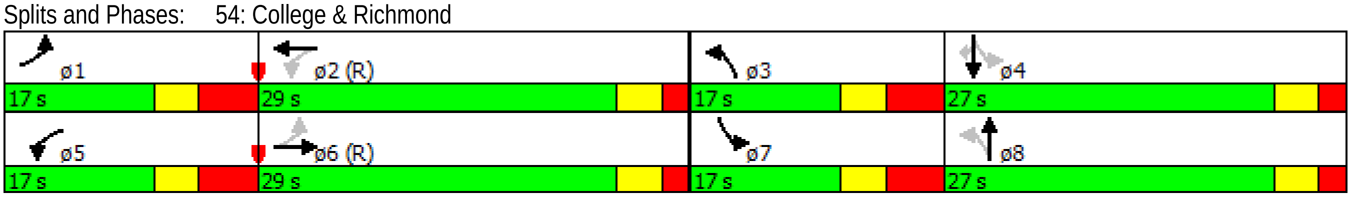
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	206	616	51	116	541	141	97	704	110	173	568	114
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	200		0	125		0	150		0	100		275
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.989			0.969			0.980				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3500	0	1630	3429	0	1630	3195	0	1630	3260	1458
Flt Permitted	0.171			0.248			0.332			0.146		
Satd. Flow (perm)	293	3500	0	425	3429	0	570	3195	0	250	3260	1458
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			36			19				194
Link Speed (mph)		28			28			34			34	
Link Distance (ft)		2324			513			416			817	
Travel Time (s)		56.6			12.5			8.3			16.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	206	616	51	116	541	141	97	704	110	173	568	114
Shared Lane Traffic (%)												
Lane Group Flow (vph)	206	667	0	116	682	0	97	814	0	173	568	114
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8			4		4
Detector Phase	1	6		5	2		3	8		7	4	4
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	11.0	24.0		11.0	24.0		11.0	24.0		11.0	24.0	24.0
Total Split (s)	17.0	29.0		17.0	29.0		17.0	27.0		17.0	27.0	27.0
Total Split (%)	18.9%	32.2%		18.9%	32.2%		18.9%	30.0%		18.9%	30.0%	30.0%
Maximum Green (s)	10.0	24.0		10.0	24.0		10.0	22.0		10.0	22.0	22.0
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
All-Red Time (s)	4.0	2.0		4.0	2.0		4.0	2.0		4.0	2.0	2.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	6.0	4.0		6.0	4.0		6.0	4.0		6.0	4.0	4.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	Max
Walk Time (s)	0.0	0.0		0.0	7.0		0.0	7.0		0.0	7.0	7.0
Flash Dont Walk (s)	0.0	11.0		0.0	11.0		0.0	11.0		0.0	11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	0
Act Effct Green (s)	35.9	29.1		32.8	25.3		30.7	23.6		34.1	27.4	27.4
Actuated g/C Ratio	0.40	0.32		0.36	0.28		0.34	0.26		0.38	0.30	0.30
v/c Ratio	0.75	0.59		0.41	0.69		0.32	0.96		0.68	0.57	0.20
Control Delay	37.0	28.9		28.7	35.1		19.4	55.5		34.6	30.6	1.1
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	37.0	28.9		28.7	35.1		19.4	55.5		34.6	30.6	1.1
LOS	D	C		C	D		B	E		C	C	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		30.8			34.2			51.7			27.4	
Approach LOS		C			C			D			C	
Queue Length 50th (ft)	72	171		41	183		33	237		62	148	0
Queue Length 95th (ft)	#173	236		73	244		64	#365		#144	211	4
Internal Link Dist (ft)		2244			433			336			737	
Turn Bay Length (ft)	200			125			150			100		275
Base Capacity (vph)	280	1139		309	990		336	851		263	991	578
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.74	0.59		0.38	0.69		0.29	0.96		0.66	0.57	0.20

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 24 (27%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.96
Intersection Signal Delay: 36.3 Intersection LOS: D
Intersection Capacity Utilization 83.9% ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 54: College & Richmond



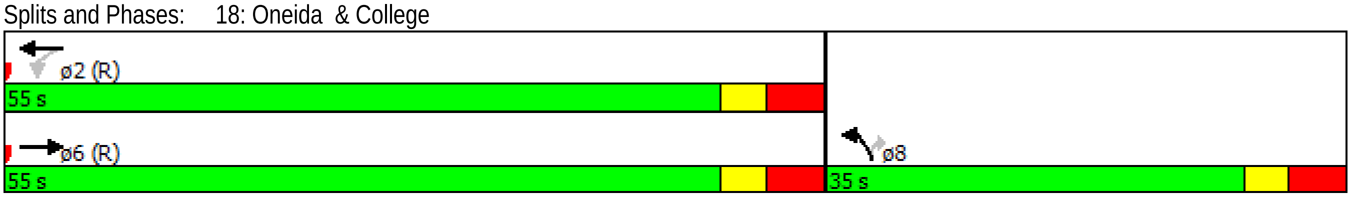
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	706	37	41	535	101	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		100	0
Storage Lanes		0	0		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt	0.993					0.850
Flt Protected				0.996	0.950	
Satd. Flow (prot)	3514	0	0	3525	1770	1583
Flt Permitted				0.844	0.950	
Satd. Flow (perm)	3514	0	0	2987	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	9					76
Link Speed (mph)	28			28	25	
Link Distance (ft)	323			412	396	
Travel Time (s)	7.9			10.0	10.8	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	751	39	44	569	107	76
Shared Lane Traffic (%)						
Lane Group Flow (vph)	790	0	0	613	107	76
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	6			2	8	
Permitted Phases			2			8
Minimum Split (s)	25.0		25.0	25.0	25.0	25.0
Total Split (s)	55.0		55.0	55.0	35.0	35.0
Total Split (%)	61.1%		61.1%	61.1%	38.9%	38.9%
Maximum Green (s)	48.0		48.0	48.0	28.0	28.0
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0
All-Red Time (s)	4.0		4.0	4.0	4.0	4.0
Lost Time Adjust (s)	-1.0			-1.0	-1.0	-1.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	49.0			49.0	29.0	29.0
Actuated g/C Ratio	0.54			0.54	0.32	0.32
v/c Ratio	0.41			0.38	0.19	0.14
Control Delay	3.0			18.0	21.6	5.4
Queue Delay	0.5			0.0	0.0	0.0
Total Delay	3.6			18.0	21.6	5.4
LOS	A			B	C	A
Approach Delay	3.6			18.0	14.9	
Approach LOS	A			B	B	
Queue Length 50th (ft)	21			142	38	0
Queue Length 95th (ft)	m31			134	73	24
Internal Link Dist (ft)	243			332	316	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Bay Length (ft)					100	
Base Capacity (vph)	1917			1626	570	561
Starvation Cap Reductn	649			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.62			0.38	0.19	0.14

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 26 (29%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
Natural Cycle: 50
Control Type: Pretimed
Maximum v/c Ratio: 0.41
Intersection Signal Delay: 10.4 Intersection LOS: B
Intersection Capacity Utilization 57.3% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 18: Oneida & College

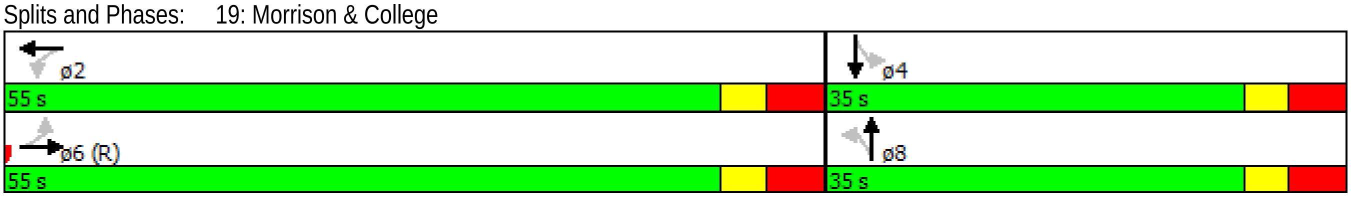


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	712	20	20	507	41	20	50	50	20	50	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.989			0.944			0.970	
Flt Protected		0.998			0.998			0.992			0.989	
Satd. Flow (prot)	0	3518	0	0	3493	0	0	1744	0	0	1787	0
Flt Permitted		0.924			0.911			0.947			0.925	
Satd. Flow (perm)	0	3257	0	0	3189	0	0	1665	0	0	1671	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			14			42			17	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		412			438			397			412	
Travel Time (s)		10.0			10.7			10.8			11.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	24	734	21	21	523	42	21	52	52	21	52	21
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	779	0	0	586	0	0	125	0	0	94	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	6	6		2	2		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	25.0	25.0		25.0	25.0		25.0	25.0		23.0	23.0	
Total Split (s)	55.0	55.0		55.0	55.0		35.0	35.0		35.0	35.0	
Total Split (%)	61.1%	61.1%		61.1%	61.1%		38.9%	38.9%		38.9%	38.9%	
Maximum Green (s)	48.0	48.0		48.0	48.0		28.0	28.0		28.0	28.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		Max	Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		5.0	5.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		49.0			49.0			29.0			29.0	
Actuated g/C Ratio		0.54			0.54			0.32			0.32	
v/c Ratio		0.44			0.34			0.22			0.17	
Control Delay		3.0			8.8			16.1			16.7	
Queue Delay		0.2			0.0			0.0			0.0	
Total Delay		3.2			8.8			16.1			16.7	
LOS		A			A			B			B	
Approach Delay		3.2			8.8			16.1			16.7	
Approach LOS		A			A			B			B	
Queue Length 50th (ft)		30			28			33			25	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		46			92			75			54	
Internal Link Dist (ft)		332			358			317			332	
Turn Bay Length (ft)												
Base Capacity (vph)		1775			1742			564			549	
Starvation Cap Reductn		342			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.54			0.34			0.22			0.17	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 43 (48%), Referenced to phase 1: and 6:EBTL, Start of Green	
Natural Cycle: 50	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.44	
Intersection Signal Delay: 7.1	Intersection LOS: A
Intersection Capacity Utilization 55.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 19: Morrison & College



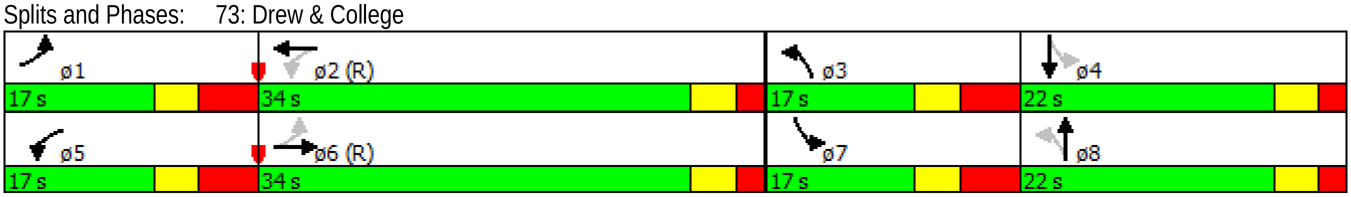
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	49	690	24	47	544	91	24	75	47	172	55	59
Ideal Flow (vphpl)	1750	1750	1900	1750	1750	1750	1900	1750	1750	1750	1750	1750
Storage Length (ft)	50		0	50		0	50		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.978			0.942			0.923	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3244	0	1630	3188	0	1770	1616	0	1630	1584	0
Flt Permitted	0.249			0.203			0.677			0.500		
Satd. Flow (perm)	427	3244	0	348	3188	0	1261	1616	0	858	1584	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			23			32			54	
Link Speed (mph)		28			28			28			28	
Link Distance (ft)		453			1029			566			812	
Travel Time (s)		11.0			25.1			15.4			19.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	53	750	26	51	591	99	26	82	51	187	60	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	776	0	51	690	0	26	133	0	187	124	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8			4		
Detector Phase	1	6		5	2		3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	11.0	23.0		11.0	23.0		11.0	23.0		11.0	23.0	
Total Split (s)	17.0	34.0		17.0	34.0		17.0	22.0		17.0	22.0	
Total Split (%)	18.9%	37.8%		18.9%	37.8%		18.9%	24.4%		18.9%	24.4%	
Maximum Green (s)	10.0	29.0		10.0	29.0		10.0	17.0		10.0	17.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	2.0		4.0	2.0		4.0	2.0		4.0	2.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-1.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	5.0	3.0		5.0	3.0		6.0	3.0		5.0	3.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		13			7			5			5	
Act Effct Green (s)	43.0	39.2		43.0	39.2		23.8	19.4		33.1	30.3	
Actuated g/C Ratio	0.48	0.44		0.48	0.44		0.26	0.22		0.37	0.34	
v/c Ratio	0.16	0.55		0.17	0.49		0.07	0.36		0.45	0.22	
Control Delay	10.4	11.2		7.1	9.7		19.4	26.0		23.7	16.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.4	11.2		7.1	9.7		19.4	26.0		23.7	16.0	
LOS	B	B		A	A		B	C		C	B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		11.1			9.5			24.9			20.6	
Approach LOS		B			A			C			C	
Queue Length 50th (ft)	8	53		6	46		9	49		73	24	
Queue Length 95th (ft)	22	86		m13	149		26	102		126	79	
Internal Link Dist (ft)		373			949			486			732	
Turn Bay Length (ft)	50			50			50			125		
Base Capacity (vph)	370	1414		342	1400		445	372		418	569	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.14	0.55		0.15	0.49		0.06	0.36		0.45	0.22	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 57 (63%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.55
Intersection Signal Delay: 13.1 Intersection LOS: B
Intersection Capacity Utilization 56.8% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 73: Drew & College



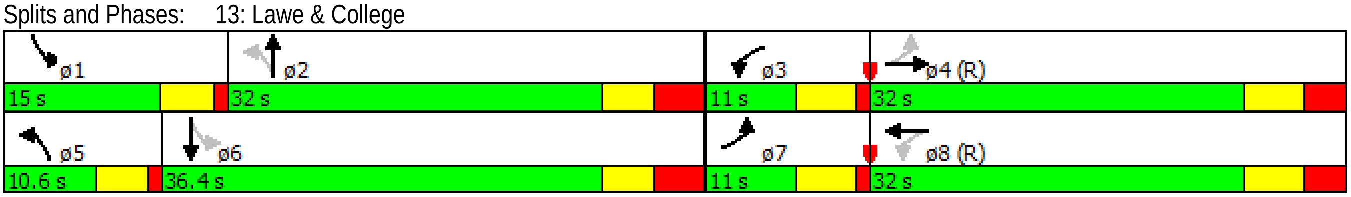
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	85	389	40	9	480	100	36	191	40	198	196	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	100		0	75		0	300		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.986			0.974			0.974			0.961	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3490	0	1770	3447	0	1770	1814	0	1770	1790	0
Flt Permitted	0.236			0.484			0.583			0.439		
Satd. Flow (perm)	440	3490	0	902	3447	0	1086	1814	0	818	1790	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			27			12			22	
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		1029			572			499			479	
Travel Time (s)		23.4			13.0			11.3			10.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	423	43	10	522	109	39	208	43	215	213	76
Shared Lane Traffic (%)												
Lane Group Flow (vph)	92	466	0	10	631	0	39	251	0	215	289	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	15.0		6.0	10.0		6.0	10.0		6.0	10.0	
Minimum Split (s)	11.0	26.0		11.0	26.0		10.5	32.0		10.5	32.0	
Total Split (s)	11.0	32.0		11.0	32.0		10.6	32.0		15.0	36.4	
Total Split (%)	12.2%	35.6%		12.2%	35.6%		11.8%	35.6%		16.7%	40.4%	
Maximum Green (s)	6.0	25.0		6.0	25.0		6.1	25.0		10.5	29.4	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.5		1.0	3.5	
Lost Time Adjust (s)	0.0	-1.0		0.0	-1.0		0.0	-1.0		0.0	-1.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0		4.5	6.0		4.5	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Ped		None	Ped	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		12.0			12.0			18.0			18.0	
Pedestrian Calls (#/hr)		10			10			10			10	
Act Effct Green (s)	37.5	35.3		34.4	28.6		33.6	26.0		42.0	34.2	
Actuated g/C Ratio	0.42	0.39		0.38	0.32		0.37	0.29		0.47	0.38	
v/c Ratio	0.34	0.34		0.02	0.57		0.09	0.47		0.44	0.42	
Control Delay	16.9	19.1		9.1	13.6		13.9	28.5		17.6	22.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	16.9	19.1		9.1	13.6		13.9	28.5		17.6	22.3	
LOS	B	B		A	B		B	C		B	C	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		18.7			13.5			26.6			20.3	
Approach LOS		B			B			C			C	
Queue Length 50th (ft)	41	115		2	55		12	111		71	118	
Queue Length 95th (ft)	m75	165		m4	70		29	183		118	192	
Internal Link Dist (ft)		949			492			419			399	
Turn Bay Length (ft)	200			100			75			300		
Base Capacity (vph)	272	1374		402	1115		451	532		492	693	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.34	0.34		0.02	0.57		0.09	0.47		0.44	0.42	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 28 (31%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.57
Intersection Signal Delay: 18.6 Intersection LOS: B
Intersection Capacity Utilization 62.8% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 13: Lawe & College

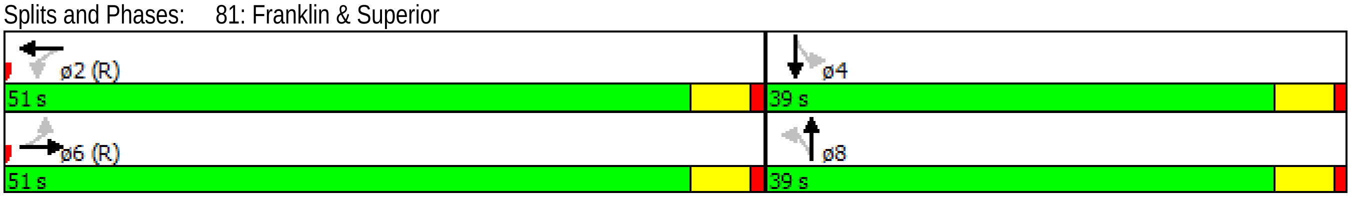


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	252	20	0	277	6	26	47	18	6	22	4
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	150		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989			0.997			0.974			0.982	
Flt Protected	0.950							0.986			0.991	
Satd. Flow (prot)	1630	1697	0	1716	1711	0	0	1648	0	0	1670	0
Flt Permitted	0.484							0.930			0.966	
Satd. Flow (perm)	830	1697	0	1716	1711	0	0	1554	0	0	1628	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			2			16			5	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		490			391			388			445	
Travel Time (s)		12.8			10.5			10.6			12.1	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	11	296	24	0	326	7	31	55	21	7	26	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	320	0	0	333	0	0	107	0	0	38	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0		23.0	23.0	
Total Split (s)	51.0	51.0		51.0	51.0		39.0	39.0		39.0	39.0	
Total Split (%)	56.7%	56.7%		56.7%	56.7%		43.3%	43.3%		43.3%	43.3%	
Maximum Green (s)	46.0	46.0		46.0	46.0		34.0	34.0		34.0	34.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0			-2.0			-2.0	
Total Lost Time (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	48.0	48.0			48.0			36.0			36.0	
Actuated g/C Ratio	0.53	0.53			0.53			0.40			0.40	
v/c Ratio	0.02	0.35			0.36			0.17			0.06	
Control Delay	10.2	13.2			9.0			15.6			15.3	
Queue Delay	0.0	0.0			0.2			0.0			0.0	
Total Delay	10.2	13.2			9.2			15.6			15.3	
LOS	B	B			A			B			B	
Approach Delay		13.1			9.2			15.6			15.3	
Approach LOS		B			A			B			B	
Queue Length 50th (ft)	3	96			62			32			11	
Queue Length 95th (ft)	10	142			85			62			29	
Internal Link Dist (ft)		410			311			308			365	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	150											
Base Capacity (vph)	442	908			913			631			654	
Starvation Cap Reductn	0	0			165			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.02	0.35			0.45			0.17			0.06	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 12 (13%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.36	
Intersection Signal Delay: 11.9	Intersection LOS: B
Intersection Capacity Utilization 31.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 81: Franklin & Superior



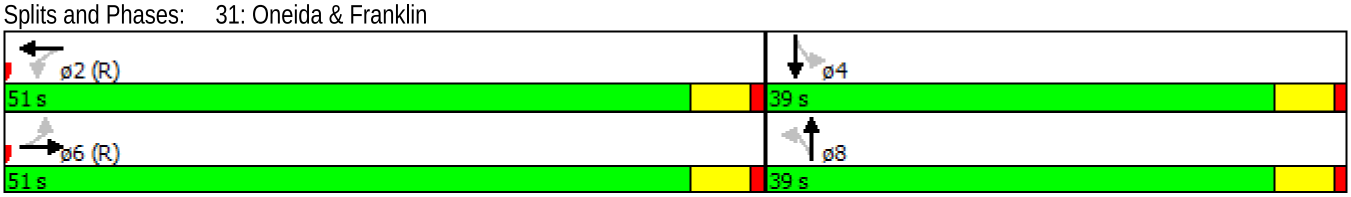
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	183	5	30	236	16	6	18	13	6	15	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	125		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.990			0.952			0.946	
Flt Protected	0.950			0.950				0.992			0.991	
Satd. Flow (prot)	1770	1855	0	1770	1844	0	0	1759	0	0	1746	0
Flt Permitted	0.527			0.591				0.975			0.973	
Satd. Flow (perm)	982	1855	0	1101	1844	0	0	1729	0	0	1715	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		2			6			15			16	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		338			417			394			310	
Travel Time (s)		8.2			10.2			10.7			8.5	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	6	206	6	34	265	18	7	20	15	7	17	16
Shared Lane Traffic (%)												
Lane Group Flow (vph)	6	212	0	34	283	0	0	42	0	0	40	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0		23.0	23.0	
Total Split (s)	51.0	51.0		51.0	51.0		39.0	39.0		39.0	39.0	
Total Split (%)	56.7%	56.7%		56.7%	56.7%		43.3%	43.3%		43.3%	43.3%	
Maximum Green (s)	46.0	46.0		46.0	46.0		34.0	34.0		34.0	34.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0			-2.0			-2.0	
Total Lost Time (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	48.0	48.0		48.0	48.0			36.0			36.0	
Actuated g/C Ratio	0.53	0.53		0.53	0.53			0.40			0.40	
v/c Ratio	0.01	0.21		0.06	0.29			0.06			0.06	
Control Delay	6.0	6.4		9.0	10.1			12.4			11.8	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	6.0	6.4		9.0	10.1			12.4			11.8	
LOS	A	A		A	B			B			B	
Approach Delay		6.4			10.0			12.4			11.8	
Approach LOS		A			A			B			B	
Queue Length 50th (ft)	1	30		7	59			9			8	
Queue Length 95th (ft)	m3	43		18	91			29			27	
Internal Link Dist (ft)		258			337			314			230	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	100			125								
Base Capacity (vph)	523	990		587	986			700			695	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.01	0.21		0.06	0.29			0.06			0.06	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 11 (12%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 50
Control Type: Pretimed
Maximum v/c Ratio: 0.29
Intersection Signal Delay: 9.0 Intersection LOS: A
Intersection Capacity Utilization 30.1% ICU Level of Service A
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 31: Oneida & Franklin



Intersection						
Int Delay, s/veh	4.4					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	98	77	100	20	7	95
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	107	84	109	22	8	103

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	130	0	-	0	417	120
Stage 1	-	-	-	-	120	-
Stage 2	-	-	-	-	297	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1455	-	-	-	592	931
Stage 1	-	-	-	-	905	-
Stage 2	-	-	-	-	754	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1455	-	-	-	546	931
Mov Cap-2 Maneuver	-	-	-	-	546	-
Stage 1	-	-	-	-	905	-
Stage 2	-	-	-	-	696	-

Approach	EB	WB	SB
HCM Control Delay, s	4.3	0	9.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1455	-	-	-	888
HCM Lane V/C Ratio	0.073	-	-	-	0.125
HCM Control Delay (s)	7.7	0	-	-	9.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.2	-	-	-	0.4

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	70	20	10	0	9	40	64	0	10	31	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	76	22	11	0	10	43	70	0	11	34	11
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.2	7.7	7.8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	20%	70%	8%	11%
Vol Thru, %	61%	20%	35%	11%
Vol Right, %	20%	10%	57%	78%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	51	100	113	90
LT Vol	31	20	40	10
Through Vol	10	10	64	70
RT Vol	10	70	9	10
Lane Flow Rate	55	109	123	98
Geometry Grp	1	1	1	1
Degree of Util (X)	0.069	0.132	0.139	0.11
Departure Headway (Hd)	4.47	4.488	4.066	4.063
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	804	803	886	885
Service Time	2.48	2.488	2.076	2.073
HCM Lane V/C Ratio	0.068	0.136	0.139	0.111
HCM Control Delay	7.8	8.2	7.7	7.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.5	0.5	0.4

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	10	10	70
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	11	11	76
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	7.6
HCM LOS	A

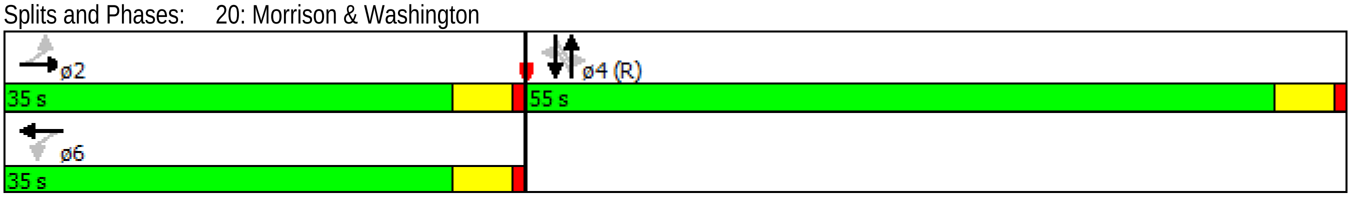
Lane

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	163	20	20	75	11	37	68	10	20	40	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.986			0.986			0.988			0.967	
Flt Protected		0.998			0.991			0.984			0.988	
Satd. Flow (prot)	0	1833	0	0	1820	0	0	1811	0	0	1780	0
Flt Permitted		0.992			0.932			0.905			0.933	
Satd. Flow (perm)	0	1822	0	0	1712	0	0	1666	0	0	1681	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			7			9			22	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		407			414			412			393	
Travel Time (s)		11.1			11.3			11.2			10.7	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	8	183	22	22	84	12	42	76	11	22	45	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	213	0	0	118	0	0	129	0	0	89	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			4	
Permitted Phases	2			6			4			4		
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0		23.0	23.0	
Total Split (s)	35.0	35.0		35.0	35.0		55.0	55.0		55.0	55.0	
Total Split (%)	38.9%	38.9%		38.9%	38.9%		61.1%	61.1%		61.1%	61.1%	
Maximum Green (s)	30.0	30.0		30.0	30.0		50.0	50.0		50.0	50.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0			-1.0	
Total Lost Time (s)		3.0			3.0			3.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		32.0			32.0			52.0			51.0	
Actuated g/C Ratio		0.36			0.36			0.58			0.57	
v/c Ratio		0.33			0.19			0.13			0.09	
Control Delay		22.2			19.9			10.1			7.3	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		22.2			19.9			10.1			7.3	
LOS		C			B			B			A	
Approach Delay		22.2			19.9			10.1			7.3	
Approach LOS		C			B			B			A	
Queue Length 50th (ft)		84			43			33			17	
Queue Length 95th (ft)		140			81			61			35	
Internal Link Dist (ft)		327			334			332			313	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)												
Base Capacity (vph)		652			613			966			962	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.33			0.19			0.13			0.09	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 44 (49%), Referenced to phase 4:NBSB, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.33	
Intersection Signal Delay: 16.4	Intersection LOS: B
Intersection Capacity Utilization 29.5%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 20: Morrison & Washington



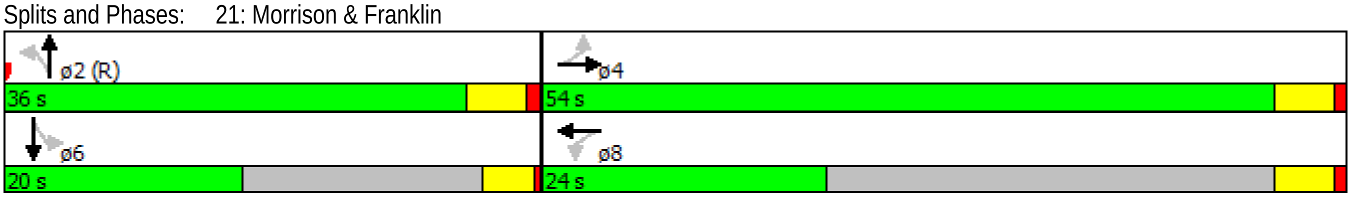
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	9	200	20	20	133	11	19	49	20	20	30	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	300		0	0		0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.986			0.991			0.969			0.961	
Flt Protected	0.950				0.994			0.990			0.986	
Satd. Flow (prot)	1770	1837	0	0	1835	0	0	1787	0	0	1765	0
Flt Permitted	0.644				0.954			0.947			0.927	
Satd. Flow (perm)	1200	1837	0	0	1761	0	0	1709	0	0	1659	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			7			19			22	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		417			894			393			308	
Travel Time (s)		10.2			21.8			10.7			8.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	10	215	22	22	143	12	20	53	22	22	32	22
Shared Lane Traffic (%)												
Lane Group Flow (vph)	10	237	0	0	177	0	0	95	0	0	76	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0		20.0	20.0	
Total Split (s)	54.0	54.0		24.0	24.0		36.0	36.0		20.0	20.0	
Total Split (%)	60.0%	60.0%		26.7%	26.7%		40.0%	40.0%		22.2%	22.2%	
Maximum Green (s)	49.0	49.0		19.0	19.0		31.0	31.0		16.0	16.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		0.5	0.5	
Lost Time Adjust (s)	-1.0	-2.0			-2.0			-1.0			-1.0	
Total Lost Time (s)	4.0	3.0			3.0			4.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		5.0	5.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	50.0	51.0			51.0			32.0			33.0	
Actuated g/C Ratio	0.56	0.57			0.57			0.36			0.37	
v/c Ratio	0.02	0.23			0.18			0.15			0.12	
Control Delay	5.9	5.6			9.6			12.3			14.8	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	5.9	5.6			9.6			12.3			14.8	
LOS	A	A			A			B			B	
Approach Delay		5.6			9.6			12.3			14.8	
Approach LOS		A			A			B			B	
Queue Length 50th (ft)	1	26			43			15			20	
Queue Length 95th (ft)	5	42			76			29			49	
Internal Link Dist (ft)		337			814			313			228	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	150											
Base Capacity (vph)	666	1044			1000			619			622	
Starvation Cap Reductn	0	0			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.02	0.23			0.18			0.15			0.12	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 59 (66%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle: 50
Control Type: Pretimed
Maximum v/c Ratio: 0.23
Intersection Signal Delay: 9.0 — Intersection LOS: A
Intersection Capacity Utilization 36.4% — ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 21: Morrison & Franklin



Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	10	10	10	0	10	2	4	0	33	34	3
Peak Hour Factor	0.92	0.83	0.83	0.83	0.92	0.83	0.83	0.83	0.92	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	12	12	12	0	12	2	5	0	40	41	4
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.3	7.3	7.6
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	47%	33%	62%	32%
Vol Thru, %	49%	33%	12%	29%
Vol Right, %	4%	33%	25%	38%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	70	30	16	34
LT Vol	34	10	2	10
Through Vol	3	10	4	13
RT Vol	33	10	10	11
Lane Flow Rate	84	36	19	41
Geometry Grp	1	1	1	1
Degree of Util (X)	0.097	0.04	0.022	0.045
Departure Headway (Hd)	4.129	4.031	4.153	3.929
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	866	880	853	907
Service Time	2.162	2.095	2.22	1.973
HCM Lane V/C Ratio	0.097	0.041	0.022	0.045
HCM Control Delay	7.6	7.3	7.3	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.1	0.1	0.1

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	11	10	13
Peak Hour Factor	0.92	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	13	12	16
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	7.2
HCM LOS	A

Lane

Intersection	
Intersection Delay, s/veh	8.1
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	52	4	28	0	16	62	17	0	9	69	56
Peak Hour Factor	1.00	0.90	0.90	0.90	1.00	0.90	0.90	0.90	1.00	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	58	4	31	0	18	69	19	0	10	77	62
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.1	8.2	8.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	7%	62%	17%	13%
Vol Thru, %	51%	5%	65%	83%
Vol Right, %	42%	33%	18%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	134	84	95	63
LT Vol	69	4	62	52
Through Vol	56	28	17	3
RT Vol	9	52	16	8
Lane Flow Rate	149	93	106	70
Geometry Grp	1	1	1	1
Degree of Util (X)	0.175	0.116	0.131	0.088
Departure Headway (Hd)	4.233	4.466	4.455	4.548
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	849	804	805	788
Service Time	2.253	2.488	2.477	2.572
HCM Lane V/C Ratio	0.176	0.116	0.132	0.089
HCM Control Delay	8.2	8.1	8.2	8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.4	0.4	0.3

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	8	52	3
Peak Hour Factor	1.00	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	9	58	3
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8
HCM LOS	A

Lane

Future Year (2036) - PM Peak

Alternative 2: Two-Way Appleton St.

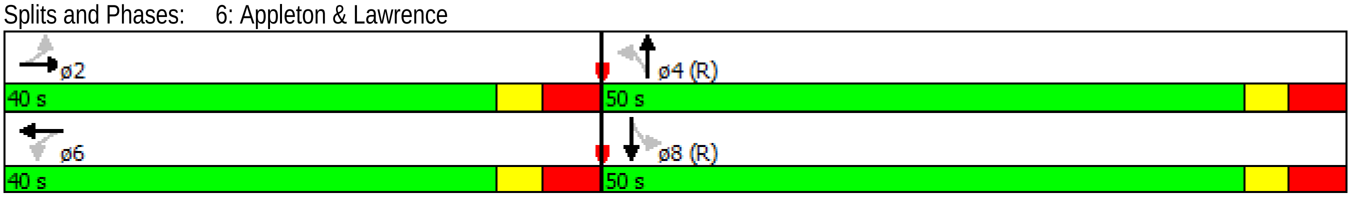
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	59	90	208	136	101	47	36	181	83	25	452	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	150		0	150		0	150		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.91	0.94		0.97	0.96		0.97	0.98		0.98	0.99	
Frt		0.895			0.952			0.953			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1567	0	1770	1699	0	1770	1748	0	1770	1806	0
Flt Permitted	0.655			0.460			0.306			0.548		
Satd. Flow (perm)	1108	1567	0	827	1699	0	554	1748	0	1002	1806	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		148			30			36			10	
Link Speed (mph)		25			25			30			25	
Link Distance (ft)		1279			319			661			394	
Travel Time (s)		34.9			8.7			15.0			10.7	
Confl. Peds. (#/hr)	46		24	24		46	40		12	12		40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	98	226	148	110	51	39	197	90	27	491	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	324	0	148	161	0	39	287	0	27	555	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	23.0	23.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	40.0	40.0		40.0	40.0		50.0	50.0		50.0	50.0	
Total Split (%)	44.4%	44.4%		44.4%	44.4%		55.6%	55.6%		55.6%	55.6%	
Maximum Green (s)	33.0	33.0		33.0	33.0		43.0	43.0		43.0	43.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	5.0	5.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		15	15		6	6		16	16	
Act Effct Green (s)	34.0	34.0		34.0	34.0		44.0	44.0		44.0	44.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.49	0.49		0.49	0.49	
v/c Ratio	0.15	0.47		0.47	0.24		0.14	0.33		0.06	0.62	
Control Delay	19.8	13.7		27.5	16.7		14.5	13.4		6.1	9.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	2.2	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	19.8	13.7		27.5	16.7		14.5	13.4		6.1	11.4	
LOS	B	B		C	B		B	B		A	B	
Approach Delay		14.7			21.9			13.5			11.2	
Approach LOS		B			C			B			B	
Queue Length 50th (ft)	24	69		63	49		12	82		5	123	
Queue Length 95th (ft)	52	145		123	95		32	137		m6	m132	
Internal Link Dist (ft)		1199			239			581			314	
Turn Bay Length (ft)	150			150			150			150		
Base Capacity (vph)	418	684		312	660		270	872		489	888	
Starvation Cap Reductn	0	0		0	0		0	0		0	201	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.15	0.47		0.47	0.24		0.14	0.33		0.06	0.81	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 87 (97%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.63
Intersection Signal Delay: 14.6 Intersection LOS: B
Intersection Capacity Utilization 71.5% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Appleton & Lawrence



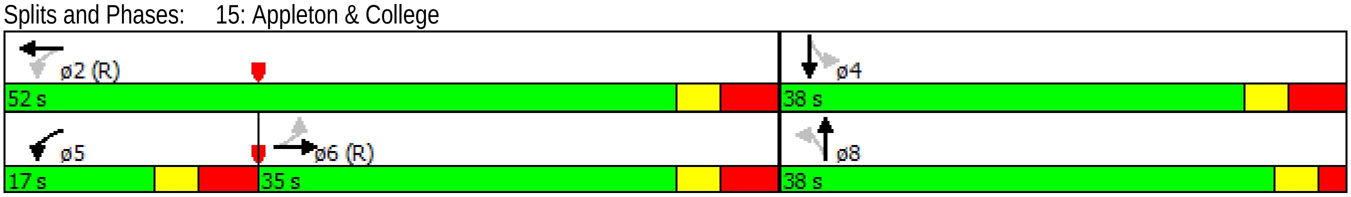
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	47	753	142	57	568	41	43	175	88	67	372	184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	150		0	150		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98			0.99			0.89		0.96	0.98	
Frt		0.977			0.991			0.950			0.950	
Flt Protected		0.998			0.996		0.950			0.950		
Satd. Flow (prot)	0	3404	0	0	3460	0	1770	1574	0	1770	1729	0
Flt Permitted		0.868			0.646		0.157			0.475		
Satd. Flow (perm)	0	2953	0	0	2244	0	292	1574	0	846	1729	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		24			11			32			31	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		412			323			394			213	
Travel Time (s)		10.0			7.9			10.7			5.8	
Confl. Peds. (#/hr)	55		29	29		55	100		250	47		39
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	49	793	149	60	598	43	45	184	93	71	392	194
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	991	0	0	701	0	45	277	0	71	586	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		6		5	2			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	6	6		5	2		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	26.0	26.0		11.5	26.0		24.0	24.0		26.0	26.0	
Total Split (s)	35.0	35.0		17.0	52.0		38.0	38.0		38.0	38.0	
Total Split (%)	38.9%	38.9%		18.9%	57.8%		42.2%	42.2%		42.2%	42.2%	
Maximum Green (s)	28.0	28.0		10.0	45.0		33.0	33.0		31.0	31.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	4.0		4.0	4.0		2.0	2.0		4.0	4.0	
Lost Time Adjust (s)		-1.0			-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)		6.0			6.0		4.0	4.0		6.0	6.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?				Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		Max	C-Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0		5.0	5.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	15	15			25		20	20		20	20	
Act Effct Green (s)		29.0			46.0		34.0	34.0		32.0	32.0	
Actuated g/C Ratio		0.32			0.51		0.38	0.38		0.36	0.36	
v/c Ratio		1.02			0.54		0.41	0.45		0.24	0.92	
Control Delay		46.9			6.1		29.3	17.1		16.4	40.8	
Queue Delay		0.0			0.0		0.0	0.0		0.0	4.3	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		46.9			6.2		29.3	17.1		16.4	45.1	
LOS		D			A		C	B		B	D	
Approach Delay		46.9			6.2			18.8			42.0	
Approach LOS		D			A			B			D	
Queue Length 50th (ft)		~316			35		15	80		22	333	
Queue Length 95th (ft)		#433			46		36	126		m42	#524	
Internal Link Dist (ft)		332			243			314			133	
Turn Bay Length (ft)							150			150		
Base Capacity (vph)		967			1300		110	614		300	634	
Starvation Cap Reductn		0			26		0	0		0	24	
Spillback Cap Reductn		0			0		0	0		0	5	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		1.02			0.55		0.41	0.45		0.24	0.96	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 50 (56%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.02
Intersection Signal Delay: 31.6 Intersection LOS: C
Intersection Capacity Utilization 99.6% ICU Level of Service F
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: Appleton & College



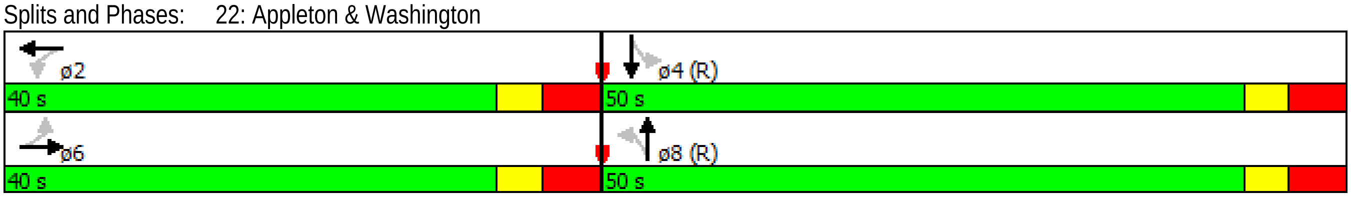
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	35	68	221	85	45	64	170	37	18	355	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	100		0	150		0	150		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.96			0.97		0.95	0.98		0.94	1.00	
Frt		0.925			0.983			0.973			0.998	
Flt Protected		0.992			0.969		0.950			0.950		
Satd. Flow (prot)	0	1642	0	0	1759	0	1770	1778	0	1770	1857	0
Flt Permitted		0.907			0.750		0.450			0.610		
Satd. Flow (perm)	0	1496	0	0	1325	0	799	1778	0	1063	1857	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		74			9			17			1	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		398			340			206			389	
Travel Time (s)		10.9			9.3			5.6			10.6	
Confl. Peds. (#/hr)	20		21	21		20	40		36	36		40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	38	74	240	92	49	70	185	40	20	386	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	134	0	0	381	0	70	225	0	20	390	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Minimum Split (s)	35.0	35.0		35.0	35.0		43.0	43.0		43.0	43.0	
Total Split (s)	40.0	40.0		40.0	40.0		50.0	50.0		50.0	50.0	
Total Split (%)	44.4%	44.4%		44.4%	44.4%		55.6%	55.6%		55.6%	55.6%	
Maximum Green (s)	33.0	33.0		33.0	33.0		43.0	43.0		43.0	43.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)		-1.0			-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	2	2		2	2		2	2		2	2	
Act Effct Green (s)		34.0			34.0		44.0	44.0		44.0	44.0	
Actuated g/C Ratio		0.38			0.38		0.49	0.49		0.49	0.49	
v/c Ratio		0.22			0.75		0.18	0.26		0.04	0.43	
Control Delay		10.3			35.0		14.5	13.3		9.1	11.3	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.4	
Total Delay		10.3			35.0		14.5	13.3		9.1	11.7	
LOS		B			D		B	B		A	B	
Approach Delay		10.3			35.0			13.6			11.6	
Approach LOS		B			D			B			B	
Queue Length 50th (ft)		22			181		21	66		4	75	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		60			#323		48	111		m11	103	
Internal Link Dist (ft)		318			260			126			309	
Turn Bay Length (ft)							150			150		
Base Capacity (vph)		611			506		390	877		519	908	
Starvation Cap Reductn		0			0		0	0		0	167	
Spillback Cap Reductn		6			0		0	0		0	179	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.22			0.75		0.18	0.26		0.04	0.53	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 80 (89%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green	
Natural Cycle: 80	
Control Type: Pretimed	
Maximum v/c Ratio: 0.75	
Intersection Signal Delay: 19.2	Intersection LOS: B
Intersection Capacity Utilization 63.9%	ICU Level of Service B
Analysis Period (min) 15	

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 22: Appleton & Washington

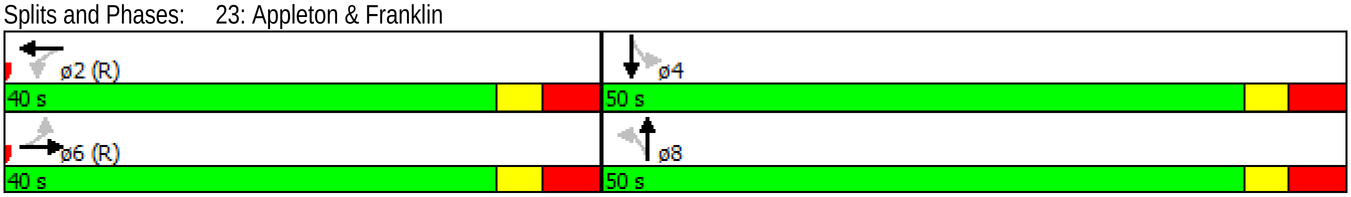


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	158	62	26	212	3	68	132	32	11	273	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	100		0	150		0	150		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.97	0.97		0.93	1.00		0.96	0.98		0.95	0.99	
Frt		0.958			0.998			0.971			0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1707	0	1703	1787	0	1770	1781	0	1752	1816	0
Flt Permitted	0.559			0.553			0.513			0.646		
Satd. Flow (perm)	997	1707	0	925	1787	0	916	1781	0	1136	1816	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			1			19			5	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		391			338			389			313	
Travel Time (s)		9.5			8.2			10.6			8.5	
Confl. Peds. (#/hr)	20		41	41		20	29		24	24		29
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	2%	2%	2%	3%	3%	3%
Adj. Flow (vph)	38	170	67	28	228	3	73	142	34	12	294	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	38	237	0	28	231	0	73	176	0	12	314	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Minimum Split (s)	26.0	26.0		26.0	26.0		26.0	26.0		26.0	26.0	
Total Split (s)	40.0	40.0		40.0	40.0		50.0	50.0		50.0	50.0	
Total Split (%)	44.4%	44.4%		44.4%	44.4%		55.6%	55.6%		55.6%	55.6%	
Maximum Green (s)	33.0	33.0		33.0	33.0		43.0	43.0		43.0	43.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)	-1.0	-2.0		-2.0	-2.0		-2.0	-1.0		-2.0	-2.0	
Total Lost Time (s)	6.0	5.0		5.0	5.0		5.0	6.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	20	20		15	15		15	15		15	15	
Act Effct Green (s)	34.0	35.0		35.0	35.0		45.0	44.0		45.0	45.0	
Actuated g/C Ratio	0.38	0.39		0.39	0.39		0.50	0.49		0.50	0.50	
v/c Ratio	0.10	0.35		0.08	0.33		0.16	0.20		0.02	0.35	
Control Delay	10.7	11.6		8.4	10.6		9.3	8.1		11.6	14.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.7	11.6		8.4	10.6		9.3	8.1		11.6	14.7	
LOS	B	B		A	B		A	A		B	B	
Approach Delay		11.5			10.3			8.5			14.6	
Approach LOS		B			B			A			B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	15	91		9	77		16	33		3	101	
Queue Length 95th (ft)	33	155		25	122		m28	m51		12	159	
Internal Link Dist (ft)		311			258			309			233	
Turn Bay Length (ft)	150			100			150			150		
Base Capacity (vph)	376	679		359	695		458	880		568	910	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.10	0.35		0.08	0.33		0.16	0.20		0.02	0.35	

Intersection Summary	
Area Type:	Other
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 35 (39%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.35	
Intersection Signal Delay: 11.5	Intersection LOS: B
Intersection Capacity Utilization 55.3%	ICU Level of Service B
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 23: Appleton & Franklin

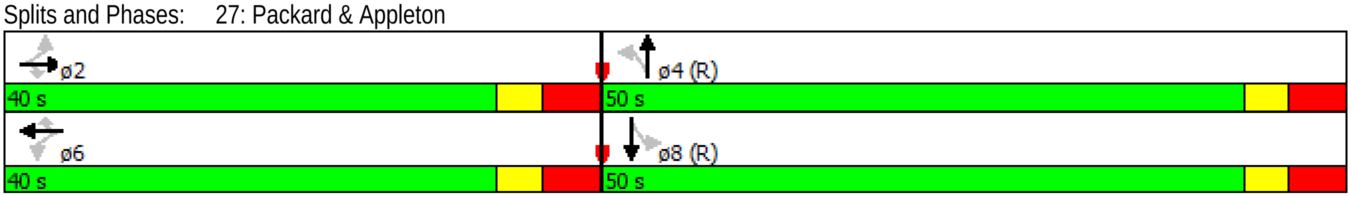


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	88	34	3	98	0	59	150	16	8	211	32
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	0		0	0		0	100		0	200		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00	0.97		1.00		0.99	0.99		0.97	1.00	
Frt			0.850					0.986			0.980	
Flt Protected		0.987			0.999		0.950			0.950		
Satd. Flow (prot)	0	1693	1458	0	1714	1716	1630	1682	0	1630	1675	0
Flt Permitted		0.913			0.995		0.548			0.639		
Satd. Flow (perm)	0	1560	1409	0	1707	1716	930	1682	0	1065	1675	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			48					8			12	
Link Speed (mph)		28			28			28			28	
Link Distance (ft)		2206			281			292			577	
Travel Time (s)		53.7			6.8			7.1			14.1	
Confl. Peds. (#/hr)	8		5	5		8	12		15	15		12
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	34	100	39	3	111	0	67	170	18	9	240	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	134	39	0	114	0	67	188	0	9	276	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2		2	6		6	4			8		
Minimum Split (s)	23.5	23.5	23.5	26.0	26.0	26.0	26.0	26.0		26.0	26.0	
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	50.0	50.0		50.0	50.0	
Total Split (%)	44.4%	44.4%	44.4%	44.4%	44.4%	44.4%	55.6%	55.6%		55.6%	55.6%	
Maximum Green (s)	33.0	33.0	33.0	33.0	33.0	33.0	43.0	43.0		43.0	43.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lost Time Adjust (s)		-2.0	-2.0		-2.0	-1.0	-1.0	-1.0		-2.0	-2.0	
Total Lost Time (s)		5.0	5.0		5.0	6.0	6.0	6.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	5.0	5.0	5.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	15	15	15	12	12	12	5	5		8	8	
Act Effct Green (s)		35.0	35.0		35.0		44.0	44.0		45.0	45.0	
Actuated g/C Ratio		0.39	0.39		0.39		0.49	0.49		0.50	0.50	
v/c Ratio		0.22	0.07		0.17		0.15	0.23		0.02	0.33	
Control Delay		19.7	4.7		18.9		13.8	13.5		11.6	14.2	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		19.7	4.7		18.9		13.8	13.5		11.6	14.2	
LOS		B	A		B		B	B		B	B	
Approach Delay		16.3			18.9			13.6			14.1	
Approach LOS		B			B			B			B	
Queue Length 50th (ft)		50	0		42		20	56		2	85	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		89	15		76		44	95		10	135	
Internal Link Dist (ft)		2126			201			212			497	
Turn Bay Length (ft)							100			200		
Base Capacity (vph)		606	577		663		454	826		532	843	
Starvation Cap Reductn		0	0		0		0	0		0	0	
Spillback Cap Reductn		0	0		0		0	0		0	0	
Storage Cap Reductn		0	0		0		0	0		0	0	
Reduced v/c Ratio		0.22	0.07		0.17		0.15	0.23		0.02	0.33	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 60 (67%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.33	
Intersection Signal Delay: 15.1	Intersection LOS: B
Intersection Capacity Utilization 57.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 27: Packard & Appleton



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	218	747	79	123	573	149	382	745	124	183	609	121
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	200		0	125		0	150		0	100		275
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.986			0.969			0.979				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3490	0	1630	3429	0	1630	3191	0	1630	3260	1458
Flt Permitted	0.175			0.187			0.263			0.143		
Satd. Flow (perm)	300	3490	0	321	3429	0	451	3191	0	245	3260	1458
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			34			22				158
Link Speed (mph)		28			28			34			34	
Link Distance (ft)		2324			513			416			817	
Travel Time (s)		56.6			12.5			8.3			16.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	218	747	79	123	573	149	382	745	124	183	609	121
Shared Lane Traffic (%)												
Lane Group Flow (vph)	218	826	0	123	722	0	382	869	0	183	609	121
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8			4		4
Detector Phase	1	6		5	2		3	8		7	4	4
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	12.0	24.0		12.0	24.0		12.0	24.0		12.0	24.0	24.0
Total Split (s)	17.0	24.0		17.0	24.0		17.0	32.0		17.0	32.0	32.0
Total Split (%)	18.9%	26.7%		18.9%	26.7%		18.9%	35.6%		18.9%	35.6%	35.6%
Maximum Green (s)	11.0	20.0		11.0	20.0		11.0	28.0		11.0	28.0	28.0
Yellow Time (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	3.0	3.0
All-Red Time (s)	4.0	1.0		4.0	1.0		4.0	1.0		4.0	1.0	1.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	3.0		5.0	3.0		5.0	3.0		5.0	3.0	3.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	Max
Walk Time (s)	0.0	7.0		0.0	7.0		0.0	7.0		0.0	7.0	7.0
Flash Dont Walk (s)	0.0	11.0		0.0	11.0		0.0	11.0		0.0	11.0	11.0
Pedestrian Calls (#/hr)	0	10		0	8		0	10		0	10	10
Act Effct Green (s)	32.6	22.9		29.4	21.4		40.1	30.1		37.9	29.0	29.0
Actuated g/C Ratio	0.36	0.25		0.33	0.24		0.45	0.33		0.42	0.32	0.32
v/c Ratio	0.78	0.92		0.49	0.86		1.07	0.80		0.68	0.58	0.21
Control Delay	41.6	49.9		32.4	35.0		88.5	33.9		30.0	28.1	2.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	41.6	49.9		32.4	35.0		88.5	33.9		30.0	28.1	2.7
LOS	D	D		C	C		F	C		C	C	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		48.2			34.6			50.6			25.1	
Approach LOS		D			C			D			C	
Queue Length 50th (ft)	84	238		53	116		~161	233		57	150	0
Queue Length 95th (ft)	#195	#377		109	#275		#339	#318		#123	205	21
Internal Link Dist (ft)		2244			433			336			737	
Turn Bay Length (ft)	200			125			150			100		275
Base Capacity (vph)	287	898		286	840		357	1080		290	1050	576
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.76	0.92		0.43	0.86		1.07	0.80		0.63	0.58	0.21

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 87 (97%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.07

Intersection Signal Delay: 40.9 Intersection LOS: D

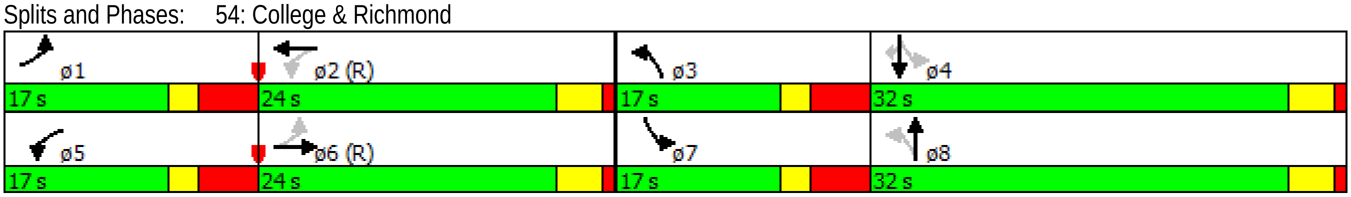
Intersection Capacity Utilization 90.0% ICU Level of Service E

Analysis Period (min) 15

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

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

Splits and Phases: 54: College & Richmond



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	792	44	54	566	107	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		100	0
Storage Lanes		0	0		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt	0.992					0.850
Flt Protected				0.996	0.950	
Satd. Flow (prot)	3511	0	0	3525	1770	1583
Flt Permitted				0.797	0.950	
Satd. Flow (perm)	3511	0	0	2821	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	10					80
Link Speed (mph)	28			28	25	
Link Distance (ft)	323			412	396	
Travel Time (s)	7.9			10.0	10.8	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	843	47	57	602	114	80
Shared Lane Traffic (%)						
Lane Group Flow (vph)	890	0	0	659	114	80
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	6			2	8	
Permitted Phases			2			8
Minimum Split (s)	26.0		26.0	26.0	26.0	26.0
Total Split (s)	55.0		55.0	55.0	35.0	35.0
Total Split (%)	61.1%		61.1%	61.1%	38.9%	38.9%
Maximum Green (s)	48.0		48.0	48.0	28.0	28.0
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0
All-Red Time (s)	4.0		4.0	4.0	4.0	4.0
Lost Time Adjust (s)	-1.0			-1.0	-1.0	-1.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	49.0			49.0	29.0	29.0
Actuated g/C Ratio	0.54			0.54	0.32	0.32
v/c Ratio	0.46			0.43	0.20	0.14
Control Delay	8.1			7.6	21.3	4.8
Queue Delay	0.5			0.0	0.0	0.0
Total Delay	8.6			7.6	21.3	4.8
LOS	A			A	C	A
Approach Delay	8.6			7.6	14.5	
Approach LOS	A			A	B	
Queue Length 50th (ft)	81			51	43	1
Queue Length 95th (ft)	m82			61	81	27
Internal Link Dist (ft)	243			332	316	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Bay Length (ft)					100	
Base Capacity (vph)	1916			1535	570	564
Starvation Cap Reductn	570			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.66			0.43	0.20	0.14

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 34 (38%), Referenced to phase 2:WBTL and 6:EBT, Start of Green

Natural Cycle: 55

Control Type: Pretimed

Maximum v/c Ratio: 0.46

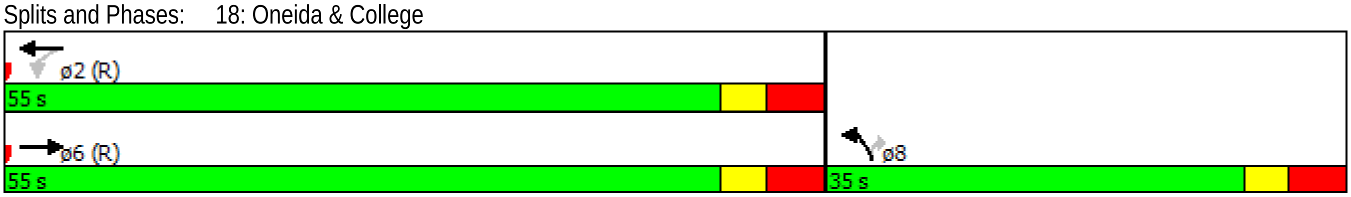
Intersection Signal Delay: 8.9 Intersection LOS: A

Intersection Capacity Utilization 61.4% ICU Level of Service B

Analysis Period (min) 15

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

Splits and Phases: 18: Oneida & College



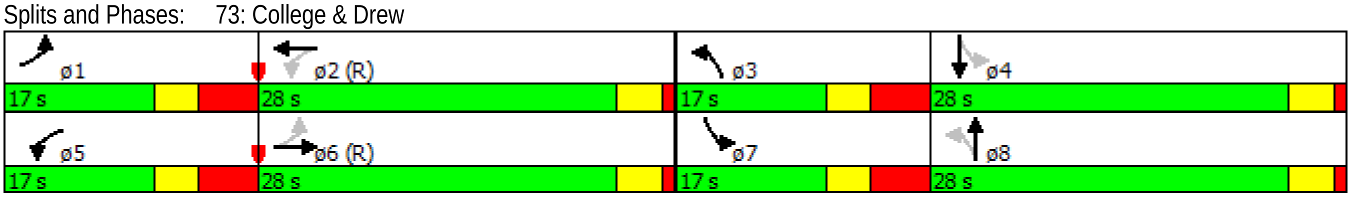
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	740	25	50	576	106	25	86	50	379	70	62
Ideal Flow (vphpl)	1750	1750	1900	1750	1750	1750	1900	1750	1750	1750	1750	1750
Storage Length (ft)	50		0	50		0	50		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.977			0.945			0.930	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3244	0	1630	3185	0	1770	1621	0	1630	1596	0
Flt Permitted	0.156			0.157			0.666			0.507		
Satd. Flow (perm)	268	3244	0	269	3185	0	1241	1621	0	870	1596	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			24			33			50	
Link Speed (mph)		28			28			28			28	
Link Distance (ft)		453			1029			566			812	
Travel Time (s)		11.0			25.1			15.4			19.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	57	804	27	54	626	115	27	93	54	412	76	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	831	0	54	741	0	27	147	0	412	143	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8			4		
Detector Phase	1	6		5	2		3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	11.0	23.0		11.0	23.0		11.0	23.0		11.0	23.0	
Total Split (s)	17.0	28.0		17.0	28.0		17.0	28.0		17.0	28.0	
Total Split (%)	18.9%	31.1%		18.9%	31.1%		18.9%	31.1%		18.9%	31.1%	
Maximum Green (s)	10.0	24.0		10.0	24.0		10.0	24.0		10.0	24.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	1.0		4.0	1.0		4.0	1.0		4.0	1.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-1.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	5.0	2.0		5.0	2.0		6.0	2.0		5.0	2.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		13			7			5			5	
Act Effct Green (s)	36.1	31.2		35.9	31.1		29.3	26.0		39.1	37.3	
Actuated g/C Ratio	0.40	0.35		0.40	0.35		0.33	0.29		0.43	0.41	
v/c Ratio	0.23	0.74		0.22	0.66		0.06	0.30		0.86	0.21	
Control Delay	16.5	17.5		10.7	26.9		15.6	21.1		40.3	13.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	16.5	17.5		10.7	26.9		15.6	21.1		40.3	13.9	
LOS	B	B		B	C		B	C		D	B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		17.4			25.8			20.2			33.5	
Approach LOS		B			C			C			C	
Queue Length 50th (ft)	10	61		13	208		9	49		169	28	
Queue Length 95th (ft)	m22	#161		m27	280		24	100		#343	84	
Internal Link Dist (ft)		373			949			486			732	
Turn Bay Length (ft)	50			50			50			125		
Base Capacity (vph)	294	1128		294	1117		519	491		479	691	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.19	0.74		0.18	0.66		0.05	0.30		0.86	0.21	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 80 (89%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 24.1 Intersection LOS: C
Intersection Capacity Utilization 71.6% ICU Level of Service C
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 73: College & Drew



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	786	42	10	508	117	40	202	42	210	218	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	100		0	75		0	300		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992			0.972			0.974			0.962	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3511	0	1770	3440	0	1770	1814	0	1770	1792	0
Flt Permitted	0.222			0.179			0.537			0.419		
Satd. Flow (perm)	414	3511	0	333	3440	0	1000	1814	0	780	1792	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			32			12			20	
Link Speed (mph)		28			28			30			30	
Link Distance (ft)		1029			572			499			479	
Travel Time (s)		25.1			13.9			11.3			10.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	854	46	11	552	127	43	220	46	228	237	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	98	900	0	11	679	0	43	266	0	228	317	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	15.0		6.0	10.0		6.0	10.0		6.0	10.0	
Minimum Split (s)	11.0	26.0		11.0	26.0		10.5	32.0		10.5	32.0	
Total Split (s)	11.0	34.0		11.0	34.0		10.6	32.0		13.0	34.4	
Total Split (%)	12.2%	37.8%		12.2%	37.8%		11.8%	35.6%		14.4%	38.2%	
Maximum Green (s)	6.0	27.0		6.0	27.0		6.1	25.0		8.5	27.4	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.5		1.0	3.5	
Lost Time Adjust (s)	0.0	-1.0		0.0	-1.0		0.0	-1.0		0.0	-1.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0		4.5	6.0		4.5	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Ped		None	Ped	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		12.0			12.0			18.0			18.0	
Pedestrian Calls (#/hr)		10			10			10			10	
Act Effct Green (s)	39.0	36.8		36.0	30.2		33.6	26.0		39.2	32.6	
Actuated g/C Ratio	0.43	0.41		0.40	0.34		0.37	0.29		0.44	0.36	
v/c Ratio	0.36	0.63		0.05	0.58		0.10	0.50		0.53	0.48	
Control Delay	11.6	14.5		9.5	14.9		14.9	29.2		21.0	25.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	11.6	14.5		9.5	14.9		14.9	29.2		21.0	25.0	
LOS	B	B		A	B		B	C		C	C	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		14.2			14.8			27.2			23.3	
Approach LOS		B			B			C			C	
Queue Length 50th (ft)	14	72		2	68		13	120		79	138	
Queue Length 95th (ft)	m19	m313		m4	92		32	195		130	222	
Internal Link Dist (ft)		949			492			419			399	
Turn Bay Length (ft)	200			100			75			300		
Base Capacity (vph)	269	1438		229	1175		425	532		433	662	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.36	0.63		0.05	0.58		0.10	0.50		0.53	0.48	

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 24 (27%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.63

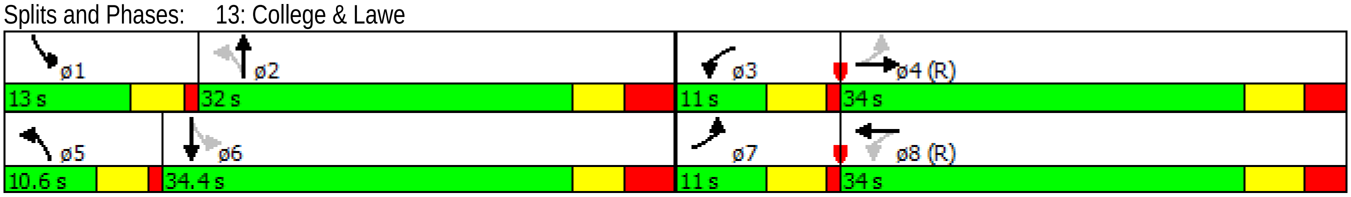
Intersection Signal Delay: 17.9 Intersection LOS: B

Intersection Capacity Utilization 70.8% ICU Level of Service C

Analysis Period (min) 15

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

Splits and Phases: 13: College & Lawe

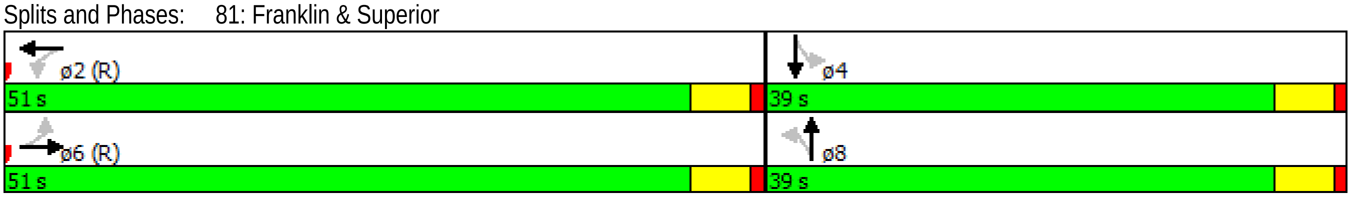


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	14	267	39	0	293	6	49	50	19	6	23	4
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	150		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.981			0.997			0.979			0.983	
Flt Protected	0.950							0.980			0.991	
Satd. Flow (prot)	1630	1683	0	1716	1711	0	0	1646	0	0	1671	0
Flt Permitted	0.468							0.883			0.964	
Satd. Flow (perm)	803	1683	0	1716	1711	0	0	1483	0	0	1626	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			2			13			5	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		490			391			388			445	
Travel Time (s)		12.8			10.5			10.6			12.1	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	16	314	46	0	345	7	58	59	22	7	27	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	360	0	0	352	0	0	139	0	0	39	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0		23.0	23.0	
Total Split (s)	51.0	51.0		51.0	51.0		39.0	39.0		39.0	39.0	
Total Split (%)	56.7%	56.7%		56.7%	56.7%		43.3%	43.3%		43.3%	43.3%	
Maximum Green (s)	46.0	46.0		46.0	46.0		34.0	34.0		34.0	34.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0			-2.0			-2.0	
Total Lost Time (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	48.0	48.0			48.0			36.0			36.0	
Actuated g/C Ratio	0.53	0.53			0.53			0.40			0.40	
v/c Ratio	0.04	0.40			0.39			0.23			0.06	
Control Delay	10.4	13.6			9.7			17.4			15.4	
Queue Delay	0.0	0.0			0.5			0.0			0.0	
Total Delay	10.4	13.6			10.2			17.4			15.4	
LOS	B	B			B			B			B	
Approach Delay		13.5			10.2			17.4			15.4	
Approach LOS		B			B			B			B	
Queue Length 50th (ft)	4	110			65			46			12	
Queue Length 95th (ft)	13	159			109			82			29	
Internal Link Dist (ft)		410			311			308			365	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	150											
Base Capacity (vph)	428	903			913			601			653	
Starvation Cap Reductn	0	0			245			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.04	0.40			0.53			0.23			0.06	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 10 (11%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.40	
Intersection Signal Delay: 12.9	Intersection LOS: B
Intersection Capacity Utilization 38.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 81: Franklin & Superior



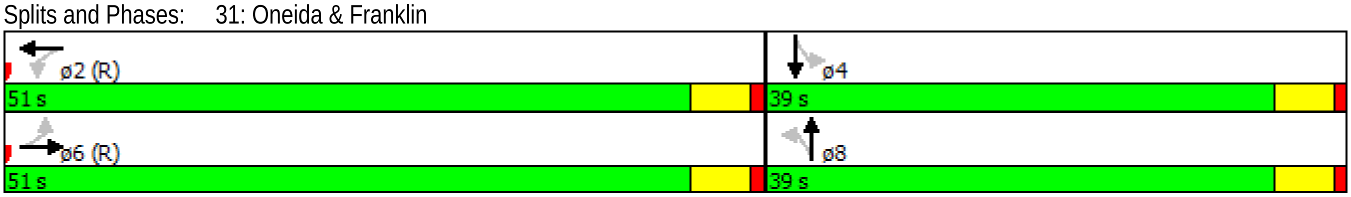
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	194	6	61	250	17	6	19	14	9	21	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	125		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.990			0.951			0.955	
Flt Protected	0.950			0.950				0.992			0.990	
Satd. Flow (prot)	1770	1853	0	1770	1844	0	0	1757	0	0	1761	0
Flt Permitted	0.512			0.579				0.975			0.966	
Satd. Flow (perm)	954	1853	0	1079	1844	0	0	1727	0	0	1718	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			6			16			17	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		338			417			394			310	
Travel Time (s)		8.2			10.2			10.7			8.5	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	6	218	7	69	281	19	7	21	16	10	24	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	6	225	0	69	300	0	0	44	0	0	51	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0		23.0	23.0	
Total Split (s)	51.0	51.0		51.0	51.0		39.0	39.0		39.0	39.0	
Total Split (%)	56.7%	56.7%		56.7%	56.7%		43.3%	43.3%		43.3%	43.3%	
Maximum Green (s)	46.0	46.0		46.0	46.0		34.0	34.0		34.0	34.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0			-2.0			-2.0	
Total Lost Time (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	48.0	48.0		48.0	48.0			36.0			36.0	
Actuated g/C Ratio	0.53	0.53		0.53	0.53			0.40			0.40	
v/c Ratio	0.01	0.23		0.12	0.30			0.06			0.07	
Control Delay	6.6	7.4		10.4	11.2			12.3			12.7	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	6.6	7.4		10.4	11.2			12.3			12.7	
LOS	A	A		B	B			B			B	
Approach Delay		7.4			11.1			12.3			12.7	
Approach LOS		A			B			B			B	
Queue Length 50th (ft)	1	37		17	78			9			12	
Queue Length 95th (ft)	m3	55		35	118			30			33	
Internal Link Dist (ft)		258			337			314			230	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	100			125								
Base Capacity (vph)	508	989		575	986			700			697	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.01	0.23		0.12	0.30			0.06			0.07	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 14 (16%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.30	
Intersection Signal Delay: 10.0	Intersection LOS: B
Intersection Capacity Utilization 31.2%	ICU Level of Service A
Analysis Period (min) 15	

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

Splits and Phases: 31: Oneida & Franklin



Intersection	
Int Delay, s/veh	5.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	174	82	120	24	7	129
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	189	89	130	26	8	140

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	157	0	-	0	610	143
Stage 1	-	-	-	-	143	-
Stage 2	-	-	-	-	467	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1423	-	-	-	458	905
Stage 1	-	-	-	-	884	-
Stage 2	-	-	-	-	631	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1423	-	-	-	394	905
Mov Cap-2 Maneuver	-	-	-	-	394	-
Stage 1	-	-	-	-	884	-
Stage 2	-	-	-	-	543	-

Approach	EB	WB	SB
HCM Control Delay, s	5.4	0	10.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1423	-	-	-	848
HCM Lane V/C Ratio	0.133	-	-	-	0.174
HCM Control Delay (s)	7.9	0	-	-	10.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0.5	-	-	-	0.6

Intersection	
Intersection Delay, s/veh	8
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	74	21	11	0	14	42	69	0	11	33	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	80	23	12	0	15	46	75	0	12	36	12
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.3	7.9	7.9
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	20%	70%	11%	11%
Vol Thru, %	60%	20%	34%	11%
Vol Right, %	20%	10%	55%	77%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	55	106	125	96
LT Vol	33	21	42	11
Through Vol	11	11	69	74
RT Vol	11	74	14	11
Lane Flow Rate	60	115	136	104
Geometry Grp	1	1	1	1
Degree of Util (X)	0.075	0.144	0.155	0.119
Departure Headway (Hd)	4.524	4.514	4.117	4.121
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	794	796	874	872
Service Time	2.541	2.529	2.131	2.136
HCM Lane V/C Ratio	0.076	0.144	0.156	0.119
HCM Control Delay	7.9	8.3	7.9	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.5	0.5	0.4

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	11	11	74
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	12	12	80
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	7.7
HCM LOS	A

Lane

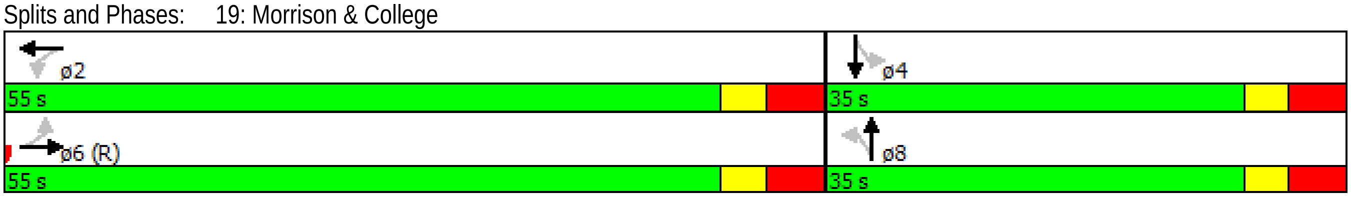
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	796	22	22	537	45	60	149	147	22	54	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.996			0.989			0.944			0.970	
Flt Protected		0.999			0.998			0.992			0.989	
Satd. Flow (prot)	0	3522	0	0	3493	0	0	1744	0	0	1787	0
Flt Permitted		0.924			0.902			0.926			0.885	
Satd. Flow (perm)	0	3257	0	0	3157	0	0	1628	0	0	1599	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		5			14			42			17	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		412			438			397			412	
Travel Time (s)		10.0			10.7			10.8			11.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	25	821	23	23	554	46	62	154	152	23	56	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	869	0	0	623	0	0	368	0	0	102	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	6	6		2	2		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	26.0	26.0		26.0	26.0		26.0	26.0		25.5	25.5	
Total Split (s)	55.0	55.0		55.0	55.0		35.0	35.0		35.0	35.0	
Total Split (%)	61.1%	61.1%		61.1%	61.1%		38.9%	38.9%		38.9%	38.9%	
Maximum Green (s)	48.0	48.0		48.0	48.0		28.0	28.0		28.0	28.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		Max	Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	2	2		2	2		2	2		2	2	
Act Effct Green (s)		49.0			49.0			29.0			29.0	
Actuated g/C Ratio		0.54			0.54			0.32			0.32	
v/c Ratio		0.49			0.36			0.67			0.19	
Control Delay		6.0			22.7			30.1			22.4	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		6.0			22.7			30.1			22.4	
LOS		A			C			C			C	
Approach Delay		6.0			22.7			30.1			22.4	
Approach LOS		A			C			C			C	
Queue Length 50th (ft)		42			170			159			39	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		57			220			259			81	
Internal Link Dist (ft)		332			358			317			332	
Turn Bay Length (ft)												
Base Capacity (vph)		1775			1725			553			526	
Starvation Cap Reductn		73			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.51			0.36			0.67			0.19	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 40 (44%), Referenced to phase 1: and 6:EBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.67
Intersection Signal Delay: 16.7 Intersection LOS: B
Intersection Capacity Utilization 74.9% ICU Level of Service D
Analysis Period (min) 15

Splits and Phases: 19: Morrison & College



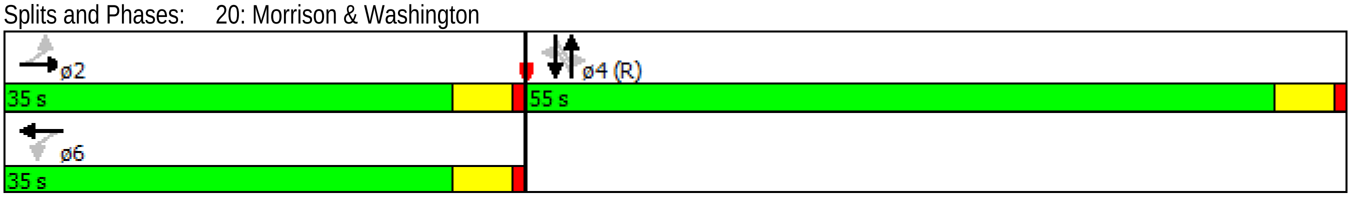
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	178	22	22	79	13	96	69	25	22	44	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.986			0.984			0.982			0.966	
Flt Protected		0.998			0.990			0.975			0.988	
Satd. Flow (prot)	0	1833	0	0	1815	0	0	1783	0	0	1778	0
Flt Permitted		0.992			0.923			0.818			0.913	
Satd. Flow (perm)	0	1822	0	0	1692	0	0	1496	0	0	1643	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			8			14			25	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		407			414			412			393	
Travel Time (s)		11.1			11.3			11.2			10.7	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	8	200	25	25	89	15	108	78	28	25	49	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	233	0	0	129	0	0	214	0	0	99	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			4	
Permitted Phases	2			6			4			4		
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0		23.0	23.0	
Total Split (s)	35.0	35.0		35.0	35.0		55.0	55.0		55.0	55.0	
Total Split (%)	38.9%	38.9%		38.9%	38.9%		61.1%	61.1%		61.1%	61.1%	
Maximum Green (s)	30.0	30.0		30.0	30.0		50.0	50.0		50.0	50.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0			-1.0	
Total Lost Time (s)		3.0			3.0			3.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		32.0			32.0			52.0			51.0	
Actuated g/C Ratio		0.36			0.36			0.58			0.57	
v/c Ratio		0.36			0.21			0.25			0.11	
Control Delay		22.7			20.1			6.5			2.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		22.7			20.1			6.5			2.9	
LOS		C			C			A			A	
Approach Delay		22.7			20.1			6.5			2.9	
Approach LOS		C			C			A			A	
Queue Length 50th (ft)		93			47			33			10	
Queue Length 95th (ft)		152			88			m50			19	
Internal Link Dist (ft)		327			334			332			313	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)												
Base Capacity (vph)		652			606			870			941	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.36			0.21			0.25			0.11	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 81 (90%), Referenced to phase 4:NBSB, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.36	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 39.2%	ICU Level of Service A
Analysis Period (min) 15	

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

Splits and Phases: 20: Morrison & Washington



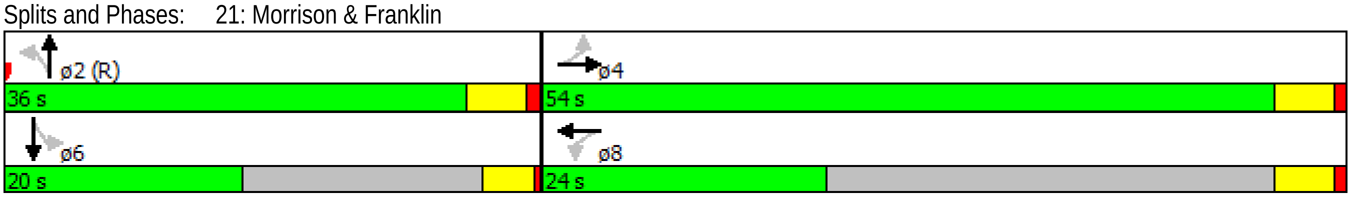
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	212	21	21	141	12	31	74	30	20	51	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	300		0	0		0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.986			0.991			0.970			0.969	
Flt Protected	0.950				0.994			0.989			0.989	
Satd. Flow (prot)	1770	1837	0	0	1835	0	0	1787	0	0	1785	0
Flt Permitted	0.635				0.953			0.928			0.935	
Satd. Flow (perm)	1183	1837	0	0	1759	0	0	1677	0	0	1688	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			7			18			19	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		417			894			393			308	
Travel Time (s)		10.2			21.8			10.7			8.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	11	228	23	23	152	13	33	80	32	22	55	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	251	0	0	188	0	0	145	0	0	100	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0		20.0	20.0	
Total Split (s)	54.0	54.0		24.0	24.0		36.0	36.0		20.0	20.0	
Total Split (%)	60.0%	60.0%		26.7%	26.7%		40.0%	40.0%		22.2%	22.2%	
Maximum Green (s)	49.0	49.0		19.0	19.0		31.0	31.0		16.0	16.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		0.5	0.5	
Lost Time Adjust (s)	-1.0	-2.0			-2.0			-1.0			-1.0	
Total Lost Time (s)	4.0	3.0			3.0			4.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		5.0	5.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	50.0	51.0			51.0			32.0			33.0	
Actuated g/C Ratio	0.56	0.57			0.57			0.36			0.37	
v/c Ratio	0.02	0.24			0.19			0.24			0.16	
Control Delay	3.5	3.1			9.7			21.2			16.3	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	3.5	3.1			9.7			21.2			16.3	
LOS	A	A			A			C			B	
Approach Delay		3.1			9.7			21.2			16.3	
Approach LOS		A			A			C			B	
Queue Length 50th (ft)	1	14			46			54			30	
Queue Length 95th (ft)	3	25			80			99			65	
Internal Link Dist (ft)		337			814			313			228	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	150											
Base Capacity (vph)	657	1044			999			607			630	
Starvation Cap Reductn	0	0			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.02	0.24			0.19			0.24			0.16	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 75 (83%), Referenced to phase 2:NBTL, Start of Green
Natural Cycle: 50
Control Type: Pretimed
Maximum v/c Ratio: 0.24
Intersection Signal Delay: 10.6 Intersection LOS: B
Intersection Capacity Utilization 41.9% ICU Level of Service A
Analysis Period (min) 15

Splits and Phases: 21: Morrison & Franklin



Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	11	11	11	0	11	2	4	0	36	37	3
Peak Hour Factor	0.92	0.83	0.83	0.83	0.92	0.83	0.83	0.83	0.92	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	13	13	13	0	13	2	5	0	43	45	4
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.3	7.4	7.7
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	47%	33%	65%	32%
Vol Thru, %	49%	33%	12%	30%
Vol Right, %	4%	33%	24%	38%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	76	33	17	37
LT Vol	37	11	2	11
Through Vol	3	11	4	14
RT Vol	36	11	11	12
Lane Flow Rate	92	40	20	45
Geometry Grp	1	1	1	1
Degree of Util (X)	0.105	0.045	0.024	0.049
Departure Headway (Hd)	4.143	4.051	4.188	3.944
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	863	874	845	901
Service Time	2.182	2.12	2.261	1.997
HCM Lane V/C Ratio	0.107	0.046	0.024	0.05
HCM Control Delay	7.7	7.3	7.4	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	0.1	0.1	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	12	11	14
Peak Hour Factor	0.92	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	14	13	17
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	7.2
HCM LOS	A

Lane

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	55	5	30	0	21	66	18	0	10	112	65
Peak Hour Factor	1.00	0.90	0.90	0.90	1.00	0.90	0.90	0.90	1.00	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	61	6	33	0	23	73	20	0	11	124	72
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.4	8.5	8.8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	61%	20%	12%
Vol Thru, %	60%	6%	63%	83%
Vol Right, %	35%	33%	17%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	187	90	105	66
LT Vol	112	5	66	55
Through Vol	65	30	18	3
RT Vol	10	55	21	8
Lane Flow Rate	208	100	117	73
Geometry Grp	1	1	1	1
Degree of Util (X)	0.25	0.129	0.15	0.095
Departure Headway (Hd)	4.334	4.635	4.629	4.675
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	829	773	775	766
Service Time	2.361	2.667	2.66	2.708
HCM Lane V/C Ratio	0.251	0.129	0.151	0.095
HCM Control Delay	8.8	8.4	8.5	8.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1	0.4	0.5	0.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	8	55	3
Peak Hour Factor	1.00	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	9	61	3
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.2
HCM LOS	A

Lane

Future Year (2036) - PM Peak

Alternative 2: Two-Way Appleton St.

With Development

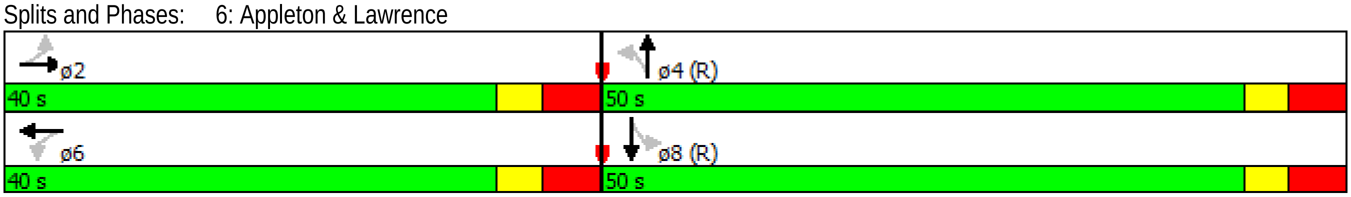
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	59	102	208	190	112	82	36	181	143	77	452	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	125		0	150		0	150		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.92	0.94		0.97	0.94		0.97	0.98		0.98	0.99	
Frt		0.899			0.937			0.934			0.983	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1578	0	1770	1648	0	1770	1702	0	1770	1806	0
Flt Permitted	0.599			0.445			0.306			0.485		
Satd. Flow (perm)	1024	1578	0	801	1648	0	554	1702	0	889	1806	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		131			47			62			10	
Link Speed (mph)		25			25			30			25	
Link Distance (ft)		1279			319			661			394	
Travel Time (s)		34.9			8.7			15.0			10.7	
Confl. Peds. (#/hr)	46		24	24		46	40		12	12		40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	64	111	226	207	122	89	39	197	155	84	491	64
Shared Lane Traffic (%)												
Lane Group Flow (vph)	64	337	0	207	211	0	39	352	0	84	555	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2			6			4			8		
Detector Phase	2	2		6	6		4	4		8	8	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	23.0	23.0		25.0	25.0		25.0	25.0		25.0	25.0	
Total Split (s)	40.0	40.0		40.0	40.0		50.0	50.0		50.0	50.0	
Total Split (%)	44.4%	44.4%		44.4%	44.4%		55.6%	55.6%		55.6%	55.6%	
Maximum Green (s)	33.0	33.0		33.0	33.0		43.0	43.0		43.0	43.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)	6.0	6.0		6.0	6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	Max	Max		Max	Max		C-Max	C-Max		C-Max	C-Max	
Walk Time (s)	5.0	5.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		15	15		6	6		16	16	
Act Effct Green (s)	34.0	34.0		34.0	34.0		44.0	44.0		44.0	44.0	
Actuated g/C Ratio	0.38	0.38		0.38	0.38		0.49	0.49		0.49	0.49	
v/c Ratio	0.17	0.50		0.69	0.32		0.14	0.41		0.19	0.62	
Control Delay	20.1	15.6		37.4	16.9		14.5	13.6		7.1	9.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	2.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay	20.1	15.6		37.4	16.9		14.5	13.6		7.1	11.9	
LOS	C	B		D	B		B	B		A	B	
Approach Delay		16.3			27.0			13.7			11.3	
Approach LOS		B			C			B			B	
Queue Length 50th (ft)	24	84		97	63		12	98		18	132	
Queue Length 95th (ft)	53	163		#203	118		32	165		m18	m136	
Internal Link Dist (ft)		1199			239			581			314	
Turn Bay Length (ft)	150			125			150			150		
Base Capacity (vph)	386	677		302	651		270	863		434	888	
Starvation Cap Reductn	0	0		0	0		0	0		0	215	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.17	0.50		0.69	0.32		0.14	0.41		0.19	0.82	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 87 (97%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.69
Intersection Signal Delay: 16.4 Intersection LOS: B
Intersection Capacity Utilization 81.3% ICU Level of Service D
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 6: Appleton & Lawrence



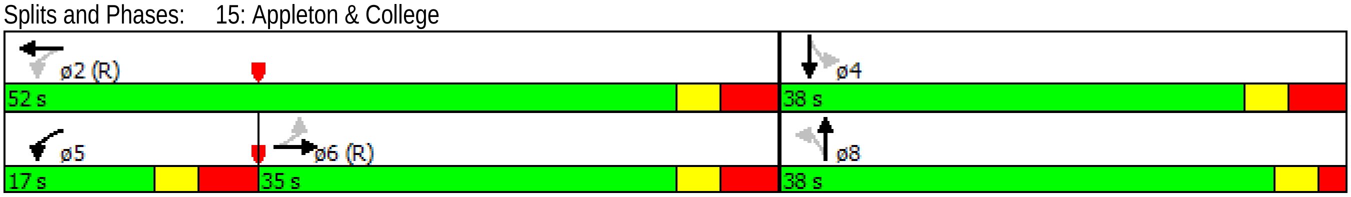
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	47	790	177	57	603	47	73	180	88	67	389	184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	150		0	150		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.98			0.99			0.89		0.96	0.98	
Frt		0.974			0.990			0.951			0.952	
Flt Protected		0.998			0.996		0.950			0.950		
Satd. Flow (prot)	0	3386	0	0	3454	0	1770	1579	0	1770	1734	0
Flt Permitted		0.867			0.622		0.138			0.469		
Satd. Flow (perm)	0	2935	0	0	2157	0	257	1579	0	836	1734	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		29			12			32			29	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		412			323			394			213	
Travel Time (s)		10.0			7.9			10.7			5.8	
Confl. Peds. (#/hr)	55		29	29		55	100		250	47		39
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	49	832	186	60	635	49	77	189	93	71	409	194
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1067	0	0	744	0	77	282	0	71	603	0
Turn Type	Perm	NA		pm+pt	NA		Perm	NA		Perm	NA	
Protected Phases		6		5	2			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	6	6		5	2		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	26.0	26.0		11.5	26.0		24.0	24.0		26.0	26.0	
Total Split (s)	35.0	35.0		17.0	52.0		38.0	38.0		38.0	38.0	
Total Split (%)	38.9%	38.9%		18.9%	57.8%		42.2%	42.2%		42.2%	42.2%	
Maximum Green (s)	28.0	28.0		10.0	45.0		33.0	33.0		31.0	31.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	4.0		4.0	4.0		2.0	2.0		4.0	4.0	
Lost Time Adjust (s)		-1.0			-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)		6.0			6.0		4.0	4.0		6.0	6.0	
Lead/Lag	Lag	Lag		Lead								
Lead-Lag Optimize?				Yes								
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		Max	C-Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0			7.0		5.0	5.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0			11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	15	15			25		20	20		20	20	
Act Effct Green (s)		29.0			46.0		34.0	34.0		32.0	32.0	
Actuated g/C Ratio		0.32			0.51		0.38	0.38		0.36	0.36	
v/c Ratio		1.11			0.59		0.79	0.46		0.24	0.95	
Control Delay		76.6			8.0		74.1	18.1		16.5	45.4	
Queue Delay		0.0			0.1		0.0	0.0		0.0	5.6	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay		76.6			8.1		74.1	18.1		16.5	50.9	
LOS		E			A		E	B		B	D	
Approach Delay		76.6			8.1			30.1			47.3	
Approach LOS		E			A			C			D	
Queue Length 50th (ft)		~364			50		30	91		22	346	
Queue Length 95th (ft)		#483			91		#126	143		m42	#550	
Internal Link Dist (ft)		332			243			314			133	
Turn Bay Length (ft)							150			150		
Base Capacity (vph)		965			1266		97	616		297	635	
Starvation Cap Reductn		0			38		0	0		0	22	
Spillback Cap Reductn		0			0		0	0		0	9	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		1.11			0.61		0.79	0.46		0.24	0.98	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 50 (56%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.11
Intersection Signal Delay: 45.9 Intersection LOS: D
Intersection Capacity Utilization 104.5% ICU Level of Service G
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: Appleton & College



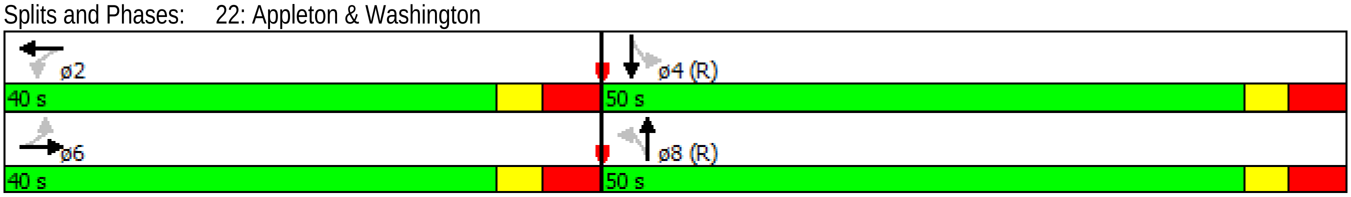
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	20	35	68	221	85	45	64	170	37	18	355	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	50		0	100		0	150		0	150		0
Storage Lanes	0		0	0		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		0.96			0.97		0.95	0.98		0.94	1.00	
Frt		0.925			0.983			0.973			0.998	
Flt Protected		0.992			0.969		0.950			0.950		
Satd. Flow (prot)	0	1642	0	0	1759	0	1770	1778	0	1770	1857	0
Flt Permitted		0.907			0.750		0.450			0.610		
Satd. Flow (perm)	0	1496	0	0	1325	0	799	1778	0	1063	1857	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		74			9			17			1	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		398			340			206			389	
Travel Time (s)		10.9			9.3			5.6			10.6	
Confl. Peds. (#/hr)	20		21	21		20	40		36	36		40
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	38	74	240	92	49	70	185	40	20	386	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	134	0	0	381	0	70	225	0	20	390	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Minimum Split (s)	35.0	35.0		35.0	35.0		43.0	43.0		43.0	43.0	
Total Split (s)	40.0	40.0		40.0	40.0		50.0	50.0		50.0	50.0	
Total Split (%)	44.4%	44.4%		44.4%	44.4%		55.6%	55.6%		55.6%	55.6%	
Maximum Green (s)	33.0	33.0		33.0	33.0		43.0	43.0		43.0	43.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)		-1.0			-1.0		-1.0	-1.0		-1.0	-1.0	
Total Lost Time (s)		6.0			6.0		6.0	6.0		6.0	6.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	2	2		2	2		2	2		2	2	
Act Effct Green (s)		34.0			34.0		44.0	44.0		44.0	44.0	
Actuated g/C Ratio		0.38			0.38		0.49	0.49		0.49	0.49	
v/c Ratio		0.22			0.75		0.18	0.26		0.04	0.43	
Control Delay		10.3			35.0		14.5	13.3		9.1	11.3	
Queue Delay		0.0			0.0		0.0	0.0		0.0	0.5	
Total Delay		10.3			35.0		14.5	13.3		9.1	11.8	
LOS		B			D		B	B		A	B	
Approach Delay		10.3			35.0			13.6			11.7	
Approach LOS		B			D			B			B	
Queue Length 50th (ft)		22			181		21	66		4	75	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		60			#323		48	111		m11	103	
Internal Link Dist (ft)		318			260			126			309	
Turn Bay Length (ft)							150			150		
Base Capacity (vph)		611			506		390	877		519	908	
Starvation Cap Reductn		0			0		0	0		0	167	
Spillback Cap Reductn		7			0		0	0		0	198	
Storage Cap Reductn		0			0		0	0		0	0	
Reduced v/c Ratio		0.22			0.75		0.18	0.26		0.04	0.55	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 80 (89%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green
Natural Cycle: 80
Control Type: Pretimed
Maximum v/c Ratio: 0.75
Intersection Signal Delay: 19.3 Intersection LOS: B
Intersection Capacity Utilization 63.9% ICU Level of Service B
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 22: Appleton & Washington



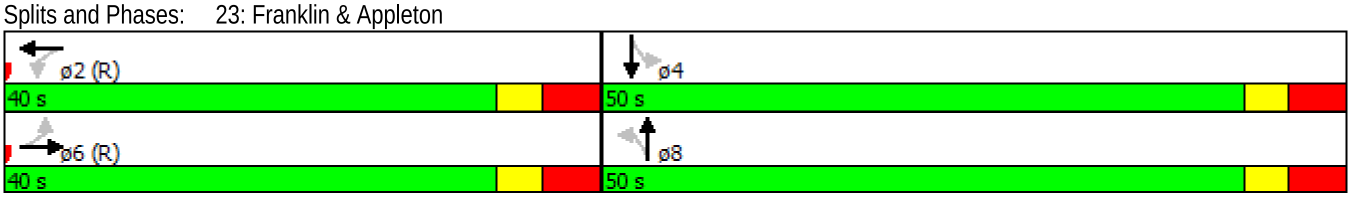
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	158	62	26	212	3	68	132	32	11	273	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	100		0	150		0	150		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor	0.97	0.97		0.93	1.00		0.96	0.98		0.95	0.99	
Frt		0.958			0.998			0.971			0.990	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1752	1707	0	1703	1787	0	1770	1781	0	1752	1816	0
Flt Permitted	0.559			0.553			0.513			0.646		
Satd. Flow (perm)	997	1707	0	925	1787	0	916	1781	0	1136	1816	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		26			1			19			5	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		391			338			389			313	
Travel Time (s)		9.5			8.2			10.6			8.5	
Confl. Peds. (#/hr)	20		41	41		20	29		24	24		29
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles (%)	3%	3%	3%	6%	6%	6%	2%	2%	2%	3%	3%	3%
Adj. Flow (vph)	38	170	67	28	228	3	73	142	34	12	294	20
Shared Lane Traffic (%)												
Lane Group Flow (vph)	38	237	0	28	231	0	73	176	0	12	314	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Minimum Split (s)	26.0	26.0		26.0	26.0		26.0	26.0		26.0	26.0	
Total Split (s)	40.0	40.0		40.0	40.0		50.0	50.0		50.0	50.0	
Total Split (%)	44.4%	44.4%		44.4%	44.4%		55.6%	55.6%		55.6%	55.6%	
Maximum Green (s)	33.0	33.0		33.0	33.0		43.0	43.0		43.0	43.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)	-1.0	-2.0		-2.0	-2.0		-2.0	-1.0		-2.0	-2.0	
Total Lost Time (s)	6.0	5.0		5.0	5.0		5.0	6.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	20	20		15	15		15	15		15	15	
Act Effct Green (s)	34.0	35.0		35.0	35.0		45.0	44.0		45.0	45.0	
Actuated g/C Ratio	0.38	0.39		0.39	0.39		0.50	0.49		0.50	0.50	
v/c Ratio	0.10	0.35		0.08	0.33		0.16	0.20		0.02	0.35	
Control Delay	10.7	11.6		8.4	10.6		9.3	8.1		11.6	14.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	10.7	11.6		8.4	10.6		9.3	8.1		11.6	14.7	
LOS	B	B		A	B		A	A		B	B	
Approach Delay		11.5			10.3			8.5			14.6	
Approach LOS		B			B			A			B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 50th (ft)	15	91		9	77		16	33		3	101	
Queue Length 95th (ft)	33	155		25	122		m28	m51		12	159	
Internal Link Dist (ft)		311			258			309			233	
Turn Bay Length (ft)	150			100			150			150		
Base Capacity (vph)	376	679		359	695		458	880		568	910	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.10	0.35		0.08	0.33		0.16	0.20		0.02	0.35	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 35 (39%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 55
Control Type: Pretimed
Maximum v/c Ratio: 0.35
Intersection Signal Delay: 11.5 Intersection LOS: B
Intersection Capacity Utilization 55.3% ICU Level of Service B
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 23: Franklin & Appleton

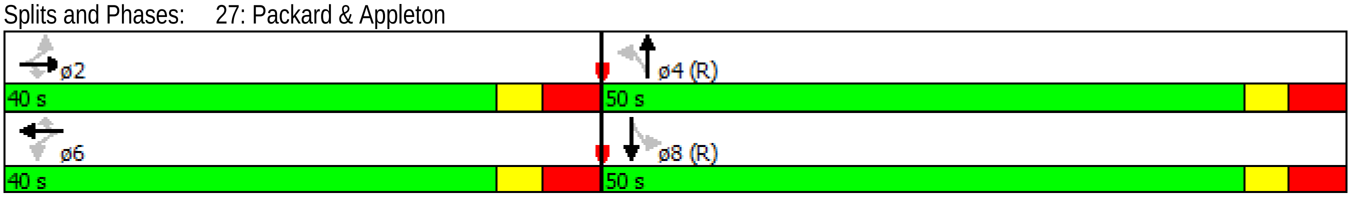


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	30	88	34	3	98	0	59	150	16	8	211	32
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	0		0	0		0	100		0	200		0
Storage Lanes	0		1	0		1	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ped Bike Factor		1.00	0.97		1.00		0.99	0.99		0.97	1.00	
Frt			0.850					0.986			0.980	
Flt Protected		0.987			0.999		0.950			0.950		
Satd. Flow (prot)	0	1693	1458	0	1714	1716	1630	1682	0	1630	1675	0
Flt Permitted		0.913			0.995		0.548			0.639		
Satd. Flow (perm)	0	1560	1409	0	1707	1716	930	1682	0	1065	1675	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			48					8			12	
Link Speed (mph)		28			28			28			28	
Link Distance (ft)		2206			281			292			577	
Travel Time (s)		53.7			6.8			7.1			14.1	
Confl. Peds. (#/hr)	8		5	5		8	12		15	15		12
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	34	100	39	3	111	0	67	170	18	9	240	36
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	134	39	0	114	0	67	188	0	9	276	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		2			6			4			8	
Permitted Phases	2		2	6		6	4			8		
Minimum Split (s)	23.5	23.5	23.5	26.0	26.0	26.0	26.0	26.0		26.0	26.0	
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	50.0	50.0		50.0	50.0	
Total Split (%)	44.4%	44.4%	44.4%	44.4%	44.4%	44.4%	55.6%	55.6%		55.6%	55.6%	
Maximum Green (s)	33.0	33.0	33.0	33.0	33.0	33.0	43.0	43.0		43.0	43.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lost Time Adjust (s)		-2.0	-2.0		-2.0	-1.0	-1.0	-1.0		-2.0	-2.0	
Total Lost Time (s)		5.0	5.0		5.0	6.0	6.0	6.0		5.0	5.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	5.0	5.0	5.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	15	15	15	12	12	12	5	5		8	8	
Act Effct Green (s)		35.0	35.0		35.0		44.0	44.0		45.0	45.0	
Actuated g/C Ratio		0.39	0.39		0.39		0.49	0.49		0.50	0.50	
v/c Ratio		0.22	0.07		0.17		0.15	0.23		0.02	0.33	
Control Delay		19.7	4.7		18.9		13.8	13.5		11.6	14.2	
Queue Delay		0.0	0.0		0.0		0.0	0.0		0.0	0.0	
Total Delay		19.7	4.7		18.9		13.8	13.5		11.6	14.2	
LOS		B	A		B		B	B		B	B	
Approach Delay		16.3			18.9			13.6			14.1	
Approach LOS		B			B			B			B	
Queue Length 50th (ft)		50	0		42		20	56		2	85	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		89	15		76		44	95		10	135	
Internal Link Dist (ft)		2126			201			212			497	
Turn Bay Length (ft)							100			200		
Base Capacity (vph)		606	577		663		454	826		532	843	
Starvation Cap Reductn		0	0		0		0	0		0	0	
Spillback Cap Reductn		0	0		0		0	0		0	0	
Storage Cap Reductn		0	0		0		0	0		0	0	
Reduced v/c Ratio		0.22	0.07		0.17		0.15	0.23		0.02	0.33	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 60 (67%), Referenced to phase 4:NBTL and 8:SBTL, Start of Green	
Natural Cycle: 55	
Control Type: Pretimed	
Maximum v/c Ratio: 0.33	
Intersection Signal Delay: 15.1	Intersection LOS: B
Intersection Capacity Utilization 57.5%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 27: Packard & Appleton



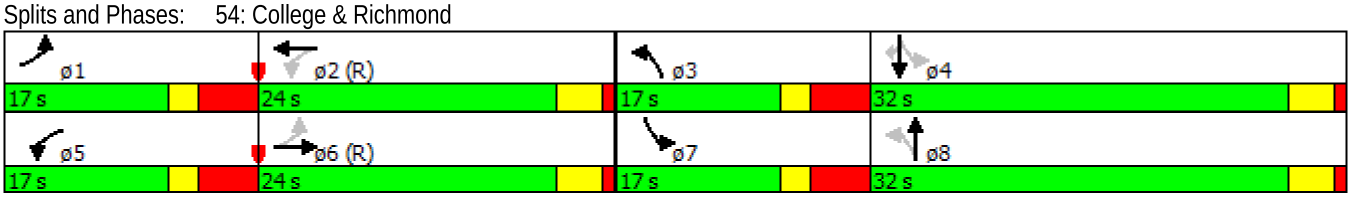
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↱		↰	↑↱		↰	↑↑		↰	↑↑	↱
Volume (vph)	218	747	79	123	573	149	382	745	124	183	609	121
Ideal Flow (vphpl)	1750	1900	1750	1750	1900	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	200		0	125		0	150		0	100		275
Storage Lanes	1		0	1		0	1		0	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	0.95	1.00	0.95	1.00
Frt		0.986			0.969			0.979				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3490	0	1630	3429	0	1630	3191	0	1630	3260	1458
Flt Permitted	0.175			0.187			0.263			0.143		
Satd. Flow (perm)	300	3490	0	321	3429	0	451	3191	0	245	3260	1458
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		12			34			22				158
Link Speed (mph)		28			28			34			34	
Link Distance (ft)		2324			513			416			817	
Travel Time (s)		56.6			12.5			8.3			16.4	
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj. Flow (vph)	218	747	79	123	573	149	382	745	124	183	609	121
Shared Lane Traffic (%)												
Lane Group Flow (vph)	218	826	0	123	722	0	382	869	0	183	609	121
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8			4		4
Detector Phase	1	6		5	2		3	8		7	4	4
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
Minimum Split (s)	12.0	24.0		12.0	24.0		12.0	24.0		12.0	24.0	24.0
Total Split (s)	17.0	24.0		17.0	24.0		17.0	32.0		17.0	32.0	32.0
Total Split (%)	18.9%	26.7%		18.9%	26.7%		18.9%	35.6%		18.9%	35.6%	35.6%
Maximum Green (s)	11.0	20.0		11.0	20.0		11.0	28.0		11.0	28.0	28.0
Yellow Time (s)	2.0	3.0		2.0	3.0		2.0	3.0		2.0	3.0	3.0
All-Red Time (s)	4.0	1.0		4.0	1.0		4.0	1.0		4.0	1.0	1.0
Lost Time Adjust (s)	-1.0	-1.0		-1.0	-1.0		-1.0	-1.0		-1.0	-1.0	-1.0
Total Lost Time (s)	5.0	3.0		5.0	3.0		5.0	3.0		5.0	3.0	3.0
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	Max
Walk Time (s)	0.0	7.0		0.0	7.0		0.0	7.0		0.0	7.0	7.0
Flash Dont Walk (s)	0.0	11.0		0.0	11.0		0.0	11.0		0.0	11.0	11.0
Pedestrian Calls (#/hr)	0	10		0	8		0	10		0	10	10
Act Effct Green (s)	32.6	22.9		29.4	21.4		40.1	30.1		37.9	29.0	29.0
Actuated g/C Ratio	0.36	0.25		0.33	0.24		0.45	0.33		0.42	0.32	0.32
v/c Ratio	0.78	0.92		0.49	0.86		1.07	0.80		0.68	0.58	0.21
Control Delay	41.6	49.9		32.4	35.0		88.5	33.9		30.0	28.1	2.7
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	41.6	49.9		32.4	35.0		88.5	33.9		30.0	28.1	2.7
LOS	D	D		C	C		F	C		C	C	A

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		48.2			34.6			50.6			25.1	
Approach LOS		D			C			D			C	
Queue Length 50th (ft)	84	238		53	116		~161	233		57	150	0
Queue Length 95th (ft)	#195	#377		109	#275		#339	#318		#123	205	21
Internal Link Dist (ft)		2244			433			336			737	
Turn Bay Length (ft)	200			125			150			100		275
Base Capacity (vph)	287	898		286	840		357	1080		290	1050	576
Starvation Cap Reductn	0	0		0	0		0	0		0	0	0
Spillback Cap Reductn	0	0		0	0		0	0		0	0	0
Storage Cap Reductn	0	0		0	0		0	0		0	0	0
Reduced v/c Ratio	0.76	0.92		0.43	0.86		1.07	0.80		0.63	0.58	0.21

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 87 (97%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.07
Intersection Signal Delay: 40.9 Intersection LOS: D
Intersection Capacity Utilization 90.0% ICU Level of Service E
Analysis Period (min) 15
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 54: College & Richmond



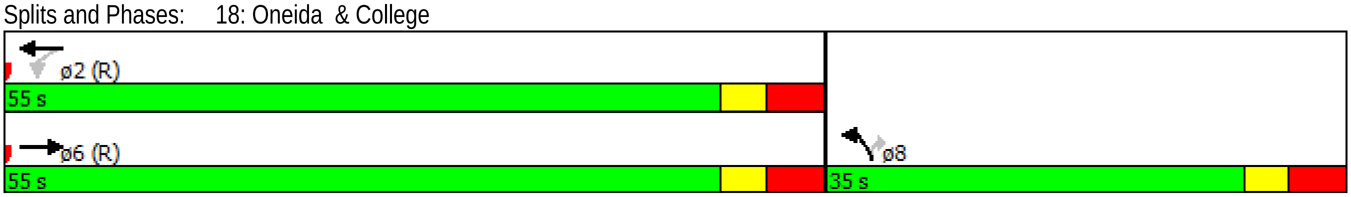
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	797	76	86	571	142	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		0	0		100	0
Storage Lanes		0	0		1	1
Taper Length (ft)			25		25	
Lane Util. Factor	0.95	0.95	0.95	0.95	1.00	1.00
Frt	0.987					0.850
Flt Protected				0.994	0.950	
Satd. Flow (prot)	3493	0	0	3518	1770	1583
Flt Permitted				0.674	0.950	
Satd. Flow (perm)	3493	0	0	2385	1770	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)	17					106
Link Speed (mph)	28			28	25	
Link Distance (ft)	323			412	396	
Travel Time (s)	7.9			10.0	10.8	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	848	81	91	607	151	106
Shared Lane Traffic (%)						
Lane Group Flow (vph)	929	0	0	698	151	106
Turn Type	NA		Perm	NA	Prot	Perm
Protected Phases	6			2	8	
Permitted Phases			2			8
Minimum Split (s)	26.0		26.0	26.0	26.0	26.0
Total Split (s)	55.0		55.0	55.0	35.0	35.0
Total Split (%)	61.1%		61.1%	61.1%	38.9%	38.9%
Maximum Green (s)	48.0		48.0	48.0	28.0	28.0
Yellow Time (s)	3.0		3.0	3.0	3.0	3.0
All-Red Time (s)	4.0		4.0	4.0	4.0	4.0
Lost Time Adjust (s)	-1.0			-1.0	-1.0	-1.0
Total Lost Time (s)	6.0			6.0	6.0	6.0
Lead/Lag						
Lead-Lag Optimize?						
Walk Time (s)	7.0		7.0	7.0	7.0	7.0
Flash Dont Walk (s)	11.0		11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	0		0	0	0	0
Act Effct Green (s)	49.0			49.0	29.0	29.0
Actuated g/C Ratio	0.54			0.54	0.32	0.32
v/c Ratio	0.49			0.54	0.26	0.18
Control Delay	8.3			8.3	24.2	5.5
Queue Delay	0.7			0.0	0.0	0.0
Total Delay	9.0			8.3	24.2	5.5
LOS	A			A	C	A
Approach Delay	9.0			8.3	16.5	
Approach LOS	A			A	B	
Queue Length 50th (ft)	82			55	63	0
Queue Length 95th (ft)	m78			66	112	35
Internal Link Dist (ft)	243			332	316	

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Turn Bay Length (ft)					100	
Base Capacity (vph)	1909			1298	570	581
Starvation Cap Reductn	577			0	0	0
Spillback Cap Reductn	0			0	0	0
Storage Cap Reductn	0			0	0	0
Reduced v/c Ratio	0.70			0.54	0.26	0.18

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 34 (38%), Referenced to phase 2:WBTL and 6:EBT, Start of Green
Natural Cycle: 55
Control Type: Pretimed
Maximum v/c Ratio: 0.54
Intersection Signal Delay: 9.7 Intersection LOS: A
Intersection Capacity Utilization 65.6% ICU Level of Service C
Analysis Period (min) 15
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 18: Oneida & College



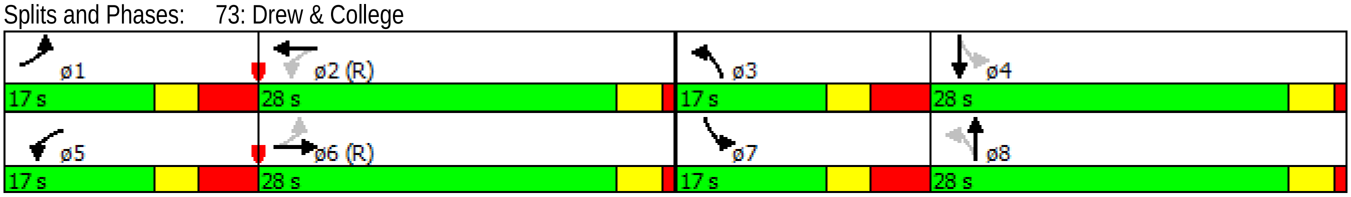
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	52	740	25	50	576	106	25	86	50	379	70	62
Ideal Flow (vphpl)	1750	1750	1900	1750	1750	1750	1900	1750	1750	1750	1750	1750
Storage Length (ft)	50		0	50		0	50		0	125		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.977			0.945			0.930	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1630	3244	0	1630	3185	0	1770	1621	0	1630	1596	0
Flt Permitted	0.156			0.157			0.666			0.507		
Satd. Flow (perm)	268	3244	0	269	3185	0	1241	1621	0	870	1596	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		4			24			33			50	
Link Speed (mph)		28			28			28			28	
Link Distance (ft)		453			1029			566			812	
Travel Time (s)		11.0			25.1			15.4			19.8	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	57	804	27	54	626	115	27	93	54	412	76	67
Shared Lane Traffic (%)												
Lane Group Flow (vph)	57	831	0	54	741	0	27	147	0	412	143	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases	6			2			8			4		
Detector Phase	1	6		5	2		3	8		7	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	11.0	23.0		11.0	23.0		11.0	23.0		11.0	23.0	
Total Split (s)	17.0	28.0		17.0	28.0		17.0	28.0		17.0	28.0	
Total Split (%)	18.9%	31.1%		18.9%	31.1%		18.9%	31.1%		18.9%	31.1%	
Maximum Green (s)	10.0	24.0		10.0	24.0		10.0	24.0		10.0	24.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	1.0		4.0	1.0		4.0	1.0		4.0	1.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0		-1.0	-2.0		-2.0	-2.0	
Total Lost Time (s)	5.0	2.0		5.0	2.0		6.0	2.0		5.0	2.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Max		None	Max	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		11.0			11.0			11.0			11.0	
Pedestrian Calls (#/hr)		13			7			5			5	
Act Effct Green (s)	36.1	31.2		35.9	31.1		29.3	26.0		39.1	37.3	
Actuated g/C Ratio	0.40	0.35		0.40	0.35		0.33	0.29		0.43	0.41	
v/c Ratio	0.23	0.74		0.22	0.66		0.06	0.30		0.86	0.21	
Control Delay	16.2	17.5		10.7	26.9		15.6	21.1		40.3	13.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	16.2	17.5		10.7	26.9		15.6	21.1		40.3	13.9	
LOS	B	B		B	C		B	C		D	B	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		17.4			25.8			20.2			33.5	
Approach LOS		B			C			C			C	
Queue Length 50th (ft)	10	60		13	208		9	49		169	28	
Queue Length 95th (ft)	m22	#164		m27	280		24	100		#343	84	
Internal Link Dist (ft)		373			949			486			732	
Turn Bay Length (ft)	50			50			50			125		
Base Capacity (vph)	294	1128		294	1117		519	491		479	691	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.19	0.74		0.18	0.66		0.05	0.30		0.86	0.21	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 80 (89%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.86
Intersection Signal Delay: 24.1 Intersection LOS: C
Intersection Capacity Utilization 71.6% ICU Level of Service C
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 73: Drew & College

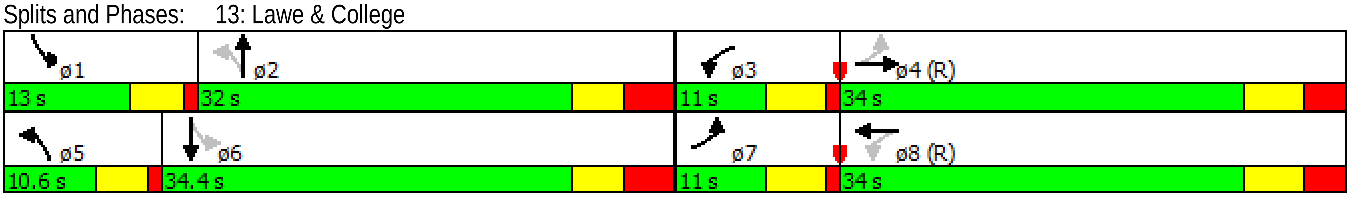


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	786	42	10	508	117	40	202	42	210	218	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	100		0	75		0	300		0
Storage Lanes	1		0	1		0	1		0	1		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.992			0.972			0.974			0.962	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3511	0	1770	3440	0	1770	1814	0	1770	1792	0
Flt Permitted	0.222			0.179			0.537			0.419		
Satd. Flow (perm)	414	3511	0	333	3440	0	1000	1814	0	780	1792	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			32			12			20	
Link Speed (mph)		28			28			30			30	
Link Distance (ft)		1029			572			499			479	
Travel Time (s)		25.1			13.9			11.3			10.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	854	46	11	552	127	43	220	46	228	237	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	98	900	0	11	679	0	43	266	0	228	317	0
Turn Type	pm+pt	NA		pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4			8			2			6		
Detector Phase	7	4		3	8		5	2		1	6	
Switch Phase												
Minimum Initial (s)	6.0	15.0		6.0	10.0		6.0	10.0		6.0	10.0	
Minimum Split (s)	11.0	26.0		11.0	26.0		10.5	32.0		10.5	32.0	
Total Split (s)	11.0	34.0		11.0	34.0		10.6	32.0		13.0	34.4	
Total Split (%)	12.2%	37.8%		12.2%	37.8%		11.8%	35.6%		14.4%	38.2%	
Maximum Green (s)	6.0	27.0		6.0	27.0		6.1	25.0		8.5	27.4	
Yellow Time (s)	4.0	4.0		4.0	4.0		3.5	3.5		3.5	3.5	
All-Red Time (s)	1.0	3.0		1.0	3.0		1.0	3.5		1.0	3.5	
Lost Time Adjust (s)	0.0	-1.0		0.0	-1.0		0.0	-1.0		0.0	-1.0	
Total Lost Time (s)	5.0	6.0		5.0	6.0		4.5	6.0		4.5	6.0	
Lead/Lag	Lead	Lag		Lead	Lag		Lead	Lag		Lead	Lag	
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	None	C-Max		None	C-Max		None	Ped		None	Ped	
Walk Time (s)		7.0			7.0			7.0			7.0	
Flash Dont Walk (s)		12.0			12.0			18.0			18.0	
Pedestrian Calls (#/hr)		10			10			10			10	
Act Effct Green (s)	39.0	36.8		36.0	30.2		33.6	26.0		39.2	32.6	
Actuated g/C Ratio	0.43	0.41		0.40	0.34		0.37	0.29		0.44	0.36	
v/c Ratio	0.36	0.63		0.05	0.58		0.10	0.50		0.53	0.48	
Control Delay	11.6	14.5		9.5	14.9		14.9	29.2		21.0	25.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	11.6	14.5		9.5	14.9		14.9	29.2		21.0	25.0	
LOS	B	B		A	B		B	C		C	C	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay		14.2			14.8			27.2			23.3	
Approach LOS		B			B			C			C	
Queue Length 50th (ft)	14	73		2	68		13	120		79	138	
Queue Length 95th (ft)	m19	m312		m4	92		32	195		130	222	
Internal Link Dist (ft)		949			492			419			399	
Turn Bay Length (ft)	200			100			75			300		
Base Capacity (vph)	269	1438		229	1175		425	532		433	662	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.36	0.63		0.05	0.58		0.10	0.50		0.53	0.48	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 24 (27%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 17.9	Intersection LOS: B
Intersection Capacity Utilization 70.8%	ICU Level of Service C
Analysis Period (min) 15	
m Volume for 95th percentile queue is metered by upstream signal.	

Splits and Phases: 13: Lawe & College

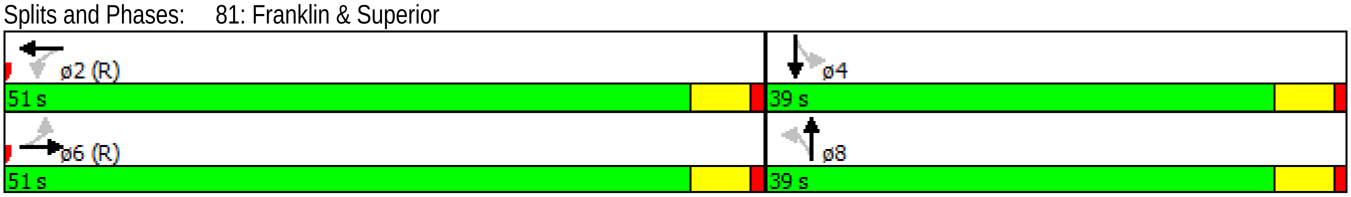


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	14	267	39	0	293	6	49	50	19	6	23	4
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Storage Length (ft)	150		0	100		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.981			0.997			0.979			0.983	
Flt Protected	0.950							0.980			0.991	
Satd. Flow (prot)	1630	1683	0	1716	1711	0	0	1646	0	0	1671	0
Flt Permitted	0.468							0.883			0.964	
Satd. Flow (perm)	803	1683	0	1716	1711	0	0	1483	0	0	1626	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		13			2			13			5	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		490			391			388			445	
Travel Time (s)		12.8			10.5			10.6			12.1	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	16	314	46	0	345	7	58	59	22	7	27	5
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	360	0	0	352	0	0	139	0	0	39	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0		23.0	23.0	
Total Split (s)	51.0	51.0		51.0	51.0		39.0	39.0		39.0	39.0	
Total Split (%)	56.7%	56.7%		56.7%	56.7%		43.3%	43.3%		43.3%	43.3%	
Maximum Green (s)	46.0	46.0		46.0	46.0		34.0	34.0		34.0	34.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0			-2.0			-2.0	
Total Lost Time (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	48.0	48.0			48.0			36.0			36.0	
Actuated g/C Ratio	0.53	0.53			0.53			0.40			0.40	
v/c Ratio	0.04	0.40			0.39			0.23			0.06	
Control Delay	10.4	13.6			9.7			17.4			15.4	
Queue Delay	0.0	0.0			0.5			0.0			0.0	
Total Delay	10.4	13.6			10.2			17.4			15.4	
LOS	B	B			B			B			B	
Approach Delay		13.5			10.2			17.4			15.4	
Approach LOS		B			B			B			B	
Queue Length 50th (ft)	4	110			65			46			12	
Queue Length 95th (ft)	13	159			109			82			29	
Internal Link Dist (ft)		410			311			308			365	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	150											
Base Capacity (vph)	428	903			913			601			653	
Starvation Cap Reductn	0	0			245			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.04	0.40			0.53			0.23			0.06	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 10 (11%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.40	
Intersection Signal Delay: 12.9	Intersection LOS: B
Intersection Capacity Utilization 38.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 81: Franklin & Superior



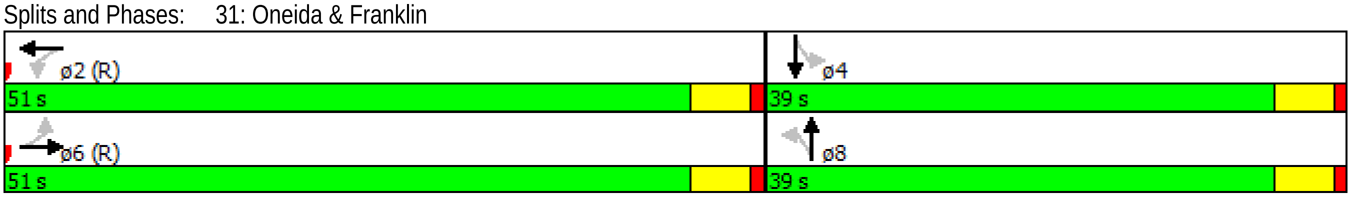
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	5	194	6	61	250	17	6	19	14	9	21	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	100		0	125		0	0		0	0		0
Storage Lanes	1		0	1		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.990			0.951			0.955	
Flt Protected	0.950			0.950				0.992			0.990	
Satd. Flow (prot)	1770	1853	0	1770	1844	0	0	1757	0	0	1761	0
Flt Permitted	0.512			0.579				0.975			0.966	
Satd. Flow (perm)	954	1853	0	1079	1844	0	0	1727	0	0	1718	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		3			6			16			17	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		338			417			394			310	
Travel Time (s)		8.2			10.2			10.7			8.5	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	6	218	7	69	281	19	7	21	16	10	24	17
Shared Lane Traffic (%)												
Lane Group Flow (vph)	6	225	0	69	300	0	0	44	0	0	51	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0		23.0	23.0	
Total Split (s)	51.0	51.0		51.0	51.0		39.0	39.0		39.0	39.0	
Total Split (%)	56.7%	56.7%		56.7%	56.7%		43.3%	43.3%		43.3%	43.3%	
Maximum Green (s)	46.0	46.0		46.0	46.0		34.0	34.0		34.0	34.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)	-2.0	-2.0		-2.0	-2.0			-2.0			-2.0	
Total Lost Time (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	48.0	48.0		48.0	48.0			36.0			36.0	
Actuated g/C Ratio	0.53	0.53		0.53	0.53			0.40			0.40	
v/c Ratio	0.01	0.23		0.12	0.30			0.06			0.07	
Control Delay	6.6	7.4		10.4	11.2			12.3			12.7	
Queue Delay	0.0	0.0		0.0	0.0			0.0			0.0	
Total Delay	6.6	7.4		10.4	11.2			12.3			12.7	
LOS	A	A		B	B			B			B	
Approach Delay		7.4			11.1			12.3			12.7	
Approach LOS		A			B			B			B	
Queue Length 50th (ft)	1	37		17	78			9			12	
Queue Length 95th (ft)	m3	55		35	117			30			33	
Internal Link Dist (ft)		258			337			314			230	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	100			125								
Base Capacity (vph)	508	989		575	986			700			697	
Starvation Cap Reductn	0	0		0	0			0			0	
Spillback Cap Reductn	0	0		0	0			0			0	
Storage Cap Reductn	0	0		0	0			0			0	
Reduced v/c Ratio	0.01	0.23		0.12	0.30			0.06			0.07	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 14 (16%), Referenced to phase 2:WBTL and 6:EBTL, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.30	
Intersection Signal Delay: 10.0	Intersection LOS: B
Intersection Capacity Utilization 31.2%	ICU Level of Service A
Analysis Period (min) 15	

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

Splits and Phases: 31: Oneida & Franklin



Intersection	
Intersection Delay, s/veh	15.3
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	174	89	117	0	35	125	24	0	111	76	55
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	189	97	127	0	38	136	26	0	121	83	60
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	18.8	12.5	14.3
HCM LOS	C	B	B

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	46%	46%	19%	4%
Vol Thru, %	31%	23%	68%	32%
Vol Right, %	23%	31%	13%	65%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	242	380	184	200
LT Vol	76	89	125	64
Through Vol	55	117	24	129
RT Vol	111	174	35	7
Lane Flow Rate	263	413	200	217
Geometry Grp	1	1	1	1
Degree of Util (X)	0.453	0.649	0.345	0.362
Departure Headway (Hd)	6.197	5.788	6.218	5.987
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	584	628	578	602
Service Time	4.219	3.788	4.251	4.011
HCM Lane V/C Ratio	0.45	0.658	0.346	0.36
HCM Control Delay	14.3	18.8	12.5	12.4
HCM Lane LOS	B	C	B	B
HCM 95th-tile Q	2.3	4.7	1.5	1.6

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	7	64	129
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	8	70	140
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	12.4
HCM LOS	B

Lane

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	109	21	18	0	14	42	69	0	15	54	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	118	23	20	0	15	46	75	0	16	59	12
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	9	8.3	8.4
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	19%	74%	11%	7%
Vol Thru, %	68%	14%	34%	19%
Vol Right, %	14%	12%	55%	74%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	80	148	125	148
LT Vol	54	21	42	28
Through Vol	11	18	69	109
RT Vol	15	109	14	11
Lane Flow Rate	87	161	136	161
Geometry Grp	1	1	1	1
Degree of Util (X)	0.115	0.211	0.165	0.192
Departure Headway (Hd)	4.761	4.722	4.381	4.301
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	751	759	817	833
Service Time	2.8	2.759	2.418	2.335
HCM Lane V/C Ratio	0.116	0.212	0.166	0.193
HCM Control Delay	8.4	9	8.3	8.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	0.8	0.6	0.7

Intersection				
Intersection Delay, s/veh				
Intersection LOS				

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	11	28	109
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	12	30	118
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.4
HCM LOS	A

Lane

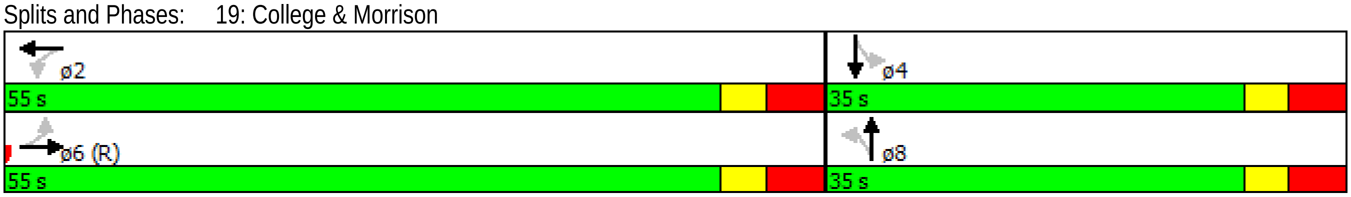
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	24	821	27	62	569	45	65	160	187	22	61	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.95	0.95	0.95	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.995			0.990			0.939			0.972	
Flt Protected		0.999			0.995			0.992			0.990	
Satd. Flow (prot)	0	3518	0	0	3486	0	0	1735	0	0	1792	0
Flt Permitted		0.921			0.776			0.928			0.870	
Satd. Flow (perm)	0	3243	0	0	2719	0	0	1623	0	0	1575	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6			13			49			16	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		412			438			397			412	
Travel Time (s)		10.0			10.7			10.8			11.2	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	25	846	28	64	587	46	67	165	193	23	63	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	899	0	0	697	0	0	425	0	0	109	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		6			2			8			4	
Permitted Phases	6			2			8			4		
Detector Phase	6	6		2	2		8	8		4	4	
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Minimum Split (s)	26.0	26.0		26.0	26.0		26.0	26.0		25.5	25.5	
Total Split (s)	55.0	55.0		55.0	55.0		35.0	35.0		35.0	35.0	
Total Split (%)	61.1%	61.1%		61.1%	61.1%		38.9%	38.9%		38.9%	38.9%	
Maximum Green (s)	48.0	48.0		48.0	48.0		28.0	28.0		28.0	28.0	
Yellow Time (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
All-Red Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lost Time Adjust (s)		-1.0			-1.0			-1.0			-1.0	
Total Lost Time (s)		6.0			6.0			6.0			6.0	
Lead/Lag												
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Recall Mode	C-Max	C-Max		Max	Max		Max	Max		Max	Max	
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	2	2		2	2		2	2		2	2	
Act Effct Green (s)		49.0			49.0			29.0			29.0	
Actuated g/C Ratio		0.54			0.54			0.32			0.32	
v/c Ratio		0.51			0.47			0.76			0.21	
Control Delay		6.5			23.8			34.8			23.0	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		6.6			23.8			34.8			23.0	
LOS		A			C			C			C	
Approach Delay		6.6			23.8			34.8			23.0	
Approach LOS		A			C			C			C	
Queue Length 50th (ft)		45			186			192			45	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Length 95th (ft)		64			237			#335			86	
Internal Link Dist (ft)		332			358			317			332	
Turn Bay Length (ft)												
Base Capacity (vph)		1768			1486			556			518	
Starvation Cap Reductn		63			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.53			0.47			0.76			0.21	

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 40 (44%), Referenced to phase 1: and 6:EBTL, Start of Green
Natural Cycle: 55
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.76
Intersection Signal Delay: 18.7 Intersection LOS: B
Intersection Capacity Utilization 87.2% ICU Level of Service E
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Splits and Phases: 19: College & Morrison



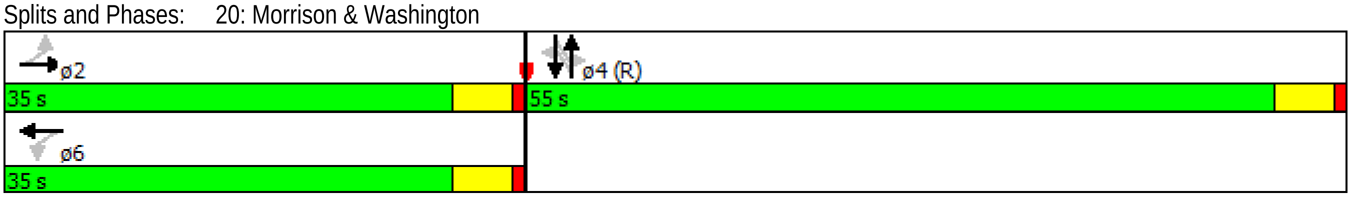
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	7	178	22	22	79	13	96	69	25	22	44	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		0	0		0	100		0	0		0
Storage Lanes	0		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.986			0.984			0.982			0.966	
Flt Protected		0.998			0.990			0.975			0.988	
Satd. Flow (prot)	0	1833	0	0	1815	0	0	1783	0	0	1778	0
Flt Permitted		0.992			0.923			0.818			0.913	
Satd. Flow (perm)	0	1822	0	0	1692	0	0	1496	0	0	1643	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7			8			14			25	
Link Speed (mph)		25			25			25			25	
Link Distance (ft)		407			414			412			393	
Travel Time (s)		11.1			11.3			11.2			10.7	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	8	200	25	25	89	15	108	78	28	25	49	25
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	233	0	0	129	0	0	214	0	0	99	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			4			4	
Permitted Phases	2			6			4			4		
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0		23.0	23.0	
Total Split (s)	35.0	35.0		35.0	35.0		55.0	55.0		55.0	55.0	
Total Split (%)	38.9%	38.9%		38.9%	38.9%		61.1%	61.1%		61.1%	61.1%	
Maximum Green (s)	30.0	30.0		30.0	30.0		50.0	50.0		50.0	50.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		1.0	1.0	
Lost Time Adjust (s)		-2.0			-2.0			-2.0			-1.0	
Total Lost Time (s)		3.0			3.0			3.0			4.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		7.0	7.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)		32.0			32.0			52.0			51.0	
Actuated g/C Ratio		0.36			0.36			0.58			0.57	
v/c Ratio		0.36			0.21			0.25			0.11	
Control Delay		22.7			20.1			6.2			2.9	
Queue Delay		0.0			0.0			0.0			0.0	
Total Delay		22.7			20.1			6.2			2.9	
LOS		C			C			A			A	
Approach Delay		22.7			20.1			6.2			2.9	
Approach LOS		C			C			A			A	
Queue Length 50th (ft)		93			47			31			10	
Queue Length 95th (ft)		152			88			m49			19	
Internal Link Dist (ft)		327			334			332			313	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)												
Base Capacity (vph)		652			606			870			941	
Starvation Cap Reductn		0			0			0			0	
Spillback Cap Reductn		0			0			0			0	
Storage Cap Reductn		0			0			0			0	
Reduced v/c Ratio		0.36			0.21			0.25			0.11	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 81 (90%), Referenced to phase 4:NBSB, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.36	
Intersection Signal Delay: 14.1	Intersection LOS: B
Intersection Capacity Utilization 39.2%	ICU Level of Service A
Analysis Period (min) 15	

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

Splits and Phases: 20: Morrison & Washington

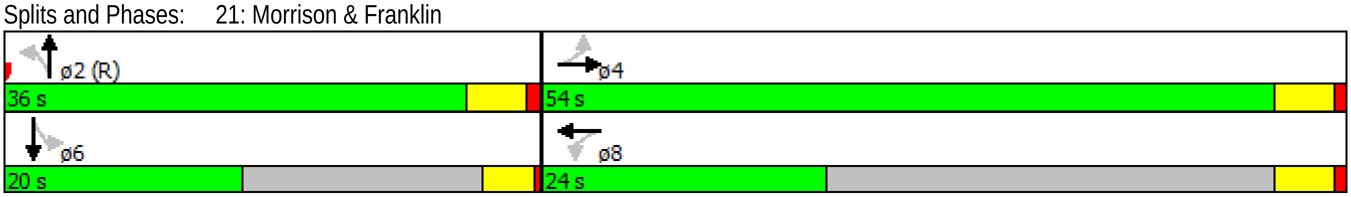


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	212	21	21	141	12	31	74	30	20	51	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	150		0	0		0	300		0	0		0
Storage Lanes	1		0	0		0	0		0	0		0
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.986			0.991			0.970			0.969	
Flt Protected	0.950				0.994			0.989			0.989	
Satd. Flow (prot)	1770	1837	0	0	1835	0	0	1787	0	0	1785	0
Flt Permitted	0.635				0.953			0.928			0.935	
Satd. Flow (perm)	1183	1837	0	0	1759	0	0	1677	0	0	1688	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		9			7			18			19	
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		417			894			393			308	
Travel Time (s)		10.2			21.8			10.7			8.4	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	11	228	23	23	152	13	33	80	32	22	55	23
Shared Lane Traffic (%)												
Lane Group Flow (vph)	11	251	0	0	188	0	0	145	0	0	100	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Minimum Split (s)	23.0	23.0		23.0	23.0		23.0	23.0		20.0	20.0	
Total Split (s)	54.0	54.0		24.0	24.0		36.0	36.0		20.0	20.0	
Total Split (%)	60.0%	60.0%		26.7%	26.7%		40.0%	40.0%		22.2%	22.2%	
Maximum Green (s)	49.0	49.0		19.0	19.0		31.0	31.0		16.0	16.0	
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		3.5	3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0		1.0	1.0		0.5	0.5	
Lost Time Adjust (s)	-1.0	-2.0			-2.0			-1.0			-1.0	
Total Lost Time (s)	4.0	3.0			3.0			4.0			3.0	
Lead/Lag												
Lead-Lag Optimize?												
Walk Time (s)	7.0	7.0		7.0	7.0		7.0	7.0		5.0	5.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0		0	0		0	0	
Act Effct Green (s)	50.0	51.0			51.0			32.0			33.0	
Actuated g/C Ratio	0.56	0.57			0.57			0.36			0.37	
v/c Ratio	0.02	0.24			0.19			0.24			0.16	
Control Delay	3.5	3.1			9.7			21.1			16.3	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	3.5	3.1			9.7			21.1			16.3	
LOS	A	A			A			C			B	
Approach Delay		3.1			9.7			21.1			16.3	
Approach LOS		A			A			C			B	
Queue Length 50th (ft)	1	14			46			55			30	
Queue Length 95th (ft)	3	25			80			97			65	
Internal Link Dist (ft)		337			814			313			228	

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Turn Bay Length (ft)	150											
Base Capacity (vph)	657	1044			999			607			630	
Starvation Cap Reductn	0	0			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.02	0.24			0.19			0.24			0.16	

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 75 (83%), Referenced to phase 2:NBTL, Start of Green	
Natural Cycle: 50	
Control Type: Pretimed	
Maximum v/c Ratio: 0.24	
Intersection Signal Delay: 10.5	Intersection LOS: B
Intersection Capacity Utilization 41.9%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 21: Morrison & Franklin



Intersection	
Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	11	11	11	0	11	2	4	0	36	37	3
Peak Hour Factor	0.92	0.83	0.83	0.83	0.92	0.83	0.83	0.83	0.92	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	13	13	13	0	13	2	5	0	43	45	4
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	7.3	7.4	7.7
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	47%	33%	65%	32%
Vol Thru, %	49%	33%	12%	30%
Vol Right, %	4%	33%	24%	38%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	76	33	17	37
LT Vol	37	11	2	11
Through Vol	3	11	4	14
RT Vol	36	11	11	12
Lane Flow Rate	92	40	20	45
Geometry Grp	1	1	1	1
Degree of Util (X)	0.105	0.045	0.024	0.049
Departure Headway (Hd)	4.143	4.051	4.188	3.944
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	863	874	845	901
Service Time	2.182	2.12	2.261	1.997
HCM Lane V/C Ratio	0.107	0.046	0.024	0.05
HCM Control Delay	7.7	7.3	7.4	7.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.4	0.1	0.1	0.2

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	12	11	14
Peak Hour Factor	0.92	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	14	13	17
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	7.2
HCM LOS	A

Lane

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Vol, veh/h	0	55	5	30	0	21	66	18	0	10	112	65
Peak Hour Factor	1.00	0.90	0.90	0.90	1.00	0.90	0.90	0.90	1.00	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	61	6	33	0	23	73	20	0	11	124	72
Number of Lanes	0	0	1	0	0	0	1	0	0	0	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	1	1	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	1	1
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	1	1	1
HCM Control Delay	8.4	8.5	8.8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	5%	61%	20%	12%
Vol Thru, %	60%	6%	63%	83%
Vol Right, %	35%	33%	17%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	187	90	105	66
LT Vol	112	5	66	55
Through Vol	65	30	18	3
RT Vol	10	55	21	8
Lane Flow Rate	208	100	117	73
Geometry Grp	1	1	1	1
Degree of Util (X)	0.25	0.129	0.15	0.095
Departure Headway (Hd)	4.334	4.635	4.629	4.675
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	829	773	775	766
Service Time	2.361	2.667	2.66	2.708
HCM Lane V/C Ratio	0.251	0.129	0.151	0.095
HCM Control Delay	8.8	8.4	8.5	8.2
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	1	0.4	0.5	0.3

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Vol, veh/h	0	8	55	3
Peak Hour Factor	1.00	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	9	61	3
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	1
Conflicting Approach Left	WB
Conflicting Lanes Left	1
Conflicting Approach Right	EB
Conflicting Lanes Right	1
HCM Control Delay	8.2
HCM LOS	A

Lane

Appendix K

College Avenue Road Diet (Alt. 3) Traffic Analysis

AECOM
1350 Deming Way
Suite 100
Middleton, WI 53562
www.aecom.com

608 836 9800 tel
608 836 9767 fax

Memorandum

To	Amy Canfield, P.E. - AECOM	Page	1
CC			
Subject	Operational Analysis – College Avenue Road Diet		
From	Jeff Sandberg, P.E. – AECOM Derek Salomonsen, EIT - AECOM		
Date	July 21, 2016		

As part of the Downtown Appleton Mobility Study, AECOM completed an analysis of an alternative for a road diet along College Ave. This alternative will allow for better pedestrian and bicycle accommodations through downtown Appleton. The analysis area was for the intersection of College Ave. & Appleton St.

OPERATIONAL ANALYSIS

The road diet would extend from Richmond St. to Drew St. with a lane being added/dropped between Richmond St. and State St. to the west and a lane added/ dropped between Durkee St. and Drew St to the east. The intersection of College Ave. & Appleton St. is the critical point of the College Ave. corridor, and was the controlling intersection for the analysis. Intersection operations were analyzed for the PM peak hour (4:30 – 5:30 PM) in the existing year and the design year (2036). An eastbound right-turn lane was included for the intersection of College Ave. & Appleton St. and will require the removal of parking and pedestrian bump-outs. Intersection operations were analyzed for the PM peak hour (4:30 – 5:30 PM) in the existing year and the design year. See attached reports for the College Ave. & Appleton St. synchro reports.

Existing Year – College Ave. & Appleton St.

- Intersection Level of Service (LOS) B.
    - All movements are LOS C or better.
    - Eastbound through movement has over 500 ft. of queuing with potential of queue spillback into adjacent intersection.

Future Year (2036) – College Ave. & Appleton St.

- Intersection Level of Service (LOS) E.
    - Included leading pedestrian intervals (LPI) for all pedestrian movements.
    - Eastbound through movement is LOS F.
        - Over 100 seconds of delay.
        - Over 750 ft. of queuing with queue spillback into adjacent intersection. These queues are likely to propagate along College Ave.
    - All other movements are LOS D or better.

CONCLUSION

The alternative for a College Ave. road diet is not feasible. The intersection of College Ave. & Appleton St. has operational issues in the existing year and design year. Operational issues are severe for the eastbound direction along College Ave. Other operational issues are likely along College Ave., with the intersection of College Ave. & Appleton St. being the worst.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↱	↰	↑						↰↑	↱
Volume (vph)	0	661	77	54	536	0	0	0	0	63	351	165
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	100		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Frt			0.850									0.850
Flt Protected				0.950							0.992	
Satd. Flow (prot)	0	1397	1583	1770	1397	0	0	0	0	0	3511	1583
Flt Permitted				0.242							0.992	
Satd. Flow (perm)	0	1397	1583	451	1397	0	0	0	0	0	3511	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			85									174
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		412			323			394			213	
Travel Time (s)		10.0			7.9			10.7			5.8	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Parking (#/hr)		30			30							
Adj. Flow (vph)	0	696	81	57	564	0	0	0	0	66	369	174
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	696	81	57	564	0	0	0	0	0	435	174
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Detector Phase		6	6	5	2					4	4	4
Switch Phase												
Minimum Initial (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Minimum Split (s)		23.0	23.0	9.0	23.0					23.0	23.0	23.0
Total Split (s)		58.0	58.0	9.0	67.0					23.0	23.0	23.0
Total Split (%)		64.4%	64.4%	10.0%	74.4%					25.6%	25.6%	25.6%
Maximum Green (s)		53.5	53.5	4.0	62.0					18.0	18.0	18.0
Yellow Time (s)		3.5	3.5	4.0	4.0					4.0	4.0	4.0
All-Red Time (s)		1.0	1.0	1.0	1.0					1.0	1.0	1.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0	-1.0						-2.0	-2.0
Total Lost Time (s)		3.5	3.5	4.0	4.0						3.0	3.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Recall Mode		Max	Max	C-Max	C-Max					Max	Max	Max
Walk Time (s)		7.0	7.0		7.0					7.0	7.0	7.0
Flash Dont Walk (s)		11.0	11.0		11.0					11.0	11.0	11.0
Pedestrian Calls (#/hr)		0	0		9					9	9	9
Act Effct Green (s)		54.5	54.5	63.0	63.0						20.0	20.0
Actuated g/C Ratio		0.61	0.61	0.70	0.70						0.22	0.22
v/c Ratio		0.82	0.08	0.15	0.58						0.56	0.36
Control Delay		16.7	0.9	4.7	7.6						34.3	7.1
Queue Delay		0.0	0.0	0.0	0.3						0.0	0.0
Total Delay		16.7	0.9	4.7	7.9						34.3	7.1

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS		B	A	A	A						C	A
Approach Delay		15.0			7.6						26.5	
Approach LOS		B			A						C	
Queue Length 50th (ft)		93	0	6	98						116	0
Queue Length 95th (ft)		#539	m5	m15	161						164	50
Internal Link Dist (ft)		332			243			314			133	
Turn Bay Length (ft)			100	100								
Base Capacity (vph)		845	992	388	977						780	487
Starvation Cap Reductn		0	0	0	89						0	0
Spillback Cap Reductn		0	0	0	0						0	0
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		0.82	0.08	0.15	0.64						0.56	0.36

Intersection Summary

Area Type: Other
Cycle Length: 90
Actuated Cycle Length: 90
Offset: 80 (89%), Referenced to phase 2:WBTL and 5:WBL, Start of Green
Natural Cycle: 80
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.82
Intersection Signal Delay: 16.2 Intersection LOS: B
Intersection Capacity Utilization 59.7% ICU Level of Service B
Analysis Period (min) 15
\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 15: Appleton St & College Ave

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	753	142	57	568	0	0	0	0	67	372	184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	0		100	100		0	0		0	0		0
Storage Lanes	0		1	1		0	0		0	0		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00
Ped Bike Factor			0.94								0.98	0.87
Frt			0.850									0.850
Flt Protected				0.950							0.992	
Satd. Flow (prot)	0	1397	1583	1770	1397	0	0	0	0	0	3511	1583
Flt Permitted				0.149							0.992	
Satd. Flow (perm)	0	1397	1483	278	1397	0	0	0	0	0	3435	1370
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			145									194
Link Speed (mph)		28			28			25			25	
Link Distance (ft)		412			323			394			213	
Travel Time (s)		10.0			7.9			10.7			5.8	
Confl. Peds. (#/hr)	55		29	29		55	39		47	47		39
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Parking (#/hr)		30			30							
Adj. Flow (vph)	0	793	149	60	598	0	0	0	0	71	392	194
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	793	149	60	598	0	0	0	0	0	463	194
Turn Type		NA	Perm	pm+pt	NA					Perm	NA	Perm
Protected Phases		6		5	2						4	
Permitted Phases			6	2						4		4
Detector Phase		6	6	5	2					4	4	4
Switch Phase												
Minimum Initial (s)		8.0	8.0	4.0	8.0					8.0	8.0	8.0
Minimum Split (s)		26.0	26.0	11.0	26.0					24.0	24.0	24.0
Total Split (s)		55.0	55.0	11.0	66.0					24.0	24.0	24.0
Total Split (%)		61.1%	61.1%	12.2%	73.3%					26.7%	26.7%	26.7%
Maximum Green (s)		47.0	47.0	4.0	58.0					16.0	16.0	16.0
Yellow Time (s)		4.0	4.0	3.0	4.0					4.0	4.0	4.0
All-Red Time (s)		4.0	4.0	4.0	4.0					4.0	4.0	4.0
Lost Time Adjust (s)		-1.0	-1.0	-1.0	-1.0						-2.0	-2.0
Total Lost Time (s)		7.0	7.0	6.0	7.0						6.0	6.0
Lead/Lag		Lag	Lag	Lead								
Lead-Lag Optimize?												
Vehicle Extension (s)		3.0	3.0	3.0	3.0					3.0	3.0	3.0
Recall Mode		C-Max	C-Max	Max	C-Max					Max	Max	Max
Walk Time (s)		4.0	4.0		4.0					4.0	4.0	4.0
Flash Dont Walk (s)		11.0	11.0		11.0					11.0	11.0	11.0
Pedestrian Calls (#/hr)		15	15		25					20	20	20
Act Effct Green (s)		48.0	48.0	60.0	59.0						18.0	18.0
Actuated g/C Ratio		0.53	0.53	0.67	0.66						0.20	0.20
v/c Ratio		1.06	0.17	0.22	0.65						0.67	0.45
Control Delay		58.8	0.8	4.5	6.7						38.9	8.5

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Queue Delay		10.3	0.0	0.0	0.5						0.0	0.0
Total Delay		69.1	0.8	4.5	7.2						38.9	8.6
LOS		E	A	A	A						D	A
Approach Delay		58.3			7.0						29.9	
Approach LOS		E			A						C	
Queue Length 50th (ft)		~508	0	5	60						128	0
Queue Length 95th (ft)		#715	m5	m14	127						181	55
Internal Link Dist (ft)		332			243			314			133	
Turn Bay Length (ft)			100	100								
Base Capacity (vph)		745	858	268	915						687	429
Starvation Cap Reductn		0	0	0	80						0	0
Spillback Cap Reductn		18	0	0	8						0	1
Storage Cap Reductn		0	0	0	0						0	0
Reduced v/c Ratio		1.09	0.17	0.22	0.72						0.67	0.45

Intersection Summary	
Area Type: Other	
Cycle Length: 90	
Actuated Cycle Length: 90	
Offset: 35 (39%), Referenced to phase 2:WBTL and 6:EBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.06	
Intersection Signal Delay: 35.1	Intersection LOS: D
Intersection Capacity Utilization 73.7%	ICU Level of Service D
Analysis Period (min) 15	

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

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

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

Splits and Phases: 15: Appleton St & College Ave

Appendix L

Stakeholders Meeting Minutes

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Memorandum

To	Eric Lom, P.E. – City of Appleton
CC	Mike Hardy – City of Appleton Paula Vandehey – City of Appleton
Subject	**Minutes – 2/3/2016 Stakeholders Meeting** Downtown Appleton Mobility Study AECOM Project No. 60445894
From	Amy Canfield, P.E. – AECOM
Date	February 4, 2016

On Wednesday, February 3, 2016 a stakeholders meeting was held in Appleton for the Downtown Appleton Mobility Study. The purpose of the meeting was to educate the stakeholders on the purpose of the study, the issues identified by the project team, and gather their thoughts on existing mobility issues and improvement ideas. A copy of the presentation is attached for reference. The following people attended the meeting:

Name	Representing
Nicholas Hoffman	History Museum
Dan Sandmeier	Valley Transit
Chad Doran	Communications Specialist, Mayor's Office, City of Appleton
Jake Woodford	Lawrence University
Danielle Englebert	YMCA
Monica Stage	Community & Economic Development, City of Appleton
Todd Freeman	Police Department, City of Appleton
Colleen Rortvedt	Library, City of Appleton
Jennifer Stephany	Appleton Downtown, Inc.
Tim Hanna	Mayor, City of Appleton
Joe Sargent	Appleton Area School District
Joe Martin	Alderperson, City of Appleton
Vered Meltzer	Alderperson, City of Appleton
Patti Coenen	Alderperson, City of Appleton
Paula Vandehey	City of Appleton Director of Public Works
Eric Lom	City of Appleton Traffic
Mike Hardy	City of Appleton Traffic
Amy Canfield	AECOM
Kevin Luecke	Toole Design Group

The following people were invited but unable to attend the meeting:

Name	Representing
Tom Flick	Parks and Recreation, City of Appleton
William Siebers	Alderperson, City of Appleton
Kurt Eggebrecht	Health Department, City of Appleton
Bill Collins	Student, University of Wisconsin

The purpose of the Downtown Appleton Mobility Plan study is to determine and evaluate strategies to improve multi-modal mobility and traffic circulation in downtown Appleton. The study area is bounded by Richmond Street/Memorial Drive to the west, the Fox River to the south, Lawe Street to the east, and Atlantic street to the north.

To date, the study team has conducted PM peak hour traffic counts at several downtown intersections, worked with the East Central Wisconsin Regional Planning Commission (ECWRPC) to develop traffic forecasts, held meetings with City traffic staff and completed an existing conditions report.

The majority of the meeting centered around discussing mobility issues from a bicycle, pedestrian and traffic perspective. The study team highlighted the following key issues:

- Crossing streets and getting to the waterfront can be problematic (bike/ped issue)
- Many streets are good for bicycling, but they rarely have destinations people want to get to (bike/ped issue)
- Bicycle parking is essentially non-existent downtown (bike/ped issue)
- There is an oversupply of car parking throughout downtown (bike/ped/traffic opportunity)
- No serious traffic congestion is anticipated in the study area for the next 20 years (bike/ped/traffic opportunity)
- Northbound routing through downtown Appleton is very confusing (traffic issue)
- Almost all of the confusing intersections in the study area are a result of confusing northbound routing (traffic issue)
- Two traffic signals on Franklin Street could be removed (traffic issue)
- Truck routing is confusing

The stakeholders, who were seated in small groups, identified several additional bicycle, pedestrian and traffic issues for the study team to consider. Following the identification of existing issues, the stakeholders were asked to brainstorm improvement ideas for the downtown area. The following sections note the issues and improvement ideas identified by the stakeholders. Some of the issues/ideas may be edited for clarity. A copy of each group's original comments is attached for reference.

Bicycle & Pedestrian Issues

Group A Members: Doran, Hoffman, Meltzer, Sandmeier

- All right turns on to College Avenue are scary! Vehicles impede on pedestrian's right of way.
- Connections to the river need to be clearly defined.

- Connections for bikes and pedestrians traveling east-west off of College Avenue are needed – especially on the south side of downtown.
- Pedestrian-friendliness of sidewalks decreases the further you are from College Avenue. Lighting is poor.
- Awkward and dangerous streets / crossings exist.

Group B Members: Coenen, Sargent, Stephany, Hanna

- Bike access and flow around the S. Appleton St./ Lawrence St. area.
- Very difficult to bike near the YMCA and N. Morrison St./ Lawrence St. area.
- Biking to businesses throughout downtown is difficult.
- Drew St. south of College Ave. is an issue for both bikes and pedestrians.

Group C Members: Rortvedt, Freeman, Hardy

- East College Ave. crosswalks near the Lawrence University campus have safety and traffic movement issues
- Lighting for bikes / pedestrians at the transition perimeter from residential to business district.
- Bike violations on College Ave. sidewalks are common. Consider bike corrals around the corner to promote riding off of College Ave.
- Pedestrian crossings on Memorial Drive (WIS 47) south of College Ave. are lacking.
- Bike connection to riverfront needed near Jones Park. It is not easy to access the waterfront by bike.
- Bike trails leading into downtown needed as an alternative to vehicles.
- Pedestrian crossing an issue at College Avenue and Durkee St. intersection.

Group D Members: Dani, Joe, Jake, Monica

- Lawrence crosswalks - improve functionality, placement, pedestrian awareness, traffic speed, special event logistics.
- YMCA – it’s hard to bike to, difficult for pedestrian crossing, and angle parking is unsafe
- S. Appleton St. – consider trucks turning toward expo center
- Curve of S/E Water St is sharp and the crosswalk is located at a blind spot
- E. Water bike share road
- Access to river front lacking. Stairs are unmarked. Need lighting.
- Peds crossing Washington St. to get from mall/ work to ramps

Traffic Issues

Group A Members: Doran, Hoffman, Meltzer, Sandmeier

- Better directions / routing / awareness of parking ramps
- The perception of traffic downtown is closely tied to the longer route to get there. West College Ave. needs beautification / less stopping.
- North / south connector needs to be improved to provide better access to Wisconsin Ave.
- Better communication when College Ave. is closed for specific events
- The awkwardness of Lawrence Street

- Digital counters to show number of open parking spaces in ramps so people aren't afraid to go in and find a spot

Group B Members: Sargent, Coenen, Stephany, Hanna

- Access for growth off of the Lawrence St. / Elm St. area
- Potential of YMCA ramp being built in a different location and how that could help the traffic flow in this area
- Traffic flows when College Ave. is closed for special events
- Look at widths of streets and how that could help the downtown

Group C Members: Freeman, Rortvedt

- A left turn arrow / lane are needed at College Ave. / Division St. intersection. The PAC has done a poor job communicating the need to use STH 47 / Franklin / Division.
- Left turns are problematic at intersections without left turn arrows.
- One-way Morrison Street
- People turn from alley the wrong way on Durkee Street because they don't realize it is 1-way

Group D Members: Monica, Jake, Dani, Joe

- Re-evaluate whether a traffic signal is needed at the Franklin St. and Drew St. intersection. Keep N/S traffic flowing.
- N. Oneida St. / Packard St. wait time very long at traffic signal.
- YMCA – the traffic lights along Morrison St. for pedestrian crossing need changes. The Lawrence St. / Morrison St. converge is confusing.
- Special events – plan traffic flow to keep accessibility to businesses. One way streets are difficult.
- Appleton St. – consider the possibility for it to be 2-ways
- S. Jackman St. down to the river is confusing

Improvement Ideas to Consider

Group A Members: Doran, Hoffman, Meltzer, Sandmeier

- John St. bike and pedestrian connection to downtown cutting through Lawrence University needed.
- Reconfigure College Ave. Add bike racks, slow down traffic speed, reconfigure lanes and parking on street, bike lanes.
- Protected bike lanes (on College Ave especially)
- Add residential options downtown so people can opt to live downtown instead of commute. Downtown housing options need to be affordable in order to attract people who currently commute.
- Make Valley Transit 2 stories and consolidate Valley Transit offices
- Clarify difference between city-owned ramps and private parking ramps
- Many opportunities to improve signage

Group B Members: Sargent, Coenen, Stephany, Hanna

- Left turn arrow on at Division St. / College Ave. intersection
- Two-way S. Appleton St. and what would make it work
- Consider whether traffic signal at Drew St. / Franklin St. is needed

Group C Members: Freeman, Rortvedt, Hardy

- Make journey, city travel, more enjoyable, i.e. like Houdini plaza and other improvements along the way
- Bike parking / repair stations (tire air / repair) needed
- Like separated / good contrast between bikes and vehicles

Group D Members: Monica, Jake, Joe, Dani

- More bike lockers and bike racks needed.
- Ped/ bike access is needed from S. Appleton St. down to Jones Park
- Build up Washington St. / Lawrence St. with more pedestrian/ bike facilities. Less parking and better utilization of wider streets.
- Possibly open up S. Appleton St. to 2-way traffic with bike lane.
- Wayfinding improvements needed.
- Reorient parking in front of YMCA to building side instead of across the street.

Group Members (last names): Doran, Hoffman, Meltzer, Schmeier

Bicycle & Pedestrian Issues – What's Missing?

1. All right turns on to College are scary! Vehicles impeding on pedestrian right-a-ways.

2. Connections to the river → clearly defined.

3. Connections by bike + ped going east-west off College Ave on South side.

4. Any sidewalks ~ pedestrian friendly off College. Quality falls farther from College. Poor lighting.

5. Specific ~~[illegible]~~ awkward and dangerous streets/crossings. See Map!

Other thoughts:

Group Members (last names): Coenen, Sargent, Stephany, Hanna

Bicycle & Pedestrian Issues – What's Missing?

1. S. Appleton St / Lawrence Bike access & flow
2. YMCA -> N. Morrison / Lawrence very difficult to bike near.
3. Biking to businesses throughout downtown.
4. Drew St. south of college is an issue for both bikes & peds.
5.

Other thoughts:

Downtown Appleton Mobility Study
Stakeholders Meeting – February 3, 2016

Group Members (last names): Rortvedt / Freeman / Hardy

Bicycle & Pedestrian Issues – What's Missing?

1. E. College crosswalks - LU campus - safety + traffic movement.
2. Lighting for bike/ped - transition perimeter from residential to business district.
3. Bike violations on College Ave sidewalks - bike corrals around corner to promote off College riding?
4. Pedestrian crossings on STH 47 south of College - lacking
5. Bike connection to river front near Jones Park? - not easy access to waterfront by bike.

Other thoughts: - Bike trails leading into downtown - alternative ~~of~~ to vehicles.

Pedestrian crossing at college & Durkee

Downtown Appleton Mobility Study
Stakeholders Meeting – February 3, 2016

Group Members (last names): Dani, Joe, Jake, Monica

Bicycle & Pedestrian Issues – What's Missing?

1. Lawrence Crosswalks - improve functionality, placement, ped awareness traffic speed, special event logistics
2. YMCA - hard to bike to, ped crossings (3) parking on opposite side road angle unsafe
3. S. Appleton St - trucks turning toward expo center
4. Curve of S/E Water St (sharp) crosswalk located at a blind spot
5. E Water Bike Share road (Shared)

Access to river front lacking, stairs unmarked, lighted

Other thoughts:

- Peds crossing Washington St. to get from mall/work to ramps

Downtown Appleton Mobility Study
Stakeholders Meeting – February 3, 2016

Group Members (last names): Doran, Hoffman, Meltzer, ~~[illegible]~~ Sandmeier

Traffic Issues – What's Missing?

1. Better direction/routing/awareness of parking ramps.

2. The perception of traffic downtown is closely tied to the longer route to get there → Ex: West College needs beautification/less stopping.

3. North/South connector improved. → especially to Wisconsin Ave.

4. Better communication when College closed for special events.

5. The awkwardness of Lawrence Street.

Other thoughts:

Digital counters to show # open parking spaces in ramps so people aren't afraid to go in & find a spot.

Downtown Appleton Mobility Study
Stakeholders Meeting – February 3, 2016

Group Members (last names): Sargent, Coenen, Stephany, Hanna

Traffic Issues – What's Missing?

1. Access for growth down off of the Lawrence / Elm area

2. Potential of YMCA ramp being built in a different location & how that could help the traffic flow in this area.
3. Traffic flows when college Ave is closed for Special Events.

4. Look at widths of streets & how that could help the downtown.

5.

Other thoughts:

Downtown Appleton Mobility Study
Stakeholders Meeting – February 3, 2016

Group Members (last names): Freeman / Rortvedt

Traffic Issues – What's Missing?

1. No left turn arrow / lane at College / Division - PAC has done a poor job communicating the need to use STH 47 / Franklin / Division.
2. Left turns are problematic at non-arrowed intersections.
3. One-way (Morrison St.) (Durkee - 100 S.) Appleton St.
4.
5.

Other thoughts:

Downtown Appleton Mobility Study
Stakeholders Meeting – February 3, 2016

Group Members (last names): Monica Jake, Dani, Joe

Traffic Issues – What's Missing?

1. Franklin & Drew reevaluate whether to have signal, keep N/S traffic flow
2. N Oneida / Packard wait time very long for traffic
3. YMCA - 3 lights on Morrison St
   Ped crossing / traffic light changes needed
   Lawrence St / Morrison converging together
4. Special events → plan flow to keep accessibility to businesses – one way streets
5. Appleton - two way possibility

   S Jackman down to river confusing

Other thoughts:

Group Members (last names): Metzger, Sandmeier, Doran, Hoffman

Improvement Ideas to Consider

1. John St bike & ped connection to downtown cutting through Lawrence University.
2. Reconfigure College Ave. Add bike racks, slow down traffic speed, reconfigure lanes & parking on street, bike lanes.
3. Protected bike lanes (on College Ave especially)
4. Add residential options downtown so ppl can opt to live downtown instead of commute.
5. Make Valley Transit 2 stories & consolidate VT offices

Other thoughts:

~~[illegible] between Blue Ramp & YMCA Ramp [illegible] walk [illegible]~~

Clarify difference between city-owned ramps & private parking ramps.

many opportunities to improve signage.

Downtown housing options need to be affordable in order to [illegible] attract ppl who currently commute.

Group Members (last names): Sargent, Coenen, Stephany, Hanna

Improvement Ideas to Consider

1. Left turn arrow on Division/College
2. Two-way S. Appleton and what would make it work.
3. Lights @ Drew/Franklin - is it needed.
4.
5.

Other thoughts:

Downtown Appleton Mobility Study
Stakeholders Meeting – February 3, 2016

Group Members (last names): FREEMAN / RORTVEDT / HARDY

Improvement Ideas to Consider

1. MAKE JOURNEY, CITY TRAVEL, MORE ENJOYABLE ie. like HOUDINI PLAZA & OTHER IMPROVEMENTS ALONG THE WAY
2. BIKE PARKING / REPAIR STATIONS. (TIRE AIR / REPAIR)
3. LIKE SEPARATED / GOOD CONTRAST BETWEEN BIKES & VEHICLES
4.
5.

Other thoughts:

Downtown Appleton Mobility Study
Stakeholders Meeting – February 3, 2016

Group Members (last names): Monica, Jake, Joe, Dani

Improvement Ideas to Consider

* 1. Bike lockers, more racks,

* 2. Ped / Bike access down thru S Appleton down to Jones Park

3. ~~College ... ?~~ or

* Build up Washing / Lawrence with more ped/bike and ... cross connections streets are wider, less parking

4. better utilization of wider streets

* 5. Possible open up Appleton St to two way w/ bike lane

* Wayfinding improvement

* Reorient parking in front of Y to building side instead of across the street.

Other thoughts:

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Memorandum

To	Eric Lom, P.E. – City of Appleton
CC	Mike Hardy – City of Appleton Paula Vandehey – City of Appleton
Subject	**Minutes – 3/21/2016 Stakeholders Meeting** Downtown Appleton Mobility Study AECOM Project No. 60445894
From	Amy Canfield, P.E. – AECOM
Date	April 4, 2016

On Monday, March 21, 2016 a stakeholders meeting was held in Appleton for the Downtown Appleton Mobility Study. The purpose of the meeting was to educate the stakeholders on the purpose of the study, the issues identified by the project team, and gather their thoughts on traffic, bicycle and pedestrian improvement alternative ideas. A copy of the presentation is attached for reference. The following people attended the meeting:

Name	Representing
Nick Hoffman	History Museum
Chad Doran	Communications Specialist, Mayor's Office, City of Appleton
Jake Woodford	Lawrence University
Danielle Englebert	YMCA
Monica Stage	Community & Economic Development, City of Appleton
Todd Freeman	Police Department, City of Appleton
Colleen Rortvedt	Library, City of Appleton
Jennifer Stephany	Appleton Downtown, Inc.
Joe Sargent	Appleton Area School District
Joe Martin	Alderperson, City of Appleton
Vered Meltzer	Alderperson, City of Appleton
Patti Coenen	Alderperson, City of Appleton
Kurt Eggebrecht	Health Department, City of Appleton
Jeanne Roberts	League of Women Voters
Penny Robinson	League of Women Voters
Melissa Kraemer Badtke	East Central Wisconsin Regional Planning Commission (ECWRPC)
Paula Vandehey	City of Appleton Director of Public Works
Eric Lom	City of Appleton Traffic
Mike Hardy	City of Appleton Traffic
Amy Canfield	AECOM
Kevin Luecke	Toole Design Group

The following people were invited but unable to attend the meeting:

Name	Representing
Tom Flick	Parks and Recreation, City of Appleton
William Siebers	Alderperson, City of Appleton
Bill Collins	Student, University of Wisconsin

The purpose of the Downtown Appleton Mobility Plan study is to determine and evaluate strategies to improve multi-modal mobility and traffic circulation in downtown Appleton. The study area is bounded by Richmond Street/Memorial Drive to the west, the Fox River to the south, Lawe Street to the east, and Atlantic Street to the north.

Three traffic improvement ideas were presented.

1. Alternative 1: Maintain Northbound Routing
    a. This alternative would not change the way northbound traffic is currently routed through downtown via Morrison Street. There would be no major changes to the Lawrence Street / Morrison Street intersection.
    b. Traffic signals could be removed at the Franklin Street / Superior Street intersection and Franklin Street / Oneida Street intersection. Truck routing could be modified to use College Avenue. Traffic signals could be retimed to reduce delay.
2. Alternative 2: 2-way Appleton Street
    a. This alternative would convert Appleton Street to 2-way traffic, thereby making Appleton Street the main north/south route to / through downtown Appleton. Existing 1-way streets would be converted to 2-way streets and the intersection of Lawrence Street and Morrison Street would be reconfigured to return to a grid system.
    b. Traffic signals could be removed at the Franklin Street / Superior Street intersection and Franklin Street / Oneida Street intersection. Truck routing could be modified to use College Avenue. Traffic signals could be retimed to reduce delay. 4-way stop control could be converted to 2-way stop control at some intersections along Harris Street.
3. Alternative 3: College Avenue Road Diet
    a. This alternative would reduce the number of through lanes on College Avenue from 2 in each direction to 1 in each direction plus a two-way left turn lane in the middle of the road. Parking would be maintained and bicycle lanes would be added.
    b. This alternative would not change the way northbound traffic is currently routed through downtown via Morrison Street. There would be no major changes to the Lawrence Street / Morrison Street intersection.
    c. Traffic signals could be removed at the Franklin Street / Superior Street intersection and Franklin Street / Oneida Street intersection. Traffic signals could be retimed to reduce delay.
    d. From a traffic operations perspective, this alternative does not appear to operate favorably enough to be a long-term alternative for College Avenue. Significant delay is anticipated by the design year 2036. If this alternative were to receive significant support, it would need to be studied to a much

greater level of detail to determine if it was even feasible from a traffic standpoint.

The following pedestrian and bicycle alternatives were presented.

1. General recommendations for pedestrians:
   a. Mark crosswalks consistently
   b. Provide policies for sidewalk maintenance and ADA compliance
2. College Avenue Crossing at Lawrence University
   a. Evaluate if the current crossing is working well for all modes
3. Access to Water Street
   a. Provide better access to Water Street and the Fox River via a Grand Staircase
4. Recommended bicycle improvements included bike lanes, shared lane markings, bicycle boulevards, signed routes and off-road paths. A detailed map was provided in the presentation.
5. Several options for Packard Street were presented. All options reduced the typical section from 4 travel lanes to 2 and added either bike lanes, buffered bike lanes, or separated bike lanes.

The stakeholders, who were seated in small groups, were asked to reflect on the traffic, pedestrian and bicycle alternatives presented. The following tables note the opinions each stakeholder had on the alternatives. Some of the issues/ideas may be edited for clarity. A copy of each group's original comments is attached for reference.

Traffic Alternative Comments

Comment	Name / Representing
Alternative 3 is not appealing. Alternatives 1 and 2 have different appeal. Alternative 1 doesn't solve dominant issues. Love that Alternative 2 has more 2-way streets and a grid. Like having another dominant street (Appleton St.). Concern about expense. Concern about College Ave. / Appleton St. intersection.	Colleen Rortvedt Library
Alternative 2 – Removing parking on Appleton St. will create a disadvantage for businesses that front Appleton St. The Building for Kids relies on loading stalls on Appleton St. they are researching options for alternative locations. Worth exploring! Alternative 2 will improve direct route to Exhibition Center. Alternative 3 - Very concerned about traffic volume on College Ave. Not In support of Alternative 3. Alternative 2 - Is a bike lane on one side of Appleton St. an option? With parking on one side? Or bike lanes on Lawrence St. to Morrison St. to proceed northbound.	Jennifer Stephany Appleton Downtown, Inc.
Alternative 3 is a great concept, but not worth political capital needed to make most important changes. Alternative 2 makes good sense and restores order in downtown. Glad to see elimination of unneeded signals. Please fix Packard St!	Jake Woodford Lawrence University
Alternative 2 (Appleton St. 2-way) is a nice idea. Many unanswered / unknown questions – hesitant to encourage through traffic on N. Oneida	Todd Freeman Police Department

St. north of Pacific St. No way to College Ave. road diet (Alternative 3). Existing configuration works to dispense traffic east/ west fairly quickly without pushing it into neighborhoods north of downtown.	
I like Alternative 2: 2-way Appleton Street. I like the north and southbound bike lanes as I believe folks will use the route with or without lanes. Diverting bikes may not lead to the behavior intended.	Kurt Eggebrecht Health Department
Alternative 2, in my opinion, offers the most improvement to the system with minimal negative impact on the entire downtown. Maybe look at alternate bike lanes or a reduction to this design. Alt 3: I don't mind this design, but since it's going to be a struggle to make it work and cannot be accomplished with Alternative 2, I don't think it adds to the system. The north/south issue is much more important especially for the school district and reducing the traffic on Morrison St. and Harris St.	Joe Sargent School District
Alternative 3 seems to not be a solution for College Avenue. Time going through would increase, turn lanes would snarl traffic more. Cyclists would get hit by car doors. 2 lanes for traffic not enough here. I rate this alternative a 2 on a scale of 1-10. Alternative 2 is appealing but I wonder if enough traffic would be shed before they get to curve at Oneida. I'm worried about the intersection with College Ave. and Appleton St. I rate this alternative a 7 on a scale of 1-10. Alternative 3 is ok but signaling the pedestrian crossing is still best option, slightly better than Alternative 2. Alternative 2 would be better for visitors to city and to move traffic away from high volume business/ possible business congestion. I rate this alternative a 8 on a scale of 1-10.	Dani Englebert YMCA
Alternative 2 seems the best choice. Most bang for buck. Need to figure out loading zone for Appleton Street bars. I think the 1-way to 2-way conversion is the most beneficial charge we can make to improve traffic. Alternative 1 is too minimal and Alternative 3 is unfeasible in long term.	Vered Meltzer Alderperson
Alternative 2 seems to be most realistic. There would be a need to change the curved bridge that goes to Lawrence St and past the church.	Jeanne Roberts League of Women Voters
Alternative 2 seems to have the best possibility. The road diet on College Ave. does not make sense with a 4-lane bridge coming in on the east. Alternative 2 also allows for better bike lane accommodations and a more direct route north.	Patti Coenen Alderperson
Focus on Alternative 2 to fix current and future issues. Great 2-way traffic on Appleton St. and grid system! Consider rebuilding bridge south of Lawrence St. at this time and consider adding a multi-entry parking ramp with access from Rocky Bleir Run/ Water Street and entry from Lawrence Street in the area formerly used for the north bound bridge. Maybe this is a mixed use building?	Monica Stage Comm. & Econ. Dev. Dept.
Alternative 2 makes best use of space and improves Lawrence Street and makes north/south route clear for visitors. Also connects Houdini Plaza with bike infrastructure.	Nick Hoffman History Museum

I'm fine with losing some parking; we already have plenty throughout downtown. Restoring north/south routing is an often discussed problem. Visitors find that routing confusing and so do residents. What would it take to fix north/south routing and do the College Ave. road diet? If we go with Alternative 2, how could we still improve bike/ ped conditions on College Ave.?	Chad Doran Communications, City of Appleton
I like Alternative 2 which addresses the directional issues however as a bicyclist I'm concerned about getting the average community member out bicycling. You have to make it easy for them. Alternative 2 - are there transit routes on Appleton St.? If there are, with 10' travel lanes, buses are 10.5' and it could be problematic near Houdini Plaza. After looking and discussing ped & bike recommendations I would like to look at alternatives with College Ave.	Melissa Kraemer Badtke ECWRPC

Bicycle & Pedestrian Alternative Comments

Comment	Name / Representing
For the Grand Staircase, I would like to see something that allows for wheelchairs and bicycle access, not another set of stairs, and connects to Jones Park Path. I like Packard St. proposal and Lawrence St. lane proposals. Also like marking the route through Lawrence University. Connect Lawe St. north route with signed bike route.	Colleen Rortvedt Library
Love the access to Water St. grand staircase. Better path down into Jones Park - walk and bike across. Concerned about bike lane option on College Ave. For Packard St., the buffered bike lanes seem like the best option OR two way lane with better buffer. What would happen to parking on Washington St.? Need to retain parking on Lawrence St. with exhibition center coming.	Jennifer Stephany Appleton Downtown, Inc.
Look forward to discussing function of signals across College at the Lawrence campus and possible bike route through campus.	Jake Woodford Lawrence University
Bike lanes on College Ave. tough to do safely. There are parallel streets now which can be safely used for bikes- Lawrence St. / Washington St. Put bike lanes on them instead. With Wisconsin weather, bike/ ped commitments need to be kept reasonable. Lane marking is fine. An overall redo to try to significantly emphasize bikes is problematic. I like the Packard designs. Bike lanes/ shared left lanes and one lane each way.	Todd Freeman Police Department
I really like the separated bike lane concept. Packard St. with separated bike lane would be awesome.	Kurt Eggebrecht Health Department
What is the point of better access to the river on Water St.? I am not familiar with this area. Will it be used? I like the Packard options. It's a good street section to utilize buffered or separated bike lanes.	Joe Sargent School District
No bicycle lanes on College Ave., it's too tight. No road diet on College Ave. Definitely develop the bike/ ped on trestles to connect paths by the water front.	Dani Englebert YMCA

Grand stairway is epic and exciting! Road diet for Packard St. or buffered bike lanes would be a good improvement. Bike lanes on Lawrence St. and Washington St. can help divert bikes even though it can't divert cars. Signage is easy, inexpensive, and very necessary! Still significant ignorance about where to bike. Education is necessary.	Vered Meltzer Alderperson
Need for education of drivers regarding rights of bikers and pedestrians. Staircases are great. Bike lane improvements also look good.	Jeanne Roberts League of Women Voters
I like the idea of consistent and more visible street crossings. Changing Packard St. to 2 lanes is also a great idea with bike lanes that continue to bike boulevard on North St. Staircase is also a great addition to get easy access to water front.	Patti Coenen Alderperson
Road diet isn't a great option for traffic so the bike lanes on College Ave. aren't possible. However, building out the other street facilities would be a great improvement. I love the grand staircase and regular staircase to better connect the downtown and Fox River!	Monica Stage Comm. & Econ. Dev. Dept.
Bicycle boulevards are great! Consider more through the city - great for bike/ ped and slows traffic for kids playing in the yard. I would like to see more motion flashers on trail crossings on Newbery St. / Riverfront and outside the shady area on Apple Creek.	Nick Hoffman History Museum
If we don't add bike lanes on College Ave. how do we better sign Lawrence St. / Washington St. as primary routes? Need to add bike parking accommodation on College Ave. regardless of whether we add bike lanes there.	Chad Doran Communications, City of Appleton
Packard St. – I like that idea. Increased access to the riverfront. Pedestrian facilities. Build into Capital Improvement Plan. Work with ECWRPC on way finding routes.	Melissa Kraemer Badtke ECWRPC

Name: Colleen Rortvedt

Representing: Library

Traffic Alternatives – What are your thoughts?

Alt 3 is not appealing

Alts 1 & 2 have different appeal.

Alt. 1 doesn't solve dominant issues

Alt. 2 Love more 2-way streets and having grid.
Like having another dominant street (Appleton)
Concern about bridge expense
Concern about Appleton/College intersection

Bicycle & Pedestrian Alternatives – What are your thoughts?

"Grand staircase" would like something that allows for wheelchairs, bikes, not another set of stairs and connects to Jones Park Path.

I like ~~to~~ Packard St. Proposal and Lawrence Street lane proposals.
Also like marking the route through Lawrence.

Connect Lawe St ~~south~~ north route w/ Skyred bike route

Downtown Appleton Mobility Study
Stakeholders Meeting – March 21, 2016

Name: Jennifer Stephany

Representing: ADI

Traffic Alternatives – What are your thoughts?

2). • Businesses front on Appleton St. removing parking will create a dissadvantage for those businesses
• Building for kids relies on loading stalls on Appleton St. they are researching options for alternative locations. Worth exploring!
2 will improve direct route to Exhibition Center
3) Very concerned about traffic volume on College Ave.. Not in support.

2. Is A bike lane on one side of Appleton an option? Parking on one side
2 OR Bike lane on Lawrence to Morrison to proceed northbound

Bicycle & Pedestrian Alternatives – What are your thoughts?

Love the access to Water St. grand staircase
Better path down into Jones - walk and bike access

- Concerned about bike lane option on College Ave.

Packard Street → Buffered bike lanes seem like the best option OR Two way lane w/ better buffer

What would happen to parking on Washington

Need to retain parking on Lawrence St. with exhibition Center coming

Downtown Appleton Mobility Study
Stakeholders Meeting – March 21, 2016

Name: Jan Woodford

Representing: Lawrence University

Traffic Alternatives – What are your thoughts?

Alt. 3 is a great concept but not worth political capital needed to make most important changes. Alt 2 makes good sense and restores order in downtown. Glad to see elimination of unneeded signals.
Please fix Packard St.!

Bicycle & Pedestrian Alternatives – What are your thoughts?

Look forward to discussing function of signals across College at the Lawrence campus and possible bike route through campus.

Downtown Appleton Mobility Study
Stakeholders Meeting – March 21, 2016

Name: Todd Freeman

Representing: Appleton Police

Traffic Alternatives – What are your thoughts?

#2 (Appleton St two way) – Nice idea – many unanswered / unknown questions – hesitant to encourage through traffic on N. Oneida St – North of Pacific St. "College Diet" – NO WAY.

(1) Existing – works to disperse traffic East / West fairly quickly w/o pushing into neighborhoods north of downtown.

Bicycle & Pedestrian Alternatives – What are your thoughts?

(2) Bike lane – College Ave – tough to do safely. There are parallel streets now which can be safely used for bikes – Lawrence / Washington – lane them instead. (?).

(4) With Wisconsin weather, bike / ped commitments need to be kept reasonable. Lane markings – fine – overall idea to try to significantly emphasize bikes is problematic.

– I like the Packard designs – bike lanes / shared left lane + one lane each way.

Downtown Appleton Mobility Study
Stakeholders Meeting – March 21, 2016

Name: Kurt Eggebrecht

Representing: Appleton Health Dept.

Traffic Alternatives – What are your thoughts?

I like Alt 2: 2 way Appleton Street

I like the north and southbound bike lanes as I believe folks will use the route with or without lanes. Diverting bikes than may not lead to the behavior intended.

I really like the separated bike lane concept.

Bicycle & Pedestrian Alternatives – What are your thoughts?

→ Durand Street with separated bike lane would be awesome

Name: Joe Sargent

Representing: AASD

Traffic Alternatives – What are your thoughts?

Alt 2: in my opinion, offers the most improvement to the system w/ minimal negative impact on the entire downtown. Maybe look at alternate bike lanes or a reduction to this design.

Alt 1: Doesn't seem to address the issues.

Alt 3: I don't mind this design, but since its going to be a struggle to make it work & cannot be accomplished w/ Alt 2, I don't think it adds to the system. The N/S issue is much more important especially for the school district and reducing the traffic on Morrison & Harris.

Bicycle & Pedestrian Alternatives – What are your thoughts?

What is the point of better access to the river on Water St? I am not familiar with this area. Will it be used? I like the Packard options. Its a good street section to utilize buffered or separated bike lanes.

Name: Dani Englebert

Representing: YMCA

(Rate 1 - 10)

Traffic Alternatives – What are your thoughts?

Rate (2) #3 seems to not be a solution for College time going thru would increase, turn lanes would snarl traffic more. Dooring cyclists, 2 lanes for traffic not enough here

(Rate 7) #2 appealling but wondered if enough traffic would be shed before they get to curve at Oneida, worrisome intersection w/college and appleton

(Rate 8) #3 ok w/but signalize/crossings still best option, slightly better than #2

#2 would be better for vistors to city and to move traffic away from high volume business/possible business congestion.

Bicycle & Pedestrian Alternatives – What are your thoughts?

- No bicycle lanes on College - too tight, no diet
- Definitely develop the bike/ped on trestles to connect paths by the waterfront
-

Downtown Appleton Mobility Study
Stakeholders Meeting – March 21, 2016

Name: Vered Meltzer

Representing: Appleton Dist 2

"most bang for our buck"

Traffic Alternatives – What are your thoughts?

Alt 2 seems the best choice. Need to figure out loading zone for Appleton Street bars.

I think the 1 way to 2 way conversion is the ~~[illegible]~~ most (beneficial) change we can make to improve traffic.

~~Alt 1 is too minimal~~ Alt. 1 is too minimal & Alt 3 is ~~[illegible]~~ unfeasible in long term.

Bicycle & Pedestrian Alternatives – What are your thoughts?

Grand stairway is epic & exciting!
Road Diet for Packard or buffered bike lanes would be a good improvement.

~~[illegible]~~ Bike lanes on Lawrence & Washington can help divert bikes even though it can't divert cars.

Signage is easy, inexpensive, and very necessary! Still significant ignorance about where to bike, education necessary.

Downtown Appleton Mobility Study
Stakeholders Meeting – March 21, 2016

Name: Jeanne Roberts

Representing: LWV

Traffic Alternatives – What are your thoughts?

Alt 2 seems to be most realistic. There would be a need to change the curved bridge that ~~is~~ goes to Lawrence St and past the church.

Bicycle & Pedestrian Alternatives – What are your thoughts?

Need for education of drivers regarding rights of bikers and pedestrians. Staircases are great. Bike lane improvements also look good.

Downtown Appleton Mobility Study
Stakeholders Meeting – March 21, 2016

Name: Pati Coenen

Representing: district 11

Traffic Alternatives – What are your thoughts?

Alt. 2 seems to have the best possibility. The road diet on College does not make sense with a 4 lane bridge coming in on the east. Alt 2 also allows for better bike lane accomodations. and a more direct route North.

Bicycle & Pedestrian Alternatives – What are your thoughts?

I like the idea of consistent + more visible street crossings.

Changing Packard to 2 lanes also great idea w/ bike lanes that continue to bike boulevard on North St

Stair cases also a great addition to get easy access to water front.

Downtown Appleton Mobility Study
Stakeholders Meeting – March 21, 2016

Name: Melissa Kraemer Badtke

Representing: East Central WI Regional Planning Commission

Traffic Alternatives – What are your thoughts?

I like the Alt. 2 which addresses the directional issues however as a bicyclist concerned about getting ~~[illegible]~~ the average community member out bicycling you have to make it easy for them

Alt 2 - Are there transit routes on Appleton Rd? ~~[illegible]~~ If there are 10' travel lanes, would there be bicycle lanes? If so, consider the 10' travel lane & buses are 10.5' could be problematic near Houdini Plaza.

After looking & discussing ped & bike recommendations I would like to look @ alternatives w/ College Ave.

Bicycle & Pedestrian Alternatives – What are your thoughts?

Packard St → like that idea

Increased access - to the river front

Pedestrian facilities - Build into CIP

Work with EC on wayfinding routes

Downtown Appleton Mobility Study
Stakeholders Meeting – March 21, 2016

Name: Monica Stage

Representing: Appleton Comm. & Econ Dev. Dept.

Traffic Alternatives – What are your thoughts?

Focus on Alt #2 to fix current and future issues. Great two way traffic on Appleton and grid system! :)
Consider rebuilding bridge south of Lawrence at this time and consider adding a multistory parking ramp with access from Rocky Bleier Run / Water Street grade and entry from Lawrence Street in the area formerly used for the northbound bridge.
Maybe this is a mixed use building?

Bicycle & Pedestrian Alternatives – What are your thoughts?

Road diet isn't a great option for traffic so the bike lanes on College aren't possible. However, building out the other street facilities would be a great improvements

LOVE the grand staircase & regular staircase to better connect the downtown & Fox River!

Name: Nick Hoffman

Representing: FCCA / History Museum

Traffic Alternatives – What are your thoughts?

Alternative 2 -> makes best use of space and improves Lawrence Street and makes N/S route clear for visitors. Also connects Houdini Plaza w/ bike infrastructure.

Bicycle & Pedestrian Alternatives – What are your thoughts?

- Bicycle Boulevards - Great! Consider more through the city -> great for bike/ped and slows traffic for kids playing in the yard.

- Would like to see more motion flashers on trail crossings on Newberry / Riverfront and outside the study area in Apple Creek.

Downtown Appleton Mobility Study
Stakeholders Meeting – March 21, 2016

Name: Chad Doran

Representing: City of Appleton

Traffic Alternatives – What are your thoughts?

- Fine with losing some parking - we already have plenty throughout downtown
- restoring N/S routing is an often discussed problem - visitors find that routing confusing and so do residents
- What would it take to fix N/S and do the College Ave plan?
- Going with Alt. 2 - how could we still improve bike/ped on College?

Bicycle & Pedestrian Alternatives – What are your thoughts?

If we don't add bike lanes on College - how do we better sign Lawrence / Washington as primary routes?

Need to add bike parking accomodations on College regardless of whether we add bike lanes there

Appendix M

Public Meeting Minutes

AECOM
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Suite 100
Middleton, WI 53562
www.aecom.com

608 836 9800 tel
608 836 9767 fax

Memorandum

To	Eric Lom, P.E. – City of Appleton
CC	Mike Hardy – City of Appleton Paula Vandehey – City of Appleton
Subject	**Minutes – 4/7/2016 Public Meeting** Downtown Appleton Mobility Study AECOM Project No. 60445894
From	Amy Canfield, P.E. – AECOM
Date	April 15, 2016

On Thursday, April 7, 2016 a public meeting was held in Appleton for the Downtown Appleton Mobility Study. The purpose of the meeting was to educate the public on the purpose of the study, the issues identified by the project team, and gather their thoughts on traffic, bicycle and pedestrian improvement alternative ideas.

Attendance
60 people (+7 city/consultant staff members) signed in at the meeting. A copy of the sign-in sheet is attached (Exhibit 1).

The meeting was advertised through social media via the Appleton City Hall's Facebook page.

- There were four days of posts prior to the meeting that reached 20,495 people. A copy of the articles linked to these posts is attached (Exhibit 2). For a full list of comments on the Facebook posts, see the Appleton City Hall Facebook page.
- 2,246 clicks to the website story from the Facebook post (although we don't know how many people actually read the story from there).
- 589 likes, shares on the posts – this helped us reach the audience of 20,000+.
- City staff live-tweeted updates from the meeting on Twitter.

Three news media outlets (listed below) also attended the public meeting and featured stories on their newscasts.

- FOX (Channel 11)
- CBS (Channel 5)
- ABC (Channel 2)

Presentation
Amy Canfield and Kevin Luecke gave a 20 minute presentation which covered the purpose of the study, issues identified by the study team, and potential traffic, bicycle and pedestrian improvements. A copy of the presentation is attached (Exhibit 3).

Exhibits
Seven exhibits were on display for attendees to view. The exhibits, which are summarized below and attached (Exhibit 4), included:

1. Purpose of the study / Map of the study area
2. Mobility issues – Traffic
3. Mobility issues – Bicycle & Pedestrian
4. Alternative 1: Maintain Northbound Routing
5. Alternative 2: Two-way Appleton Street
6. Alternative 3: College Avenue Road Diet
7. Bicycle and Pedestrian Alternatives

Public Comment
20 people left written comments which are summarized in Table 1. Original comment forms are attached (Exhibit 5). Additional comments study team members noted from the meeting are listed below.

- Support for 2-way Appleton Street with bike lanes.
- Support for 2-way Appleton Street if parking is included.
- Stairway to river should have wheelchair/stroller access.
- Support for Lawrence Street and Washington Street bike lanes.
- Need safe places to lock bikes. Want to be able to see bike.
- Connecting to riverfront is important.
- Concern about people riding their bicycles on the sidewalk even with bike lanes.
- Concern about where vendors will park for Farmer's Market / concerts without loading zones by Houdini Park.
- There should be a 4-way stop at Franklin / Superior intersection because there are bad sight lines at this intersection.
- Concern over how transit will be incorporated in to study. Show bus on a rendering.
- Several people supportive of bike lanes, others concerned about loss of parking.
- Desire to connect Washington Street bike route behind the PAC to State Street.
- Unnamed park along river has been named Ellen Kort Peace Park.
- Fat Girlz Bakin does not want to lose any parking stalls. Essential for her customers as well as her having to run product into and out of her store.
- Education about the plan and safety reminders for bikes and motorists will be key. This will fall on City staff as it is outside scope of this study.
- Avenue Mall should be torn down and northbound Oneida Street should be restored the way it was meant to be.
- Restore Lawrence Street and Washington Street so they can be continuous east/west through routes.
- Tavern on S. Appleton Street supports the two-way conversion but wants to keep all on-street parking.

- Asked if bluff site could handle Library or other development. Study team responded that yes, there is plenty of capacity for additional traffic demand.
- Candy store at College Ave. / Appleton St. corner does not want to lose on-street parking.
- Attendee asked if short-term parking could be created in Appleton Street /College Avenue area. Study team explained that short-term parking is an option and will be determined as a second phase once road designs are determined.
- Attendee asked if the outside lanes of College Avenue could be marked as shared lanes for vehicles and bicycles. Study team explained that they could look at the concept closer, however based on traffic volumes (13,800+ vehicles per day) only a subset of bikers would feel comfortable using a shared lane in that situation.

Table 1: Summary of Comment Forms Received

Name ***Business / Org.***	**Traffic Alt. Comments**	**Bike / Ped Alt. Comments**
Dale Ver Voort ***Crazy Sweet***	• I like the idea of 2-way traffic on Appleton St., but not at the expense of parking.	• Is it possible to have a shared bike lane on the east side of Appleton St. and keep parking on west side? • Use curved street off Oneida St. bridge as a bike path to route bikes into Soldier Square area. • Provide multiple bike racks and lighting in Soldier Square area for people who bike to work or shop downtown.
Anonymous	• I think making Appleton St. a 2-way street will be awesome.	• Plan is a good start. • More bike racks needed.
Gwen Sargeant	• Alt. 2 is great. • Would love to fix 1-way problem at the YMCA. • Would love to see Appleton St. with bike lanes since Oneida St. will make them continuous.	• I would love College Ave. bike lanes (Alt. 3) but I will settle for Alt 2: 2-way Appleton St. with bike lanes.
Bob Huber	• Appleton 2-way looks good assuming parking for local business can be addressed.	• Love the paved bike / stroller / wheelchair ramp from Lawrence St., down to Rocky Bleier Run. • College Ave. for a bicyclist without using the sidewalk is still a problem. During rush hour, traffic on College Ave. almost precludes bicycle use.

Name *Business / Org.*	Traffic Alt. Comments	Bike / Ped Alt. Comments
John Cuff ***? Illegible ?***	• I am a fearless rider and will take my lane wherever it is. Of the alternatives listed, I like the conversion of Appleton St. to 2-way since that would make a consistent uninterrupted north-south route as S. Oneida St. gets fixed up. I currently zig zag on Memorial Dr. to State St. to Oneida St., which works but is not intuitive for less experienced bikers.	
Jennifer Stephany ***Appleton Downtown Inc.***	• Please keep parking on Appleton St.! • Make parking on the west side of Appleton St. 30-minute short-term parking for loading and pick up.	
Jamie Cartwright ***Weidert Group***		• At the very least, cars on College Ave. should know that bicyclists MUST bike on College Ave, if they're going to be on that route. So, they need markings in the right lanes – bicycle markings.
Paul VanderLinden ***Muncheez Pizzeria***	• OK with Alt. 2 but not with bike lanes because there is too much loss of parking. Where will vendors setup / park for farmers markets and Thursday concerts? I like loading zone only on both sides of Appleton St., then it'd be a bike lane by default when no loading was happening. • Not ok with Alt. 3. We need 2 lanes or traffic will slow way too much. • Please fix all intersections where weight sensors for lights don't work well.	

Name ***Business / Org.***	**Traffic Alt. Comments**	**Bike / Ped Alt. Comments**
Sue Bogenschutz ***Atlas Waterfront Café & Gathering Room***	• Glad to see thought put into waterfront access. Let's talk about Jackson St. as a gateway now that the new road is complete and open! • Thank you for all you do.	• Perhaps a good thought would be to incorporate bike lanes into sidewalks (increasing the width of the walk ways) rather than trying to combine bike lanes and vehicle roadways. • We see this done in southern golf communities that frequently have "cart lanes" sharing roadways with cars. When that becomes dangerous for carts, the cart traffic is moved to wider sidewalks where walkers, bicycles, roller bladders and carts share a common wider 2-way path! The Villages in Florida is a great example. Need to take a trip and see what they do!
Dick Abb	• Your study was apprehensive but devotes a preponderance to bicycle traffic. • In any given day, passenger vehicle movement through your defined study area is <u>substantially</u> greater than bicycle usage. The impact of your options should incorporate existing and replacement parking structures. Their cost and direct impact on the paving of streets in the study area.	• This effort grossly focuses on bicycle needs without comparable cost estimates and capacity of the new and replacement parking structures.
Mark Pappas	• Alt. 2 (2-way Appleton St.) is by far the best option and the "common sense" answer to the vast majority of the current downtown traffic challenges.	• Alt. 2 with the bike lanes is a near requirement. I agree that College Ave. will not work with bikes, as a result Washington St. and Lawrence St. should have bike lanes. However, they need dedicated connector routes between them. As a result, Appleton St. must have bike lanes along with Morrison St.

Name ***Business / Org.***	**Traffic Alt. Comments**	**Bike / Ped Alt. Comments**
Mark Green		• I desire well defined bike lanes wherever it makes sense. I only want to suggest to business owners that they take advantage of an opportunity to provide bike parking at their businesses if a bike lane occurs in front of their business. They may be surprised by the additional patrons they can gain.
John Ulness ***Ulness Health***	• Making Appleton St. 2-way with no parking and bicycle lanes will create too much of a bottle neck and loss of access. • Attention should be made to the new Soldier Square parking ramp traffic pattern along with Morrison St. and the Trinity Lutheran Church / Michaels development. • There really is no big demand for people to get to a northern destination coming from the Oneida St. bridge.	• Too much attention is given to bike lanes. • Parking on Appleton St. is more important than bike lanes, because bikers do have more alternatives. • Need to work with other people doing planning and developing before any further planning in this area.
Jon Corelis	• I like Alt. 3 if it were possible, but since it isn't, Alt. 2. • Have you considered where retail parking in the rear of some businesses (like Flanagan's Liquors has) could replace some of lost street parking?	• Separate bike lanes, as separate as possible, are best. Please look at new bike lanes on Prospect Ave. between Oneida St. and 6th St. for an example of how NOT to do it: hideously confusing and insanely dangerous. • One problem, for pedestrians, especially the disabled, is that in winter many residences and businesses don't shovel and salt sidewalks adequately, and snow plows often leave mounts of snow blocking sidewalks in front of street.

Name *Business / Org.*	Traffic Alt. Comments	Bike / Ped Alt. Comments
Penny Robinson	• More consideration should be given to development where Trinity Lutheran and Fox Banquets are. Some of us think it's perfect for a library and community center. Do we want to leave another mobility study?	
Lynn Krueger ***Fat Girlz Bakin***		• Is it necessary to have bike lanes on both sides of Appleton St.? What if you put the bike lane along the side by Houdini Plaza on Appleton St. and leave parking on the side of Appleton St. towards the businesses. Some businesses utilize the parking for loading and unloading and for customers.
Sandy Campshure	• Reopen Oneida St. thru downtown. Mall escalators could be rebooted east-west to go over Oneida St. No parking would have to be removed from Appleton St. • No medians separating bike lanes. It's not good for plowing, extra maintenance costs for life of road, extra construction costs.	• Bikes can ride on any roads but the main roads should remain traffic movers. Side streets are better suited for bicycles. • It's tough enough getting around downtown without closing roads to cars. • No Grand Staircase – Minimize concrete!
Mark DeJardin	• I really appreciate the numbers and the study. I live on Drew St. and have a family. I like what is currently being proposed, especially Alt. 2.	• Anything is an improvement. I'd like to see the City Center taken down. Alt. 2 is my preferred.
Jordan Hereford ***Ambassador***	• Loss of loading zones for pubs, Appleton City Center, Trout Museum.	• S. Appleton St. has very narrow sidewalks.
Nick Peeters	• I am in favor of 2-way Appleton St. It will greatly help getting through downtown.	• I live on the west side of downtown. Having a safe way to access the east side of town is important to me. Also, I would love to be able to safely get from downtown bike trails north and south of the city.

EXHIBIT 5

Welcome to the **Downtown Appleton Mobility Study** public meeting. Your comments are important to us! Please take the time to write down your thoughts before leaving tonight and leave this form in the black box on the registration table. If you would like, you may email your comments to Eric.Lom@Appleton.org by April 15, 2016.

Name: Dale Ver Voort

Representing (Business/org. if applicable): Crazy Sweet

Traffic Alternatives – What are your thoughts? What are the pros/cons of the each alternative?

Like the idea of 2 way traffic on Appleton st but not at the expense of parking

Bicycle & Pedestrian Alternatives – What are your thoughts? How do you feel about the location of suggested improvements?

possible to have a shared bike line on the East side of Appleton - keep parking on west side

Use curved street off Oneida bridge as a bike path to route bikes into Soldier square area - provide multiple bike racks & lighting in that area for people who bike to work or shop downtown

Downtown Appleton Mobility Study
Public Meeting – April 7, 2016

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Name: ______________________________

Representing (Business/org. if applicable): ______________________

Traffic Alternatives – What are your thoughts? What are the pros/cons of the each alternative?

I think making Appleton St a 2way stree will Be awesome

Bicycle & Pedestrian Alternatives – What are your thoughts? How do you feel about the location of suggested improvements?

is a good start more Bike Rack

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Name: Gwen Sargeant

Representing (Business/org. if applicable): ______________________

Traffic Alternatives – What are your thoughts? What are the pros/cons of the each alternative?

Option 2 is great.

Would love to fix one way problem at the YMCA.

Would love to see Appleton with bike lanes since Oneida will make them continous.

Bicycle & Pedestrian Alternatives – What are your thoughts? How do you feel about the location of suggested improvements?

I would love College Bike lanes (option 4) but I will settle for option 2, 2 way Appleton with Bike lanes.

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Name: Bob Huber

Representing (Business/org. if applicable): ______

Traffic Alternatives – What are your thoughts? What are the pros/cons of the each alternative?

Love the paved bike/stroller/wheelchair ramp from Lawrence, down to Rocky Bluff Run.

N/S Appleton two way looks good assuming parking for local business can be addressed.

Bicycle & Pedestrian Alternatives – What are your thoughts? How do you feel about the location of suggested improvements?

See above

College Ave for a bicyclist w/o using the sidewalk is still a problem. During rush hour traffic on College almost precludes bicycle use.

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Name: John Cuff

Representing (Business/org. if applicable): EAA

Traffic Alternatives – What are your thoughts? What are the pros/cons of the each alternative?

I am a fearless rider and will take my lane wherever it is. Of the alternatives listed I like the conversion of Appleton to 2 way since that would make a consistent uninterrupted North South route as South Oneida gets fixed up. I currently zig zag on Memorial to State to Oneida which works but is not intuitive to less experienced bikers.

Bicycle & Pedestrian Alternatives – What are your thoughts? How do you feel about the location of suggested improvements?

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Name: Jennifer Stephany

Representing (Business/org. if applicable): Appleton Downtown Inc. Business Improvement District

Traffic Alternatives – What are your thoughts? What are the pros/cons of the each alternative?

Please Keep Parking on Appleton St!
~~one on the other side~~
The West Side of Appleton St,
Make parking There 30 minute
Short Term parking for loading
and pick up.

Bicycle & Pedestrian Alternatives – What are your thoughts? How do you feel about the location of suggested improvements?

Downtown Appleton Mobility Study
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Name: JAMIE CARTWRIGHT

Representing (Business/org. if applicable): WEIDERT GROUP

Traffic Alternatives – What are your thoughts? What are the pros/cons of the each alternative?

Bicycle & Pedestrian Alternatives – What are your thoughts? How do you feel about the location of suggested improvements?

At the very least, cars on College should know that bicyclists MUST bike on College Ave, if they're going to be on that route. So, they need markings in the right lanes — bicycle markings.

Downtown Appleton Mobility Study
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Name: Paul VanderLinden

Representing (Business/org. if applicable): Muncheez Pizzeria

Traffic Alternatives – What are your thoughts? What are the pros/cons of the each alternative?

OK w/ Alt. #2 but not w/ Bike lanes cause too much loss of parking. Where will vendors/setup/etc. park for farmers markets + Thurs. Concerts? Like loading zone only on both sides of Appleton St., then it'd be a bike lane by default when no loading

Not OK w/ Alt. #3 - need two lanes or traffic will slow way too much

When doing this fix all intersections where weight sensors for lights don't work well

Bicycle & Pedestrian Alternatives – What are your thoughts? How do you feel about the location of suggested improvements?

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Name: Sue Bozevsenik

Representing (Business/org. if applicable): Atlas Waterfront Cafe + Gathering Room

Traffic Alternatives – What are your thoughts? What are the pros/cons of the each alternative?

Glad to see thought put into waterfront access. Lets talk about Jackman Street as a gateway now that the new road is complete + open!

Thanks for all you do

Bicycle & Pedestrian Alternatives – What are your thoughts? How do you feel about the location of suggested improvements?

Perhaps a good thought would be to ~~incorpate~~ incorporate bike lanes into sidewalks (increasing the width of the walkways) rather than trying to combine bike lanes + vehicular roadways.

We see this done in southern golf communities that frequently have "cart lanes" sharing roadways with cars. When that becomes dangerous for carts, the cart traffic is moved to wider sidewalks where walkers, bicycles, roller bladers + carts share a common wider 2-way path! The Villages Florida is a great example. Need to take a trip + see what they do!

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Name: Dick ABB

Representing (Business/org. if applicable): N/A

Traffic Alternatives – What are your thoughts? What are the pros/cons of the each alternative?

Your study was comprehensive but devotes a preponderance to bicycle traffic —

In any given day — passenger vehicle movement through your defined study area is substantially greater than bicycle usage. The impact of your options should

Bicycle & Pedestrian Alternatives – What are your thoughts? How do you feel about the location of suggested improvements?

Incorporate existing and replacement parking structures — their cost and direct impact on the parking on streets in the study area.

This effort grossly focuses on bicycle needs without a comparable cost estimates & capacity of the new and replacement parking structures

Downtown Appleton Mobility Study
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Name: Mark Pappas

Representing (Business/org. if applicable): ____________________

Traffic Alternatives – What are your thoughts? What are the pros/cons of the each alternative?

Alt 2 (2-way Appleton St) is by far the best option. and the "common Sense" answer to the vast majority of the current downtown traffic challenges.

Bicycle & Pedestrian Alternatives – What are your thoughts? How do you feel about the location of suggested improvements?

Alt 2 with bike lanes is a near requirement. I agree that College Ave will not work with bikes, as a result Washington & Lawrence should have bike lanes. However, They need dedicated connection routes between them, As a result Appleton St Must have bike lanes along with Morrison. North/South.

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Name: Mark Green

Representing (Business/org. if applicable): Bicycling / Automobiles

Traffic Alternatives – What are your thoughts? What are the pros/cons of the each alternative?

Bicycle & Pedestrian Alternatives – What are your thoughts? How do you feel about the location of suggested improvements?

I desire well defined bikelanes ~~and~~ where ever it makes sense. I only want to suggest to business owners that they take advantage of an opportunity to provide bike parking at their businesses if a bike lane occurs in front of their business. They may be surprised by the additional patrons they can gain.

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Name: John Ulness

Representing (Business/org. if applicable): Ulness Health

Traffic Alternatives – What are your thoughts? What are the pros/cons of the each alternative?

Making Appleton St two way with no parking and bicycle lanes will create too much of a bottle neck and loss of access.

Attention should be made to the new Soldir Square parking ramp traffic pattern along with Morrison street and the Trinity Luth Church / michaels development.

There really is no big demand for people to get to a northern destination coming from the Oneida St. Bridge.

Bicycle & Pedestrian Alternatives – What are your thoughts? How do you feel about the location of suggested improvements?

Too much attention is given to bike lanes.

Parking on Appleton street is more important than bike lanes, because bikers do have more alternatives

Need to work with other people doing planning and developing before any further planning in this area.

Downtown Appleton Mobility Study
Public Meeting – April 7, 2016

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Name: Jon Corelis

Representing (Business/org. if applicable): ____________

Traffic Alternatives – What are your thoughts? What are the pros/cons of the each alternative?

Alt 3 if it were possible, but since it isn't, alt 2. Have you considered where retail parking in the rear of some businesses (like Flanagans Liquors has) could replace some of lost street parking?

Bicycle & Pedestrian Alternatives – What are your thoughts? How do you feel about the location of suggested improvements?

Separate bike lines, as separate as possible, are best. Please look at new bike lanes on Prospect between Oneida and 6th for an example of how NOT to do it: hideously confusing + insanely dangerous. One problem for pedestrians, esp. disabled, is that in winter many residences + businesses don't shovel + salt sidewalks adequately, and snow plows often leave mounds of snow blocking sidewalks from the street.

Downtown Appleton Mobility Study
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Name: Penny Robinson

Representing (Business/org. if applicable): ______

Traffic Alternatives – What are your thoughts? What are the pros/cons of the each alternative?

More consideration should be given to development where Trinity Lutheran & Fox Banquets are. Some of us think it's perfect for a library and community center. Do we want to have another mobility study?

Bicycle & Pedestrian Alternatives – What are your thoughts? How do you feel about the location of suggested improvements?

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Name: [illegible signature]

Representing (Business/org. if applicable): Fat Girlz Bakin

Traffic Alternatives – What are your thoughts? What are the pros/cons of the each alternative?

Bicycle & Pedestrian Alternatives – What are your thoughts? How do you feel about the location of suggested improvements?

Is it necessary to have biking lanes on both sides of Appleton St? What if you put the bike lane along the side by Houdini Plaza on Appleton St. and leave parking on the side of Appleton St towards the businesses. Some businesses utilize the parking for loading and unloading and for customers.

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Name: SANDY CAMPSHURE

Representing (Business/org. if applicable): ______

Traffic Alternatives – What are your thoughts? What are the pros/cons of the each alternative?

REOPEN ONEIDA ST THRU DOWNTOWN. MALL ESCALATORS COULD BE REROUTED EAST-WEST TO GO OVER ONEIDA ST. NO PARKING WOULD HAVE TO BE REMOVED FROM APPLETON ST.

NO MEDIANS SEPARATING BIKE LANES - NOT GOOD FOR PLOWING, EXTRA MAINTENANCE COSTS FOR LIFE OF ROAD, EXTRA CONSTRUCTION COSTS.

Bicycle & Pedestrian Alternatives – What are your thoughts? How do you feel about the location of suggested improvements?

BIKES CAN RIDE ON ANY ROADS BUT THE MAIN ROADS SHOULD REMAIN TRAFFIC MOVERS. SIDE STREETS ARE BETTER SUITED FOR BICYCLES.

IT'S TOUGH ENOUGH GETTING AROUND DOWNTOWN W/O CLOSING ROADS TO CARS.

NO GRAND STAIRCASE - MINIMIZE CONCRETE!

Welcome to the **Downtown Appleton Mobility Study** public meeting. Your comments are important to us! Please take the time to write down your thoughts before leaving tonight and leave this form in the black box on the registration table. If you would like, you may email your comments to Eric.Lom@Appleton.org by April 15, 2016.

Name: Mark DeJardin

Representing (Business/org. if applicable): ______

Traffic Alternatives – What are your thoughts? What are the pros/cons of the each alternative?

I really appreciate the numbers, and the study.
I live on Drew st and have a family. I like what is currently being proposed, especially option 2.

Bicycle & Pedestrian Alternatives – What are your thoughts? How do you feel about the location of suggested improvements?

Anything is an improvement.
I'd like to see the City center taken down.
Option 2 is my prefered.

Welcome to the **Downtown Appleton Mobility Study** public meeting. Your comments are important to us! Please take the time to write down your thoughts before leaving tonight and leave this form in the black box on the registration table. If you would like, you may email your comments to Eric.Lom@Appleton.org by April 15, 2016.

Name: JORDAN HEREFORD

Representing (Business/org. if applicable): AMBASSADOR

Traffic Alternatives – What are your thoughts? What are the pros/cons of the each alternative?

LOSS OF LOADING ZONES FOR PUBS, APPLETON CITY CENTER, TROUT MUSEUM, ETC.

Bicycle & Pedestrian Alternatives – What are your thoughts? How do you feel about the location of suggested improvements?

S. APPLETON ST HAS VERY NARROW SIDEWALK.

Welcome to the **Downtown Appleton Mobility Study** public meeting. Your comments are important to us! Please take the time to write down your thoughts before leaving tonight and leave this form in the black box on the registration table. If you would like, you may email your comments to Eric.Lom@Appleton.org by April 15, 2016.

Name: Nick Peeters

Representing (Business/org. if applicable): ______

Traffic Alternatives – What are your thoughts? What are the pros/cons of the each alternative?

I am in favor in Appleton Street going ~~to~~ North/South it will greatly help ~~~~ getting through downtown.

Bicycle & Pedestrian Alternatives – What are your thoughts? How do you feel about the location of suggested improvements?

I live on the west side of downtown, having a safe way to access the east side of town is important to me. Also would love to be able to safely get from downtown to both the bike trails north of the city and south of the city

May 2, 2016

My wife Pam and I work and live in Downtown Appleton. Everyday, we experience Downtown Appleton traffic flow and mobility.

Downtown Appleton is truly one great place, and more people would like to live here. The common response we get from many people when they see our renovated apartment is, "I want to live here! Let us know if you ever want to rent it out."

Downtown Appleton housing is needed along with other private development projects that can generate tax revenue and support our existing Downtown businesses.

The current preliminary proposal to make Appleton St a two-way street puts too much traffic in too small of a space.

A better solution is needed that facilitates future development. The mobility solution should expand not restrict street access.

After the Superior St railroad crossing closed, everyday, we experience the effect of little traffic past our business, and people asking how to get to Wichmann's funeral home. Superior St offered access from Lawrence St to Wisconsin Ave and now it does not.

The City of Appleton is mostly landlocked, and the focus should be on how to best develop our Downtown.

There needs to be a better option than creating a traffic bottleneck in the middle of Downtown Appleton.

Please call if you would like to discuss further.

John Ulness

920-450-0275

john@ulnesshealth.com

ulnesshealth
INSURANCE / WELLNESS

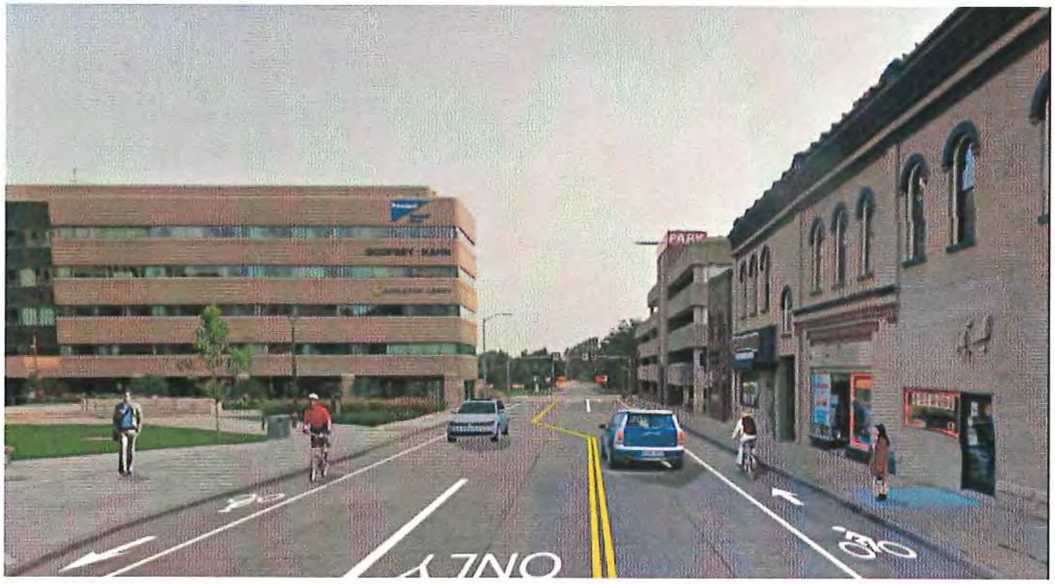
Look At The Big Picture

Is there a better solution?

The Post Crescent April17, 2016

Picture 10,000 Cars Per Day

What happens when more than two cars want to turn left and have no where to go?



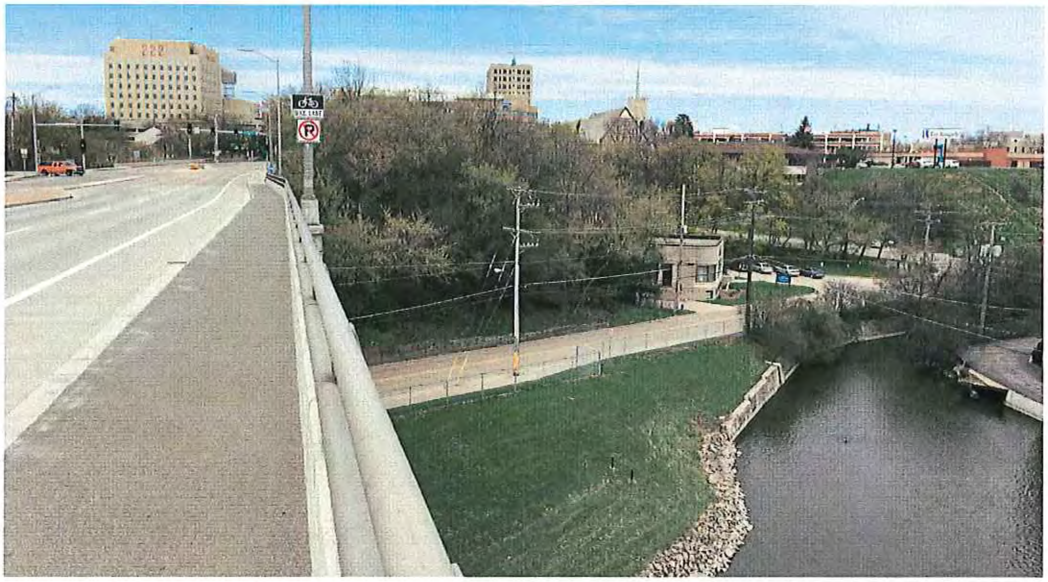
Appleton Needs A Bigger Picture

The proposed two-way solution is too short-term.

The Post Crescent Editorial April17, 2016

Appleton Downtown Potential

A coordinated long range plan, working with private developers, can make the Oneida St tunnel possible.



Picture How College Ave Changes

Bump outs gone? No Parking? Denser traffic? Left-turn backups? Pedestrian and Building For Kids safety?

City of Appleton Center

The right traffic flow plan is a great opportunity to stimulate future downtown development and tax revenue.

Update City Center

Work with the owners of City Center to open College Ave to Washington St and add high-rise apartments.

Picture A City Center Marketplace

Connect College Ave to Washington St through City Center.

City Center Traffic Flow Focus

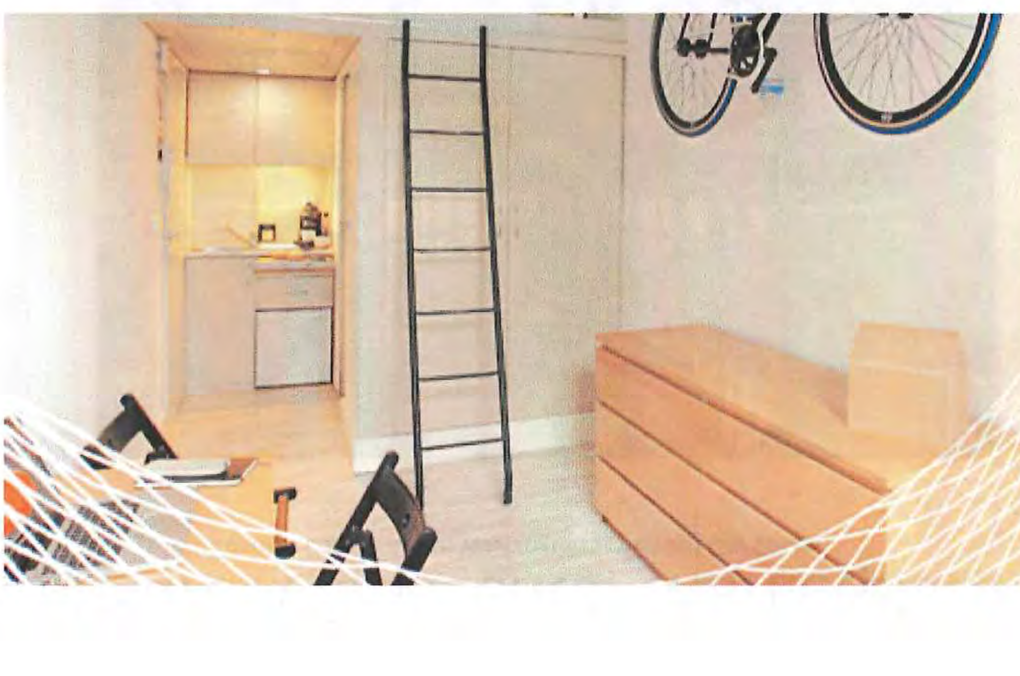
With private developer input the City of Appleton can set a street design that fits future development.

The Blue Ramp To Be Demoed

Coordinate future projects to maximize planning and future development.

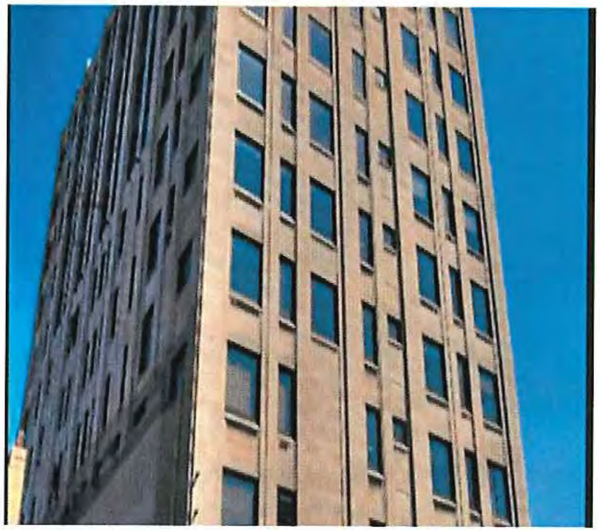
Attract More People Downtown

Needed apartments can get more people living Downtown and on the City's bicycle lanes.



Picture City Center Apartments

Appleton needs downtown housing for people who want to live an urban lifestyle.

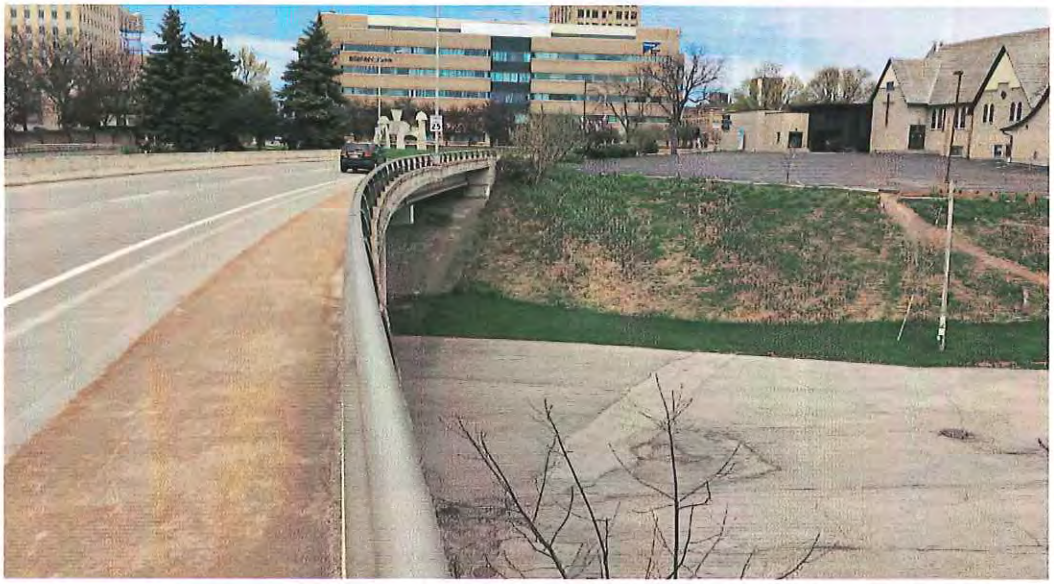


Soldier Square Ramp Demo

Another major project to coordinate with future plans and private development.

Tunnel Opportunity

The Bluff Site offers access to tunnel under Oneida St with the ramp demos on south and north.

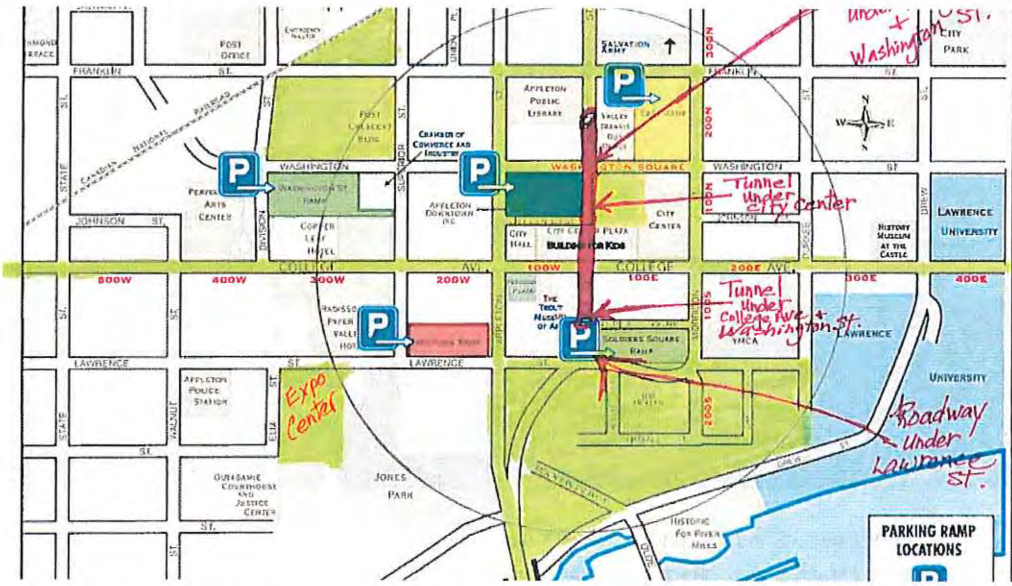


Traffic Flow For Downtown Events

The Oneida St Tunnel offers better traffic flow that creates greater mobility.

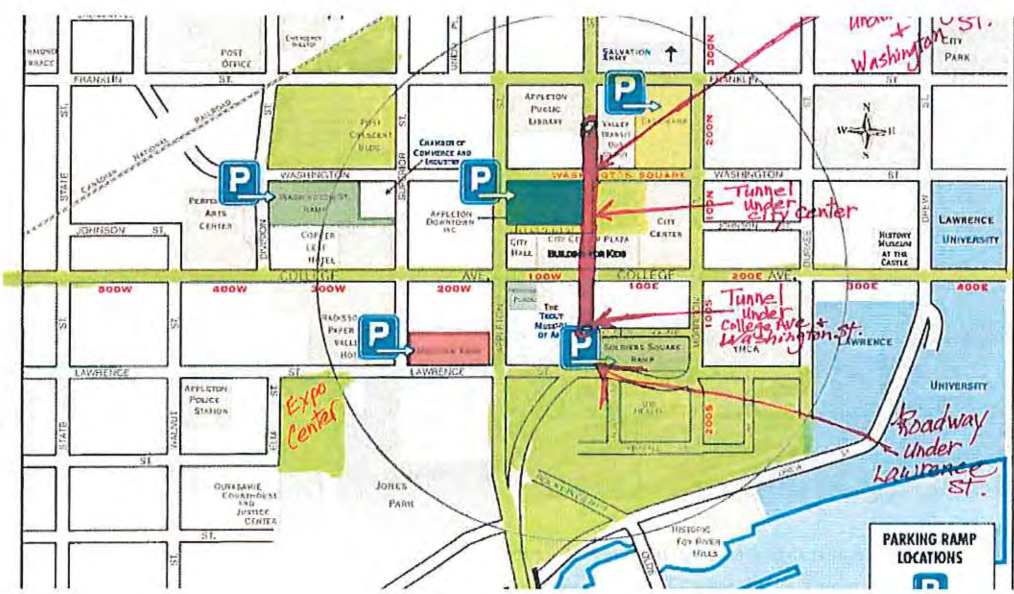
A Tunnel Expands Mobility

A long-range plan that co-ordinates with current projects and future development can be a great investment.



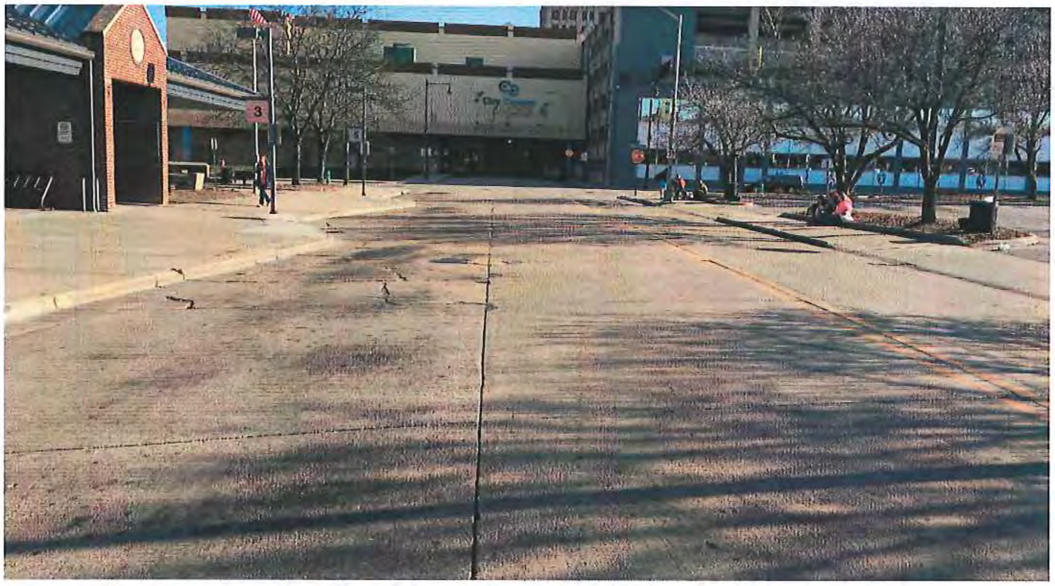
Oneida St. Tunnel Solution

The tunnel could fit under Oneida St infrastructure.



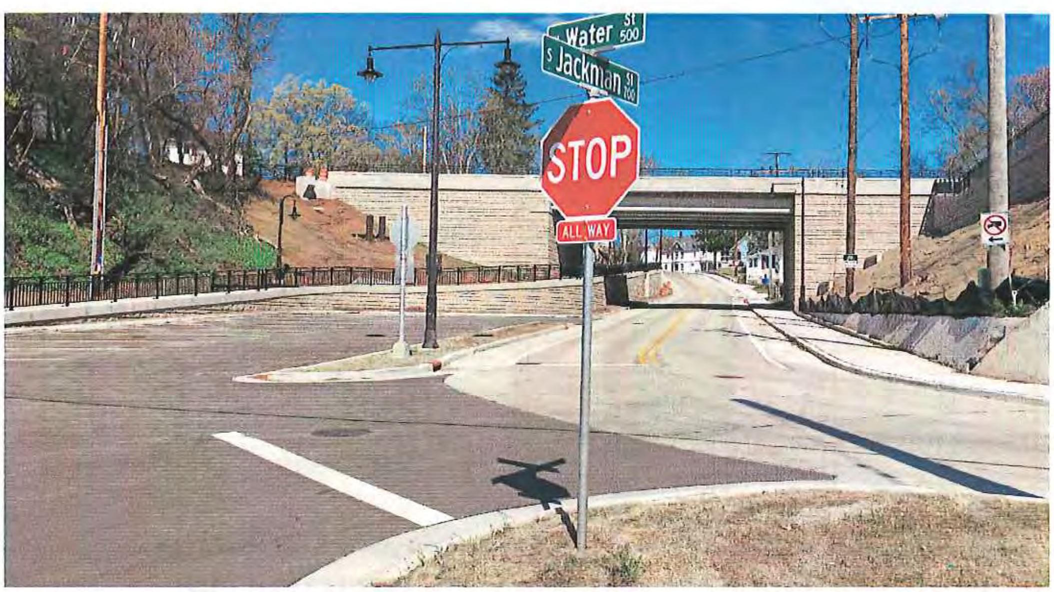
Picture Traffic Flow and Mobility

An Oneida St tunnel will infuse an isolated area with activity created by better traffic flow.



Picture Traffic Flow and Mobility

Oneida St traffic can go to Lawrence St above and under Lawrence St, College Ave, CC and Washington St.

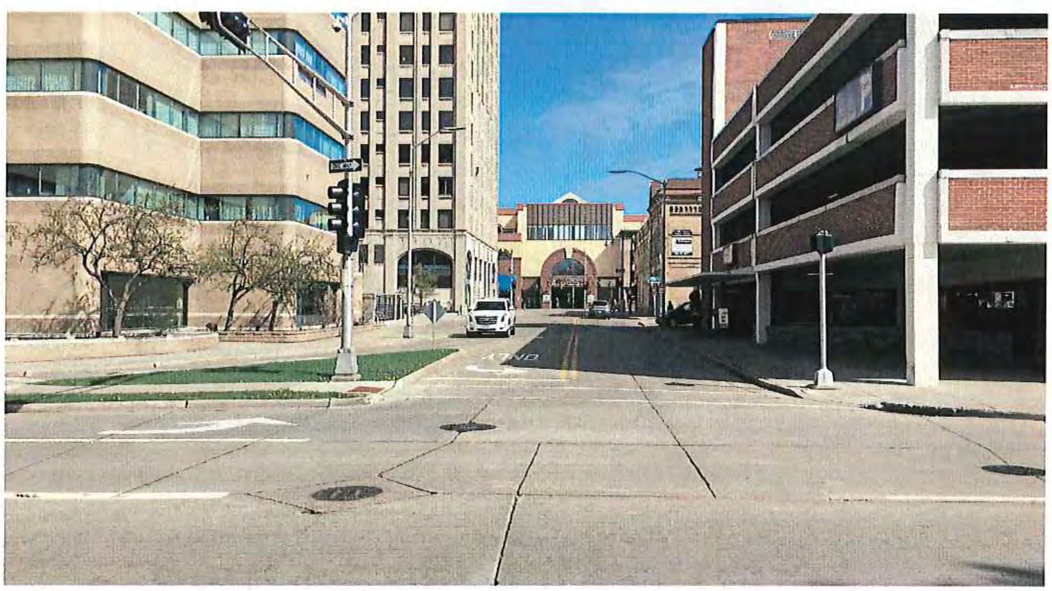


Other Designs To Be Explored

Just like LU's Warch Center shown below, a dig out of the bluff offers many design possibilities for parking, riverfront access, Expo Center access, building and walk way designs that would connect the City Center to the riverfront.

Traffic Flow and Riverfront Access

Connecting the Riverfront to the City has many more possibilities with the Oneida Street tunnel.

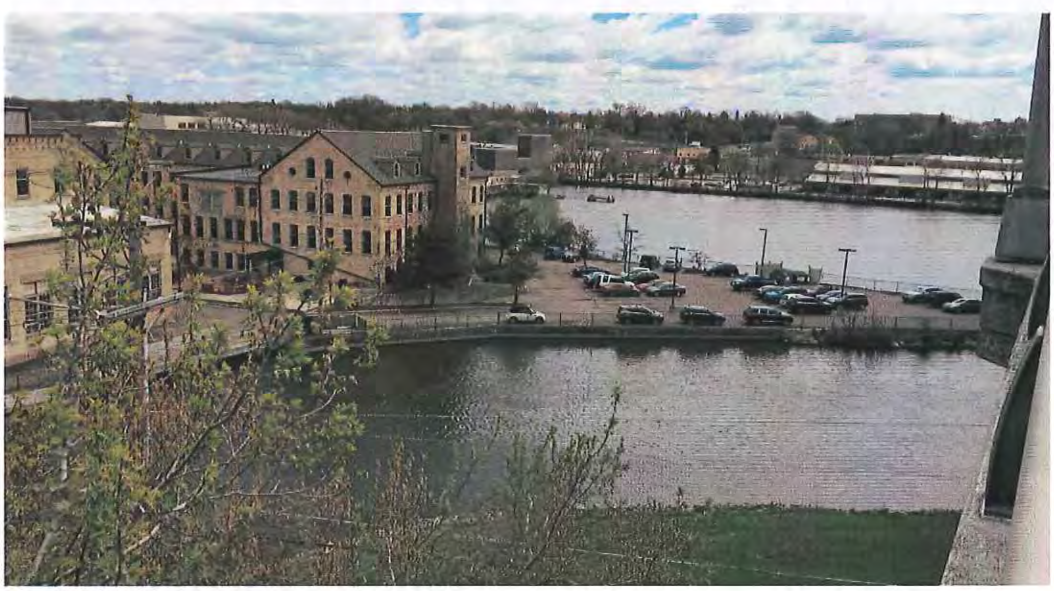


Bluff Design Opportunity

Private development of the Bluff Site, offers many possibilities for parking, traffic, mobility and riverfront access.

Olde Oneida Connection

The right design can create an Oneida St corridor to the riverfront.



Appendix N

Social Media Articles

News List

Mobility study to look at best ways to navigate downtown

Post Date: 04/04/2016 12:18 PM

Note: This is the first in a series of stories leading up to a community input session on April 7, from 5 p.m. - 6:30 p.m. in the Common Council chambers at City Hall.

Whether by bus, bike, car or on foot, how you move through downtown is the focus of a study that will help the city plan for the best way to get you where you are going downtown for years to come.

City staff have been working with a consultant to study traffic patterns downtown. The consultant analyzed data to create a series of recommendations that have been presented to stakeholder groups for feedback. Those groups include city staff, downtown businesses, Appleton Downtown Incorporated and Lawrence University among others.

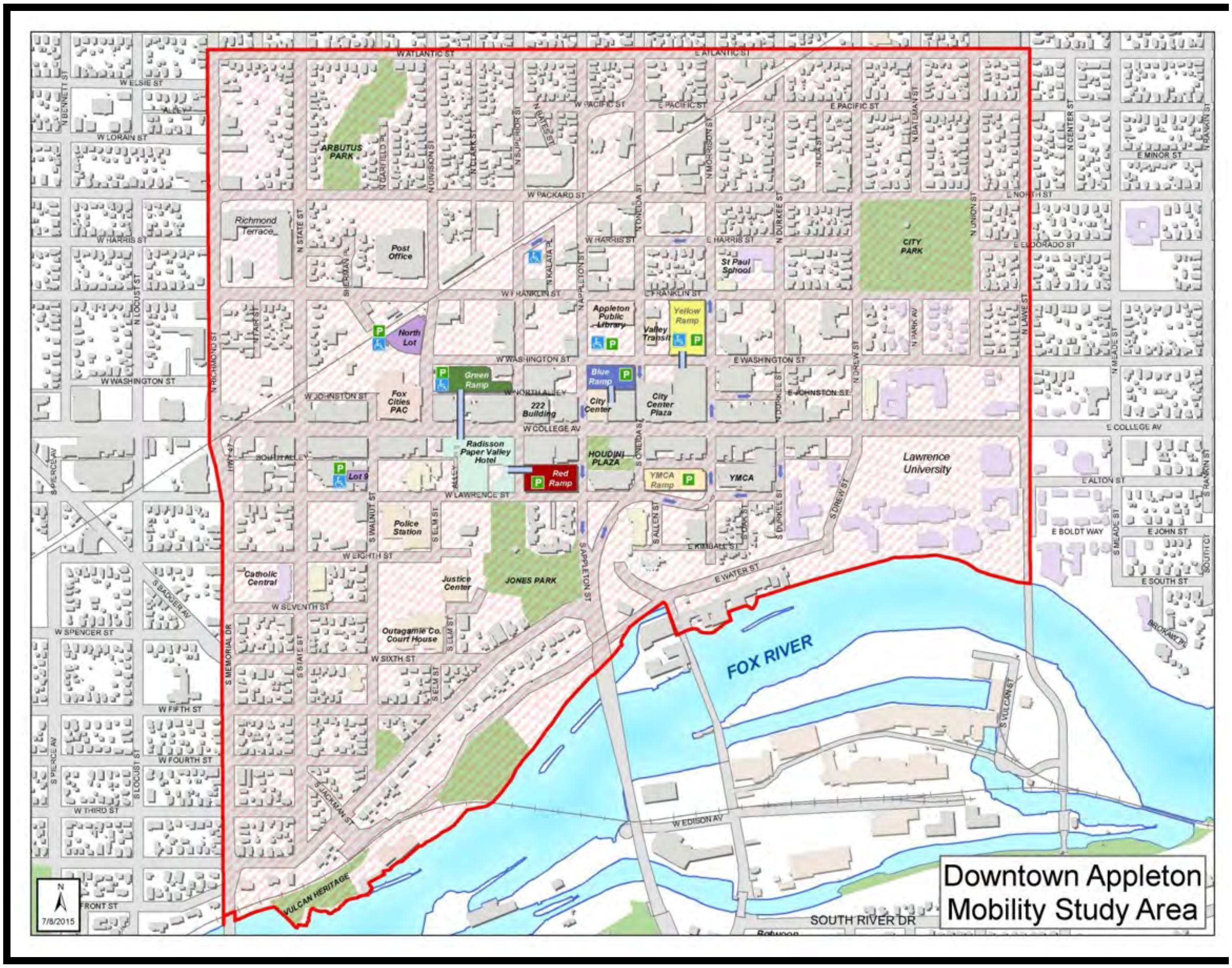
A community input meeting is slated for April 7 from 5 p.m. - 6:30 p.m. at City Hall. The consultant will use the community feedback to refine their recommendations. City staff and the municipal services committee will then review those options and ultimately make recommendations to the Common Council.

Goals

There are a couple of key goals for this study. First, we're trying to find a better and less confusing way to route northbound and southbound traffic through downtown. Another goal which goes hand-in-hand with the first one is to convert some of the one-way streets downtown to two-way streets. They are confusing and difficult to navigate for residents, let alone visitors not familiar with the city. Finally, enhance pedestrian and bicycle accommodations, as well as enhance safety for those transportation options as well.

Study Area

The area of focus for the mobility study is the section of downtown bordered by Richmond Street on the west, Lawe Street on the east, Atlantic Street to the north and the Fox River to the south. The map below gives a visual reference of the study area.



Moving Through The City

This study is about more than just cars. We know that your transportation habits are changing and that cars aren't for everyone. This study will give us suggestions to improve ways for moving bikes and pedestrians through the city as well. That could include better signage to mark routes for bikes and pedestrians, bike parking opportunities, additional bike lanes and more.

Connecting The Riverfront

We're constantly looking for ways to better connect the downtown to the riverfront. Access from the downtown can be difficult with no easy connection by road or trail. But the study will examine ways to improve that as well. Those recommendations could include signage and even stairways leading from downtown to the riverfront.

Timeline

Following meetings with stakeholder groups the next step is a community input session. This is your chance to weigh in on some of the ideas the consultant has already been studying and add your own as well. The final recommendations with the study will be made to city staff in April. Those options will be shared with the municipal services committee in late April or early May for final comments. The city will receive the final recommendations in June.

Keep in mind it is possible that only some or none of the recommendations from the consultant and city staff will ultimately be approved by the Common Council. The costs to implement some of the recommendations would range depending on the scope of the project.

This week in a series of stories we will break down and explain the options that were presented to the stakeholder groups that will also be shared at the community input meeting on April 7. We hope these explanations will give you a sense of what we are trying to accomplish and ultimately get you interested in getting involved in helping make our downtown vibrant for years to come.

We know that our thriving downtown is a big part of what makes Appleton great. In 2014 College Avenue was named a "People's Choice Great Place" award winner. But to remain a great place in the future we can't let the downtown stand still.

Appleton Communications Coordinator Chad Doran can be reached at (920) 832-5814 or chad.doran@appleton.org.

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Return to full list >>

News List

Mobility study - by bike and on foot

Options to enhance opportunities downtown

Post Date: 04/05/2016 9:04 AM

Note: This is the second in a series of stories leading up to a community input session on April 7, from 5 p.m. - 6:30 p.m. in the Common Council chambers at City Hall.

Monday we gave an overview of the goals of our downtown mobility study. In part two of the series today we're highlighting some of the options for enhancing pedestrian and bike access downtown. We'll also talk about one of three alternative options for vehicle traffic that you will get to learn about in greater detail on April 7.

Alternative #1

Admittedly this alternative doesn't change much. What it does suggest is that the city remove two stoplights on Franklin St. One at Superior St. and the other at Oneida St. The study found that most pedestrians don't use those lights to cross and don't wait for the walk signal anyway. The recommendation will be to remove the lights which will also make Franklin St. a more free-flowing route for all forms of transportation.

What this alternative does not do is change one-way streets, address issues at confusing intersections or make any substantial functional changes downtown. We say that because this is a good opportunity to point out one of the good things we learned from doing this mobility study.

For a city our size and based on how our downtown streets are laid out, we have very few issues with traffic volume and delays today. Based on calculations, we will still see only minimal increases over the next 20 years. Traffic congestion is rated on a A-F scale, with an "A" being the best score (lowest traffic delays) and "F" the worst score (highest traffic delays). Currently of all of the intersections studied downtown the lowest scoring intersection was rated a "B" meaning the longest you may sit at a traffic light is about 30 seconds, with a wait time of 20 seconds or less at most intersections.

Bicycle Accommodations

There are several types of bike lanes commonly used to identify lanes for bicycles:

The traditional bike lane is what we have used here in Appleton. These are lanes marked specifically for bikes and can be used on a variety of streets.

The buffered bike lane is similar to the standard bike lane but adds another stripe to provide additional space between bikes and cars.

The separated bike lane adds some sort of vertical element to further separate the bike lane from the vehicle lane. The vertical element can be a concrete barrier, posts or some other form of additional buffer.

Shared lane markings are used on lower volume streets and show where a cyclist should ride alongside vehicle traffic.

The final design is a bicycle boulevard. This can be designed in a number of ways, but is a street that is signed and marked primarily for bikes rather than vehicles.

These are just the different types of options for bike lanes the city could opt to use. Each has advantages and disadvantages that would need to be weighed for the impact on other modes of transportation. The consultant will also recommend the city look to designate specific bike routes through downtown. These would be streets that will feature better signage to direct cyclists as to the best way for them to get through and to different areas of downtown.

Pedestrian Access

Among some of the recommendations for improving pedestrian access is to make better connections to the riverfront from downtown. The suggestion will be to add several staircases throughout the downtown that lead to the riverfront. Those could also include seating areas along the staircase to take in the views of the river from above.

The consultant will also recommend the city create more marked crosswalks throughout the downtown and create policies for sidewalk maintenance and compliance with the American's with Disabilities Act. The city could add more lighting downtown for pedestrians as well as enhanced crossings at intersections where visibility or other factors make crossing a challenge.

What's Next?

Tomorrow we'll look ahead to what will be recommended to fix the northbound/southbound routing through downtown and the impacts it could have on everything from parking to traffic and more.

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Return to full list >>

News List

Mobility study - Fixing the north/south access downtown

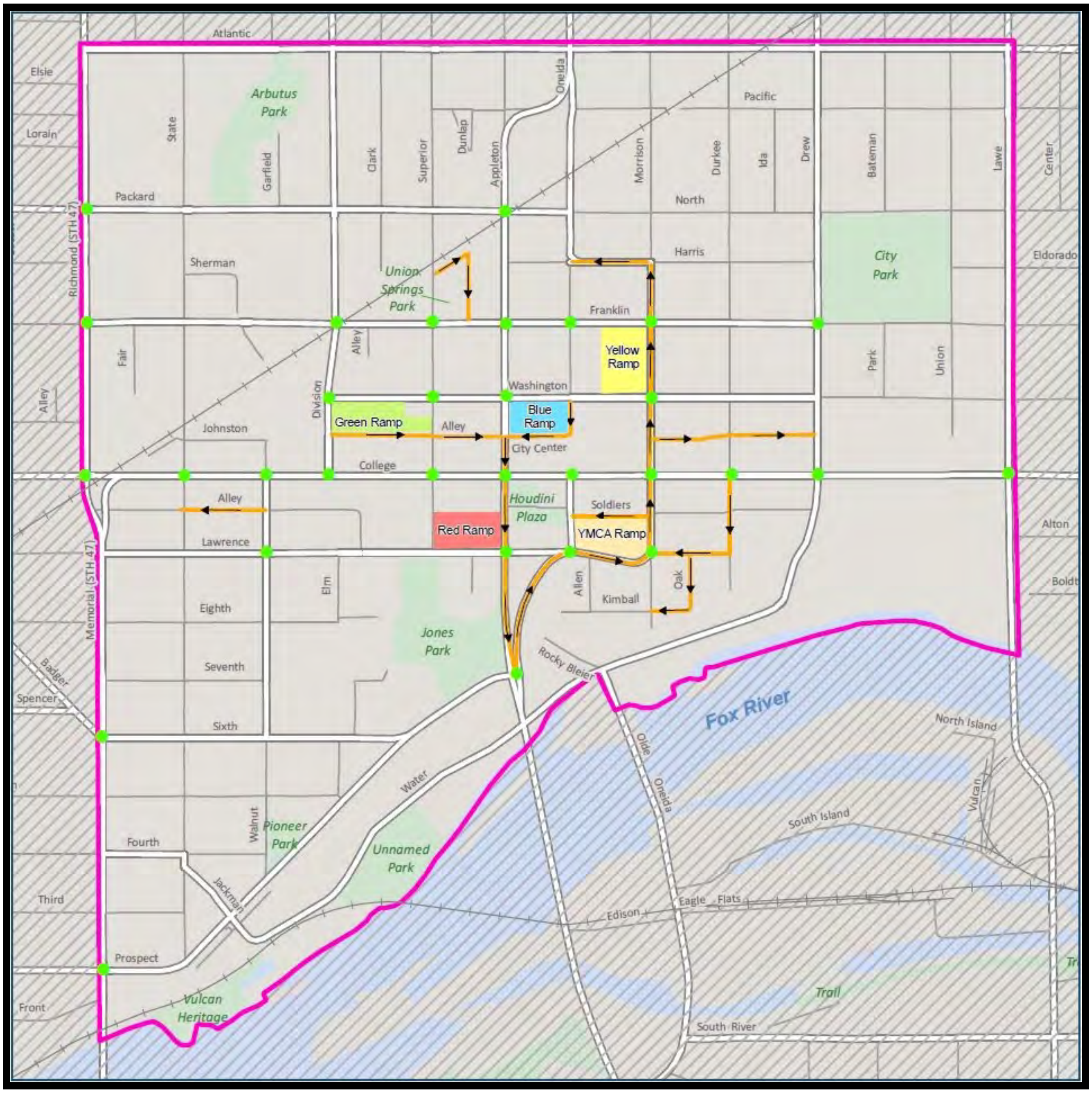
Post Date: 04/06/2016 9:20 AM

Note: This is the third in a series of stories leading up to a community input session on April 7, from 5 p.m. - 6:30 p.m. in the Common Council chambers at City Hall.

Tuesday we highlighted some ways to improve mobility downtown for pedestrians and bicyclists. Monday we gave an overview of the goals of our downtown mobility study. In part three of the series today we're highlighting a recommendation to improve the northbound/southbound access through downtown.

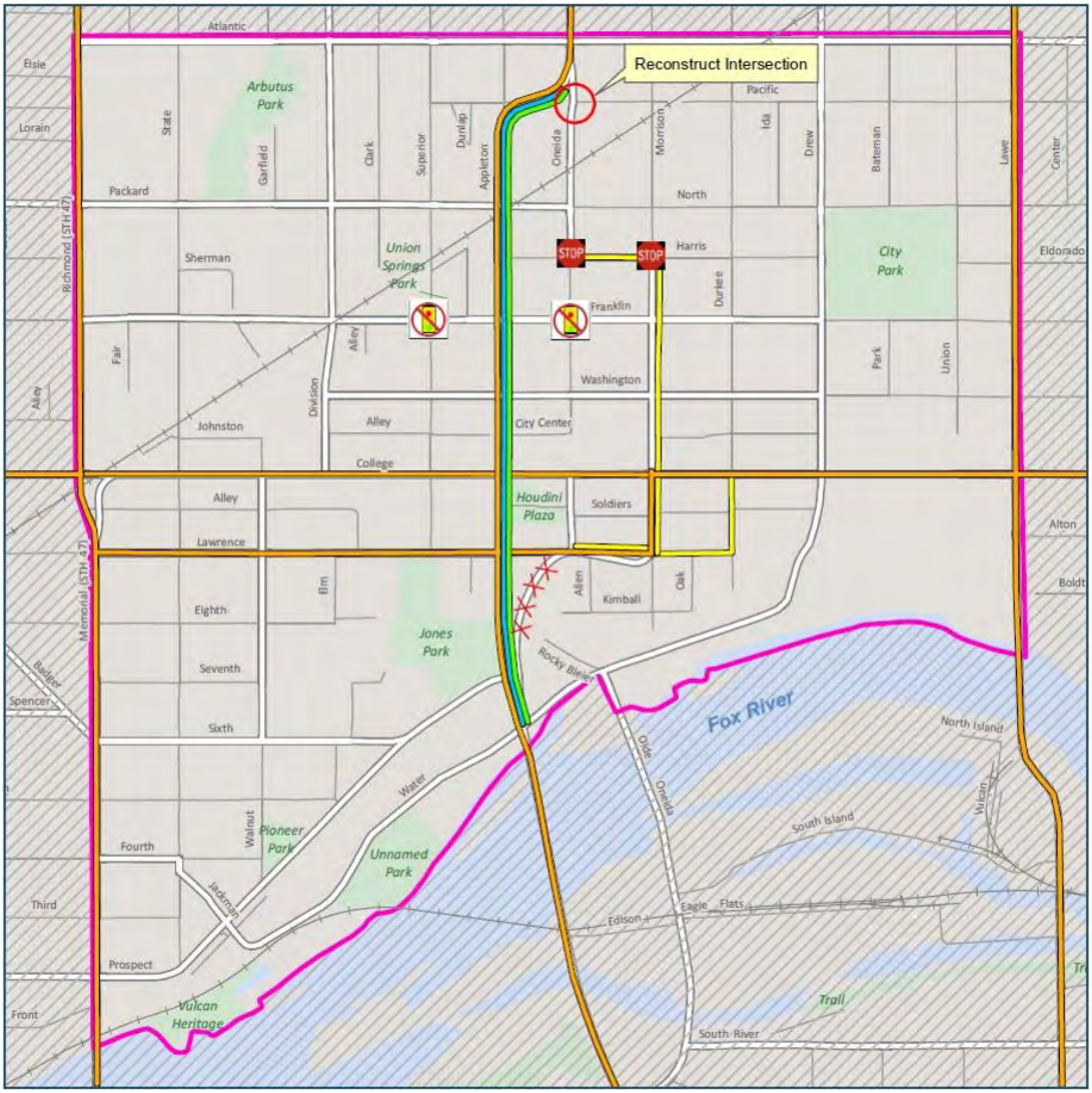
For drivers, the confusion downtown starts with Appleton Street. The partial one-way street leads south to Oneida Street and the south side of town from Washington Street. But coming across the Oneida Skyline Bridge drivers heading north need to navigate a confusing maze of one-way streets to get to the north side of the city.

Referencing the map below, the consultant found six one-way intersections that are confusing to drivers because of the difficultly of traveling north through downtown.



Making Appleton Street two-way

This alternative completely redesigns the the northbound flow of traffic through downtown. It would turn Appleton Street back into a two-way street throughout the length of downtown, making it the primary north/south route through the city. It would also allow us to turn the one-way side streets back into two-way streets.



The proposed changes are shown in the map above. What is referred to as Alternative #2 would also result in the closure of the familiar sweeping turn towards downtown coming north from the Oneida Skyline Bridge.

But, what it would do is create a straight path through downtown connecting the north and south sides of the city, while also allowing us to create a more traditional grid pattern downtown by turning the majority of the one-way streets downtown back into two-way streets.

This alternative would require construction and reconstruction of portions of several streets along the route. A cost estimate for the project has not been determined. The view below shows how the street would look with two travel lanes and a left-turn lane at each intersection.

Other impacts

If the Common Council would approve turning Appleton Street into a two-way street again, this proposal also recommends removing on-street parking along the route downtown to add bike lanes. As part of the upcoming reconstruction project on South Oneida Street, the city will add bike lanes from Highway 441 up to the Oneida Skyline Bridge. The consultant recommends continuing them through downtown heading north on Appleton Street. This would not only make Appleton Street the main north/south route through downtown, but also the main route for bicycles as well.

We realize some downtown businesses would be concerned about losing parking along Appleton Street. This is one of many factors that will be considered as the recommendations are brought forward to the Municipal Services committee and Common Council in the coming months. This is also one of the reasons we are encouraging community feedback on what options the community would like to see as well.

What's Next?

Tomorrow we will highlight the final alternative studied by the consultant. This option would change the configuration of College Avenue and have significant impacts on parking, and bike/pedestrian options downtown as well.

Appleton Communications Coordinator Chad Doran can be reached at (920) 832-5814 or chad.doran@appleton.org.

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Return to full list >>

News List

Mobility study - College Ave. reconfiguration

Post Date: 04/07/2016 9:17 AM

In our last story in our series on the downtown mobility study, we're taking a look at ways to improve multi-modal access on College Avenue.

Wednesday we explained a recommendation to improve north/south access through the city on Appleton Street. Tuesday we highlighted some ways to improve mobility downtown for pedestrians and bicyclists. Monday we gave an overview of the goals of our downtown mobility study. We hope this will encourage many of you to take part in tonight's mobility study community input session in the Common Council Chambers here at City Hall from 5-6:30 p.m. tonight.

Road Diet

Before we really explain what a "road diet" is, we want to say up front that this will not be an option that the city staff will recommend to the Common Council. It was studied thoroughly enough to give our traffic engineers reasonable certainty that it would create major traffic issues. The College Avenue road diet option would also not work in conjunction with the Appleton Street plan we explained Wednesday. But we want to explain what the road diet concept is and what it would look like if it would be implemented here.

The concept behind a road diet is to create low cost, safety, mobility and access improvements for all road users. In a sense it creates a "complete streets" environment that accommodates the needs of vehicles, pedestrians and cyclists without compromising access and safety.

Currently College Avenue is a four-lane road with parallel parking available on both sides of the street throughout downtown. The city's main east/west thoroughfare handles between 13,000-15,000 cars per day.

The road diet option for College Avenue would essentially shrink the road from four lanes to three lanes and add bike lanes on each side of the street, with a left-turn lane in the middle.

If this option were to be implemented, it would look something like this:

Other initiatives

BIKE PARKING - College Avenue has attractive destinations for cyclists, but as the study points out, once they are here, cyclists have no where to park their bikes. Adding designated bike parking areas in multiple locations downtown is one of the recommendations.

VEHICLE PARKING - As we've explained in the past, a parking study completed in 2015 shows that we have an oversupply of parking in the downtown. Not everyone wants to park in the parking ramps, but part of the pedestrian improvements in this study are meant to encourage people to be willing to park a little further away and walk to their destination, enjoying all that downtown has to offer along the way.

By 2020 the parking ramp connected to the City Center and the Soldier's Square ramp will be at the end of their useful life and need to be torn down. That parking study recommends replacing one of the ramps - most likely the Soldier's Square ramp with a new mixed-use parking ramp with retail businesses on the first floor and parking above that. Even then, we will still have more than enough parking downtown - including the expected influx from the soon-to-be-built exhibition center.

Final thoughts

The study by AECOM and the Toole Design Group is meant to be a long-range planning guide to help the city improve access for all forms of transportation downtown. Any decisions on implementing any of the recommendations or portions of them, would be made by the Common Council. Many of these projects require some form of road work and would need to be budgeted for, meaning implementation could still be months or several years away depending on what, if any of the recommendations are implemented.

We hope to hear your feedback on how you feel about these options or other ideas you may have as well. We encourage you to attend our community input meeting tonight or send comments to us through our Facebook page.

Following tonight's meeting the consultants will create a final recommendation that will come to the Municipal Services Committee in June.

Appleton Communications Coordinator Chad Doran can be reached at (920) 832-5814 or chad.doran@appleton.org.

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Return to full list >>

Appendix O

Municipal Services Committee Meeting Minutes

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Memorandum

To	Eric Lom – City of Appleton
CC	Mike Hardy – City of Appleton Paula Vandehey – City of Appleton
Subject	**Minutes – 7/12/2016 Municipal Services Committee Meeting** Downtown Appleton Mobility Study AECOM Project No. 60445894
From	Amy Canfield, P.E. – AECOM
Date	July 14, 2016

On Tuesday, July 12, 2016 the study team presented the draft recommendations for the Mobility Study to the Municipal Services Committee. This meeting was open to the public. The purpose of the meeting was to educate the committee on:

- The purpose of the study
- Issues identified
- Alternatives considered
- Public involvement
- Draft recommendations

The study team was seeking feedback on the items noted above in order to finalize the draft recommendations.

Attendance

Municipal Services Committee members and alderpersons Patti Coenen (District 11), Curt Konetzke (District 3), Joe Martin (District 4) and Margaret Mann (District 9) were in attendance. 25 members of the public signed in at the meeting. In addition, the following alderpersons attended the meeting:

- Alderperson Matt Reed (District 8)
- Alderperson Christine Williams (District 10)
- Alderperson Jeff Jirschele (District 15)
- Alderperson Kathleen Plank (District 7)
- Alderperson Vered Meltzer (District 2)

Eric Lom, Paula Vandehey, Amy Canfield (AECOM) and Kevin Luecke (Toole Design Group) attended on behalf of the study team. A copy of the sign-in sheet is attached (Exhibit 1).

Presentation

Amy Canfield and Kevin Luecke gave a 60 minute presentation which covered the purpose of the study, issues identified, alternatives considered, public involvement and draft recommendations. A copy of the presentation is attached (Exhibit 2). A video recording of the presentation is available on the City of Appleton website at www.appleton.org. Click on the "Agendas and Meeting Videos" link.

Exhibits/Handouts
Municipal Services Committee members were provided with a copy of the presentation and two handouts (Exhibit 3). The first handout was a map showing the recommended ultimate build out improvements in the central downtown area. The second handout was a map showing all bicycle improvements in the study area. The public was provided with both handouts and a large exhibit displaying the recommended ultimate build out improvements was available for viewing.

Public Comment
18 people provided verbal comments following the presentation. A list of each person's concerns is below. For more information, refer to the video recording noted above.

Table 1: Summary of Public Comments/Questions

Name ***Business / Org.***	**Comments**
John Gosling	• Pro bike. • Would like to see bike lanes on Franklin St. between Division St. and Richmond St. • Supports replacing planters on College Ave. with bike racks.
John Cuff	• Supportive of proposed recommendations. • Supportive of 2-way Appleton St. Believes there is currently no good way to travel north-south through downtown Appleton.
Jamie Cartwright	• Concerned about bicyclists riding on the sidewalks on College Ave. • Supportive of more signing/education to let people know it is illegal. Would like to see very obvious signage. • Questioned whether sharrows could be used on higher volume roads like College Ave. Noted that Washington St. in Green Bay has shared lanes.
Linda Nikolai	• Concerned about Lawe St. bike lanes due to congestion. • Supports education for bikers/drivers. • Would like to see a bicycle/pedestrian elevator from the bluff site to Water St.
Ronna Swift	• Supports 2-way Appleton St. recommendation. • Supportive of planned trestle trail bike facilities south of the study area. • Supportive of signed route through the Lawrence University campus. • Desires an accessible ramp with switchbacks near Trinity Church down the bluff to the river. Would like to see benches for people to rest.
Jordan Hereford *Ambassador Bar*	• Business owner of Ambassador Bar on the 100 block of Appleton St. • Likes benefit of 2-way traffic on Appleton St., does not like losing parking. • Concerned about lack of loading zone on Appleton St. – especially in the winter.

Name ***Business / Org.***	**Comments**
Penny Barnard-Schaber*	• Downtown resident. Pro bike. • Desires consistent signage/markings for bike routes and improved education. • Questioned whether bike routes were needed on Packard St., Franklin St. and Washington St. since they were all parallel and close to each other. • Concerned that Lawe St. would be a dangerous bike route. • Questioned why traffic signals were not designed to detect bikers.
Jennifer Stephany *(ADI)*	• Recognizes benefits of 2-way Appleton St. • Supportive of bikeable, liveable downtown. • Concerned about loading zones for businesses on Appleton St. • Questioned whether a loading zone could be created on the west side of Houdini plaza. • Questioned whether parking would be impacted on State St. with the recommendation of a bicycle boulevard.
Andrew Dane	• Concerned about potential conflicts between bicyclists and trucks on Lawe St. • Opposed to removing trees along Lawe St. to provide bike lanes.
Daniel Froehling*	• Not supportive of proposed recommendations. • Concerned that too few people will benefit. Used terms such as looking out for the greater good and using common sense. • Concerned plans could not be translated from paper to reality. • Concerned about ADA accessibility from bluff site to Water St.
Rob Gusky*	• Believes a vital downtown is important to the city. • Believes this is really an infrastructure plan for economic development.
Barb Westhofen	• Concerned over removing parking close to businesses because she is elderly. • Sought clarification on comment earlier in the meeting that biking was banned on College Ave. sidewalks – she interpreted the comment as biking was banned on all Appleton sidewalks and wanted to see that changed. • Concerned about bike safety on Drew. St. hill.
Mark Green	• Supports 2-way Appleton St. recommendation.
Cheryl Zadrazil	• Spoke on behalf of Fox Cities Greenways. Supports bike improvements.
Ron Mohr	• Concerned about potential conflicts between bicyclists and trucks on Lawe St. • Questioned whether a 1-way pair using Lawe St. and Meade St. was feasible. • Opposed to removing trees along Lawe St. to provide bike lanes.
Gwen Sargent	• Concerned about the amount of traffic on Lawe St. and the recommendation for bike lanes on this street. • Questioned how much traffic was on Lawe St.
Dick Nikolai	• Would like to see better accommodations for winter biking. • Education for bikers/drivers needed. • Better markings needed for bicycle lanes/accommodations.

Name ***Business / Org.***	**Comments**
Mary Kelley *Crazy Sweet*	• Business owner of Crazy Sweet, located on the corner of College Ave. and Appleton St. • Supports 2-way Appleton St. recommendation but is concerned about parking for delivery vehicles. • Questioned whether bike lanes could be moved to Superior St. Asked if Appleton St. was too skinny for bike lanes.

* Did not sign in at meeting. Name/spelling may be incorrect.

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Memorandum

To	Eric Lom – City of Appleton
CC	Mike Hardy – City of Appleton Paula Vandehey – City of Appleton
Subject	**Minutes – 8/9/2016 Municipal Services Committee Meeting** Downtown Appleton Mobility Study AECOM Project No. 60445894
From	Amy Canfield, P.E. – AECOM
Date	August 12, 2016

On Tuesday, August 9, 2016 the study team returned to meet with the Municipal Services Committee. This meeting was open to the public. The purpose of the meeting was to:

- Discuss feedback received at the July 12, 2016 Municipal Services Committee meeting
- Review changes proposed to draft recommendations as a result of feedback received
- Answer questions from the Committee regarding the draft recommendations

Attendance
Municipal Services Committee members and alderpersons Chris Croatt (District 14), Patti Coenen (District 11), Curt Konetzke (District 3) and Joe Martin (District 4) were in attendance. In addition, the following alderpersons attended the meeting:

- Alderperson Christine Williams (District 10)
- Alderperson Kathleen Plank (District 7)
- Alderperson Vered Meltzer (District 2)

Eric Lom, Paula Vandehey, Amy Canfield (AECOM) and Kevin Luecke (Toole Design Group) attended on behalf of the study team.

Presentation
Amy Canfield and Kevin Luecke discussed the comments received and the changes proposed to the recommendations. The highlights are noted below:

- 15-minute loading zone added to west side of Houdini Plaza
- Additional language was added to emphasize that all shared-use paths and stairways/ramps should be ADA accessible if possible.
- Emphasized that if significant redevelopment occurs on the bluff site, Allen Street should be removed and a southern extension of Oneida Street south of Lawrence Street provided.
- Additional information on pedestrian lighting priorities was added to the report.

- Additional information regarding upgrading traffic signal systems to include bicycle detection capabilities was added to the report.

A copy of the speaker's notes is attached. A video recording of the presentation is available on the City of Appleton website at www.appleton.org. Click on the "Agendas and Meeting Videos" link.

Exhibits/Handouts
Municipal Services Committee members were provided with a copy of the revised recommendations, updated recommended improvements map and updated bicycle recommendations maps (See attachments). The maps were also available to members of the public who were in attendance.

Questions/Comments
The following questions/comments were noted at the meeting:

- There is 30-minute parking in front of Cleo's on College Avenue. This area could be considered for a potential loading zone designation.
- Much of the discussion regarding parking impacts has centered on the 100 and 200 blocks of Appleton Street. However, won't there be parking impacts all along Appleton Street?
  - Yes – parking will be removed from one side of the street to accommodate bike lanes. Many businesses in this area have off-street parking lots.
- Concern regarding removing pedestrian bump-outs in order to provide bicycle facilities – is safety for pedestrians being sacrificed to improve safety for bicyclists?
  - Study team noted that pedestrian bump-outs have the highest safety benefits at unsignalized intersections.
- Concern over bike lanes recommended for Lawe Street due to truck traffic and overall traffic volume. Desire for Meade Street to be considered instead. Another person spoke in favor of the Lawe Street bike lanes as long as the curb-to-curb distance did not change.
- A representative from Appleton Downtown Inc. (ADI) spoke in favor of the Mobility Study recommendations and the new recommendation to add a loading zone to the west side of Houdini Plaza.

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Memorandum

To	Eric Lom – City of Appleton
CC	Paula Vandehey – City of Appleton
Subject	**Comments to Address at 8/9/2016 Municipal Services Committee Meeting** Downtown Appleton Mobility Study AECOM Project No. 60445894
From	Amy Canfield, P.E. – AECOM
Date	August 8, 2016

On Tuesday, July 12, 2016 the study team presented the draft recommendations for the Mobility Study to the Municipal Services Committee. Following the formal presentation, 18 people provided verbal comments. These comments are detailed in the meeting minutes prepared for the July meeting.

On Tuesday, August 9, 2016 the study team will return to the Municipal Services Committee to address the comments received and explain changes made to the draft recommendations. The paragraphs below summarize the significant comments received and the study team's response to these comments. This information is intended to be presented verbally during the Municipal Services Committee meeting.

Comment: **Consider a loading zone on Appleton St. on the west side of Houdini Plaza.**
Response: A 15-minute loading zone on the west side of Houdini Plaza has been added to the recommendations map. The loading zone was located to avoid utility impacts in Houdini Plaza and will require reconfiguring the pedestrian walkways within the plaza. It is recommended that it be designed to accommodate a single unit truck, similar in size to a UPS truck.

Comment: **Did the Mobility Study consider a 1-way pair using Lawe Street and Meade Street?**
Response: No, the Mobility Study did not consider a 1-way pair using Lawe Street and Meade Street. Meade Street is outside the study area and one of the main goals of the study was to improve mobility by eliminating as many 1-way streets as possible.

Comment: **Is there an education plan for bikers, drivers and pedestrians associated with this Study?**
Response: An education plan is outside the scope of this study. At this time, the City does not have any plans for a robust program. City staff will look into potential education opportunities as resources permit.

Comment: **What is the City doing to improve bicycle detection at signalized intersections?**
Response: City staff will continue to upgrade signal detection systems to include detection for bicyclists and look for opportunities to install push buttons if automated means are not feasible.

Comment: **Concern regarding the safety of bicycles, pedestrians and vehicles on the hill on Drew Street between College Avenue and Water Street.**
Response: The City is looking in to opportunities to improve sight lines near the curve by potentially removing vegetation from the inside of the curve.

Comment: **Clarify sidewalk biking ban.**
Response: The City's sidewalk biking ban is limited to College Avenue between Badger Avenue and Drew Street.

Comment: **Provide shared lane markings on College Avenue**
Response: The traffic volumes and speeds on College Avenue warrant a bicycle lane, buffered bicycle lane, or separated bicycle lane; however space constraints within the right of way will not allow for any of these facilities. Shared lane markings can work well to encourage bicyclists to "take the lane" on streets with moderate traffic levels and speeds; they also alert motorists to the potential presence of bicyclists and where bicyclists should be positioned on the street. According to the NACTO Urban Bikeway Design Guide, shared lane markings are desirable on streets where:

- The speed differential between bicyclists and motor vehicles is very low;
- Where street widths can only accommodate a bicycle lane in one direction; or
- To fill a gap in an otherwise continuous bike path or bike lane, generally for a short distance.

None of these characteristics align with the conditions on College Avenue. Additionally, shared lane markings do not tend to inspire less confident bicyclists to ride on a marked street. There are significant issues with sidewalk riding by bicyclists on College Avenue; shared lane markings are unlikely to move many of these bicyclists to the street.

These recommendations do not preclude the City from installing shared lane markings on College Avenue in the future if other efforts to dissuade sidewalk bicycling (i.e. parallel routes, bicycle parking near corners, better signage) are not successful.

Comment: **Why are bicycle facilities needed on Packard, Franklin and Washington, which are all parallel routes?**
Response: The intent of the recommendations is to provide comfortable bicycle accommodations throughout the study area. Just as redundant facilities are provided for motor vehicles, the same should occur for bicycles whenever possible. The following is noted about each street:

- **Packard Street /North Street:** West Packard Street is substantially overbuilt for the volume of motor vehicle traffic it carries; one or two lanes can be converted to bicycle facilities without impacting motor vehicle operations. It is logical for these facilities to continue east on East North Street. The recommendations also connect to recommendations from the City's 2010 Bicycle Plan on both West Packard Street and East North Street.
- **Franklin Street:** Bicycle lanes already exist on Franklin Street between North Richmond Street and North Drew Street. Providing bicycle lanes on East Franklin Street from North

Drew Street to North Lawe Street provides a connection to City Park and a connection to future bike lanes on North Lawe Street.

- **Washington Street:** Washington Street provides a parallel route to College Avenue – a significant commercial corridor without bicycle accommodations. Bicycle accommodations on Washington Street will allow bicyclists to get close to destinations on College Avenue without having to ride on College Avenue itself.

Comment: Bike lanes on Lawe Street are a bad idea – there is too much traffic and too many trucks there.
Response: Lawe Street provides an important north-south connection in Appleton, particularly with the bridge crossings of the Fox River, which has very limited bicycle crossings. When installed, bike lanes on Lawe Street will be five feet wide with eleven foot wide travel lanes. These lane widths should be adequate for the speed (25mph speed limit), volume (~6,000 vehicles per day), and types of vehicles (truck route with moderate truck volumes) present on Lawe Street. Similar lane widths are in use on other streets in Appleton without issue.

Comment: Bike lanes on South Appleton Street should be shifted over to South Superior Street to allow for parking and or loading zones on South Appleton Street.
Response: Bike lanes recommended for South Appleton Street provide a direct north-south connection for bicyclists through downtown Appleton and provide direct access to the South Oneida Street Bridge. Shifting the bike lanes to South Superior Street creates an indirect route for bicyclists. More importantly, shifting the bike lanes to South Superior Street would require northbound bicyclists to turn left across South Appleton Street traffic to access West Lawrence Street, and cross North Appleton Street traffic when returning to their original route – this introduces significantly more risk of a crash at those crossings.

Comment: Any ramps, stairs or paths down to the waterfront should provide access for wheelchairs, strollers, and bikes.
Response: Designs for these access points, primarily the Grand Staircase, are purely conceptual at this point. Any final designs will need to meet Americans with Disability Act (ADA) accessibility requirements, which will allow for wheelchair access. All maps have been updated to note that ADA accessibility will examined when designs are further studied.

Downtown Appleton Mobility Plan – DRAFT

August 2016

Downtown Appleton Mobility Study / 60445894

Contents

List of Tables

List of Figures

List of Exhibits

List of Appendices

Introduction

City centers across the nation are experiencing revival and renaissance. Demographic and market studies consistently show that in a 21st century economy, people want livable, walkable neighborhoods. A combination of transportation strategies is needed to accommodate these shifting attitudes.

Study Area

The study area is bound by the following streets:

- WIS 47 (Richmond Street / Memorial Drive) to the west
- Atlantic Street to the north
- Lawe Street to the east
- Fox River to the south

This area is approximately 0.92 miles wide and 0.7. miles high, resulting in an overall study area of approximately 0.64 square miles. For a larger map of the study area, see Exhibit 1.

Purpose of the Study

The purpose of the Downtown Appleton Mobility Study is to determine and evaluate strategies that would improve multi-modal mobility and traffic circulation in downtown Appleton. The study included an evaluation and analysis of existing and projected conditions, an evaluation of alternative transportation modes (bicycle, pedestrian) and recommendations for future projects.

The results of the study, documented in this Mobility Plan, are intended to set the stage for reconfiguring the transportation network in downtown Appleton. The proposed transportation network provides convenient access to valuable community resources such as employment centers, parks, the Fox River, cultural and entertainment attractions and civic uses. A well-designed multi-modal transportation network supports community health and well-being and promotes a strong economy.

Mobility is about more than just vehicular traffic. One-third of the population does not drive.

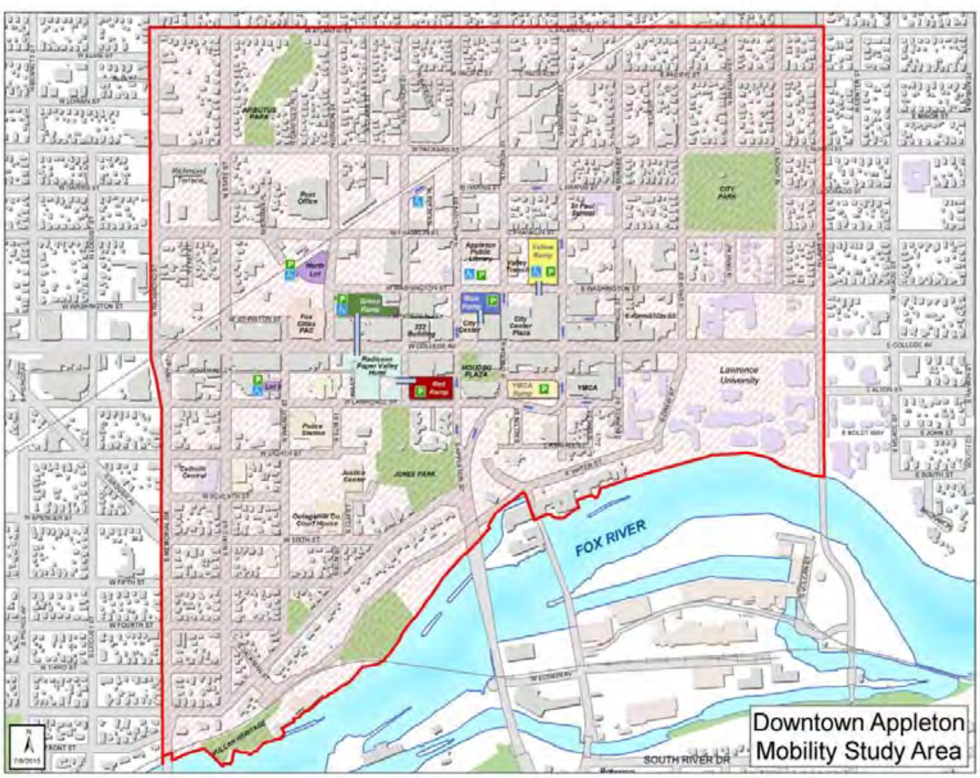


Figure 1: Study Area

Existing Conditions

Traffic flows well through downtown Appleton, even during peak hours. The study area is also already generally a pleasant place to bike and walk.

Vehicles

Traffic operations were analyzed for existing conditions (2015) and projected year 2036 no-build conditions. The 2036 no-build analysis looks at traffic operations in 2036 with no changes to the transportation system other than signal timing improvements.

Average Daily Traffic

Average Annual Daily Traffic (AADT) data was provided by the City of Appleton. The data included AADT counts from 2010 – 2015 along major routes within the study limits. Additional AADT data available from the Wisconsin Department of Transportation (WisDOT) for major routes (College Avenue, Richmond Street, etc.) in the study area was also referenced. See Exhibit 2 for a map of AADT in the study area.

Intersection Turning Movement Counts

The City of Appleton provided turning movement counts for six intersections in the study area. To supplement this data, turning movement traffic counts were conducted in November and December 2015. The counts were completed for the PM peak period from 3-6 PM. The PM peak hour was determined to be the controlling period for traffic operations by city staff. For a list of all intersections where traffic counts were conducted, see Appendix A.

Traffic Forecasting

The 2036 traffic forecasts were based on the AADT and intersection turning movement count data described previously. This information was provided to the East Central Wisconsin Regional Planning Commission (ECWRPC). ECWRPC used the regional travel demand model to predict future traffic growth. For additional information on the traffic forecasting process, see Appendix B.

Traffic Operations

Traffic operations for existing conditions and 2036 future conditions were analyzed using the Highway Capacity Manual (HCM) method in Synchro traffic modeling software for all stop-controlled intersections and Synchro methodology for all signalized intersections. The intersection Level of Service (LOS) of all analyzed intersections can be seen on Exhibit 3. If any specific movement at any of the intersections operates at LOS E or worse, it is noted on the exhibit. Traffic modeling results for the existing conditions analysis and 2036 no-build analysis can be found in Appendix C.

LOS is based on the average control delay per vehicle. Control delay is the increased time of travel for a vehicle approaching and passing through a controlled intersection, compared with a free-flow vehicle if it were not required to slow or stop at the intersection. This delay is made up of a number of factors that relate to control, geometrics, and traffic flow. LOS is an indicator of driver discomfort, frustration, fuel consumption, and increased travel time.

Traffic congestion is minimal in downtown Appleton. Vehicles typically experience less than 20 seconds of delay at the majority of intersections during the PM peak hour.

LOS is assigned a letter "grade" from A through F. LOS A indicates operations with very low control delay while LOS F describes operations with extremely high average control delay. The LOS criteria for stop controlled (unsignalized) intersections is shown in Table 1 and the LOS for signalized intersections is shown in Table 2.

Table 1: Unsignalized Intersection Level of Service Criteria

Level of Service	Average Control Delay (sec/veh)
A	0-10
B	> 10 - 15
C	> 15 - 25
D	> 25 - 35
E	> 35 - 50
F	> 50

Source: *Highway Capacity Manual*

Table 2: Signalized Intersection Level of Service Criteria

Level of Service	Average Control Delay (sec/veh)
A	0-10
B	> 10 - 20
C	> 20 - 35
D	> 35 - 55
E	> 55 - 80
F	> 80

Source: Highway Capacity Manual

Pedestrians

Every trip begins and ends with walking.

To reach your vehicle, bike, or transit stop, one must walk. Pedestrian comfort and safety is critical to achieving a balanced, multi-modal transportation system.

The majority of the streets within the study area include continuous sidewalks on both sides. See Exhibit 4 for a map showing gaps in the sidewalk system. Where sidewalks do exist, some are aging and are in need of maintenance and repair. For those in wheelchairs or pushing strollers, most intersections within the study area include curb ramps. However, many of the existing curb ramps do not meet the current requirements of the Americans with Disabilities Accessibility (ADA) Guidelines. For example, detectable warnings are not present at many intersections.

Portions of the study area have terraces between the sidewalk and the curb, often including mature street trees. These areas are the places where walking is the most pleasant. Pedestrians have physical separation from moving traffic and have the benefit of shade. In other parts of the study area, the sidewalk is immediately adjacent to the curb. This creates a less appealing walking environment, particularly on the streets with heavier traffic volumes, such as Richmond Street.

The most significant pedestrian safety problems are at intersections.

With a nearly continuous sidewalk network, Downtown Appleton's most significant pedestrian safety problems are at intersections. Pedestrian crossings are most difficult on busier streets such as Richmond Street, particularly in locations where there are no traffic signals. In locations with more than one lane in the same direction, such as the midblock crosswalk located on Appleton Street between Lawrence Street and College Avenue, pedestrians are exposed to the multiple-threat condition. This is when a car in one lane stops for a pedestrian, and the vehicle in the adjacent lane does not stop. This is a high-risk condition for pedestrians, particularly if vehicles stop close to the pedestrian, blocking the traffic in the adjacent lane from the pedestrian's view.

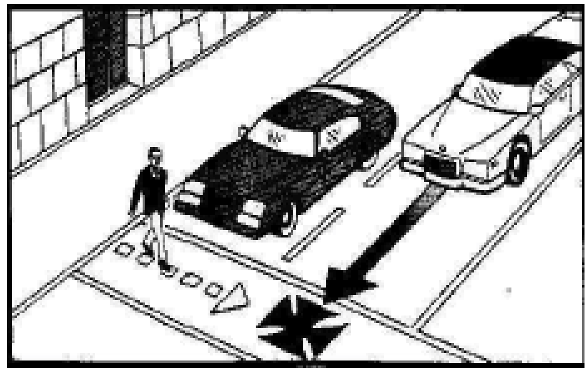


Figure 2: Multiple Threat Condition
A multiple-threat condition exists when a car in one lane stops for a pedestrian but a vehicle in the adjacent lane does not.

The study area has many unmarked crosswalks. Marked crosswalks are helpful in indicating preferred pedestrian crossing locations, to alert drivers to often-used pedestrian crossings, and to designate crosswalks on school walking routes. For the marked crosswalks that do exist, many are between six and ten feet in width. Wider crosswalks of ten to fifteen feet are more easily seen by drivers. Further, where marked crosswalks do exist, most consist of two parallel lines rather than high visibility crosswalks with transverse stripes, even in locations near schools where there is an increased need to draw driver's attention to the need to watch out for pedestrians.

The intersections of Lawrence and Morrison Streets and Lawrence and Oneida Streets have been observed to be problematic to pedestrians. Both are areas where there is high pedestrian demand and where the intersection geometry is complex.

There are also a number of existing plans and policies that address pedestrian and bicycle transportation in downtown Appleton. For a summary of these plans and their applicability to multi-modal mobility, see Appendix D.

Bicycles

Many streets in the study area are good for bicycling. However, they rarely have destinations people want to go to.

For the most part, downtown Appleton is a pleasant place to bike even though there are few designated bicycle facilities within the study area. See Exhibit 5 for a map of existing bicycle facilities in the study area. The street network is generally gridded, offering multiple route options. Major challenges in the study area include:

- College Avenue, where many destinations are located, is suitable only for enthused and confident bicyclists.

- Bicyclists are frequently observed riding on sidewalks in the study area, even when it is not allowed (College Avenue).
- Connections to the Fox River are lacking.
- There are few bicycle parking racks in the study area.

A Level of Traffic Stress analysis was performed to categorize study area streets based on how attractive they were to different categories of bicycle riders. A summary of this analysis can be found in Appendix E. The majority of the streets within the study area are comfortable for biking. While these streets do not contain many of the destinations people bike to, they do contain schools and homes. Efforts to make Appleton more bikeable will be made easier by the large number of streets already suited for most bicyclists.

Safety

Crash data for the five year period from 2010 through 2014 was reviewed to determine locations where vehicle, pedestrian or bicycle crashes occurred in downtown Appleton. Data was obtained from the Wisconsin Traffic Operations and Safety (TOPS) Laboratory.

Vehicles

Crash diagrams (see Appendix F) were prepared if an intersection had more than 20 crashes in the five year analysis period or if the intersection crash rate was greater than 1.0 crash per million entering vehicles. The following four intersections met these criteria:

- College Avenue and Appleton Street
- College Avenue and Drew Street
- Franklin Street and Superior Street
- Franklin Street and Morrison Street

Bicycles and Pedestrians

There were 70 pedestrian and bicycle crashes in downtown Appleton between 2010 and 2014. See Appendix F for more information. The following trends were noted:

- The intersection of College Avenue and Richmond Street has the highest number of crashes for both bicyclists and pedestrians.
- There were many pedestrian and bicycle crashes on College Avenue.
- Drew Street was the location of several bicycle and pedestrian crashes.
- The intersection of Richmond Street and Franklin Street was the location of several bicycle crashes.
- There was roughly the same number of bicycle and pedestrian crashes in the study area between 2010 and 2014.

Issues

The main issue in the study area is confusing northbound routing.

Identifying mobility issues in the study area was one of the first steps in the study. The issues identified and described below form the basis for the need for the study. The identification of issues was a joint effort between the study team, city staff, stakeholders and the public.

Northbound Routing

The existing northbound route through downtown Appleton requires misdirection for motorists and can be confusing. See Exhibit 6 for a map of the existing northbound route. In 1987, The City Center Plaza (originally the Avenue Mall) opened in downtown Appleton on the north side of College Avenue between Appleton Street and Morrison Street. Construction of the mall effectively severed a piece of the grid roadway network in downtown Appleton by removing a one-block portion of Oneida Street between College Avenue and Washington Street. Instead of a grid of two-way streets, northbound and southbound traffic through the middle of downtown Appleton was re-routed onto one-way streets.

Figure 3: Northbound Route
The route northbound traffic coming from the Oneida Street bridge takes to / through downtown Appleton is indirect and confusing.

Northbound traffic experienced the greatest traffic disruption. One of the main routes into downtown Appleton from the south is via the Oneida Skyline bridge over the Fox River. Currently, drivers proceed over the bridge and are then routed east along Lawrence Street before turning north along Morrison Street. North of College Avenue, the routing becomes more confusing. In the past, a splitter island at the Morrison Street and Harris Street intersection directed traffic west on Harris Street and then north on Oneida Street out of the downtown area. The splitter island was removed several years ago and traffic now follows whichever route it chooses, though Harris Street is still the marked route. This is confusing to drivers and leads traffic through residential neighborhoods north of downtown.

Southbound traffic follows Appleton Street through the downtown area. North of downtown, southbound traffic generally approaches from Oneida Street and is then redirected to Appleton Street just north of Pacific Street. Appleton Street transitions to a one-way street south of Washington Street.

Confusing Intersections

Several intersections in the downtown area were identified by city staff as confusing and/or unconventional.

Six of the seven intersections identified as confusing intersections are located on the city's one-way northbound route.

Field reviews of each intersection were completed and vehicular, bicycle and pedestrian issues were noted. The unconventional intersections include:

1. Oneida Street and Lawrence Street
2. Morrison Street and Lawrence Street
3. Morrison Street and Harris Street
4. Oneida Street and Harris Street
5. Oneida Street and North Street
6. Oneida Street and Pacific Street
7. State Street and Jackman Street

Details on each intersection can be found in Appendix G.

Figure 4: Oneida Street and Lawrence Street Intersection
The Oneida Street and Lawrence Street intersection is one of the most confusing in downtown Appleton.

Railroad Crossings

As part of an agreement with Canadian National Railroad, the City must close one public at-grade railroad crossing somewhere within the city limits. Through a separate study, the City has identified two potential at-grade crossings located in the downtown study area which are being considered for closure. The crossing locations, which are described in more detail in Appendix H, are located at Oneida Street and Morrison Street.

Figure 5: Oneida Street Railroad Crossing

Figure 6: Morrison Street Railroad Crossing

Truck Routing

Existing truck routes through the downtown area are shown on Exhibit 7. Contrary to driver expectancy, the signed truck routes do not take drivers down College Avenue, instead redirecting eastbound/westbound traffic to Lawrence Street and Washington Street. Northbound and southbound routing is also confusing with truck routes that abruptly end and no truck route entering or exiting the downtown area to the north.

Loading Zones

The location and availability of loading zones is a very important issue to business owners in the downtown area. The marked loading zones noted on Exhibit 7 were noted during a December 2015 field review.

Abundance of On-street Parking

A Downtown Parking Study was completed by Walker Parking Consultants in February 2015. The plan analyzed existing parking conditions and proposed recommendations for changing parking facilities and policy in the future. The Blue Ramp (City Center ramp) will be removed from service within 5 years. The Soldier Square Ramp, operated by the YMCA and not city owned, is nearing the end of its useful life.

Current weekday peak parking conditions at 11 AM are 65% occupancy. Weekday evening parking conditions at 7 PM are 33% occupancy. On-street occupancy was measured at 42%. The study projects future parking supply given a variety of scenarios.

In each scenario, even with a new expo center, new library and other organic growth, an oversupply of parking is projected.

This oversupply also assumes closure of the Blue Ramp and the Soldier Square/YMCA ramp.

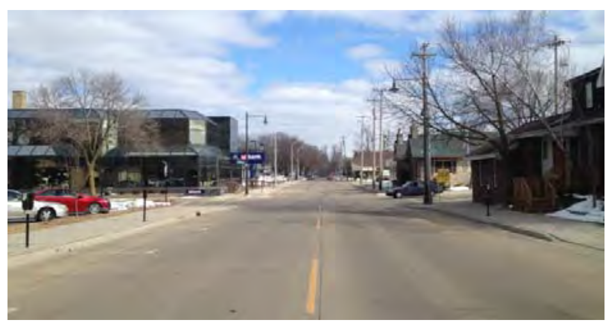


Figure 7: Washington Street Parking
Unoccupied on-street parking on Washington Street on a Saturday afternoon.

The parking oversupply is relevant to the mobility study for the following reasons:

- In order to provide bicycle facilities on some downtown streets, it may be necessary to reconfigure on-street parking in select locations. The oversupply of parking indicates that this is feasible from a parking utilization perspective.
- In order to encourage use of municipal and private parking ramps, it is necessary to have good pedestrian connections from those ramps to destinations throughout downtown. Parking in a ramp and walking a few blocks to a nearby destination should not be a significant inconvenience for users.

Unwarranted Traffic Signals

There are two traffic signals in the study area that do not meet traffic signal warrants.

There is not enough vehicular traffic or pedestrians passing through the intersection to justify the traffic signal from an engineering perspective.

The signals are located at the following intersections:

- Franklin Street and Superior Street
- Franklin Street and Oneida Street

See Appendix I for more information.

Figure 8: Franklin Street and Oneida Street Intersection
The existing traffic signal at the Franklin Street and Oneida Street intersection is not warranted.

Low Levels of Traffic Congestion

Most communities would consider low levels of traffic congestion to be a positive attribute. While this is true, very low levels of traffic congestion in a downtown area can also be an indicator of a lower level of economic activity. Existing traffic congestion in downtown Appleton, especially off College Avenue, is low and is predicted to remain that way through 2036 under the no-build scenario.

A well designed transportation system is needed to shape transportation demand and serve the economic future.

Access to the Fox River

One of the major challenges in downtown Appleton for vehicles, pedestrians and bicyclists is connecting to the Fox River. Close to the river, the streets stray from the grid pattern characteristic of most of the study area. In part due to topography challenges, relatively few streets connect to the river. Pedestrian desire lines have been trampled into the ground in some locations, indicating demand for more connections to the water. Vehicular access to the river is limited to Water Street which can only be accessed from two points in the downtown area – Drew Street and Jackman Street.

Figure 9: Pedestrian Trail to Water Street
A pedestrian trail trampled in the grass. The trail leads from the Water Street and Old Oneida Street intersection up the bluff.

Crosswalks

Downtown Appleton's most significant pedestrian safety problems are at intersections. The study area has many unmarked crosswalks. Marked crosswalks are helpful in indicating preferred pedestrian crossing locations, to alert drivers to often-used pedestrian crossings, and to designate crosswalks on school walking routes. Where marked crosswalks do exist, many are between six and ten feet in width; wider crosswalks of ten to fifteen feet are generally preferred as they are more easily seen by drivers. Further, where marked crosswalks do exist, most consist of two parallel lines rather than high visibility crosswalks with transverse stripes, even in locations near schools where there is an increased need to draw driver's attention to the need to watch out for pedestrians. While marked crosswalks are not necessary everywhere, crosswalk markings and the type of markings used should be carefully near schools, parks, and location where moderate numbers of pedestrians are expected.

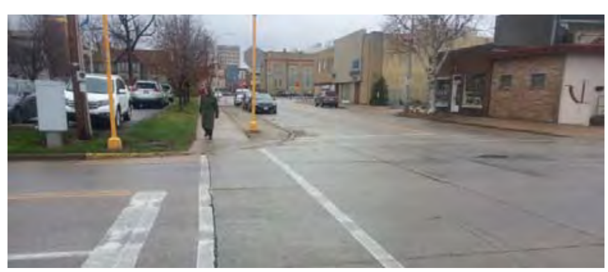


Figure 10: Downtown Area Crosswalk
Crosswalks in the downtown area lack visibility.

Bicycle Access to Destinations

Although the majority of the streets in the study area are already comfortable for biking, there are rarely destinations on these streets that people want to get to. In the study area, a large majority of the destinations are on College Avenue. Biking is not allowed on College Avenue sidewalks. This fact, combined with the lack of designated bicycle facilities, amount of traffic on College Avenue, and frequent parking turnover make biking on this road undesirable for most cyclists.

Bicycle Parking

One of the most common obstacles for people using their bicycles is the lack of secure bicycle parking facilities when they arrive at their destination. Providing bicycle parking encourages people to use their bicycles and also benefits non-cyclists because bicycles are less likely to be locked to trees, benches, light posts and railings. This can cause damage to the street furniture and can result in bicycles blocking the sidewalk.

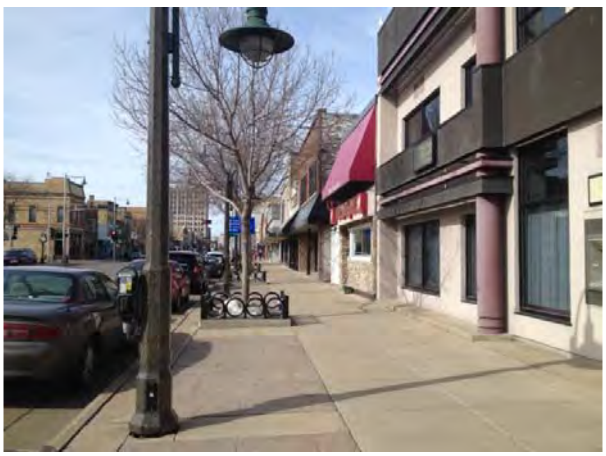


Figure 11: College Avenue Terrace
Bicycle parking is scarce in the study area, especially on College Avenue where there are many destinations.

Alternatives Considered

All alternatives seek to address the issues identified in the “Issues” section.

Traffic

Three alternatives were considered to improve traffic operations in downtown Appleton. These alternatives are described in more detail below. A fourth concept, which included a set of one-way pairs using Appleton Street and Oneida Street, was not studied because it necessitated removing a portion of the City Center Plaza and reconnecting Oneida Street. Studying the feasibility of this alternative from a structural standpoint was not supported by the Municipal Services Committee and therefore this concept was not studied.

Bicycle and pedestrian alternatives are described in detail following the description of traffic alternatives.

Alternative 1: Maintain Northbound Routing

Alternative 1 does not include any changes to northbound routing through downtown Appleton. Traffic entering the study area from the Oneida Street bridge would continue to follow one-way Lawrence Street to Morrison Street. There would be no major changes to the confusing intersections identified along the current northbound route.

This alternative would include the following changes:

- Removal of the traffic signals at the Franklin Street and Superior Street and Franklin Street and Oneida Street intersections. Both intersections would be replaced with two-way stop control on the Superior Street and Oneida Street.
- Updated signal timing at all intersections in the study area to reduce delay.
- Designating College Avenue as a truck route in the study area.

This alternative would provide minimal traffic benefits to downtown Appleton.

Alternative 2: Two-way Appleton Street

Alternative 2 would convert Appleton Street to two-way traffic throughout the study area and make it the main north/south route into and through downtown.

This alternative would include the following changes:

- Converting the following one-way streets to two-way traffic :
  - o Appleton Street between Prospect Avenue and Washington Street
  - o Lawrence Street between Appleton Street and Durkee Street

Figure 12: Two-way Appleton Street
This rendering depicts the 100 block of Appleton Street between College Avenue and Lawrence Street (looking south towards Lawrence Street) after conversion from one-way southbound traffic to two-way traffic.

  - Morrison Street between Lawrence Street and Harris Street
  - Harris Street between Oneida Street and Morrison Street
  - Durkee Street between Lawrence Street and College Avenue
- Reconstructing the northbound Oneida Street bridge over Jones Park to realign the roadway toward Appleton Street.
- Removing the curved portion of Oneida Street between Prospect Avenue Lawrence Street.
- Removing Allen Street and extending Oneida Street south of Lawrence Street. The land south of Lawrence Street in this area is referred to as the bluff site and has redevelopment potential.
- Designating Appleton Street as the main north/south route to/through downtown
- Removal of the traffic signals at the Franklin Street and Superior Street and Franklin Street and Oneida Street intersections. Both intersections would be replaced with two-way stop control on Superior Street and Oneida Street.
- Removal of the traffic signal at Lawrence Street and Oneida Street. The intersection would be converted to two-way stop control on Oneida Street.
- Removal of the traffic signal at Lawrence Street and Morrison Street. The intersection would be converted to four-way stop control. Four-way stop control is recommended to improve pedestrian safety as this intersection is adjacent to the YMCA.
- Updated signal timing at all intersections in the study area to reduce delay.
- Designating College Avenue as a truck route in the study area.
- Converting the Harris Street and Morrison Street intersection from four-way stop to two-way stop on Harris Street.
- Converting the Harris Street and Oneida Street intersection from three-way stop to two-way stop on Harris Street and reconstructing the southeast quadrant of the intersection to remove the diverter.

This alternative addresses confusing northbound routing and the intersections associated with it. However, it would also increase traffic congestion on Appleton Street and streets that intersect Appleton Street. On-street parking would also be removed on several streets to accommodate bicycle facilities. Consultant staff completed a PM peak hour traffic analysis and sensitivity analysis and City staff completed an AM peak hour traffic analysis and sensitivity analysis. For more details on the PM peak hour traffic analysis performed, see Appendix J.

Alternative 3: College Avenue Road Diet

A road diet typically involves converting an existing 4-lane, undivided roadway to a 3-lane segment consisting of two through lanes and a center, two-way left turn lane. This configuration, along with bicycle lanes and parking on both sides of the street, is proposed for Alternative 3. Road diets are known to reduce crashes (improve safety) and improve mobility and access for all road users. Road diets are also relatively low cost as they typically do not involve complete roadway reconstruction.

This alternative would not make any changes to northbound routing through downtown Appleton. Traffic entering the study area from the Oneida Street bridge would continue to follow one-way Lawrence Street to Morrison Street. There would be no major changes to the confusing intersections identified along the current northbound route.

The traffic analysis completed for the study showed that a road diet on College Avenue resulted in too much congestion on the roadway, even if Appleton Street was still one-way southbound. Significant queuing occurred at the signalized intersections along College Avenue resulting in very high LOS and near-gridlock conditions during the PM peak hour.

The College Avenue Road Diet alternative was dropped from further consideration due to unacceptable traffic operations on College Avenue.

See Appendix K for more information on the traffic analysis.

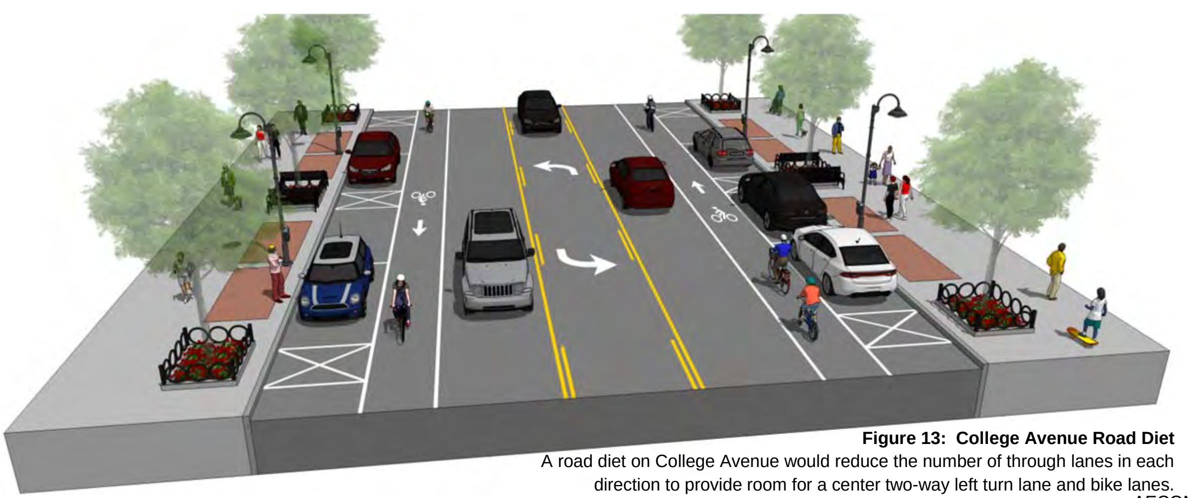


Figure 13: College Avenue Road Diet
A road diet on College Avenue would reduce the number of through lanes in each direction to provide room for a center two-way left turn lane and bike lanes.

Pedestrian Facilities

This section provides a brief overview of pedestrian facilities and treatments considered for downtown Appleton.

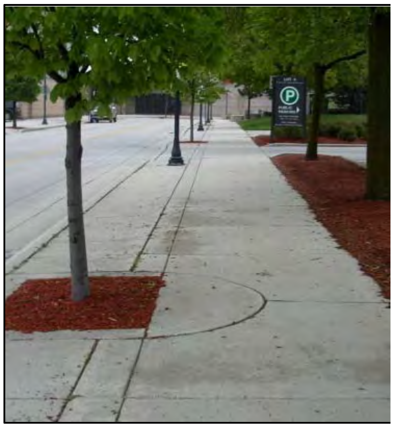


Figure 14: Sidewalk
A sidewalk is a dedicated space for pedestrians adjacent to a street. Most streets in Downtown Appleton have sidewalks. A 5-foot sidewalk is typical in residential neighborhoods; in commercial areas, sidewalks can be much wider than 5 feet to accommodate additional pedestrian traffic and street furniture.

Figure 15: Slow Street
Slow streets are designed for very low speed use by giving pedestrians and bicyclists priority while limiting motor vehicle speeds. Slow streets are known by a variety of names including play streets, low speed streets, and "woonerfs" after their Dutch name. The streets are generally at sidewalk level, without curbs. Motor vehicles are allowed to use the street to gain access to homes, businesses, or parking, but at very low speeds. Often the street is designed with chicanes or street furniture that forces vehicles to meander and move at a very slow pace. Many European countries have turned other lower volume residential streets into slower streets using a variety of treatments.

Figure 16: Raised Intersection
Raised intersections elevate an entire intersection to the level of the curb and sidewalk, essentially creating a large speed table. Like raised crosswalks, raised intersections crosswalks encourage motorists to yield to pedestrians because the raised intersection increases pedestrian visibility and forces motorists to slow down before going over the speed table. The crosswalks on each approach to a raised intersection are also elevated to enable pedestrians to cross the road at the same level as the sidewalk, eliminating the need for curb ramps. Raised intersections may use standard paving materials such as concrete or asphalt, or may use materials such as brick or other pavers to further differentiate the space.

Figure 17: Crosswalk: Marked
Marked crosswalks emphasize and designate the part of an intersection where drivers can expect pedestrians to cross. They also define the pedestrian crossing area where they otherwise would not exist such as a mid-block crossing. Motorists must always yield the right of way to pedestrians in any crosswalk except at a signalized intersection where pedestrians follow the appropriate signal. Crosswalks may be marked with two parallel lines ("standard") or with wide bars that run in the direction of traffic ("continental," shown here). Continental crosswalks are more visible to motorists than standard crosswalks.

Figure 18: Crosswalk: Unmarked
In Wisconsin, unmarked crosswalks are the continuation from a sidewalk on one side of the street to the other side of the street. Motorist must always yield the right of way to pedestrians in any unmarked or marked crosswalk except at a signalized intersection where pedestrians follow the appropriate signal.

Figure 19: Pedestrian Hybrid Beacon ("HAWK")
A pedestrian hybrid beacon is an overhead warning device, used at locations that are unusually hazardous or where pedestrians or bicyclists should be expected to cross throughout the day or where pedestrian crossing activity would not be readily apparent. The beacon is dark until activated by a pedestrian or bicyclist. When activated, the beacon displays a yellow signal followed by a red signal to drivers and a "walk" signal to pedestrians. Criteria for installation are available in the MUTCD.

Figure 20: Rectangular Rapid Flashing Beacons (RRFBs)
Rectangular Rapid Flashing Beacons (RRFBs) are attached to pedestrian crossing warning signs (mounted street-side as shown), or are overhead, and are pedestrian activated or automated by sensors. The beacon remains dark until activated by a pedestrian; when activated, the beacon flashes yellow strobe lights to indicate to drivers that a pedestrian is present and they should yield to the pedestrian.

Figure 21: Median Refuge Island
A median refuge island is a protected area in the center of a street that allows pedestrians to cross one direction of traffic at a time. This makes finding gaps in traffic easier on busy two-way streets.

Figure 22: Pedestrian Bump-out / Curb Extension
Curb extensions reduce the effective street crossing distance for pedestrians by narrowing the streets. They also have a minor impact on reducing traffic speeds by narrowing the street. Curb extensions can also provide space for bicycle racks, benches, or other amenities.

Figure 23: Raised Crosswalk
Raised crosswalks are elevated from the street level, typically to the level of the curb and sidewalk. Raised crosswalks are essentially speed tables with a flat top that is wide enough for a crosswalk. Raised crosswalks encourage motorists to yield to pedestrians because the raised crosswalk increases pedestrian visibility and forces motorists to slow down before going over the speed table. Raised crosswalks may eliminate the need for pedestrian ramps at intersections. Street drainage must be carefully considered when retrofitting raised crosswalks.

Figure 24: Wayfinding Signs
Wayfinding signs and maps can help pedestrians navigate areas with lots of major activity centers. Wayfinding signs can be placed at key intersections and decision points.

Figure 25: Pedestrian Lighting
Standard street lights often do not provide adequate lighting of pedestrian areas including sidewalks. In areas with significant pedestrian use, anticipated pedestrian use, or concerns about safety, pedestrian-scale lighting should be installed. Pedestrian-scale lighting focuses light on pedestrian areas including sidewalks and shared use paths, often using light fixtures that are lower to the ground than traditional street lights. Pedestrian-scale lighting often uses decorative poles that can enhance the aesthetics of a street, or provide a historic appearance in historic areas.

Photo source: NACTO

Figure 26: Street Furniture and Amenities
Street furniture such as benches or other seating platforms should be considered in areas of high pedestrian activity, or where such activity is desirable. Providing spaces for pedestrians to gather and socialize can add significantly to the appeal and vitality of a streetscape. In addition to benches, items including water fountains, trash and recycling receptacles and public art should be considered.

> The study area includes numerous land uses: residential streets, commercial and retail areas, and Lawrence University. Pedestrian access is critical in all of these areas to allow people access to businesses and homes, to transit, and to provide transportation and recreation options. In general, downtown Appleton has a complete pedestrian network. However, there are gaps in the pedestrian system, and areas in which pedestrian accommodations could be enhanced.

Bicycle Facilities

This section provides a brief overview of bicycle facilities and treatments considered for downtown Appleton.

Figure 27: Bike Lane – Standard
Standard bike lanes are signed and marked with pavement markings to designate space for bicyclists outside of the travel lanes to minimize conflicts on busier streets. Bike lanes typically operate in the same direction as motor vehicle traffic. Bike lanes are best suited for two-way arterial and collector streets where there is enough width to accommodate a bike lane in both directions. On one-way streets, they may be located on either the right or the left side of the roadway.
Preferred Width: 5 feet plus gutter pan; 6 feet with integral curb and gutter; 6+ feet next to parking
Minimum Width: 4 feet plus gutter pan; 5 feet with integral curb and gutter; 5+ feet next to parking

Figure 28: Bike Lane – Buffered
Buffered bike lanes are standard bike lanes that include a painted buffer on one or both sides of the bike lane. This buffer provides increased separation between a bike lane and a motor vehicle travel lane or a parking lane. A typical bike lane and buffer combination is a 5 foot bike lane and a 2-3 foot buffer. A buffer next to travel lane ensures that motorists give bicyclists the minimum 3-feet clearance when passing. A buffer next to parked cars helps to keep bicyclists from riding in an area where car doors may open into their paths.

Figure 29: Bike Lane – Separated
Separated bike lanes, sometimes called "cycle tracks" or "protected bike lanes," separate the bike lane from travel lanes with a vertical element such as curbs, bollards, pavement elevation, parked cars, or planters. While separated bike lanes increase bicyclists' sense of comfort, they still have conflict points at intersections and driveways, where turning traffic crosses them. Separated bike lanes may be placed at street level, sidewalk level, or an intermediate level, and may include vertical or rolled curbs.
Preferred Width: 6.5 feet plus gutter pan (one way); 10+ feet plus gutter pan (two-way)
Minimum Width: 5 feet plus gutter pan (one-way); 8 feet plus gutter pan (two-way)

Figure 30: Bike Lane – Climbing
A climbing lane provides a bicycle lane or buffered bicycle lane in the uphill direction on a hill, and shared lane markings in the downhill direction. This is often done where there is not room to fit a bicycle lane on each side of the street; providing a bicycle lane uphill allows slow moving bicyclists to move out of the travel lane. Bicyclists traveling downhill are often moving much closer to the speed of motor vehicles, and shared lane markings help position bicyclists in the most appropriate location to ride while also providing a visual cue to motorists that bicyclists have a right to use the street.

Figure 31: Bike Lane – Contraflow
Counter-flow bike lanes are signed and marked lanes that accommodate bicycle travel on one-way streets in the opposite direction of motor vehicle traffic. Counter-flow bike lanes may be conventional bike lanes, buffered bike lanes, or fully separated bike lanes.

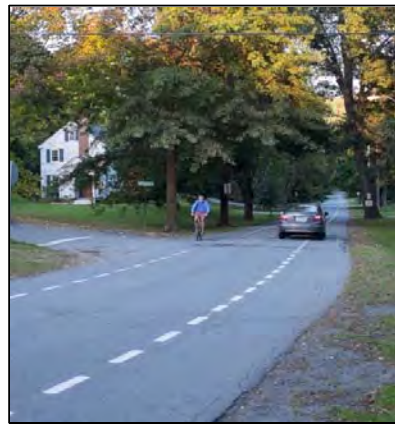


Figure 32: Bike Lane – Advisory
Many lower-traffic roads are too narrow to provide exclusive space for two standard-width bicycle lanes and two standard-width travel lanes. For lower volume, lower speed roads, advisory bike lanes (ABLs) have been developed as an alternative to a shared lane marking treatment to separate bicyclists from automobile traffic. These roads are marked to provide two separate standard width bicycle lanes on either side of a single shared (un-laned) motor vehicle travel space essentially creating a three-lane cross section. Roadway centerlines are not present. Parking lanes may be provided outside the advisory bike lanes.

Figure 33: Bicycle Boulevard (Neighborhood Greenway)
A bicycle boulevard is a street with low motorized traffic volumes and speeds designated to provide priority to bicyclists and neighborhood motor vehicle traffic. Bicycle boulevards may simply have signs and shared lane markings, or may include traffic calming elements including speed humps, traffic circles, chicanes, or traffic diverters. Bicycle boulevards benefit neighborhoods by reducing cut-through traffic and speeding without limiting access by residents. Recommendations for bicycle boulevards in this plan do not include guidance for specific treatments.

Figure 34: Shared Lane Marking (Sharrow)
Shared lane markings, sometimes called sharrows, are used on streets where bicyclists and motor vehicles share the same travel lane. The sharrow helps position bicyclists in the most appropriate location to ride. It also provides a visual cue to motorists that bicyclists have a right to use the street.

Shared lane markings are suitable for low-volume local and collector streets where there is insufficient right-of-way for bike lanes or where traffic volumes and speeds are low enough that a bike lane is not warranted. Shared lane markings should not be considered a replacement for bicycle lanes. The “Bicycles May Use Full Lane” sign (MUTCD R4-11) is commonly used in conjunction with shared lane markings and is recommended for the City of Appleton.

Figure 35: Shared-Use Path
A shared use path is an off-street bicycle and pedestrian facility that is physically separated from motor vehicle traffic. Typically shared use paths are located in an independent right-of-way such as in a park, stream valley greenway, along a utility corridor, or an abandoned railroad corridor. Shared-use paths are used by other non-motorized users including pedestrians, skaters, wheelchair users, joggers, and sometimes equestrians.

Consideration should be given to providing a smooth path surface for users. When concrete is used, joints should be saw cut. Asphalt is also an acceptable surface material.

Intersection Treatments and Bicycle Signage

Figure 36: Colored Pavement
Green colored pavement may be used to increase the visibility of bicycle facilities. Colored pavement may be used to highlight an entire bicycle corridor, but is most useful to highlight bicycle facilities in conflict areas – through intersections, across driveways, or crossing highway ramps.

Figure 37: Bike Box
A bike box is a designated area at the front of a traffic lane at a signalized intersection. Bike boxes provide bicyclists with a location to wait for a green signal that puts them in a location visible to motor vehicle traffic also stopped at the intersection. Bike boxes can facilitate left turns for bicyclists and can reduce the likelihood of "right-hook" crashes with turning vehicles. Bike boxes can also benefit pedestrians as they reduce vehicle encroachment in crosswalks. Installation of bike boxes also requires installation of "No Turn on Red" signs.

Figure 38: Bike Signal
Bicycle signals are traffic signals that govern bicycle movements at an intersection. Bicycle signals may be used when bicycles, pedestrians, and motor vehicles have different movement cycles.

Figure 39: Wayfinding Signs
Wayfinding signs indicate the direction and distance to specific destinations for bicyclists. Wayfinding signs can be used to enhance bicycle facilities including bike lanes, bike boulevards, and shared use paths. Signs can help bicyclists navigate the bicycle network and can be placed at key intersections to guide users to specific destinations. They can include the distance to those locations and approximate travel time as well.

For bicycle facility design guidance, refer to:

- AASHTO Guide for the Development of Bicycle Facilities, 4th Edition (https://bookstore.transportation.org/)
- Manual on Uniform Traffic Control Devices (http://mutcd.fhwa.dot.gov/)
- NACTO Urban Bikeway Design Guide (http://nacto.org/publication/urban-bikeway-design-guide/)
- Wisconsin Bicycle Facility Design Guide (http://wisconsindot.gov/Documents/projects/multimodal/bike/facility.pdf)

Stakeholder / Public Involvement

The study team sought input from the community through a stakeholders group, public meetings, social media and meetings with key stakeholders.

Throughout the planning process, community involvement played a critical role in shaping the overall project approach and vision of the Mobility Plan. Interested persons were provided the opportunity to participate in a variety of involvement activities including a stakeholders group, public meetings, reading and commenting on social media, and attending city government meetings. This section provides a summary of each activity.

Stakeholder Group

A stakeholders group, consisting of representatives from various organizations / entities in the study area, was formed in January 2016. This group met three times during the study to provide input and ideas to the study team. A list of groups / individuals who participated in the stakeholders meetings can be seen in Table 3.

A list of meeting dates and the purpose of each meeting is noted below. A copy of the minutes, which include the comments submitted by each stakeholder, can be found in Appendix L.

- **February 3, 2016 – Meeting 1**
  - The purpose of the meeting was to educate the stakeholders on the purpose and need for the study and the issues identified by the study team. Feedback was sought on existing mobility issues and ideas for improvements.
- **March 21, 2016 – Meeting 2**
  - The purpose of the meeting was to gather feedback on traffic, bicycle and pedestrian improvement ideas.
- **July 6, 2016 – Meeting 3**
  - The purpose of the meeting was to review the draft recommended improvements prior to the July 12, 2016 Municipal Services Committee meeting.

Table 3: Stakeholders Meeting Attendees

Organization	Representative
History Museum	Nicholas Hoffman
Valley Transit	Dan Sandmeier
Appleton Mayor’s Office	Chad Doran
Lawrence University	Jake Woodford
YMCA	Danielle Englebert
Appleton Community and Economic Development	Monica Stage
Appleton Police Department	Todd Freeman, Larry Potter
Appleton Library	Colleen Rortvedt, Jessica Brittnacher
Appleton Downtown, Inc.	Jennifer Stephany, John Peterson
Appleton Mayor’s Office	Tim Hanna
Appleton Area School District	Joe Sargent
Alderperson – District 4	Joe Martin
Alderperson – District 2	Vered Meltzer
Alderperson – District 11	Patti Coenen
Appleton Health Department	Kurt Eggebrecht
League of Women Voters	Jeanne Roberts, Penny Robinson
East Central Wisconsin Regional Planning Commission	Melissa Kraemer Badtke
Alderperson – District 1	William Siebers

All entities listed attended at least one meeting.

Public Involvement Meeting

A public involvement meeting was held on Thursday, April 7, 2016. The purpose of the meeting was to educate the public on the purpose of the study, the issues identified by the project team, and gather their thoughts on traffic, bicycle and pedestrian improvement alternative ideas. The meeting included a formal presentation, a question / answer session, and time for attendees to speak individually with members of the project team.

Sixty people in addition to the study team signed in at the public meeting.

Three news media outlets, FOX, CBS and ABC, featured stories about the public meeting and the study on their newscasts. For more information, see the meeting minutes in Appendix M.

Figure 40: April 7, 2016 Public Meeting

Twenty people submitted comment forms at the meeting. A few representative comments are shown below.

- ✓ Like the idea of 2-way Appleton Street, but concerned about loss of on-street parking.
- ✓ Too much emphasis on bicycle accommodations.
- ✓ Like staircase from bluff site to Water St.
- ✓ 2-way Appleton solves northbound routing problem.

Social Media

The public involvement meeting was advertised using social media via the Appleton City Hall Facebook page. Prior to the meeting, four separate posts about the study were posted to the page. Each post contained a link to an article about the study. For a copy of each article, see Appendix N.

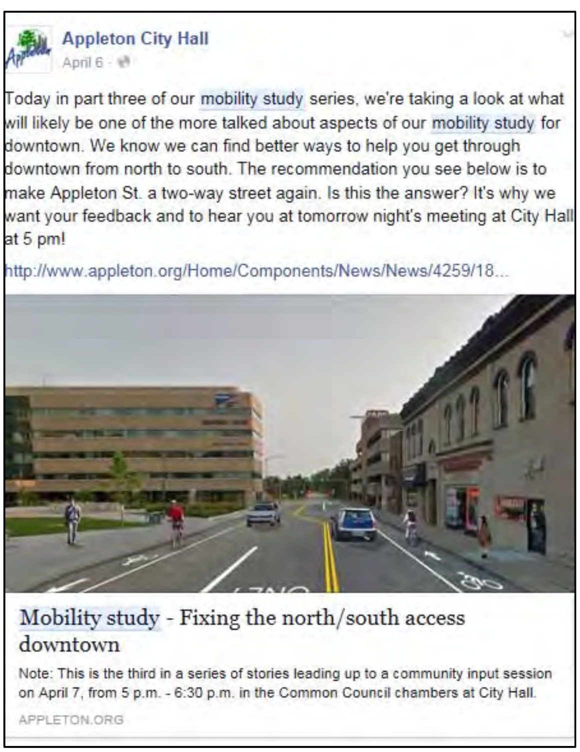


Figure 41: Facebook post discussing the study

The outreach via Facebook was very successful. Four days of posts reached approximately 20,400 people and resulted in 2, 246 clicks to the website stories from Facebook. The posts received 589 likes/shares.

In addition to Facebook, city staff live-tweeted updates from the public involvement meeting via Twitter.

Municipal Services Committee Meetings

The mobility study was discussed at the Municipal Services Committee meeting on July 12, 2016. The meeting included a lengthy presentation about the study and a map showing draft improvement recommendations in the core downtown area.

This meeting was open to the public. Approximately 25 people attended the meeting and 18 people provided verbal comments following the presentation.

Most attendees were supportive of the draft recommendations.

Key concerns included:

- Need for loading zone in the 100 block (near Houdini Plaza) of Appleton Street.
- Concern over the recommendation for bike lanes on Lawe Street and conflicts with vehicles and truck traffic.
- Need for education for bicyclists and drivers.

For more information, see the meeting minutes in Appendix O.

Other Meetings

Members of the study team also held separate meetings with representatives from the following organizations:

- YMCA – Tuesday, June 28, 2016
- Appleton Downtown, Inc. – Tuesday, June 28, 2016

Recommended Improvements

The recommendations improve northbound routing by eliminating one-way streets in the downtown area. A significant number of bicycle and pedestrian improvements help to improve mobility for multiple transportation modes.

Recommended improvements in the core downtown area bound by Superior Street to the west, Washington Street to the north, Drew Street to the east and Water Street to the south are shown on the Recommended Improvements Map in Exhibit 8. The map should be printed full size (36" x 48") for maximum readability.

Traffic Recommendations

Alternative 2: Two-way Appleton Street is recommended.

This alternative is recommended because it:

- Creates a direct northbound route to/through downtown Appleton by converting Appleton Street from one-way to two-way traffic. Appleton Street is already two-way north of Washington Street.
- Improves several confusing intersections by eliminating one-way streets.
- Provides an opportunity for additional economic development on the bluff site by creating a larger redevelopment parcel west of Trinity Church through the removal of Oneida Street south of Lawrence Street.
- Removes unwarranted traffic signals on Franklin Street to reduce delay.
- Creates direct truck routes through the study area.
- Best utilizes the existing right of way to improve mobility for all modes of transportation by including numerous bicycle facilities.

The specific changes recommended as part of this alternative are described in detail on the next several pages.

Convert One-way Streets to Two-way Streets

The following streets are proposed to be converted from one-way streets to two-way streets:

- Appleton Street between Prospect Avenue and Washington Street
  - The typical section north of Lawrence Street should include one through lane in each direction, left turn lanes at intersections and bike lanes. Lane widths vary depending on the available right of way.
  - South of Lawrence Street, two through lanes approach the intersection from the Oneida Street bridge. One lane should be designated as a right turn only lane at Lawrence Street and the other as a through lane to Appleton Street.
  - Restrict left turns at the following locations to maintain traffic flow or improve safety:
    - Left turns out of the private parking ramp in the northeast quadrant of the Appleton Street and Lawrence Street intersection. This ramp currently only has access to southbound Appleton Street. This modification would switch access to northbound Appleton Street.
    - Northbound left turns into the Red Ramp from Appleton Street.
    - Northbound left turns into the alley north of College Avenue from Appleton Street.
    - Left turns from the City Center Alley.
    - Left turns from the alley north of College Avenue.
  - When the Blue Ramp is removed, remove access to Appleton Street at this location and create a loading/parking zone.
- Lawrence Street between Appleton Street and Durkee Street
  - This section of Lawrence Street would need to be reconstructed to achieve the desired configuration. Additional right of way is proposed to be acquired from the south side of the street to provide one through lane in each direction, bike lanes, parking and a median.

- Morrison Street between Lawrence Street and Harris Street
  - The typical section should include one through lane in each direction, bike lanes and parking on one side of the street. A loading zone is provided near the YMCA.
- Harris Street between Oneida Street and Morrison Street
  - The typical section should include one through lane in each direction and parking on one side of the street. See Exhibit 9 for more details.
- Durkee Street between Lawrence Street and College Avenue
  - The typical section should include one through lane in each direction, bike lanes and parking on one side of the street. To achieve this configuration within the existing right of way, the existing terrace on the east side of the street would be removed.

See Exhibit 8 for a detailed map of improvements and the recommended typical section for each street. With regard to the prioritization of traffic improvements, reconstruction of the Oneida Street bridge and conversion of Appleton Street from one-way to two-way traffic south of Washington Street should be the first priority. This project is the impetus for the other one-way to two-way conversions and the entire downtown mobility plan.

Reconstruct the Oneida Street Bridge

The northbound Oneida Street bridge over Jones Park would need to be reconstructed and realigned to provide a direct connection to Appleton Street. The bridge was constructed in 1980 and rehabilitated in 2009. In 2014, the bridge had a sufficiency rating of 85.5, meaning it is still in good condition. It should be noted that construction of a new bridge would likely impact Jones Park, a Section 4(f) resource.

After the bridge is reconstructed, the portion of Oneida Street between Prospect Avenue and Lawrence Street should be removed. Removing this portion of Oneida Street creates a large parcel of land for potential future development.

Remove Traffic Signals

Four traffic signals would be removed to decrease delay and improve mobility.

Remove traffic signals at the following intersections:

- Franklin Street and Superior Street. Install two-way stop control on Superior Street. Consider pedestrian refuge islands on Franklin Street as described in Appendix P.
- Franklin Street and Oneida Street. Install two-way stop control on Oneida Street. Consider pedestrian refuge islands on Franklin Street as described in Appendix P.
- Lawrence Street and Oneida Street. Install two-way stop control on Oneida Street. If a south leg of Oneida Street is not constructed in conjunction with potential redevelopment on the bluff site, stop control would be one-way on Oneida Street.
- Lawrence Street and Morrison Street. Install four-way stop control and create a raised intersection. This configuration would promote a safe environment for pedestrians adjacent to the entrance to the YMCA.

Reconstruct Lawrence Street

As noted previously, Lawrence Street would be reconstructed to accommodate 2-way traffic. Lawrence Street should also be realigned between Oneida Street and Morrison Street to remove the existing curve. Any significant redevelopment of the bluff site should remove Allen Street and extend Oneida Street south of Lawrence Street.

Additional right of way is proposed to be acquired to provide one through lane in each direction, bike lanes, parking and a median. Raised intersections are

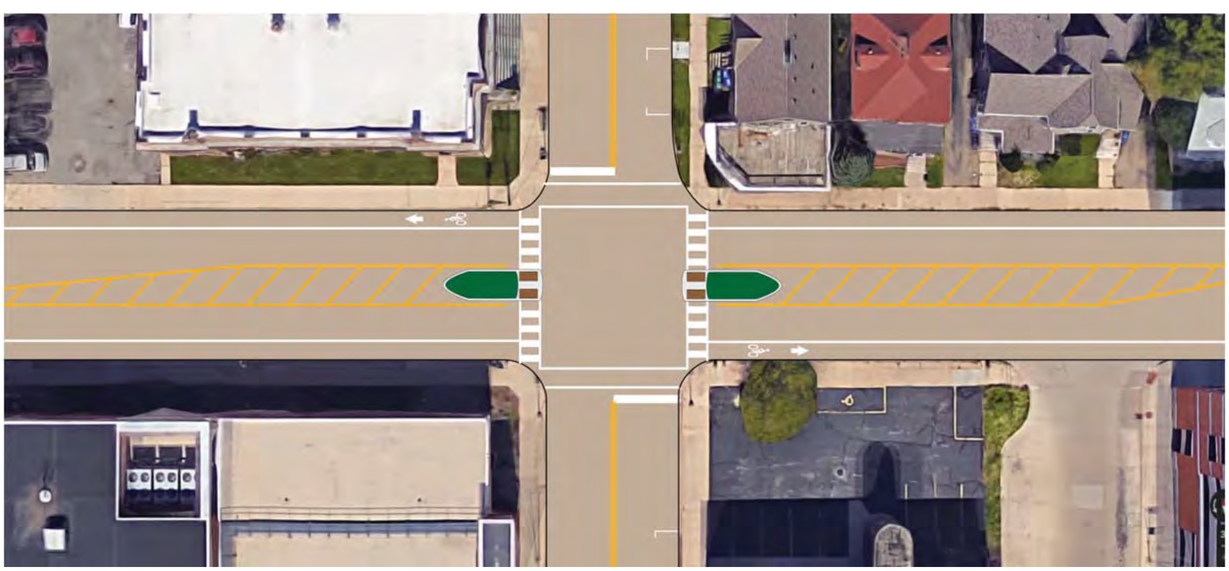


Figure 42: Franklin Street and Oneida Street Intersection
Conceptual image showing pedestrian refuge islands on Franklin Street.

recommended at the Morrison Street and Durkee Street intersections to promote pedestrian safety in the area surrounding the YMCA.

Modify Truck Routes

Truck routes through the downtown study area should be designated as follows:

- College Avenue between Richmond Street and Lawe Street
- Franklin Street between Richmond Street and Appleton Street
- Appleton Street between Lawrence Street and Franklin Street
- Oneida Street between the Fox River and Lawrence Street

Designate College Avenue a truck route.

This designation removes truck routes from the following locations:

- Lawrence Street between Memorial Drive and Morrison Street
- Morrison Street between Lawrence Street and Washington Street
- Washington Street between Division Street and Morrison Street.
- Division Street between Washington Street and Franklin Street

See Exhibit 7 for a map of existing truck routes and Exhibit 10 for a map of proposed truck routes. It should be noted that due to roadway right of way limitations, truck turns to/from College Avenue to Appleton Street would be very difficult and should only be attempted during off peak hours. Large vehicles would need the entire intersection area to complete turning movements.

Figure 43: Proposed Truck Routes
Proposed truck routes on College Avenue, Appleton Street and Franklin Street.

Maintain Oneida Street Railroad Crossing

The Oneida Street railroad crossing is important for mobility in the study area and should not be removed.

- Oneida Street provides access to a large senior/low income apartment building immediately north of the railroad tracks. A Salvation Army building is located south of the railroad tracks on North Street. If the railroad crossing was removed, it would require residents living in the apartment building who visit the Salvation Army to take a longer route, which may be difficult for seniors or those with limited mobility.
- Valley Transit uses Oneida Street for Route 5. This route includes a stop across the street from the senior/low income apartment building.
- The dead-end streets created by closing the railroad crossing would make access to the multiple commercial businesses in this area difficult.
- Oneida Street between Washington Avenue and Pacific Street is an alternate, parallel route to Appleton Street. Maintaining this link would improve mobility and reduce congestion on Appleton Street.

Reconstruct the Appleton Street / Oneida Street / Pacific Street Intersection

Designating Appleton Street as the main northbound route to/through downtown Appleton would increase traffic on Appleton Street. The existing intersection of Appleton Street / Oneida Street / Pacific Street was identified as a confusing intersection. Oneida Street access to Pacific Street is one way northbound and controlled with a yield sign, however vehicles typically do not yield as they should. An increase in traffic on Appleton Street would decrease the number of gaps for vehicles entering from Oneida Street which could become a safety issued. If a safety or operations issue develops, this intersection should be reconstructed to address this issue. City staff have created concept sketches for potential improvements to this intersection (see Exhibit 11).

Pedestrian Recommendations

Every street is intended to provide for comfortable and safe pedestrian travel. This section contains recommendations related to pedestrian facilities in downtown Appleton, although most of the policy-related recommendations are applicable citywide and not just in the study area.

Sidewalks

- Add sidewalks along any streets without sidewalks when they are next reconstructed; if reconstruction is more than ten years away, consider installing sidewalks as a standalone project. Dead-end streets may only require installation of a sidewalk on one side of the street, although sidewalks on both sides are recommended if buildings front on both sides of the street. Streets without sidewalks are displayed on Exhibit 4. The following streets should be a priority for sidewalk installation:
    - North Street between Oneida Street and Morrison Street
    - Fourth Street between State Street and Walnut Street
    - Prospect Avenue between State Street and Sixth Street

Lighting

- Ensure that adequate pedestrian lighting exists throughout the study area. Pedestrians do not feel comfortable walking in poorly lit areas, and often will choose to avoid these areas. Pedestrian lighting should be present in all commercial areas of the study area, and along other corridors where pedestrians are expected or desired.

- Pedestrian lighting improves the visibility of pedestrians walking along and across the street and enhances security. Pedestrian scaled street lighting is directed toward the sidewalk, positioned lower than roadway lighting (luminaires are mounted 12 to 14 feet above the sidewalk), and is more closely spaced than roadway lighting. Pedestrian lighting can be used alone or in combination with roadway-scale lighting in high activity areas to encourage nighttime use. Pedestrian lighting can be located on the same pole as roadway lighting to reduce the number of poles within the landscape/furniture zone.
- Pedestrian lighting should be prioritized in commercial areas, on transit routes, in areas of moderate pedestrian use, and in areas where personal security is an issue. Pedestrian ways not adjacent to streets may require lighting as determined by City staff.
- Intersection street lighting should be placed downstream of the curb ramps, perpendicular to the curb. Following FHWA guidance, luminaires should be located at least 10 feet from the crosswalk and positioned to light the side of the pedestrian facing the approaching vehicle. Where feasible, lighting should be placed on the approach side of a mid-block pedestrian crossing (near side) to enhance visibility of pedestrians.

Crosswalks and Curb Ramps

- Crosswalks should be wider and marked with higher visibility markings than has traditionally been used in the study area. The following guidance should be used:
    - Crosswalks in the study area should be a minimum of eight feet wide.
    - High visibility continental or ladder markings should be used at stop controlled or uncontrolled crossings of collector and arterial streets (such as Appleton Street and College Avenue). Continental or ladder markings should be used at all intersections near schools, the library, the transit center, the YMCA, Lawrence University, parking ramps and other areas with significant pedestrian volumes. The Federal Highway Administration document *Designing Sidewalks and Trails for Access* recommends continental markings for all crosswalks due to the increased visibility of the markings.
    - Where transverse lines are used to mark crosswalks, each line should be a minimum of 12 inches wide.

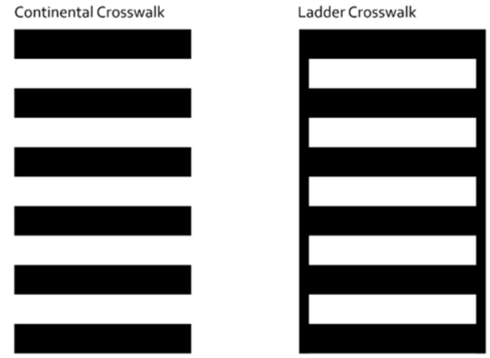


Figure 44: Typical Crosswalk Marking Styles

- Continue to ensure that ADA-compliant curb ramps are provided at all crosswalks (marked and unmarked). In general, this can be accomplished when the adjacent roadway is being resurfaced or reconstructed, although curb ramp retrofits may be warranted at select locations.

Pathways and Access to the River

- Provide a grand staircase or walkway from the corner of Olde Oneida Street and Water Street up the bluff to Kimball Street (currently the Fox Banquets property). Such a staircase could serve as a significant attraction downtown with lookouts or terraces cut into the hillside. This staircase should be integrated with any redevelopment of the Trinity Lutheran Church / Fox Banquets properties and should be clearly and easily accessible from Soldiers Square and College Avenue. The staircase should including a bike runnel—a small ramp at the edge of the stairway that allows bicyclists to wheel their bicycles up and down the stairs. The final design should meet Americans with Disabilities Act (ADA) requirements by including a path; the path location should be proximate to the staircase itself. It may be desirable from a grade perspective to provide the path from the west end of Kimball Street to Rocky Bleier Run; this path would provide an accessible route as well as bicycle access to the riverfront.

Figure 45: Existing Conditions – Location of Proposed Staircase

Figure 46: Conceptual Rendering of Staircase (Actual design to be determined – ADA accessibility should be considered)

- Provide a wide shared use path from Lawrence Street through Jones Park to Rocky Bleier Run. This path should be ADA compliant, and should integrate with any redevelopment of the park.
- Consider providing a ramp in the existing City easement/property from Prospect Avenue to Water Street approximately where Elm Street intersects with Prospect Avenue. The ramp should comply with ADA requirements and should include lighting and regular landings for resting points. It may be feasible for the ramp to bridge over Water Street to provide a direct connection to the park on the south side of the street.

Bicycle Recommendations

The City adopted the City of Appleton On-Street Bike Lane Plan in September 2010. This document presents many recommendations for the study area, as well as the rest of the city. This document builds upon those recommendations, but this document is not intended to fully supplant the 2010 Plan. The 2010 Plan should be consulted for connections outside of the study area, as well as specific bicycle parking recommendations.

The proposed bicycle facilities create a comprehensive bicycle network for downtown Appleton. It is recognized that some projects may require years or even decades of planning, community discussion, and financial preparation before they can be realized. Many of these projects are also driven by opportunities; when a street is resurfaced or reconstructed, a much greater opportunity exists for incorporating a bikeway at a modest cost, but the bikeway improvement must be delayed for the roadway work. However, some projects represent very minor changes to existing infrastructure and can be implemented quickly and at little cost. It is also important to recognize that some network links are more critical than others. To this end, recommendations have been categorized into short, medium, and long term projects. See Appendix Q for a list of improvements included in each category and a map showing the location of each recommended improvement. An ultimate buildout map can also be seen in Exhibit 12.

- Short Term Improvements (0-3 years)
    - The timeframe for short term projects is roughly 0–3 years. These recommendations are typically expected to be less intrusive and less expensive such as adding shared lane markings to a street, or adding bicycle lanes with minimal impacts on parking. A few short term projects present some challenges and may be more expensive, but have been included because of the importance of the connection they create in the network.
- Medium Term Improvements (4-10 years)
    - The medium term includes projects that would be expected to be completed within 4–10 years. These projects tend to be more challenging than short term projects and likely require further study and more significant funding.
- Long Term Improvements (10+ years)
    - Projects in the long term category constitute useful connections in the bicycle network but are not likely candidates for implementation for ten years or more. The majority of these projects require significant reconstruction of a street or bridge in order to be achieved.

Figure 47: Bike Lanes

Regardless of the time horizon, these recommendations are meant to inform future decision making by the City. Any discussions of specific transportation investments ought to include consideration of cycling facilities, whether they appear as a recommendation in this plan or not. Such decisions should be informed by the contents of this plan but not restricted by it.

Table 4 displays the total centerline mileage of each type of recommended facility (i.e. bike lanes on both sides of a two-way street are only counted as one mile in Table 4). This table does not reflect facilities recommended in previous plans including the shared use paths near the riverfront.

Table 4: Centerline Miles of Recommended Bicycle Facilities by Facility Type

Facility Type	Miles
Bicycle Boulevard	1.42
Buffered Bike Lane	0.42
Bike Lane	5.26
Climbing Lane	0.32
Shared Lane Marking	2.20
Slow Street	0.07
Signed Route	0.43
Shared Use Path	0.62
Grand Total	**10.74**

Ultimate Buildout

The full bicycle facility recommendations are displayed on the Exhibit 11. This map reflects the ultimate buildout of facilities, and displays facilities that are recommended in previous plans. The facilities shown on this map should not be considered a limiting factor to adding bicycle facilities. Every time a street is resurfaced or reconstructed within the study area, the City should consider if it is appropriate and feasible to add a bicycle facility or treatment; this is particularly true further in the future as the conditions considered for this study change.

Figure 48: Packard Street – Existing Conditions

Figure 49: Packard Street – Proposed Buffered Bike Lane

Bicycle Detection at Traffic Signals

Some traffic signals in the study area are not capable of detecting bicycles. It is recommended that city staff continue to upgrade signal detection systems to include detection for bicyclists and look for opportunities to install push buttons if automated means are not feasible. For more information, refer to page 99 of the Second Edition of the National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide.

Minimum Width Facilities

Design guidance for streets and bicycle facilities generally includes minimum recommended widths for driving, bicycle, and parking lanes. While it is acceptable to use minimum width facilities, using a minimum width facility adjacent to another minimum width facility can be problematic. For example, a 10 foot wide driving lane may be desirable to provide space for other uses such as bicycling or parking, and to calm traffic speeds. However, providing a 10 foot travel lane adjacent to a minimum width bike lane (four feet, not including gutter pan), can result in very uncomfortable situations for bicyclists, particularly if on-street parking is also provided. Whenever possible, bicycle lanes wider than the minimum should be provided; in particular, the combined minimum width of a bicycle lane plus an on-street parking lane should be 14.5 feet. This helps prevent "dooring" crashes in which parked motorists open their car door into a bicyclist in a bike lane.

Bicycle Parking

One of the most common obstacles for people using their bicycles is the lack of secure bicycle parking facilities when they arrive at their destination. Providing bicycle parking encourages people to use their bicycles for transportation, but it also benefits non-cyclists:

- Bicycle parking is good for business. Economic development studies have found that people on bikes are more likely to make repeat trips to their local businesses, and to spend more money per month than those who drive.[1]

- Bicycle parking is much more space-efficient than automobile parking. Every customer arriving on a bike leaves a car parking space free for someone else.

- Providing bicycle parking gives a more orderly appearance to the streetscape. When bike racks are not present, people will lock their bikes to trees, benches, light posts, and railings. This causes damage to the street furniture and can result in bicycles blocking the sidewalk. Well-designed bicycle parking keeps bikes upright and out of the pedestrian right-of-way.

For additional bicycle parking recommendations, including information on acceptable bicycle racks for short and long term storage and policy recommendations, see Appendix R.

Figure 50: Saris brand Circle Dock Bike Rack

[1] Darren Flusche, "Bicycling Means Business: The Economic Benefits of Bicycle Infrastructure," (Advocacy Advance, 2012)

Other Considerations

Transit

Given the proposed changes to the transportation network in downtown Appleton, there would be impacts to existing Valley Transit routes. Many of the changes would be beneficial to transit riders as cities with grid systems and an abundance of 2-way streets offer the most options for routes and riders.

Figure 51: Valley Transit bus with bike racks

There are no transit stops shown on the proposed improvements map in Exhibit 8. This study did not include coordination with Valley Transit to determine where stops are needed and the type of accommodation desired. City staff should work with Valley Transit to determine the best way to incorporate transit routes and stops in to the proposed transportation network.

A method for improving transit operations is Transit Signal Priority (TSP). TSP works by allowing individual buses to communicate with the traffic signal controller at an intersection it's approaching. If intersection conditions allow, the traffic signal phasing can be altered to prioritize the bus movement by extending the bus phase or shortening conflicting phases to bring up the bus phase sooner.

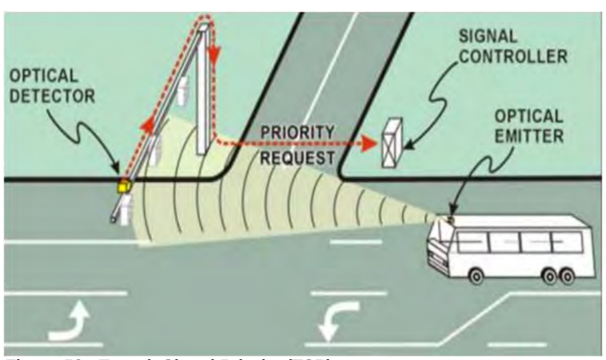


Figure 52: Transit Signal Priority (TSP)
Photo source: Streetsblog.org

The positive aspects of implementing TSP include reduction in bus travel times and improvement of on-time reliability. The negative aspect of TSP is the benefit is marginal for corridors with low traffic signal density and minimal recurring congestion. The College Avenue corridor has high signal density. While some recurring congestion is present, it's not to a degree where TSP would have a sizeable benefit. If the City wishes to pursue TSP, additional study to explore costs and benefits is recommended.

Loading Zones

The presence and availability of loading zones is very important to downtown business owners. Of particular concern during the study was the removal of parking and loading zones from the 100 (near Houdini Plaza) and 200 (near the Blue Ramp) blocks of Appleton Street. New loading zones are proposed on Oneida Street and in the 100 and 200 blocks of Appleton Street. Additional parking areas are proposed on Lawrence Street where none currently exist to help mitigate this concern. The Appleton Street loading zone in the 200 block (near existing Blue Ramp) and portions of the Oneida Street loading zone would not be available until after the Blue Ramp and YMCA ramp were removed. Following the July Municipal Services Committee meeting, a loading zone on the west edge of Houdini Plaza in the 100 block of Appleton Street was added to the proposed improvement plan. It should be noted that Houdini Plaza may be considered a Section 4(f) resource.

Development / Land Use Changes in the Study Area

Many portions of the study area are poised for redevelopment. Anticipated changes include a new expo center on Lawrence Street, a new library (location unknown), potential redevelopment of the bluff site and other organic growth. These changes were considered as part of the study and a traffic modeling sensitivity analysis was done to reflect potential build conditions with 20 percent more traffic. The proposed improvements, which create a 2-way grid system for the majority of the downtown area, would also help alleviate congestion due to the availability of alternate routes.

If significant redevelopment is proposed for a specific site downtown, a traffic impact analysis (TIA) should be completed once details about the development are known. Given the limited right of way available in the downtown area, it is likely any development would need to use the existing or planned roadway system.

Cost Estimates

These planning-level costs should only be used as very rough figures for long-range budgeting for projects – actual budgets should be developed based on specific project scopes, engineering plans, and competitive bids.

Roadway Cost Estimates

Planning level roadway cost estimates will be developed for the reconstruction of Appleton Street (south of Washington Street) and the Oneida Street bridge prior to the final report submittal. This area was selected because it is most likely the first major section to be constructed and the impetus for construction on surrounding streets.

Bicycle Facility Cost Estimates

Developing accurate cost estimates for bikeways included in a plan is challenging for a number of reasons. Estimating costs for any project is a challenge, until the actual project is scoped and designed. Estimating bikeway costs that are part of a roadway project is especially vexing since it often is impossible to estimate what portion of the total cost of a larger roadway project should be attributed to bicycling when the bikeway is incidental to the overall project. Often that requires comparing the cost of the same project without a bikeway with the additional cost to add the bikeway. In most cases, that marginal cost for the bikeway is small since the fixed costs are already associated with the larger project and adding more to a project takes advantage of the economies of scale of the larger roadway project.

This plan provides planning-level cost estimates as a range for the recommended bikeway types to provide an order of magnitude for the potential costs involved. These planning-level costs should only be used as very rough figures for long-range budgeting for projects – actual budgets should be developed based on specific project scopes, engineering plans, and competitive bids. The cost assumptions are based on regional and national-level data for bikeway construction projects. Table 5 provides a range of facility costs for the recommended bikeways for this plan while Table 6 provides the recommended system mileage and a computation of the costs based on the per mile costs and the mileage.

Table 5: Planning Level Cost Estimates for Bicycle Facilities (per mile)

Facility Type (Action)	Low Estimate per Mile	High Estimate per Mile
Signed Route (Add Signs)	$3,000	$5,000
Shared Lane Marking (Add Markings and Signs)	$10,000	$15,000
Bike Lane – Paint (Add Striping and Signs)	$10,000	$20,000
Bike Lane – Thermoplastic (Add Striping and Signs)	$20,000	$40,000
Bike Lane (Widen Road and Add Signs)	$200,000	$350,000
Climbing Lane – Paint (Add Striping and Signs)	$10,000	$20,000
Buffered Bike Lane	$30,000	$40,000
Bicycle Boulevard (Add traffic calming, Markings and Signs)	$5,000	$100,000
Shared Use Path (Construct New)	$300,000	$500,000

Table 6: Total Planning Level Estimated Costs by Facility Type

Facility Type	Miles	Low Estimate	High Estimate
Signed Route	0.43	$2,000	$3,000
Shared Lane Marking	2.20	$15,000	$22,000
Bike Lane	5.26	$43,000	$64,000
Climbing Lane	0.32	$4,000	$7,000
Buffered Bike Lane	0.42	$13,000	$17,000
Bicycle Boulevard	1.42	$8,000	$142,000
Slow Street*	0.07	$100,000	$200,000
Shared Use Path	0.62	$61,000	$101,000
Total	**10.74**	**$388,000**	**$791,000**

Notes: The cost for building a Slow Street is approximately the same as a standard street reconstruction. A single cost for providing bike lanes is provided regardless of if street widening would be required or not.

Exhibit 8

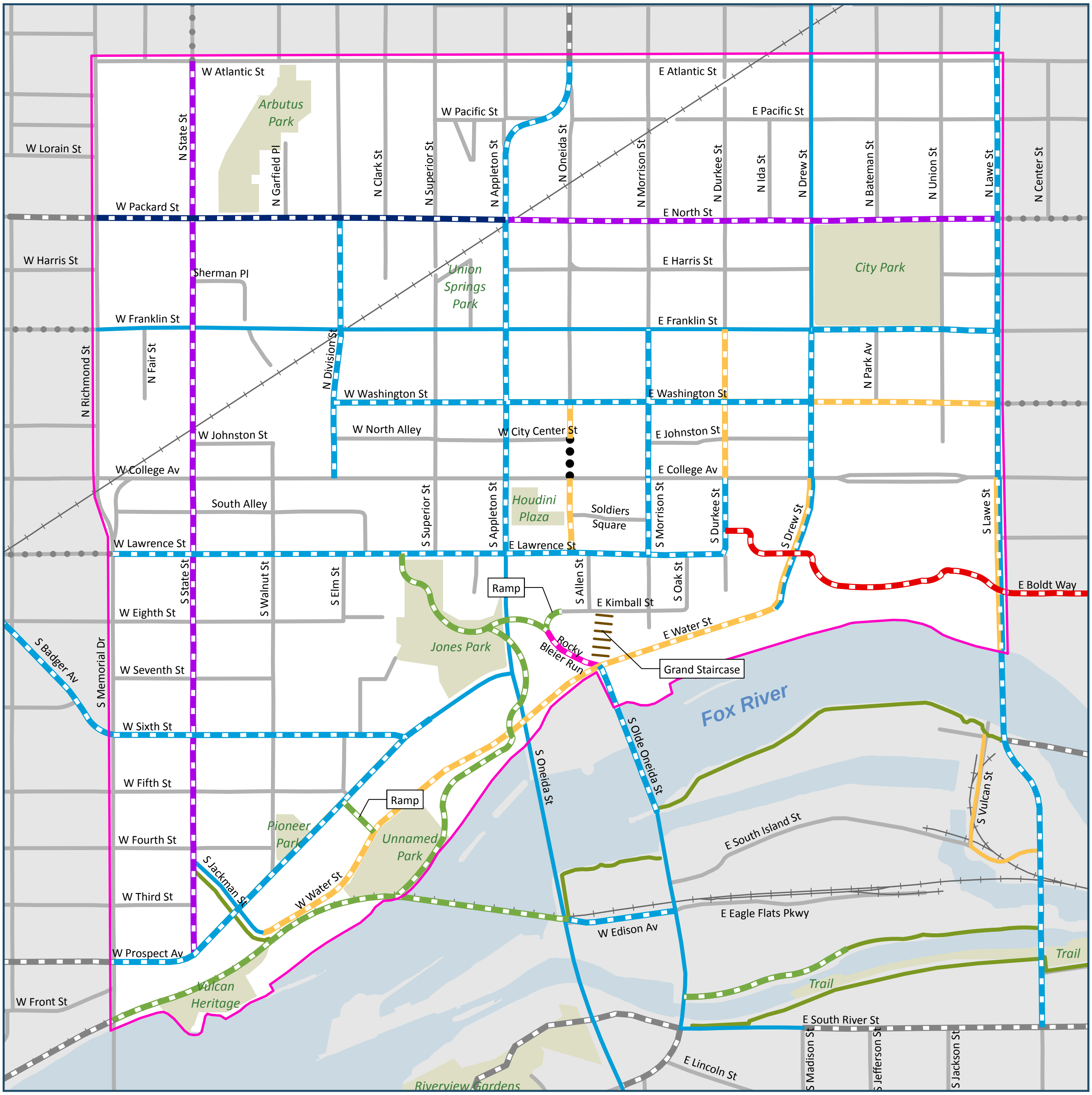
Recommended Improvements


Recommended Improvements
Ultimate Build Out
July 2016
SCALE, FT
0
100
200
Appleton
Downtown Appleton Mobility Study
AECOM Project No. 60445894
Washington St.
College Ave.
Lawrence St.
Kimball St.
Water St.
Prospect Ave.
Rocky Bleier Run
Olde Oneida St.
Superior St.
Appleton St.
Oneida St.
Morrison St.
Durkee St.
Drew St.
Allen St.
Library
Valley Transit
Yellow Ramp
Green Ramp
Blue Ramp
Red Ramp
YMCA Ramp
YMCA
City Center Plaza
Houdini Plaza
Radisson Paper Valley Hotel
Jones Park
Fox River
Remove access when Blue Ramp is demolished
Loading zone and Parking
No left turn from North Alley
No left turn from City Center Alley
No left turn into north alley
Convert to 2-way traffic when Blue Ramp is removed
Bike and pedestrian connection to be determined
Expand existing roadway
15 Minute loading zone
No left turn into red ramp
Loading zone
No left turn out of private parking ramp
Loading zone and Parking
Signed bike route
Raised intersection
Reconstruct bridge to accommodate widened Drew St. Bridge should be minimum of 16' wide.
Climbing lane for bicycles traveling uphill. Requires expansion.
New south leg of Oneida St.
Remove roadway
Remove roadway and realign with Oneida St.
Shared use path (ADA accessible): route to be determined
Reconstruct bridge
Grand staircase (consider ADA accessibility)
Potential entrance to new development on bluff
Back-in angle parking
Realign Rocky Bleier Run to improve intersection sight distance.
Reconstruct bridge to accommodate bike lanes

Appendix Q

Bicycle Recommendations

Downtown Appleton Mobility Study



Proposed Bicycle Facilities - Ultimate Build Out

July 2016

Legend
- Study Area
- Park
- Water

Existing Bicycle Facilities
- Bike Lane
- Shared Lane Marking
- Shared Use Path

Proposed Bicycle Facilities
- Buffered Bike Lane
- Bike Lane
- Climbing Lane
- Shared Lane Marking
- To Be Determined
- Slow Street
- Bicycle Boulevard
- Signed Route
- Shared Use Path
- Bike Lane (2010 Plan)
- Signed Route (2010 Plan)

N

Feet
0 250 500

Bicycle Facility Recommendations: Short Term (0 – 3 Years)

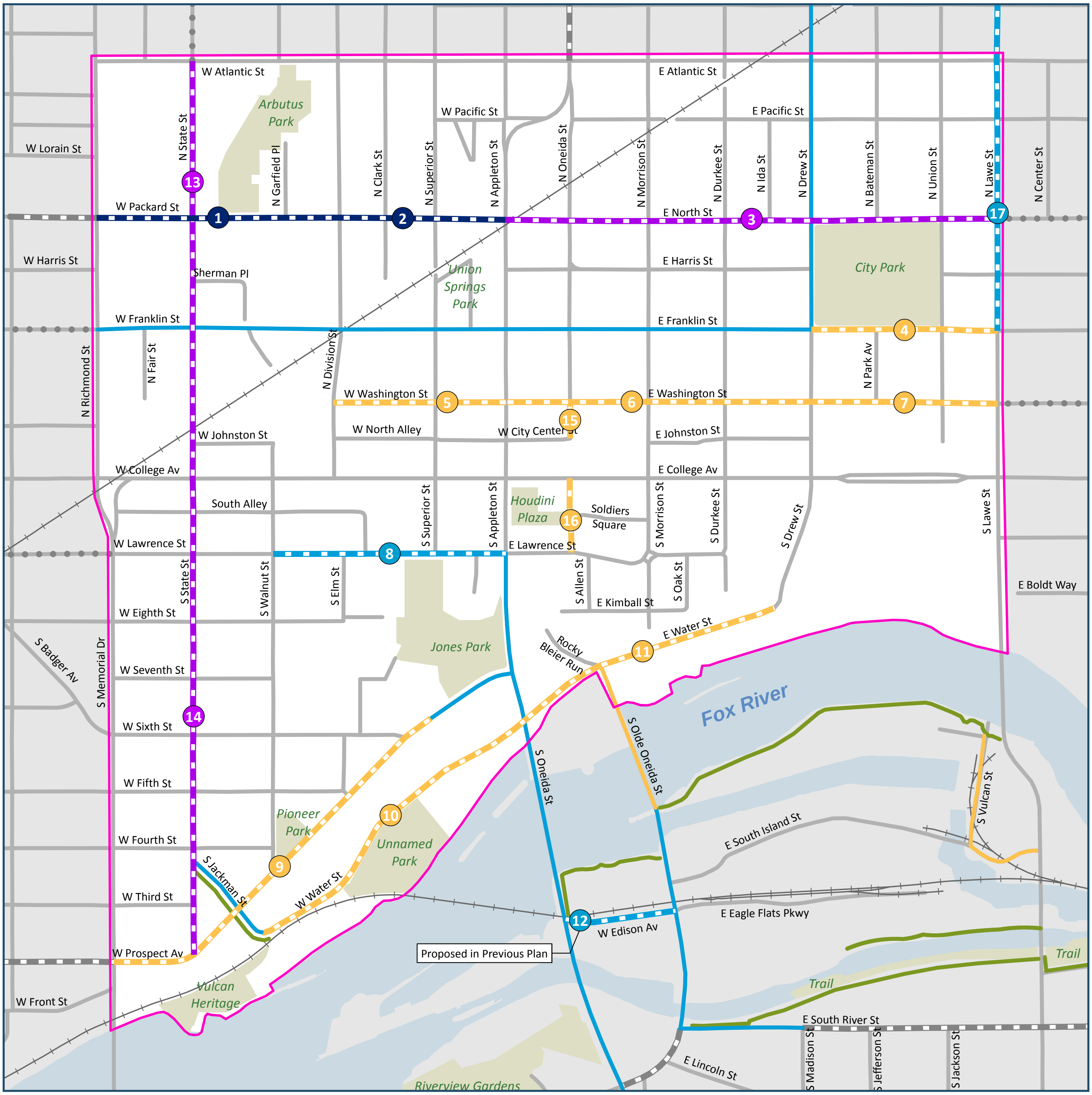
Table 2 displays recommended bicycle facility recommendations for implementation in the short term. These recommendations focus on building out the bicycle network in the study area at low cost and providing facilities or treatments with little impact on parking.

Table 1: Bicycle facilities recommended for implementation in the short term (0 – 3 years).

ID	Street	From	To	Miles	Facility	Action	Notes
1	W Packard St	N Richmond St	N Division St	0.25	Buffered Bike Lane	Road Diet	Requires road diet from four lanes to two lanes
2	W Packard St	N Division St	N Appleton St	0.17	Buffered Bike Lane	Parking Removal	Requires parking removal on one side of street; provide buffered lane on side with parking, standard lane on side without parking
3	E North St	N Appleton St	N Lawe St	0.50	Bike Blvd	Retrofit	
4	E Franklin St	N Drew St	N Lawe St	0.19	SLM*	Retrofit	Provide SLMs until bike lanes can be provided
5	W Washington St	N Division St	N Appleton St	0.18	SLM	Retrofit	Curb bump outs limit feasibility of bike lanes; provide shared lane markings in short term
6	E Washington St	N Appleton St	N Drew St	0.31	SLM	Retrofit	Curb bump outs limit feasibility of bike lanes; provide shared lane markings in short term
7	E Washington St	N Drew St	N Lawe St	0.19	SLM	Retrofit	
8	W Lawrence St	S Walnut Street	S Appleton St	0.24	Bike Lane	Parking Removal	Requires parking removal on one side of the street
9	W Prospect Ave	S Memorial Dr	Existing bike lanes	0.43	SLM	Retrofit	Provide SLMs until bike lanes can be provided
10	W Water St	S Jackman St	S Olde Oneida St	0.35	SLM	Retrofit	
11	E Water St	S Olde Oneida St	S Drew St	0.28	SLM	Retrofit	
12	W Edison Ave	S Oneida St	S Olde Oneida St	0.12	Bike Lane	Parking Removal	Not in study area, requires removal of parking on both sides of the street
13	N State St	W College Ave	W Atlantic Ave	0.43	Bike Blvd	Retrofit	
14	S State St	W Prospect Ave	W College Ave	0.49	Bike Blvd	Retrofit	
15	N Oneida St	W Washington St	W City Center St	0.04	SLM	Retrofit	
16	S Oneida St	E College Ave	E Lawrence St	0.08	SLM	Retrofit	

** SLM: Shared Lane Marking*

Downtown Appleton Mobility Study



Proposed Bicycle Facilities - Short Term (0 - 3 Years)

July 2016

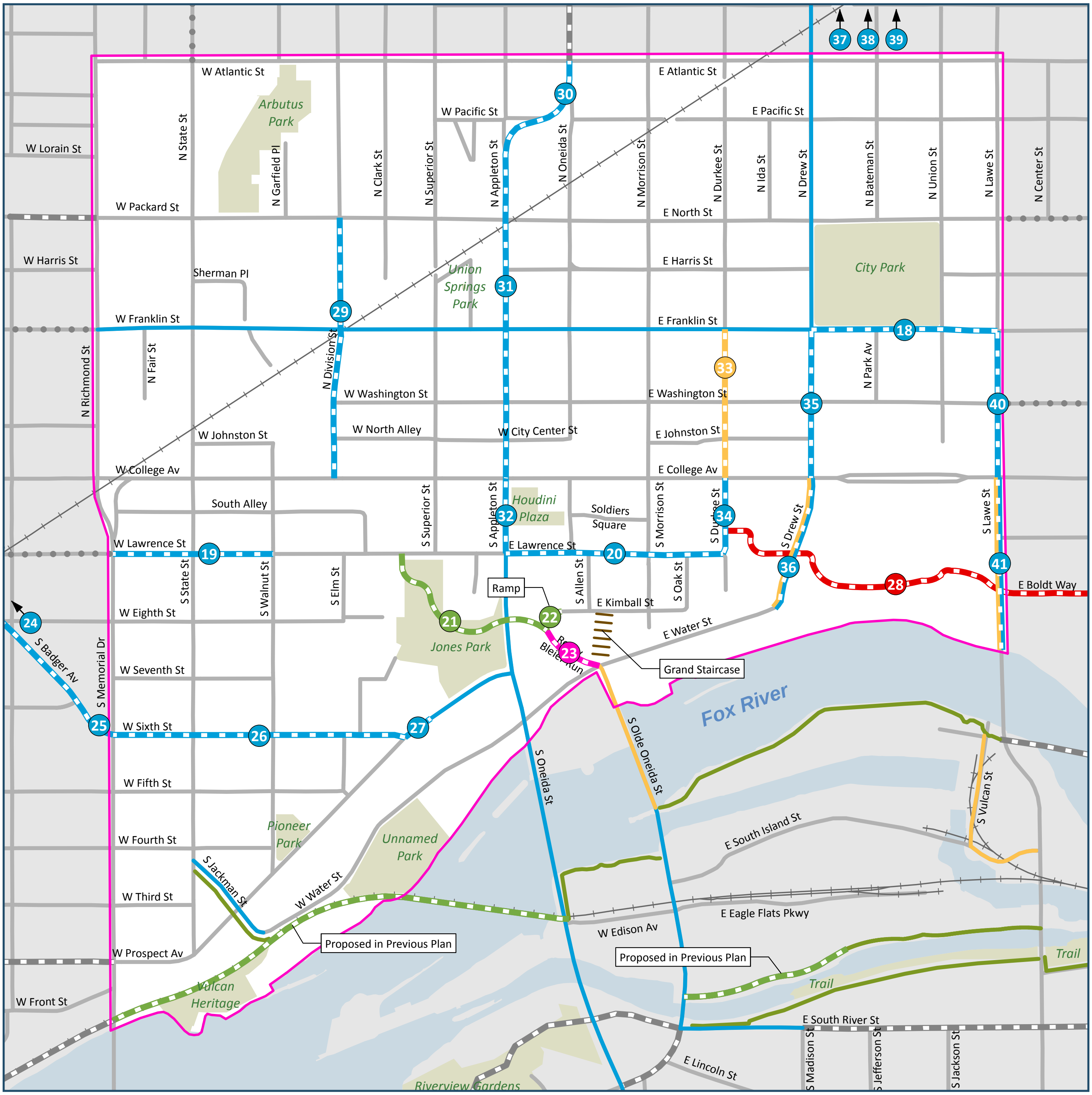
Bicycle Facility Recommendations: Medium Term (4 – 10 Years)

Table 3 displays bicycle facilities and treatments to be implemented in the medium term. These recommendations will be more challenging to carry out than short term recommendations, either because they require more parking removal, which can be controversial, or require street widening, which is expensive. Projects requiring street widening should be implemented when the street requires reconstruction for maintenance reasons; this will minimize the project cost.

Table 2: Bicycle facilities recommended for implementation in the medium term (4 – 10 years).

ID	Street	From	To	Miles	Facility	Action	Notes
17	N Lawe St	E Spring St	E Franklin St	0.50	Bike Lane	Retrofit	
18	E Franklin St	N Drew St	N Lawe St	0.19	Bike Lane	Parking Removal	Requires parking removal on one side of street
19	W Lawrence St	S Memorial Dr	S Walnut St	0.16	Bike Lane	Parking Removal	Requires parking removal on one side of street
20	E Lawrence St	S Appleton St	S Durkee St	0.24	Bike Lane	Parking Removal	Dependent on one- to two-way conversion, requires parking removal on one side of street
21	Jones Park Path	W Lawrence St	Rocky Bleier Run	0.20	Shared Use Path	Retrofit	Path should meet ADA grade requirements
22	E Kimball St Path	E Kimball St	Rocky Bleier Run	0.03	Shared Use Path/Ramp	Retrofit	Path/ramp should meet ADA grade requirements
23	Rocky Bleier Run	Jones Park	E Water St	0.07	Slow Street	Reconstruct	Reconstruct as curbless slow street open to all modes
24	N Badger Ave	W Washington St	W College Ave	0.08	Bike Lane	Road Diet	Not in study area
25	S Badger Ave	W College Ave	S Memorial Dr	0.37	Bike Lane	Road Diet	Not in study area
26	W Sixth St	S Memorial Dr	W Prospect Ave	0.30	Bike Lane	Parking Removal	Requires parking removal on both sides of street or widening
27	W Prospect Ave	W Sixth St	Exist. bike lanes	0.03	Bike Lane	Widening	Requires widening
28	Lawrence Bike Route	S Durkee St	S Meade St / E Boldt Way	0.43	Signed Route	Retrofit	Signed route through Lawrence University; will require facility upgrades on west end
29	N Division St	W College Ave	W Packard St	0.27	Bike Lane	Parking Removal	Requires parking removal on one side of street
30	N Oneida St	W Pacific St	W Atlantic St	0.07	Bike Lane	Widening	Dependent on one- to two-way conversion
31	N Appleton St	W College Ave	W Pacific St	0.39	Bike Lane	Parking Removal	Dependent on one- to two-way conversion, requires parking removal on both sides of street
32	S Appleton St	W Lawrence St	W College Ave	0.08	Bike Lane	Parking Removal	Dependent on one- to two-way conversion, requires parking removal on both sides of street
33	N Durkee St	E Franklin St	E College Ave	0.15	SLM	Retrofit	Implement when bike lanes are implemented on S Durkee St
34	S Durkee St	E Lawrence St	E College Ave	0.08	Bike Lane	Parking Removal	Dependent on one- to two-way conversion, requires parking removal on one side of street
35	N Drew St	E College Ave	W Franklin St	0.16	Bike Lane	Widening	Constrained environment, requires widening at intersections/turn lanes
36	S Drew St	E Water St	E College Ave	0.14	Climbing Lane	Widening	Climbing lane uphill; SLMs downhill; may require widening
37	N Meade St	E Wisconsin Ave	E Summer St	0.05	Bike Lane	Widening	Not in study area
38	E Summer St	N Meade St	N Lawe St	0.09	Bike Lane	Widening	Not in study area
39	N Lawe St	E College Ave	E Spring St	0.02	Bike Lane	Widening	Not in study area
40	N Lawe St	E Franklin St	E College Ave	0.15	Bile Lane	Widening	Requires widening
41	S Lawe St	E College Ave	North side of Fox River Bridge	0.18	Climbing Lane	Widening	Climbing lane uphill; SLMs downhill; may require widening

Downtown Appleton Mobility Study



Proposed Bicycle Facilities - Medium Term (4 - 10 Years)

July 2016

Legend
- Study Area
- Park
- Water

Existing Bicycle Facilities
- Bike Lane
- Shared Lane Marking
- Shared Use Path

Proposed Bicycle Facilities
- Buffered Bike Lane
- Bike Lane
- Climbing Lane
- Shared Lane Marking
- To Be Determined
- Slow Street
- Bicycle Boulevard
- Signed Route
- Shared Use Path
- Bike Lane (2010 Plan)
- Signed Route (2010 Plan)

N

Feet
0 250 500

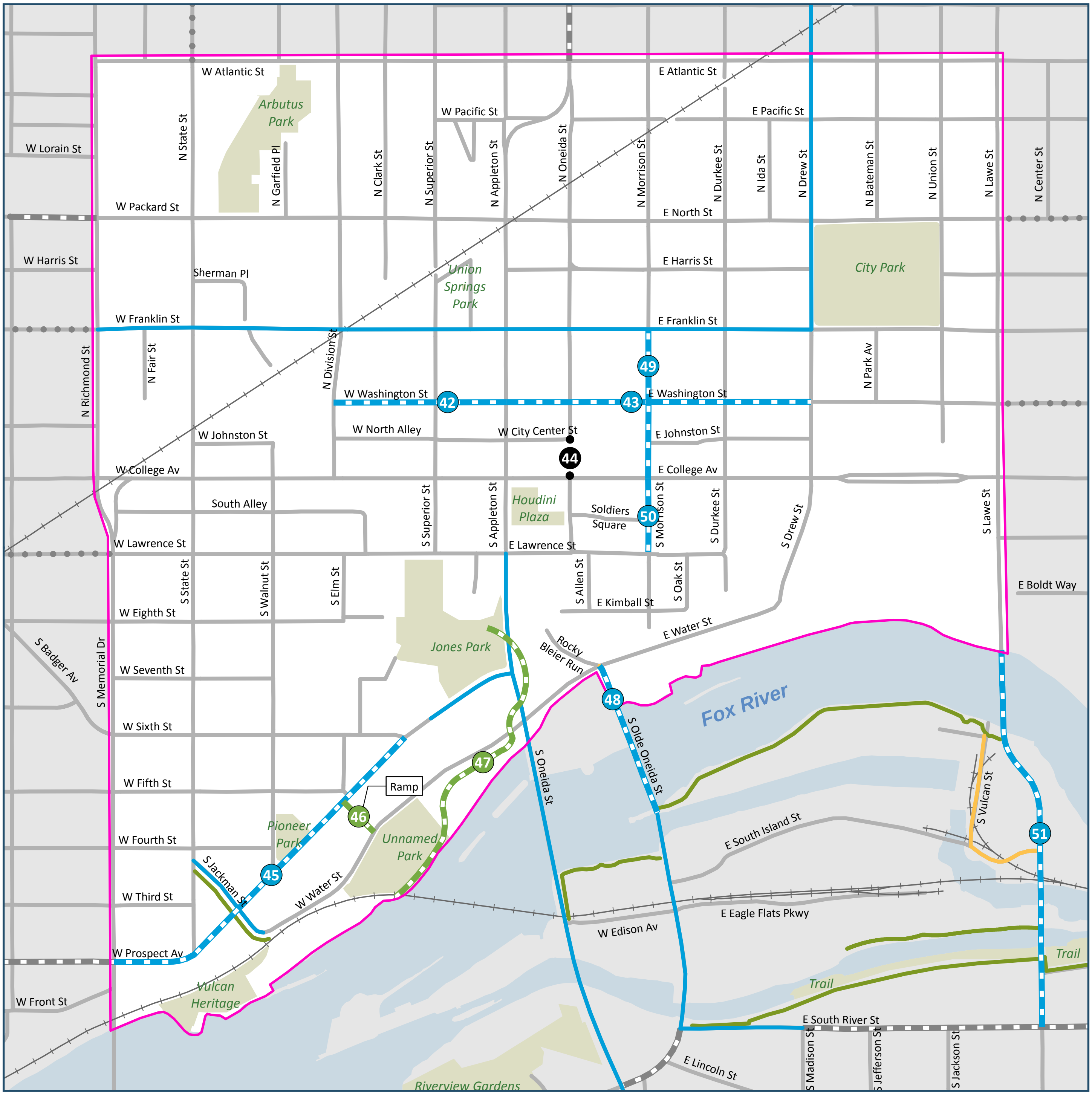
Bicycle Facility Recommendations: Long Term (10+ Years)

Table 4 displays recommendations for bicycle facilities to be implemented in the long term. These projects require significant changes to existing infrastructure such as bridge or street widening, or removal of pedestrian bump outs that were recently installed. The map displaying the long term recommendations also displays a number of shared use paths that were recommended by previous plans; these paths are still recommended, but are not detailed in Table 4.

Table 3: Bicycle facilities recommended for implementation in the long term (10+ years).

ID	Street	From	To	Miles	Facility	Action	Notes
42	W Washington St	N Division St	N Appleton St	0.18	Bike Lane	Parking Removal	Remove curb bump outs on the side with parking removed
43	E Washington St	N Appleton St	N Drew St	0.31	Bike Lane	Parking Removal	Remove curb bump outs on the side with parking removed
44	N Oneida St	W City Center St	W College Ave	0.04	TBD	TBD	Bicycle and pedestrian facility and access to be determined
45	W Prospect Ave	S Memorial Dr	W Sixth St	0.39	Bike Lane	Widening	Constrained environment, requires widening
46	Prospect-Water Ramp	W Prospect Ave	W Water St	0.04	Shared Use Path/Ramp	Retrofit	Path/ramp should meet ADA grade requirements
47	Riverfront Path	Jones Park	Trestle Path	0.35	Shared Use Path	Retrofit	
48	S Olde Oneida St	E Water St	North Island Trail	0.16	Bike Lane	Widening	Requires widening; maintain shared lane markings until bike lanes installed
49	N Morrison St	E Franklin St	E College Ave	0.15	Bike Lane	Parking Removal	Remove curb bump outs on the side with parking removed
50	S Morrison St	E College Ave	E Lawrence Ave	0.08	Bike Lane	Parking Removal	Remove curb bump outs on the side with parking removed
51	S Lawe St	North side of Fox River Bridge	E South River St	0.40	Bike Lane	Widening	Bridges will require widening; a face-to-face width of 34 feet will allow for 6 foot integral bike lanes and 11 foot travel lanes

Downtown Appleton Mobility Study



Proposed Bicycle Facilities - Long Term (10+ Years)

July 2016

Legend
- Study Area
- Park
- Water

Existing Bicycle Facilities
- Bike Lane
- Shared Lane Marking
- Shared Use Path

Proposed Bicycle Facilities
- Buffered Bike Lane
- Bike Lane
- Climbing Lane
- Shared Lane Marking
- To Be Determined
- Slow Street
- Bicycle Boulevard
- Signed Route
- Shared Use Path
- Bike Lane (2010 Plan)
- Signed Route (2010 Plan)

Feet

0 250 500

N

Appendix P

Franklin Street Pedestrian Refuge Islands

16 North Carroll Street, Suite 200
Madison, WI 53703
608.663.8080
www.tooledesign.com

MEMORANDUM

Date:	June 21, 2016
To:	Eric Lom
From:	Kevin Luecke
Re:	Franklin Street Crossing Treatments

The recommendations of the Downtown Appleton Mobility Plan include removing existing traffic signals at the intersections of West Franklin Street and North Superior Street and West Franklin Street and North Oneida Street. In order to facilitate pedestrian crossing of West Franklin Street at these intersections, removal of the left turn lanes is recommended to allow the installation of median islands. Median islands provide a refuge for pedestrians crossing the street, and allow them to focus on traffic approaching from just one direction before making their crossing. This memo provides conceptual illustrations of median crossing islands at these intersections.

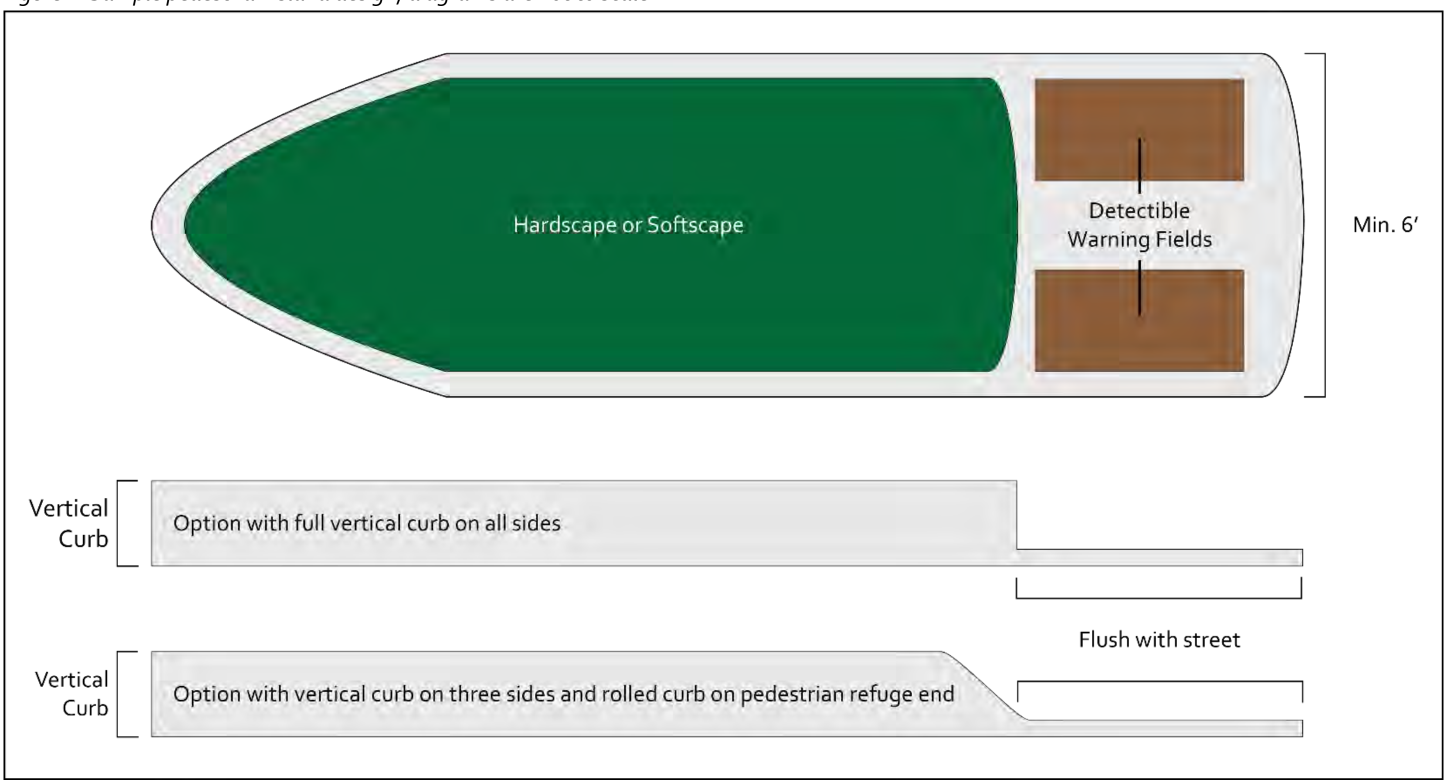
Sample Median Island

Figure 1 displays a sample median island design. This example has two primary components:

- A raised island that can be hardscaped or softscaped; and
- A pedestrian waiting area that is flush with the street and contains two detectible warning fields.

Providing a pedestrian waiting area that is flush with the street allows the area to be cleared of snow by plows that are clearing the street. While having a physical curb on both sides of the pedestrian waiting area is desirable, this necessitates clearing snow by hand, something that often doesn't occur until well after a snowfall. Providing a flush area allows plow operators to clear the pedestrian zone as they clear the street.

Figure 1: Sample pedestrian island design; diagrams are not to scale.



West Franklin Street & North Superior Street

Figure 2 displays the existing conditions at the intersection of West Franklin Street and North Superior Street. Figure 3 displays a conceptual illustration of the crosswalks moved back from the intersection and installation of median crossing islands at the intersection. The median islands in Figure 3 should be a minimum of six feet wide; a width of eight to ten feet is preferred.

Figure 2: Existing conditions at the West Franklin Street and North Superior Street intersection; imagery courtesy Google.

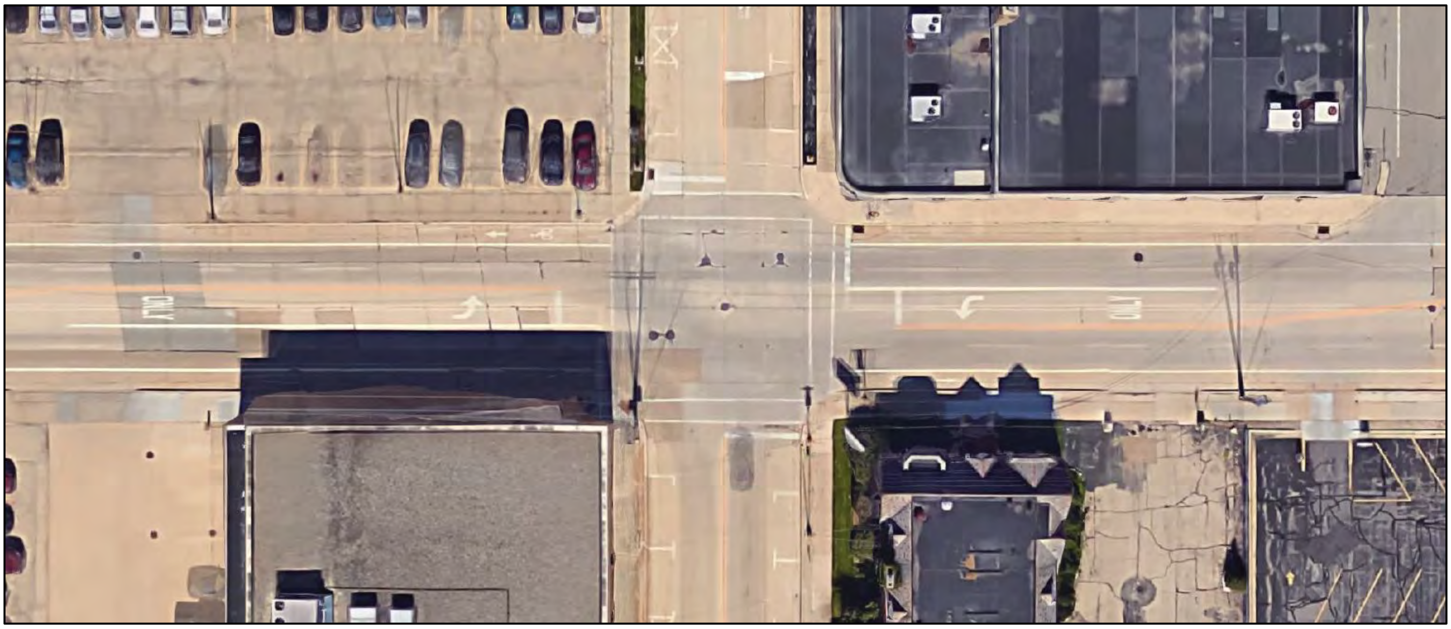
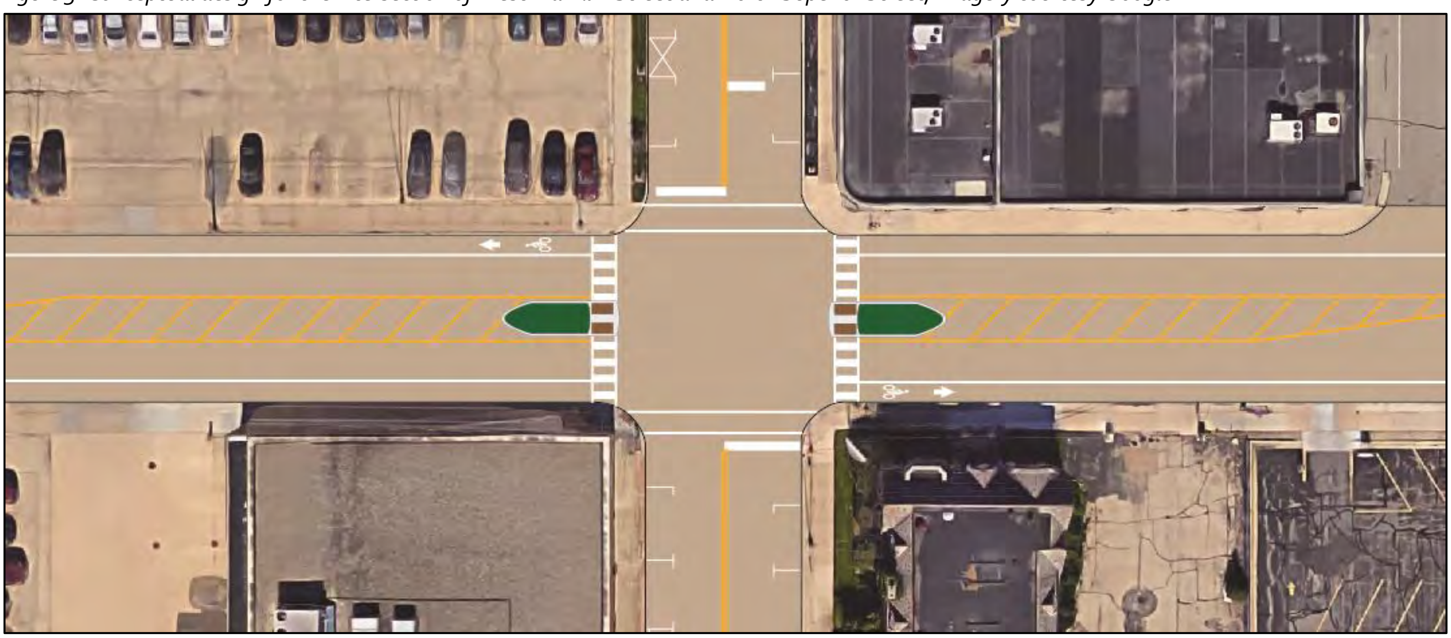


Figure 3: Conceptual design for the intersection of West Franklin Street and North Superior Street; imagery courtesy Google.



West Franklin Street & North Oneida Street

Figure 4 displays the existing conditions at the intersection of West Franklin Street and North Oneida Street. Figure 5 displays a conceptual illustration of the crosswalks moved back from the intersection and installation of median crossing islands at the intersection. The median islands in Figure 5 should be a minimum of six feet wide; a width of eight to ten feet is preferred.

Figure 4: Existing conditions at the West Franklin Street and North Oneida Street intersection; imagery courtesy Google.

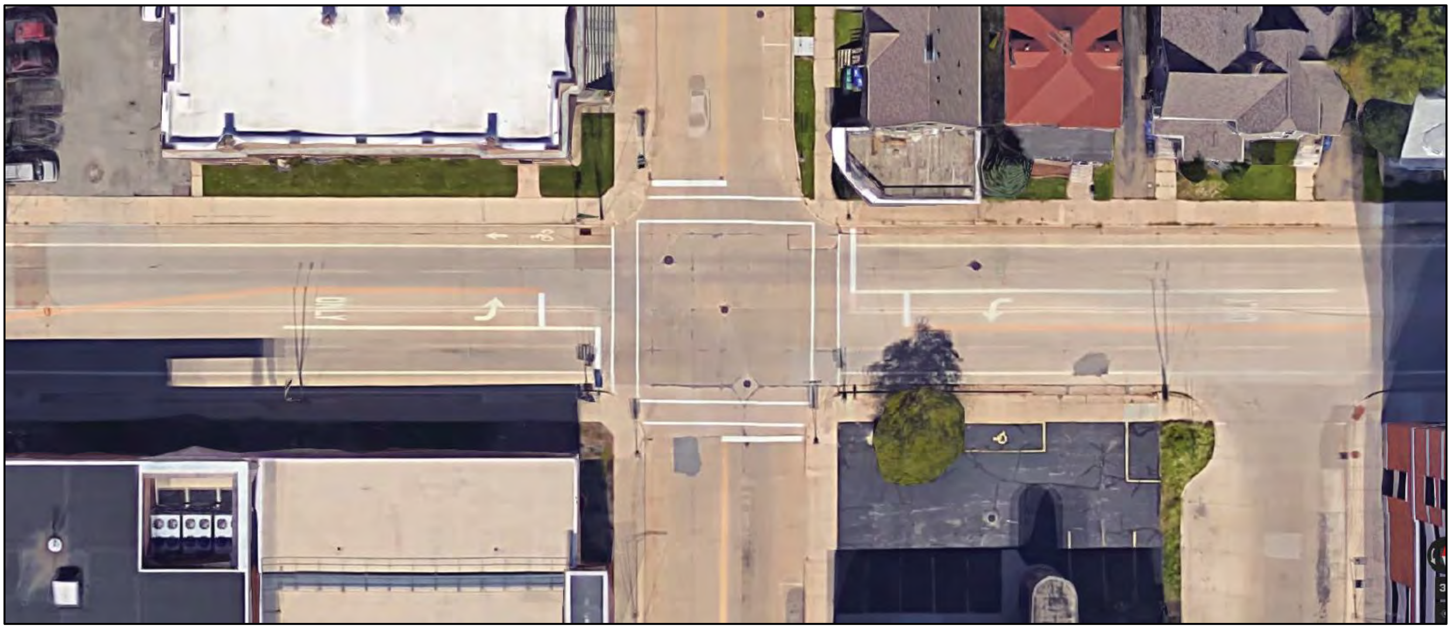
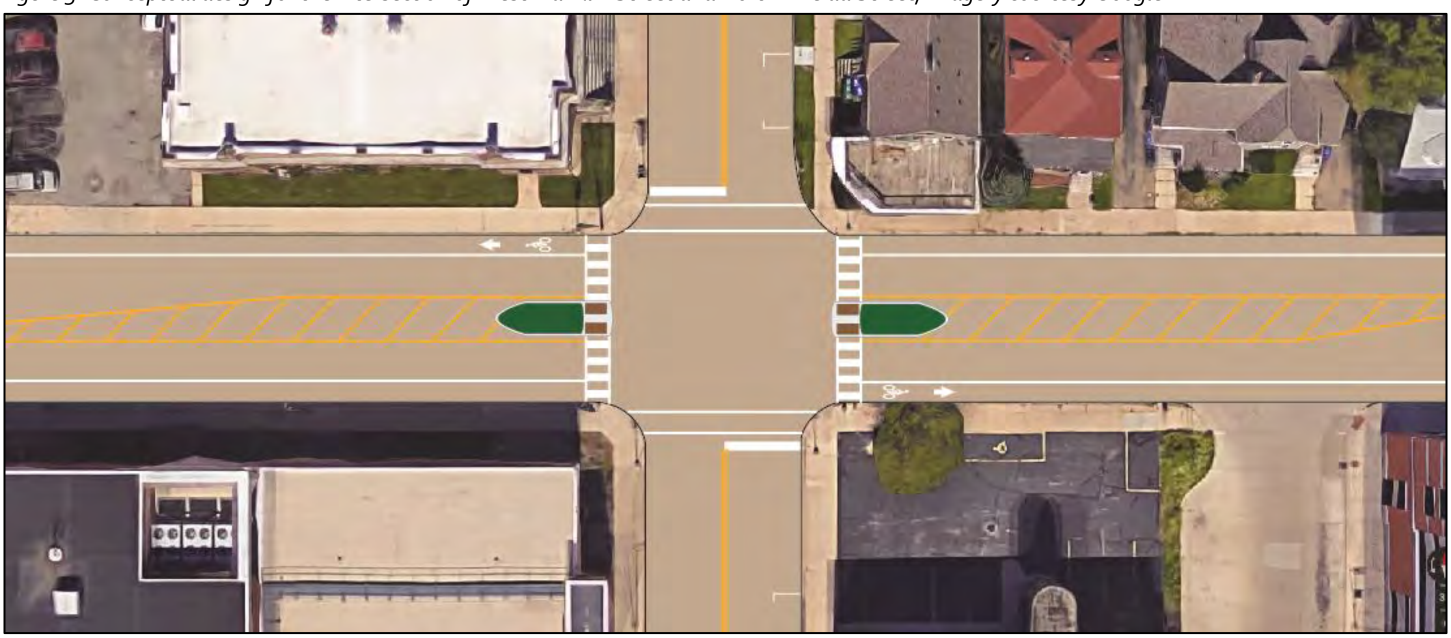


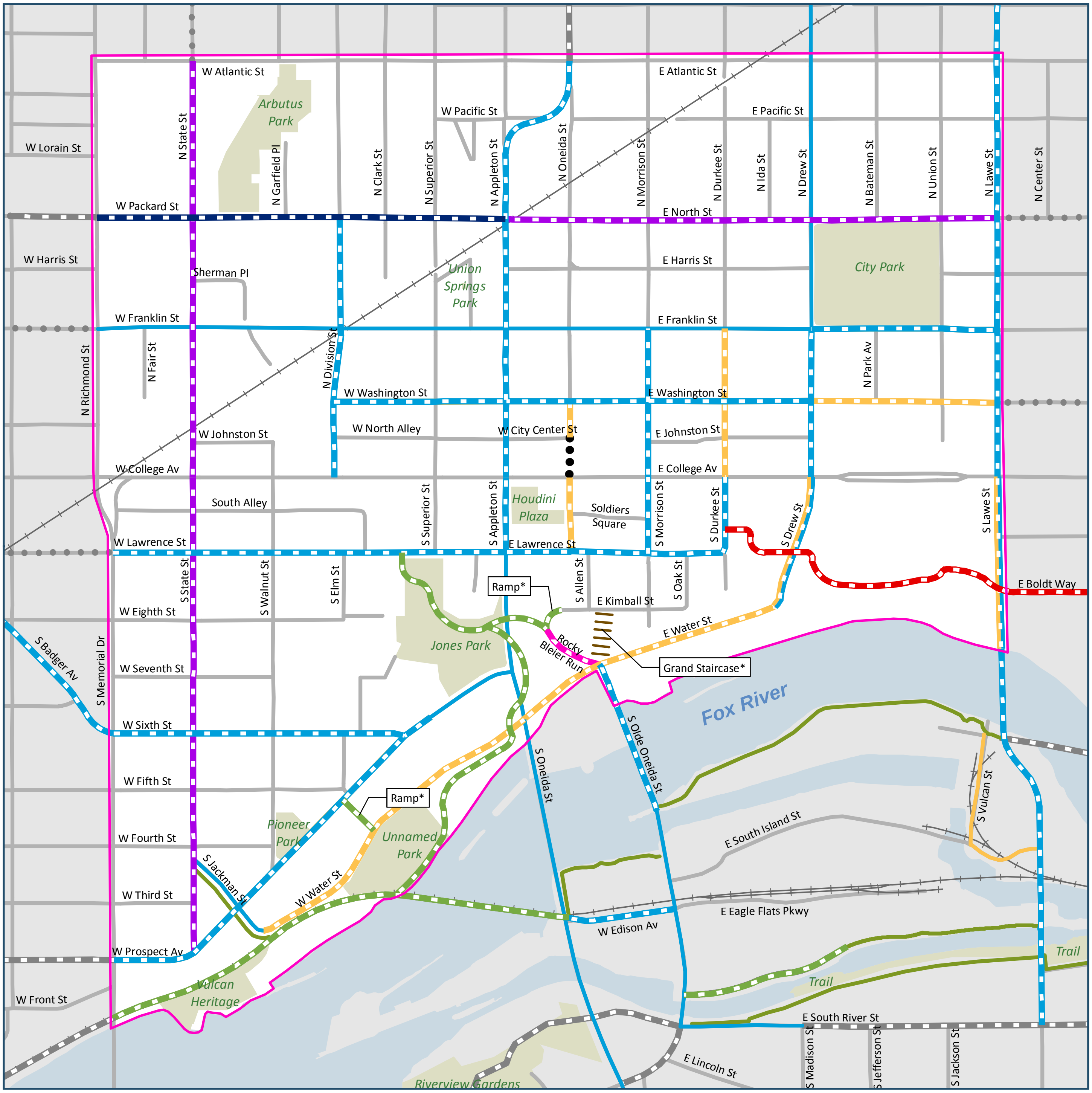
Figure 5: Conceptual design for the intersection of West Franklin Street and North Oneida Street; imagery courtesy Google.



Appendix Q

Bicycle Recommendations

Downtown Appleton Mobility Study



Proposed Bicycle Facilities - Ultimate Build Out

August 2016

Legend	Existing Bicycle Facilities	Proposed Bicycle Facilities		
Study Area	Bike Lane	Buffered Bike Lane	Slow Street	Bike Lane (2010 Plan)
Park	Shared Lane Marking	Bike Lane	Bicycle Boulevard	Signed Route (2010 Plan)
Water	Shared Use Path	Climbing Lane	Signed Route	
		Shared Lane Marking	Shared Use Path	
* ADA Accessible Faciliites to be Studied		To Be Determined		

N

Feet

0 250 500

Bicycle Facility Recommendations: Short Term (0 – 3 Years)

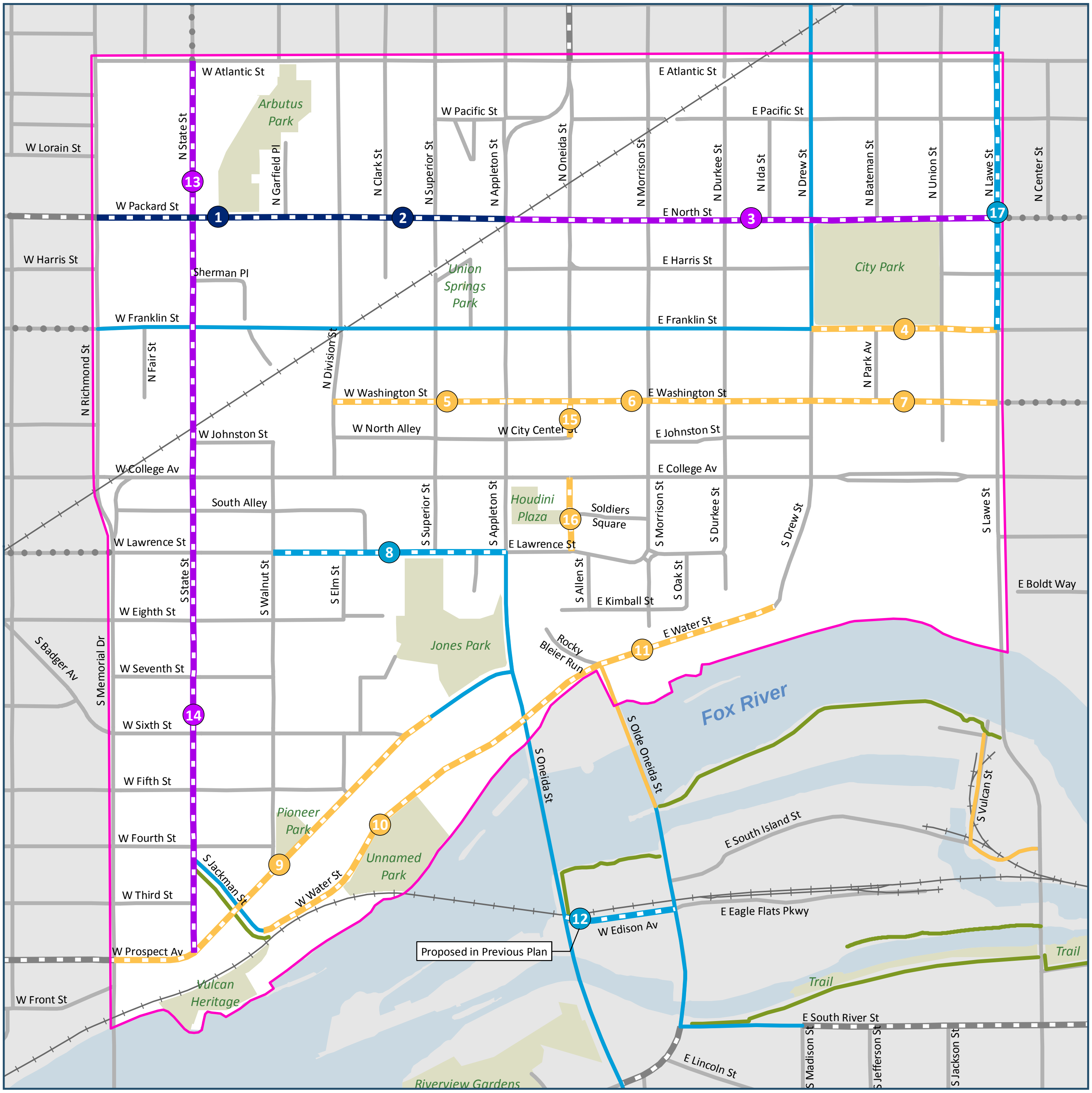
Table 2 displays recommended bicycle facility recommendations for implementation in the short term. These recommendations focus on building out the bicycle network in the study area at low cost and providing facilities or treatments with little impact on parking.

Table 1: Bicycle facilities recommended for implementation in the short term (0 – 3 years).

ID	Street	From	To	Miles	Facility	Action	Notes
1	W Packard St	N Richmond St	N Division St	0.25	Buffered Bike Lane	Road Diet	Requires road diet from four lanes to two lanes
2	W Packard St	N Division St	N Appleton St	0.17	Buffered Bike Lane	Parking Removal	Requires parking removal on one side of street; provide buffered lane on side with parking, standard lane on side without parking
3	E North St	N Appleton St	N Lawe St	0.50	Bike Blvd	Retrofit	
4	E Franklin St	N Drew St	N Lawe St	0.19	SLM*	Retrofit	Provide SLMs until bike lanes can be provided
5	W Washington St	N Division St	N Appleton St	0.18	SLM	Retrofit	Curb bump outs limit feasibility of bike lanes; provide shared lane markings in short term
6	E Washington St	N Appleton St	N Drew St	0.31	SLM	Retrofit	Curb bump outs limit feasibility of bike lanes; provide shared lane markings in short term
7	E Washington St	N Drew St	N Lawe St	0.19	SLM	Retrofit	
8	W Lawrence St	S Walnut Street	S Appleton St	0.24	Bike Lane	Parking Removal	Requires parking removal on one side of the street
9	W Prospect Ave	S Memorial Dr	Existing bike lanes	0.43	SLM	Retrofit	Provide SLMs until bike lanes can be provided
10	W Water St	S Jackman St	S Olde Oneida St	0.35	SLM	Retrofit	
11	E Water St	S Olde Oneida St	S Drew St	0.28	SLM	Retrofit	
12	W Edison Ave	S Oneida St	S Olde Oneida St	0.12	Bike Lane	Parking Removal	Not in study area, requires removal of parking on both sides of the street
13	N State St	W College Ave	W Atlantic Ave	0.43	Bike Blvd	Retrofit	
14	S State St	W Prospect Ave	W College Ave	0.49	Bike Blvd	Retrofit	
15	N Oneida St	W Washington St	W City Center St	0.04	SLM	Retrofit	
16	S Oneida St	E College Ave	E Lawrence St	0.08	SLM	Retrofit	

** SLM: Shared Lane Marking*

Downtown Appleton Mobility Study



Proposed Bicycle Facilities - Short Term (0 - 3 Years)

August 2016

Legend
- Study Area
- Park
- Water

Existing Bicycle Facilities
- Bike Lane
- Shared Lane Marking
- Shared Use Path

Proposed Bicycle Facilities
- Buffered Bike Lane
- Bike Lane
- Climbing Lane
- Shared Lane Marking
- To Be Determined
- Slow Street
- Bicycle Boulevard
- Signed Route
- Shared Use Path
- Bike Lane (2010 Plan)
- Signed Route (2010 Plan)

N

Feet

0 250 500

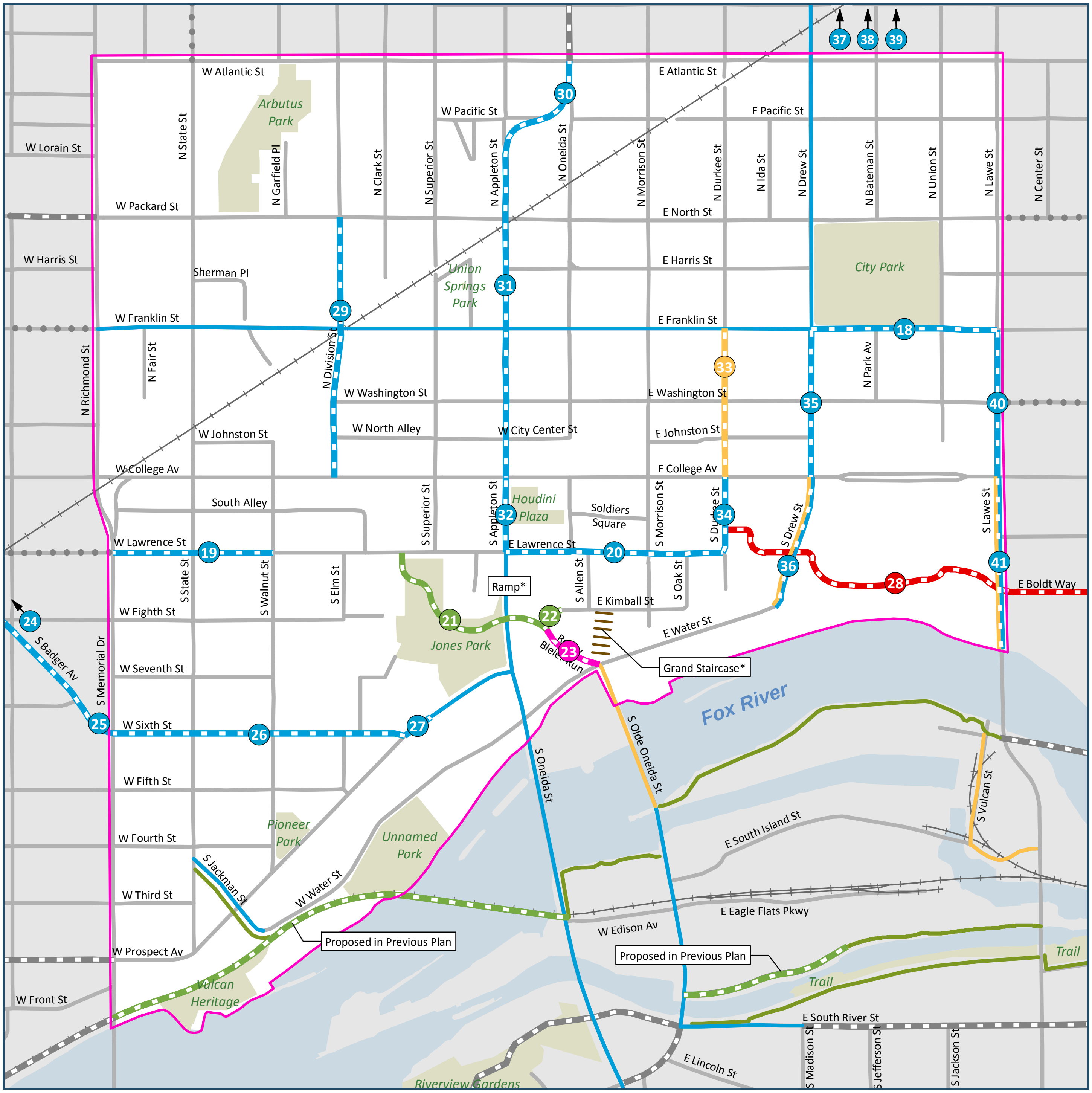
Bicycle Facility Recommendations: Medium Term (4 – 10 Years)

Table 3 displays bicycle facilities and treatments to be implemented in the medium term. These recommendations will be more challenging to carry out than short term recommendations, either because they require more parking removal, which can be controversial, or require street widening, which is expensive. Projects requiring street widening should be implemented when the street requires reconstruction for maintenance reasons; this will minimize the project cost.

Table 2: Bicycle facilities recommended for implementation in the medium term (4 – 10 years).

ID	Street	From	To	Miles	Facility	Action	Notes
17	N Lawe St	E Spring St	E Franklin St	0.50	Bike Lane	Retrofit	
18	E Franklin St	N Drew St	N Lawe St	0.19	Bike Lane	Parking Removal	Requires parking removal on one side of street
19	W Lawrence St	S Memorial Dr	S Walnut St	0.16	Bike Lane	Parking Removal	Requires parking removal on one side of street
20	E Lawrence St	S Appleton St	S Durkee St	0.24	Bike Lane	Parking Removal	Dependent on one- to two-way conversion, requires parking removal on one side of street
21	Jones Park Path	W Lawrence St	Rocky Bleier Run	0.20	Shared Use Path	Retrofit	Path should meet ADA grade requirements
22	E Kimball St Path	E Kimball St	Rocky Bleier Run	0.03	Shared Use Path/Ramp	Retrofit	Path/ramp should meet ADA grade requirements
23	Rocky Bleier Run	Jones Park	E Water St	0.07	Slow Street	Reconstruct	Reconstruct as curbless slow street open to all modes
24	N Badger Ave	W Washington St	W College Ave	0.08	Bike Lane	Road Diet	Not in study area
25	S Badger Ave	W College Ave	S Memorial Dr	0.37	Bike Lane	Road Diet	Not in study area
26	W Sixth St	S Memorial Dr	W Prospect Ave	0.30	Bike Lane	Parking Removal	Requires parking removal on both sides of street or widening
27	W Prospect Ave	W Sixth St	Exist. bike lanes	0.03	Bike Lane	Widening	Requires widening
28	Lawrence Bike Route	S Durkee St	S Meade St / E Boldt Way	0.43	Signed Route	Retrofit	Signed route through Lawrence University; will require facility upgrades on west end
29	N Division St	W College Ave	W Packard St	0.27	Bike Lane	Parking Removal	Requires parking removal on one side of street
30	N Oneida St	W Pacific St	W Atlantic St	0.07	Bike Lane	Widening	Dependent on one- to two-way conversion
31	N Appleton St	W College Ave	W Pacific St	0.39	Bike Lane	Parking Removal	Dependent on one- to two-way conversion, requires parking removal on both sides of street
32	S Appleton St	W Lawrence St	W College Ave	0.08	Bike Lane	Parking Removal	Dependent on one- to two-way conversion, requires parking removal on both sides of street
33	N Durkee St	E Franklin St	E College Ave	0.15	SLM	Retrofit	Implement when bike lanes are implemented on S Durkee St
34	S Durkee St	E Lawrence St	E College Ave	0.08	Bike Lane	Parking Removal	Dependent on one- to two-way conversion, requires parking removal on one side of street
35	N Drew St	E College Ave	W Franklin St	0.16	Bike Lane	Widening	Constrained environment, requires widening at intersections/turn lanes
36	S Drew St	E Water St	E College Ave	0.14	Climbing Lane	Widening	Climbing lane uphill; SLMs downhill; may require widening
37	N Meade St	E Wisconsin Ave	E Summer St	0.05	Bike Lane	Widening	Not in study area
38	E Summer St	N Meade St	N Lawe St	0.09	Bike Lane	Widening	Not in study area
39	N Lawe St	E College Ave	E Spring St	0.02	Bike Lane	Widening	Not in study area
40	N Lawe St	E Franklin St	E College Ave	0.15	Bile Lane	Widening	Requires widening
41	S Lawe St	E College Ave	North side of Fox River Bridge	0.18	Climbing Lane	Widening	Climbing lane uphill; SLMs downhill; may require widening

Downtown Appleton Mobility Study



Proposed Bicycle Facilities - Medium Term (4 - 10 Years)

August 2016

Legend		Existing Bicycle Facilities	Proposed Bicycle Facilities		
Study Area		Bike Lane	Buffered Bike Lane	Slow Street	Bike Lane (2010 Plan)
Park		Shared Lane Marking	Bike Lane	Bicycle Boulevard	Signed Route (2010 Plan)
Water		Shared Use Path	Climbing Lane	Signed Route	
			Shared Lane Marking	Shared Use Path	
*	ADA Accessible Faciliites to be Studied		To Be Determined		

N

Feet
0 250 500

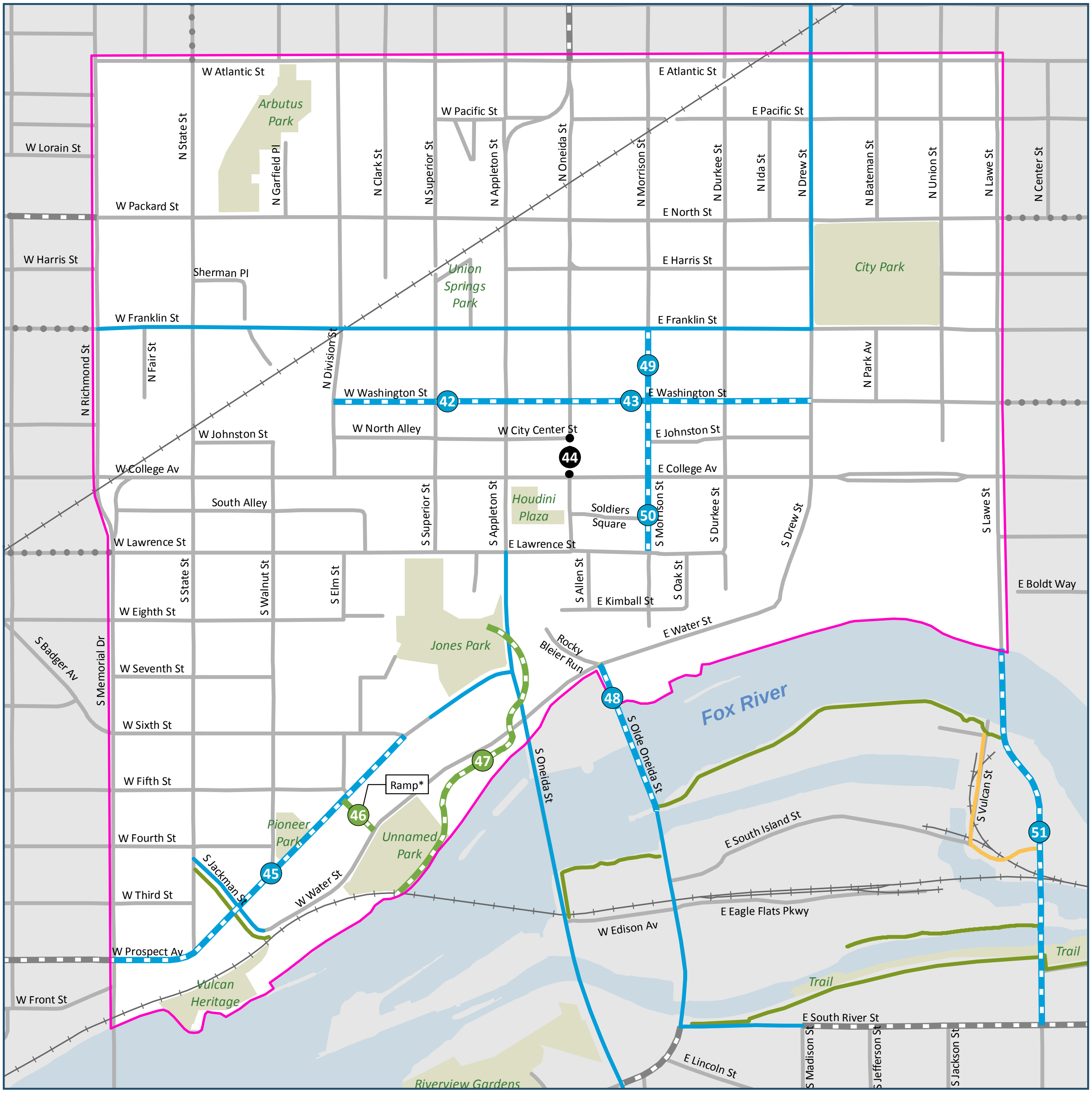
Bicycle Facility Recommendations: Long Term (10+ Years)

Table 4 displays recommendations for bicycle facilities to be implemented in the long term. These projects require significant changes to existing infrastructure such as bridge or street widening, or removal of pedestrian bump outs that were recently installed. The map displaying the long term recommendations also displays a number of shared use paths that were recommended by previous plans; these paths are still recommended, but are not detailed in Table 4.

Table 3: Bicycle facilities recommended for implementation in the long term (10+ years).

ID	Street	From	To	Miles	Facility	Action	Notes
42	W Washington St	N Division St	N Appleton St	0.18	Bike Lane	Parking Removal	Remove curb bump outs on the side with parking removed
43	E Washington St	N Appleton St	N Drew St	0.31	Bike Lane	Parking Removal	Remove curb bump outs on the side with parking removed
44	N Oneida St	W City Center St	W College Ave	0.04	TBD	TBD	Bicycle and pedestrian facility and access to be determined
45	W Prospect Ave	S Memorial Dr	W Sixth St	0.39	Bike Lane	Widening	Constrained environment, requires widening
46	Prospect-Water Ramp	W Prospect Ave	W Water St	0.04	Shared Use Path/Ramp	Retrofit	Path/ramp should meet ADA grade requirements
47	Riverfront Path	Jones Park	Trestle Path	0.35	Shared Use Path	Retrofit	
48	S Olde Oneida St	E Water St	North Island Trail	0.16	Bike Lane	Widening	Requires widening; maintain shared lane markings until bike lanes installed
49	N Morrison St	E Franklin St	E College Ave	0.15	Bike Lane	Parking Removal	Remove curb bump outs on the side with parking removed
50	S Morrison St	E College Ave	E Lawrence Ave	0.08	Bike Lane	Parking Removal	Remove curb bump outs on the side with parking removed
51	S Lawe St	North side of Fox River Bridge	E South River St	0.40	Bike Lane	Widening	Bridges will require widening; a face-to-face width of 34 feet will allow for 6 foot integral bike lanes and 11 foot travel lanes

Downtown Appleton Mobility Study



Proposed Bicycle Facilities - Long Term (10+ Years)

August 2016

Legend
- Study Area
- Park
- Water

Existing Bicycle Facilities
- Bike Lane
- Shared Lane Marking
- Shared Use Path

Proposed Bicycle Facilities
- Buffered Bike Lane
- Bike Lane
- Climbing Lane
- Shared Lane Marking
- To Be Determined
- Slow Street
- Bicycle Boulevard
- Signed Route
- Shared Use Path
- Bike Lane (2010 Plan)
- Signed Route (2010 Plan)

N

Feet
0 250 500

* ADA Accessible Faciliites to be Studied

Appendix R

Bicycle Parking Recommendations

16 North Carroll Street, Suite 200
Madison, WI 53703
608.663.8080
www.tooledesign.com

The following text was originally included in the memo identified below. The information relevant to bicycle parking has been copied from that memo and displayed here.

MEMORANDUM

Date:	July 19, 2016
To:	Eric Lom
From:	Kevin Luecke
Re:	Appleton Downtown Mobility Plan Bicycle and Pedestrian Alternatives - REVISED

Bicycle Parking Recommendations

One of the most common obstacles for people using their bicycles is the lack of secure bicycle parking facilities when they arrive at their destination. Providing bicycle parking encourages people to use their bicycles for transportation, but it also benefits non-cyclists:

- Bicycle parking is good for business. Economic development studies have found that people on bikes are more likely to make repeat trips to their local businesses, and to spend more money per month than those who drive.[1]

- Bicycle parking is much more space-efficient than automobile parking. Every customer arriving on a bike leaves a car parking space free for someone else.

- Providing bicycle parking gives a more orderly appearance to the streetscape. When bike racks are not present, people will lock their bikes to trees, benches, light posts, and railings. This causes damage to the street furniture and can result in bicycles blocking the sidewalk. Well-designed bicycle parking keeps bikes upright and out of the pedestrian right-of-way.

Getting it Right

Frequently, when bicycle parking is provided, it fails to be useful to people locking their bikes. If a bicycle rack is in the wrong location, is not secure, or does not support or fit their bike well, people will not use it. There are many resources available that provide guidance on how to install the right kinds of bicycle racks in the right locations. When planning for bicycle parking, it is important to consider the following criteria:

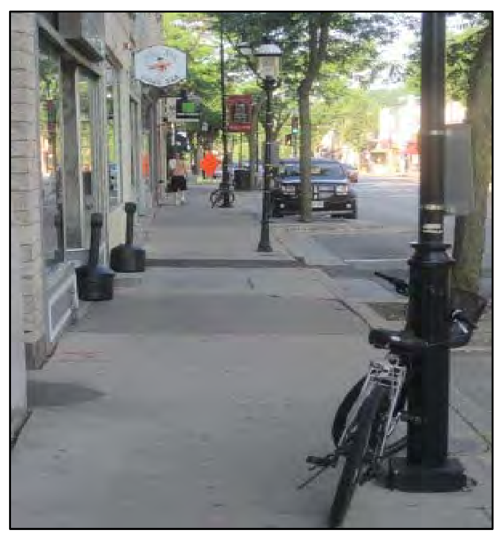


Figure 1: Bicycles in the study area are frequently locked to objects such as street lights, benches, and trees which can cause pedestrian hazards and is unsightly.

- **Location**. Bike parking should be close to the building entrance in a highly-visible and easily accessible area. People who are parking their bikes for longer periods, such as people who live in an apartment building, are willing to sacrifice some convenience for more secure or sheltered bike parking, such as in a basement or parking ramp.

- **Sufficient surrounding space.** Space around the bike rack should take into account that bikes are typically 2 feet wide by 6 feet long and people need maneuvering space to get their bikes in and out of the space. Bicycles should not obstruct pedestrian traffic when

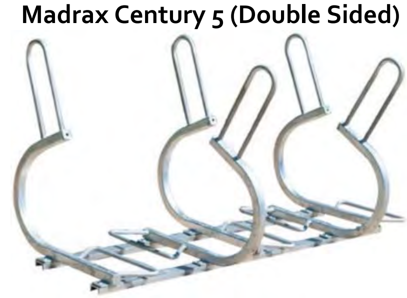
[1] Darren Flusche, "Bicycling Means Business: The Economic Benefits of Bicycle Infrastructure," (Advocacy Advance, 2012)

secured to the rack.

- **Bike rack design.** Bike racks should support the bicycle frame in two or more places to prevent the bicycle from tipping over. Racks should accommodate a variety of locks and allow both the bicycle frame and wheels to be secured to the bike rack. Acceptable bicycle rack styles are displayed in Table 1.

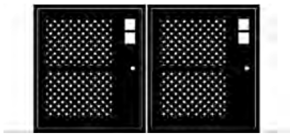
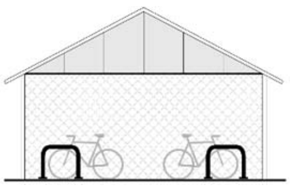
- **Securely anchored in pavement.** A bike rack should be securely anchored to the ground to prevent theft and provide stability to the bikes locked to it.

Table 1: Acceptable bicycle rack types for short-term parking (source: APBP)

Rack Type	Sample Image	Description	Example Rack
Inverted U (Staple, Loop)		Common style appropriate for many uses; two points of ground contact. Can be installed in series on rails to create a free-standing parking area in variable quantities. Available in many variations.	**Saris Circle Dock** 
Post & Ring		Common style appropriate for many uses; one point of ground contact. Compared to inverted-U racks, these are less prone to unintended perpendicular parking. Products exist for converting unused parking meter posts.	**Dero Bike Hitch** 
Wheelwell Secure		Includes an element that cradles one wheel. Design and performance vary by manufacturer; typically contains bikes well, which is desirable for long-term parking and in large-scale installations (e.g. campus); accommodates fewer bicycle types and attachments than the two styles above.	**Madrax Century 5 (Double Sided)** 

Note: Example racks are not intended to endorse a specific vendor; similar rack styles are available from a variety of vendors.

Table 2: Types of long-term parking enclosures (source: APBP)

Rack Type	Sample Image	Description	Example Rack
Locker		Bike lockers provide secure storage for individual bicycles. Lockers may be reserved on a long term basis, or may be available on-demand using an automated payment system. Because bike lockers are self-contained, they can be located nearly anywhere.	**Bikelink Bicycle Locker** 
Sheltered Secure Enclosure		Sheltered secure enclosures may be freestanding structures, or may be bike cages or rooms located within parking garages or buildings. These enclosures may utilize a variety of rack types, including those displayed in Table 7. Access is typically provided through a membership system or to employees or users of specific businesses or buildings.	**Duo-Gard Bike Shelter** 

Bicycle Parking Recommendations

The 2010 Appleton On-Street Bike Lane Plan made the following recommendations related to bike parking in Appleton:

1. Explore developing bicycle parking standards, like automobile parking standards, for multifamily residential and commercial developments to ensure secure and accessible bicycle parking is available on-site. The standards should include dimensions for the parking space and acceptable rack facilities.

2. Encourage employees to bicycle and walk to work by offering incentives and by providing needed facilities at the workplace such as bicycle parking and improved connections to the site.

3. Actively involve local businesses in providing convenient and secure bicycle parking.

The recommendations from the 2010 Bike Lane Plan are still valid. The following recommendations are added to the recommendations from the 2010 Plan:

4. Utilize the Association of Pedestrian and Bicycle Professionals' (APBP) *Essentials of Bike Parking* and *Bicycle Parking Guidelines* as formal design guides for installing bicycle parking; ensure that bicycle parking required to be installed by private parties meets the same guidance that the City is following.

5. Install bicycle racks that will require minimal maintenance. Finish materials should be galvanized or stainless steel to minimize corrosion; if colored racks are desired, the color should be applied over galvanized or stainless steel.

6. Add bicycle parking requirements to each land use defined in the zoning code that has an automobile parking requirement; suggested additions to the zoning code and minimum bicycle parking requirements are provided in the appendix.

7. A program should be established to install bicycle racks in the public right of way when requested by businesses. Such a program could fund a reasonable number of racks each year at minimal cost to the City. Applications to this program should be limited to businesses that cannot install racks on their own property as the property is fully built out.

Appendix: Bicycle Parking and the Zoning Code

Many cities have amended their zoning codes to require bike parking in new developments and redevelopments, just as they require automobile parking.

Section 23-172 of the City Appleton's Zoning Code establishes off-street parking and loading standards for different land use types in the city. Within that section, subsection (l) includes the following language regarding bicycle parking:

> *(l)* ***Applicability of bicycle parking space requirements****. All uses, except for single and two-family dwellings, hereafter established, reconstructed, expanded, changed in use shall provide bicycle parking spaces in accordance with the standards set forth in this chapter, unless otherwise stated in this chapter. The Central Business District (CBD) is exempt from the bicycle parking standards.*
>
> ***(1) Design requirements:***
>
> a. ***Surfacing****: Bicycle parking spaces shall be concrete, asphalt or other hard surface such as permeable pavers*
>
> b. ***Location****: Required bicycle parking spaces may be located indoors or outdoors and must be located on private property.*
>
> c. ***Rack/Locker/Support Design****:*
>
> i. *For each bicycle parking space required, a stationary rack(s) shall be provided which can accommodate bicyclists' locks securing the frame and/or wheels, or a lockable enclosure in which the bicycle is stored shall be provided.*
>
> ii. *All bicycle racks, lockers, or other facilities shall be securely anchored to the ground or a structure which must hold bicycles securely by means of the frame.*

Apart from this section, there is no other mention of the number of required bicycle parking spaces in the Appleton zoning code. This section should be amended and elaborated, so that it:

- Allows private developers or property owners to install racks in the public right of way if they have formal permission from the City
- Distinguishes short-term parking needs from long-term parking needs. For all residential land uses, at least 90% of required resident parking should be designed as long-term parking. Any guest parking shall be designed as short-term parking. For all other land uses, at least 90% of all bicycle parking shall be designed as short-term parking.
- Describes standards for long-term bicycle parking. Long-term bicycle parking spaces should be in enclosed and secured areas providing protection from theft, vandalism, and weather.
- Sets forth minimum bicycle parking spaces of 2 ½ by 6 feet in size, with minimum 5 foot access aisle.
- Establishes standards for the location of bicycle parking. Short-term bicycle parking spaces shall be in a convenient and visible area at least as close as the closest non-accessible automobile parking and within one hundred feet of a principal entrance.
- Allows developers to replace some automobile bicycle parking spaces with bicycle parking spaces.

The following subsection (m) of Section 23-172 of Appleton's Zoning Code establishes the minimum off-street automobile parking spaces required for each land use type. This table should be amended to include the minimum number of bicycle spaces required for each use. Table 3 provides recommended bicycle parking requirements for each land use type in the zoning code.

Table 3: Recommended bicycle parking requirements by zoning type

Existing Text in Appleton Zoning Code		Recommended Bicycle Parking Requirement
Use Type	**Minimum Off-street Parking Spaces Required**	**Minimum Bicycle Spaces**
Residential		
Adult family home	Up to three (3) bedrooms - Two (2) spaces for each dwelling unit. Four (4) or more bedrooms – Three (3) spaces for each dwelling unit.	1
Bed and breakfast establishment	Two (2) spaces for each dwelling unit plus one (1) space for each tourist	1 for every 2 bedrooms
Dwelling, multi-family	Up to two (2) bedrooms – One space for each dwelling unit. Three (3) or more bedrooms – Two (2) spaces for each dwelling unit. Visitor parking – One (1) space for every two (2) dwelling units.	1 long-term parking space for each unit up to 2-bedrooms, ½ space per additional bedroom; 1 short-term space for every 10 dwelling units
Dwelling, single-family detached	Up to three (3) bedrooms - Two (2) spaces for each dwelling unit Four (4) or more bedrooms – Three (3) spaces for each dwelling unit	Not required
Dwelling, two-family	Up to three (3) bedrooms – Two (2) spaces for each dwelling unit Four (4) or more bedrooms – Three (3) spaces for each dwelling unit	
Residential care apartment complex	Up to two (2) bedrooms – One (1) space for each dwelling unit Three (3) or more bedrooms – Two (2) spaces for each dwelling unit	1 for every 4 units
Use Type	**Minimum Off-street Parking Spaces Required**	**Minimum Bicycle Spaces**
Public/Institutional		
Assisted living facility, nursing, or convalescent home	One (1) space for every three (3) residents based on the maximum number of residents allowed by license.	1 for every 4 units + 1 for every 5 employees.
Auditoriums, stadium, gymnasium	One (1) space for every five (5) persons based on maximum capacity	1 for every 20 persons based on maximum capacity
Bus terminal	One (1) space for each five hundred (500) square feet of gross floor area or one (1) space for every five (5) seats; whichever is greater	1 for every five employees; 50% short-term, 50% long-term
Cemetery Chapel	One (1) space for every six (6) persons based on maximum capacity	Determined by Zoning Administrator
Club	One (1) space for every five (5) persons based on maximum capacity	1 for every 20 persons based on maximum capacity
Community-based residential facility or community living arrangement	One (1) space for every three (3) residents based on the maximum number of residents allowed by license.	1 long-term space for every dwelling unit plus 1 for every 3 rooms.
Dormitories	One (1) space for every six (6) occupants.	1 long-term space for every bedroom plus 1 short-term space for every 4 bedrooms.
Educational institution; business, technical or vocational	Classrooms – One (1) space for every three (3) seats based on maximum capacity Gymnasiums/auditoriums – One (1) space for every five (5) persons based on maximum capacity	1 space for every 5 students
Educational institution; college or university	Classrooms – One (1) space for every three (3) seats based on maximum capacity Gymnasiums/auditoriums – One (1) space for every five (5) persons based on maximum capacity	1 space for every classroom and 1 for every 5 students, except as established in Campus Master Plan.
Educational institution; elementary school or middle school	Classrooms – One (1) space for each classroom Gymnasiums/auditoriums – One (1) space for every five (5) persons based on maximum capacity	1 for every 5 students
Educational institution; high school	Classrooms – Three (3) spaces for each classroom Gymnasiums/auditoriums – One (1) space for every five (5) persons based on maximum capacity	1 for every 5 students
Golf course	Four (4) spaces for each hole Clubhouse – One (1) space for every four (4) persons based on maximum capacity.	1 for every 20 persons based on maximum capacity.
Governmental facility	Shall be provided at a ratio of same or similar uses listed in this chapter	Shall be provided at a ratio of same or similar uses listed in this

		chapter
Museum	One (1) space for each five hundred (500) square feet of gross floor area	1 for each 2,000 square feet floor area
Hospital	One (1) space for each bed plus one (1) space for each two hundred (200) square feet in any emergency room and/or outpatient area	1 for each 2,000 square feet floor area.
Place of worship	One (1) space for each eight (8) persons based on maximum capacity in the main place of assembly	1 for each 50 persons based on maximum capacity
Recreational facility, non-profit	One (1) space for each five (5) persons based on maximum capacity	1 for each 20 persons based on maximum capacity
Registered historic place	One (1) space for each four hundred (400) square feet of usable floor area open to the public	
Use Type	**Minimum Off-street Parking Spaces Required**	**Minimum Bicycle Spaces**
Commercial		
Amusement arcade	One (1) space for each five (5) persons based on maximum capacity	1 for each 20 persons based on maximum capacity.
Automobile maintenance shop	Four (4) spaces for each service bay.	1 for every 5 employees
Automobile, RV, truck, cycle, boat sales and display lot or rental lot	One (1) space for each four hundred (400) square feet of gross floor area under roof plus one (1) space for each two thousand (2,000) square feet of open sales lot area devoted to the sale and display of vehicles	
Body repair and/or paint shop	Four (4) spaces for each service bay	
Car wash	Drive-in – Six (6) stacking spaces for each washing bay Self-service – Three (3) stacking spaces for each washing bay	
Commercial entertainment, Indoor	One (1) space for each three (3) seats or one space for each two hundred (200) square feet of gross floor area whichever is greater	1 for every 20 persons based on maximum capacity.
Commercial entertainment, Outdoor	One (1) space for each three (3) seats or one space for each two hundred (200) square feet of outdoor entertainment area, whichever is greater	
Day care center, adult	One (1) space for each employee plus one (1) space for each five (5) persons based on maximum capacity	1 for every 5 employees
Day care center, group childcare	One (1) space for employee plus one (1) space for each five (5) children based on the maximum number of children allowed by license.	
Gasoline sales	Two (2) spaces located at each pump.	
Greenhouse/greenhouse nursery	One (1) space for every one thousand (1,000) gross square feet of sales area	
Hotel/motel	One (1) space for each sleeping room	1 for every 10 bedrooms
Kennel, indoor or outdoor	One (1) space for each employee plus one (1) space for ten (10) animals served	1 for every 5 employees
Marina	One (1) space for two (2) boat slips	Determined by Zoning Administrator
Microbrewery	One (1) space for each three (3) persons based on maximum capacity	1 for each 2,000 square feet of floor area
Office	One (1) space for each three hundred (300) square feet of gross floor area	
Personal service	One (1) space for each two hundred fifty (250) square feet of gross floor area	
Personal storage	One (1) space for every five (5) rental or leasable storage units	1 for every 10 employees
Printing	One (1) space for each two hundred fifty (250) square feet of gross floor area	1 for each 2,000 square feet of floor area
Professional service	One (1) space for each two hundred fifty (250) square feet of gross floor area	
Recycling and waste recovery center	One (1) space for each five hundred (500) square feet of gross floor area	1 for every 10 employees
Restaurant	One (1) space for each three (3) persons allowed based on maximum capacity	1 for each 2,000 square feet of floor area or 1 for each 20 persons based on maximum capacity.
Restaurant, fast food	One (1) space for each two (2) persons allowed based on maximum capacity	
Retail business	One (1) space for each two hundred fifty (250) square feet of gross	1 for each 2,000 square feet of

	floor area	floor area
Sexually-oriented establishment	One (1) space for each three (3) persons based on maximum capacity	1 for every 20 persons based on maximum capacity
Shopping center	Under 100,000 square feet of gross floor area – One (1) space for each two hundred fifty (250) square feet of gross floor area 100,000 square feet to under 250,000 square feet of gross floor area – One (1) space for each three hundred (300) square feet of gross floor area Over 250,000 square feet of gross floor area – One (1) space for each four hundred (400) square feet of gross floor area	1 for each 2,000 square feet of floor area
Tavern	One (1) space for each three (3) persons allowed based on maximum capacity	1 for each 2,000 square feet of floor area or 1 for each 20 persons based on maximum capacity.
Towing business	One (1) space for each employee plus sufficient space for vehicles towed	1 for every 5 employees
Veterinarian clinic	One (1) space for each examination room plus one (1) space for each two hundred (200) square feet of gross floor area	
Wholesale facility	One (1) space for each one thousand (1,000) square feet of gross floor area	
Use Type	**Minimum Off-street Parking Spaces Required**	**Minimum Bicycle Spaces**
Industrial		
Asphalt plant	One (1) space for each employee on the largest shift	1 for every 10 employees on largest shift
Bulk flammable or combustible liquid storage or distribution facility	One (1) space for each employee on the largest shift	
Concrete mixing	One (1) space for each employee on the largest shift	
Freight distribution or moving center	One (1) space for each one thousand (1,000) square feet of gross floor area	
Manufacturing; custom, light or heavy	One (1) space for each one (1) employee on the largest shift, plus three (3) visitors spaces, plus space to accommodate all company vehicles in connection therewith	
Research laboratory or testing facility	One (1) space for each five hundred (500) feet of gross floor area	1 for every 5 employees
Salvage yard or junk facility	One (1) space for each employee on the largest shift plus space to accommodate all company vehicles in connection therewith	1 for every 10 employees on largest shift
Warehouse (storage or distribution)	One (1) space for each employee on the largest shift plus three (3) visitor spaces plus space to accommodate all company vehicles in connection therewith	

Appendix S

Appleton Street Cost Estimate

Downtown Appleton Mobility Study
Preliminary Cost Estimate

Location: Appleton St: Prospect Ave - Washington St
Alt. No. Two-Way Appleton St.

WisDOT - Average Unit Price List
Fiscal Year 2015

ITEM	DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	COST
1	REMOVALS				
	REMOVING PAVEMENT	SY	$3.50	2,718	$10,000
	REMOVING CURB & GUTTER	LF	$3.50	1,464	$5,000
	REMOVING SIDEWALK	SY	$5.00	901	$5,000
	REMOVING CONC SURFACE PARTIAL DEPTH	SF	$0.50	32,109	$16,000
2	NEW PAVEMENT				
	CONCRETE PAVEMENT (10-INCH)	SY	$50.00	2,779	$139,000
	ASPHALTIC SURFACE (2-INCH)	SY	$12.00	3,819	$46,000
	BASE AGGREGATE (6-INCH)	CY	$25.00	616	$15,000
	BREAKER RUN (12-INCH)	CY	$30.00	926	$28,000
3	EARTHWORK				
	EXCAVATION	CY	$6.00	8,337	$50,000
	SUBGRADE IMPROVEMENTS	LS	-	5 % of Items 1-2	$13,000
4	CURB AND GUTTER				
	CURB AND GUTTER 2.5 FT	LF	$14.00	1,433	$20,000
5	SIDEWALK (6 inch)	SF	$4.50	6,968	$31,000
6	EROSION CONTROL	LS	-	3 % of Items 1-5	$11,000
7	TRAFFIC CONTROL	MI	$550,000.00	0.27	$149,000
8	SIGNING AND PAVEMENT MARKING	LS	-	4 % of Items 1-5	$15,000
9	SIGNALS	EACH	$150,000.00	2	$300,000
10	MODIFICATIONS TO LIGHTING SYSTEM	LS	-	1	$200,000
11	MOBILIZATION AND FIELD OFFICE	LS	-	5 % of Items 1-10	$53,000
12	ROADWAY INCIDENTALS	LS	-	15 % of Items 1-11	$166,000
	TOTAL ROADWAY COSTS (ITEMS 1-12)				$1,272,000
13	STRUCTURES				
	REMOVING BRIDGE	LS	-	1	$200,000
	PRESTRESSED GIRDER BRIDGE	SF	$140.00	10,912	$1,527,700
	TOTAL STRUCTURE COSTS (ITEM 13)				$1,727,700
14	CONSTRUCTION CONTINGENCY	LS	-	10 % of Items 1-13	$300,000
15	CONSTRUCTION ENGINEERING	LS	-	7 % of Items 1-13	$210,000
16	UTILITIES	LS	-	7 % of Items 1-5	$26,000
	TOTAL CONSTRUCTION COSTS (ITEMS 1-16)				**$3,535,700**
17	DESIGN ENGINEERING	LS	-	15 % of Items 1-13	$450,000
	TOTAL DESIGN ENGINEERING COST (ITEM 17)				**$450,000**
	TOTAL ALTERNATIVE COST				**$3,985,700**

NOTES:

1) Estimate is for the area indicated on the attached Exhibit 1 on Appleton St. between Prospect Ave. and Washington St.
2) Unit price information was gathered from WisDOT - Average Unit Price List for FY 15.
3) 100 ft. of reconstruction on Lawrence St. east and west of Appleton St. is included in this estimate.
4) There are unknown utilities located on the existing Oneida St. bridge over Jones Park. To account for the cost to relocate these utilities, the utility cost (Item 16) was increased from 5% to 7%.
5) The new NB Appleton St. bridge over Jones Park is assumed to be 44' wide and 248' long. It is assumed to be similar in length and type to the existing SB bridge.
6) Estimate does not include right-of-way. It is assumed that any right-of-way required is already city owned.
7) The Lawrence St. / Oneida St. intersection will need to be reconstructed when the south leg of Oneida St. is removed.

Downtown Appleton Mobility Study
Preliminary Cost Estimate

Location: Appleton St: Prospect Ave - Washington St
Alt. No. Two-Way Appleton St.

State Project - 4984-08-71
City of Appleton, Lawe St. (12/2015)

ITEM	DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	COST
1	REMOVALS				
	REMOVING PAVEMENT	SY	$5.00	2,718	$14,000
	REMOVING CURB & GUTTER	LF	$5.00	1,464	$7,000
	REMOVING SIDEWALK	SY	$5.40	901	$5,000
	REMOVING CONC SURFACE PARTIAL DEPTH	SF	$0.50	32,109	$16,000
2	NEW PAVEMENT				
	CONCRETE PAVEMENT (10-INCH)	SY	$50.00	2,779	$139,000
	ASPHALTIC SURFACE (2-INCH)	SY	$12.00	3,819	$46,000
	BASE AGGREGATE (6-INCH)	CY	$25.00	616	$15,000
	BREAKER RUN (12-INCH)	CY	$30.00	926	$28,000
3	EARTHWORK				
	EXCAVATION	CY	$28.00	8,337	$233,000
	SUBGRADE IMPROVEMENTS	LS	-	5 % of Items 1-2	$14,000
4	CURB AND GUTTER				
	CURB AND GUTTER 2.5 FT	LF	$25.00	1,433	$36,000
5	SIDEWALK (6 inch)	SF	$4.50	6,968	$31,000
6	EROSION CONTROL	LS	-	3 % of Items 1-5	$18,000
7	TRAFFIC CONTROL	MI	$550,000.00	0.27	$149,000
8	SIGNING AND PAVEMENT MARKING	LS	-	4 % of Items 1-5	$23,000
9	SIGNALS	EACH	$150,000.00	2	$300,000
10	MODIFICATIONS TO LIGHTING SYSTEM	LS	-	1	$200,000
11	MOBILIZATION AND FIELD OFFICE	LS	-	5 % of Items 1-10	$64,000
12	ROADWAY INCIDENTALS	LS	-	15 % of Items 1-11	$201,000
	TOTAL ROADWAY COSTS (ITEMS 1-12)				$1,539,000
13	STRUCTURES				
	REMOVING BRIDGE	LS	-	1	$200,000
	PRESTRESSED GIRDER BRIDGE	SF	$140.00	10,912	$1,527,700
	TOTAL STRUCTURE COSTS (ITEM 13)				$1,727,700
14	CONSTRUCTION CONTINGENCY	LS	-	10 % of Items 1-13	$327,000
15	CONSTRUCTION ENGINEERING	LS	-	7 % of Items 1-13	$229,000
16	UTILITIES	LS	-	7 % of Items 1-5	$41,000
	TOTAL CONSTRUCTION COSTS (ITEMS 1-16)				**$3,863,700**
17	DESIGN ENGINEERING	LS	-	15 % of Items 1-13	$490,000
	TOTAL DESIGN ENGINEERING COST (ITEM 17)				**$490,000**
	TOTAL ALTERNATIVE COST				**$4,353,700**

NOTES:

1) Estimate is for the area indicated on the attached Exhibit 1 on Appleton St. between Prospect Ave. and Washington St.
2) Unit price information was gathered from WisDOT - Average Unit Price List for FY 15 and from bids received for State Project 4984-08-71 (City of Appleton, Lawe St). Items grey shaded were updated to unit prices gathered from bids received for State Project 4984-08-71.
3) 100 ft. of reconstruction on Lawrence St. east and west of Appleton St. is included in this estimate.
4) There are unknown utilities located on the existing Oneida St. bridge over Jones Park. To account for the cost to relocate these utilities, the utility cost (Item 16) was increased from 5% to 7%.
5) The new NB Appleton St. bridge over Jones Park is assumed to be 44' wide and 248' long. It is assumed to be similar in length and type to the existing SB bridge.
6) Estimate does not include right-of-way. It is assumed that any right-of-way required is already city owned.
7) The Lawrence St. / Oneida St. intersection will need to be reconstructed when the south leg of Oneida St. is removed.

Downtown Appleton Mobility Study
Preliminary Cost Estimate

Location: Appleton St: Prospect Ave - Washington St
Alt. No. Two-Way Appleton St.

State Project - 4984-09-71
City of Appleton, Prospect Ave. (2/2015)

ITEM	DESCRIPTION	UNIT	UNIT PRICE	QUANTITY	COST
1	REMOVALS				
	REMOVING PAVEMENT	SY	$1.00	2,718	$3,000
	REMOVING CURB & GUTTER	LF	$2.00	1,464	$3,000
	REMOVING SIDEWALK	SY	$5.40	901	$5,000
	REMOVING CONC SURFACE PARTIAL DEPTH	SF	$0.50	32,109	$16,000
2	NEW PAVEMENT				
	CONCRETE PAVEMENT (10-INCH)	SY	$50.00	2,779	$139,000
	ASPHALTIC SURFACE (2-INCH)	SY	$12.00	3,819	$46,000
	BASE AGGREGATE (6-INCH)	CY	$25.00	616	$15,000
	BREAKER RUN (12-INCH)	CY	$30.00	926	$28,000
3	EARTHWORK				
	EXCAVATION	CY	$16.60	8,337	$138,000
	SUBGRADE IMPROVEMENTS	LS	-	5 % of Items 1-2	$13,000
4	CURB AND GUTTER				
	CURB AND GUTTER 2.5 FT	LF	$22.00	1,433	$32,000
5	SIDEWALK (6 inch)	SF	$4.50	6,968	$31,000
6	EROSION CONTROL	LS	-	3 % of Items 1-5	$14,000
7	TRAFFIC CONTROL	MI	$550,000.00	0.27	$149,000
8	SIGNING AND PAVEMENT MARKING	LS	-	4 % of Items 1-5	$19,000
9	SIGNALS	EACH	$150,000.00	2	$300,000
10	MODIFICATIONS TO LIGHTING SYSTEM	LS	-	1	$200,000
11	MOBILIZATION AND FIELD OFFICE	LS	-	5 % of Items 1-10	$58,000
12	ROADWAY INCIDENTALS	LS	-	15 % of Items 1-11	$181,000
			TOTAL ROADWAY COSTS (ITEMS 1-12)		$1,390,000
13	STRUCTURES				
	REMOVING BRIDGE	LS	-	1	$200,000
	PRESTRESSED GIRDER BRIDGE	SF	$140.00	10,912	$1,527,700
			TOTAL STRUCTURE COSTS (ITEM 13)		$1,727,700
14	CONSTRUCTION CONTINGENCY	LS	-	10 % of Items 1-13	$312,000
15	CONSTRUCTION ENGINEERING	LS	-	7 % of Items 1-13	$218,000
16	UTILITIES	LS	-	7 % of Items 1-5	$33,000
			TOTAL CONSTRUCTION COSTS (ITEMS 1-16)		**$3,680,700**
17	DESIGN ENGINEERING	LS	-	15 % of Items 1-13	$468,000
			TOTAL DESIGN ENGINEERING COST (ITEM 17)		**$468,000**
			TOTAL ALTERNATIVE COST		**$4,148,700**

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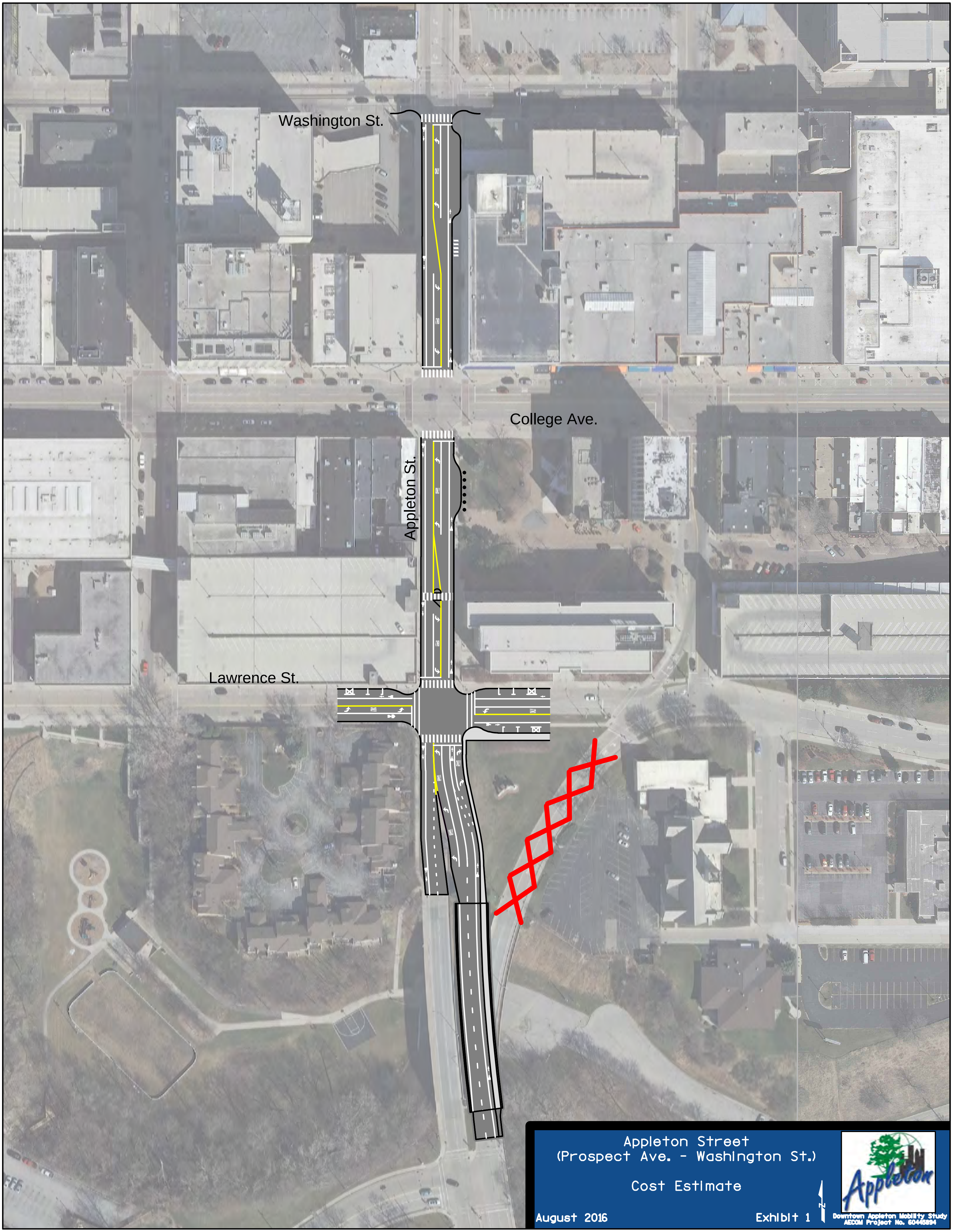
3) 100 ft. of reconstruction on Lawrence St. east and west of Appleton St. is included in this estimate.
4) There are unknown utilities located on the existing Oneida St. bridge over Jones Park. To account for the cost to relocate these utilities, the utility cost (Item 16) was increased from 5% to 7%.
5) The new NB Appleton St. bridge over Jones Park is assumed to be 44' wide and 248' long. It is assumed to be similar in length and type to the existing SB bridge.
6) Estimate does not include right-of-way. It is assumed that any right-of-way required is already city owned.
7) The Lawrence St. / Oneida St. intersection will need to be reconstructed when the south leg of Oneida St. is removed.



Washington St.
College Ave.
Appleton St.
Lawrence St.
Appleton Street
(Prospect Ave. - Washington St.)
Cost Estimate
August 2016
Exhibit 1
N
Appleton
Downtown Appleton Mobility Study
AECOM Project No. 60445894