

Traffic Signal Optimization Project Phase III

Coordinated Intersections

Onondaga County Department of Transportation

CHA Project Number: 27137



Prepared for:



*Syracuse Metropolitan
Transportation Council
126 North Salina Street
100 Clinton Square, Suite 100
Syracuse, New York 13202*

Prepared by:



*441 South Salina Street
Syracuse, New York 13202
(315) 471-3569*

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CHA, Inc
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For Further Information Contact:

Aaron McKeon, Project Manager
Syracuse Metropolitan Transportation Council
126 North Salina Street, 100 Clinton Square, Suite 100
Syracuse, NY 13202
Phone: (315) 422-5716; Fax: (315) 422-7753
www.smtcmpo.org

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CHAPTER I

OVERVIEW

Traffic signals affect the lives of Onondaga County citizens every day. Every signalized intersection in Onondaga County addresses a wide variety of needs. The signal must be effective and functional for a wide variety of users that include pedestrians, automobiles, bicyclists, transit, and large trucks. Signalized intersections provide for the organized control of conflicting traffic movements in a safe manner; however these intersections can be a source of frustration for motorists due to delays. As Onondaga County continues to develop, travel patterns have changed over the years, leading to outdated traffic signal timings that account for a significant amount of delay on roadways throughout the county. By updating signal timings and installing new technology, benefits can be achieved at a relatively low cost. Updated signal timings and equipment have the potential to reduce vehicular delay and thereby improve air quality through reduced emissions and less time spent idling at an intersection. The Onondaga County Department of Transportation desires to implement coordinated signal systems in for corridors to move traffic more efficiently in areas where there are closely spaced signalized intersections. Traffic signal coordination is a tool to provide the ability to synchronize multiple intersections to enhance the operation of one or more directional movements in a system.

This report summarizes the results of the studies conducted at various Onondaga County Department of Transportation (OCDOT) controlled intersections throughout Onondaga County.

A. Study Area

The Onondaga County Department of Transportation Traffic Signal Optimization Project – Phase III includes the following intersections that are within corridors that were evaluated for coordination:

- Buckley Road Corridor
 - Bailey Road
 - Hopkins Road
- Henry Clay Boulevard Corridor
 - Buckley Road
 - Wetzel Road
- West Genesee Street Corridor
 - Whedon Road
 - Beverly Drive
 - Gillespie Avenue
- Taft Road Corridor
 - Kreischer Drive
 - Interstate 81 Northbound Ramps
 - Interstate 81 Southbound Ramps
 - Post Office/John Street
 - South Bay Road
 - US Route 11
 - School Driveway
 - US Route 11 at Shopping Center

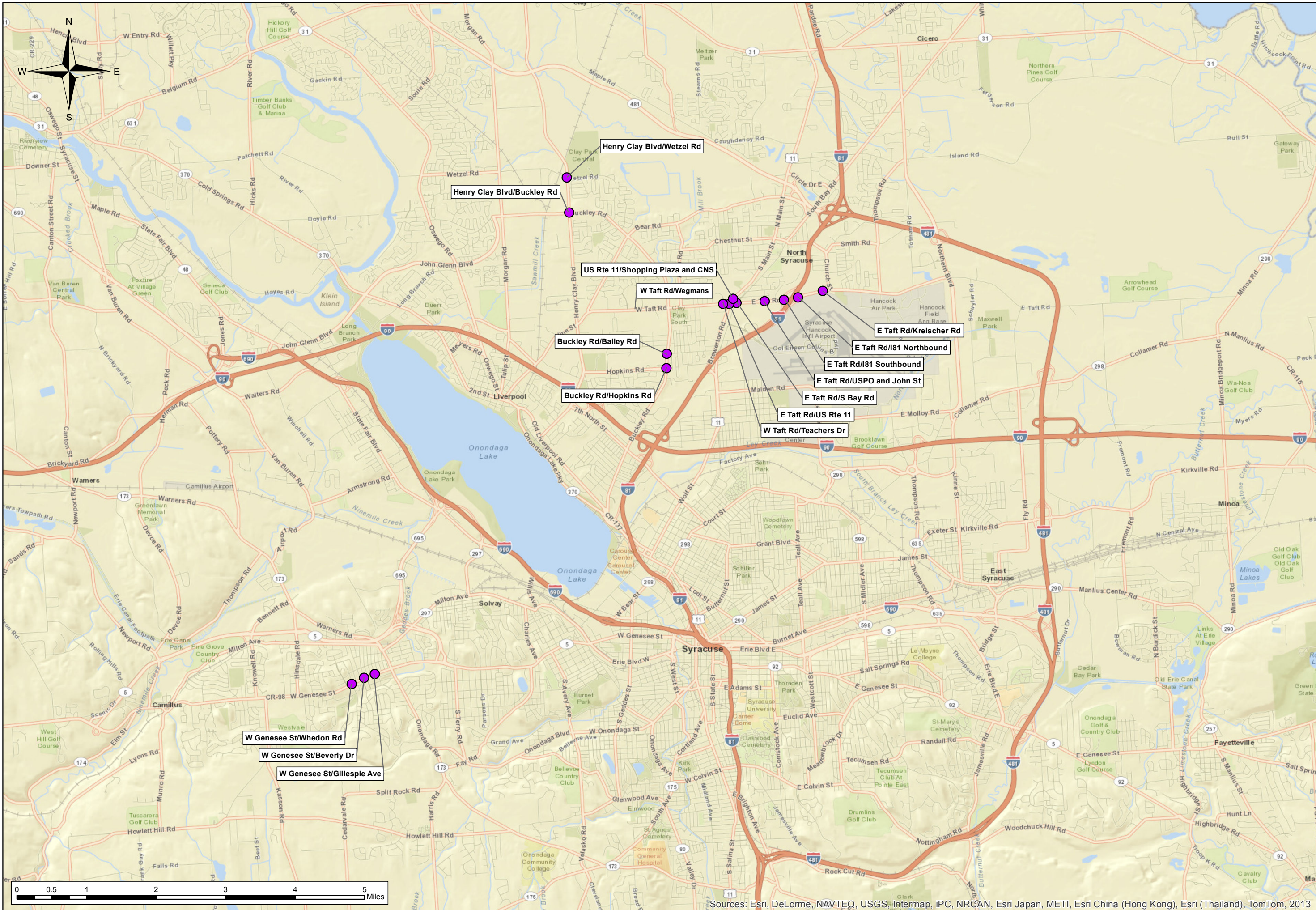
These intersections are illustrated in Figure 1.

B. Project Purpose

Traffic signal optimization and coordination is a cost effective way to improve the flow of traffic along a corridor. At signalized intersections it is important for the signal timing plans to match existing traffic patterns within the corridor. The coordination and optimizing of traffic signals is a way to maximize the capacity of the intersections within the corridor without having to perform costly infrastructure improvements. Benefits from signal coordination and optimization include:

- Reduction in travel time and delays
- Reduction in stops and traffic slow downs could reduce accident potential
- Reduction in fuel consumption (i.e., less idling time) and vehicle emissions
- Potential to delay/eliminate the need for intersection widening
- Reduced driver frustration by having to stop at numerous closely spaced signalized intersection

This project is part of an overall goal of the Onondaga County Department of Transportation to evaluate the operation of all of its traffic signals. This project is the third phase of a multi-phase project.



Project Location Map - Coordinated Intersections
Onondaga County Department of Transportation
Traffic Signal Optimization - Phase III

FIGURE 1

Chapter II

COORDINATED INTERSECTION ANALYSIS

To meet the project purpose, an evaluation of existing conditions was completed and new signal timing and coordination plans were developed. In order to develop new timing plans for each intersection with the two corridors under study, traffic count data, existing signal timing data, and intersection geometry were provided by the Syracuse Metropolitan Transportation Council (SMTC) and OCDOT. The intersections were analyzed using the traffic analysis software SYNCHRO 7 using the information provided by the SMTC and OCDOT. The existing operations were documented so that a comparison could be made to future proposed changes. The study area intersections within each corridor were then evaluated using different signal timing and coordination parameters, signal phasing sequences and detection types to improve the overall performance of the individual intersections.

A. Methodology

Traffic data, including peak hour turning movement volumes, traffic signal timing and phasing data, intersection geometric data and photographs were provided to CHA in order to develop SYNCHRO models for the existing conditions at the four corridors that are included within this study. These models were used to determine existing weekday AM and PM peak hour levels of service (LOS) for all the study intersections. For the Buckley Road corridor, the School peak hour was also analyzed and for the West Genesee Street corridor, the Saturday peak hour was also analyzed. The intersections within each corridor were then optimized using different cycle lengths, offsets and signal timing parameters. The existing levels of service were used for comparison purposes to establish the benefits of coordinating and optimizing the operation of the intersection.

Prior to developing the new signal timing plans, it was important to understand and validate the existing conditions at each intersection. By using the data that was provided and knowledge of the existing conditions observed in the field, a model of each corridor was built for each peak period using SYNCHRO.

The existing conditions of the signals along each corridor were analyzed in a manner consistent with the Highway Capacity Manual 2000 methodologies. CHA performed an operational analysis for each isolated intersections within the corridor to establish baseline operations. The capacity analyses were consistent with the Highway Capacity Manual 2000 methodology when comparing improvement options. Existing and proposed signal phasing and sequencing were analyzed as well as identifying other possible operational improvements, such as pavement marking changes, signal control equipment additions and/or upgrades, etc. Consideration was given to compliance issues with the FHWA Manual on Uniform Traffic Control Devices (MUTCD). In discussions with OCDOT staff, it was determined that the development of optimized signal plans should be accomplished with a minimal amount of infrastructure investment (new signal heads, controllers, detection, etc). Consequently, where possible, all existing signal equipment was maintained and only as a last resort was new signal equipment proposed.

Minimum green times and yellow and all red clearance intervals were reviewed for each intersection to determine if these intervals are within industry standards. Onondaga County Department of Transportation signal timing standards were utilized to evaluate minimum green times and clearance intervals. Minimum green times are based upon the FHWA classification of the roadways at each intersection. The yellow and all red clearance times are based on the approach speeds of the intersecting

roadways and the widths of the intersections. Minimum green times were determined using the OCDOT signal timing standards for actuated phases and using the proposed optimized Synchro timings times 1.25 for not actuated phases. Maximum green times are based upon OCDOT signal timing standards for actuated phases or by taking the optimized Synchro maximum green times and multiplying them by 1.5. This value is then compared to the actuated green time for each type of roadways as shown in the OCDOT traffic signal timing standards, and whichever number is greater, that was used as the maximum green time for that phase.

Passage times were determined by using the existing speed limits on the intersecting roadways and estimating the length of the detection zones shown in the intersection plans that were provided to CHA. Where plans were not available, OCDOT provided additional information, or detection zones were assumed based on detector layouts at similar intersections.

New timing and coordination plans were then developed for each intersection within the corridor using the data previously collected and the results of the existing conditions analysis. Two timing plans were developed for each corridor — an AM and PM peak hour plan. For the Buckley Road, an additional timing plan was developed for the School peak hour and for the West Genesee Street corridor, an additional timing plan was developed for the Saturday peak hour. The development of these timing and coordination plans began with an evaluation of each intersection. A review of yellow and all red clearances was performed to determine if existing clearance intervals were within the OCDOT standards and initial green times, maximum green times and vehicle extension intervals were also reviewed. Finally, the most efficient cycle lengths and offsets were determined for each intersection within the corridor under study. This was accomplished by the use of SYNCHRO network cycle length and network offset evaluations, knowledge gained from field observations, and professional judgment. After the cycle lengths were determined, the optimal phase split times were established. This data was entered into the SYNCHRO models and then the phase sequences were evaluated to determine the optimal level of service, thus reducing vehicle stops and delay. All of this was performed while attempting to remain within the signal timing parameters of the OCDOT signal timing standards.

The final component to the timing plans was to prepare coding sheets for each intersection. CHA transferred the proposed timing plans from the SYNCHRO model into a format compatible with OCDOT's traffic signal timing program (Microsoft Excel spreadsheets).

B. Buckley Road Corridor

This corridor includes the following two signalized intersections with Buckley Road:

- Bailey Road
- Hopkins Road

1. Bailey Road

This is a three-legged intersection which operates as a semi-actuated, three-phase signal and an exclusive pedestrian phase with presence detection on the Bailey Road approach, the Buckley Road southbound left turn and northbound right turn movements. There is a pedestrian crossing of the northbound leg of the intersection with pedestrian signals. Maximum recall is set for the Buckley Road through phases. The signal currently operates on a maximum 101 second cycle for the entire day. The geometry of the intersection is as follows:

- Buckley Road Northbound – Exclusive through and right turn lanes
- Buckley Road Southbound – Exclusive through and left turn lanes
- Bailey Road Westbound – Exclusive left and right turn lanes

The posted speed limit on Buckley Road is 25 mph and 30 mph on Bailey Road. Table II.B.1 presents the results of the level of service for the existing and proposed conditions.

Table II.B.1
Buckley Road at Bailey Road

Intersection	AM		PM		School Peak	
	Existing	Proposed	Existing	Proposed	Existing	Proposed
Buckley Rd/Bailey Rd						
WB L	C(28.9)	D(39.1)	C(31.1)	C(33.6)	C(26.8)	E(60.7)
R	D(46.3)	C(25.5)	D(35.6)	C(24.4)	E(59.5)	C(28.2)
NB T	C(25.6)	A(5.2)	C(31.3)	C(24.9)	C(27.6)	B(10.7)
R	C(21.2)	A(2.4)	B(19.8)	A(7.7)	B(18.8)	A(4.8)
SB L	B(16.7)	A(5.4)	B(15.3)	A(8.9)	B(12.2)	A(5.7)
SB T	A(7.6)	A(3.6)	A(6.4)	A(4.5)	A(8.0)	A(3.4)
Overall	C(22.5)	B(10.7)	C(26.3)	B(18.4)	C(26.7)	B(15.7)

XX(XX) – LOS(delay)

Recommended improvements to the signal timing include the following:

- Change phasing to allow for a lead southbound left turn phase.
- Set minimum green time to 5 seconds for southbound left turn phase
- Change minimum green time to 7 seconds for Bailey Road phase
- Change yellow clearance interval to 3 seconds for all phases.
- Change the red clearance interval from 2 seconds to 3 seconds for the Buckley Road through phases.
- Set the Buckley Road through phases to minimum recall.
- Change the minimum gap and passage time on the Buckley Road phases to 1.1 seconds and 1.4 seconds for the Bailey Road phase. This passage time is based on the prevailing speed limits and the length of the detection zones.
- The coordinated movements are the Buckley Road northbound and southbound through movements.
- Set the cycle length to 65 seconds for the AM peak hour with an offset of 31 seconds. Change the cycle length to 75 seconds with an offset of 28 seconds for the PM peak hour. Change the cycle length to 85 seconds with an offset of 24 seconds for the School peak hour.

2. Hopkins Road

This is a three-legged intersection which operates as a semi-actuated, two phase signal presence detection on the Hopkins Road movements. Maximum recall is set for the Buckley Road northbound and southbound movements. There are no pedestrian accommodations at the intersection. The signal currently operates on a maximum 55 second cycle length with similar timings for each of the peak hours. The geometry of the intersection is as follows:

- Buckley Road Northbound – shared through/left turn lane
- Buckley Road Southbound – shared through/right turn lane
- Hopkins Road Eastbound – exclusive left and right turn lanes

The posted speed limit on both roads is 35 mph. Table II.B.2 presents the results of the level of service for the existing and proposed conditions.

Table II.B.2
Buckley Road at Hopkins Road

Intersection	AM		PM		Early Evening	
	Existing	Proposed	Existing	Proposed	Existing	Proposed
Buckley Rd/Hopkins Rd						
EB L	B(16.2)	C(26.2)	B(15.7)	C(33.0)	B(18.3)	D(35.3)
R	B(14.3)	C(22.1)	B(13.7)	C(27.9)	B(16.2)	C(31.9)
NB L/T	A(7.1)	A(5.5)	B(19.6)	A(8.5)	A(6.4)	A(4.8)
SB T/R	A(9.5)	A(5.2)	A(6.7)	A(2.5)	A(5.5)	A(2.7)
Overall	B(10.9)	B(11.7)	B(14.3)	B(10.3)	A(8.2)	A(9.6)

XX(XX) – LOS(delay)

Recommended improvements to the signal timing include the following:

- Change the minimum green to 30 seconds for Buckley Road and 10 seconds for Hopkins Road.
- Change all red clearance interval from 2.0 seconds for all phases to 2.5 seconds for Buckley Road and 1.0 seconds for Hopkins Road
- Change the minimum gap and passage time from 3.0 seconds to 2.2 seconds for the Hopkins Road phase.
- The coordinated phase is the Buckley Road northbound and southbound through phase.
- Change the cycle length to 65 seconds for AM with an offset of 0 seconds, 75 seconds for the PM peak hour with an offset of 0 and 85 seconds with an offset of 9 for the Saturday peak hour.

C. Henry Clay Boulevard

This corridor includes the following two signalized intersections with Henry Clay Boulevard:

- Buckley Road
- Wetzel Road

1. Buckley Road

This is a four-legged intersection which operates as a fully-actuated, four phase signal with presence detection on all movements. There are crosswalks across all approaches with pedestrian signals. There is no recall. The signal currently operates on a 104 second cycle during both peak hours with similar timings for each of the peak hours. The geometry of the intersection is as follows:

- Buckley Road Eastbound – exclusive left turn lane, two exclusive through lanes and an exclusive right turn lane
- Buckley Road Westbound – exclusive left turn lane, exclusive through lane and a shared through/right turn lane

- Henry Clay Boulevard Northbound – two exclusive left turn lanes, exclusive through lane and a shared through/right turn lane
- Henry Clay Boulevard Southbound – exclusive left turn lane, exclusive through lane and a shared through/right turn lane

The posted speed limit on all approaches is 45 mph with the exception of Buckley Road westbound which is 35 mph. Table II.C.1 presents the results of the level of service for the existing and proposed conditions.

Table II.C.1
Henry Clay Boulevard at Buckley Road

Intersection	AM		PM	
	Existing	Proposed	Existing	Proposed
Henry Clay Blvd/Buckley Rd				
EB L	D(41.9)	D(51.0)	D(39.6)	D(42.3)
T	C(31.9)	D(45.1)	C(27.6)	C(33.8)
R	C(26.5)	D(46.6)	B(14.3)	B(13.3)
WB L	D(40.2)	D(43.7)	D(41.4)	D(53.9)
T/R	C(27.0)	C(33.2)	C(31.5)	D(45.3)
NB L	D(35.4)	D(40.0)	D(38.4)	C(33.7)
TR	B(18.6)	B(19.0)	C(24.7)	C(23.3)
SB L	D(42.2)	C(28.8)	D(41.1)	D(43.8)
T/R	C(29.3)	B(17.0)	C(28.8)	C(29.3)
Overall	C(29.3)	C(32.9)	C(29.3)	C(31.6)

XX(XX) – LOS(delay)

Recommended improvements to the signal timing include the following:

- Change the minimum green to 7 seconds for the Henry Clay Boulevard left turn phase and all through movement phases to 15 seconds.
- Change the yellow clearance time from 4.5 seconds to 3.0 seconds for all through movement phases.
- Change the all red clearance time to 2.0 seconds for the Henry Clay Boulevard left turn phases, 2.5 seconds for the Henry Clay Boulevard through and Buckley Road left turn phases and 3.0 seconds for the Buckley Road through phases..
- Change the minimum gap and passage time to 1.2 seconds for Buckley Road westbound left turn phase, 1.4 seconds for the Buckley Road westbound through phase, 1.6 seconds for the Henry Clay Boulevard southbound left turn and Buckley Road eastbound left turn phases, and 1.7 seconds for all other phases. This passage time is based on the prevailing speed limits and the length of the detection zones.
- The coordinated phase is the Henry Clay Boulevard northbound and southbound through phases.
- Change the cycle length to 105 seconds with an offset of 6 seconds for the AM peak hour and 105 seconds for the PM peak hour with an offset of 68 seconds.

2. Wetzel Road

This is a four-legged intersection which operates as a fully-actuated, three phase traffic signal with presence detection on all movements. There are crosswalks across all approaches, with the exception of the Wetzel Road eastbound approach, with pedestrian signals. Minimum recall is set for the Henry Clay Boulevard northbound and southbound through movement phases. The signal currently operates on a maximum 125 second cycle during the AM peak hour and a 117 second cycle during the PM peak hour with different timings for each of the peak hours. The geometry of the intersection is as follows:

- Wetzel Road Eastbound – exclusive left turn lane and a share through/right turn lane
- Wetzel Road Westbound – exclusive left turn lane and a share through/right turn lane
- Henry Clay Boulevard Northbound – exclusive left turn lane, exclusive through lane and a shared through/right turn lane
- Henry Clay Boulevard Southbound – exclusive left turn lane, exclusive through lane and a shared through/right turn lane

The posted speed limit on Henry Clay Boulevard is 45 mph and 35 mph on Wetzel Road. Table II.C.2 presents the results of the level of service for the existing and proposed conditions.

Table II.C.2
Henry Clay Boulevard at Wetzel Road

Intersection	AM		PM	
	Existing	Proposed	Existing	Proposed
Henry Clay Blvd/Wetzel Rd				
EB L	C(20.4)	D(36.2)	B(18.8)	C(25.6)
TR	C(25.6)	D(47.4)	C(24.3)	C(30.1)
WB L	B(18.4)	C(34.2)	B(19.4)	C(25.3)
T/R	C(23.2)	D(39.9)	D(37.4)	D(45.6)
NB L	D(37.1)	D(34.3)	D(38.8)	C(30.4)
T/R	B(18.2)	A(8.3)	C(32.1)	B(14.8)
SB L	C(33.1)	D(44.5)	D(38.6)	D(39.5)
T/R	B(19.5)	B(14.1)	C(28.1)	C(27.6)
Overall	C(22.4)	C(25.5)	C(32.3)	C(29.1)

XX(XX) – LOS(delay)

Recommended improvements to the signal timing include the following:

- Change the minimum green to 5 seconds for all left turn phases and 15 seconds for the through phases.
- Change the yellow clearance time to 3.0 seconds for all phases.
- Change the all red clearance time from 2.0 seconds to 3.0 seconds for the Buckley Road though phases.
- Change the passage time to 1.3 seconds for Buckley Road left turn phases, 1.4 seconds for the Buckley Road through phases, 1.5 seconds for Henry Clay Boulevard left turn phases and 1.7 seconds for the Henry Clay Boulevard through phases. This passage time is based on the prevailing speed limits and the length of the detection zones.
- The coordinated phase is the Henry Clay Boulevard northbound and southbound through phase.

- Change the cycle length to 105 seconds with an offset of 0 for the AM and PM peak hours.

D. West Genesee Street Corridor

This corridor includes the following three signalized intersections with West Genesee Street:

- Gillespie Avenue
- Beverly Drive/Mackay Avenue
- Whedon Road

1. Gillespie Avenue

This is currently a four-legged intersection that operates as a fully actuated, two phase traffic signal with presence detection on all approaches. There are pedestrian accommodations on all approaches with the exception of West Genesee Street eastbound. The signal currently operates on a 67 second cycle during the AM, PM and Saturday peak hours with similar timings for each of the peak hours. The geometry of the intersection is as follows:

- West Genesee Street Eastbound – shared through/left turn lane and a shared through/right turn lane
- West Genesee Street Westbound – shared through/left turn lane and a shared through/right turn lane
- Gillespie Avenue Northbound – single lane from which all movements are made
- Gillespie Avenue Southbound – single lane from which all movements are made.

The posted speed limit on West Genesee Street is 35 mph and 30 mph on Gillespie Avenue. Table II.D.1 presents the results of the level of service for the existing and proposed conditions.

Table II.D.1
West Genesee Street at Gillespie Avenue

Intersection	AM		PM		Saturday	
	Existing	Proposed	Existing	Proposed	Existing	Proposed
West Genesee St/Gillespie Ave						
EB L/T/R	A(5.0)	A(1.0)	A(5.2)	A(1.4)	A(5.2)	A(0.7)
WB L/T/R	A(4.9)	A(2.3)	A(5.9)	A(3.5)	A(5.2)	A(2.7)
NB L/T/R	B(12.5)	C(32.6)	B(17.0)	C(31.5)	B(16.8)	D(35.4)
SB L/T/R	B(12.2)	C(32.2)	B(18.4)	C(34.6)	B(17.0)	D(35.6)
Overall	A(5.7)	A(4.6)	A(7.0)	A(6.0)	A(6.1)	A(4.3)

XX(XX) – LOS(delay)

Recommended improvements to the signal timing include the following:

- Change the minimum green to 7 seconds for the Gillespie Avenue phase and 26 seconds for the West Genesee Street phase.
- Change the yellow clearance time from 4.0 seconds to 3.0 seconds for all phases.
- Change the minimum gap and passage time from 3.0 seconds to 1.2 seconds for the Gillespie Avenue phase. This passage time is based on the prevailing speed limits and the length of the detection zones.

- Set the signal to maximum recall for the West Genesee Street phase.
- The coordinated phase is the West Genesee Street eastbound and westbound through phase.
- Change the cycle length to 75 seconds with an offset of 29 seconds for the AM peak hour, 75 seconds for the PM peak hour with an offset of 16 seconds and 80 seconds for the Saturday peak hour with an offset of 24 seconds.

2. Beverly Drive/Mackay Avenue

This is currently a four-legged intersection that operates as a semi-actuated, two phase traffic signal with presence detection on the Beverly Drive and Mackay Avenue approaches. There are pedestrian accommodations on all approaches with the exception of West Genesee Street westbound. The signal currently operates on a 57 second cycle during the AM, PM and Saturday peak hours with similar timings for each of the peak hours. The geometry of the intersection is as follows:

- West Genesee Street Eastbound – shared through/left turn lane and a shared through/right turn lane
- West Genesee Street Westbound – shared through/left turn lane and a shared through/right turn lane
- Beverly Drive Northbound – shared through/left turn lane and an exclusive right turn lane
- Mackay Avenue Southbound – single lane from which all movements are made.

The posted speed limit on West Genesee Street is 35 mph and 30 mph on Beverly Drive and Mackay Drive. Table II.D.2 presents the results of the level of service for the existing and proposed conditions.

Table II.D.2
West Genesee Street at Beverly Drive/Mackay Avenue

Intersection	AM		PM		Saturday	
	Existing	Proposed	Existing	Proposed	Existing	Proposed
West Genesee St/Beverly Dr						
EB L/T/R	A(5.1)	A(1.2)	A(7.9)	A(2.2)	A(8.2)	A(2.7)
WB L/T/R	A(4.5)	A(3.2)	A(9.4)	A(6.1)	A(7.8)	A(6.7)
NB L/T	C(20.0)	D(35.6)	B(19.9)	D(36.3)	C(24.6)	D(37.1)
R	B(16.1)	C(28.2)	B(16.0)	C(24.7)	B(15.1)	C(24.8)
SB L/T/R	B(17.3)	C(29.9)	B(14.1)	C(28.7)	B(15.8)	C(26.3)
Overall	A(7.8)	A(8.4)	B(10.4)	A(9.1)	B(10.3)	A(9.6)

XX(XX) – LOS(delay)

Recommended improvements to the signal timing include the following:

- Change the minimum green to 7 seconds for the side street phase and 32 seconds for the West Genesee Street phase.
- Change the yellow clearance time from 3.5 seconds to 3.0 seconds for the West Genesee Street phase.
- Change the minimum gap and passage time from 3.0 seconds to 1.9 seconds for the side street phase.
- The coordinated phase is the West Genesee Street eastbound and westbound through phase.
- Change the cycle length to 75 seconds with an offset of 1 second for the AM peak hour, 75

seconds with an offset of 74 seconds for the PM peak hour and 80 seconds for the Saturday peak hour with an offset of 78 seconds.

3. Whedon Road

This is currently a three-legged intersection that operates as a semi-actuated, three phase traffic signal with presence detection on the Whedon Road and West Genesee Street westbound approaches. There are pedestrian accommodations on all approaches with the exception of West Genesee Street westbound. The signal currently operates on a 74 second cycle during the AM, PM and Saturday peak hours with similar timings for each of the peak hours. The geometry of the intersection is as follows:

West Genesee Street Eastbound –shared through/right turn lane and an exclusive through lane

- West Genesee Street Westbound – shared through/left turn lane and an exclusive through lane
- Whedon Road Northbound – exclusive left and right turn lanes

The posted speed limit on West Genesee Street is 35 mph and 30 mph on Whedon Road. Table II.D.3 presents the results of the level of service for the existing and proposed conditions.

Table II.D.3
West Genesee Street at Whedon Road

Intersection	AM		PM		Saturday	
	Existing	Proposed	Existing	Proposed	Existing	Proposed
West Genesee St/Whedon Road						
EB T/R	B(10.4)	A(8.1)	B(12.6)	A(7.4)	B(12.9)	A(6.9)
WB L/T	A(4.5)	A(1.7)	A(5.2)	A(1.9)	A(4.6)	A(1.3)
NB L	B(30.1)	C(33.7)	C(30.1)	D(38.1)	C(27.6)	D(37.1)
R	B(16.1)	C(24.4)	B(15.5)	C(26.3)	B(15.9)	C(29.7)
Overall	B(11.0)	B(10.1)	B(10.4)	A(7.8)	A(9.9)	A(6.6)

XX(XX) – LOS(delay)

Recommended improvements to the signal timing include the following:

- Change the minimum green to 7 seconds for the West Genesee Street left turn phase.
- Change the all red clearance time from 1.5 seconds to 2.0 seconds for the Whedon Road and West Genesee Street left turn phases and 2.5 seconds for the West Genesee Street through phases.
- Change the minimum gap and passage time to 1.2 seconds for the Whedon Road and West Genesee Street westbound through phases and 1.4 second for the West Genesee Street left turn and eastbound through phases. This passage time is based on the prevailing speed limits and the length of the detection zones.
- Change the signal to minimum recall for the West Genesee Street through phases.
- The coordinated phase is the West Genesee Street eastbound and westbound through phase.
- Change the cycle length to 75 seconds with an offset of 0 seconds for the AM peak hour and PM peak hours and 80 seconds with an offset of 0 seconds for the Saturday peak hour.

E. Taft Road Corridor

This corridor includes the following nine signalized intersections with Taft Road:

- Kreischer Drive
- Interstate 81 Northbound Ramps
- Interstate 81 Southbound Ramps
- United States Post Office/John Street
- South Bay Road
- US Route 11
- Teachers Drive
- US Route 11/Shopping Center Driveway

The South Bay Road, US Route 11 and US Route 11/Shopping Center Driveway intersections currently operate as a coordinated system and the two intersections of Taft Road with the Interstate 81 Ramps operate as a coordinated system. These signals were analyzed as isolated intersections, as requested, but that is not how they operate. Consequently the levels of service shown is worse than what currently exists because of the analysis as isolated intersections.

1. Kreischer Road

This is a three-legged intersection which operates as a fully actuated, three phase signal with full presence detection on all approaches. There is a continuous sidewalk along the north side of East Taft Road and a crosswalk across the Kreischer Road approach with pedestrian signals. Minimum recall is on for the East Taft Road eastbound and westbound through phase. The signal currently operates on a maximum 62 second cycle during the AM peak hour and 84 seconds during the PM peak hour with different timings for each of the peak hours. The geometry of the intersection is as follows:

- East Taft Road Eastbound – exclusive left turn lane and two exclusive through lanes
- East Taft Road Westbound – exclusive through lane and a shared through/right turn lane
- Kreischer Road Southbound – exclusive left and right turn lanes

The posted speed limit on East Taft Road is 40 mph and 35 mph on Kreischer Road. Table II.E.1 presents the results of the level of service for the existing and proposed conditions.

Table II.E.1
East Taft Road at Kreischer Road

Intersection	AM		PM	
	Existing	Proposed	Existing	Proposed
East Taft Rd/Kreischer Rd				
EB L	A(4.0)	A(1.5)	A(7.8)	A(8.3)
T	A(3.4)	A(2.1)	A(3.2)	A(3.0)
WB T/R	B(11.3)	A(6.4)	B(14.2)	A(8.3)
SB L	B(19.9)	D(38.3)	C(24.8)	D(51.4)
R	B(12.0)	C(31.2)	B(14.7)	D(38.2)
Overall	A(8.6)	A(9.9)	B(10.7)	B(11.1)

XX(XX) – LOS(delay)

Recommended improvements to the signal timing include the following:

- Change the minimum green time to 15 seconds for Taft Road through phases and 10 seconds for the Kreischer Road phase.
- Change the yellow clearance interval from 3.8 seconds to 3.0 seconds for all phases.
- Change the all red phase from 2.0 seconds to 1.5 seconds for the Taft Road left turn phase and the Kreischer Road phase.
- Change the minimum gap and passage time from 3.0 seconds to 1.6 seconds for the Taft Road through phases, 1.5 seconds for the Taft Road left turn phase and 2.0 seconds for the Kreischer Road phase. This passage time is based on the prevailing speed limits and the length of the detection zones.
- The coordinated phase is the Taft Road eastbound and westbound through phase.
- Change the cycle length to 95 seconds with an offset of 91 seconds for the AM peak hour and 120 seconds for the PM peak hour with an offset of 68.

2. Interstate 81 Northbound Ramps

This is a four-legged intersection with one of the legs being an on-ramp to Interstate 81 northbound. It operates as a fully actuated, three phase signal with presence detection on all movements. The traffic signal is coordinated with the adjacent signal on East Taft Road at the Interstate 81 southbound ramps. There is a continuous sidewalk along the north side of East Taft Road and a crosswalk across the Interstate 81 northbound on ramp with pedestrian signals. Maximum recall is set for the East Taft Road eastbound and westbound through phase. The signal currently operates on a 60 second cycle during the AM peak hour and a 70 second cycle during the PM peak hour. The geometry of the intersection is as follows:

- East Taft Road Eastbound – exclusive left turn lane and two exclusive through lanes
- East Taft Road Westbound – exclusive through lane and shared through/right turn lane
- Interstate 81 Northbound Off Ramp – shared through/left turn lane and two exclusive right turn lanes

The posted speed limit is 35 mph on the East Taft Road eastbound approach, 40 mph on the East Taft Road westbound approach and 30 mph on the Interstate 81 northbound off ramp. Table II.E.2 presents the results of the level of service for the existing and proposed conditions.

Table II.E.2
East Taft Road at Interstate 81 Northbound Ramps

Intersection	AM		PM	
	Existing	Proposed	Existing	Proposed
East Taft Rd/I-81 NB Ramps				
EB L	A(9.1)	A(5.6)	C(23.3)	C(26.9)
T	A(1.7)	A(0.7)	A(2.8)	A(0.4)
WB T	A(9.9)	A(5.4)	C(24.0)	B(19.0)
NB L/R	C(25.2)	D(42.8)	D(36.3)	E(64.2)
R	C(20.4)	C(34.4)	C(25.2)	D(45.0)
Overall	B(10.9)	B(12.7)	C(21.3)	C(24.5)

XX(XX) – LOS(delay)

Recommended improvements to the signal timing include the following:

- Change the minimum green time to 5 seconds for the Taft Road left turn phase, 15 seconds for the Taft Road through phases and 7 seconds for the Interstate 81 Off Ramp phase.
- Change the yellow clearance interval from 3.0 seconds to 2.5 seconds for the Taft Road through phases and 2.0 seconds for the Taft Road left turn and Interstate 81 Off Ramp phases..
- Change the all red phase to 2.5 seconds for the Taft Road through phases and 2.0 seconds for all other phases.
- Change the minimum gap and passage time to 1.2 seconds for the Interstate 81 Off Ramp, 1.3 seconds for the Taft Road left turn phase, 1.4 seconds for the Taft Road eastbound through phase and 1.6 seconds for the Taft Road westbound through phase. This passage time is based on the prevailing speed limits and the length of the detection zones.
- Change the cycle length to 86 seconds for the AM peak hour and 87 seconds for the PM peak hour.
- The coordinated phase is the Taft Road eastbound and westbound through phase.
- Change the cycle length to 95 seconds with and offset of 18 seconds for the AM peak hour and 120 seconds with an offset of 38 seconds for the PM peak hour.

3. Interstate 81 Southbound Ramps

This is a four-legged intersection with one of the legs being an on-ramp to Interstate 81 southbound. It operates as a fully actuated, three phase signal with presence detection on all movements. The traffic signal is coordinated with the adjacent signal on East Taft Road at the Interstate 81 northbound ramps. There is a continuous sidewalk along the north side of East Taft Road and a crosswalk across the Interstate 81 southbound off ramp with pedestrian signals. Maximum recall is set for the East Taft Road eastbound and westbound through phase. The signal currently operates on a 60 second cycle during the AM peak hour and a 70 second cycle during the PM peak hour. The geometry of the intersection is as follows:

- East Taft Road Eastbound – two exclusive through lanes and exclusive right turn lane
- East Taft Road Westbound – two exclusive through lanes and exclusive left turn lane
- Interstate 81 Southbound Off Ramp –exclusive left turn lane and shared through/right turn lane

The posted speed limit is 35 mph on the East Taft Road eastbound approach, 40 mph on the East Taft Road westbound approach and 30 mph on the Interstate 81 southbound off ramp. Table II.E.3 presents the results of the level of service for the existing and proposed conditions.

Table II.E.3
East Taft Road at Interstate 81 Southbound Ramps

Intersection	AM		PM	
	Existing	Proposed	Existing	Proposed
East Taft Rd/I-81 SB Ramps				
EB T	B(18.8)	C(21.1)	B(16.5)	B(15.4)
R	B(15.1)	C(20.3)	B(11.6)	B(14.1)
WB L	C(22.2)	B(17.7)	B(16.4)	C(20.8)
T	B(11.7)	A(5.3)	A(3.5)	A(0.9)

	SB L	B(16.8)	C(24.9)	C(20.6)	D(51.9)
	T/R	D(41.3)	D(48.9)	C(22.7)	D(51.7)
Overall		C(22.5)	C(23.2)	B(13.3)	B(16.9)

Recommended improvements to the signal timing include the following:

- Change the minimum green time to 5 seconds for the Taft Road left turn phase, 7 seconds for the Interstate 81 Off Ramp phase and 15 seconds for the Taft Road through phases.
- Change the yellow clearance intervals to 3.0 seconds for all phases
- Change the all red interval to 1.5 seconds for the Taft Road left turn phase, 3.0 seconds for the Interstate 81 Off Ramp phase and 2.5 seconds for the Taft Road through phases.
- Change the minimum gap and passage time to 1.2 seconds for the Interstate 81 Off Ramp phase, 1.4 seconds for the Taft Road eastbound phase and 1.6 seconds for the Taft Road westbound phases. This passage time is based on the prevailing speed limits and the length of the detection zones.
- The coordinated phase is the Taft Road eastbound and westbound through phase
- Change the cycle length to 95 seconds with an offset of 91 seconds for the AM peak hour and 120 seconds with an offset of 62 seconds for the PM peak hour.

4. United State Post Office/John Street

This is a four-legged intersection which operates as a fully actuated, three-phase traffic signal with full presence detection on all approaches. There is a continuous sidewalk along the north side of East Taft Road and a crosswalk across the John Street approach with pedestrian signals. Recall is set to maximum for the East Taft Road eastbound and westbound through phase. The signal currently operates on a maximum 55 second cycle length during the AM peak hour and a 70 second cycle during the PM peak hour with different timings for each of the peak hours. The geometry of the intersection is as follows:

- East Taft Road Eastbound – exclusive left turn lane, exclusive through lane and a shared through/right turn lane
- East Taft Road Westbound – exclusive left turn lane, exclusive through lane and a shared through/right turn lane
- USPO Driveway Northbound – exclusive left turn lane, shared through/right turn lane
- John Street Southbound – single lane from which all movements are made

The posted speed limit on East Taft Road is 35 mph and 30 mph on the John Street and USPO Driveway approaches. Table II.E.4 presents the results of the level of service for the existing and proposed conditions.

**Table II.E.4
East Taft Road at USPO/John Street**

Intersection	AM		PM	
	Existing	Proposed	Existing	Proposed
East Taft Rd/John St/USPO				
EB L	A(5.3)	A(1.8)	A(4.6)	A(2.1)
EB T/R	A(9.2)	A(2.8)	A(8.8)	A(2.8)
WB L	A(3.3)	A(2.3)	A(3.5)	A(3.2)
WB T/R	A(7.8)	A(5.1)	A(5.9)	A(4.2)
NB L	B(18.3)	D(36.2)	C(26.4)	D(50.1)
NB T/R	B(17.9)	D(35.2)	C(24.6)	D(45.3)
SB L/T/R	B(19.7)	D(46.3)	C(25.2)	D(46.5)
Overall	A(9.0)	A(8.5)	A(9.2)	A(8.4)

XX(XX) – LOS(delay)

Recommended improvements to the signal timing include the following:

- Change the minimum green to 7 seconds for the side street phases and 15 seconds for the Taft Road through phases.
- Change the yellow clearance time to 3.0 seconds for all phases.
- Change the all red clearance time to 2.5 seconds for the Taft Road through phases.
- Change the minimum gap and passage time to 1.4 seconds for the Taft Road through phases, 1.2 seconds for the John Street phase, and 1.9 seconds for the Post Office phases. This passage time is based on the prevailing speed limits and the length of the detection zones.
- The coordinated phase is the Taft Road eastbound and westbound through phase.
- Change the cycle length to 95 seconds with an offset of 49 seconds for the AM peak hour and 120 seconds with an offset of 94 seconds for the PM peak hour.

5. South Bay Road

This is a four-legged intersection which operates as a fully-actuated, eight phase traffic signal with full presence detection on all movements. This traffic signal is coordinated with the adjacent signal at East Taft Road and US Route 11. There is a continuous sidewalk along the north side of East Taft Road and a crosswalk across the South Bay Road southbound approach with pedestrian signals. Maximum recall is set for the East Taft Road eastbound and westbound through movements. The signal currently operates on a 90 second cycle during both peak hours with similar timings for each of the peak hours. The geometry of the intersection is as follows:

- East Taft Road Eastbound – exclusive left turn lane, two exclusive through lanes and a channelized right turn lane that is under yield control
- East Taft Road Westbound – exclusive left turn lane, three exclusive through lanes and a

- channelized right turn lane that is under yield control
- South Bay Road Northbound – exclusive left turn lane, exclusive through lane and a shared through/right turn lane
- South Bay Road Southbound – exclusive left turn lane, exclusive through lane and a shared through/right turn lane

The posted speed limit on both roadways is 35 mph. Table II.E.5 presents the results of the level of service for the existing and proposed conditions.

Table II.E.5
East Taft Road at South Bay Road

Intersection	AM		PM	
	Existing	Proposed	Existing	Proposed
East Taft Rd/South Bay Rd				
EB L	C(34.5)	E(62.6)	D(36.9)	E(76.1)
T	B(16.2)	A(8.7)	C(21.7)	C(21.0)
R	C(29.8)	A(2.0)	B(19.3)	B(12.4)
WB L	D(37.4)	C(31.3)	D(36.9)	E(57.3)
T	B(12.5)	B(15.9)	B(18.8)	C(21.2)
R	B(11.2)	C(22.9)	B(16.2)	B(19.4)
NB L	D(39.6)	D(42.0)	F(196)	D(54.5)
T/R	C(31.7)	D(35.6)	C(34.5)	D(38.7)
SB L	D(40.8)	D(42.1)	D(42.1)	E(55.5)
T/R	C(34.1)	D(37.7)	C(31.6)	D(49.5)
Overall	C(23.8)	C(22.5)	D(40.8)	C(34.4)

XX(XX) – LOS(delay)

Recommended improvements to the signal timing include the following:

- Change the minimum green to 5 seconds for all left turn phases.
- Change the yellow clearance interval to 3.0 seconds for all phases.
- Change the all red interval to 2.5 seconds for all left turn phases and 3.0 seconds for all through phases.
- Change the minimum gap and passage time from 3.0 seconds to 1.0 seconds for the Taft Road westbound left turn phase, 1.1 seconds for the South Bay Road southbound through, the Taft Road eastbound left turn and the Taft Road westbound through phases, 1.2 seconds for the South Bay Road left turn phase and 1.3 seconds for the Taft Road eastbound through and South Bay Road northbound left turn phases. This passage time is based on the prevailing speed limits and the length of the detection zones.
- The coordinated phase is the Taft Road eastbound and westbound through phase.
- Change the cycle length to 95 seconds with an offset of 8 seconds for the AM peak hour and 120 seconds with an offset of 10 seconds for the PM peak hour.

6. US Route 11

This is a four-legged intersection which operates as a fully-actuated, eight phase traffic signal with presence detection on all movements. This traffic signal is coordinated with the adjacent signals at East

Taft Road/South Bay Road and US Route 11/Shopping Plaza. There is a continuous sidewalk along the north side of East Taft Road and a crosswalk across the US Route 11 southbound approach with pedestrian signals. Maximum recall is set for the East Taft Road eastbound and westbound through phases. The signal currently operates on a maximum 90 second cycle with similar timings for each of the peak hours. The geometry of the intersection is as follows:

- West Taft Road Eastbound – exclusive left turn lane, two exclusive through lanes and a channelized right turn lane that is under yield control
- West Taft Road Westbound – exclusive left turn lane, three exclusive through lanes and a channelized right turn lane that is under yield control
- US Route 11 Northbound – exclusive left turn lane, exclusive through lane and a shared through/right turn lane
- US Route 11 Southbound – exclusive left turn lane, two exclusive through lanes and an exclusive right turn lane

The posted speed limit on both roads is 35 mphs. Table II.E.6 presents the results of the level of service for the existing and proposed conditions.

Table II.E.6
East Taft Road at US Route 11

Intersection	AM		PM	
	Existing	Proposed	Existing	Proposed
West Taft Rd/US Route 11				
EB L	D(42.1)	F(81.2)	E(77.5)	F(102)
T	C(22.1)	B(17.7)	C(20.8)	C(28.2)
R	D(38.6)	E(69.0)	D(37.9)	D(38.4)
WB L	D(39.3)	D(50.9)	D(51.5)	E(64.8)
T	C(34.9)	A(9.4)	D(36.9)	C(22.1)
R	E(78.0)	A(2.9)	F(109)	B(13.7)
NB L	E(61.7)	E(78.5)	F(297)	F(91.2)
T/R	C(25.6)	C(32.5)	C(35.0)	D(40.5)
SB L	D(42.2)	E(55.8)	E(66.6)	F(85.3)
T	C(31.1)	D(51.7)	C(30.4)	F(102)
R	B(19.8)	C(28.7)	B(16.4)	C(32.4)
Overall	C(34.5)	D(38.2)	E(68.4)	D(50.4)

XX(XX) – LOS(delay)

Recommended improvements to the signal timing include the following:

- Change the minimum green time to 5 seconds for all left turn phases.
- Change the yellow clearance interval from 3.5 seconds to 3.0 seconds for all phases.
- Change the all red interval from 1.5 seconds to 2.5 seconds for all left turn phases and 3.0 seconds for all through phases.
- Change the minimum gap and passage time from 3.0 seconds to 1.4 seconds for all phases. This passage time is based on the prevailing speed limits and the length of the detection zones.
- The coordinated phase is the Taft Road eastbound and westbound through phase.
- Change the cycle length to 95 seconds with an offset of 0 seconds for the AM peak hour and 120

seconds with an offset of 0 seconds for the PM peak hour.

7. Teachers Drive

This is a four-legged intersection which operates as fully-actuated, three phase traffic signal with presence detection on all movements. There is a continuous sidewalk on the north side of West Taft Road with pedestrian crossings and pedestrian signals across the Teachers Drive southbound approach and the West Taft Road eastbound approach. Maximum recall is set for the West Taft Road eastbound and westbound through phases. The signal currently operates on a maximum 80 second cycle during the AM peak hour and 100 second cycle during the PM peak hour with different timings for each of the peak hours. The geometry of the intersection is as follows:

- West Taft Road Eastbound – exclusive left turn lane, exclusive through lane and a shared through/right turn lane
- West Taft Road Westbound – exclusive left turn lane, two exclusive through lanes and a shared through/right turn lane
- Plaza Driveway Northbound – exclusive left turn lane and a shared through/right turn lane
- Teachers Drive Southbound – exclusive left turn lane and a shared through/right turn lane

The posted speed limit on West Taft Road is 35 mph and 30 mph on the side roads. Table II.E.7 presents the results of the level of service for the existing and proposed conditions.

Table II.E.7
West Taft Road at Teachers Drive

Intersection	AM		PM	
	Existing	Proposed	Existing	Proposed
West Taft Rd/Teachers Dr				
EB L	A(7.8)	A(9.0)	A(3.9)	A(2.7)
EB T/R	B(14.6)	B(16.3)	A(6.2)	A(4.6)
WB L	B(11.8)	B(19.6)	A(5.7)	A(4.3)
WB T/R	B(16.2)	C(20.1)	A(9.5)	A(6.2)
NB L	C(20.6)	C(23.9)	C(27.6)	D(51.4)
T/R	B(19.8)	C(23.1)	C(26.7)	D(50.2)
SB L	D(52.8)	D(53.6)	C(30.4)	E(61.9)
T/R	B(16.2)	C(22.1)	C(22.3)	E(60.5)
Overall	B(18.9)	C(21.8)	A(10.0)	B(12.1)

XX(XX) – LOS(delay)

Recommended improvements to the signal timing include the following:

- Change the minimum green time to 5.0 seconds for the Taft Road left turn phase, 7 seconds for the Teacher Driveway phase and 39 seconds for the Taft Road through phases.
- Change the all red clearance time to 2.5 seconds for the Taft Road through phases, 3.0 seconds for the side street phases.
- Change the minimum gap and passage time to 1.2 seconds for the Teacher Driveway phase, 1.3 seconds for the Taft Road left turn phases, 1.4 seconds for the Taft Road eastbound through phase, 1.5 seconds for the Taft Road westbound through phase and 2.0 seconds for the Pharmacy

Driveway phase. This passage time is based on the prevailing speed limits and the length of the detection zones.

- The coordinated phase is the Taft Road eastbound and westbound through phase.
- Change the cycle length to 95 seconds with an offset of 64 seconds for the AM peak hour and 120 seconds and an offset of 98 seconds for the PM peak hour.

8. US Route 11 at Shopping Plaza

This is a three-legged intersection which operates as a fully-actuated, three phase signal with presence detection on all movements. This signal is coordinated with the signal at the intersection of US Route 11 and West Taft Road. There are crosswalks across the US Route 11 southbound and Shopping Plaza Driveway approaches with pedestrian signals. Maximum recall is set for the US Route 11 northbound and southbound through phases. The signal currently operates on a maximum 90 second cycle with similar timings for each of the peak hours. The geometry of the intersection is as follows:

- US Route 11 Northbound – exclusive left turn lane and two exclusive through lanes
- US Route 11 Southbound – exclusive through lane and a shared through/right turn lane
- Shopping Plaza Eastbound – exclusive left and right turn lanes

The posted speed limit on US Route 11 is 35 mph and 30 mph on the Shopping Plaza driveway. Table II.E.8 presents the results of the level of service for the existing and proposed conditions.

Table II.E.8
US Route 11 at Shopping Plaza

Intersection	AM		PM	
	Existing	Proposed	Existing	Proposed
US Route 11/Shopping Plaza				
EB L	D(44.3)	D(43.9)	D(37.9)	E(57.3)
R	D(35.6)	D(38.5)	C(26.1)	D(39.7)
NB L	A(1.0)	A(0.5)	A(4.8)	A(2.2)
T	A(0.9)	A(0.5)	A(2.6)	A(1.2)
SB T/R	A(3.5)	A(3.8)	A(9.4)	A(8.2)
Overall	A(5.0)	A(5.0)	A(10.0)	B(11.4)

XX(XX) – LOS(delay)

Recommended improvements to the signal timing include the following:

- Change the minimum green time to 5 seconds for US Route 11 left turn phase, 7 seconds for the driveway phase and 10 seconds for the US Route 11 phases.
- Change the yellow clearance interval to 3.0 seconds for all phases.
- Change the all red clearance time to 1.5 seconds for the driveway phase and 2.5 seconds for all other phases.
- Change the minimum gap and passage time to 1.4 seconds for all phases with the exception of the US Route 11 left turn phase. This passage time is based on the prevailing speed limits and the length of the detection zones.
- The coordinated phase is the Taft Road eastbound and westbound through phase.

- Change the cycle length to 95 seconds with an offset of 57 seconds for the AM peak hour and 120 seconds with an offset of 76 seconds for the PM peak hour.

CHAPTER III

SUMMARY OF RECOMMENDATIONS

Based on the results of the signal timing analysis of the two coordinated study area corridors, the following is a summary of the recommendations.

❖ **Buckley Road Corridor**

• **Bailey Road**

- Change phasing to allow for a lead southbound left turn phase.
- Set minimum green time to 5 seconds for southbound left turn phase
- Change minimum green time to 7 seconds for Bailey Road phase
- Change yellow clearance interval to 3 seconds for all phases.
- Change the red clearance interval from 2 seconds to 3 seconds for the Buckley Road through phases.
- Set the Buckley Road through phases to minimum recall.
- Change the minimum gap and passage time on the Buckley Road phases to 1.1 seconds and 1.4 seconds for the Bailey Road phase. This passage time is based on the prevailing speed limits and the length of the detection zones.
- The coordinated movements are the Buckley Road northbound and southbound through movements.
- Set the cycle length to 65 seconds for the AM peak hour with an offset of 31 seconds. Change the cycle length to 75 seconds with an offset of 28 seconds for the PM peak hour. Change the cycle length to 85 seconds with an offset of 24 seconds for the School peak hour.

• **Hopkins Road**

- Change the minimum green to 30 seconds for Buckley Road and 10 seconds for Hopkins Road.
- Change all red clearance interval from 2.0 seconds for all phases to 2.5 seconds for Buckley Road and 1.0 seconds for Hopkins Road
- Change the minimum gap and passage time from 3.0 seconds to 2.2 seconds for the Hopkins Road phase.
- The coordinated phase is the Buckley Road northbound and southbound through phase.
- Change the cycle length to 65 seconds for AM with an offset of 0 seconds, 75 seconds for the PM peak hour with an offset of 0 and 85 seconds with an offset of 9 for the Saturday peak hour.

❖ **Henry Clay Boulevard Corridor**

• **Buckley Road**

- Change the minimum green to 7 seconds for the Henry Clay Boulevard left turn phase and all through movement phases to 15 seconds.
- Change the yellow clearance time from 4.5 seconds to 3.0 seconds for all through movement phases.

- Change the all red clearance time to 2.0 seconds for the Henry Clay Boulevard left turn phases, 2.5 seconds for the Henry Clay Boulevard through and Buckley Road left turn phases and 3.0 seconds for the Buckley Road through phases..
 - Change the minimum gap and passage time to 1.2 seconds for Buckley Road westbound left turn phase, 1.4 seconds for the Buckley Road westbound through phase, 1.6 seconds for the Henry Clay Boulevard southbound left turn and Buckley Road eastbound left turn phases, and 1.7 seconds for all other phases. This passage time is based on the prevailing speed limits and the length of the detection zones.
 - The coordinated phase is the Henry Clay Boulevard northbound and southbound through phases.
 - Change the cycle length to 105 seconds with an offset of 6 seconds for the AM peak hour and 105 seconds for the PM peak hour with an offset of 68 seconds.
- **Wetzel Road**
 - Change the minimum green to 5 seconds for all left turn phases and 15 seconds for the through phases.
 - Change the yellow clearance time to 3.0 seconds for all phases.
 - Change the all red clearance time from 2.0 seconds to 3.0 seconds for the Buckley Road through phases.
 - Change the passage time to 1.3 seconds for Buckley Road left turn phases, 1.4 seconds for the Buckley Road through phases, 1.5 seconds for Henry Clay Boulevard left turn phases and 1.7 seconds for the Henry Clay Boulevard through phases. This passage time is based on the prevailing speed limits and the length of the detection zones.
 - The coordinated phase is the Henry Clay Boulevard northbound and southbound through phase.
 - Change the cycle length to 105 seconds with an offset of 0 for the AM and PM peak hours.
- ❖ **West Genesee Street Corridor**
- **Gillespie Avenue**
 - Change the minimum green to 7 seconds for the Gillespie Avenue phase and 26 seconds for the West Genesee Street phase.
 - Change the yellow clearance time from 4.0 seconds to 3.0 seconds for all phases.
 - Change the minimum gap and passage time from 3.0 seconds to 1.2 seconds for the Gillespie Avenue phase. This passage time is based on the prevailing speed limits and the length of the detection zones.
 - Set the signal to maximum recall for the West Genesee Street phase.
 - The coordinated phase is the West Genesee Street eastbound and westbound through phase.
 - Change the cycle length to 75 seconds with an offset of 29 seconds for the AM peak hour, 75 seconds for the PM peak hour with an offset of 16 seconds and 80 seconds for the Saturday peak hour with an offset of 24 seconds.
 - **Beverly Drive/Mackay Avenue**
 - Change the minimum green to 7 seconds for the side street phase and 32 seconds for the West Genesee Street phase.

- Change the yellow clearance time from 3.5 seconds to 3.0 seconds for the West Genesee Street phase.
- Change the minimum gap and passage time from 3.0 seconds to 1.9 seconds for the side street phase.
- The coordinated phase is the West Genesee Street eastbound and westbound through phase.
- Change the cycle length to 75 seconds with an offset of 1 second for the AM peak hour, 75 seconds with an offset of 74 seconds for the PM peak hour and 80 seconds for the Saturday peak hour with an offset of 78 seconds.

- **Whedon Road**

- Change the minimum green to 7 seconds for the West Genesee Street left turn phase.
- Change the all red clearance time from 1.5 seconds to 2.0 seconds for the Whedon Road and West Genesee Street left turn phases and 2.5 seconds for the West Genesee Street through phases.
- Change the minimum gap and passage time to 1.2 seconds for the Whedon Road and West Genesee Street westbound through phases and 1.4 second for the West Genesee Street left turn and eastbound through phases. This passage time is based on the prevailing speed limits and the length of the detection zones.
- Change the signal to minimum recall for the West Genesee Street through phases.
- The coordinated phase is the West Genesee Street eastbound and westbound through phase.
- Change the cycle length to 75 seconds with an offset of 0 seconds for the AM peak hour and PM peak hours and 80 seconds with an offset of 0 seconds for the Saturday peak hour.

❖ **Taft Road Corridor**

- **Kreischer Road**

- Change the minimum green time to 15 seconds for Taft Road through phases and 10 seconds for the Kreischer Road phase.
- Change the yellow clearance interval from 3.8 seconds to 3.0 seconds for all phases.
- Change the all red phase from 2.0 seconds to 1.5 seconds for the Taft Road left turn phase and the Kreischer Road phase.
- Change the minimum gap and passage time from 3.0 seconds to 1.6 seconds for the Taft Road through phases, 1.5 seconds for the Taft Road left turn phase and 2.0 seconds for the Kreischer Road phase. This passage time is based on the prevailing speed limits and the length of the detection zones.
- The coordinated phase is the Taft Road eastbound and westbound through phase.
- Change the cycle length to 95 seconds with an offset of 91 seconds for the AM peak hour and 120 seconds for the PM peak hour with an offset of 68.

- **Interstate 81 Northbound Ramps**

- Change the minimum green time to 5 seconds for the Taft Road left turn phase, 15 seconds for the Taft Road through phases and 7 seconds for the Interstate 81 Off Ramp phase.

- Change the yellow clearance interval from 3.0 seconds to 2.5 seconds for the Taft Road through phases and 2.0 seconds for the Taft Road left turn and Interstate 81 Off Ramp phases..
 - Change the all red phase to 2.5 seconds for the Taft Road through phases and 2.0 seconds for all other phases.
 - Change the minimum gap and passage time to 1.2 seconds for the Interstate 81 Off Ramp, 1.3 seconds for the Taft Road left turn phase, 1.4 seconds for the Taft Road eastbound through phase and 1.6 seconds for the Taft Road westbound through phase. This passage time is based on the prevailing speed limits and the length of the detection zones.
 - Change the cycle length to 86 seconds for the AM peak hour and 87 seconds for the PM peak hour.
 - The coordinated phase is the Taft Road eastbound and westbound through phase.
 - Change the cycle length to 95 seconds with an offset of 18 seconds for the AM peak hour and 120 seconds with an offset of 38 seconds for the PM peak hour.
- **Interstate 81 Southbound Ramps**
 - Change the minimum green time to 5 seconds for the Taft Road left turn phase, 7 seconds for the Interstate 81 Off Ramp phase and 15 seconds for the Taft Road through phases.
 - Change the yellow clearance intervals to 3.0 seconds for all phases
 - Change the all red interval to 1.5 seconds for the Taft Road left turn phase, 3.0 seconds for the Interstate 81 Off Ramp phase and 2.5 seconds for the Taft Road through phases.
 - Change the minimum gap and passage time to 1.2 seconds for the Interstate 81 Off Ramp phase, 1.4 seconds for the Taft Road eastbound phase and 1.6 seconds for the Taft Road westbound phases. This passage time is based on the prevailing speed limits and the length of the detection zones.
 - The coordinated phase is the Taft Road eastbound and westbound through phase
 - Change the cycle length to 95 seconds with an offset of 91 seconds for the AM peak hour and 120 seconds with an offset of 62 seconds for the PM peak hour.
- **USPO/John Street**
 - Change the minimum green to 7 seconds for the side street phases and 15 seconds for the Taft Road through phases.
 - Change the yellow clearance time to 3.0 seconds for all phases.
 - Change the all red clearance time to 2.5 seconds for the Taft Road through phases.
 - Change the minimum gap and passage time to 1.4 seconds for the Taft Road through phases, 1.2 seconds for the John Street phase, and 1.9 seconds for the Post Office phases. This passage time is based on the prevailing speed limits and the length of the detection zones.
 - The coordinated phase is the Taft Road eastbound and westbound through phase.
 - Change the cycle length to 95 seconds with an offset of 49 seconds for the AM peak hour and 120 seconds with an offset of 94 seconds for the PM peak hour.
- **South Bay Road**
 - Change the minimum green to 5 seconds for all left turn phases.
 - Change the yellow clearance interval to 3.0 seconds for all phases.

- Change the all red interval to 2.5 seconds for all left turn phases and 3.0 seconds for all through phases.
 - Change the minimum gap and passage time from 3.0 seconds to 1.0 seconds for the Taft Road westbound left turn phase, 1.1 seconds for the South Bay Road southbound through, the Taft Road eastbound left turn and the Taft Road westbound through phases, 1.2 seconds for the South Bay Road left turn phase and 1.3 seconds for the Taft Road eastbound through and South Bay Road northbound left turn phases. This passage time is based on the prevailing speed limits and the length of the detection zones.
 - The coordinated phase is the Taft Road eastbound and westbound through phase.
 - Change the cycle length to 95 seconds with an offset of 8 seconds for the AM peak hour and 120 seconds with an offset of 10 seconds for the PM peak hour.
- **US Route 11**
 - Change the minimum green time to 5 seconds for all left turn phases.
 - Change the yellow clearance interval from 3.5 seconds to 3.0 seconds for all phases.
 - Change the all red interval from 1.5 seconds to 2.5 seconds for all left turn phases and 3.0 seconds for all through phases.
 - Change the minimum gap and passage time from 3.0 seconds to 1.4 seconds for all phases. This passage time is based on the prevailing speed limits and the length of the detection zones.
 - The coordinated phase is the Taft Road eastbound and westbound through phase.
 - Change the cycle length to 95 seconds with an offset of 0 seconds for the AM peak hour and 120 seconds with an offset of 0 seconds for the PM peak hour.
- **Teachers Drive**
 - Change the minimum green time to 5.0 seconds for the Taft Road left turn phase, 7 seconds for the Teacher Driveway phase and 39 seconds for the Taft Road through phases.
 - Change the all red clearance time to 2.5 seconds for the Taft Road through phases, 3.0 seconds for the side street phases.
 - Change the minimum gap and passage time to 1.2 seconds for the Teacher Driveway phase, 1.3 seconds for the Taft Road left turn phases, 1.4 seconds for the Taft Road eastbound through phase, 1.5 seconds for the Taft Road westbound through phase and 2.0 seconds for the Pharmacy Driveway phase. This passage time is based on the prevailing speed limits and the length of the detection zones.
 - The coordinated phase is the Taft Road eastbound and westbound through phase.
 - Change the cycle length to 95 seconds with an offset of 64 seconds for the AM peak hour and 120 seconds and an offset of 98 seconds for the PM peak hour.
- **US Route 11 at Shopping Center**
 - Change the minimum green time to 5 seconds for US Route 11 left turn phase, 7 seconds for the driveway phase and 10 seconds for the US Route 11 phases.
 - Change the yellow clearance interval to 3.0 seconds for all phases.
 - Change the all red clearance time to 1.5 seconds for the driveway phase and 2.5 seconds for all other phases.

- Change the minimum gap and passage time to 1.4 seconds for all phases with the exception of the US Route 11 left turn phase. This passage time is based on the prevailing speed limits and the length of the detection zones.
- The coordinated phase is the Taft Road eastbound and westbound through phase.
- Change the cycle length to 95 seconds with an offset of 57 seconds for the AM peak hour and 120 seconds with an offset of 76 seconds for the PM peak hour.